DELTA COUNTY PLANNING COMMISSION

Delta County Administration Building
560 Dodge St., Delta, CO 81416
Wednesday, November 17, 2021 @ 5:30 p.m.

Tom Kay, Chair
Tate Locke, Vice-Chair
Carl Holm, Director

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https://www.deltacounty.com/725/Agendas-and-Minutes
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Instructions for Public Participation via Zoom:
The public can join the meeting remotely by registering in advance of the meeting at:
https://us02web.zoom.us/meeting/register/tZUpfuiuqDgsEtDfRLf9jxoLnISzt9Y4S0lP
After registering, you will receive a confirmation email containing information about joining the meeting.

REGULAR AGENDA

5:30 P.M. – **CALL TO ORDER**

ROLL CALL

DISTRICT 1	DISTRICT 2	DISTRICT 3
Dick Gilmore	Layne Brones	Jacob Gray
Steve Schrock	Tate Locke, Vice Chair	Tom Kay, Chair
Steve Shea	Hardy Hutto	Eli Wolcott
Cindy Watson, Associate	Vacant, Associate	Kate Darlington, Associate

PUBLIC COMMENTS

This is time set aside for the public to comment on matters not on the agenda. The Chair may set a time limit for speakers.

AGENDA ADDITIONS, DELETIONS, AND CORRECTIONS

The Planning Commission Secretary will announce if there are any changes to the agenda that arose after posting of the agenda.

SCHEDULED ITEMS

1. Meeting Minutes
    a. October 27, 2021
    b. October 28, 2021

    RECOMMENDATION: Approve the action minutes as presented

CERTIFICATION OF POSTING
On 11/12/2021 at 8:30 AM, Kate Kelly did post the above AGENDA as public notice of the 11/17/2021 meeting. The official notice is placed on the front entrance of the Delta County Courthouse located at 501 Palmer, Delta, Colorado and a courtesy copy is sent to the Delta County website at www.deltacounty.com.

2. PLN21-010/Corona
   Consider: A Preliminary Plat to subdivide approximately 34.0 acres into six (6) lots in the A-5 zoning district. The property is located at 5898 & 5884 2100 Road, Delta.
   RECOMMENDATION: Staff recommends that the Planning Commission recommend that the Board of County Commissioners:
   a. Find that PLN21-010 meets the requirements of the Land Use Code for a Preliminary Plat; and
   b. Approve a Preliminary Plat to subdivide 34.36 acres into six (6) lots: Lot 1 (5.085 acres), Lot 2 (5.085 acres), Lot 3 (5.015 acres), Lot 4 (5.005 acres), Lot 5 (5.015 acres) and Lot 6 (9.158 acres) in the A-5 zone, subject to four (4) conditions.

3. PLN21-030/Garnet Mesa Solar LLC
   Consider: A Limited Use Permit to install and operate an 80MW ground mounted solar photovoltaic energy generating facility. The project involves two sites consisting of three (3) parcels totaling 472+ acres generally located west of 2200 Road and at the southwest corner of G Road and 2100 Road, approximately 2.2 miles east of Delta (Parcels: 3455-231-00-001, 3455-232-00-009, 3455-133-00-020).
   RECOMMENDATION: Staff recommends that the Planning Commission recommend that the Board of County Commissioners:
   a. Find that PLN21-030 complies with the Land Use Code; and
   b. Approve PLN21-030, a Limited Use Permit for an 80MW ground mounted solar photovoltaic energy generating facility developed over three (3) parcels totaling 472.85 acres generally located between 2200 Road on the east and 2050 Road on the west, north and south of G Road, Delta (Parcel: 3455-231-00-001, 3455-232-00-009, 3455-133-00-020), subject to four (4) conditions.

COMMISSIONER COMMENTS, REQUESTS AND REFERRALS

This is time set aside for the Commission to comment, request, or refer a matter that is not on the agenda for future consideration.

DEPARTMENT REPORT

This is time set aside for the Director to report on matters affecting the Department.

ADJOURNMENT

Next Meeting: Wednesday, December 8, 2021 at 5:30 pm, Hotchkiss, CO

CERTIFICATION OF POSTING

On 11/12/2021 at 8:30 AM, Kate Kelly did post the above AGENDA as public notice of the 11/17/2021 meeting. The official notice is placed on the front entrance of the Delta County Courthouse located at 501 Palmer, Delta, Colorado and a courtesy copy is sent to the Delta County website at www.deltacounty.com.

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PLANNING & COMMUNITY DEVELOPMENT

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REGULAR PLANNING COMMISSION MEETING MINUTES
DELTA COUNTY
560 DODGE ST, DELTA, CO 81416
October 27, 2021

Planning Commission Members in Attendance:
Hardy Hutto
Steve Schrock
Jacob Gray
Kate Darlington
Cindy Watson
Tom Kay
Tate Locke
Eli Wolcott
Dick Gilmore

Absent Members:
Steve Shea
Layne Brones

Planning Staff in Attendance:
Delta County Community Development & Natural Resource Director, Carl Holm
Delta County Planning & Community Development Technician II, Kate Kelly
Delta County Planning & Community Development Administrative Assistant, Kim Henderson

Chairman Tom Kay called the meeting to order at 5:30 p.m. in the Administration Building Commissioner's Meeting Room.

Item #1: Meeting Minutes
a. August 25, 2021
b. September 8, 2021
RECOMMENDATION: Approve the action minutes as presented.

Motion/Second: Dick Gilmore moves to approve the minutes as presented. Eli Wolcott seconds the motion.

Action: Motion carried unanimously

Item #2 SUB19-040/Victorian Subdivision
Consider: A Sketch Plan for SUB19-040/Victorian Subdivision: subdividing approximately 34 acres into two (2) Lots: Lot 1 (21.2 acres), Lot 2 (13.4 acres). The project is located at 37586 & 37614 Back River Road, Paonia.
RECOMMENDATION: Staff recommends that the Planning Commission continue SUB19-040 (Sketch Plan) to a date uncertain with direction to address access, lot design, and irrigation prior to the Planning Commission considering a Sketch Plan for SUB19-040/Victorian Subdivision.

Motion/Second: Eli Wolcott moves to approve the Sketch Plan SUB19-040/Victorian Subdivision with staff recommendations as well as the additional recommendations: a clear decision on which access is for each property, a written irrigation plan with infrastructure, make the 10 foot easements into 20 foot to the irrigation box, confirm lot line encroachment of the second access, see finalized lot lines, proper distribution of irrigation water, clean up all mistakes on the prior sketch plans, consolidating notes from the new sketch and old, note that the County needs to move the domestic line if the 50 foot Right of Way is taken. Jacob Gray seconds the motion.

Action: Motion carried 5-3

Item #3 PLN21-001/Miller (Alliance Ready Mix) Conditional Use Permit (CUP)
RECOMMENDATION: Staff recommends that the Planning Commission recommend that the Board of County Commissioners:
a. Find that PLN21-001 complies with the Land Use Code; and
b. Approve PLN21-001, a Conditional Use Permit for a Mobile Concrete Batch Plant at 19337 F Road, Delta (Parcel: 345522300015), subject to eleven (11) conditions.

Motion/Second: Tate Locke moves to continue PLN21-001 until the recommended conditions of approval by staff are answered and until a business plan is addressed for the commission to evaluate. Eli Wolcott seconds the motion.

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Action: Motion carried unanimously.

Meeting adjourned at 9:00 p.m.

Respectfully submitted by:
Administrative Assistant, Kim Henderson

DRAFT

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PLANNING REFRESHER WORKSHOP MEETING MINUTES
PRESENTED BY THE DEPARTMENT OF LOCAL AFFAIRS (DOLA)
DELTA COUNTY
560 DODGE ST, DELTA, CO 81416
October 28, 2021

Board of Adjustments Members in Attendance:
Mike Twamley, District 1

Planning Commission Members in Attendance:
Hardy Hutto
Steve Schrock
Layne Brones

Planning Commission Members in Attendance Via Zoom:
Jacob Gray
Kate Darlington
Tom Kay
Eli Wolcott
Dick Gilmore
Cindy Watson

Delta County Staff in Attendance:
Delta County Community Development & Natural Resource Director, Carl Holm
Delta County Planning & Community Development Technician II, Kate Kelly
Delta County Planning & Community Development Administrative Assistant, Kim Henderson
Delta County Planning & Community Development Code Compliance Officer, Everett Neil
Delta County Engineer, Tim McCracken
Delta County Engineering Technician, Sara Crawford
Delta County Administrator, Robbie LaValley

City of Delta Community Development Manager, Shay Coburn called the meeting to order at 6:00 p.m. in the Administration Building Commissioner's Meeting Room.

Item #1:	6:00pm	Welcome & Introductions Why Plan & Planning Authority Roles & Responsibilities of Elected Officials & Planning Commissioners Long Range Planning and Implementation Tools
	6:45pm	Effective Meetings & Decision-Making "How to Stay Out of Trouble" – Legal & Ethical Issues Scenario Discussion (throughout) Questions and Discussion
	8:00pm	Adjourn

Meeting adjourned at 8:00 p.m.

Respectfully submitted by:
Administrative Assistant, Kim Henderson

DRAFT

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STAFF REPORT

Delta County Planning Commission

Delta County Administration Building
560 Dodge Street, Delta, CO 81416

Wednesday, November 17, 2021 @ 5:30 p.m.

PLN21-010/Corona Preliminary Plat

Consider a Preliminary Plat to subdivide approximately 34.0 acres into six (6) lots in the A-5 zoning district. The property is located at 5898 & 5884 2100 Road, Delta.

PROJECT INFORMATION:
Property Owner: Ricardo Corona
Applicant: Ricardo Corona
Site Address: 2100 Road/Pleasant Valley Road, Delta
Location: Section 24, Township 15S, Range 95W, 6th PM
Parcel ID/Acct: 3455-242-10-003/R023258
Parcel Size: 34.36 acres
Zoning: A-5

RECOMMENDATION:
Staff recommends that the Planning Commission recommend that the Board of County Commissioners:

a) Find that PLN21-030 meets the requirements of the Land Use Code for a Preliminary Plat; and
b) Approve a Preliminary Plat to subdivide 34.36 acres into six (6) lots: Lot 1 (5.085 acres), Lot 2 (5.085 acres), Lot 3 (5.015 acres), Lot 4 (5.005 acres), Lot 5 (5.015 acres) and Lot 6 (9.158 acres) in the A-5 zone, subject to four (4) conditions.

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SUMMARY:

Mr. Ricardo Corona, owner/applicant, is requesting a 6-lot subdivision (Preliminary Plat) from an approximately 34.36-acre through-parcel with frontage on 2100 Road and Pleasant Valley Road about 3 miles east of the City of Delta. Lots 1 & 2 have an existing shared access, Lots 3 & 6 will take access from an existing 60-foot access easement from 2100 Road and Lots 4 & 5 will have a shared access off of Pleasant Valley Road.

On June 14, 2021, Mr. Corona applied for a variance for the proposed Preliminary Plat as the original lots consisted of two (2) 2.5-acre lots and one (1) 28-acre remainder lot. The variance application was presented to the Board of Adjustments (BOA) on August 26, 2021. The BOA voted 3-0 to deny the request for variances allowing creation of three lots, two of which did not meet the minimum 5.0 acres. The BOA determined that a variance was not required to subdivide this property as there was ability to subdivide the parcel and meet the zoning standards.

A revised Preliminary Plat (dated September 9, 2021) was submitted to the Planning Department, by Mr. Corona, on September 30, 2021. This revised plat was for the currently proposed six (6) lot subdivision. The minimum acreage for subdividing this parcel is 5 acres per lot and the proposal includes creating six lots of 5 acres or more. The Preliminary Plat, with and without an aerial overlay, is attached (**Attachment**).

Staff sent the Preliminary Plat to the Review Agencies on September 30, 2021. Comments were received from multiple agencies. In addition, a public hearing notice was sent to adjoining property owners within a 200' radius on November 2, 2021. Staff has received one comment from a neighbor.

DISCUSSION:

The application (PLN21-010/Corona) is for a 6-lot subdivision (Preliminary Plat) from an approximately 34.36-acre through parcel with frontage on 2100 Road and Pleasant Valley Road.

- Lot 1: 5.085 acres (5884 2100 Road)
- Lot 2: 5.085 acres (5898 2100 Road)
- Lot 3: 5.015 acres (vacant, 2100 Road Access Easement)
- Lot 4: 5.005 acres (vacant, Pleasant Valley Road)
- Lot 5: 5.015 acres (vacant, Pleasant Valley Road)
- Lot 6: 9.158 acres (vacant, 2100 Road Access Easement)

2100 Road and Pleasant Valley Road are public roads (publically maintained).

Pleasant Valley Subdivision (2004). Properties north, south, and east of the subject property were generally created by the Pleasant Valley Major Subdivision (MJ 02-020), which subdivided about 142 acres into 35 lots ranging in size from 1.92 to 10.01 acres, and a 4.80-acre pond area.

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There is an existing 60-foot wide Emergency Access Easement (private easement) between Lots 19 and 20 of the Pleasant Valley Subdivision. A 60-foot-wide easement also exists across the northern portion of the subject parcel (Lot 3), connecting emergency access from Friendship Road to 2100 Road. Mr. Corona noted that this access has been fenced by the neighboring property owner, blocking access.

Hood Mobile Home Subdivision (2009). The "Hood Mobile Home Subdivision" (MJ07-013) subdivided a 35.2-acre parcel into three lots: Lots 1 & 2 (2.5 acres each), and Lot 3 (35.2 acres). Lot 1 was to have three RV spaces plus an existing double wide served by two septic systems. Lot 2 was to contain two existing single wide mobile homes and one septic system. The Final Plat was conditioned to include the following statements (notes):

- "*The SCS report indicates there may be severe limitations for homes, septic systems due to slope, shallow and steepness, high shrink/swell potential, very slow internal drainage*"
- *Lot 1 and Lot 2 are restricted to no further subdivision, Lot 1 to one single family dwelling and 3 RV spaces and Lot 2 to two single family dwellings*."

The subject 35-acre parcel is the remainder from that subdivision, and includes a detention pond to serve that development. A copy of this Plat is **attached** for reference.

The area south of G Road and west of 2100 Road is zoned A-35 and consists of larger Ag properties. This subject property and the Pleasant Valley area are zoned A-5 under the new Land Use Code. The minimum acreage for subdividing this parcel is 5 acres per lot.

A pre-application conference was held on May 3, 2021 with staff representatives from County Planning, Engineering, Road & Bridge and GIS. At a pre-application conference, staff discussed items, including: the 60-foot-wide (private) easement across the northern portion of the subject parcel, the proposed configuration (lot design), the variance process, access, and domestic water/septic. The 60-foot-wide easement serves as an emergency access for residential properties north/east of the subject lot. However, this access has been fenced off (blocked) by the neighboring property owner (Lot 20 of the Pleasant Valley Subdivision).

The Variance process was discussed at length as the applicant was proposing to subdivide the subject property into three (3) lots, two of which would not meet the minimum acreage required by the LUC. The proposed layout would not impact agricultural operations; however, staff felt that the exception for the variation to the lot size was to create a single exception to address a unique situation, not a subdivision. It was explained that there was the ability to create lots that are 5 acres (2-3 lots) vs. 2.5 acre lots, such that no variance is required.

On June 14, 2021, Mr. Corona applied for a Variance. The variance application was presented to the Board of Adjustments (BOA) on August 26, 2021. The BOA voted 3-0 to deny the request for variances allowing creation of three lots, two of which did not

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meet the minimum 5.0 acres. The BOA determined that a variance was not required to subdivide this property as there was ability to subdivide the parcel and meet the zoning standards.

Staff received a Revised Preliminary Plat from Mr. Corona on September 30, 2021. The revised plat shows a total of six (6) lots being proposed with access from both 2100 Road and Pleasant Valley Road (public roads, publicly maintained). All six lots meet the minimum required acreage as listed in the LUC.

Staff met with Mr. Corona to discuss the comments received from Tri-County Water where they identify which lots will require meters/taps to be purchased. Tri-County did not indicate that taps were not available for this subdivision. Mr. Corona confirmed that the residents for the proposed Lots 1 & 2 are receiving water that is piped over from the existing meter located on the proposed Lot 5 (TCW Acct. #7165). Staff confirmed that this is a temporary use of water, and Mr. Corona was informed that he would need to obtain water taps from Tri-County before a Final Plat can be accepted.

OTHER AGENCY INVOLVEMENT

Planning Staff sent the Preliminary Plat along with a summary to the Review Agencies for comment on September 30, 2021. Adjoining Property Owners (within a 200-foot radius from Parcel #345524210003) were also sent a Public Notice for this application, including the applicant. Comments have been received by DMEA, City of Delta, CDOT, County Engineering, Parks & Wildlife, Tri-County Water, UVWUA and Sharon Dodds (neighbor). Planning has not received any additional feedback from any other review agencies or adjoining property owners.

DMEA (attached): Lots 3 and 6 do not have electric service at the lot line. In order to maintain acceptable voltages and reliability, developers larger than 5 lots, present or future, will need to be designed with an appropriate number of phase conductors to be installed within the development to enable balancing the feeder load. The primary electrical system will need to be designed with the ability to feed each lot with an alternate phase or feeder connection to DMEA's primary system. Exceptions to those standards require written approval by DMEA's Engineering and Operation Managers.

Three phase power is not available in this area.

DMEA requires all developers to submit the latest and most updated (Approved Preliminary Plat) electronic version of their development before a DMEA System Designer can meet with the developer.

City of Delta (attached): No issues.

CDOT (attached): CDOT has no comment.

County Engineering (attached):

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- 2100 Road is classified as a Local Access Road with a 60' right-of-way width. No additional right-of-way is needed, see Hood Mobile Home Subdivision MJ07-013, Reception #638988.
- Pleasant Valley Road is classified as a Local Access Road with a 60' right-of-way width. No additional right-of-way is needed, see Hood Mobile Home Subdivision MJ07-013, Reception #638988. Label the Reception Number for Pleasant Valley Road on the Final Plat.
- Show Total Acres Table on the Final Plat.
- Show setbacks on the Final Plat.
- Revise the adjacent property owner labels (Lot 21 and Lot 15).
- Show proposed access for Lots 3, 4, 5, and 6 on the Final Plat.
- Add a note to the plat regarding the proposed driveways. *The proposed driveway needs to be placed, designed, and constructed per Items 13, 14, & 16, Appendix 5 of the Delta County Roadway Design and Construction Standards.*
- Add the property owner and the reception number for the owner on the west side of 2100 Road.

Parks & Wildlife (attached): CPW policy directs our efforts towards proposals that will potentially have high impacts to wildlife and wildlife habitat, with an emphasis on large acreages, high priority habitats, wildlife diversity, and effects to species of special concern. At this time, impacts of the development, as proposed, may be characterized as minimal. This does not mean that the landscape has no value to wildlife or value to the community. It is important to remember that incremental and cumulative loss of natural areas and open spaces will, over time, significantly degrade the overall quality of wildlife habitat in the area.

Tri-County Water (attached):

- Lot #1 currently has no water service. Will need a meter, same side.
- Lot #2 currently has no water service. Will need a bore to feed this meter.
- Lot #3 currently has no water service. Will need a meter, same side.
- Lot #4 currently has no water service. Will need a meter, same side.
- Lot #5 may use existing meter. TCW Acct. #7165
- Lot #6 currently has no water service. Will need a meter, same side.

Uncompahgre Valley Water Users Association (UVWUA) (attached): This acreage has no irrigation water delivered by the Uncompahgre Valley Water Users Association. No water will be attached to this land in the future. We have no objection to the proposed subdivision.

Sharon Dodds (neighbor) (attached): It looks as if a second prior owned mobile home is going in on lot #1. How many units should we expect to be placed on this property? Please be aware that the unit I spoke of is the 3rd on that property. Two on Lot #1 and one on Lot #2. So from your information a permit was filed with you because each lot has a main home and one or more RV units. This additional unit would exceed the 4 or more units.

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Attached material: list, in order as attached

- Hood Mobile Home Plat (2009)
- Preliminary Plat/Corona
- Preliminary Plat/Corona (with aerial overlay)

Conditions of Approval
PLN21-010/Corona Preliminary Plat

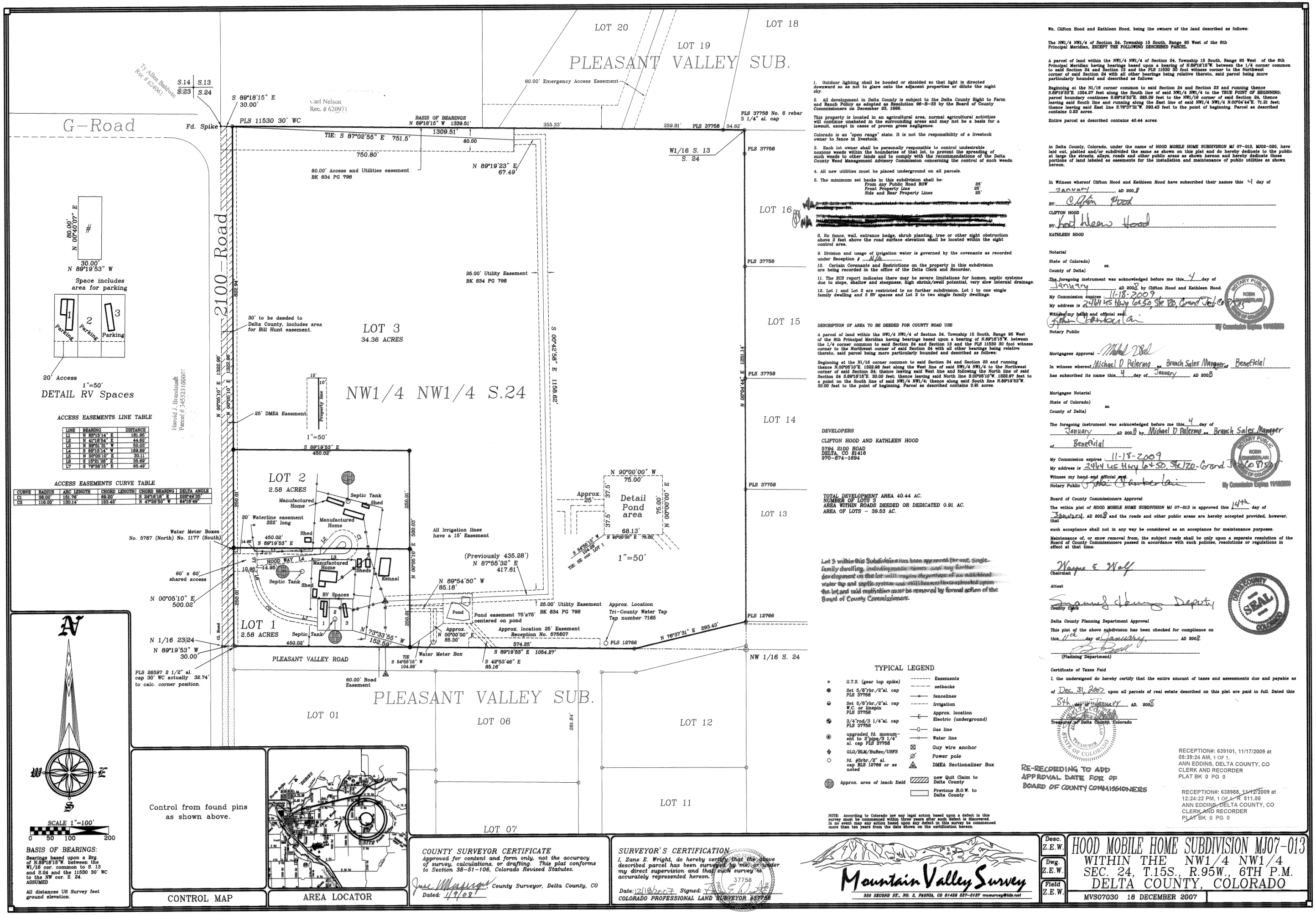
1. The Preliminary Plat shall expire if a Final Plat is not submitted within 12 months from the date of final Board of County Commissioner approval of the Preliminary Plat, unless a request to extend this timeframe is submitted at least 30 days prior to the expiration. (Planning)

2. Prior to accepting the Final Plat for Lots 3 and 6, the applicant shall extend electrical service to those lots. The primary electrical system will need to be designed with the ability to feed each lot with an alternate phase or feeder connection to DMEA's primary system. Exceptions to these standards will require written approval by DMEA's Engineering and Operation Manager. (DMEA)

3. The Final Plat shall include the following note: "*The proposed driveway needs to be placed, designed, and constructed per Items 13, 14, & 16, Appendix 5 of the Delta County Roadway Design and Construction Standards."* (County Engineering)

4. The Final Plat shall include/provide easements necessary for water delivery systems to the satisfaction of the Planning Director. Water service will need to be installed to the requirements of Tri-County Water and proof will need to be submitted to the Planning Department. (Tri-County Water/Planning)

RECEPTION#: 639101, 11/17/2009 at 08:39:24 AM, 1 OF 1, ANN EDDINS, DELTA COUNTY, CO CLERK AND RECORDER PLAT BK 0 PG 0



LINE	BEARING	DISTANCE
L1	N 89°15'14" E	161.95'
L2	N 41°16'54" E	44.62'
L3	N 89°51'31" W	50.03'
L4	S 89°15'14" W	169.89'
L5	N 00°00'10" E	30.11'
L6	S 15°21'26" E	35.69'
L7	S 79°38'15" E	65.49'

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	98.00'	181.76'	69.20'	S 24°16'15" E	222°49'29"
C2	116.00'	130.14'	123.42'	N 47°29'50" W	64°18'49"

1. Outdoor lighting shall be hooded or shielded so that light is directed downward so as not to glare onto the adjacent properties or dilute the night sky.

2. All development in Delta County is subject to the Delta County Right to Farm and Ranch Policy as adopted as Resolution 96-R-33 by the Board of County Commissioners on December 23, 1996.

This property is located in an agricultural area, normal agricultural activities will continue unabated in the surrounding areas and may not be a basis for a lawsuit, except in cases of proven gross negligence.

Colorado is an "open range" state. It is not the responsibility of a livestock owner to fence in livestock.

3. Each lot owner shall be personally responsible to control undesirable noxious weeds within the boundaries of that lot, to prevent the spreading of such weeds to other lands and to comply with the recommendations of the Delta County Weed Management Advisory Commission concerning the control of such weeds.

4. All new utilities must be placed underground on all parcels.

5. The minimum set backs in this subdivision shall be:

From Any Public Road ROW	25'
Front Property Line	25'
Side and Rear Property Lines	25'

6. ~~All lots as shown are restricted to no further subdivision and one single family dwelling/park.~~

~~The Geologic Hazards and Engineering Geology Report for this Subdivision is on file at the Delta County Planning Department and all recommendations in said report shall be complied with in the development of this subdivision.~~

8. No fence, wall, entrance hedge, shrub planting, tree or other sight obstruction above 2 feet above the road surface elevation shall be located within the sight control area.

9. Division and usage of irrigation water is governed by the covenants as recorded under Reception # N/A.

10. Certain Covenants and Restrictions on the property in this subdivision are being recorded in the office of the Delta Clerk and Recorder.

11. The SCS report indicates there may be severe limitations for homes, septic systems due to slope, shallow and steepness, high shrink/swell potential, very slow internal drainage.

12. Lot 1 and Lot 2 are restricted to no further subdivision. Lot 1 to one single family dwelling and 3 RV spaces and Lot 2 to two single family dwellings.

DESCRIPTION OF AREA TO BE DEEDED FOR COUNTY ROAD USE

A parcel of land within the NW1/4 NW1/4 of Section 24, Township 15 South, Range 95 West of the 6th Principal Meridian having bearings based upon a bearing of N.89°18'15"W. between the 1/4 corner common to said Section 24 and Section 13 and the PLS 11530 30 foot witness corner to the Northwest corner of said Section 24 with all other bearings being relative thereto, said parcel being more particularly bounded and described as follows:

Beginning at the N1/16 corner common to said Section 24 and Section 23 and running thence N.00°05'10"E. 1322.98 feet along the West line of said NW1/4 NW1/4 to the Northwest corner of said Section 24; thence leaving said North line and following the North line of said Section 24 S.89°18'15"E. 30.00 feet; thence leaving said North line S.00°05'10"W. 1322.97 feet to a point on the South line of said NW1/4 NW1/4; thence along said South line N.89°19'53"W. 30.00 feet to the point of beginning. Parcel as described contains 0.91 acres.

DEVELOPERS

CLIFTON HOOD AND KATHLEEN HOOD
5794 2100 ROAD
DELTA, CO 81416
970-874-1694

TOTAL DEVELOPMENT AREA 40.44 AC.
NUMBER OF LOTS 3
AREA WITHIN ROADS DEEDED OR DEDICATED 0.91 AC.
AREA OF LOTS - 39.53 AC.

Lot 3 within this Subdivision has been approved for one single family dwelling, including mobile homes, and any further development on the lot will require the purchase of an additional water tap and septic system and will have to be constructed upon the lot, and said restriction must be removed by formal action of the Board of County Commissioners.

TYPICAL LEGEND

- G.T.S. (gear top spike)
- Set 5/8"rbr./2"al. cap PLS 37758
- Set 5/8"rbr./2"al. cap W.C. or linepin PLS 37758
- 3/4"rod/3 1/4"al. cap PLS 37758
- upgraded fd. monument to 2"pipe/3 1/4" al. cap PLS 37758
- GLO/BLM/BuRec/USFS
- fd. #5rbr./2" al. cap PLS 12766 or as noted
- Approx. area of leach field
- Easements
- setbacks
- fencelines
- Irrigation
- Approx. location Electric (underground)
- Gas line
- Water line
- Guy wire anchor
- Power pole
- DMEA Sectionalizer Box
- new Quit Claim to Delta County
- Previous R.O.W. to Delta County

NOTE: According to Colorado law any legal action based upon a defect in this survey must be commenced within three years after such defect is discovered. In no event may any action based upon any defect in this survey be commenced more than ten years from the date shown on the certification hereon.

We, Clifton Hood and Kathleen Hood, being the owners of the land described as follows:

The NW1/4 NW1/4 of Section 24, Township 15 South, Range 95 West of the 6th Principal Meridian, EXCEPT THE FOLLOWING DESCRIBED PARCEL.

A parcel of land within the NW1/4 NW1/4 of Section 24, Township 15 South, Range 95 West of the 6th Principal Meridian having bearings based upon a bearing of N.89°18'15"W. between the 1/4 corner common to said Section 24 and Section 13 and the PLS 11530 30 foot witness corner to the Northwest corner of said Section 24 with all other bearings being relative thereto, said parcel being more particularly bounded and described as follows:

Beginning at the N1/16 corner common to said Section 24 and Section 23 and running thence S.89°19'53"E. 1054.27 feet along the South line of said NW1/4 NW1/4 to the TRUE POINT OF BEGINNING; parcel boundary continues S.89°19'53"E. 285.39 feet to the NW1/16 corner of said Section 24, thence leaving said South line and running along the East line of said NW1/4 NW1/4 N.00°05'44"E. 71.31 feet; thence leaving said East line S.76°37'31"W. 293.43 feet to the point of beginning. Parcel as described contains 0.23 acres.

Entire parcel as described contains 40.44 acres.

In Delta County, Colorado, under the name of HOOD MOBILE HOME SUBDIVISION MJ 07-013, MJG2-020, have laid out, platted and/or subdivided the same as shown on this plat and do hereby dedicate to the public at large the streets, alleys, roads and other public areas as shown hereon and hereby dedicate those portions of land labeled as easements for the installation and maintenance of public utilities as shown hereon.

In Witness whereof Clifton Hood and Kathleen Hood have subscribed their names this 4 day of January AD 2008

BY: Clifton Hood
CLIFTON HOOD

BY: Kathleen Hood
KATHLEEN HOOD

Notarial

State of Colorado)
ss.
County of Delta)

The foregoing instrument was acknowledged before me this 4 day of January AD 2008 by Clifton Hood and Kathleen Hood.

My Commission expires 11-18-2009
My address is 2464 US Hwy 6 & 50, Ste 120, Grand Jct CO 81505
Witness my hand and official seal.
John Chamberlain
Notary Public

ROBIN CHAMBERLAIN NOTARY PUBLIC STATE OF COLORADO My Commission Expires 11/18/2009

Mortgagees Approval - Michael D Palermo

In witness whereof Michael D Palermo as Branch Sales Manager of Beneficial has subscribed its name this 4 day of January AD 2008

Mortgagee Notarial

State of Colorado)
ss.
County of Delta)

The foregoing instrument was acknowledged before me this 4 day of January AD 2008 by Michael D Palermo as Branch Sales Manager of Beneficial

My Commission expires 11-18-2009
My address is 2464 US Hwy 6 & 50, Ste 120-Grand Jct CO 81505
Witness my hand and official seal.
Notary Public John Chamberlain

ROBIN CHAMBERLAIN NOTARY PUBLIC STATE OF COLORADO My Commission Expires 11/18/2009

Board of County Commissioners Approval

The within plat of HOOD MOBILE HOME SUBDIVISION MJ 07-013 is approved this 14th day of January, AD 2008 and the roads and other public areas are hereby accepted provided, however, that

such acceptance shall not in any way be considered as an acceptance for maintenance purposes.

Maintenance of, or snow removal from, the subject roads shall be only upon a separate resolution of the Board of County Commissioners passed in accordance with such policies, resolutions or regulations in effect at that time.

Wayne E Wolf
Chairman

Attest
Emanuel Hanger Deputy
County Clerk

DELTA COUNTY SEAL COLORADO

Delta County Planning Department Approval

This plat of the above subdivision has been checked for compliance on this 11th day of January AD 2008

(Planning Department)

Certificate of Taxes Paid

I, the undersigned do hereby certify that the entire amount of taxes and assessments due and payable as of Dec. 31, 2007 upon all parcels of real estate described on this plat are paid in full. Dated this 8th day of January AD, 2008

Treasurer of Delta County, Colorado

STATE OF COLORADO TREASURER

RE-RECORDING TO ADD APPROVAL DATE FOR OF BOARD OF COUNTY COMMISSIONERS

RECEPTION#: 639101, 11/17/2009 at 08:39:24 AM, 1 OF 1, ANN EDDINS, DELTA COUNTY, CO CLERK AND RECORDER PLAT BK 0 PG 0

RECEPTION#: 638988, 11/12/2009 at 12:24:22 PM, 1 OF 1, R $11.00 ANN EDDINS, DELTA COUNTY, CO CLERK AND RECORDER PLAT BK 0 PG 0

COUNTY SURVEYOR CERTIFICATE
Approved for content and form only, not the accuracy of survey, calculations, or drafting. This plat conforms to Section 38-51-106, Colorado Revised Statutes.
Jesse Mossman County Surveyor, Delta County, CO
Dated: 1/9/08

SURVEYOR'S CERTIFICATION
I, Zane E. Wright, do hereby certify that the above described parcel has been surveyed by me, or under my direct supervision and that such survey is accurately represented hereon.
Date: 12/18/2007 Signed: Zane E. Wright
COLORADO PROFESSIONAL LAND SURVEYOR #37758

Mountain Valley Survey
320 SECOND ST., NO. 2, PAONIA, CO 81428 527-5137 mvsurvey@tds.net

Desc.	Z.E.W.
Dwg.	Z.E.W.
Field	Z.E.W.

HOOD MOBILE HOME SUBDIVISION MJ07-013
WITHIN THE NW1/4 NW1/4
SEC. 24, T.15S., R.95W., 6TH P.M.
DELTA COUNTY, COLORADO
MVS07030 18 DECEMBER 2007

PRELIMINARY PLAT

CORONA SUBDIVISION PLN21-010

A REPLAT OF LOT 3, HOOD MOBILE SUBDIVISION MJ07-013 WITHIN THE NW1/4 NW1/4 SECTION 24, T.15S., R.95W., 6TH P.M.

DELTA COUNTY, COLORADO

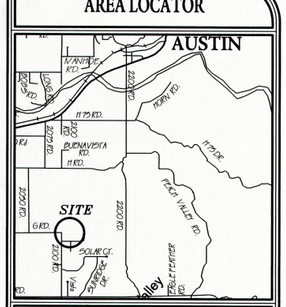
PLAT REFERENCES:

"HOOD MOBILE HOME SUBDIVISION MJ07-013"--RECORDED NOVEMBER 17, 2009 UNDER RECEPTION NO. 639101

"PLEASANT VALLEY MAJOR SUBDIVISION MJ02-020--RECORDED JANUARY 15, 2004 UNDER RECEPTION NO. 575503

"PLEASANT VALLEY MAJOR SUBDIVISION MJ02-020 PHASE 2-- --RECORDED JULY 21, 2004 UNDER RECEPTION NO. 581766

"PLEASANT VALLEY MAJOR SUBDIVISION MJ02-020 PHASE 4-- --RECORDED JULY 3, 2008 UNDER RECEPTION NO. 626932



TYPICAL LEGEND

- Found Mag Nail in Asphalt
- Set 5/8" rebar 30" long with 2" aluminum cap PLS25972
- Set 5/8" rebar 30" long with 2" aluminum cap as Witness corner or linepin PLS25972
- Found 5/8" rebar with 2" aluminum cap PLS 12766 or PLS 37758
- Found 5/8" rebar with 2" aluminum cap as Witness corner or linepin PLS 12766
- Found 3/4" rebar with 3-1/4" aluminum cap PLS 37758 per monument record

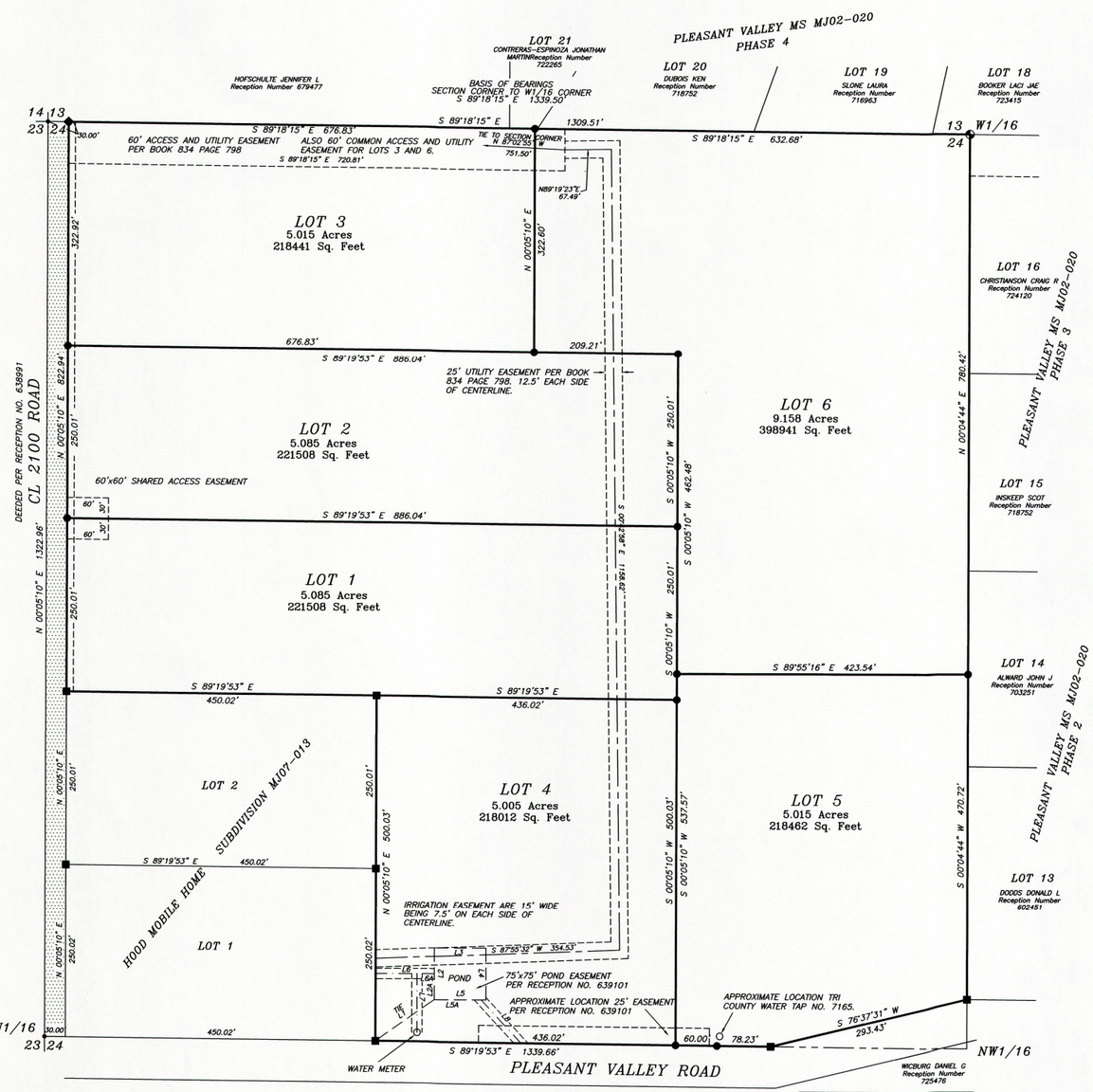
—x— Fencelines
—E— Electric (overhead)
—UE— Electric (underground)
—W— Water line
- - - - Easement
—·—·— CL Irrigation Easement
New Quit Claim to Delta County
Previous R.O.W. to Delta County

BASIS OF BEARINGS:

S.89°18'15"E. FROM THE SECTION CORNER COMMON TO SEC. 13, 14, 23 & 24 TO THE W1/16 COR. COMMON TO SEC. 13 & 24 GEODETIC NORTH GPS OBSERVATION

SCALE 1"=100 U.S. SURVEY FEET

0 50 100 200



LINE	BEARING	DISTANCE
L1	S 54°55'15" W	104.26'
L2	N 00°00'00" W	75.00'
L2A	N 00°00'00" W	37.50'
L3	N 90°00'00" E	75.00'
L4	S 00°00'00" E	75.00'
L5	N 90°00'00" W	75.00'
L5A	N 90°00'00" W	68.13'
L6	N 89°54'50" W	85.18'
L6A	N 89°54'50" W	25'
L7	S 00°00'00" E	85.30'
L8	S 42°53'46" E	85.16'

NOTES:

1. OUTDOOR LIGHTING SHALL BE HOODED OR SHIELDED SO THAT LIGHT IS DIRECTED DOWNWARD SO AS NOT TO GLARE ONTO THE ADJACENT PROPERTY OR DILUTE THE NIGHT SKY.
2. ALL DEVELOPMENT IN DELTA COUNTY IS SUBJECT TO THE DELTA COUNTY RIGHT TO FARM AND RANCH POLICY, ADOPTED AS RESOLUTION 99-R-020 BY THE BOARD OF COUNTY COMMISSIONERS ON SEPTEMBER 27, 1999.
3. THIS PROPERTY IS LOCATED IN AN AGRICULTURAL AREA. NORMAL AGRICULTURAL ACTIVITIES WILL CONTINUE UNABATED IN THE SURROUNDING AREAS AND MUST NOT BE A BASIS FOR A LAWSUIT, EXCEPT IN CASES OF PROVEN GROSS NEGLIGENCE.
4. ACCESS TO ALL SHOWN OR UN-SHOWN IRRIGATION DITCHES FOR CLEANING AND MAINTENANCE PURPOSES IS PERMITTED.
5. COLORADO IS AN "OPEN RANGE" STATE. IT IS NOT THE RESPONSIBILITY OF A LIVESTOCK OWNER TO FENCE IN LIVESTOCK.
6. IF THERE ARE COVENANTS, RESTRICTIONS OR OTHER DOCUMENTS FOR THE PROPERTY IN THIS SUBDIVISION, THEY WILL BE RECORDED IN THE OFFICE OF THE DELTA COUNTY CLERK AND RECORDER.
7. EACH LOT OWNER SHALL BE PERSONALLY RESPONSIBLE TO CONTROL UNDESIRABLE, NOXIOUS WEEDS WITHIN THE BOUNDARIES OF THAT LOT, TO PREVENT THE SPREADING OF SUCH WEEDS TO OTHER LANDS AND TO COMPLY WITH THE RECOMMENDATIONS OF THE DELTA COUNTY WEED MANAGEMENT ADVISORY COMMISSION CONCERNING THE CONTROL OF SUCH WEEDS.
8. UNLESS APPROVED OTHERWISE, ALL LOTS WITHIN THIS SUBDIVISION HAVE BEEN APPROVED FOR ONE SINGLE RESIDENTIAL USE ONLY. ANY FURTHER SUBDIVISION OR ANY CHANGE OF USE TO OTHER THAN SINGLE FAMILY RESIDENTIAL OR AGRICULTURAL USE REQUIRES THE LOT OWNER TO PROCESS THE REQUEST IN ACCORDANCE WITH THE REGULATION OF DELTA COUNTY.
9. ALL UTILITIES MUST BE PLACED UNDERGROUND ON ALL PARCELS.
10. THE MINIMUM SET BACKS FOR ALL STRUCTURES (INCLUDING ONSITE WASTEWATER TREATMENT SYSTEMS), IN THIS SUBDIVISION SHALL BE:

ANY PUBLIC ROAD ROW	25'
INTERIOR PROPERTY LINE	15'

11. SHARES OF IRRIGATION WATER CONVEYED TO LOTS AT THE TIME OF PLAT RECORDING MAY OR MAY NOT BE SOLD SEPARATELY FROM THE PROPERTY AND MAY NOT RUN WITH THE LAND.

NOTE: According to Colorado law any legal action based upon a defect in this survey must be commenced within three years after such defect is discovered. In no event may any action based upon any defect in this survey be commenced more than ten years from the date shown on the certification hereon.

SUBDIVISION DEDICATION

We, Ricardo Corona and Anna Corona, being the owner of land described as follows:

LEGAL DESCRIPTION

LOT 3,
HOOD MOBILE HOME SUBDIVISION, ACCORDING TO THE PLATS RECORDED NOVEMBER 12, 2009 UNDER RECEPTION NO. 638988 AND NOVEMBER 17, 2009 UNDER RECEPTION NO. 639101.
COUNTY OF DELTA, STATE OF COLORADO.

in Delta County, Colorado, under the name of CORONA SUBDIVISION PLN21-010, have laid out, platted and/or subdivided the same as shown on this plat and do hereby dedicate to the public at large the streets, alleys, roads and other public areas as shown hereon and those portions of land labeled as easements for the installation and maintenance of public utilities as shown hereon.

In witness whereof Ricardo Corona and Anna Corona have subscribed their names this _____ day of _____, A.D. 20_____.

By:_____ Ricardo Corona

By:_____ Anna Corona

NOTARIAL:

State of)
) ss.
County of)

The foregoing instrument was acknowledged before me this _____ day of _____, A.D. 20_____, by Ricardo Corona and Anna Corona

My commission expires: _____

My address is _____

_____

Witness my hand and official seal.

DELTA COUNTY PLANNING DEPARTMENT APPROVAL

This plat of the above subdivision has been checked for compliance by _____ on this _____ day of _____.

_____
Planning Staff

BOARD OF COUNTY COMMISSIONERS APPROVAL

The within plat of CORONA SUBDIVISION PLN21-010 is approved this _____ day of _____, AD 20_____, and the roads and other public areas are hereby accepted provided, however, that such acceptance shall not in any way be considered as an acceptance for maintenance purposes.

Maintenance of, or snow removal from, the subject roads shall be only upon a separate resolution of the Board of County Commissioners passed in accordance with such policies, resolutions or regulations in effect at that time.

_____
Chairman

Attest

_____
County Clerk

CERTIFICATE OF TAXES PAID

I, the undersigned, do hereby certify that the entire amount of taxes and assessments due and payable as of _____ upon all parcels of real estate described on this plat are paid in full. Dated this _____ day of _____, A.D. 20_____.

_____
Treasurer of Delta County, Colorado

COUNTY SURVEYOR'S CERTIFICATE:

Approved for content and form only and not as to the accuracy of survey, computations or drafting, pursuant to CRS 38-51-106.

_____ County Surveyor _____ Date

SURVEYOR'S CERTIFICATION

I, Randy A. Wilmore, do hereby certify that the above described parcel has been surveyed by me and under my direct supervision and that such survey is accurately represented hereon, and is based upon my knowledge, information and belief, and is in accordance with applicable standards of practice and is not a guaranty or warranty, either expressed or implied.

Date:_____ Signed: _____
COLORADO PROFESSIONAL LAND SURVEYOR #25972

WILMORE & COMPANY
PROFESSIONAL LAND SURVEYING, INC.
406 Grand Avenue
P.O. Box 1652
Paonia, Colorado 81428
970.527-4200 PHONE
970.260-4130 PHONE
www.wilmorelandsurveying.com
EMAIL randy@wilmorelandsurveying.com
Defining Boundaries

FIELD CREW:	RAW, CW
DRAFTER:	RAW
CHECKED BY:	KC

CORONA SUBDIVISION PLN21-010

A REPLAT OF LOT 3, HOOD MOBILE SUBDIVISION MJ07-013 WITHIN THE NW1/4 NW1/4 SECTION 24, T.15S., R.95W., 6TH P.M. DELTA COUNTY, COLORADO

J21200FINAL

9 SEPTEMBER 2021

PRELIMINARY PLAT

CORONA SUBDIVISION PLN21-010

A REPLAT OF LOT 3, HOOD MOBILE SUBDIVISION MJ07-013 WITHIN THE NW1/4 NW1/4 SECTION 24, T.15S., R.95W., 6TH P.M.

DELTA COUNTY, COLORADO

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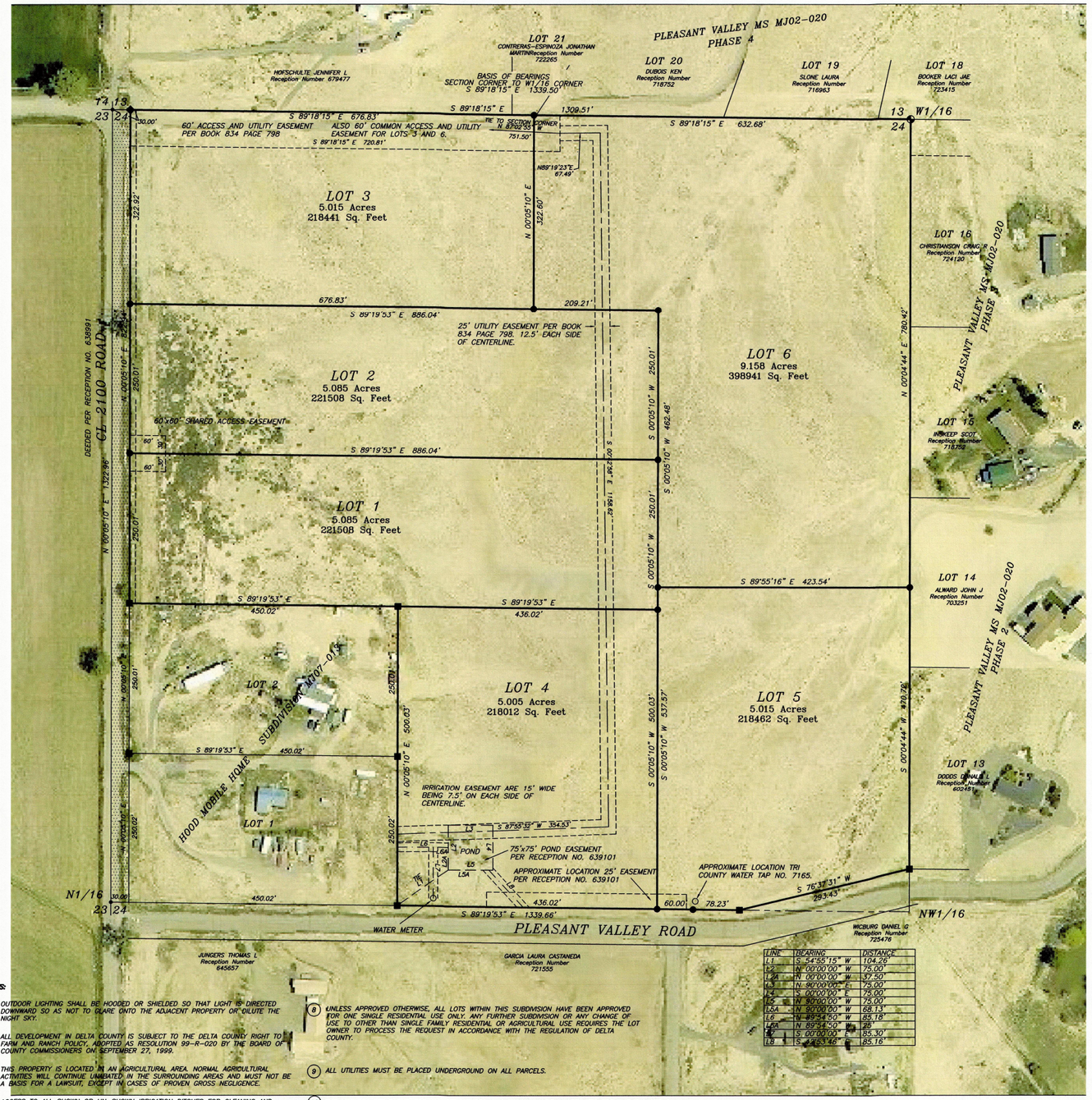
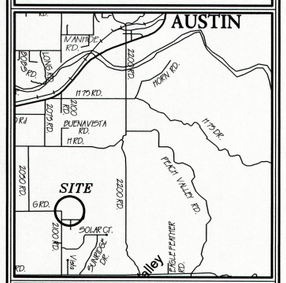


AREA LOCATOR



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—UE— Electric (underground)
—W— Water line
- - - - Easement
—·—·— CL Irrigation Easement
New Quit Claim to Delta County
Previous R.O.W. to Delta County

BASIS OF BEARINGS:

S.89°18'15"E. FROM THE SECTION CORNER COMMON TO SEC. 13, 14, 23 & 24 TO THE W1/16 COR. COMMON TO SEC. 13 & 24

GEODETIC NORTH
GPS OBSERVATION

SCALE 1"=100 U.S. SURVEY FEET

0 50 100 200

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SUBDIVISION DEDICATION

We, Ricardo Corona and Anna Corona, being the owner of land described as follows:

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COUNTY OF DELTA, STATE OF COLORADO.

in Delta County, Colorado, under the name of CORONA SUBDIVISION PLN21-010, have laid out, platted and/or subdivided the same as shown on this plat and do hereby dedicate to the public at large the streets, alleys, roads and other public areas as shown herean and those portions of land labeled as easements for the installation and maintenance of public utilities as shown hereon.

In witness whereof Ricardo Corona and Anna Corona *have subscribed their names this _____ day of _____, A.D. 20_____.*

By:_____ *By:_____*
Ricardo Corona *Anna Corona*

NOTARIAL:

State of)
) ss.
County of)

The foregoing instrument was acknowledged before me this _____ day of _____, A.D. 20_____, by Ricardo Corona and Anna Corona

My commission expires: _____

My address is _____

_____

Witness my hand and official seal.

DELTA COUNTY PLANNING DEPARTMENT APPROVAL

This plat of the above subdivision has been checked for compliance by _____ on this _____ day of _____.

_____
Planning Staff

BOARD OF COUNTY COMMISSIONERS APPROVAL

The within plat of CORONA SUBDIVISION PLN21-010 is approved this _____ day of _____, AD 20_____, and the roads and other public areas are hereby accepted provided, however, that such acceptance shall not in any way be considered as an acceptance for maintenance purposes.

Maintenance of, or snow removal from, the subject roads shall be only upon a separate resolution of the Board of County Commissioners passed in accordance with such policies, resolutions or regulations in effect at that time.

_____
Chairman

Attest

_____
County Clerk

CERTIFICATE OF TAXES PAID

I, the undersigned, do hereby certify that the entire amount of taxes and assessments due and payable as of _____ upon all parcels of real estate described on this plat are paid in full. Dated this _____ day of _____, A.D. 20_____.

_____
Treasurer of Delta County, Colorado

COUNTY SURVEYOR'S CERTIFICATE:
Approved for content and form only and not as to the accuracy of survey, computations or drafting, pursuant to CRS 38-51-106.

_____ _____
County Surveyor Date

SURVEYOR'S CERTIFICATION
I, Randy A. Wilmore, do hereby certify that the above described parcel has been surveyed by me and under my direct supervision and that such survey is accurately represented hereon, and is based upon my knowledge, information and belief, and is in accordance with applicable standards of practice and is not a guaranty or warranty, either expressed or implied.

Date:_____ Signed:_____
COLORADO PROFESSIONAL LAND SURVEYOR #25972

WILMORE & COMPANY
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www.wilmorelandsurveying.com
EMAIL randy@wilmorelandsurveying.com
Defining Boundaries

FIELD CREW:	RAW, CW
DRAFTER:	RAW
CHECKED BY:	KC

CORONA SUBDIVISION PLN21-010

A REPLAT OF LOT 3, HOOD MOBILE SUBDIVISION MJ07-013 WITHIN THE NW1/4 NW1/4 SECTION 24, T.15S., R.95W., 6TH P.M. DELTA COUNTY, COLORADO

J21200FINAL | 9 SEPTEMBER 2021

DELTA COUNTY
PLANNING & COMMUNITY DEVELOPMENT

295 W 6th Street
Delta, Colorado 81416
planning@deltacounty.com
970.874.2110

STAFF REPORT

Delta County Planning Commission

Delta County Administrative Building
560 Dodge Street, Delta, CO 81416

Wednesday, November 17, 2021 @ 5:30 p.m.

PLN21-030/Garnet Mesa Solar LLC
(DMEA/Guzman Energy)

Consider a Limited Use Permit to install and operate an 80MW ground mounted solar photovoltaic energy generating facility. The project involves two sites consisting of three (3) parcels totaling 472+ acres generally located west of 2200 Road and at the southwest corner of G Road and 2100 Road, approximately 2.2 miles east of Delta (Parcels: 3455-231-00-001, 3455-232-00-009, 3455-133-00-020).

PROJECT INFORMATION:
Property Owner: Garnet Mesa Land LLC
Applicant: Garnet Mesa Solar LLC
Representative: Matthew Kosakowski, Citra Power
Site Address: 20426 G Road, Delta
Location: Section 23, Township 15S, Range 95W, 6thPM
Parcel ID: 3455-231-00-001, 3455-232-00-009, 3455-133-00-020
Parcel Size: 240 Ac, 41.8 Ac, 191 Ac (472.8+ Ac total)
Zoning: A-20, A-5

RECOMMENDATION:
Staff recommends that the Planning Commission recommend that the Board of County Commissioners:

a. Find that PLN21-030 complies with the Land Use Code; and

295 W 6th Street
Delta, Colorado 81416
planning@deltacounty.com
970.874.2110

b. Approve PLN21-030, a Limited Use Permit for an 80MW ground mounted solar photovoltaic energy generating facility developed over three (3) parcels totaling 472.85 acres generally located between 2200 Road on the east and 2050 Road on the west, north and south of G Road, Delta (Parcel: 3455-231-00-001, 3455-232-00-009, 3455-133-00-020), subject to four (4) conditions.

SUMMARY:

Garnet Mesa Land LLC, a subsidiary of Guzman Energy, owns multiple parcels that they propose use for a ground mounted solar power generating facility. The proposed project involves two (2) sites:

1) Northeast (East Phase). One (1) parcel consisting of approximately 191 acres generally located west of 2200 Road with access just north of Arroyo Drive. About 50% of the property is used for irrigated agriculture, with the remainder being undeveloped lands. Most of this property is zoned A-20, with about 15 acres on the southern portion zoned A-5 (added through a Boundary Line Adjustment). No development is proposed on the A-5 portion of this property. A 60-foot wide easement over Parcel 345513100022 (6687 2200 Road, Norell) provides access from 2200 Road.
2) Southwest (West Phase). Two (2) parcels totaling about 280 acres located at the southwest corner of G Road and 2100 Road. Both parcels are zoned A-20. Most of this property is used for irrigated agriculture and grazing. An existing homestead and corrals are located along G Road.

The applicant has a 25-foot wide utility easement over Parcel 345513300009 (5990 2100 Road, Hofschulte). This easement will be used for underground power line(s) that connect the two sites. There is a wetland that will not be impacted by boring the line under this area. A right-of-way use (utility) permit will be required to bore under the County roadway, at the corner of G Road and 2100 Road.

This facility will be designed with strings of panels mounted on rows of single axis trackers (posts), which can be operated remotely to track the sun during daylight hours. At sunset, the solar array trackers will enter a “sleep” mode where they are held still in the most stable position to protect against any night winds. Each site will be secured with a 7-foot tall wire mesh fence with wood posts, and landscaping will be installed to help screen the site from the public right-of-way.

Inverters within the sites will convert the Direct Current (“DC”) power (how the power is generated) into Alternating Current (“AC”) power (how the power is used in households) before it is transmitted through the DMEA system. The system would generate about 120MWdc of raw power that, once converted, would produce 80MWac of usable power.

295 W 6th Street
Delta, Colorado 81416
planning@deltacounty.com
970.874.2110

A pre-application conference was held on June 7, 2021 with County staff from Planning, Engineering, Economic Development, and Road & Bridge. The applicant described their operation and answered a number of questions.

Under the 2021 Delta County Land Use Code, a Renewable Energy Facility is a Limited Use (any zoning designating) subject to Administrative Review (director approval) with no public hearing. However, the Director is referring this application to the Planning Commission (PC) to make a recommendation to the Board of County Commissioners (BoCC).

The PC shall determine if the application complies with the Land Use Code, and recommend approval, approval with conditions, or denial. A number of documents were submitted with the application that provides information about this project (**Attached**).

Staff has reviewed all documents submitted by the applicant and finds that they are sufficient. All required fees have been paid for this application. Therefore, Staff is recommending that the PC find the project complies with the Land Use Code and recommend approval of the PLN21-030.

DISCUSSION:
In 2020, Guzman Energy replaced Tri-State as the wholesale energy provider to DMEA, meaning that Guzman is now responsible for sourcing the energy that DMEA ultimately distributes to the community instead of Tri-State. Guzman Energy owns the two project LLCs; 1) Garnet Mesa Land, LLC owns the land, and 2) Garnet Mesa Solar, LLC holds all of the assets of the solar project. The Solar LLC will have a lease with the Land LLC which will give the solar project the right to construct on the property. Citra is working under contract to Guzman Energy and performing all of the project development work.

On April 29, 2021, Mr. Matthew Kosakowski with Citra Power, representing Garnet Mesa Solar LLC submitted a pre-application form (PLN21-030/Garnet Mesa) for an approximately 360-acre ground mounted solar photovoltaic generating facility and collector substation.

Initial plans identified use of six (6) parcels between 2200 Road on the east and 2050 Road on the west, north and south of G Road. These parcels have been separated into three groups as follows:

1. Three parcels (totaling about 472.85 acres) are the primary sites for installing solar arrays:
    a. Southwest (West Phase).
        i. Parcel 345523100001 (G Road/2100 Road) 240 Acres of irrigated farmland, Zoned A-20.
        ii. Parcel 345523200009 (20426 G Road) 41.8 Acres of irrigated farmland with a homestead, Zoned A-20.

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b. Northeast (East Phase).
   i. Parcel 345513300020 (2200 Road); 191.0469 Acres with areas of irrigated farmlands, Zoned A-20, about 15 acres zoned A-5.

2. Two parcels include easements that support the project:
   a. Parcel 345513300009 (5990 2100 Road, Zoned A-5). A 15.4393-acre parcel owned by Jennifer Hofschulte with a 25-foot wide utility easement (Reception #: 696085, 06/19/2017). This easement is a part of the project to allow for the two phases to be connected. There would be no solar components on this parcel. See **Exhibit 2.F** Site Plan Supplemental
   b. Parcel 345513100022 (6687 2200 Road, Zoned A-20). A 67.55 acre parcel owned by Kenneth Norell with a 60-foot wide easement providing access from 2200 Road to the East Phase project site (Norell Ranch Survey Plat, Reception #: 727607, 03/29/2021).

3. One parcel (about 40 Acres) was identified in the pre-application and as "contingency land" where no development is proposed at this time (included at the pre-application stage but not included in the formal application):
   a. Parcel 345514300008 (6469 2050 Road, Zoned A-20). A 40-acre parcel located on the west side of 2050 Road, owned by Garnet Mesa Land LLC. At the pre-application conference, this parcel was identified as "contingency" land; however, the applicant does not plan on using the contingency parcel and it is not part of this permit.

Renewable Energy Facility is identified as a Limited Use in all zoning designations. Under the 2021 Delta County Land Use Code, a Limited Use is subject to Administrative Review (director approval) with no public hearing. However, the Director determined that the Limited Use is related to smaller, individual systems versus larger commercial facilities. Therefore, this application is being referred to the Planning Commission (PC) to make a recommendation to the Board of County Commissioners (BoCC).

There are no specific findings required for a Limited Use. Chapters 3-6 of the Land Use Code (LUC) establish standards to assess certain development applications.

On June 7, 2021, a Pre-Application Conference was held between the applicant's representatives (Citra Power, DMEA) and staff from County Planning, Engineering, Economic Development and Road & Bridge. Staff had questions/comments that came up during the pre-application conference for the applicant to consider/answer. The applicant described their operation and answered a number of questions. A PowerPoint presented at the pre-application conference is **attached** for reference.

A number of documents were submitted as part of the formal application that addressed some of these items, and were referred out to reviewing agencies:

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- Site Selection. The applicant noted the need to be located in close proximity to where the 46kV (DMEA Transmission) and 115kV (Tri-State Transmission) intersect. There are three (3) substations fitting these criteria where the requisite acreage is available. This was narrowed to Garnet Mesa because it had the least number of residential properties around and has the most favorable topography and geology (less rocky). See Slide #5 in the pre-application conference PowerPoint.
- Agriculture. Aerial imagery shows irrigated agricultural lands, and the proposed location for the operation would be in an area of the site that would impact the irrigated area. Staff noted the County policy to limit impact to agricultural lands, and expressed some options that would afford continuation of agricultural use on these properties (e.g. grazing-sheep, honey bees, etc.), which can also address fire (fuel) management. **Exhibit 4.A** of the application package (**attached**) provides the applicant's Agriculture Management Plan, which includes grazing sheep on these properties.
- Drainage. There are multiple canals/ditches that traverse the project area, which create prescriptive easements for users to access any point at any time. However, the site will be secured from access. Staff requested the applicant to address how these facilities will allow access for maintenance and operation of the users (**Exhibit 4.B**, Drainage Access). A Stormwater Management Plan is included as **Exhibit 3.K**.
- Wetlands. A wetland was identified where the utility easement is located on Parcel A. As proposed, a utility line would bore under the wetland to avoid impact. Also, the subdivision file references an arroyo on Parcel II that requires a 100-foot set back. Please provide proof from the regulatory agencies that there is no jurisdictional wetland impact (issue) that could trigger NEPA. **Exhibit 3.E** provides a wetland/biological delineation and **Exhibit 4.C** address the potential impact.
- Noise. Properties surrounding the site are predominately rural residential and agriculture uses. Staff inquired about noise levels during the day and night. At sunset the solar array trackers will enter a "sleep" mode where they are held still in the most stable position to protect against any night winds. The power inverters will enter a low energy state—similar to a phone when it's not in use. They will be on, just not doing anything and therefore be quiet. The transformers too will be technically on, but because no power is being generated they will be quiet.
  Chapter 4, Section 7.C of the Land Use Code (LUC) specifies that development shall not exceed the thresholds set out in State statute. Motors are 30 dBA. Inverters and transformers are 80 dBA but located toward the middle of an array so a good distance from the property line. **Exhibit 3.A** describes this operation and **Exhibit 4.D** provides a noise assessment. Based on this assessment, staff finds that a noise mitigation plan is not required in this case.
- Operation. Staff inquired about the operation and if it might include a live on caretaker, since there is an existing house on one of the parcels in the

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West Phase. Proposed plans identify that this house would remain and be used as a field office, drop-in versus full time occupancy (**Exhibit 3.A** Project Description/Operations, and **Exhibit 4.E** Conversion Plan). Some solar facilities include battery storage, but the applicant noted there are no plans for accommodating battery storage at this time. Life of these solar panels is 35-40 years, at which time the site would either be decommissioned or you would apply to renew the permit (**Exhibit 3.P** Decommission Plan). Construction was identified as being nine months to one year and would be completed all in one phase (**Exhibits 3.O and 3.R** Construction Traffic and Schedule).

- Aesthetic. At the pre-application conference we discussed options for fencing and screening. Staff expressed a preference for a more rural looking fence with wood poles and field fencing to secure the site, and a lower profile type of panel array. **Exhibit 3.N** provides photo simulation reflecting existing conditions, fencing and landscaping. Fencing would be 7-foot tall wire mesh with wood posts, and the panels would be set back about 60 feet from 2100 Road. There will be no permanent lighting for the project to avoid disturbing neighbors overnight.
- Traffic/Access: A Traffic Study Letter was prepared (**Exhibit 3.O**) for this project. Traffic consists primarily of temporary construction traffic. The report recommends traffic control measures at access points during construction. Once completed, the traffic generation is de minimus from existing conditions.

OTHER AGENCIES INVOLVED:
Planning Staff sent the entire application package to the Review Agencies for comment on September 14, 2021. Adjoining Property Owners (within a 1,000-foot radius from all applicable parcels) were also sent a Public Notice for this application, including the applicant.

Comments have been received by UVWUA, County Engineering, City of Delta, CDOT, CO Dept of Natural Resources (DNR), and CO Dept of Parks and Wildlife (CPW). Planning has not received any additional feedback from any other review agencies or adjoining property owners. There have been a few informal conversations when members of the project happened to run into neighbors, but the applicant has not held any organized in-person neighborhood meetings.

UVWUA (attached)**:** This acreage has irrigation water delivered by the Uncompahgre Valley Water Users Association. No new water delivery structures will be constructed. The irrigation water for this tract of land will be delivered through the existing head gates. They request that the owners be responsible for necessary easements (**Condition #1**).

County Engineering (attached): Identifies right-of-way widths based on the road classification and notes existing conditions. Structural setbacks are also noted.

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County Engineering finds that additional right-of-way (20 feet) is required along the west side of 2100 Road (**Condition #2**).

City of Delta**:** No comment.

CDOT**:** No comment.

DNR**:** No issues.

Colorado Parks and Wildlife (attached)**:** Solar facilities are required to be fully secured, which can impact wildlife movement. Recommendations include preventing impact to the riparian corridor, which is excluded from proposed development, and located outside of the perimeter (security) fence. CPW provided several recommendations to help minimize impact to wildlife (**Condition #3**). CPW recognizes the applicant's noxious weed and reclamation efforts.

Prepared by: Carl P. Holm, AICP, Planning & Community Development
970.874.2110
cholm@deltacounty.com
November 10, 2021

Attachment(s):

- Recommended Conditions
- Pre-Application PowerPoint (6-7-2021)
- Application package (8-24-2021) [*NOTE: These documents are large files provided to the Planning Commission. If a member of the public would like to receive a zip file with these documents, please email planning@deltacounty.com*]
    - Exhibits 2.A-2.G
    - Exhibits 3.A- 3.R
    - Exhibit 4.A-4.E
- UVWUA Comments (9-27-2021)
- County Engineering Comments (6-7-2021)
- CPW Comments (10-5-2021)

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Recommended Conditions of Approval
Garnet Mesa Solar Facility (PLN21-030)
PC, November 17, 2021

1. Development of the Garnet Mesa Solar array shall be in accordance with approved plans and supplemental documentation to the satisfaction of the Director of Community Development and Natural Resources. Any significant modification shall require an amendment to be considered by the Planning Commission and Board of County Commissioners.

2. Parcel owners shall be responsible for any necessary easements or water delivery systems and for the removal of tail/wastewater back to the U.V.W.U.A. water delivery system for each lot (per letter dated September 27, 2021). [UVWUA]

3. Applicant/Owner/Operator shall offer for dedication to Delta County, 20-feet along the west side of 2100 Road for the purposes of public right-of-way. [County Engineering]

4. Applicant/Owner/Operator shall implement recommendation for wildlife movement in accordance with CO Parks and Wildlife letter dated October 5, 2021. [CPW]

GARNET MESA SOLAR PROJECT

Delta County Planning and Community Development Board

Limited Use Zoning Permit

Pre-Application Project Overview

June 7, 2021

Guzman Energy

CITRA

DMEA

A Touchstone Energy® Cooperative

CITRA

TODAY'S GOALS

- *Present our working vision and project concept*
- *Collect initial feedback and questions*
- *Open discussions*

1. Introduction and Vision
2. Request
3. Site Analysis and Selection
4. Context
5. Site Plan
6. Project Timeline
7. Solar FAQ
8. Feedback

INTRODUCTION AND VISION

Citra Power has significant expertise in renewable energy development, technical engineering, construction management and oversight, project and portfolio acquisitions, and wholesale power procurement.

In mid-2020, Citra Power, Guzman Energy, and DMEA started discussions around developing a local renewable energy resource to meet DMEA's goal of providing stable, affordable, clean energy for their members. The Citra Power team completed a rigorous diligence process to evaluate all constraints within the area over several months. We ultimately narrowed in on a project in the Garnet Mesa region, which we believe is ideally situated to integrate into the community and provide the entire region with energy stability far into the future.

When complete, the project will include 171,000+ solar panels, will generate 80MW of electricity, and will supply approximately 20% of DMEA's total local power use.

> *"When we transitioned to Guzman Energy as our power supplier, we had three primary goals: rate stabilization, increased local renewable generation, and local control. The Garnet Mesa Solar Project helps us achieve all three."*
> *Virginia Harman, DMEA's acting CEO*

REQUEST

The Garnet Mesa Solar Project is seeking to obtain a Limited Use Zoning Permit for a Renewable Energy Facility on A20 zoned land pursuant to the process outlined in Chapter 7 of the Delta County Land Use Code dated January 5, 2021.

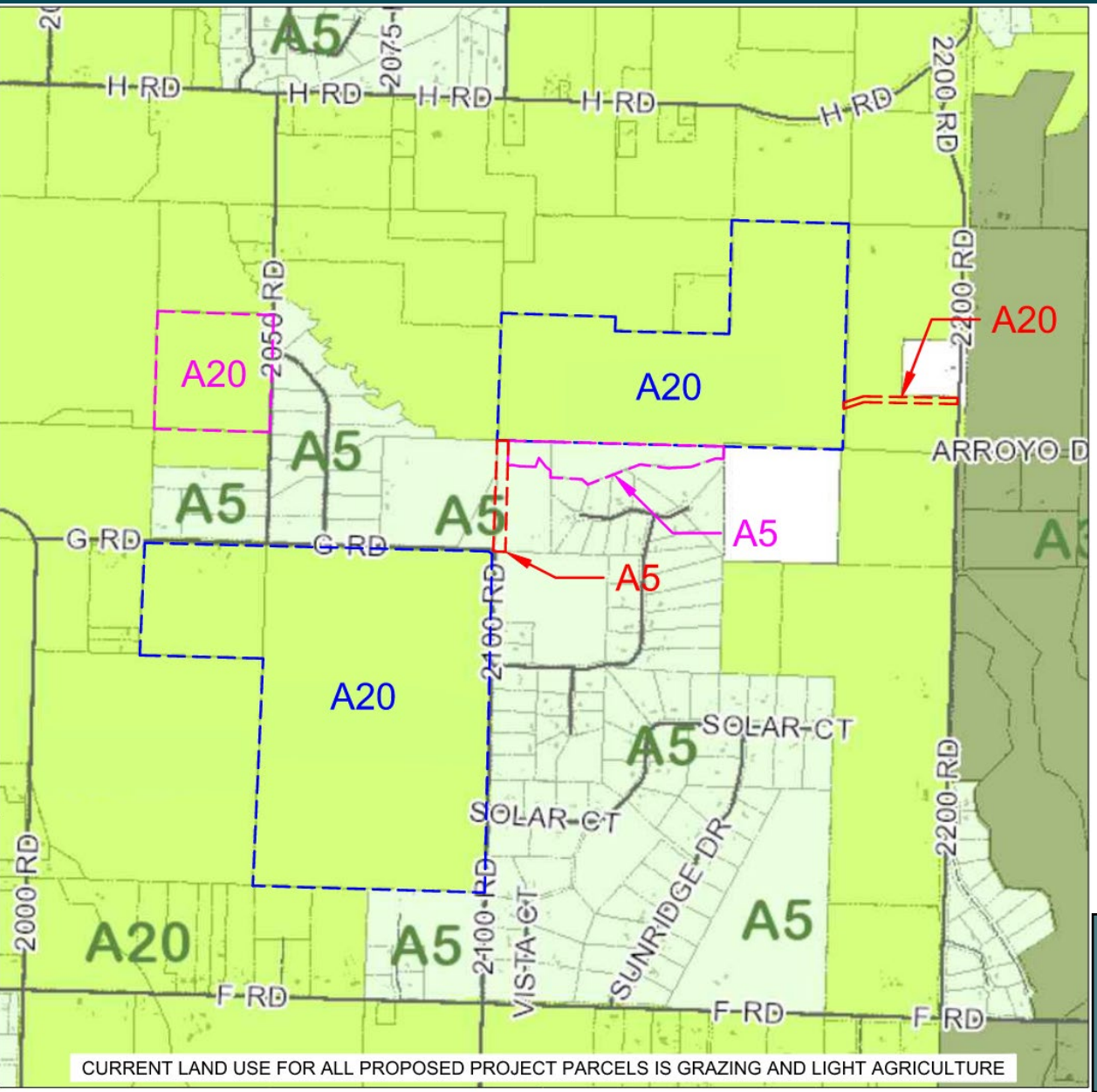
SITE ANALYSIS AND SELECTION: WHY GARNET MESA?

CITRA

- Large Contiguous Parcels supporting 350-400 Acre Project
- Appropriate Zoning
- Compatible Terrain
  - limited slopes
  - geotechnical compatibility
  - avoidance of environmental impacts
- Proximity to DMEA & Tri-State Transmission

Compatible Substation (DMEA & Tri-State Network Access)
Non-Compatible Substation
46kV Transmission
115kV Transmission
230kV Transmission

CONTEXT: CURRENT ZONING



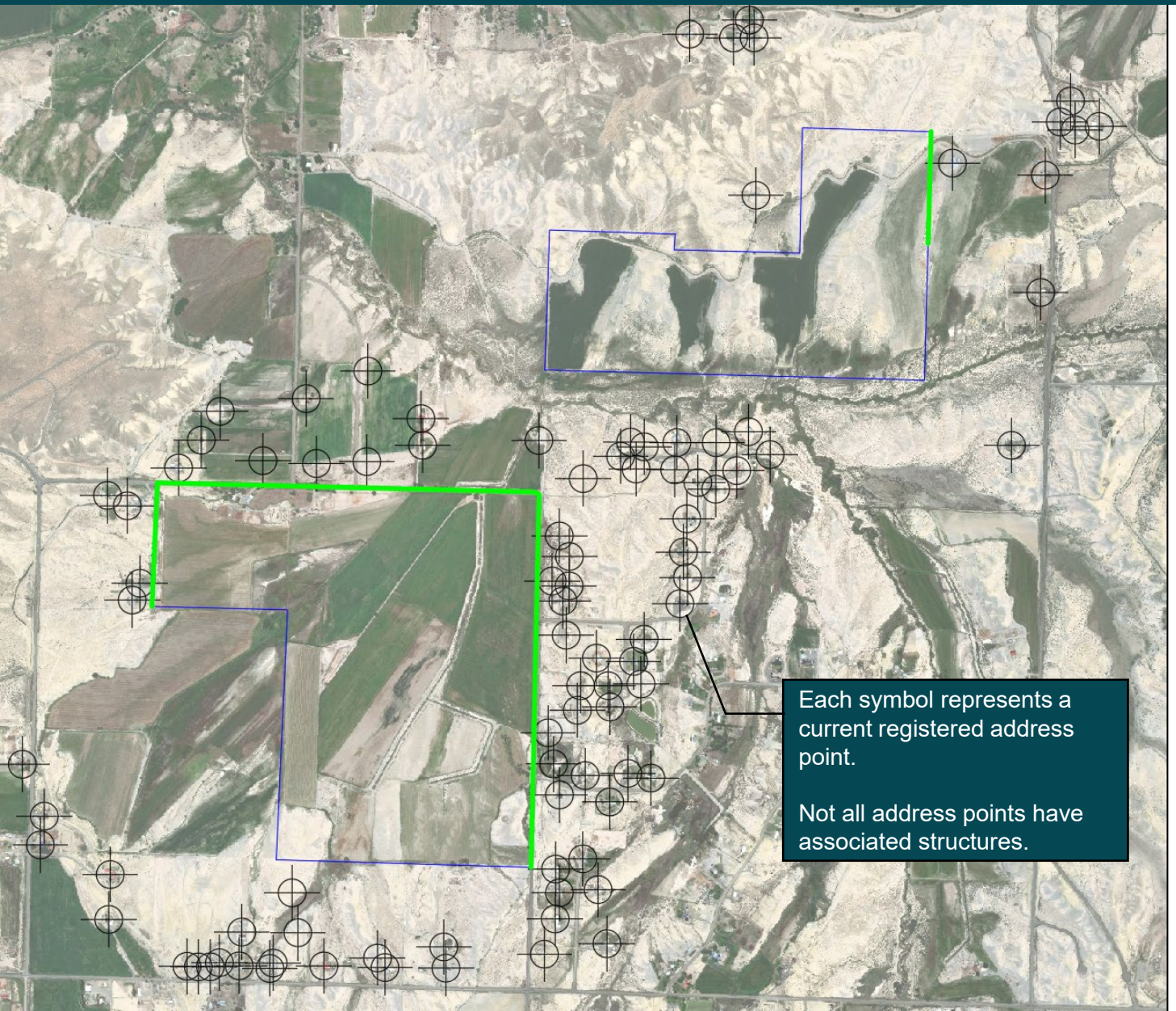
Parcel ID	Address	Acreage	Description	Owner
345514300008	6469 2050 Rd	40	Unused	Garnet Mesa Land LLC
345523100001	G Rd	240	Project Parcel	Garnet Mesa Land LLC
345523200009	20426 G Rd	41.8	Project Parcel	Garnet Mesa Land LLC
245513100020	6687 2200 Rd	181.5	Project Parcel	Garnet Mesa Land LLC
345513300009	5990 2100 Rd	2.56	Easement Only (Electrical Lines)	Jennifer Hofschulte
345513100022	6687 2200 Rd	67.55	Easement Only (Driveway)	Kenneth Norell

Site parcel

Owned by project company, not used for project

Driveway and electrical collections easements

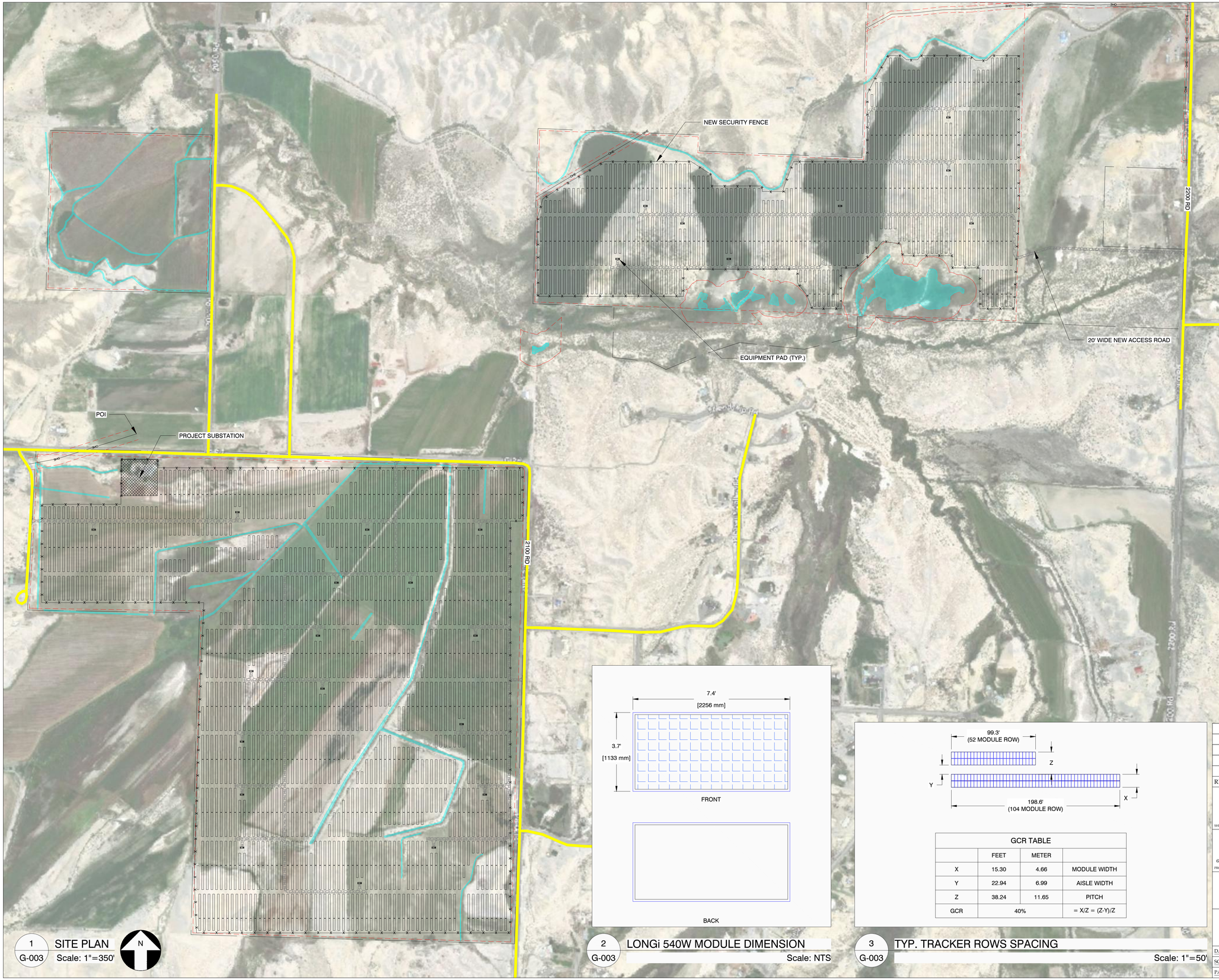
CONTEXT: PROJECT NEIGHBORS



The project resides in an agricultural region with residential interface as defined in the Delta County Master Plan future land use designation.

The team seeks input from the Planning Board on how best to mitigate impacts on surrounding agricultural and residential uses.

The team anticipates increased visual mitigation in the areas depicted along the green lines on the map.



1 G-003 SITE PLAN
Scale: 1"=350'

2 G-003 LONGi 540W MODULE DIMENSION
Scale: NTS

GCR TABLE			
	FEET	METER	
X	15.30	4.66	MODULE WIDTH
Y	22.94	6.99	AISLE WIDTH
Z	38.24	11.65	PITCH
GCR	40%		= X/Z = (Z-Y)/Z

3 G-003 TYP. TRACKER ROWS SPACING
Scale: 1"=50'

SYSTEM SPECIFICATIONS	
SYSTEM SIZE DC	92,664.00 kW
SYSTEM SIZE AC	80,000.00 kW
DC/AC RATIO	1.16
MODULE MANUFACTURER	LONGi SOLAR
MODULE MODEL	LR5-72-HBD-540M-BIFACIAL
MODULE RATING	540 W
TOTAL MODULE QTY	171,600
MODULES PER STRING	26
TOTAL NO. OF STRINGS	6,600
INVERTER MODEL	POWER ELECTRONICS FS3430M
INVERTER RATING	3,200 kW
INVERTER QTY	25
STEP-UP TRANSFORMER	(25) 3.55 MVA, 34.5kV/0.6kV
RACKING TYPE	FTC VOYAGER 2P HSAT
TILT	0°
AZIMUTH	180°
GCR	40%
AVAILABLE PROPERTY AREA	579.59 Ac
FENCED AREA	365.00 Ac

LEGEND

- FTC VOYAGER 2P MODULE TRACKER ROWS (1,507)
- FTC VOYAGER 2P MODULE TRACKER ROWS (286)
- POWER STATION EQUIPMENT PAD
- PROPERTY LINE
- SETBACK LINE
- MIN. 6' SECURITY FENCE
- PROJECT SUBSTATION
- GRAVEL ACCESS ROAD
- EXISTING OVERHEAD LINE
- EXISTING ROAD
- WETLAND

DRAFT
NOT FOR CONSTRUCTION

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	AA	DG	05/25/2021

SHEET TITLE: GENERAL SITE PLAN

SHEET NO.: G-003

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

SOLVIDA DESIGN + ENGINEERING
1400 Shattuck Avenue, Suite 3
Berkeley, California 94709

soa SIERRA OVERHEAD ANALYTICS

DATE:	05/25/2021	DFTR:	LAKIR RAMBHIA
SCALE:	AS SHOWN	CHKD:	STEPHEN SMITH
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

CONFIDENTIALITY STATEMENT
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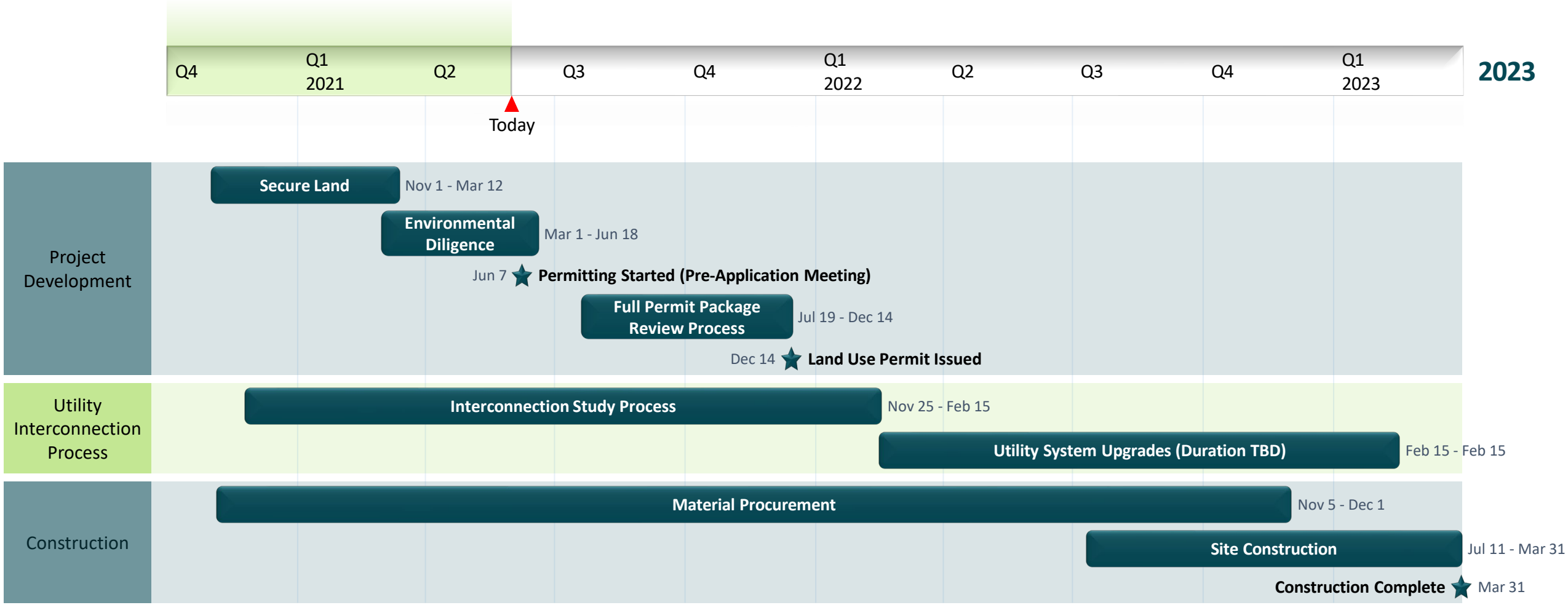
PROJECT TIMELINE



PERMIT PACKAGE: PLANNED SUPPORTING MATERIALS

The larger Garnet Mesa Solar Project development team includes local environmental and land personnel who are currently completing a full package of submittals to support the upcoming permit request. These partners include:

ERO

BUCKHORN ENGINEERING

ROCKY MOUNTAIN SURVEYING, LLC.

Additional solar-specific partners include:

SOLVIDA DESIGN + ENGINEERING
1641 Kains Avenue, Berkeley, California 94702

soa SIERRA OVERHEAD ANALYTICS

The team requests the Board's review and concurrence of the items listed here.

Material	Status
Project Description and Operating Plan	In Work
Existing and Surrounding Land Use Summary	In Work
Legal Descriptions	Completed
Mineral Rights Summary	Completed
Environmental/Species Survey	In Work
Vegetation Plan	In Work
Geotechnical Hazard Assessment	Completed
Construction Costs Summary	In Work
Construction Traffic Study	In Work
Water Quality Impact Assessment	In Work
Visual Mitigation Plan	In Work
Emergency Response Plan	In Work
Draft SWPPP Plan	In Work
Noxious Weed Control Plan	In Work
Utility Easement Plan	In Work
Decommissioning Plan	In Work
Construction Schedule	In Work
Site Plan	In Work

SOLAR FAQ

CITRA

What do projects look like?

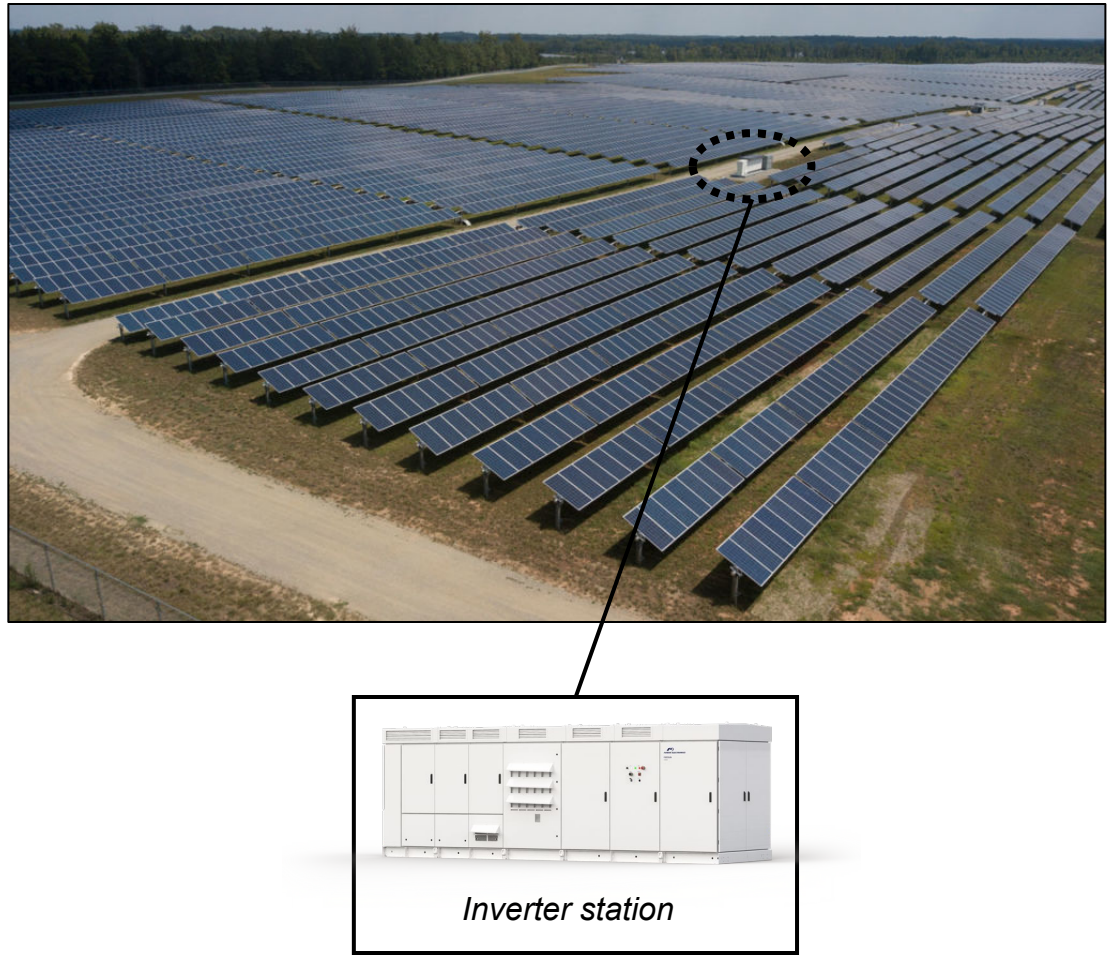
- A 7ft security fence surrounds the entire project.
- Site roads are minimal and consist of crushed gravel.
- Solar panels are connected on rows running North to South. Each row pivots East to West to follow the sun.
- The panels are at full tilt in the mornings and evenings when the sun is lowest. Full tilt is typically 50-55°. At full tilt, the maximum height above grade is 10ft.
- At night, the rows “sleep” in a horizontal position.
- Site sensors monitor for high winds and will automatically position the rows into a defensive wind buffering stance to protect the equipment.

SOLAR FAQ

CITRA

How does utility scale solar work?

- Solar panels convert sunlight into electricity. The greater the intensity of sunlight, the more electricity is generated.
- The typical project includes three primary components: solar panels, inverter stations, and a collection substation.
- The solar panels are connected electrically via cabling running below the panels.
- The cabling is aggregated and ultimately connects into inverter stations.
- The inverter stations convert the power from direct current (“DC”) to alternating current (“AC”).
- The output flows to a collection substation, which adjusts the voltage to be compatible with the utility’s transmission system.
- The utility takes ownership of the electricity at the point it exits the substation and is supplied to the grid.



Inverter station

SOLAR FAQ

CITRA

How long will the project last?

We are seeking a permit term of 40 years.

What happens at the end of the permit term?

At the end of the permit term, the site may either be re-permitted for additional years of service, or the project can be decommissioned.

When decommissioned, all equipment is removed, and the land is restored to its original state. Most of the equipment used on the project is fully recyclable or reusable on different projects. The project plan and budget include an allocation to fully decommission the site. Unlike traditional forms of fossil fuel generation, solar produces no long-term environmental contamination. After the site is uninstalled, the land can convert back to agricultural or grazing use immediately with no remediation work.

SOLAR FAQ

CITRA

What is the expected water use for the project?

During construction, an estimated 25 to 30 acre-feet of water will be used for dust control.

The panels may require occasional cleaning, typically no more than once per year. We estimate 1-gallon of water per panel, totaling 0.5 acre-feet for the project.

What are the project's plans for site vegetation?

We will work with local and state level experts to craft a region-appropriate seed mix. The goal is to control erosion and provide habitat for birds, insects, small mammals, and other local wildlife. We anticipate the proposed vegetation will include native species like low growth shrubs and grasses that require infrequent mowing and no pesticide use.

Example of native grasslands at an operational project

SOLAR FAQ

CITRA

What kind of fencing do projects utilize?

Solar project fencing requirements are set by National Electrical Code, which stipulates that fencing be constructed at least 7 feet high or use a combination of 6 feet of fencing with at least 1 foot of three strands of barbed wire at the top of the fence. Projects and communities often collaborate to establish fencing that meets both the code requirements and site-specific goals.

7ft galvanized chain link

7ft epoxy coated colored chain link

6ft chain link with 1ft barbed wire

7ft wire mesh with wood poles

7ft chain link with privacy slats

7ft galvanized chain link with vegetation buffer

SOLAR FAQ

CITRA

? Is there any noise associated with the project during operations?

Three systems within the project generate measurable levels of operational noise: tracker motors, inverters, and transformers. It is important to note that these devices only generate noise when the sun is up; noise emission before 7am and after 7pm for all equipment will be negligible. The tracker motors operate intermittently and produce minimal noise, typically under 30 dBA. For reference, 30 dBA on standard noise level charts is equivalent to a whisper or rustling leaves.

The inverters and transformers are always co-located, as they operate together. We anticipate using equipment generating 79 dBA under maximum load. Per the same noise level charts, this is often compared to a noisy restaurant or city traffic. However, this equipment will be set back from the project perimeter, such that the noise at the fence line will be under the statutory limit of 55dBA from 7am to 7pm.

? Will glare from the panels reflect onto nearby residences or roads?

No. This is a common misconception with solar panels. Solar panels are designed to absorb the sun's rays and not reflect them. It is through this absorption of light that the panels create electricity. The FAA and US Air Force are both excellent case studies on this topic. Both agencies have extensively studied potential for glare and have determined this to be a non-issue. This is reflected in the large number of solar facilities successfully operating at airports and military bases.

SOLAR FAQ

CITRA

How long will it take to construct the project?

We anticipate the construction of the project to take 9 to 10 months.

What impacts will the project have to local traffic?

During operations, the facility will operate mostly unmanned and will not materially increase traffic on surrounding roads. During a normal operating day, we expect one or two visits to the site from local operations personnel in standard passenger cars and trucks to check on the project.

During construction, there will be an increase in traffic commensurate with the amount of construction personnel on site at any given time.

SOLAR FAQ

CITRA

How many jobs will be created by the project?

During construction, we anticipate 350 to 400 construction jobs being generated for local civil contractors, electricians, laborers, and support services. During operations, the project is expected to create 1 to 2 new full-time jobs for local site management personnel.

What is the anticipated investment into the project and the economic impact to the community?

Construction costs are anticipated to fall between $75-80 million, and approximately $20 million of this total is allocated for labor expenses. Staffing preference will be provided to local individuals and businesses, which keeps a significant proportion of investment within the community.

Given the large number of staff required, we anticipate also drawing from outside the greater Delta community. The staff from outside the region typically stay in local hotels and RV parks near the project site during the work week, which spurs significant investment into local businesses for lodging, food, and entertainment.

The project will generate $10 million of property tax over 35 years.

THANK YOU!

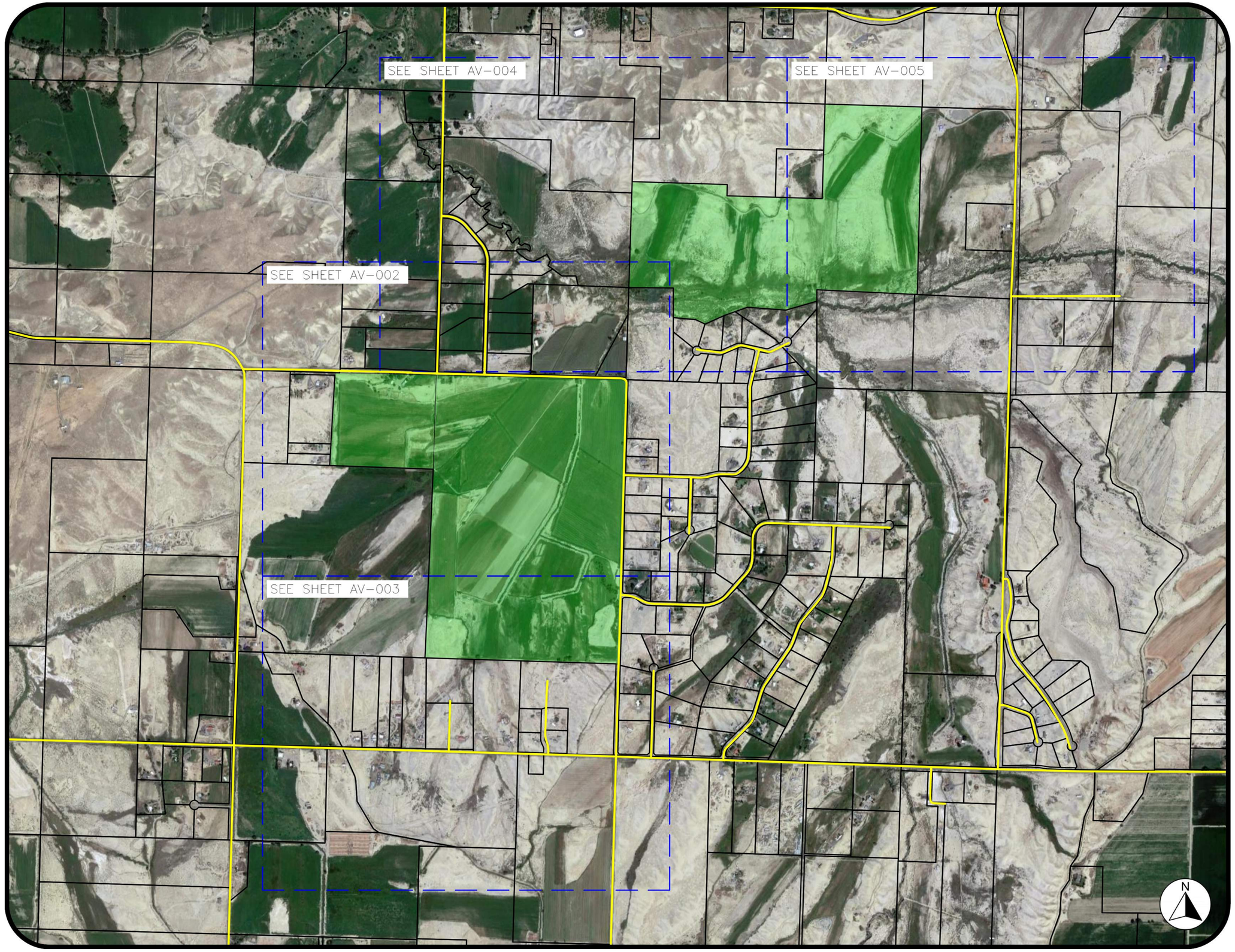
Matt Kosakowski

kosakowski@citrapower.com

(303) 884-5598

Attachment 2-A

Aerial View Map



AERIAL VIEW

General Notes

SUBJECT PARCEL

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

CITRA

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: AV-001
Date: AUGUST 8, 2021	
Scale: 1" = 600 FT	

AERIAL VIEW

General Notes

SUBJECT PARCEL

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

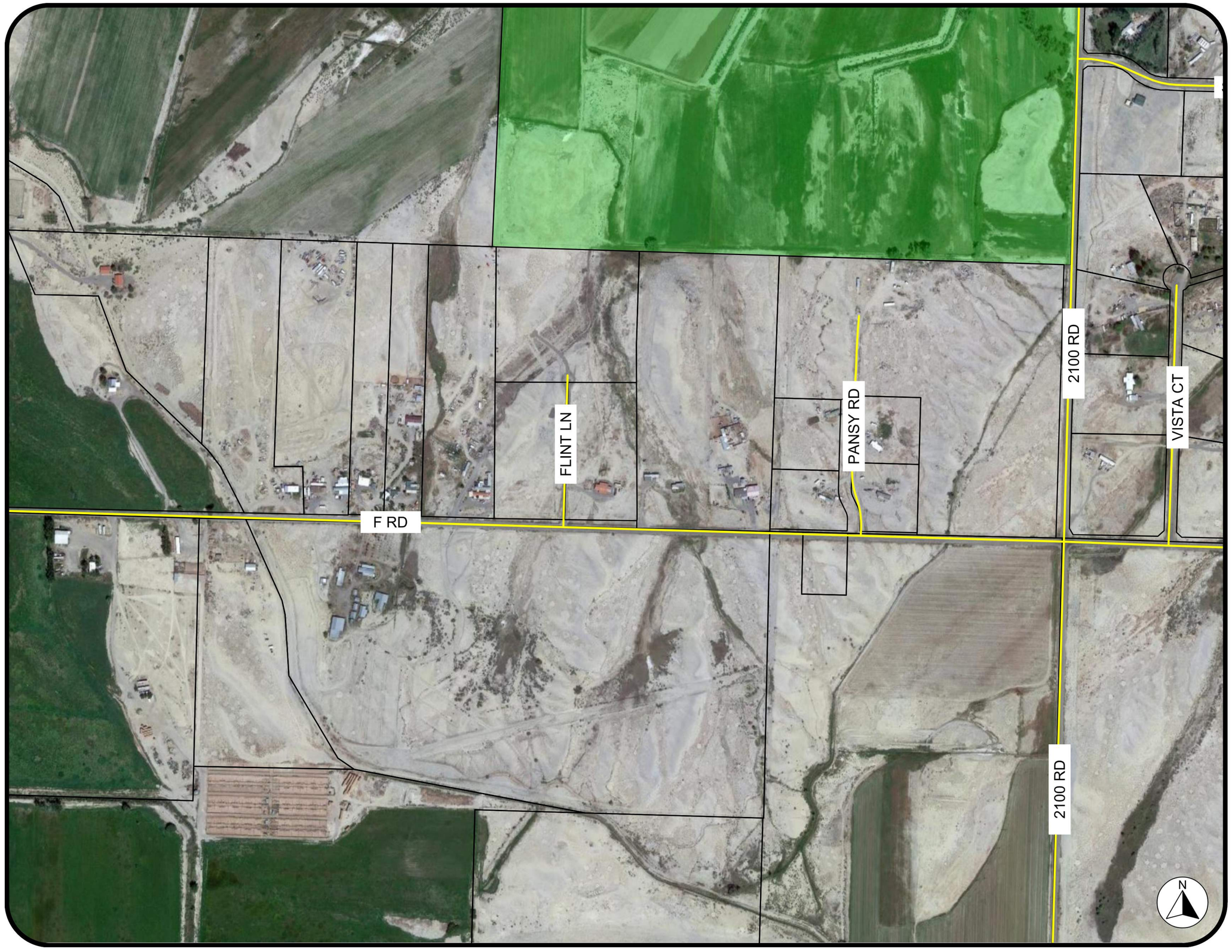
CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

CITRA

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: AV-002
Date: AUGUST 8, 2021	
Scale: 1" = 200 FT	



AERIAL VIEW

General Notes

SUBJECT PARCEL

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

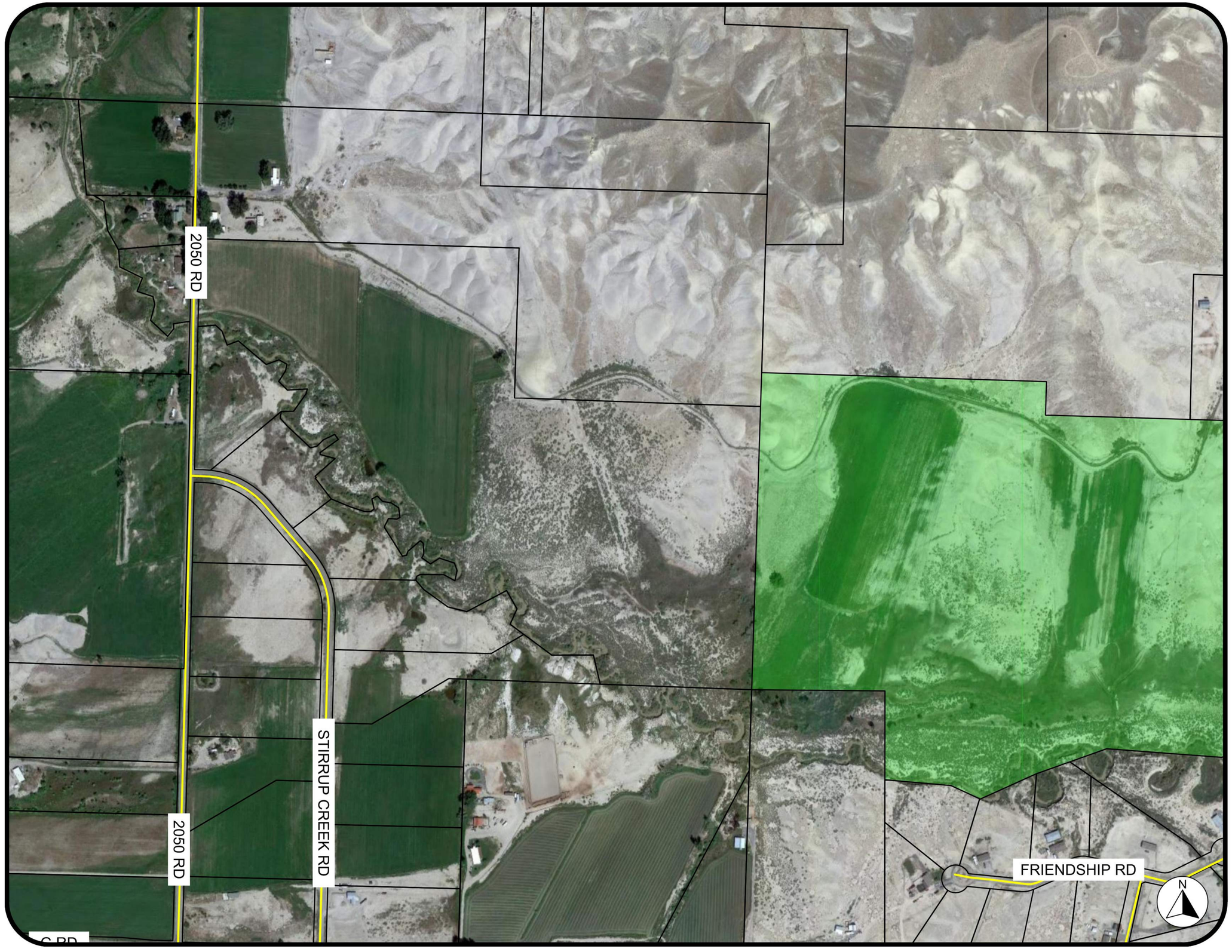
CITRA

CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: AV-003
Date: AUGUST 8, 2021	
Scale: 1" = 200 FT	



AERIAL VIEW

General Notes

SUBJECT PARCEL

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

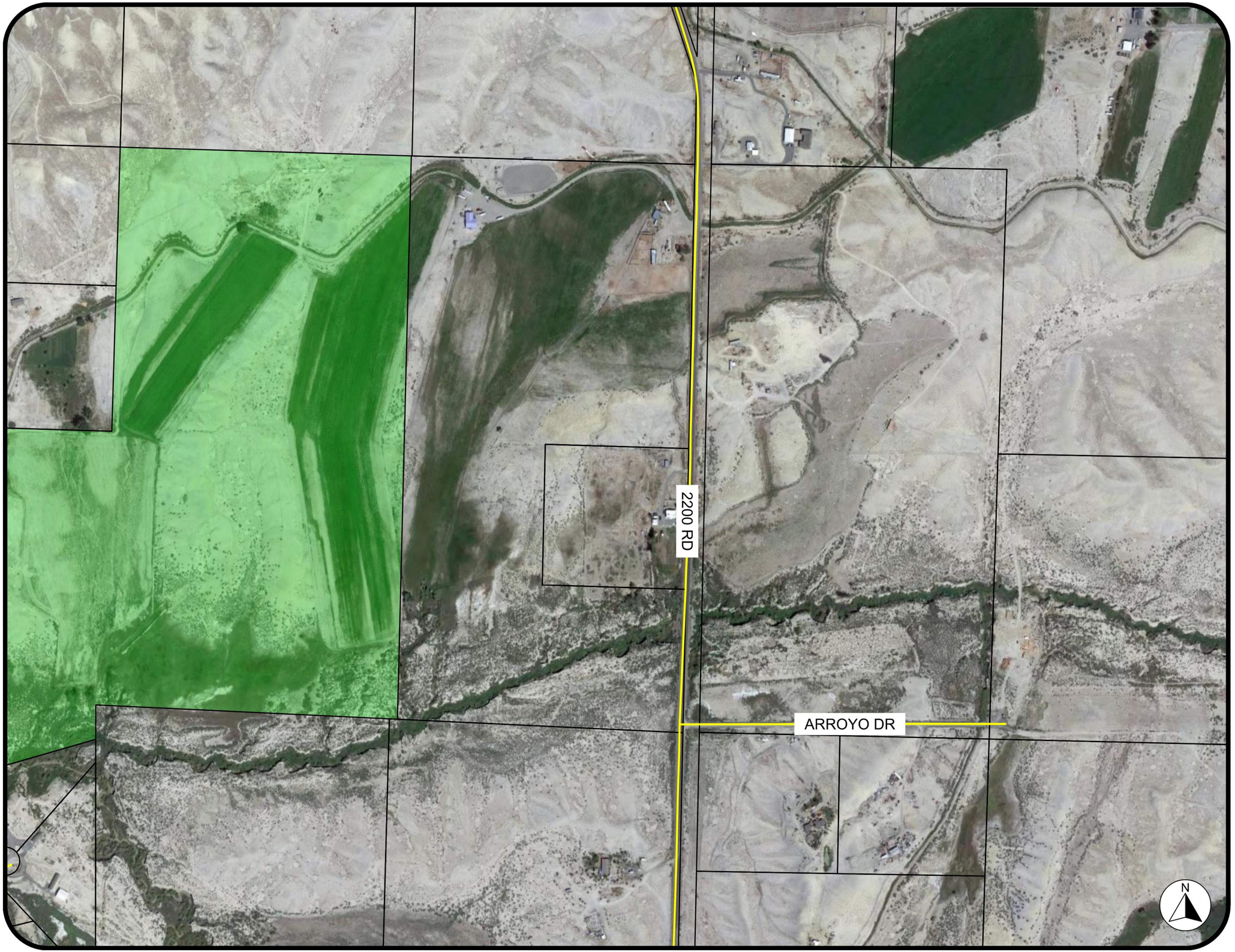
CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

CITRA

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: AV-004
Date: AUGUST 8, 2021	
Scale: 1" = 200 FT	



AERIAL VIEW

General Notes

SUBJECT PARCEL

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

CITRA

CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

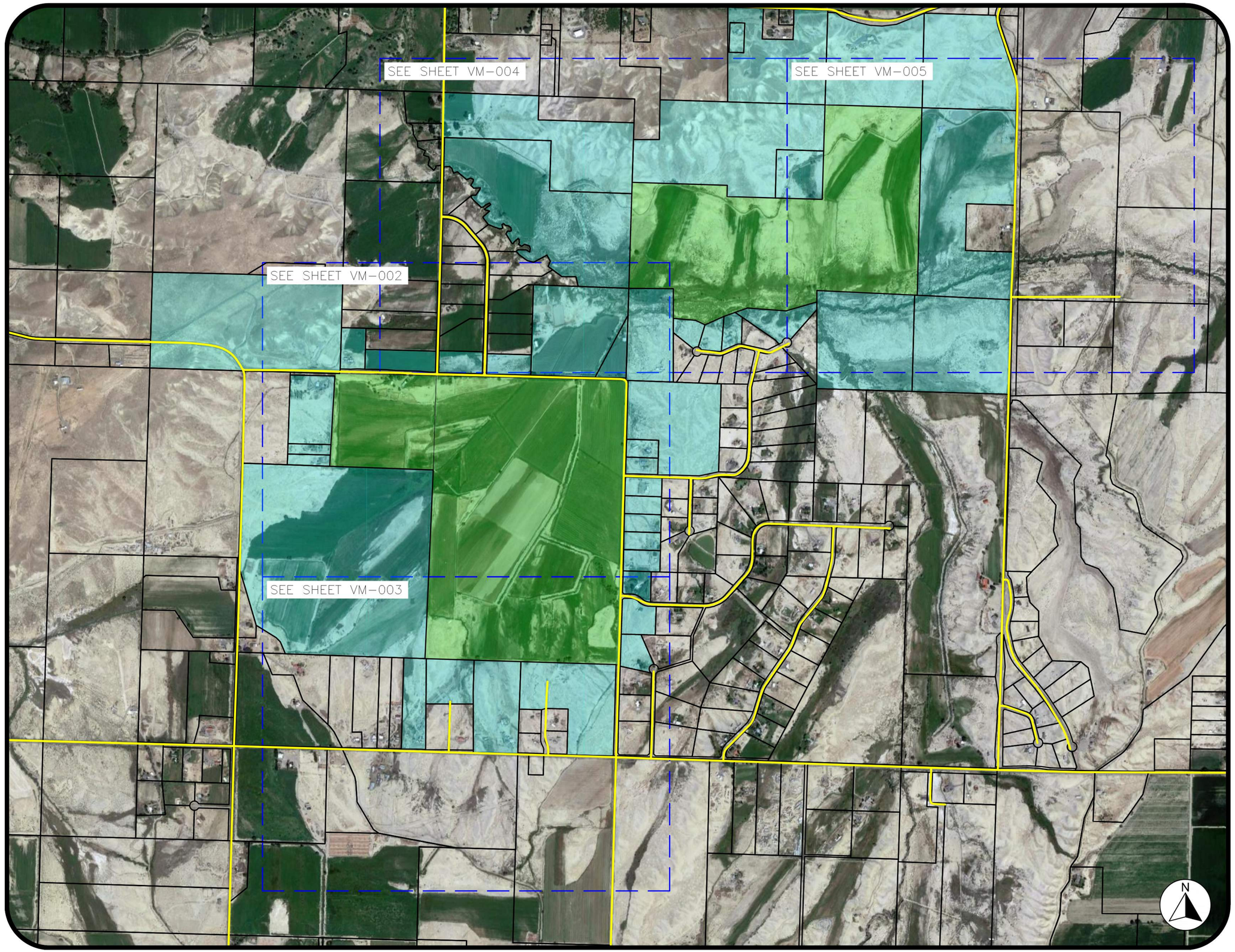
Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: AV-005
Date: AUGUST 8, 2021	
Scale: 1" = 200 FT	

Attachment 2-B

Vicinity Map



VICINITY MAP
PROPERTY OWNERS

General Notes

SUBJECT PARCEL

ADJACENT PARCEL

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

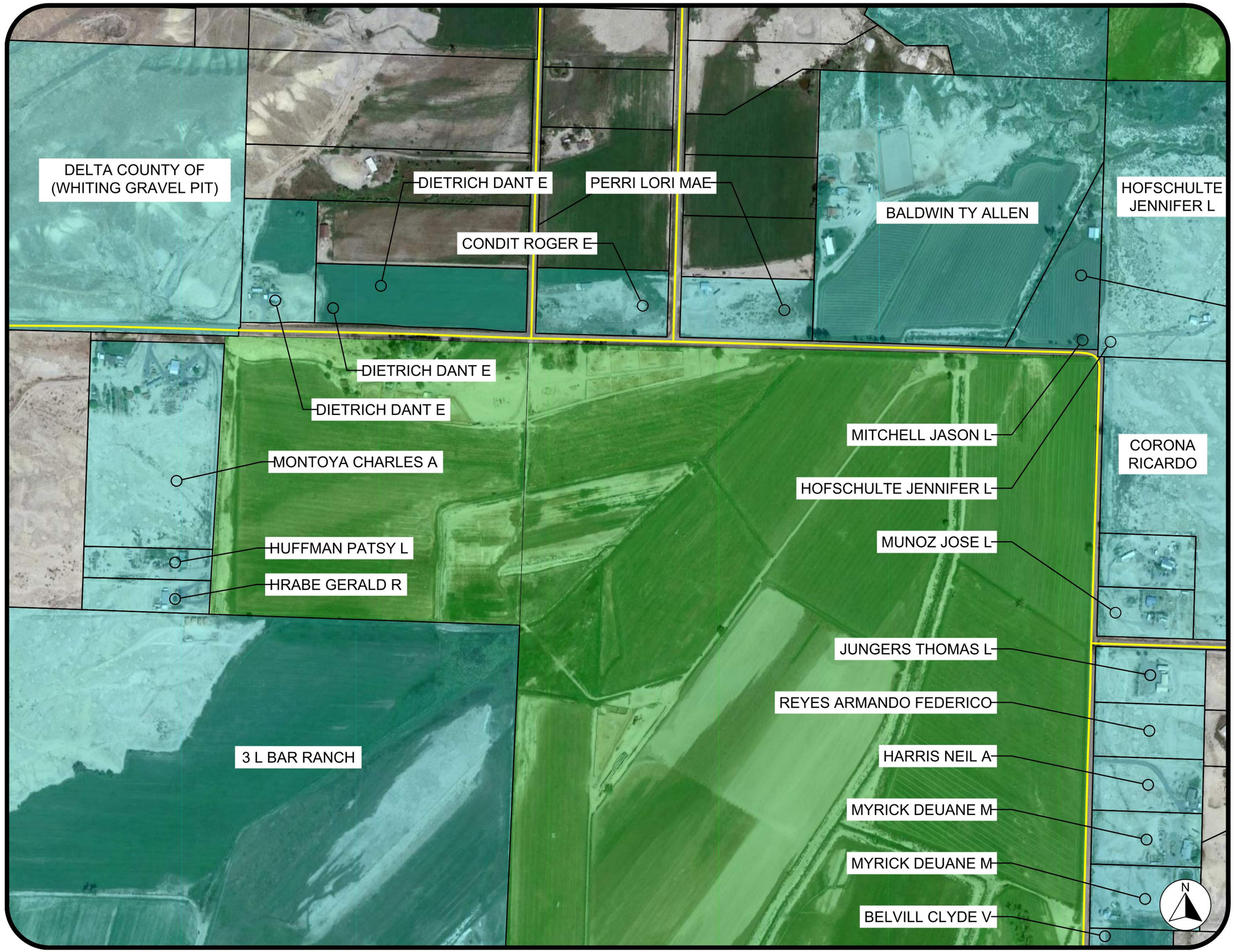
CITRA

CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: VM-001
Date: AUGUST 8, 2021	
Scale: 1" = 600 FT	



VICINITY MAP
PROPERTY OWNERS

General Notes

SUBJECT PARCEL

ADJACENT PARCEL

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

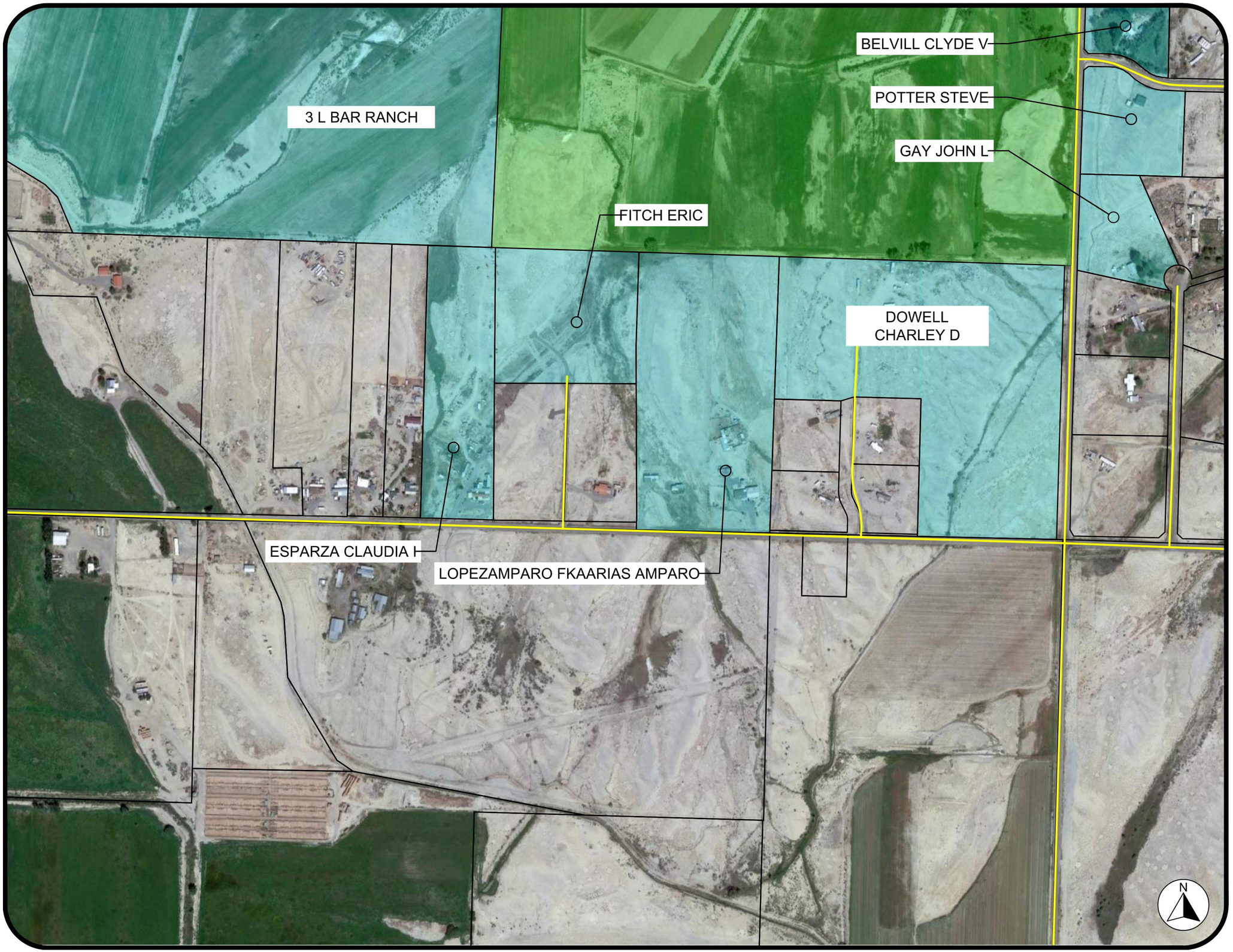
CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

CITRA

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: VM-002
Date: AUGUST 8, 2021	
Scale: 1" = 200 FT	



VICINITY MAP
PROPERTY OWNERS

General Notes

SUBJECT PARCEL

ADJACENT PARCEL

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

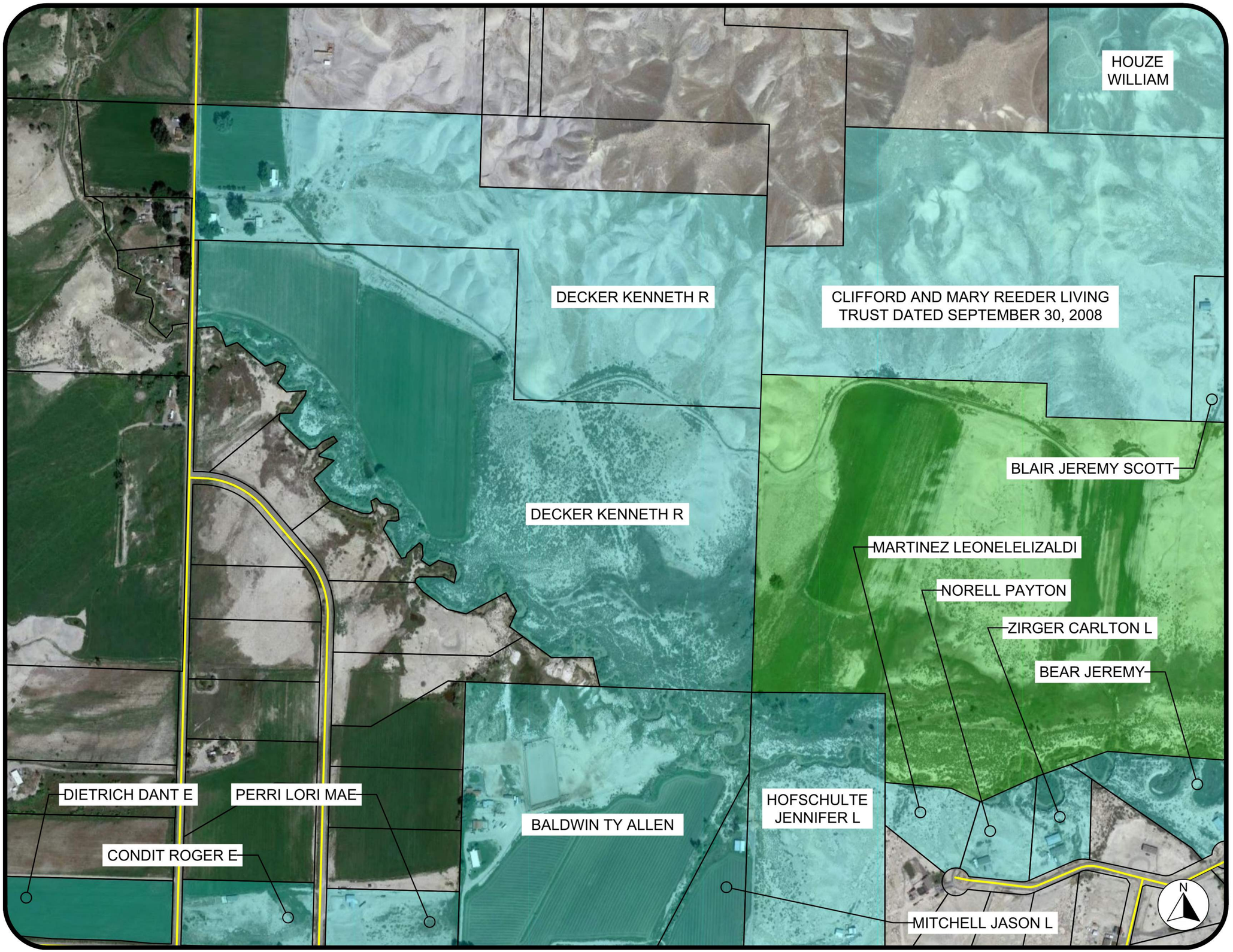
CITRA

CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: VM-003
Date: AUGUST 8, 2021	
Scale: 1" = 200 FT	



VICINITY MAP
PROPERTY OWNERS

General Notes

SUBJECT PARCEL

ADJACENT PARCEL

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

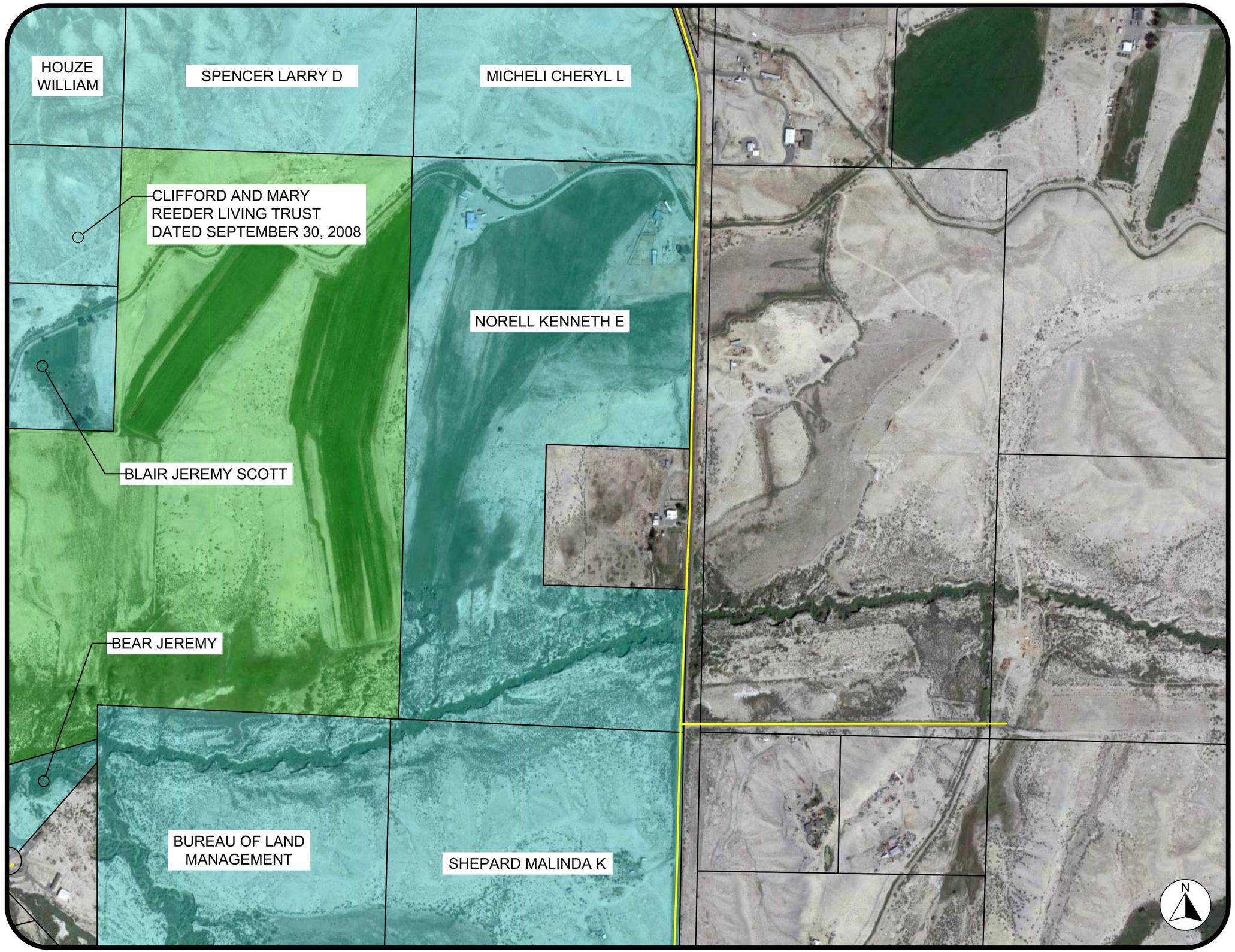
CITRA

CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: VM-004
Date: AUGUST 8, 2021	
Scale: 1" = 200 FT	



VICINITY MAP
PROPERTY OWNERS

General Notes

SUBJECT PARCEL

ADJACENT PARCEL

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

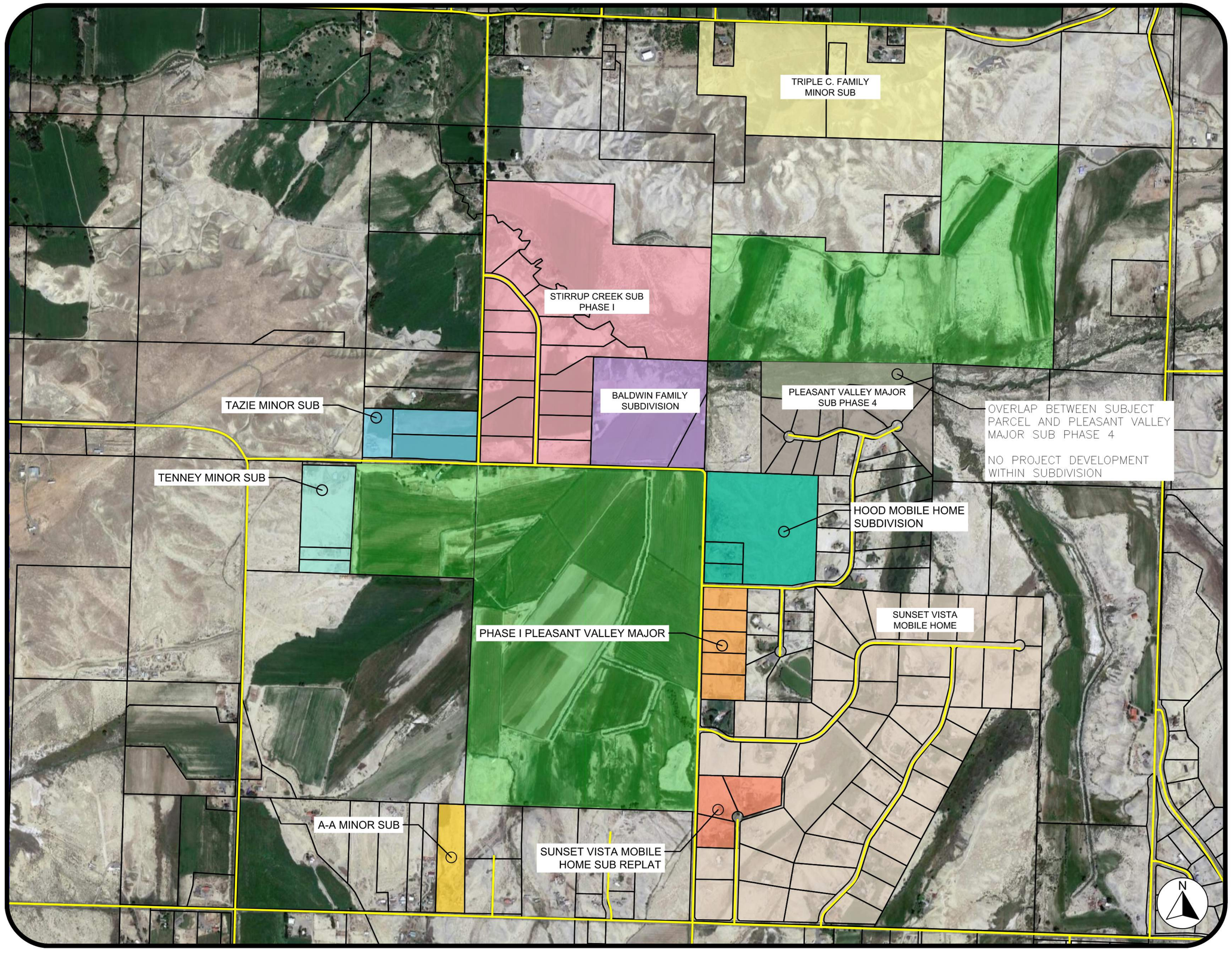
CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

CITRA

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: VM-005
Date: AUGUST 8, 2021	
Scale: 1" = 200 FT	



VICINITY MAP
ADJACENT SUBDIVISIONS

General Notes

SUBJECT PARCEL

VARIOUS COLOR FILL
SUBDIVISION DESIGNATION

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

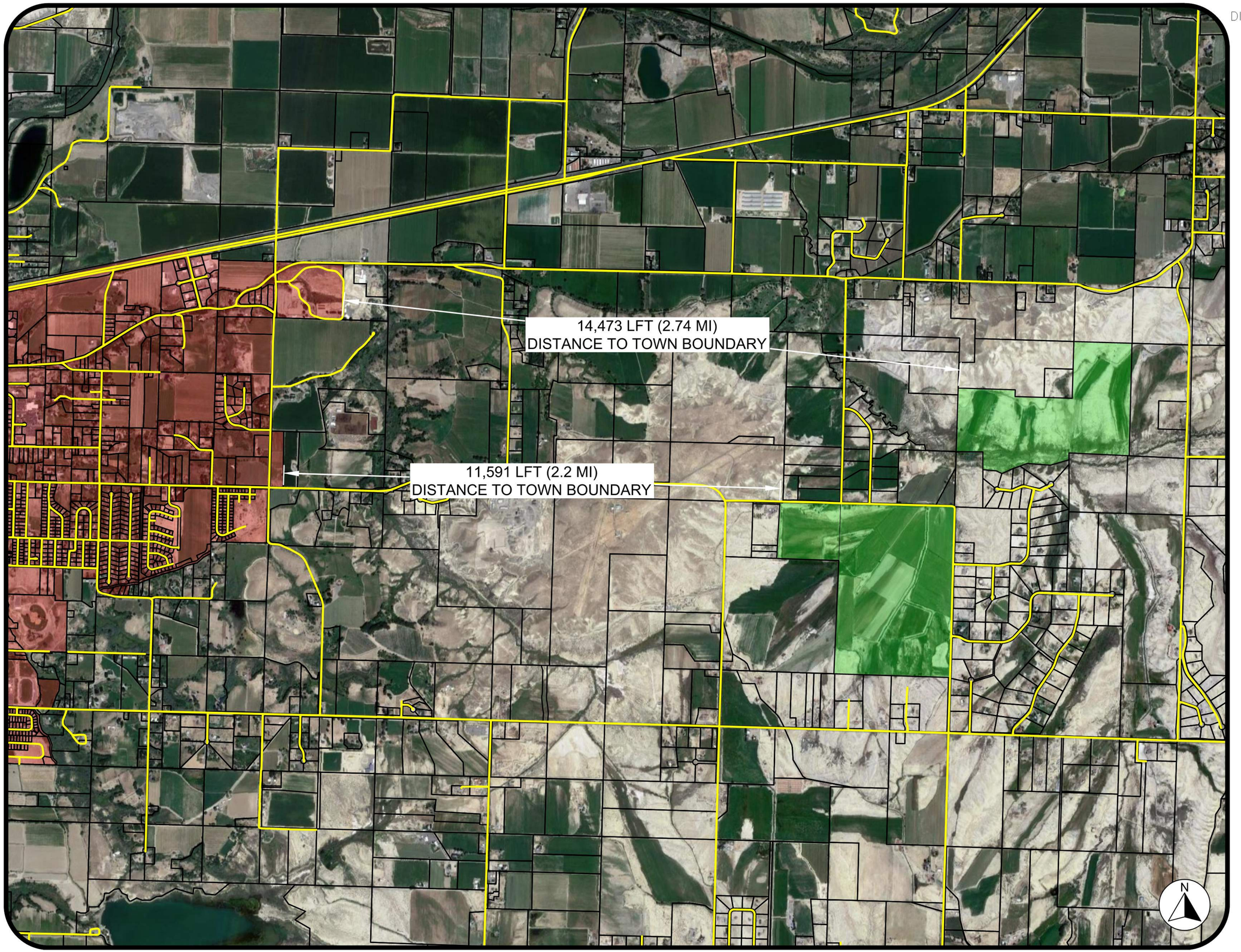
CITRA

CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: VM-006
Date: AUGUST 8, 2021	
Scale: 1" = 500 FT	



VICINITY MAP
DISTANCE FROM CLOSEST TOWN

General Notes

SUBJECT PARCEL

DELTA TOWN BOUNDARY

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

CITRA

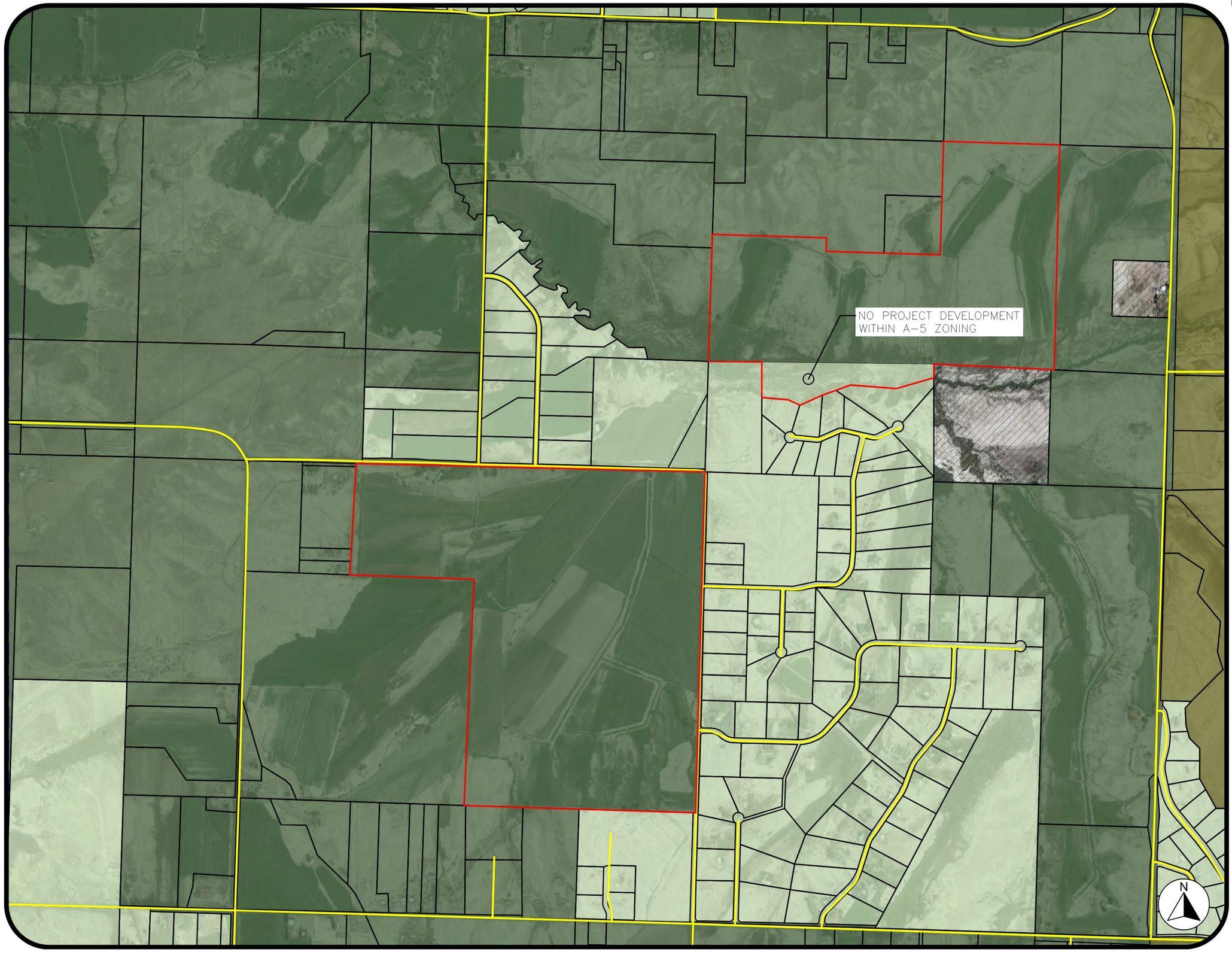
CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: VM-007
Date: AUGUST 8, 2021	
Scale: 1" = 1,000 FT	

EXISTING & SURROUNDING USE ZONING



General Notes

SUBJECT PARCELS

AGRICULTURE (35-ACRE)

AGRICULTURE (20-ACRE)

AGRICULTURE (5-ACRE)

NO APPLIED ZONING: FEDERAL LANDS

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

CITRA

CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: EU-001
Date: AUGUST 8, 2021	
Scale: 1" = 500 FT	

Attachment 2-C

Legal Descriptions

(ALTA Survey)

ALTA/NSPS LAND TITLE SURVEY

LOCATED IN SECTIONS 13,14 & 23, TOWNSHIP 15 SOUTH, RANGE 95 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF DELTA, STATE OF COLORADO

TITLE COMMITMENT NOTES (TC1) PARCEL 1:

FOR ALL INFORMATION REGARDING EASEMENTS, RIGHT-OF-WAY OR TITLE OF RECORD, WASHBURN LAND SURVEYING, LLC RELIED UPON TITLE COMMITMENT ORDER NUMBER F070116-397-DG0-LCO, BY FIDELITY NATIONAL TITLE COMPANY, WITH AN EFFECTIVE DATE OF JANUARY 21, 2021 AT 5:30 P.M..
THE FOLLOWING COMMENTS ARE IN REGARDS TO THE ABOVE REFERENCED TITLE COMMITMENT.

SCHEDULE B NOTES:

[ITEMS 1-7 ARE NON-SPECIFIC AND THEREFORE NOT SHOWN]

8. RESERVATIONS CONTAINED IN THE PATENT
FROM: THE UNITED STATES OF AMERICA
PATENT NO: 1028159
WHICH AMONG OTHER THINGS RECITES AS FOLLOWS:
ANY VESTED AND ACCRUED WATER RIGHTS FOR MINING, AGRICULTURAL, MANUFACTURING OR OTHER PURPOSES AND RIGHTS TO DITCHES AND RESERVOIRS USED IN CONNECTION WITH SUCH WATER RIGHTS AS MAY BE RECOGNIZED AND ACKNOWLEDGED BY LOCAL CUSTOMS, LAWS AND DECISIONS OF COURTS.
[APPLIES TO SUBJECT PROPERTY, NOT PLOTTABLE]

9. RESERVATIONS CONTAINED IN THE PATENT
FROM: THE UNITED STATES OF AMERICA
PATENT NO: 1159152
WHICH AMONG OTHER THINGS RECITES AS FOLLOWS: THE RIGHT TO PROSPECT FOR, MINE AND REMOVE ALL OIL, GAS AND OTHER MINERAL DEPOSITS, A RIGHT OF WAY THEREON FOR DITCHES OR CANALS CONSTRUCTED BY THE AUTHORITY OF THE UNITED STATES OF AMERICA. ANY VESTED AND ACCRUED WATER RIGHTS FOR MINING, AGRICULTURAL, MANUFACTURING OR OTHER PURPOSES AND RIGHTS TO DITCHES AND RESERVOIRS USED IN CONNECTION WITH SUCH WATER RIGHTS AS MAY BE RECOGNIZED AND ACKNOWLEDGED BY LOCAL CUSTOMS, LAWS AND DECISIONS OF COURTS. THE RIGHT OF THE PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT THE PREMISES HEREBY GRANTED AS PROVIDED BY LAW.
[APPLIES TO SUBJECT PROPERTY, NOT PLOTTABLE]

10. RESERVATIONS CONTAINED IN THE PATENT
FROM: THE UNITED STATES OF AMERICA
RECORDING DATE: NOVEMBER 12, 1914
RECORDING NO: BOOK 118 AT PAGE 69
WHICH AMONG OTHER THINGS RECITES AS FOLLOWS:
THE RIGHT TO PROSPECT FOR, MINE AND REMOVE ALL OIL, GAS AND OTHER MINERAL DEPOSITS. A RIGHT OF WAY THEREON FOR DITCHES OR CANALS CONSTRUCTED BY THE AUTHORITY OF THE UNITED STATES OF AMERICA. ANY VESTED AND ACCRUED WATER RIGHTS FOR MINING, AGRICULTURAL, MANUFACTURING OR OTHER PURPOSES AND RIGHTS TO DITCHES AND RESERVOIRS USED IN CONNECTION WITH SUCH WATER RIGHTS AS MAY BE RECOGNIZED AND ACKNOWLEDGED BY LOCAL CUSTOMS, LAWS AND DECISIONS OF COURTS.
[APPLIES TO SUBJECT PROPERTY, NOT PLOTTABLE]

11. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS CONTAINED IN THE OIL AND GAS LEASE AND ANY AND ALL INTERESTS THEREIN OR RIGHTS THEREUNDER AS SET FORTH BELOW:
RECORDING DATE: MARCH 7, 1955
RECORDING NO.: 268358
[APPLIES TO SUBJECT PROPERTY, NOT PLOTTABLE]

12. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS CONTAINED IN THE OIL AND GAS LEASE, AND ANY AND ALL INTERESTS THEREIN OR RIGHTS THEREUNDER AS SET FORTH BELOW:
RECORDING DATE: MAY 26, 1955
RECORDING NO.: 269913
[APPLIES TO SUBJECT PROPERTY, NOT PLOTTABLE]

13. RIGHTS OF WAY, TOGETHER WITH THE TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS CONTAINED IN THE INSTRUMENT AS SET FORTH BELOW:
RECORDING DATE: JANUARY 15, 1958
RECORDING NO.: BOOK 354 AT PAGE 82
[APPLIES TO SUBJECT PROPERTY, NOT PLOTTABLE]

14. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS CONTAINED IN THE AGREEMENT RECODED IN BOOK 126 AT PAGE 49. **[APPLIES TO SUBJECT PROPERTY, NOT PLOTTABLE]**

15. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS CONTAINED IN THE AGREEMENT RECORDED IN BOOK 188 AT PAGE 34. **[DOES NOT APPLY TO SUBJECT PROPERTY]**

16. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS CONTAINED IN THE AGREEMENT RECORDED AUGUST 20, 1968 IN BOOK 42 AT PAGE 432 AT RECEPTION NO. 326870. **[MAY APPLY TO SUBJECT PROPERTY, DOCUMENT NOT SPECIFIC]**

17. TERMS, CONDITIONS, RESTRICTIONS, PROVISIONS, NOTES AND EASEMENTS BUT OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, INCLUDING BUT NOT LIMITED TO THOSE BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, OR SOURCE OF INCOME, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW, AS SET FORTH ON THE PLAT(S) OF SAID SUBDIVISION SET FORTH BELOW:
RECORDING DATE: JULY 3, 2008
RECORDING NO: 626932
[APPLIES TO THAT PORTION OF SUBJECT PROPERTY LOCATED IN THE SOUTH HALF OF THE SOUTHWEST QUARTER OF SECTION 13, NOT PLOTTABLE]

18. COVENANTS, CONDITIONS AND RESTRICTIONS AND LIEN RIGHTS BUT OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, INCLUDING BUT NOT LIMITED TO THOSE BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, OR SOURCE OF INCOME, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW, AS SET FORTH IN THE DOCUMENT
RECORDING DATE: JANUARY 13, 2004
RECORDING NO: 575508
[APPLIES TO THAT PORTION OF SUBJECT PROPERTY LOCATED IN THE SOUTH HALF OF THE SOUTHWEST QUARTER OF SECTION 13, NOT PLOTTABLE]

19. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS CONTAINED IN THE EASEMENT DEED AS SET FORTH BELOW:
RECORDING DATE: DECEMBER 29, 2005
RECORDING NO.: 599073
[MAY APPLY TO SUBJECT PROPERTY, DOCUMENT NOT SPECIFIC]

20. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS, RESTRICTIONS AND OBLIGATIONS CONTAINED IN THE QUITCLAIM DEED AS SET FORTH BELOW:
RECORDING DATE: JULY 3, 2008
RECORDING NO.: 626933
[APPLIES TO THAT PORTION OF SUBJECT PROPERTY LOCATED IN THE SOUTH HALF OF THE SOUTHWEST QUARTER OF SECTION 13, NOT PLOTTABLE]

21. EASEMENT(S), TOGETHER WITH ITS TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, RESERVATIONS AND OBLIGATIONS FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:
GRANTED TO: DELTA-MONTROSE ELECTRIC ASSOCIATION
PURPOSE: GENERAL RIGHT-OF-WAY
RECORDING DATE: JANUARY 3, 2005
RECORDING NO: 587052
[MAY APPLY TO SUBJECT PROPERTY, EVIDENCE OF ELECTRIC UTILITIES SHOWN HEREON]

22. EASEMENT(S), TOGETHER WITH ITS TERMS, AGREEMENTS, PROVISIONS, CONDITIONS, RESERVATIONS AND OBLIGATIONS FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:
GRANTED TO: DELTA-MONTROSE ELECTRIC ASSOCIATION, A COLORADO ELECTRIC COOPERATIVE ASSOCIATION
PURPOSE: TELECOMMUNICATIONS CABLE SYSTEM
RECORDING DATE: MARCH 17, 2017
RECORDING NO: 693949
[MAY APPLY TO SUBJECT PROPERTY, EVIDENCE OF ELECTRIC UTILITIES SHOWN HEREON]

23. TERMS, CONDITIONS, RESTRICTIONS, PROVISIONS, NOTES AND EASEMENTS BUT OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, INCLUDING BUT NOT LIMITED TO THOSE BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, SOURCE OF INCOME, GENDER, GENDER IDENTITY, GENDER EXPRESSION, MEDICAL CONDITION OR GENETIC INFORMATION, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW, AS SET FORTH ON THE PLAT(S) OF SAID SUBDIVISION SET FORTH BELOW:
RECORDING DATE: JULY 16, 2018
RECORDING NO: 704678
[APPLIES TO THAT PORTION OF SUBJECT PROPERTY LOCATED IN THE SOUTH HALF OF THE SOUTHWEST QUARTER OF SECTION 13, NOT PLOTTABLE]

24. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS CONTAINED IN THE RIGHT-OF-WAY AND ACCESS EASEMENT AS SET FORTH BELOW:
RECORDING DATE: SEPTEMBER 25, 2020
RECORDING NO.: 722198
[MAY APPLY TO SUBJECT PROPERTY, EVIDENCE OF ELECTRIC UTILITIES SHOWN HEREON]

25. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS CONTAINED IN THE RIGHT-OF-WAY AND ACCESS EASEMENT AS SET FORTH BELOW:
RECORDING DATE: OCTOBER 19, 2020
RECORDING NO.: 722946
[MAY APPLY TO SUBJECT PROPERTY, EVIDENCE OF ELECTRIC UTILITIES SHOWN HEREON]

26. ANY LOSS OR DAMAGE ARISING FROM THE FACT THAT ANY FENCE LINES ON OR NEAR THE PERIMETER OF THE LAND MAY NOT COINCIDE WITH PROPERTY LINES.
[MAY APPLY TO SUBJECT PROPERTY, EVIDENCE OF FENCE LINES SHOWN HEREON]

TITLE COMMITMENT NOTES PARCEL (TC2) PARCELS 1, 2 & 3:

FOR ALL INFORMATION REGARDING EASEMENTS, RIGHT-OF-WAY OR TITLE OF RECORD, WASHBURN LAND SURVEYING, LLC RELIED UPON TITLE COMMITMENT ORDER NUMBER 32011003, BY FIDELITY NATIONAL TITLE COMPANY, WITH AN EFFECTIVE DATE OF NOVEMBER 8, 2021 AT 5:30 P.M..
THE FOLLOWING COMMENTS ARE IN REGARDS TO THE ABOVE REFERENCED TITLE COMMITMENT.

SCHEDULE B NOTES:

[ITEMS 1-7 ARE NON-SPECIFIC AND THEREFORE NOT SHOWN]

8. RESERVATIONS AS CONTAINED IN UNITED STATES PATENT RECORDED JULY 13, 1895 IN BOOK 16 AT PAGE 284, AND PATENT RECORDED JULY 13, 1895 IN BOOK 16 AT PAGE 285, SAID RESERVATIONS BEING AS FOLLOWS: RIGHT OF THE PROPRIETOR OF A VEIN OR LODE TO EXTRACT AND REMOVE HIS ORE THEREFROM SHOULD THE SAME BE FOUND TO PENETRATE OR INTERSECT SAID PREMISES. RIGHT OF WAY FOR DITCHES AND CANALS CONSTRUCTED BY THE AUTHORITY OF THE UNITED STATES.
[APPLIES TO PARCEL 2, NOT PLOTTABLE]

9. RESERVATION AS CONTAINED IN UNITED STATES PATENT RECORDED JUNE 5, 1941 IN BOOK 269 AT PAGE 17, SAID RESERVATION BEING AS FOLLOWS: SUBJECT TO ANY VESTED AND ACCRUED WATER RIGHTS FOR MINING, AGRICULTURAL, MANUFACTURING, OR OTHER PURPOSES AND RIGHTS TO DITCHES AND RESERVOIRS USED IN CONNECTION WITH SUCH WATER RIGHTS, AS MAY BE RECOGNIZED AND ACKNOWLEDGED BY THE LOCAL CUSTOMS, LAWS, AND DECISIONS OF COURTS: BUT EXCEPTING, NEVELESS, AND RESERVING UNTO THE UNITED STATES, RIGHTS OF WAY OVER, ACROSS, AND THROUGH SAID LANDS FOR CANALS AND DITCHES CONSTRUCTED, OR TO BE CONSTRUCTED, BY IT'S AUTHORITY, ALL IN THE MANNER PRESCRIBED AND DIRECTED BY THE ACT OF CONGRESS APPROVED AUGUST 30, 1890 (26 STAT. 391). TO SECURE PAYMENT TO THE UNITED STATES, OR IT'S SUCCESSORS IN THE OWNERSHIP OR CONTROL OF THE WORKS CONSTITUTING AND APPERTAINING TO THE SAID RECLAMATION PROJECT, OF ALL SUMS DUE OR TO BECOME DUE THE UNITED STATES OR ITS SUCCESSORS IN CONTROL OF SAID RECLAMATION PROJECT IN CONNECTION WITH SAID LAND AND WATER RIGHTS, A LIEN PRIOR TO ALL OTHER LIENS, CLAMS OR DEMAND WHATSOEVER UPON THE LANDS HEREIN AND HEREBY DESCRIBED AND CONVEYED, UPON ALL WATER RIGHTS THERETO APPURTENANT AND UPON THE RIGHT TOM RECEIVE AND USE WATER FROM THE RESERVOIRS AND CANALS OF SAID RECLAMATION PROJECT, IS EXPRESSLY RESERVED.
[DOES NOT APPLY TO SUBJECT PROPERTY]

10. TERMS, CONDITIONS, STIPULATIONS, OBLIGATIONS AND RESTRICTIONS AS MAY BE CONTAINED BY INSTRUMENT RECORDED DECEMBER 30, 1913 IN BOOK 118 AT PAGE 482. **[MAY APPLY TO SUBJECT PROPERTY, DOCUMENT NOT SPECIFIC]**

11. AN UNDIVIDED ONE-HALF INTEREST IN ALL OIL, GAS AND OTHER MINERAL RIGHTS AS RESERVED BY M.J. HERDING, RECORDED JANUARY 3, 1925 IN BOOK 195 AT PAGE 336, AND ANY AND ALL ASSIGNMENTS THEREOF OF INTERESTS THEREIN.
[APPLIES TO PARCEL 2, NOT PLOTTABLE]

12. A POLE LINE EASEMENT AS GRANTED TO DELTA-MONTROSE ELECTRIC ASSOCIATION, BY INSTRUMENT RECORDED JANUARY 4, 1993 IN BOOK 695 AT PAGE 537. **[APPLIES TO PARCEL 2, EVIDENCE OF ELECTRIC UTILITIES SHOWN HEREON]**

13. A RIGHT OF WAY AS GRANTED DELTA-MONTROSE ELECTRIC ASSOCIATION, BY INSTRUMENT RECORDED DECEMBER 2, 1996 IN BOOK 770 AT PAGE 874. **[APPLIES TO PARCEL 2, EVIDENCE OF ELECTRIC UTILITIES SHOWN HEREON]**

14. TERMS, CONDITIONS, STIPULATIONS, OBLIGATIONS AND RESTRICTIONS AS MAY BE CONTAINED BY BOUNDARY LINE AGREEMENT RECORDED JUNE 3, 1997 IN BOOK 780 AT PAGE 356.
[APPLIES TO PARCEL 3, SHOWN HEREON]

15. TERMS, CONDITIONS STIPULATIONS, OBLIGATIONS AND RESTRICTIONS AS MAY BE CONTAINED BY APPLICATION AND REALLOCATION OF PROJECT WATER RECORDED DECEMBER 19, 2016 AT RECEPTION NUMBER 691990, AND APPLICATION RECORDED JULY 28, 2017 AT RECEPTION NUMBER 697030. **[APPLIES TO PARCEL 2, NOT PLOTTABLE]**

16. ANY AND ALL LIENS, BURDENS, OBLIGATIONS, EASEMENTS AND RIGHTS OF WAY ARISING FROM OR CREATED BY MEMBERSHIP IN APPLICATIONS TO OR CONTRACTS WITH, INCLUDING BUT NOT LIMITED TO, THE GHA LATERAL DITCH, UNCOMPAHGRE VALLEY WATER USERS AND TRI-COUNTY DOMESTIC WATER. **[MAY APPLY TO SUBJECT PROPERTY, NO DOCUMENT PROVIDED]**

17. AN PORTION OF SUBJECT PROPERTY LYING WITHIN THE RIGHT OF WAY OF COUNTY ROADS.
[APPLIES TO SUBJECT PROPERTY, EDGE OF COUNTY ROADS SHOWN HERON]

18. ANY LOSS OR DAMAGE ARISING FROM THE FACT THAT THE FENCE LINES ON OR NEAR THE PERIMETER OF SUBJECT PROPERTY DO NOT COINCIDE WITH THE EXACT PROPERTY LINES.
[MAY APPLY TO SUBJECT PROPERTY, EVIDENCE OF FENCE LINES SHOWN HEREON]

19. RIGHTS OF WAY FOR ROADS, DITCHES, LATERALS, FLUMES, PIPES AND POWER LINES, AND EASEMENTS THEREFOR, INSOFAR AS THE SAME MIGHT AFFECT SUBJECT PROPERTY.
[MAY APPLY TO SUBJECT PROPERTY, EVIDENCE OF ROADS, DITCHES AND UTILITIES SHOWN HEREON]

20. TERMS, CONDITIONS, STIPULATIONS, OBLIGATIONS AND RESTRICTIONS AS MAY BE CONTAINED BY TELECOMMUNICATIONS CABLE SYSTEM EASEMENT RECORDED MARCH 17, 2017 AT RECEPTION NUMBER 693947.
[APPLIES TO PARCEL 2, EVIDENCE OF UTILITIES SHOWN HEREON]

LEGEND

- FOUND MONUMENT AS NOTED
- CALCULATED POSITION FROM REFERENCE MONUMENTS
- SET NAIL WITH DISC STAMED WLS PLS 37963
- SET REBAR WITH PLASTIC CAP STAMPED WLS PLS 37963
- WATER VALVE
- WATER METER
- FIRE HYDRANT
- UTILITY PEDESTAL
- TRANSFORMER
- LIGHTPOLE
- UTILITY POLE
- SEWER MANHOLE
- SEWER CLEANOUT
- STORM-DRAIN MANHOLE

LINE TYPES AND HATCHING

- EASEMENT
- RIGHT OF WAY
- RIGHT OF WAY CENTERLINE
- LOT LINE
- PARCEL LINE
- FENCE LINE
- ASPHALT
- CONCRETE
- GRAVEL

LEGAL DESCRIPTION:

PARCEL 1 (TC1)
THE N1/2 SW1/4, THE S1/2 NE1/4, THE NW1/4 SE1/4, THE W1/2 NE1/4 SE1/4, THE SE1/4 NE1/4 SE1/4, AND THE SOUTH 132 FEET OF THE S1/2 S1/2 SW1/4 NW1/4, ALL IN SECTION 13, T 15 S, R 95 W, 6TH PRINCIPAL MERIDIAN.
TOGETHER WITH PART OF LOT 23, PHASE IV, PLEASANT VALLEY MAJOR SUBDIVISION MJ 02-020 WHICH IS LOCATED IN THE SE1/4 SW1/4 AND THE E1/2 SW1/4 SW1/4 OF SECTION 13, T 15 S, R 95 W, 6TH PRINCIPAL MERIDIAN, THE SAID PART OF LOT 23 BEING FURTHER DESCRIBED FOLLOWS:
BEGINNING AT THE NORTHEAST CORNER OF SAID LOT 23 WHICH IS THE NORTHEAST CORNER OF THE SAID SE1/4 SW1/4 (THE CENTER SOUTH 1/16 CORNER OF SAID SECTION 23);
THENCE ON THE EAST LINE OF SAID LOT 23 WHICH IS THE EAST LINE OF THE SAID SE1/4 SW1/4 S 00°04'28" W, 160.20 FEET TO THE SOUTHEAST CORNER OF SAID LOT 23;
THENCE ON THE SOUTHERLY LINE OF SAID LOT 23 THE FOLLOWING THREE (3) COURSES:
(A) S 74°22'03" W, 444.28 FEET;
(B) N 85°41'57" W, 539.01 FEET; AND
(C) S 70°19'24" W, 349.36 FEET (PREVIOUSLY DESCRIBED AS S 70°23'26" W, 348.86 FEET);
THENCE S 65°45'45" W, 297.98 FEET TO THE SAID SOUTHERLY LINE OF LOT 23;
THENCE ON THE SAID SOUTHERLY LINE OF LOT 23 THE FOLLOWING TWO (2) COURSES
(A) N 65°15'40" W, 147.28 FEET; AND
(B) N 84°57'27" W, 310.88 FEET TO THE SOUTHWEST CORNER OF SAID LOT 23 BEING A POINT ON THE WEST LINE OF THE SAID E1/2 SW1/4 SW1/4;
THENCE ON THE WEST LINE OF SAID LOT 23 N 00°04'24" E, 415.57 FEET TO THE NORTHWEST CORNER OF SAID LOT 23 BEING THE NORTHWEST CORNER OF THE SAID E1/2 SW1/4 SW1/4; THENCE ON THE NORTH LINE OF SAID LOT 23 THE FOLLOWING TWO (2) COURSES:
(A) S89°17'06" E, 669.76 FEET THE NORTH LINE OF THE SAID E1/2 SW1/4 SW1/4 TO THE NORTHEAST CORNER OF THE SAID E1/2 SW1/4 SW1/4 (THE SOUTHWEST 1/16 CORNER OF SAID SECTION 23); AND
(B) S 89°17'06" E, 1339.52 FEET ON THE NORTH
LINE OF THE SAID SE1/4 SW1/4 TO THE POINT OF BEGINNING.

EXCEPT THAT PORTION OF LOT 23 NOW DESCRIBED AS LOT 23A OF REPLAT OF LOT 23, PHASE IV, PLEASANT VALLEY MAJOR SUBDIVISION MJ 02-020, RECORDED JULY 16, 2018 AT RECEPTION NO. 704678,
COUNTY OF DELTA, STATE OF COLORADO

PARCEL 1 (TC2)
THE NE 1/4 OF THE SW 1/4 OF SECTION 14, TOWNSHIP 15 SOUTH, RANGE 95 WEST OF THE 6TH P.M.,
COUNTY OF DELTA, STATE OF COLORADO

PARCEL 2 (TC2)
THE NE 1/4 AND THE N 1/2 OF SECTION 23, TOWNSHIP 15 SOUTH, RANGE 95 WEST OF THE 6TH P.M.

PARCEL 3 (TC2)
THE NE 1/4 OF THE NW 1/4 OF SECTION 23, TOWNSHIP 15 SOUTH, RANGE 95 WEST OF THE 6TH P.M.,
ALSO PART OF THE E 1/2 OF THE NW 1/4 OF THE NW 1/4 OF SECTION 23, T15S, R95W OF THE 6TH P.M. DESCRIBED AS FOLLOWS:
BEGINNING AT THE NORTHEAST CORNER OF THE SAID E1/2 NW1/4 NW1/4;
THENCE ON THE EAST LINE OF THE SAID E1/2 NW1/4 NW¼ S01°32'16", 1317.49 FEET TO THE SOUTHEAST CORNER OF THE E1/2 NW1/4 NW1/4;
THENCE ON THE SOUTH LINE OF SAID E1/2 NW1/4 NW1/4 N88°33'50"W, 79.17 FEET TO AN EXISTING FENCE LINE;
THENCE ALONG THE SAID EXISTING FENCE LINE N03°04'13"E, 1317.93 FEET TO THE NORTH LINE OF LINE SAID E1/2 NW1/4 NW1/4;
THENCE ON THE SAID NORTH LINE S88°40'52"E, 43.92 FEET TO THE POINT OF BEGINNING.
COUNTY OF DELTA, STATE OF COLORADO.

GENERAL NOTES:

1. DEFINITION: CERTIFY, CERTIFICATION - A PROFESSIONAL'S OPINION BASED ON HIS OR HER OBSERVATION OF CONDITIONS, KNOWLEDGE, INFORMATION AND BELIEFS. IT IS EXPRESSLY UNDERSTOOD THAT THE PROFESSIONAL'S CERTIFICATION OF A CONDITION'S EXISTENCE RELIEVES NO OTHER PARTY OF ANY RESPONSIBILITY OR OBLIGATION HE OR SHE HAS ACCEPTED BY CONTRACT OR CUSTOM.
2. PER C.R.S. 18-04-508, ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACES ANY PUBLIC LAND SURVEY MONUMENT OR LAND MONUMENT OR ACCESSORY, COMMITS A CLASS TWO (2) MISDEMEANOR.
3. ALL REFERENCES HEREON TO BOOKS, PAGES, MAPS AND RECEPTION NUMBERS ARE PUBLIC DOCUMENTS FILED IN THE RECORDS OF DELTA COUNTY, COLORADO.
4. EASEMENTS AND PUBLIC DOCUMENTS SHOWN OR NOTED HEREON WERE EXAMINED AS TO LOCATION AND PURPOSE AND WERE NOT EXAMINED AS TO RESERVATIONS, RESTRICTIONS, CONDITIONS, OBLIGATIONS, TERMS, OR AS TO THE RIGHT TO GRANT THE SAME.
5. NEITHER WASHBURN LAND SURVEYING, LLC, NOR THE SURVEYOR OF RECORD, HAS THE EXPERTISE TO ADDRESS MINERAL RIGHTS. IT IS RECOMMENDED THAT INTERESTED PARTIES RETAIN AN EXPERT TO ADDRESS THESE MATTERS. WASHBURN LAND SURVEYING, LLC ASSUMES NO RESPONSIBILITY FOR THE MINERAL RIGHTS UPON SUBJECT PROPERTY.
6. BURIED UTILITIES AND/OR PIPELINES ARE SHOWN PER VISIBLE AND APPARENT SURFACE EVIDENCE OR RECORD DRAWINGS OF THE CONSTRUCTED UTILITY LINES. IF MORE ACCURATE LOCATIONS OF UNDERGROUND UTILITIES ARE REQUIRED, THE UTILITY WILL HAVE TO BE VERIFIED BY FIELD POTHOLING. WASHBURN LAND SURVEYING, LLC AND THE SURVEYOR OF RECORD SHALL NOT BE LIABLE FOR THE LOCATION OF OR THE FAILURE TO NOTE THE LOCATION OF NON-VISIBLE UTILITIES.
7. PER C.R.S. 38-51-106, "ALL LINEAL UNITS DEPICTED ON THIS LAND SURVEY PLAT ARE U.S. SURVEY FEET. ONE METER EQUALS 39.37/12 U.S. SURVEY FEET, EXACTLY ACCORDING TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY.

SURVEYOR'S STATEMENT

TO: FIDELITY NATIONAL TITLE COMPANY, GARNET MESA LAND LLC AND KENNETH E. NORELL AND PAULA JO NORELL.

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1-3, 7a AND 8 OF TABLE A THEREOF. THE FIELDWORK WAS COMPLETED ON MAY 15, 2021.
DATE OF PLAT OR MAP: JUNE 9, 2021.

COLORADO LICENSED PROFESSIONAL LAND SURVEYOR CHAD R. WASHBURN 37963

CHAD R. WASHBURN
COLORADO LICENSED PROFESSIONAL LAND SURVEYOR 37963
FOR AND ON BEHALF OF WASHBURN LAND SURVEYING, LLC.
970.232.9645

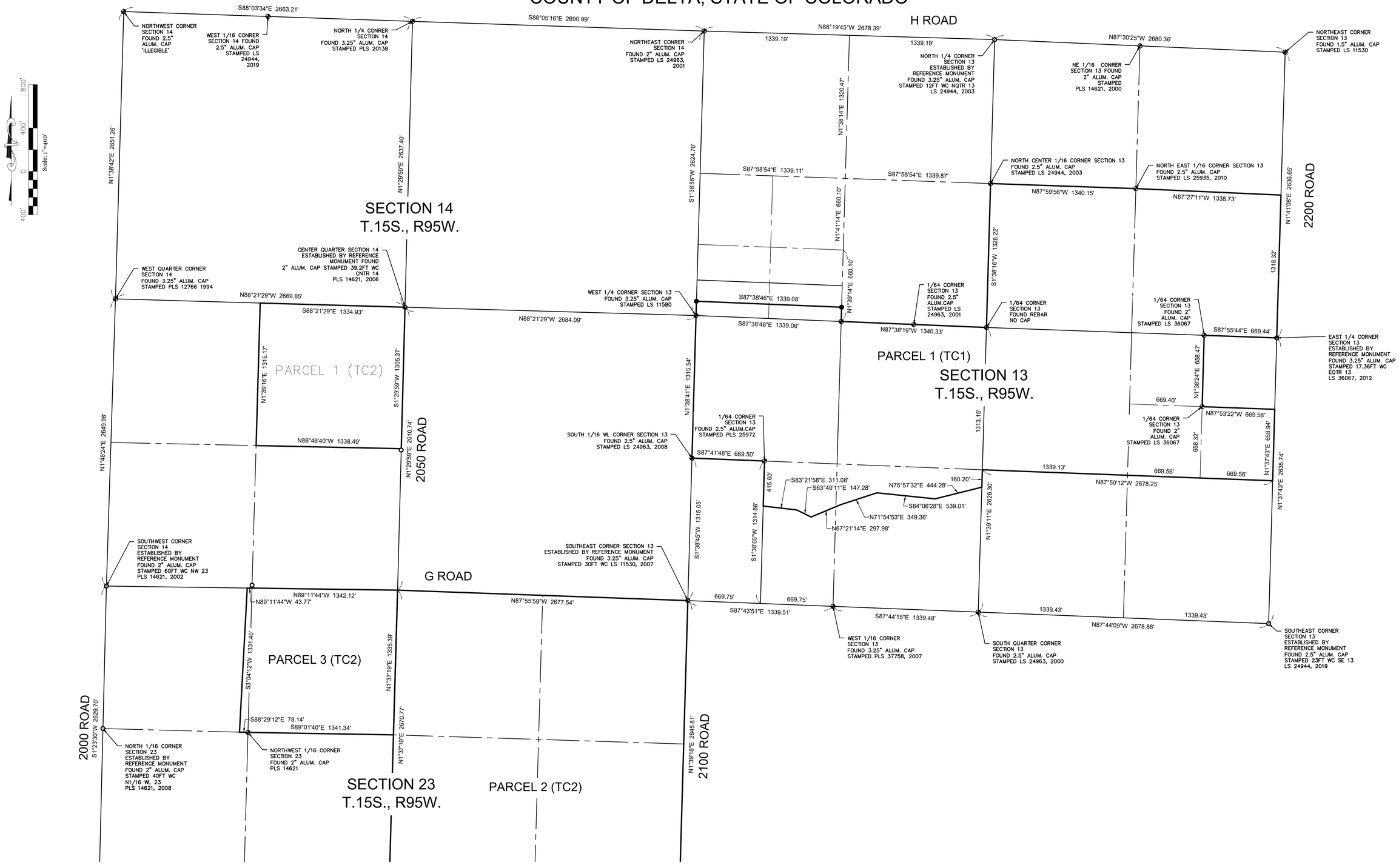
NOTICE

ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS AFTER THE DATE OF CERTIFICATION.

Washburn LAND SURVEYING
www.WashburnSurveying.com
4025 Automation Way, Suite C4
Fort Collins, CO 80525
970-232-9645

ALTA/NSPS LAND TITLE SURVEY

LOCATED IN SECTIONS 13,14 & 23, TOWNSHIP 15 SOUTH, RANGE 95 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF DELTA, STATE OF COLORADO



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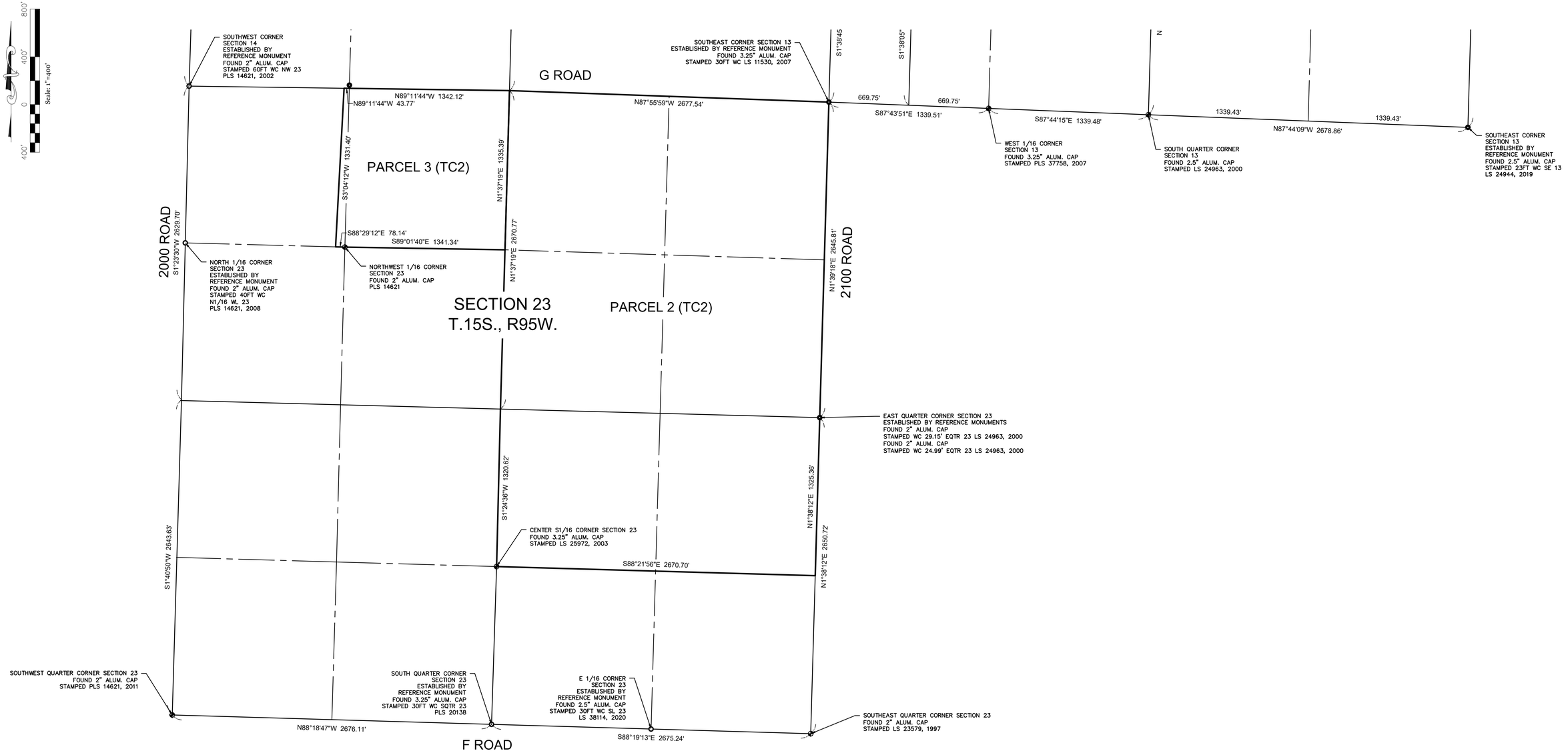

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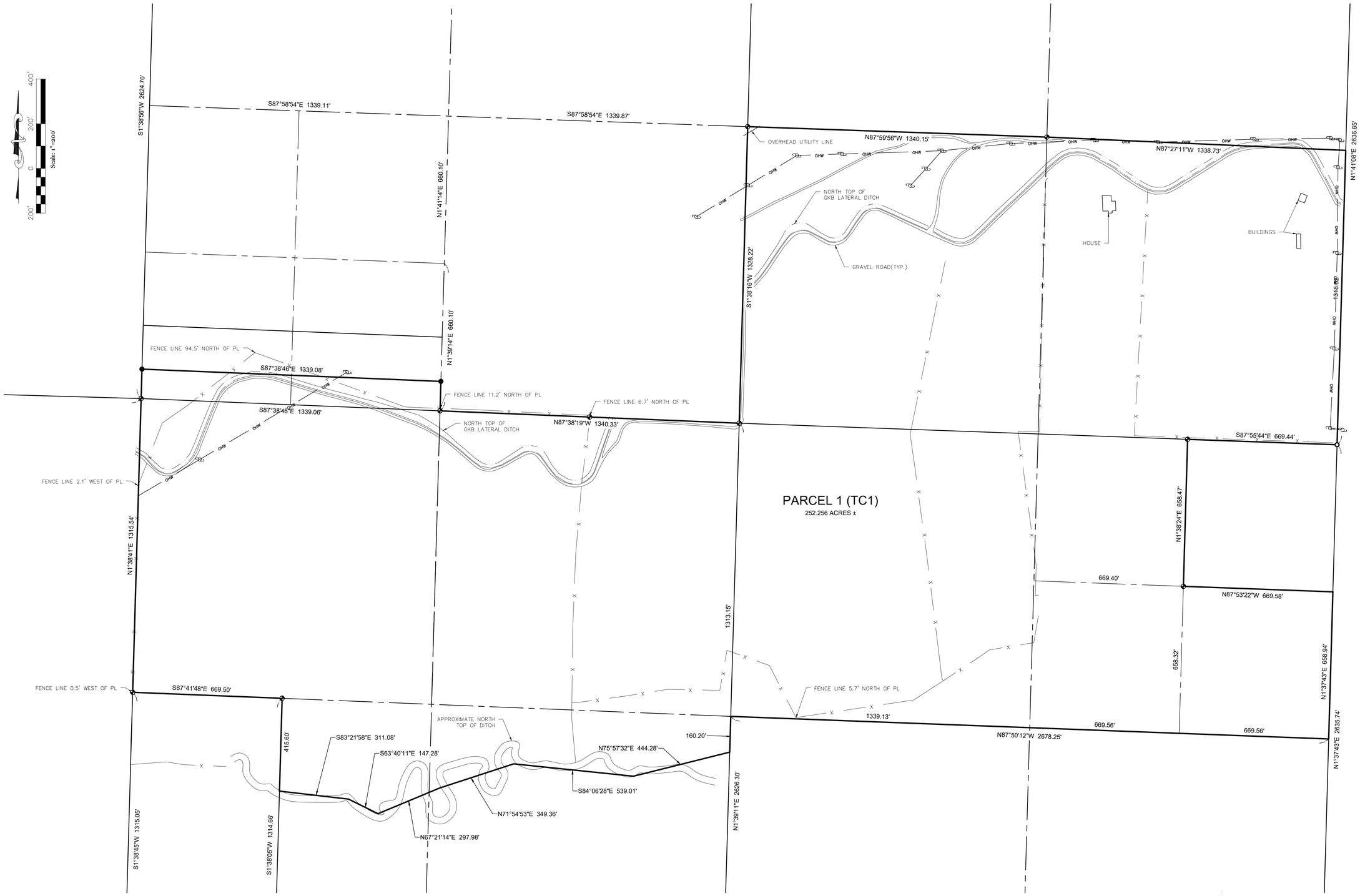

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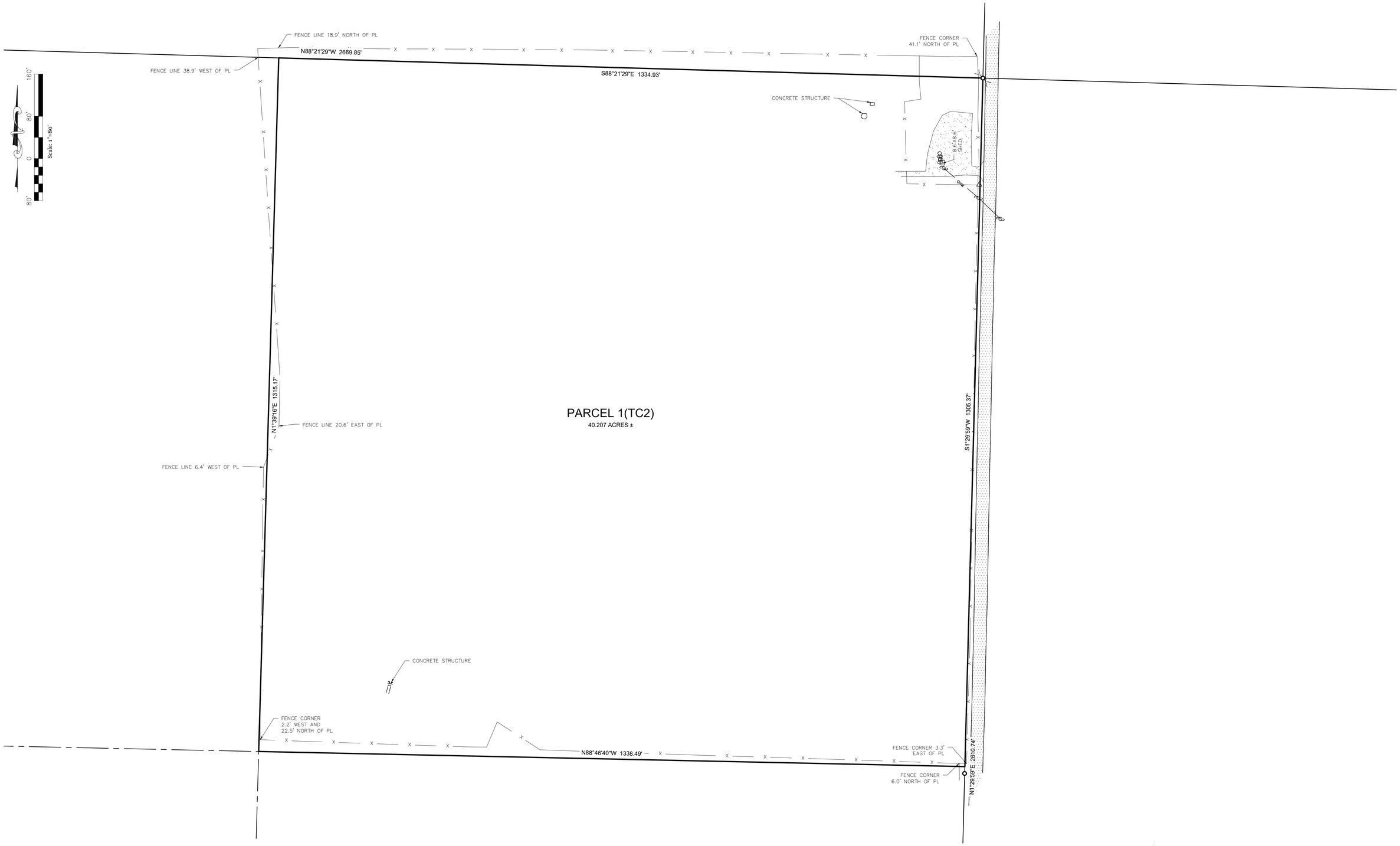

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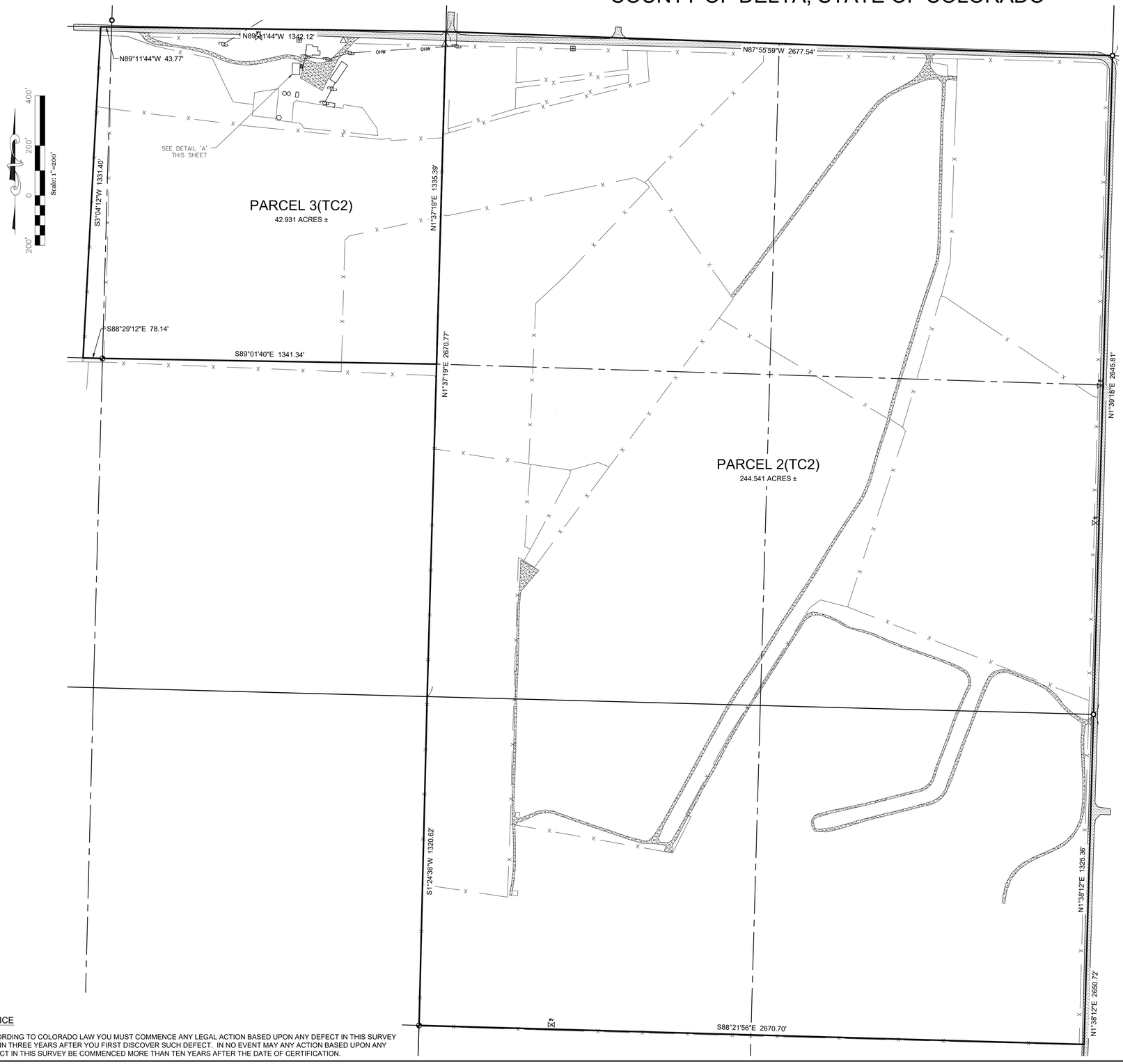
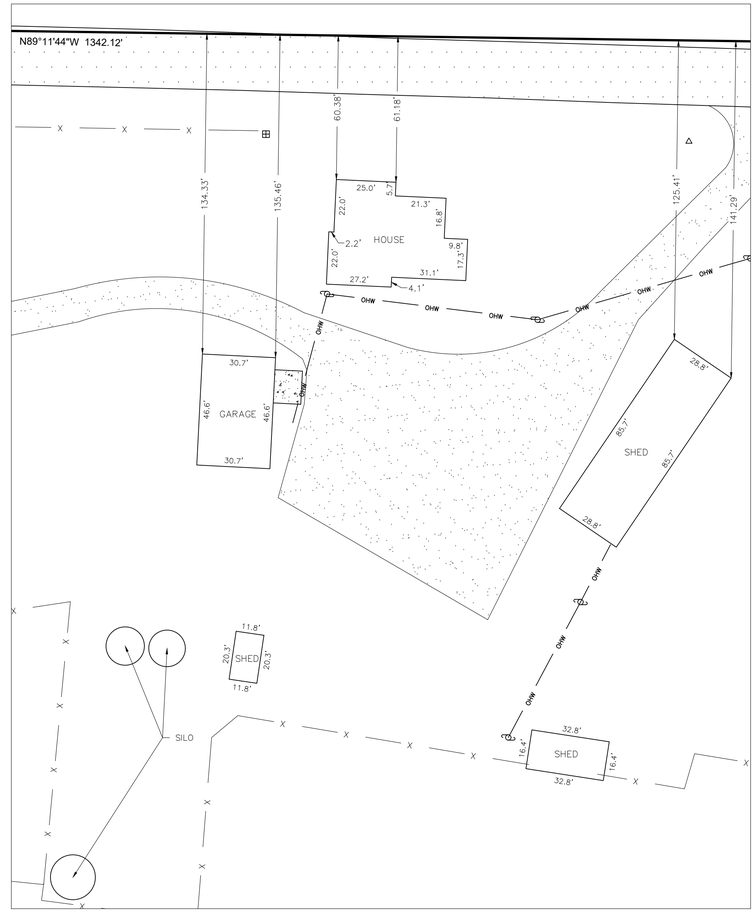
Washburn LAND SURVEYING
www.WashburnSurveying.com
4025 Automation Way, Suite C4
Fort Collins, CO 80525
970-232-9945

ALTA/NSPS LAND TITLE SURVEY

LOCATED IN SECTIONS 13,14 & 23, TOWNSHIP 15 SOUTH, RANGE 95 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF DELTA, STATE OF COLORADO



DETAL A:
SCALE: 1"=30'



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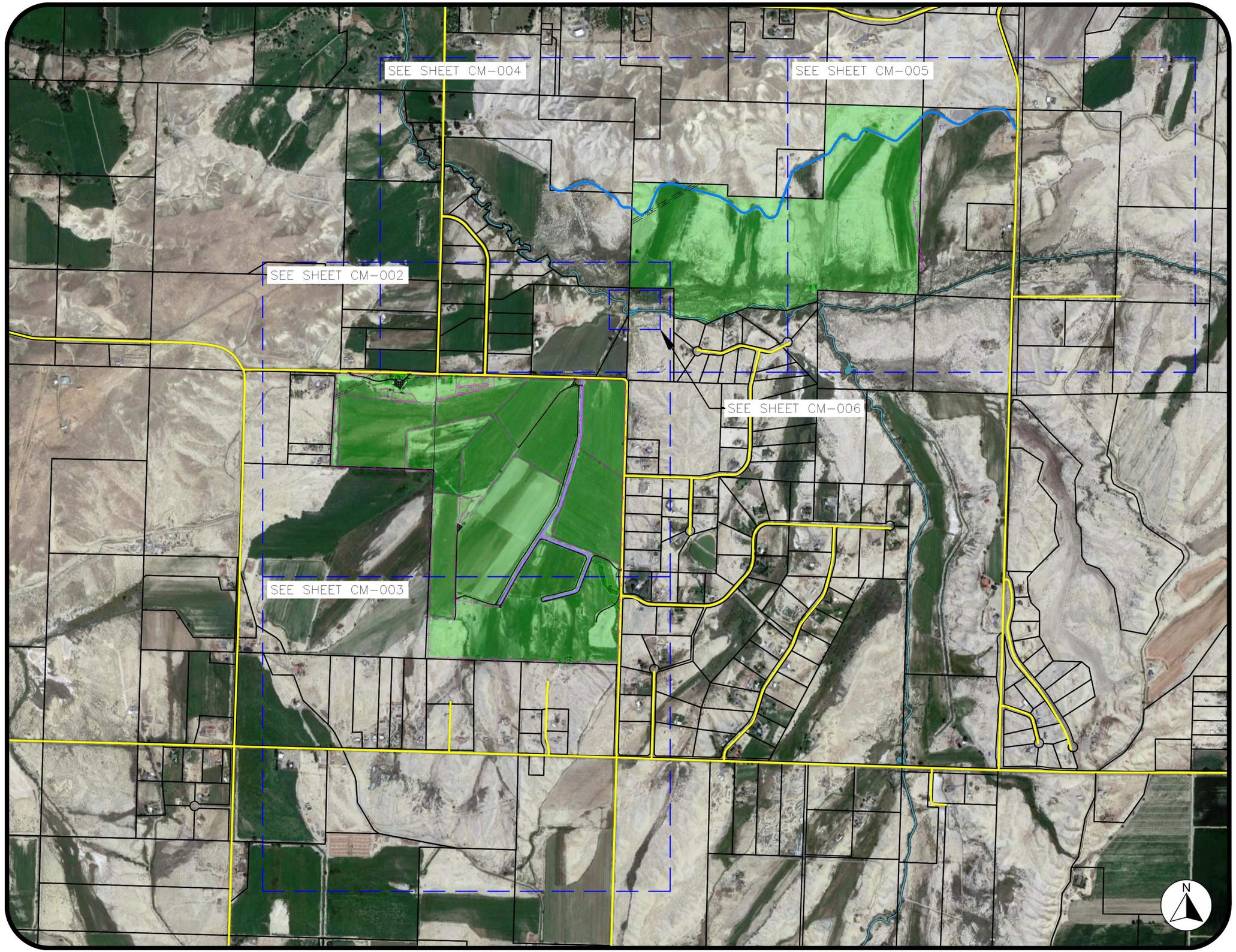
4025 Automation Way, Suite C4
Fort Collins, CO 80525
970-232-9645

Attachment 2-D

Constraints Map



CONSTRAINTS MAP

General Notes

SUBJECT PARCEL

COUNTY PARCELS

USFWS DEFINED EAST CANAL BOUNDARY

TREE BOUNDARY

COUNTY ROAD

EXISTING AGRICULTURE FENCE

GHA LATERAL DITCH

GKB LATERAL DITCH

O/H — O/H — O/H
OVERHEAD POWER

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

CITRA

CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: CM-001
Date: AUGUST 8, 2021	
Scale: 1" = 600 FT	

CONSTRAINTS MAP

General Notes

SUBJECT PARCEL

COUNTY PARCELS

USFWS DEFINED EAST CANAL BOUNDARY

TREE BOUNDARY

COUNTY ROAD

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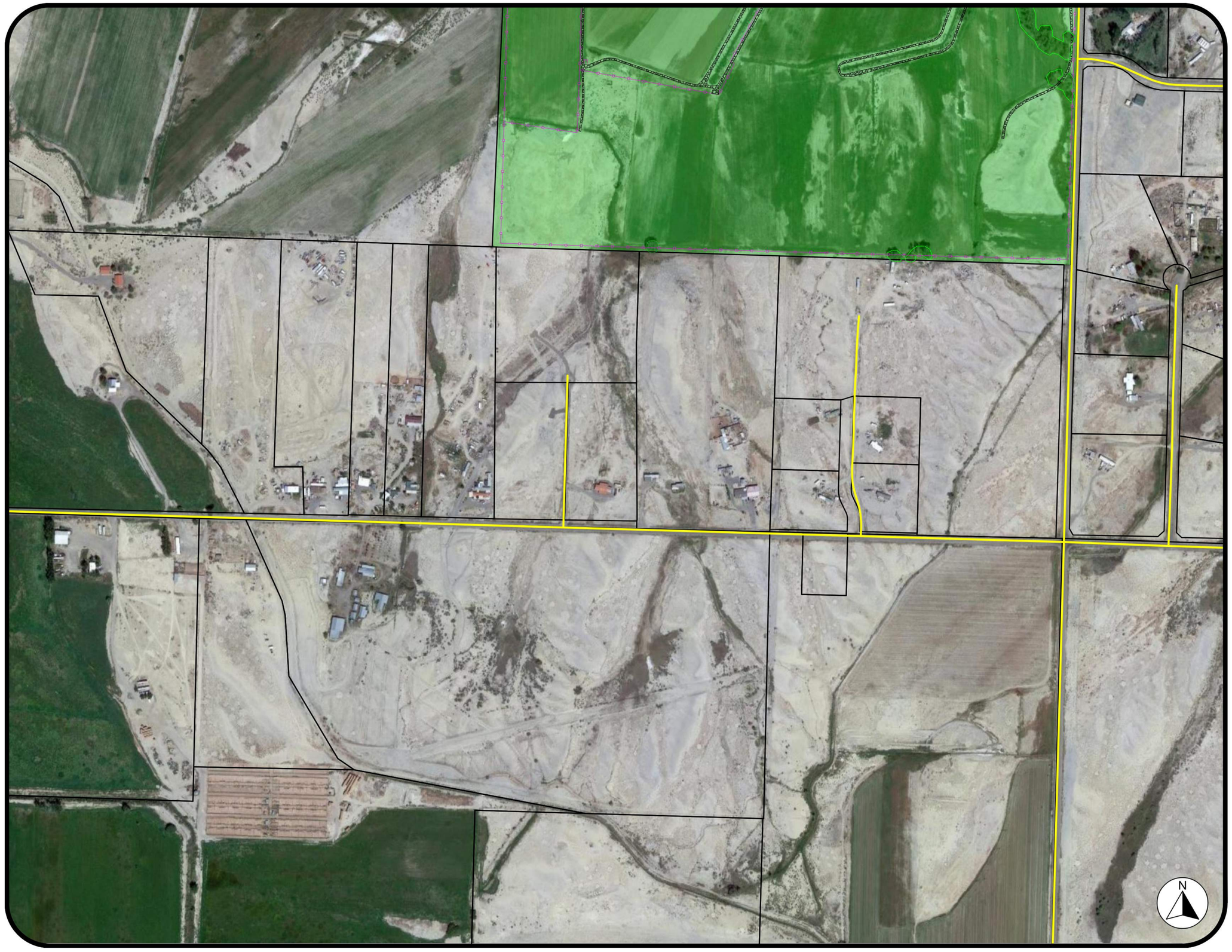
GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: CM-002
Date: AUGUST 8, 2021	
Scale: 1" = 200 FT	



CONSTRAINTS MAP

General Notes

SUBJECT PARCEL

COUNTY PARCELS

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TREE BOUNDARY

COUNTY ROAD

EXISTING AGRICULTURE FENCE

GHA LATERAL DITCH

GKB LATERAL DITCH

O/H — O/H — O/H

OVERHEAD POWER

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

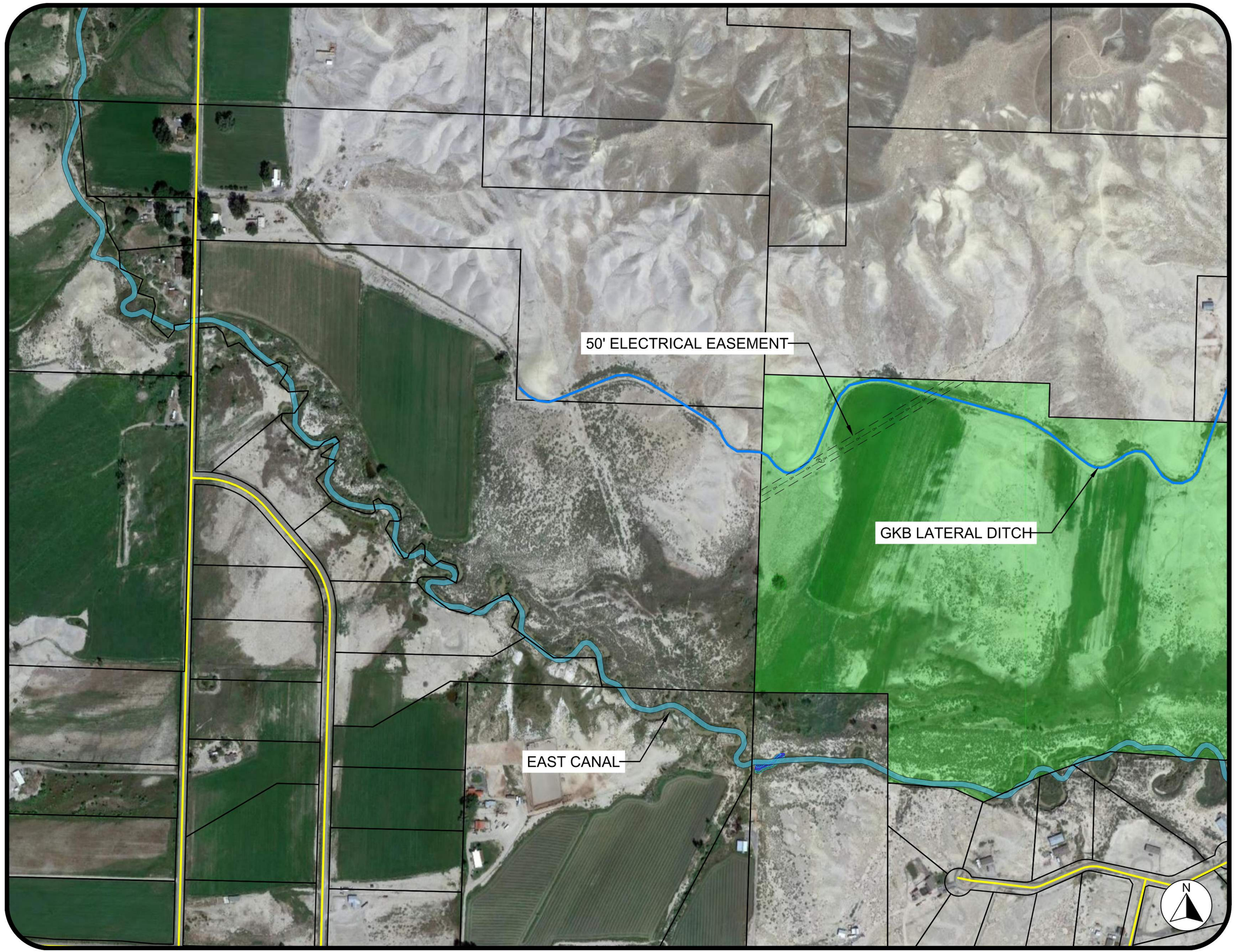
CITRA

CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: CM–003
Date: AUGUST 8, 2021	
Scale: 1" = 200 FT	



CONSTRAINTS MAP

General Notes

SUBJECT PARCEL

COUNTY PARCELS

USFWS DEFINED EAST CANAL BOUNDARY

TREE BOUNDARY

COUNTY ROAD

EXISTING AGRICULTURE FENCE

GHA LATERAL DITCH

GKB LATERAL DITCH

O/H O/H O/H
OVERHEAD POWER

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

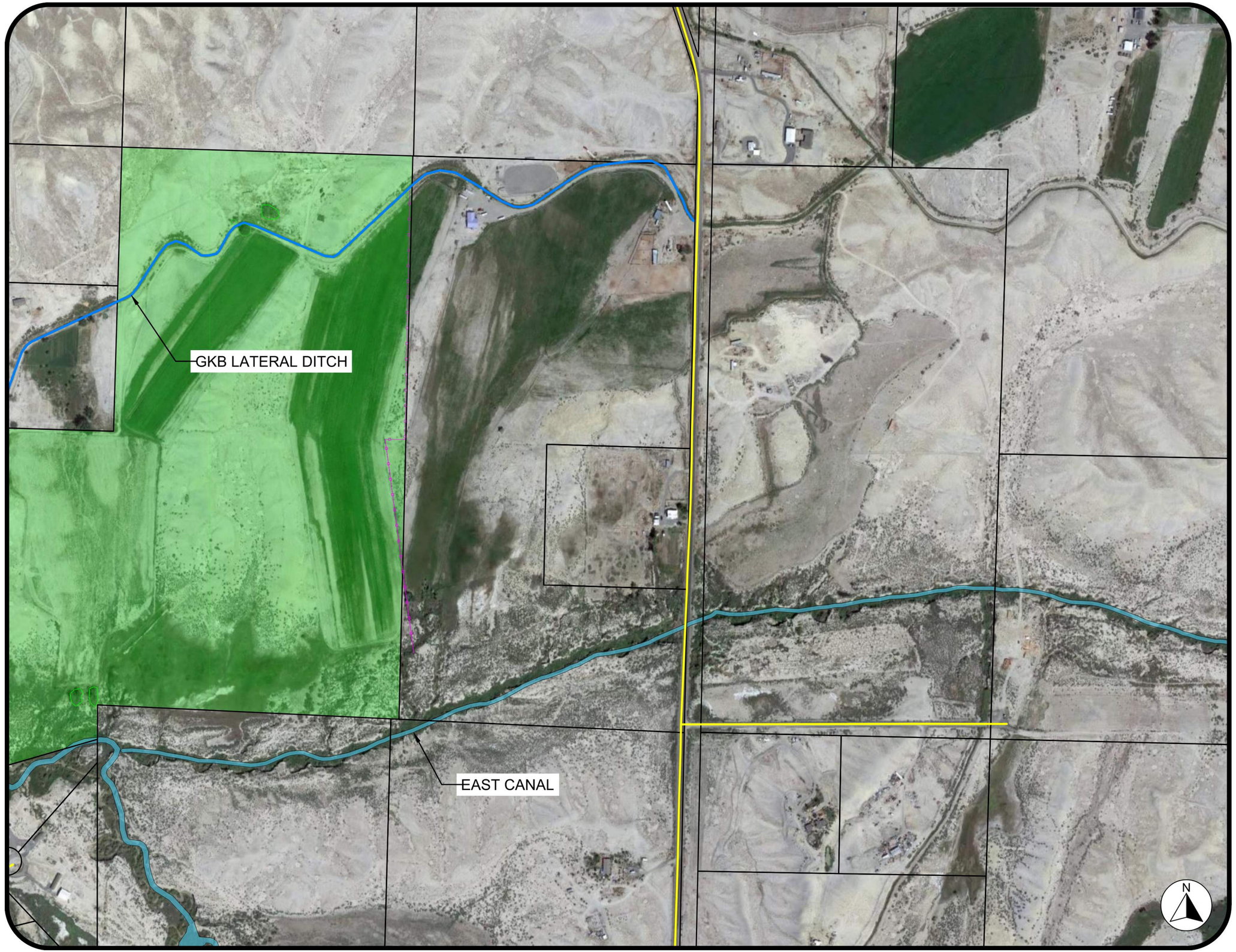
CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

CITRA

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: CM-004
Date: AUGUST 8, 2021	
Scale: 1'' = 200 FT	



CONSTRAINTS MAP

General Notes

SUBJECT PARCEL

COUNTY PARCELS

USFWS DEFINED EAST CANAL BOUNDARY

TREE BOUNDARY

COUNTY ROAD

EXISTING AGRICULTURE FENCE

GHA LATERAL DITCH

GKB LATERAL DITCH

O/H — O/H — O/H
OVERHEAD POWER

A	ISSUED FOR PERMIT	8/8/21

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GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: CM-005
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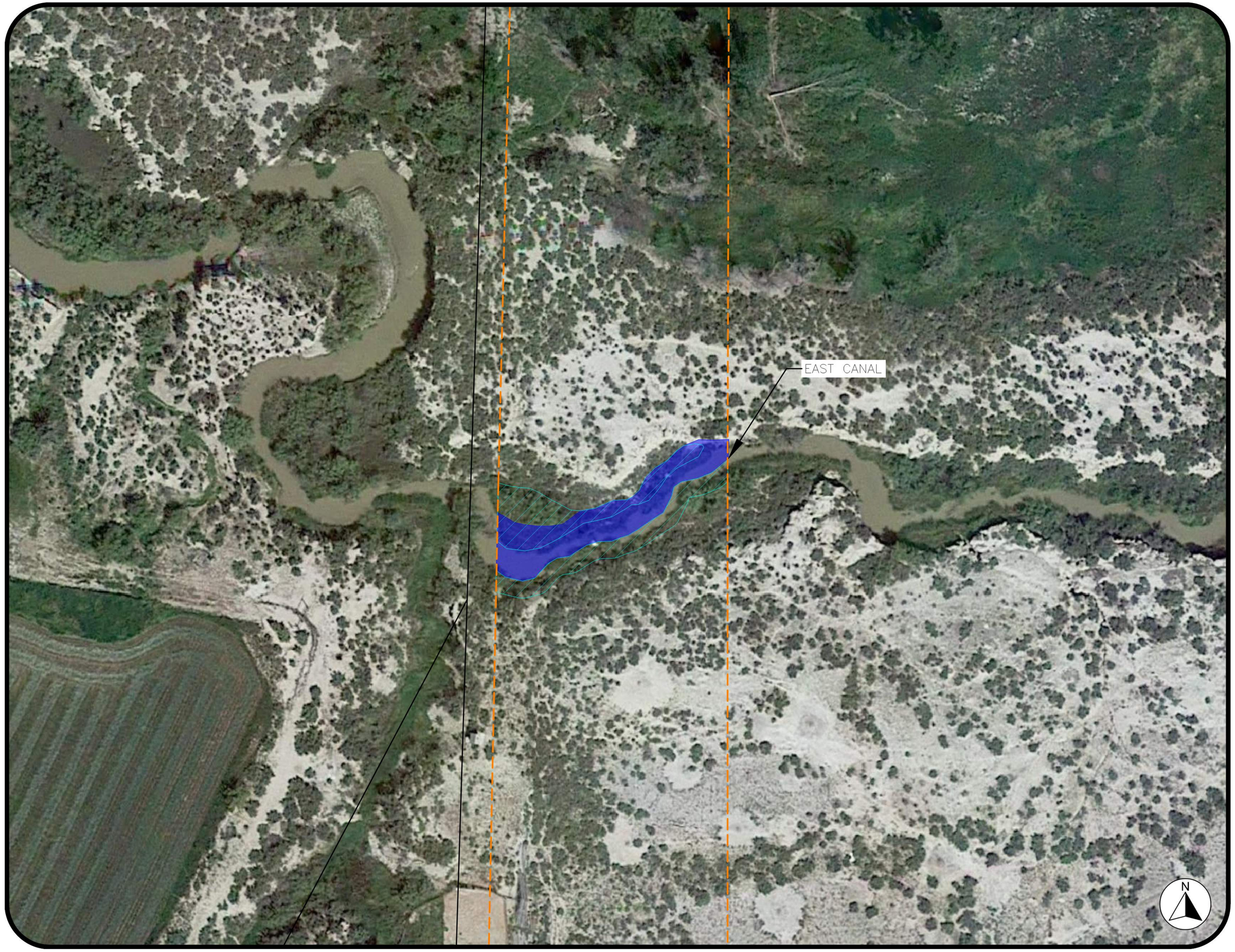


CONSTRAINTS MAP

General Notes

ORDINARY HIGH WATER MARK

SURVEY DELINEATED WETLAND

COUNTY PARCELS

EXTENTS OF SURVEY
& EXTENTS OF PROJECT EASEMENT

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

CITRA

CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: CM-006
Date: AUGUST 8, 2021	
Scale: 1" = 25 FT	

Attachment 2-E

Grading and Slope Map

A preliminary grading and slope map was created for a 2P tracker design to give the County a general understanding into the limited civil grading work required to construct the project. Since the County has not yet made a final determination as to their preferred type of tracker structure, the grading and slope map shown here will be adjusted as required and shall be submitted for final review prior to the issuance of building permits.

GARNET MESA PV FACILITY
DELTA COUNTY, COLORADO

SCOPE OF WORK

DEVELOP AN APPROXIMATELY 800 MW AC SOLAR PHOTOVOLTAIC ELECTRICAL GENERATING FACILITY ON APPROXIMATELY 384 ACRES OF LAND. THE SOLAR POWER PLANT WILL BE A GROUND MOUNTED SINGLE AXIS TRACKER SYSTEM. THE ENTIRE SITE WILL HAVE SPOT GRADING FOR AIDING IN THE INSTALLATION OF THE GROUND MOUNTED SINGLE AXIS TRACKER SYSTEM, ROAD CONSTRUCTION AND PAD INSTALLATION.

BUILDING CODES AND DESIGN REFERENCES

AUTHORITIES HAVING JURISDICTION:

DELTA COUNTY DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT,
295 WEST 6TH STREET
DELTA, CO 81416

APPLICABLE CODES:

BUILDING CODE:
2018 INTERNATIONAL BUILDING CODE WITH COLORADO AMENDMENTS

FIRE CODE:
2018 INTERNATIONAL FIRE CODE WITH COLORADO AMENDMENTS

GEOTECH REPORT BY:

BUCKHORN ENGINEERING
222 SOUTH PARK AVENUE
MONTROSE, CO 81401

HYDROLOGICAL REPORT BY:

SIERRA OVERHEAD ANALYTICS
18859 MICROTRONICS WAY SUITE B7
SANORA, CALIFORNIA, 95370

OWNER INFORMATION, PROJECT TEAM

PROJECT OWNER:

CITRA POWER, LLC
115 117TH STREET SUITE 740
DENVER, CO 80202

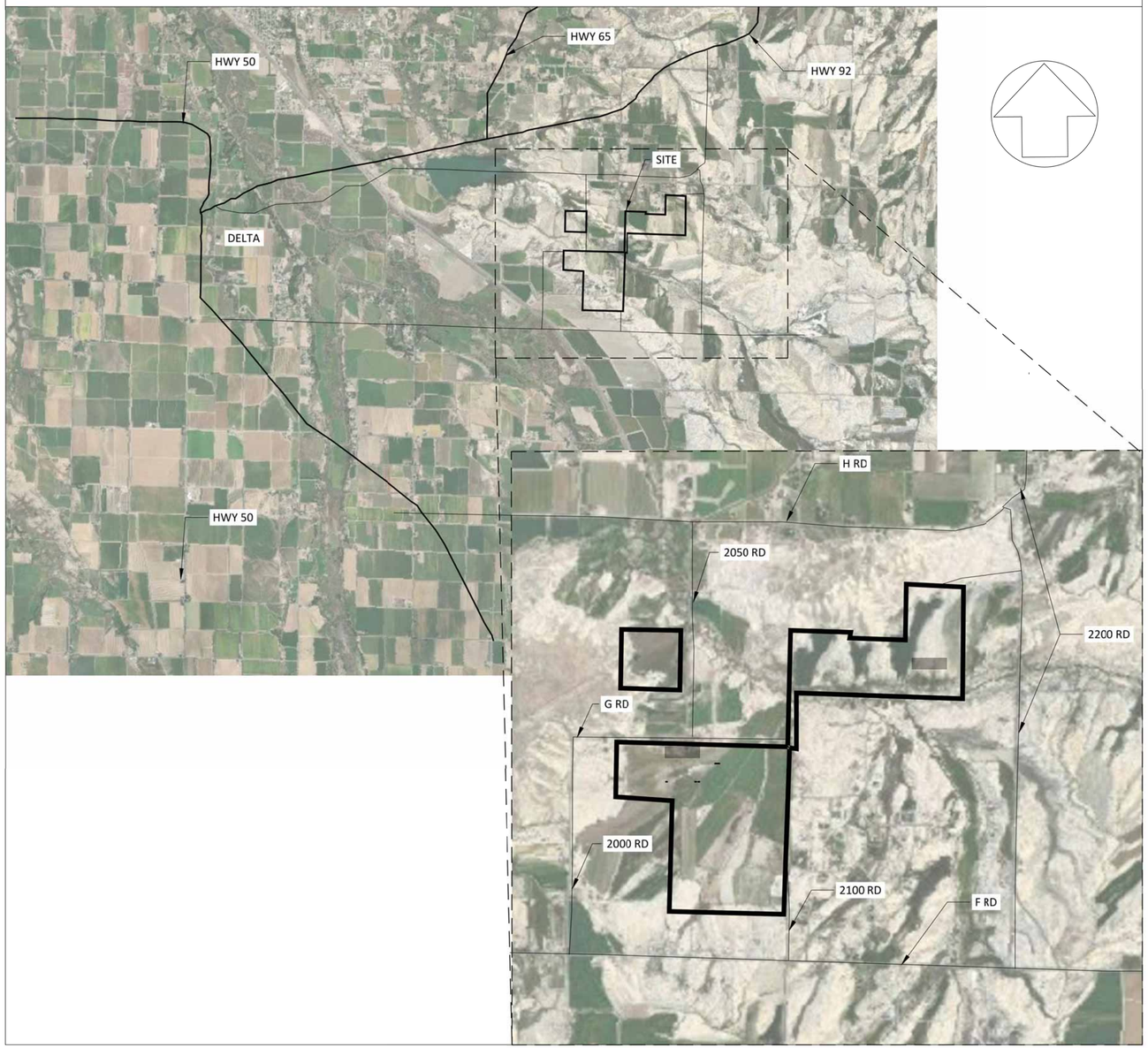
PROJECT MANAGER: MATT KOSAKOWSKI

CIVIL ENGINEER:

SIERRA OVERHEAD ANALYTICS
18859 MICROTRONICS WAY SUITE B7
SANORA, CALIFORNIA, 95370

CONTACT: DARIN GALLOWAY, PE#56414
DGALLOWAY@SIERRAOVERHEAD.COM
(775) 848-5540

SITE LOCATION AND AERIAL VIEW N.T.S.



Sheet List Table

Sheet Number	Sheet Title
C-001	COVER
C-100	CIVIL NOTES
C-200	CIVIL SITE OVERVIEW
C-201	CIVIL SITE PLAN
C-202	CIVIL SITE PLAN
C-300	SITE ENTRANCE PLAN
C-301	ROADWAY PROFILE
C-302	ROADWAY PROFILE
C-303	ROADWAY PROFILE
C-304	ROADWAY PROFILE
C-305	ROADWAY PROFILE
C-306	ROADWAY PROFILE
C-307	ROADWAY PROFILE
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C-311	ROADWAY PROFILE
C-312	ROADWAY PROFILE
C-313	ROADWAY PROFILE
C-314	ROADWAY PROFILE
C-315	CIVIL DETAILS
C-316	FENCE DETAILS
G&D-200	GRADING & DRAINAGE OVERVIEW
G&D-201	GRADING & DRAINAGE SITE PLAN
G&D-202	GRADING & DRAINAGE SITE PLAN
G&D-203	GRADING & DRAINAGE SITE PLAN
G&D-204	GRADING & DRAINAGE SITE PLAN
G&D-205	GRADING & DRAINAGE SITE PLAN
G&D-300	GRADING & DRAINAGE DETAILS

NOT FOR CONSTRUCTION
08/16/2021 12:44:33 PM

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

SHEET TITLE: COVER
SHEET NO.: C-001

PROJECT DETAILS: GARNET MESA
6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

DATE: 08/16/2021
SCALE: AS SHOWN
PAPER SIZE: 24" X 36"
DFTR: KEVIN BYRUM-THORSON
CHKD: DARIN GALLOWAY
ENGR: DARIN GALLOWAY

CONFIDENTIALITY STATEMENT
THIS DRAWING IS THE PROPERTY OF SOLVIDA DESIGN AND ENGINEERING. THIS INFORMATION IS CONFIDENTIAL AND IS TO BE USED ONLY IN CONNECTION WITH WORK DESCRIBED BY SOLVIDA. NO PART IS TO BE DISCLOSED TO OTHERS WITHOUT WRITTEN PERMISSION FROM SOLVIDA DESIGN AND ENGINEERING.

GENERAL CIVIL NOTES:

1. CONSTRUCTION SHALL BE IN ACCORDANCE WITH THESE SPECIFICATIONS, DELTA COUNTY, COLORADO STANDARDS & SPECIFICATIONS AND THE INTERNATIONAL BUILDING CODE WITH COLORADO AMMENDMENTS.

2. ALL EARTHWORK AND TESTING SHALL ADHERE TO THE RECOMMENDATIONS OF GARNET MESA SOLAR PRELIM GEOTECH REPORT (GEOTECH REPORT), PROVIDED BY BUCKHORN ENGINEERING. (PROJECT NO. 2021-010-GEO).

3. EARTHWORK ON THE SITE SHALL BE OBSERVED AND EVALUATED BY THE GEOTECHNICAL ENGINEER OF RECORD (G-EOR).

4. THE EVALUATION OF EARTHWORK SHALL INCLUDE OBSERVATION AND TESTING OF ON-SITE BACKFILL MATERIAL AND OTHER GEOTECHNICAL CONDITIONS EXPOSED DURING ROAD IMPROVEMENT CONSTRUCTION AT THE DIRECTION OF THE G-EOR.

5. WHERE DEVIATIONS EXIST BETWEEN THESE SPECIFICATIONS/DESIGN AND THE GEOTECH REPORT, THIS DESIGN SHALL TAKE PRECEDENCE.

6. NOTES AND DETAILS NOTED AS "TYPICAL," SHALL BE USED WHENEVER APPLICABLE. SPECIFIC DETAILS AND NOTES TAKE PRECEDENCE OVER TYPICAL DETAILS AND NOTES.

7. DRAWINGS, SPECIFICATIONS, DETAILS, AND NOTES DEPICTED IN THIS DESIGN REPRESENT THE FINISHED PRODUCT AND DO NOT INDICATE THE MEANS, METHODS, PROCEDURES, OR SEQUENCE OF CONSTRUCTION UNLESS SPECIFICALLY NOTED.

8. CHANGES OR DEVIATIONS FROM THE DRAWINGS, SPECIFICATIONS, DETAILS, AND NOTES DEPICTED IN THIS DESIGN ARE NOT ALLOWED WITHOUT WRITTEN AUTHORIZATION FROM THE CIVIL ENGINEER OF RECORD (C-EOR).

9. CONTRACTOR IS RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH THE DESIGN DRAWINGS, REPORTS, AND SITE.

10. CONTRACTOR IS SOLELY RESPONSIBLE FOR DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM CONTRACTORS OPERATIONS, REGARDLESS OF WHETHER THOSE FACILITIES ARE DEPICTED ON THESE PLANS.

11. CONTRACTOR SHALL ADHERE TO ALL FEDERAL, STATE, AND LOCAL SAFETY REGULATIONS.

12. CONTRACTOR SHALL ENACT MEASURES TO PROTECT AND SAFEGUARD WORKERS AND THE PUBLIC FROM INJURY DURING CONSTRUCTION.

13. CONTRACTOR SHALL MAINTAIN THE JOB SITE IN AN ORDERLY, CLEAN MANNER THROUGHOUT THE COURSE OF THE WORK.

14. CONTRACTOR SHALL NOT BLOCK LEGAL ENTRANCES OR EXITS.

15. CONTRACTOR SHALL LEAVE THE WORK AREA CLEAN AND FREE OF DEBRIS AND TRASH AT THE END OF EACH DAY.

16. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES AND ORDINANCES.

17. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL CONSTRUCTION SURVEYING MONUMENTS AND STAKES SET BY THE OWNER. ANY DEVIATIONS FROM EXISTING GRADES AS SHOWN ON THE PLANS SHALL BE IMMEDIATELY REPORTED TO THE OWNER AND C-EOR.

18. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND MATERIAL QUANTITIES PRIOR TO CONSTRUCTION. MATERIAL QUANTITIES LISTED IN THE CIVIL DESIGN ARE APPROXIMATE.

19. REQUESTS FOR INFORMATION (RFIs) FOR CLARIFICATION OF THE INTENT OF THE DESIGN SHALL BE SUBMITTED TO THE C-EOR. RFIs SHALL INCLUDE A DETAILED WRITTEN STATEMENT THAT INDICATES THE SPECIFIC DRAWINGS OR SPECIFICATIONS IN NEED OF CLARIFICATION AND THE NATURE OF THE CLARIFICATION REQUIRED. THE C-EOR SHALL RESPOND IN WRITING AND ISSUE CLARIFICATIONS AS NECESSARY. RESPONSES TO RFIs DO NOT CONSTITUTE APPROVED DESIGN CHANGES.

20. IF CULTURAL RESOURCES ARE LOCATED DURING CONSTRUCTION (ARCHEOLOGICAL FINDINGS UNEARTHED), WORK SHALL STOP IN THAT AREA AND THE CONTRACTOR SHALL IMMEDIATELY NOTIFY PROJECT MANAGEMENT.

EARTHWORK:

21. COMPACTION STANDARD FOR NATIVE, SCARIFIED, AND RE-COMPACTED SUBGRADES SHALL BE 95% BY ASTM D698 (STANDARD PROCTOR).
22. COMPACTION STANDARD FOR STRUCTURAL FILL BENEATH FOUNDATIONS, SLABS ON GRADE, AND SITE ACCESS ROADS SHALL BE 95% MDD BY ASTM D698.
23. MOISTURE CONTENT OF STRUCTURAL FILL TO BE COMPACTED SHALL BE ±2% OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698 AT THE TIME OF PLACEMENT AND COMPACTION.
24. PLACE FILL MATERIAL IN MAXIMUM LIFTS OF 6" LOOSE THICKNESS.
25. FILL MATERIAL TYPES SHALL BE IN ACCORDANCE WITH STRUCTURAL FILL TYPES LISTED IN THE GEOTECH REPORT.
26. PRIOR TO PLACING FILL OR COMPACTING SCARIFIED SOIL IN FOUNDATION AREAS, ALL UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE CONSTRUCTION AREAS. THIS SHALL INCLUDE THE REMOVAL OF ALL VEGETATION AND TOPSOIL, DEBRIS, LOOSE AND DISTURBED SOIL, CONTAMINATED SOIL AND OTHER DELETERIOUS MATERIALS THAT MAY EXIST WITHIN THE AREA OF THE PROPOSED CONSTRUCTION.
27. IF UNDERGROUND FACILITIES ARE ENCOUNTERED DURING SITE CLEARING, CONTRACTOR SHALL IMMEDIATELY NOTIFY C-EOR SO THAT A SOLUTION CAN BE CREATED TO PROTECT AND/OR RELOCATE (E) UTILITY.
28. DRY AND LOW-DENSITY SOIL SHALL BE REMOVED OR WETTED AND COMPACTED IN-PLACE PRIOR TO PLACING ADDITIONAL FILL OVER THE MATERIAL.
29. ORGANIC SOILS SHALL BE LEFT IN PLACE IN NON-STRUCTURAL AREAS SUCH AS WITHIN THE ARRAY AREAS.
30. VEGETATION REMOVAL SHALL ONLY TAKE PLACE IN AREAS TO BE DISTURBED, CONTRACTOR SHALL MINIMIZE DISTURBANCE OF VEGETATION DUE TO CONSTRUCTION ACTIVITIES.
31. IN LOCATIONS OF SOIL DISTURBANCE DUE TO EARTHWORK, NATIVE TOPSOIL WILL BE REMOVED, STOCKPILED, AND EITHER REPLACED OR SPREAD ON SITE.

SITE ACCESS ROADS:

32. SURFACE COURSE SHALL HAVE A MINIMUM COMPACTED THICKNESS OF 6" OF CDOT CLASS 6 ROADBASE (CDOT 2021 CONSTRUCTION SPECIFICATIONS, SECTION 703.04).
33. GAB THICKNESS SHALL BE MEASURED AFTER FULL COMPACTION AND CONSTRUCTED DIRECTLY ABOVE 18" MOISTURE CONDITIONED, AND COMPACTED NATIVE SOIL.
34. GAB SHALL BE COMPACTED TO 95% MDD VIA MODIFIED PROCTOR (ASTM D1557).
35. PRIOR TO PLACING GAB, OR COMPACTING SCARIFIED SOILS IN ROAD EXCAVATIONS, ALL UNSUITABLE MATERIAL SHALL BE REMOVED. THIS SHALL INCLUDE THE REMOVAL OF ALL VEGETATION AND TOPSOIL, DEBRIS, LOOSE AND DISTURBED SOIL, CONTAMINATED SOIL AND OTHER DELETERIOUS MATERIALS THAT MAY EXIST WITHIN THE AREA OF THE PROPOSED ROADWAY CONSTRUCTION.
36. SCARIFY (OR TILL), MOISTURE CONDITION AND RE-COMPACT NATIVE SUBBASE MATERIAL TO 18" DEPTH MINIMUM BEFORE ADDING GAB.
37. NATIVE SUBBASE MATERIAL SHALL BE COMPACTED TO 95% MAXIMUM DRY DENSITY (MDD) PER ASTM D698, ±2% OPTIMUM MOISTURE CONTENT.
38. SITE ACCESS ROADWAYS SHALL BE CONSTRUCTED AT GRADE WITH A VERTICAL TOLERANCE OF +/- 2" WITH A 2% CROWN FROM CENTERLINE, UNLESS NOTED OTHERWISE (UNO).
39. POSITIVE DRAINAGE SHALL BE MAINTAINED ACROSS THE ROADWAYS.
40. ON-SITE ROADWAY SLOPES SHALL NOT EXCEED 5%.

TEMPORARY LAYDOWN AREAS:

41. IF TEMPORARY LAYDOWN AREAS ARE USED, EROSION AND SEDIMENT CONTROL SHALL BE PLACED IN ACCORDANCE WITH ESC SHEETS.
42. TEMPORARY LAYDOWN AREAS WILL BE CLEARED AND GRUBBED.
43. SCARIFY (OR TILL) NATIVE MATERIAL TO A DEPTH OF 12" AND RE-COMPACT.
44. PROOF ROLL COMPACTED SUB BASE NATIVE MATERIAL USING A LOADED TANDEM AXLE TRUCK IN ACCORDANCE WITH PROOF ROLL RECOMMENDATIONS IN THE GEOTECH REPORT.
45. COMPACTION SHALL DEEMED ADEQUATE WHEN PROOF ROLL INDICATES 1" OR LESS DEFLECTION.
46. COVER TEMPORARY LAYDOWN AREA WITH 4" MIN. DEPTH OF GAB.
47. TEMPORARY LAYDOWN AREAS SHALL BE REMOVED AND MITIGATED TO PRE-CONSTRUCTION GRADE BY REMOVING GAB AND SCARIFYING OR TILLING COMPACTED SOIL.
48. FINAL STABILIZATION OF TEMPORARY LAYDOWN AREAS SHALL BE IN ACCORDANCE WITH ESC SHEETS.

CLEARING AND GRUBBING:

49. SITE-WIDE STORMWATER MANAGEMENT IS BASED ON THE PRESERVATION OF EXISTING VEGETATION ROOT STRUCTURES.
50. GRUBBING SHALL ONLY BE PERFORMED IN AREAS OF ROAD INSTALLATION AND WHERE NECESSARY FOR ELECTRICAL EQUIPMENT INSTALLATION. GRUBBING SHALL NOT BE PERFORMED ON A MASS SCALE ACROSS THE SITE.
51. IT IS THE INTENTION OF THE DESIGN THAT THE MAJORITY OF THE SITE BE MOWED OR CLEARED IN A MANNER THAT PRESERVES THE ROOT STRUCTURE OF EXISTING VEGETATION.
52. CLEARING SHALL BE DEFINED AS THE REMOVAL OF PLANTS AT OR ABOVE THE GROUND SURFACE.
53. GRUBBING SHALL BE DEFINED AS THE REMOVAL OF ROOTS BENEATH THE GROUND SURFACE.

TEMPORARY SOIL STOCKPILING:

54. EXCAVATED TOPSOIL SHALL BE KEPT SEPARATE FROM OTHER STOCKPILED MATERIAL FOR REUSE IN AREAS REQUIRING TOPSOIL.
55. EXCAVATED SOILS SHALL ONLY BE STOCKPILED IN TEMPORARY LAYDOWN AREAS OR NEAR AREAS OF USE.
56. EXCAVATED SOILS SHALL BE REUSED ON-SITE.
57. REUSE OF EXCAVATED SOIL ON-SITE SHALL BE PLACE SUCH THAT SITE HYDROLOGY IS NOT ALTERED.
58. EXCAVATED SOIL REUSE LOCATIONS SHALL BE PROVIDED TO THE C-EOR FOR APPROVAL.
59. EROSION AND SEDIMENT CONTROLS FOR TEMPORARY STOCKPILES SHALL BE IN ACCORDANCE WITH ESC SHEETS.

GRADING:

60. MASS GRADING ACROSS THE SITE SHALL NOT BE PERFORMED.
61. MINOR AMOUNTS OF GRADING MAY BE REQUIRED TO MAINTAIN PIER HEIGHT TOLERANCES.
62. GRADING AREAS SHALL BE EVALUATED ON A CASE BY CASE BASIS AS NEEDED.

PERMANENT STORMWATER CONTROLS:

63. GRASS LINED CHANNELS, ENHANCED DRY SWALES, AND BIORETENTION BASINS (RAINGARDENS) SHALL BE INSTALLED AT THE END OF ARRAY CONSTRUCTION TO MINIMIZE COMPACTION AND SEDIMENTATION.
64. FOLLOWING RAINGARDEN CONSTRUCTION, RAINGARDENS SHALL VEGETATED WITH A POLLINATOR FRIENDLY SEED MIX/PLANTING SCHEDULE.

UTILITY LOCATE:

65. PRIOR TO CONSTRUCTION CONTRACTOR SHALL CONTACT UTILITY LOCATION SERVICES TO LOCATE ALL PUBLIC AND PRIVATE UTILITIES.
66. PUBLIC UTILITY LOCATION SERVICES (COLORADO 811) CAN BE REACHED BY DIALING 811 OR 1-800-282-7411 OR BY VISITING THEIR WEBSITE AT WWW.COLORADO811.COM.

SURVEY CONTROL (CIVIL SHEETS ONLY):

67. HORIZONTAL COORDINATE SYSTEM: NAD 83, COLORADO WEST ZONE, STATE PLANE, US FOOT.
68. VERTICAL DATUM: NAD 83, FEET.
69. ANY COORDINATES SHOWN IN CIVIL SHEETS ARE GRID COORDINATES.

SPECIAL INSPECTIONS:

70. SPECIAL INSPECTION AND TESTING FIRM SHALL SUBMIT THE FOLLOWING TO THE OWNER AND C-EOR:
    - 70.1. SPECIAL INSPECTION AND TESTING REPORTS FOR THE FOLLOWING AT A MINIMUM:
        - 70.1.1. PERIODIC VERIFICATION THAT MATERIALS BELOW SHALLOW FOUNDATIONS AND EQUIPMENT PADS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.
        - 70.1.2. PERIODIC VERIFICATION THAT EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND WIDTH AND HAVE REACHED SUITABLE MATERIAL.
        - 70.1.3. PERIODIC CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.
        - 70.1.4. CONTINUOUS VERIFICATION OF THE USE OF PROPER MATERIALS, DENSITIES, AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED STRUCTURAL FILL.
        - 70.1.5. PERIODIC INSPECTION OF SUBGRADE, PRIOR TO PLACEMENT OF COMPACTED FILL, TO VERIFY THAT EXCAVATION SITE HAS BEEN PREPARED PROPERLY.

SUBMITTALS:

71. CONTRACTOR SHALL SUBMIT CUT SHEETS AND DETAILS FOR THE FOLLOWING TO THE OWNER AND C-EOR FOR REVIEW PRIOR TO PLACEMENT:
    - 71.1. PERIMETER FENCE
    - 71.2. FILL AND/OR STRUCTURAL FILL MATERIALS AND EQUIPMENT PAD EXCAVATION FILL MATERIALS
    - 71.3. CONCRETE MIX DESIGNS
    - 71.4. SEED MIX DESIGNS
    - 71.5. SOIL AMENDMENT MIX DESIGN FOR RAINGARDENS

ALTERNATIVES:

72. THE C-EOR WILL CONSIDER ALTERNATIVES FOR MATERIALS AND PROCEDURES. HOWEVER, IT IS THE CONTRACTOR'S RESPONSIBILITY TO DEMONSTRATE THAT ALL ALTERNATIVES ARE EQUAL IN STRENGTH, PERFORMANCE, AND DURABILITY TO THE MATERIALS OR PROCEDURES SPECIFIED IN THE DESIGN.
73. WRITTEN APPROVAL BY THE C-EOR SHALL BE REQUIRED PRIOR TO USING ANY ALTERNATIVE. CONSIDERATION OF ANY ALTERNATIVE SHALL NOT BE DEEMED TO IMPLY ADVANCE ACCEPTANCE BY THE C-EOR. THE C-EOR RESERVES THE RIGHT TO REJECT ANY ALTERNATIVE.

MATERIAL SPECIFICATIONS

74. CDOT GRANULAR AGGREGATE BASE PER FOLLOWING TABLE:

Sieve Size	Percent Passing By Weight
Structural Fill (CDOT Class 6 roadbase)	
3/4" (19.00mm)	100
#4 (4.75mm)	30-65
#8 (2.36mm)	25-55
#200 (0.075 mm)	3-12
Structural Fill (CDOT Class 1)	
2.5" (63.5mm)	100
2" (50 mm)	95-100
#4 (4.75 mm)	30-65
#200 (0.075 mm)	3-15
Fill under exterior concrete flatwork	
3" (75 mm)	100
#200 (0.075 mm)	0-5
Free-draining fill	
3" (75 mm)	100
3/4" (19mm)	20-90
#4 (4.75 mm)	0-20
#200 (0.075 mm)	0-3

75. GEOTECH REPORT STRUCTURAL FILL
    - 75.1. STRUCTURAL FILL MATERIAL SHALL BE FREE OF ORGANIC DEBRIS, WASTE CONSTRUCTION DEBRIS, AND OTHER DELETERIOUS MATERIAL.
    - 75.2. THE PLASTICITY INDEX FOR ALL FILL SOILS SHOULD BE LESS THAN 6.

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REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

SHEET TITLE: CIVIL NOTES
SHEET NO.: C-100

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

DATE:	08/16/2021
SCALE:	AS SHOWN
PAPER SIZE:	24" X 36"
DFTR:	KEVIN BYRUM-THORSON
CHKD:	DARIN GALLOWAY
ENGR:	DARIN GALLOWAY

soa
SIERRA OTTERBEIN ASSOCIATES

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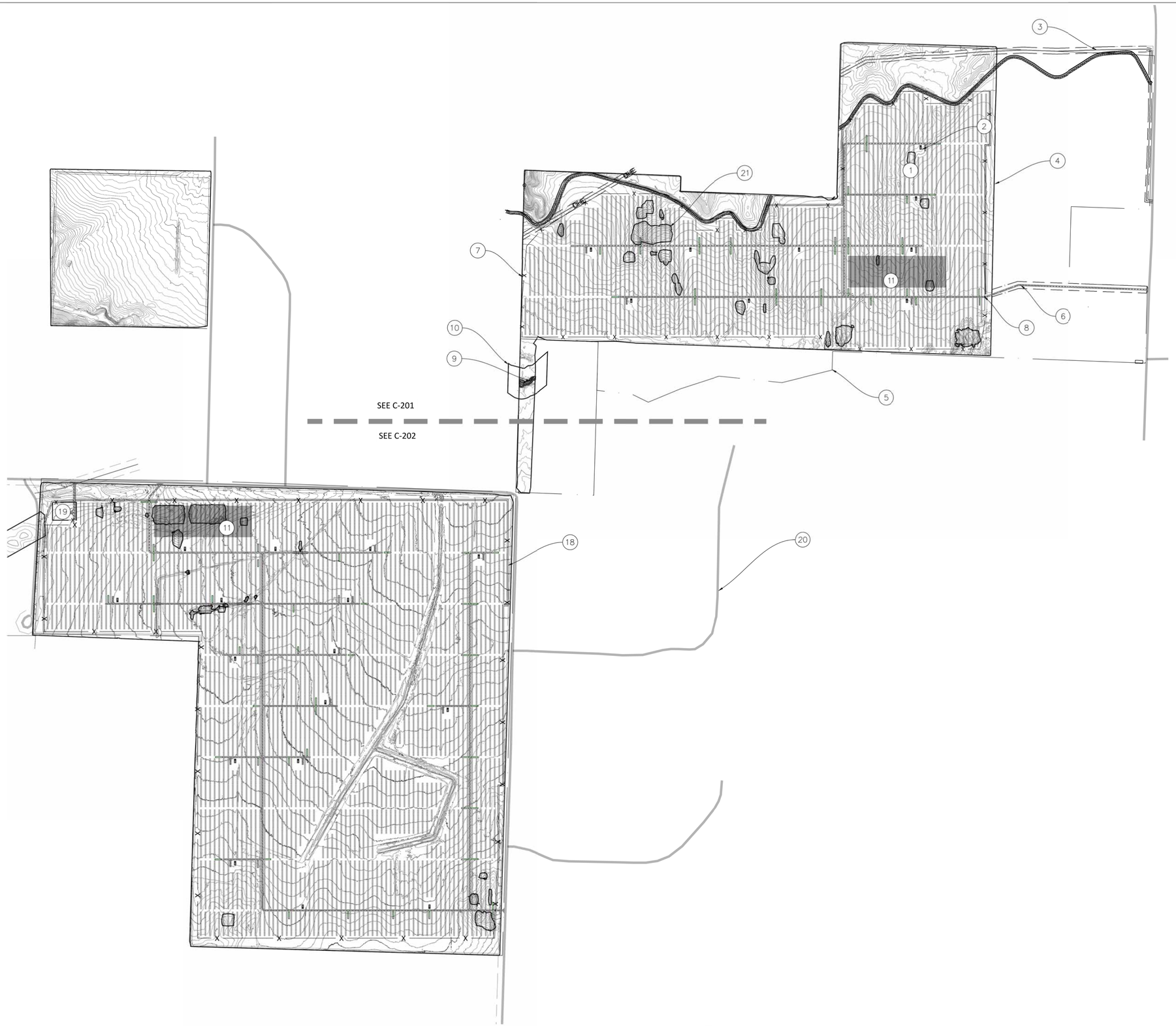

1 C-200 CIVIL SITE OVERVIEW
SCALE: 1" = 400'
0 400 800

LEGEND

1		ARRAY AREA
2		POWER STATION EQUIPMENT PAD (S-200)
3	OVE	(E) OVERHEAD ELECTRIC LINE
4		SETBACK FROM PROPERTY LINE
5		PROPERTY LINE
6		16' SITE ACCESS ROAD
7	X	PROJECT SITE SECURITY FENCE
11		TEMPORARY LAYDOWN AREA
18		LANDSCAPE BUFFER
19		SUBSTATION
20		EXISTING PUBLIC ROAD
21		GRADING AREA
	240	MAJOR CONTOUR
	241	MINOR CONTOUR
	240	(N) MAJOR CONTOUR
	241	(N) MINOR CONTOUR

GENERAL NOTES

1. PROJECT SITE ARRAY AREA = 348 ACRES
2. DISTURBED AREA = 348 ACRES
3. DISTURBED AREAS INCLUDE: GRADING, EXCAVATION, PILE, ROADWORK, CLEARING AND EQUIPMENT PADS.
4. SITE PREPARATION INCLUDES CLEARING/GRUBBING, MINOR GRADING, COMPACTION, MOWING OF VEGETATION, AND RESTABILIZATION OF DISTURBED AREAS.
5. TOPSOIL SHALL NOT BE REMOVED FROM THE PROJECT SITE OR SOLD UNLESS REMOVAL OF EXCESS SOIL IS APPROVED BY THE AHJ.
6. EXCESS TOPSOIL SHALL BE SPREAD ON-SITE SO AS TO PROVIDE SIX INCHES OF COVER ORIGINALLY EXISTING ON THE SITE OR A MINIMUM OF FOUR INCHES OF COVER IF THE ORIGINAL COVER WAS LESS.
7. IF REMOVAL OF EXCESS TOPSOIL IS REQUIRED IT MUST BE COORDINATED AND MEET AHJ REQUIREMENTS.
8. PROJECT SITE SHALL BE STABILIZED BY SEEDING AND/OR SODDING.
9. ADDITIONAL VEGETATION MAY NEED TO BE REMOVED PRIOR TO CONSTRUCTION. AREAS THAT ARE NOT CLEARED/GRUBBED SHALL BE MOWED TO A MINIMUM OF THREE INCHES.
10. CONTRACTOR RESPONSIBLE FOR PRESERVATION OF EXISTING VEGETATION, NOT CLEARED/GRUBBED OR MOWED, TO THE EXTENT PRACTICABLE.
11. VEGETATION REMOVAL SHALL ONLY OCCUR WITHIN THE LIMIT OF DISTURBANCE.
12. CONTRACTOR TO REMOVE ONLY VEGETATION WHICH SHALL BE DESIGNATED BY THE OWNERS REPRESENTATIVE FOR REMOVAL AND SHALL EXERCISE CARE AROUND EXISTING VEGETATION TO BE SAVED. CONSTRUCTION FENCING MAY BE INSTALLED TO PROTECT AREAS THAT ARE NOT TO BE DISTURBED.
13. BURNING OF DEBRIS SHALL NOT OCCUR WITHOUT APPROPRIATE PERMITS AND/OR AHJ AND OWNER APPROVAL.
14. FINAL STABILIZATION SHALL BE ACHIEVED WHEN A UNIFORM VEGETATIVE COVER WITH AN INDIVIDUAL PLANT DENSITY OF AT LEAST 70% OF PRE DISTURBANCE LEVELS, OR EQUIVALENT PERMANENT PHYSICAL EROSION REDUCTION METHODS HAVE BEEN EMPLOYED IN ALL AREAS OF DISTURBED GROUND.
15. THE PROPOSED DEVELOPMENT PORTIONS OF THIS PROPERTY ARE IN FLOOD ZONE "X" AS PER FLOOD INSURANCE RATE MAP FOR DELTA COUNTY, PANEL # 08029C0650D, WITH AN EFFECTIVE DATE OF 8/18/2010. ZONE "X" DENOTES AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

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CIVIL SITE OVERVIEW (SHEET TITLE) — C-200 (SHEET NO.)

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 (PROJECT DETAILS) LAT:TBD / LON:W84°50'15.97"

soa SIERRA OVERHEAD ANALYTICS

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
SCALE:	AS SHOWN	CHKD:	DARIN GALLOWAY
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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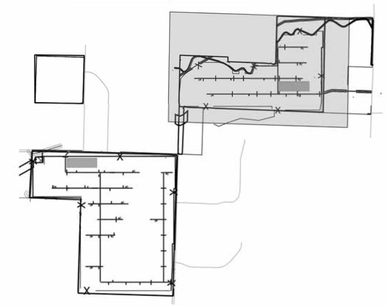
1 C-201 CIVIL SITE PLAN
SCALE: 1" = 200'
0 200 400

LEGEND

1		ARRAY AREA
2		POWER STATION EQUIPMENT PAD (S-200)
3	OVE	(E) OVERHEAD ELECTRIC LINE
4		SETBACK FROM PROPERTY LINE
5		PROPERTY LINE
6		16' SITE ACCESS ROAD
7	X	PROJECT SITE SECURITY FENCE
8		(N) SITE SECURITY GATE
9		WETLAND
10		WETLAND SETBACK
11		TEMPORARY LAYDOWN AREA
13		RAIN GARDEN (SEE DETAIL 2/G&D-300)
18		LANDSCAPE BUFFER
21		GRADING AREA
	240	MAJOR CONTOUR
	241	MINOR CONTOUR
	240	(N) MAJOR CONTOUR
	241	(N) MINOR CONTOUR

MAP LEGEND (SCALE 1"=2000')



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REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

CIVIL SITE PLAN (SHEET TITLE) — C-201 (SHEET NO.)

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 (PROJECT DETAILS) LAT:TBD / LON:W84°50'15.97"

soa SIERRA OVERHEAD ANALYTICS

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
SCALE:	AS SHOWN	CHKD:	DARIN GALLOWAY
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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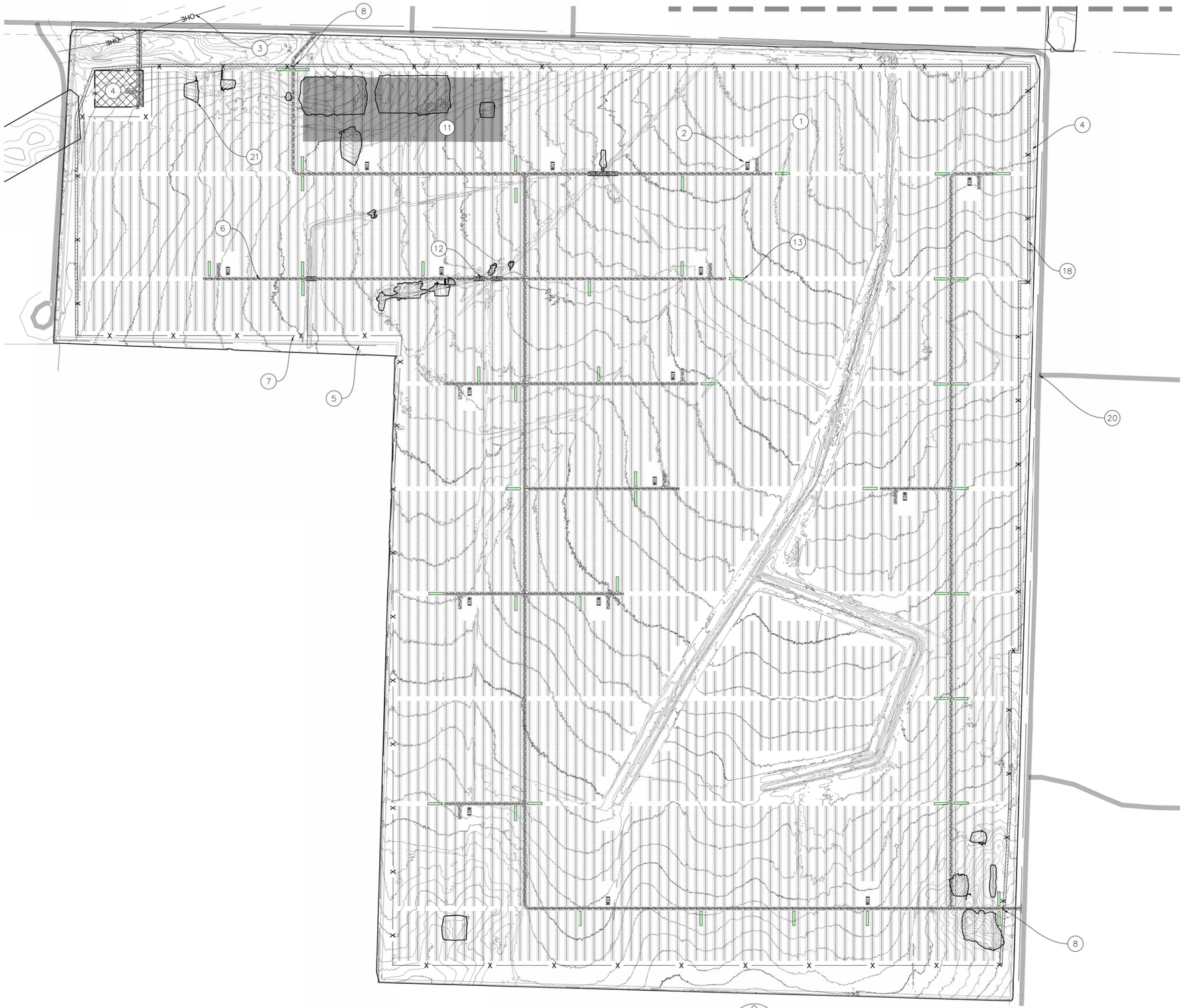
SEE C-201



1 C-202 CIVIL SITE PLAN
SCALE: 1" = 200'
0 200 400

LEGEND

1		ARRAY AREA
2		POWER STATION EQUIPMENT PAD (S-200)
3	OVE	(E) OVERHEAD ELECTRIC LINE
4		SETBACK FROM PROPERTY LINE
5		PROPERTY LINE
6		16' SITE ACCESS ROAD
7	X	PROJECT SITE SECURITY FENCE
8		(N) SITE SECURITY GATE
11		TEMPORARY LAYDOWN AREA
12		PROPOSED CULVERT (NTS, SEE DETAIL 4/G&D-300)
13		RAIN GARDEN (SEE DETAIL 2/G&D-300)
18		LANDSCAPE BUFFER
19		SUBSTATION
20		EXISTING PUBLIC ROAD
21		GRADING AREA
	240	MAJOR CONTOUR
	241	MINOR CONTOUR
	240	(N) MAJOR CONTOUR
	241	(N) MINOR CONTOUR

MAP LEGEND (SCALE 1"=2000')

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ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

SHEET TITLE: CIVIL SITE PLAN
SHEET NO.: C-202

PROJECT DETAILS: GARNET MESA
6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

DATE: 08/16/2021
SCALE: AS SHOWN
PAPER SIZE: 24" X 36"
DFTR: KEVIN BYRUM-THORSON
CHKD: DARIN GALLOWAY
ENGR: DARIN GALLOWAY

soa
SIERRA OVERHEAD (SALTECH)

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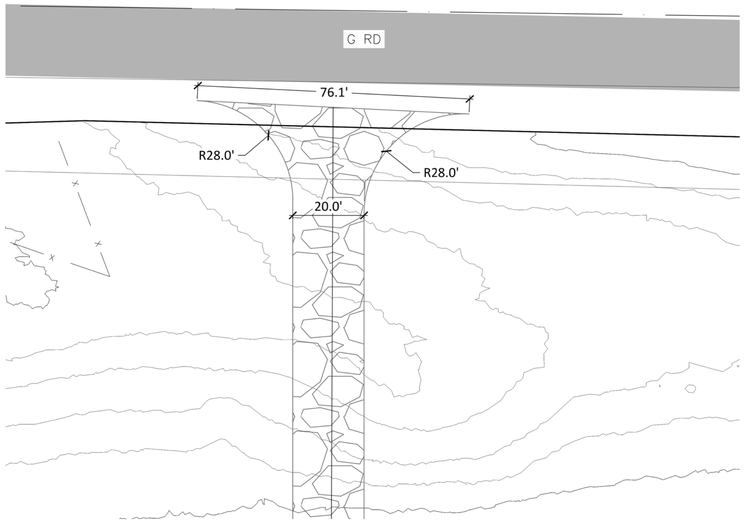
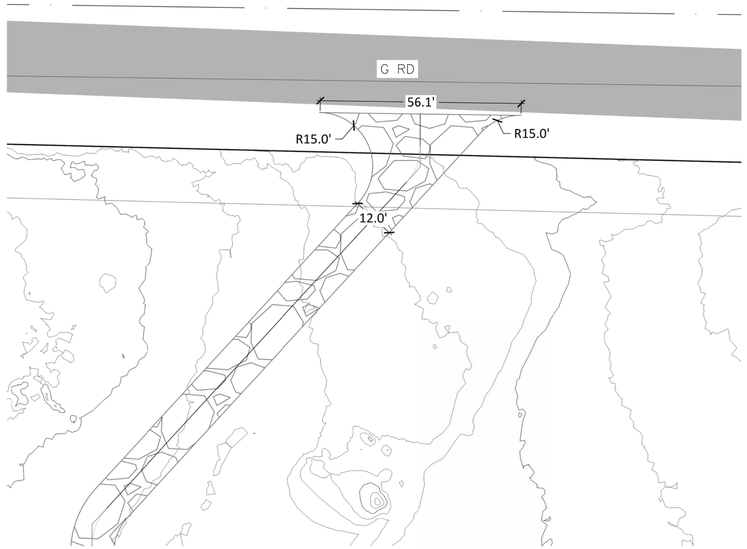
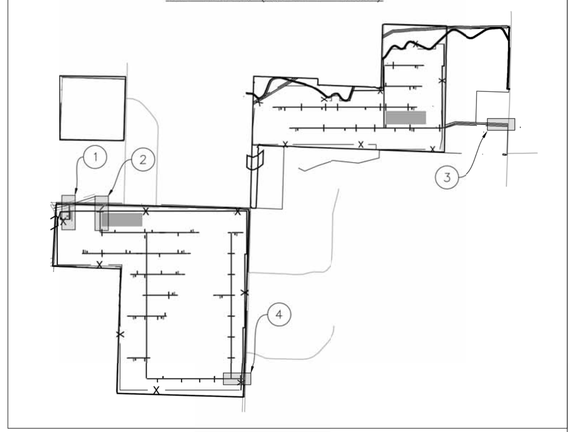


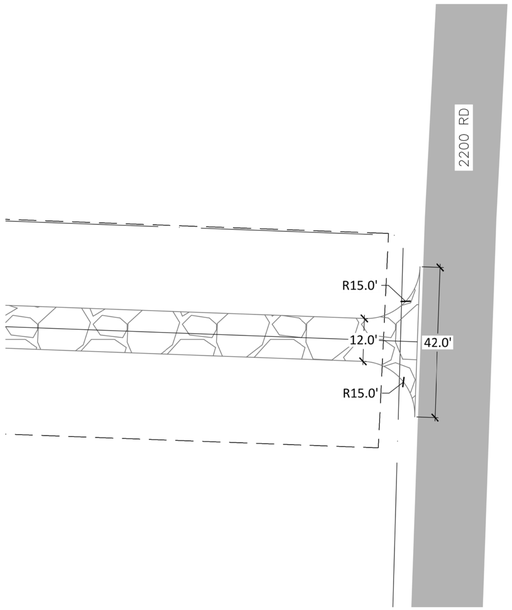
1 C-300 WESTERN ACCESS ROAD 1
SCALE: 1" = 20'
0 20 40



2 C-300 WESTERN ACCESS ROAD 2
SCALE: 1" = 20'
0 20 40

MAP LEGEND (SCALE 1"=1500')





3 C-300 EASTERN ACCESS ROAD
SCALE: 1" = 20'
0 20 40

4 C-300 SOUTHERN ACCESS ROAD
SCALE: 1" = 20'
0 20 40

GENERAL NOTES

1. 12'–20' ACCESS ROADS SHALL ACCOMMODATE ALL CONSTRUCTION, OPERATIONS, MAINTENANCE, AND UTILITY TRAFFIC THROUGHOUT THE SITE.
2. ON–SITE ROADWAYS SHALL NOT EXCEED 10% SLOPE PER 2018 INTERNATIONAL FIRE CODE APPENDIX D103.2.

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REV	DESCRIPTION	BY	CHK	DATE
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SHEET TITLE: SITE ENTRANCE PLAN
SHEET NO.: C-300

PROJECT DETAILS: GARNET MESA
6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

DATE: 08/16/2021
SCALE: AS SHOWN
PAPER SIZE: 24" X 36"
DFTR: KEVIN BYRUM-THORSON
CHKD: DARIN GALLOWAY
ENGR: DARIN GALLOWAY

soa
SIERRA OVERHEAD ANALYSIS

CONFIDENTIALITY STATEMENT
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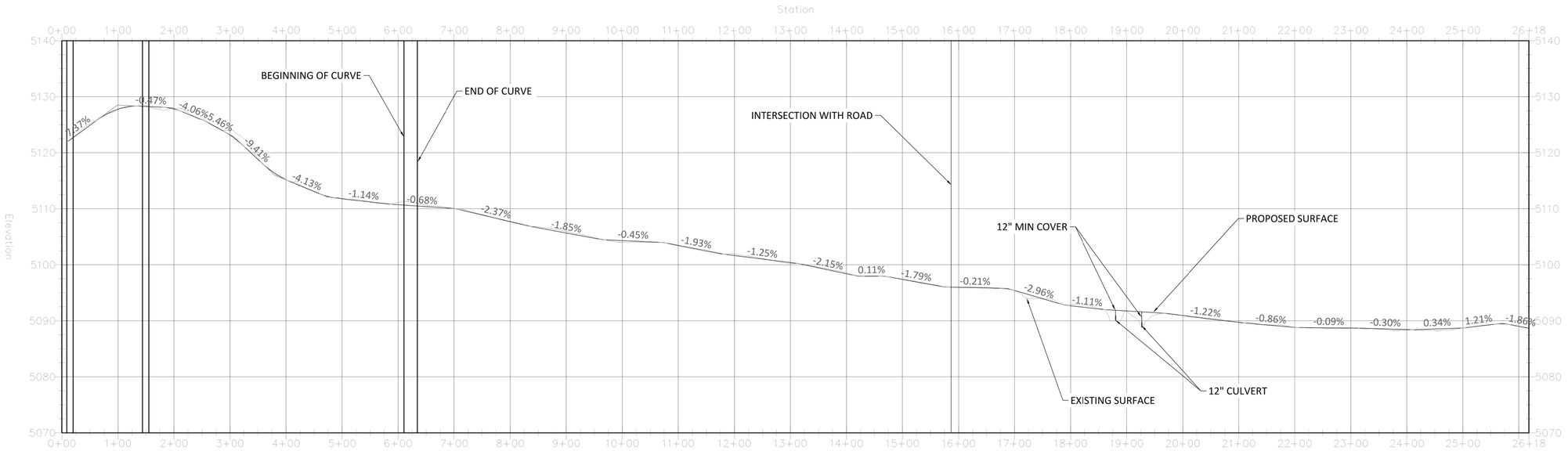
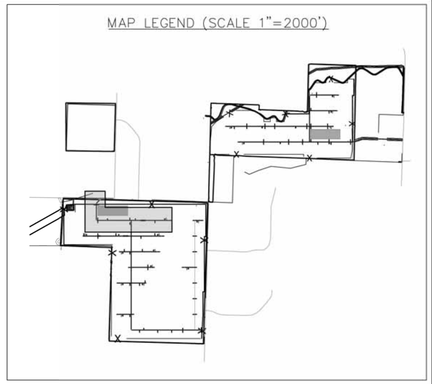
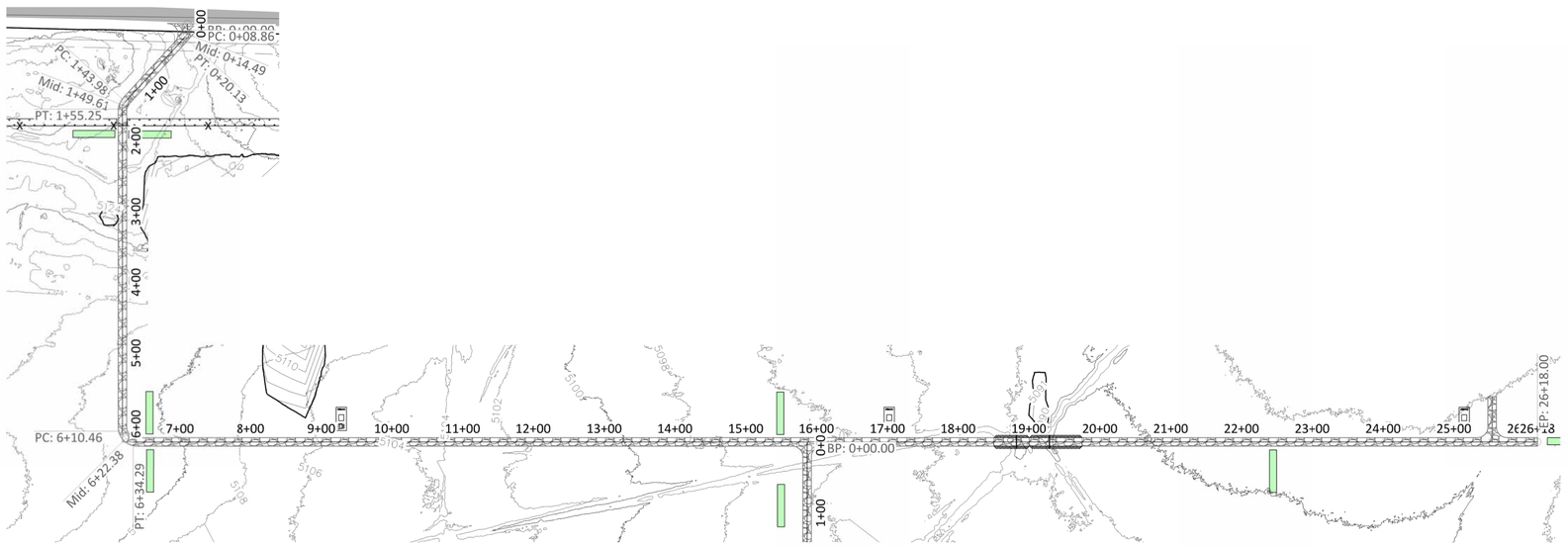


1 C-301 ROADWAY PROFILE (STA 0+00 TO STA 26+18)

SCALE: H:1" = 100' V:1"=10'





2 C-301 ROADWAY PLAN (STA 0+00 TO STA 26+18)

SCALE: 1"=100'

GENERAL NOTES

1. 12'–20' ACCESS ROADS SHALL ACCOMMODATE ALL CONSTRUCTION, OPERATIONS, MAINTENANCE, AND UTILITY TRAFFIC THROUGHOUT THE SITE.
2. ON–SITE ROADWAYS SHALL NOT EXCEED 10% SLOPE PER 2018 INTERNATIONAL FIRE CODE APPENDIX D103.2.

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REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

ROADWAY PROFILE — SHEET TITLE

C-301 — SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

PROJECT DETAILS

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
SCALE:	AS SHOWN	CHKD:	DARIN GALLOWAY
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

soa
SIERRA OVERHEAD ARCHITECTS

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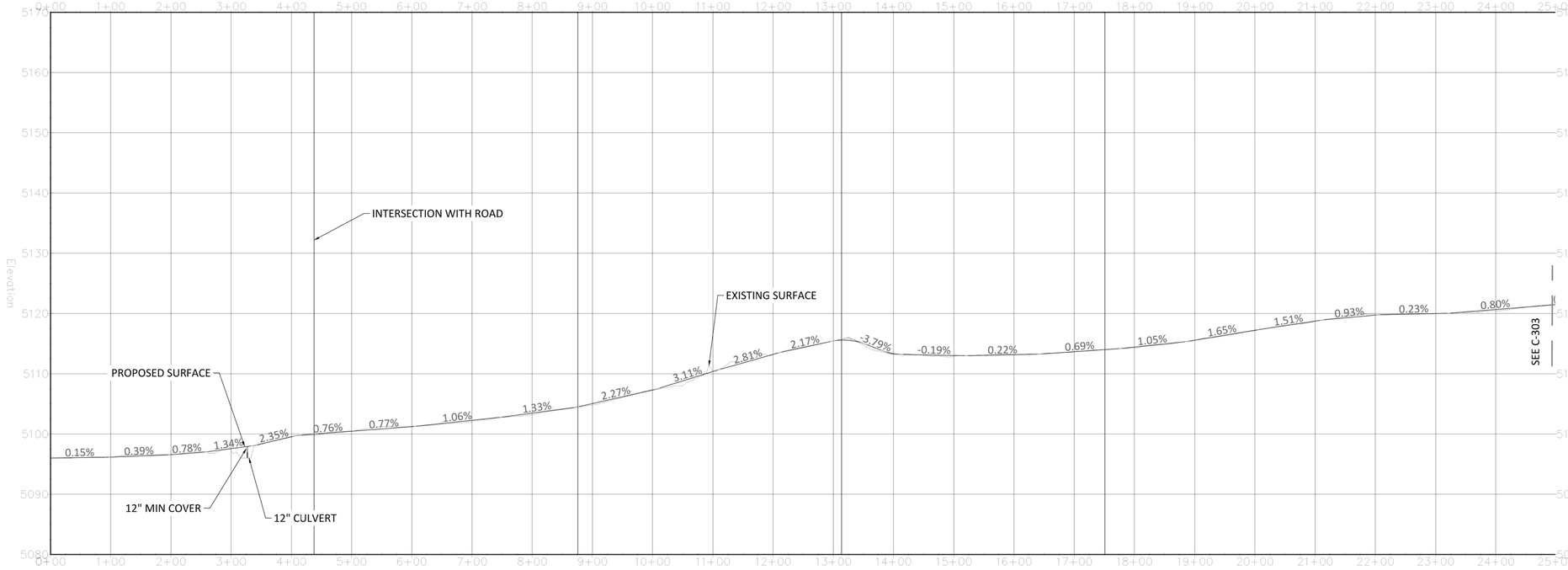
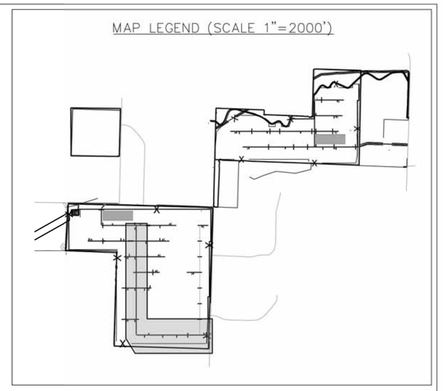
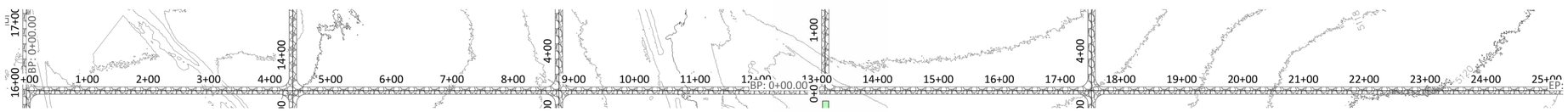


1 C-302 ROADWAY PROFILE (STA 0+00 TO STA 25+00)

SCALE: H:1"=100' V:1"=10'





2 C-302 ROADWAY PLAN (STA 0+00 TO STA 25+00)

SCALE: 1" = 100'

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08/16/2021 12:44:42 PM

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

SHEET TITLE: ROADWAY PROFILE

SHEET NO.: C-302

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

PROJECT DETAILS

DATE: 08/16/2021 DFTR: KEVIN BYRUM-THORSON

SCALE: AS SHOWN CHKD: DARIN GALLOWAY

PAPER SIZE: 24" X 36" ENGR: DARIN GALLOWAY

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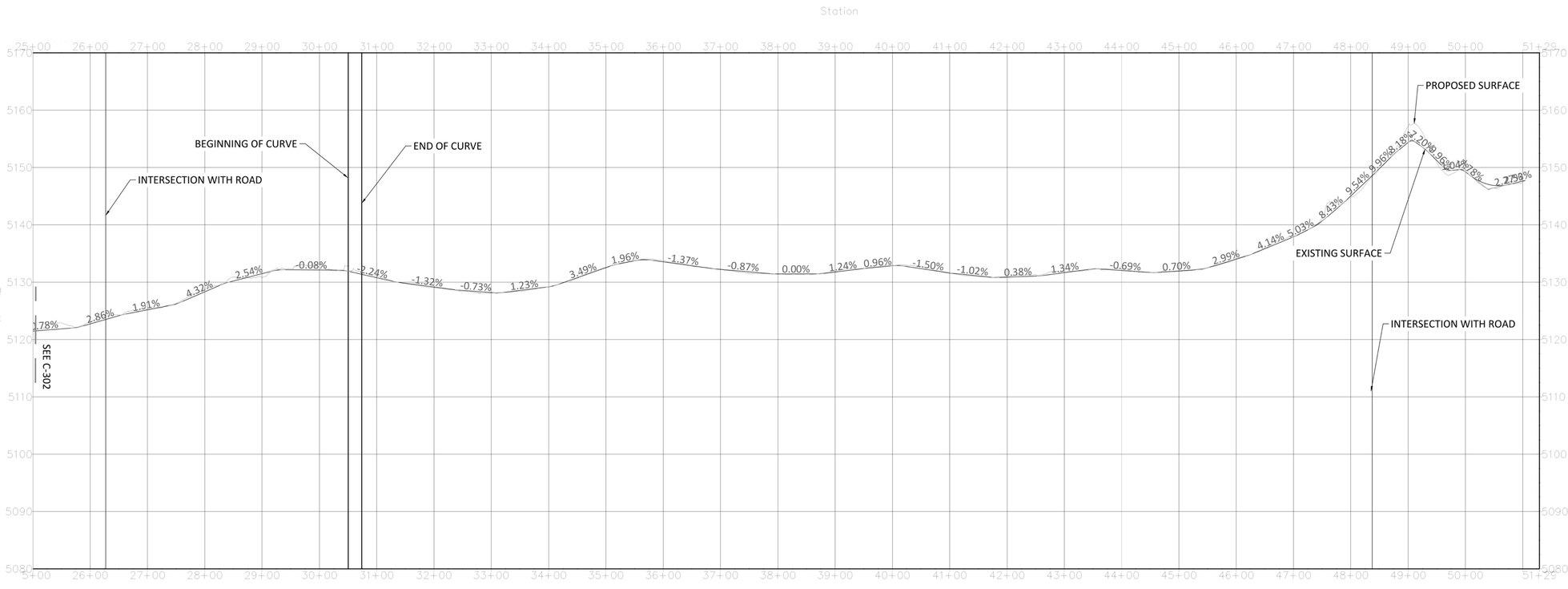
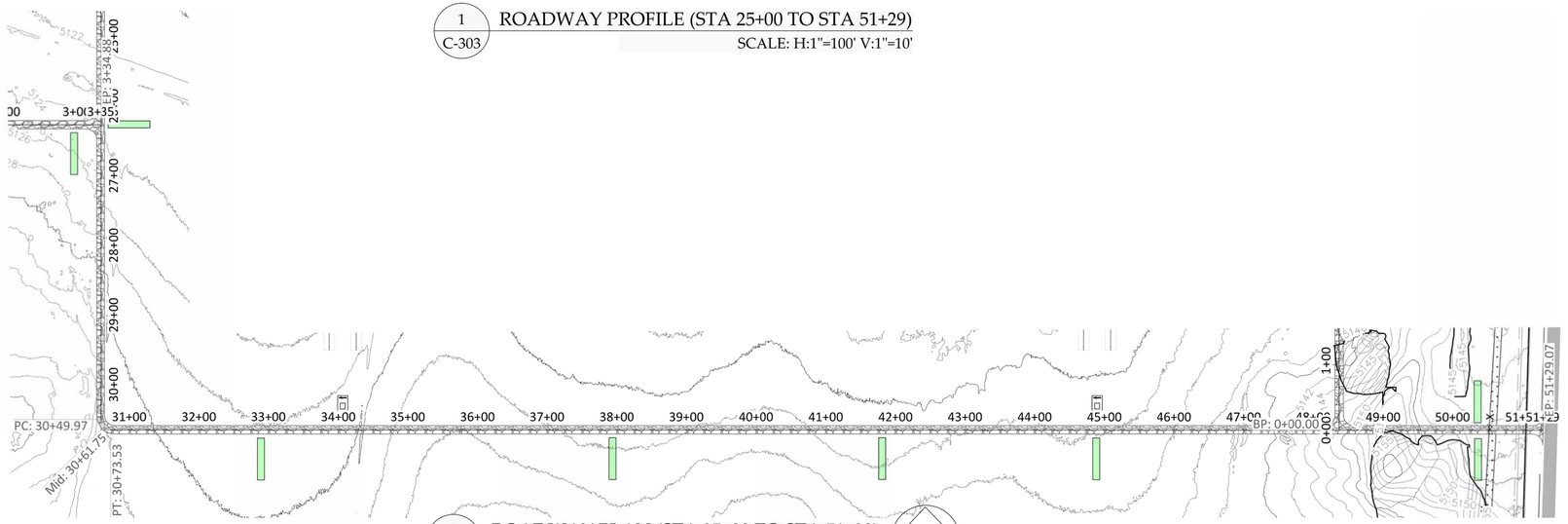
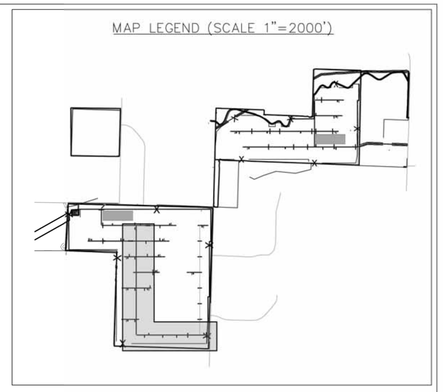


1 C-303 ROADWAY PROFILE (STA 25+00 TO STA 51+29)
SCALE: H:1"=100' V:1"=10'



2 C-303 ROADWAY PLAN (STA 25+00 TO STA 51+29)
SCALE: 1" = 100'



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ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

SHEET TITLE: ROADWAY PROFILE

SHEET NO.: C-303

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
SCALE:	AS SHOWN	CHKD:	DARIN GALLOWAY
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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SIERRA OVERHEAD ANALYTICS

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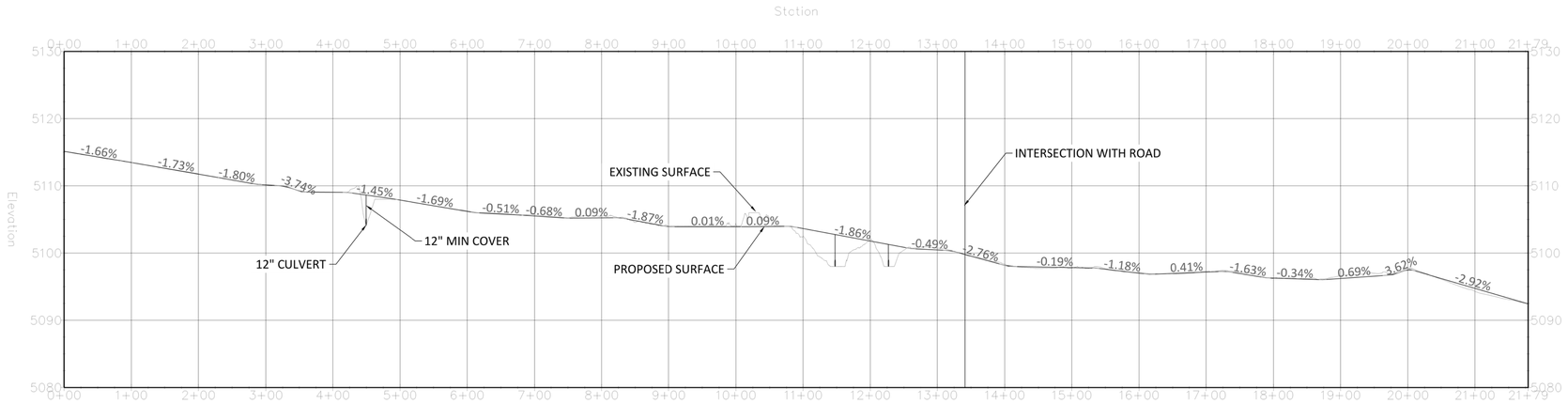
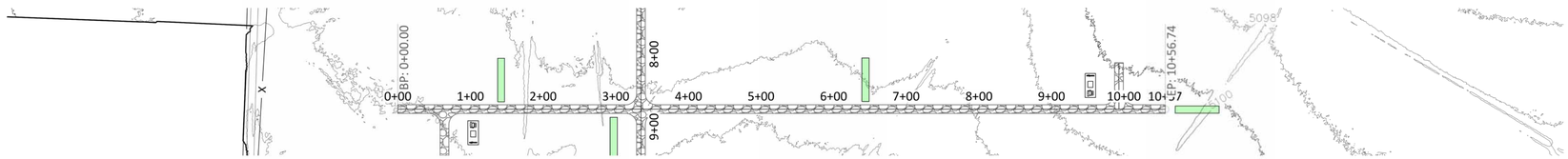
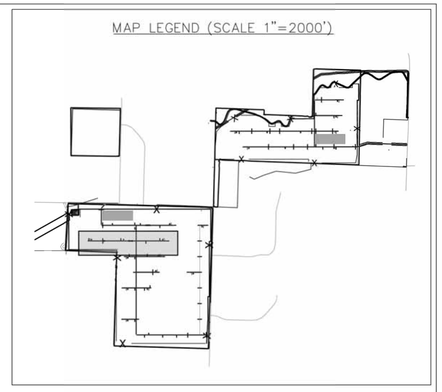


1 C-304 ROADWAY PROFILE (STA 0+00 TO STA 21+79)
SCALE: H:1"=100' V:1"=10'



2 C-304 ROADWAY PLAN (STA 0+00 TO STA 21+79)
SCALE: 1" = 100'


MAP LEGEND (SCALE 1"=2000')

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ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

ROADWAY PROFILE
SHEET TITLE

C-304
SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

soa
SIERRA OVERHEAD (NAUTICS)

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
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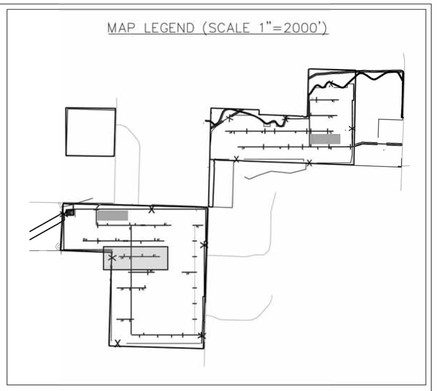
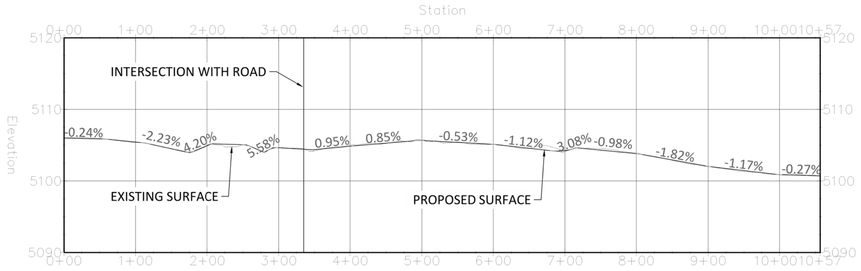
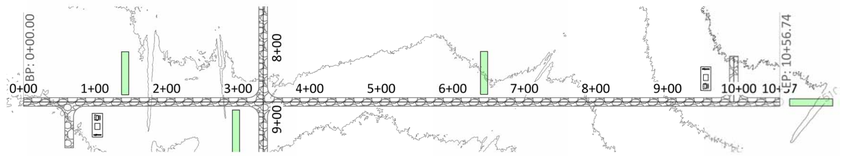




1 C-305 ROADWAY PROFILE (STA 0+00 TO STA 10+57)

SCALE: H:1"=100' V:1"=10'



2 C-305 ROADWAY PLAN (STA 0+00 TO STA 10+57)

SCALE: 1" = 100'

GENERAL NOTES

1. 12'–20' ACCESS ROADS SHALL ACCOMMODATE ALL CONSTRUCTION, OPERATIONS, MAINTENANCE, AND UTILITY TRAFFIC THROUGHOUT THE SITE.
2. ON–SITE ROADWAYS SHALL NOT EXCEED 10% SLOPE PER 2018 INTERNATIONAL FIRE CODE APPENDIX D103.2.

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ROADWAY PROFILE — SHEET TITLE

C-305 — SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

PROJECT DETAILS

soa — SIERRA OVERHEAD ARCHITECTS

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
SCALE:	AS SHOWN	CHKD:	DARIN GALLOWAY
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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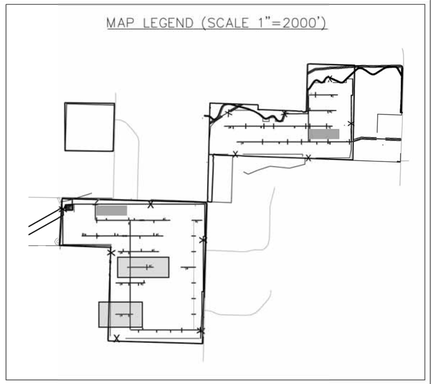
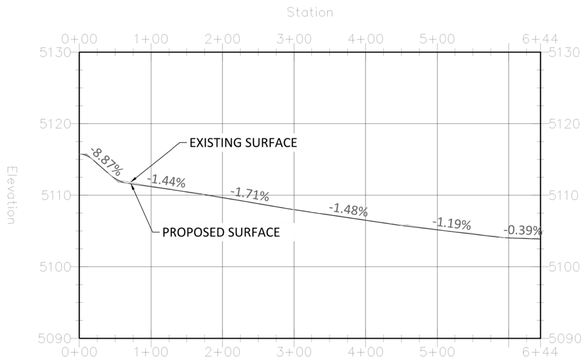
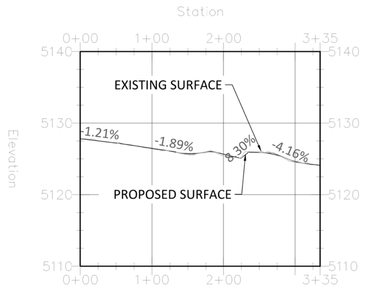
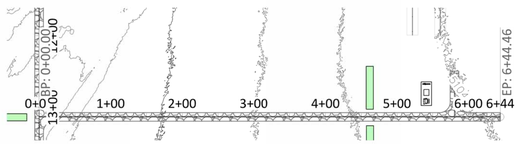




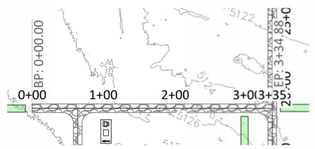
1 C-306 ROADWAY PROFILE (STA 0+00 TO STA 6+44)
SCALE: H:1"=100' V:1"=10'



2 C-306 ROADWAY PROFILE (STA 0+00 TO STA 3+35)
SCALE: H:1"=100' V:1"=10'



3 C-306 ROADWAY PLAN (STA 0+00 TO 6+44)
SCALE: 1" = 100'



4 C-306 ROADWAY PLAN (STA 0+00 TO STA 3+35)
SCALE: 1" = 100'

GENERAL NOTES

1. 12'-20' ACCESS ROADS SHALL ACCOMMODATE ALL CONSTRUCTION, OPERATIONS, MAINTENANCE, AND UTILITY TRAFFIC THROUGHOUT THE SITE.
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ENGINEER'S STAMP

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ROADWAY PROFILE
SHEET TITLE

C-306
SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

soa
SIERRA OVERHEAD (NAILTICH)

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
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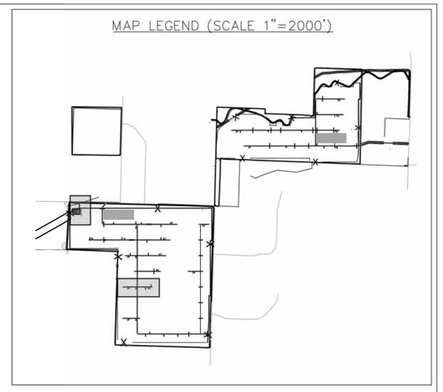
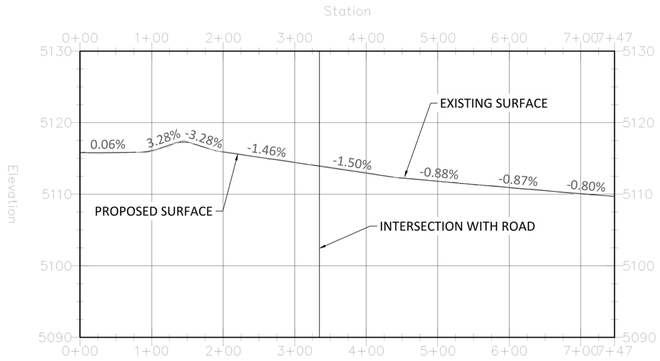
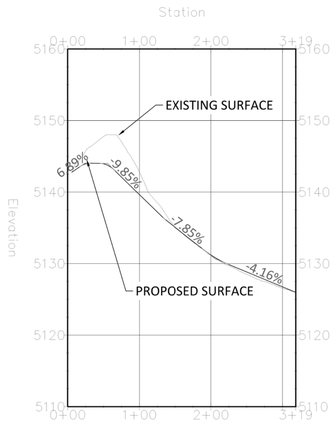
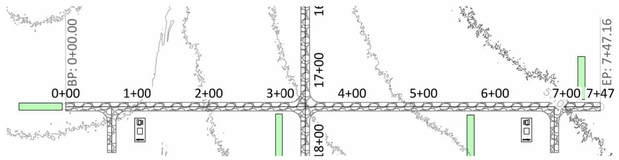




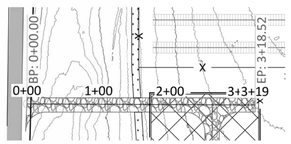
1 C-307 ROADWAY PROFILE (STA 0+00 TO STA 7+47)
SCALE: H:1"=100' V:1"=10'



2 C-307 ROADWAY PROFILE (STA 0+00 TO STA 3+19)
SCALE: H:1"=100' V:1"=10'



3 C-307 ROADWAY PLAN (STA 0+00 TO STA 7+47)
SCALE: 1" = 100'



4 C-307 ROADWAY PLAN (STA 0+00 TO STA 3+19)
SCALE: 1" = 100'

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ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
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ROADWAY PROFILE
SHEET TITLE

C-307
SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

soa
SIERRA OVERHEAD (NAILTICH)

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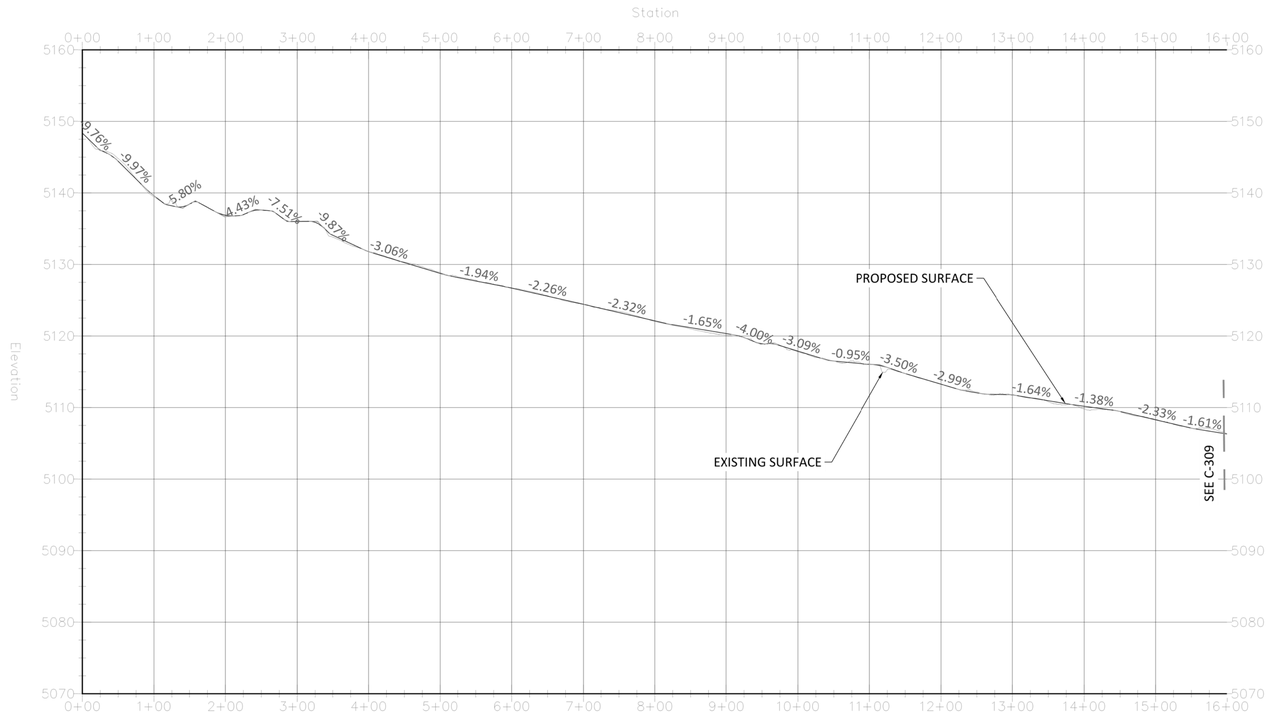
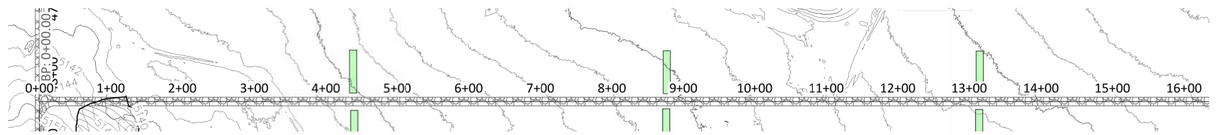
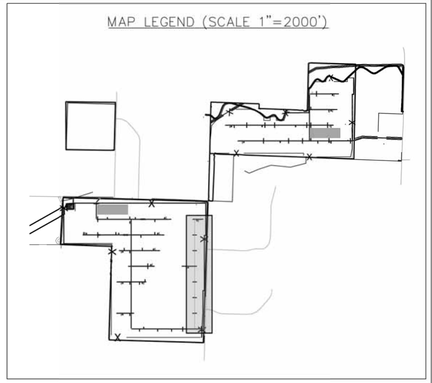


1 C-308 ROADWAY PROFILE (STA 0+00 TO STA 16+00)
SCALE: H:1"=100' V:1"=10'



2 C-308 ROADWAY PLAN (STA 0+00 TO STA 16+00)
SCALE: 1" = 100'



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REV	DESCRIPTION	BY	CHK	DATE
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ROADWAY PROFILE
SHEET TITLE

C-308
SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

soa
SIERRA OVERHEAD ANALYTICS

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GENERAL NOTES

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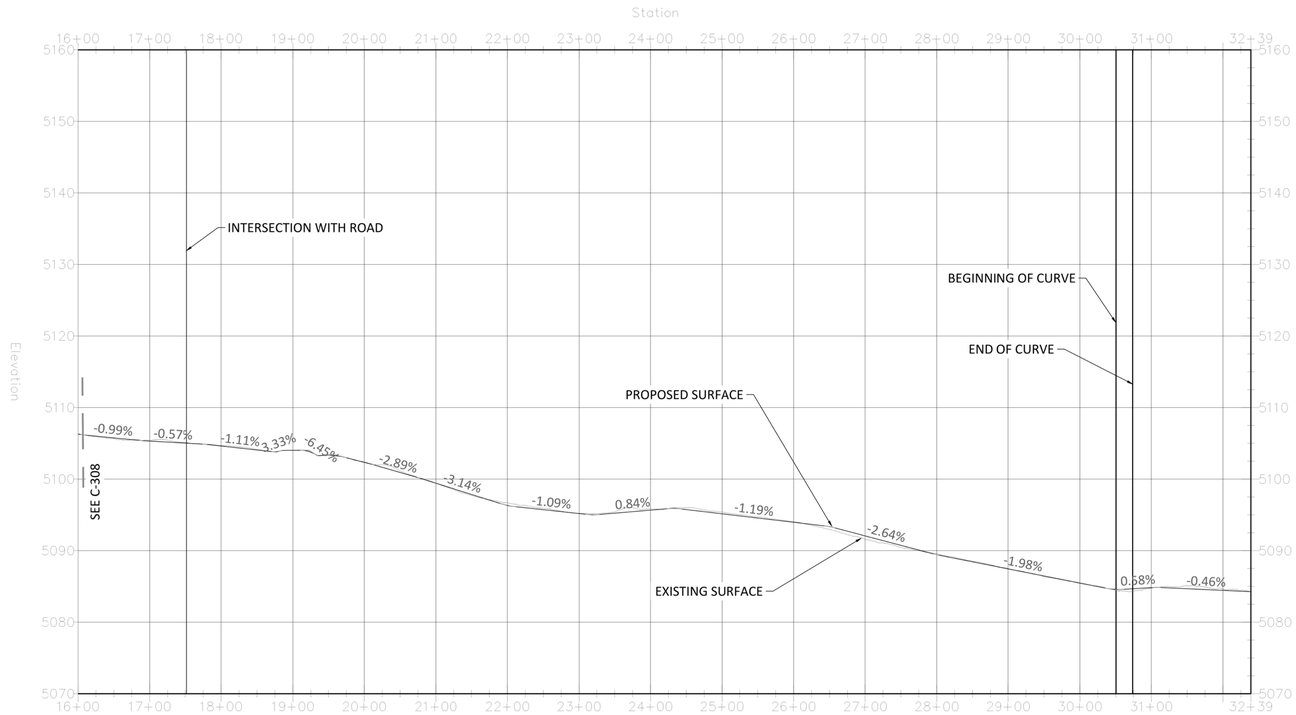
2. ON-SITE ROADWAYS SHALL NOT EXCEED 10% SLOPE PER 2018 INTERNATIONAL FIRE CODE APPENDIX D103.2.



1 C-309 ROADWAY PROFILE (STA 16+00 TO STA 32+39)

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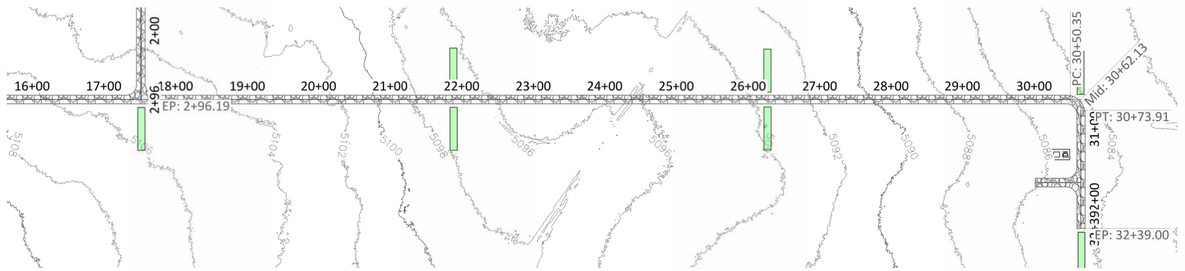
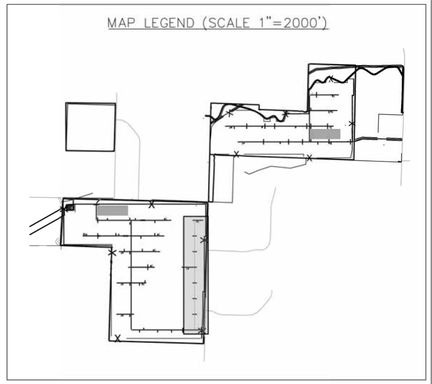


2 C-309 ROADWAY PLAN (STA 16+00 TO STA 32+39)

SCALE: 1" = 100'



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ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

ROADWAY PROFILE

SHEET TITLE

C-309

SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

PROJECT DETAILS

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
SCALE:	AS SHOWN	CHKD:	DARIN GALLOWAY
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

soa
SIERRA OVERHEAD ANALYTICS

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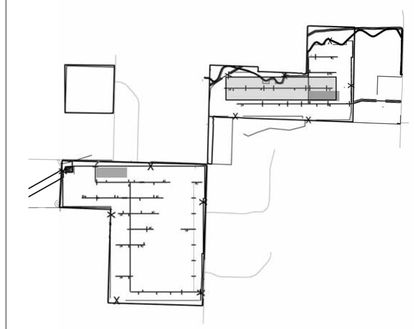
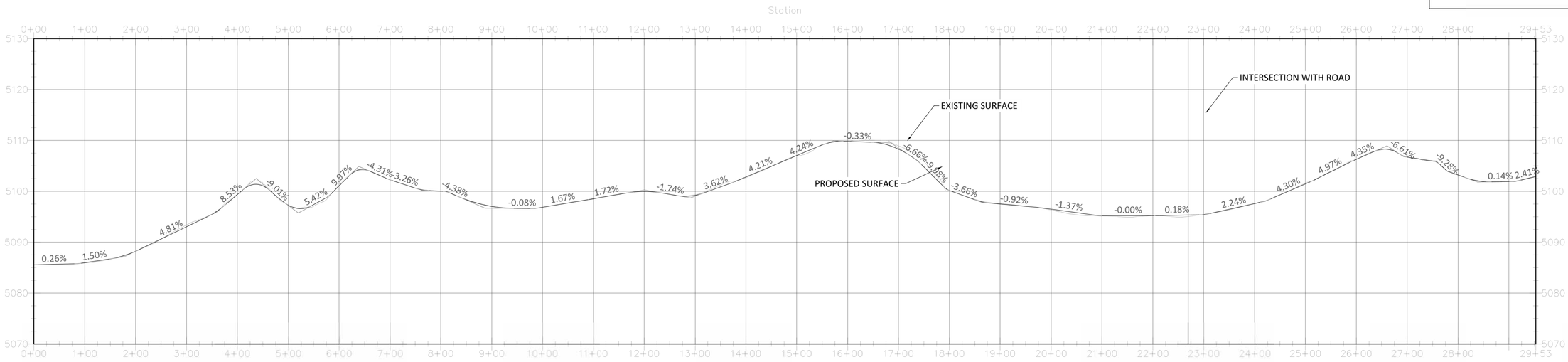
MAP LEGEND (SCALE 1"=2000')





1 C-310 ROADWAY PROFILE (STA 0+00 TO STA 29+53)

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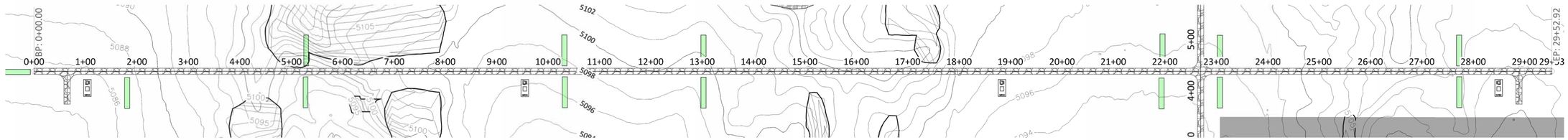

2 C-310 ROADWAY PLAN (STA 0+00 TO STA 29+53)

SCALE: 1" = 100'

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ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
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ROADWAY PROFILE — SHEET TITLE

C-310 — SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 — PROJECT DETAILS

LAT:TBD / LON:W84°50'15.97"

soa — SIERRA OVERHEAD ANALYTICS

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
SCALE:	AS SHOWN	CHKD:	DARIN GALLOWAY
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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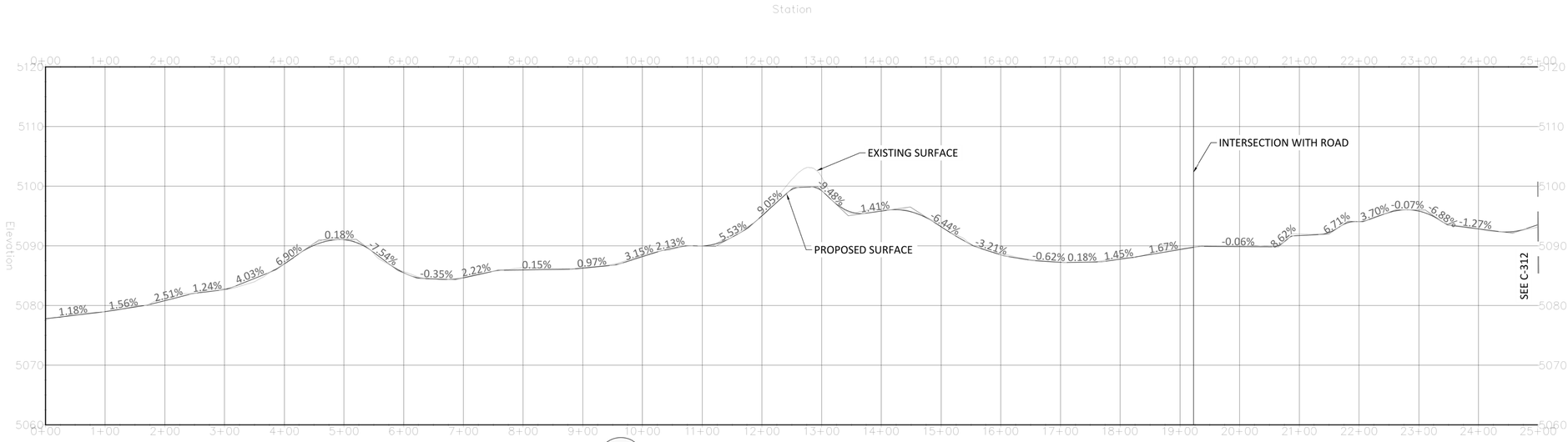

1 C-311 ROADWAY PROFILE (STA 0+00 TO STA 25+00)
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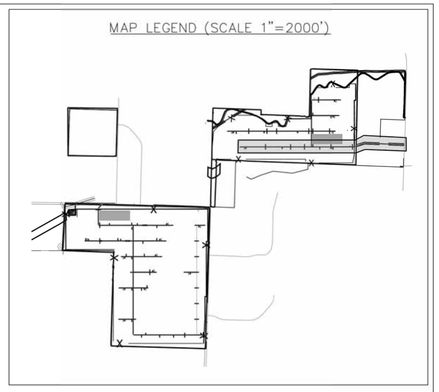

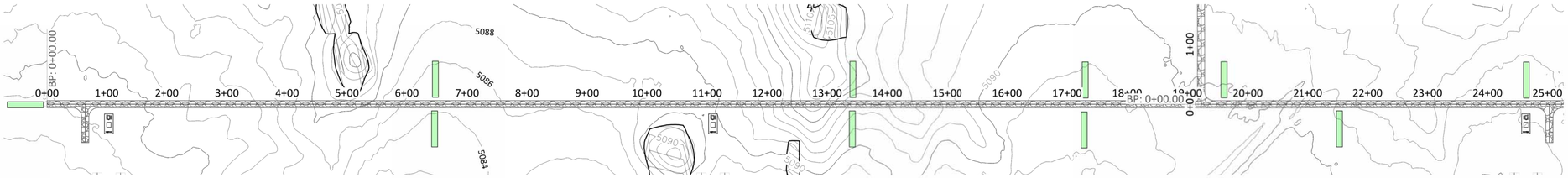

2 C-311 ROADWAY PLAN (STA 0+00 TO STA 25+00)
SCALE: 1" = 100'

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ENGINEER'S STAMP

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ROADWAY PROFILE
SHEET TITLE

C-311
SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

DATE: 08/16/2021
SCALE: AS SHOWN
PAPER SIZE: 24" X 36"
DFTR: KEVIN BYRUM-THORSON
CHKD: DARIN GALLOWAY
ENGR: DARIN GALLOWAY

SIERRA OVERHEAD ANALYTICS

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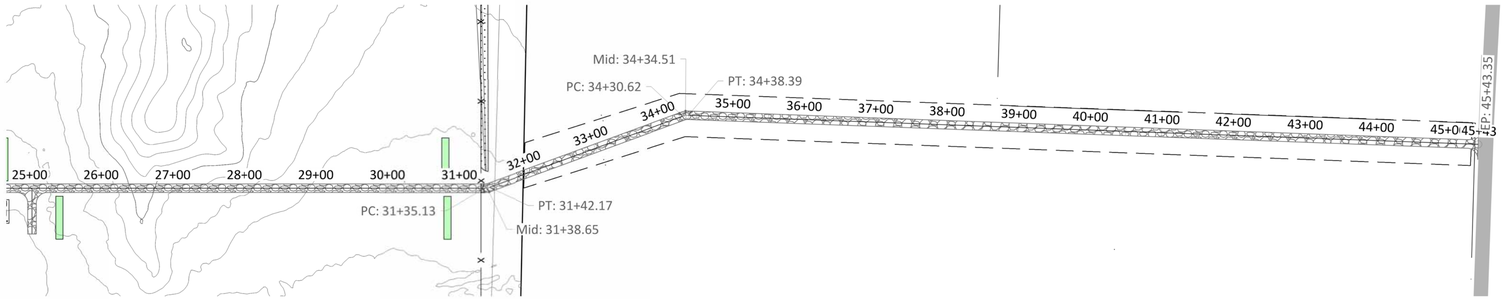
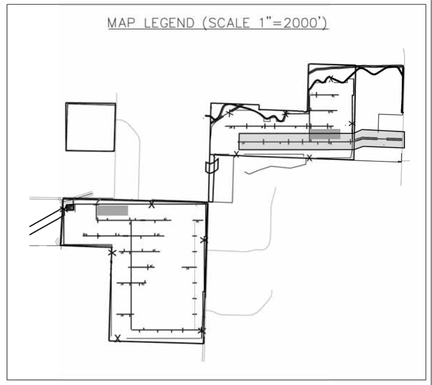
1 C-312 ROADWAY PROFILE (STA 25+00 TO STA 45+43)
SCALE: H:1"=100' V:1"=10'



2 C-312 ROADWAY PLAN (STA 25+00 TO STA 45+43)
SCALE: 1" = 100'


MAP LEGEND (SCALE 1"=2000')

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ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

ROADWAY PROFILE
SHEET TITLE

C-312
SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

soa
SIERRA OVERHEAD ANALYTICS

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
SCALE:	AS SHOWN	CHKD:	DARIN GALLOWAY
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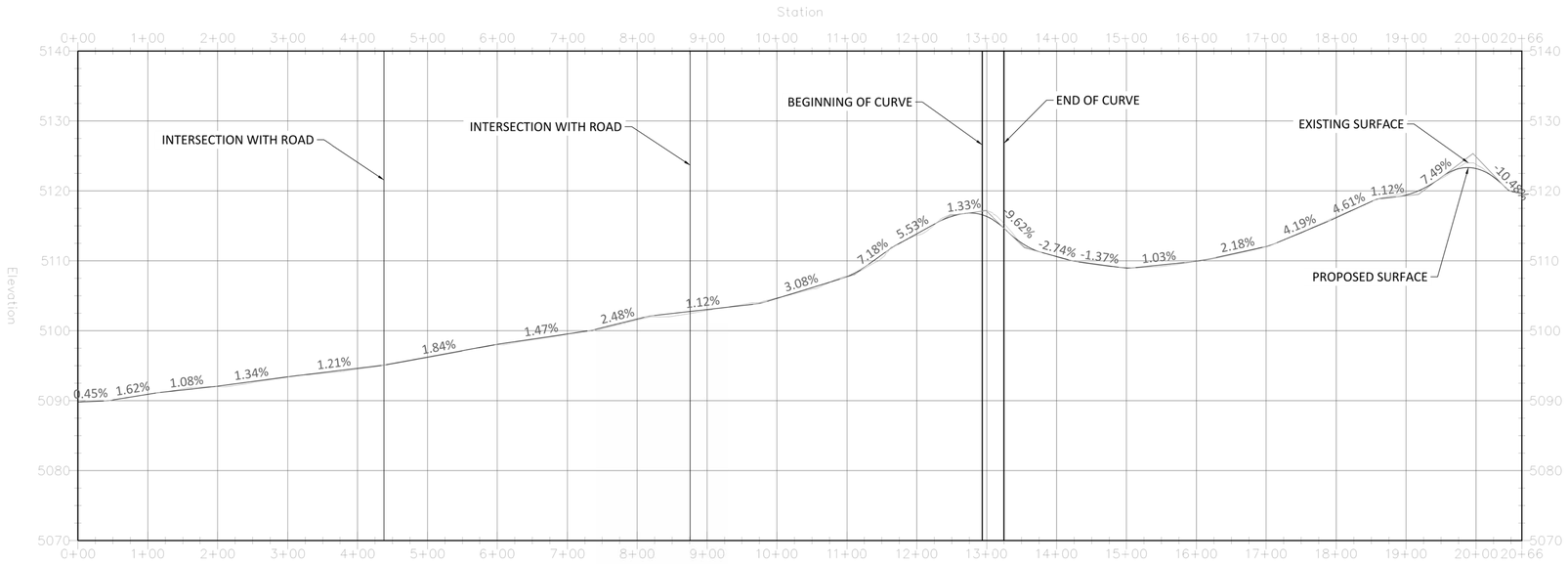
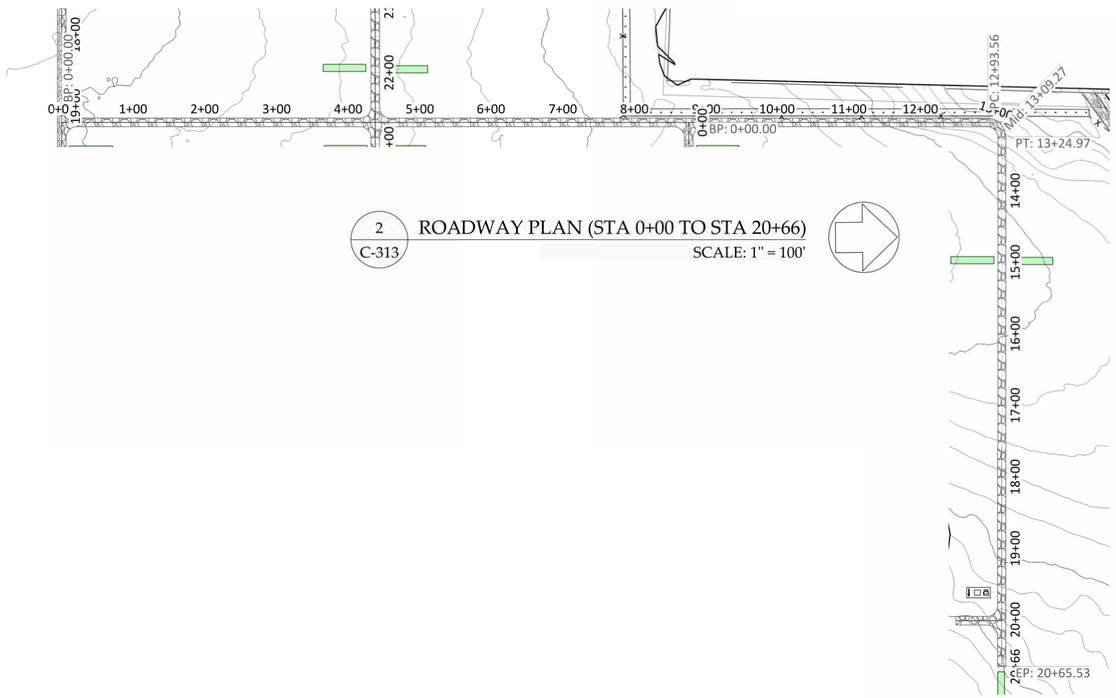
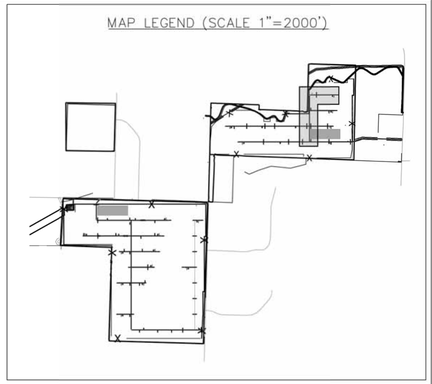


1 C-313 ROADWAY PROFILE (STA 0+00 TO STA 20+66)
SCALE: H:1"=100' V:1"=10'



2 C-313 ROADWAY PLAN (STA 0+00 TO STA 20+66)
SCALE: 1" = 100'


MAP LEGEND (SCALE 1"=2000')

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ENGINEER'S STAMP

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ROADWAY PROFILE
SHEET TITLE

C-313
SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

soa
SIERRA OVERHEAD (NAUTICA)

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
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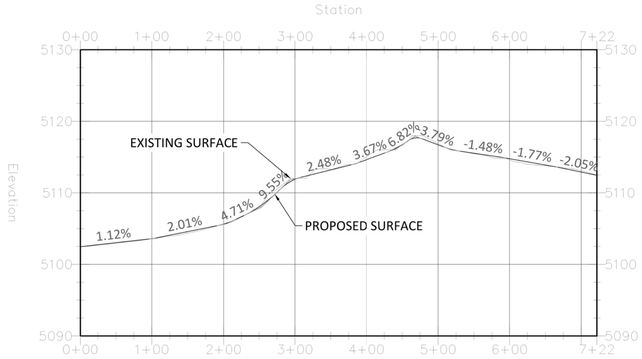

1 C-314 ROADWAY PROFILE (STA 0+00 TO STA 7+22)

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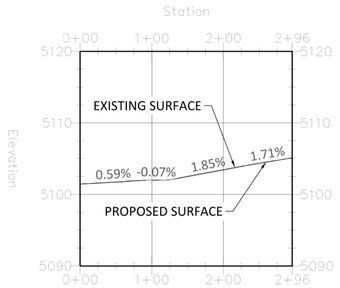
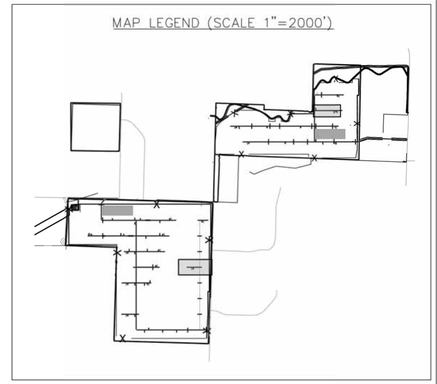
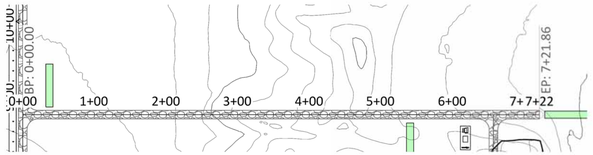


2 C-314 ROADWAY PROFILE (STA 0+00 TO STA 2+96)

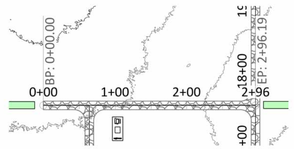
SCALE: H:1"=100' V:1"=10'





3 C-314 ROADWAY PLAN (STA 0+00 TO STA 7+22)

SCALE: 1" = 100'



4 C-314 ROADWAY PLAN (STA 0+00 TO STA 2+96)

SCALE: 1" = 100'

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ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

ROADWAY PROFILE — SHEET TITLE

C-314 — SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

PROJECT DETAILS

DATE: 08/16/2021
SCALE: AS SHOWN
PAPER SIZE: 24" X 36"

DFTR: KEVIN BYRUM-THORSON
CHKD: DARIN GALLOWAY
ENGR: DARIN GALLOWAY

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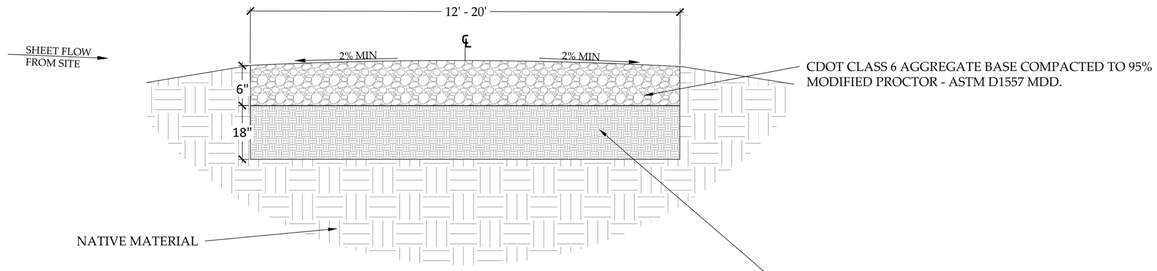

1 C-315 SITE ROAD CROSS SECTION, TYP.
SCALE: NTS

ON-SITE ACCESS ROAD CONSTRUCTION NOTES:

1. SURFACE COURSE SHALL HAVE A MINIMUM COMPACTED THICKNESS OF 6" OF CODT CLASS 6 ROADBASE (CODT 2021 CONSTRUCTION SPECIFICATIONS, SECTION 703.04.
1.1. GAB THICKNESS SHALL BE MEASURED AFTER FULL COMPACTION AND CONSTRUCTED DIRECTLY ABOVE 18" MOISTURE CONDITIONED, AND COMPACTED NATIVE SOIL.
1.2. GAB SHALL BE COMPACTED TO 95% MDD VIA MODIFIED PROCTOR (ASTM D1557).
2. PRIOR TO PLACING GAB, OR COMPACTING SCARIFIED SOILS IN ROAD EXCAVATIONS, ALL UNSUITABLE MATERIAL SHALL BE REMOVED. THIS SHALL INCLUDE THE REMOVAL OF ALL VEGETATION AND TOPSOIL, DEBRIS, LOOSE AND DISTURBED SOIL, CONTAMINATED SOIL AND OTHER DELETERIOUS MATERIALS THAT MAY EXIST WITHIN THE AREA OF THE PROPOSED ROADWAY CONSTRUCTION.
3. NATIVE SUBBASE COURSE (6" TO 18" DEPTH)
3.1. SCARIFY (OR TILL), MOISTURE CONDITION AND RE-COMPACT NATIVE SUBBASE MATERIAL TO 18" DEPTH MINIMUM BEFORE ADDING GAB.
3.2. NATIVE SUBBASE MATERIAL SHALL BE COMPACTED TO 95% MAXIMUM DRY DENSITY (MDD) PER ASTM D698, ±2% OPTIMUM MOISTURE CONTENT.
4. SITE ACCESS ROADWAYS SHALL BE CONSTRUCTED AT GRADE WITH A VERTICAL TOLERANCE OF +/- 2" WITH A 2% CROWN FROM CENTERLINE, UNLESS NOTED OTHERWISE (UNO).
4.1. POSITIVE DRAINAGE SHALL BE MAINTAINED ACROSS THE ROADWAYS. ON-SITE ROADWAY SLOPES SHALL NOT EXCEED 5%.
5. ENGINEERED FILL SHOULD BE TESTED FOR MOISTURE CONTENT AND COMPACTION DURING PLACEMENT.
6. IF IN-PLACE DENSITY TEST INDICATE THE SPECIFIED MOISTURE OR COMPACTION LIMITS HAVE NOT BEEN MET, THE AREA REPRESENTED BY THE TESTS SHOULD BE REWORKED AND RETESTED AS REQUIRED UNTIL THE SPECIFIED MOISTURE AND COMPACTION REQUIREMENTS ARE ACHIEVED.
7. IN-PLACE DENSITY TESTING FREQUENCY SHALL INCLUDE 2 TESTS PER LIFT PER DAY PER 200 LINEAR FEET OF ROAD.

Sieve Size	Percent Passing By Weight
Structural Fill (CDOT Class 6 roadbase)	
3/4" (19.00mm)	100
#4 (4.75mm)	30-65
#8 (2.36mm)	25-55
#200 (0.075 mm)	3-12
Structural Fill (CDOT Class 1)	
2.5" (63.5mm)	100
2" (50 mm)	95-100
#4 (4.75 mm)	30-65
#200 (0.075 mm)	3-15
Fill under exterior concrete flatwork	
3" (75 mm)	100
#200 (0.075 mm)	0-5
Free-draining fill	
3" (75 mm)	100
3/4" (19mm)	20-90
#4 (4.75 mm)	0-20
#200 (0.075 mm)	0-3

2 C-315 CDOT AGGREGATE BASE SPECIFICATIONS
SCALE: NTS

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ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
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CIVIL DETAILS
SHEET TITLE

C-315
SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

soa
SIERRA OVERHEAD ANALYTICS

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
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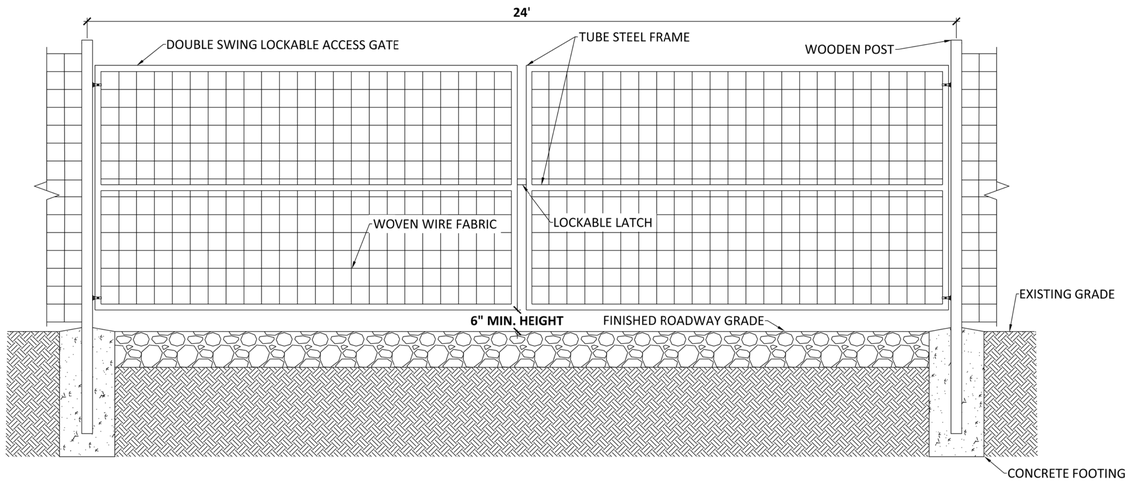
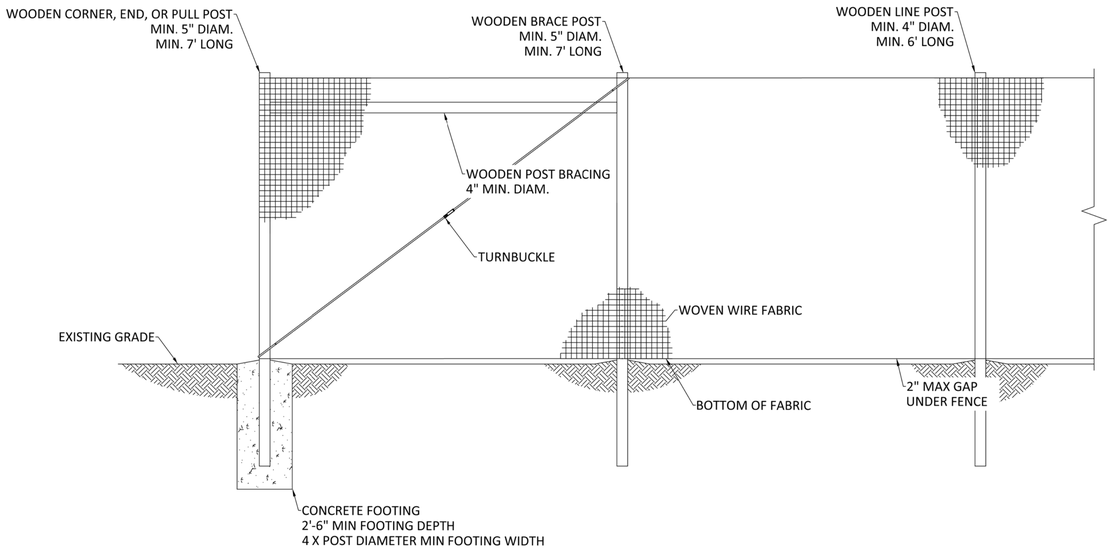


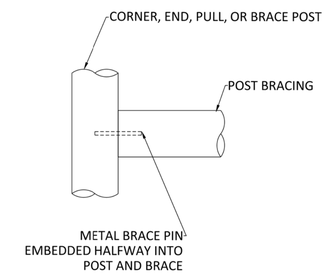
1 C-316 GATE DETAIL, TYP.
Scale: NTS

FENCE INSTALLATION NOTES:

1. FENCE TO BE INSTALLED IN GENERAL ACCORDANCE WITH ASTM F537.
2. FENCE FABRIC SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A116, CLASS 2. 2" MESH. (COATED BEFORE WEAVING 2 OUNCE PER SQUARE FOOT)
3. CORNER, END, OR PULL POST FOOTING MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE 2,500 PSI MIN.
4. CORNER, END, OR PULL POST FOOTING DEPTH SHALL BE A MINIMUM OF 24" PLUS AN ADDITIONAL 3" DEPTH FOR EACH 1' POST HEIGHT INCREASE ABOVE 4' POST HEIGHT ABOVE GROUND.
5. SWING GATE TO CONSIST OF ASTM F900
   - 5.1. MATERIALS AS SPECIFIED.
     - 5.1.1. GALVANIZED PER ASTM A153.
     - 5.1.2. HINGES TO PERMIT 180-DEGREES INWARD AND OUTWARD GATE MOTION.
     - 5.1.3. PROVIDE HEAVY DUTY PADLOCK.
6. IN AREAS WHERE EXISTING FENCES CONFLICT WITH SITE SECURITY FENCE, CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING FENCE.
7. POSTS SHALL BE WOOD,
   - 7.1. LINE POSTS – 4"
   - 7.2. TERMINAL POSTS (EXTENDED, END, AND PULL) 5"
8. ALL STEEL OR MALLEABLE IRON PARTS AND ACCESORIES SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION.
9. WARNING SIGNS TO BE DISPLAYED EVERY 100' AROUND SUBSTATION FENCE.
10. FENCE POSTS IN PRIVACY SLAT LOCATIONS TO BE INSTALLED WITH CONCRETE FOOTINGS SAME DESIGN AND DEPTH AS PULL, END, & CORNER POSTS.
11. BRACE 4" WOODEN POST
12. ALL FENCE FITTINGS TO BE ASTM F626
13. 10' MAX LINE POST SPACING.



2 C-316 SECURITY FENCE DETAIL, TYP.
Scale: NTS



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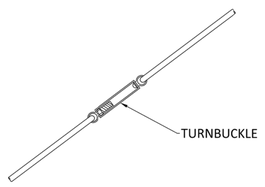
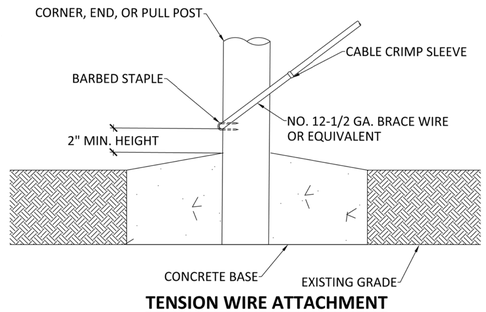
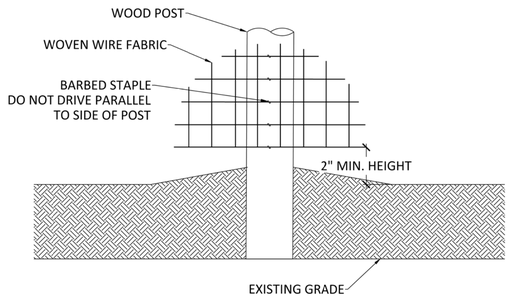


TURNBUCKLE ALONG TENSION WIRE



TENSION WIRE ATTACHMENT



WIRE FABRIC ATTACHMENT

3 C-316 FENCE ATTACHEMENT DETAILS, TYP.
Scale: NTS

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08/16/2021 12:44:44 PM

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

FENCE DETAILS — C-316
SHEET TITLE — SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 — LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

soa
SIERRA OVERHEAD ANALYSTS

DATE: 08/16/2021
SCALE: AS SHOWN
PAPER SIZE: 24" X 36"
DFTR: KEVIN BYRUM-THORSON
CHKD: DARIN GALLOWAY
ENGR: DARIN GALLOWAY

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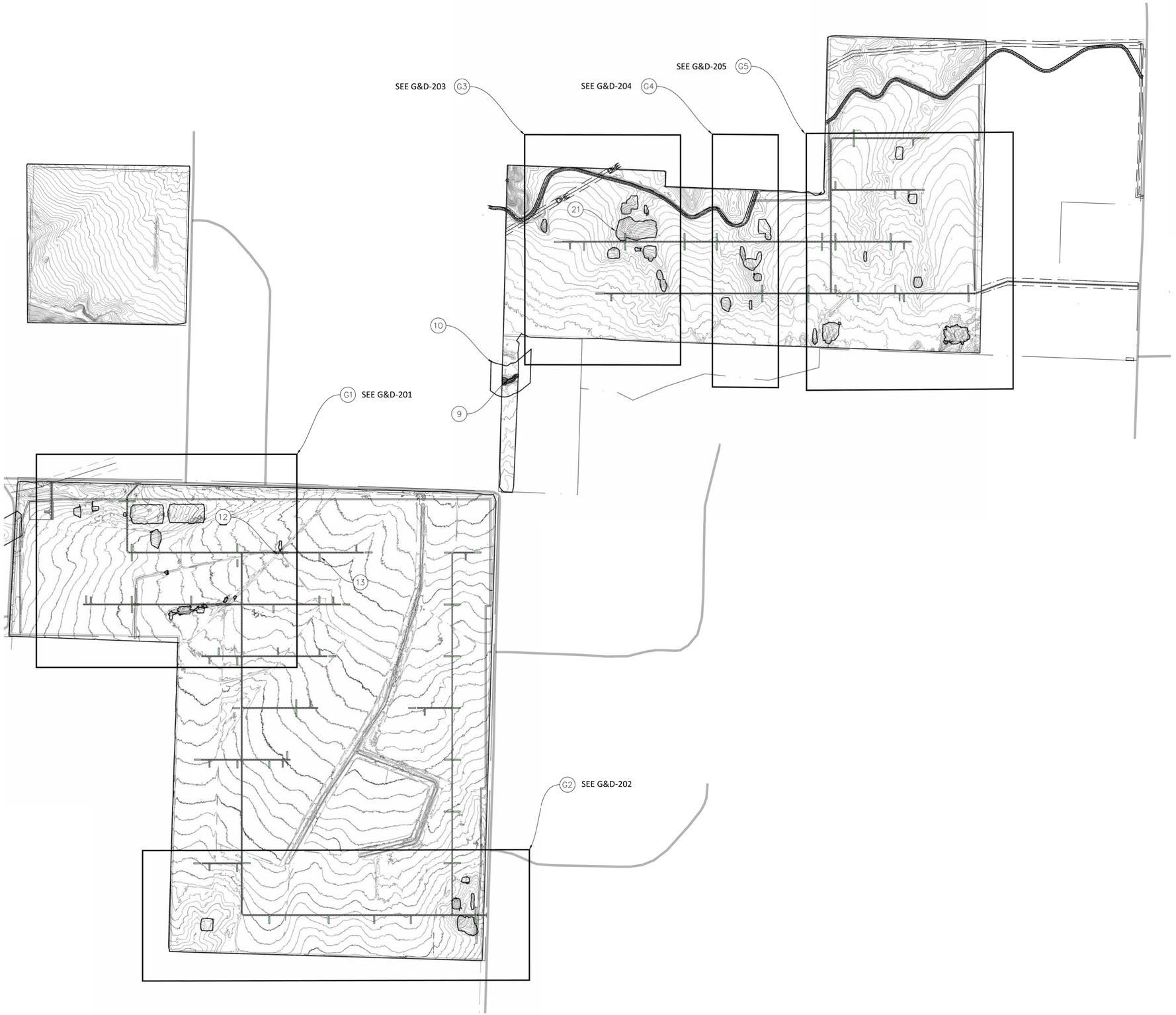

1 GRADING & DRAINAGE OVERVIEW
G&D-200
SCALE: 1" = 400'

0 400 800

LEGEND

9		WETLAND
10		WETLAND SETBACK
12		PROPOSED CULVERT (NTS, SEE DETAIL 4/G&D-300)
13		RAIN GARDEN (SEE DETAIL 2/G&D-300)
21		GRADING AREA
	240	MAJOR CONTOUR
	241	MINOR CONTOUR
	240	(N) MAJOR CONTOUR
	241	(N) MINOR CONTOUR

GENERAL NOTES

1. ARRAY AND ELECTRICAL ITEMS NOT SHOWN FOR CLARITY.
2. ALL WORK SHALL COMPLY WITH THE CONDITIONS OF THE PERMITS OBTAINED FOR THE PROJECT AND ALL FEDERAL, STATE, AND LOCAL REGULATIONS.
3. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF TRASH AND DEBRIS.
4. GRADING SURFACE IS BASED ON 3' SURFACE UNDULATION TOLERANCE ACROSS A ROW.
5. ALL GRADING BOUNDARIES ARE BASED ON SURFACE PROVIDED BY OTHERS.
6. SOIL STOCKPILING SHALL ONLY OCCUR WITHIN THE PROJECT BOUNDARY. STOCKPILED SOIL SHALL BE SURROUNDED WITH AN EROSION CONTROL BMP WHILE NOT IN USE.
7. DUST CONTROL SHALL BE IMPLEMENTED AS REQUIRED.
8. SEDIMENT TRACK-OFF ONTO PAVED SURFACES SHALL BE REMOVED WITHIN 24-HOURS OF DISCOVERY.
9. EARTHWORK SHALL NOT EXCEED THE LIMIT OF DISTURBANCE.
10. EXCESS SOIL SHALL BE SPREAD IN SOIL SPREADING LOCATION AND BE GRADED AS TO MINIMIZE IMPACT TO WATER FLOW.
11. ACCURACY OF GRADING, VOLUMES OF EARTHWORK, AND STORMWATER CONTROLS ARE DEPENDANT ON ACCURACY OF SURVEY WORK PROVIDED BY OTHERS.

CUT & FILL ANALYSIS

LOCATION	AREA (ACRE)	CUT (YD³)	FILL (YD³)	BALANCE (YD³)
G1	2.98	6518.71	1408.13	5110.58 CUT
G2	1.00	2752.28	603.28	2419.01 CUT
G3	2.40	6379.73	1132.86	5246.88 CUT
G4	0.95	1873.82	609.61	1264.21 CUT
G5	1.63	2696.82	2965.22	268.41 FILL
TOTAL	8.96	20221.37	6719.10	13502.27 CUT

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REV	DESCRIPTION	BY	CHK	DATE
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GRADING & DRAINAGE OVERVIEW — SHEET TITLE
G&D-200 — SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

soa
SIERRA OVERHEAD (SOA)LUTION

DATE: 08/16/2021
SCALE: AS SHOWN
PAPER SIZE: 24" X 36"
DFTR: KEVIN BYRUM-THORSON
CHKD: DARIN GALLOWAY
ENGR: DARIN GALLOWAY

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1 GRADING & DRAINAGE PLAN - G1
G&D-201

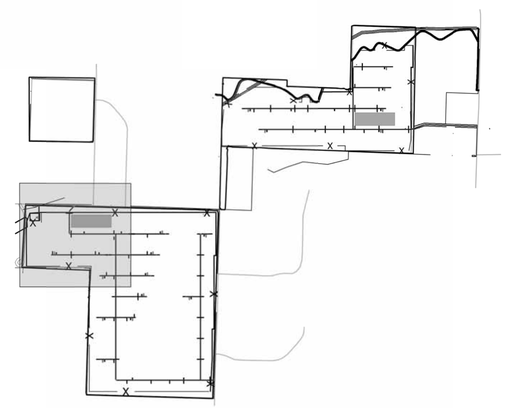
SCALE: 1" = 100'

0 100 200

LEGEND

12	PROPOSED CULVERT (NTS, SEE DETAIL 4/G&D-300)
13	RAIN GARDEN (SEE DETAIL 2/G&D-300)
21	GRADING AREA
240	MAJOR CONTOUR
241	MINOR CONTOUR
240	(N) MAJOR CONTOUR
241	(N) MINOR CONTOUR

MAP LEGEND (SCALE 1"=1500')



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ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

GRADING & DRAINAGE SITE PLAN
SHEET TITLE

G&D-201
SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

DATE:	08/16/2021
SCALE:	AS SHOWN
PAPER SIZE:	24" X 36"
DFTR:	KEVIN BYRUM-THORSON
CHKD:	DARIN GALLOWAY
ENGR:	DARIN GALLOWAY

soa
SIERRA OVERHEAD ANALYTICS

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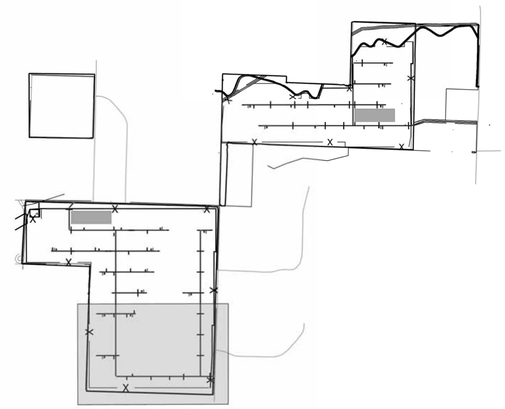
LEGEND

13		RAIN GARDEN (SEE DETAIL 2/G&D-300)
21		GRADING AREA
	240	MAJOR CONTOUR
	241	MINOR CONTOUR
	240	(N) MAJOR CONTOUR
	241	(N) MINOR CONTOUR

MAP LEGEND (SCALE 1"=1500')



1 GRADING & DRAINAGE OVERVIEW
G&D-202
SCALE: 1" = 100'
0 100 200

NOT FOR CONSTRUCTION
08/16/2021 12:44:44 PM

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

SHEET TITLE: GRADING & DRAINAGE SITE PLAN
SHEET NO.: G&D-202

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

soa
SIERRA OVERHEAD ANALYTICS

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
SCALE:	AS SHOWN	CHKD:	DARIN GALLOWAY
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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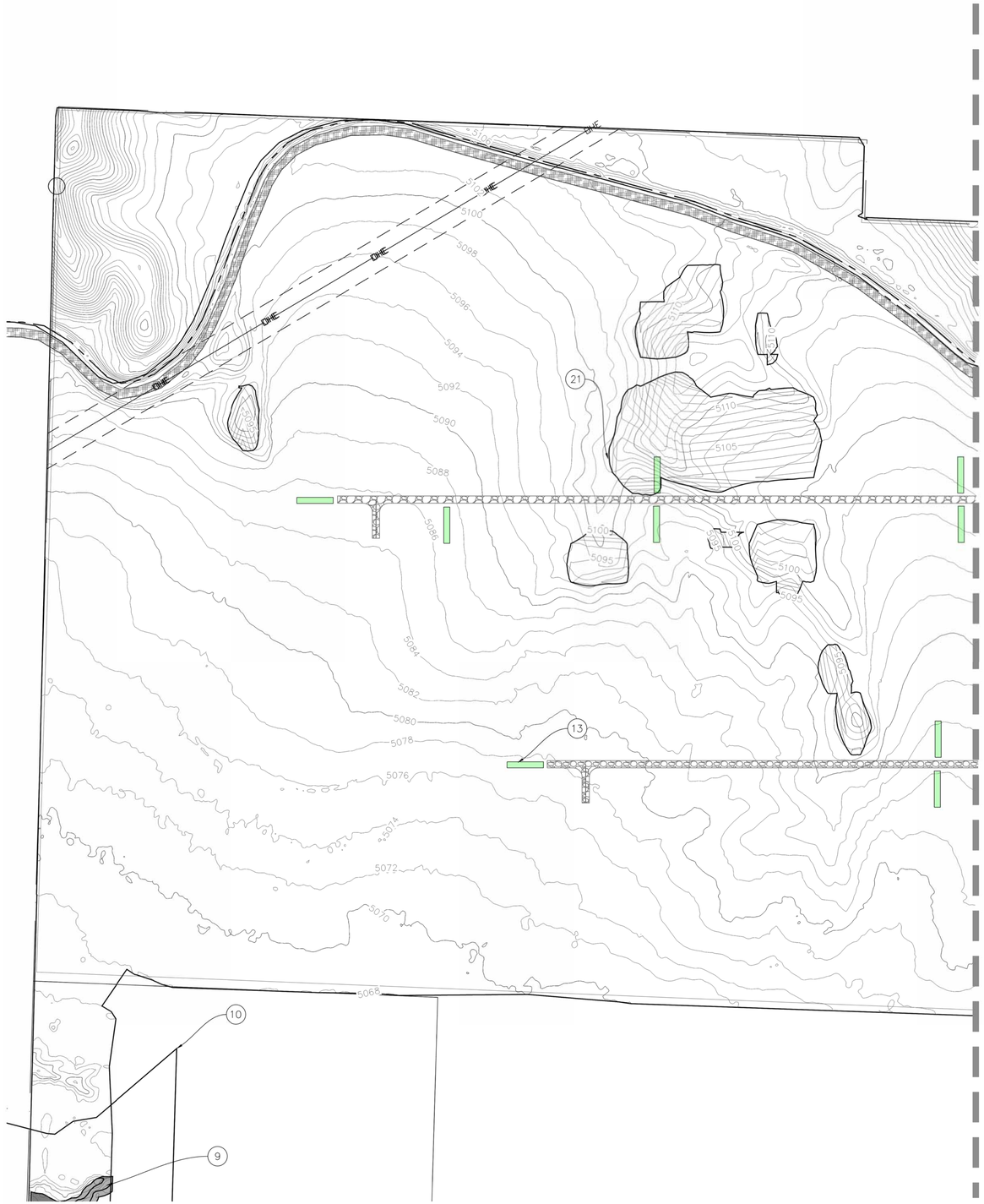


1 GRADING & DRAINAGE PLAN - G3
G&D-203

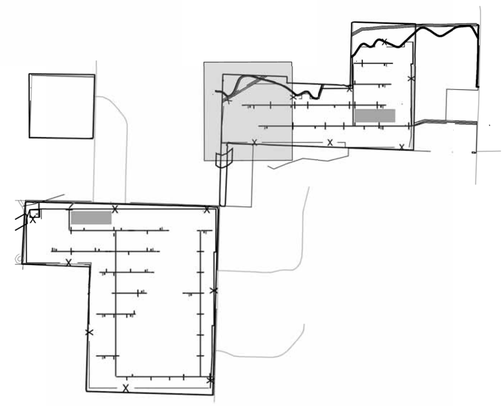
SCALE: 1" = 100'

0 100 200

LEGEND

10		WETLAND SETBACK
13		RAIN GARDEN (SEE DETAIL 2/G&D-300)
21		GRADING AREA
	240	MAJOR CONTOUR
	241	MINOR CONTOUR
	240	(N) MAJOR CONTOUR
	241	(N) MINOR CONTOUR

MAP LEGEND (SCALE 1"=1500')



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ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

GRADING & DRAINAGE SITE PLAN — SHEET TITLE

G&D-203 — SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

soa
SIERRA OVERHEAD ANALYTICS

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
SCALE:	AS SHOWN	CHKD:	DARIN GALLOWAY
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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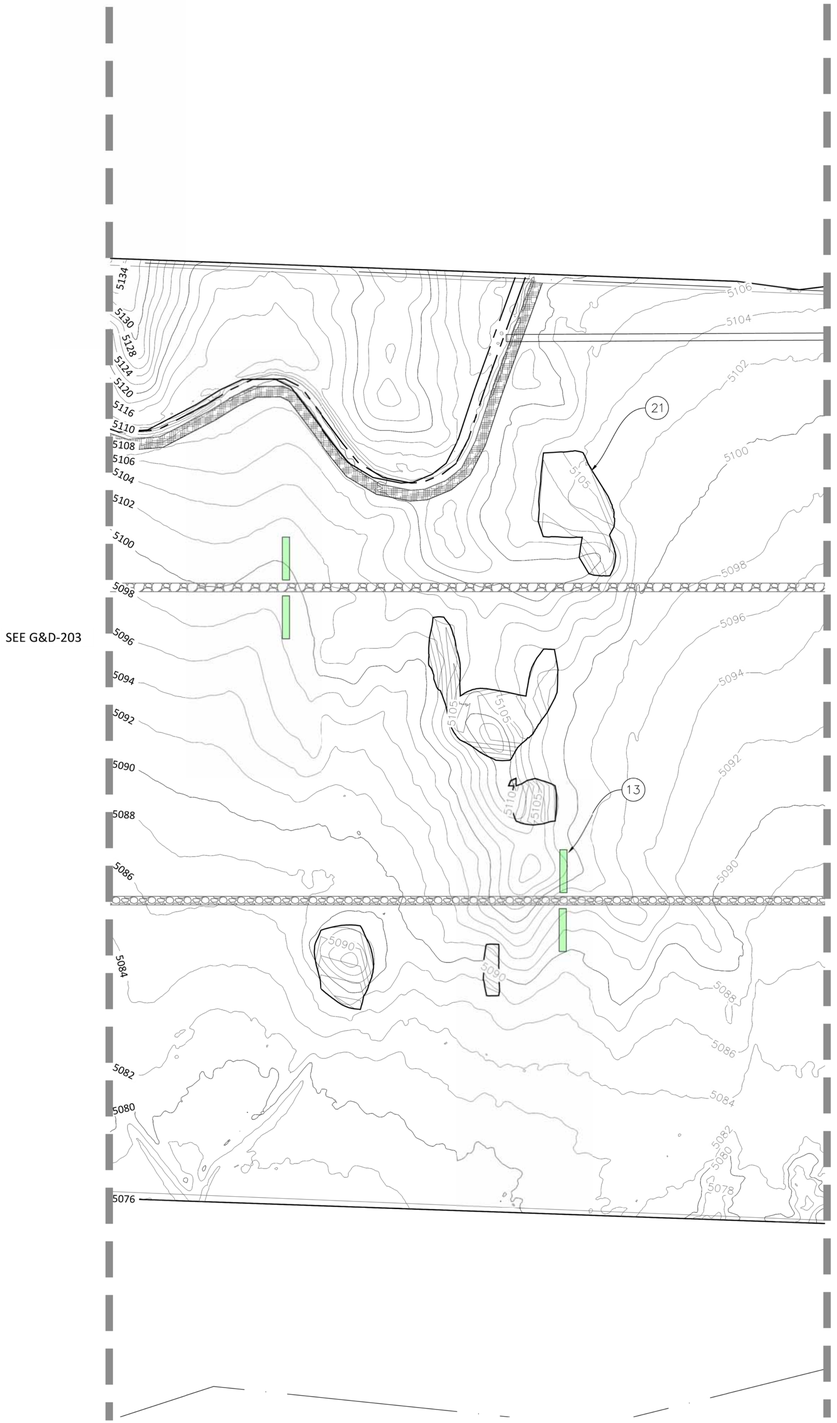


1 GRADING & DRAINAGE PLAN - G4
G&D-204

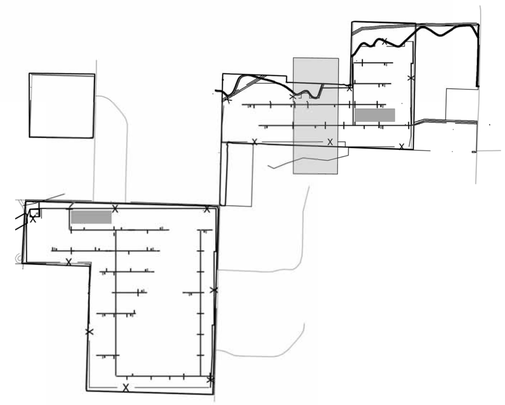
SCALE: 1" = 100'

0 100 200

LEGEND

13	RAIN GARDEN (SEE DETAIL 2/G&D-300)
21	GRADING AREA
240	MAJOR CONTOUR
241	MINOR CONTOUR
240	(N) MAJOR CONTOUR
241	(N) MINOR CONTOUR

MAP LEGEND (SCALE 1"=1500')



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ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

GRADING & DRAINAGE SITE PLAN
SHEET TITLE

G&D-204
SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
SCALE:	AS SHOWN	CHKD:	DARIN GALLOWAY
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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SIERRA OVERHEAD ANALYTICS

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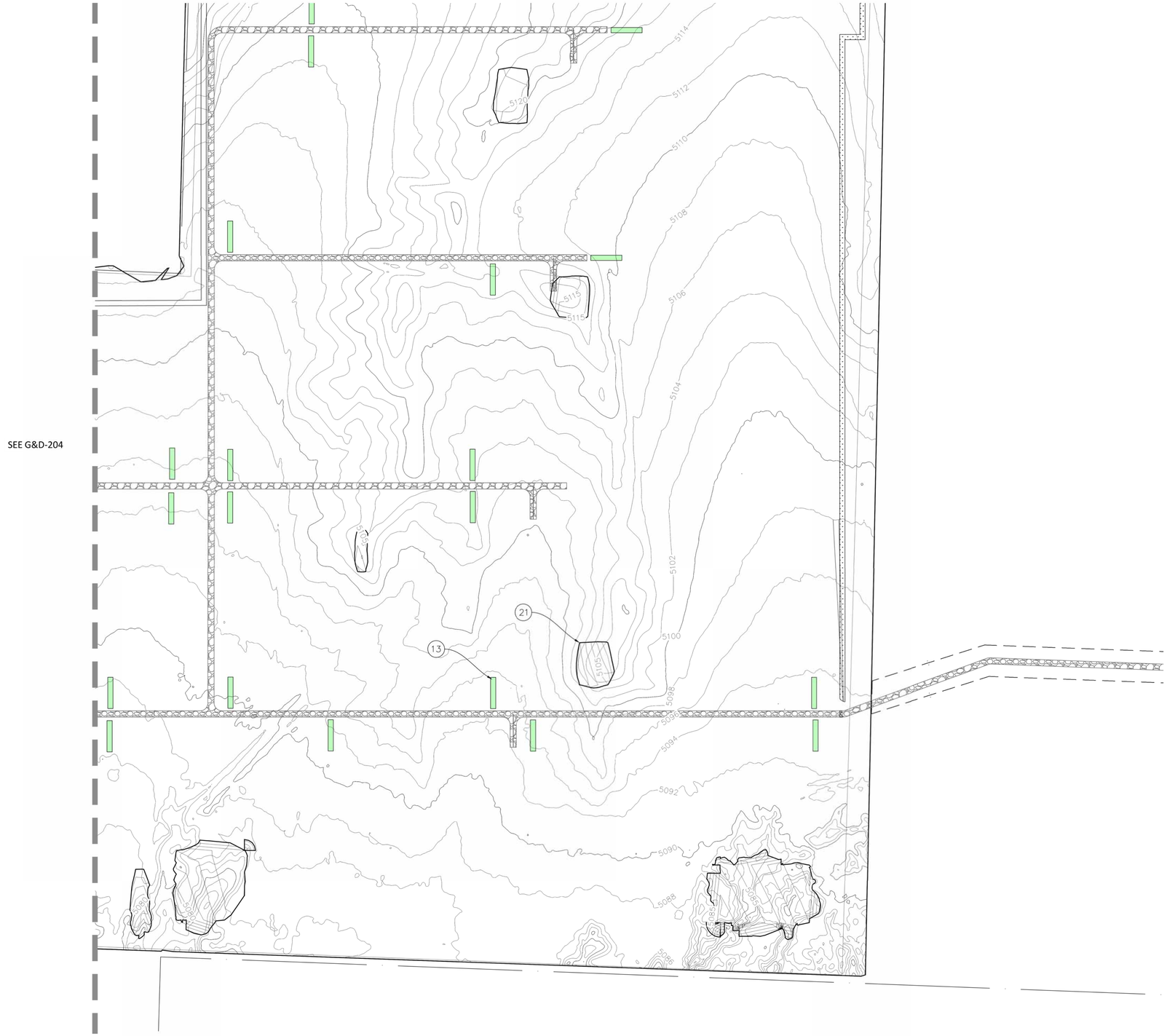
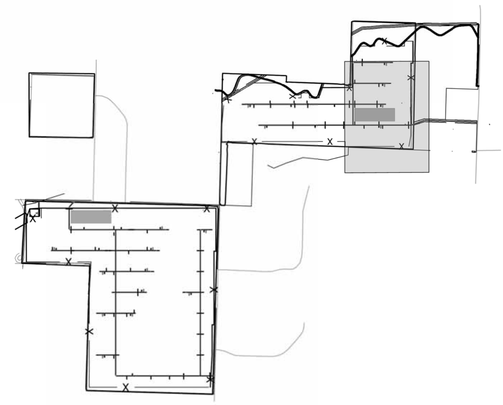


SEE G&D-204

LEGEND

13	RAIN GARDEN (SEE DETAIL 2/G&D-300)
21	GRADING AREA
240	MAJOR CONTOUR
241	MINOR CONTOUR
240	(N) MAJOR CONTOUR
241	(N) MINOR CONTOUR

MAP LEGEND (SCALE 1"=1500')



1 GRADING & DRAINAGE PLAN - G5
G&D-205

SCALE: 1" = 100'

0 100 200

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ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

GRADING & DRAINAGE SITE PLAN — SHEET TITLE

G&D-205 — SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

soa
SIERRA OVERHEAD ANALYTICS

DATE: 08/16/2021
SCALE: AS SHOWN
PAPER SIZE: 24" X 36"
DFTR: KEVIN BYRUM-THORSON
CHKD: DARIN GALLOWAY
ENGR: DARIN GALLOWAY

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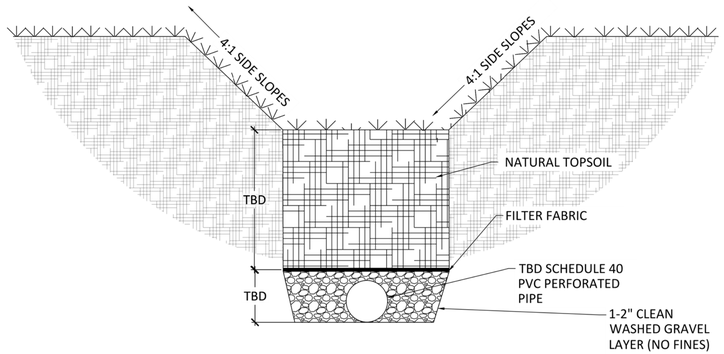
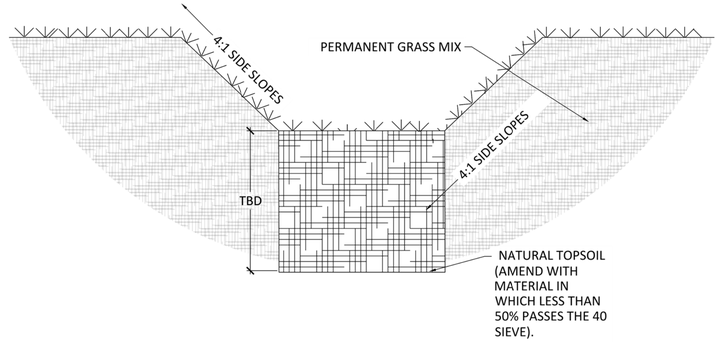
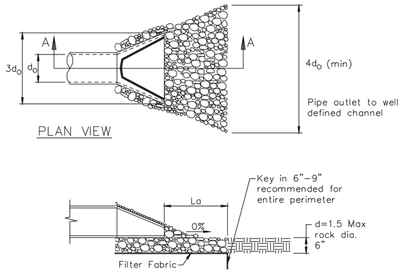


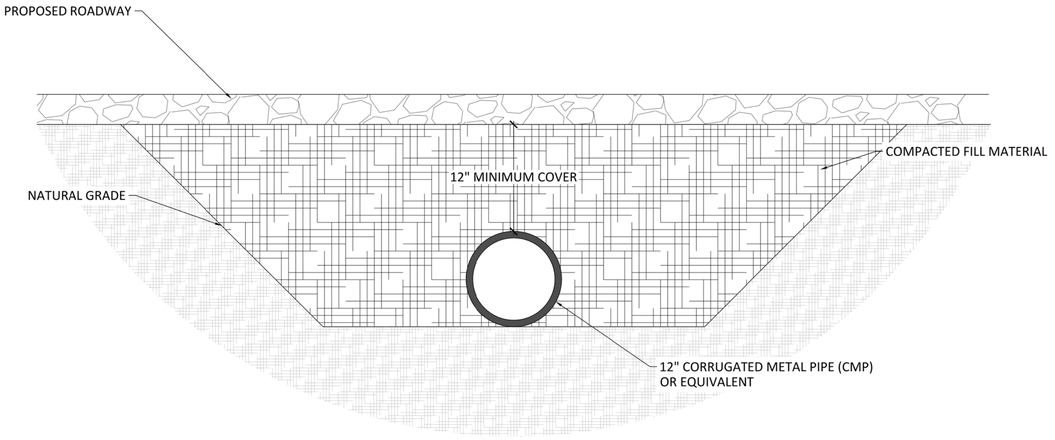
1 DRY-ENHANCED SWALE WITH UNDERDRAIN, TYP.
G&D-300 Scale: NTS



2 RAIN GARDEN WITHOUT UNDERDRAIN, TYP.
G&D-300 Scale: NTS



3 UNDERDRAIN OUTLET
G&D-300 Scale: NTS



4 WATER CROSSING OVER PIPE CULVERT, TYP.
G&D-300 Scale: NTS

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08/16/2021 12:44:45 PM

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	KB	DG	08/16/2021

GRADING & DRAINAGE DETAILS
SHEET TITLE

G&D-300
SHEET NO.

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"
PROJECT DETAILS

soa
SIERRA OVERHEAD ANALYTICS

DATE:	08/16/2021	DFTR:	KEVIN BYRUM-THORSON
SCALE:	AS SHOWN	CHKD:	DARIN GALLOWAY
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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Attachment 2-F

Site Plan

Part 1	1P Tracker Site Plan
Part 2	2P Tracker Site Plan

In the pre-application conference on June 7, 2021, the project team presented a preliminary two-in-portrait ("2P") tracker site plan. This type of racking installs two panels per row versus a one-in-portrait ("1P") design with just one. Example images of both configurations are below.

Figure 1: 2P Tracker Configuration

Figure 2: 1P Tracker Configuration

The 2P configuration has fewer total rows spaced further apart than the 1P configuration. However, the total height of a 2P configuration is greater than a 1P configuration. There are pros and cons to both approaches.

The Planning Board requested visualizations of both options, along with fencing and vegetative screening, be provided as part of the full Limited Use Permit application. These visualizations are included in Attachment 3-N to this permit application.

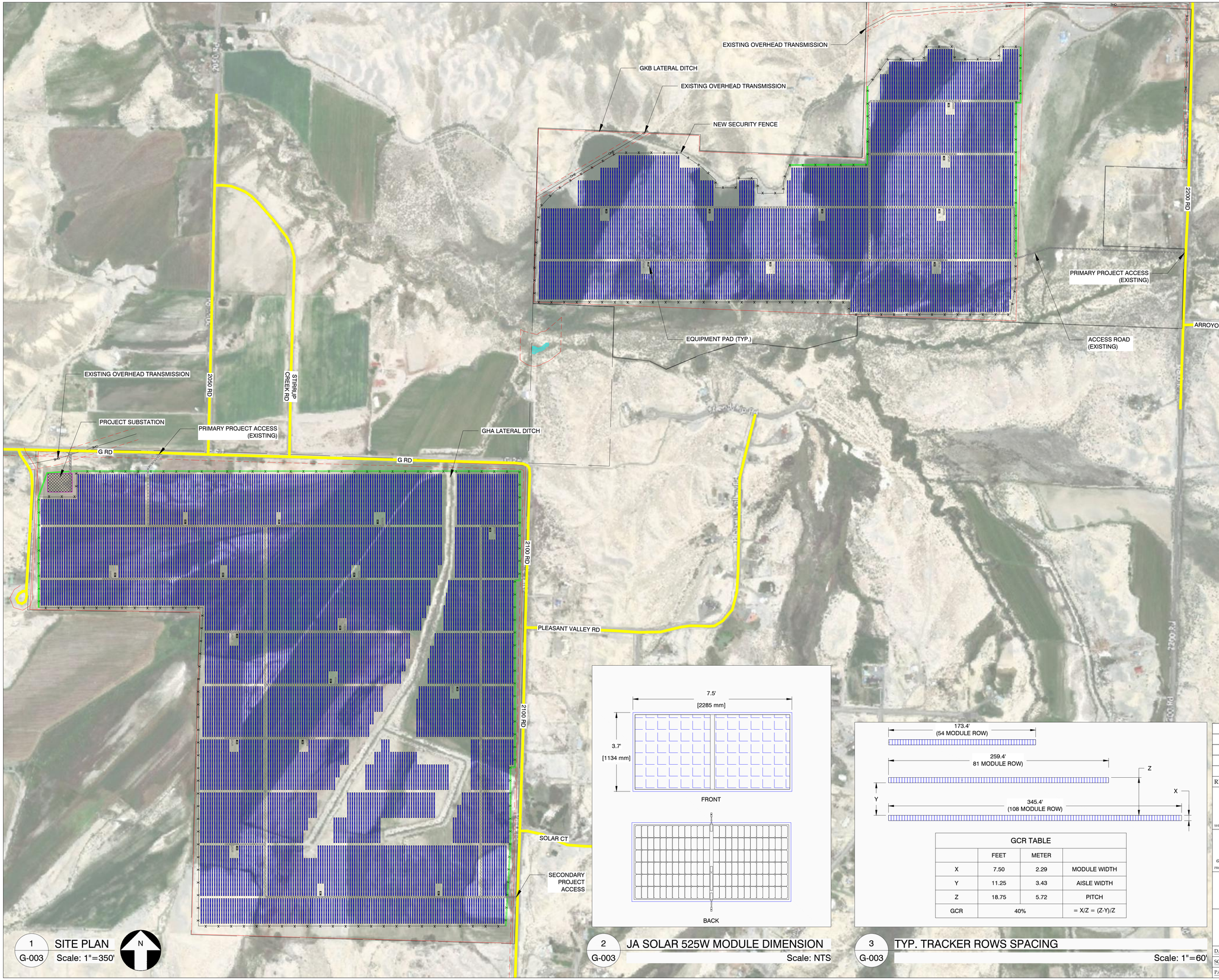
Garnet Mesa Solar would request the board make a determination as part of the permit review and issuance process that either (a) both 1P and 2P systems are permitted, or (b) only 1P is permitted, or (c) only 2P is permitted. In order to retain the most flexibility in optimizing the site design, Garnet Mesa Solar is requesting the board approve option (a) above and authorize either system for use.

Attachment 2-F

Site Plan

Part 1

1P Tracker Site Plan



1 G-003 SITE PLAN
Scale: 1"=350'

2 G-003 JA SOLAR 525W MODULE DIMENSION
Scale: NTS

GCR TABLE			
	FEET	METER	
X	7.50	2.29	MODULE WIDTH
Y	11.25	3.43	AISLE WIDTH
Z	18.75	5.72	PITCH
GCR	40%		= X/Z = (Z-Y)/Z

3 G-003 TYP. TRACKER ROWS SPACING
Scale: 1"=60'

SYSTEM SPECIFICATIONS

SYSTEM SIZE DC	102,513.60 kW
SYSTEM SIZE AC	80,000.00 kW
DC/AC RATIO	1.28
MODULE MANUFACTURER	JA SOLAR
MODULE MODEL	JAM72D30 525-MB
MODULE RATING	525 W
TOTAL MODULE QTY	195,264
MODULES PER STRING	27
TOTAL NO. OF STRINGS	7,232
INVERTER MODEL	POWER ELECTRONICS FS3430M
INVERTER RATING	3,200 kW
INVERTER QTY	25
STEP-UP TRANSFORMER	(25) 3.55 MVA, 34.5kV/0.6kV
RACKING TYPE	ATI HORIZON 1P SAT
TILT	0°
AZIMUTH	180°
GCR	40%
AVAILABLE PROPERTY AREA	579.59 Ac
FENCED AREA	383.71 Ac

LEGEND

- ATI 1P 108 MODULE TRACKER ROWS (1,387)
- ATI 1P 81 MODULE TRACKER ROWS (342)
- ATI 1P 54 MODULE TRACKER ROWS (329)
- POWER STATION EQUIPMENT PAD
- PROPERTY LINE
- SETBACK LINE
- MIN. 6' SECURITY FENCE
- SUBSTATION FENCE
- PROJECT SUBSTATION
- GRAVEL ACCESS ROAD
- EXISTING OVERHEAD LINE
- EXISTING PUBLIC ROAD
- LANDSCAPE BUFFER
- WETLAND

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	AA	DG	07/13/2021

SHEET TITLE: GENERAL SITE PLAN

SHEET NO.: G-101

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

PROJECT DETAILS

SOLVIDA DESIGN + ENGINEERING
1400 Boston Avenue, Suite 2
Kentucky, California 94714

soa SIERRA OVERHEAD ANALYTICS

DATE:	07/13/2021	DFTR:	LAKIR RAMBHIA
SCALE:	AS SHOWN	CHKD:	STEPHEN SMITH
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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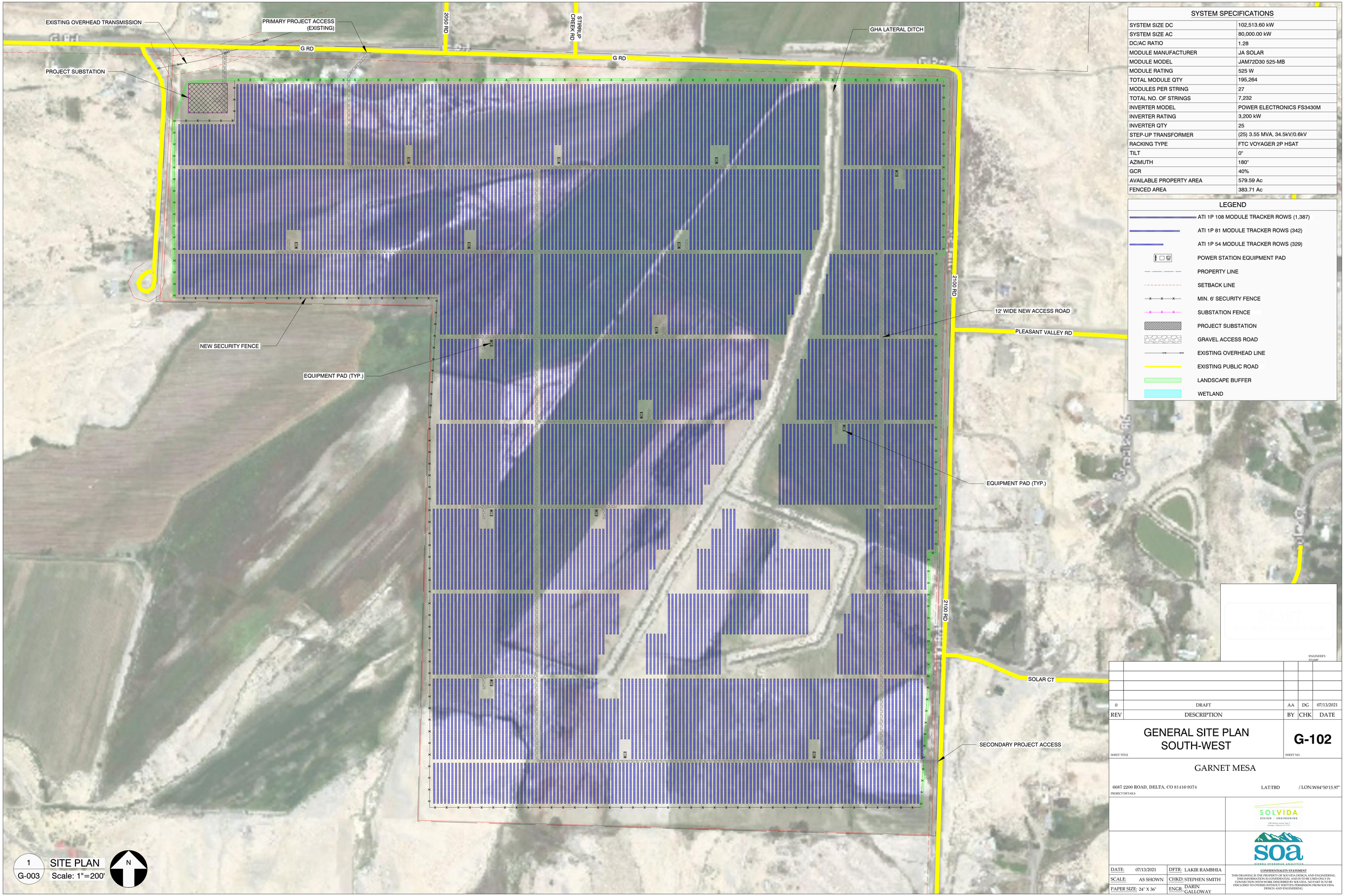

1 G-003 SITE PLAN
Scale: 1"=200'

N

SYSTEM SPECIFICATIONS

SYSTEM SIZE DC	102,513.60 kW
SYSTEM SIZE AC	80,000.00 kW
DC/AC RATIO	1.28
MODULE MANUFACTURER	JA SOLAR
MODULE MODEL	JAM72D30 525-MB
MODULE RATING	525 W
TOTAL MODULE QTY	195,264
MODULES PER STRING	27
TOTAL NO. OF STRINGS	7,232
INVERTER MODEL	POWER ELECTRONICS FS3430M
INVERTER RATING	3,200 kW
INVERTER QTY	25
STEP-UP TRANSFORMER	(25) 3.55 MVA, 34.5kV/0.6kV
RACKING TYPE	FTC VOYAGER 2P HSAT
TILT	0°
AZIMUTH	180°
GCR	40%
AVAILABLE PROPERTY AREA	579.59 Ac
FENCED AREA	383.71 Ac

LEGEND

- ATI 1P 108 MODULE TRACKER ROWS (1,387)
- ATI 1P 81 MODULE TRACKER ROWS (342)
- ATI 1P 54 MODULE TRACKER ROWS (329)
- POWER STATION EQUIPMENT PAD
- PROPERTY LINE
- SETBACK LINE
- MIN. 6' SECURITY FENCE
- SUBSTATION FENCE
- PROJECT SUBSTATION
- GRAVEL ACCESS ROAD
- EXISTING OVERHEAD LINE
- EXISTING PUBLIC ROAD
- LANDSCAPE BUFFER
- WETLAND

DRAFT

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	AA	DG	07/13/2021

SHEET TITLE: GENERAL SITE PLAN SOUTH-WEST

SHEET NO.: G-102

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

SOLVIDA DESIGN · ENGINEERING

soa SIERRA OVERHEAD ANALYTICS

DATE:	07/13/2021	DFTR:	LAKIR RAMBHIA
SCALE:	AS SHOWN	CHKD:	STEPHEN SMITH
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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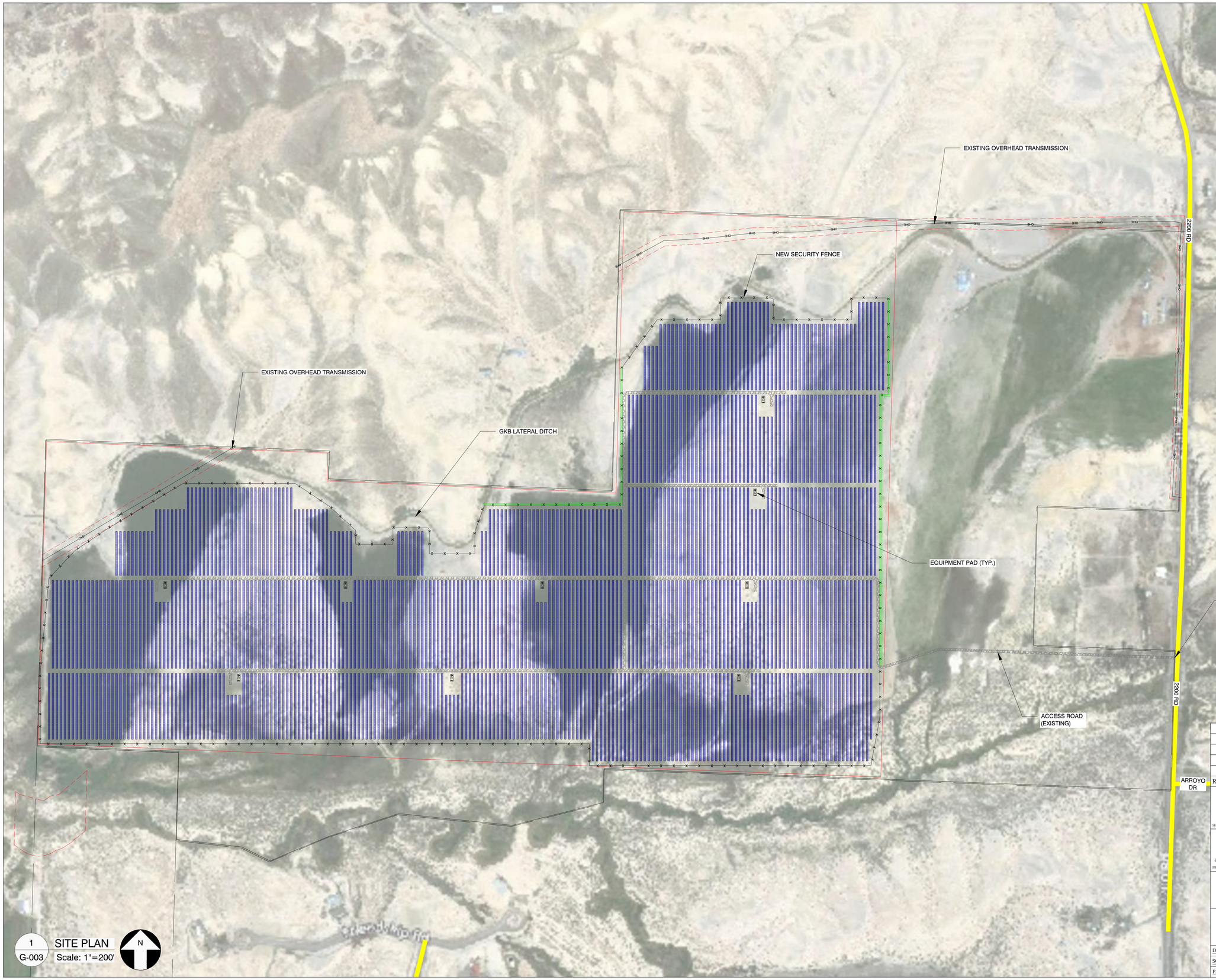

1 G-003 SITE PLAN
Scale: 1"=200'

SYSTEM SPECIFICATIONS

SYSTEM SIZE DC	102,513.60 kW
SYSTEM SIZE AC	80,000.00 kW
DC/AC RATIO	1.28
MODULE MANUFACTURER	JA SOLAR
MODULE MODEL	JAM72D30 525-MB
MODULE RATING	525 W
TOTAL MODULE QTY	195,264
MODULES PER STRING	27
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ENGINEER'S STAMP

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0	DRAFT	AA	DG	07/13/2021

SHEET TITLE: GENERAL SITE PLAN NORTH-EAST

SHEET NO.: G-103

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

SOLVIDA DESIGN + ENGINEERING
1400 Boston Avenue, Suite 3
Kelseyville, California 94703

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DATE:	07/13/2021	DFTR:	LAKIR RAMBHIA
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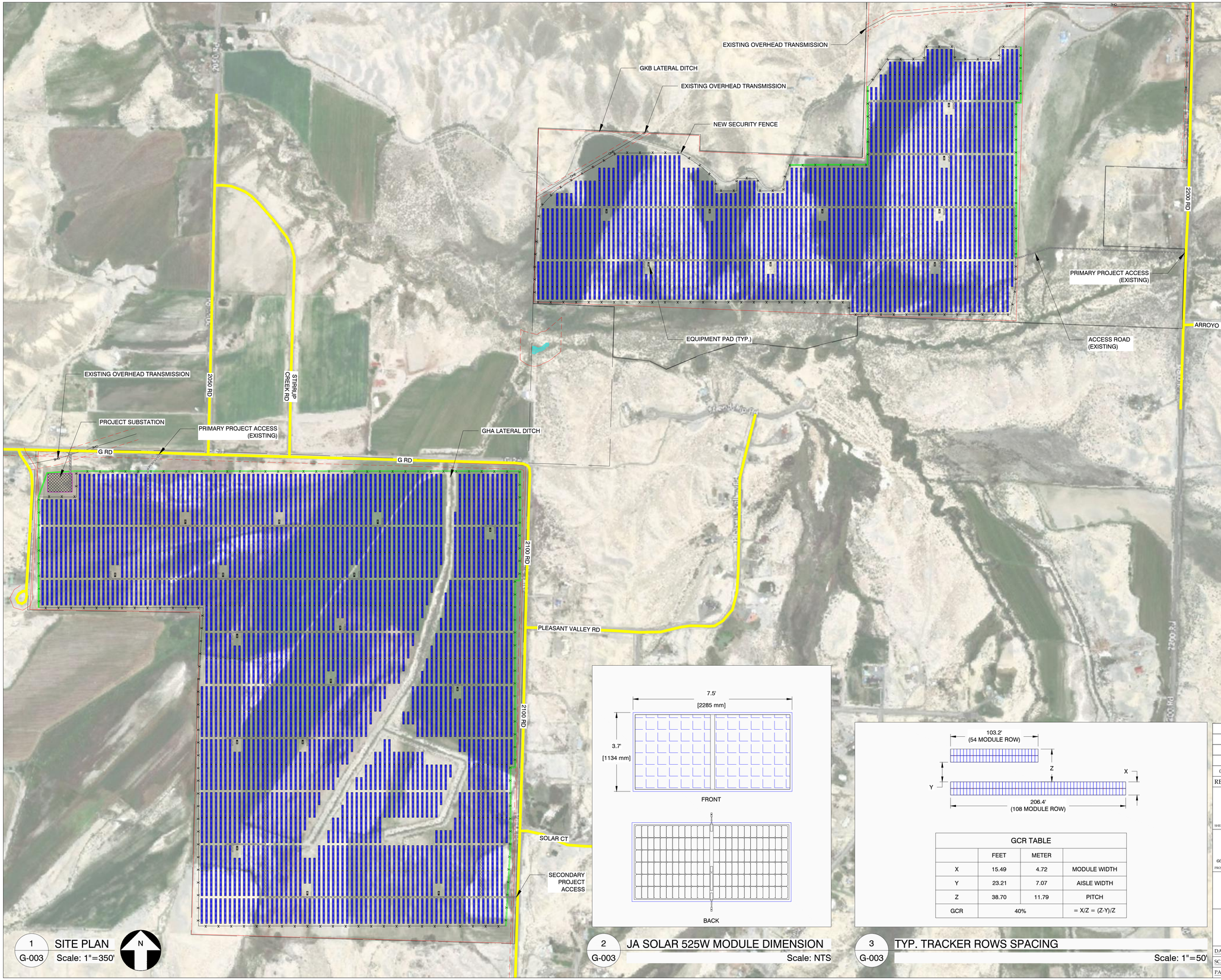
Attachment 2-F

Site Plan

Part 2

2P Tracker Site Plan



1 G-003 SITE PLAN
Scale: 1"=350'

2 G-003 JA SOLAR 525W MODULE DIMENSION
Scale: NTS

GCR TABLE			
	FEET	METER	
X	15.49	4.72	MODULE WIDTH
Y	23.21	7.07	AISLE WIDTH
Z	38.70	11.79	PITCH
GCR	40%		= X/Z = (Z-Y)/Z

3 G-003 TYP. TRACKER ROWS SPACING
Scale: 1"=50'

INDICATIVE SYSTEM SPECIFICATIONS	
SYSTEM SIZE DC	102,513.60 kW
SYSTEM SIZE AC	80,000.00 kW
DC/AC RATIO	1.28
MODULE MANUFACTURER	JA SOLAR
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FENCED AREA	383.71 Ac

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- WETLAND

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	AA	DG	07/13/2021

SHEET TITLE: GENERAL SITE PLAN

SHEET NO.: G-101

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

SOLVIDA DESIGN + ENGINEERING
1400 Boston Avenue, Suite 2
Kennedy, California 91714

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DATE:	07/13/2021	DFTR:	LAKIR RAMBHIA
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EXISTING OVERHEAD TRANSMISSION

PRIMARY PROJECT ACCESS (EXISTING)

PROJECT SUBSTATION

G RD

2050 RD

STIRRUP CREEK RD

G RD

GHA LATERAL DITCH

2100 RD

12' WIDE NEW ACCESS ROAD

PLEASANT VALLEY RD

NEW SECURITY FENCE

EQUIPMENT PAD (TYP.)

EQUIPMENT PAD (TYP.)

2100 RD

SOLAR CT

SECONDARY PROJECT ACCESS

1 G-003 SITE PLAN Scale: 1"=200'

N

INDICATIVE SYSTEM SPECIFICATIONS

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REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	AA	DG	07/13/2021

SHEET TITLE: GENERAL SITE PLAN SOUTH-WEST

SHEET NO.: G-102

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

SOLVIDA DESIGN - ENGINEERING

soa SIERRA OVERHEAD ANALYTICS

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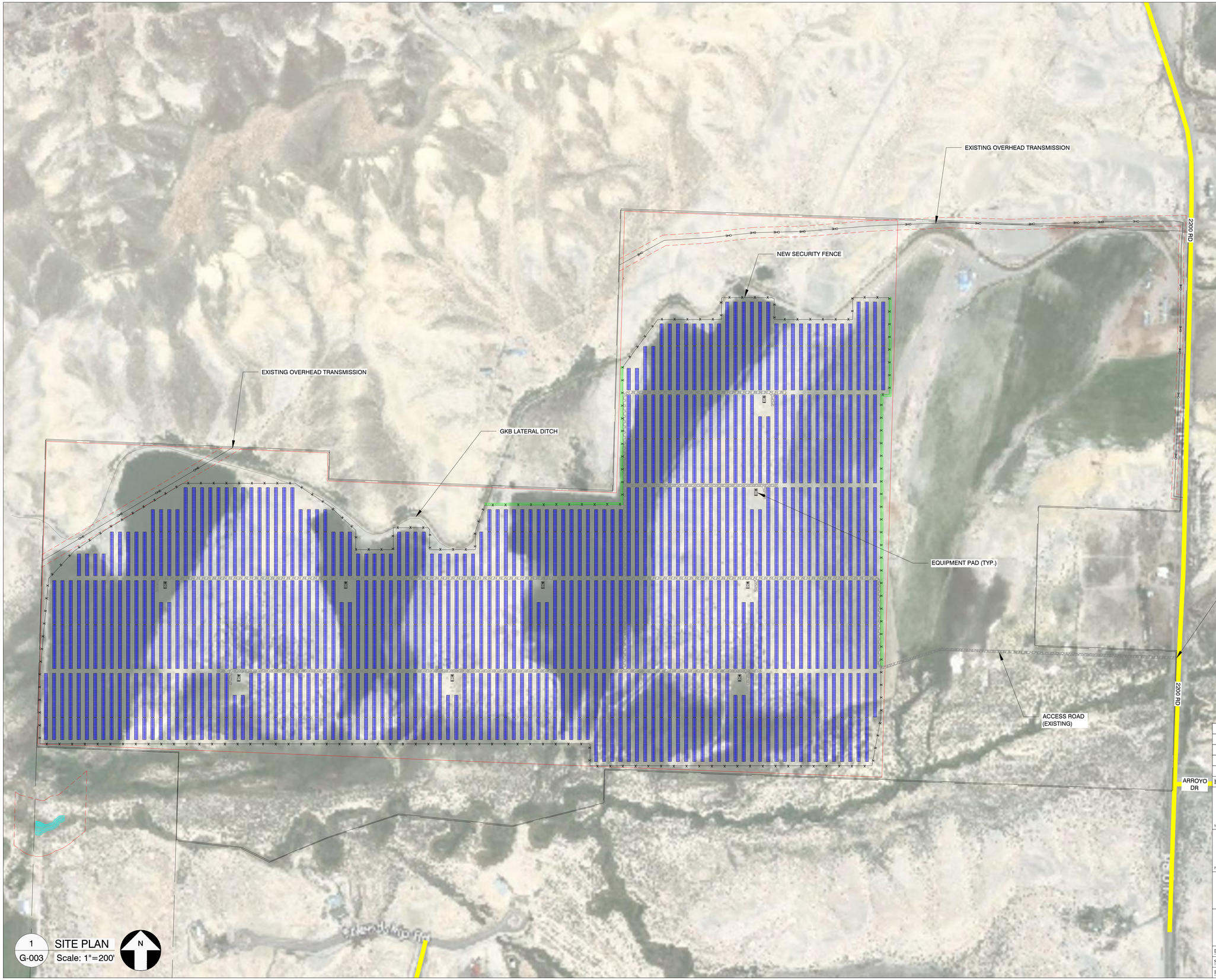

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REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	AA	DG	07/13/2021

SHEET TITLE: GENERAL SITE PLAN NORTH-EAST

SHEET NO.: G-103

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

SOLVIDA DESIGN + ENGINEERING
1400 Bonnie Avenue, Suite 3
Berkeley, California 94704

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DATE:	07/13/2021	DFTR:	LAKIR RAMBHIA
SCALE:	AS SHOWN	CHKD:	STEPHEN SMITH
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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Attachment 2-G

Fuel Management Plan

LANDSCAPE BUFFER

PLEASE REFERENCE PROVIDED CIVIL DRAWINGS IN ATTACHMENT 3-L FOR DETAIL ON PROPOSED LANDSCAPE BUFFER

LANDSCAPE BUFFER

PLEASE REFERENCE PROVIDED CIVIL DRAWINGS IN ATTACHMENT 3-L FOR DETAIL ON PROPOSED LANDSCAPE BUFFER

12' ACCESS ROAD

EMERGENCY VEHICLE ACCESS

PLEASE REFERENCE PROVIDED CIVIL DRAWINGS IN ATTACHMENT 2-E FOR ROAD PROFILE AND CROSS SECTION DETAIL

EMERGENCY VEHICLE ACCESS

PLEASE REFERENCE PROVIDED CIVIL DRAWINGS IN ATTACHMENT 2-E FOR ROAD PROFILE AND CROSS SECTION DETAIL

DRAINAGE DITCH TO BE KEPT CLEAR OF ALL WEEDS AND SHRUBS PER RECOMMENDATION OF DELTA COUNTY FIRE PROTECTION DISTRICT

PROJECT TO RETAIN AND SUPPLEMENT EXISTING GRASSES
PLEASE REFERENCE ATTACHMENT 3-L FOR THE PROJECT VEGETATION MANAGEMENT PLAN AND ATTACHMENT 4-1 FOR THE PROJECT AGRICULTURE MANAGEMENT/GRAZING PLAN

LANDSCAPE BUFFER

PLEASE REFERENCE PROVIDED CIVIL DRAWINGS IN ATTACHMENT 3-L FOR DETAIL ON PROPOSED LANDSCAPE BUFFER

EMERGENCY VEHICLE ACCESS

PLEASE REFERENCE PROVIDED CIVIL DRAWINGS IN ATTACHMENT 2-E FOR ROAD PROFILE AND CROSS SECTION DETAIL

2200 RD

2100 RD

2300 Rd

Summerville Rd

Rosevelt Rd

1 G-003 SITE PLAN Scale: 1"=350'

N

SYSTEM SPECIFICATIONS

SYSTEM SIZE DC	102,513.60 kW
SYSTEM SIZE AC	80,000.00 kW
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- SUBSTATION FENCE
- PROJECT SUBSTATION
- GRAVEL ACCESS ROAD
- EXISTING OVERHEAD LINE
- EXISTING ROAD
- LANDSCAPE BUFFER
- WETLAND
- DRAINAGE DITCH CLEARED OF VEGETATION
- PROJECT MAINTAINED GRASSLANDS

NOE: TRACKER ROWS HAVE BEEN HIDDEN TO AID IN VISIBILITY

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	AA	DG	07/13/2021

FUEL MANAGEMENT PLAN (SHEET TITLE)

F-101 (SHEET NO.)

GARNET MESA

6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

PROJECT DETAILS

SOLVIDA DESIGN + ENGINEERING

SOA SIERRA OVERHEAD ANALYTICS

DATE:	07/13/2021	DFTR:	LAKIR RAMBHIA
SCALE:	AS SHOWN	CHKD:	STEPHEN SMITH
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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Attachment 3-A

Project Description and Operating Plan

CITRA

Project Description and Operating Plan

Garnet Mesa Solar, LLC

Delta County, Colorado

Revision	Date
Initial Draft	*8/8/2021*

CITRA

Project Description

The Garnet Mesa Solar facility will be an 80.0 MWac, approximately 102.5 MWdc solar photovoltaic ("PV") project. The facility design includes high-efficiency, crystalline silicon solar panels from JA Solar or a similar company. The PV modules would be connected in series to form strings, which are subsequently connected in parallel and mounted on rows of horizontal, single-axis trackers. These trackers offer increased energy production compared to fixed-tilt designs by dynamically tracking the sun's position throughout the day. The preliminary project design for the one in portrait configuration ("1P") includes the DuraTrack HZ v3 single-axis trackers from Array Technologies, Inc., which features:

- Existing installation base at over 900 utility-scale and commercial projects across the globe;
- Over 30 years of solar tracker installation experience;
- Full-scale wind tunnel testing; and,
- Full certification under UL and IEC standards and ISO 9001 quality management standards.

The preliminary project design for the two in portrait configuration ("2P") includes the FTC Voyager+ single-axis trackers from FTC Solar, which features:

- Up to 60% fewer foundation posts versus a 1P system design;
- Independently driven tracker rows allowing flexibility in design and O&M;
- Best in industry tracking range of motion (+/- 60 degrees);
- Dedicated motor and integrated battery backup on all rows;
- Full-scale wind tunnel testing; and,
- Full certification under UL and IEC standards and ISO 9001 quality management standards.

The project would also feature high efficiency, central power inverters and transformers to convert the DC power to AC electricity. The project was designed with 3.2 MVA Power Electronics FS3430M, an industry-leading 1,500 V inverter with a peak-efficiency of 98.6%. PE offers the following benefits and certifications:

- Over 10 GW of PV inverters installed in the U.S. and 30 GW world-wide;
- Over 30 years of PV inverter manufacturing and R&D experience; and,
- Advanced grid connection features, including power factor control, reactive/active power control, and fault ride through.

While we have designed the project with the above specifications in mind, given ongoing fluctuations in material pricing and availability, Garnet Mesa Solar may be required to make a change to the equipment above as development progresses. We are vendor neutral and maintain relationships with several major equipment providers in order to deliver the PV solar solutions that best meet the project's requirements. The technology landscape can change drastically from the planning period to equipment procurement, so we will continually optimize the project design to offer the best performance and operational characteristics.

CITRA

Equipment Warranty

The proposed equipment will also feature industry leading manufacturer warranties. The solar modules will include a minimum 10 year product warranty and 25 year performance warranty. The single-axis trackers feature a 10 year warranty on structural components and 5 year warranty on drive and control systems. The project inverters also feature a 5 year manufacturer's warranty.

Operation & Maintenance Plan

To ensure long-term reliable operation, performance, and general facility upkeep, we plan to implement an operation and maintenance ("O&M") plan with a third-party O&M provider. We have identified several industry-leading vendors for services on the Garnet Mesa Solar project, allowing us to monitor and maintain the project over the entire project lifecycle.

The selected O&M provider will maintain an operations center, which provides remote monitoring of the plant 7 days a week, 24 hours a day. Operations staff supervises the ongoing operation of the plant, tracks performance, detects and diagnoses issues, and schedules and manages on-site maintenance activities. As a NERC-registered generator operator, our O&M partner will act as a single point of contact for the facility and will be available on a 24/7 basis in order to respond to requests, directives, and emergency orders.

Additionally, the O&M provider will staff field personnel directly at the project site to monitor site conditions and perform ongoing quality control inspections.

Key components of a typical O&M plan include the following:

- **Remote Monitoring:** This includes the real-time remote plant monitoring using advanced monitoring and control technology such as supervisory controls and data acquisition ("SCADA") systems. This type of system will allow technicians to compare expected performance metrics to actual plant performance and make any necessary adjustments to correct issues. The system will also automatically inform technicians of production-impacting events, allowing the technicians to respond quickly and assess whether on-site repairs are needed.
- **Preventative Maintenance:** Some equipment, such as transformers, inverters, and meters need to be maintained as per manufacturer's guidelines or compliance requirements. Maintenance typically includes visual inspections and testing on either a semi-annual or annual basis. Major maintenance activities are scheduled well in advance for periods in which production is likely to be low, such as at night, to limit impact to performance. The maintenance plan is also coordinated with the interconnecting utility, the Independent System Operator ("ISO"), and outside contractors, as needed.
- **Corrective Maintenance:** Occasionally, it may be necessary to perform equipment maintenance or repair prior to the scheduled timeframe, in which case, the O&M provider will send specialized repair personnel to the site as required.

- **Site and Ground Maintenance:** This includes activities such as array washing, vegetation abatement, and upkeep of maintenance roads and other infrastructure on an as-needed basis. The frequency of these activities varies project by project depending on certain site characteristics such as dust levels, regional snowfall, etc.

The following table includes a summary of a typical solar plant maintenance plan for illustrative purposes:

TYPICAL SOLAR PROJECT MAINTENANCE SCHEDULE		
Type of Maintenance	Description	Frequency
Remote Monitoring	Monitor plant operation, record performance, and take any necessary corrective measures	Ongoing
Facility and Interconnection Equipment Inspection	Visual inspection of physical and mechanical condition of electrical equipment	Monthly
System and General Plant Condition Inspection	Visual inspection of modules, structures, and inverters for correct operation	Ongoing (6 months full inspections)
String and Meter Testing	Perform string voltage and current testing on array; calibrate meters	Annually
Transformer Maintenance	Perform power factor testing and insulation resistance testing	Triennially
Array Washing	Clean modules of dust, etc.	As Needed
Vegetation Abatement	Graze sheep, mow grass and de-fertilize areas that could shadow array	As Needed

Attachment 3-B

Existing and Surrounding Land Use Summary

CITRA

Existing and Surrounding Land Use Summary

Garnet Mesa Solar, LLC

Delta County, Colorado

Revision	Date
Initial Draft	*8/8/2021*

CITRA

Contents

Description of the Existing Site and Surrounding Area 3
Executive Summary 3
Past and Present Use of the Project Site 3
East Phase 3
West Phase 4
Existing Zoning Districts 4
Character of Adjacent Lots 5

CITRA

Description of the Existing Site and Surrounding Area

Executive Summary

The purpose of this document is to provide a general description of the current and prior characteristics of the land proposed for development as well as the surrounding area. This document is not intended to describe the property as proposed for development. Other sections of this application go into great detail describing the future proposed use of the property.

As illustrated in **Figure 1**, the land under consideration ("Project Land") is divided into two components, a western phase ("West Phase") and an eastern phase ("East Phase").

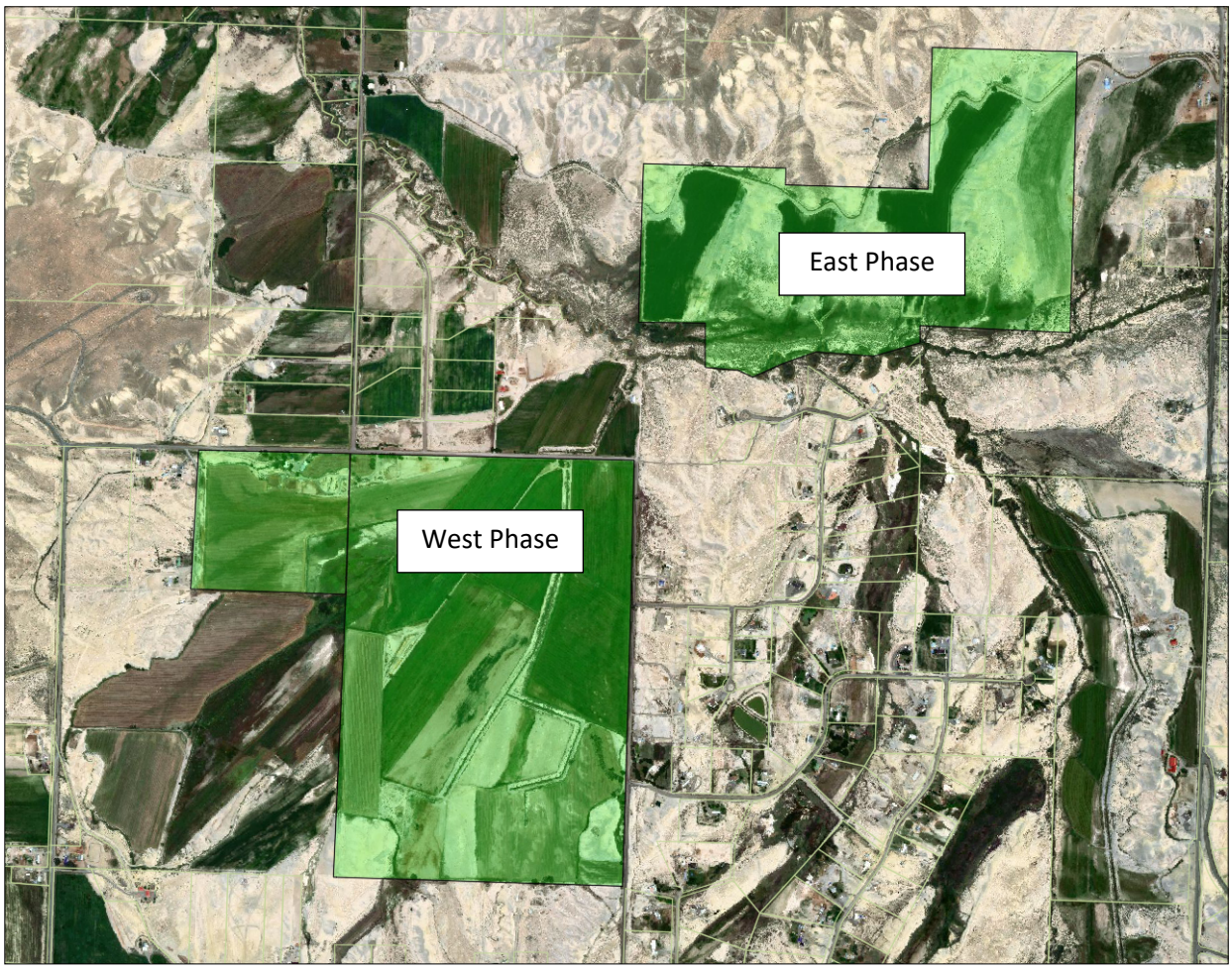


Figure 1: Project Land

Past and Present Use of the Project Site

East Phase

The East Phase land is currently in use for limited agriculture and grazing. Property records and historical imagery have confirmed that this property has been in consistent use for the same such purposes, or has been vacant, for as far back as records exist for the property. Site investigations:

boundary survey, phase I ESA, wetland delineation, cultural resources, species investigation, and geotechnical studies, have not identified any evidence of prior uses other than agriculture and grazing.

West Phase

Similar to the East Phase, the West Phase is currently in use as an agricultural property focused on supporting a cattle herd. Also similar to the East Phase, the West Phase has no evidence of any differing prior uses for as far back as records exist for the property.

The West Phase does differ from the East Phase in terms of permanent structures (**Figure 2**). A ranch home was constructed in 1972, and various supporting structures for the ranch operation are present. All structures are constructed in the north-west corner of the West Phase, with the exemption of a single corral located central to the property.

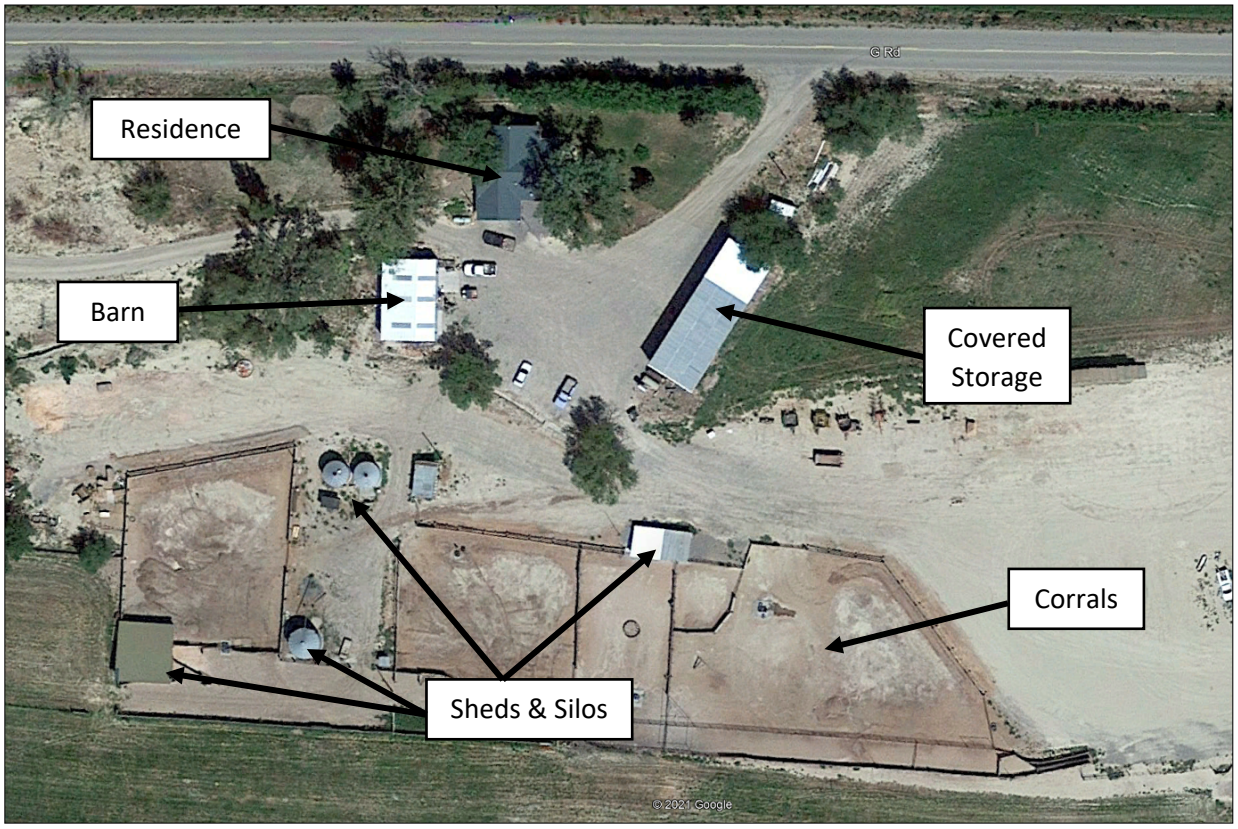


Figure 2: West Phase Permanent Structures

Existing Zoning Districts

The Project Land proposed for development all resides in an A-20 zoning district. As defined by Delta County Land Use Code, this zoning district is intended for agricultural rural residential uses of parcels of land that are generally 20 acres or more. This zoning district allows for a broad range of agricultural and supporting uses.

The Project Land is immediately surrounded by either other A-20 zoned parcels or A-5 zoned parcels. Further to the east of the Project Land, the zoning district changes to A-35. Please reference **Appendix 1** which depicts the Project Land relative to current Delta County zoning district classifications.

CITRA

Character of Adjacent Lots

The land surrounding the Project Land can be best characterized as rural and agricultural. The area has a legacy of agricultural use dating back decades. The residences in this area are either associated with those families operating active grazing and farming activities, or consist of free-standing single family homes on larger lots.

All parcels in the vicinity of the Project Land reside on either A-5 or A-20 classified land. Immediately adjacent to the Project Land are 41 parcels averaging 22.8 acres each (max of 154.5 acres / min of 2.0 acres). The residences constructed on the lots in this area typically occupy a small proportion of their respective parcels and are constructed to maximize setbacks from public roads and neighboring properties.

The images below (**Figures 3 and 4**) are both looking north on 2100 Rd and are representative of the typical residential lot configuration found in this region with a large setback.

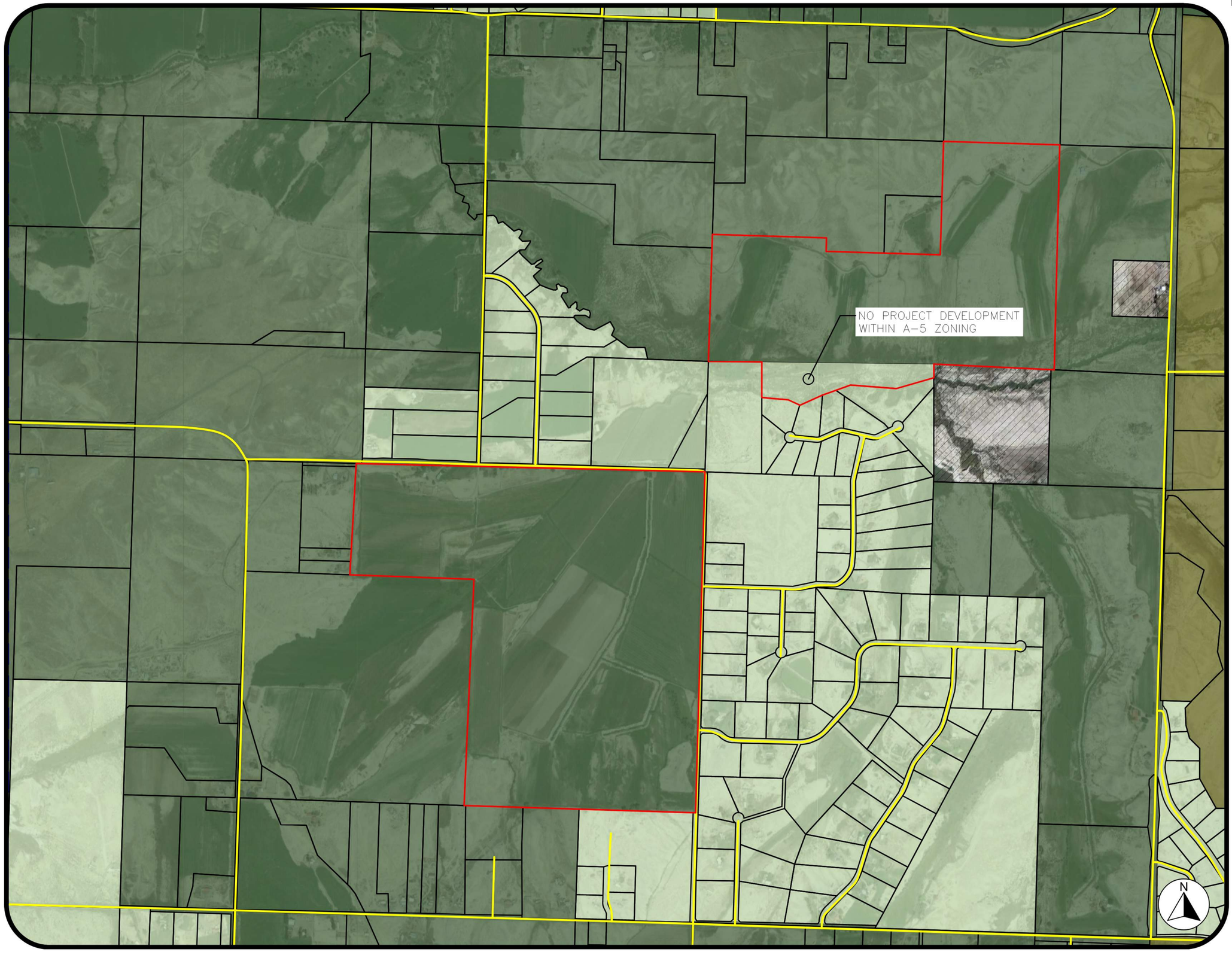
Figure 3: Representative A-5 Residential Lot

Figure 4: Representative A-5 Residential Lot

Appendix 1

Existing Zoning

EXISTING & SURROUNDING USE ZONING



General Notes

SUBJECT PARCELS

AGRICULTURE (35-ACRE)

AGRICULTURE (20-ACRE)

AGRICULTURE (5-ACRE)

NO APPLIED ZONING: FEDERAL LANDS

COUNTY PARCELS

COUNTY ROAD

A	ISSUED FOR PERMIT	8/8/21

Firm Name and Address

CITRA

CITRA POWER LLC
624 KERMODI ST
BOZEMAN, MT 59715

Project Name and Address

GARNET MESA SOLAR
20426 G RD
DELTA, CO 81416

Project: GARNET MESA SOLAR	Sheet: EU-001
Date: AUGUST 8, 2021	
Scale: 1" = 500 FT	

Attachment 3-C

Title Report

Part 1	Parcel: 345513300009
Part 2	Parcel: 345513300020
Part 3	Parcel: 345523100001 & 345523200009

Attachment 3-C

Title Report

Part 1

Parcel 345513300009

FIDELITY
NATIONAL TITLE COMPANY

1521 Oxbow Drive Suite 200
Montrose, CO 81401
Phone: (970) 252-0160
Fax: (970) 252-0191

DATE: **March 31, 2021**
FILE NUMBER: **598-F0707580-397-DG0**
PROPERTY ADDRESS: **5990 2100 Road**, **Delta, CO 81416**
BUYER/BORROWER: **Garnet Mesa Land LLC, a Delaware limited liability company**
OWNER(S): **Jennifer L. Hofschulte**
YOUR REFERENCE NUMBER:
ASSESSOR PARCEL NUMBER: **R011354**

PLEASE TAKE NOTE OF THE FOLLOWING REVISED TERMS CONTAINED HEREIN:

None.

WIRED FUNDS ARE REQUIRED ON ALL CASH PURCHASE TRANSACTIONS. FOR WIRING INSTRUCTIONS, PLEASE CONTACT YOUR ESCROW OFFICE AS NOTED ON THE TRANSMITTAL PAGE OF THIS COMMITMENT.

TO:	**Fidelity National Title Company** **1521 Oxbow Drive Suite 200** **Montrose, CO 81401**	ATTN: PHONE: FAX: E-MAIL:	**Diane Gorrono** **(970) 252-0160** (970) 252-0191 **dgorrono@fnf.com**

TO:	**Lone Eagle Land Brokerage, Inc.** **21263 Hwy 550** **Montrose, CO 81401**	**ATTN:** **PHONE:** **FAX:** **E-MAIL:**	**Bryan Walchle** **(970) 249-4300** **(970) 249-1313** **bryan@eagleland.com**
TO:	**Montrose** **1521 Oxbow Drive Suite 200** **Montrose, CO 81401**	**ATTN:** **PHONE:** **FAX:** **E-MAIL:**	**Diane Gorrono** **(970) 252-0160** **(970) 252-0191** **dgorrono@fnf.com**

END OF TRANSMITTAL

COMMITMENT FOR TITLE INSURANCE

Issued by

Fidelity National Title Insurance Company

NOTICE

IMPORTANT—READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRA CONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

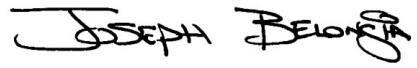
THE COMPANY'S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and the Commitment Conditions, **Fidelity National Title Insurance Company**, a Florida Corporation (the "Company"), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Policy Amount and the name of the Proposed Insured.

If all of the Schedule B, Part I—Requirements have not been met within 6 Months after the Commitment Date, this Commitment terminates and the Company's liability and obligation end.

Countersigned by:



Authorized Signature

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by Fidelity National Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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AMERICAN LAND TITLE ASSOCIATION

COMMITMENT CONDITIONS

1. DEFINITIONS

(a) "Knowledge" or "Known": Actual or imputed knowledge, but not constructive notice imparted by the Public Records.

(b) "Land": The land described in Schedule A and affixed improvements that by law constitute real property. The term "Land" does not include any property beyond the lines of the area described in Schedule A, nor any right, title, interest, estate, or easement in abutting streets, roads, avenues, alleys, lanes, ways, or waterways, but this does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.

(c) "Mortgage": A mortgage, deed of trust, or other security instrument, including one evidenced by electronic means authorized by law.

(d) "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.

(e) "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.

(f) "Proposed Policy Amount": Each dollar amount specified in Schedule A as the Proposed Policy Amount of each Policy to be issued pursuant to this Commitment.

(g) "Public Records": Records established under state statutes at the Commitment Date for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without Knowledge.

(h) "Title": The estate or interest described in Schedule A.

2. If all of the Schedule B, Part I—Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:

(a) the Notice;
(b) the Commitment to Issue Policy;
(c) the Commitment Conditions;
(d) Schedule A;
(e) Schedule B, Part I—Requirements;
(f) Schedule B, Part II—Exceptions; and
(g) a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company shall not be liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY

(a) The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:

(i) comply with the Schedule B, Part I—Requirements;
(ii) eliminate, with the Company's written consent, any Schedule B, Part II—Exceptions; or
(iii) acquire the Title or create the Mortgage covered by this Commitment.

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AMERICAN LAND TITLE ASSOCIATION

(b) The Company shall not be liable under Commitment Condition 5(a) if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.
(c) The Company will only have liability under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.
(d) The Company's liability shall not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Conditions 5(a)(i) through 5(a)(iii) or the Proposed Policy Amount.
(e) The Company shall not be liable for the content of the Transaction Identification Data, if any.
(f) In no event shall the Company be obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I—Requirements have been met to the satisfaction of the Company.
(g) In any event, the Company's liability is limited by the terms and provisions of the Policy.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT

(a) Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.
(b) Any claim must be based in contract and must be restricted solely to the terms and provisions of this Commitment.
(c) Until the Policy is issued, this Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.
(d) The deletion or modification of any Schedule B, Part II—Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.
(e) Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.
(f) When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT HAS BEEN ISSUED BY AN ISSUING AGENT

The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for the purpose of providing closing or settlement services.

8. PRO-FORMA POLICY

The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

9. ARBITRATION

The Policy contains an arbitration clause. All arbitrable matters when the Proposed Policy Amount is $2,000,000 or less shall be arbitrated at the option of either the Company or the Proposed Insured as the exclusive remedy of the parties. A Proposed Insured may review a copy of the arbitration rules at <http://www.alta.org/arbitration>.

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AMERICAN LAND TITLE ASSOCIATION

Transaction Identification Data for reference only:

Issuing Agent: Fidelity National Title Company
Issuing Office: 8055 E Tufts Ave, Suite 300, Denver, CO 80237
Loan ID Number:
Issuing Office File Number: 598-F0707580-397-DG0
Property Address: 5990 2100 Road, Delta, CO 81416
Revision Number:

SCHEDULE A

AMERICAN LAND TITLE ASSOCIATION COMMITMENT

1. Commitment Date: **March 16, 2021**
2. Policy to be issued:
   (a) **ALTA Owners Policy 6-17-06**
   Proposed Insured: **Garnet Mesa Land LLC, a Delaware limited liability company**
   Proposed Policy Amount: **$15,000.00**
   (b) **None**
   Proposed Insured:
   Proposed Policy Amount: **$0.00**
   (c) **None**
   Proposed Insured:
   Proposed Policy Amount: **$0.00**
3. The estate or interest in the Land described or referred to in this Commitment is:

   Easement
4. The Title is, at the Commitment Date, vested in:

   Jennifer L. Hofschulte
5. The Land is described as follows:

   See Exhibit A attached hereto and made a part hereof.

PREMIUMS:

Owners Coverage	470.00
Tax Cert	10.00

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EXHIBIT A
LEGAL DESCRIPTION

A perpetual access easement across a parcel of land situated in the SW ¼, Section 13, T 15 S, R 95 W, 6th P.M., County of Delta, State of Colorado, more particularly described as follows:

Beginning at the Southwest corner of said Section 13;
Thence N 00°06'13" E a distance of 30.00 feet;
Thence S 89°19'06" E a distance of 30.00 feet;
Thence N 00°06'13" E a distance of 1284.93 feet;
Thence S 89°15'15" E a distance of 100.01 feet;
Thence S 00°06'13" W a distance of 420.97 feet;
Thence N 89°38'56" W a distance of 70.00 feet;
Thence S 00°06'13" W a distance of 893.81 feet;
Thence N 89°19'06" W a distance of 60.00 feet to the Point of Beginning.

Legal prepared by Steven A. Yelton
PLS 33645
March 11, 2021

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AMERICAN LAND TITLE ASSOCIATION

SCHEDULE B

PART I – REQUIREMENTS

All of the following Requirements must be met:

a. Pay the agreed amounts for the interest in the land and/or for the mortgage to be insured.

b. Pay us the premiums, fees and charges for the policy.

c. Obtain a certificate of taxes due from the county treasurer or the county treasurer's authorized agent.

d. Evidence that any and all assessments for common expenses, if any, have been paid.

e. The Company will require that an Affidavit and Indemnity Agreement be completed by the party(s) named below before the issuance of any policy of title insurance.

Party(s): Jennifer L. Hofschulte

The Company reserves the right to add additional items or make further requirements after review of the requested Affidavit.

f. Easement Agreement sufficient to convey the estate or interest in the Land described or referred to herein, to the Proposed Insured Purchaser.

NOTE: Statement of Authority for Garnet Mesa Land LLC recorded September 6, 2016 at 689817 discloses the following person(s) authorized to sign on behalf of the entity, pursuant to Colorado Revised Statutes:

Richard A. Hansen , Member

g. Recordation of UPDATED Statement of Authority for Garnet Mesa Land LLC pursuant to Colorado Revised Statutes evidencing the existence of the entity and authority of the person(s) authorized to execute and deliver instruments affecting title to real property on behalf of the entity and containing other information required by Colorado Revised Statutes.

h. The search did not disclose any open mortgages or deeds of trust of record, therefore the Company reserves the right to require further evidence to confirm that the property is unencumbered, and further reserves the right to make additional requirements or add additional items or exceptions upon receipt of the requested evidence.

Click to view Tax Info

Note: Please be aware that due to the conflict between federal and state laws concerning the cultivation, distribution, manufacture or sale of marijuana, the Company is not able to close or insure any transaction involving Land that is associated with these activities.

NOTE: Exception(s) number(ed) 1-4 will not appear on the Owner's Policy. Exception number 5 will be removed from the policy provided the company conducts the closing.

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AMERICAN LAND TITLE ASSOCIATION

SCHEDULE B
PART I – Requirements
(Continued)

24 MONTH CHAIN OF TITLE, FOR INFORMATIONAL PURPOSES ONLY:

The following vesting deeds relating to the subject property have been recorded in the Clerk and Recorder's office of the County in which the property is located:

There are no conveyances affecting said land recorded within 24 months of the date of this report

END OF REQUIREMENTS

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AMERICAN LAND TITLE ASSOCIATION

SCHEDULE B

PART II – EXCEPTIONS

THIS COMMITMENT DOES NOT REPUBLISH ANY COVENANT, CONDITION, RESTRICTION, OR LIMITATION CONTAINED IN ANY DOCUMENT REFERRED TO IN THIS COMMITMENT TO THE EXTENT THAT THE SPECIFIC COVENANT, CONDITION, RESTRICTION, OR LIMITATION VIOLATES STATE OR FEDERAL LAW BASED ON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, GENDER IDENTITY, HANDICAP, FAMILIAL STATUS, OR NATIONAL ORIGIN.

The Policy will not insure against loss or damage resulting from the terms and provisions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

1. Any facts, rights, interests or claims that are not shown by the Public Records but which could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.

2. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.

3. Any encroachments, encumbrances, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by Public Records.

4. Any lien or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law and not shown by the Public Records.

5. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the Public Records or attaching subsequent to the effective date hereof but prior to the date the proposed Insured acquires of record for the value the estate or interest or mortgage thereon covered by this Commitment.

   NOTE: Upon satisfaction of all requirements herein, the above exception will not be reflected on any proposed title policy identified in Schedule A.

6. Water rights, claims of title to water, whether or not these matters are shown by the Public Records.

7. All taxes and assessments, now or heretofore assessed, due or payable.

   NOTE: This tax exception will be amended at policy upon satisfaction and evidence of payment of taxes.

8. Reservations contained in the Patent

From:	The United States of America
Recording Date:	March 20, 1957
Recording No:	Book 349 at Page 505

   Which among other things recites as follows:

   A right of way thereon for ditches or canals constructed by the authority of the United States of America.

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AMERICAN LAND TITLE ASSOCIATION

SCHEDULE B
PART II – Exceptions
(Continued)

Any vested and accrued water rights for mining, agricultural, manufacturing or other purposes and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by local customs, laws and decisions of courts.

The right of the proprietor of a vein or lode to extract and remove his ore therefrom should the same be found to penetrate or intersect the premises hereby granted as provided by law.

9. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

Granted to:	Rocky Mountain Natural Gas Company
Purpose:	Right of way
Recording Date:	November 29, 1968
Recording No:	Book 423 at Page 254

Assignment:

Recording Date:	January 8, 1971
Recording No:	Book 432 at Page 614

10. Notes, easements and any other matters as shown or set forth on Boundary Survey

Recording Date:	March 17, 2015
Recording No:	679041

11. Terms, conditions, provisions, agreements and obligations and easements contained in the Right-of-Way Easement as set forth below:

Recording Date:	June 19, 2017
Recording No.:	696085

12. Terms, conditions, provisions, agreements and obligations and easements contained in the Grant of Easement as set forth below:

Recording Date:	July 13, 2020
Recording No.:	720161

13. Right of Way for G Road and 2100 Road insofar as the same may affect the Land.

14. Right of Way for Relief Ditch insofar as the same may affect the Land.

15. Any loss or damage arising from the fact that any fence lines on or near the perimeter of the Land may not coincide with property lines.

16. Terms, conditions, provisions, agreements and obligations contained in the Easement Agreement as set forth below:

Recording Date:

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AMERICAN LAND TITLE ASSOCIATION

SCHEDULE B
PART II – Exceptions
(Continued)

Recording No.:

END OF EXCEPTIONS

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AFFIDAVIT AND INDEMNITY AGREEMENT

TO Fidelity National Title Company a Colorado Corporation and Fidelity National Title Insurance Company, a Florida Corporation.

1. This is written evidence to you that there are no unpaid bills, and to the extent there may be unpaid bills, that the undersigned undertakes and agrees to cause the same to be paid such that there shall be no mechanics or materialmen's liens affecting the property for materials or labor furnished for construction and erection, repairs or improvements contracted by or on behalf of the undersigned on property:

   legally described as:

   See Attached Affidavit and Indemnity Agreement Legal Description

   Property Address: 5990 2100 Road, Delta, CO 81416

2. We further represent that to the actual knowledge and belief of the undersigned there are no public improvements affecting the property prior to the date of closing that would give rise to a special property tax assessment against the property after the date of closing.

3. We further represent that to the actual knowledge and belief of the undersigned there are no pending proceedings or unsatisfied judgments of record, in any Court, State, or Federal, nor any tax liens filed or taxes assessed against us which may result in liens, and that if there are judgments, bankruptcies, probate proceedings, state or federal tax liens of record against parties with same or similar names, that they are not against us.

4. We further represent that there are no unrecorded contracts, leases, easements, or other agreements or interests relating to said premises of which we have knowledge.

5. We further represent that to the actual knowledge and belief of the undersigned we are in sole possession of the real property described herein other than leasehold estates reflected as recorded items under the subject commitment for title insurance.

6. We further represent that there are no unpaid charges and assessments that could result in a lien in favor of any association of homeowners which are provided for in any document referred to in Schedule B of Commitment referenced above.

7. We further understand that any payoff figures shown on the settlement statement have been supplied to Fidelity National Title Company as settlement agent by the seller's/borrower's lender and are subject to confirmation upon tender of the payoff to the lender. If the payoff figures are inaccurate, we hereby agree to immediately pay any shortage(s) that may exist. If applicable as disclosed or referred to on Schedule A of Commitment referenced above.

   The undersigned affiant(s) know the matters herein stated are true and indemnifies Fidelity National Title Company, a Colorado Corporation and Fidelity National Title Insurance Company, a Florida Corporation against loss, costs, damages and expenses of every kind incurred by it by reason of its reliance on the statements made herein.

   This agreement is executed with and forms a part of the sale and/or financing of the above described premises, and is given in addition to the conveyance and/or financing of the premises in consideration for the conveyance and/or financing, and forms a complete agreement by itself for any action thereon.

SELLER: **SELLER:**

_____ _____

Jennifer L. Hofschulte

SELLER: **SELLER:**

_____ _____

State of Colorado }ss:
County of **Delta**

The foregoing instrument was acknowledged, subscribed, and sworn to before me on _____ by Jennifer L. Hofschulte.

(SEAL)

_____
Notary Public
My Commission Expires:

ATTACHED AFFIDAVIT AND INDEMNITY AGREEMENT
LEGAL DESCRIPTION

A perpetual access easement across a parcel of land situated in the SW ¼, Section 13, T 15 S, R 95 W, 6th P.M., County of Delta, State of Colorado, more particularly described as follows:

Beginning at the Southwest corner of said Section 13;
Thence N 00°06'13" E a distance of 30.00 feet;
Thence S 89°19'06" E a distance of 30.00 feet;
Thence N 00°06'13" E a distance of 1284.93 feet;
Thence S 89°15'15" E a distance of 100.01 feet;
Thence S 00°06'13" W a distance of 420.97 feet;
Thence N 89°38'56" W a distance of 70.00 feet;
Thence S 00°06'13" W a distance of 893.81 feet;
Thence N 89°19'06" W a distance of 60.00 feet to the Point of Beginning.

Legal prepared by Steven A. Yelton
PLS 33645
March 11, 2021

DISCLOSURE STATEMENT

- Pursuant to Section 38-35-125 of Colorado Revised Statutes and Colorado Division of Insurance Regulation 8-1-2 (Section 5), if the parties to the subject transaction request us to provide escrow-settlement and disbursement services to facilitate the closing of the transaction, then all funds submitted for disbursement must be available for immediate withdrawal.
- Colorado Division of Insurance Regulation 8-1-2, Section 5, Paragraph H, requires that "Every title insurance company shall be responsible to the proposed insured(s) subject to the terms and conditions of the title insurance commitment, other than the effective date of the title insurance commitment, for all matters which appear of record prior to the time of recording whenever the title insurance company, or its agent, conducts the closing and settlement service that is in conjunction with its issuance of an owners policy of title insurance and is responsible for the recording and filing of legal documents resulting from the transaction which was closed". Provided that Fidelity National Title Company conducts the closing of the insured transaction and is responsible for recording the legal documents from the transaction, exception No. 5 in Schedule B-2 will not appear in the Owner's Title Policy and Lender's Title Policy when issued.
- Colorado Division of Insurance Regulation 8-1-2, Paragraph M of Section 5, requires that prospective insured(s) of a single family residence be notified in writing that the standard exception from coverage for unfiled Mechanics or Materialmans Liens may or may not be deleted upon the satisfaction of the requirement(s) pertinent to the transaction. These requirements will be addressed upon receipt of a written request to provide said coverage, or if the Purchase and Sale Agreement/Contract is provided to the Company then the necessary requirements will be reflected on the commitment.
- Colorado Division of Insurance Regulation 8-1-3, Paragraph C. 11.f. of Section 5 - requires a title insurance company to make the following notice to the consumer: “A closing protection letter is available to be issued to lenders, buyers and sellers.”
- If the sales price of the subject property exceeds $100,000.00 the seller shall be required to comply with the Disclosure of Withholding Provisions of C.R.S. 39-22-604.5 (Nonresident Withholding).
- Section 39-14-102 of Colorado Revised Statutes requires that a Real Property Transfer Declaration accompany any conveyance document presented for recordation in the State of Colorado. Said Declaration shall be completed and signed by either the grantor or grantee.
- Recording statutes contained in Section 30-10-406(3)(a) of the Colorado Revised Statutes require that all documents received for recording or filing in the clerk and recorder's office shall contain a top margin of at least one inch and a left, right, and bottom margin of at least one-half of an inch. The clerk and recorder may refuse to record or file a document that does not conform to requirements of this paragraph.
- Section 38-35-109 (2) of the Colorado Revised Statutes, requires that a notation of the purchasers legal address, (not necessarily the same as the property address) be included on the face of the deed to be recorded.
- Regulations of County Clerk and Recorder's offices require that all documents submitted for recording must contain a return address on the front page of every document being recorded.
- Pursuant to Section 10-11-122 of the Colorado Revised Statutes, the Company is required to disclose the following information:
  - The subject property may be located in a special taxing district.
  - A Certificate of Taxes Due listing each taxing jurisdiction shall be obtained from the County Treasurer or the County Treasurer's authorized agent.
  - Information regarding special districts and the boundaries of such districts may be obtained from the Board of County Commissioners, the County Clerk and Recorder or the County Assessor.
- Pursuant to Section 10-11-123 of the Colorado Revised Statutes, when it is determined that a mineral estate has been severed from the surface estate, the Company is required to disclose the following information: that there is recorded evidence that a mineral estate has been severed, leased, or otherwise conveyed from the surface estate and that there is a substantial likelihood that a third party holds some or all interest in oil, gas, other minerals, or geothermal energy in the property; and that such mineral estate may include the right to enter and use the property without the surface owner's permission.

Note: Notwithstanding anything to the contrary in this Commitment, if the policy to be issued is other than an ALTA Owner's Policy (6/17/06), the policy may not contain an arbitration clause, or the terms of the arbitration clause may be different from those set forth in this Commitment. If the policy does contain an arbitration clause, and the Amount of Insurance is less than the amount, if any, set forth in the arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties.

Wire Fraud Alert

This Notice is not intended to provide legal or professional advice. If you have any questions, please consult with a lawyer.

All parties to a real estate transaction are targets for wire fraud and many have lost hundreds of thousands of dollars because they simply relied on the wire instructions received via email, without further verification. **If funds are to be wired in conjunction with this real estate transaction, we strongly recommend verbal verification of wire instructions through a known, trusted phone number prior to sending funds.**

In addition, the following non-exclusive self-protection strategies are recommended to minimize exposure to possible wire fraud.

- **NEVER RELY** on emails purporting to change wire instructions. Parties to a transaction rarely change wire instructions in the course of a transaction.
- **ALWAYS VERIFY** wire instructions, specifically the ABA routing number and account number, by calling the party who sent the instructions to you. DO NOT use the phone number provided in the email containing the instructions, use phone numbers you have called before or can otherwise verify. **Obtain the phone number of relevant parties to the transaction as soon as an escrow account is opened**. DO NOT send an email to verify as the email address may be incorrect or the email may be intercepted by the fraudster.
- **USE COMPLEX EMAIL PASSWORDS** that employ a combination of mixed case, numbers, and symbols. Make your passwords greater than eight (8) characters. Also, change your password often and do NOT reuse the same password for other online accounts.
- **USE MULTI-FACTOR AUTHENTICATION** for email accounts. Your email provider or IT staff may have specific instructions on how to implement this feature.

For more information on wire-fraud scams or to report an incident, please refer to the following links:

Federal Bureau of Investigation:
http://www.fbi.gov

Internet Crime Complaint Center:
http://www.ic3.gov

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FIDELITY NATIONAL FINANCIAL, INC.
PRIVACY NOTICE

Effective January 1, 2021

Fidelity National Financial, Inc. and its majority-owned subsidiary companies (collectively, "FNF," "our," or "we") respect and are committed to protecting your privacy. This Privacy Notice explains how we collect, use, and protect personal information, when and to whom we disclose such information, and the choices you have about the use and disclosure of that information.

A limited number of FNF subsidiaries have their own privacy notices. If a subsidiary has its own privacy notice, the privacy notice will be available on the subsidiary's website and this Privacy Notice does not apply.

Collection of Personal Information

FNF may collect the following categories of Personal Information:

- contact information (*e.g.*, name, address, phone number, email address);
- demographic information (*e.g.*, date of birth, gender, marital status);
- identity information (*e.g.* Social Security Number, driver's license, passport, or other government ID number);
- financial account information (*e.g.* loan or bank account information); and
- other personal information necessary to provide products or services to you.

We may collect Personal Information about you from:

- information we receive from you or your agent;
- information about your transactions with FNF, our affiliates, or others; and
- information we receive from consumer reporting agencies and/or governmental entities, either directly from these entities or through others.

Collection of Browsing Information

FNF automatically collects the following types of Browsing Information when you access an FNF website, online service, or application (each an "FNF Website") from your Internet browser, computer, and/or device:

- Internet Protocol (IP) address and operating system;
- browser version, language, and type;
- domain name system requests; and
- browsing history on the FNF Website, such as date and time of your visit to the FNF Website and visits to the pages within the FNF Website.

Like most websites, our servers automatically log each visitor to the FNF Website and may collect the Browsing Information described above. We use Browsing Information for system administration, troubleshooting, fraud investigation, and to improve our websites. Browsing Information generally does not reveal anything personal about you, though if you have created a user account for an FNF Website and are logged into that account, the FNF Website may be able to link certain browsing activity to your user account.

Other Online Specifics

Cookies. When you visit an FNF Website, a "cookie" may be sent to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive. Information gathered using cookies helps us improve your user experience. For example, a cookie can help the website load properly or can customize the display page based on your browser type and user preferences. You can choose whether or not to accept cookies by changing your Internet browser settings. Be aware that doing so may impair or limit some functionality of the FNF Website.

Web Beacons. We use web beacons to determine when and how many times a page has been viewed. This information is used to improve our websites.

Do Not Track. Currently our FNF Websites do not respond to "Do Not Track" features enabled through your browser.

Links to Other Sites. FNF Websites may contain links to unaffiliated third-party websites. FNF is not responsible for the privacy practices or content of those websites. We recommend that you read the privacy policy of every website you visit.

Use of Personal Information

FNF uses Personal Information for three main purposes:

- To provide products and services to you or in connection with a transaction involving you.
- To improve our products and services.
- To communicate with you about our, our affiliates', and others' products and services, jointly or independently.

When Information Is Disclosed

We may disclose your Personal Information and Browsing Information in the following circumstances:

- to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure;
- to nonaffiliated service providers who provide or perform services or functions on our behalf and who agree to use the information only to provide such services or functions;

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- to nonaffiliated third party service providers with whom we perform joint marketing, pursuant to an agreement with them to jointly market financial products or services to you;
- to law enforcement or authorities in connection with an investigation, or in response to a subpoena or court order; or
- in the good-faith belief that such disclosure is necessary to comply with legal process or applicable laws, or to protect the rights, property, or safety of FNF, its customers, or the public.

The law does not require your prior authorization and does not allow you to restrict the disclosures described above. Additionally, we may disclose your information to third parties for whom you have given us authorization or consent to make such disclosure. We do not otherwise share your Personal Information or Browsing Information with nonaffiliated third parties, except as required or permitted by law. We may share your Personal Information with affiliates (other companies owned by FNF) to directly market to you. Please see "Choices with Your Information" to learn how to restrict that sharing.

We reserve the right to transfer your Personal Information, Browsing Information, and any other information, in connection with the sale or other disposition of all or part of the FNF business and/or assets, or in the event of bankruptcy, reorganization, insolvency, receivership, or an assignment for the benefit of creditors. By submitting Personal Information and/or Browsing Information to FNF, you expressly agree and consent to the use and/or transfer of the foregoing information in connection with any of the above described proceedings.

Security of Your Information
We maintain physical, electronic, and procedural safeguards to protect your Personal Information.

Choices With Your Information
If you do not want FNF to share your information among our affiliates to directly market to you, you may send an "opt out" request as directed at the end of this Privacy Notice. We do not share your Personal Information with nonaffiliates for their use to direct market to you without your consent.

Whether you submit Personal Information or Browsing Information to FNF is entirely up to you. If you decide not to submit Personal Information or Browsing Information, FNF may not be able to provide certain services or products to you.

For California Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties, except as permitted by California law. For additional information about your California privacy rights, please visit the "California Privacy" link on our website (https://fnf.com/pages/californiaprivacy.aspx) or call (888) 413-1748.

For Nevada Residents: You may be placed on our internal Do Not Call List by calling (888) 934-3354 or by contacting us via the information set forth at the end of this Privacy Notice. Nevada law requires that we also provide you with the following contact information: Bureau of Consumer Protection, Office of the Nevada Attorney General, 555 E. Washington St., Suite 3900, Las Vegas, NV 89101; Phone number: (702) 486-3132; email: BCPINFO@ag.state.nv.us.

For Oregon Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties for marketing purposes, except after you have been informed by us of such sharing and had an opportunity to indicate that you do not want a disclosure made for marketing purposes.

For Vermont Residents: We will not disclose information about your creditworthiness to our affiliates and will not disclose your personal information, financial information, credit report, or health information to nonaffiliated third parties to market to you, other than as permitted by Vermont law, unless you authorize us to make those disclosures.

Information From Children
The FNF Websites are not intended or designed to attract persons under the age of eighteen (18).We do not collect Personal Information from any person that we know to be under the age of thirteen (13) without permission from a parent or guardian.

International Users
FNF's headquarters is located within the United States. If you reside outside the United States and choose to provide Personal Information or Browsing Information to us, please note that we may transfer that information outside of your country of residence. By providing FNF with your Personal Information and/or Browsing Information, you consent to our collection, transfer, and use of such information in accordance with this Privacy Notice.

FNF Website Services for Mortgage Loans
Certain FNF companies provide services to mortgage loan servicers, including hosting websites that collect customer information on behalf of mortgage loan servicers (the "Service Websites"). The Service Websites may contain links to both this Privacy Notice and the mortgage loan servicer or lender's privacy notice. The sections of this Privacy Notice titled When Information is Disclosed, Choices with Your Information, and Accessing and Correcting Information do not apply to the Service Websites. The mortgage loan servicer or lender's privacy notice governs use, disclosure, and access to your Personal Information. FNF does not share Personal Information collected through the Service Websites, except as required or authorized by contract with the mortgage loan servicer or lender, or as required by law or in the good-faith belief that such disclosure is necessary: to comply with a legal process or applicable law, to enforce this Privacy Notice, or to protect the rights, property, or safety of FNF or the public.

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Your Consent To This Privacy Notice; Notice Changes; Use of Comments or Feedback

By submitting Personal Information and/or Browsing Information to FNF, you consent to the collection and use of the information in accordance with this Privacy Notice. We may change this Privacy Notice at any time. The Privacy Notice's effective date will show the last date changes were made. If you provide information to us following any change of the Privacy Notice, that signifies your assent to and acceptance of the changes to the Privacy Notice.

Accessing and Correcting Information; Contact Us

If you have questions, would like to correct your Personal Information, or want to opt-out of information sharing for affiliate marketing, visit FNF's Opt Out Page or contact us by phone at (888) 934-3354 or by mail to:

Fidelity National Financial, Inc.
601 Riverside Avenue
Jacksonville, Florida 32204
Attn: Chief Privacy Officer

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Attachment 3-C

Title Report

Part 2

Parcel 345513300020

Re1521 Oxbow Drive Suite 200
Montrose, CO 81401
Phone: (970) 252-0160
Fax: (970) 252-0191

DATE: **February 11, 2021**
FILE NUMBER: **598-F0701116-397-DG0**
PROPERTY ADDRESS: **6687 2200 Road, Delta, CO 81416-9374**
BUYER/BORROWER: **Garnet Mesa Land LLC**
OWNER(S): **Kenneth E. Norell and Paula Jo Norell**
YOUR REFERENCE NUMBER:
ASSESSOR PARCEL NUMBER: **R024736**

PLEASE TAKE NOTE OF THE FOLLOWING REVISED TERMS CONTAINED HEREIN:

None.

WIRED FUNDS ARE REQUIRED ON ALL CASH PURCHASE TRANSACTIONS. FOR WIRING INSTRUCTIONS, PLEASE CONTACT YOUR ESCROW OFFICE AS NOTED ON THE TRANSMITTAL PAGE OF THIS COMMITMENT.

TO:	**Fidelity National Title Company** **1521 Oxbow Drive Suite 200** **Montrose, CO 81401**	ATTN: PHONE: FAX: E-MAIL:	**Diane Gorrono** **(970) 252-0160** (970) 252-0191 **dgorrono@fnf.com**

TO:	**Lone Eagle Land Brokerage, Inc.** **21263 Hwy 550** **Montrose, CO 81401**	**ATTN:** **PHONE:** **FAX:** **E-MAIL:**	**Bryan Walchle** **(970) 249-4300** **(970) 249-1313** **bryan@eagleland.com**
TO:	**Lone Eagle Land Brokerage, Inc.** **21263 Hwy 550** **Montrose, CO 81401**	**ATTN:** **PHONE:** **FAX:** **E-MAIL:**	**Bryan Walchle** **(970) 249-4300** **(970) 249-1313** **bryan@eagleland.com**
TO:	**Steve Yelon**	**ATTN:** **PHONE:** **FAX:** **E-MAIL:**	 **syelton00@gmail.com**
TO:	**Lisa Carlson**	**ATTN:** **PHONE:** **FAX:** **E-MAIL:**	 **lcarlson@fnf.com**
TO:	**Montrose** **1521 Oxbow Drive Suite 200** **Montrose, CO 81401**	**ATTN:** **PHONE:** **FAX:** **E-MAIL:**	**Diane Gorrono** **(970) 252-0160** **(970) 252-0191** **dgorrono@fnf.com**

END OF TRANSMITTAL

COMMITMENT FOR TITLE INSURANCE

Issued by

Fidelity National Title Insurance Company

NOTICE

IMPORTANT—READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRA CONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

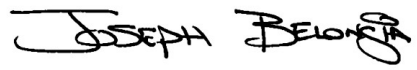
THE COMPANY'S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and the Commitment Conditions, **Fidelity National Title Insurance Company**, a Florida Corporation (the "Company"), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Policy Amount and the name of the Proposed Insured.

If all of the Schedule B, Part I—Requirements have not been met within 6 Months after the Commitment Date, this Commitment terminates and the Company's liability and obligation end.

Countersigned by:



Authorized Signature

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by Fidelity National Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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AMERICAN LAND TITLE ASSOCIATION

COMMITMENT CONDITIONS

1. DEFINITIONS

(a) "Knowledge" or "Known": Actual or imputed knowledge, but not constructive notice imparted by the Public Records.

(b) "Land": The land described in Schedule A and affixed improvements that by law constitute real property. The term "Land" does not include any property beyond the lines of the area described in Schedule A, nor any right, title, interest, estate, or easement in abutting streets, roads, avenues, alleys, lanes, ways, or waterways, but this does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.

(c) "Mortgage": A mortgage, deed of trust, or other security instrument, including one evidenced by electronic means authorized by law.

(d) "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.

(e) "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.

(f) "Proposed Policy Amount": Each dollar amount specified in Schedule A as the Proposed Policy Amount of each Policy to be issued pursuant to this Commitment.

(g) "Public Records": Records established under state statutes at the Commitment Date for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without Knowledge.

(h) "Title": The estate or interest described in Schedule A.

2. If all of the Schedule B, Part I—Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:

(a) the Notice;
(b) the Commitment to Issue Policy;
(c) the Commitment Conditions;
(d) Schedule A;
(e) Schedule B, Part I—Requirements;
(f) Schedule B, Part II—Exceptions; and
(g) a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company shall not be liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY

(a) The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:

(i) comply with the Schedule B, Part I—Requirements;
(ii) eliminate, with the Company's written consent, any Schedule B, Part II—Exceptions; or
(iii) acquire the Title or create the Mortgage covered by this Commitment.

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AMERICAN LAND TITLE ASSOCIATION

(b) The Company shall not be liable under Commitment Condition 5(a) if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.
(c) The Company will only have liability under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.
(d) The Company's liability shall not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Conditions 5(a)(i) through 5(a)(iii) or the Proposed Policy Amount.
(e) The Company shall not be liable for the content of the Transaction Identification Data, if any.
(f) In no event shall the Company be obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I—Requirements have been met to the satisfaction of the Company.
(g) In any event, the Company's liability is limited by the terms and provisions of the Policy.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT

(a) Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.
(b) Any claim must be based in contract and must be restricted solely to the terms and provisions of this Commitment.
(c) Until the Policy is issued, this Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.
(d) The deletion or modification of any Schedule B, Part II—Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.
(e) Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.
(f) When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT HAS BEEN ISSUED BY AN ISSUING AGENT

The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for the purpose of providing closing or settlement services.

8. PRO-FORMA POLICY

The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

9. ARBITRATION

The Policy contains an arbitration clause. All arbitrable matters when the Proposed Policy Amount is $2,000,000 or less shall be arbitrated at the option of either the Company or the Proposed Insured as the exclusive remedy of the parties. A Proposed Insured may review a copy of the arbitration rules at <http://www.alta.org/arbitration>.

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AMERICAN LAND TITLE ASSOCIATION

Transaction Identification Data for reference only:

Issuing Agent:	Fidelity National Title Company
Issuing Office:	8055 E Tufts Ave, Suite 300, Denver, CO 80237
Loan ID Number:	
Issuing Office File Number:	598-F0701116-397-DG0
Property Address:	6687 2200 Road, Delta, CO 81416-9374
Revision Number:	

SCHEDULE A

AMERICAN LAND TITLE ASSOCIATION COMMITMENT

1. Commitment Date: **January 21, 2021**
2. Policy to be issued:
   (a) **ALTA Owners Policy 6-17-06**
   Proposed Insured: **Garnet Mesa Land LLC**
   Proposed Policy Amount: **$1,080,000.00**
   (b) **None**
   Proposed Insured:
   Proposed Policy Amount: **$0.00**
   (c) **None**
   Proposed Insured:
   Proposed Policy Amount: **$0.00**
3. The estate or interest in the Land described or referred to in this Commitment is:
   FEE SIMPLE
4. The Title is, at the Commitment Date, vested in:
   Kenneth E. Norell and Paula Jo Norell
5. The Land is described as follows:
   See Exhibit A attached hereto and made a part hereof.

PREMIUMS:

Owners Coverage	2,597.00
Tax Certificate	13.50
Tax Certificate	75.00

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EXHIBIT A
LEGAL DESCRIPTION

The N1/2 SW1/4, the S1/2 NE1/4, the NW1/4 SE1/4, the W1/2 NE1/4 SE1/4, the SE1/4 NE1/4 SE1/4, and the South 132 feet of the S1/2 S1/2 SW1/4 NW1/4, all in Section 13, T 15 S, R 95 W, 6TH Principal Meridian.

TOGETHER with part of Lot 23, Phase IV, Pleasant Valley Major Subdivision MJ 02-020 which is located in the SE1/4 SW1/4 and the E1/2 SW1/4 SW1/4 of Section 13, T 15 S, R 95 W, 6TH Principal Meridian, the said part of Lot 23 being further described follows: Beginning at the Northeast corner of said Lot 23 which is the Northeast Corner of the said SE1/4 SW1/4 (the Center South 1/16 corner of said Section 23); thence on the East line of said Lot 23 which is the East line of the said SE1/4 SW1/4 S 00°04'28" W, 160.20 feet to the Southeast corner of said Lot 23; thence on the Southerly line of said Lot 23 the following three (3) courses: (a) S 74°22'03" W, 444.28 feet; (b) N 85°41'57" W, 539.01 feet; and (c) S 70°19'24" W, 349.36 feet (previously described as S 70°23'26" W, 348.86 feet); thence S 65°45'45" W, 297.98 feet to the said Southerly line of Lot 23; thence on the said Southerly line of Lot 23 the following two (2) Courses (a) N 65°15'40" W, 147.28 feet; and (b) N 84°57'27" W, 310.88 feet to the Southwest corner of said Lot 23 being a point on the West line of the said E1/2 SW1/4 SW1/4; thence on the West line of said Lot 23 N 00°04'24" E, 415.57 feet to the Northwest corner of said Lot 23 being the Northwest Corner of the said E1/2 SW1/4 SW1/4; thence on the North line of said Lot 23 the following two (2) Courses: (a) S 89°17'06" E, 669.76 feet the North line of the said E1/2 SW1/4 SW1/4 to the Northeast corner of the said E1/2 SW1/4 SW1/4 (the Southwest 1/16 Corner of said Section 23); and (b) S 89°17'06" E, 1339.52 feet on the North line of the said SE1/4 SW1/4 to the point of beginning.

Except that portion of Lot 23 now described as Lot 23A of Replat of Lot 23, Phase IV, Pleasant Valley Major Subdivision MJ 02-020, recorded July 16, 2018 at Reception No. 704678,

County of Delta, State of Colorado

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AMERICAN LAND TITLE ASSOCIATION

SCHEDULE B

PART I – REQUIREMENTS

All of the following Requirements must be met:

a. Pay the agreed amounts for the interest in the land and/or for the mortgage to be insured.

b. Pay us the premiums, fees and charges for the policy.

c. Obtain a certificate of taxes due from the county treasurer or the county treasurer's authorized agent.

d. Evidence that any and all assessments for common expenses, if any, have been paid.

e. The Company will require that an Affidavit and Indemnity Agreement be completed by the party(s) named below before the issuance of any policy of title insurance.

Party(s): Kenneth E. Norell and Paula Jo Norell

The Company reserves the right to add additional items or make further requirements after review of the requested Affidavit.

f. Deed sufficient to convey the fee simple estate or interest in the Land described or referred to herein, to the Proposed Insured Purchaser.

g. Furnish for recordation a full release of deed of trust:

Amount:	$717,000.00
Trustor/Grantor:	Kenneth E. Norell and Norell Paula Jo
Trustee:	Public Trustee of Delta County
Loan No.:	Unknown
Beneficiary:	American Agcredit FLCA
Recording Date:	June 19, 2015
Recording No:	680939

h. Prior to issuing its policy of title insurance, the Company will require evidence satisfactory to the Company that Garnet Mesa Investments, LLC, is currently (and as of date of Title Policy) in good standing and authorized to do business in the State or Country where the said Entity was formed.

i. Recordation of Statement of Authority for Garnet Mesa Investments, LLC pursuant to Colorado Revised Statutes evidencing the existence of the entity and authority of the person(s) authorized to execute and deliver instruments affecting title to real property on behalf of the entity and containing other information required by Colorado Revised Statutes.

j. Furnish to the Company an Improvement Location Certificate in form, content and certification to Fidelity National Title Insurance Company and Fidelity National Title Company.

Note: Certificate of Permanent Location for a Manufactured Home recorded November 21, 2018 at Reception No. 707421.

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AMERICAN LAND TITLE ASSOCIATION

SCHEDULE B
PART I – Requirements
(Continued)

Click to view Tax Info

Note: Please be aware that due to the conflict between federal and state laws concerning the cultivation, distribution, manufacture or sale of marijuana, the Company is not able to close or insure any transaction involving Land that is associated with these activities.

NOTE: Exception(s) number(ed) 1-4 will not appear on the Owner's Policy. Exception number 5 will be removed from the policy provided the company conducts the closing.

24 MONTH CHAIN OF TITLE, FOR INFORMATIONAL PURPOSES ONLY:

The following vesting deeds relating to the subject property have been recorded in the Clerk and Recorder's office of the County in which the property is located:

There are no conveyances affecting said land recorded within 24 months of the date of this report

END OF REQUIREMENTS

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SCHEDULE B

PART II – EXCEPTIONS

THIS COMMITMENT DOES NOT REPUBLISH ANY COVENANT, CONDITION, RESTRICTION, OR LIMITATION CONTAINED IN ANY DOCUMENT REFERRED TO IN THIS COMMITMENT TO THE EXTENT THAT THE SPECIFIC COVENANT, CONDITION, RESTRICTION, OR LIMITATION VIOLATES STATE OR FEDERAL LAW BASED ON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, GENDER IDENTITY, HANDICAP, FAMILIAL STATUS, OR NATIONAL ORIGIN.

The Policy will not insure against loss or damage resulting from the terms and provisions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

1. Any facts, rights, interests or claims that are not shown by the Public Records but which could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.

2. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.

3. Any encroachments, encumbrances, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by Public Records.

4. Any lien or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law and not shown by the Public Records.

5. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the Public Records or attaching subsequent to the effective date hereof but prior to the date the proposed Insured acquires of record for the value the estate or interest or mortgage thereon covered by this Commitment.

   NOTE: Upon satisfaction of all requirements herein, the above exception will not be reflected on any proposed title policy identified in Schedule A.

6. Water rights, claims of title to water, whether or not these matters are shown by the Public Records.

7. All taxes and assessments, now or heretofore assessed, due or payable.

   NOTE: This tax exception will be amended at policy upon satisfaction and evidence of payment of taxes.

8. Reservations contained in the Patent
   From: The United States of America
   Patent No: 1028159

   Which among other things recites as follows:

   Any vested and accrued water rights for mining, agricultural, manufacturing or other purposes and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by local customs, laws and decisions of courts.

9. Reservations contained in the Patent

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by Fidelity National Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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AMERICAN LAND TITLE ASSOCIATION

SCHEDULE B
PART II – Exceptions
(Continued)

From: The United States of America
Patent No: 1159152

Which among other things recites as follows:

The right to prospect for, mine and remove all oil, gas and other mineral deposits.

A right of way thereon for ditches or canals constructed by the authority of the United States of America.

Any vested and accrued water rights for mining, agricultural, manufacturing or other purposes and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by local customs, laws and decisions of courts.

The right of the proprietor of a vein or lode to extract and remove his ore therefrom should the same be found to penetrate or intersect the premises hereby granted as provided by law.

10. Reservations contained in the Patent

From: The United States of America
Recording Date: November 12, 1914
Recording No: Book 118 at Page 69

Which among other things recites as follows:

The right to prospect for, mine and remove all oil, gas and other mineral deposits.

A right of way thereon for ditches or canals constructed by the authority of the United States of America.

Any vested and accrued water rights for mining, agricultural, manufacturing or other purposes and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by local customs, laws and decisions of courts.

11. Terms, conditions, provisions, agreements and obligations contained in the Oil and Gas Lease and any and all interests therein or rights thereunder as set forth below:

Recording Date: March 7, 1955
Recording No.: 268358

12. Terms, conditions, provisions, agreements and obligations contained in the Oil and Gas Lease, and any and all interests therein or rights thereunder as set forth below:

Recording Date: May 26, 1955
Recording No.: 269913

13. Rights of way, together with the terms, conditions, provisions, agreements and obligations contained in the instrument as set forth below:

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AMERICAN LAND TITLE ASSOCIATION

SCHEDULE B
PART II – Exceptions
(Continued)

Recording Date: January 15, 1958
Recording No.: Book 354 at Page 82

14. Terms, conditions, provisions, agreements and obligations contained in the Agreement recoded in Book 126 at Page 49.

15. Terms, conditions, provisions, agreements and obligations contained in the Agreement recorded in Book 188 at Page 34.

16. Terms, conditions, provisions, agreements and obligations contained in the Agreement recorded August 20, 1968 in Book 42 at Page 432 at Reception No. 326870.

17. Terms, conditions, restrictions, provisions, notes and easements but omitting any covenants or restrictions, if any, including but not limited to those based upon race, color, religion, sex, sexual orientation, familial status, marital status, disability, handicap, national origin, ancestry, or source of income, as set forth in applicable state or federal laws, except to the extent that said covenant or restriction is permitted by applicable law, as set forth on the Plat(s) of said subdivision set forth below:

    Recording Date: July 3, 2008
    Recording No: 626932

18. Covenants, conditions and restrictions and lien rights but omitting any covenants or restrictions, if any, including but not limited to those based upon race, color, religion, sex, sexual orientation, familial status, marital status, disability, handicap, national origin, ancestry, or source of income, as set forth in applicable state or federal laws, except to the extent that said covenant or restriction is permitted by applicable law, as set forth in the document

    Recording Date: January 13, 2004
    Recording No: 575508

19. Terms, conditions, provisions, agreements and obligations contained in the easement deed as set forth below:

    Recording Date: December 29, 2005
    Recording No.: 599073

20. Terms, conditions, provisions, agreements, restrictions and obligations contained in the QuitClaim Deed as set forth below:

    Recording Date: July 3, 2008
    Recording No.: 626933

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by Fidelity National Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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AMERICAN LAND TITLE ASSOCIATION

SCHEDULE B
PART II – Exceptions
(Continued)

21. Easement(s), together with its terms, agreements, provisions, conditions, reservations and obligations for the purpose(s) shown below and rights incidental thereto, as granted in a document:
Granted to: Delta-Montrose Electric Association
Purpose: general right-of-way
Recording Date: January 3, 2005
Recording No: 587052

22. Easement(s), together with its terms, agreements, provisions, conditions, reservations and obligations for the purpose(s) shown below and rights incidental thereto, as granted in a document:

Granted to: Delta-Montrose Electric Association, a Colorado electric cooperative association
Purpose: telecommunications cable system
Recording Date: March 17, 2017
Recording No: 693949

23. Terms, conditions, restrictions, provisions, notes and easements but omitting any covenants or restrictions, if any, including but not limited to those based upon race, color, religion, sex, sexual orientation, familial status, marital status, disability, handicap, national origin, ancestry, source of income, gender, gender identity, gender expression, medical condition or genetic information, as set forth in applicable state or federal laws, except to the extent that said covenant or restriction is permitted by applicable law, as set forth on the Plat(s) of said subdivision set forth below:

Recording Date: July 16, 2018
Recording No: 704678

24. Terms, conditions, provisions, agreements and obligations contained in the Right-of-Way and Access Easement as set forth below:

Recording Date: September 25, 2020
Recording No.: 722198

25. Terms, conditions, provisions, agreements and obligations contained in the Right-of-Way and Access Easement as set forth below:

Recording Date: October 19, 2020
Recording No.: 722946

26. Any loss or damage arising from the fact that any fence lines on or near the perimeter of the Land may not coincide with property lines.

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AMERICAN LAND TITLE ASSOCIATION

SCHEDULE B
PART II – Exceptions
(Continued)

END OF EXCEPTIONS

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by Fidelity National Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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AFFIDAVIT AND INDEMNITY AGREEMENT

TO Fidelity National Title Company a Colorado Corporation and Fidelity National Title Insurance Company, a Florida Corporation.

1. This is written evidence to you that there are no unpaid bills, and to the extent there may be unpaid bills, that the undersigned undertakes and agrees to cause the same to be paid such that there shall be no mechanics or materialmen's liens affecting the property for materials or labor furnished for construction and erection, repairs or improvements contracted by or on behalf of the undersigned on property:

   legally described as:

   See Attached Affidavit and Indemnity Agreement Legal Description

   Property Address: 6687 2200 Road, Delta, CO 81416-9374

2. We further represent that to the actual knowledge and belief of the undersigned there are no public improvements affecting the property prior to the date of closing that would give rise to a special property tax assessment against the property after the date of closing.

3. We further represent that to the actual knowledge and belief of the undersigned there are no pending proceedings or unsatisfied judgments of record, in any Court, State, or Federal, nor any tax liens filed or taxes assessed against us which may result in liens, and that if there are judgments, bankruptcies, probate proceedings, state or federal tax liens of record against parties with same or similar names, that they are not against us.

4. We further represent that there are no unrecorded contracts, leases, easements, or other agreements or interests relating to said premises of which we have knowledge.

5. We further represent that to the actual knowledge and belief of the undersigned we are in sole possession of the real property described herein other than leasehold estates reflected as recorded items under the subject commitment for title insurance.

6. We further represent that there are no unpaid charges and assessments that could result in a lien in favor of any association of homeowners which are provided for in any document referred to in Schedule B of Commitment referenced above.

7. We further understand that any payoff figures shown on the settlement statement have been supplied to Fidelity National Title Company as settlement agent by the seller's/borrower's lender and are subject to confirmation upon tender of the payoff to the lender. If the payoff figures are inaccurate, we hereby agree to immediately pay any shortage(s) that may exist. If applicable as disclosed or referred to on Schedule A of Commitment referenced above.

   The undersigned affiant(s) know the matters herein stated are true and indemnifies Fidelity National Title Company, a Colorado Corporation and Fidelity National Title Insurance Company, a Florida Corporation against loss, costs, damages and expenses of every kind incurred by it by reason of its reliance on the statements made herein.

   This agreement is executed with and forms a part of the sale and/or financing of the above described premises, and is given in addition to the conveyance and/or financing of the premises in consideration for the conveyance and/or financing, and forms a complete agreement by itself for any action thereon.

SELLER:

_____
Kenneth E. Norell

SELLER:

_____

SELLER:

Paula Jo Norell

SELLER:

_____

State of Colorado }ss:
County of **Delta**

The foregoing instrument was acknowledged, subscribed, and sworn to before me on _____ by Kenneth E. Norell and Paula Jo Norell.

(SEAL)

_____
Notary Public
My Commission Expires:

ATTACHED AFFIDAVIT AND INDEMNITY AGREEMENT
LEGAL DESCRIPTION

The N1/2 SW1/4, the S1/2 NE1/4, the NW1/4 SE1/4, the W1/2 NE1/4 SE1/4, the SE1/4 NE1/4 SE1/4, and the South 132 feet of the S1/2 S1/2 SW1/4 NW1/4, all in Section 13, T 15 S, R 95 W, 6TH Principal Meridian.

TOGETHER with part of Lot 23, Phase IV, Pleasant Valley Major Subdivision MJ 02-020 which is located in the SE1/4 SW1/4 and the E1/2 SW1/4 SW1/4 of Section 13, T 15 S, R 95 W, 6TH Principal Meridian, the said part of Lot 23 being further described follows: Beginning at the Northeast corner of said Lot 23 which is the Northeast Corner of the said SE1/4 SW1/4 (the Center South 1/16 corner of said Section 23); thence on the East line of said Lot 23 which is the East line of the said SE1/4 SW1/4 S 00°04'28" W, 160.20 feet to the Southeast corner of said Lot 23; thence on the Southerly line of said Lot 23 the following three (3) courses: (a) S 74°22'03" W, 444.28 feet; (b) N 85°41'57" W, 539.01 feet; and (c) S 70°19'24" W, 349.36 feet (previously described as S 70°23'26" W, 348.86 feet); thence S 65°45'45" W, 297.98 feet to the said Southerly line of Lot 23; thence on the said Southerly line of Lot 23 the following two (2) Courses (a) N 65°15'40" W, 147.28 feet; and (b) N 84°57'27" W, 310.88 feet to the Southwest corner of said Lot 23 being a point on the West line of the said E1/2 SW1/4 SW1/4; thence on the West line of said Lot 23 N 00°04'24" E, 415.57 feet to the Northwest corner of said Lot 23 being the Northwest Corner of the said E1/2 SW1/4 SW1/4; thence on the North line of said Lot 23 the following two (2) Courses: (a) S 89°17'06" E, 669.76 feet the North line of the said E1/2 SW1/4 SW1/4 to the Northeast corner of the said E1/2 SW1/4 SW1/4 (the Southwest 1/16 Corner of said Section 23); and (b) S 89°17'06" E, 1339.52 feet on the North line of the said SE1/4 SW1/4 to the point of beginning.

Except that portion of Lot 23 now described as Lot 23A of Replat of Lot 23, Phase IV, Pleasant Valley Major Subdivision MJ 02-020, recorded July 16, 2018 at Reception No. 704678,

County of Delta, State of Colorado

DISCLOSURE STATEMENT

- Pursuant to Section 38-35-125 of Colorado Revised Statutes and Colorado Division of Insurance Regulation 8-1-2 (Section 5), if the parties to the subject transaction request us to provide escrow-settlement and disbursement services to facilitate the closing of the transaction, then all funds submitted for disbursement must be available for immediate withdrawal.
- Colorado Division of Insurance Regulation 8-1-2, Section 5, Paragraph H, requires that "Every title insurance company shall be responsible to the proposed insured(s) subject to the terms and conditions of the title insurance commitment, other than the effective date of the title insurance commitment, for all matters which appear of record prior to the time of recording whenever the title insurance company, or its agent, conducts the closing and settlement service that is in conjunction with its issuance of an owners policy of title insurance and is responsible for the recording and filing of legal documents resulting from the transaction which was closed". Provided that Fidelity National Title Company conducts the closing of the insured transaction and is responsible for recording the legal documents from the transaction, exception No. 5 in Schedule B-2 will not appear in the Owner's Title Policy and Lender's Title Policy when issued.
- Colorado Division of Insurance Regulation 8-1-2, Paragraph M of Section 5, requires that prospective insured(s) of a single family residence be notified in writing that the standard exception from coverage for unfiled Mechanics or Materialmans Liens may or may not be deleted upon the satisfaction of the requirement(s) pertinent to the transaction. These requirements will be addressed upon receipt of a written request to provide said coverage, or if the Purchase and Sale Agreement/Contract is provided to the Company then the necessary requirements will be reflected on the commitment.
- Colorado Division of Insurance Regulation 8-1-3, Paragraph C. 11.f. of Section 5 - requires a title insurance company to make the following notice to the consumer: “A closing protection letter is available to be issued to lenders, buyers and sellers.”
- If the sales price of the subject property exceeds $100,000.00 the seller shall be required to comply with the Disclosure of Withholding Provisions of C.R.S. 39-22-604.5 (Nonresident Withholding).
- Section 39-14-102 of Colorado Revised Statutes requires that a Real Property Transfer Declaration accompany any conveyance document presented for recordation in the State of Colorado. Said Declaration shall be completed and signed by either the grantor or grantee.
- Recording statutes contained in Section 30-10-406(3)(a) of the Colorado Revised Statutes require that all documents received for recording or filing in the clerk and recorder's office shall contain a top margin of at least one inch and a left, right, and bottom margin of at least one-half of an inch. The clerk and recorder may refuse to record or file a document that does not conform to requirements of this paragraph.
- Section 38-35-109 (2) of the Colorado Revised Statutes, requires that a notation of the purchasers legal address, (not necessarily the same as the property address) be included on the face of the deed to be recorded.
- Regulations of County Clerk and Recorder's offices require that all documents submitted for recording must contain a return address on the front page of every document being recorded.
- Pursuant to Section 10-11-122 of the Colorado Revised Statutes, the Company is required to disclose the following information:
    - The subject property may be located in a special taxing district.
    - A Certificate of Taxes Due listing each taxing jurisdiction shall be obtained from the County Treasurer or the County Treasurer's authorized agent.
    - Information regarding special districts and the boundaries of such districts may be obtained from the Board of County Commissioners, the County Clerk and Recorder or the County Assessor.
- Pursuant to Section 10-11-123 of the Colorado Revised Statutes, when it is determined that a mineral estate has been severed from the surface estate, the Company is required to disclose the following information: that there is recorded evidence that a mineral estate has been severed, leased, or otherwise conveyed from the surface estate and that there is a substantial likelihood that a third party holds some or all interest in oil, gas, other minerals, or geothermal energy in the property; and that such mineral estate may include the right to enter and use the property without the surface owner's permission.

Note: Notwithstanding anything to the contrary in this Commitment, if the policy to be issued is other than an ALTA Owner's Policy (6/17/06), the policy may not contain an arbitration clause, or the terms of the arbitration clause may be different from those set forth in this Commitment. If the policy does contain an arbitration clause, and the Amount of Insurance is less than the amount, if any, set forth in the arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties.

Wire Fraud Alert

This Notice is not intended to provide legal or professional advice. If you have any questions, please consult with a lawyer.

All parties to a real estate transaction are targets for wire fraud and many have lost hundreds of thousands of dollars because they simply relied on the wire instructions received via email, without further verification. **If funds are to be wired in conjunction with this real estate transaction, we strongly recommend verbal verification of wire instructions through a known, trusted phone number prior to sending funds.**

In addition, the following non-exclusive self-protection strategies are recommended to minimize exposure to possible wire fraud.

- **NEVER RELY** on emails purporting to change wire instructions. Parties to a transaction rarely change wire instructions in the course of a transaction.
- **ALWAYS VERIFY** wire instructions, specifically the ABA routing number and account number, by calling the party who sent the instructions to you. DO NOT use the phone number provided in the email containing the instructions, use phone numbers you have called before or can otherwise verify. **Obtain the phone number of relevant parties to the transaction as soon as an escrow account is opened**. DO NOT send an email to verify as the email address may be incorrect or the email may be intercepted by the fraudster.
- **USE COMPLEX EMAIL PASSWORDS** that employ a combination of mixed case, numbers, and symbols. Make your passwords greater than eight (8) characters. Also, change your password often and do NOT reuse the same password for other online accounts.
- **USE MULTI-FACTOR AUTHENTICATION** for email accounts. Your email provider or IT staff may have specific instructions on how to implement this feature.

For more information on wire-fraud scams or to report an incident, please refer to the following links:

Federal Bureau of Investigation:
http://www.fbi.gov

Internet Crime Complaint Center:
http://www.ic3.gov

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FIDELITY NATIONAL FINANCIAL, INC.
PRIVACY NOTICE

Effective April 9, 2020

Fidelity National Financial, Inc. and its majority-owned subsidiary companies (collectively, "FNF," "our," or "we") respect and are committed to protecting your privacy. This Privacy Notice explains how we collect, use, and protect personal information, when and to whom we disclose such information, and the choices you have about the use and disclosure of that information.

A limited number of FNF subsidiaries have their own privacy notices. If a subsidiary has its own privacy notice, the privacy notice will be available on the subsidiary's website and this Privacy Notice does not apply.

Collection of Personal Information

FNF may collect the following categories of Personal Information:

- contact information (*e.g.*, name, address, phone number, email address);
- demographic information (*e.g.*, date of birth, gender, marital status);
- identity information (*e.g.* Social Security Number, driver's license, passport, or other government ID number);
- financial account information (*e.g.* loan or bank account information); and
- other personal information necessary to provide products or services to you.

We may collect Personal Information about you from:

- information we receive from you or your agent;
- information about your transactions with FNF, our affiliates, or others; and
- information we receive from consumer reporting agencies and/or governmental entities, either directly from these entities or through others.

Collection of Browsing Information

FNF automatically collects the following types of Browsing Information when you access an FNF website, online service, or application (each an "FNF Website") from your Internet browser, computer, and/or device:

- Internet Protocol (IP) address and operating system;
- browser version, language, and type;
- domain name system requests; and
- browsing history on the FNF Website, such as date and time of your visit to the FNF Website and visits to the pages within the FNF Website.

Like most websites, our servers automatically log each visitor to the FNF Website and may collect the Browsing Information described above. We use Browsing Information for system administration, troubleshooting, fraud investigation, and to improve our websites. Browsing Information generally does not reveal anything personal about you, though if you have created a user account for an FNF Website and are logged into that account, the FNF Website may be able to link certain browsing activity to your user account.

Other Online Specifics

Cookies. When you visit an FNF Website, a "cookie" may be sent to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive. Information gathered using cookies helps us improve your user experience. For example, a cookie can help the website load properly or can customize the display page based on your browser type and user preferences. You can choose whether or not to accept cookies by changing your Internet browser settings. Be aware that doing so may impair or limit some functionality of the FNF Website.

Web Beacons. We use web beacons to determine when and how many times a page has been viewed. This information is used to improve our websites.

Do Not Track. Currently our FNF Websites do not respond to "Do Not Track" features enabled through your browser.

Links to Other Sites. FNF Websites may contain links to unaffiliated third-party websites. FNF is not responsible for the privacy practices or content of those websites. We recommend that you read the privacy policy of every website you visit.

Use of Personal Information

FNF uses Personal Information for three main purposes:

- To provide products and services to you or in connection with a transaction involving you.
- To improve our products and services.
- To communicate with you about our, our affiliates', and others' products and services, jointly or independently.

When Information Is Disclosed

We may disclose your Personal Information and Browsing Information in the following circumstances:

- to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure;
- to nonaffiliated service providers who provide or perform services or functions on our behalf and who agree to use the information only to provide such services or functions;

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- to nonaffiliated third party service providers with whom we perform joint marketing, pursuant to an agreement with them to jointly market financial products or services to you;
- to law enforcement or authorities in connection with an investigation, or in response to a subpoena or court order; or
- in the good-faith belief that such disclosure is necessary to comply with legal process or applicable laws, or to protect the rights, property, or safety of FNF, its customers, or the public.

The law does not require your prior authorization and does not allow you to restrict the disclosures described above. Additionally, we may disclose your information to third parties for whom you have given us authorization or consent to make such disclosure. We do not otherwise share your Personal Information or Browsing Information with nonaffiliated third parties, except as required or permitted by law. We may share your Personal Information with affiliates (other companies owned by FNF) to directly market to you. Please see "Choices with Your Information" to learn how to restrict that sharing.

We reserve the right to transfer your Personal Information, Browsing Information, and any other information, in connection with the sale or other disposition of all or part of the FNF business and/or assets, or in the event of bankruptcy, reorganization, insolvency, receivership, or an assignment for the benefit of creditors. By submitting Personal Information and/or Browsing Information to FNF, you expressly agree and consent to the use and/or transfer of the foregoing information in connection with any of the above described proceedings.

Security of Your Information
We maintain physical, electronic, and procedural safeguards to protect your Personal Information.

Choices With Your Information
If you do not want FNF to share your information among our affiliates to directly market to you, you may send an "opt out" request by email, phone, or physical mail as directed at the end of this Privacy Notice. We do not share your Personal Information with nonaffiliates for their use to direct market to you without your consent.

Whether you submit Personal Information or Browsing Information to FNF is entirely up to you. If you decide not to submit Personal Information or Browsing Information, FNF may not be able to provide certain services or products to you.

For California Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties, except as permitted by California law. For additional information about your California privacy rights, please visit the "California Privacy" link on our website (https://fnf.com/pages/californiaprivacy.aspx) or call (888) 413-1748.

For Nevada Residents: You may be placed on our internal Do Not Call List by calling (888) 934-3354 or by contacting us via the information set forth at the end of this Privacy Notice. Nevada law requires that we also provide you with the following contact information: Bureau of Consumer Protection, Office of the Nevada Attorney General, 555 E. Washington St., Suite 3900, Las Vegas, NV 89101; Phone number: (702) 486-3132; email: BCPINFO@ag.state.nv.us.
For Oregon Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties for marketing purposes, except after you have been informed by us of such sharing and had an opportunity to indicate that you do not want a disclosure made for marketing purposes.

For Vermont Residents: We will not disclose information about your creditworthiness to our affiliates and will not disclose your personal information, financial information, credit report, or health information to nonaffiliated third parties to market to you, other than as permitted by Vermont law, unless you authorize us to make those disclosures.

Information From Children
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If you have questions, would like to correct your Personal Information, or want to opt-out of information sharing for affiliate marketing, send your requests to privacy@fnf.com, by phone to (888) 934-3354, or by mail to:

Fidelity National Financial, Inc.
601 Riverside Avenue
Jacksonville, Florida 32204
Attn: Chief Privacy Officer

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Attachment 3-C

Title Report

Part 3

Parcel 345523100001 & 345523200009

Remit Payment To:

The Title Company of Delta County
721 Main St. Ste #6
Delta, CO 81416

INVOICE

Billed To:
Shaffer Real Estate Company
P.O. Box 220
Austin, Colorado 81401

Invoice Date: November 13, 2020
Please Pay Before:
Our File Number: 32011003
Your Reference Number:

Property:
6469 2050 rd & 20426 & TBD G rd
Delta, CO 81416

Brief Legal:

DESCRIPTION	AMOUNT
Policy premium for Owner's (policy $4700.75 less $1645.27 re-issue rate)	3,055.48
Copies	4.75
Invoice Total Amount Due	**$ 3,060.23**

Title Company of Delta County
721 Main St. Ste #6
Delta, CO 81416
ph: 970-874-9557
fax: 970-874-9566
titlecodelta@aol.com

ranchbroker@tds.net

bryan@eagleland.com

COMMITMENT FOR TITLE INSURANCE

FIDELITY NATIONAL TITLE INSURANCE COMPANY

FIDELITY NATIONAL TITLE INSURANCE COMPANY, a Florida company ("Company"), for a valuable consideration, hereby commits to issue its policy or policies of title insurance, as identified in Schedule A, in favor of the Proposed Insured named in Schedule A, as owner or mortgagee of the estate or interest covered hereby in the land described or referred to in Schedule A, upon payment of the premiums and charges therefore; all subject to the provisions of Schedule A and B and to the Conditions and Stipulations hereof.

This Commitment shall be effective only when the identity of the Proposed Insured and the amount of the policy or policies committed for have been inserted in Schedule A hereof by the Company, either at the time of the issuance of this Commitment or by subsequent endorsement.

This Commitment is preliminary to the issuance of such policy or policies of title insurance and all liability and obligations hereunder shall cease and terminate within six (6) months after the effective date hereof or when the policy or policies committed for shall issue, whichever first occurs, provided that the failure to issue such policy or policies is not the fault of the Company. This Commitment shall not be valid or binding until countersigned by an authorized officer or agent.

IN WITNESS WHEREOF, FIDELITY NATIONAL TITLE INSURANCE COMPANY has caused its corporate name and seal to be hereunto affixed and these presents to be signed in facsimile under authority of its by-laws on the date shown in Schedule A.

FIDELITY NATIONAL TITLE INSURANCE COMPANY

By: _____
Authorized Officer or Agent

Robin S. Black
The Title Co Of Delta County
721 Main St Ste 6
Delta, CO 81416-1854
Tel:970-874-9557
Fax:970-874-9566

SEAL

By: _____

President

Attest: _____

Secretary

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CONDITIONS AND STIPULATIONS

1. The term "mortgage", when used herein, shall include deed of trust, trust deed, or other security instrument

2. If the proposed Insured has or acquires actual knowledge of any defect, lien, encumbrance, adverse claim or other matter affecting the estate or interest or mortgage thereon covered by this Commitment other than those shown in Schedule B hereof, and shall fail to disclose such knowledge to the Company in writing, the Company shall be relieved from liability for any loss or damage resulting from any act of reliance hereon to the extent the Company is prejudiced by failure to so disclose such knowledge. If the proposed Insured shall disclose such knowledge to the Company, or if the Company otherwise acquires actual knowledge of any such defect, lien encumbrance, adverse claim or other matter, the Company at its option may amend Schedule B of this Commitment accordingly, but such amendment shall not relieve the Company from liability previously incurred pursuant to paragraph 3 of these Conditions and Stipulations.

3. Liability of the Company under this Commitment shall be only to the named proposed Insured and such parties included under the definition of Insured in the form of policy or policies committed for and only for actual loss incurred in reliance hereon in undertaking in good faith (a) to comply with the requirements hereof, or (b) to eliminate exceptions shown in Schedule B, or (c) to acquire or create the estate or interest or mortgage thereon covered by this Commitment. In no event shall such liability exceed the amount stated in Schedule A for the policy or policies committed for and such liability is subject to the insuring provisions, the Conditions and Stipulations, and Exclusions from Coverage of the form of policy or policies committed for in favor of the proposed Insured which are hereby incorporated by reference and are made a part of this Commitment except as expressly modified herein.

4. Any action or actions or rights of action that the proposed Insured may have or may bring against the Company arising out of the status of the title to the estate or interest or the status of the mortgage thereon covered by this Commitment must be based on and are subject to the provisions of this Commitment.

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Fidelity National Title Insurance Company

Commitment Number: 32011003

SCHEDULE A

1. Commitment Date: November 8, 2020 at 08:00 AM

2. Policy (or Policies) to be issued: Policy Amount

   (a) Owner's Policy (ALTA Own.Policy(06/17/06)) $ 2,355,000.00
   Proposed Insured:
   Garnet Mesa Land LLC

   (b) Loan Policy
   Proposed Insured:

3. Fee Simple interest in the land described in this Commitment is owned, at the Commitment Date, by:
   Gary Volk and Gail Volk

4. The land referred to in the Commitment is described as follows:
   SEE SCHEDULE C ATTACHED HERETO

Fidelity National Title Insurance Company

By: _____
The Title Company of Delta County, LLC

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AMERICAN LAND TITLE ASSOCIATION

Fidelity National Title Insurance Company

Commitment Number: 32011003

SCHEDULE B - SECTION I
REQUIREMENTS

The following requirements must be met:

1.. Payment of taxes and assessments now a lien due and payable.

2. Release of the Deed of Trust from Gary Volk and Gail Volk to the Public Trustee of Delta County for the use of Bank of Colorado, to secure $1,177,906.68, dated November 28, 2017 and recorded November 29, 2017 at Reception Number 699762.

3. Release of the Deed of Trust from Gary Volk and Gail Volk to the Public Trustee of Delta County for the use of Bank of Colorado, to secure $201,108.00, dated May 3, 2019 and recorded May 3, 2019 at Reception Number 710577.

4. Release of the Deed of Trust from Gary Volk and Gail Volk to the Public Trustee of Delta County for the use of Bank of Colorado, to secure $150,938.81, dated March 31, 2020 and recorded April 3, 2020 at Reception Number 717990.

5. Release of the Deed of Trust from Gary Volk and Gail Volk to the Public Trustee of Delta County for the use of Bank of Colorado, to secure $100,245.00, dated March 31, 2020 and recorded April 3, 2020 at Reception Number 717991.

6. Release of the Deed of Trust from Gary Volk and Gail Volk to the Public Trustee of Delta County for the use of Bank of Colorado, to secure $300,000.00, dated April 1, 2020 and recorded April 3, 2020 at Reception Number 717992.

7. Warranty Deed from Gary Volk and Gail Volk to Garnet Mesa Land LLC, conveying the land described herein.

8. Statement of authority of agreement of Garnet Mesa Land LLC, identifying the partners thereof.
Record with the Clerk and Recorder of Delta.

9. Receipt of Certificate of Good Standing or other evidence of Corporate existance from the Secretary of State of Colorado, showing the existence of Garnet Mesa Land LLC.

10. SUBJECT TO OVER LIMIT APPROVAL BY FIDELITY NATIONAL TITLE INSURANCE COMPANY.

11. NOTICE: Due to the conflict between federal and state laws concerning the cultivation, distribution, manufacture or sale of marijuana, the Company is not able to close or insure any transaction involving Land that is associated with these activities.

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AMERICAN LAND TITLE ASSOCIATION

Fidelity National Title Insurance Company

Commitment Number: 32011003

SCHEDULE B - SECTION II
EXCEPTIONS

Any policy we issue will have the following exceptions unless they are taken care of to our satisfaction.

1.. Right or claims of parties in possession not shown by the public records.

2. Easements, or claims of easements, not shown by the public records.

3. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, and any facts, which a correct survey and inspection of the premises would disclose, and which are not shown by the public records.

4. Any lien, or right to a lien, for services, labor, or material heretofore or hereafter furnished, imposed by law and not shown by the public records.

5. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the public records or attaching subsequent to the effective date hereof but prior to the date the proposed insured acquires of record for value the estate or interest or mortgage thereon covered by this Commitment.

6. All taxes and assessments now a lien due or payable.

7. The Owner's Policy to be issued, if any, shall contain the following items in addition to the ones set forth above:
(1) The Deed of Trust, if any, required under Schedule B.-Section 1, Item (b).
(2) Unpatented mining claims; reservations or exceptions in patents or in Acts authorizing issuance thereof; water rights, claims or title to water.
(3) Any and all unpaid taxes, assessments and unredeemed tax sales.

8. Reservations as contained in United States Patent recorded July 13, 1895 in Book 16 at Page 284, and Patent recorded July 13, 1895 in Book 16 at Page 285, said reservations being as follows: Right of the proprietor of a vein or lode to extract and remove his ore therefrom should the same be found to penetrate or intersect said premises. Right of way for ditches and canals constructed by the authority of the United States.

9. Reservation as contained in United States Patent recorded June 5, 1941 in Book 269 at Page 17, said reservation being as follows: Subject to any vested and accrued water rights for mining, agricultural, manufacturing, or other purposes and rights to ditches and reservoirs used in connection with such water rights, as may be recognized and acknowledged by the local customs, laws, and decisions of courts: but excepting, nerveless, and reserving unto the United States, rights of way over, across, and through said lands for canals and ditches constructed, or to be constructed, by it's authority, all in the manner prescribed and directed by the Act of Congress approved August 30, 1890 (26 Stat. 391). To secure payment to the United States, or it's successors in the ownership or control of the works constituting and appertaining to the said reclamation project, of all sums due or to become due the United States or it's successors in control of said reclamation project in connection with said land and water rights, a lien prior to all other liens, claims or demands whatsoever upon the lands herein and hereby described and conveyed, upon all water rights thereto appurtenant and upon the right tom receive and use water from the reservoirs and canals of said reclamation project, is expressly reserved.

10. Terms, conditions, stipulations, obligations and restrictions as may be contained by Instrument recorded December 30, 1913 in Book 118 at Page 482.

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AMERICAN LAND TITLE ASSOCIATION

Commitment Number: 32011003

11. An undivided one-half interest in all oil, gas and other mineral rights as reserved by M. J. Herding, recorded January 3, 1925 in Book 195 at Page 336, and any and all assignments thereof of interests therein.

12. A Pole Line Easement as granted to Delta-Montrose Electric Association, by instrument recorded January 4, 1993 in Book 695 at Page 537.

13. A Right of Way as granted Delta-Montrose Electric Association, by instrument recorded December 2, 1996 in Book 770 at Page 874.

14. Terms, conditions, stipulations, obligations and restrictions as may be contained by Boundary Line Agreement recorded June 3, 1997 in Book 780 at Page 356.

15. Terms, conditions, stipulations, obligations and restrictions as may be contained by Application and Reallocation of Project Water recorded December 19, 2016 at Reception Number 691990, and Application recorded July 28, 2017 at Reception Number 697030.

16. Any and all liens, burdens, obligations, easements and rights of way arising from or created by membership in, applications to or contracts with, including but not limited to, the GHA Lateral Ditch, Uncompahgre Valley Water Users and Tri-County Domestic Water.

17. Any portion of subject property lying within the right of way of County Roads.

18. Any loss or damage arising from the fact that the fence lines on or near the perimeter of subject property do not coincide with the exact property lines.

19. Rights of way for roads, ditches, laterals, flumes, pipes and power lines, and easements therefor, insofar as the same might affect subject property.

20. Terms, conditions, stipulations, obligations and restrictions as may be contained by Telecommunications Cable System Easement recorded March 17, 2017 at Reception Number 693947.

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AMERICAN LAND TITLE ASSOCIATION

Fidelity National Title Insurance Company

Commitment Number: 32011003

SCHEDULE C
PROPERTY DESCRIPTION

The land referred to in this Commitment is described as follows:

Parcel 1:
The NE ¼ of the SW ¼ of Section 14, Township 15 South, Range 95 West of the 6th P. M.,

County of Delta, State of Colorado.

Parcel 2:
The NE ¼ and the N ½ of the SE ¼ of Section 23, Township 15 South, Range 95 West of the 6th P.M.

Parcel 3:
The NE ¼ of the NW ¼ of Section 23, Township 15 South Range 95 West of the 6th P.M.
ALSO part of the E ½ of the NW ¼ of the NW ¼ of Section 23, T15S, R95W of the 6th P.M. Described as follows:
Beginning at the Northeast corner of the said E ½ NW ¼ NW ¼;
Thence on the East line of the Said E ½ NW ¼ NW ¼ S01°32'16", 1317.49 feet to the Southeast corner of the E ½ NW ¼ NW ¼;
Thence on the South line of the said E ½ NW ¼ NW ¼ N88° 33'50" W, 79.17 feet to an existing fence line;
Thence along the said existing fence line N03°04'13"E, 1317.93 feet to the North line of line said E ½ NW ¼ NW ¼;
Thence on the said North line S88 °40'52"E, 43.92 feet to the point of beginning.

County of Delta, State of Colorado.

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AMERICAN LAND TITLE ASSOCIATION

CHICAGO TITLE INSURANCE COMPANY
COMMONWEALTH LAND TITLE INSURANCE COMPANY
FIDELITY NATIONAL TITLE INSURANCE COMPANY

NOTICE OF AVAILABILITY OF CLOSING PROTECTION COVERAGE

TO: _____ DATE: _____

_____

Address or legal description of property which is the subject of this transaction:

_____

_____

If you are involved in a real estate transaction in which one or more policies of title insurance will be issued, you are also entitled to Closing Protection Letter. If a Loan Policy of title insurance insuring the title to the property you are buying is being issued to your mortgage lender and that lender has requested a Closing Protection Letter, you automatically receive the benefit of the Closing Protection Letter issued to the lender. If you are the seller, the Closing Protection Letter issued to the purchaser's lender does not provide the benefit of its terms to you. If the transaction in which you are involved is a cash transaction and no lender is involved, no Closing Protection Letter is being issued unless you specifically request it.

A Closing Protection Letter offers reimbursement for loss in connection with misappropriation of closing funds and noncompliance with written closing instructions. A Closing Protection Letter may be issued to protect you. The charge for this coverage is $25.00 per letter issued in connection with a real estate closing in which one or more of the Company's title insurance policies are being issued.

You may obtain a Closing Protection Letter if you request it at this time.

If you are uncertain as to whether you should obtain a Closing Protection Letter, you are urged to seek independent advice.

THE TITLE COMPANY OF DELTA COUNTY, LLC

By:_____

Authorized Agent

_____ I/We do request a Closing Protection Letter

_____ I/We do not request a Closing Protection Letter

DATE: _____ _____

NOTE: All parties in cash transactions must make an election above and sign. Otherwise, only the seller(s) must sign

_____

DISCLOSURE STATEMENT

- Pursuant to Section 38-35-125 of Colorado Revised Statutes and Colorado Division of Insurance Regulation 8-1-2 (Section 5), if the parties to the subject transaction request us to provide escrow-settlement and disbursement services to facilitate the closing of the transaction, then all funds submitted for disbursement must be available for immediate withdrawal.

- Colorado Division of Insurance Regulation 8-1-2, Section 5, Paragraph H, requires that "Every title insurance company shall be responsible to the proposed insured(s) subject to the terms and conditions of the title insurance commitment, other than the effective date of the title insurance commitment, for all matters which appear of record prior to the time of recording whenever the title insurance company, or its agent, conducts the closing and settlement service that is in conjunction with its issuance of an owners policy of title insurance and is responsible for the recording and filing of legal documents resulting from the transaction which was closed". Provided that XXXXXXXX Company conducts the closing of the insured transaction and is responsible for recording the legal documents from the transaction, exception No. 5 in Schedule B-2 will not appear in the Owner's Title Policy and Lender's Title Policy when issued.

- Colorado Division of Insurance Regulation 8-1-2, Paragraph M of Section 5, requires that prospective insured(s) of a single family residence be notified in writing that the standard exception from coverage for unfiled Mechanics or Materialmans Liens may or may not be deleted upon the satisfaction of the requirement(s) pertinent to the transaction. These requirements will be addressed upon receipt of a written request to provide said coverage, or if the Purchase and Sale Agreement/Contract is provided to the Company then the necessary requirements will be reflected on the commitment.

- Colorado Division of Insurance Regulation 8-1-3, Paragraph C. 11.f. of Section 5 - requires a title insurance company to make the following notice to the consumer: "A closing protection letter is available to be issued to lenders, buyers and sellers"

- If the sales price of the subject property exceeds $100,000.00 the seller shall be required to comply with the Disclosure of Withholding Provisions of C.R.S. 39-22-604.5 (Nonresident Withholding).

- Section 39-14-102 of Colorado Revised Statutes requires that a Real Property Transfer Declaration accompany any conveyance document presented for recordation in the State of Colorado. Said Declaration shall be completed and signed by either the grantor or grantee.

- Recording statutes contained in Section 30-10-406(3)(a) of the Colorado Revised Statutes require that all documents received for recording or filing in the clerk and recorder's office shall contain a top margin of at least one inch and a left, right, and bottom margin of at least one-half of an inch. The clerk and recorder may refuse to record or file a document that does not conform to requirements of this paragraph.

- Section 38-35-109 (2) of the Colorado Revised Statutes, 1973, requires that a notation of the purchasers legal address, (not necessarily the same as the property address) be included on the face of the deed to be recorded.

- Regulations of County Clerk and Recorder's offices require that all documents submitted for recording must contain a return address on the front page of every document being recorded.

- Pursuant to Section 10-11-122 of the Colorado Revised Statutes, 1987 the Company is required to disclose the following information:

    - The subject property may be located in a special taxing district.
    - A Certificate of Taxes Due listing each taxing jurisdiction shall be obtained from the County Treasurer or the County Treasurer's authorized agent.
    - Information regarding special districts and the boundaries of such districts may be obtained from the Board of County Commissioners, the County Clerk and Recorder or the County Assessor.

- Pursuant to Section 10-11-123 of the Colorado Revised Statutes, when it is determined that a mineral estate has been severed from the surface estate, the Company is required to disclose the following information: that there is recorded evidence that a mineral estate has been severed, leased, or otherwise conveyed from the surface estate and that there is a substantial likelihood that a third party holds some or all interest in oil, gas, other minerals, or geothermal energy in the property; and that such mineral estate may include the right to enter and use the property without the surface owner's permission.

Note: Notwithstanding anything to the contrary in this Commitment, if the policy to be issued is other than an ALTA Owner's Policy (6/17/06), the policy may not contain an arbitration clause, or the terms of the arbitration clause may be different from those set forth in this Commitment. If the policy does contain an arbitration clause, and the Amount of Insurance is less than the amount, if any, set forth in the arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties.

FIDELITY NATIONAL FINANCIAL
PRIVACY NOTICE

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Fidelity National Financial, Inc. and its majority-owned subsidiary companies (collectively, "FNF," "our," or "we") respect and are committed to protecting your privacy. This Privacy Notice explains how we collect, use, and protect personal information, when and to whom we disclose such information, and the choices you have about the use and disclosure of that information.

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Collection of Personal Information

FNF may collect the following categories of Personal Information:

- contact information (*e.g.*, name, address, phone number, email address);
- demographic information (*e.g.*, date of birth, gender, marital status);
- identity information (*e.g.* Social Security Number, driver's license, passport, or other government ID number);
- financial account information (*e.g.* loan or bank account information); and
- other personal information necessary to provide products or services to you.

We may collect Personal Information about you from:

- information we receive from you or your agent;
- information about your transactions with FNF, our affiliates, or others; and
- information we receive from consumer reporting agencies and/or governmental entities, either directly from these entities or through others.

Collection of Browsing Information

FNF automatically collects the following types of Browsing Information when you access an FNF website, online service, or application (each an "FNF Website") from your Internet browser, computer, and/or device:

- Internet Protocol (IP) address and operating system;
- browser version, language, and type;
- domain name system requests; and
- browsing history on the FNF Website, such as date and time of your visit to the FNF Website and visits to the pages within the FNF Website.

Like most websites, our servers automatically log each visitor to the FNF Website and may collect the Browsing Information described above. We use Browsing Information for system administration, troubleshooting, fraud investigation, and to improve our websites. Browsing Information generally does not reveal anything personal about you, though if you have created a user account for an FNF Website and are logged into that account, the FNF Website may be able to link certain browsing activity to your user account.

Other Online Specifics

Cookies. When you visit an FNF Website, a "cookie" may be sent to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive. Information gathered using cookies helps us improve your user experience. For example, a cookie can help the website load properly or can customize the display page based on your browser type and user preferences. You can choose whether or not to accept cookies by changing your Internet browser settings. Be aware that doing so may impair or limit some functionality of the FNF Website.

Web Beacons. We use web beacons to determine when and how many times a page has been viewed. This information is used to improve our websites.

Do Not Track. Currently our FNF Websites do not respond to "Do Not Track" features enabled through your browser.

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Links to Other Sites. FNF Websites may contain links to unaffiliated third-party websites. FNF is not responsible for the privacy practices or content of those websites. We recommend that you read the privacy policy of every website you visit.

Use of Personal Information

FNF uses Personal Information for three main purposes:

- To provide products and services to you or in connection with a transaction involving you.
- To improve our products and services.
- To communicate with you about our, our affiliates', and others' products and services, jointly or independently.

When Information Is Disclosed

We may disclose your Personal Information and Browsing Information in the following circumstances:

- to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure;
- to nonaffiliated service providers who provide or perform services or functions on our behalf and who agree to use the information only to provide such services or functions;
- to nonaffiliated third party service providers with whom we perform joint marketing, pursuant to an agreement with them to jointly market financial products or services to you;
- to law enforcement or authorities in connection with an investigation, or in response to a subpoena or court order; or
- in the good-faith belief that such disclosure is necessary to comply with legal process or applicable laws, or to protect the rights, property, or safety of FNF, its customers, or the public.

The law does not require your prior authorization and does not allow you to restrict the disclosures described above. Additionally, we may disclose your information to third parties for whom you have given us authorization or consent to make such disclosure. We do not otherwise share your Personal Information or Browsing Information with nonaffiliated third parties, except as required or permitted by law. We do share Personal Information among affiliates (other companies owned by FNF) to directly market to you. Please see "Choices with Your Information" to learn how to restrict that sharing.

We reserve the right to transfer your Personal Information, Browsing Information, and any other information, in connection with the sale or other disposition of all or part of the FNF business and/or assets, or in the event of bankruptcy, reorganization, insolvency, receivership, or an assignment for the benefit of creditors. By submitting Personal Information and/or Browsing Information to FNF, you expressly agree and consent to the use and/or transfer of the foregoing information in connection with any of the above described proceedings.

Security of Your Information

We maintain physical, electronic, and procedural safeguards to protect your Personal Information.

Choices With Your Information

If you do not want FNF to share your information among our affiliates to directly market to you, you may send an "opt out" request by email, phone, or physical mail as directed at the end of this Privacy Notice. We do not share your Personal Information with nonaffiliates for their use to direct market to you.

Whether you submit Personal Information or Browsing Information to FNF is entirely up to you. If you decide not to submit Personal Information or Browsing Information, FNF may not be able to provide certain services or products to you.

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For Nevada Residents: You may be placed on our internal Do Not Call List by calling (888) 934-3354 or by contacting us via the information set forth at the end of this Privacy Notice. Nevada law requires that we also provide you with the following contact information: Bureau of Consumer Protection, Office of the Nevada Attorney General, 555 E. Washington St., Suite 3900, Las Vegas, NV 89101; Phone number: (702) 486-3132; email: BCPINFO@ag.state.nv.us.

For Oregon Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties for marketing purposes, except after you have been informed by us of such sharing and had an opportunity to indicate that you do not want a disclosure made for marketing purposes.

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Jacksonville, Florida 32204
Attn: Chief Privacy Officer

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284 (1107) 10175. PRE-EMPTION AND CASH ENTRY PATENT.—John Hoyt, Successor to Oliver, Page, Hoyt & Co., Stationers, Chicago.

THE UNITED STATES OF AMERICA,

Ute series
Certificate No. 839

To all to Whom these Presents shall come, GREETING:

Whereas, Emil Schweizer of Delta County Colorado

has deposited in the General Land Office of the United States a Certificate of the Register of the Land Office at Montrose, Colorado whereby it appears that full payment has been made by the said Emil Schweizer

according to the provisions of the Act of Congress of the 24th of April, 1820, entitled "An Act making further provision for the sale of the Public Lands," and the acts supplemental thereto for the North half of the North East Quarter, the south East Quarter of the North East Quarter, and the North East Quarter of the south East Quarter of Section twenty-three in Township fifteen South of Range ninety-five West of the sixth Principal Meridian, in Colorado containing one hundred and sixty acres.

according to the Official Plat of the Survey of the said Lands, returned to the General Land Office by the Surveyor General, which said Tract has been purchased by the said Emil Schweizer

Now Know Ye, That the United States of America, in consideration of the premises, and in conformity with the several Acts of Congress in such case made and provided, have given and granted, and by these presents do give and grant unto the said Emil Schweizer and to his heirs, the said Tract above described: To Have and to Hold the same, together with all the rights, privileges, immunities and appurtenances, of whatsoever nature, thereunto belonging, unto the said Emil Schweizer and to his heirs and assigns forever; subject to any vested and accrued water rights for mining, agricultural, manufacturing or other purposes, and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by the local customs, laws and decisions of Courts, and also subject to the right of the proprietor of a vein or lode to extract and remove his ore therefrom, should the same be found to penetrate or intersect the premises hereby granted, as provided by law. and there is reserved from the lands hereby granted, a right of way thereon for ditches or canals constructed by the authority of the United States

In Testimony Whereof, I, Grover Cleveland President of the United States of America, have caused these letters to be made patent, and the Seal of the General Land Office to be hereunto affixed.

Given under my hand, at the City of Washington, the twentieth day of March, in the year of our Lord one thousand eight hundred and Ninety-five, and of the Independence of the United States the one hundred and Ninetenth.

U.S. GENERAL [SEAL] LAND OFFICE

BY THE PRESIDENT: Grover Cleveland

By M. McKean Secretary.

L. Q. C. Lamar Recorder of the General Land Office.

Recorded, Vol. 3A Page 287

Filed for Record the 13" day of July A. D. 1895, at 10 o'clock A.M.

C. D. Johnson
Recorder.

By Deputy.

(1107) 10176 PRE-EMPTION AND CASH ENTRY PATENT. John Morris, successor to Colton, Page, Boyce & Co., Stockbridge, Chicago.

THE UNITED STATES OF AMERICA,

Ute Series

Certificate No. 828

To all to Whom these Presents shall come, GREETING:

Whereas, Charles Schweizer of Delta County, Colorado

has deposited in the General Land Office of the United States a Certificate of the Register of the Land Office at Montrose Colorado whereby it appears that full payment has been made by the said Charles Schweizer according to the provisions of the Act of Congress of the 24th of April, 1820, entitled "An Act making further provision for the sale of the Public Lands," and the acts supplemental thereto, for the East half of the North West quarter, the South West quarter of the North East Quarter and the North West Quarter of the South East Quarter of Section twenty-three in Township fifteen South of Range ninety-five West of the Sixth Principal Meridian, in Colorado, Containing one hundred and sixty acres

according to the Official Plat of the Survey of the said Lands, returned to the General Land Office by the Surveyor General, which said Tract has been purchased by the said Charles Schweizer

Now Know Ye, That the United States of America, in consideration of the premises, and in conformity with the several Acts of Congress in such case made and provided, have given and granted, and by these presents do give and grant unto the said Charles Schweizer and to his heirs, the said Tract above described: To Have and to Hold the same, together with all the rights, privileges, immunities and appurtenances, of whatsoever nature, thereunto belonging, unto the said Charles Schweizer and to his heirs and assigns forever; subject to any vested and accrued water rights for mining, agricultural, manufacturing or other purposes, and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by the local customs, laws and decisions of Courts; and also subject to the right of the proprietor of a vein or lode to extract and remove his ore therefrom, should the same be found to penetrate or intersect the premises hereby granted, as provided by law. and there is reserved from the lands hereby granted, a right of way thereon for ditches or canals constructed by the authority of the United States

In Testimony Whereof, I, Grover Cleveland President of the United States of America, have caused these letters to be made patent, and the Seal of the General Land Office to be hereunto affixed.

Given under my hand, at the City of Washington, the twentieth day of March, in the year of our Lord one thousand eight hundred and Ninety-five, and of the Independence of the United States the one hundred and nineteenth.

U.S. GENERAL LAND OFFICE [SEAL]

BY THE PRESIDENT: Grover Cleveland

By W. McKean Secretary.

L. Q. C. Lamar Recorder of the General Land Office.

Recorded, Vol. 3 A Page 286

Filed for Record the 13th day of July A. D. 1895, at 10 o'clock A. M.

C. E. Johnson Recorder

By Deputy.

199139 PATENT

United States TO Jennie A. Welch

Filed for record June 6, 1941 at 2:25 o'clock P.M.

O. A. Ehrgott Recorder
MW

Denver 036987 4--1046

THE UNITED STATES OF AMERICA,

To all to whom these presents shall come, Greeting:

WHEREAS, the Act of Congress approved August 9, 1912, entitled "An Act providing for patents on reclamation entries, and for other purposes," provides--

"That every patent and water-right certificate issued under this Act shall expressly reserve to the United States a prior lien on the land patented or for which water right is certified, together with all water rights appurtenant or belonging thereto, superior to all othe liens, claims or demands whatsoever for the payment of all sums due or to become due to the United States or its successors in control of the irrigation project in connection with such lands and water rights."

And it is further provided:

"That no person shall at any one time or in any manner, except as hereinafter otherwise provided, acquire, own or hold irrigable land for which entry or water-right application shall have been made under the said reclamation Act of June seventeenth, nineteen hundred and two, and Acts supplementary thereto and amendatory thereof, before final payment in full of all installments of building and betterment charges shall have been made on account of such land in excess of one farm unit as fixed by the Secretary of the Interior as the limit of area per entry of public land or per single ownership of private land for which a water right may be purchased respectively, nor in any case in excess of one hundred and sixty acres, now shall water be furnished under said Acts nor a water right sold or recognized for such excess; but any such excess land acquired at any time in good faith by descent, by will, or by foreclosure of any lien may be held for two years and no longer after its acquisition; and every excess holding prohibited as aforesaid shall be forfeited to the United States by proceedings instituted by the Attorney General for that purpose in any court of competent jurisdiction; and this proviso shall be recited in every patent and water-right certificate issued by the United States under the provisions of this Act."

And WHEREAS, it appears from a Certificate of the Register at Denver, Colorado, that Jennie A. Welch, assignee by mesne conveyance of John B. Jacobson, is under the provisions of said Act, entitled to a patent for the Farm Unit "L", according to the Farm Unit Plat, or the Northeast quarter of the southwest quarter of Section fourteen in Township fifteen south of Range ninety-five west of the Sixth Principal Meridian, Colorado, containing forty acres, according to the Official Plat of the Survey of the said Land, on file in the General Land Office:

NOW KNOW YE, That the UNITED STATES OF AMERICA, In consideration of the premises, and in conformity with the several Acts of

1

Denver 036987 4--1048

Congress in such case made and provided, HAS GIVEN AND GRANTED, and by these presents DOES GIVE AND GRANT, unto the said Jennie A. Welch and to her heirs, the Tract above described, together with the right to the use of water from the Uncompahgre Reclamation Project as an appurtenance to the irrigable lands in said tract; TO HAVE AND TO HOLD the same together with all the rights, privileges, immunities, and appurtenances, of whatsoever nature, thereunto belonging, unto the said Jennie A. Welch and to her heirs and assigns forever; subject to any vested and accrued water rights for mining, agricultural, manufacturing, or other purposes, and rights to ditches

and reservoirs used in connection with such water rights, as may be recognized and acknowledged by the local customs, laws, and decisions of courts; but excepting, nevertheless, and reserving unto the United States, rights of way over, across, and through said lands for canals and ditches constructed, or to be constructed, by its authority, all in the manner prescribed and directed by the Act of Congress approved August 30, 1890 (26 Stat., 391). To secure payment to the United States, or its successors in the ownership or control of the works constituting and appertaining to the said reclamation project, of all sums due or to become due the United States or its successors in control of said reclamation project in connection with said land and water rights, a lien prior and superior to all other liens, claims, or demands whatsoever upon the lands he herein and hereby described and conveyed, upon all water rights thereto appurtenant and upon the right to receive and use water from the reservoirs and canals of said reclamation project, is expressly reserved.

IN TESTIMONY WHEREOF, I, Franklin D. Roosevelt, President of the United States of America, have caused these letters to be made Patent, and the Seal of the General Land Office to be hereunto affixed. GIVEN under my hand, at the City of Washington, the NINTH day of MAY in the year of our Lord one thousand nine hundred and FORTY-ONE and of the Independence of the United States the one hundred and SIXTY-FIFTH

By the President: Franklin D. Roosevelt

By Jeanne Kavanagh : Secretary

(Official Seal)

R. S. Clinton
Chief, Patents Division, General Land Office.

RECORDED: Patent Number 1111271

2

199145 ✓

DEED OF GIFT

John R. Cline TO Roy G. & Marjorie I. Long

Filed for record June 7, 1941 at 10:20 o'clock A.M.

O. A. Ehrgott Recorder

MW

DEED OF GIFT

THIS INDENTURE, Made this 15th day of November, A.D. 1940, between JOHN R. CLINE, party of the first part, and ROY G. LONG and MARJORIE I. LONG, parties of the second part:

WITNESSETH: WHEREAS, ROY G. LONG is the step-son of JOHN R. CLINE, and MARJORIE I. LONG is the wife of ROY G. LONG;

NOW, THEREFORE, in consideration of natural love and affection which he has unto said ROY G. LONG and MARJORIE I. LONG, and for the better support and maintenance of said ROY G. LONG and MARJORIE I. LONG, JOHN R. CLINE does heregy give, grant, convey and confirm unto the said ROY G. LONG and MARJORIE I. LONG, their heirs and assigns forever, all that certain piece of property described as follows, to wit:

> The West Half of the Southwest Quarter of the Southwest Quarter (W½SW¼SW¼), Section Two (2), and the East Half of the Southeast Quarter of the Southeast Quarter (E½SE¼SE¼), Section Three (3), all in Township Fifteen (15), South, Range Ninety-five (95), West of the Sixth Principal Meridian, in Delta County, Colorado, containing forty (40) acres more or less, together with all ditches, ditch and water rights unto the same belonging and used in its irrigation.

TO HAVE AND TO HOLD the same, together with all the tenements, hereditaments and appurtenances thereto belonging, unto the said ROY G. LONG and MARJORIE I. LONG, their heirs,

65689 RECEIPT.

United States to John B. Jacobson,

Filed for record at 10 o'clock A. M. Dec. 30, 1913,

W. A. Shepherd, Recorder,

A. N.

DEPARTMENT OF THE INTERIOR,

UNITED STATES LAND OFFICE,

Montrose, Colorado,

August 13, 1912.

John B. Jacobson,

Delta, Colorado.

In reference to your final proof in support of homestead entry No. 0960, you are advised that under date of July 11, 1912, the Assistant Commissioner of the General Land Office has examined said proof and found the same to be sufficient as to residence, cultivation and improvement.

(A copy of the decision is enclosed.

Very respectfully,

P. B Blair, Register,

William C. Blair, Receiver.

359.

Homestead

John B Jacobson

Attest this marginal entry this 5 day of Jan A.D. 1914 at 1 o'clock P.M. W A Shepherd County Clerk.

#65772

No. 123671

500—WARRANTY DEED.—Out West Printing and Stationery Co., Colorado Springs, Colo.

This Deed, Made this twenty fifth day of October in the year of our Lord one thousand nine hundred and twenty four between Mrs F. J. Harding

of the County of Delta, and State of Colorado, of the first part, and Charles E. Dedisse and Martha Dedisse

of the City and County of Denver, and State of Colorado, of the second part:

Witnesseth, That the said party of the first part, for and in consideration of the sum of One dollar and other good and valuable consideration ##### Dollars, to the said party of the first part in hand paid by the said party of the second part, the receipt whereof is hereby confessed and acknowledged, has granted, bargained, sold and conveyed, and by these presents do grant, bargain, sell, convey and confirm unto the said party of the second part, their heirs and assigns forever, all the following described lot or parcel of land, situate, lying and being in the County of Delta and State of Colorado, to-wit:

An undivided one half interest in and to the following described lands:- The Northeast quarter and the North half of the Southeast quarter of Section Twenty three, Township Fifteen South of Range Ninety five and West of the Sixth Principal Meridian, containing 240 acres more or less according to the Government survey. Less rights of way for roads and ditches as now existing and subject to the debt and call of The Uncompahgre Valley Water Users Association.

Also included and conveyed are all water rights and priviledges, including all laterals and waste-ways, rights of way and priorities and all laterals, ditch and water rights appurtenant or attached to said land.

One half of all oil and gas rights are hereby reserved by the first party.

Together with all and singular the hereditaments and appurtenances thereunto belonging, or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof; and all the estate, right, title, interest, claim and demand whatsoever of the said party of the first part, either in law or equity, of, in and to the above bargained premises, with the hereditaments and appurtenances.

To Have and to Hold The said premises above bargained and described, with the appurtenances, unto the said party of the second part, their heirs and assigns forever. And the said Mrs. F. J. Harding party of the first part, for herself and heirs, executors and administrators, does covenant, grant, bargain and agree to and with the said party of the second part, their heirs and assigns, that at the time of the ensealing and delivery of these presents they are well seized of the premises above conveyed, as of good, sure, perfect, absolute and indefeasible estate of inheritance, in law, in fee simple, and have good right, full power and lawful authority to grant, bargain, sell and convey the same, in manner and form aforesaid, and that the same are free and clear from all former and other grants, bargains, sales, liens, taxes, assessments and incumbrances, of whatever kind or nature soever; One half of all oil and gas rights are reserved. Subject to the requirements and assessments of the Uncompahgre Valley Water Users Ass'n and the taxes for 1924 due in 1925

and the above bargained premises, in the quiet and peaceable possession of the said parties of the second part, their heirs and assigns, against all and every person or persons lawfully claiming or to claim the whole or any part thereof, the said party of the first part shall and will Warrant and Forever Defend.

In Witness Whereof, The said party of the first part has hereunto set her hand and seal the day and year first above written.

SIGNED, SEALED AND DELIVERED IN PRESENCE OF

Mrs. F. J. Harding Seal

$ 1.50 Documentary Revenue Stamps. Seal

10/15 1924 Seal

Seal

STATE OF COLORADO, } ss.
County of Delta }

I, A Notary Public in and for said Delta County, in the State aforesaid, do hereby certify that Mrs. F. J. Harding who is personally known to me to be the person whose name is subscribed to the annexed Deed, appeared before me this day in person, and acknowledged that she signed, sealed and delivered the said instrument of writing as her free and voluntary act for the uses and purposes therein set forth.

Notarial Seal

Given under my hand and Notarial seal, this 15th day of December A. D. 1924

My commission expires February 14, 1925

Eugene S. Corbin

Filed for record the 3 day of Jan. A. D. 1925, at 11:00 o'clock A. M.

Paul K. Osborne Recorder.

By N. E. Clack GS Deputy.

W.O. 10081-02531 (Bruce)

10:28A
5.00
1-4-93
537

465048

DELTA-MONTROSE ELECTRIC ASSOCIATION

POLE LINE EASEMENT

KNOW ALL MEN BY THESE PRESENTS:

That Harold J. and Lois M. Brandstadt

of the county of Delta and State of Colorado, Grantors, for the sum of one ($1.00) dollar, and other good and valuable considerations, the receipt whereof is hereby acknowledged, do hereby grant, bargain, sell, warrant and convey unto DELTA-MONTROSE ELECTRIC ASSOCIATION, an electric cooperative of the State of Colorado, its successors and assigns, Grantee, the right, privilege, and easement forever to enter upon the real property of the Grantors, situated in the county of Delta, State of Colorado, to-wit:

A perpetual easement and right of way for the erection and continued maintenance, repair, alteration and replacement of the electric transmission and distribution circuits of the Grantee, with the necessary towers, poles, guys, stubs, cross-arms and other attachments thereon, affixed thereto, for the support of said circuits, to be erected and maintained upon and across the premises of the Grantor as described as follows:

A General Easement, 25 foot in width, (12.5 feet either side of the center line as construction), located in the NE¼NW¼, of Section 23, Township 15S, Range 95W of the 6th Principal Meridian, on grantor's property as described in Delta County Records, Book 529, Page 793.

DELTA COUNTY, CO 465048 01/04/93 10:28A
BK0695 PG537 JOSEPHINE M.GORE,RECORDER 1 OF 1

Together with all rights of ingress and egress necessary or convenient for the full and complete use, occupation and enjoyment of the easement hereby granted, and all rights and privileges incident thereto, including the right to cut and remove timber, trees, brush, overhanging branches and other obstructions which may injure or interfere with the Grantee's use, occupation or enjoyment of this easement.

It is understood that, whenever necessary, words used in this instrument in the singular shall be construed to read the plural and that words used in the masculine gender shall be construed to read in the feminine.

TO HAVE AND TO HOLD, said Easement, together with all singular the rights and privileges appertaining thereto, unto said DELTA-MONTROSE ELECTRIC ASSOCIATION, its successors and assigns forever.

Signed and delivered this 22nd day of December, 19 92.

DON R. WEISBART NOTARY PUBLIC STATE OF COLORADO

Harold J. Brandstadt (SEAL)
Harold J. Brandstadt

Lois M. Brandstadt (SEAL)
Lois M. Brandstadt

STATE OF COLORADO)
COUNTY OF Delta) ss

The foregoing instrument was acknowledged before me this 22nd day of December, 19 92, by Harold J. and Lois M. Brandstadt. Witness my hand and official seal.

My Commission Expires: My Commission Expires

Section(s) 23 Township 15S
Range 95W 6th. P.M.

NOTARY PUBLIC

Reissued 10/92

AD030

500612 12/02/1996 02:19P B: 770 P: 674
Delta County Clerk & Recorder Lela J. McCracken

DELTA-MONTROSE ELECTRIC ASSOCIATION

GENERAL RIGHT-OF-WAY EASEMENT

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned, (whether one or more)

Harold J. Brandstadt and Lois M. Brandstadt (hereinafter called the "Grantor") for good and valuable consideration do grant, bargain, sell, warrant and convey unto DELTA-MONTROSE ELECTRIC ASSOCIATION, an electric cooperative of the State of Colorado (herein called the "Cooperative") and to it's successors and assigns, the right, privilege, and easement forever to enter upon the real property of the Grantor (s), situated in the County of Delta, State of Colorado, and more particularly as follows:

A general easement, 10 feet in width, (5 feet either side of the center line as constructed) located in the NE1/4 NW1/4 of Section 23, Township 15 South, Range 95 West, of the 6th Principal Meridian, on grantor's property as described in Delta County Records, Book 418, Page 440.

...including, in addition, such additional area as is necessary to properly guy, angle, and dead-end structures located upon said right-of-way. The right-of-way easement hereby granted authorizes either an overhead and/or underground electrical system or a combination thereof.

Grantor further grants unto the Cooperative the right to construct, operate and maintain an electric transmission and /or distribution line or system on or under the above-described lands and/or in, upon or under all streets, roads or highways abutting said lands; to inspect and make such repairs, changes, alterations, improvements, removal from, substitutions, and additions to it's facilities as Cooperative may from time to time deem advisable, including, by way of example and not by way of limitation:

the right to increase or decrease the number of poles, towers, fixtures, guy wires, conduits, wires, cables, vaults, transformers, pads, and enclosures;

the right, at Cooperative's option, at any future date, to replace any above ground facilities described above with underground facilities used for the same or similar purposes and to reconstruct, replace, remove, maintain, and upgrade such underground facilities;

the right to cut, trim and control the growth by chemical means, machinery or otherwise of trees and shrubbery to the extent necessary to keep them clear of said electric lines or system, and to cut down from time to time all dead, weak, leaning or dangerous trees that are tall enough to strike said electric line or system in falling;

Grantor further grants unto the Cooperative, and it's successors and assigns, the right of ingress and egress from the above described right-of-way by means of existing roads and lanes, if there is such on Grantor's lands, or by such routes as shall be agreed upon by Grantor and the Cooperative.

Grantor agrees that all poles, wires and other facilities, installed in, on, above, or under the described lands at the Cooperative's expense either wholly or partially, shall remain the property of the Cooperative, removable at the option of the Cooperative.

Grantor reserves the right to occupy, use, and landscape said easement for all purposes not inconsistent with the rights granted to Cooperative so long as said use does not damage or interfere with the Cooperative's facilities or the maintenance, repair and replacement thereof. Grantor shall install no structures or facilities of any kind on, over, under or across said easement without the written approval of Cooperative.

Cooperative shall use due care and diligence in the exercise of the rights and privileges granted herein to avoid damages to crops, livestock, fences, irrigation systems or other improvements or personal property. If Cooperative causes any such damage, Cooperative will, at its sole option, either compensate Grantor or cause such damage to be repaired at Cooperative's expense.

Grantor agrees that the failure to enforce all or any portion of this easement by the Cooperative shall not be deemed acquiescence or waiver by the Cooperative of any of it's hereby expressed rights.

Grantor covenants that he/she/they are the owners of the above described lands and that the said lands are free and clear of encumbrances and liens of whatsoever character except those held by the following persons:

This agreement shall be binding upon and inure to the benefit of the successors, legal representatives and assigns of the respective parties hereto.

SIGNED AND SEALED BY GRANTOR (S) this 16TH day of AUGUST 19 96.

Harold J Brandstadt (Grantor)
Harold J. Brandstadt

Lois M. Brandstadt (Grantor)
Lois M. Brandstadt

Address: 2040 G Road, Delta, CO 81416 (WO910081-02255)

STATE OF COLORADO)
COUNTY OF Delta) SS

The foregoing instrument was acknowledged before me this 16TH day of AUGUST 19 96
by Harold J. Brandstadt, Lois M. Brandstadt
Witness my hand and official seal. My commission expires: OCT 13, 1998
Section (s) 23 Township 15 South Range 95 West 6th P.M.

Phillip B Stinnett
Notary Public

Issued 03/96

AD030 - General

505068 06/03/1997 12:10P B780 P356 LMcCracken
1 of 3 R 16.00 D 0.00 Delta Cty, CO Clk & Rec

BOUNDARY LINE AGREEMENT
(38-44-112 C.R.S.)

WHEREAS, the Parties hereto are adjoining land owners in the County of Delta, State of Colorado, and;

WHEREAS, there has heretofore existed a boundary line dispute between Donald L. Tenney and Kathleen J. Tenney 2014 G Rd. Delta, CO 81416, hereinafter referred to as "Tenneys"; and Harold J. Brandstadt and Lois M. Brandstadt 2040 G. Rd. Delta, CO, hereinafter referred to as "Brandstadts"

NOW THEREFORE, to resolve the boundary dispute between them and their respective and adjoining properties the parties agree as follows:

For and in consideration of the sum of $500.00, paid them by Brandstadts, the receipt of which is herewith acknowledged, Tenneys, pursuant to 38-44-112 C.R.S. , by these presents do remise, release, sell, convey and QUIT CLAIM unto the Brandstadts, their successors and assigns, forever, all the right, title, interest, claim and demand which the grantors have in and to the real property, together with improvements, if any, situate, lying and being in the County of Delta and State of Colorado, Part of the E½ NW¼ NW¼ of Section 23, T 15 S, R95 W of the 6th P.M. described as follows:

Beginning at the northeast corner of the said E½ NW¼ NW¼ ; thence on the east line of the said E½ NW¼ NW¼ S 01° 32' 16" W, 1317.49 feet to the southeast corner of the said E½ NW¼ NW¼ ; thence on the south line of the said E¼ NW½ NW½ 88° 33' 50" W, 79.17 feet to an existing fence line; thence along the said existing fence line N 03° 04' 13" E, 1317.93 feet to the north line of the said E½ NW½ NW½; thence on the said north line S 88° 40' 52" E, 43.92 feet to the point of beginning.

Map attached hereto, made a part hereof.

IN WITNESS WHEREOF, the Parties hereto have executed this agreement.

Donald L. Tenney

Harold J. Brandstadt

Kathleen J. Tenney

Lois M. Brandstadt

505068 06/03/1997 12:10P B780 P357 LMcCracken
2 of 3 R 16.00 D 0.00 Delta Cty, CO Clk & Rec

STATE OF COLORADO)
) ss.
COUNTY OF DELTA)

The foregoing instrument was acknowledged before me this 13th day of May, 1997 by Donald L. Tenney and Kathleen J. Tenney.

Witness my hand and official seal.

My commission expires: 3-21-00.

(SEAL) AARON R CLAY NOTARY PUBLIC STATE OF COLORADO

Aaron R Clay
Notary Public

STATE OF COLORADO)
) ss.
COUNTY OF DELTA)

The foregoing instrument was acknowledged before me this 15th day of May, 1997 by Harold J. Brandstadt and Lois M. Brandstadt

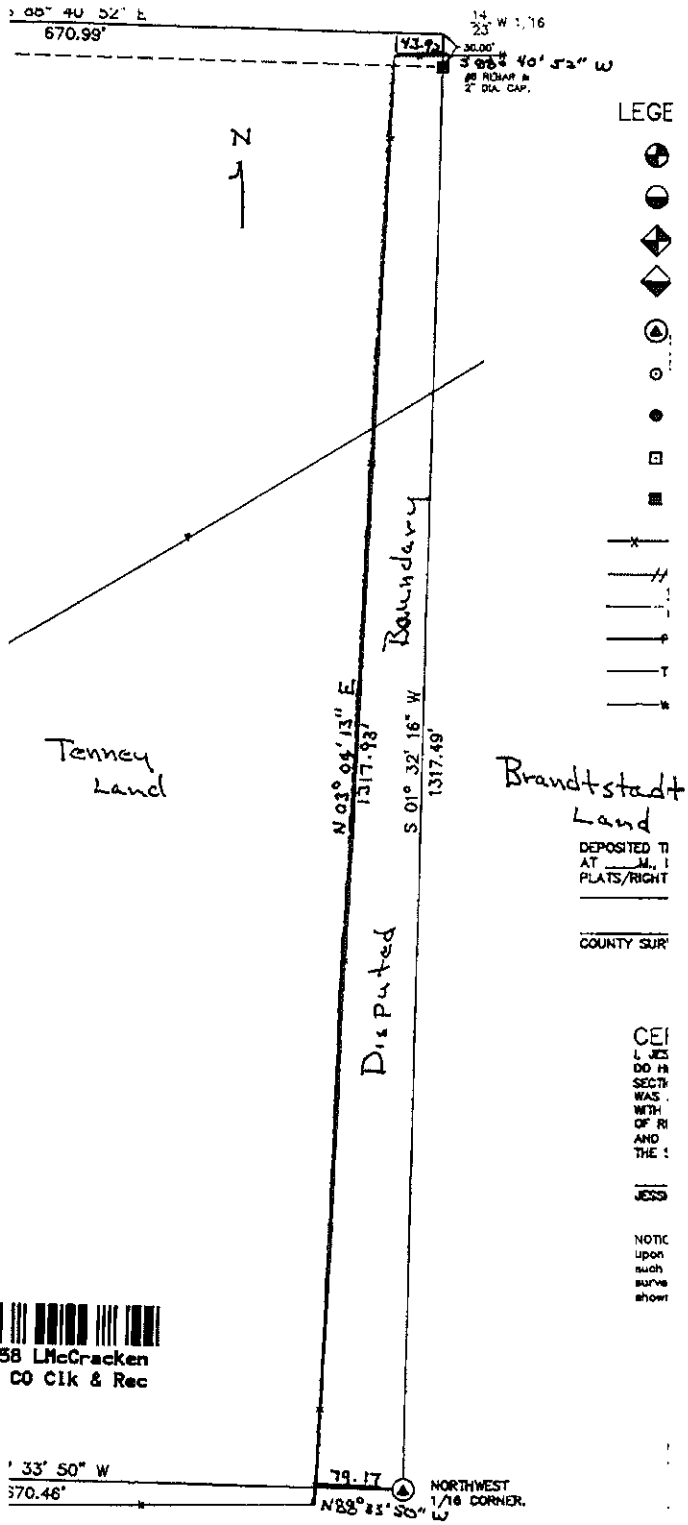
Witness my hand and official seal.

My commission expires: 12/27/97.

(SEAL)

Donna R. Wilmer
Notary Public

Jessie J. Messenger, P.L.S. P.O.Box 104 Austin, CO 81410
Name and Address of person Creating New Legal Description (§ 38-35-106.5 C.R.S.)



505068 06/03/1997 12:10P B780 P358 LMcCracken
3 of 3 R 16.00 D 0.00 Delta Cty, CO Clk & Rec

RECEPTION#: 691990, 12/19/2016 at 02:16:42 PM, 1 OF 2, R $16.00
TERI A. STEPHENSON, DELTA COUNTY, CO CLERK AND RECORDER

UNCOMPAHGRE VALLEY WATER USERS ASSOCIATION
Montrose, Colorado

APPLICATION AND ORDER FOR REALLOCATION OF PROJECT WATER ALLOTMENT

Application is respectfully made for reallocation of 80.3 shares of Project water allotment, from the unallocated pool of Project water held by the Association to certain parcels of lands, all as specifically set forth below, and in support of this application the undersigned state:

1. The undersigned constitute all of the OWNERS and LIENHOLDERS of all the tracts or parcels of real estate to which the allotment of water would be reallocated.

2. The undersigned OWNERS covenant and agree that they shall be bound by the agreements contained in the original petition and order covering the hereinafter-described allotment as well as all other binding agreements including but not limited to those for payment of assessments, the same as if such were fully set forth herein and that they will timely pay any and all water assessments as they become due and payable.

3. The undersigned LIENHOLDERS hereby subordinate such lien rights to those assessments and assessment liens which may be made hereafter or the allotments to the real estate to which reallocation is made pursuant to this application.

OWNERS (Print or Type)	**LIENHOLDERS (Print or Type)**
Melvin J. Brandstadt 19239 G Rd. Delta, CO 81416-3086	American AgCredit, PCA 1540 E. Niagara Montrose, Co 81401
SIGNATURES:	**SIGNATURES:**
	BY: [illegible] **TITLE:** Leader

Application having been made by all parties interested for the reallocation of the water allotment and the lien rights created hereby, and after a hearing by the board of directors, a motion duly made and seconded and a vote having been taken, it is hereby ORDERERED that said application be and the same hereby is granted, on the same terms and conditions as in the original petition and order for allotment of water, to the extent of the reallocated water and shall attach to the real estate to which reallocation is now made, all as more specifically set forth herein.

UNCOMPAHGRE VALLEY WATER USERS ASSOCATION

ATTEST: SECRETARY	**PRESIDENT**

I hereby certify that the foregoing is a true copy of the application for reallocation and the order entered hereon by the directors of the Uncompahgre Valley Water Users Association. Upon execution of this application, it is to be recorded in the Clerk and Recorder's Office of Delta County, Colorado.

DATE 11-21-16	**SECRETARY**

LAND TO WHICH REALLOCATION IS MADE Description	6th Principal Meridian Section	Township	Range	Irrigable Acres	Allotted Shares
Parcel Number 345523100001 **Tax Area Id** F1- - - F1- **Situs Address** G RD **Legal Summary** G RD DELTA 81416 S: 23 T: 15S R: 95W TOTAL AC 240+- SEC 23 T15S R95W 6PM NE4 SEC 23 N2SE4 SEC 23 LESS 1/2 MR BK 195 PG 336 BK 195 PG 337 BK 256 PG 275 BK 283 PG 41 BK 382 PG 402 BK 381 PG 44 & 154 R672529-LTR R672530-LTR R672532	14 & 23	15S	95W	246.3	166.0 80.3 Reallocated shares
Parcel Number 345523200009 **Tax Area Id** F1- - F1- 20426 G RD DELTA 81416 S:23 T:15S R:95W TOTAL AC 41.86+- SEC 23 T15ST95W 6PM NE4NW4 SEC 23 BK 418 PG 440 BK 780 PG 356 ALSO 1.86 AC R672529-ltr R672530-LTR R672531 R672532					
Parcel Number 345514300008 **Tax Area Id** F1 - - F1- 6469 2050 RD DELTA 81416 S:14 T:15S R:95W Subdivision: RURAL AREA TOTAL AC 40+- SEC 14 T15S R95W 6PM NE4SW4 SEC 14 BK 255 PG 21 BK 255 PG 423 BK 341 PG 335 BK 289 PG 577 BK 290 PG 245 BK 294 PG 89 BK 341 PG 335 R672529-LTR R672530-LTR R672532					
TOTALS	**14** **23**	**15S** **15S**	**95W** **95W**	**246.3**	**246.3**

REMARKS

State of Colorado)
County of Montrose) ss

The foregoing Application was acknowledged before me by Melvin J. Brandstadt(OWNER) this 7th day of November, 2016.
My commission expires: 11.6.18

(Seal)

BRIDGET ATWOOD
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID #20144038458
My Commission Expires November 6, 2018

Bridget Atwood
Notary Public

State of Colorado)
County of Montrose) ss

The foregoing Application was acknowledged before me this 7th day of November, 2016, by American AgCredit, ACA Lender (Title), of 1540 E. Niagara (LIENHOLDERS).
My commission expires: 11.6.18

(Seal)

BRIDGET ATWOOD
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID #20144038458
My Commission Expires November 6, 2018

Bridget Atwood
Notary Public

RECEPTION#: 697030, 07/28/2017 at 01:28:37 PM, 1 OF 3, R $23.00
TERI A. STEPHENSON, DELTA COUNTY, CO CLERK AND RECORDER

UNCOMPAHGRE VALLEY WATER USERS ASSOCIATION
Montrose, Colorado

APPLICATION AND ORDER FOR TRANSFER OF PROJECT WATER ALLOTMENT

Application is respectfully made for transfer of 246.3 shares of Project water allotment, attached to certain parcels of lands by order of the Association which said parcels are being transferred by sale, as specifically set forth below and in support of this application the undersigned state:

1. The undersigned OWNERS and LIENHOLDERS constitute all of the owners and lienholders of all the tracts or parcels of real estate to which the allotment is now attached and to which the transfer is sought.

2. The undersigned OWNERS covenant and agree that they shall be bound by the agreements contained in the original petition and order covering the hereinafter-described allotment the same as if such were fully set forth herein and that they are current on all payments and there are no liens in favor of the Association.

3. The undersigned LIENHOLDERS hereby release all right, title, and interest in said water allotments as applied to the real estate to which the original allotment has been made, and/or subordinate such lien rights to those assessments and assessment liens which may be made hereafter or the allotments to the real estate to which transfer is made pursuant to this application.

4. The undersigned PURCHASERS constitute all the Purchasers and they hereby covenant and agree that they shall be bound by the agreements contained in the original petition and order covering the hereinafter-described allotment as well as all other binding agreements including but not limited to those for payment of assessments, the same as if such were fully set forth herein and that they will timely pay any and all water assessments as they become due and payable.

CURRENT OWNER

PURCHASER OF LANDS TO WHICH WATER ALLOTMENT IS SOUGHT TO TRANSFERRED

OWNERS	PURCHASERS
Melvin J. Brandstadt	Gary Volk Gail Volk
SIGNATURES:	SIGNATURES: Gary Volk Gail Volk

LIENHOLDER	NEW LIENHOLDER
American AgCredit FLCA	American AgCredit FLCA
BY: Justin Wetzel Senior loan officer	BY: Justin Wetzel Senior loan officer

Application having been made by all parties interested for the transfer of the water allotment and the lien rights created hereby and after a hearing by the board of directors, a motion made and duly seconded and voted upon, it is hereby ORDERERED that said application be and the same hereby is granted, on the same terms and conditions as in the original petition and order for allotment of water, except that the lien is hereby discharged as to the previous landowner to the extent of the allotment transferred shall remain attached to the real estate to which transfer is now made, all as more specifically set forth herein.

UNCOMPAHGRE VALLEY WATER USERS ASSOCATION

ATTEST: SECRETARY	PRESIDENT

I hereby certify that the foregoing is a true copy of the application for transfer and the order entered hereon by the directors of the Uncompahgre Valley Water Users Association. Upon execution of this application, it is to be recorded in the Clerk and Recorder's Office of _____, County, Colorado.

DATE 5-15-17	SECRETARY

LAND TO WHICH WATER HAS BEEN ALLOTTED Description	Principal Meridian Section	Township	Range	Irrigable Acres	Allotted Shares
SEE ATTACHED LEGAL DESCRIPTION EXHIBIT A					
U.V.W.U.A Water Right Number: 1868-0 874-1 952-0 TOTALS					

REMARKS

State of Colorado)
) ss
County of Delta)

The foregoing Application was acknowledged before me by Melvin J. Brandstadt and _____, (OWNERS) this 24th day of March, 2017.

My commission expires: _____

(Seal)

ANNETTE L MILLER
Notary Public
State of Colorado
My Commission Expires: February 10, 2018
LIC# 19944002318

Annette L Miller
Notary Public

State of Colorado)
) ss
County of Delta)

The foregoing Application was acknowledged before me this 24th day of March, 2017, by Justin Wetzel Sr loan officer (Title), of American AgCredit (Lienholder).

My commission expires:

(Seal)

ANNETTE L MILLER
Notary Public
State of Colorado
My Commission Expires: February 10, 2018
LIC# 19944002318

Annette L Miller
Notary Public

State of Colorado)
) ss
County of Mesa)

The foregoing Application was acknowledged before me by Gary Volk and Gail Volk, (PURCHASERS) this 24th day of March, 2017.

My commission expires: _____

(Seal)

ANNETTE L MILLER
Notary Public
State of Colorado
My Commission Expires: February 10, 2018
LIC# 19944002318

Annette L Miller
Notary Public

State of Colorado)
) ss
County of Mesa)

The foregoing Application was acknowledged before me by Justin Wetzel ~~and~~ as Sr loan officer, American AgCredit (NEW LIENHOLDER) this 24th day of March, 2017.

My commission expires: _____

(Seal)

ANNETTE L MILLER
Notary Public
State of Colorado
My Commission Expires: February 10, 2018
LIC# 19944002318

Annette L Miller
Notary Public

Exhibit A

Parcel 1:
The NE ¼ of the SW ¼ of Section 14, Township 15 South, Range 95 West of the 6th P. M.,
County of Delta, State of Colorado.

Parcel 2:
The NE ¼ and the N ½ of the SE ¼ of Section 23, Township 15 South, Range 95 West of the 6th P.M.

Parcel 3:
The NE ¼ of the NW ¼ of Section 23, Township 15 South Range 95 West of the 6th P.M.
ALSO part of the E ½ of the NW ¼ of the NW ¼ of Section 23, T15S, R95W of the 6th P.M. Described as follows:
Beginning at the Northeast corner of the said E ½ NW ¼ NW ¼;
Thence on the East line of the Said E ½ NW ¼ NW ¼ S01°32'16", 1317.49 feet to the Southeast corner of the E ½ NW ¼ NW ¼;
Thence on the South line of the said E ½ NW ¼ NW ¼ N88° 33'50" W, 79.17 feet to an existing fence line;
Thence along the said existing fence line N03°04'13"E, 1317.93 feet to the North line of line said E ½ NW ¼ NW ¼;
Thence on the said North line S88 °40'52"E, 43.92 feet to the point of beginning.
County of Delta, State of Colorado.

RECEPTION#: 693947, 03/17/2017 at 12:46:20 PM, 1 OF 3, R $23.00
TERI A. STEPHENSON, DELTA COUNTY, CO CLERK AND RECORDER

WHEN RECORDED RETURN TO:

Delta Montrose Electric Association
P.O. Box 910
Montrose, CO. 81402

TELECOMMUNICATIONS CABLE SYSTEM EASEMENT

1. **GRANT.** In consideration of the sum of Ten Dollars ($10.00) and of the further agreements, compensation and considerations in this Telecommunications Cable System Easement (the "Easement"), the receipt and sufficiency of which is hereby acknowledged, MELVIN J BRANDSTADT ("Grantor") hereby grants to DELTA-MONTROSE ELECTRIC ASSOCIATION, a Colorado electric cooperative association ,with offices at 11925 6300 Rd, Montrose, Colorado, ("Grantee") and to its employees, agents, licensees, invitees, contractors, lessees, successors and assigns a perpetual, non-exclusive easement in, on, over, under and across property located in Delta County, Colorado, and described as:

   A general easement 50 feet in width, 25 feet either side of the center line of the electrical facilities as constructed (the "Easement Area") located on Lot __, Section 23, Township 15S, Range 95W, of the 6th Principal Meridian, also known as 20426 G RD DELTA 81416 S: 23 T: 15S R: 95W TOTAL AC 41.86+- SEC 23 T15S R95W 6PM NE4NW4SEC 23 **(the "Easement Premises").**

2. **TELECOMMUNICATIONS CABLE SYSTEM USE.** Grantor grants to Grantee an easement for one or more fiber optic cables, copper cables, coaxial cables or other cable devices through which commercial and non-commercial voice, data, video or other signals are transmitted, as well as conduits, inner ducts, hand holes, splice vaults, poles, optical or electronic equipment, and other related facilities appropriate for installation, use, or maintenance of such cables or devices (collectively, the "Telecommunications Cable System") in, on, over, under and across the Easement Area and which are either owned by Grantee or useable by Grantee through an indefeasible right to use agreement, long term capital lease, or any other right or authorization from the owner of such facilities or other party having the sufficient rights to allow such uses (the "Grantee's Facilities Rights"), together with the right to inspect, alter, upgrade, repair, and remove the same in whole or in part at any time, in, on, over, under and across the Easement Area, including reasonable access on the Easement Premises and adjacent lands owned by Grantor for Grantee to access the Easement Premises.

3. **NON-EXCLUSIVITY, PERPETUITY.** The easements granted here are non-exclusive, perpetual, and deemed to run with the land.

4. **GRANTOR RESERVED RIGHTS.** The Grantor reserves for itself, its successors and assigns all rights not specifically hereunder granted to Grantee. Grantor reserves the right to use and occupy the Easement Area for any and all purposes that will not interfere with Grantee's uses thereof or endanger or damage Grantee's facilities installed in the Easement Area. Grantor shall have the right to access, cultivate, graze, use, and occupy the Easement

[redacted]

Area for purposes which will not constitute a safety hazard or interfere with Grantee's rights and privileges.

5. **GRANTOR COVENANTS.** Unless written permission is granted by Grantee, Grantor shall not erect or construct any building or other structure (including mobile homes or travel trailers); store flammable or explosive materials; stack hay or straw; conduct fueling operations; construct, install or operate above ground mechanical irrigation facilities which pose a risk of interfering with or damaging the Telecommunications Cable System; drill wells or conduct mining operations; or appreciably alter the grade of the ground surface within the Easement Area.

   Upon receipt of written notice from Grantee identifying material or property deemed by Grantee to interfere with the safe operation or maintenance of the Telecommunications Cable System, the Grantors, their successors, heirs or assigns shall remove the material or property within ten days. If there is a failure to so remove the material or property within ten days, Grantee may remove it and collect the associated costs from Grantor.

   Grantor agrees to obtain Grantee's prior written consent before granting any subsequent easement affecting the Easement Area or reasonable access to the Easement Area.

6. **GRANTOR WARRANTS.** Grantor warrants that: 1) Grantor is the owner of the land on which the easements conveyed herein are situated, 2) Grantor has full authority to grant these easements, and 3) the rights granted herein are subject only to easements of record and mineral rights of record in third parties.

7. **GRANTEE MAINTENANCE.** To the extent permitted by the Grantee's Facilities Rights, Grantee may at any time cut, remove, clear away, trim and control, by chemical means, machinery or otherwise, any and all trees, brush and shrubbery whether on or adjacent to the Easement Area, which, in the sole and exclusive opinion of Grantee, may interfere with safe construction, operation and maintenance of the Telecommunications Cable System. Grantee may also install and use gates in all of Grantor's fences which now or might hereafter cross or be adjacent to the Easement Area. Grantee shall at all times exercise reasonable care and diligence to avoid damaging Grantor's real property, fences, crops, livestock and other personal property located on or adjacent to the Easement Area, and shall repair or pay Grantor for damage to said real property, fences, crops, livestock and other personal property caused by Grantee, its employees, agents, licensees, invitees, contractors, and lessees.

8. **NON-USE, TERMINATION.** Non-use or limited use of this Easement shall not prevent Grantee from thereafter making use of the easement to the full extent authorized here. If the Telecommunications Cable System is removed and the Easement Area is permanently abandoned, the easement shall be terminated by one or more releases of easement executed and delivered by Grantee to Grantor.

9. **MISCELLANEOUS.** The provisions of this Easement shall be binding upon and shall inure to the benefit of the heirs, executors, administrators, personal representatives,

successors and assigns of the Grantor and Grantee. The rights, privileges, and obligations granted and created hereunder may be assigned, licensed, leased or otherwise conveyed or transferred, in whole or in part. Grantee shall be entitled to all remedies at law or in equity to enforce the terms of this Easement or to recover damages for breach. If any provision of this Easement is held by a court of competent jurisdiction to be invalid or unenforceable or not run with the land, such holding shall not affect the validity or enforceability of the remainder of this Easement. This Easement may be amended only if in writing and signed by Grantor and Grantee.

GRANTOR signs this Telecommunications Cable System Easement on APRIL 1, 2016.

GRANTOR: _____

Printed Name: Melvin J. Brandstadt

Address: 19239 G Rd., Delta, CO. 81416-3086

ACKNOWLEDGMENT

STATE OF COLORADO)
) ss:
COUNTY OF DELTA)

The foregoing instrument was acknowledged before me on APRIL 1, 2016, by as Grantor.

(Notarial Seal)

JAMES T. GARBER
NOTARY PUBLIC - STATE OF COLORADO
Notary Identification #20164011185
My Commission Expires 3/21/2020

_____
Notary Public

My commission expires: 3/21/2020

[redacted]

Attachment 3-D

Mineral Rights Summary

Part 1	Parcel: 345513300020
Part 2	Parcel: 345523100001 & 345523200009

Attachment 3-D

Mineral Rights Summary

Part 1

Parcel 345513300020

DUFFORD WALDECK LAW

744 HORIZON COURT, SUITE 300
GRAND JUNCTION, CO 81506

970-241-5500
WWW.DWMK.COM

January 8, 2021

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D. J. Dufford
(1919-1998)

William G. Waldeck
(1923-2009)

+ Also admitted in Oregon
* Also admitted in Utah
~ Also admitted in Wisconsin
✧ Also admitted in Wyoming

Dan Ryan via ryan@citrapower.com
Garnet Mesa Land LLC

Re: Title Commitment Review

Dear Mr. Ryan:

I have reviewed the three parcels identified in the title commitment that you provided. Based on the title commitment, a review of the Colorado Oil and Gas Conservation Commission website, the historical transfer documents provided, and a brief review of the Delta County Clerk and Recorder's records, it appears the mineral rights should be available to transfer to the buyer.

The parcels were patented without federal reservation of minerals, and as such, the minerals can transfer to subsequent owners as any interest in land. The only item of note in the title commitment is in regard to Parcel 2 (NE and the N2SE of Sec 23) -- Harding to Dedisse-- Oct. 25, 1924. The title commitment refers to "An undivided one half interest in and to the following described lands: The Northeast quarter and the North half of the Southeast quarter of Section 23 – 240 acres. One half of all oil and gas rights are hereby reserved by the first party." It is not clear what exactly the grantor was trying to accomplish by this language. As the grant was only for "an undivided one-half interest in the land" and the reservation was for "one half of all oil and gas rights." Two possibilities exist: 1) the grantor was trying to reserve all of the minerals, or 2) the grantor was trying to reserve one half of the one half that was being granted. Either the deed transferred a one-half interest in the surface and no interest in the "oil and gas rights," or a one half interest in the surface and a one fourth interest in the "oil and gas rights." Nonetheless, since the entirety of the surface was eventually transferred to a single owner, apparently without further reservations or mineral transfers, these "oil and gas rights" should still be available to acquire with the property.

Regardless of whether the minerals transferred with the surface or this parcel remains a split estate, you do not need surface use agreements with the mineral owners to move forward with use of the surface. Colorado follows the "accommodation doctrine" which means both estates are "mutually dominant." In addition, it is unlikely there would be any oil and gas exploration in the area of the parcels as it is not within any existing oil and gas play and there is no activity of

NATE KEEVER
970-248-5856
keever@dwmk.com

note in that area. This area has not been historically active in either oil and gas extraction or hard rock mining. In short, you would not need to locate mineral owners if such exist.

It is my opinion that based on the title commitment and assuming no other recent transfers have occurred, the minerals should transfer at closing as long as the appropriate deed language is used (no reservation of minerals). Be advised that this is not a full mineral title opinion. My opinions are based solely on the title commitment.

Thank you for the opportunity to work on this matter. Please do not hesitate to contact me if you have additional questions or concerns.

Very truly yours,

NATE KEEVER

Attachment 3-D

Mineral Rights Summary

Part 2

Parcel 345523100001 & 345523200009

DUFFORD WALDECK LAW

744 HORIZON COURT, SUITE 300
GRAND JUNCTION, CO 81506

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February 17, 2021

Partners
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D. J. Dufford
(1919-1998)

William G. Waldeck
(1923-2009)

+ Also admitted in Oregon
* Also admitted in Utah
~ Also admitted in Wisconsin
✧ Also admitted in Wyoming

Dan Ryan via ryan@citrapower.com
Garnet Mesa Land LLC

Re: Title Commitment Review - Norell

Dear Mr. Ryan:

I have reviewed the property identified in the title commitment that you provided for the Norells. Based on the title commitment, a review of the Colorado Oil and Gas Conservation Commission website, the historical transfer documents provided, and a brief review of the Delta County Clerk and Recorder's records, it appears that the private mineral rights are available to transfer to the buyer.

Note that a substantial portion of the property was patented with federal reservation of minerals, and as such, those federal minerals cannot transfer to subsequent owners:

N2SW4: private minerals – patent book 118, p. 69.
S2NE4: mostly private minerals (S3/4SW4NE4; SE4NE4 – private)
NW4SE4: federal minerals – patent 1159152 (reserving oil and gas)
W2NE4SE4: federal minerals – patent 1159152 (reserving oil and gas)
SE4NE4SE4: federal minerals – patent 1159152 (reserving oil and gas)
S2S2SW4NW4: federal minerals
Part of Lot 23 in SW4: private minerals

The federal minerals are not currently leased nor are they likely to be leased in the immediate future as it is not within any existing oil and gas play and there is no activity of note in that area. This area has not been historically active in either oil and gas extraction or hard rock mining.

The private minerals listed above are not shown as previously reserved and as such should be available for transfer to the buyer. The two 1955 oil and gas leases identified in the title commitment have long ago expired due to lack of production and are of no effect today.

NATE KEEVER
970-248-5856
keever@dwmk.com

It is my opinion that based on the title commitment and assuming no other recent transfers have occurred, the private minerals should transfer at closing as long as the appropriate deed language is used (no reservation of minerals). Be advised that this is not a full mineral title opinion. My opinions are based primarily on the title commitment provided.

Thank you for the opportunity to work on this matter. Please do not hesitate to contact me if you have additional questions or concerns.

NATE KEEVER

Attachment 3-E

Wetland Delineation and Biological Delineation Report

ERO

Consultants in Natural Resources and the Environment

Wetland Delineation Report
Garnet Mesa Solar Development Project
Delta County, Colorado

Prepared for—

Garnet Mesa Solar LLC
1125 17th Street, Suite 740
Denver, Colorado 80202

Prepared by—

ERO Resources Corporation
161 South Second Street
Hotchkiss, Colorado 81419
(970) 872-3020
ERO Project #21-051

June 21, 2021

Executive Summary

Garnet Mesa Solar LLC retained ERO Resources Corporation (ERO) to provide a wetland delineation for the Garnet Mesa Solar Development Project (project area; Figure 1). Garnet Mesa Solar LLC plans to install a solar farm in the project area. Project details have not been disclosed. ERO conducted a wetland delineation as described in this report to facilitate compliance with the Clean Water Act (CWA).

The CWA protects the chemical, physical, and biological quality of waters of the U.S. The U.S. Army Corps of Engineers' (Corps) Regulatory Program administers and enforces Section 404 of the CWA. Under Section 404, a Corps permit is required for the discharge of dredged or fill material into wetlands and other waters of the U.S. (streams, ponds, and other waterbodies). On June 22, 2020, the Environmental Protection Agency (EPA) and Corps' Navigable Waters Protection Rule (NWPR) to define "waters of the United States" became effective in 49 states and in all U.S. territories. A preliminary injunction was granted for Colorado. On March 2, 2021, the United States Court of Appeals for the 10th Circuit vacated the stay on the NWPR in Colorado, thereby ruling the NWPR effective in Colorado. After April 23, 2021, jurisdiction of wetlands and other potential waters of the U.S. in Colorado will be determined using the NWPR. Therefore, interpretation of waters of the U.S. in this report is based on the NWPR.

The NWPR outlines four categories of waters of the U.S.: (1) territorial seas and traditionally navigable waters (TNWs); (2) tributaries; (3) lakes, ponds, and impoundments of jurisdictional waters; and (4) adjacent wetlands. Under the NWPR, tributaries include perennial and intermittent rivers and streams that contribute surface flow to TNWs in a typical year. Ditches are to be considered tributaries only where they satisfy the flow conditions of the perennial and intermittent tributary definition and either were constructed in or relocate a tributary or were constructed in an adjacent wetland and contribute perennial or intermittent flow to a TNW in a typical year (EPA 2020). Adjacent wetlands are generally defined under the NWPR as those physically touching other jurisdictional waters; separated from a water of the U.S. by only a natural berm, bank, or dune; inundated by flooding from a water of the U.S.; or wetlands that are physically separated by certain artificial structures so long as the structure allows for a direct hydrologic surface connection between the wetlands and the jurisdictional water in a typical year.

The aquatic resource findings include:

- Total survey area of 498.346 acres;
- 1 wetland of 0.083 acre adjacent to East Canal (jurisdictional); and
- 1 perennial waterway (East Canal) totaling 0.074 acre (jurisdictional).

ERO has made a preliminary determination that two resources (East Canal and adjacent wetlands) are likely jurisdictional waters of the U.S. under the NWPR. Data were collected to document the presence of artificial hydrology in several areas throughout the project area, outside of documented jurisdictional areas. Other areas investigated include irrigation supported wetlands, GKB Lateral Ditch, unnamed excavated ditches and drains, and field/ephemeral ditches. These areas are supported solely by artificial hydrology, and are nonjurisdictional due to their nontributary nature and association with irrigation practices; specifically, these areas are not tributary to an (a)(1) water (also known as TNW) nor are they within the extent of flooding from an (a)(1) water in a typical year.

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Wetland Delineation Report
Garnet Mesa Solar Development Project
Delta County, Colorado

June 21, 2021

Introduction

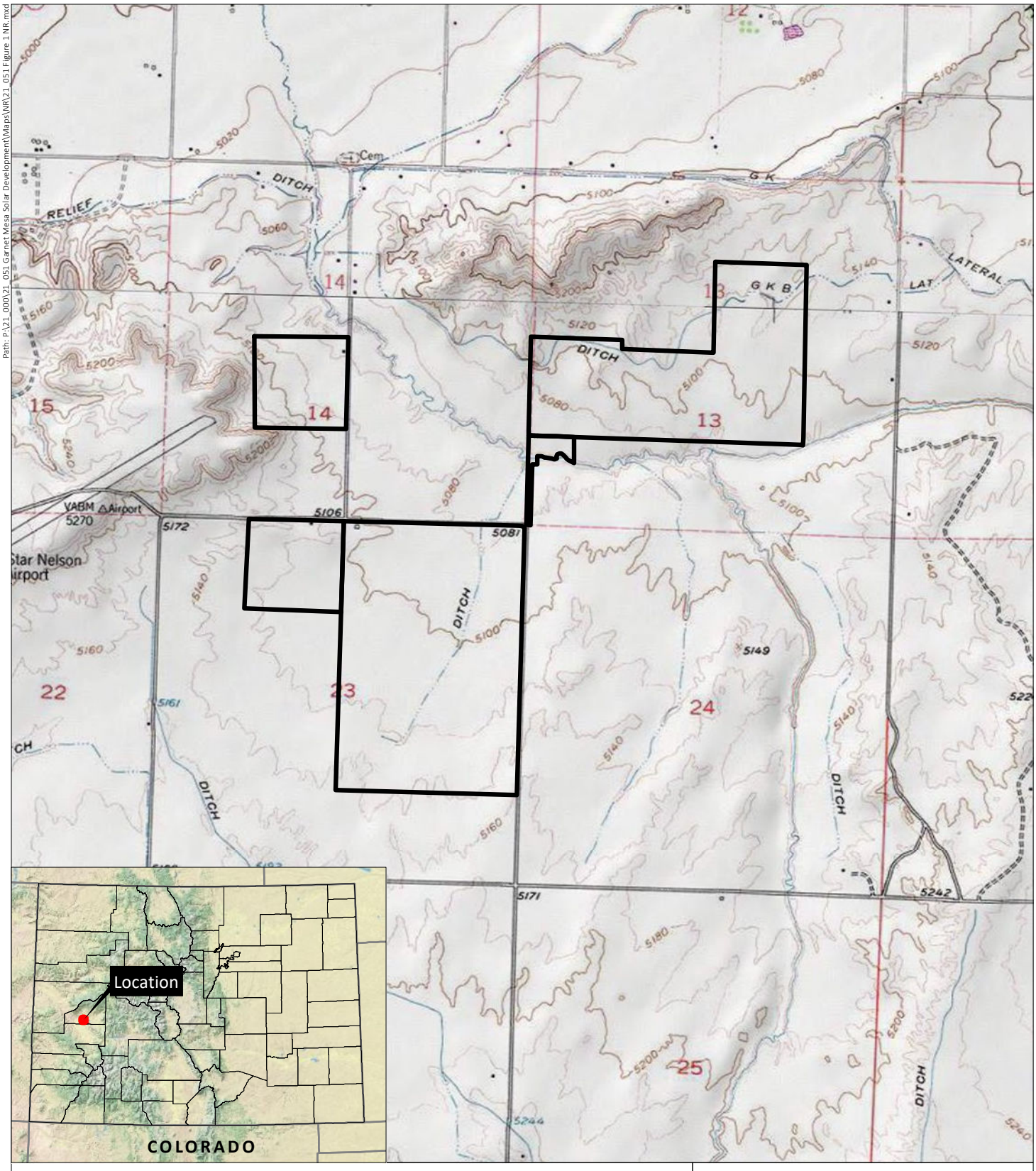
Garnet Mesa Solar LLC retained ERO Resources Corporation (ERO) to provide a wetland delineation for the Garnet Mesa Solar Development Project (project area; Figure 1). Garnet Mesa Solar LLC plans to install a solar farm in the project area. Project details have not been disclosed. ERO conducted a wetland delineation as described in this report to facilitate compliance with the Clean Water Act (CWA).

ERO conducted a wetland delineation as described in this report to facilitate compliance with the CWA. There are concerns that the proposed project would result in the placement of dredged or fill material into wetlands and other waters that are subject to U.S. Army Corps of Engineers (Corps) jurisdiction (jurisdictional). ERO assessed the project area for potential isolated wetlands, jurisdictional wetlands, and other waters of the U.S. (WOTUS).

Background

The CWA protects the chemical, physical, and biological quality of WOTUS. The Corps' Regulatory Program administers and enforces Section 404 of the CWA. Under Section 404, a Corps permit is required for the discharge of dredged or fill material into wetlands and other WOTUS (streams, ponds, and other waterbodies). On June 22, 2020, the Environmental Protection Agency (EPA) and Corps' Navigable Waters Protection Rule (NWPR) to define "waters of the United States" became effective in 49 states and in all U.S. territories. A preliminary injunction was granted for Colorado. On March 2, 2021, the United States Court of Appeals for the 10th Circuit vacated the stay on the NWPR in Colorado, thereby ruling the NWPR effective in Colorado. After April 23, 2021, jurisdiction of wetlands and other potential WOTUS in Colorado will be determined using the NWPR. Therefore, interpretation of WOTUS in this report is based on the NWPR.

Path: P:\21_000\21_051 Garnet Mesa Solar Development\Maps\NR\21_051 Figure 1 NR.mxd



Garnet Mesa Solar Development

Sections 13, 14, and 23, T15S, R95W; 6th PM

UTM NAD 83: Zone 13N; 241771mE, 4292464mN

Longitude 107.977133°W, Latitude 38.743123°N

USGS Olathe NW and Orchard City, CO Quadrangles

Delta County, Colorado

0 1,000 2,000 Feet

1:24,000

N

Figure 1
Vicinity Map

Prepared for: Garnet Mesa Solar, LLC

File: 21_051 Figure 1 NR.mxd (WH)

April 29, 2021

ERO Resources Corp.

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The NWPR outlines four categories of WOTUS: (1) territorial seas and traditionally navigable waters (TNWs); (2) tributaries; (3) lakes, ponds, and impoundments of jurisdictional waters; and (4) adjacent wetlands. Under the NWPR, tributaries include perennial and intermittent rivers and streams that contribute surface flow to TNWs in a typical year. Ditches are to be considered tributaries only where they satisfy the flow conditions of the perennial and intermittent tributary definition and either were constructed in or relocate a tributary or were constructed in an adjacent wetland and contribute perennial or intermittent flow to a TNW in a typical year (EPA 2020). Adjacent wetlands are generally defined under the NWPR as those physically touching other jurisdictional waters; separated from a WOTUS by only a natural berm, bank, or dune; inundated by flooding from a WOTUS; or wetlands that are physically separated by certain artificial structures so long as the structure allows for a direct hydrologic surface connection between the wetlands and the jurisdictional water in a typical year.

Location

The project area is in Sections 13, 14, and 23, T15S, R95W; of the Sixth Principal Meridian in Delta County, Colorado (Figure 1). The UTM coordinates of the approximate center of the project area are Zone 13N; 241771mE, 4292464mNof NAD83. The longitude/latitude of the project area is 107.97133°W/ 38.743123°N. The elevation of the project area is approximately 5,080 feet above sea level, and the project area is shown on the U.S. Geological Survey (USGS) Olathe NW and Orchard City, CO Quadrangles.

Project Area Description

The proposed project area surrounds the intersection of G Road and 2100 Road, about 5 miles east of the town of Delta, Colorado. East Canal flows from east to west in the project area and converges with the North Fork of the Gunnison River about 3 miles north of the project area. The drainage is a steep-banked arroyo with a narrow wetland fringe. Lands surrounding the project area consist of cropland (hay) and irrigated pasture, and bare hills supporting salt desert scrub and sagebrush communities. Fields are irrigated and drained by a series of field/ephemeral ditches, constructed drains, and intermittent ditches. Disturbed areas including outbuildings, corrals, and residences are present. Small patches of riparian vegetation with trees and shrubs as described below occur along ditches and East Canal. Nonirrigated areas primarily support a salt desert scrub vegetation community. Photos of the project area are in Appendix A.

Vegetation

The project area's ecological context includes both native and introduced species and is characterized by the following communities:

- **Wetlands** – Narrow fringe wetlands (averaging about 3 to 6 feet wide; palustrine persistent emergent Cowardin class) occur along East Canal (Photos 1 and 2), with herbaceous vegetation primarily dominated by saltgrass (*Distictlis spicata* – facultative (FAC)) with reed canarygrass (*Phalaris arundinacea* – facultative wetland (FACW)), and scratchgrass or alkali muhly

(*Muhlenbergia asperifolia* – FACW). Tamarisk (*Tamarix parviflora* – FAC) also is present in limited amounts. The East Canal banks upslope of the wetland fringe are dominated by upland (UPL) or facultative upland (FACU) species including cheatgrass (*Bromus tectorum*), prickly pear cactus (*Opuntia* sp.), four-wing saltbush (*Atriplex canescens*), sagebrush (*Artemisia tridentata*), snakeweed (*Gutierrezia sarothrae*), common horsebrush (*Tetradymia canescens*), and rubber rabbitbrush (*Ericameria nauseosa*).

- **Riparian woodland** – Some patches of upland riparian woodland are present along benches and ditch banks throughout the project area (Photo 3). Dominant species include cottonwood (*Populus deltoides* – FAC), Siberian elm (*Ulmus pumila* – UPL), and Russian olive (*Elaeagnus angustifolia* – FAC). Limited areas with sparse narrow-leaf willow (*Salix exigua* – FACW) saplings were observed.
- **Disturbed roadside/outbuildings and abandoned irrigated lands** – Bare ground along roads, fields, drains, and canals in the project area (2050 Road, 2100 Road, G Road, and GKB Lateral Ditch); and along farm roads or surrounding outbuildings is evidence of disturbance, with FACU and UPL species common such as smooth brome (*Bromus inermis*), cheatgrass (*Bromus tectorum*), halogeton (*Halogeton glomerata*), Russian thistle (*Salsola tragus*), Russian knapweed (*Acroptilon repens*), Canada thistle (*Cirsium arvense*), rubber rabbitbrush, and yellow sweetclover (*Melilotus officinales*) (Photos 4, 5, 6 and 7).
- **Sagebrush/salt desert scrub community** – Uplands outside the disturbed road corridor and in nonirrigated areas are vegetated with sagebrush, rubber rabbitbrush, smooth brome, yellow sweet clover, dandelion (*Taraxacum officinale*), four-wing saltbush, snakeweed, field bindweed (*Convolvulus arvensis*), red stem filaree (*Erodium cicutarium*), and skunkbush sumac (*Rhus trilobata*) as well as the weedy species listed above (Photo 8).

Soils

Soil types in the project area have been identified by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) Soil Surveys for Ridgway Area, Parts of Delta, Gunnison, Montrose and Ouray Counties, Colorado (NRCS 2021a) (Appendix B). Twelve soil types are mapped in the project area (Table 1).

Table 1. Project area soil classification.

Soil Unit Name	Percent of Project Area
Montrose silty clay loam, 0 to 2 percent slopes	48.9
Sagers silty clay loam, 2 to 7 percent slopes	2.8
Montrose silty clay loam, 2 to 6 percent slopes	2.4
Gyprockmesa-Gypimack complex, 2 to 5 percent slopes	2.0
Killpack silty clay loam, 0 to 2 percent slopes	15.7
Killpack-Persayo complex, 2 to 8 percent slopes	10.0
Persayo-Killpack complex, 1 to 6 percent slopes	4.3
Fruita silty clay loam, 0 to 5 percent slopes	0.2
Persayo-Fruita complex, 0 to 12 percent slopes	11.3
Briny clay loam, 0 to 3 percent slopes, rarely flooded	0.1
Persayo loam, 4 to 25 percent slopes	1.9
Persayo-Badland complex, 25 to 75 percent slopes	0.4

Source: NRCS 2021a.

Methods

Wetland Delineation

On April 19, 2021, Aleta Powers and Hidde Snieder, environmental scientists with ERO, surveyed the project area for potential isolated wetlands, jurisdictional wetlands, and other WOTUS (2021 field survey). Early spring conditions were present. Prior to the 2021 field survey, ERO reviewed USGS quadrangle topographic maps and aerial photography to identify mapped streams and areas of open water that could indicate wetlands or WOTUS.

ERO conducted the wetland delineation following the methods for routine on-site wetland determinations as described in the 1987 *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and used methods in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (Corps 2008) to determine wetland boundaries. The Corps defines wetlands as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 Code of Federal Regulations (CFR) 328.2(c)). Wetland boundaries were determined by a visible change in vegetation community, soils, topographic changes, and other visible distinctions between wetlands and uplands.

The wetland indicator status of plant species was identified using the *National Wetland Plant List* (Corps 2018), taxonomy was determined using *Flora of Colorado* (Ackerfield 2015), and nomenclature was determined using the *PLANTS Database* (NRCS 2021b).

Intermittent, ephemeral, and perennial drainages with characteristics of a defined streambed, streambank, ordinary high water mark (OHWM), and other erosional features also were identified. The OHWM identifies the lateral jurisdictional limits of nonwetland WOTUS. Federal jurisdiction over nonwetland WOTUS extends to the OHWM, defined in 33 CFR 328.3 as "the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." The Corps defines "stream bed" as "the substrate of the stream channel between the OHWMs. The substrate may be bedrock or inorganic particles that range in size from clay to boulders."

Natural hydrology was established for potential WOTUS consistent with the criteria under the NWPR, including that a surface water connection is present in a typical year and not only in response to storm events. Artificial hydrology including ditches, drains and other constructed drainage features are excluded from qualifying hydrology.

The boundaries of identified wetlands and other characteristics of potential WOTUS were mapped using a Trimble Global Positioning System (GPS) unit. Data were differentially corrected using the

CompassCom base station. All differential correction was completed using Trimble Pathfinder Office 5.9 software. GPS data were incorporated using ESRI® ArcGIS Desktop software.

Wetland Classification

Delineated wetlands were classified according to the U.S. Fish and Wildlife Service's (Service) Cowardin classification system (Cowardin et al. 1979) combined with a hydrogeomorphic (HGM) approach (Brinson 1993). The HGM approach assesses the chemical, physical, and biological functions of wetlands based on geomorphic setting, water source, and hydrodynamics. HGM classes found in Colorado are mineral soil flats, organic soil flats, riverine, lacustrine fringe, slope, and depressional. The Cowardin classification uses a hierarchical structure of systems, subsystems, and classes to classify both wetlands and deepwater habitats. Wetlands with persistent or nonpersistent vegetation are classified in the Cowardin system as palustrine, which typically includes wetlands referred to as marshes, fens, wet meadows, and sloughs. The palustrine system also includes small, shallow, permanent, or intermittent water bodies such as ponds. Palustrine wetlands may be situated shoreward of lakes and river channels, on river floodplains, in isolated catchments, or on slopes (Cowardin et al. 1979). Under the palustrine system, wetlands are classified as emergent (erect, rooted, herbaceous, and usually perennial hydrophytes that remain standing until at least the next growing season); scrub-shrub (woody vegetation less than 20 feet tall); or forested (woody vegetation 20 feet or taller). In wetlands where more than one wetland type occurs, the wetland type of the largest area is used. For example, an area that is predominantly palustrine emergent (PEM) wetlands but also contains a small amount of palustrine scrub-shrub (PSS) wetlands would be categorized as PEM wetlands. During the wetland delineation, ERO classified the wetlands as PEM. Open waters/drainages were classified as upper perennial.

Jurisdictional Assessment

To assist the Corps in making a preliminary jurisdictional determination, ERO reviewed the proximity and potential surface water connection of wetlands to known jurisdictional WOTUS using aerial photo interpretation and information from the wetland delineation. This information is accurate as of the date of this report and may change when further guidance documentation is issued.

A perennial creek (East Canal) is tributary to the North Fork of the Gunnison River about 2 miles north of the project area. The North Fork of the Gunnison River is eventually tributary to the Colorado River. East Canal supports a narrow wetland fringe along most of its length. East Canal is tributary to a TNW and, therefore, East Canal and the abutting wetlands are jurisdictional waters.

GKB Lateral Ditch crosses the northern portion of the project area. This feature is classified as R4SBCx; System Riverine (R); Subsystem Intermittent (4); Class Streambed (SB); Water Regime Seasonally Flooded (C); Special Modifier Excavated (x) (human created/excavated). Water in this lateral ditch is diverted from other ditches to the south, then flows in East Canal for a short distance (about 600 feet), and continues to flow as a lateral ditch to the northeast until it passes Buena Vista Road, where it

appears to end in an irrigated field. GKB Lateral Ditch is solely supported by artificial hydrology (man-made ditch), does not appear to be tributary and is assumed nonjurisdictional.

Multiple field/ephemeral ditches and field lateral ditches/drains occur throughout the project area. The NRCS has been actively assisting with water management solutions and drainage issues over the past decade. Based on a review of historic aerials, these features appear to have been excavated in uplands on nonadjacent wetlands, or potentially in wetlands supported solely by the application of irrigation water. However, these features have been in place since prior to the oldest aerial photos readily available online. These features are not relocated tributaries, or within the extent of inundation by flooding from an (a)(1) water (also known as a TNW) in a typical year. Therefore, ERO assumes that all ditches and drains mapped in the project area are nonjurisdictional.

Several wetland patches were mapped near the north edge of the project area. Most are isolated pockets that appear to be supported by tailwater runoff. Ditches, drains, and drainage swales are evident, connecting the wetland areas to irrigation practices. These wetland areas are shown on the National Wetland Inventory (NWI) mapping as PEM1C. Irrigation activities have been ongoing since prior to the oldest aerial photos readily available online. These wetlands are not relocated tributaries, or within the extent of inundation by flooding from an (a)(1) water in a typical year. Therefore, ERO assumes that the irrigation-dependent wetlands mapped in the project area are supported solely by artificial hydrology and are nonjurisdictional (see Datasheets, Attachment C). Although these areas were determined to be nonjurisdictional, data collected in these areas supported the wetland mapping along East Canal.

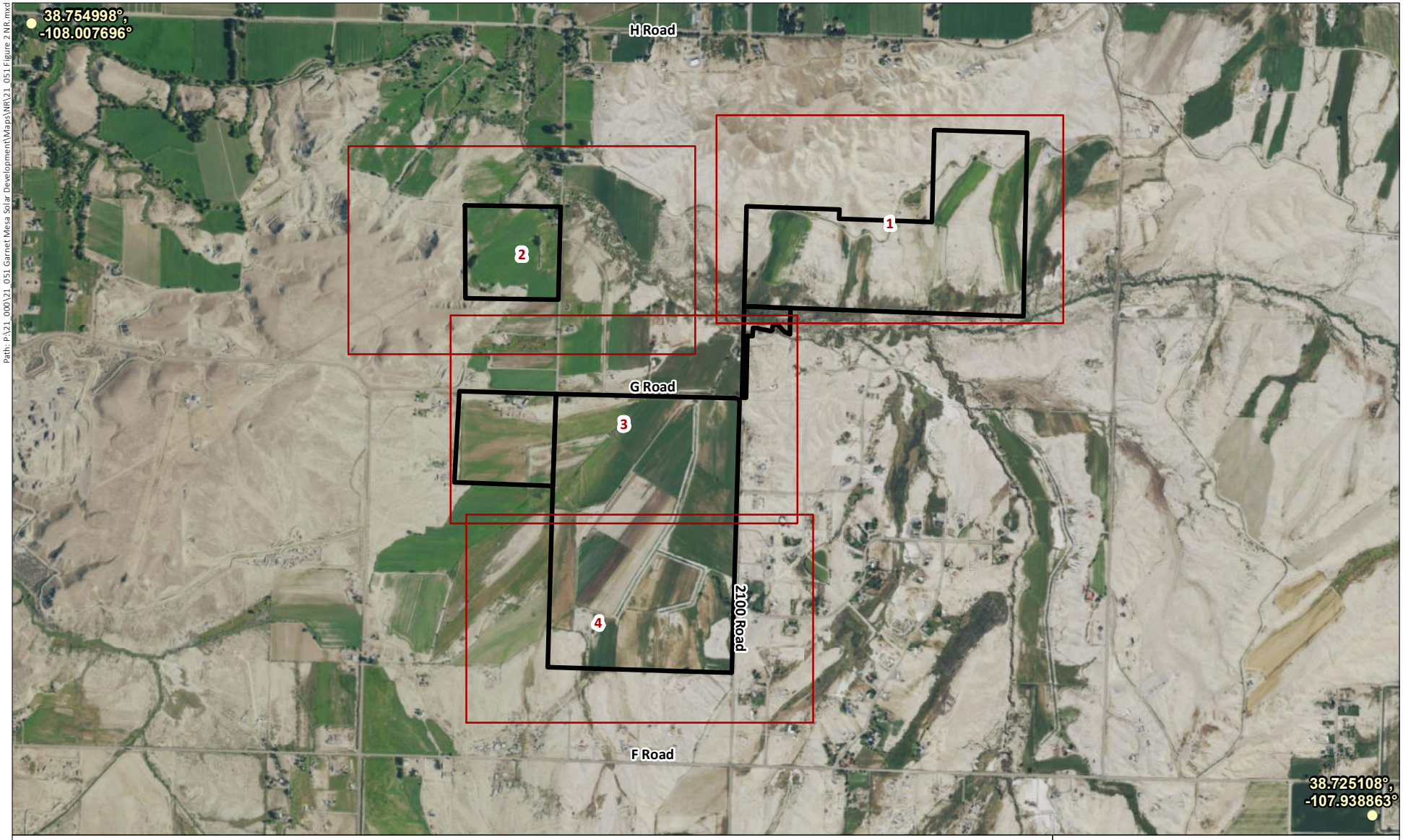
Description of Wetlands and Other Waters

ERO assessed the project area for wetlands and other WOTUS as described below. Data were collected to document the characteristics of East Canal Lateral and the adjacent uplands and wetlands, and the transition areas between them (Figure 2 and Figure 2a through Figure 2d). Table 2 provides a summary of the mapped WOTUS in the project area, including Cowardin classification and HGM for each feature. Approximately 0.074 acre of open waters and 0.083 acres of wetlands occur in the project area.

Table 2. Wetland area, Cowardin classification, and HGM.

Water/ Wetland ID	Latitude	W. Longitude	Feature Size (acre)	Cowardin Classification	HGM
East Canal	38.743594	-107.971091	0.074	Riverine-Perennial	Upper perennial
		Open Water Total	0.074		
East Canal Wetland	38.743582	-107.971118	0.083	PEM	Riverine
		Wetland Total	*0.083*		

PEM = palustrine emergent.



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Garnet Mesa Solar Development

Map Grid/Matchline

Project Area Boundary

Image Source: USDA-FS-AFPO NAIP September 13, 2019

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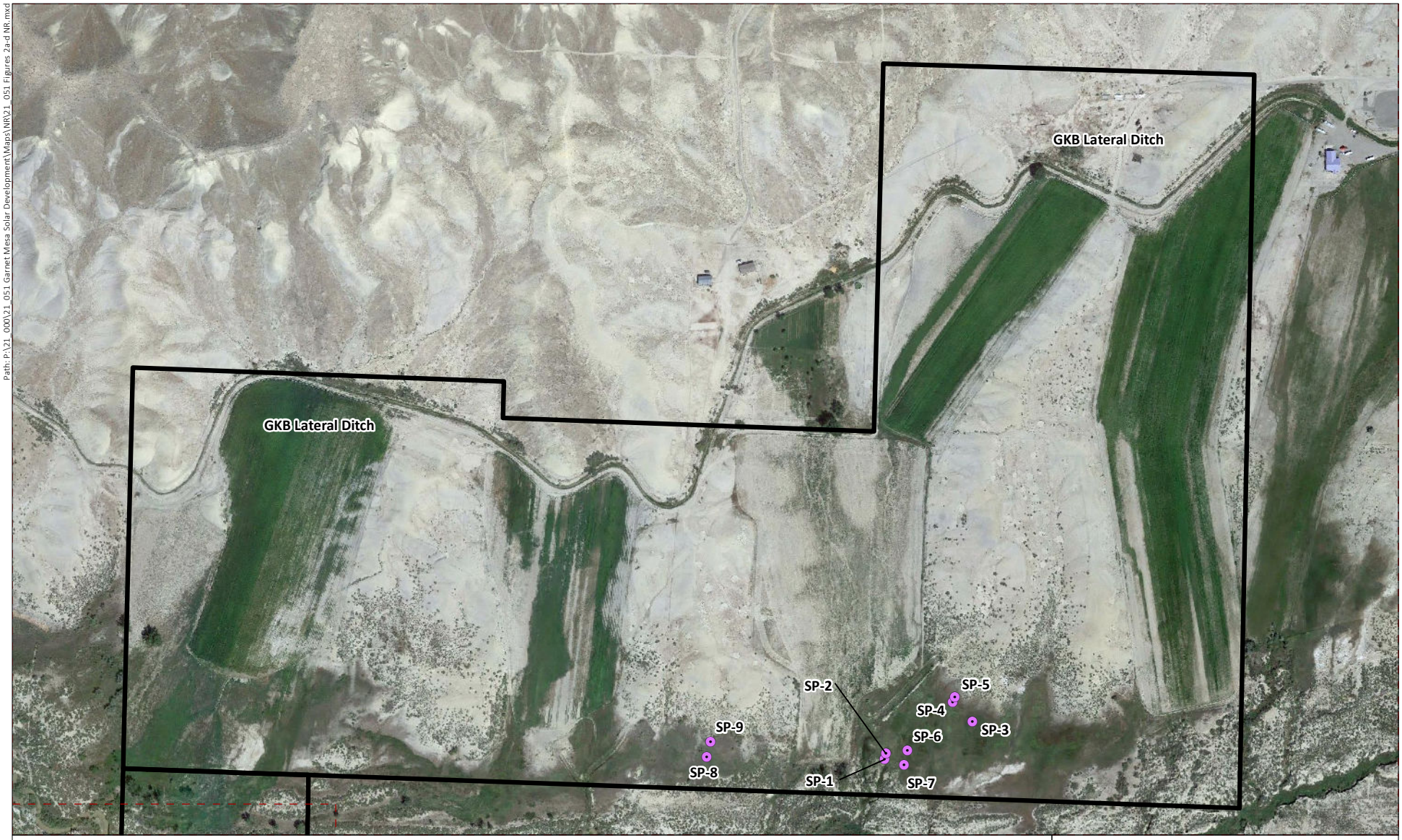
Figure 2
Wetlands and
Waters of the U.S.
Map Index

Prepared for: Garnet Mesa Solar, LLC
File: 21_051 Figure 2 NR.mxd (WH)
April 29, 2021

ERO Resources Corp.

Path: P:\21_000\21_051 Garnet Mesa Solar Development\Maps\NR\21_051 Figures 2a-d NR.mxd



Garnet Mesa Solar Development

- Soil Pit
- Ordinary High Water Mark (0.074 ac)
- Wetland (0.083 ac)
- Project Area Boundary (498.346 ac)
- Map Grid/Matchline

Image Source: Google© Earth August 25, 2019

0 250 500 feet

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Figure 2a
Wetlands and Waters of the U.S.

Prepared for: Citra Power
File: 21_051 Figures 2a-d NR.mxd (WH)
June 6, 2021

ERO Resources Corp.

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Garnet Mesa Solar Development

- Soil Pit
- Ordinary High Water Mark (0.074 ac)
- Wetland (0.083 ac)
- Project Area Boundary (498.346 ac)
- Map Grid/Matchline

Image Source: Google© Earth August 25, 2019

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Figure 2b
Wetlands and Waters of the U.S.

Prepared for: Citra Power
File: 21_051 Figures 2a-d NR.mxd (WH)
June 6, 2021

ERO Resources Corp.

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Garnet Mesa Solar Development

- Soil Pit
- Ordinary High Water Mark (0.074 ac)
- Wetland (0.083 ac)
- Project Area Boundary (498.346 ac)
- Map Grid/Matchline

Image Source: Google© Earth August 25, 2019

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Figure 2c
Wetlands and Waters of the U.S.

Prepared for: Citra Power
File: 21_051 Figures 2a-d NR.mxd (WH)
June 6, 2021

ERO Resources Corp.

Path: P:\21_000\21_051 Garnet Mesa Solar Development\Maps\NR\21_051 Figures 2a-d NR.mxd

Garnet Mesa Solar Development

- Soil Pit
- Ordinary High Water Mark (0.074 ac)
- Wetland (0.083 ac)
- Project Area Boundary (498.346 ac)
- Map Grid/Matchline

Image Source: Google© Earth August 25, 2019

0 250 500 feet

1:6,000

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Figure 2d
Wetlands and
Waters of the U.S.

Prepared for: Citra Power
File: 21_051 Figures 2a-d NR.mxd (WH)
June 6, 2021

ERO Resources Corp.

Waters of the U.S.

East Canal

East Canal is shown on the USGS Orchard City, Colorado topographic quadrangle as a perennial drainage (solid blue line) and has 0.074 acre of open water in the project area (Figure 2c). East Canal is about 15 to 20 feet across from bank to bank at the OHWM with an unconsolidated bottom (Photos 1 and 2). The OHWM was determined by vegetation, evidence of flow, and change in slope. The water quality was poor and opaque at the time of the 2021 field survey and depth could not be determined visually; however, based on prior experience, ERO estimates that the depth at this location is likely about 3 to 5 feet at the OHWM. The NWI online mapper classifies this feature as R3UBH; Riverine, upper perennial, unconsolidated bottom, permanently flooded. As noted previously, based on site characteristics, ERO believes this drainage likely is perennial during a typical year.

Wetlands

East Canal Wetland

East Canal supports a narrow (3- to 6-foot) wetland fringe, palustrine persistent emergent Cowardin class, which was mapped during the 2021 field survey on aerial photos (0.083 acre; Figure 2c). The East Canal banks are near-vertical, and the banks could not be safely accessed for flagging and mapping with a GPS unit. Soil pit data was not collected due to the unsafe conditions; however other soil pits collected nearby were assumed to be representative. Due to the position of the East Canal Wetlands along a perennial, tributary drainage, the hydrology is assumed to be “natural” rather than “artificial” as noted on the datasheets in Attachment C. Herbaceous vegetation is primarily dominated by saltgrass, reed canarygrass, and alkali muhly. Tamarisk also is present in limited amounts. The East Canal banks upslope of the wetland fringe are dominated by cheatgrass, four-wing saltbush, sagebrush, and rubber rabbitbrush. An abrupt transition of slope was used to map the wetland fringe on aerial photography. In addition, the boundary between “natural” and “artificial” hydrology was mapped based on the lateral extent of wetlands in areas along East Canal where upslope wetlands (with artificial hydrology) were not present.

Raptors and Migratory Birds

Potential habitat for migratory birds and raptors is present in the project area, including cottonwood trees that provide nesting and roosting habitat for raptors. Two migratory bird nests, presumed to be magpie nests, were observed during the 2021 field survey. Other smaller migratory birds likely use the habitat in the project area. A soaring red-tailed hawk was observed at the north end of the project area and raptor nesting is possible; however, no nests were observed in the adequately sized trees in the project area.

Threatened and Endangered Species

Based on the 2021 field survey, no potential habitat for threatened and endangered species occurs in the project area. The project has no potential to impact threatened and endangered species. The rationale for each species found in Delta County is provided in Table 3.

Table 3. Threatened and endangered species in Delta County.

Common Name (Scientific Name)	Status	Habitat Description	Potential to Occur in Project Area
Birds			
Yellow-billed cuckoo (*Coccyzus americanus*)	Threatened	Deciduous riparian woodlands, with dense cottonwood and willow, and sometimes tamarisk.	No suitable nesting habitat or foraging habitat; high levels of human disturbance.
Fish			
Bonytail chub* (*Gila elegans*)	Endangered	Found within the Colorado River and its tributaries.	Downstream habitat/occurrence.
Colorado pikeminnow (=squawfish)* (*Ptychocheilus lucius*)	Endangered	Found within the Colorado River and its tributaries.	Downstream habitat/occurrence.
Humpback chub* (*Gila cypha*)	Endangered	Found within the Colorado River and its tributaries.	Downstream habitat/occurrence.
Razorback sucker* (*Xyrauchen texanus*)	Endangered	Found within the Colorado River and its tributaries.	Downstream habitat/occurrence.
Plants			
Colorado hookless cactus (*Sclerocactus glaucus*)	Threatened	On exposed, bare gravel-covered clay hills; in saltbrush or sagebrush flats; or in pinyon-juniper woodlands.	No suitable habitat; presence of weeds and disturbance preclude species. None observed during the 2021 field survey.
Clay loving wild-buckwheat (*Eriogonum pelinophilum*)	Threatened	Rolling clay and adobe hills and flats; white alkaline clay barrens derived from Mancos Shale Formation.	No suitable habitat; presence of weeds and unsuitable soils preclude species. None observed during the 2021 field survey.

*Habitat occurs in the Gunnison River; the river is about 6 miles downstream of the project area.
Source: Service 2021.

General Wildlife Habitat

There is no mapped sensitive wildlife habitat in the project area (Colorado Oil and Gas Commission 2021; Colorado Parks and Wildlife 2021). It is likely that deer pass through the project area regularly, but no sensitive winter range or production areas are present.

General wildlife likely present in the project area includes predators such as black bear, mountain lion, bobcat, coyote, and fox; small mammals (rabbit, mouse, shrew, racoon, skunk, and bats); and reptiles and amphibians (sagebrush lizard, fence lizard, whiptail, bull snake, garter snake, and various frogs and toads). Species present in the project area are likely adapted to some level of human disturbance including agricultural and residential uses (Armstrong et. al 2011).

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Appendix A Photo Log

Photo 1 - Overview of East Canal showing steep, incised banks.

Photo 2 - Looking down at East Canal showing steep, incised banks and wetland fringe.

Photo 3 - Riparian woodland on upland bench north of East Canal and south of irrigated fields.

Photo 4 - View north showing GKB Lateral Ditch, road, and sidecast berms.

Photo 5 - View west in pasture south of G Road and 2050 Road intersection.

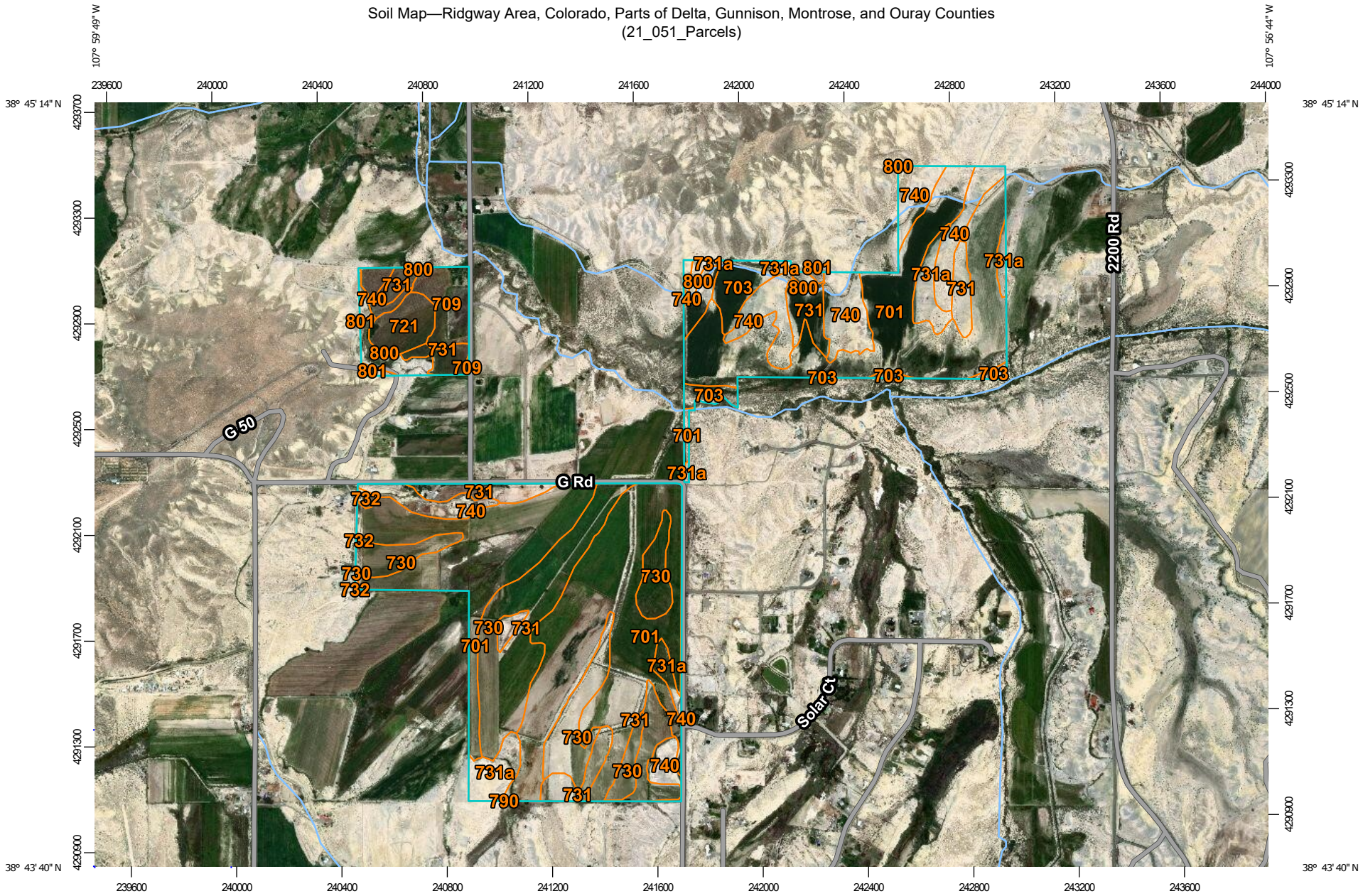
Photo 6 - View north showing storage area.

Photo 7 - Typical excavated drain.

Photo 8 - Disturbed salt desert scrub/sagebrush community.

Appendix B Soil Map

Soil Map—Ridgway Area, Colorado, Parts of Delta, Gunnison, Montrose, and Ouray Counties
(21_051_Parcels)



Map Scale: 1:20,400 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 300 600 1200 1800

Feet: 0 500 1000 2000 3000

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

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: Ridgway Area, Colorado, Parts of Delta, Gunnison, Montrose, and Ouray Counties
Survey Area Data: Version 12, Jun 5, 2020

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

Date(s) aerial images were photographed: Dec 31, 2009—Jul 7, 2017

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
701	Montrose silty clay loam, 0 to 2 percent slopes	243.6	48.9%
703	Sagers silty clay loam, 2 to 7 percent slopes	14.1	2.8%
709	Montrose silty clay loam, 2 to 6 percent slopes	12.2	2.4%
721	Gyprockmesa-Gypimack complex, 2 to 5 percent slopes	10.0	2.0%
730	Killpack silty clay loam, 0 to 2 percent slopes	78.2	15.7%
731	Killpack-Persayo complex, 2 to 8 percent slopes	49.8	10.0%
731a	Persayo-Killpack complex, 0 to 6 percent slopes	21.2	4.3%
732	Fruita silty clay loam, 0 to 5 percent slopes	1.1	0.2%
740	Persayo-Fruita complex, 0 to 12 percent slopes	56.5	11.3%
790	Briny clay loam, 0 to 3 percent slopes, rarely flooded	0.0	0.0%
800	Persayo loam, 4 to 25 percent slopes	9.5	1.9%
801	Persayo-Badland complex, 25 to 75 percent slopes	2.1	0.4%
Totals for Area of Interest		**498.4**	**100.0%**

Appendix C Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 21-051 Garnet Mesa Solar Project City/County: Delta Sampling Date: 4.19.21

Applicant/Owner: Matthew Kosakowski, Citra Power State: CO Sampling Point: SP-1

Investigator(s): Aleta Powers and Hidde Sneider Section, Township, Range: S13 T15S R95W 6th PM

Landform (hillslope, terrace, etc.): swale by low irr. field Local relief (concave, convex, none): concave Slope (%): 4

Subregion (LRR): D Lat: 38.745 Long: -107.962 Datum: NAD83

Soil Map Unit Name: Montrose silty clay loam, 0-2% slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation n, Soil n, or Hydrology n significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation n, Soil n, or Hydrology n naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

drainage from irrigated field -

Solely sourced by artificial hydrology; not jurisdictional

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Distichlis spicata	70	Y	FAC
2. Asteraceae	5	N	FACW
3. Muhlenbergia asperifolia	5	N	FACW
4.			
5.			
6.			
7.			
8.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 2.5/1	100					loamy clay	
4-20	2.5Y 4/1	80	2.5Y 4/4	20	C	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes X No ____ Depth (inches): 10"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): Surface

Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland is solely sourced from artificial hydrology and is non-jurisdictional

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 21-051 Garnet Mesa Solar Project City/County: Delta Sampling Date: 4.19.21

Applicant/Owner: Matthew Kosakowski, Citra Power State: CO Sampling Point: SP-2 (wp)

Investigator(s): Aleta Powers and Hidde Sneider Section, Township, Range: S13 T15S R95W 6th PM

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): — Slope (%): 8

Subregion (LRR): D Lat: 38.745 Long: -107.962 Datum: NAD83

Soil Map Unit Name: Montrose silty clay loam, 0-2% slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks: Upper slopes of swale

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Distichlis spicata	50	Y	FAC
2. Astragalus falcatus	5	N	FACU
3. Taraxacum officinales	5	N	FACU
4. Acroptilon repens	5	N	UPL
5.			
6.			
7.			
8.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 35 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: marginal veg; transition to uplands

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	2.5Y4/3	100					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

no hydric soil indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

dry. No hydrology indicators
some salt deposits.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 21-051 Garnet Mesa Solar Project City/County: Delta Sampling Date: 4.19.21

Applicant/Owner: Matthew Kosakowski, Citra Power State: CO Sampling Point: SP-3

Investigator(s): Aleta Powers and Hidde Sneider Section, Township, Range: S13 T15S R95W 6th PM

Landform (hillslope, terrace, etc.): field Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): D Lat: 38.745 Long: -107.961 Datum: NAD83

Soil Map Unit Name: Montrose silty clay loam, 0-2% slopes NWI classification: PEMIC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: appears to be a seepage-fed w. from tailwater / irrigated land + canal to the north

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 4 ft 2)			
1. Juncus balticus	20	Y	FACW
2. Eleocharis palustris	20	Y	OBL
3. Distichlis spicata	20	Y	FAC
4. Alopecurus sp	5	N	UNK
5.			
6.			
7.			
8.			
	____ = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 35 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: SP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR4/1	95	5YR4/6	5	C	PL	sandy clay loam	
4-20	10YR5/2	90	7.5YR4/8	10	C	PL	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 10"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Solely sourced by artificial hydrology; not jurisdictional

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 21-051 Garnet Mesa Solar Project City/County: Delta Sampling Date: 4.19.21

Applicant/Owner: Matthew Kosakowski, Citra Power State: CO Sampling Point: SP-4

Investigator(s): Aleta Powers and Hidde Sneider Section, Township, Range: S13 T15S R95W 6th PM

Landform (hillslope, terrace, etc.): field Local relief (concave, convex, none): — Slope (%): 1

Subregion (LRR): D Lat: 38.745 Long: -107.961 Datum: _____

Soil Map Unit Name: Montrose silty clay loam NWI classification: PEMIC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

may be irrigation/seepage fed

Solely sourced by artificial hydrology; not jurisdictional

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 4')			
1. Distichlis spicata	60	Y	FAC
2. Acroptilon repens	5	N	UPL
3.			
4.			
5.			
6.			
7.			
8.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 35 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

__ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: SP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR4/1	95	7.5YR4/6	5	C	M	clay loam	
6-20	10YR5/2	95	10YR5/8	5	C	M	"	"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

patchy salt

Solely sourced by artificial hydrology - Not natural, not jurisdictional

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 21-051 Garnet Mesa Solar Project City/County: Delta Sampling Date: 4-19-21

Applicant/Owner: Matthew Kosakowski, Citra Power State: CO Sampling Point: SP-5 (wp)

Investigator(s): Aleta Powers and Hidde Sneider Section, Township, Range: S13, T15S R95W 6th PM

Landform (hillslope, terrace, etc.): field/slope Local relief (concave, convex, none): — Slope (%): 1

Subregion (LRR): D Lat: 38.745 Long: -107.961 Datum: NAD83

Soil Map Unit Name: Montrose silty clay loam NWI classification: PEMIC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 4 x 2)			
1. Distichlis spicata	40	Y	FAC
2. Acroptilon repens	5	N	UPL
3. Taraxacum officinale	<1	N	FACU
4.			
5.			
6.			
7.			
8.			
	46 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 54 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

dry edges at transition to salt desert scrub

SOIL

Sampling Point: SP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR4/2	100					clay loam	
3-20	10YR4/2	95	10YR4/4	5	C	PL	"	"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

depleted matrix persists due to heavy clay; soils dry & vegetation transition to upland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

dry; no w hydro

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 21-051 Garnet Mesa Solar Project City/County: Delta Sampling Date: 4.19.21

Applicant/Owner: Matthew Kosakowski, Citra Power State: CO Sampling Point: SP-6

Investigator(s): Aleta Powers and Hidde Sneider Section, Township, Range: S13 T15S R95W 6th PM

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): — Slope (%): 1

Subregion (LRR): D Lat: 38.745 Long: -107.961 Datum: NAD83

Soil Map Unit Name: Montrose silty clay loam, 0-2% slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation n, Soil n, or Hydrology n significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation n, Soil n, or Hydrology n naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	Is the Sampled Area within a Wetland? Yes ___ No X
Hydric Soil Present?	Yes X	No ___	
Wetland Hydrology Present?	Yes ___	No X	

Remarks: Barely - swale / wet

Solely sourced by artificial hydrology; not jurisdictional

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		

Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		

Herb Stratum (Plot size: 4')			
1. Distichlis spicata	30	Y	FACW
2. Aster tacatius	5	N	FACU
3. Cirsium arvense	5	N	FACU
4. Muhlenbergia asperifolia	5	N	FACW
5.			
6.			
7.			
8.			
	45 = Total Cover		

Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum 55 % Cover of Biotic Crust ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: SP-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR3/2	95	10YR5/2	5	C	PL	clay loam	
3-20	10YR5/2	90	10YR5/8	10	C	PL	"	"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: damp @ 18"

Solely sourced by artificial hydrology; not jurisdictional

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 21-051 Garnet Mesa Solar Project City/County: Delta Sampling Date: 4.19.21

Applicant/Owner: Matthew Kosakowski, Citra Power State: CO Sampling Point: SP-7 (wp)

Investigator(s): Aleta Powers and Hidde Sneider Section, Township, Range: S 13 T15S R95W 6th pm

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): — Slope (%): 1

Subregion (LRR): D Lat: Long: Datum:

Soil Map Unit Name: Montrose silty clay loam NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation n, Soil n, or Hydrology n significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation n, Soil n, or Hydrology n naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 4')			
1. distichlis spicata	40	Y	FAC
2. Acroptilon repens	30	Y	UPL
3.			
4.			
5.			
6.			
7.			
8.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: SP-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-20	10YR5/3	100					sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

no indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

no indicators; dry; no rhizospheres

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 21-051 Garnet Mesa Solar Project City/County: Delta Sampling Date: 4-19-21

Applicant/Owner: Matthew Kosakowski, Citra Power State: CO Sampling Point: SP-8

Investigator(s): Aleta Powers and Hidde Sneider Section, Township, Range: S13 T15S R95W 6th PM

Landform (hillslope, terrace, etc.): field Local relief (concave, convex, none): concave Slope (%): —

Subregion (LRR): D Lat: 38.745 Long: -107.964 Datum: NAD83

Soil Map Unit Name: Montrose salty clay loam, 0-2% slopes NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes _____	No X	

Remarks: patch of W below irrigated field/canal

Solely sourced by artificial hydrology; not jurisdictional

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 4')			
1. Distichlis spicata	90	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: a few tamarisk nearby

SOIL

Sampling Point: SP-8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR3/2	100					organic-loam	
3-10	10YR5/2	85	10YR5/8	15	C	PL	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

damp @ 20" but not saturated

Solely sourced by artificial hydrology; not jurisdictional

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 21-051 Garnet Mesa Solar Project City/County: Delta Sampling Date: 4.19.21

Applicant/Owner: Matthew Kosakowski, Citra Power State: CO Sampling Point: SP-9

Investigator(s): Aleta Powers and Hidde Sneider Section, Township, Range: S13 T15S R95W 6th PM

Landform (hillslope, terrace, etc.): field Local relief (concave, convex, none): — Slope (%): 1

Subregion (LRR): D Lat: 38.745 Long: -107.964 Datum: NAD83

Soil Map Unit Name: Montrose silty clay loam, 0-2% slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes Y No (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes No X	
Wetland Hydrology Present?	Yes No X	

Remarks: down gradient of irrigation/canal
no other apparent sources of hydrology

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 4')			
1. Distichlis spicata	40	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	40 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 60 % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No

Remarks: no other species; 4-wing SB nearby

SOIL

Sampling Point: SP-9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR4/2	100					Sl. Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

none; no hydric soil indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

dry; no indicators

Attachment 3-F

Phase I ESA

ERO

Consultants in Natural Resources and the Environment

Phase I Environmental Site Assessment
Garnet Mesa Solar Development Property
Delta County, Colorado

Prepared for—

Garnet Mesa Solar, LLC
1125 17th Street, Suite 740
Denver, Colorado 80202

Prepared by—

ERO Resources Corporation
1842 Clarkson Street
Denver, Colorado 80218
(303) 830-1188
ERO Project #21-051

April 30, 2021

Per ASTM E1527-13 §4.6, this Phase I ESA is considered valid through:
September 26, 2021

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Summary

Garnet Mesa Solar, LLC retained ERO Resources Corporation (ERO) to conduct a Phase I Environmental Site Assessment (Phase I ESA) for the Garnet Mesa Solar Development property in Delta County, Colorado (hereafter called the property). ERO performed this Phase I ESA according to the "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" (ASTM International E1527-13 2013) (ASTM 2013). This Phase I ESA consists of a review of historical information and federal, state, and local records; interviews with persons knowledgeable of the property; a site reconnaissance; and preparation of this report.

Property Description. The property consists of three parcels of land and portions of two additional parcels, totaling 493.9 acres. Historically, the property and surrounding area have been undeveloped, agricultural, and rural residential land.

Records Review. Federal, state, and local records did not identify any sites or incidents on or near the property typically associated with recognized environmental conditions (RECs).

Site Reconnaissance. During the site reconnaissance, ERO investigated the parcels by driving or walking along the perimeter of each parcel and traversing the interior. Three aboveground storage tanks (ASTs) and numerous containers and 55-gallon drums of petroleum products were observed on the property, primarily in and around buildings in the farmstead area in the southwest parcel. Only *de minimis* staining was observed on the ground and concrete around the ASTs, containers, and drums. In addition, solid waste disposal sites consisting of scrap metal and wood, concrete debris, metal wire, and old beer cans and bottles were observed on the south and northeast parcels; and one pole-mounted electrical transformer was observed on the property. A septic system was observed north of the travel trailers on the northwest parcel and the residence on the southwest parcel is reportedly connected to a septic system. No site conditions or features typically associated with RECs were identified during the site reconnaissance.

Conclusions. ERO performed this Phase I ESA in conformance with the scope and limitations of ASTM Practice E1527. Any exceptions to or deletions from this practice are described in the Introduction section of this report. This assessment has revealed no evidence of RECs in connection with the property. In accordance with the ASTM standard, this Phase I ESA is valid if completed less than 180 days prior to property acquisition or intended transaction.

Phase I Environmental Site Assessment

Garnet Mesa Solar Development Property
Delta County, Colorado

April 30, 2021

1.0 Introduction

Garnet Mesa Solar, LLC retained ERO Resources Corporation (ERO) to conduct a Phase I Environmental Site Assessment (Phase I ESA) for the Garnet Mesa Solar Development property in Delta County, Colorado (the property). The area surrounding the property is shown on Figure 1. This report presents the findings, opinions, and conclusions of this Phase I ESA.

This Phase I ESA was performed to satisfy the Work Scope and contract between Garnet Mesa Solar, LLC and ERO dated January 22, 2021 (Appendix D). The conclusions in this report are based on limited observations and investigations described herein at the time this Phase I ESA was conducted; future events may alter these findings.

1.1 Location and Legal Description

The property is in Sections 13, 14, and 23, Township 15 South, Range 95 West of the 6th Principal Meridian in Delta County, Colorado. ERO was not provided with a legal description for the property. The property location and extent subject to this Phase I ESA are shown on Figure 1 and Figure 2.

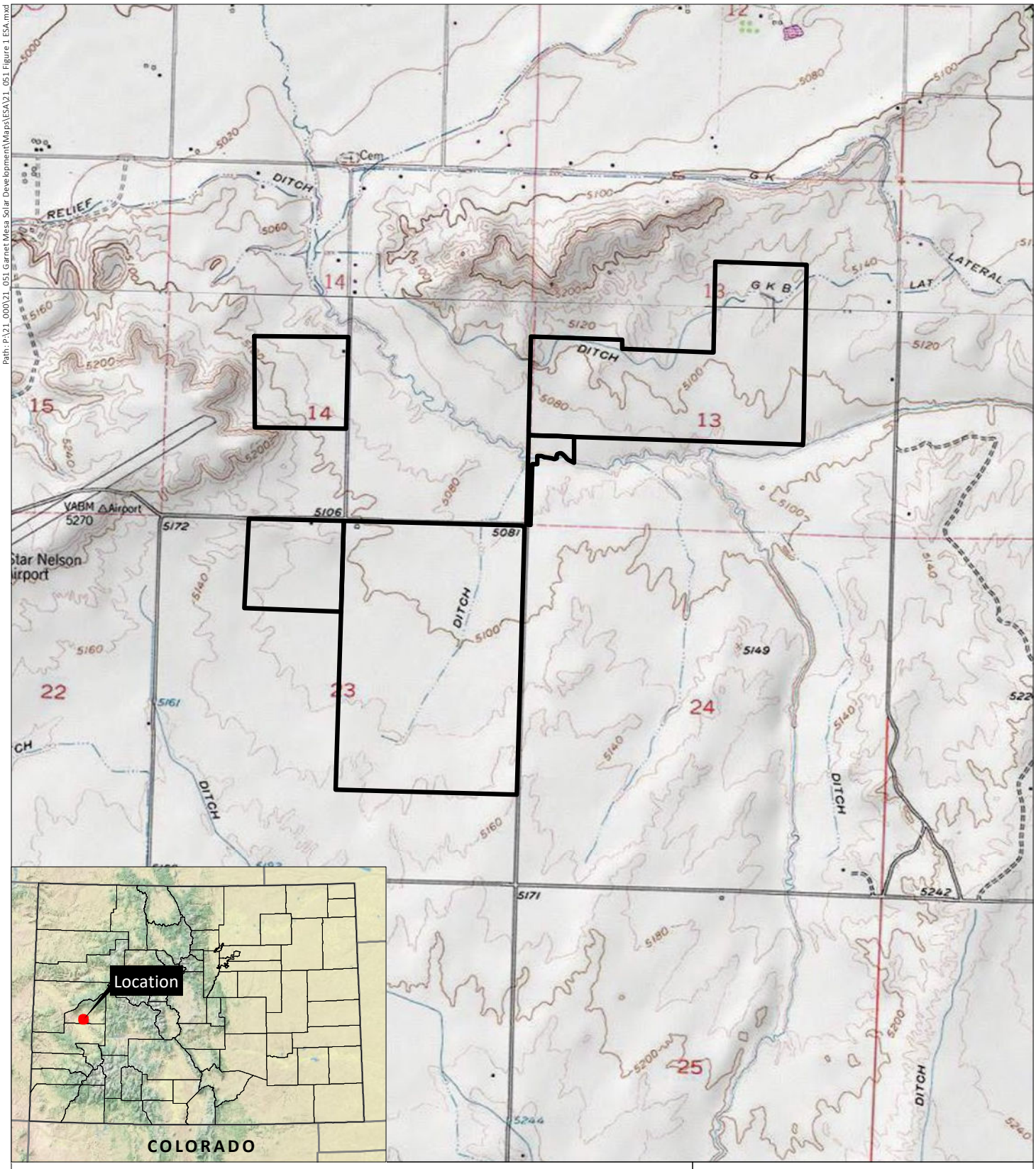
According to the Delta County Assessor's Office, the property is zoned as agricultural land listed as the following parcels (Delta County Assessor's Office 2021):

- Parcel No. 345514300008 (northwest parcel) (40 acres);
- Parcel No. 345523100001 (south parcel) (240 acres);
- Parcel No. 345523200009 (southwest parcel) (41.8 acres);
- Portion of Parcel No. 345513100021 (northeast parcel) (165.7 acres); and
- Portion of Parcel No. 345513300009 (central parcel) (6.4 acres).

1.2 Site and Vicinity General Characteristics

The property consists of three parcels and portions of two parcels totaling 493.90 acres. Three parcels (northwest, south, and southwest) are owned by Garnet Mesa Land, LLC; the northeast parcel is owned by Kenneth and Paula Jo Norell; and the central parcel is owned by Jennifer Hofschulte. The property is generally surrounded by agricultural, undeveloped, and rural residential land, and various county roads (Figure 2).

Path: P:\21_000\21_051 Garnet Mesa Solar Development\Maps\ESA\21_051 Figure 1 ESA.mxd



Garnet Mesa Solar Development

Sections 13, 14, and 23, T15S, R95W; 6th PM

UTM NAD 83: Zone 13N; 241771mE, 4292464mN

Longitude 107.97133°W, Latitude 38.743123°N

USGS Olathe NW and Orchard City, CO Quadrangles

Delta County, Colorado

Figure 1
Vicinity Map

Prepared for: Garnet Mesa Solar, LLC

File: 21_051 Figure 1 ESA.mxd (WH)

April 28, 2021

ERO Resources Corp.

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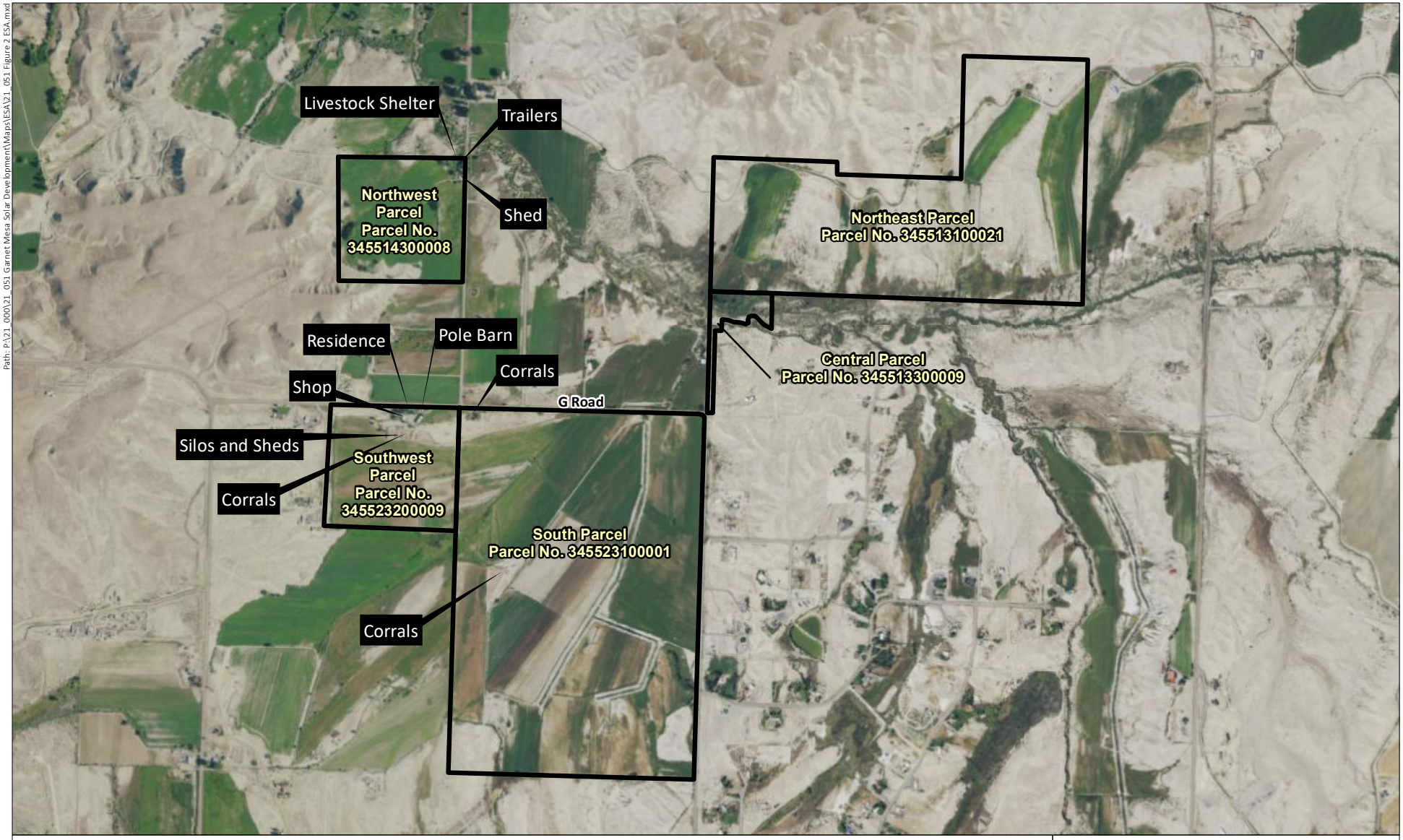
Path: P:\21_000\21_051 Garnet Mesa Solar Development\Maps\ESA\21_051 Figure 2 ESA.mxd



Garnet Mesa Solar Development

Property Boundary

Image Source: USDA-FS-AFPO NAIP September 13, 2019

0 750 1,500 feet

N

Figure 2
Site Plan

Prepared for: Garnet Mesa Solar, LLC
File: 21_051 Figure 2 ESA.mxd (WH)
April 28, 2021

ERO Resources Corp.

1.3 Purpose

ERO conducted this Phase I ESA to identify recognized environmental conditions (RECs) associated with the property. The term REC means the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property due to a release to the environment, under conditions indicative of a release to the environment, or under conditions that pose a material threat of a future release to the environment.[1] The term includes hazardous substances or petroleum products even under conditions in compliance with laws.

Three additional conditions indicative of releases of hazardous substances or petroleum products on a property may be identified. These consist of the following:

Controlled recognized environmental condition (CREC) – when a past release of hazardous substances or petroleum products has occurred and has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). This designation does not imply that ERO has evaluated or confirmed the adequacy, implementation, or effectiveness of the controls.

Historical recognized environmental condition (HREC) – when a past release of any hazardous substances or petroleum products has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meets unrestricted use criteria established by a regulatory authority without any required controls.

***De minimis* conditions** – those conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not RECs.

While no Phase I ESA can wholly eliminate uncertainty regarding the potential for RECs in connection with a property, the environmental conditions of the property have been investigated in accordance with ASTM Standard E1527-13, developed to define commercial and customary practices for Phase I ESAs. The Phase I ESA process is not an exhaustive assessment of a property; it is intended to reduce but not eliminate uncertainty regarding the potential for RECs in connection with the property, recognizing the limits of time and cost. In addition, this Phase I ESA was performed to permit the user to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability: that is, the practice that constitutes "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" as defined in 42 U.S.C. Section 9601(35)(B).

[1] ASTM 2013. Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. Section 1.1.1 – Definition of recognized environmental condition.

1.4 Scope of Work

This Phase I ESA was conducted in accordance with ASTM E1527-13, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process." Deviations from this practice, if any, are listed in Section 1.6. ERO's Work Scope is included in Appendix D. This Phase I ESA generally consists of four components:

- A review of reasonably ascertainable historical and regulatory database records to help identify RECs in connection with the property.
- A site reconnaissance to visually and physically observe the property, the adjoining properties, and the surrounding area.
- Interviews with the user of the Phase I ESA, one occupant, and local government officials to help identify RECs associated with the property.
- A report and evaluation of the information collected as part of this Phase I ESA that presents ERO's findings, opinions, and conclusions.

1.5 Limitations, Exceptions, and Assumptions

This Phase I ESA was performed in a professional manner using the degree of skill and care exercised for similar projects under similar conditions by reputable and competent environmental professionals. A lack of evidence of the presence of hazardous substances or petroleum products during this Phase I ESA does not guarantee the absence of such materials; it merely indicates that none were identified within the contracted scope of this Phase I ESA. Unforeseen conditions may significantly affect the ability to make conclusions based solely on the level of effort mutually agreed upon to conduct this Phase I ESA, which may ultimately affect the level of risk. ERO shall not be held responsible for any conditions or consequences arising from relevant facts that were concealed, withheld, or not fully disclosed. The opinions and conclusions in this report are based on commonly known, reasonably ascertainable, publicly available information and site reconnaissance observations described herein at the time this Phase I ESA was conducted. Future events or changes in publicly available information may alter the findings, opinions, and conclusions of this report. No other warranty, expressed or implied, is made as to the professional opinions included in this report.

The following issues are specifically excluded from this Phase I ESA: wetlands, migratory birds, asbestos-containing materials, radon, lead-based paint, lead in drinking water, mold, and ownership of subsurface mineral rights or leases. Aside from those stated in the Work Scope in Appendix D and those listed above, no significant assumptions apply to this Phase I ESA.

1.6 Deviations

This Phase I ESA was conducted with no known deviations from the ASTM Standard Practice for Environmental Site Assessments (ASTM 2013). ERO was not provided with contact information for property owners Kenneth and Paula Jo Norell (northeast parcel) and Jennifer Hofschulte (central parcel).

1.7 Special Terms and Conditions

No special terms or conditions apply to this Phase I ESA.

1.8 User Reliance

This report is for the use and benefit of Garnet Mesa Solar, LLC and is not to be used by others without the prior written consent of ERO. No other party shall rely on the information contained herein without the prior written consent of Garnet Mesa Solar, LLC or ERO.

2.0 User-Provided Information

Mr. Matthew Kosakowski with Garnet Mesa Solar, LLC, the user of this Phase I ESA, completed a User Questionnaire regarding his knowledge of the property. Mr. Kosakowski has been associated with the property for three months. The following sections present the information provided by Mr. Kosakowski (Kosakowski 2021).

2.1 Owner, Property Manager, and Occupant Information

Mr. Kosakowski did not indicate the owners or occupants of the property. However, he provided contact information for himself as a representative of Garnet Mesa Solar, LLC and the realtor (Kosakowski 2021).

2.2 Land Title Records/Environmental Liens or Activity and Use Limitations

The ASTM E1527-13 practice indicates that it is the responsibility of the user of this Phase I ESA, Garnet Mesa Solar, LLC, to identify any environmental liens and activity use limitations (AULs) recorded or filed against the property. Mr. Kosakowski was unaware of any environmental liens or AULs associated with the property (Kosakowski 2021).

2.3 Actual or Specialized Knowledge

According to Mr. Kosakowski, he does not have any actual or specialized knowledge of any uses or incidents on the property that would indicate RECs in connection with the property (Kosakowski 2021).

2.4 Valuation Reduction for Environmental Issues

According to Mr. Kosakowski, the proposed purchase/acquisition price of the property does not reflect a reduction in value below fair market value for reasons of known contamination on the property (Kosakowski 2021).

2.5 Commonly Known or Reasonably Ascertainable Information

According to Mr. Kosakowski, he is not aware of any commonly known or reasonably ascertainable information within the local community that would indicate RECs in connection with the property (Kosakowski 2021).

2.6 Degree of Obviousness

According to Mr. Kosakowski, to his knowledge, there is no obvious indication of releases or threatened releases on the property (Kosakowski 2021).

2.7 Reason for Performing Phase I

According to Mr. Kosakowski, this Phase I ESA is being conducted as environmental due diligence prior to redevelopment as a ground-mount solar photovoltaic power plant (Kosakowski 2021).

3.0 Records Review

3.1 Physical Setting

The elevation of the property ranges from 5,060 to 5,150 feet above sea level (U.S. Geological Survey [USGS] 2019). Surface geology in the area is characterized by Quaternary-age alluvial, mud flow, and mud fan deposits and the Smoky Hill and Fort Hays Members of the Cretaceous-era Mancos Shale Formation (Noe and Zawaski 2013; Noe et al. 2014). According to the Colorado Division of Water Resources (CDWR), there are no water wells on the property, and a monitoring well was reportedly installed by the USGS in 2014 within 0.5 mile of the property to the southeast with a reported depth to groundwater of 26 feet below ground surface (CDWR 2021). According to topographic information from the USGS 7.5-minute quadrangle map, surface water on the property flows toward an unnamed creek that bisects the property and flows to the northwest, toward the Gunnison River (USGS 2019). Based on the topography and field observations, the flow direction of the uppermost groundwater is expected to follow the topography and flow generally to the northwest.

3.2 Current and Future Use of the Property

The property is currently developed for agricultural and rural residential use. According to Garnet Mesa Solar, LLC, the property is proposed for a ground-mount photovoltaic solar plant (Kosakowski 2021).

3.3 Structures, Roads, or Other Improvements on the Property

There is a residence, shop building, and pole barn on the southwest parcel. The residence is a 1,026-square-foot, one-story, wood-framed residence built in 1962 with a slab foundation and a small partial basement with vinyl siding and metal roof. A shop building and a pole barn are in the vicinity of the aforementioned residence. Both the shop and pole barn are wood-framed structures with metal siding and roofs, and the shop was built on a concrete foundation and the pole barn has a dirt floor. Several woodsheds and metal silos are also in the vicinity of the residence. The residence is heated with a propane-fired forced-air furnace and no cooling units are connected to the structure.

Potable water is provided to the residence by the city of Delta and the residence is connected to a septic system. Natural gas is provided to the residence by an on-site propane tank and electricity is provided by the Delta Montrose Electrical Association.

Two travel trailers and a shed are on the northwest parcel. The shed is a prefabricated woodshed with an asphalt roof.

3.4 Historical Use Information for the Property and Adjoining Properties

ERO used the following standard historical sources to evaluate current and past uses of the property and adjoining properties:

- Aerial photographs from 1945 to 2019
- Historical topographic maps from 1955 to 2019

Other standard historical sources for the site, such as fire insurance maps, street directories, property tax files, recorded land title records, building department records, or zoning/land use records, were not reasonably ascertainable, were not available, or, based on ERO's professional experience, are unlikely to be sufficiently useful, accurate, or complete and are unlikely to provide significant additional historical information concerning the property.

3.4.1 Historical Aerial Photographs

Historical aerial photographs from 1945 to 2019 showing the property and surrounding area were reviewed and are discussed below (Environmental Data Resources, Inc. [EDR] 2021a; Google Earth 2021). However, the east and west portions of the property are only shown on aerial photographs more recent than 1993.

1945, 1950, 1955, 1960, 1976, and 1978 Aerial Photographs; Scale: 1 inch = 500 feet
The aerial photographs from 1945 through 1978 shows the property and surrounding area as undeveloped and used for cultivated agricultural fields. A barn is visible on the southwest parcel and G Road is visible along the north sides of the southwest and south parcels. Several irrigation ditches are visible crossing the property and an unnamed creek flows across the property to the northwest.

1982 and 1989 Aerial Photographs; Scale: 1 inch = 1,000 feet
Significant changes to the property and surrounding area in the aerial photographs from 1982 and 1989 compared with the previous photographs consist of the following:

- A north-south road is visible extending north from G Road, along the property boundary;
- Several structures are visible on the southwest parcel; and
- Increased agricultural and rural residential land are visible in the surrounding area.

1993 Aerial Photograph; Scale: 1 inch = 500 feet and Google Earth
Significant changes to the property and surrounding area in the 1993 aerial photograph compared with the previous photographs consist of the following:

- The current buildings and livestock corrals are visible on the south and southwest parcels; and
- More irrigation ditches are visible on the property.

2005, 2006, 2011, and 2012 Aerial Photographs; Google Earth
Significant changes to the property and surrounding area in the aerial photographs from 2005 through 2012 compared with the previous photograph consist of the following:

- A barn or livestock shelter is visible on the northwest parcel;
- Evidence of equipment and materials storage is visible in the northeast corner of the property; and
- Increasing residential development is visible southeast of the property.

2014 Aerial Photograph; Google Earth
No significant changes to the surrounding area are visible in the 2014 aerial photograph compared with the previous photographs. Significant changes to the property consist of the following:

- The barn or livestock shelter is no longer visible on the northwest parcel.

2019 Aerial Photograph; Google Earth
No significant changes to the surrounding area are visible in the 2019 aerial photograph compared with the previous photograph. Significant changes to the property consist of the following:

- A mobile home and travel trailer are visible on the northwest parcel.

3.4.2 Historical Topographic Maps

Historical USGS topographic maps from 1955 to 2019 showing the property and surrounding area were reviewed and are discussed below.

1955 USGS 7.5-Minute Series, Olathe NW, CO; Scale: 1:24,000
The USGS topographic map from 1955 shows the majority of the property and surrounding area as undeveloped. Two structures are shown on the southwest and south parcels and one residential-sized structure is shown on the northwest parcel. Several irrigations ditches are shown on the property. The Star Nelson Airport is shown west of the property. A small portion of the northeast corner of the property is not shown on the 1955 map.

2010, 2013, 2016, and 2019 USGS 7.5-Minute Series, Olathe NW and Orchard City, CO; Scale: 1:24,000
The 2010, 2013, 2016, and 2019 USGS topographic maps with corresponding aerial photograph base maps show the property and surrounding area as they appeared in the aerial photographs for the same period discussed above.

3.5 Previous Environmental Reports

ERO did not identify and was not made aware of any previous environmental reports for the property.

3.6 Standard Environmental Record Sources

ERO contracted with a commercial database search company, EDR, to conduct a search of publicly available database records (EDR 2021b). All ASTM search distance sites are measured from the property boundary.

ERO reviewed initial search results for inaccuracies using both field and mapping data sources. In addition, ERO attempted to locate orphan sites, those that lack adequate location information to map, using zip code, city name, site name, or other information. The property was not identified in the search of publicly available database records, and one site was found to be within the approximate ASTM search distances. A summary is included in Table 1, and copies of records reviewed are in Appendix B.

Table 1. Summary of publicly available environmental records.

Record Sources	Search Distance (miles)[1]	Property	No. of Sites
Federal NPL site list	1.0	No	0
Federal Delisted NPL site list	0.5	No	0
Federal SEMS list	0.5	No	0
Federal SEMS-Archive site list	0.5	No	0
Federal RCRA CORRACTS site list	1.0	No	0
Federal RCRA TSD facilities list	0.5	No	0
Federal RCRA generators list	property and adjoining	No	0
Federal institutional control/engineering control registries	property only	No	0
Federal ERNS list	property only	No	0
State NPL-equivalent sites[2]	1.0	No	0
State CERCLIS-equivalent sites[2]	0.5	No	0
State landfill and/or solid waste disposal site list	0.5	No	1
State leaking storage tank list	0.5	No	0
State registered storage tank list	property and adjoining	No	0
State institutional control/engineering control registries	property only	No	0
State Voluntary Cleanup Program sites	0.5	No	0
State Brownfields sites	0.5	No	0

[1]ASTM E1527-13 standard search distances.
[2]In Colorado, the lead agency for NPL/CERCLA may be either the Environmental Protection Agency (EPA) or the Colorado Department of Public Health and Environment (CDPHE).

3.6.1 State Landfill and Solid Waste Disposal Sites

The CDPHE lists one permitted landfill or other solid waste disposal site within 0.5 mile of the property.

- The Jack of All Trades Salvage site at 21464 F Road is about 0.5 mile southeast of the property. The site is a mobile home salvage facility that received a compliance advisory from the CDPHE on July 28, 2010 based on the results of a compliance inspection. No further information for the site was identified in CDPHE records (CDPHE 2021).

3.7 Additional Environmental Record Sources

3.7.1 Colorado Oil and Gas Conservation Commission Records

ERO reviewed records maintained by the Colorado Oil and Gas Conservation Commission (COGCC), the agency that regulates oil and natural gas exploration and production in Colorado. According to the COGCC, no oil and gas wells are located on or near the property (COGCC 2021).

3.7.2 Colorado Department of Public Health and Environment

ERO reviewed the CDPHE Hazardous Materials and Waste Management Division online mapping application for any known sites that may indicate RECs on or near the property. No records for the property or adjoining sites were identified in a search of the online records (CDPHE 2021).

3.7.3 Colorado Division of Water Resources

ERO reviewed records maintained by the CDWR for the property. The CDWR has no records of wells on the property (CDWR 2021).

3.8 Vapor Encroachment Evaluation

ERO evaluated the results of the environmental record searches detailed in Sections 3.6 and 3.7 with respect to potential vapor encroachment in accordance with ASTM E2600-15, the "Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions" (ASTM 2015).

No sites were identified during ERO's vapor encroachment analysis within the applicable search distance criteria denoting the Area of Concern for vapor encroachment. Therefore, it is ERO's professional opinion that a vapor encroachment condition does not exist on the property.

4.0 Site Reconnaissance

4.1 Methodology and Limiting Conditions

Courtney Sockwell, an Environmental Professional with ERO, and Cassandra Shenk, an Environmental Scientist with ERO, conducted the site reconnaissance on April 9, 2021. They investigated the parcels by driving or walking along the perimeter of each parcel and traversing the interior. Representative photographs taken during the site reconnaissance are presented in Appendix A.

4.2 General Site Setting

The property was generally used for agricultural purposes including growing hay and livestock grazing. A farmstead with a residence, a shop, pole barn, and various sheds were observed on the southwest and south parcels, and two travel trailers and a shed were observed on the northwest parcel. The topography on the property generally slopes toward an unnamed drainage that bisects the property and flows to the northwest. Numerous unimproved roads, dirt tracks, and various sizes of irrigation ditches were observed on the property.

The residence is a 1,026-square-foot, one-story, wood-framed structure built in 1962 with a slab foundation and a small partial basement with vinyl siding and metal roof. A shop building and a pole barn are in the vicinity of the aforementioned residence. Both the shop and pole barn are wood-framed structures with metal siding and roofs, and the shop was built on a concrete foundation and the pole barn has a dirt floor. Several woodsheds, metal silos, and corrals are also located in the farmstead area. Farm equipment and trucks were present in and around the farmstead area in the southwest and south parcels.

Two travel trailers and a shed are located on the northwest parcel. The shed is a prefabricated woodshed with an asphalt roof.

The adjoining parcels are rural residential and agricultural land.

4.2.1 Storage Tanks

No vent pipes, fill ports, tank pits, or other indications of underground storage tanks were observed on the property. Two 500-gallon aboveground storage tanks (ASTs) and one 250-gallon AST on a stand were observed on the property, adjacent to the pole barn in the southwest parcel. In addition, propane

tanks were observed on the west side of the residence on the southwest parcel and between the travel trailers on the northwest parcel.

4.2.2 Odors

No strong, pungent, or noxious odors were noted during the site reconnaissance.

4.2.3 Pools of Liquid

No pools of liquid were observed on the property. Water was observed in various irrigation ditches and cattle water tanks on the property.

4.2.4 Drums/Containers

Numerous retail-sized containers of petroleum products, automotive fluids, household cleaners, and paint; two 55-gallon drums of new oil; three compressed welding-gas cylinders; and a 50-gallon air compressor tank were observed inside the shop building. Three 55-gallon drums and several 5-gallon buckets of used oil were observed outside the shop building. Twenty empty 50-gallon containers were observed in the pole barn. Staining from spills of *de minimis* quantities of petroleum products was observed in various places inside and outside of the shop, beneath a tractor parked in the pole barn, and beneath one of the ASTs.

4.2.5 Hazardous Substance and Petroleum Products Materials/Waste Use or Storage

Aside from the aforementioned ASTs, drums, and containers, no additional storage or use of hazardous substances or petroleum products was observed.

4.2.6 Transformers/PCBs

One pole-mounted electrical transformer was observed near the residential structure. No indications of leakage were observed on or beneath the transformer.

4.3 Exterior Observations

4.3.1 Pits, Ponds, and Lagoons

ERO observed a pit containing cow carcasses, scrap wood, and metal in the south portion of the south parcel. No indications that the pit was used for the disposal of hazardous substances or petroleum products were identified.

4.3.2 Stained Soil or Pavement

Staining from spills of *de minimis* quantities of petroleum products was observed in various places inside and outside of the shop, beneath a tractor parked in the pole barn, and beneath one of the ASTs.

4.3.3 Stressed Vegetation

No stressed vegetation resulting from a release of hazardous substances or petroleum products was observed on the property.

4.3.4 Solid Waste Disposal

Several areas of solid waste disposal were observed on the east portion of the northeast parcel along the north side of the unnamed creek that flows across the property and in the south portion of the south parcel. Items observed generally included inert materials including scrap metal and wood, concrete debris, metal wire, and old beer cans and bottles. No indications of hazardous substances or petroleum products were observed within the materials disposed.

4.3.5 Wastewater Discharge

ERO did not observe a wastewater discharge system into which wastewater and liquids on or adjacent to the property discharge.

4.3.6 Wells

ERO did not observe any monitoring, domestic, irrigation, injection, abandoned, or other wells on the property.

4.3.7 Process Equipment

No manufacturing, remediation, or other chemical process equipment was observed on the property.

4.3.8 On-Site Septic Systems

ERO observed a septic system north of the travel trailers on the northwest parcel. The residence on the southwest parcel is reportedly connected to a septic system. However, the septic system was not observed during the site reconnaissance and David Todd, occupant, was unaware of the location of the septic system connected to the residence (Todd, pers. comm. 2021).

4.4 Interior Observations

ERO did not inspect the interior of the residence or travel trailers on the property. The interior of the shop building on the southwest parcel and the shed on the northwest parcel were inspected. The shop building was used for storage of tools, ranching equipment, and household items; and the shed contained a washing machine and various household items. The pole barn was used for storage of ranching equipment, materials, tractors, and various farm implements.

4.4.1 Heating and Cooling

The shop building is heated with a wood-burning stove and the shed is not heated. The residence is heated with a propane-fired forced-air furnace. No cooling units are connected to the structures on the property.

4.4.2 Drains and Sumps

No floor drains or sumps were observed in the shop building or shed.

4.4.3 Stains or Corrosion

No stains or corrosion were observed on the floors, walls, or ceilings of the structures except those caused by water.

5.0 Interviews

5.1 Interview with Owner

Matthew Kosakowski, the current property owner representative for Garnet Mesa Land, LLC, completed a User Questionnaires for each parcel being investigated as part of this Phase I ESA. According to Mr. Kosakowski, he has been associated with the property for about three months. Mr. Kosakowski was unaware of any environmental problems with the property or in the surrounding area (Kosakowski 2021).

The northeast parcel is owned by Kenneth and Paula Jo Norell and the central parcel is owned by Jennifer Hofschulte. ERO was not provided contact information for these owners in order to conduct interviews, which is a data gap.

5.2 Interviews with Occupants

ERO interviewed David Todd on April 27, 2021, the occupant and rancher on the property, primarily in the southwest, south, and northwest parcels. Mr. Todd has lived and worked on the property for four years. The property has been used as a cattle ranch during that time. According to Mr. Todd, there are no underground storage tanks on the property and the ASTs have been used during his time on the property. He is unaware of any leaks or spills of hazardous substances or petroleum products on the property, aside from the *de minimis* releases observed during the site reconnaissance. He reportedly only conducted minor vehicle and equipment maintenance on the property and he stores used oil on the property temporarily before transporting off-site to be burned in an oil burning heater. He indicated that he uses herbicides for occasional spot treatments along the ditches on the property but that he primarily burns the weeds along the ditches. He was unaware of any solid waste disposal sites on the property (Todd, pers. comm. 2021).

5.3 Interviews with Local Government Officials

5.3.1 Interview with Local Health Department

ERO sent a request to the Delta County Environmental Health Department (DCEH) on April 27, 2021 for information that may indicate RECs on or near the property. ERO had not received a response from DCEH at the time this report was completed.

5.3.2 Interview with Local Fire Department

Based on the rural nature of the property, ERO did not contact the local fire department for information that may indicate RECs on or near the property.

6.0 Evaluation

6.1 Findings

The property consists of three parcels and portions of two additional parcel totaling 493.90 acres. Historically, the property and surrounding area have been undeveloped, agricultural, and rural residential land.

Federal, state, and local records do not identify any records of sites or incidents typically associated with RECs on or near the property except for the Jack of All Trades Salvage site about 0.5 mile southeast of the property.

Three ASTs and numerous containers and 55-gallon drums of petroleum products were observed on the property, primarily in and around buildings in the farmstead area in the southwest parcel. In addition, solid waste disposal sites were observed on the south and northeast parcels, and one pole-mounted electrical transformer was observed on the property. A septic system was observed north of the travel trailers on the northwest parcel, and the residence on the southwest parcel is reportedly connected to a septic system.

6.2 Opinion

A summary of identified findings and ERO's determination if the findings constitute RECs associated with the property is presented in Table 2. It is ERO's professional opinion that no RECs are associated with the property.

Table 2. Findings and opinion summary.

Finding	REC, CREC, or HREC?	Rationale
Jack of All Trades Salvage site about 0.5 mile southeast of the property	No	This site is located too far away to have adversely impacted the property.
Three ASTs and numerous containers and 55-gallon drums of petroleum products	No	Only *de minimis* staining was observed on the ground and concrete around the ASTs, containers, and drums.
Solid waste piles on the property	No	Inert material was observed to be discarded, and no indication of hazardous substances or petroleum products was observed.
Pole-mounted transformer on the property	No	No indications of leaks or releases were observed.
Two septic systems on the property	No	No indications that the septic systems have been used for disposal of hazardous substances or petroleum products were identified.

Based on ERO's vapor encroachment analysis, it is ERO's professional opinion that a vapor encroachment condition does not exist on the property.

6.3 Data Gap Summary

Summary of Historical Data. Historical data sources are listed below in Table 3 with gaps of greater than 5 years between sources identified as data gaps. ERO was unable to document land use on the property back to 1940. However, because of the consistent land use of the property and surrounding

area as agricultural, undeveloped, and rural residential land, it is ERO's professional opinion that the data gaps identified in Table 3 do not constitute significant data gaps with respect to this Phase I ESA. It is ERO's professional opinion that no significant historical data gaps are associated with this Phase I ESA.

Table 3. Historical data gap analysis.

Source	Year	Gap	Data Gap
Aerial Photograph	1945	-	-
Aerial Photograph	1950	5	No
Topographic Map and Aerial Photograph	1955	5	No
Aerial Photograph	1960	5	No
Aerial Photograph	1976	16	Yes
Aerial Photograph	1978	2	No
Aerial Photograph	1982	4	No
Aerial Photograph	1989	7	Yes
Aerial Photograph	1993	4	No
Aerial Photograph	2005	12	Yes
Aerial Photograph	2006	1	No
Topographic Map	2010	4	No
Aerial Photograph	2011	1	No
Aerial Photograph	2012	1	No
Topographic Map	2013	1	No
Aerial Photograph	2014	1	No
Topographic Map	2016	2	No
Topographic Map and Aerial Photograph	2019	3	No

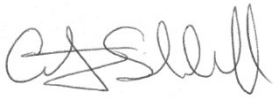
Significant Data Gaps. ERO was able to access the entire property, received a User/Owner Questionnaire, and interviewed the occupant currently using the property for ranching. ERO reviewed online databases for the CDPHE, COGCC, CDWR, and Delta County. ERO did not interview two private property owners, had not received a response from the DCEH, and did not contact the local fire department, which are data gaps. However, based on information reviewed as part of this Phase I ESA, it is ERO's professional opinion that the absence of information from those owners, DCEH, and the fire department are not significant data gaps with respect to ERO's ability to identify RECs associated with the property. Based on the information reviewed as part of this Phase I ESA, it is ERO's professional opinion that no significant data gaps are associated with this Phase I ESA with respect to ERO's ability to identify RECs associated with the property.

6.4 Conclusions

ERO performed this Phase I ESA in conformance with the scope and limitations of ASTM Practice E1527 of the Garnet Mesa Solar Development property in Delta County, Colorado. Any exceptions to or deletions from this practice are described in the Introduction section of this report. This assessment has revealed no evidence of RECs in connection with the property. In accordance with the ASTM standard, this Phase I ESA is presumed to be valid if completed less than 180 days prior to property acquisition or intended transaction.

6.5 Environmental Professionals Statement

"We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in 40 CFR 312.10. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312."



Courtney Sockwell
Environmental Professional

And

Craig Sovka
Environmental Professional

The qualifications of the personnel noted above are listed in Appendix C.

7.0 References

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Kosakowski, Matthew. 2021. Property owner and Phase I ESA User representative with Garnet Mesa Solar, LLC. User Questionnaires. March 30.

Noe, David C. and Michael J. Zawaski. 2013. Geological Map of the Orchard City Quadrangle, Delta County, Colorado. Denver: U.S. Geological Survey Open-File Report OF-13-05.

Noe, David C., M.L. Morgan, and S.M. Townley. 2014. Geological Map of the Olathe NW Quadrangle, Delta County, Colorado. Denver: U.S. Geological Survey Open-File Report OF-13-07.

Todd, David. 2021. Occupant/rancher on the property. Telephone interview with Courtney Sockwell, Environmental Professional with ERO Resources Corporation. April 27.

U.S. Geological Survey (USGS). Olathe NW Quadrangle, 1955; Olathe NW and Orchard City Orthophotographic Quadrangle, 2010, 2013, 2016, and 2019. Denver, CO.

Appendix A Site Photographs

Photo 1 - The residence on the southwest parcel

Photo 2 - The pole barn on the southwest parcel

Photo 3 - The ASTs adjacent to the pole barn

Photo 4 - The soil staining observed beneath the AST

Photo 5 - The soil staining observed in the pole barn

Photo 6 - The shop building on the southwest parcel

Photo 7 - The used oil storage outside the shop

Photo 8 - Typical storage observed inside the shop

Photo 9 - Typical storage observed inside the shop

Photo 10 - Typical view of the corrals on the southwest and south parcels

Photo 11 - The travel trailers and shed on the northwest parcel

Photo 12 - The pit containing cow carcasses in the south end of the south parcel

Photo 13 - Typical solid waste observed on the northeast parcel

Photo 14 - Typical solid waste observed on the northeast parcel

Photo 15 - Typical solid waste observed on the northeast parcel

Photo 16 - The creek that flows across the property to the northwest

Photo 17 - A typical view of the northeast parcel

Photo 18 - The center parcel as seen from the south

Appendix B Environmental Records

Garnet Mesa Solar Project
20426 G Rd.
Delta, CO 81416

Inquiry Number: 06427682.2r
March 30, 2021

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

20426 G RD.
DELTA, CO 81416

COORDINATES

Latitude (North):	38.7427250 - 38° 44' 33.81''
Longitude (West):	107.9723520 - 107° 58' 20.46''
Universal Tranverse Mercator:	Zone 13
UTM X (Meters):	241657.4
UTM Y (Meters):	4292215.5
Elevation:	5070 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5962615 OLATHE NW, CO
Version Date:	2013
North Map:	5963046 ORCHARD CITY, CO
Version Date:	2013
Southwest Map:	5962281 DELTA, CO
Version Date:	2013
Northwest Map:	5962325 NORTH DELTA, CO
Version Date:	2013

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20150910, 20150909
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
20426 G RD.
DELTA, CO 81416

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	GK LATERAL PIPELINE,	2100 RD 2175 RD AND	NPDES	Higher	4569, 0.865, North
A2	GK LATERAL PIPELINE,	2100 RD 2175 RD AND	FINDS, ECHO	Higher	4569, 0.865, North
3		20868 H ROAD	ASBESTOS	Higher	4596, 0.870, North
4	TRIAD PIT		MINES	Lower	5293, 1.002, North

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-VSQG ---------- RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System

US ENG CONTROLS ..... Engineering Controls Sites List
US INST CONTROLS ..... Institutional Controls Sites List

Federal ERNS list

ERNS ..... Emergency Response Notification System

State- and tribal - equivalent CERCLIS

SHWS ..... This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ..... Solid Waste Sites & Facilities

State and tribal leaking storage tank lists

LTANKS ..... Petroleum Release Events Listing
LAST ..... Leaking Aboveground Storage Tank Listing
LUST ..... Leaking Underground Storage Tank List
INDIAN LUST ..... Leaking Underground Storage Tanks on Indian Land
LUST TRUST ..... RAP Site Listing

State and tribal registered storage tank lists

FEMA UST ..... Underground Storage Tank Listing
UST ..... Underground Storage Tank Database
AST ..... Aboveground Tank List
INDIAN UST ..... Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

AUL ..... Environmental Covenants and Environmental Use Restrictions List

State and tribal voluntary cleanup sites

VCP ..... Voluntary Cleanup & Redevelopment Act Application Tracking Report
INDIAN VCP ..... Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS ..... Brownfields Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

HIST LF ..... Historical Landfill List
SWRCY ..... Registered Recyclers Listing

EXECUTIVE SUMMARY

INDIAN ODI	Report on the Status of Open Dumps on Indian Lands
ODI	Open Dump Inventory
DEBRIS REGION 9	Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS	Open Dumps on Indian Land
DENVER CO HISTORIC FILL	Denver City & County Historic Fill Areas

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL	Delisted National Clandestine Laboratory Register
CDL	Meth Lab Locations
US CDL	National Clandestine Laboratory Register

Local Land Records

LIENS 2	CERCLA Lien Information

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System
SPILLS	Spills Database
SPILLS 90	SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR	RCRA - Non Generators / No Longer Regulated
FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem

US MINES - Mines Master Index File
ABANDONED MINES - Abandoned Mines
UXO - Unexploded Ordnance Sites
DOCKET HWC - Hazardous Waste Compliance Docket Listing
FUELS PROGRAM - EPA Fuels Program Registered Listing
AIRS - Permitted Facility & Emissions Listing
METHANE SITE - Methane Site Investigations - Jefferson County 1980
Methane Investigation - Methane Gas & Swamp Findings
DRYCLEANERS - Drycleaner Facilities
Financial Assurance - Financial Assurance Information Listing
LEAD - LEAD
UIC - Underground Injection Control
UMTRA - Uranium Mill Tailings Sites
MINES MRDS - Mineral Resources Data System

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP - EDR Proprietary Manufactured Gas Plants
EDR Hist Auto - EDR Exclusive Historical Auto Stations
EDR Hist Cleaner - EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF - Recovered Government Archive Solid Waste Facilities List
RGA LUST - Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act]

and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 11/04/2020 has revealed that there is 1 FINDS site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GK LATERAL PIPELINE, Registry ID:: 110070133590	***2100 RD 2175 RD AND***	***N 1/2 - 1 (0.865 mi.)***	***A2***	***9***

ECHO: ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

A review of the ECHO list, as provided by EDR, and dated 01/02/2021 has revealed that there is 1 ECHO site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GK LATERAL PIPELINE, Registry ID: 110070133590	***2100 RD 2175 RD AND***	***N 1/2 - 1 (0.865 mi.)***	***A2***	***9***

ASBESTOS: Asbestos abatement and demolition projects by the contractor.

A review of the ASBESTOS list, as provided by EDR, and dated 11/06/2019 has revealed that there is 1 ASBESTOS site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported	20868 H ROAD	N 1/2 - 1 (0.870 mi.)	3	9

MINES: This dataset represents permitted mines in the State of Colorado

A review of the MINES list, as provided by EDR, and dated 01/11/2021 has revealed that there is 1 MINES site within approximately 1.125 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
TRIAD PIT Facility Id: M1994069		N 1 - 2 (1.002 mi.)	4	10

NPDES: A listing of permitted facilities from the Water Quality Control Division.

A review of the NPDES list, as provided by EDR, and dated 10/01/2020 has revealed that there is 1 NPDES site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GK LATERAL PIPELINE,	2100 RD 2175 RD AND	N 1/2 - 1 (0.865 mi.)	A1	8

EXECUTIVE SUMMARY

Permit Number: COG076074

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 06427682.2R

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Garnet Mesa Solar Project	CLIENT:	ERO Resources
ADDRESS:	20426 G Rd. Delta CO 81416	CONTACT:	Courtney Sockwell
LAT/LONG:	38.742725 / 107.972352	INQUIRY #:	06427682.2r
		DATE:	March 30, 2021 1:27 pm

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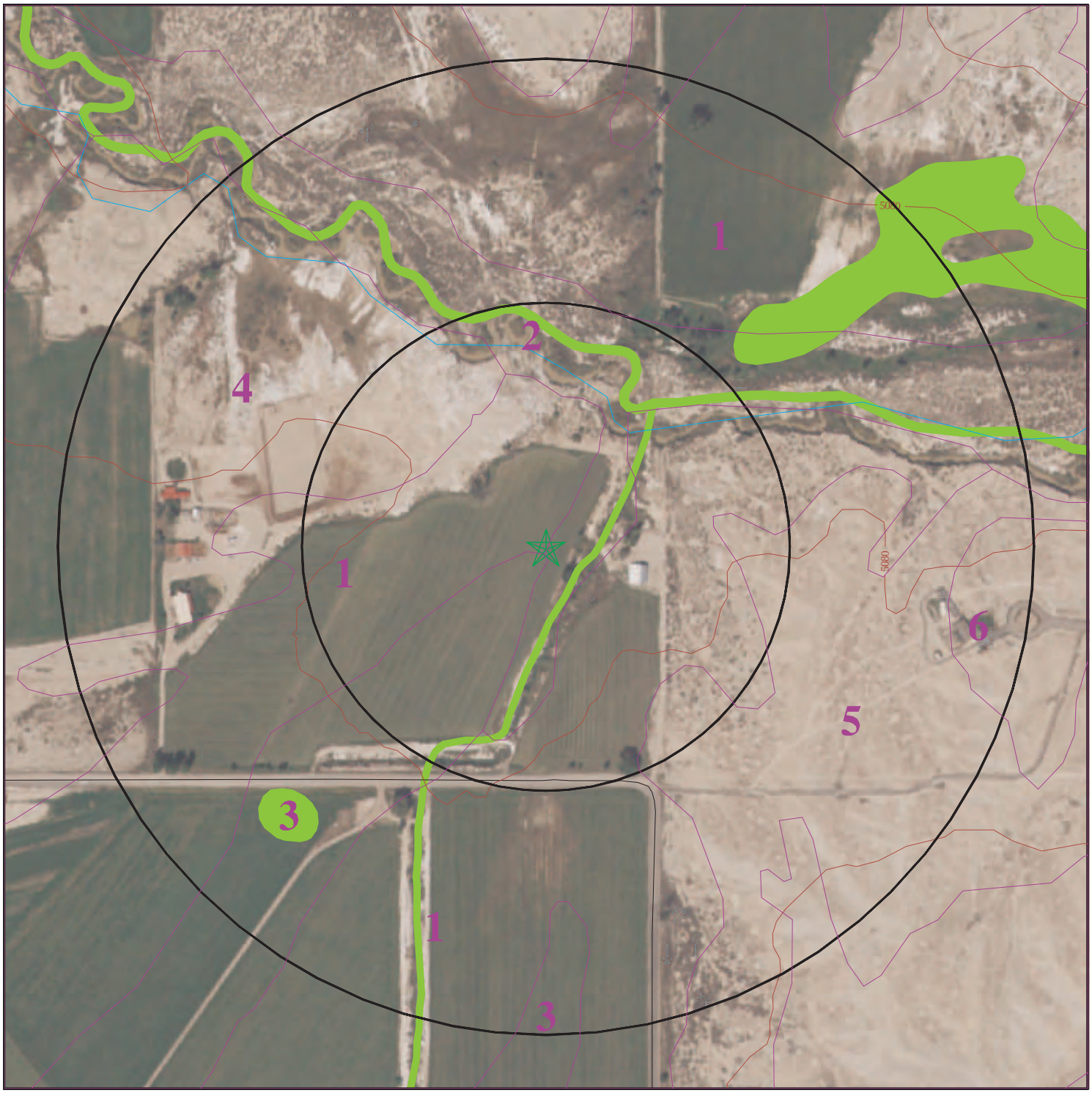
DETAIL MAP - 06427682.2R



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites

0 1/16 1/8 1/4 Miles

- Indian Reservations BIA
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Garnet Mesa Solar Project	CLIENT:	ERO Resources
ADDRESS:	20426 G Rd. Delta CO 81416	CONTACT:	Courtney Sockwell
		INQUIRY #:	06427682.2r
LAT/LONG:	38.742725 / 107.972352	DATE:	March 30, 2021 1:27 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	2.000		0	0	0	0	0	0
Proposed NPL	2.000		0	0	0	0	0	0
NPL LIENS	2.000		0	0	0	0	0	0
Federal Delisted NPL site list								
Delisted NPL	2.000		0	0	0	0	0	0
Federal CERCLIS list								
FEDERAL FACILITY	1.500		0	0	0	0	0	0
SEMS	1.500		0	0	0	0	0	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	1.500		0	0	0	0	0	0
Federal RCRA CORRACTS facilities list								
CORRACTS	2.000		0	0	0	0	0	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	1.500		0	0	0	0	0	0
Federal RCRA generators list								
RCRA-LQG	1.250		0	0	0	0	0	0
RCRA-SQG	1.250		0	0	0	0	0	0
RCRA-VSQG	1.250		0	0	0	0	0	0
Federal institutional controls / engineering controls registries								
LUCIS	1.500		0	0	0	0	0	0
US ENG CONTROLS	1.500		0	0	0	0	0	0
US INST CONTROLS	1.500		0	0	0	0	0	0
Federal ERNS list								
ERNS	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	N/A		N/A	N/A	N/A	N/A	N/A	N/A
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	1.500		0	0	0	0	0	0
State and tribal leaking storage tank lists								
LTANKS	1.500		0	0	0	0	0	0
LAST	1.500		0	0	0	0	0	0
LUST	1.500		0	0	0	0	0	0
INDIAN LUST	1.500		0	0	0	0	0	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LUST TRUST	1.500		0	0	0	0	0	0
State and tribal registered storage tank lists								
FEMA UST	1.250		0	0	0	0	0	0
UST	1.250		0	0	0	0	0	0
AST	1.250		0	0	0	0	0	0
INDIAN UST	1.250		0	0	0	0	0	0
State and tribal institutional control / engineering control registries								
AUL	1.500		0	0	0	0	0	0
State and tribal voluntary cleanup sites								
VCP	1.500		0	0	0	0	0	0
INDIAN VCP	1.500		0	0	0	0	0	0
State and tribal Brownfields sites								
BROWNFIELDS	1.500		0	0	0	0	0	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	1.500		0	0	0	0	0	0
Local Lists of Landfill / Solid Waste Disposal Sites								
HIST LF	1.500		0	0	0	0	0	0
SWRCY	1.500		0	0	0	0	0	0
INDIAN ODI	1.500		0	0	0	0	0	0
ODI	1.500		0	0	0	0	0	0
DEBRIS REGION 9	1.500		0	0	0	0	0	0
IHS OPEN DUMPS	1.500		0	0	0	0	0	0
DENVER CO HISTORIC FILL	1.500		0	0	0	0	0	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	1.000		0	0	0	0	NR	0
CDL	1.000		0	0	0	0	NR	0
US CDL	1.000		0	0	0	0	NR	0
Local Land Records								
LIENS 2	1.000		0	0	0	0	NR	0
Records of Emergency Release Reports								
HMIRS	1.000		0	0	0	0	NR	0
SPILLS	1.000		0	0	0	0	NR	0
SPILLS 90	1.000		0	0	0	0	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	1.250		0	0	0	0	0	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FUDS	2.000		0	0	0	0	0	0
DOD	2.000		0	0	0	0	0	0
SCRD DRYCLEANERS	1.500		0	0	0	0	0	0
US FIN ASSUR	1.000		0	0	0	0	NR	0
EPA WATCH LIST	1.000		0	0	0	0	NR	0
2020 COR ACTION	1.250		0	0	0	0	0	0
TSCA	1.000		0	0	0	0	NR	0
TRIS	1.000		0	0	0	0	NR	0
SSTS	1.000		0	0	0	0	NR	0
ROD	2.000		0	0	0	0	0	0
RMP	1.000		0	0	0	0	NR	0
RAATS	1.000		0	0	0	0	NR	0
PRP	1.000		0	0	0	0	NR	0
PADS	1.000		0	0	0	0	NR	0
ICIS	1.000		0	0	0	0	NR	0
FTTS	1.000		0	0	0	0	NR	0
MLTS	1.000		0	0	0	0	NR	0
COAL ASH DOE	1.000		0	0	0	0	NR	0
COAL ASH EPA	1.500		0	0	0	0	0	0
PCB TRANSFORMER	1.000		0	0	0	0	NR	0
RADINFO	1.000		0	0	0	0	NR	0
HIST FTTS	1.000		0	0	0	0	NR	0
DOT OPS	1.000		0	0	0	0	NR	0
CONSENT	2.000		0	0	0	0	0	0
INDIAN RESERV	2.000		0	0	0	0	0	0
FUSRAP	2.000		0	0	0	0	0	0
UMTRA	1.500		0	0	0	0	0	0
LEAD SMELTERS	1.000		0	0	0	0	NR	0
US AIRS	1.000		0	0	0	0	NR	0
US MINES	1.250		0	0	0	0	0	0
ABANDONED MINES	1.250		0	0	0	0	0	0
FINDS	1.000		0	0	0	1	NR	1
UXO	2.000		0	0	0	0	0	0
ECHO	1.000		0	0	0	1	NR	1
DOCKET HWC	1.000		0	0	0	0	NR	0
FUELS PROGRAM	1.250		0	0	0	0	0	0
AIRS	1.000		0	0	0	0	NR	0
ASBESTOS	1.000		0	0	0	1	NR	1
METHANE SITE	1.000		0	0	0	0	NR	0
Methane Investigation	1.000		0	0	0	0	NR	0
DRYCLEANERS	1.250		0	0	0	0	0	0
Financial Assurance	1.000		0	0	0	0	NR	0
LEAD	1.000		0	0	0	0	NR	0
MINES	1.125		0	0	0	0	1	1
NPDES	1.000		0	0	0	1	NR	1
UIC	1.000		0	0	0	0	NR	0
UMTRA	1.500		0	0	0	0	0	0
MINES MRDS	1.000		0	0	0	0	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	2.000		0	0	0	0	0	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EDR Hist Auto	1.125		0	0	0	0	0	0
EDR Hist Cleaner	1.125		0	0	0	0	0	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	1.000		0	0	0	0	NR	0
RGA LUST	1.000		0	0	0	0	NR	0
- Totals --		0	0	0	0	4	1	5

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

A1
North
1/2-1
0.865 mi.
4569 ft.

GK LATERAL PIPELINE, BOR PROJECT NO R17PS00295
2100 RD 2175 RD AND D50 RD
DELTA, CO 81416

Site 1 of 2 in cluster A

NPDES **S121424929**
N/A

Relative:
Higher

Actual:
5084 ft.

NPDES:

Name:	GK LATERAL PIPELINE, BOR PROJECT NO R17PS00295
Address:	2100 RD 2175 RD AND D50 RD
City,State,Zip:	DELTA, CO 81416
Primary Permit SIC Code:	1623
Permit Number:	COG076074
Permit Name:	ESCO Construction Co
Termination Date:	03/01/2018
Receiving Water:	Gunnison River
Issued:	10/30/2017
Effective:	10/30/2017
Expires:	08/31/2018
Permit Type Desc:	COG070000-Construction dewatering
Permittee Street Address:	PO Box 2796
Addr City/State/Zip:	Evergreen, CO 80437
Contact Name:	Bohlen
Contact Office Phone Num:	720-391-2797
Contact Office Phone Ext:	Not reported
Facility Type Desc:	Not reported
Latitude:	38.75525
Longitude:	-107.971584
Immediate Water:	Not reported
SW Construction Activity:	Not reported
Permit SIC1:	1799
Legal First Name:	Gabe
Legal Last Name:	Wallace
Legal Title:	GM
Facility Contact Title:	MGR Constr
Stream Segment:	COGULG04a
SW Construction Total Acres:	Not reported
SW Construction Disturbed Acres:	Not reported
SW Construction Start Date:	Not reported
SW Construction End Date:	Not reported
Reuse TREATER ID:	Not reported
Reuse TREATER:	Not reported
Facility Description:	Not reported
Facility Contact Organization:	Not reported
Billing Organization:	Not reported
Billing Fname:	Not reported
Billing Lname:	Not reported
Billing Title:	Not reported
DMR Organization:	Not reported
DMR Fname:	Not reported
DMR Lname:	Not reported
DMR Title:	Not reported

A2
North
1/2-1
0.865 mi.
4569 ft.

GK LATERAL PIPELINE, BOR PROJECT NO R17PS00295
2100 RD 2175 RD AND D50 RD
DELTA, CO 81416

Site 2 of 2 in cluster A

FINDS **1024023692**
ECHO **N/A**

Relative:
Higher

Actual:
5084 ft.

FINDS:
Registry ID: 110070133590

Click Here:

Environmental Interest/Information System:
US National Pollutant Discharge Elimination System (NPDES) module of the Compliance Information System (ICIS) tracks surface water permits issued under the Clean Water Act. Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid:	1024023692
Registry ID:	110070133590
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110070133590
Name:	GK LATERAL PIPELINE, BOR PROJECT NO R17PS00295
Address:	2100 RD 2175 RD AND D50 RD
City,State,Zip:	DELTA, CO 81416

3
North
1/2-1
0.870 mi.
4596 ft.

20868 H ROAD
DELTA, CO

ASBESTOS **S115150650**
N/A

Relative:
Higher

Actual:
5075 ft.

CO ASBESTOS:

Year:	2013
Permit Number:	Not reported
Permit Date:	Not reported
Contractor:	Benson Brothers
Project:	16
Linear Ft:	Not reported
Square Ft:	Not reported
Project Type:	Demolition Projects
Demo Number:	13DL5451D
Notice Date:	2013-11-06 00:00:00
Drums:	Not reported
Begin Date:	Not reported
End Date:	Not reported

4
North
> 1
1.002 mi.
5293 ft.

TRIAD PIT
, CO

MINES **S112331264**
N/A

Relative:
Lower

Actual:
5055 ft.

MINES:

Name:	TRIAD PIT
Address:	Not reported
City,State,Zip:	CO
Facility Id:	M1994069
Mine Type:	surface
Status Description:	Terminated
Permittee:	Triad Cattle Feeders
Permit Type:	ILL
Date Permit Issued:	Not reported
Permit Acreage:	0
Commodity 2:	Not reported
Annual Fee:	0
Required Surety:	0
Actual Surety:	0
UTM X:	241643
UTM Y:	4293828.7999999998
Latitutde:	38.757240000000003
Longitude:	-107.97311999999999
Post Mining:	rangeland
Pre Mining:	rangeland
Affected Acres:	2
Mineral Owner:	blank - future update
Surface Owner:	blank - future update
Permit Specialist Assigned:	Not reported

Count: 0 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
		NO SITES FOUND			

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 03/04/2021
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 03/04/2021
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 26

Source: EPA
Telephone: N/A
Last EDR Contact: 03/04/2021
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 12/23/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/18/2021
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/04/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/18/2021
Number of Days to Update: 35

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/04/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 02/09/2021
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 39

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/08/2021
Next Scheduled EDR Contact: 05/24/2021
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/18/2020
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/23/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/18/2020
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/23/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/15/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 7

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: Department of Public Health & Environment
Telephone: 303-692-3300
Last EDR Contact: 02/09/2021
Next Scheduled EDR Contact: 05/24/2021
Data Release Frequency: N/A

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Solid Waste Sites & Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 10/30/2020
Date Data Arrived at EDR: 11/03/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 6

Source: Department of Public Health & Environment
Telephone: 303-692-3300
Last EDR Contact: 02/02/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Varies

State and tribal leaking storage tank lists

LTANKS: Petroleum Release Events Listing

Active and Closed OPS Petroleum Release Events in Colorado. Includes the OPS Open Event locations, but also shows locations of closed events (releases that have been issued a No Further Action determination).

Date of Government Version: 11/02/2020
Date Data Arrived at EDR: 12/01/2020
Date Made Active in Reports: 02/11/2021
Number of Days to Update: 72

Source: Department of Labor & Employment
Telephone: 303-318-8525
Last EDR Contact: 03/03/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Quarterly

LAST: Leaking Aboveground Storage Tank Listing

A listing of leaking aboveground storage tank sites. This list is no longer maintained. For current Leaking AST information, please see LTANKS.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/07/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 27

Source: Department of Labor & Employment
Telephone: 303-318-8525
Last EDR Contact: 05/31/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: No Update Planned

LUST: Leaking Underground Storage Tank List

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/07/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 27

Source: Department of Labor and Employment, Oil Inspection Section
Telephone: 303-318-8521
Last EDR Contact: 03/07/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land

Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/07/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/12/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/09/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 09/30/2020
Date Data Arrived at EDR: 12/22/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 10/02/2020
Date Data Arrived at EDR: 12/18/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 84

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

TRUST: Lust Trust Sites
Reimbursement application package. The 1989 Colorado General Assembly established Colorado's Petroleum Storage Tank Fund. The Fund reimburses eligible applicants for allowable costs incurred in cleaning up petroleum contamination from underground and aboveground petroleum storage tanks, as well as for third-party liability expenses. Remediation of contamination caused by railroad or aircraft fuel is not eligible for reimbursement. The Fund satisfies federal Environmental Protection Agency financial assurance requirements. Monies in the Fund come from various sources, predominantly the state environmental surcharge imposed on all petroleum products except railroad or aircraft fuel.

Date of Government Version: 12/02/2020
Date Data Arrived at EDR: 12/02/2020
Date Made Active in Reports: 02/17/2021
Number of Days to Update: 77

Source: Department of Labor and Employment, Oil Inspection Section
Telephone: 303-318-8521
Last EDR Contact: 03/18/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Varies

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/29/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 33

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

UST: Underground Storage Tank Database
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 11/30/2020
Date Data Arrived at EDR: 12/02/2020
Date Made Active in Reports: 02/16/2021
Number of Days to Update: 76

Source: Department of Labor and Employment, Oil Inspection Section
Telephone: 303-318-8521
Last EDR Contact: 02/26/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Quarterly

AST: Aboveground Tank List
Aboveground storage tank locations.

Date of Government Version: 11/30/2020
Date Data Arrived at EDR: 12/02/2020
Date Made Active in Reports: 02/16/2021
Number of Days to Update: 76

Source: Department of Labor and Employment, Oil Inspection Section
Telephone: 303-318-8521
Last EDR Contact: 02/26/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Semi-Annually

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 10/02/2020
Date Data Arrived at EDR: 12/18/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 84

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/30/2020
Date Data Arrived at EDR: 12/22/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 10/07/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 11/12/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 10/09/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

AUL: Environmental Real Covenants List

Senate Bill 01-145 gave authority to the Colorado Department of Public Health and Environment to approve requests to restrict the future use of a property using an enforceable agreement called an environmental covenant. When a contaminated site is not cleaned up completely, land use restrictions may be used to ensure that the selected cleanup remedy is adequately protective of human health and the environment.

Date of Government Version: 08/07/2020
Date Data Arrived at EDR: 10/22/2020
Date Made Active in Reports: 01/11/2021
Number of Days to Update: 81

Source: Department of Public Health & Environment
Telephone: 303-692-3331
Last EDR Contact: 01/25/2021
Next Scheduled EDR Contact: 05/10/2021
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 03/22/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup & Redevelopment Act Application Tracking Report

The Voluntary Cleanup and Redevelopment Act is intended to permit and encourage voluntary cleanups by providing a method to determine clean-up responsibilities in planning the reuse of property. The VCRA was intended for sites which were not covered by existing regulatory programs.

Date of Government Version: 12/04/2019
Date Data Arrived at EDR: 01/07/2020
Date Made Active in Reports: 03/16/2020
Number of Days to Update: 69

Source: Department of Public Health and Environmental
Telephone: 303-692-3331
Last EDR Contact: 01/08/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

State and tribal Brownfields sites

BROWNFIELDS: Brownfields Sites Listing
Brownfields Sites Listing

Date of Government Version: 09/09/2020
Date Data Arrived at EDR: 10/08/2020
Date Made Active in Reports: 12/30/2020
Number of Days to Update: 83

Source: Department of Public Health & Environment
Telephone: 303-692-3331
Last EDR Contact: 02/01/2021
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/11/2020
Date Data Arrived at EDR: 12/11/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/16/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY: Registered Recyclers Listing
A listing of registered recycler locations in the state of Colorado.

Date of Government Version: 09/15/2020
Date Data Arrived at EDR: 12/02/2020
Date Made Active in Reports: 02/17/2021
Number of Days to Update: 77

Source: Department of Public Health & Environment
Telephone: 303-692-3337
Last EDR Contact: 03/08/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Semi-Annually

HISTORICAL LANDFILL: Historical Landfill List
Abandoned/Inactive Landfills.

Date of Government Version: 01/31/1993
Date Data Arrived at EDR: 04/24/1994
Date Made Active in Reports: 05/30/1994
Number of Days to Update: 36

Source: Department of Public Health & Environment
Telephone: 303-692-3300
Last EDR Contact: 09/05/1996
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 01/25/2021
Next Scheduled EDR Contact: 05/10/2021
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/19/2021
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 01/29/2021
Next Scheduled EDR Contact: 05/10/2021
Data Release Frequency: Varies

DENVER CO HISTORIC FILL: Denver City & County Historic Fill Areas

This dataset denotes the approximate locations of historical fill areas within the City and County of Denver (CCoD) and with within approximately three-quarters of a mile of the CCoD boundaries. The data is of a general nature and obtained from historic and current documents that may not be accurate or precise.

Date of Government Version: 12/17/2019
Date Data Arrived at EDR: 01/07/2020
Date Made Active in Reports: 03/13/2020
Number of Days to Update: 66

Source: City & County of Denver
Telephone: 720-913-5237
Last EDR Contact: 01/08/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: No Update Planned

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/09/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 83

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/22/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: No Update Planned

CDL: Meth Lab Locations

Meth lab locations that were reported to the Department of Public Health & Environment.

Date of Government Version: 09/15/2020
Date Data Arrived at EDR: 09/24/2020
Date Made Active in Reports: 12/14/2020
Number of Days to Update: 81

Source: Department of Public Health and Environment
Telephone: 303-692-3023
Last EDR Contact: 03/26/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/09/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 83

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/22/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/18/2021
Number of Days to Update: 35

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 03/04/2021
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/16/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 85

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/24/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

CO ERNS: Spills Database

State reported spills.

Date of Government Version: 09/15/2020
Date Data Arrived at EDR: 09/24/2020
Date Made Active in Reports: 12/14/2020
Number of Days to Update: 81

Source: Department of Public Health and Environmental
Telephone: 303-692-2000
Last EDR Contact: 03/26/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

SPILLS 2: Spills

A listing of spills reported to the Oil & Gas Conservation Commission

Date of Government Version: 09/18/2020
Date Data Arrived at EDR: 09/22/2020
Date Made Active in Reports: 12/14/2020
Number of Days to Update: 83

Source: Oil & Gas Conservation Commission
Telephone: 303-894-2100
Last EDR Contact: 03/11/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 10/15/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/06/2013
Number of Days to Update: 34

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 09/29/2020
Date Data Arrived at EDR: 11/17/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 69

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 02/17/2021
Next Scheduled EDR Contact: 05/31/2021
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/15/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/07/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/09/2021
Next Scheduled EDR Contact: 05/24/2021
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/02/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/05/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/17/2020
Date Made Active in Reports: 09/10/2020
Number of Days to Update: 85

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/19/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 08/14/2020
Date Made Active in Reports: 11/04/2020
Number of Days to Update: 82

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/02/2021
Next Scheduled EDR Contact: 05/31/2021
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 01/20/2021
Date Data Arrived at EDR: 01/21/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 60

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/21/2021
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/18/2021
Number of Days to Update: 35

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 03/04/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/02/2020
Date Data Arrived at EDR: 11/12/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 74

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/19/2021
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 03/05/2021
Number of Days to Update: 50
Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 03/11/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/19/2020
Date Data Arrived at EDR: 01/08/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 73
Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/08/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/30/2020
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/05/2020
Date Data Arrived at EDR: 08/10/2020
Date Made Active in Reports: 10/08/2020
Number of Days to Update: 59
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 01/19/2021
Next Scheduled EDR Contact: 05/03/2021
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 12/01/2020
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 70
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 03/05/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/02/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 02/05/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 03/25/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 01/27/2021
Next Scheduled EDR Contact: 05/10/2021
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 01/13/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 68

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/22/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 151

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/08/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 02/02/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/18/2021
Next Scheduled EDR Contact: 05/31/2021
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 26

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 03/04/2021
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/23/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 63

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 02/24/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Semi-Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 11/24/2020
Date Data Arrived at EDR: 11/30/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 56

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 03/01/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Quarterly

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 05/06/2020
Date Data Arrived at EDR: 05/27/2020
Date Made Active in Reports: 08/13/2020
Number of Days to Update: 78

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 02/26/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 02/26/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 12/11/2020
Date Data Arrived at EDR: 12/11/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 81

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 03/10/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/04/2020
Date Data Arrived at EDR: 12/01/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 55

Source: EPA
Telephone: (303) 312-6312
Last EDR Contact: 03/03/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 07/02/2020
Date Made Active in Reports: 09/17/2020
Number of Days to Update: 77

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 01/15/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 01/02/2021
Date Data Arrived at EDR: 01/08/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 01/08/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/17/2020
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 02/26/2021
Next Scheduled EDR Contact: 06/06/2021
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/17/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 33

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/17/2021
Next Scheduled EDR Contact: 05/31/2021
Data Release Frequency: Quarterly

AIRS: Permitted Facility & Emissions Listing

A listing of Air Pollution Control Division permits and emissions data.

Date of Government Version: 11/30/2020
Date Data Arrived at EDR: 12/02/2020
Date Made Active in Reports: 02/17/2021
Number of Days to Update: 77

Source: Department of Public Health & Environment
Telephone: 303-692-3213
Last EDR Contact: 02/26/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Varies

ASBESTOS: Asbestos Abatement & Demolition Projects

Asbestos abatement and demolition projects by the contractor.

Date of Government Version: 11/06/2019
Date Data Arrived at EDR: 01/09/2020
Date Made Active in Reports: 03/16/2020
Number of Days to Update: 67

Source: Department of Public Health & Environment
Telephone: 303-692-3100
Last EDR Contact: 02/01/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Semi-Annually

METHANE SITE: Methane Site Investigations - Jefferson County 1980

The objectives of the study are to define as closely as possible the boundaries of methane producing solid waste landfills.

Date of Government Version: 12/31/1980
Date Data Arrived at EDR: 02/13/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 50

Source: Jefferson County Health Department
Telephone: 303-239-7175
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

METHANE INVESTIGATION: Methane Gas & Swamp Findings

The primary objective of this study was to assess methane gas related hazards at selected landfill sites in Colorado. These sites were selected by the Colorado Department of Health following evaluation of responses received from County and Municipal agencies about completed and existing landfills within their jurisdiction.

Date of Government Version: 03/15/1979
Date Data Arrived at EDR: 02/13/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 50

Source: Department of Health
Telephone: 303-640-3335
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DRYCLEANERS: Drycleaner Facilities
A listing of drycleaning facilities.

Date of Government Version: 11/30/2020
Date Data Arrived at EDR: 12/02/2020
Date Made Active in Reports: 02/17/2021
Number of Days to Update: 77

Source: Department of Public Health & Environment
Telephone: 303-692-3213
Last EDR Contact: 02/26/2021
Next Scheduled EDR Contact: 06/14/2021
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
A listing of financial assurance information for hazardous waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 01/07/2021
Date Made Active in Reports: 03/23/2021
Number of Days to Update: 75

Source: Department of Public Health & Environment
Telephone: 303-692-3350
Last EDR Contact: 03/26/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 01/07/2021
Date Made Active in Reports: 03/23/2021
Number of Days to Update: 75

Source: Department of Public Health & Environment
Telephone: 303-392-3350
Last EDR Contact: 03/26/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

LEAD: Lead Abatement Permit Listing
Lead inspection

Date of Government Version: 11/07/2019
Date Data Arrived at EDR: 11/14/2019
Date Made Active in Reports: 01/21/2020
Number of Days to Update: 68

Source: Department of Publich Health & Environment
Telephone: 303-692-2000
Last EDR Contact: 02/01/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: Varies

MINES: Permitted Mines Listing
This dataset represents permitted mines in the State of Colorado

Date of Government Version: 01/11/2021
Date Data Arrived at EDR: 01/12/2021
Date Made Active in Reports: 03/24/2021
Number of Days to Update: 71

Source: Division of Reclamation Mining and safety
Telephone: 303-866-3567
Last EDR Contact: 01/12/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Semi-Annually

NPDES: Permitted Facility Listing
A listing of permitted facilities from the Water Quality Control Division.

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 10/27/2020
Date Made Active in Reports: 01/15/2021
Number of Days to Update: 80

Source: Department of Public Health & Environment
Telephone: 303-692-3611
Last EDR Contact: 10/27/2020
Next Scheduled EDR Contact: 05/10/2021
Data Release Frequency: Varies

UIC: Underground Injection Control
A list of underground injection wells and their locations.

Date of Government Version: 02/08/2021
Date Data Arrived at EDR: 02/09/2021
Date Made Active in Reports: 03/01/2021
Number of Days to Update: 20

Source: Oil & Gas Conservation Commission
Telephone: 303-894-2100
Last EDR Contact: 02/08/2021
Next Scheduled EDR Contact: 05/24/2021
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites
There were nine uranium mill tailings sites in Colorado designated for cleanup under the federal Uranium Mill Tailings Radiation Control Act. These nine sites, know commonly as UMTRA sites, were remediated jointly by the State of Colorado and the U.S. Department of Energy during the late 1980's and early 1990's. Mill tailings were removed from 8 of the mill sites and relocated in engineered disposal cells. A disposal cell is designed to encapsulate the material, reduce radon emanation, and prevent the movement of water through the material. At one site, Maybell, CO, the tailings were stabilized in-place at the mill site. After remediation of the tailings was completed, the State and DOE began to investigate the residual impacts to groundwater at the mill sites. The groundwater phase of the UMTRA program is on-going.

Date of Government Version: 11/23/2004
Date Data Arrived at EDR: 03/21/2007
Date Made Active in Reports: 05/02/2007
Number of Days to Update: 42

Source: Department of Public Health & Environment
Telephone: 970-248-7164
Last EDR Contact: 02/16/2021
Next Scheduled EDR Contact: 05/31/2021
Data Release Frequency: Varies

PCS INACTIVE: Listing of Inactive PCS Permits
An inactive permit is a facility that has shut down or is no longer discharging.

Date of Government Version: 11/05/2014
Date Data Arrived at EDR: 01/06/2015
Date Made Active in Reports: 05/06/2015
Number of Days to Update: 120

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

PCS: Permit Compliance System
PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Date Data Arrived at EDR: 08/05/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 55

Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

PCS ENF: Enforcement data
No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 12/30/2020
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 10/21/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 3

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 02/26/2021
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Public Health & Environment in Colorado.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/15/2014
Number of Days to Update: 198

Source: Department of Public Health & Environment
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Labor and Employment, Oil Inspection Section in Colorado.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/02/2014
Number of Days to Update: 185

Source: Department of Labor and Employment, Oil Inspection Section
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ADAMS COUNTY:

LF ADAMS: Summary Report on Methane Gas Hazards and Surveys Conducted on Domestic and Demolition Landfills in Adams County

As of May 8, 1978, all known landfills or dumping sites in the Adams County area have been surveyed.

Date of Government Version: 05/08/1978
Date Data Arrived at EDR: 02/16/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 47

Source: Tri-County Health Department
Telephone: 303-761-1340
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

ARAPAHOE COUNTY:

LF ARAPAHOE: A Survey of Landfills in Arapahoe County

A survey of Arapahoe County was conducted from August through November, 1977, of all open and closed landfills and dumpsites in the county. Each of the sites found was classified as domestic or demolition.

Date of Government Version: 12/31/1978
Date Data Arrived at EDR: 02/16/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 47

Source: Tri-County Health Department
Telephone: 303-761-1340
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

BOULDER COUNTY:

LF BOULDER: Old Landfill Sites

Landfill sites in Boulder county.

Date of Government Version: 05/01/1986
Date Data Arrived at EDR: 11/14/1995
Date Made Active in Reports: 12/07/1995
Number of Days to Update: 23

Source: Boulder County Health Department
Telephone: 303-441-1182
Last EDR Contact: 01/30/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DENVER COUNTY:

LF DENVER: Landfills in Denver County
Landfill sites in the city and county of Denver.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 06/23/2017
Date Made Active in Reports: 09/06/2017
Number of Days to Update: 75

Source: City and County of Denver
Telephone: 720-913-4839
Last EDR Contact: 04/03/2019
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: No Update Planned

LF DENVER CO METHANE: Investigation of Methane Gas Hazards
The purpose of this study was to assess the actual and potential generation, migration, explosive and related problem associated with specified old landfills, and to identify existing and potential problems, suggested strategies to prevent, abate, and control such problems and recommend investigative and monitoring functions as may be deemed necessary. Eight sites determined to be priorities due to population density and potential hazards to population and property were selected by the Colorado Department of Health.

Date of Government Version: 01/01/1981
Date Data Arrived at EDR: 01/29/2013
Date Made Active in Reports: 03/08/2013
Number of Days to Update: 38

Source: City and County of Denver Department of Environmental Health
Telephone: 720-865-5522
Last EDR Contact: 01/15/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DOUGLAS COUNTY:

LF DOUGLAS: Douglas County Landfill Key
Landfill sites in Douglas county.

Date of Government Version: 06/12/1991
Date Data Arrived at EDR: 02/16/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 47

Source: Tri-County Health Department
Telephone: 303-761-1340
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

PUEBLO COUNTY:

LF PUEBLO: Designated Disposal & Landfill Sites
Only inert materials. Asphalt, cement, dirt & rock unless otherwise specified. These sites are no longer active.

Date of Government Version: 04/30/1990
Date Data Arrived at EDR: 11/16/1995
Date Made Active in Reports: 12/07/1995
Number of Days to Update: 21

Source: Pueblo City-County Health Department
Telephone: 719-583-4300
Last EDR Contact: 11/13/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

TRI COUNTY:

LF TRI: Tri-County Area Solid Waste Facilities List (Adams, Arapahoe and Douglas Counties)
Closed Domestic Landfills in Adams County, Closed Domestic Landfills in Arapahoe County, Closed Demolition Landfills in Arapahoe County, Closed Domestic Landfills in Douglas County.

Date of Government Version: 10/15/1983
Date Data Arrived at EDR: 02/16/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 47

Source: Tri-County Health Department
Telephone: 303-761-1340
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

WELD COUNTY:

LF WELD: Solid Waste Facilities in Weld County
Solid Waste Facilities in Weld County.

Date of Government Version: 01/16/2018
Date Data Arrived at EDR: 02/09/2018
Date Made Active in Reports: 02/23/2018
Number of Days to Update: 14

Source: Weld County Department of Public Health
Telephone: 970-304-6415
Last EDR Contact: 02/05/2021
Next Scheduled EDR Contact: 05/17/2021
Data Release Frequency: No Update Planned

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 10/20/2020
Date Made Active in Reports: 11/02/2020
Number of Days to Update: 13

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/12/2021
Next Scheduled EDR Contact: 05/24/2021
Data Release Frequency: No Update Planned

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 04/29/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 72

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 01/29/2021
Next Scheduled EDR Contact: 05/10/2021
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/11/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/08/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Daycare Listing
Source: Department of Human Services
Telephone: 303-866-5958

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Riparian Vegetation Data
Source: Division of Wildlife
Telephone: 970-416-3360

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

GARNET MESA SOLAR PROJECT
20426 G RD.
DELTA, CO 81416

TARGET PROPERTY COORDINATES

Latitude (North):	38.742725 - 38° 44' 33.81''
Longitude (West):	107.972352 - 107° 58' 20.47''
Universal Tranverse Mercator:	Zone 13
UTM X (Meters):	241657.4
UTM Y (Meters):	4292215.5
Elevation:	5070 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5962615 OLATHE NW, CO
Version Date:	2013
North Map:	5963046 ORCHARD CITY, CO
Version Date:	2013
Southwest Map:	5962281 DELTA, CO
Version Date:	2013
Northwest Map:	5962325 NORTH DELTA, CO
Version Date:	2013

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

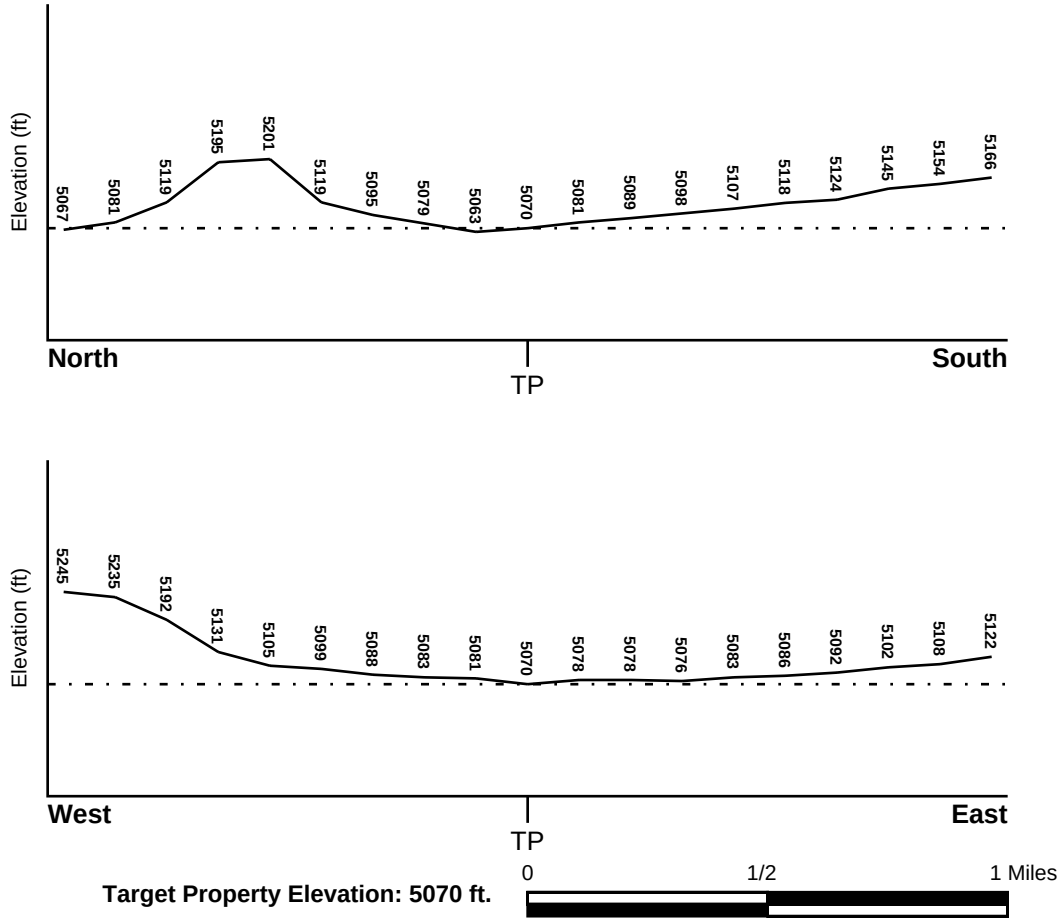
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General NE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
Not Reported	

Additional Panels in search area:	FEMA Source Type
08029C0438D	FEMA FIRM Flood data
08029C0439D	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

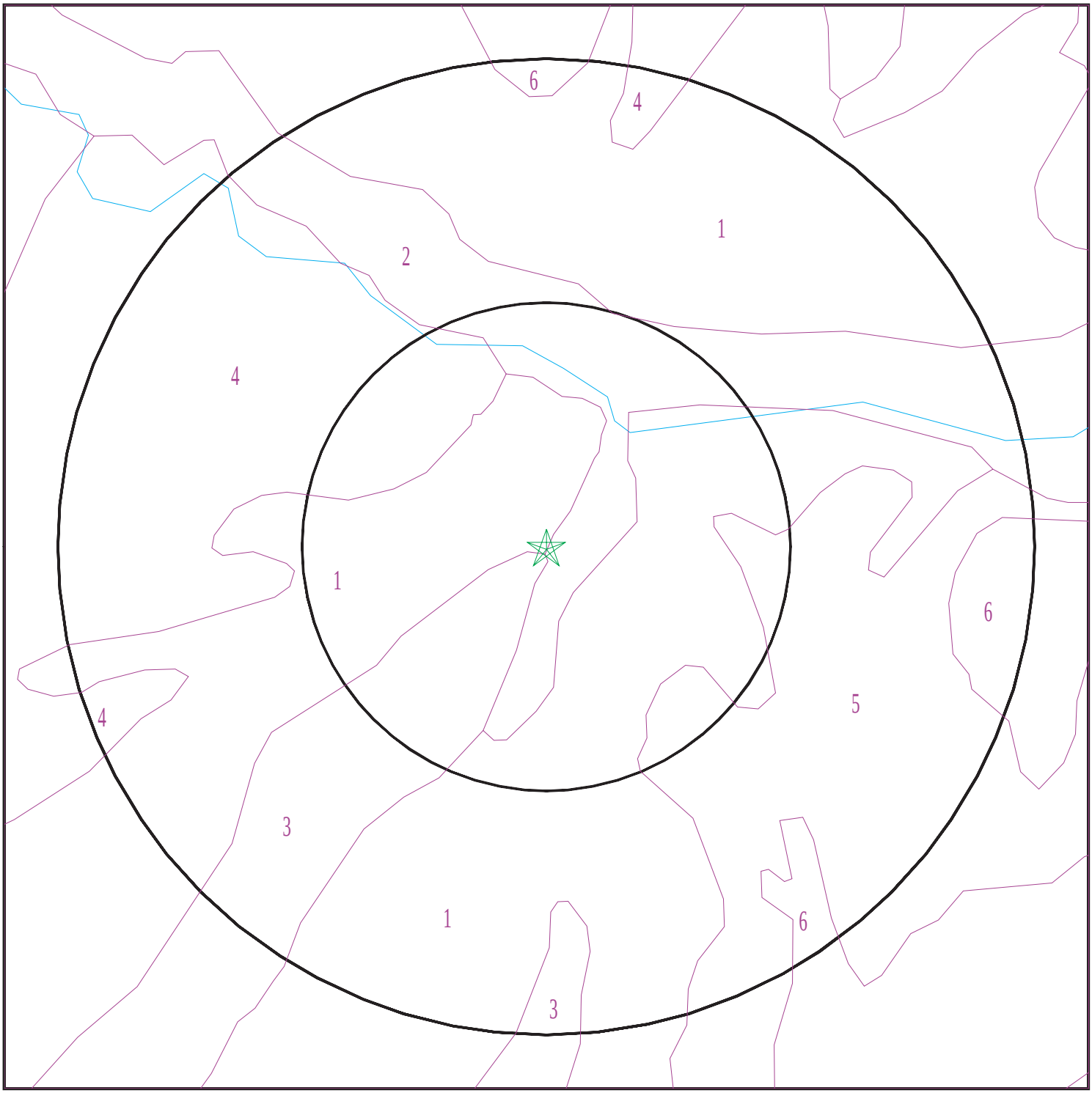
Era:	Mesozoic
System:	Cretaceous
Series:	Austin and Eagle Ford Groups
Code:	uK2 *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 06427682.2r



SITE NAME:	Garnet Mesa Solar Project	CLIENT:	ERO Resources
ADDRESS:	20426 G Rd. Delta CO 81416	CONTACT: INQUIRY #:	Courtney Sockwell 06427682.2r
LAT/LONG:	38.742725 / 107.972352	DATE:	March 30, 2021 1:28 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Montrose

Soil Surface Texture: silty clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 102 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	3 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.2333 Min: 0.4233	Max: 8.8 Min: 7.8
2	47 inches	64 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.2333 Min: 0.4233	Max: 8.8 Min: 7.8
3	35 inches	47 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.2333 Min: 0.4233	Max: 8.8 Min: 7.8
4	3 inches	12 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.2333 Min: 0.4233	Max: 8.8 Min: 7.8

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
5	12 inches	35 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.2333 Min: 0.4233	Max: 8.8 Min: 7.8

Soil Map ID: 2

Soil Component Name: Typic Haplocambids, dissected

Soil Surface Texture: silty clay

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 20 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	48 inches	64 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 0.42	Max: 8.6 Min: 7.4
2	20 inches	48 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 0.42	Max: 8.6 Min: 7.4

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
3	4 inches	20 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 0.42	Max: 8.6 Min: 7.4
4	0 inches	4 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 0.42	Max: 8.6 Min: 7.4

Soil Map ID: 3

Soil Component Name: Loutzenhizer

Soil Surface Texture: silty clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	22 inches	26 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.2333 Min: 0.4233	Max: 8.8 Min: 7.6

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	14 inches	22 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.2333 Min: 0.4233	Max: 8.8 Min: 7.6
3	26 inches	37 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.2333 Min: 0.4233	Max: 8.8 Min: 7.6
4	0 inches	14 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.2333 Min: 0.4233	Max: 8.8 Min: 7.6

Soil Map ID: 4

Soil Component Name: Loutzenhizer

Soil Surface Texture: silty clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	27 inches	35 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.2333 Min: 0.4233	Max: 8.8 Min: 7.6
2	7 inches	27 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.2333 Min: 0.4233	Max: 8.8 Min: 7.6
3	35 inches	39 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.2333 Min: 0.4233	Max: 8.8 Min: 7.6
4	0 inches	7 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4.2333 Min: 0.4233	Max: 8.8 Min: 7.6

Soil Map ID: 5

Soil Component Name: Persayo

Soil Surface Texture: silt loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	3 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:
2	3 inches	16 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:
3	16 inches	35 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:
4	35 inches	90 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 6

Soil Component Name: Ellaybee

Soil Surface Texture: silty clay loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 104 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 0.42	Max: 9 Min: 7.6
2	19 inches	30 inches	very paragravelly silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 0.42	Max: 9 Min: 7.6
3	30 inches	42 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 0.42	Max: 9 Min: 7.6
4	13 inches	19 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 0.42	Max: 9 Min: 7.6
5	5 inches	13 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 0.42	Max: 9 Min: 7.6

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1.000 miles
State Database	0.000

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

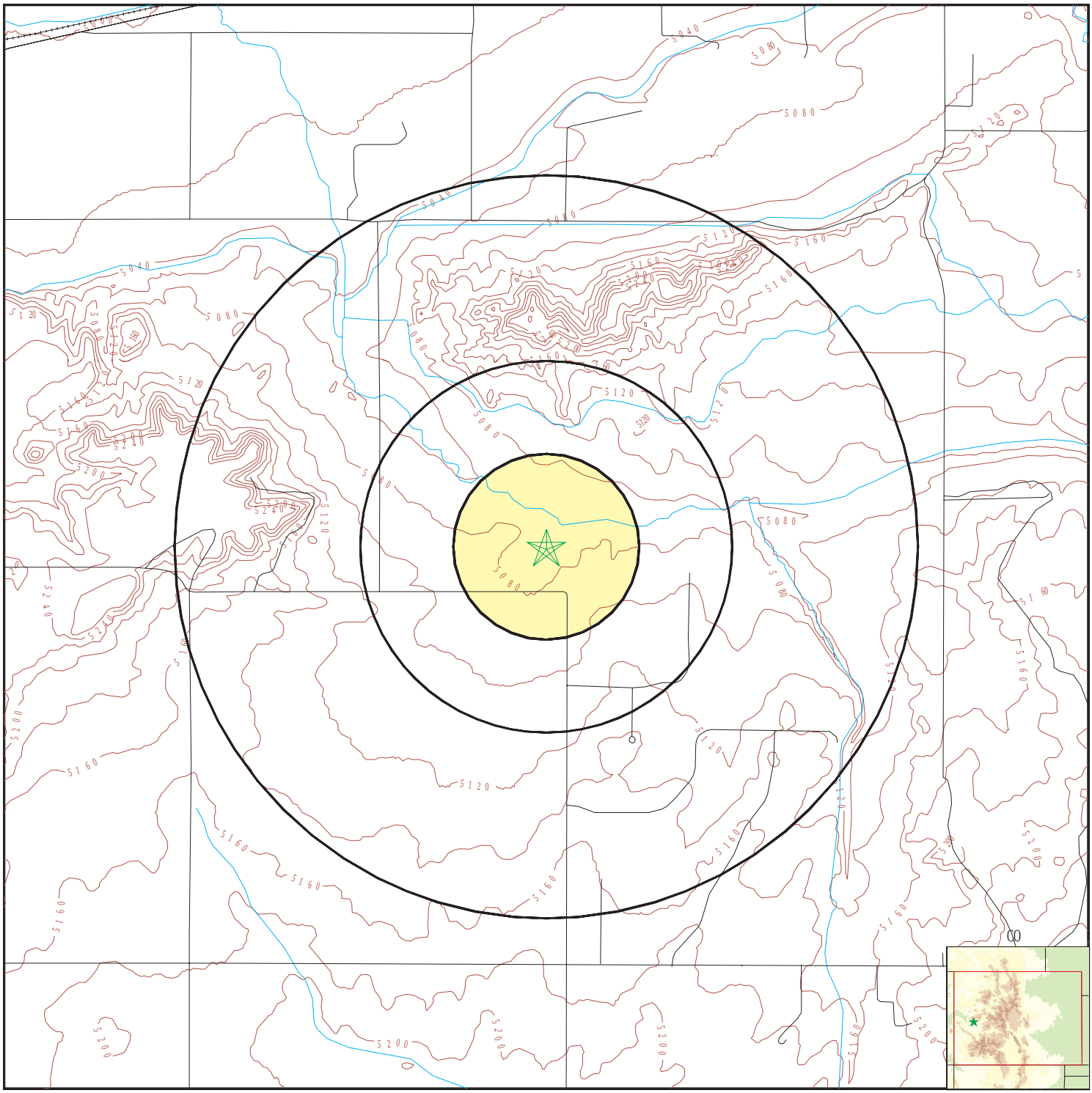
MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

OTHER STATE DATABASE INFORMATION

STATE OIL/GAS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	COOG20000011140	1 - 2 Miles NNE
2	COOG20000011135	1 - 2 Miles SSE
3	COOG20000011137	1 - 2 Miles ESE

PHYSICAL SETTING SOURCE MAP - 06427682.2r



- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- Oil, gas or related wells

SITE NAME:	Garnet Mesa Solar Project	CLIENT:	ERO Resources
ADDRESS:	20426 G Rd. Delta CO 81416	CONTACT:	Courtney Sockwell
LAT/LONG:	38.742725 / 107.972352	INQUIRY #:	06427682.2r
		DATE:	March 30, 2021 1:28 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance

Database EDR ID Number

1
NNE **OIL_GAS** **COOG20000011140**
1 - 2 Miles

API #:	05-029-05010	Well #:	1
Well Name:	HALLOCK	Operator #:	100997
Operator:	HACKATHORN DRILLING CO	Field Name:	WILDCAT
Facility ID:	208713	Facility Type:	WELL
Facility Status:	DRY AND ABANDONED WELL.	Location Name:	HALLOCK-615S95W 12SENW
SPUD date:	01-JAN-47	Ground Elevation (ft):	5710
Max Measured Depth:	60	Max Total Vertical Depth:	0

2
SSE **OIL_GAS** **COOG20000011135**
1 - 2 Miles

API #:	05-029-05004	Well #:	1
Well Name:	MAGEE	Operator #:	66802
Operator:	PAN AMERICAN PETROLEUM CORP		
Field Name:	CEDAR CREEK	Facility ID:	208709
Facility Type:	WELL	Facility Status:	DRY AND ABANDONED WELL.
Location Name:	MAGEE-615S95W 25NESW	SPUD date:	23-JAN-58
Ground Elevation (ft):	5219	Max Measured Depth:	1700
Max Total Vertical Depth:	0		

3
ESE **OIL_GAS** **COOG20000011137**
1 - 2 Miles

API #:	05-029-05007	Well #:	1
Well Name:	GOLDSTON-GOVT	Operator #:	100122
Operator:	GUNNISON ENERGY CORPORATION		
Field Name:	WILDCAT	Facility ID:	208710
Facility Type:	WELL	Facility Status:	DRY AND ABANDONED WELL.
Location Name:	GOLDSTON-GOVT-615S94W 19NWSE		
SPUD date:	12-JUL-53	Ground Elevation (ft):	5202
Max Measured Depth:	845	Max Total Vertical Depth:	0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CO Radon

Radon Test Results

Zip	Total Sites	Avg	% sites<=4 pCi/L	% sites>4&<10 pCi/L	% sites>=10&<20 pCi/L	% sites>20 pCi/L
81416	7	4.04	57.14	42.86	0.00	0.00

Federal EPA Radon Zone for DELTA County: 1

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 81416

Number of sites tested: 3

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	2.400 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	5.500 pCi/L	33%	67%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Riparian Vegetation Data
Source: Division of Wildlife
Telephone: 970-416-3360

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Colorado GIS Well Database
Source: Office of State Engineer, Division of Water Resources
Telephone: 303-866-3581
The GIS Well database includes all wells that the Division of Water Resources permits.

OTHER STATE DATABASE INFORMATION

Oil and Gas Well Locations
Source: Department of Natural Resources
Telephone: 303-894-2100

RADON

State Database: CO Radon
Source: Department of Public Health & Environment
Telephone: 303-692-3090
Radon Study in Colorado

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

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Property Record Card

DELTA COUNTY Delta County Assessor

NORELL KENNETH E
NORELL PAULA JO

6687 2200 ROAD
DELTA, CO 81416-9374

Account: R024736
Tax Area: F1- - - F1-
Acres: 249.055

Parcel: 345513100021
Situs Address:
6687 2200 RD
DELTA, 81416

Value Summary

Value By:	Market	Override
Land (1)	$6,561	N/A
Land (2)	$15,717	N/A
Land (3)	$1,737	N/A
Residential (1)	$172,389	N/A
Extra Features (1)	$0	N/A
Extra Features (2)	$7,318	N/A
Extra Features (3)	$1,361	N/A
Total	**$205,083**	**$205,083**

Legal Description

6687 2200 RD DELTA 81416 TOTAL AC-249.055+-REPLAT LT 23, PHASE VI,PLEASANT VALLEY SUB, NORELL BOUNDARY ADJ. N2SW4, S2NE4, NW4SE4, W2NE4SE4, SE4NE4SE4 & S132' S2SW4NW4 SEC 13 T15S R95W 6PM. TOGETHER WITH PT LOT 23, PHASE VI, SUB. BEG NE COR LT 23 TH EAST LINE SE4SW4 S0*04'28"W 160.20';S74*22'03"W 444.28';N85*41'57"W 539.01';S70*19'24"W 349.36';S65*45'45"W 297.98';N65*15'40"W 147.28';N84*57'27"W 310.88'; ETC TO POB PLAT R-704678 R-704679 R-722198ESMT R-722946ESMT

Public Remarks

Entry Date	Model	Remark
10/05/2018		DEACTIVATED R-11347 & R-22811 CREATED NEW R-24736 & R-24737 DS
10/09/2018		10/2108 CHECKED PROPERTY FOR SPLIT-CHGD ROOF COVER FROM CORROGATED TO MODULAR METAL ON HOUSE-ADDED SKETCH- PUT ON ADDITIONAL UOP- ADDED EQUIPMENT SHED AND LOAFING-JT
10/26/2018		UPDATE VALUE TAB FOR SPLIT
02/21/2019		2/20/2019 SITE VISIT TO UPDATE ACCOUNT PHOTOS -EH

Land Occurrence 1

LVal	417300 - IIIB 1&2 AC	Abstract Code	4173 - 4173 - irrigated IIIB, areas 1 & 2
Lot Front	0	Lot Depth	0
Adj 1	100	Adj 2	100

Property Record Card

DELTA COUNTY Delta County Assessor

Land Occurrence 1

Adj 3	100	Adj 4	100
Neighborhood	91001 - NORTH PEACH VALLEY	Road	0 - N/A
TOPO	0 - N/A	Utilities	0 - N/A
Appr Dist	3 - PAONIA - JODY	Subdivision	0 - N/A
Ag Subdivision	90136 - PLEASANT VALLEY PHASE IV	Use Code	4000
Review Date	201810 - Oct-18		

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
AC		10			10
Total		10.00			10.00
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$6,561	656.10			656.10

Land Occurrence 2

LVal	417400 - IV 1&2 AC	Abstract Code	4174 - 4174 - irrigated IV, areas 1 & 2
Lot Front	0	Lot Depth	0
Adj 1	100	Adj 2	100
Adj 3	100	Adj 4	100
Neighborhood	91001 - NORTH PEACH VALLEY	Road	0 - N/A
TOPO	0 - N/A	Utilities	0 - N/A
Appr Dist	3 - PAONIA - JODY	Subdivision	0 - N/A
Ag Subdivision	90136 - PLEASANT VALLEY PHASE IV	Use Code	4000
Review Date	201810 - Oct-18		

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
AC		28			28
Total		28.00			28.00
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$15,717	561.32			561.32

Land Occurrence 3

LVal	447300 - GRAZE VIII AC	Abstract Code	4473 - 4473 - graze VIII
Lot Front	0	Lot Depth	0
Adj 1	100	Adj 2	100
Adj 3	100	Adj 4	100
Neighborhood	91001 - NORTH PEACH VALLEY	Road	0 - N/A
TOPO	0 - N/A	Utilities	0 - N/A
Appr Dist	3 - PAONIA - JODY	Ag Subdivision	90136 - PLEASANT VALLEY PHASE IV
Use Code	4000	Review Date	201810 - Oct-18

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
AC		211.055			211.055
Total		211.055			211.055
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$1,737	8.23			8.23

Residential Occurrence 1

Abstract Code	4277 - 4277 - farm/ranch residence-improvements	BVAL	427701 - AG SFR DELTA
Arch Style	7 - RANCH	Exterior wall	31 - VINYL
RCVR	12 - MODULAR METAL	RSTR	3 - GABLE/HIP

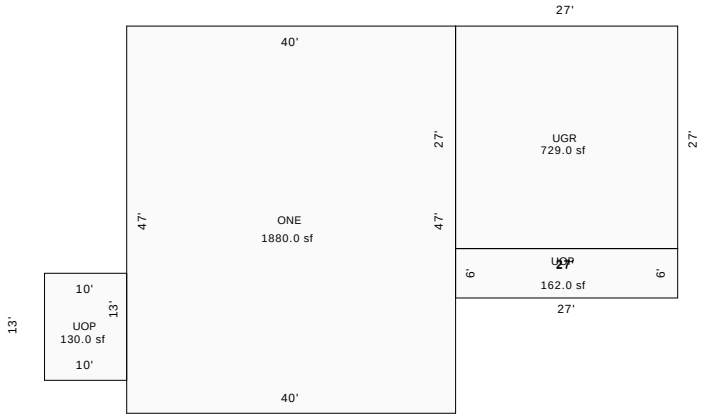
Property Record Card

DELTA COUNTY Delta County Assessor

Residential Occurrence 1

Interior Wall	5 - DRYWALL	Flooring	14 - CARPET 15 - HARDTILE
Heating Fuel	3 - GAS	Heating Type	3 - FORCED AIR
QUAL	3 - AVERAGE	Frame type	2 - WOOD FRAME
Appr Dist	PAONIA - JODY	STYS	1 - 1
Subdivision	90136 - PLEASANT VALLEY PHASE IV	Number of Baths	2
RMS	4	Number of Bedrooms	3
Actual Year Built	2001	Use Code	4000
DEPR01	2001 - DEPR01	Neighborhood	91001 - NORTH PEACH VALLEY

SubArea		**ADJUSTED**	**HEATED**	**PRIME**	**ACTUAL**
UGR - GARAGE/UNF		182			729
ONE - ONE STORY		1,880	1,880	1,880	1,880
UOP - UF/OPN/PRC		58			292
Total		2,120.70	1,880.00	1,880.00	2,901.00
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$172,389	81.29	91.70	91.70	59.42



Sketch by Apex Medina™

Extra Features Occurrence 1

CODE	15400 - SHED INVENTORY 10 X 10 OR LESS	Abstract Code	4277 - FARM/RANCH RESIDENCE-IMPROVEM
DIM1	8	DIM2	12
Neighborhood	91001 - NORTH PEACH VALLEY		

Extra Features Occurrence 2

CODE	41600 - EQUIPMENT SHED D AVG	Abstract Code	4279 - FARM/RANCH SUPPORT BUILDINGS

Extra Features Occurrence 2

DEPR23	2001 - DEPR23	DIM1	20
DIM2	40	Neighborhood	91001 - NORTH PEACH VALLEY

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
UT - UT		800			800
Total		800.00			800.00
	Value	Rate	Rate	Rate	Rate
	$7,318	9.15			9.15

Extra Features Occurrence 3

CODE	42800 - LOAFING SHED D LOW	Abstract Code	4279 - FARM/RANCH SUPPORT BUILDINGS
DEPR18	1970 - DEPR18	DIM1	15
DIM2	64	Neighborhood	91001 - NORTH PEACH VALLEY

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
UT - UT		960			960
Total		960.00			960.00
	Value	Rate	Rate	Rate	Rate
	$1,361	1.42			1.42

Abstract Summary

Code	Classification	Actual Value	Taxable Value	Actual Override	Taxable Override
4173	4173 - irrigated IIIB, areas 1 & 2	$6,561	$1,903	NA	NA
4174	4174 - irrigated IV, areas 1 & 2	$15,717	$4,558	NA	NA
4277	4277 - farm/ranch residence-improvements	$172,389	$12,326	NA	NA
4279	4279 - farm/ranch support buildings	$8,679	$2,517	NA	NA
4473	4473 - graze VIII	$1,737	$504	NA	NA
Total		**$205,083**	**$21,808**	**NA**	**NA**

Property Record Card

DELTA COUNTY Delta County Assessor

HOFSCHULTE JENNIFER L

5990 2100 ROAD
DELTA, CO 81416-8202

Account: R011354

Tax Area: F1- - - F1-

Acres: 21.210

Parcel: 345513300009

Situs Address:
5990 2100 RD
DELTA, 81416

Value Summary

Value By:	Market	Override
Land (1)	$30,755	N/A
Residential (1)	$95,202	N/A
Residential (2)	$66,069	N/A
Total	**$192,026**	**$192,026**

Legal Description

5990 2100 RD DELTA 81416 S: 13 T: 15S R: 95W Subdivision: RURAL AREA TOTAL AC 21.211+- PT W2SW4SW4 SEC 13 T15S R95W 6PM. BEG CORNER COMMON TO SEC 13,14, 23 & 24 TH RUNNING N00*05'00"E 1315.03'; S89*15'12"E 669.65'; S00.05'05"W 1314.56';N89*17'36"W 669.91'; TO POB BK 185 PG 26 BK 289 PG 285 BK 313 PG 314 BK 325 PG 258 BK 527 PG 957 BK 527 PG 958 BK 527 PG 959 BK 633 PG 257 BK 877 PGS 760 THRU 763 R-620971 R-679474-AS R-679475-AS R-679476-AS R-679477 R-679041 SVY R-696085-ESMT

Public Remarks

Entry Date	Model	Remark
05/31/2006		5/06 CHANGED MAILING PER OWNER. DS
06/21/2006		MAIL ADD CHNGD 6-06 GW
12/03/2007		12/03/2007-TD/INVENTORY FORMS MAILED-NN
12/17/2007		12/17/2007-TD/INVENTORY FORMS REC'D-NN
04/17/2015		TD/INVENTORY FORM SENT DS
08/11/2015		ACREAGE CHANGE FROM 20 TO 21.21 PER DEB S-JT
04/13/2016		4/5/2016 CHECKED SALE-JT
11/07/2017		10/31/2017 MEASURED NEW HOUSE-JT
12/16/2019		12/4/2019 SON BUILDING A SMALL HOUSE ON PROPERTY-JT

Sale Data

Doc. #	Sale Date	Deed Type	Validity	Verified	Sale Price	Ratio	Adj. Price	Ratio	Time Adj. Price	Ratio
679477	04/01/2015	WD	QV	Y	$55,000	55.92	$55,000	55.92	$55,000	55.92

Property Record Card

DELTA COUNTY Delta County Assessor

Sale Data

620971	11/26/2007	WT	QV	Y	$63,050	48.78	$63,050	48.78	$63,050	48.78

Land Occurrence 1

LVal	570154 - DEL EAST ADOBE SOIL	Abstract Code	1112 - 1112 - single family residence- land
Lot Front	0	Lot Depth	0
Adj 1	100	Adj 2	100
Adj 3	100	Adj 4	100
Neighborhood	91001 - NORTH PEACH VALLEY	Road	0 - N/A
TOPO	0 - N/A	Utilities	0 - N/A
Appr Dist	3 - PAONIA - JODY	Subdivision	90500 - DEL EAST RURAL UNPLAT PER ACRE
Use Code	1000	Review Date	201912 - Dec-19

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
AC		21.21			21.21
Total		21.21			21.21
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$30,755	1,450.02			1,450.02

Residential Occurrence 1

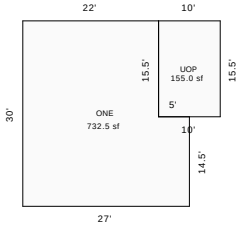
Abstract Code	1212 - 1212 - single family residence-improvements	BVAL	121201 - SFR DELTA
Arch Style	7 - RANCH	Exterior wall	5 - CEMENT LAP SIDING 23 - METAL
RCVR	12 - MODULAR METAL	RSTR	3 - GABLE/HIP
Interior Wall	5 - DRYWALL	Flooring	10 - FORMICA/LAMINATE 15 - HARDTILE
Heating Fuel	4 - ELECTRIC	Heating Type	7 - RAD ELECT
QUAL	3 - AVERAGE	Frame type	2 - WOOD FRAME
Appr Dist	PAONIA - JODY	STYS	1 - 1
Subdivision	90500 - DEL EAST RURAL UNPLAT PER ACRE	Number of Baths	1
RMS	3	Number of Bedrooms	2
Actual Year Built	2017	Use Code	1000
DEPR01	2017 - DEPR01	Neighborhood	91001 - NORTH PEACH VALLEY

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
ONE - ONE STORY		732	732	732	732
UOP - UF/OPN/PRC		31			155
Total		763.50	732.50	732.50	887.50
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$95,202	124.69	129.97	129.97	107.27

Property Record Card

DELTA COUNTY Delta County Assessor

Residential Occurrence 1



Sketch by Apex Medina™

Residential Occurrence 2

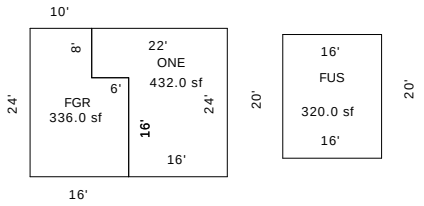
Abstract Code	1212 - 1212 - single family residence-improvements	BVAL	121201 - SFR DELTA
Arch Style	15 - 2 STORY	Exterior wall	5 - CEMENT LAP SIDING
RCVR	12 - MODULAR METAL	RSTR	7 - GAMBREL
Interior Wall	5 - DRYWALL	Flooring	10 - FORMICA/LAMINATE
Heating Fuel	4 - ELECTRIC	Heating Type	7 - RAD ELECT
QUAL	3 - AVERAGE	Frame type	2 - WOOD FRAME
Appr Dist	PAONIA - JODY	STYS	2 - STYS
Subdivision	90500 - DEL EAST RURAL UNPLAT PER ACRE	Number of Baths	1.5
RMS	3	Number of Bedrooms	1
Actual Year Built	2019	Use Code	1000
DEPR01	2019 - DEPR01	Neighborhood	91001 - NORTH PEACH VALLEY
SPCD5	71 - UC	SPCD5	71 - UC

SubArea		**ADJUSTED**	**HEATED**	**PRIME**	**ACTUAL**
FUS - F.UPPERST		224	320	320	320
FGR - GARAGE/FIN		101			336
ONE - ONE STORY		432	432	432	432
Total		756.80	752.00	752.00	1,088.00
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$66,069	87.30	87.86	87.86	60.73

Property Record Card

DELTA COUNTY Delta County Assessor

Residential Occurrence 2



Sketch by Apex Sketch v5 Pro™

Abstract Summary

Code	Classification	Actual Value	Taxable Value	Actual Override	Taxable Override
1112	1112 - single family residence- land	$30,755	$2,199	NA	NA
1212	1212 - single family residence-improvements	$161,271	$11,531	NA	NA
Total		**$192,026**	**$13,730**	**NA**	**NA**

Property Record Card

DELTA COUNTY Delta County Assessor

GARNET MESA LAND LLC
1125 17TH ST SUITE 740
DENVER, CO 80202-2070

Account: R011375
Tax Area: F1- - - F1-
Acres: 40.000

Parcel: 345514300008
Situs Address:
6469 2050 RD
DELTA, 81416

Value Summary

Value By:	Market	Override
Land (1)	$5,613	N/A
Land (2)	$5,257	N/A
Land (3)	$240	N/A
Total	**$11,110**	**$11,110**

Legal Description

6469 2050 RD DELTA 81416 S: 14 T: 15S R: 95W Subdivision: RURAL AREA TOTAL AC 40+- SEC 14 T15S R95W 6PM NE4SW4 SEC 14 BK 255 PG 21 BK 255 PG 423 BK 341 PG 335 BK 289 PG 577 BK 290 PG 245 BK 294 PG 89 BK 341 PG 335 R672529-LTR R672530-LTR R672532 R-694184 R-694183-H2O R-697030-H2O R-727162 R-727163 H2O

Public Remarks

Entry Date	Model	Remark
05/01/2008		CHECKED INVENTORY WITH TENANT, CHECKED SKETCH, NEW PICTURES GC
04/01/2014		TD/INVENTORY FORMS MAILED 4/7/14 FORMS REC'D AND SCANNED
08/12/2014		8/7/2014 PER SITE VISIT HOUSE GONE-JT
04/22/2015		VALUE TRACK DESTROYED PROPERTY FOR HOUSE GONE
04/06/2017		TD/INVENTORY FORMS MAILED VCL TD/INVENTORY FORM RETURNED & SCANNED VCL
07/19/2017		7/2017 CHECKED SALE-PULLED IN 5TH WHEEL AFTER SALE-JT
		POOR CONDITION
		3 4 87 BM
		R-697030 2463 SHARES OF UVWUA. THERE ARE NO BREAK DOWNS OF THE WATER ALLOCATION FOR THE 3 SEPARATE PARCELS. THIS IS JUST FOR INFORMATION FOR HISTORICAL PURPOSES.

Sale Data

Doc. #	Sale Date	Deed Type	Validity	Verified	Sale Price	Ratio	Adj. Price	Ratio	Time Adj. Price	Ratio
727162	03/12/2021	SP	UV	Y	$2,362,000	0.47	$2,362,000	0.47	$2,362,000	0.47

Property Record Card

DELTA COUNTY Delta County Assessor

Sale Data

694184	03/24/2017	WJ	UV	Y	$1,300,000	0.85	$1,300,000	0.85	$1,300,000	0.85
672532	03/28/2014	PR	UI	N	$1,811,000	0.61	$1,811,000	0.61	$1,811,000	0.61

Land Occurrence 1

LVal	417400 - IV 1&2 AC	Abstract Code	4174 - 4174 - irrigated IV, areas 1 & 2
Lot Front	0	Lot Depth	0
Adj 1	100	Adj 2	100
Adj 3	100	Adj 4	100
Neighborhood	91001 - NORTH PEACH VALLEY	Road	0 - N/A
TOPO	0 - N/A	Utilities	0 - N/A
Appr Dist	3 - PAONIA - JODY	Subdivision	0 - N/A
Ag Subdivision	90000 - DEL RURAL (EAST)	Use Code	4000
Review Date	201408 - Aug-14		

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
AC		10			10
Total		10.00			10.00
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$5,613	561.30			561.30

Land Occurrence 2

LVal	437200 - MEAD V 1&2 AC	Abstract Code	4372 - 4372 - meadow hay, areas 1 & 2
Lot Front	0	Lot Depth	0
Adj 1	100	Adj 2	100
Adj 3	100	Adj 4	100
Neighborhood	91001 - NORTH PEACH VALLEY	Road	0 - N/A
TOPO	0 - N/A	Utilities	0 - N/A
Appr Dist	3 - PAONIA - JODY	Subdivision	0 - N/A
Ag Subdivision	90000 - DEL RURAL (EAST)	Use Code	4000
Review Date	201408 - Aug-14		

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
AC		14			14
Total		14.00			14.00
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$5,257	375.50			375.50

Land Occurrence 3

LVal	447200 - GRAZE VII AC	Abstract Code	4472 - 4472 - graze VII
Lot Front	0	Lot Depth	0
Adj 1	100	Adj 2	100
Adj 3	100	Adj 4	100
Neighborhood	91001 - NORTH PEACH VALLEY	Road	0 - N/A
TOPO	0 - N/A	Utilities	0 - N/A
Appr Dist	3 - PAONIA - JODY	Subdivision	90000 - DEL RURAL (EAST)
Ag Subdivision	90000 - DEL RURAL (EAST)	Use Code	4000
Review Date	201408 - Aug-14		

SubArea	ADJUSTED	HEATED	PRIME	ACTUAL
AC	16			16
Total	16.00			16.00

Property Record Card

DELTA COUNTY Delta County Assessor

Land Occurrence 3

Value	Rate	Rate	Rate	Rate
$240	15.00			15.00

Abstract Summary

Code	Classification	Actual Value	Taxable Value	Actual Override	Taxable Override
4174	4174 - irrigated IV, areas 1 & 2	$5,613	$1,628	NA	NA
4372	4372 - meadow hay, areas 1 & 2	$5,257	$1,525	NA	NA
4472	4472 - graze VII	$240	$70	NA	NA
Total		**$11,110**	**$3,223**	**NA**	**NA**

Property Record Card

DELTA COUNTY Delta County Assessor

GARNET MESA LAND LLC
1125 17TH ST SUITE 740
DENVER, CO 80202-2070

Account: R013107
Tax Area: F1- - - F1-
Acres: 240.000

Parcel: 345523100001
Situs Address:
G RD
DELTA, 81416

Value Summary

Value By:	Market	Override
Land (1)	$33,680	N/A
Land (2)	$2,695	N/A
Total	**$36,375**	**$36,375**

Legal Description

G RD DELTA 81416 S: 23 T: 15S R: 95W TOTAL AC 240+- SEC 23 T15S R95W 6PM NE4 SEC 23 N2SE4 SEC 23 LESS 1/2 MR BK 195 PG 336 BK 195 PG 337 BK 256 PG 275 BK 283 PG 41 BK 382 PG 402 BK 381 PG 44 & 154 R672529-LTR R672530-LTR R672532 R-694184 R-694183-H2O R-697030-H2O R-727162 R-727163 H2O

Public Remarks

Entry Date	Model	Remark
04/01/2014		TD/INVENTORY FORMS MAILED 4/7/14 FORMS REC'D AND SCANNED
04/06/2017		TD/INVENTORY FORMS MAILED VCL TD/INVENTORY FORM RETURNED & SCANNED VCL
08/03/2017		R-697030 2463 SHARES OF UVWUA. THERE ARE NO BREAK DOWNS OF THE WATER ALLOCATION FOR THE 3 SEPARATE PARCELS. THIS IS JUST FOR INFORMATION FOR HISTORICAL PURPOSES.

Sale Data

Doc. #	Sale Date	Deed Type	Validity	Verified	Sale Price	Ratio	Adj. Price	Ratio	Time Adj. Price	Ratio
727162	03/12/2021	SP	UV	Y	$2,362,000	1.54	$2,362,000	1.54	$2,362,000	1.54
694184	03/24/2017	WJ	UV	Y	$1,300,000	2.80	$1,300,000	2.80	$1,300,000	2.80
672532	03/28/2014	PR	UI	N	$1,811,000	2.01	$1,811,000	2.01	$1,811,000	2.01

Land Occurrence 1

LVal	417400 - IV 1&2 AC	Abstract Code	4174 - 4174 - irrigated IV, areas 1 & 2
Lot Front	0	Lot Depth	0
Adj 1	100	Adj 2	100

Property Record Card

DELTA COUNTY Delta County Assessor

Land Occurrence 1

Adj 3	100	Adj 4	100
Neighborhood	92001 - SOUTH PEACH VALLEY	Road	0 - N/A
TOPO	0 - N/A	Utilities	0 - N/A
Appr Dist	3 - PAONIA - JODY	Subdivision	0 - N/A
Ag Subdivision	90000 - DEL RURAL (EAST)	Use Code	4000
Review Date	201408 - Aug-14		

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
AC		60			60
Total		60.00			60.00
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$33,680	561.33			561.33

Land Occurrence 2

LVal	447200 - GRAZE VII AC	Abstract Code	4472 - 4472 - graze VII
Lot Front	0	Lot Depth	0
Adj 1	100	Adj 2	100
Adj 3	100	Adj 4	100
Neighborhood	92001 - SOUTH PEACH VALLEY	Road	0 - N/A
TOPO	0 - N/A	Utilities	0 - N/A
Appr Dist	3 - PAONIA - JODY	Subdivision	0 - N/A
Ag Subdivision	90000 - DEL RURAL (EAST)	Use Code	4000
Review Date	201408 - Aug-14		

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
AC		180			180
Total		180.00			180.00
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$2,695	14.97			14.97

Abstract Summary

Code	Classification	Actual Value	Taxable Value	Actual Override	Taxable Override
4174	4174 - irrigated IV, areas 1 & 2	$33,680	$9,767	NA	NA
4472	4472 - graze VII	$2,695	$782	NA	NA
Total		**$36,375**	**$10,549**	**NA**	**NA**

Property Record Card

DELTA COUNTY Delta County Assessor

GARNET MESA LAND LLC
1125 17TH ST SUITE 740
DENVER, CO 80202-2070

Account: R013111
Tax Area: F1- - - F1-
Acres: 41.860

Parcel: 345523200009
Situs Address:
20426 G RD
DELTA, 81416

Value Summary

Value By:	Market	Override
Land (1)	$17,060	N/A
Land (2)	$237	N/A
Residential (1)	$100,318	N/A
Extra Features (1)	$8,731	N/A
Extra Features (2)	$423	N/A
Extra Features (3)	$300	N/A
Extra Features (4)	$2,484	N/A
Extra Features (5)	$5,377	N/A
Extra Features (6)	$847	N/A
Total	**$135,777**	**$135,777**

Legal Description

20426 G RD DELTA 81416 S: 23 T: 15S R: 95W TOTAL AC 41.86+- SEC 23 T15S R95W 6PM NE4NW4SEC 23 BK 418 PG 440 BK 780 PG 356 ALSO 1.86 AC R672529-LTR R672530-LTR R672531 R672532 R-694184 R-694183-H2O R-693947 R-697030-H2O R-727162 R-727163 H2O

Public Remarks

Entry Date	Model	Remark
07/16/2003		3 SALVAGE GRAINERIES 7/03 SM
07/16/2003		AG INVENTORY 7/03 SM
04/01/2014		TD/INVENTORY FORMS MAILED 4/7/14 FORMS REC'D AND SCANNED
08/12/2014		8/7/2014 SITE VISIT FOR SALE-JT
04/06/2017		TD/INVENTORY FORMS MAILED VCL TD/INVENTORY FORM RETURNED & SCANNED VCL
08/03/2017		R-697030 2463 SHARES OF UVWUA. THERE ARE NO BREAK DOWNS OF THE WATER ALLOCATION FOR THE 3 SEPARATE PARCELS. THIS IS JUST FOR INFORMATION FOR HISTORICAL PURPOSES.
03/18/2021		TD FORMS MAILED AG

Property Record Card

DELTA COUNTY Delta County Assessor

Public Remarks

3/23/87 BOB

Sale Data

Doc. #	Sale Date	Deed Type	Validity	Verified	Sale Price	Ratio	Adj. Price	Ratio	Time Adj. Price	Ratio
727162	03/12/2021	SP	UV	Y	$2,362,000	5.75	$2,362,000	5.75	$2,362,000	5.75
694184	03/24/2017	WJ	UV	Y	$1,300,000	10.44	$1,300,000	10.44	$1,300,000	10.44
672532	03/28/2014	PR	UI	N	$1,811,000	7.50	$1,811,000	7.50	$1,811,000	7.50

Land Occurrence 1

LVal	417300 - IIIB 1&2 AC	Abstract Code	4173 - 4173 - irrigated IIIB, areas 1 & 2
Lot Front	0	Lot Depth	0
Adj 1	100	Adj 2	100
Adj 3	100	Adj 4	100
Neighborhood	92001 - SOUTH PEACH VALLEY	Road	0 - N/A
TOPO	0 - N/A	Utilities	0 - N/A
Appr Dist	3 - PAONIA - JODY	Subdivision	0 - N/A
Ag Subdivision	90000 - DEL RURAL (EAST)	Use Code	4000
Review Date	201408 - Aug-14		

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
AC		26			26
Total		26.00			26.00
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$17,060	656.15			656.15

Land Occurrence 2

LVal	447200 - GRAZE VII AC	Abstract Code	4472 - 4472 - graze VII
Lot Front	0	Lot Depth	0
Adj 1	100	Adj 2	100
Adj 3	100	Adj 4	100
Neighborhood	92001 - SOUTH PEACH VALLEY	Road	0 - N/A
TOPO	0 - N/A	Utilities	0 - N/A
Appr Dist	3 - PAONIA - JODY	Subdivision	0 - N/A
Ag Subdivision	90000 - DEL RURAL (EAST)	Use Code	4000
Review Date	201408 - Aug-14		

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
AC		15.86			15.86
Total		15.86			15.86
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$237	14.94			14.94

Residential Occurrence 1

Abstract Code	4277 - 4277 - farm/ranch residence-improvements	BVAL	427701 - AG SFR DELTA
Arch Style	7 - RANCH	Exterior wall	31 - VINYL
RCVR	12 - MODULAR METAL	RSTR	3 - GABLE/HIP
Interior Wall	5 - DRYWALL	Flooring	14 - CARPET 8 - SHT VINYL 10 - FORMICA/LAMINATE
Heating Fuel	3 - GAS	Heating Type	3 - FORCED AIR
Air Conditioning	1 - NONE	QUAL	3 - AVERAGE

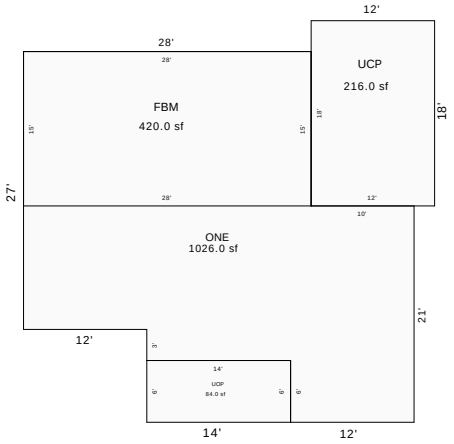
Property Record Card

DELTA COUNTY Delta County Assessor

Residential Occurrence 1

Frame type	2 - WOOD FRAME	Appr Dist	PAONIA - JODY
STYS	1 - 1	Subdivision	90000 - DEL RURAL (EAST)
Number of Baths	1	RMS	5
Number of Bedrooms	2	Actual Year Built	1962
Use Code	4000	DEPR01	1972 - DEPR01
Neighborhood	92001 - SOUTH PEACH VALLEY	UD1	0 - N/A
Fire Place	1 - WOOD FIREPLACE		

SubArea		ADJUSTED	HEATED	PRIME	ACTUAL
FBM - BASM/FIN		294	420	420	420
UCP - CARPRT/UNF		43			216
ONE - ONE STORY		1,026	1,026	1,026	1,026
UOP - UF/OPN/PRC		17			84
Total		1,380.00	1,446.00	1,446.00	1,746.00
	Value	**Rate**	**Rate**	**Rate**	**Rate**
	$100,318	72.69	69.38	69.38	57.46



Sketch by Apex Medina™

Extra Features Occurrence 1

CODE	42540 - EQUIP (SHOP) BLDG S LOW	Abstract Code	4279 - FARM/RANCH SUPPORT BUILDINGS
DEPR23	1991 - DEPR23	DIM1	30
DIM2	46	Neighborhood	92001 - SOUTH PEACH VALLEY
ECONAREA	3 - ECONAREA-UNPLATTED	Review Date	Jul-03

SubArea	ADJUSTED	HEATED	PRIME	ACTUAL
UT - UT	1,380			1,380
Total	1,380.00			1,380.00

Extra Features Occurrence 1

	Value	Rate	Rate	Rate	Rate
	$8,731	6.33			6.33

Extra Features Occurrence 2

CODE	40300 - UTILITY BLDG FARM D LOW	Abstract Code	4279 - FARM/RANCH SUPPORT BUILDINGS
DIM1	12	DIM2	20
Neighborhood	92001 - SOUTH PEACH VALLEY	ECONAREA	3 - ECONAREA-UNPLATTED
Review Date	Jul-03		

SubArea	ADJUSTED	HEATED	PRIME	ACTUAL
UT - UT	240			240
Total	240.00			240.00

	Value	Rate	Rate	Rate	Rate
	$423	1.76			1.76

Extra Features Occurrence 3

CODE	41900 - UTILITY GRAIN STORAGE S LOW	Abstract Code	4279 - FARM/RANCH SUPPORT BUILDINGS
DEPR00	1962 - DEPR00	DIM1	0
DIM2	0	Neighborhood	92001 - SOUTH PEACH VALLEY
ECONAREA	3 - ECONAREA-UNPLATTED	Review Date	Jul-03

SubArea	ADJUSTED	HEATED	PRIME	ACTUAL
UT - UT	3			3
Total	3.00			3.00

	Value	Rate	Rate	Rate	Rate
	$300	100.00			100.00

Extra Features Occurrence 4

CODE	40300 - UTILITY BLDG FARM D LOW	Abstract Code	4279 - FARM/RANCH SUPPORT BUILDINGS
DIM1	32	DIM2	40
Neighborhood	92001 - SOUTH PEACH VALLEY	ECONAREA	3 - ECONAREA-UNPLATTED
Review Date	Jul-03		

SubArea	ADJUSTED	HEATED	PRIME	ACTUAL
UT - UT	1,280			1,280
Total	1,280.00			1,280.00

	Value	Rate	Rate	Rate	Rate
	$2,484	1.94			1.94

Extra Features Occurrence 5

CODE	43600 - HAY SHED D AVG	Abstract Code	4279 - FARM/RANCH SUPPORT BUILDINGS
DEPR23	2000 - DEPR23	DIM1	28
DIM2	60	Neighborhood	92001 - SOUTH PEACH VALLEY
ECONAREA	3 - ECONAREA-UNPLATTED	Review Date	Jul-03

SubArea	ADJUSTED	HEATED	PRIME	ACTUAL
UT - UT	1,680			1,680
Total	1,680.00			1,680.00

Extra Features Occurrence 5

	Value	Rate	Rate	Rate	Rate
	$5,377	3.20			3.20

Extra Features Occurrence 6

CODE	40300 - UTILITY BLDG FARM D LOW	Abstract Code	4279 - FARM/RANCH SUPPORT BUILDINGS
DIM1	15	DIM2	32
Neighborhood	92001 - SOUTH PEACH VALLEY	ECONAREA	3 - ECONAREA-UNPLATTED
Review Date	Jul-03		

SubArea	ADJUSTED	HEATED	PRIME	ACTUAL
UT - UT	480			480
Total	480.00			480.00

	Value	Rate	Rate	Rate	Rate
	$847	1.76			1.76

Abstract Summary

Code	Classification	Actual Value	Taxable Value	Actual Override	Taxable Override
4173	4173 - irrigated IIIB, areas 1 & 2	$17,060	$4,947	NA	NA
4277	4277 - farm/ranch residence-improvements	$100,318	$7,173	NA	NA
4279	4279 - farm/ranch support buildings	$18,162	$5,267	NA	NA
4472	4472 - graze VII	$237	$69	NA	NA
Total		**$135,777**	**$17,456**	**NA**	**NA**

ERO RESOURCES CORPORATION
PHASE I ESA USER QUESTIONNAIRE

This questionnaire has been designed to comply with §6 and §7.3.2 of the ASTM Standard E 1527-13. Please complete and sign this questionnaire for the following property:

A. General Property Information

Site Address/Location: **6687 2200 RD, Delta, CO**

1) Why is the Phase I being conducted for this property?
Sale (by user) Purchase (by user) Exchange CATEX Easement
Baseline Conditions Refinance Confidential **Other (Redevelopment)**

2) What is the property size? **165.7ac**

3) How long have you been involved with the property? **Approximately 3 months.**

4) What is the current use of the property? **Agricultural use**

5) Describe the future uses of the property.

Ground mount solar PV power plant

6) Are there any structures on the property? (Y/N)_**N**_____
If so, please list any details of the structures:

Structure Name (Residence, garage, business etc.)	Approx. size (square footage if known)	Accessible? (Y/N)

7) Are you aware of any of the following information about the owner, operator, key site manager, realtor and/or developer of the property:

	Primary Contact	Secondary Contact (if applicable)
Name	Matt Kosakowski	Bryan Walchle (realtor)
Address	2330 W Scott Pl	
	Denver, CO 80211	
Telephone		970-249-4300
Mobile Phone	303-884-5598	970-209-7500

8) The owner, key site manager, realtor and/or developer of the property may be contacted regarding this Phase I Environmental Site Assessment. Please indicate any potential problems associated with contacting these individuals or entities:

No problem

9) Please specify below any other person(s) who is familiar with the property and may be useful to contact.

Bryan Walchle (contact information in #7) may be able to assist in connecting you to the prior owner.

10) Are you aware of the providers of the following utilities?

Potable Water	**Unknown**
Sanitary Sewer	**Unknown**
Electricity	**Unknown**
Natural Gas	**Unknown**

B. Historical Property Information

11) Do any of the following documents exist?

YES	NO	
	X	Environmental Site Assessment reports
	X	Environmental Audit reports
	X	Environmental permits
	X	Registration for USTs and aboveground storage tanks
	X	Reports on hydrogeologic conditions on the property and surrounding area
	X	Geotechnical studies
	X	Maps of the property (plats, site maps)
X		Legal description of property
X		Survey of property

If you answered YES to any of the above, please describe below (use additional sheets, if necessary). Please forward copies of these documents.

We have an ALTA survey and the title report along with legal description for the property.

12) Are you aware of any of the following:

YES	NO	
	X	Pending, threatened, or past litigation relevant to hazardous substances of petroleum products in, on, or from the property?
	X	Pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the property?
	X	Notices from any governmental entity regarding any possible liability relating to hazardous substances or petroleum products?

If you answered YES to any of the above, please describe below (use additional sheets, if necessary). Please forward information and/or documents relevant to above.

13) Are you aware of any underground or aboveground storage tanks currently or previously located on the property or adjoining properties?

No

14) Are you aware of any incidents involving hazardous substances or petroleum products on or in the vicinity of the property?

YES	NO
	X

If you answered yes, please describe below (use additional sheets, if necessary).

C. All Appropriate Inquiry Information

In order to qualify for one of the Landowner Liability Protections offered by the Small Business Liability Relief and Brownsfields Revitalization Act of 2001, the user must provide the following information (if available) to ERO. Failure to provide this information could result in a determination that "all appropriate inquiry" is not complete.

15) Are you aware of any environmental covenants, settlement agreements, deed or zoning restrictions or other encumbrances on the property? If so, please explain.

No

16) Are you aware of any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state or local law? If so, please explain.

No

17) Are you aware of any activity and land use limitations, such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law? If so, please explain.

No

18) As the user of this ESA, do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or adjoining property so that you would have specialized knowledge of the chemical processes used by this type of business? If so, please explain.

No

19) Does the purchase price being paid for this property reasonable reflect the fair market value of the property? (Y/N)_**Yes**_____

a) If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property? If so, please explain.

20) Are you aware of commonly known or reasonable ascertainable information about the property that would help ERO identify conditions indicative of releases or threatened releases?

No

For example, as user:

a) Do you know the current and past uses of the property?

It is our understanding that the land has seen no changes in use in the recent past relative to its current state.

b) Do you know of specific chemicals that are present or once were present at the property?

No

c) Do you know of spills or other chemical releases that have taken place at the property?

No

d) Do you know of any environmental cleanups that have taken place at the property?

No

21) As the user of this ESA, based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of contamination at the property?

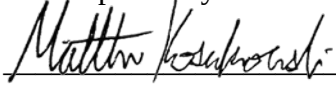
No

How many copies of the final report do you need? **Digital copy is sufficient**

Please identify any other parties that will rely on this report:

At this point, third party reliance is not required. In the future, we may ask for reliance letters.

Questionnaire completed by: **Matthew Kosakowski**

Signature:  Date: 3/30/21

If you have any questions about this questionnaire, please call Courtney Sockwell at (303) 830-1188. Please email this information to Courtney Sockwell at csockwell@eroresources.com. The User Questionnaire must be received no later than 5 working days before the project completion date.

ERO RESOURCES CORPORATION
PHASE I ESA USER QUESTIONNAIRE

This questionnaire has been designed to comply with §6 and §7.3.2 of the ASTM Standard E 1527-13. Please complete and sign this questionnaire for the following property:

A. General Property Information

Site Address/Location: **5990 2100 RD, Delta, CO**

1) Why is the Phase I being conducted for this property?
Sale (by user) Purchase (by user) Exchange CATEX Easement
Baseline Conditions Refinance Confidential **Other (Redevelopment)**

2) What is the property size? **2.56ac**

3) How long have you been involved with the property? **Approximately 3 months.**

4) What is the current use of the property? **Vacant, driveway use to adjacent properties**

5) Describe the future uses of the property.

Easement route for electrical collection lines

6) Are there any structures on the property? (Y/N)_**N**_____
If so, please list any details of the structures:

Structure Name (Residence, garage, business etc.)	Approx. size (square footage if known)	Accessible? (Y/N)

7) Are you aware of any of the following information about the owner, operator, key site manager, realtor and/or developer of the property:

	Primary Contact	Secondary Contact (if applicable)
Name	Matt Kosakowski	Bryan Walchle (realtor)
Address	2330 W Scott Pl	
	Denver, CO 80211	
Telephone		970-249-4300
Mobile Phone	303-884-5598	970-209-7500

8) The owner, key site manager, realtor and/or developer of the property may be contacted regarding this Phase I Environmental Site Assessment. Please indicate any potential problems associated with contacting these individuals or entities:

No problem

9) Please specify below any other person(s) who is familiar with the property and may be useful to contact.

Bryan Walchle (contact information in #7) may be able to assist in connecting you to the current owner.

10) Are you aware of the providers of the following utilities?

Potable Water	**Unknown**
Sanitary Sewer	**Unknown**
Electricity	**Unknown**
Natural Gas	**Unknown**

B. Historical Property Information

11) Do any of the following documents exist?

YES	NO	
	X	Environmental Site Assessment reports
	X	Environmental Audit reports
	X	Environmental permits
	X	Registration for USTs and aboveground storage tanks
	X	Reports on hydrogeologic conditions on the property and surrounding area
	X	Geotechnical studies
	X	Maps of the property (plats, site maps)
X		Legal description of property
X		Survey of property

If you answered YES to any of the above, please describe below (use additional sheets, if necessary). Please forward copies of these documents.

We have an ALTA survey and the title report along with legal description for the property.

12) Are you aware of any of the following:

YES	NO	
	X	Pending, threatened, or past litigation relevant to hazardous substances of petroleum products in, on, or from the property?
	X	Pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the property?
	X	Notices from any governmental entity regarding any possible liability relating to hazardous substances or petroleum products?

If you answered YES to any of the above, please describe below (use additional sheets, if necessary). Please forward information and/or documents relevant to above.

13) Are you aware of any underground or aboveground storage tanks currently or previously located on the property or adjoining properties?

No

14) Are you aware of any incidents involving hazardous substances or petroleum products on or in the vicinity of the property?

YES	NO
	X

If you answered yes, please describe below (use additional sheets, if necessary).

C. All Appropriate Inquiry Information

In order to qualify for one of the Landowner Liability Protections offered by the Small Business Liability Relief and Brownsfields Revitalization Act of 2001, the user must provide the following information (if available) to ERO. Failure to provide this information could result in a determination that "all appropriate inquiry" is not complete.

15) Are you aware of any environmental covenants, settlement agreements, deed or zoning restrictions or other encumbrances on the property? If so, please explain.

No

16) Are you aware of any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state or local law? If so, please explain.

No

17) Are you aware of any activity and land use limitations, such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law? If so, please explain.

No

18) As the user of this ESA, do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or adjoining property so that you would have specialized knowledge of the chemical processes used by this type of business? If so, please explain.

No

19) Does the purchase price being paid for this property reasonable reflect the fair market value of the property? (Y/N)_**Yes**_____

a) If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property? If so, please explain.

20) Are you aware of commonly known or reasonable ascertainable information about the property that would help ERO identify conditions indicative of releases or threatened releases?

No

For example, as user:

a) Do you know the current and past uses of the property?

No

b) Do you know of specific chemicals that are present or once were present at the property?

No

c) Do you know of spills or other chemical releases that have taken place at the property?

No

d) Do you know of any environmental cleanups that have taken place at the property?

No

21) As the user of this ESA, based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of contamination at the property?

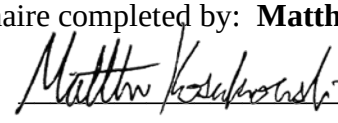
No

How many copies of the final report do you need? **Digital copy is sufficient**

Please identify any other parties that will rely on this report:

At this point, third party reliance is not required. In the future, we may ask for reliance letters.

Questionnaire completed by: **Matthew Kosakowski**

Signature:  Date: 3/30/21

If you have any questions about this questionnaire, please call Courtney Sockwell at (303) 830-1188. Please email this information to Courtney Sockwell at csockwell@eroresources.com. The User Questionnaire must be received no later than 5 working days before the project completion date.

ERO RESOURCES CORPORATION
PHASE I ESA USER QUESTIONNAIRE

This questionnaire has been designed to comply with §6 and §7.3.2 of the ASTM Standard E 1527-13. Please complete and sign this questionnaire for the following property:

A. General Property Information

Site Address/Location: **6469 2050 Rd, Delta, CO**

1) Why is the Phase I being conducted for this property?
Sale (by user) Purchase (by user) Exchange CATEX Easement
Baseline Conditions Refinance Confidential **Other (Redevelopment)**

2) What is the property size? **40ac**

3) How long have you been involved with the property? **Approximately 3 months.**

4) What is the current use of the property? **Cattle grazing and mobile home**

5) Describe the future uses of the property.

Ground mount solar PV power plant

6) Are there any structures on the property? (Y/N)_**Y**_____
If so, please list any details of the structures:

Structure Name (Residence, garage, business etc.)	Approx. size (square footage if known)	Accessible? (Y/N)
Mobile home trailer	**Unknown**	**N**

7) Are you aware of any of the following information about the owner, operator, key site manager, realtor and/or developer of the property:

	Primary Contact	Secondary Contact (if applicable)
Name	Matt Kosakowski	Bryan Walchle (realtor)
Address	2330 W Scott Pl	
	Denver, CO 80211	
Telephone		970-249-4300
Mobile Phone	303-884-5598	970-209-7500

8) The owner, key site manager, realtor and/or developer of the property may be contacted regarding this Phase I Environmental Site Assessment. Please indicate any potential problems associated with contacting these individuals or entities:

No problem

9) Please specify below any other person(s) who is familiar with the property and may be useful to contact.

Bryan Walchle (contact information in #7) may be able to assist in connecting you to the prior owner.

10) Are you aware of the providers of the following utilities?

Potable Water	**Unknown if any is present**
Sanitary Sewer	**Unknown if any is present**
Electricity	**DMEA**
Natural Gas	**Unknown if any is present**

B. Historical Property Information

11) Do any of the following documents exist?

YES	NO	
	X	Environmental Site Assessment reports
	X	Environmental Audit reports
	X	Environmental permits
	X	Registration for USTs and aboveground storage tanks
	X	Reports on hydrogeologic conditions on the property and surrounding area
	X	Geotechnical studies
	X	Maps of the property (plats, site maps)
X		Legal description of property
	X	Survey of property

If you answered YES to any of the above, please describe below (use additional sheets, if necessary). Please forward copies of these documents.

We have the title report along with legal description for the property

12) Are you aware of any of the following:

YES	NO	
	X	Pending, threatened, or past litigation relevant to hazardous substances of petroleum products in, on, or from the property?
	X	Pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the property?
	X	Notices from any governmental entity regarding any possible liability relating to hazardous substances or petroleum products?

If you answered YES to any of the above, please describe below (use additional sheets, if necessary). Please forward information and/or documents relevant to above.

13) Are you aware of any underground or aboveground storage tanks currently or previously located on the property or adjoining properties?

No

14) Are you aware of any incidents involving hazardous substances or petroleum products on or in the vicinity of the property?

YES	NO
	X

If you answered yes, please describe below (use additional sheets, if necessary).

C. All Appropriate Inquiry Information

In order to qualify for one of the Landowner Liability Protections offered by the Small Business Liability Relief and Brownsfields Revitalization Act of 2001, the user must provide the following information (if available) to ERO. Failure to provide this information could result in a determination that "all appropriate inquiry" is not complete.

15) Are you aware of any environmental covenants, settlement agreements, deed or zoning restrictions or other encumbrances on the property? If so, please explain.

No

16) Are you aware of any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state or local law? If so, please explain.

No

17) Are you aware of any activity and land use limitations, such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law? If so, please explain.

No

18) As the user of this ESA, do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or adjoining property so that you would have specialized knowledge of the chemical processes used by this type of business? If so, please explain.

No

19) Does the purchase price being paid for this property reasonable reflect the fair market value of the property? (Y/N)_**Yes**_____

a) If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property? If so, please explain.

20) Are you aware of commonly known or reasonable ascertainable information about the property that would help ERO identify conditions indicative of releases or threatened releases?

No

For example, as user:

a) Do you know the current and past uses of the property?

It is our understanding that the land has seen no changes in use in the recent past relative to its current state.

b) Do you know of specific chemicals that are present or once were present at the property?

No

c) Do you know of spills or other chemical releases that have taken place at the property?

No

d) Do you know of any environmental cleanups that have taken place at the property?

No

21) As the user of this ESA, based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of contamination at the property?

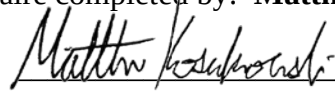
No

How many copies of the final report do you need? **Digital copy is sufficient**

Please identify any other parties that will rely on this report:

At this point, third party reliance is not required. In the future, we may ask for reliance letters.

Questionnaire completed by: **Matthew Kosakowski**

Signature:  Date: 3/30/21

If you have any questions about this questionnaire, please call Courtney Sockwell at (303) 830-1188. Please email this information to Courtney Sockwell at csockwell@eroresources.com. The User Questionnaire must be received no later than 5 working days before the project completion date.

ERO RESOURCES CORPORATION
PHASE I ESA USER QUESTIONNAIRE

This questionnaire has been designed to comply with §6 and §7.3.2 of the ASTM Standard E 1527-13. Please complete and sign this questionnaire for the following property:

A. General Property Information

Site Address/Location: **G RD, Delta, CO**

1) Why is the Phase I being conducted for this property?
Sale (by user) Purchase (by user) Exchange CATEX Easement
Baseline Conditions Refinance Confidential **Other (Redevelopment)**

2) What is the property size? **240ac**

3) How long have you been involved with the property? **Approximately 3 months.**

4) What is the current use of the property? **Cattle grazing**

5) Describe the future uses of the property.

Ground mount solar PV power plant

6) Are there any structures on the property? (Y/N)_**N**_____
If so, please list any details of the structures:

Structure Name (Residence, garage, business etc.)	Approx. size (square footage if known)	Accessible? (Y/N)

7) Are you aware of any of the following information about the owner, operator, key site manager, realtor and/or developer of the property:

	Primary Contact	Secondary Contact (if applicable)
Name	Matt Kosakowski	Bryan Walchle (realtor)
Address	2330 W Scott Pl	
	Denver, CO 80211	
Telephone		970-249-4300
Mobile Phone	303-884-5598	970-209-7500

8) The owner, key site manager, realtor and/or developer of the property may be contacted regarding this Phase I Environmental Site Assessment. Please indicate any potential problems associated with contacting these individuals or entities:

No problem

9) Please specify below any other person(s) who is familiar with the property and may be useful to contact.

Bryan Walchle (contact information in #7) may be able to assist in connecting you to the prior owner.

10) Are you aware of the providers of the following utilities?

Potable Water	**Unknown if any is present**
Sanitary Sewer	**Unknown if any is present**
Electricity	**Unknown if any is present**
Natural Gas	**Unknown if any is present**

B. Historical Property Information

11) Do any of the following documents exist?

YES	NO	
	X	Environmental Site Assessment reports
	X	Environmental Audit reports
	X	Environmental permits
	X	Registration for USTs and aboveground storage tanks
	X	Reports on hydrogeologic conditions on the property and surrounding area
	X	Geotechnical studies
	X	Maps of the property (plats, site maps)
X		Legal description of property
	X	Survey of property

If you answered YES to any of the above, please describe below (use additional sheets, if necessary). Please forward copies of these documents.

We have the title report along with legal description for the property

12) Are you aware of any of the following:

YES	NO	
	X	Pending, threatened, or past litigation relevant to hazardous substances of petroleum products in, on, or from the property?
	X	Pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the property?
	X	Notices from any governmental entity regarding any possible liability relating to hazardous substances or petroleum products?

If you answered YES to any of the above, please describe below (use additional sheets, if necessary). Please forward information and/or documents relevant to above.

13) Are you aware of any underground or aboveground storage tanks currently or previously located on the property or adjoining properties?

No

14) Are you aware of any incidents involving hazardous substances or petroleum products on or in the vicinity of the property?

YES	NO
	X

If you answered yes, please describe below (use additional sheets, if necessary).

C. All Appropriate Inquiry Information

In order to qualify for one of the Landowner Liability Protections offered by the Small Business Liability Relief and Brownsfields Revitalization Act of 2001, the user must provide the following information (if available) to ERO. Failure to provide this information could result in a determination that "all appropriate inquiry" is not complete.

15) Are you aware of any environmental covenants, settlement agreements, deed or zoning restrictions or other encumbrances on the property? If so, please explain.

No

16) Are you aware of any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state or local law? If so, please explain.

No

17) Are you aware of any activity and land use limitations, such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law? If so, please explain.

No

18) As the user of this ESA, do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or adjoining property so that you would have specialized knowledge of the chemical processes used by this type of business? If so, please explain.

No

19) Does the purchase price being paid for this property reasonable reflect the fair market value of the property? (Y/N)_**Yes**_____

a) If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property? If so, please explain.

20) Are you aware of commonly known or reasonable ascertainable information about the property that would help ERO identify conditions indicative of releases or threatened releases?

No

For example, as user:

a) Do you know the current and past uses of the property?

It is our understanding that the land has been used exclusively for grazing for some time

b) Do you know of specific chemicals that are present or once were present at the property?

No

c) Do you know of spills or other chemical releases that have taken place at the property?

No

d) Do you know of any environmental cleanups that have taken place at the property?

No

21) As the user of this ESA, based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of contamination at the property?

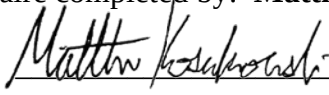
No

How many copies of the final report do you need? **Digital copy is sufficient**

Please identify any other parties that will rely on this report:

At this point, third party reliance is not required. In the future, we may ask for reliance letters.

Questionnaire completed by: **Matthew Kosakowski**

Signature:  Date: 3/30/21

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ERO RESOURCES CORPORATION
PHASE I ESA USER QUESTIONNAIRE

This questionnaire has been designed to comply with §6 and §7.3.2 of the ASTM Standard E 1527-13. Please complete and sign this questionnaire for the following property:

A. General Property Information

Site Address/Location: **20426 G RD, Delta, CO**

1) Why is the Phase I being conducted for this property?
Sale (by user) Purchase (by user) Exchange CATEX Easement
Baseline Conditions Refinance Confidential **Other (Redevelopment)**

2) What is the property size? **41.8ac**

3) How long have you been involved with the property? **Approximately 3 months.**

4) What is the current use of the property? **Cattle grazing, agricultural equipment storage, barn, house**

5) Describe the future uses of the property.

Ground mount solar PV power plant

6) Are there any structures on the property? (Y/N)_**Y**_____
If so, please list any details of the structures:

Structure Name (Residence, garage, business etc.)	Approx. size (square footage if known)	Accessible? (Y/N)
Residence	**1026 sqft**	**N**
Barn	**2500 sqft**	**Y**
Equipment sheds and cover structures		**Y**

7) Are you aware of any of the following information about the owner, operator, key site manager, realtor and/or developer of the property:

	Primary Contact	Secondary Contact (if applicable)
Name	Matt Kosakowski	Bryan Walchle (realtor)
Address	2330 W Scott Pl	
	Denver, CO 80211	
Telephone		970-249-4300

Mobile Phone	303-884-5598	970-209-7500

8) The owner, key site manager, realtor and/or developer of the property may be contacted regarding this Phase I Environmental Site Assessment. Please indicate any potential problems associated with contacting these individuals or entities:

No problem

9) Please specify below any other person(s) who is familiar with the property and may be useful to contact.

Bryan Walchle (contact information in #7) may be able to assist in connecting you to the prior owner.

10) Are you aware of the providers of the following utilities?

Potable Water	**Unknown**
Sanitary Sewer	**Unknown**
Electricity	**DMEA**
Natural Gas	**Unknown**

B. Historical Property Information

11) Do any of the following documents exist?

YES	NO	
	X	Environmental Site Assessment reports
	X	Environmental Audit reports
	X	Environmental permits
	X	Registration for USTs and aboveground storage tanks
	X	Reports on hydrogeologic conditions on the property and surrounding area
	X	Geotechnical studies
	X	Maps of the property (plats, site maps)
X		Legal description of property
	X	Survey of property

If you answered YES to any of the above, please describe below (use additional sheets, if necessary). Please forward copies of these documents.

We have the title report along with legal description for the property

12) Are you aware of any of the following:

YES	NO	
	X	Pending, threatened, or past litigation relevant to hazardous substances of petroleum products in, on, or from the property?
	X	Pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on, or from the property?
	X	Notices from any governmental entity regarding any possible liability relating to hazardous substances or petroleum products?

If you answered YES to any of the above, please describe below (use additional sheets, if necessary). Please forward information and/or documents relevant to above.

13) Are you aware of any underground or aboveground storage tanks currently or previously located on the property or adjoining properties?

No

14) Are you aware of any incidents involving hazardous substances or petroleum products on or in the vicinity of the property?

YES	NO
	X

If you answered yes, please describe below (use additional sheets, if necessary).

C. All Appropriate Inquiry Information

In order to qualify for one of the Landowner Liability Protections offered by the Small Business Liability Relief and Brownsfields Revitalization Act of 2001, the user must provide the following information (if available) to ERO. Failure to provide this information could result in a determination that "all appropriate inquiry" is not complete.

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17) Are you aware of any activity and land use limitations, such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law? If so, please explain.

No

18) As the user of this ESA, do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or adjoining property so that you would have specialized knowledge of the chemical processes used by this type of business? If so, please explain.

No

19) Does the purchase price being paid for this property reasonable reflect the fair market value of the property? (Y/N)_**Yes**_____

a) If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property? If so, please explain.

20) Are you aware of commonly known or reasonable ascertainable information about the property that would help ERO identify conditions indicative of releases or threatened releases?

No

For example, as user:

a) Do you know the current and past uses of the property?

It is our understanding that the land has been used exclusively for grazing for some time

b) Do you know of specific chemicals that are present or once were present at the property?

No

c) Do you know of spills or other chemical releases that have taken place at the property?

No

d) Do you know of any environmental cleanups that have taken place at the property?

No

21) As the user of this ESA, based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of contamination at the property?

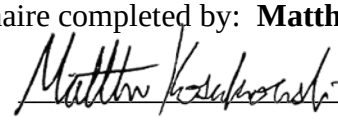
No

How many copies of the final report do you need? **Digital copy is sufficient**

Please identify any other parties that will rely on this report:

At this point, third party reliance is not required. In the future, we may ask for reliance letters.

Questionnaire completed by: **Matthew Kosakowski**

Signature:  Date: 3/30/21

If you have any questions about this questionnaire, please call Courtney Sockwell at (303) 830-1188. Please email this information to Courtney Sockwell at csockwell@eroresources.com. The User Questionnaire must be received no later than 5 working days before the project completion date.

Appendix C Qualifications of Environmental Professionals

Courtney Sockwell, *Environmental Scientist*

Since 2000, Courtney has completed numerous Phase I and II Environmental Site Assessments, Modified Phase I ESAs, and CDOT Initial Site Assessments. He has served as project manager for Phase I and Phase II ESAs for various CDOT and county road construction projects throughout Colorado. He has experience with soil and ground water contamination delineation and characterization; soil, vapor, and ground water sampling; remediation system design, installation, and operation; and solid and hazardous waste management. He has also assisted with permitting, discharge sampling, and reporting for numerous construction dewatering projects.

Education

2000: B.S. Geology and Environmental Science, Stephen F. Austin State University

Certifications and Training

1910.120(e) 40-Hour Hazardous Waste Operation and Emergency Response, with Annual 8-Hour Refreshers

City of Greeley, Various Projects, CO

Project manager for numerous Phase I and Phase II ESAs and mineral assessments for various properties for the City of Greeley. The sites have consisted of a former grocery store site in downtown Greeley, a former sand and gravel pit and concrete and asphalt batch plant, and numerous agricultural sites along the Cache La Poudre River containing oil and gas wells and productions facilities.

City of Thornton, Various Projects, CO

Has assisted in management of projects, under a general environmental services contract with the City of Thornton. Projects have included numerous Phase I and Phase II ESAs for undeveloped open space and NEPA compliance for various infrastructure improvement projects.

City of Boulder, Various Projects, CO

Assisted the City of Boulder with various environmental issues encountered during transportation-related projects in the city. Tasks have included Phase II ESAs; construction oversight and materials management; and dewatering discharge sampling and permit coordination, and data management.

Categorical Exclusion Transportation Projects, CO

Project manager for Phase I ESAs, Initial Site Assessments (ISAs), and Phase II ESAs for numerous CDOT and local agency road construction projects in Colorado, including:

- 71st Avenue Improvements Project, Greeley, Colorado
- Cherry Creek South Drive Reconstruction, Denver, Colorado
- Broadway, Wesley Avenue to Yale Avenue, Denver, Colorado
- Broadway, Iowa Avenue to Wesley Avenue, Denver, Colorado
- 92nd Avenue and Federal Boulevard Intersection Improvements, Denver, Colorado
- US6 and 19th Street Interchange Project, Golden, Colorado
- South McIntyre Street, 52nd to 60th, Jefferson County, Colorado
- Broadway, Pine Street to Iris Avenue, Boulder, Colorado

Prairie Waters Project, CO

Field manager for environmental site investigations for the City of Aurora's near-term plan for a new water supply source and treatment facilities. Completed numerous Phase I and Phase II site investigations on agricultural properties and proposed rights-of-way containing oil and gas production equipment and other recognized environmental conditions, for either acquisition or easement alignment. Conducted and completed investigations on flexible schedules to accommodate varying property access and real estate transactions in a timely manner so as not to delay design progress. All investigations were completed to comply with the ASTM Phase I and Phase II standards and guidelines.

Chatfield Reallocation Environmental Impact Statement, CO

As a critical step in designing and evaluating mitigation for impacts on wetlands and other natural resources that would result from increasing water storage in Chatfield Reservoir, managed the design and installation of an extensive ground water monitoring system over approximately 1,000 acres around Chatfield Reservoir. Responsible for obtaining clearances and permits from federal and state agencies and supervised the installation of 80 ground water piezometers. Gather, process, and analyze data from well data loggers over the past five years.

Craig Sovka, *Geologist*

Craig has 25 years of consulting experience in the environmental field including hydrogeological investigations; Phase I and II environmental site assessments; site characterization and monitoring; surface and subsurface soil and water investigations; remediation system design, installation, and operation; and preparation of environmental impact statements and environmental assessments.

Education

1992: B.S. Geology, Princeton University

Licensure and Certifications

Listed Environmental Scientist, Colorado Department of Labor and Employment, Division of Oil and Public Safety, Listing No. #5784

OSHA 1910.120(e)

40-hour Hazardous Waste Operations and Emergency Response, with Annual 8-Hour Refreshers

Certified Asbestos Building Inspector

Dover Industries, Inc., Boulder, CO

Ground water investigations and operation of a containment and treatment system for chlorinated hydrocarbon-contaminated ground water at a manufacturing facility.

Power Engineering Company, Denver, CO

Project manager for soil and ground water investigations to delineate the source and extent of contamination at a chrome plating facility. Assisted in the design, construction, and operation of an innovative treatment system to remediate hexavalent chromium-contaminated soil and ground water.

Dry Cleaner Investigations and Remediation, CO

Project manager for soil and ground water investigations to delineate the source and extent of dry cleaner solvent contamination at several former and active dry cleaner facilities. Designed and implemented in-situ treatment strategies to remediate contaminated soil and ground water.

Vista Ridge Development Corporation, CO

Project manager for all environmental issues associated with the development of a new 900-acre golf course community in Erie, Colorado. Services included Phase I environmental site assessments on numerous parcels, remediation of oil and gas well production waste, and preparation and implementation of a Voluntary Cleanup Plan of a 50-year old rifle and skeet shooting range.

St. Joseph Hospital, Denver, CO

Project manager for underground storage tank investigations of numerous diesel fuel tanks for the hospital's emergency power generators, including site characterization, oversight of tank removal, and preparation and implementation of a Corrective Action Plan. Prepared No Further Action Request forms and received closure of all tanks from the regulatory agency.

Adams County Bus Facility, Thornton, CO

Field manager overseeing the decommissioning of a large school bus maintenance facility. The project entailed asbestos abatement, underground storage tank closures, refrigerant recovery, water well abandonment, hazardous waste removal, building demolition, and site restoration to accommodate a future shopping center development.

New Mexico Interstate Stream Commission, Pecos River Basin, NM

Project manager for site assessments at numerous farm and ranch properties in the Pecos River Basin. The New Mexico Interstate Stream Commission planned to acquire up to 18,000 acres of land and water rights in the river basin and required an evaluation of environmental conditions prior to purchasing each property.

City and County of Broomfield, CO

Phase I and II environmental site assessments at numerous properties purchased by Broomfield for open space preservation.

Arkansas Valley Conduit Project, Pueblo, CO

Project manager for a Phase I ESA of a 5-mile proposed pipeline corridor to deliver water from Pueblo Reservoir to southeast Colorado communities.

Appendix D Phase I ESA Work Scope

WORK SCOPE
PHASE I ENVIRONMENTAL SITE ASSESSMENT

Summary

ERO Resources Corporation (ERO) will conduct a Phase I Environmental Site Assessment[1] (ESA) of the subject property. The ESA will consist of a visual inspection of the subject property, interviews with the property owner, project manager, and key site manager, and a compilation and review of publicly available information from a variety of sources about past and current environmental conditions at the subject property. ERO will provide the Client with a written report including a detailed presentation of findings.

Task 1. Phase I Environmental Site Assessment Tasks

Site reconnaissance. ERO will conduct a visual site reconnaissance of the subject property. The purpose of the inspection is to document recognized environmental conditions. Photographs will be taken as appropriate. ERO will not take any samples during the site reconnaissance. The following issues are specifically excluded from this ESA— wetlands, migratory birds, asbestos-containing materials, radon, lead-based paint, lead in drinking water, mold, and subsurface mineral rights, leases, or ownership.

ERO will document the general site setting, such as current use(s) of the subject property and adjoining properties, and general hydrogeologic and topographic features. A general description of structures and other improvements on the subject property will be provided. ERO will identify the following site conditions, if they are visually or physically observed, during the site reconnaissance—

- The quantity, type, and storage system for hazardous substances and petroleum products in connection with identified uses
- Tanks, containers, drums, barrels, and other systems used for storing hazardous substance and petroleum products not connected to identified uses
- Aboveground and underground storage tanks

[1] According to ASTM 1527-13: "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process."

- Pits, ponds, lagoons and other features potentially used for storage and/or disposal of hazardous substances and petroleum product
- Odors, pools of liquids, stained soils and pavement, and stressed vegetation
- Presence of electrical equipment potentially containing PCBs.

Interviews. ERO will conduct interviews with the ESA user, property owner, site manager and/or other persons with knowledge of the subject property.

File search and regulatory agency review. ERO will conduct a search of records and files from a variety of sources, and compile existing information pertaining to current and past environmental conditions. This search may include the following information, as ERO deems appropriate—

- Topographic, land use, and environmental resource maps
- Aerial photographs
- County and city records
- State and federal databases

Vapor Encroachment Screening. ERO will evaluate the sites identified during the Records Review to evaluate potential vapor encroachment in accordance with ASTM E 2600-15, the "Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions" (ASTM 2015). ERO will conduct a Tier 1 Screening using information presented in the Phase I ESA records review to whether a Vapor Encroachment Condition VEC exists or does not exist on the property. The results of this screening will be included in the Phase I ESA report. No sampling or testing is included with the screening.

Reports and recommendations. Based on the information gathered during the above tasks, ERO will compile the information and findings in a written report for the subject property. The report will contain a detailed presentation of findings, including the site description, records review, site reconnaissance, and conclusions.

Products:

- Draft and final Phase I ESA report.

Assumptions and Conditions

It is important to emphasize that considerable uncertainty is inherent in conducting this type of investigation. The ESA will be completed by qualified environmental professionals using that degree of care and skill ordinarily exercised under similar circumstances by other environmental professionals practicing in this field. Unforeseen conditions may significantly

affect the ability to make conclusions and recommendations based solely on the proposed investigations, which may ultimately affect the level of risk for a given level of investigative effort and cost. The following assumptions and conditions describe some of the possible limitations under this Work Scope.

1. ERO assumes the subject property will not present conditions that may be hazardous to the health and safety of ERO personnel. The presence of visible hazards or contamination may be sufficient cause for ERO to halt work immediately and request a meeting with the Client to discuss to the problem.
2. All work will be conducted according to the provisions given in this Work Scope and in the accompanying Terms and Conditions. No other specifications or guidelines have been agreed to, nor will any such specifications or guidelines be addressed except as will otherwise be according to this Work Scope.
3. Adequate and timely access to the subject property to conduct the ESA is assumed. Written authorization or other arrangements as may be necessary to ensure access by ERO personnel will be provided by the Client.
4. Any conditions, known or suspected to the Client, that may have bearing on these investigations, or to the findings or recommendations made pursuant to this Work Scope, will be disclosed to ERO before initiation of the Work Scope. The Client will make available to ERO any appraisal reports, title histories, engineering reports or other technical reports or information that may pertain to this investigation.
5. All references, statements or recommendations in this Work Scope or in any subsequent written reports to substances being either hazardous or not hazardous are made solely in accordance with or in reference to such official designations made by government agencies or other authorities under applicable laws, regulations, or guidelines. ERO itself makes no claim, warranty or implication as to whether any substance may or may not be hazardous.
6. This Work Scope does not include an assessment of the potential for any particular condition adversely to affect public health.
7. Any laboratory analytical work will be conducted by a laboratory or laboratories under separate contract or subcontract. While ERO will endeavor to select qualified laboratories for sample analysis, ERO will accept no responsibility or liability for laboratory results, quality control or analytical turnaround time.
8. Deviations from these assumptions may result in cost increases or changes in schedule.
9. All site boundaries shown or discussed in the report are approximations based on information supplied by the Client. ERO Resources will accept no responsibility or liability for the accuracy of the site boundaries.
10. The Client will be responsible for completing the user questionnaire, obtaining a map/survey of the subject property, determining property size, and forwarding these items to ERO at least five days before the date of project completion.

Attachment 3-G

Cultural Resources Survey

ERO

Consultants in Natural Resources and the Environment

Cultural Resource Survey
Garnet Mesa Solar Development Project
Delta County, Colorado

Prepared for and submitted to—

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State Permit No. 79494
SHPO Report ID DT.AE.R7
ERO Project No. 21-051

June 2021

For Official Use Only: Disclosure of site locations prohibited (43 CFR 7.18)

Abstract

Garnet Mesa Solar LLC contracted ERO Resources Corporation (ERO) to conduct a cultural resource survey for the proposed Garnet Mesa Solar project in Delta County, Colorado. Garnet Mesa Solar LLC plans to install a solar farm in the project area. Project details have not yet been disclosed. The area of potential effect (APE) is 498 acres. A cultural resource survey was conducted in case project development triggers federal permitting and therefore compliance with Section 106 (54 United States Code [U.S.C.] § 306108) of the National Historic Preservation Act (NHPA, 1966, as amended; 54 U.S.C. § 300101 et seq.) and to fulfill funding requirements.

Within or overlapping the APE are six previously documented or newly recorded resources or linear resources. One ditch (5DT2458) is recommended eligible for listing in the National Register of Historic Places (NRHP). One ditch segment (5DT1815.3) is recommended non-supporting and one (5DT2688.1) is recommended supporting of an eligible linear resource. Three historical resources (5DT2682, 5DT2683, and 5DT2684) are recommended not eligible for listing in the NRHP. Additionally, three isolated finds (5DT2685 through 5DT2687) were documented and recommended not eligible for inclusion in the NRHP.

Avoidance is recommended for the eligible and supporting resources. ERO recommends that no further work is necessary for all resources recommended not eligible. If all eligible or supporting resources are avoided, ERO recommends a determination of “no adverse effect to historic properties” pursuant to 36 Code of Federal Regulations 800.5 of the NHPA.

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Appendices

Appendix A Cultural Resource Location Map

Appendix B OAHP Cultural Resource Documentation Forms

Cultural Resource Survey
Garnet Mesa Solar Development Project
Delta County, Colorado
June 2021

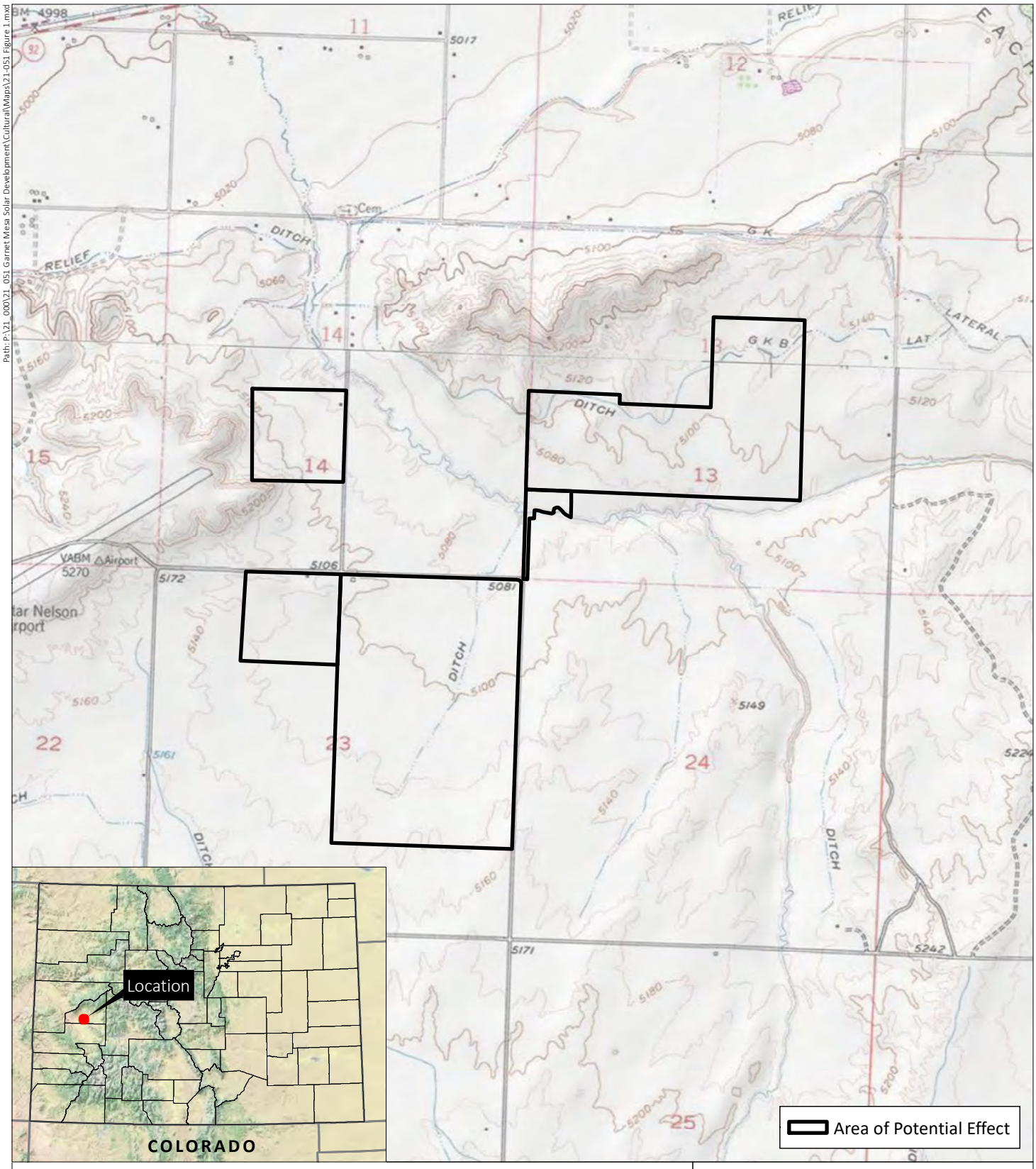
Project Description

Garnet Mesa Solar LLC contracted ERO Resources Corporation (ERO) to perform a cultural resource inventory for the Garnet Mesa Solar Development project in Delta County, Colorado. The project details have not yet been disclosed. The project requires compliance with the Delta County Land Use Code. A cultural resource survey was conducted in case project development triggers federal permitting and therefore compliance with Section 106 (54 United States Code [U.S.C.] § 306108) of the National Historic Preservation Act (NHPA, 1966, as amended; 54 U.S.C. § 300101 et seq.) and to fulfill funding requirements.

The area of potential effect (APE) is defined as 498 acres. Land within the APE is privately owned. The APE is located on the Olathe NW 7.5-minute U.S. Geological Survey (USGS) quadrangle (Figure 1). The legal locations are Sections 13, 14, 23, and 24 in Township 15 South, Range 95 West of the 6th Principal Meridian.

ERO archaeologists Jenny Engleman and Molly Dickinson conducted a Class III cultural resource survey of the entire APE on May 19 through 22, 2021.

Path: P:\21_000\21_051 Garnet Mesa Solar Development\Cultural\Maps\21-051 Figure 1.mxd



Cultural Resource Survey
Garnet Mesa Solar Development Project
Delta County, Colorado

Sections 13, 14, 23, and 24, T15S, R95W; 6th PM
USGS Olathe NW, CO Quadrangle (1:24,000; 1960)
USGS Orchard City, CO Quadrangle (1:24,000; 1979)
Delta County, Colorado

N

0 1,000 2,000 Feet

1:24,000

Figure 1
Project Location

Prepared for:
Citra Power
File: 21-051 Figure 1.mxd (ME)
June 3, 2021

ERO Resources Corp.

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Natural Environment

The APE is located on agricultural lands between Garnet Mesa, to the west, and Peach Valley, to the east. East Canal, a tributary of the Gunnison River cuts through the middle of project area. The project area is characterized by plowed agricultural fields and hogbacks of decomposing Mancos Shale (Figure 2). The elevation ranges from 5,065 feet (ft) to 5,150 ft above sea level (asl). The ground visibility ranges from 20 to 80 percent. The surface geology consists of Cretaceous-age Mancos Shale (Tweto 1979).

Figure 2. Overview of the project area showing abandoned agricultural fields and Mancos Shale slopes in the background.

The soil series represented in the APE are presented in Table 1 in order of first appearance from north to south (Natural Resources Conservation Service 2021). The vegetation community in the APE consists of cultivated agricultural fields of grasses and alfalfa, rabbitbrush, snakeweed, and cottonwoods along the major arroyo and drainages.

Table 1. Soil series encountered in the APE.

Soil Series	Slope Range	Description
Montrose	0–12%	Consists of very deep, well-drained soils that formed in alluvium or slope alluvium derived from calcareous sandstone and shale. Montrose soils are on stream terraces, strath terraces, and eroded fan remnants.
Persayo	0–65%	Consists of shallow, well-drained soils that formed in slope alluvium or colluvium over residuum derived from soft sedimentary bedrock. These soils are on hills, basin floor remnants, fan remnants, dipslopes, scarp slopes, and escarpments.

Soil Series	Slope Range	Description
Killpack	0–25%	Consists of moderately deep, well-drained soils that formed in slope alluvium or alluvium over residuum derived from shale. Killpack soils are on hills, pediments, and strath terraces.
Fruita	0–8%	Consists of very deep, well-drained soils formed in alluvium derived from sandstone and shale. These soils are on stream and strath terraces.
Sagers	0–7%	Consists of very deep, well-drained, moderately to slowly permeable soils that formed in alluvium and slope alluvium derived from marine shale and other sedimentary rocks. These soils are on basin and valley floor remnants, alluvial fans, stream terraces, and toeslopes of shale hills.
Briny	0–4%	Consists of very deep, poorly or very poorly drained soils that formed in alluvium derived from shale and siltstone. Briny soils are on alluvial flats, floodplains, and drainageways.

Cultural Overview

The temporal framework for the northern Colorado River Basin is divided into five major prehistoric and historic eras: Paleoindian (13400 to 7500 B.P.), Archaic (ca. 7500 to 2000 B.P.), Late Prehistoric (2400 to 700 B.P.), Protohistoric (700 to 132 B.P.), and Historic (200 to 50 B.P.) (Reed and Metcalf 1999). A full discussion of the prehistory of the area can be found in *Colorado Prehistory: A Context for the Northern Colorado River Basin* (Reed and Metcalf 1999). No prehistoric resources were documented; the following context focuses on historical context relevant to the project.

Historic (200 to 50 B.P., A.D. 1800 to 1950)

Historic Euroamerican settlement of western Colorado occurred during the early 1800s with the arrival of government survey expeditions. In the early part of the nineteenth century, Ute contact with Euroamerican settlers became more widespread with the advance of fur trappers and foreign traders, the development of the Old Spanish trail, and others seeking land and opportunity (Ute Mountain Ute Tribal Historic Preservation Office 2019). In 1849, the Ute signed the Calhoun Treaty allowing for construction of trading posts and military forts on tribal lands, as well as safe passage through traditional lands. Gold was discovered in Colorado in 1859, and soon after the Colorado Territory was established in 1861. By 1881, the U.S. government had forcibly removed the Uncompahgre and White River Ute bands from tribal lands in western Colorado; they were relocated to reservation lands in Utah (Ute Mountain Ute Tribal Historic Preservation Office 2019). Euroamerican settlers built towns and established mineral mines and lumber mills. Land was cleared for crop cultivation, cattle ranchers moved into the area, and railroads were eventually built to move goods in and out of the region. Sheep and cattle ranching became the dominant industry in the early 1900s.

Colorado's semiarid climate made necessary the development of irrigation—a network of irrigation ditches and canals across the state that collects meltwater and carries it to agricultural areas and reservoirs. Agricultural irrigation began in the state in the 1860s with the development of small mutual and individual or pioneer ditches. These ditches tend to irrigate low-lying areas in the floodplains and bottomlands by drawing water off of existing sources such as creeks, rivers, and streams. These early irrigation systems required little engineering or technology (King 1984). Pioneer ditches were often expanded into or were replaced by mutual ditches, which are used by multiple entities and are controlled by a ditch company. These ditches, too, soon expanded, and irrigation enterprises developed

to construct large systems that could carry more water and serve a larger area. By the late 1800s, the development of irrigation ditches in Colorado was viewed as an investment opportunity. Large sums of money were spent constructing irrigation systems to reach more remote areas of land in the hopes of creating a profit by selling water rights. However, Colorado's water laws, which protect the water rights of earlier uses, made many of these ditches less successful than originally planned by limiting the quantity of available water (Holleran 2005).

Methods

Historic Property Identification

This cultural resource survey provides compliance under Section 106 of the NHPA and its implementing regulations under 36 Code of Federal Regulations (CFR) Part 800 by undertaking a "reasonable and good faith effort" to identify historic properties (defined as listed in or eligible for listing in the National Register of Historic Places [NRHP]) within the defined APE. Identification and documentation standards conform to federal land managing agency requirements and secondly to guidelines provided by the State Historic Preservation Officer (SHPO). In doing so, the standards imposed by the Secretary of the Interior for the *Identification, Documentation, and Evaluation of Historic Properties* are also met. All personnel supervising survey and documentation are listed in applicable federal and state permits and meet or exceed the *Secretary of the Interior's Professional Qualification Standards* (36 CFR 61).

Historic properties may consist of buildings, structures, objects, or sites and can include districts, landscapes, and traditional cultural properties. The National Park Service has established an age criterion of 50 years for historic property evaluation and to be listed in the NRHP (but see criteria consideration (g) for an exception to the age guideline); in some instances, a federal agency will establish the age criterion at 45 years to account for the duration of the undertaking.

Cultural resources not identified in the Office of Archaeology and Historic Preservation (OAHP) file search and historical records were identified during pedestrian survey. This project used standard pedestrian survey transects spaced 15 to 20 meters (m) apart to identify unknown cultural resources within the APE. The APE is defined by the lead federal agency, generally in consultation with the SHPO, and means "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR 800.16).

Cultural Resource Documentation

ERO documents cultural resources according to a standardized approach to ensure consistency and accuracy. Sites are digitally documented from multiple perspectives, and all significant tools, diagnostic artifacts, and features are photographed to scale. The site datum is also photographed if physically established and directed by the land managing agency. Individual site maps are produced using a mapping grade (submeter and subcentimeter capable) Trimble GeoXH Explorer global positioning system (GPS) unit. Elements of the site map include all cultural features, diagnostic and point provenience artifacts (designated as field specimens), artifact concentrations, major vegetation breaks

and contour topography, modern features and disturbances, and the site datum (whether physically established or for location purposes).

All required forms are completed digitally in the field using a tablet. Archaeological resources and newly defined segments of linear resources such as ditches and railroads were documented using a Management Data Form (OAHP1400) and appropriate component form (precontact archaeology, historical archaeology, or linear); the boundaries of newly defined linear resource segments are limited to the extent of the resource within the APE. Newly identified historical buildings and structures were documented on an Architectural Inventory Form (OAHP1403). Previously recorded cultural resources identified during the OAHP file search were revisited and reevaluated on OAHP form 1405; if the resource has not been reevaluated within the last 10 years and/or substantial changes have occurred to the property since the previous evaluation, ERO rerecorded and reevaluated the resource by completing new state documentation forms. Location maps (Appendix A) and OAHP resource documentation forms (Appendix B) are included only for agency consultation and reside permanently with the OAHP.

Historic Period Sites

Historic period sites include such purposeful activities as homestead, ranching, or agricultural complexes; mining complexes; federal work programs; timber harvesting; and industry, among other site types. Age criteria are established for potential historic sites by referencing general land office (GLO) patents, county assessor records, state water division records, historical maps, and 15-minute USGS maps. Historical dumps and artifact scatters without features are evaluated on a case-by-case basis. A single artifact class within a dump, such as sanitary cans, is recorded as an isolated occurrence; conversely, dumps that exhibit diverse artifact classes and date prior to the early part of the twentieth century may be documented as archaeological sites, given their information potential.

Linear structures such as water conveyance systems, transmission lines, trails, and roads are documented as sites. An isolated fence line is generally not recorded as a resource unless it demarcates a boundary significant to the history of the area and can be physically linked with a purposeful activity; an isolated fence line may also be documented as a feature of a larger resource. Depending on their cultural context, single or small clusters of mining prospect pits with no associated artifacts are documented as isolated finds due to their general ubiquity and limited information potential.

Criteria for Evaluation

Documented cultural resources are evaluated for their eligibility to be listed in the NRHP. Significance criteria are codified under 36 CFR 60.4, summarized below:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

a) that are associated with events that have made a significant contribution to the broad patterns of our history [Criterion A]; or

b) that are associated with the lives of persons significant in the past [Criterion B]; or
c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant or distinguishable entity whose components may lack individual distinction [Criterion C]; or
d) that have yielded, or are likely to yield, information important in prehistory or history [Criterion D].

Cultural resources that do not meet the 50-year age criterion but that are integral parts of a historic district or carry exceptional importance to the history of the region are considered for eligibility under criteria consideration (g).

Certain kinds of properties are not usually considered for listing in the NRHP: "religious properties, moved properties, birthplaces and graves, cemeteries, reconstructed properties, commemorative properties, and properties achieving significance within the past fifty years" (U.S. Department of the Interior, National Park Service 1997). In order for a property to be eligible under a criteria consideration, the property must qualify for one of the four criteria and must possess integrity. Regional contexts and multi-property nominations are used to evaluate significance under Criteria A, B, and C by defining a period of significance in which the cultural resource achieved significance given events important to the interpretation of history.

Regional contexts identified in the *Cultural Overview* are used to evaluate significance under Criterion D by determining whether a potential property has the potential to answer defined research questions and/or date to a defined period of significance. Historical sites representative of the built environment (i.e., buildings, structures, and engineered features) typically qualify for listing in the NRHP under at least one of the first three criteria (A–C). Archaeological sites typically qualify exclusively under Criterion D, with notable exceptions. An otherwise heavily disturbed site may still retain information potential from intact features (potential chronometric or subsistence data) or discrete areas of the site that retain physical integrity. Archaeological sites with significant sediment deposition remain potentially eligible for listing in the NRHP even without evaluative testing.

Sites evaluated as "needs data" may be eligible under one or more criteria but require further work to determine NRHP eligibility. Cultural resources recommended "needs data" are predominantly archaeological sites (either precontact or historical) suspected of containing buried cultural deposits or historical sites where additional research is necessary to ascertain significance. Sites that are evaluated as not eligible for listing in the NRHP do not meet any of the eligibility criteria and/or have lost physical integrity. Cultural resources are assessed for integrity only if the site meets one or more eligibility criteria. Eroded or otherwise heavily disturbed archaeological sites are typically not considered eligible since the ability to convey significance in the form of intact cultural deposits (i.e., information potential) has been lost through natural or modern disturbance.

For a property to be eligible under one or more criteria, the property must possess physical integrity and retain most if not all aspects of integrity: location, design, setting, materials, workmanship, feeling, and association. Most important of these for any building or structure are the aspects of location, design,

and setting. Any property or linear resource that has been relocated or realigned no longer retains integrity of location, perhaps the most important aspect of integrity. The aspect of design is important for demonstrating a building or structure's association with significant historical trends and is required for a property to qualify under Criterion A or C. Considering most historical properties are still in use, a resource can maintain integrity of design if materials have been maintained in-kind to the design of the original structure or building. For example, in-kind replacement of materials such as wood siding or railroad hardware with modern materials does not diminish integrity of design. However, modern maintenance and upgrades to earthen ditches such as the placement of modern diversion structures and concrete lining do diminish the ditch segment's ability to support eligibility under Criterion A or C. The aspects of feeling and association are intrinsically linked to the aspect of setting; suburban development and modern intrusions on the setting of a potential historic property diminish its ability to convey significance.

ERO uses the following generalized approach to assess integrity under Criterion D. Most archaeological sites are considered to be in their original location unless post-depositional processes, such as erosion, have transported artifacts away from their original context. Artifacts can move both vertically and horizontally in subsurface contexts. The site retains location if no significant post-depositional processes have altered the primary context of the artifacts. The aspect of design is present if the relationship between features or activity loci is apparent and the spatial organization of the site is discernible; design may also be present in highly formalized tools such as projectile points, ceramic vessels, architectural elements, or individual features. Setting refers to the surrounding physical environment of a site, which may be affected by modern development or changes to the natural environment (such as important biotic species) through climate change or modern development. Setting is considered intact if the surrounding environment is similar to the environment during the time of occupation. The aspect of materials is almost always retained due to the nature of the archaeological record and the material culture inherent to archaeological sites: If there were no physical artifacts or features (i.e., materials) present, there would not be a site. Workmanship is retained by the presence of artifacts, architecture, or features emblematic of a particular culture or people, such as a Puebloan kiva or a Clovis projectile point. The aspect of feeling is difficult to ascertain for archaeological sites and is often dependent on Native American perspective. Very few of the physical features present during occupation of a precontact site still exist in the present to convey a property's character. A site that retains association can be linked to a particular cultural-historical period through the presence of diagnostic artifacts or architectural elements or by chronometric means.

Each documented cultural resource described in the *Survey Results* section, below, is provided a recommendation of NRHP eligibility and evaluated for project effects. Based on this documentation, the lead agency will provide a determination of eligibility for each documented cultural resource based on ERO's recommendation and will provide a determination of project effect on historic properties. The lead agency will then provide the SHPO an opportunity to review and provide comment regarding NRHP eligibility and project effects per 36 CFR 800.4 through 800.5. If, during consultation between the lead

agency and the SHPO, a determination of "adverse effects to historic properties" occurs, further consultation is required to resolve adverse effects.

File and Literature Review

ERO reviewed the previous cultural resource surveys and resource documentation completed in the project area by conducting a file review with the OAHP. The OAHP provided the results to ERO on March 30, 2021 (File Search No. 23529). The file search area included the entirety of the project area as defined above and a 1-mile buffer to understand context of the region.

The file search identified 12 previous intensive cultural resource surveys within 1 mile of the project area (Table 2). Of these, 3 previous cultural resource surveys (DT.R.R7, MC.R.R36, and Alpine 2021, in prep) intersect the project area. The Bureau of Reclamation's Cultural Resource Inventory of the Uncompahgre Valley Water Users Association's Gha and Ghaa Laterals project (DT.R.R7) and Survey of Cultural Resources in the Lower Gunnison Basin Unit, Colorado River Water Quality Improvement Program project (MC.R.R36) intersect a portion of the project area. Most recently, Alpine Archaeological Consultants conducted a survey for the Uncompahgre Valley Water Users Association (Reed et al. 2021). Approximately 10 percent of the project area has been previously surveyed.

Table 2. Previous cultural resource inventories within 1 mile of the project area.

State Project No.	Report Title (Date)	Institution	Intersect Project Area?
DT.LM.R70	*Cultural Resource Inventory of the Delta County Transmission Improvement Project, Transmission Line and Access Roads, Delta County, Colorado (Original and Addendum I) (2009)*	Alpine Archaeological Consultants	No
DT.R.R7	*Cultural Resource Inventory of the Uncompahgre Valley Water Users Association's Gha and Ghaa Laterals, Delta County, Colorado (2012)*	Bureau of Reclamation	Yes
DT.SC.NR101	*Delta County Limited-Results Cultural Resource Survey Report on Private Lands (Edwards) (2015)*	USDA Natural Resources Conservation Service (NRCS)	No
DT.SC.NR111	*Delta County Limited-Results Cultural Resource Survey Report on Private Land—Reuben Leon (748B05131Q2) (2017)*	NRCS	No
DT.SC.NR2	*Delta Limited Results Cultural Resource Survey on Private Lands—Walstrom/Watts (2009)*	NRCS	No
DT.SC.NR52	*Delta Limited Results Cultural Resources Survey Report—Leonard Willey (2010)*	NRCS	No
DT.SC.NR79	*Delta County Limited Results Cultural Resources Survey Report on Private Lands—Tricia Martin (2012)*	NRCS	No
DT.SC.NR81	*Delta County Limited Results Cultural Resources Survey Report on Private Lands—David Huerkamp (2012)*	NRCS	No
DT.SC.NR86	*Delta County Limited-Results Cultural Resource Survey Report on Private Lands (Diamond Lazy L Ranch) (2014)*	NRCS	No

State Project No.	Report Title (Date)	Institution	Intersect Project Area?
MC.R.R36	*Survey of Cultural Resources in the Lower Gunnison Basin Unit, Colorado River Water Quality Improvement Program Delta and Montrose Counties, Colorado (2007)*	Anthropology—Archaeological Repository of Colorado State University	Yes
MC.R.R84	*Cultural Resource Inventory and Evaluation for the Proposed Piping of Phase IV Eastside Laterals Delta and Montrose Counties, Colorado (2010)*	SWCA Environmental Consultants	No
-	*A Class III Cultural Resource Inventory of the Uncompahgre Valley Water Users Association Phase 10 Laterals in Delta and Montrose Counties, Colorado (2021)*	Alpine Archaeological Consultants	Yes

The OAHP records indicate that nine previously documented cultural resources are located within 1 mile of the project area (Table 3). Of those, two (5DT1815.1 and 5DT2458) overlap the project area. 5DT1815.1 is an irrigation ditch segment that was recommended supporting of the entire eligible linear resource. 5DT2458 is the full extent of the GKB Lateral ditch and was recommended eligible for listing in the NRHP.

Table 3. Previously documented cultural resources within 1 mile of the project area.

Smithsonian Site No.	Associated Report Nos.	Resource Type	NRHP Eligibility Status (Date)	Status
5DT.1735.1	DT.LM.R70	Historical irrigation ditch	Officially eligible (2009)	Outside project area
5DT.1737.1	DT.LM.R70	Historical irrigation ditch	Officially not eligible (2007)	Outside project area
5DT.1815.1	DT.R.R17 DT.R.R7	Historical irrigation ditch	Field eligible, supporting (2011)	Documented portion of segment within project area
5DT.1815.2	DT.R.R17 DT.R.R7	Historical irrigation ditch	Field eligible, supporting (2011)	Outside project area
5DT.2021	-	GK Lateral ditch	Officially eligible	Outside project area
5DT.2451	-	Historical artifact scatter	Recommended not eligible (2021)	Outside project area
5DT.2452	-	Historical habitation	Recommended not eligible (2021)	Outside project area
5DT.2457	-	GK Lateral ditch	Recommended eligible (2021)	Outside project area
5DT.2458	-	GKB Lateral ditch	Recommended eligible (2021)	Revisited

In addition to the OAHP file search, ERO reviewed existing literature, historical maps, and GLO records to determine if historical buildings or structures may have been previously located in the project area. Historical topographic maps of the area show two historical structures in Section 23 and one historical structure in Section 14 built prior to 1936 (Colorado State Highway Department 1936; U.S. Geological Survey 1955). Historical maps also show two ditch segments that intersect the project area.

Survey Results

ERO documented six newly documented or revisited sites in the APE (Table 4). Sites and linear segments documented in the APE are related to historical habitation and agricultural development of the area. Three historical isolated finds were also documented and are listed in Table 6.

Table 4. Revisited and newly documented sites and linear resources in the APE.

Smithsonian Site No.	Resource Name/Type	Temporal Association	NRHP Eligibility
5DT1815.3	GHA Lateral ditch segment	1915–present	Officially eligible, non-supporting
5DT2458	GKB Lateral ditch	Late 1890s–1915	Field eligible
5DT2682	Historical habitation	Early 1900s–1950s	Field not eligible
5DT2683	Historical ranch	1960s–present	Field not eligible
5DT2684	Historical habitation	1960s	Field not eligible
5DT2688.1	Ditch segment	1960s–present	Field eligible, supporting

Resource Descriptions

5DT1815.3: GHA Lateral ditch segment

Description: This segment of the GHA Lateral is situated 1.8 miles northeast of Garnet Mesa and 0.25 mile west of Delta County Road 2050. Agricultural fields border the ditch segment on the east side, and slopes of eroding Mancos Shale follow the west side of the ditch. Sediments are Persayo Series silty clay loam (Natural Resources Conservation Service 2021). The elevation is 1,567 m (5,140 ft) asl.

Segment 5DT1815.3 is a 0.25-mile section of segment 5DT1815.1, documented by Alpine Archaeological consultants in 2006 (Story 2006). At the time, the segment was an open, earthen canal. In the years since 2006, the canal has been piped. Aerial imagery shows that the canal was piped between March and October 2012 (Google, Inc. 2021). Within the project area, segment 5DT1815.3 is under a two-track ditch road. A poured concrete headgate conveys water into the field ditches that extend through adjacent agricultural fields. The full extent of the GHA Lateral ditch is 4.27 miles from its headgate at East Canal to agricultural fields to the north.

The GHA Lateral ditch system is an element of the Uncompahgre Project, which brought a significant amount of water to the Uncompahgre Valley (Story 2006). The Uncompahgre Project was funded by the Bureau of Reclamation and included the completion of the Gunnison Tunnel, the largest irrigation tunnel in the world in 1909 (Holleran 2005). By 1925, the entire irrigation system was completed, including the Montrose and Delta Canal and the Gunnison Diversion Dam (Holleran 2005). The irrigation system was transferred to the Uncompahgre Valley Water Users Association in 1932 (Holleran 2005).

NRHP Eligibility: The entire GHA Lateral system of canals (5DT1815) was determined eligible for listing in the NRHP under Criterion A for its role in the Uncompahgre Project, which made successful agriculture in the area possible, drastically changing the local economy. The GHA Lateral system is not associated with a significant historical figure and therefore does not qualify for listing under Criterion B. The irrigation system is not distinctive in design, type, or method of construction (Criterion C). The ditch has been piped and thoroughly documented; therefore, additional information that would yield

important information about the resource is unlikely (Criterion D). ERO recommends segment 5DT1815.3 non-supporting of the eligibility of the entire resource as the ditch has been buried in a conduit and no longer retains the original historical integrity.

This segment retains the aspects of setting, location, and association as much of the area remains cultivated agricultural fields and the segment is associated with the Uncompahgre Valley Project. The aspects of materials, design, workmanship, and feeling were not observed.

Management Recommendations: Avoid and protect.

5DT2458: GKB Lateral ditch

Description: The full extent of the GKB Lateral ditch was documented by Alpine Archaeological Consultants in 2020 during the inventory of the Uncompahgre Valley Water Users Association's Phase 10 Laterals project (McKetta and Kluver 2020). The GKB Lateral is currently an earthen ditch with several water diversion features and drop structures. A two-track road follows the south side of the ditch. Alpine thoroughly documented each water control feature along the segment (McKetta and Kluver 2020).

ERO revisited the full extent of the ditch via a combination of pedestrian survey and aerial imagery and found the full extent to be in the same condition as documented in 2020. No changes were observed that would impact the eligibility of the resource.

NRHP Eligibility: The full extent of 5DT2458 was recommended eligible under Criterion A for its association with the development of agriculture in Delta County and the Uncompahgre Project. ERO agrees with this recommendation. The ditch is not associated with a significant historical figure (Criterion B). Furthermore, the ditch is not distinctive in type, period, or method of construction (Criterion C). The entire resource has been thoroughly documented, and additional research is not likely to provide significant information about agricultural development in Delta County (Criterion D).

The resource retains the aspects of location, setting, design, materials, and association. The ditch is located in an unaltered rural agricultural setting and maintains the original design characteristics. The ditch is directly associated with agriculture and settlement in the area. The aspects of workmanship and feeling were not observed.

Management Recommendations: Avoid and protect.

5DT2682: Historical habitation

Description: This site is located along the north side of the GKB Lateral ditch (5DT2458) and 0.25 mile south of H Road. The site contains three large cottonwood trees growing along the ditch. Other vegetation includes tamarisk, rabbitbrush, and greasewood growing along the ditch. Sediments are deep Montrose Series silty clay loam (Natural Resources Conservation Service 2021). Bulldozing activity has left the ground visibility at 90 percent, and the elevation is 1,564 m (5,130 ft) asl.

This site contains a diffuse scatter of fragmentary artifacts, a distribution line (F1) that was originally connected to a structure, a water pipe protruding from the ground (F2), and a milled lumber structure in a cottonwood tree (F3). The entire area has been bulldozed, completely demolishing other structures or buildings that once stood in this location and leaving the artifacts heavily fragmented. Evidence of burning is also present in the form of blackened, charred sediments and melted and discolored artifacts. A modern flatbed truck trailer is at the west end of the site.

F1 consists of two standing distribution line poles connected by a wire. The line is no longer active and was likely connected to a structure or building that was demolished at an unknown time. F2 is a water pipe that is protruding from the ground in the center of a corrugated metal barrel. F3 is a milled lumber platform and associated wooden plank steps nailed to a large cottonwood tree.

The artifacts number between 750 and 1,000 and include fragments of aqua, amethyst, green, amber, and colorless bottle glass, wire nails, asphalt shingle fragments, fiberglass insulation, milled lumber, milk glass, 10 bricks stamped with "Delta," 5 tire fragments, corrugated sheet metal, 2-inch metal piping, cinder blocks, a bicycle, a stovepipe, a horseshoe, scissors, Hazel Atlas bottles, and crockery. The assemblage is primarily domestic artifacts that span the early 1900s to the 1970s. The domestic artifacts and features indicate that a residential structure was once present but was removed at an unknown time. The structure does not appear on historical maps of the area.

A search of GLO records for the area show that William B. Downs was issued a land patent for 70 acres that includes the resource boundary in 1959 (BLM Document 029000). Mr. Downs patent coincides with the date range of the artifacts. Although Mr. Downs may be associated with the site, William Downs was not found to be a significant historical figure.

NRHP Eligibility: ERO recommends this resource not eligible for listing in the NRHP under any criteria. Although associated with early settlement in Delta County, the site is in ruins and does not convey significance to this historical event (Criterion A). Archival research did not show association with a significant historical figure (Criterion B). The remaining features are not distinctive in type, period, or method of construction (Criterion C). Additional research or subsurface investigation is not likely to yield important information that would alter our understanding of historical settlement in Delta County (Criterion D).

Management Recommendations: No further work.

5DT2683: Historical ranch

Description: This historical ranch is bordered by G Road to the north and 2100 Road along the east side. Vegetation is primarily agricultural fields of grass pastures for grassing and alfalfa. Cottonwood trees are present at the southeast end of the site. Ground visibility ranges from 10 to 80 percent. Sediments are Montrose silty clay loam (Natural Resources Conservation Service 2021). The elevation is 1,563 m (5,127 ft) asl.

This 284-acre ranch includes the main residence (F10), a series of corrals (F1, F2, F3, and F8), sheds (F4 and F9), grain silos (F5, F6, and F7), a hay shed (F11), a driveway (F12), and discarded farm equipment (F13 and F14) (Table 5). The active ranch also contains various cultivated fields of grazing grasses and alfalfa, which are irrigated by a main ditch (5DT2688.1) that feeds a series of small lateral field ditches. The working ranch is in excellent condition and is actively maintained. No historical artifacts are present, as the ranch is active.

Table 5. Features on 5DT2683.

Feature Number	Feature Type	Measurements	Description
F1	Corral	500 ft by 200 ft	Triangular milled lumber enclosure with two main animal pens.
F2	Corral	520 ft by 240 ft	Metal corral with six separate animal pens; replaced older corral between August 2019 and March 2020.
F3	Corral with small attached shed	350 ft by 120 ft (corral) 32 ft by 18 ft (shed)	Rectangular milled lumber enclosure with three separate pens and a small utility shed along the north side.
F4	Shed	22 ft by 16 ft	Rectangular milled lumber utility shed with corrugated metal sheet roof.
F5	Grain silo	14 ft diameter	Corrugated metal grain storage facility.
F6	Grain silo	14 ft diameter	Corrugated metal grain storage facility.
F7	Grain silo	18 ft diameter	Corrugated metal grain storage facility.
F8	Corral with small attached shed	120 ft by 94 ft (corral) 30 ft square (shed)	Rectangular milled lumber corral with utility shed at southwest corner.
F9	Shed	46 ft by 30 ft	Modern storage shed constructed with green corrugated metal siding.
F10	Residence	40 ft by 39 ft	One-story wood-frame ranch-style residence built in 1962. The exterior is vinyl siding with a stone chimney. The roof is hipped and gabled with metal roofing.
F11	Hay shed	85 ft by 30 ft	Modern hay shed with open sides and a corrugated metal roof.
F12	Driveway	0.30 mile long by 22 ft wide	Dirt driveway that provides access to County Road G in three locations and loops past the main residence (F10) and other features.
F13	Farm equipment	12 ft long	Discarded remnants of a seeder.
F14	Farm equipment	10 ft long	Wood frame with metal plow fragments.

The residence (F10) was constructed in 1962 along with the grain storage silos (F5, F6, and F7) and likely F4 (Delta County Assessor 2021). Two structures appear on the 1955 topographic map (U.S. Geological Survey 1955) and the 1936 Colorado State Highway Department map (Colorado State Highway Department 1936) in the location of the main residence (F10) and the modern corral (F2). These original structures built prior to 1936 have likely been replaced by the current structures. GLO records show that Charles Schweizer was issued a land patent for 160 acres in 1895 that overlaps the site area (General Land Office 2021). Although Charles Schweizer may have constructed the original structures at this location, there is no physical evidence that suggests he constructed the extant ranch building and structures. Charles Schweizer was not found to be a significant historical figure.

NRHP Eligibility: ERO recommends this site not eligible for listing in the NRHP under any criteria. Although the land is associated with early settlement of Delta County, the remaining features date to the 1960s or later and are not significant to the period of early settlement (Criterion A). Archival research did not show that the site is associated with a significant historical figure (Criterion B). Furthermore, the typical ranch features are not distinctive in type, period, or method of construction (Criterion C). The research potential of the resource has been exhausted through documentation, and additional information that would aid in our understanding of the history of the area is unlikely (Criterion D).

Management Recommendations: No further work.

5DT2684: Historical habitation

Description: This habitation site is bordered by Delta County Road 2050 along the east side. The GHA Lateral ditch (5DT1815.3) is 0.25 mile southwest. The vegetation is plowed agricultural fields with grasses and large cottonwood trees and Gambel oak growing along the field ditches. Sediments are Montrose Series silty clay loam (Natural Resources Conservation Service 2021). The ground visibility is 50 percent, and the elevation is 5,062 ft (1,543 m) asl.

This historical habitation consists of an electric pole (F1) that connected to the demolished structure and a corral (F2). The likely residential structure that once stood in this location has been demolished and the ground leveled. Two modern trailers now sit in the building's place.

F1 is a standing electric pole with colorless glass insulators and a light at the top. Wire is visible along the base of the pole. It is likely that the pole was connected to the demolished structure.

F2 is a rectangular milled lumber corral under the large cottonwood trees along the west side of the site. The corral is about 60 ft by 40 ft.

No historical artifacts remain. The area where the building depicted in historical maps once stood has been demolished and the area leveled. Two modern trailers are parked in that location.

The historical structure first appears on historical maps in 1936 (Colorado State Highway Department 1936). The structure appears on topographical maps until 1975. By 2010, the structure is missing. A search of Bureau of Land Management GLO records shows that Jennie A. Welch and John B. Jacobson were issued a land patent in 1940 for 40 acres that includes the site area (General Land Office 2021). Although Jennie A. Welch and John B. Jacobson may be associated with the original building and the ranch features, there is nothing to link them to the current features. Neither Jennie A. Welch nor John B. Jacobson was found to be a significant historical figure.

NRHP Eligibility: ERO recommends this site not eligible for listing in the NRHP under any criteria. Although associated with settlement, the primary residence has been demolished, and the remaining features are not significant (Criterion A). Archival research did not show that the site is associated with a significant historical figure (Criterion B). Furthermore, the remaining features are simply constructed

and not distinctive in type, period, or method of construction (Criterion C). Additional research is not likely to yield significant information about the settlement of Delta County (Criterion D).

Management Recommendations: No further work.

5DT2688.1: Ditch segment

Description: This ditch segment flows through a historical ranch (5DT2683) on the south side of G Road between Garnet Mesa and Peach Valley. The vegetation consists of plowed agricultural fields of alfalfa and grasses for grazing. Snakeweed, rabbitbrush, greasewood, and cottonwood trees are also present along portions of the ditch. The ground visibility is 40 percent. Sediments consist of Montrose Series silty clay loam (Natural Resources Conservation Service 2021). The elevation ranges from 5,087 ft (1,551 m) to 5,128 ft (1,563 m) asl.

This ditch flows north-south through 5DT2683, and a footbridge (F1) crosses the ditch. The ditch is about 1 mile long including a spur that curves southeast from the main alignment. The main alignment of the ditch flows southwest through the ranch and contains two ditch-rider two-track roads along either side. The ditch itself is contained within electric fencing to protect the water source from livestock. The ditch is about 25 ft wide and was at least 3 ft deep at the time of documentation. The ditch is earthen with steep embankments and a maximum water depth of about 12 ft.

F1 is a wood footbridge, 32 ft long by 2 ft wide, that spans the width of the ditch. The footbridge provides access to a cultivated field and dilapidated farm equipment on the ranch (F13 and F14 on 5DT2683).

The visible extent of the ditch is about 1.25 miles based on aerial imagery. The ditch originates at an unnamed tributary of the Gunnison River and flows south-southwest. Although unnamed, the ditch is depicted on historical maps beginning in 1955 (U.S. Geological Survey 1955) and has provided irrigation water to historical ranch 5DT2863 at least since the 1950s.

NRHP Eligibility: ERO recommends the full extent of 5DT2688 eligible for listing in the NRHP under Criterion A for its role in agricultural development in Delta County. Archival research did not show that the ditch is associated with a significant historical figure (Criterion B). The simply constructed earthen ditch is not distinctive in type, period, or method of construction (Criterion C). Additional research is not likely to provide additional information that would be significant to the history of settlement in Delta County (Criterion D).

ERO recommends this segment supporting of the eligibility of the entire resource as the segment maintains sufficient historical integrity to convey its significance. Segment 5DT2688.1 retains the aspects of setting, location, design, materials, and association. The ditch remains in the original alignment and original construction in a rural agricultural setting. The segment is directly associated with agricultural development. The aspects of workmanship and feeling were not observed.

Management Recommendations: Avoid and protect.

Isolated Finds

Three historical isolated finds were documented in the APE (Table 6). All three isolated finds are related to historical dumping.

Table 6. Isolated finds.

Smithsonian Number	Temporal Period/Affiliation	Description
5DT2685	Historical	Can scatter
5DT2686	Historical	Amethyst bottle glass base
5DT2687	Historical	Amethyst glass and metal fragments

Summary and Management Recommendations

Within or overlapping the APE are six previously documented or newly recorded sites or linear resources. One ditch (5DT2458) is recommended eligible for listing in the NRHP. One ditch segment (5DT1815.3) is recommended non-supporting and one (5DT2688.1) is recommended supporting of an eligible linear resource. Three historical sites (5DT2682, 5DT2683, and 5DT2684) are recommended not eligible for listing in the NRHP. Additionally, three isolated finds (5DT2685 through 5DT2687) were documented and recommended not eligible for inclusion in the NRHP.

Avoidance is recommended for the eligible and supporting resources (Table 7). ERO recommends that no further work is necessary for all resources recommended not eligible. If all eligible or supporting resources are avoided, ERO recommends a determination of "no adverse effect to historic properties" pursuant to 36 CFR 800.5 of the NHPA.

Table 7. Management recommendations.

Smithsonian Number	Resource Type/Name	NRHP Eligibility Recommendation	Management Recommendation
5DT1815.3	GHA Lateral ditch segment	Officially eligible, non-supporting	No further work
5DT2458	GKB Lateral ditch	Field eligible	Avoid and protect
5DT2682	Historical habitation	Field not eligible	No further work
5DT2683	Historical ranch	Field not eligible	No further work
5DT2684	Historical habitation	Field not eligible	No further work
5DT2688.1	Ditch segment	Field eligible, supporting	Avoid and protect

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Appendix A Cultural Resource Location Map
For Official Use Only: Disclosure of Site Locations Prohibited (43 CFR 7.18)

Redacted

Appendix B OAHP Cultural Resource Documentation Forms
For Official Use Only: Disclosure of Site Locations Prohibited (43 CFR 7.18)

Redacted

Attachment 3-H

Geotechnical Survey

PRELIMINARY GEOTECHNICAL REPORT

GARNET MESA SOLAR
VOLK MAIN, VOLK 40 & NORREL PARCELS
G RD, 2050 RD & 2200 RD
DELTA COUNTY, COLORADO

May 27, 2021

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1.0 INTRODUCTION

Buckhorn Engineering, Inc. (BEI, formerly DOWL) conducted a preliminary evaluation of subsurface and site conditions at three parcels (Volk Main, Volk 40 and Norrel) associated with this project in Delta County, Colorado. The work began under DOWL in March and April 2021 and when DOWL closed its Montrose office, BEI began in May and existing projects such as the Garnet Mesa Solar project were assigned to BEI. For this project, BEI staff in Montrose performed the bulk of the field, office and laboratory work, while DOWL continued to provide geotechnical engineering oversight on the project. Our services were performed at the request of Matt Kosakowski to evaluate the site suitability for construction of a solar array. The evaluation consisted of site reconnaissance, drilling and logging fifteen (15) boreholes, testing of representative materials found, and analysis of available data. This report presents the findings of our evaluation and our preliminary geotechnical engineering recommendations for site preparation, foundation design, and management of drainage.

2.0 CONSTRUCTION PLANS

The proposed project consists of constructing a ground-mounted solar photovoltaic site located on the eastern portion of Garnet Mesa, which is east of the city of Delta (see Vicinity Map, Map 1 of Appendix A). The Garnet Mesa project consists of three parcels: the Norrel Parcel, the Volk 40 Parcel, and the Volk Main Parcel, as seen in the Borehole Location Map (Map 2 of Appendix A). The exact locations of the proposed arrays, substations and other features are not known at this time. The solar panel rows will be variable in length to fit the site and typically be supported on W-section galvanized steel piles or other foundation systems. Combined inverter and transformer stations will likely be distributed around the solar panel arrays. We understand at this time that the high voltage collector substation will likely be constructed in the northwest corner of the Volk Main Parcel. The transformers, substation and other supporting features are typically installed on either slab foundations or W-section piles. Foundation loads are not known at this time. Access roads are planned to be aggregate over compacted subgrade.

Since design of the site for this purpose is still on-going, the exact location and loads of project features and the possible depth of excavation and cut/fill information is not known. Since site grading, design and structural plans are not yet available, the recommendations contained in this report are preliminary and subject to review and amendment when more formalized plans are available. BEI should be provided an opportunity to review such plans and revise or supplement our recommendations as appropriate.

3.0 SITE CONDITIONS

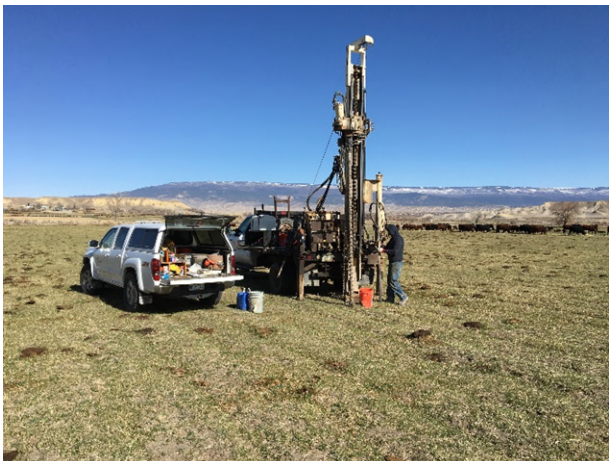
The project is located approximately five miles east of Delta, Colorado in Delta County. As seen on Map 2, the Norrel Parcel is between 2100 and 2200 Roads (west-east) and between G and H Roads (south-north), the Volk 40 is on the west side of 2050 Road between G and H Roads, and the Volk Main Parcel is between 2000 and 2100 Roads (west-east) and between F and G Roads (south-north). These three parcels have a combined acreage of approximately 500 acres. While the Volk 40 and Volk Main Parcels are primarily irrigated pasture, the Norrel Parcel contains mostly abandoned irrigated farmland with some upland non-irrigated land with sparce native desert vegetation and some Saltgrass in lowland areas. Due to the extensive flood

irrigation methods used in the region, the fields are furrowed and there are supply and return flow ditches throughout the parcels.

Topography is generally gently sloping with typical grades of two to five percent with various aspects. Elevations range from about 5,060 to 5,140 feet. As seen on Map 2 (Appendix A), we drilled a total of 15 boreholes, with four borings on the Norrel Parcel (BH#1-BH#4), two borings on the Volk 40 Parcel (BH#5-BH#6), and nine borings on the Volk Main Parcel (BH#7-BH#15). The general site conditions and vegetation for some of the boreholes at the three parcels are seen in the photographs below.

Norrel Parcel. Photo 1 (left) - View northwest at the saltgrass lowland area as BH#2 was being drilling. Note the salts that have accumulated in this area of shallow groundwater. **Photo 2 (right)** – View northwest while BH#4 was being drilled. This is an abandoned agricultural field. The Norrel Parcel generally slopes to the south towards an unnamed arroyo.

Volk 40 Parcel. Photo 3 (left) - View northeast as BH#5 was being drilled. **Photo 4 (right)** – View northeast while BH#6 was being drilled in the lower portion of the parcel. The Volk 40 Parcel generally slopes to the northeast.



Volk Main Parcel. Photo 5 (left) – View to the north as BH#8 was being drilled. **Photo 6 (right)** – View north while BH#14 was being drilled near the northwest corner of the parcel where the substation will likely be located. The Volk Main Parcel generally slopes to the north to northeast, but some areas, like shown in Photo 6, slope to the south.

4.0 GEOLOGY

According to the Colorado Geological Survey's map, *Geologic Map of the Olathe Northwest Quadrangle* (Noe et al, 2013), the geology on the subject property consists primarily of surficial Quaternary alluvial mud flow (*Qamf*) deposits in the valley fill areas underlain by the formational Cretaceous Smoky Hill and Fort Hays members of the Mancos Shale formation (*Kms*). The low mesas to the west and north of the project area are capped by Gunnison River terrace gravels (Qag_3) The geologic map is shown in Figure 1 below. For reference, the three parcels are bounded on the west by 2000 Road, on the south by F Road, on the east by 2200 Road, and on the north by H Road.

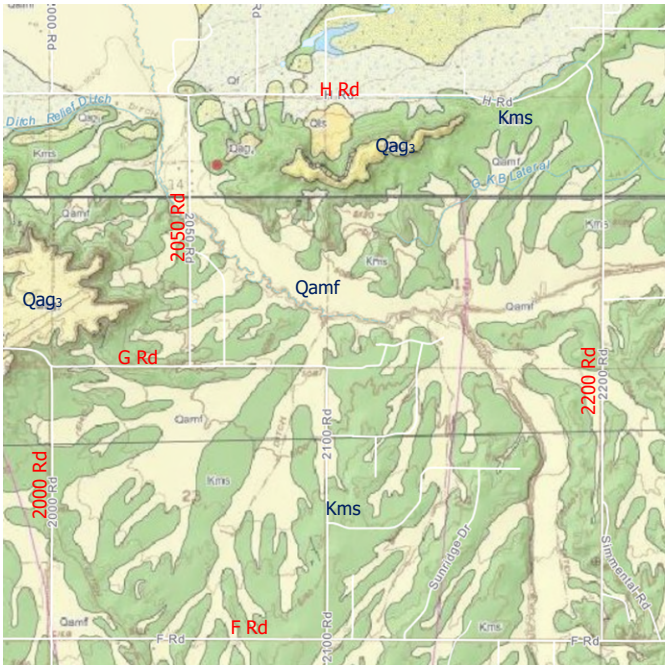


Figure 1. **Geologic map of the project area** (CGS, Open-File Report OF-13-07). Here is a key to the mapping units:

Qamf = Quaternary alluvial, mud flow, and mud fan deposits (Holocene to late Pleistocene)
Qag_3 = Quaternary alluvium three, of the Gunnison River (late to mid Pleistocene)
Kms = Cretaceous Smoky Hill and Fort Hays (Niobrara) members of the Mancos Shale formation

BUCKHORN ENGINEERING

The alluvial mud flow (Qamf) deposits are the fine-grained (clay and silt with fine sand) valley fill located on gentle terrain and along drainages. It was deposited during mud flow events with the source areas being the Mancos Shale outcrops surrounding the lowlands. According to the CGS report that accompanies the *Geologic Map of the Olathe Northwest Quadrangle*, these deposits can exceed 20 feet in thickness. Many of these mud flow deposits have been deeply dissected by stream erosion, such as by the unnamed drainage that flows to the west along the southern edge of the Norrel Parcel (Map 2, Appendix A). These drainages (or arroyos) have banks that are easily eroded and often contain evidence of collapse and piping.

The underlying Mancos Shale is a marine shale/mudstone that consists of dark gray to light gray, calcareous shale that weathers to yellowish orange to light brown color and contains occasional limestone and siltstone beds and seams of fibrous gypsum. This formation is generally soft and nonresistant, plastic when wet, and commonly slumps when undercut and/or saturated. When the Mancos Shale outcrops, it forms dissected badlands that are locally called the Adobes.

During our field exploration, we encountered deep mud flow (Qamf) soils in at boreholes BH#1, BH#2 and BH#4 on the Norrel Parcel, where these soils were 7.5 feet, 10.5 feet, and greater than 16.5 feet deep, respectively, overlying shale. On the Volk 40 Parcel these mud flow deposits were 3 to 5.5 feet thick. On the Volk Main Parcel, the depth to shale was generally less than 1 to 2 feet, which indicates more of a residual soil developed directly on the Mancos Shale. The boreholes with mud flow soils over the shale on the Volk Main Parcel were BH#9 and BH#14 (with 3 feet of fine-grained valley fill soil) and BH#15 (with 6 feet of valley fill soil). Both the residual and the transported soils overlying the shale on the three parcels are similar in composition and texture since they were both derived from the weathering of the shale. The soil materials found in our boreholes are, therefore, consistent with the geologic mapping, and will be discussed in more detail in the *Soil Characteristics* Section of this report.

5.0 GEOLOGIC HAZARDS

This section of the report is included so that the project team is aware that construction in the area comes with certain risks. Some buildings and roadways throughout the region have experienced negative impacts due to slope movement, sensitive soils, and shallow groundwater. Typical accepted structural engineering practice for design and construction can be used to reduce the potential for undesirable performance related to troublesome weather and soil conditions. However, because of the overall dynamic characteristics of the area, almost every structure is subject to at least some degree of potential risk. The primary geologic hazards relevant to the subject property and their associated risks are discussed below.

5.1 Slope Instability and Erosion

Most of the terrain on the property is flat to gently sloping. However, at the southern margin of the Norrel Parcel abruptly meets the unnamed drainage where there is the potential for bank sloughing and erosion in the vicinity of the arroyo. This is an area of deep valley fill (*Qamf*) soils that are weak, low density, highly erodible, and fine-grained soils that are susceptible to sloughing, piping, and dispersion. These soils are derived from the weathering of nearby Mancos Shale badlands and they contain salts and clay that weakly bind the soil until they are wetted. Under loads while wetted, the weak soil structure collapses into micro-voids with the

mud flow matrix. Therefore, the edge of the arroyo should be avoided and drainage in these areas should be strictly controlled.

5.2 Flooding

Flooding from overbank flows is not considered to be a hazard at these parcels. However, sheetflow flooding during rapid runoff from intense thunderstorm events can cause significant erosion of the site's weak soils. A site grading and drainage plan will be important to manage runoff and not concentrate flows during storm events.

5.3 Expansive and Compressible Soil and Rock

Soil materials and shale containing some types of clay, especially bentonite (montmorillonite), can expand in volume with water absorption and then shrink upon drying. These changes in soil volume can cause damage to foundations, roadways, pavements, and embankments. Similarly, weak and compressible soils can also cause damage to structures. Compressible soils were generally laid down rapidly, have a weak matrix containing voids, and/or are not naturally in a dense or compacted state. Compressible soils typically have a large proportion of fine-grained materials, especially silt, but they can also contain a mixture of material if deposited in a chaotic manner. For example, mud flow and debris flow deposits are often laid down rapidly and are composed of materials that are not sorted or reworked, leaving behind voids and a loose matrix of rocks, soil, and possibly organic debris. Clayey soils can also be compressible if their moisture content increases when loads are applied.

Both expansive and compressible soils were encountered in our boreholes on all three parcels. The potential hazard from expansive and compressible soil is the differential movement of foundation soils from soil swell pressure applied through the foundation. This hazard can be partly reduced by managing on-site drainage so that water accumulation, ponding or penetration into the soil near foundations and slab/pavement areas is reduced to as great a degree as practical. Further reduction of hazards can be attained through design of foundation systems that extend to firmer material or which have sufficient strength to resist differential movements. The removal of problematic soil and replacement with structural fill is another option. These methods are discussed in further detail below in the *Preliminary Recommendations* Section.

6.0 SOIL CHARACTERISTICS

6.1 Field Investigation Procedures

Fifteen borings (BH#1 - BH#15) were drilled by Colorado Drilling & Sampling under the direction of BEI geologist using a Simco 2800 track-mounted drill rig at the locations shown on the Borehole Location Map (Map 2). The locations of the borings were selected and surveyed by BEI prior to the field evaluation based on the proposed locations of project features and anticipated soil types. The locations, surveyed elevations, and depths of each borehole are summarized in Table 1 below.

Table 1: Borehole Summary Information

Boring Number	Drill Depth (ft)	Surface Elevation (ft)	Location
BH#1	16.0	5113.3	Northeast Norrel Parcel
BH#2	15.8	5097.5	Southeast Norrel Parcel, lowland wet
BH#3	15.1	5104.9	Central Norrel Parcel, upland Adobe
BH#4	16.5	5084.0	Western Norrel Parcel
BH#5	15.3	5100.5	Upper southwest Volk 40 Parcel
BH#6	16.4	5070.2	Lower northeast Volk 40 Parcel
BH#7	16.5	5127.8	Southeast quadrant Volk Main Parcel
BH#8	16.5	5105.2	East-central edge Volk Main Parcel
BH#9	16.2	5094.0	Northeast quadrant Volk Main Parcel
BH#10	16.5	5116.2	West-central portion Volk Main Parcel
BH#11	16.5	5144.7	Southwest corner Volk Main Parcel, upland Adobe
BH#12	15.4	5085.5	Northeast corner, Volk Main Parcel
BH#13	16.5	5106.9	West edge, North Central Volk Main Parcel
BH#14	25.5	5128.8	Northwest corner, substation site, Volk Main Parcel
BH#15	16.0	5114.3	Northwest quadrant, Volk Main Parcel

The boreholes were drilled using a 4.25-inch solid stem continuous flight auger. The soil, bedrock, and groundwater conditions were logged and the borehole logs are presented in Appendix B. Representative samples of soil and rock materials were tested in our laboratory with the results presented in Appendix C. Soil samples were obtained at discrete depths by withdrawing the 4-inch drill string and inserting either a standard 1.5-inch outside diameter (O.D.) split-spoon sampler without liners or a 2-inch I.D. split-spoon "California" sampler to perform in-situ Standard Penetration Tests (SPTs). The number of blows required to drive the sampler 12 inches in 6-inch increments were recorded (SPT "N" penetration resistance values) and indicate the relative density or consistency of the soils. We conducted our field exploration referencing the following ASTM standards in Table 2 below.

Table 2: ASTM Exploration Standards

Test Method	Purpose
ASTM D1452	Standard Practice for Soil Exploration and Sampling by Auger Borings
ASTM D1586	Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils
ASTM D1587	Standard Practice for Thin-Walled Tube Geotechnical Sampling of Soils
ASTM D3550	Standard Practice for Thick Wall Ring-Lined, Split barrel, Drive Sampling of Soils
ASTM D2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D2488	Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)

Our findings and recommendations are based on materials found within the profile depths obtained. Soil conditions may change between boreholes and below these depths. If deeper excavations are contemplated or if soil/rock materials different than those found in the six boreholes are encountered during construction, BEI should be called to verify soil continuity and

validity of our recommendations. This may require drilling boreholes or the excavation of test pits into the subgrade material below foundation grade at various locations once the site plan is available. This may be needed, for example, in areas of large cuts and/or fills and if heavy structures are needed outside of the warehouse building.

6.2 Field Findings

Our boreholes reached depths of 15.1 to 25.5 feet. Within these depths, formational shale is within 10 feet of the surface at all boreholes on the three parcels except for in BH#2 and BH#4, which are on the Norrel Parcel (see Map 2, Appendix A). At BH#2, shale was encountered at 10.5 feet and at BH#4, shale was not reached in 16.5 feet. These are areas of alluvial mud flow deposits (fine-grained deep valley fill) shown as light yellow on the geologic map (Figure 1 in the Geology section). For the areas where shale is within 10 feet of the surface, these are areas we refer to as areas with relatively shallow shale. Both of these conditions are discussed below.

6.2.1 Fine-Grained Valley Fill

These soils in BH#2 and BH#4 are generally a variably silty, lean clay. BH#2 is in a topographically low position with abundant salts accumulated at the surface and shallow groundwater (at 2 feet). Photos 7 and 8 below show the clayey and sticky nature these soils when they are saturated. BH#4 is in an abandoned field with a water table deeper than 16.5 feet, which was the depth of sampling. These soils are dry with many soil cracks observed throughout the ground surface and have N-values of 5 to 8 blows per foot (bpf), which is medium stiff. The soil cracks, which are indicative of dispersive soils that are susceptible to piping, erosion and caving, are extensive in the field surrounding BH#4 and were observed to be typically 1-2 inches wide and 1-3 feet long.

Photo 7 (left) – Sample from BH#2 at 10 to 11.5 feet where the wet, clayey valley fill soils (light brown wet soils on the left half of the sample) sit on weathered Mancos Shale (drier right half of the sample). **Photo 8 (right)** – Shows the wet, sticky nature of the clays in BH#2 in the upper 10.5 feet. Note how the clays stick to the auger.

Whether wet or dry, these fine-grained valley fill soils are weak, have low density, and are susceptible to consolidation and collapse when loaded. Therefore, deep foundation systems that rely on skin friction or on deeper end-bearing are typical methods to provide support for structures on these weak soils.

6.2.2 Shallow Mancos Shale

All of the remaining 13 boreholes had shale within 10 feet of the surface. The shale is often fissile and weathered in the upper few feet but becomes less weathered and harder with depth. Even when shale was encountered within 1-2 feet of the surface, the shale could be augered to a depth of 15 feet. In these boreholes (such as BH#5 to BH#15), N-values of 21 to 58 bpf were recorded in the upper 12 feet; however, by 15 feet, N-values of 50/2 (50 blows for 2 inches) to 50/5 were typically recorded in the less weathered shale. Groundwater was not observed in most of the boreholes with shallow shale at this site. However, groundwater was measured at 14 feet in BH#10, at 15 feet in BH#12, at 11.5 feet in BH#13, at 15.5 feet in BH#14, and at 12 feet in BH#15. Once regional irrigation commences, it is likely that groundwater will be present at these sites as water often seasonally perches on the low permeability shale.

The following photograph (Photo 12) shows the nature of the sandy gravel soil from BH#4 at 7.5 feet.

Photo 9 (left) – Sample from BH#11 at 5 to 6.5 feet shows the nature of the fissile, weathered Mancos Shale with salt veins, which are secondary minerals such as calcite or gypsum. **Photo 10 (right)** – Shows the highly weathered nature of the shale from BH#7 at 7.5 to 9 feet that partially weathered to clay.

Although the shale can be expansive, it becomes denser and less weathered with depth, thus offering a bearing media for drilled or driven piles that are embedded sufficiently to resist upward forces associated with expansion of clays within the shale.

6.3 Laboratory testing

Laboratory tests were performed on the predominant native soil types to evaluate the range of physical characteristics and the results are presented in Appendix C and summarized in Table 3 below.

Table 3: Summary of Laboratory Results

Borehole #	Sample #	USCS Classification	Sample Depth	Moisture content	Atterberg Limits*			Sieve Analysis				Dry Density	Swell/ Consolidation		
								%	%	% Fines			Free Swell Pressure	Swell Potential @100psf	Total Consolidation @2,000psf
			(ft)	(%)	LL	PL	PI	gravel	sand	silt	clay	pcf	(psf)	(%)	(%)
BH#1	DS1	CL	2.5	7.3%											
BH#1	DS2	CL	5	11.4%	31	14	17	0.0	9.3	29.6	61.1	114.6	2,200	5.1	6.8**
BH#1	DS3	shale	7.5	11.3%											
BH#1	DS4	shale	10	11.2%								118.4			
BH#1	DS5	shale	15	11.1%											
BH#2	DS6	CL	2.5	29.3%											
BH#2	DS7	CL	5	27.7%								93.4			
BH#2	DS8	CL	7.5	25.6%											
BH#2	DS9	CL/shale	10	16.8%											
BH#2	DS10	CL/shale	15	13.9%								116.0			
BH#3	DS11	shale	2.5	8.1%											
BH#3	DS12	shale	5	6.6%											
BH#4	DS16	CL	2.5	4.1%								91.8			
BH#4	DS17	CL	5	8.6%											
BH#4	DS18	CL	7.5	17.7%	32	15	17	0.0	17.5	32.7	49.8	101.5			
BH#4	DS19	CL	10	20.1%											
BH#4	DS20	CL	15	23.8%								101.5			
BH#5	DS21	CL	2.5	14.0%	32	17	15	0.0	10.9	36.3	52.8				
BH#5	DS22	CL	5	10.3%								111.9	1,100	2.4	3.6
BH#5	DS23	CL/shale	7.5	11.1%	44	19	25	0.0	3.1	37.6	59.3				
BH#6	DS26	CL/shale	2.5	13.8%								110.8			
BH#6	DS28	CL/shale	7.5	10.6%								113.2	800	1.80	3.5
BH#7	DS31	CL	2.5	16.5%											
BH#7	DS32	CL/shale	5	15.7%								110.0			
BH#7	DS33	CL/shale	7.5	15.9%											
BH#7	DS34	CL/shale	10	17.1%								101.3			
BH#7	DS35	shale	15	10.2%											
BH#8	DS37	CL/shale	5	9.8%								115.9			
BH#8	DS40	shale	15	7.6%											
BH#9	DS41	CL/shale	2.5	14.3%											
BH#9	DS42	CL/shale	5	12.9%											
BH#9	DS43	CL/shale	7.5	13.9%											
BH#9	DS44	shale	10	8.2%											
BH#9	DS50	shale	15	9.2%											
BH#10	DS53	CL/shale	7.5	11.9%	43	20	23	0.0	4.1	35.1	60.8				
BH#10	DS55	CL/shale	15	15.6%											
BH#11	DS57	shale	5	7.5%											
BH#11	DS60	shale	15	9.6%											
BH#12	DS61	shale	2.5	7.0%											
BH#12	DS63	shale	7.5	10.9%											
BH#12	DS65	CL/shale	15	8.6%											
BH#13	DS66	CL/shale	2.5	14.5%											
BH#13	DS67	CL/shale	5	12.2%								114.4			
BH#13	DS69	CL/shale	10	8.9%											
BH#13	DS70	shale	15	10.3%											
BH#14	DS71	CL/shale	2.5	13.2%								113.3	2,800	3.8	4.7**
BH#14	DS72	CL/shale	5	10.5%											
BH#14	DS73	CL/shale	7.5	10.7%								105.4	300	0.6	4.8
BH#14	DS74	shale	10	9.4%											
BH#14	DS75	shale	15	8.8%											
BH#14	DS76	shale	20	15.9%											
BH#14	DS77	shale	25	15.9%											
BH#15	DS78	CL	2.5	23.9%	28	17	11	0.0	12.7	48.1	39.2	90.8	230	0.2	6.7
BH#15	DS79	CL	5	20.6%								102.6			

*LL = Liquid Limit, PL = Plastic Limit, PI = Plasticity Index, NP = Non-Plastic

**total load of 4,000 psf

Note: This table does not include corrosivity, UCS, Proctor and CBR testing. See report and individual lab sheets for those results.

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6.3.1 Fine-Grained Overburden Soils

Atterberg limits tests performed on four samples from BH#1, BH#4, BH#5 and BH#15 on the fine-grained soils overlying the shale resulted in liquid limits (LL) of 28 to 32, plastic limits (PL) of 14 to 17, and plasticity indices (PI) of 11 to 17. A soil with a PI of between 15 and 30 is considered to have moderate potential for swelling or shrinking and a soil with a PI of less than 15 is considered to have low potential for changing volume with changes in moisture. Gradation analyses performed on these samples indicate that the soils are composed of 39-61% clay, 30-48% silt, 9-18% sand (mostly fine sand), and 0% gravel. Based on these laboratory test results, these soils all classify as a lean clay (CL) according to the Unified Soil Classification System (USCS). Note the high silt content, as well, with these soils containing 83-91% fines (silt plus clay). Natural moisture contents of the four bulk samples ranged from 11-24%.

Four swell/consolidation tests were performed on six samples obtained at various depths in the upper 10 feet. As seen on the swell/consolidation graphs in Appendix C, the six samples displayed a range of behaviors. Most of the samples showed swell potential which ranged from 0.6 to 5.1% swell under a load of 100 psf and produced swelling pressures of 300 to 2,800 psf, while one of the samples (DS78 from BH#15 at 2.5-4 feet) swelled only 0.2%, but consolidated 6.7% under a load of 2,000 psf. These results show the highly variable nature of this mud flow and residual fine-grained soils. The samples that swelled more likely have different clay mineralogy (i.e. more bentonitic) than others that contain more silt or salts. Soil strength and moisture-density (Standard Proctor) tests of the surficial fine-grained soils were performed on bulk sample BS1 from BH#4 obtained from a depth of 1 to 3 feet in BH#4. The Standard Proctor for BS1 was 114.7 pcf at 13.9% moisture content. Unconfined Compressive Strength (UCS) tests were performed on samples DS18, DS20 and DS78 resulting in UCS values of 5-16 psi, which indicates weak soils.

A series of geochemical tests were conducted on two samples of the overburden soils from various depths (samples DS1 and DS20). The samples had water-soluble sulfate concentrations of 1.1-1.7%, chloride contents of 0.008-0.03%, electro-conductivities of 1,850 to 2,100 µS/cm, and a pH range of 7.6-7.7. The water-soluble sulfates content and electro-conductivity are indicative of corrosive soil. Recommendations for addressing the corrosive nature of the soil are presented in the *Recommendations* Section of this report.

6.3.2 Mancos Shale Soils

Atterberg limits tests performed on shale samples from BH#5 and BH#10 indicate the highly weathered shale with clay has a Liquid Limit of 43-44, a Plastic Limit of 19-20, and a PI of 23-25. Gradation analysis of these samples resulted in 0% gravel, 3-4% sand, 35-38% silt, and 59-61% clay. This soil is classified as a lean clay (CL). Soil strength and moisture-density (Standard Proctor) tests were performed on weathered shale bulk sample BS2 from BH#8. The Standard Proctor for BS2 was 108.0 pcf at 17.2% moisture. UCS tests were performed on weathered shale sample DS73 resulting in a UCS of 30 psi, which is extremely weak rock (R0) .

A series of geochemical tests were conducted on four samples of the weathered shale from various depths (samples DS11, DS24, DS26, and DS71). The samples had water-soluble sulfate concentrations of 0.84-1.64%, chloride contents of 0.001-0.051%, electro-conductivities of 1,825 to >3999 µS/cm, and a pH range of 7.6-8.0. The water-soluble sulfates content and electro-conductivity are indicative of corrosive soil. Recommendations for addressing the corrosive nature of the soil are presented in the *Recommendations* Section of this report.

6.4 Soils Summary

In summary, the field observations and laboratory testing indicate that the fine-grained valley fill (mud flow) and residual soils derived from the weathering of Mancos Shale to the depths explored are dominated by silt and clay (classify as CL), have moderate plasticity, low to moderate density and a weak structure, and have low to high swell potential and swelling pressure as well as collapse potential. These fine-grained soils are generally only a few feet thick over most of the Volk Main, Volk 40 and portions of the Norrel Parcels, while other portions of the Norrel Parcel contain deep valley fill deposits with greater than 10 feet to formational shale. The underlying weathered Mancos Shale, which is prevalent at all three parcels at a depth of less than 10 feet, is also dominated by silt and clay (classify as CL), have moderate plasticity, low to moderate density, and have low to high swell potentials and swelling pressures. Upland, non-irrigated areas of the three parcels are typically outcrops of shale at the surface with a thin layer of residual soil at the surface.

7.0 ENGINEERING ANALYSIS

7.1 Seismicity

7.1.1 Design Accelerations

BEI utilized site soil and geologic data, our knowledge of local geology, the project location, *Minimum Design Loads and Associated Criteria for Buildings and Other Structures* (ASCE7-16) and the National Earthquake Hazards Reduction Program (NEHRP) to estimate Seismic Site Classification of "D" at the project site and Risk Category II. We queried the ATC Council website (ATC Council, 2021) and the recommend seismic design parameters are provided in Table 4 below based on the soil conditions and project location.

Table 4: Seismic Design Parameters

Period (seconds)	Modified Acceleration Coefficient for Site Class D (g)
0.0 (peak)	PGA_D = 0.50
0.2 (short	S_{DS} = 0.306
1.0 (long)	S_{D1} = 0.113

***2% probability of exceedance in 50 years**
Notes: g =gravity; PGA_D = Peak Ground Acceleration
S_{DS} = Spectral Acceleration; S_{D1} = 1 Sec. Spectral Acceleration

7.1.2 Liquefaction

Liquefaction is the partial or total loss of strength of soils that can occur during strong earthquake shaking of significant duration. Liquefaction is a process where high shear deformations result in progressive build-up of pore water pressure. Because the seismic load occurs rapidly, soil does not have time to drain and the effective stress may be reduced to near zero, resulting in a temporary loss of shear strength. Earthquake-induced liquefaction generally occurs only under particular conditions which includes saturation, strong earthquake ground shaking of long duration, and loose granular soil. Liquefaction can also occur in silts and fine-grained soils. Typically, liquefaction occurs where the groundwater table is shallow (5 to 10 feet deep) and generally only at depths less than approximately 50 feet.

Loose, saturated, sand, silt, and fine gravel may liquefy when exposed to seismic shaking. To be liquefiable, a clay or silt (CL or ML) soil must have a plasticity index (PI) of less than 7, or if the soil classifies as a silty clay (CL-ML), the plasticity index must be less than 5 (Boulanger and Idriss, 2006). Based on the laboratory test results the soils have PI's range from 11 to 25, so the soils at this site, are either non-liquefiable fine-grained soils or shale bedrock. It is our opinion that the potential for liquefaction at this site is low.

7.2 Swell and Collapse Potential

The soil at this site is subject to volume changes with changes in moisture content. The clay soil was derived from the Mancos Shale formation which is a relatively high plasticity shale which has the potential to swell. Such soils are commonly referred to as "expansive" or "swelling" soils because they expand or swell as their moisture contents increase. However, these soils also "contract" or "shrink" as their moisture contents decrease. Footings, column pads, floor slabs and pavements supported on expansive soils will experience cycles of upward and downward movement that will result in distortion, possibly causing cracking or structural damage to the structure.

In addition, much of the clay soil on this site was deposited as mud flows in a loose structure that is lightly cemented. When the moisture content of the soil increases the structure of the soil can collapse leading to several inches of settlement.

In the case of expansive and collapsible soil the movement occurs where the subsurface soil becomes wet, resulting in differential movement that can be especially damaging to structures.

The recommendations presented in this report are based on our knowledge of the site soil conditions and our experience with similar sites and structures. These recommendations will not eliminate the risk of movement and cosmetic distress, but this risk could be further reduced if significantly more expensive measures are used during construction. We recommend both expansive and collapsible soils are evaluated further in the final geotechnical evaluation.

7.3 Field Resistivity of Soils

In order to estimate the conductivity of the native soil, field resistivity readings were made using a Wenner 4-pin system in the dominant soil types of each of the three parcels. Each set of tests is run as perpendicular lines in the vicinity of a borehole. Each set of tables and graphs below are for each of the parcels, with the Norrel Parcel first (Table 5 and Figure 2), the Volk 40 Parcel next (Table 6 and Figure 3), and the Volk Main Parcel last (Table 7 and Figure 4).

For the Norrel Parcel, the three dominant soil types are upland with shallow shale, lowland Saltgrass (wet), and deep fine-grained valley fill (mud flow) soils. For the upland with shallow shale we performed the field resistivity test around BH#3, for the lowland Saltgrass soils we tested around BH#2, and for the deep, fine-grained valley fill soils we tested around BH#4. The results of the resistivity testing for the Norrel Parcel are shown in Table 5 and Figure 2 below.

Table 5: Field Resistivity Testing Results - Norrel Parcel

FIELD RESISTIVITY		
Wenner Spacing (feet)	**Orientation**	**Apparent Res. (Ω-cm)**
Location: BH#3 (green line on Figure 2)		
5	E-W	19,150
10	E-W	12,639
20	E-W	10,724
Location: BH#3 (purple line on Figure 2)		
5	N-S	9,287
10	N-S	10,724
20	N-S	11,490
Location: BH#4 (blue line on Figure 2)		
5	E-W	7,181
10	E-W	6,511
20	E-W	2,834
Location: BH#4 (orange line on Figure 2)		
5	N-S	6,798
10	N-S	4,405
20	N-S	2,873
Location: BH#2 (black line with triangle on Figure 2)		
5	E-W	1,628
10	E-W	1,609
20	E-W	1,762
Location: BH#2 (black line with square on Figure 2)		
5	N-S	1,436
10	N-S	1,475
20	N-S	1,341

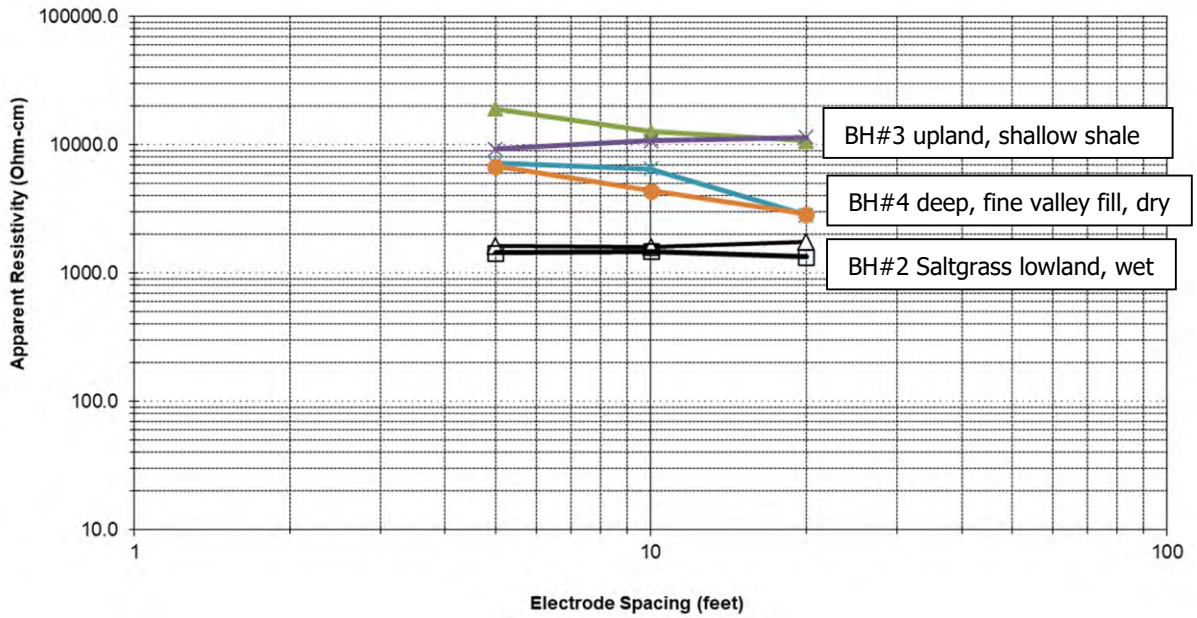

Figure 2. Graph of Field Resistivity – Norrel Parcel

As seen in Table 5 and Figure 2, the three different soil types on the Norrel Parcel exhibit different resistivities with depth (since the greater spacing of the electrodes measures the resistivity characteristics of the deeper soils). The deep valley fill clay soils decreased resistivity (increased conductivity) with depth due to the increase in moisture content with depth and the abundance of salts in the soil that enhance conductivity. The upland, shallow shale soils either slightly increase or slightly decrease with depth due to variable salt content and void spaces within the weathered shale. The low resistivity (high conductivity) of the Saltgrass lowland stayed relatively constant with depth due to the high salt content and uniformly saturated conditions throughout the soil column.

For the Volk 40 Parcel, there is basically one dominant soil type in this irrigated pasture, which is 3-5.5 feet of lean clay soil overlying highly weathered formational shale. We performed the field resistivity test around BH#6. The results of the resistivity testing for the Volk 40 Parcel are shown in Table 6 and Figure 3 below.

Table 6: Field Resistivity Testing Results – Volk 40 Parcel

FIELD RESISTIVITY		
Wenner Spacing (feet)	**Orientation**	**Apparent Res. (Ω-cm)**
Location: BH#6 (black line with triangle on Figure 3)		
5	E-W	2,968
10	E-W	3,256
20	E-W	2,604
Location: BH#6 (black line with square on Figure 3)		
5	N-S	3,064
10	N-S	3,256
20	N-S	3,753

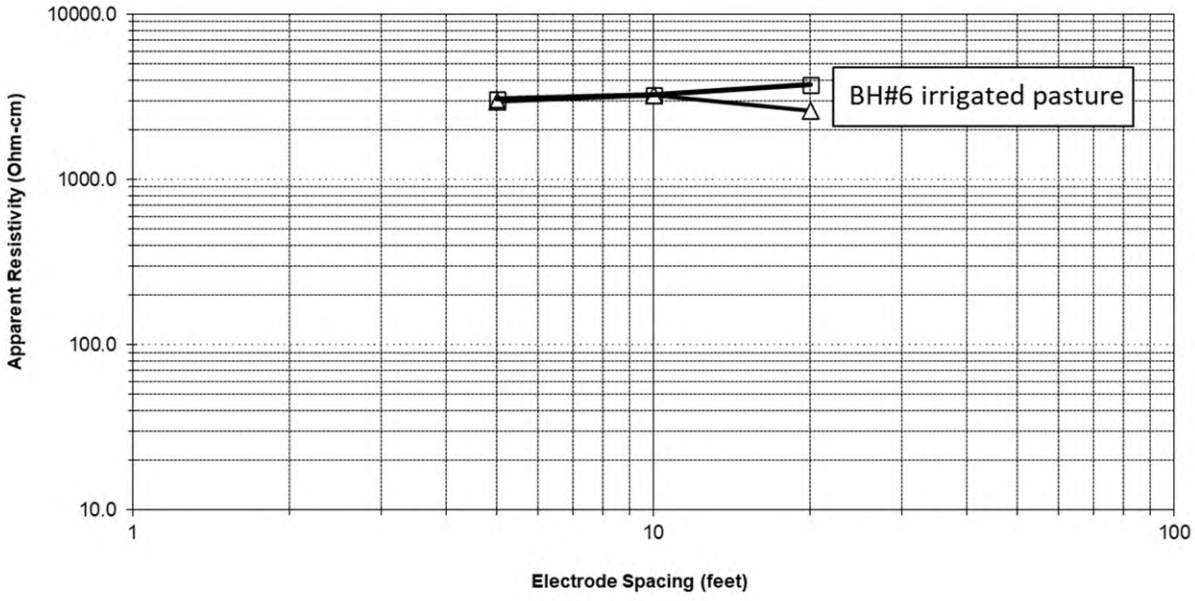

Figure 3. Graph of Field Resistivity – Volk 40 Parcel

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As seen in Table 6 and Figure 3, the resistivities of the lean clay soil over shale on the Volk 40 Parcel either slightly increased or slightly decreased with depth due to variable salt content and void spaces within the weathered shale. These soils have relatively low resistivities (high conductivities) when compared to the upland dry shale. This is likely due to the increased moisture content of the soils and shale due to irrigation, which increases conductivity.

For the Volk Main Parcel, most of the site contains irrigated pasture which consists of lean clay soil overlying highly weathered shale. We performed the field resistivity tests around BH#9 and BH#14. The results of the resistivity testing for the Volk Main Parcel are shown in Table 7 and Figure 4 below.

Table 7: Field Resistivity Testing Results – Volk Main Parcel

FIELD RESISTIVITY		
Wenner Spacing (feet)	**Orientation**	**Apparent Res. (Ω-cm)**
Location: BH#14 (black line with triangle on Figure 2)		
5	E-W	2,681
10	E-W	2,873
20	E-W	3,294
Location: BH#14 (black line with square on Figure 2)		
5	N-S	3,447
10	N-S	3,064
20	N-S	3,370
Location: BH#9 (green line on Figure 2)		
5	E-W	2,585
10	E-W	2,490
20	E-W	2,987
Location: BH#9 (purple line on Figure 2)		
5	N-S	2,202
10	N-S	2,298
20	N-S	2,643

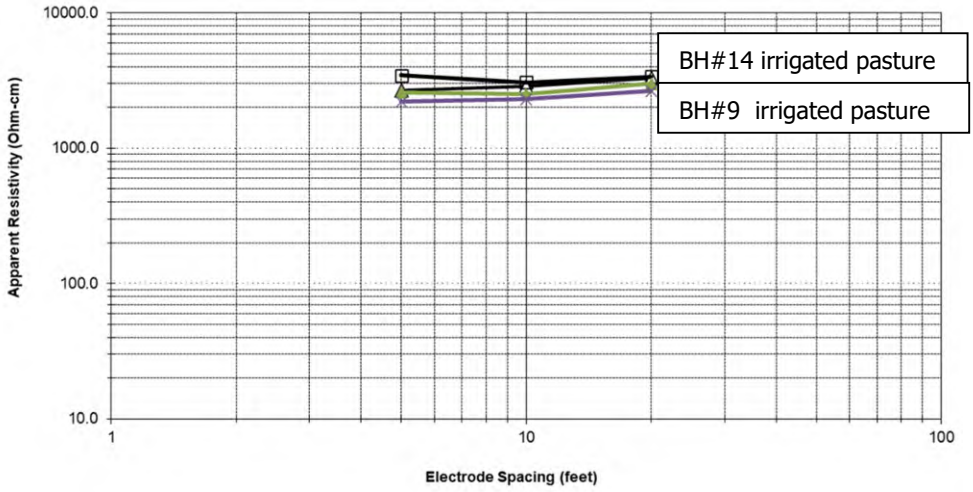

Figure 4. Graph of Field Resistivity – Volk Main Parcel

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As seen in Table 7 and Figure 4, the resistivities of the lean clay soil over shale on the Volk Main Parcel either slightly increased or slightly decreased with depth due to variable salt content and void spaces within the weathered shale. Just as recorded on the Volk 40 Parcel, these soils have relatively low resistivities (high conductivities) when compared to the upland dry shale. This is likely due to the increased moisture content of the soils and shale due to irrigation, which increases conductivity. If irrigation ceases and the soils become drier, it is likely that these soils will increase in resistivity.

7.4 Thermal Resistivity of Soils

We performed thermal resistivity testing using a Tempos Thermal Conductivity Meter with a TR-3 sensor referencing ASTM D5334 (Standard Method for Determination of Thermal Conductivity of Soil and Soft Rock by Thermal Needle Probe Procedure) and IEEE 442-1981 (Guide for Soil Thermal Resistivity Measurements). Based on Standard Proctors presented in Appendix C for the two dominant soil types (fine-grained and shale), thermal resistivity measurements were taken as seen in Table 8 below. According to the Meter Group, the supplier of the Tempos meter used by BEI, soil and rock thermal resistivity (rho) values can vary from 10 to 1,000 °C-cm/Watt and thermal resistivity of porous materials like soil, rock and concrete are not constants because rho varies with density, water content, and temperature of the material (*www.metergroup.com/environment/articles/thermal-resistivity-real-rho-values-for-the-professional-power-engineer*).

Table 8: Thermal Resistivity Testing Results

Sample Information	Compaction Effort	Soil Description	Thermal Resistivity (°C-cm/W)		Moisture Content (%)	Dry Density (lb/ft^3)
			Wet	Dry		
Sample #BS1 BH#1 @1-5'	95.1%	light brown silty CLAY *salts present (ASTM D2488)	87	152	13.6%	109.1
	87.8%		111	204		100.7
Sample #BS2/BS3 BH#8 @1-5'	94.4%	brown silty CLAY with shale *salts present (ASTM D2488)	98	182	17.1%	123.8
	85.5%		120	265		116.4

As seen in these results, thermal resistivity varies widely with soil type, density, and moisture content. For the purposes of this preliminary evaluation, protection of duct bank wiring and conduits should be designed on the worst-case thermal resistivity readings plus a factor of safety (such as 1.5x) to allow for variability in the soils that was not determined in this sample set. Additional thermal resistivity testing is recommended for the various soil types to determine a range of soil thermal properties.

8.0 PRELIMINARY RECOMMENDATIONS

Based upon our limited site evaluation and results of our subsurface testing, it preliminarily appears that the subject property is suitable for the construction of the intended solar farm with special attention to foundation subgrade preparation, foundation design, general site preparation, erosion control, and drainage design. The following preliminary recommendations are offered to enhance the long-term performance of the foundation soils, foundations and site improvements. It should be noted that the measures offered address only the construction at the proposed building site. They cannot and will not arrest or prevent large-scale geologic processes that may be on-going elsewhere on the property and within the Olathe area.

8.1 General Design Criteria

1. The unnamed drainage along the southern edge of the Norrel Parcel is a steep-walled perennial drainage. The margins of the drainage slough or calve into the arroyo as they are undercut by the meandering stream. Even though the stream channel will likely contain flood events due to its deep profile, these events can accelerate erosion of the arroyo margins. Development should be set back from the arroyo's margins and runoff should be managed so that it is not concentrated towards the arroyo, which will accelerate erosion and continued bank failures.

2. The fine-grained soils across all of the parcels are weak and susceptible to erosion. A site grading and drainage plan is necessary to reduce soil loss and potential undermining of roads and structures.

8.2 Seismic Design Criteria

The determination of seismic design criteria are based on ASCE7-16 guidelines and on our knowledge of the site are presented in Section 7.11 of this report. For Site Class D, the maximum spectral response acceleration at short periods (0.2 second, $\mathbf{S_{MS}}$) is 0.459g and at one second ($\mathbf{S_{M1}}$) is 0.17g. See ATC seismic parameter output in Appendix D.

8.3 Foundations for Solar Array Panels

Based on information from the subsurface exploration, and laboratory testing results, and our analysis, the lean clay (valley fill) and residual soils, are both weak (compressible and erodible) and expansive. Similarly, the underlying or outcropping shale is also expansive, moderately plastic, and unsuitable to support spread footings without mitigation such as over-excavation and increased reinforcement. Therefore, it is our opinion the array panels across all three parcels should be supported by a drilled or driven deep foundation system such as micropiles or driven W piles. It is important to mention that since the amounts of cuts for final grading is not known at this time, once plans are available, additional exploration should be performed to determine if other recommendations are needed for alternate conditions.

8.3.1 Micropiles and W-Piles

Micropiles are common in the region and are often preferred over other deep methods due to ease of installation, effectiveness for soft clay and hard shale conditions and where there is shallow groundwater, reasonable cost of installation, and many regional contractors are experienced with this type of installation. Micropiles could either support a grade beam which in turn supports a panel section on a rail or they could directly support a panel section. Hollow bar

micropiles drilled with grout to approximate depths of a minimum of 15 feet embedment into the fine-grained soils or shale bedrock. Micropiles can be designed to provide sufficient bond strength and adequate support for the anticipated loads, are properly installed, and are tested to confirm design loads. Actual amount of embedment can be determined once more information about panel design and loads and panel locations are known. Piles should be installed after site grading is completed with time allowed for settlement.

Alternatively, a driven W-pile system can be used with amount of embedment into the fine-grained soil to be determined. Generally, micropiles have greater skin friction than driven W-piles due to the expansion of the grout sleeve into soft soils; however, the driven piles may have a quicker installation because you do not have to wait for the grout to set. In several areas there is shallow shale. It may not be feasible to drive the piles into the shale. A cost comparison can be performed once more information about panel design and loads are known.

For either type of foundation designers must consider the expansive and compressible nature of the clay soil. When the soil becomes wet both micropiles and driven piles will lose both vertical and lateral capacity.

Since micropiles are a universal tool that can be used throughout the property for panel array foundations as well as inverter and substation support, recommendations for their use are provided here. Micropiles typically consist of 1- to 4-inch diameter steel bars (solid or hollow) that are drilled into competent material or a specified depth and grouted into place. In weak, expansive, rocky, or saturated soils, micropiles must be drilled and grouted deep enough to provide resistance to potential down-drag or uplift forces on the piles, and support the structural loads imposed. For larger structures, reinforced concrete grade beams spanning across the micropiles or micropiles are clustered to share a single pile cap for concentrated loads. The following are generalized design recommendations for a micropile foundation system. Please note that soil depths vary across the site.

1. We recommend a pre-construction meeting with the geotechnical engineer, foundation engineer, general contractor, and micropile contractor to discuss the construction and testing process, obligations of each party, construction materials testing requirements, and flow of information. Ideally, this meeting will take place prior to mobilization of equipment to the site to ensure that proper construction equipment and methods are used for both installation and testing. We recommend the bond ultimate bond strength values in Table 9.

Table 9: Preliminary Micropile Bond Strength

Depth Below Existing Grade (feet)	Soil Description	Ultimate Bond Strength (psi)
0-12	soft clay	5
12-17	stiff clay	7
17+	Shale	30

We recommend these values be verified by a minimum of two sacrificial verification tests conducted at the site well in advance of production installation. These verification tests should be designed to identify the actual ultimate grout-to-ground bond stress in the zone of interest by actual pullout of the micropile bars, without reaching the yield point of the micropile steel. The designer should select an allowable value (factor of safety)

based upon the subsurface conditions, results of testing, and structural considerations. We recommend the use of a factor of safety equal to 1.5 for this site with the verification testing and a minimum factor of safety of 3 without verification testing.

2. Micropile bars should conform to ASTM A615, which necessitates the use of aggressive micropile threads.

3. A contractor with demonstrated successful experience installing micropiles with qualified personnel in similar conditions should be chosen to perform the installations.

4. Continuous observation of the installation should be performed by BEI as a representative of the owner. A log should be maintained detailing the depth and grout pressure and volume of each micropile installation. At least 5% of the production piles should be proof tested for capacity using a proof capacity of at least 1.5 times the design capacity of the pile.

5. Site grading to lower the elevation in or near structural footprints should be performed well in advance of micropile placement to reduce the potential for down drag.

6. We provide L-Pile soil parameters for lateral analysis in Table 10 below.

Table 10: Preliminary L-Pile Soil Parameters

Layer No.	Depth (feet)	LPILE Property (USCS/Rock Classification)	Parameter	Recommended Value
1	0 to 12	Soft Clay without free water (CL)	Effective Unit Weight, γ	117
			Undrained Shear Strength, Su	1,200
			Strain, ε_{50}	0.008
2	12 to 17	Stiff Clay without free water (CL)	Effective Unit Weight, γ	119
			Undrained Shear Strength, Su	3,000
			Strain, ε_{50}	0.006
2	17+	Hard Clay without free water (CL)	Effective Unit Weight, γ	128
			Undrained Shear Strength, Su	7,200
			Strain, ε_{50}	0.004

7. We provide preliminary allowable pile capacities for W6x8.5 piles in Figure 5. As previously noted, soil and shale depths vary across the site. The capacities presented in Figure 5 will vary with the variable shale depths and consistency.

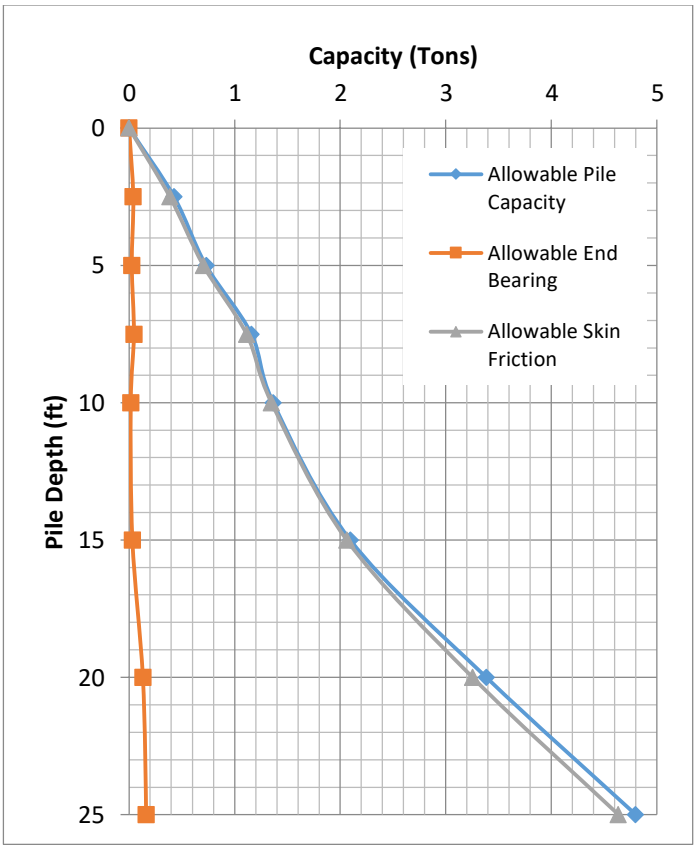


Figure 5. Preliminary W6x8.5 Pile Capacities

8.4 Foundations for Transformers, Inverter Stations, Substation

The exact locations of these features are not known at this time. However, we did evaluate the area in the vicinity of BH#14 (northwest corner of the Volk Main Parcel) for the primary Substation, at the request of the client.

Due to the potential for differential foundation movement on the weak, expansive and erodible soils of the fine-grained valley fill soils and the expansive qualities of the underlying formational shale, micropiles are recommended for all foundations. See Section 8.3.1 for design recommendations using micropiles on these soils.

All concrete used in foundation components at this site in contact with native soil should comply with the recommendations in the *Concrete* Section of these recommendations.

8.5 Lateral Earth Pressures

Currently, there does not appear to be the need for retaining structures. When the site plan is further along in the design phase when cuts and fills are known, we can carry out site-specific investigations of those areas to provide lateral earth pressures and other geotechnical recommendations.

8.6 Site Preparation and Grading

1. The site drainage plan, in tandem with the landscape and grading plans, should ensure that the construction does not impede natural drainage patterns. Surface water should be directed away from foundations both during and after construction. Drainage plans should ensure that precipitation, snowmelt, and runoff are conveyed around and away from the structures as well as roads. This runoff should be dispersed (not concentrated) in a manner consistent with the natural, pre-construction drainage pattern.

2. Development should utilize stormwater "best management practices" for design and construction so that on-site erosion is minimized. This may include selective thinning of vegetation, construction of temporary diversion ditches, silt fencing, and/or dust suppression. The local building official will be able to provide specific details regarding these requirements.

3. Fill needed on sloped areas should be placed on benched keyways to allow adequate placement and compaction of fill material. BEI should observe cut slopes for visual evidence of seepage or planes of weakness and offer remedial measures as appropriate.

4. Grading of all permanent cut and fill slopes should not exceed 2H:1V. Existing or created permanent slopes greater than 2H:1V and over 3 feet in vertical height upon which permanent improvements are constructed and/or where retention or enhancement of current slope stability is desired, should be restrained by an engineered retaining structure/system.

5. Backfill placed in utility trenches leading to the structure should be compacted in accordance with project specifications to inhibit surface water infiltration and migration towards the foundation, as well as minimize post-construction settlement of the trench backfill. We recommend low-permeability check-dams be installed in the trenches at the lot line and the structure to inhibit water flow along any utility trenches.

6. Disturbed areas should be revegetated as soon as practical to reduce soil erosion.

7. Fill used at this site should meet the gradational and compaction requirements listed in Tables 11 and 12 below. Fill should be placed and compacted in maximum 6-inch lifts, unless otherwise directed by the design engineer. Structural fill should not be placed on frozen or wet existing soil or uncompacted fill material. It is recommended that the foundation excavations be open a minimal amount of time (generally less than a few days) to avoid degradation of the foundation soils and covered if exposed to moisture or freezing conditions. Clean native soil material (all deleterious material and over-size rock removed) may be used as structural fill if approved by the design engineer.

Table 11. Gradation Requirements for Fill Material

Type	Sieve	%Passing, by weight
Structural Fill (CDOT Class 6 roadbase)	3/4" (19.0 mm)	100
	#4 (4.75 mm)	30-65
	#8 (2.36 mm)	25-55
	#200 (0.075 mm)	3-12
Structural Fill (CDOT Class 1)	2.5" (63.5 mm)	100
	2" (50 mm)	95-100
	#4 (4.75 mm)	30-65
	#200 (0.075 mm)	3-15
Fill under exterior concrete flatwork	3" (75 mm)	100
	#200 (0.075 mm)	0-5
Free-draining fill	3" (75 mm)	100
	¾" (19 mm)	20-90
	#4 (4.75 mm)	0-20
	#200 (0.075 mm)	0-3

Note: The Plasticity Index for all fill soils should be less than 6.

Table 12. Compaction Requirements for Fill Material

Application	Compaction Requirement	Proctor	Moisture
Under footings and slabs	95% max. dry density	Modified	±2% of optimum
Under exterior flatwork	90% max. dry density	Modified	±2% of optimum
Road Subgrade	95% max. dry density	Standard	0-4% above optimum
Road Subbase	95% max. dry density	Modified	±2% of optimum
Road base course	95% max. dry density	Modified	±2% of optimum
Behind retaining walls	Per project specifications*		
Utility Trenches	Per project specifications*		
General landscaping	Per project specifications*		

*As specified by the design engineer on project documents or in accordance with local municipal requirements.

8. Do not use soil containing organics, debris, topsoil, frozen soil, snow, ice, and other deleterious materials for anything other than landscaping.

9. A representative of BEI should be called out to the site to observe placement of structural fill and verify the compacted density. The owner should contact BEI in advance of the excavations to discuss the specific testing requirements, budget, and scheduling needed for these services.

8.7 Corrosion

Water-soluble sulfate tests conducted on samples of the soil and shale indicate elevated sulfate concentrations and high electro-conductivity. Therefore, we recommend that the cementitious material requirements for Class 2 sulfate exposure in Section 601.04 of CDOT's *Specifications for Road and Bridge Construction* publication be consulted and followed.

According to *Corrosion/Degradation of Soil Reinforcement for Mechanically Stabilized Earth Walls* (FWHW, 2009) the soil clay at the site is "very corrosive" and the granular soil is "corrosive" to steel. Based on that publication and electrical conductivity, in the clay soil we estimate a corrosion rate of 1.2 ounce per square foot per year for carbon steel and 0.35 ounce per square foot per year for galvanized steel. In the granular soil we estimate a corrosion rate of 0.95 ounce per square foot per year for carbon steel and 0.25 ounce per square foot per year for galvanized steel.

8.8 Preliminary Design of Access Roads

The Standard Proctor results of the two dominant soil types are 108.9 pcf at 16.0% optimum moisture content for the lean clay (CL) overburden soils and 133.8 pcf at 6.4% optimum moisture content for the weathered shale (CL). Based on empirical correlations to soil classification we expect California Bearing Ratio (CBR) values for these soils to be about 2.0. We estimated traffic would consist of about 30,000 18-kip axle passes over the life of the roads. Typical road sections would consist of removing organics and scarifying the surface and providing at least 18 inches of subbase and 6-inches of roadbase. Use of a Mirafi fabric (such as Mirafi RS380i or RS580i) would help prevent the migration of the fine-grained soils into the coarse gravels, reduce designed gravel thicknesses, and provide longer life to gravel roadway, especially if heavy equipment will be using the road on a regular basis. We estimate the section thickness would be about 9 inches of roadbase with the RS380i and 8 inches of roadbase with the RS580i.

Due to the high sulfate content in the clay soil we do not recommend using lime or cement to stabilize the soil. Cement and lime will react with the sulfate and cause the soil to heave. With high sulfate soil, lime and cement can be used; however, two treatments with a rest period of two to three months between treatments are necessary.

8.9 Excavation and Shoring

1. Temporary excavations should be in accordance with Occupational Safety and Health Administration (OSHA) regulations and with worker safety in mind.

2. Construction equipment, materials, and soil stockpiles should be located a minimum horizontal distance equal to the height of the excavation from the crest of the excavation unless otherwise approved by the design engineer.

3. The contractor's "competent person" (defined by OSHA as "an individual capable of identifying existing and predictable hazards…and who has the authorization to take prompt corrective measures to eliminate or manage these hazards and conditions) should evaluate the soil materials exposed during excavation based on composition, structure, and environmental conditions per 29 CFR 1926 and recommend appropriate slope laybacks or shoring, as required. Refer to OSHA's Technical Manual Section V: Chapter 2 on *Excavations: Hazard Recognition in Trenching and Shoring* (available on-line at: *www.osha.gov*) for further excavation guidelines. We can provide these services, as requested.

4. If the excavations will be made or remain open during wet weather, it is recommended that polyethylene sheeting be secured over the excavation face to minimize sediment

runoff and deterioration of the foundation soils. Surface runoff above the cuts should be directed away from the excavation using berms or diversion ditches.

9.0 CLOSING CONSIDERATIONS

The report is considered preliminary and recommendations herein are subject to revision based on review of final site grading and structural plans.

9.1 Recommended Additional Services

As this project advances, we recommend the following additional geotechnical services:

- Review structural loads and final layouts to evaluate the need for additional explorations.
- Provide supplemental exploration and lab testing to provide final recommendations for foundation designs and gravel road design.
- Review site grading plans to determine extents of cuts and fills and possible need for additional test pits or drilling.
- Determine the need for retaining walls based on proposed cuts and fills and provide lateral earth pressures for soil types encountered.
- Perform additional thermal resistivity and field resistivity readings at multiple locations and soil types, if determined necessary by the electrical design engineer.

9.2 Standard of Care and Interpretation of Subsurface Data

This report has been prepared in a manner consistent with local standards of professional geotechnical engineering practice. Evaluation of environmental contaminants was not part of our scope of services performed at this site. The classification of soils and interpretation of subsurface conditions is based on our training and years of experience but is necessarily based on limited subsurface observation and testing. As such, inferred ground conditions cannot be guaranteed to be exact. No other warranty, express or implied, is made.

If subsurface conditions differing from those described herein are discovered during excavation, construction should be stopped until the situation has been assessed by a representative of BEI. Construction should be resumed only when remedies or design adjustments, as necessary, have been prescribed.

9.3 Use of This Report

This report is intended for use by the design team specifically to address the site and subsurface conditions as they relate to the proposed structure(s) described in the *Construction Plans* Section. Changes to the site or proposed development plans may alter or invalidate the recommendations contained herein.

BEI retains an ownership and property interest in this report. Consistent with the industry, copies of this document that may be relied upon by the design team are limited to those that are signed and sealed by the Geotechnical Engineer (*Standard Form of Agreement Between Owner and Geotechnical Engineer for Professional Services*, Engineer's Joint Contract Documents Committee, 1996). This report together with ancillary data, analyses, test results, and other components and/or supporting parts are not intended or represented to be suitable

for reuse by the design team or others on extensions to this project or on any other project. Any such reuse or modification invalidates all aspects of the report and excuses the Geotechnical Engineer for all responsibility and liability or legal exposure.

This report is considered valid for a period of two years from the date of issue provided the site conditions and development plans have not changed from what is referenced in this report. Changes to the site may occur due to development or natural processes. Additionally, technological advances made in construction and changes in legislation may alter the recommendations made herein. Depending upon the site and proposed development changes, BEI may require additional evaluation (at additional cost) to update the recommendations contained herein.

9.4 Retention of Samples

Samples of soil and rock collected during the course of our geotechnical evaluation(s) are routinely held in our laboratory for a period of three months from the date of the evaluation and then are discarded. A written request by the client or design team is required for samples to be stored for a longer period.

10.0 REFERENCES

Boulanger, R.W. and I.M. Idriss. 2006. *Liquefaction Susceptibility Criteria for Silts and Clays*, Journal of Geotechnical and Geoenvironmental Engineering, ASCE, November 2006, pp. 1413-1426.

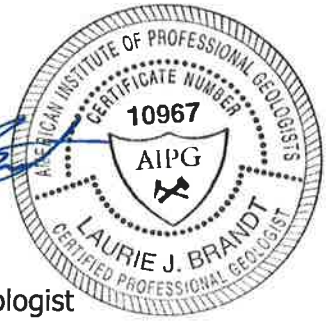
Noe, D.C., Morgan, M.L. and S.M. Townley. 2013. *Geologic Map of the Olathe Northwest Quadrangle, Delta and Montrose Counties, Colorado*, Colorado Geological Survey Open-File Report OF-13-07.

11.0 ADDITIONAL SERVICES

To provide continuity and consistency from project start to finish, we should be retained to make observations and carry out material testing as a service to the owner. As noted above, we recommend the owner contact us to discuss required services and scheduling in advance of the construction phase. BEI is a full-service engineering firm providing foundation, site grading and drainage, structural and retaining structure design services, as well as surveying, construction materials testing, and inspections.

Thank you for the opportunity to perform this geotechnical evaluation for you. If you require any of the above services or have any questions regarding this report, please contact us.

Respectfully Submitted



Laurie J. Brandt, C.P.G.
Certified Professional Geologist
Buckhorn Engineering, Inc.

Dennis A. Russell, PE
Senior Geotechnical Engineer
DOWL, LLC

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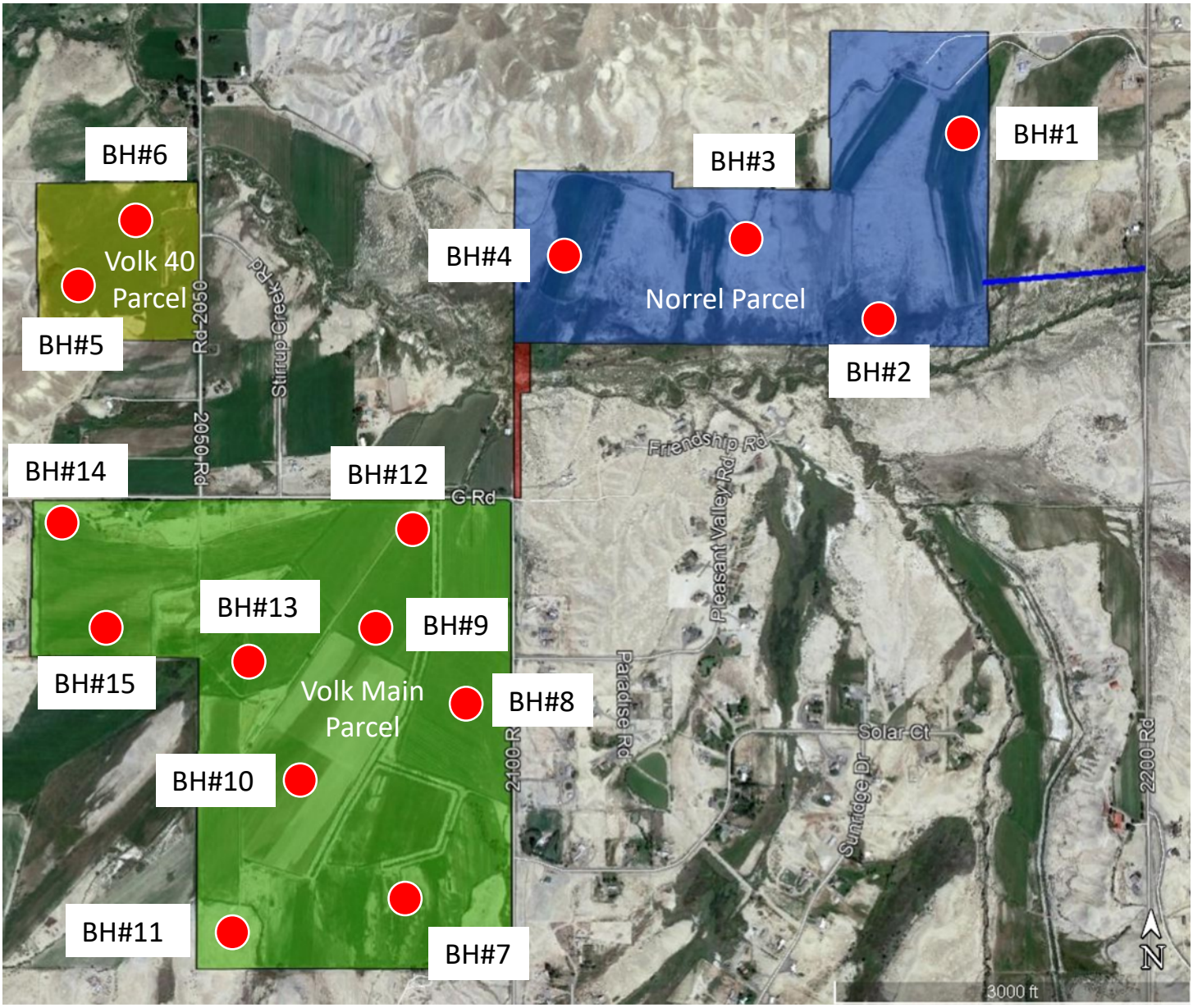
APPENDIX A - PROJECT MAPS

BUCKHORN ENGINEERING

Citra Power, LLC
Garnet Mesa Solar
Delta County, Colorado

Drafted By: L. Brandt	Project #2021-010-GEO
Date: May 2021	Map 1 – Vicinity Map



BH#1 – BH#15 Borehole locations

(Google Earth image)

BUCKHORN ENGINEERING	Citra Power, LLC Garnet Mesa Solar Delta County, Colorado
Drafted By: L. Brandt	Project #2021-010-GEO
Date: May 2021	Map 2 – Borehole Location Map

APPENDIX B - BOREHOLE LOGS

Log of Borehole #1 (BH#1)

BOREHOLE LOCATION: northwest Norrel parcel

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) / WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
0							light brown, dry, very stiff, lean CLAY (CL); salts (0-7.5')	DS1 @2.5-4' water soluble sulfates=1.73% chlorides=0.008% Electro-conductivity=1850 µS/cm pH=7.6 MC=7.3% DS2 @5-6.5' (CL) LL=31 PL=14 PI=17 gravel=00.0% sand=9.3% silt=29.6% clay=61.1% 5.08% swell @100psf+H²O Constant Volume SP=1370psf TM=6.77% @4000psf+H²O MC=11.4% DD=114.6pcf DS3 @7.5-9' MC=11.3% DS4 @10-11.5' MC=11.2% DD= 118.4pcf DS5 @15-16' MC=11.1%
		STD	DS1	8 10 11	21			
5		CA	DS2	6 10 14	24	17		
		STD	DS3	10 15 19			brown to gray-brown, moist, highly weathered MANCOS SHALE with lean clay (CL), extremely weak rock (R0): salts: fissile (7.5-16')	
10		CA	DS4	15 24 50/5"	50/5"	35/5"		
15		STD	DS5	19 40	59		end of hole at 16' no groundwater encountered bedrock (shale) at 7.5'	
20								
25								

Borehole Log 1 of 15	Field Staff: LB Drafting Staff: SJ Field Date: 4/5/2021 Project #: 2021-010-GEO	Garnet Mesa Solar Delta, Colorado

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222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

Log of Borehole #2 (BH#2)

BOREHOLE LOCATION: southeast portion of Norrel parcel

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) / WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							black, very soft, clayey topsoil with roots (OL/OH) (0-1')	
▽							light brown, wet, very soft, lean CLAY (CL) (1-10.5') groundwater encountered at 2'	DS6 @2.5-4' MC=29.3%
		STD	DS6	0 1 1	2			
5		CA	DS7	1 1 1	2	2		DS7 @5-6.5' MC=27.7% DD= 93.4pcf
		STD	DS8	0 1	1			DS8 @7.5-9' MC=25.6%
10		STD	DS9	3 6 10	16		gray-brown, moist, highly weathered SHALE with lean clay (CL), extremely weak rock (R0); salts; fissile (10.5-15.8')	DS9 @10-11.5' MC=16.8%
15		CA	DS10	28 50/3"	50/3"			DS10 @15-15.8' MC=13.9% DD= 116.0pcf
							end of hole at 15.8' groundwater encountered at 2' bedrock (shale) at 10.5'	
20								
25								

Borehole Log 2 of 15	Field Staff	LB	Garnet Mesa Solar Delta, Colorado
	Drafting Staff	SJ	
	Field Date	4/5/2021	
	Project #	2021-010-GEO	

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222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

Log of Borehole #3 (BH#3)

BOREHOLE LOCATION: central Norrel parcel

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							light brown, dry, soft, lean CLAY (CL) (0-1')	
							gray-brown, dry, hard, highly weathered SHALE with lean clay (CL), extremely weak rock (R0); salts; fissile (1-12')	DS11 @2.5-4' water soluble sulfates=1.57% chlorides=0.051% Electro-conductivity=+3999µS/cm pH=8.0 MC=8.1% DS12 @5-6.5' MC=6.6%
		STD	DS11	13 21 23	44			
5		STD	DS12	14 23 28	51			
		STD	DS13	18 28 27	55			
10		STD	DS14	28 26 27	53			
							gray, dry, less weathered SHALE, extremely weak to very weak rock (R0-R1); salts; fissile (12-15.1')	
15		STD	DS15	15/1	bounce			
							end of hole at 15.1' no groundwater encountered weathered shale (bedrock) encountered at 1' less weathered shale at 12'	
20								
25								

Borehole Log 3 of 15	Field Staff	LB	Garnet Mesa Solar Delta, Colorado
	Drafting Staff	SJ	
	Field Date	4/5/2021	
	Project #	2021-010-GEO	

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Log of Borehole #4 (BH#4)

BOREHOLE LOCATION: west portion Norrel parcel

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							dry to moist, medium stiff, lean CLAY (CL) (0-16.5')	
			BS1	4				
		CA	DS16	4	9	6		DS16 @2.5-4' MC=4.1% DD= 91.8pcf
				5				
5				4				
		STD	DS17	5	8			DS17 @5-6.5' MC=8.6%
				3				
				4			moist below 7.5'	DS18 @7.5-9' (CL) LL=32 PL=15 PI=17 gravel=0.0% sand=17.5% silt=32.7% clay=49.8% MC=17.7%
		CA	DS18	4	10	7		
				6				
10				2				
		STD	DS19	2	5			DS19 @10-11.5' MC=20.1%
				3				
15				3				
		CA	DS20	3	7	5		DS20 @15-16.5' water soluble sulfates=1.08% chlorides=0.030% Electro-conductivity=2100 µS/cm pH=7.7 MC=23.8%
				4				
							end of hole at 16.5' no groundwater or bedrock encountered	
20								
25								

Borehole Log 4 of 15	Field Staff: LB Drafting Staff: SJ Field Date: 4/5/2021 Project #: 2021-010-GEO	Garnet Mesa Solar Delta, Colorado

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Log of Borehole #5 (BH#5)

BOREHOLE LOCATION: upper southwest BH on Volk 40

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							topsoil and grass roots (0-0.5')	
		STD	DS21	4 8 13	21		brown, moist, very stiff, lean CLAY (CL); salts; occasional gravels in upper 1-2' (0.5-5.5')	DS21 @2.5-5' (CL) LL=32 PL=17 PI=15 gravel=00.0% sand=10.9% silt=36.3% clay=52.8% MC=14.0%
5		CA	DS22	14 20 36	56	39	gray-brown, moist, hard, highly weathered SHALE with lean clay (CL) extremely weak rock (R0); salts; fissile; less weathering with depth (5.5-15.3')	DS22 @5-6.5' 2.35% swell @100psf+H²O constant volume SP=710psf TM=3.58% @4000psf+H²O MC=10.3% DD=111.9pcf
		STD	DS23	10 23 35	58			DS23 @7.5-9' (CL) LL=44 PL=19 PI=25 gravel=00.0% sand=3.1% silt=37.6% clay=59.3% MC=11.1%
10		STD	DS24	15 19 26	45			DS24 @10-11.5' water soluble sulfates=0.84% chlorides=0.006% Electro-conductivity=2136 µS/cm pH=7.6
15		STD	DS25	50/4"	50/4"		end of hole at 15.3' no groundwater encountered shale at 5.5'	
20								
25								

Borehole Log 5 of 15	Field Staff: LB Drafting Staff: SJ Field Date: 4/5/2021 Project #: 2021-010-GEO	Garnet Mesa Solar Delta, Colorado

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Log of Borehole #6 (BH#6)

BOREHOLE LOCATION: lower northeast BH on Volk 40

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							topsoil and grass roots (0-0.5')	
							brown, moist, very stiff, lean CLAY (CL) (0.5-3')	DS26 @2.5-4' water soluble sulfates=1.64% chlorides=0.045% Electro-conductivity=1829 µS/cm pH=7.7 MC=13.8% DD= 110.8pcf
		CA	DS26	10 17 20	37	26	brown to gray-brown, hard, highly weathered SHALE with lean clay (CL), extremely weak rock (R0); salts; fissile; less weathering with depth (3-16.4')	
5		STD	DS27	9 10 11	21			
		CA	DS28	13 18 23	41	29		DS28 @7.5-9' 1.75% swell @100psf+H²O constant volume SP=540psf TM=3.54% @4000psf+H²O MC=10.6% DD=113.2pcf
10		STD	DS29	15 23 27	50			
15		STD	DS30	20 23 50/5"	50/5"			
							end of hole at 16.4' no groundwater encountered shale at 3'	
20								
25								

Borehole Log 6 of 15	Field Staff	LB	Garnet Mesa Solar Delta, Colorado
	Drafting Staff	SJ	
	Field Date	4/5/2021	
	Project #	2021-010-GEO	

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Log of Borehole #7 (BH#7)

BOREHOLE LOCATION: southeast corner of Volk Main parcel

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) / WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							light brown, moist, medium stiff, lean CLAY with salts, grass roots (CL) (0-1.5')	
							brown to gray-brown, moist to dry, highly weathered SHALE with lean clay (CL), extremely weak rock (R0); salts; fissile (1.5-16.5')	
		STD	DS31	6 9 11	20			DS31 @2.5-4' MC=16.5%
5		CA	DS32	8 12 18	30	21		DS32 @5-6.5' MC=15.7% DD= 110.0pcf
		STD	DS33	9 11 16	27			DS33 @7.5-9' MC=15.9%
10		CA	DS34	10 13 21	34	24		DS34 @10-11.5' MC=17.1% DD= 101.3pcf
15		STD	DS35	20 23 40	63		moist zones within shale	DS35 @15-16.5' MC=10.2%
							end of hole at 16.5' no groundwater encountered shale bedrock at 1.5'	
20								
25								

Borehole Log 7 of 15	Field Staff	LB	Garnet Mesa Solar Delta, Colorado
	Drafting Staff	SJ	
	Field Date	4/6/2021	
	Project #	2021-010-GEO	

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Log of Borehole #8 (BH#8)

BOREHOLE LOCATION: east central edge of Volk Manin parcel

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
0							dark brown, moist, TOPSOIL and grass roots (0-0.5')	
		STD	BS2	12			gray-brown to gray, moist to dry, very stiff to hard, highly weathered SHALE with lean clay (CL), extremely weak rock (R0); salts; fissile; less weathering with depth (0.5-16.5')	
		STD	DS36	15 16	31			
5				14				DS37 @5-6.5' MC=9.8% DD= 115.9pcf
		CA	DS37	18 22	40	28		
				10				
		STD	DS38	17 29	46			
10				17				
		STD	DS39	26 22	48			
15				20				DS40 @15-16.5' MC=7.6%
		STD	DS40	22 18	40			
							end of hole at 16.5' no groundwater encountered shale bedrock at 0.5'	
20								
25								

Borehole Log 8 of 15	Field Staff: LB Drafting Staff: SJ Field Date: 4/6/2021 Project #: 2021-010-GEO	Garnet Mesa Solar Delta, Colorado

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Log of Borehole #9 (BH#9)

BOREHOLE LOCATION: northeast quadrant of Volk Main parcel

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							dark brown, moist, TOPSOIL and grass roots (0-0.5')	
							brown, moist, very stiff, lean CLAY (CL); salts (0.5-3')	
		STD	DS41	6 11 16	27		brown to gray, moist to dry, hard, highly weathered SHALE with lean clay (CL), extremely weak rock (R0); salts; fissile (3-16.2')	DS41 @2.5-4' MC=14.3%
5		STD	DS42	10 14 17	31			DS42 @5-6.5' MC=12.9%
		STD	DS43	12 14 22	36			DS43 @7.5-9' MC=13.9%
10		STD	DS44	23 43 -	66			DS44 @10-11.5' MC=8.2%
15		STD	DS50	21 26 50/2"	50/2"			DS50 @15-16.5' MC=9.2%
							end of hole at 16.2' no groundwater encountered shale bedrock at 3'	
20								
25								

Borehole Log 9 of 15	Field Staff	LB	Garnet Mesa Solar Delta, Colorado
	Drafting Staff	SJ	
	Field Date	4/6/2021	
	Project #	2021-010-GEO	

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Log of Borehole #10 (BH#10)

BOREHOLE LOCATION: southwest quadrant of Volk Main parcel

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) / WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							light brown, dry, stiff, lean CLAY (CL); salts (0-2')	
		STD	BS3	7			brown to gray-brown, medium stiff to hard, weathered SHALE with lean clay (CL), extremely weak rock (R0); salts; fissile; less weathering with depth (2-16.5')	
		STD	DS51	12	31			
				19				
5				7				
		STD	DS52	11	26			
				15				
				17				
		STD	DS53	13	29			DS53 @7.5-9' (CL) LL=43 PL=20 PI=23 gravel=00.0% sand=4.1% silt=35.1% clay=60.8% MC=11.9%
				16				
10				18				
		STD	DS54	33	51			
				18				
▽							groundwater encountered at 14'	
15				13				
		STD	DS55	20	46			DS55 @15-16.5' MC=15.6%
				26				
							end of hole at 16.5' groundwater encountered at 14' shale bedrock at 2'	
20								
25								

Borehole Log 10 of 15	Field Staff: LB Drafting Staff: SJ Field Date: 4/6/2021 Project #: 2021-010-GEO	Garnet Mesa Solar Delta, Colorado

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Log of Borehole #11 (BH#11)

BOREHOLE LOCATION: southwest corner of Volk Main parcel

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) / WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							light brown, dry, medium stiff, lean CLAY (CL) (0-0.5')	
							gray-brown to gray, dry, highly weathered SHALE with lean clay (CL), extremely weak rock (R0); abundant salts (0.5-16.5')	
		STD	DS56	10 14 21	35			
5		STD	DS57	11 11 11	22			DS57 @5-6.5' MC=7.5%
		STD	DS58	18 15 18	33			
10		STD	DS59	10 14 15	29			
15		STD	DS60	22 22 24	46			DS60 @15-16.5' MC=9.6%
							end of hole at 16.5' no groundwater encountered shale bedrock at 0.5'	
20								
25								

Borehole Log 11 of 15	Field Staff	LB	Garnet Mesa Solar Delta, Colorado
	Drafting Staff	SJ	
	Field Date	4/6/2021	
	Project #	2021-010-GEO	

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Log of Borehole #12 (BH#12)

BOREHOLE LOCATION: northeast corner of Volk Main parcel

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) / WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							light brown, dry, medium stiff, lean CLAY (CL) (0-1')	
							gray-brown to gray, dry to moist, very stiff to hard, highly weathered SHALE with lean clay (CL), extremely weak rock (R0); salts, fissile (1-15.4')	
		STD	DS61	16 24 30	54			DS61 @2.5-4' MC=7.0%
5		STD	DS62	15 18 17	35			
		STD	DS63	11 12 18	30			DS63 @7.5-9' MC=10.9%
10		STD	DS64	32 29 -	51			
15 ▽			DS65	50/4.5"	50/4.5"			DS65 @15-15.4' MC=8.6%
							end of hole at 15.4' groundwater encountered at 15' shale bedrock at 1'	
20								
25								

Borehole Log 12 of 15	Field Staff	LB	Garnet Mesa Solar Delta, Colorado
	Drafting Staff	SJ	
	Field Date	4/6/2021	
	Project #	2021-010-GEO	

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Log of Borehole #13 (BH#13)

BOREHOLE LOCATION: north of corral area, west edge

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							light brown, dry, medium stiff, lean CLAY with some grass roots (CL) (0-1')	
		STD	DS66	9 12 15	27		gray -brown to gray, dry to moist, very stiff to hard, highly weathered SHALE with lean clay (CL), extremely weak rock (R0); salts; fissile (1-16.5')	DS66 @2.5-4' MC=14.5%
5		CA	DS67	11 21 38	59	41		DS67 @5-6.5' MC=12.2% DD= 114.4pcf
		STD	DS68	13 15 15	30			
10		STD	DS69	15 31 27	58		groundwater encountered at 11.5'	DS69 @10-11.5' MC=8.9%
15		STD	DS70	20 23 24	47			DS70 @15-16.5' MC=10.3%
							end of hole at 16.5' groundwater encountered at 11.5' shale bedrock at 1'	
20								
25								

Borehole Log 13 of 15	Field Staff	LB	Garnet Mesa Solar Delta, Colorado
	Drafting Staff	SJ	
	Field Date	4/6/2021	
	Project #	2021-010-GEO	

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Log of Borehole #14 (BH#14)

BOREHOLE LOCATION: southwest quadrant of Volk Main parcel

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							light brown, moist, clay loam TOPSOIL w/ grass roots (0-0.5')	DS71 @2.5-4'
							light brown, moist, stiff, lean CLAY (CL) (0.5-3')	3.79% swell @100psf+H²O constant volume SP=1730psf TM=4.67% @4000psf+H²O MC=13.2% DD=113.3pcf
		CA	DS71	16 31 40	71	50	gray-brown to gray, dry to moist, very stiff to hard, highly weathered SHALE with lean clay (CL), extremely weak rock (R0); salts; some harder layers within shale (<3-4" thick) (3-25.5')	
5		STD	DS72	11 11 11	22			DS72 @5-6.5' water soluble sulfates=1.56% chlorides=0.048% Electro-conductivity=1910 µS/cm pH=7.7 MC=10.5%
		CA	DS73	12 17 22	39	27		DS73 @7.5-9' 0.62% swell @100psf+H²O constant volume SP=230psf TM=4.78% @4000psf+H²O MC=10.7% DD=105.4pcf
10		STD	DS74	16 25 24	49			DS74 @10-11.5' MC=9.4%
15 ▽		STD	DS75	26 50/5"	50/5"		groundwater encountered at 15.5'	DS75 @15-16.5' MC=8.8%
20		STD	DS76	16 22 25	47			DS76 @20-21.5' MC=15.9%
25		STD	DS77	50/5.5"	50/5.5"		end of hole at 25.5' groundwater encountered at 15.5' shale bedrock at 3'	DS77 @25-25.5' MC=15.9%

Borehole Log 14 of 15	Field Staff: LB Drafting Staff: SJ Field Date: 4/7/2021 Project #: 2021-010-GEO	Garnet Mesa Solar Delta, Colorado

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Log of Borehole #15 (BH#15)

BOREHOLE LOCATION: northwest quadrant of Volk Main parcel

DRILLING COMPANY: CO Drilling - Scott | DRILL RIG: Simco 2800

SAMPLER: CA / STD SPT | DRILL STEM: 4 1/4" SSA

DEPTH (ft) / WATER LEVEL	GRAPHIC	SAMPLE	SAMPLE #	FIELD BLOW COUNTS	FIELD "N" VALUE (BPF)	CORRECTED "N" VALUE (BPF)	SUBSURFACE DESCRIPTION	FIELD & LABORATORY TEST RESULTS
							dark brown, TOPSOIL and grass roots (0-0.5')	
		CA	DS78	2 2 2	4	3	light brown, wet, soft to medium stiff, lean CLAY (CL) (0.5-6')	DS78 @2.5-4' (CL) LL=28 PL=17 PI=11 gravel=00.0% sand=12.7% silt=48.1% clay=39.2% 0.18% swell @100psf+H²O constant volume SP=190psf TM=5.15% @4000psf+H²O MC=30.8% DD=90.8pcf
5		CA	DS79	2 4 9	13	9		DS79 @5-6.5' MC=20.6% DD= 102.6pcf
		STD	DS80	12 15 17	32		gray-brown to gray, moist to dry, very stiff to hard, highly weathered SHALE with lean clay (CL), extremely weak rock (R0); salts (6-16')	
10		STD	DS81	16 18 21	39			
▽							groundwater encountered at 12'	
15		STD	DS82	29 48	77			
							end of hole at 16' groundwater encountered at 12' shale bedrock encountered at 6'	
20								
25								

Borehole Log 15 of 15	Field Staff	LB	Garnet Mesa Solar Delta, Colorado
	Drafting Staff	SJ	
	Field Date	4/7/2021	
	Project #	2021-010-GEO	

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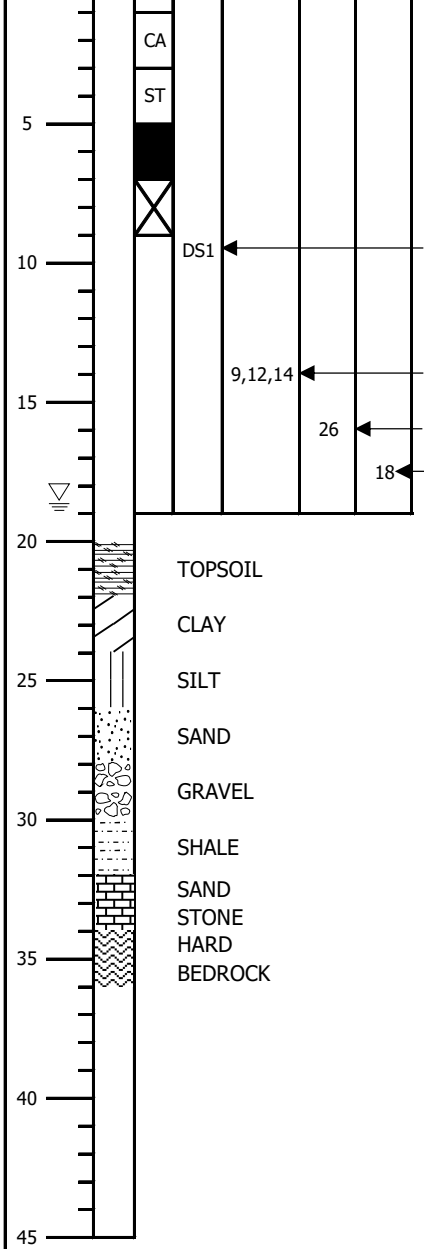
BOREHOLE LOG KEY

BOREHOLE LOCATION:

DRILLING COMPANY: DRILL RIG:

SAMPLER DRILL STEM:



SUBSURFACE DESCRIPTION

drive sample, California sampler

drive sample, standard sampler

core sample

bulk sample, obtained from augers

Sample identifier: DS = Drive sample
BS = Bulk sample from augers
CS = Core sample
GS = Grab sample

Blows required to drive sampler 6" three times; first 6" is considered to be the "seating" drive

Indicates 26 blows required to drive the sampler 12 inches

Indicates blows/foot (BPF) using a 140-lb hammer falling 30" free water depth at time of drilling

Unified Soil Classification System (ASTM D-2487)

CL = lean clay to sandy/gravelly lean clay
ML = silt to sandy/gravelly silt
CH = high plasticity clay to sandy/gravelly high plasticity clay
MH = high elasticity silt to sandy/gravelly high elasticity silt
SW = well-graded sand or well-graded sand with gravel
SP = poorly graded sand or poorly graded sand with gravel
SM = silty sand to silty sand with gravel
SC = clayey sand to clayey sand with gravel
GW = well-graded gravel or well-gravel with sand
GP = poorly graded gravel or poorly graded gravel with sand
GM = silty gravel or silty gravel with sand
GC = clayey gravel or clayey gravel with sand

Rock Weathering Classification

W1 = Fresh
W2 = Slightly weathered
W3 = Moderately weathered
W4 = Highly weathered
W5 = Completely weathered
W6 = Residual soil, no structure
RQD = Rock Quality Designation

Intact Rock Strength Classification

R0 = Extremely weak rock, 35-150 psi
R1 = Very weak rock, 150-725 psi
R2 = Weak rock, 725-3,625 psi
R3 = Medium strong rock, 3,625-7,250 psi
R4 = Strong rock, 7,250-14,500 psi
R5 = Very strong rock, 14,500-36,000 psi
R6 = Extremely strong rock, >36,000 psi

FIELD & LABORATORY TEST RESULTS

Notes in this column indicate tests performed and test results:

DD: dry density, pcf
MC: moisture content, %
LL: liquid limit
PL: plastic limit
PI: plasticity index
GF: gravel fraction, %
SF: sand fraction, %
Fines: silt/clay, %
Sh: Shear resistance
P: Penetration resistance
CBR: California Bearing Ratio
SP: swelling pressure
TM: total movement
UCS: unconfined compressive strength
psf: pounds per square foot
pcf: pounds per cubic foot
psi: pounds per square inch

N value	Relative density
sands (non-cohesive soils)	
0-4	very loose
4-10	loose
10-30	medium
30-50	dense
>50	very dense
clays (cohesive soils)	
<2	very soft
2-4	soft
4-8	medium
8-15	stiff
15-30	very stiff
>30	hard

Borehole Log	Field Staff	Borehole Log Key
	Drafting Staff	
	Field Date	
of	Project #	

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FIELD SOIL IDENTIFICATION TERMS

Relative Density of Cohesionless Soils

Description	Field Identification	N Value
Very Loose	Easily penetrated with hand shovel	0-4
Loose	Easily penetrated with 1/2" rebar pushed by hand; easily excavated with hand shovel	4-10
Moderately Dense	Easily penetrated with 1/2" rebar driven with 5 lb. hammer; difficult to excavate with hand shovel	10-30
Dense	Penetrated 1 ft. with driven rebar; must be loosened with pick to excavate	30-50
Very Dense	Penetrated only a few inches with driven rebar; very difficult to excavate even with pick	>50

Consistency & Relative Density of Cohesive Soils

Description	Field Identification	Undrained Shear Strength (psf)	N Value (Approx.)
Very Soft	Extrudes between fingers when squeezed	<250	0-2
Soft	Molded by light finger pressure	250-500	2-4
Firm	Molded by strong finger pressure	500-1,000	4-8
Stiff	Indented by thumb	1,000-2,000	8-15
Very Stiff	Indented by thumbnail	2,000-4,000	15-30
Hard	Difficult to indent with thumbnail	>4,000	>30

Soil Constituents

Modifier	trace	little	some	-ey or -y	and
% (by weight)	0 - 5	5 - 12	12 - 20	20 - 30	>30

Sheet	Field Staff	Field Soil Identification Terms	BUCKHORN ENGINEERING 222 South Park Avenue Montrose, Colorado 81401 970-249-6828
1	Drafting Staff		
of 1	Field Date		
	Project #		

APPENDIX C - LABORATORY RESULTS

Summary Table of Laboratory Results for Garnet Mesa Solar

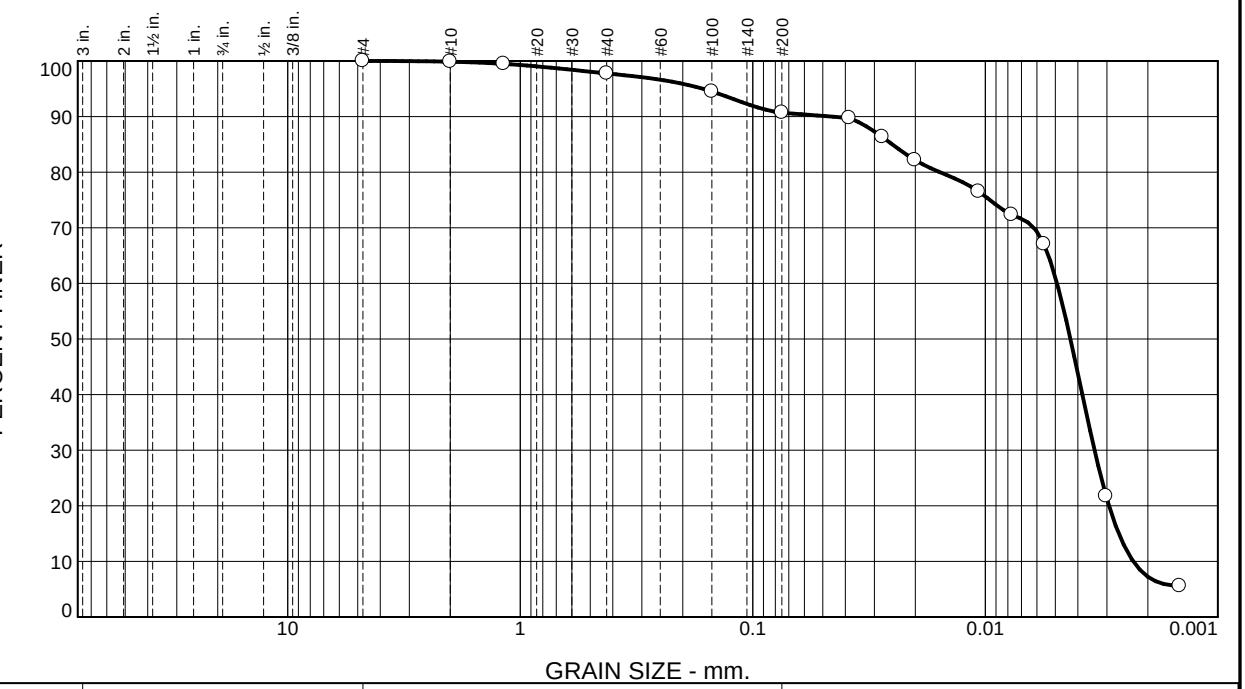
Borehole #	Sample #	USCS Classifi-cation	Sample Depth	Moisture content	Atterberg Limits*			Sieve Analysis				Dry Density	Swell/ Consolidation		
								%	%	% Fines			Free Swell Pressure	Swell Potential @100psf	Total Consoli-dation @2,000psf
			(ft)	(%)	LL	PL	PI	gravel	sand	silt	clay	pcf	(psf)	(%)	(%)
BH#1	DS1	CL	2.5	7.3%											
BH#1	DS2	CL	5	11.4%	31	14	17	0.0	9.3	29.6	61.1	114.6	2,200	5.1	6.8**
BH#1	DS3	shale	7.5	11.3%											
BH#1	DS4	shale	10	11.2%								118.4			
BH#1	DS5	shale	15	11.1%											
BH#2	DS6	CL	2.5	29.3%											
BH#2	DS7	CL	5	27.7%								93.4			
BH#2	DS8	CL	7.5	25.6%											
BH#2	DS9	CL/shale	10	16.8%											
BH#2	DS10	CL/shale	15	13.9%								116.0			
BH#3	DS11	shale	2.5	8.1%											
BH#3	DS12	shale	5	6.6%											
BH#4	DS16	CL	2.5	4.1%								91.8			
BH#4	DS17	CL	5	8.6%											
BH#4	DS18	CL	7.5	17.7%	32	15	17	0.0	17.5	32.7	49.8	101.5			
BH#4	DS19	CL	10	20.1%											
BH#4	DS20	CL	15	23.8%								101.5			
BH#5	DS21	CL	2.5	14.0%	32	17	15	0.0	10.9	36.3	52.8				
BH#5	DS22	CL	5	10.3%								111.9	1,100	2.4	3.6
BH#5	DS23	CL/shale	7.5	11.1%	44	19	25	0.0	3.1	37.6	59.3				
BH#6	DS26	CL/shale	2.5	13.8%								110.8			
BH#6	DS28	CL/shale	7.5	10.6%								113.2	800	1.80	3.5
BH#7	DS31	CL	2.5	16.5%											
BH#7	DS32	CL/shale	5	15.7%								110.0			
BH#7	DS33	CL/shale	7.5	15.9%											
BH#7	DS34	CL/shale	10	17.1%								101.3			
BH#7	DS35	shale	15	10.2%											
BH#8	DS37	CL/shale	5	9.8%								115.9			
BH#8	DS40	shale	15	7.6%											
BH#9	DS41	CL/shale	2.5	14.3%											
BH#9	DS42	CL/shale	5	12.9%											
BH#9	DS43	CL/shale	7.5	13.9%											
BH#9	DS44	shale	10	8.2%											
BH#9	DS50	shale	15	9.2%											
BH#10	DS53	CL/shale	7.5	11.9%	43	20	23	0.0	4.1	35.1	60.8				
BH#10	DS55	CL/shale	15	15.6%											
BH#11	DS57	shale	5	7.5%											
BH#11	DS60	shale	15	9.6%											
BH#12	DS61	shale	2.5	7.0%											
BH#12	DS63	shale	7.5	10.9%											
BH#12	DS65	CL/shale	15	8.6%											
BH#13	DS66	CL/shale	2.5	14.5%											
BH#13	DS67	CL/shale	5	12.2%								114.4			
BH#13	DS69	CL/shale	10	8.9%											
BH#13	DS70	shale	15	10.3%											
BH#14	DS71	CL/shale	2.5	13.2%								113.3	2,800	3.8	4.7**
BH#14	DS72	CL/shale	5	10.5%											
BH#14	DS73	CL/shale	7.5	10.7%								105.4	300	0.6	4.8
BH#14	DS74	shale	10	9.4%											
BH#14	DS75	shale	15	8.8%											
BH#14	DS76	shale	20	15.9%											
BH#14	DS77	shale	25	15.9%											
BH#15	DS78	CL	2.5	23.9%	28	17	11	0.0	12.7	48.1	39.2	90.8	230	0.2	6.7
BH#15	DS79	CL	5	20.6%								102.6			

*LL = Liquid Limit, PL = Plastic Limit, PI = Plasticity Index, NP = Non-Plastic

**total load of 4,000 psf

Note: This table does not include corrosivity, UCS, Proctor and CBR testing. See report and individual lab sheets for those results.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	2.1	7.1	29.6	61.1

Test Results (ASTM D6913 & ASTM D7928)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.9		
#16	99.5		
#40	97.8		
#100	94.5		
#200	90.7		
0.0385 mm.	89.7		
0.0278 mm.	86.3		
0.0201 mm.	82.2		
0.0107 mm.	76.5		
0.0077 mm.	72.4		
0.0056 mm.	67.1		
0.0030 mm.	21.7		
0.0015 mm.	5.6		

* (no specification provided)

Material Description

light brown LEAN CLAY
*salts present

Atterberg Limits (ASTM D 4318)

PL= 14 **LL=** 31 **PI=** 17

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-6(14)

Coefficients

D_{90}= 0.0462 D_{85}= 0.0251 D_{60}= 0.0049
D_{50}= 0.0043 D_{30}= 0.0034 D_{15}= 0.0027
D_{10}= 0.0023 C_u= 2.13 C_c= 1.01

Remarks

Natural Moisture Content = 11.4%

Date Received: 4/6/2021 **Date Tested:** 4/20/21

Tested By: SJ

Checked By: LB

Title: Professional Geologist

Source of Sample: BH#1 **Depth:** 5'
Sample Number: DS2

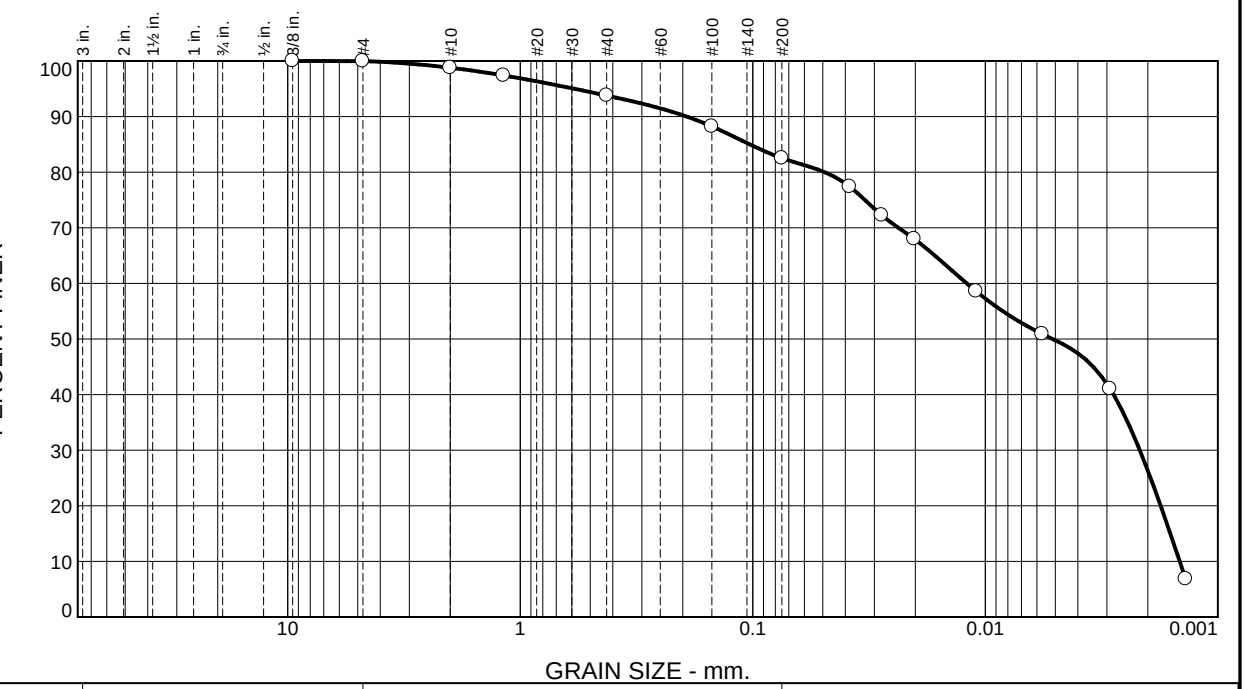
Date Sampled: 4/5/2021

Buckhorn Engineering

Client: Citra Power
Project: Garnet Mesa Solar Array
Delta, CO
Project No: 2021-010-GEO

Results are for the exclusive use of the client and apply only to the samples tested and are not indicative of apparantly identical samples.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.2	5.0	11.3	32.7	49.8

Test Results (ASTM D6913 & ASTM D7928)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3/8"	100.0		
#4	100.0		
#10	98.8		
#16	97.4		
#40	93.8		
#100	88.2		
#200	82.5		
0.0383 mm.	77.4		
0.0279 mm.	72.3		
0.0202 mm.	68.0		
0.0110 mm.	58.6		
0.0057 mm.	50.9		
0.0029 mm.	41.0		
0.0014 mm.	6.8		

* (no specification provided)

Material Description

brown LEAN CLAY with sand
*salts present

Atterberg Limits (ASTM D 4318)

PL= 15 **LL=** 32 **PI=** 17

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-6(12)

Coefficients

D_{90}= 0.1928 D_{85}= 0.1031 D_{60}= 0.0120
D_{50}= 0.0051 D_{30}= 0.0022 D_{15}= 0.0016
D_{10}= 0.0015 C_u= 8.25 C_c= 0.27

Remarks

Natural Moisture Content = 17.7%

Date Received: 4/6/21 **Date Tested:** 5/4/21

Tested By: SJ

Checked By: LB

Title: Professional Geologist

Source of Sample: BH#4 **Depth:** 7.5'
Sample Number: DS18

Date Sampled: 4/5/21

Buckhorn Engineering

Client: Citra Power
Project: Garnet Mesa Solar Array
Delta, CO
Project No: 2021-010-GEO

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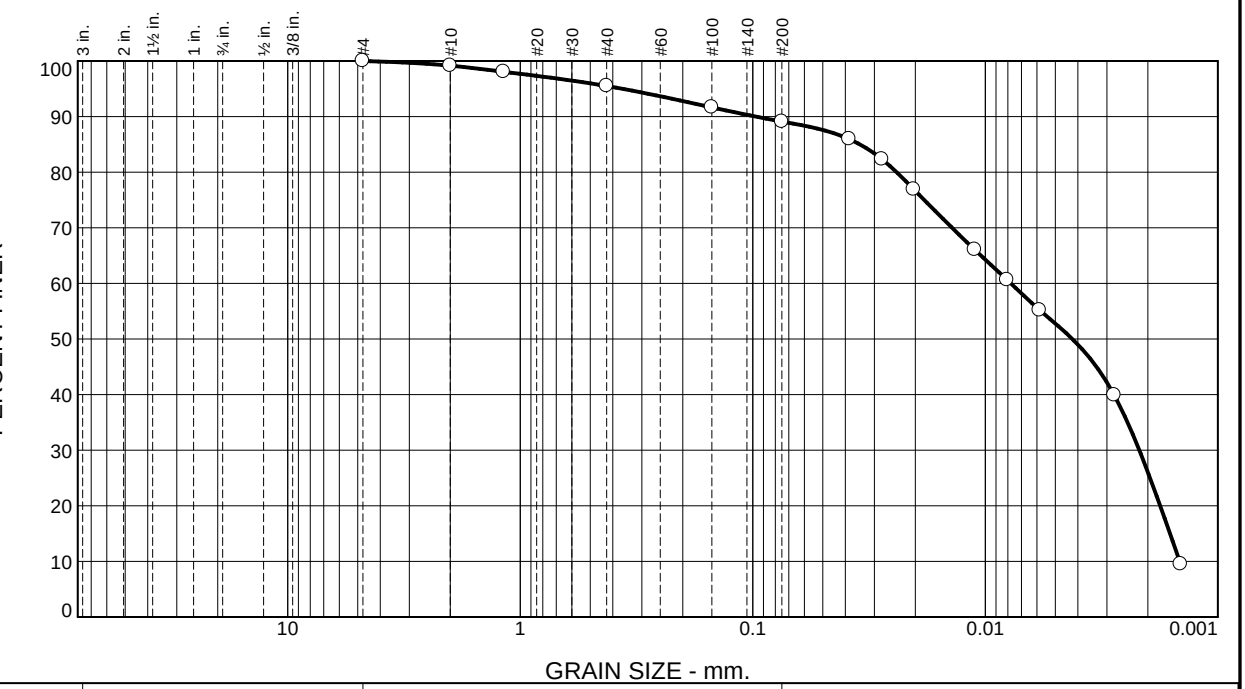
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.8	3.7	6.4	36.3	52.8

Test Results (ASTM D6913 & ASTM D7928)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.2		
#16	98.1		
#40	95.5		
#100	91.7		
#200	89.1		
0.0385 mm.	85.9		
0.0278 mm.	82.3		
0.0203 mm.	76.9		
0.0111 mm.	66.0		
0.0081 mm.	60.6		
0.0058 mm.	55.2		
0.0028 mm.	39.9		
0.0014 mm.	9.5		

* (no specification provided)

Material Description

brown LEAN CLAY
*salts present

Atterberg Limits (ASTM D 4318)

PL= 17 **LL=** 32 **PI=** 15

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-6(12)

Coefficients

D_{90}= 0.0973 D_{85}= 0.0347 D_{60}= 0.0078
D_{50}= 0.0042 D_{30}= 0.0022 D_{15}= 0.0016
D_{10}= 0.0015 C_u= 5.32 C_c= 0.42

Remarks

Natural Moisture Content = 14.0%

Date Received: 4/6/21 **Date Tested:** 4/20/21

Tested By: SJ

Checked By: LB

Title: Professional Geologist

Source of Sample: BH#5 **Depth:** 2.5'
Sample Number: DS21

Date Sampled: 4/5/21

Buckhorn Engineering

Client: Citra Power
Project: Garnet Mesa Solar Array
Delta, CO
Project No: 2021-010-GEO

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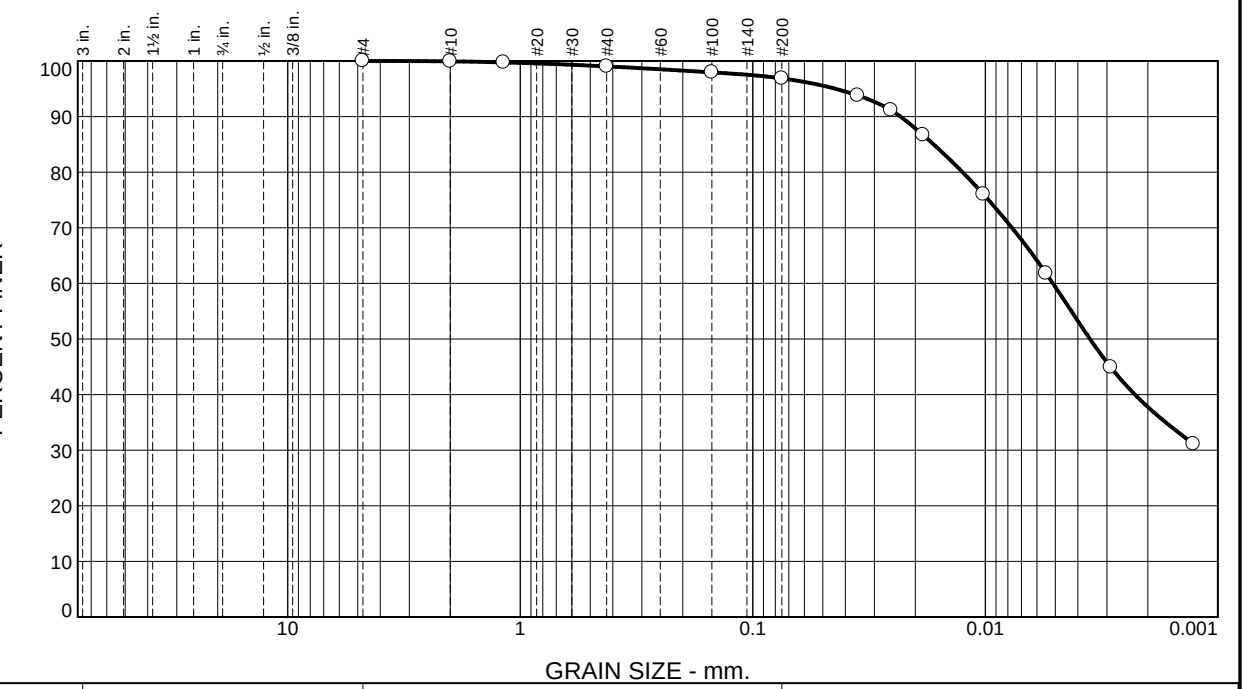
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.9	2.1	37.6	59.3

Test Results (ASTM D6913 & ASTM D7928)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.9		
#16	99.7		
#40	99.0		
#100	97.9		
#200	96.9		
0.0354 mm.	93.8		
0.0255 mm.	91.1		
0.0185 mm.	86.7		
0.0102 mm.	76.0		
0.0055 mm.	61.8		
0.0029 mm.	44.9		
0.0013 mm.	31.1		

* (no specification provided)

Material Description

brown LEAN CLAY
*salts present

Atterberg Limits (ASTM D 4318)

PL= 19 **LL=** 44 **PI=** 25

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-7-6(26)

Coefficients

D_{90}= 0.0232 D_{85}= 0.0167 D_{60}= 0.0051
D_{50}= 0.0035 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Natural Moisture Content = 11.1%

Date Received: 4/6/21 **Date Tested:** 5/4/21

Tested By: SJ

Checked By: LB

Title: Professional Geologist

Source of Sample: BH#5 **Depth:** 7.5'
Sample Number: DS23

Date Sampled: 4/5/21

Buckhorn Engineering

Client: Citra Power
Project: Garnet Mesa Solar Array
Delta, CO
Project No: 2021-010-GEO

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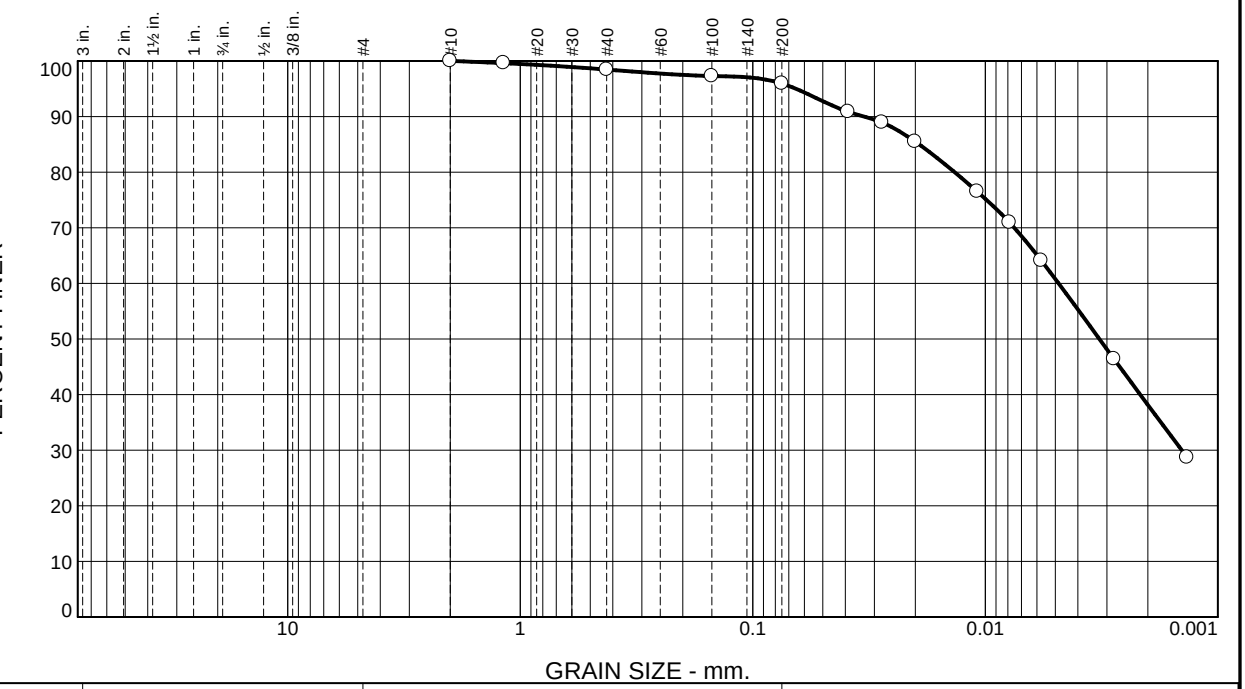
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.5	2.6	35.1	60.8

Test Results (ASTM D6913 & ASTM D7928)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#16	99.6		
#40	98.5		
#100	97.3		
#200	95.9		
0.0389 mm.	90.9		
0.0278 mm.	88.9		
0.0201 mm.	85.5		
0.0109 mm.	76.5		
0.0079 mm.	71.0		
0.0057 mm.	64.1		
0.0028 mm.	46.4		
0.0014 mm.	28.7		

* (no specification provided)

Material Description

dark gray LEAN CLAY
*salts present

Atterberg Limits (ASTM D 4318)

PL= 20 **LL=** 43 **PI=** 23

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-7-6(24)

Coefficients

D_{90}= 0.0332 D_{85}= 0.0193 D_{60}= 0.0048
D_{50}= 0.0032 D_{30}= 0.0014 D_{15}=
D_{10}= C_u= C_c=

Remarks

Natural Moisture Content = 11.9%

Date Received: 4/6/21 **Date Tested:** 4/20/21

Tested By: SJ

Checked By: LB

Title: Professional Geologist

Source of Sample: BH#10 **Depth:** 7.5'
Sample Number: DS53

Date Sampled: 4/5/21

Buckhorn Engineering

Client: Citra Power
Project: Garnet Mesa Solar Array
Delta, CO
Project No: 2021-010-GEO

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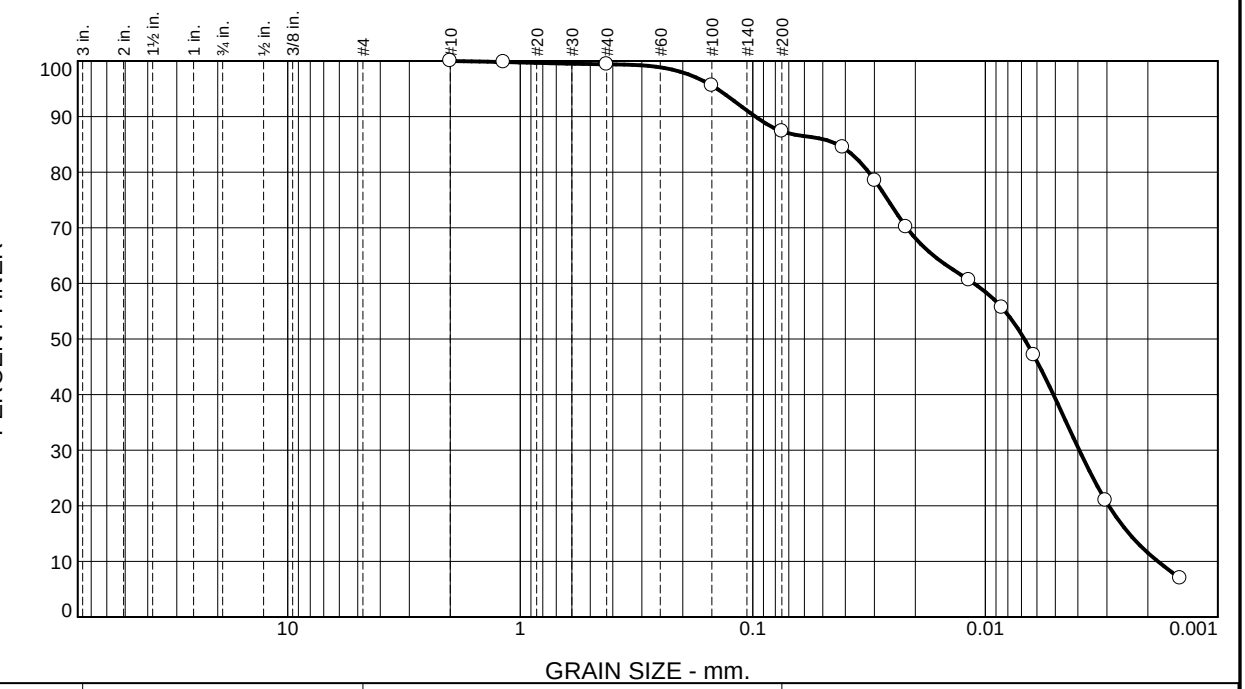
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.6	12.1	48.1	39.2

Test Results (ASTM D6913 & ASTM D7928)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#16	99.8		
#40	99.4		
#100	95.6		
#200	87.3		
0.0410 mm.	84.5		
0.0299 mm.	78.5		
0.0219 mm.	70.2		
0.0118 mm.	60.6		
0.0085 mm.	55.6		
0.0062 mm.	47.1		
0.0030 mm.	21.0		
0.0015 mm.	7.0		

* (no specification provided)

Material Description

brown LEAN CLAY
*salts present

Atterberg Limits (ASTM D 4318)

PL= 17 **LL=** 28 **PI=** 11

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-6(8)

Coefficients

D_{90}= 0.0976 D_{85}= 0.0432 D_{60}= 0.0112
D_{50}= 0.0068 D_{30}= 0.0039 D_{15}= 0.0024
D_{10}= 0.0018 C_u= 6.18 C_c= 0.77

Remarks

Natural Moisture Content = 23.9%

Date Received: 4/6/2021 **Date Tested:** 4/20/21

Tested By: SJ

Checked By: LB

Title: Professional Geologist

Source of Sample: BH#15 **Depth:** 2.5'
Sample Number: DS78

Date Sampled: 4/5/2021

Buckhorn Engineering

Client: Citra Power
Project: Garnet Mesa Solar Array
Delta, CO
Project No: 2021-010-GEO

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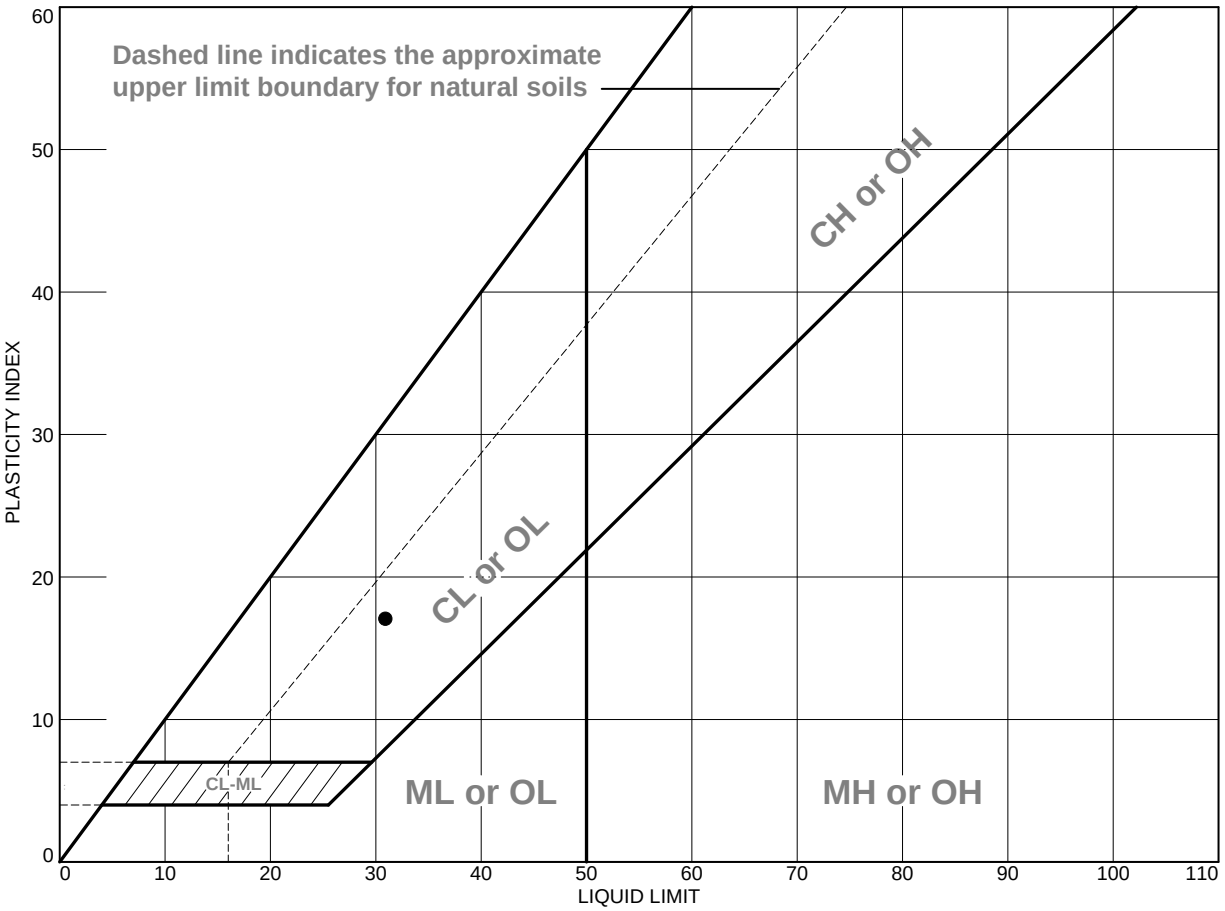
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	light brown LEAN CLAY *salts present	31	14	17	97.8	90.7	CL

Project No. 2021-010- **Client:** Citra Power

Project: Garnet Mesa Solar Array
Delta, CO

●**Source of Sample:** BH#1 **Depth:** 5' **Sample Number:** DS2

Remarks:

●Natural Moisture Content = 11.4%

Buckhorn Engineering

Tested By: JLH **Checked By:** SJ

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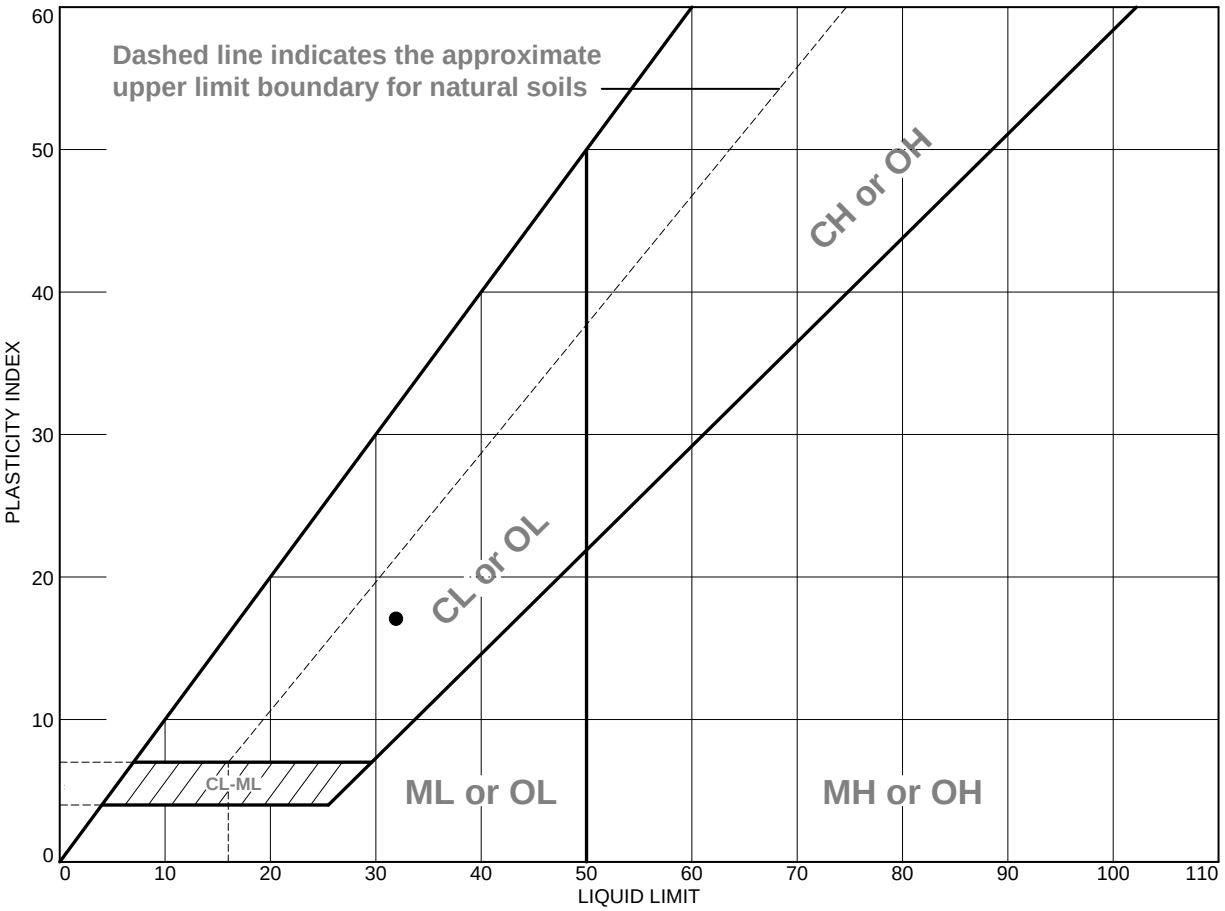
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	brown LEAN CLAY with sand *salts present	32	15	17	93.8	82.5	CL

Project No. 2021-010- **Client:** Citra Power

Project: Garnet Mesa Solar Array
Delta, CO

●**Source of Sample:** BH#4 **Depth:** 7.5' **Sample Number:** DS18

Remarks:

●Natural Moisture Content = 17.7%

Buckhorn Engineering

Tested By: SJ **Checked By:** LB

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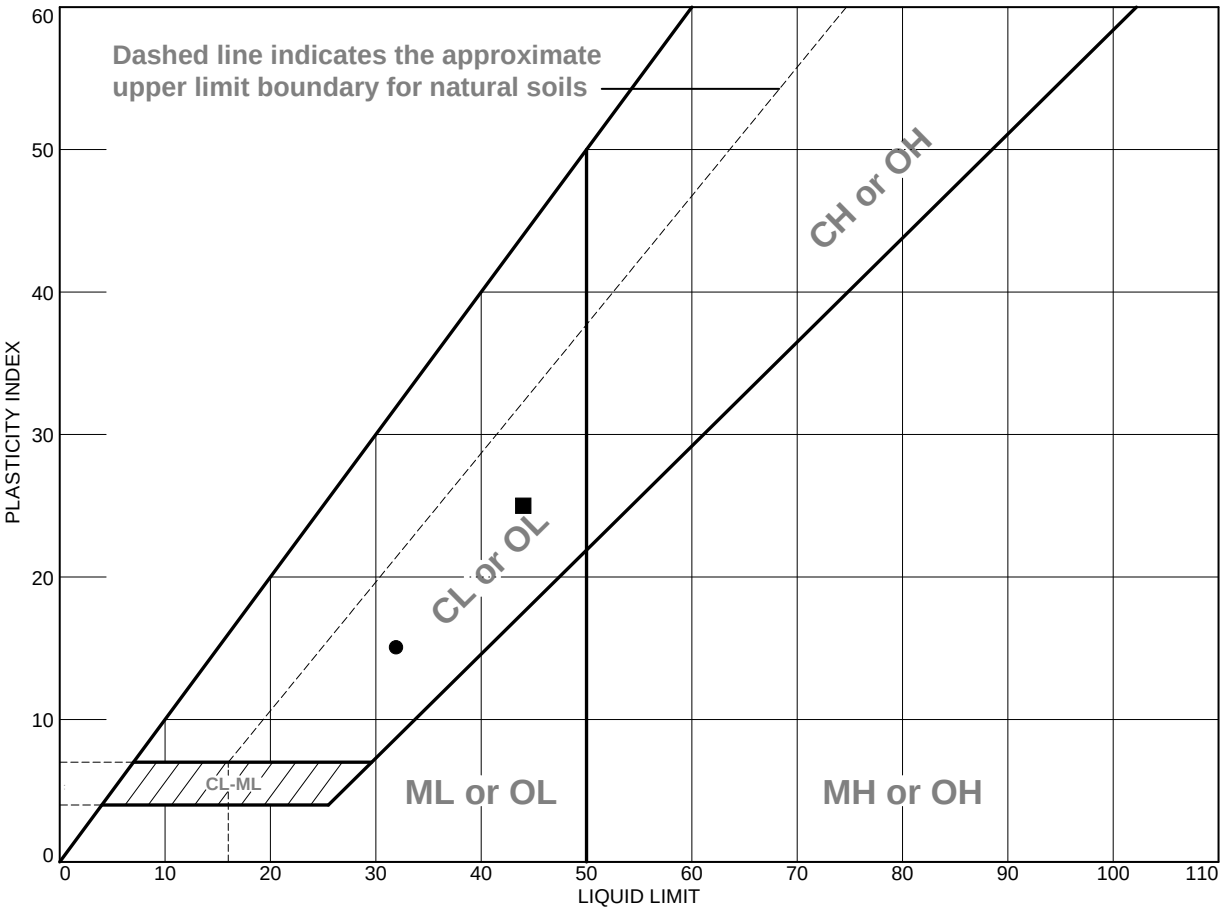
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	brown LEAN CLAY *salts present	32	17	15	95.5	89.1	CL
■	brown LEAN CLAY *salts present	44	19	25	99.0	96.9	CL

Project No. 2021-010- **Client:** Citra Power

Project: Garnet Mesa Solar Array
Delta, CO

●**Source of Sample:** BH#5 **Depth:** 2.5' **Sample Number:** DS21

■**Source of Sample:** BH#5 **Depth:** 7.5' **Sample Number:** DS23

Remarks:

●Natural Moisture Content = 14.0%

■Natural Moisture Content = 11.1%

Buckhorn Engineering

Tested By: ○ JLH □ SJ **Checked By:** SJ

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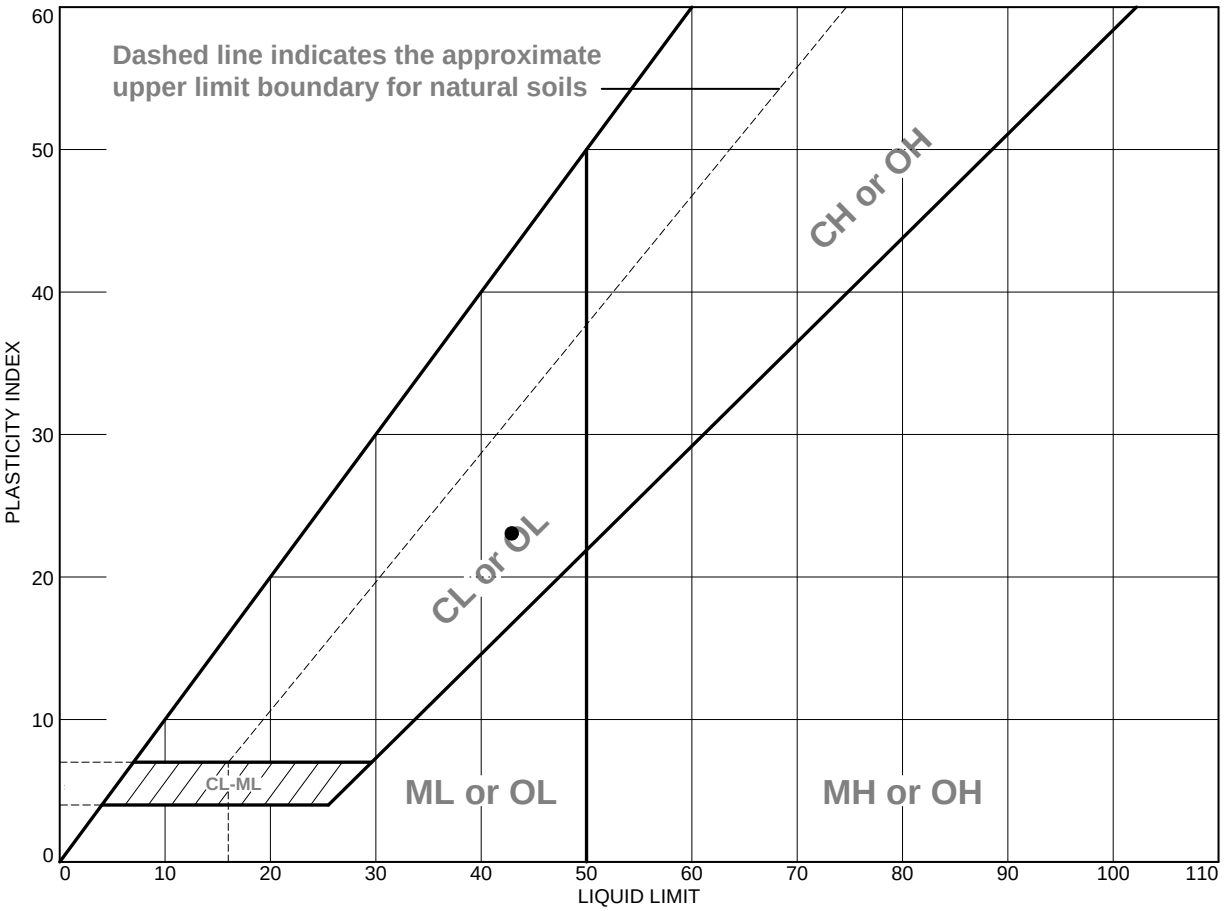
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	dark gray LEAN CLAY *salts present	43	20	23	98.5	95.9	CL

Project No. 2021-010- **Client:** Citra Power

Project: Garnet Mesa Solar Array
Delta, CO

●**Source of Sample:** BH#10 **Depth:** 7.5' **Sample Number:** DS53

Remarks:

●Natural Moisture Content = 11.9%

Buckhorn Engineering

Tested By: JLH **Checked By:** SJ

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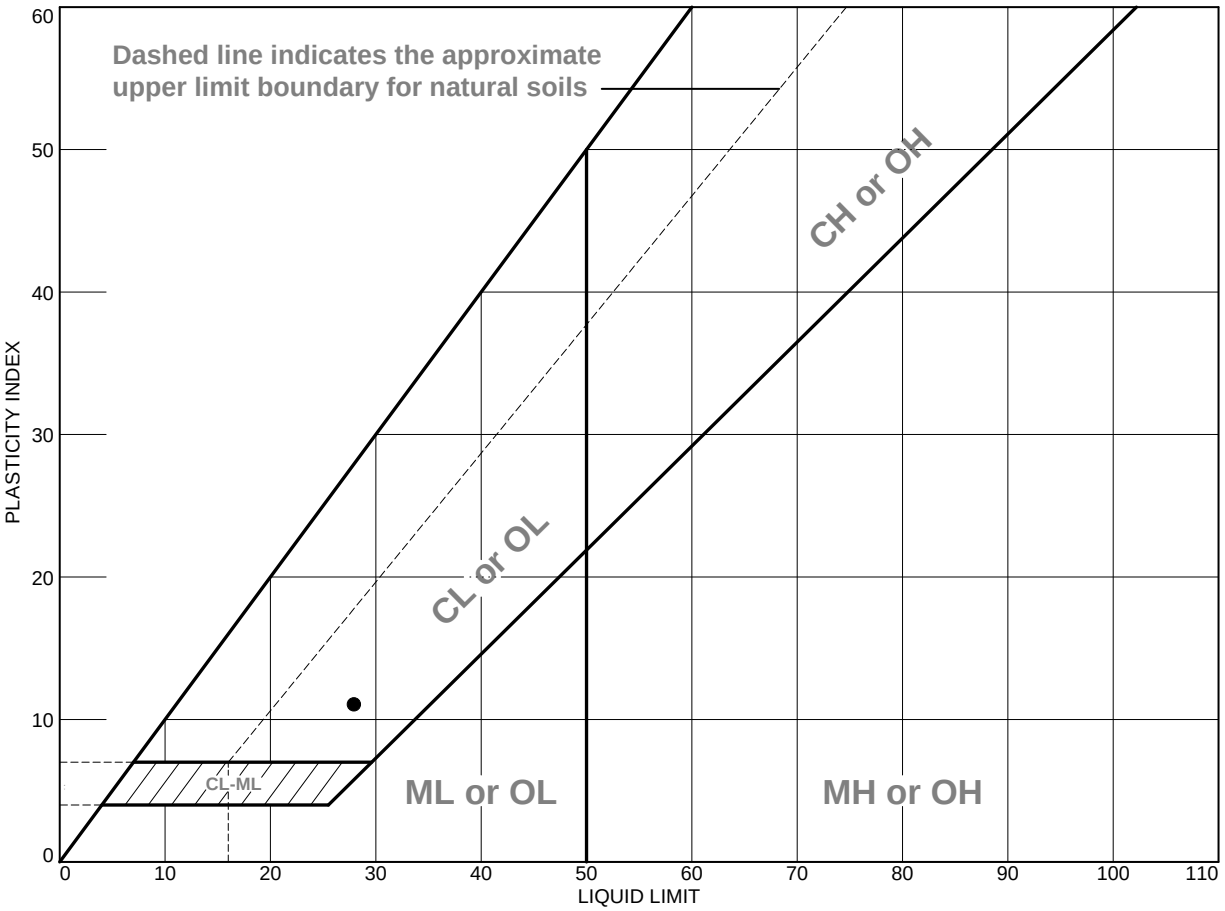
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	brown LEAN CLAY *salts present	28	17	11	99.4	87.3	CL

Project No. 2021-010- **Client:** Citra Power

Project: Garnet Mesa Solar Array
Delta, CO

●**Source of Sample:** BH#15 **Depth:** 2.5' **Sample Number:** DS78

Remarks:

●Natural Moisture Content = 23.9%

Buckhorn Engineering

Tested By: JLH **Checked By:** SJ

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BUCKHORN ENGINEERING

222 South Park Avenue ▪ Montrose, CO 81401 ▪ 970-249-6828

In-Situ Moisture Content

ASTM D 2216

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Client	Citra Power	Date Received	4/6/2021
Project No.	2021-010-GEO	Tests For	LB
		Date Tested	4/8/2021
		Tested By	SJ

Sample #	Sample Location	Soil Description	Tare (g)	Tare + wet (g)	Tare + dry (g)	% Moisture
DS1	BH#1 @2.5-4'	light brown CLAY with some sand (ASTM D2488) *salts present	36.0	126.1	120.0	7.3%
DS2	BH#1 @5-6.5'	light brown LEAN CLAY *salts present	36.5	74.7	70.8	11.4%
DS3	BH#1 @7.5-9'	brown weathered SHALE (ASTM D2488) *salts present	36.2	129.1	119.7	11.3%
DS4	BH#1 @10-11.5'	brown CLAY with shale (ASTM D2488) *salts present	86.2	390.8	360.2	11.2%
DS5	BH#1 @15-16.5'	brown weathered SHALE (ASTM D2488) *salts present	36.3	129.4	120.1	11.1%
DS6	BH#2 @2.5-4'	brown CLAY (ASTM D2488) *salts and organics present	36.7	118.7	100.1	29.3%
DS7	BH#2 @5-6.5'	brown CLAY (ASTM D2488) *salts present	79.2	260.0	220.8	27.7%
DS8	BH#2 @7.5-9'	brown CLAY (ASTM D2488) *salts and organics present	37.7	152.0	128.7	25.6%
DS9	BH#2 @10-11.5'	dark brown CLAY with shale (ASTM D2488) *salts present	36.1	116.8	105.2	16.8%
DS10	BH#2 @15-16.5'	brown CLAY with some shale (ASTM D2488) *salts present	85.6	391.5	354.2	13.9%

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In-Situ Moisture Content

ASTM D 2216

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Client	Citra Power	Date Received	4/6/2021
Project No.	2021-010-GEO	Tests For	LB
		Date Tested	4/8/2021
		Tested By	SJ

Sample #	Sample Location	Soil Description	Tare (g)	Tare + wet (g)	Tare + dry (g)	% Moisture
DS11	BH#3 @2.5-4'	brown SHALE (ASTM D2488) *salts present	36.0	129.3	122.3	8.1%
DS12	BH#3 @5-6.5'	brown weathered SHALE (ASTM D2488) *salts present	37.0	155.6	148.3	6.6%
DS16	BH#4 @2.5-4'	light brown clayey SAND with some shale (ASTM D2488) *salts present	86.5	282.0	274.3	4.1%
DS17	BH#4 @5-6.5'	brown sandy CLAY (ASTM D2488) *salts present	36.3	139.7	131.5	8.6%
DS18	BH#4 @7.5-9'	brown LEAN CLAY with sand *salts present	97.1	463.9	408.8	17.7%
DS19	BH#4 @10-11.5'	brown CLAY (ASTM D2488) *salts present	36.0	138.6	121.4	20.1%
DS20	BH#4 @15-16.5'	brown silty CLAY (ASTM D2488) *salts present	98.9	542.0	456.8	23.8%
DS21	BH#5 @2.5-4'	brown LEAN CLAY *salts present	36.4	118.9	108.8	14.0%
DS22	BH#5 @5-6.5'	brown CLAY with shale (ASTM D2488) *salts present	36.7	110.8	103.9	10.3%
DS23	BH#5 @7.5-9'	brown LEAN CLAY *salts present	36.9	128.1	119.0	11.1%

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In-Situ Moisture Content

ASTM D 2216

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Client	Citra Power	Date Received	4/6/2021
Project No.	2021-010-GEO	Tests For	LB
		Date Tested	4/8/2021
		Tested By	SJ

Sample #	Sample Location	Soil Description	Tare (g)	Tare + wet (g)	Tare + dry (g)	% Moisture
DS26	BH#6 @2.5-4'	dark brown to gray SHALE with clay (ASTM D2488) *salts present	85.6	377.4	342.1	13.8%
DS28	BH#6 @7.5-9'	brown SHALE with clay (ASTM D2488) *salts present	278.3	380.9	371.1	10.6%
DS31	BH#7 @2.5-4'	brown CLAY with shale (ASTM D2488) *salts present	36.2	130.1	116.8	16.5%
DS32	BH#7 @5-6.5'	dark brown to gray SHALE with clay (ASTM D2488) *salts present	86.2	381.0	341.0	15.7%
DS33	BH#7 @7.5-9'	dark brown CLAY with shale (ASTM D2488) *salts present	36.4	144.9	130.0	15.9%
DS34	BH#7 @10-11.5'	dark brown to gray SHALE with clay (ASTM D2488) *salts present	85.6	268.9	242.1	17.1%
DS35	BH#7 @15-16.5'	dark brown SHALE (ASTM D2488) *salts present	36.8	132.7	123.8	10.2%
DS37	BH#8 @5-6.5'	dark brown to gray SHALE with clay (ASTM D2488) *salts present	99.8	394.5	368.2	9.8%
DS40	BH#8 @15-16.5'	brown weathered SHALE (ASTM D2488) *salts present	36.0	159.4	150.7	7.6%
DS41	BH#9 @2.5-4'	brown CLAY with shale (ASTM D2488) *salts present	37.9	128.3	117.0	14.3%

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In-Situ Moisture Content

ASTM D 2216

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Client	Citra Power	Date Received	4/6/2021
Project No.	2021-010-GEO	Tests For	LB
		Date Tested	4/8/2021
		Tested By	SJ

Sample #	Sample Location	Soil Description	Tare (g)	Tare + wet (g)	Tare + dry (g)	% Moisture
DS42	BH#9 @5-6.5'	brown CLAY with shale (ASTM D2488) *salts present	36.0	144.4	132.0	12.9%
DS43	BH#9 @7.5-9'	brown CLAY with shale (ASTM D2488) *salts present	37.6	141.7	129.0	13.9%
DS44	BH#9 @10-11.5'	dark brown SHALE (ASTM D2488) *salts present	36.6	153.1	144.3	8.2%
DS50	BH#9 @15-16.5'	dark brown SHALE (ASTM D2488) *salts present	36.1	149.0	139.5	9.2%
DS53	BH#10 @7.5-9'	dark gray LEAN CLAY *salts present	36.8	115.0	106.7	11.9%
DS55	BH#10 @15-16.5'	dark brown CLAY with shale (ASTM D2488) *salts present	36.2	123.4	111.6	15.6%
DS57	BH#11 @5-6.5'	light brown SHALE (ASTM D2488) *salts present	36.4	156.7	148.3	7.5%
DS60	BH#11 @15-16.5'	brown SHALE (ASTM D2488) *salts present	36.8	131.2	122.9	9.6%
DS61	BH#12 @2.5-4'	light brown SHALE (ASTM D2488) *salts present	36.9	140.8	134.0	7.0%
DS63	BH#12 @7.5-9'	brown SHALE (ASTM D2488) *salts present	36.3	137.1	127.2	10.9%

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In-Situ Moisture Content

ASTM D 2216

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Client	Citra Power	Date Received	4/6/2021
Project No.	2021-010-GEO	Tests For	LB
		Date Tested	4/8/2021
		Tested By	SJ

Sample #	Sample Location	Soil Description	Tare (g)	Tare + wet (g)	Tare + dry (g)	% Moisture
DS65	BH#12 @15-16.5'	dark brown CLAY with shale (ASTM D2488) *salts present	36.9	134.3	126.6	8.6%
DS66	BH#13 @2.5-4'	brown CLAY with shale (ASTM D2488) *salts present	36.1	124.6	113.4	14.5%
DS67	BH#13 @5-6.5'	dark brown CLAY with shale (ASTM D2488) *salts present	97.5	394.6	362.2	12.2%
DS69	BH#13 @10-11.5'	brown CLAY with shale (ASTM D2488) *salts present	36.7	135.0	127.0	8.9%
DS70	BH#13 @15-16.5'	brown SHALE (ASTM D2488) *salts present	37.9	138.2	128.8	10.3%
DS71	BH#14 @2.5-4'	brown SHALE with clay (ASTM D2488) *salts present	37.6	128.8	118.2	13.2%
DS72	BH#14 @5-6.5'	brown CLAY with shale (ASTM D2488) *salts present	37.7	134.4	125.2	10.5%
DS73	BH#14 @7.5-9'	brown SHALE with clay (ASTM D2488) *salts present	101.5	487.9	450.6	10.7%
DS74	BH#14 @10-11.5'	brown SHALE (ASTM D2488) *salts present	36.3	149.2	139.5	9.4%
DS75	BH#14 @15-16.5'	brown SHALE with clay (ASTM D2488) *salts present	37.6	144.8	136.1	8.8%

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In-Situ Moisture Content

ASTM D 2216

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Client	Citra Power	Date Received	4/6/2021
Project No.	2021-010-GEO	Tests For	LB
		Date Tested	4/8/2021
		Tested By	SJ

Sample #	Sample Location	Soil Description	Tare (g)	Tare + wet (g)	Tare + dry (g)	% Moisture
DS76	BH#14 @20-21.5'	dark brown CLAY with shale (ASTM D2488) *salts present	36.3	139.0	124.9	15.9%
DS77	BH#14 @25-25.5'	dark brown SHALE with clay (ASTM D2488) *salts present	36.3	136.9	123.1	15.9%
DS78	BH#15 @2.5-4'	brown LEAN CLAY *salts present	97.3	502.2	424.1	23.9%
DS79	BH#15 @5-6.5'	brown CLAY (ASTM D2488) *salts present	101.5	387.7	338.9	20.6%

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Unit Weight of Soil Specimens

ASTM D7263

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Client	Citra Power	Date Received	4/6/2021
Project No.	2021-010-GEO	Tests For	LB
		Date Tested	4/12/2021
		Tested By	SJ

Sample #	Sample Location	Sample description	Moist Unit Weight (pcf)	Moisture Content (%)	Dry Unit Weight (pcf)
DS2	BH#1 @5-6.5'	light brown LEAN CLAY *salts present	127.7	11.4	114.6
DS4	BH#1 @10-11.5'	brown CLAY with shale (ASTM D2488) *salts present	131.7	11.2	118.4
DS7	BH#2 @5-6.5'	brown CLAY (ASTM D2488) *salts present	119.3	27.7	93.4
DS10	BH#2 @15-16.5'	brown CLAY with some shale (ASTM D2488) *salts present	132.1	13.9	116.0
DS16	BH#4 @2.5-4'	light brown clayey SAND with some shale (ASTM D2488) *salts present	95.6	4.1	91.8
DS18	BH#4 @7.5-9'	brown LEAN CLAY with sand *salts present	119.4	17.7	101.5
DS20	BH#4 @15-16.5'	brown silty CLAY (ASTM D2488) *salts present	125.7	23.8	101.5
DS22	BH#5 @5-6.5'	brown CLAY with shale (ASTM D2488) *salts present	123.4	10.3	111.9
DS26	BH#6 @2.5-4'	dark brown to gray SHALE with clay (ASTM D2488) *salts present	126.0	13.8	110.8

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Unit Weight of Soil Specimens

ASTM D7263

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Client	Citra Power	Date Received	4/6/2021
Project No.	2021-010-GEO	Tests For	LB
		Date Tested	4/12/2021
		Tested By	SJ

Sample #	Sample Location	Sample description	Moist Unit Weight (pcf)	Moisture Content (%)	Dry Unit Weight (pcf)
DS28	BH#6 @7.5-9'	brown SHALE with clay (ASTM D2488)	125.2	10.6	113.2
DS32	BH#7 @5-6.5'	dark brown to gray SHALE with clay (ASTM D2488) *salts present	127.3	15.7	110.0
DS34	BH#7 @10-11.5'	dark brown to gray SHALE with clay (ASTM D2488) *salts present	118.7	17.1	101.3
DS37	BH#8 @5-6.5'	dark brown to gray SHALE with clay (ASTM D2488) *salts present	127.3	9.8	115.9
DS67	BH#13 @5-6.5'	dark brown CLAY with shale (ASTM D2488) *salts present	128.4	12.2	114.4
DS71	BH#14 @2.5-4'	brown SHALE with clay (ASTM D2488) *salts present	128.2	13.2	113.3
DS73	BH#14 @7.5-9'	brown SHALE with clay (ASTM D2488) *salts present	125.4	10.7	113.3
DS78	BH#15 @2.5-4'	brown LEAN CLAY *salts present	119.7	23.9	96.6
DS79	BH#15 @5-6.5'	brown CLAY (ASTM D2488) *salts present	123.7	20.6	102.6

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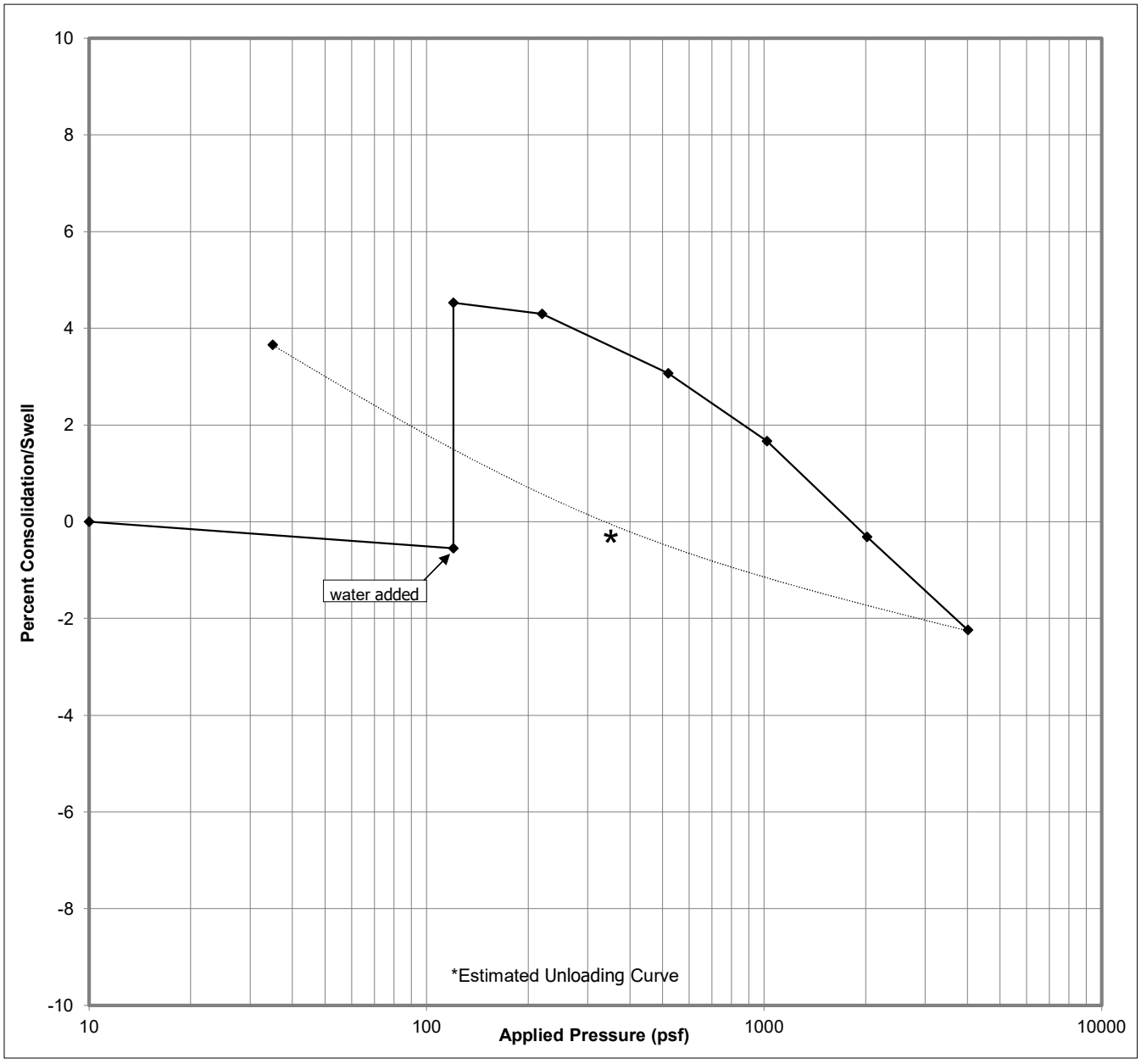
Swell/Consolidation Test

ASTM D4546

Project Name	Garnet Mesa Solar Array			Date Sampled	04/05/21
Project Location	Garnet Mesa			Sampled By	LB
Client	Citra Power			Date Received	04/06/21
Project No.	2021-010-GEO			Tests For	LB
Source/Depth	BH#1 @5-6.5'	Sample #	DS2	Date Tested	4/13/2021
Soil Description	light brown LEAN CLAY			Tested By	SJ
	*salts present				

Initial compression due to 100 psf pressure = 0.55%
Swell potential due to water and 100 psf pressure = 5.08%
Total consolidation due to water and 4000 psf pressure = 6.77%
Estimated constant volume swell pressure = 1370 psf
Estimated free swell pressure = 2200 psf

Initial Moisture Content	11.4 %	Final Moisture Content	17.8 %
Initial Dry Density	114.6 pcf	Final Dry Density	110.5 pcf
Initial Wet Density	127.7 pcf	Final Saturated Density	130.3 pcf



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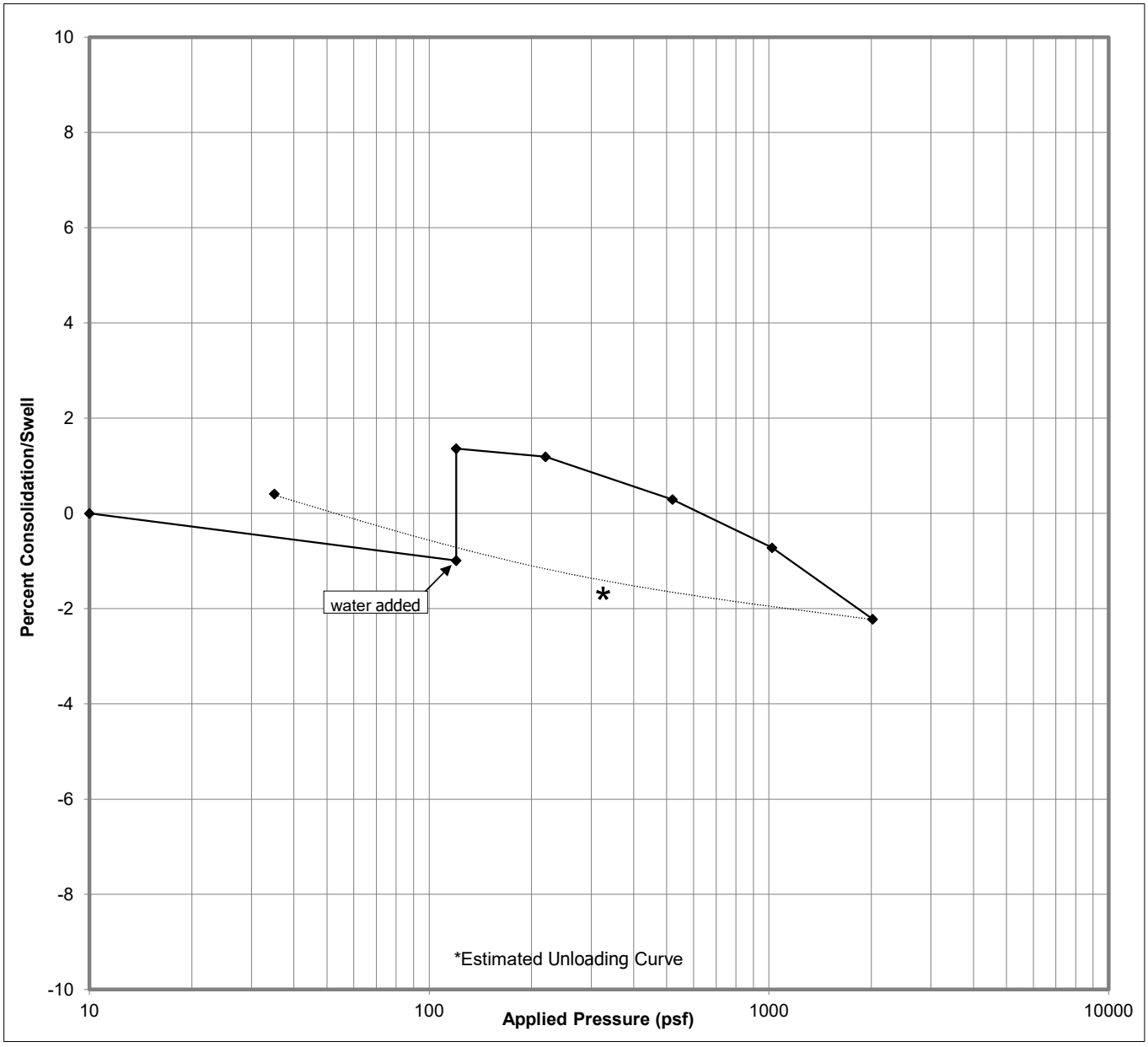
Swell/Consolidation Test

ASTM D4546

Project Name	Garnet Mesa Solar Array			Date Sampled	04/05/21
Project Location	Garnet Mesa			Sampled By	LB
Client	Citra Power			Date Received	04/06/21
Project No.	2021-010-GEO			Tests For	LB
Source/Depth	BH#5 @5-6.5'	Sample #	DS22	Date Tested	4/13/2021
Soil Description	brown CLAY with shale (ASTM D2488)			Tested By	SJ
	*salts present				

Initial compression due to 100 psf pressure = 0.99%
Swell potential due to water and 100 psf pressure = 2.35%
Total consolidation due to water and 2000 psf pressure = 3.58%
Estimated constant volume swell pressure = 710 psf
Estimated free swell pressure = 1100 psf

Initial Moisture Content	10.3 %	Final Moisture Content	18.9 %
Initial Dry Density	111.9 pcf	Final Dry Density	111.4 pcf
Initial Wet Density	123.4 pcf	Final Saturated Density	132.5 pcf



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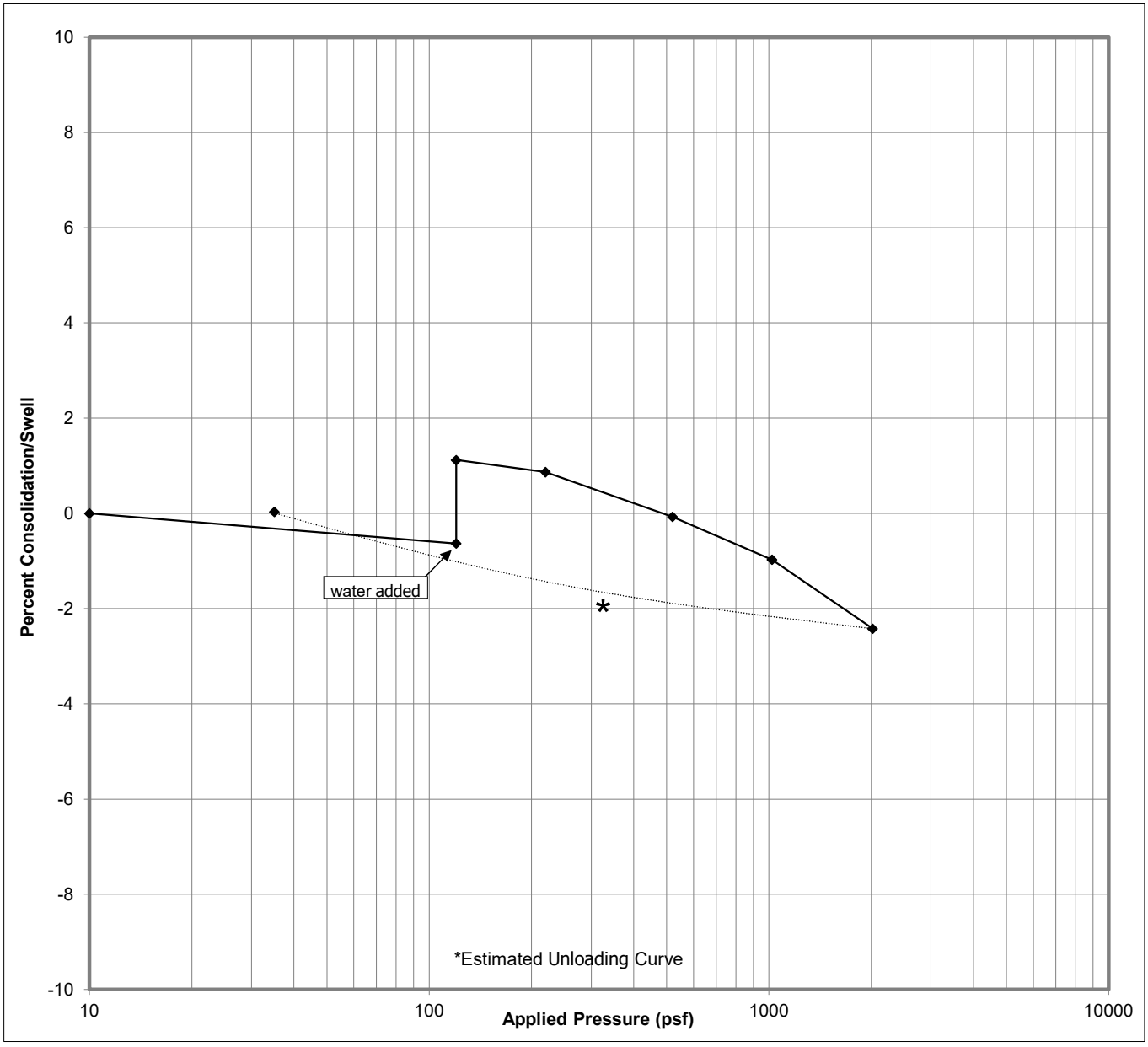
Swell/Consolidation Test

ASTM D4546

Project Name	Garnet Mesa Solar Array			Date Sampled	04/05/21
Project Location	Garnet Mesa			Sampled By	LB
Client	Citra Power			Date Received	04/06/21
Project No.	2021-010-GEO			Tests For	LB
Source/Depth	BH#6 @7.5-9'	Sample #	DS28	Date Tested	4/26/2021
Soil Description	brown SHALE with clay (ASTM D2488)			Tested By	SJ
	*salts present				

Initial compression due to 100 psf pressure = 0.63%
Swell potential due to water and 100 psf pressure = 1.75%
Total consolidation due to water and 2000 psf pressure = 3.54%
Estimated constant volume swell pressure = 540 psf
Estimated free swell pressure = 800 psf

Initial Moisture Content	10.6 %	Final Moisture Content	17.1 %
Initial Dry Density	113.2 pcf	Final Dry Density	113.2 pcf
Initial Wet Density	125.2 pcf	Final Saturated Density	132.5 pcf



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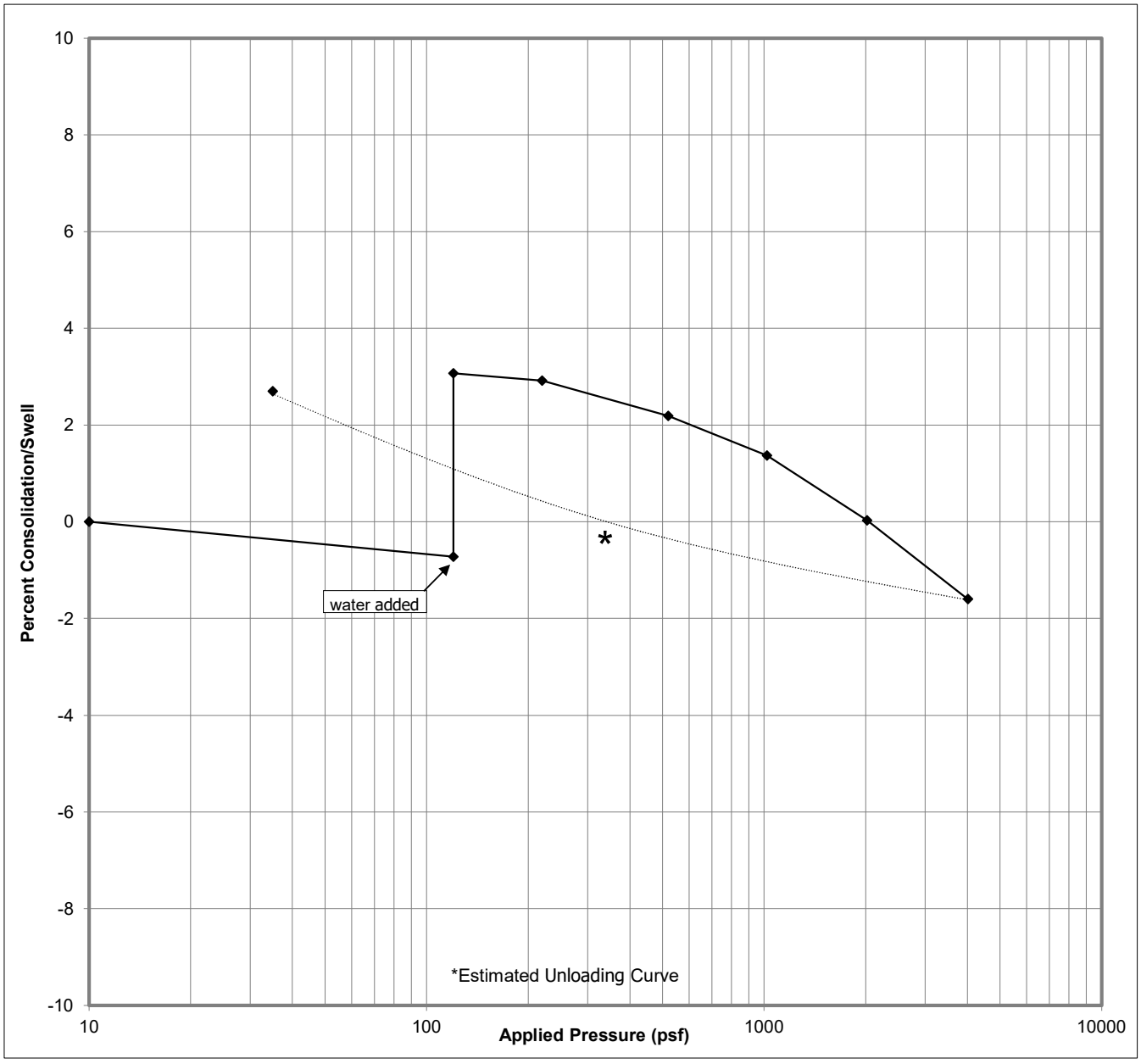
Swell/Consolidation Test

ASTM D4546

Project Name	Garnet Mesa Solar Array			Date Sampled	04/05/21
Project Location	Garnet Mesa			Sampled By	LB
Client	Citra Power			Date Received	04/06/21
Project No.	2021-010-GEO			Tests For	LB
Source/Depth	BH#14 @2.5-4'	Sample #	DS71	Date Tested	13-Apr
Soil Description	brown SHALE with clay (ASTM D2488)			Tested By	SJ
	*salts present				

Initial compression due to 100 psf pressure = 0.72%
Swell potential due to water and 100 psf pressure = 3.79%
Total consolidation due to water and 4000 psf pressure = 4.67%
Estimated constant volume swell pressure = 1730 psf
Estimated free swell pressure = 2800 psf

Initial Moisture Content	13.2 %	Final Moisture Content	18.9 %
Initial Dry Density	113.3 pcf	Final Dry Density	110.3 pcf
Initial Wet Density	128.3 pcf	Final Saturated Density	131.2 pcf



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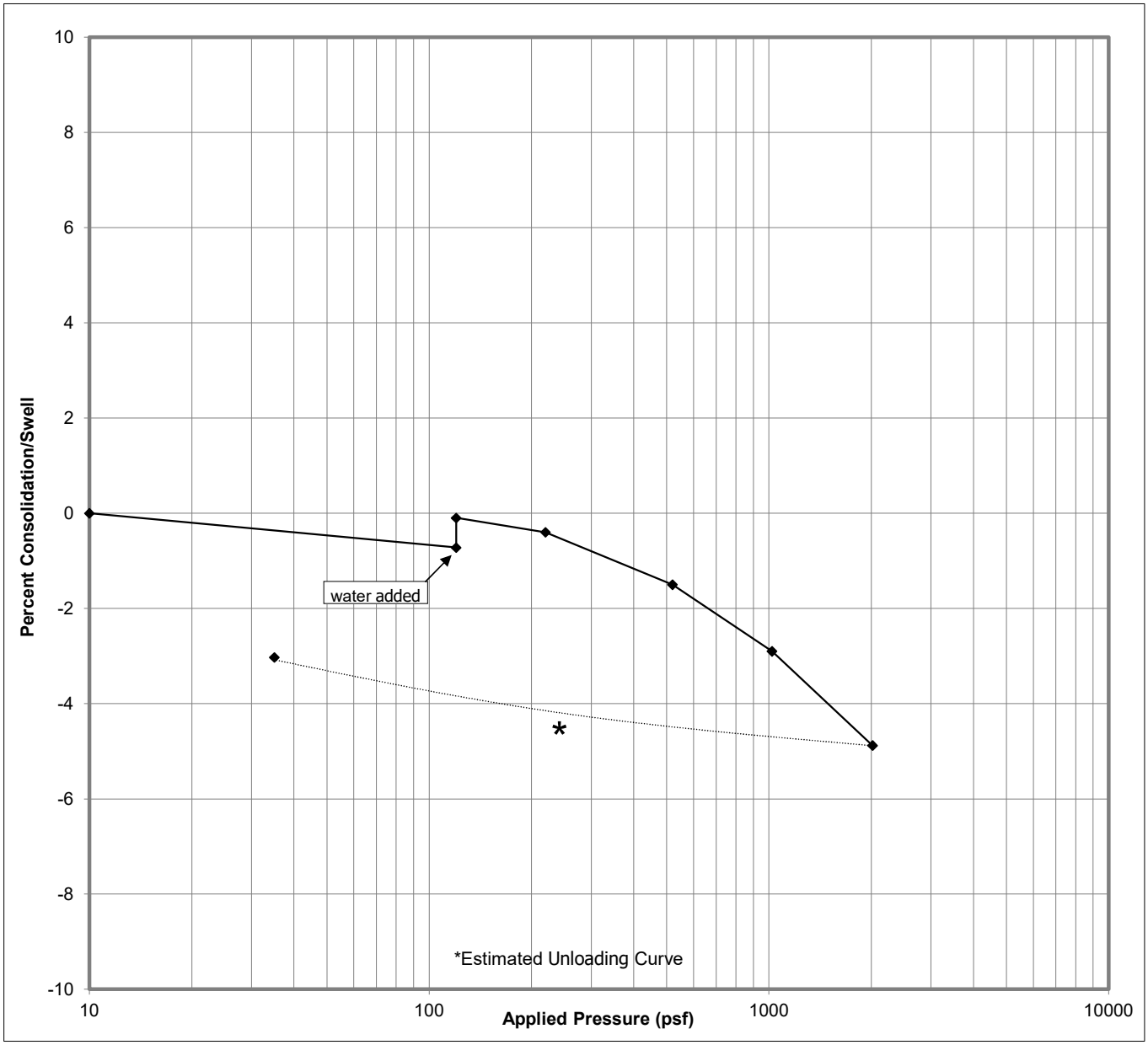
Swell/Consolidation Test

ASTM D4546

Project Name	Garnet Mesa Solar Array			Date Sampled	04/05/21
Project Location	Garnet Mesa			Sampled By	LB
Client	Citra Power			Date Received	04/06/21
Project No.	2021-010-GEO			Tests For	LB
Source/Depth	BH#14 @7.5-9'	Sample #	DS73	Date Tested	4/13/21
Soil Description	brown SHALE with clay (ASTM D2488)			Tested By	SJ
	*salts present				

Initial compression due to 100 psf pressure = 0.72%
Swell potential due to water and 100 psf pressure = 0.62%
Total consolidation due to water and 2000 psf pressure = 4.78%
Estimated constant volume swell pressure = 230 psf
Estimated free swell pressure = 300 psf

Initial Moisture Content	10.7 %	Final Moisture Content	18.4 %
Initial Dry Density	105.4 pcf	Final Dry Density	108.7 pcf
Initial Wet Density	116.7 pcf	Final Saturated Density	128.7 pcf



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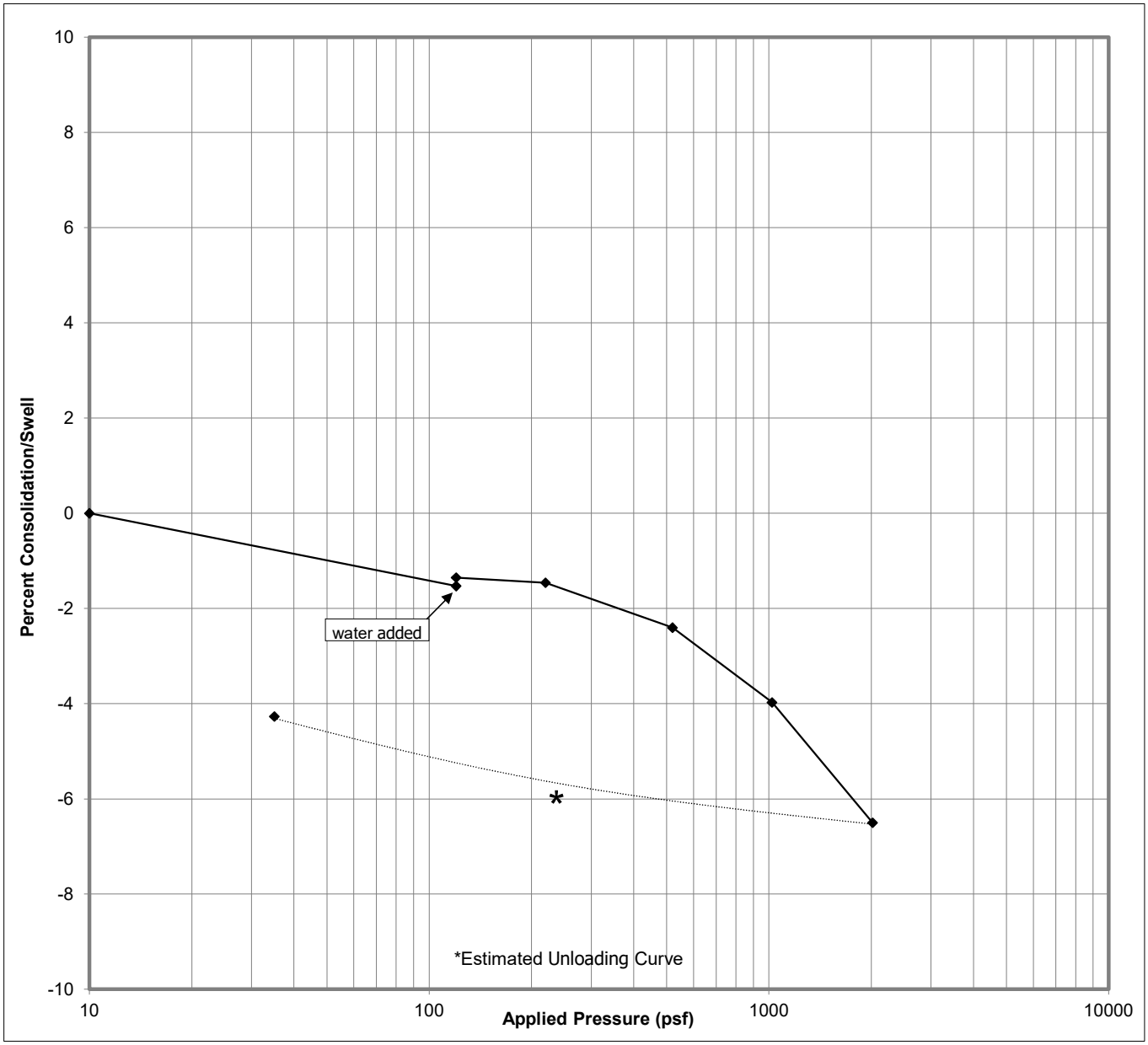
Swell/Consolidation Test

ASTM D4546

Project Name	Garnet Mesa Solar Array			Date Sampled	04/05/21
Project Location	Garnet Mesa			Sampled By	LB
Client	Citra Power			Date Received	04/06/21
Project No.	2021-010-GEO			Tests For	LB
Source/Depth	BH#15 @2.5-4'	Sample #	DS78	Date Tested	4/13/2021
Soil Description	brown LEAN CLAY			Tested By	SJ
	*salts present				

Initial compression due to 100 psf pressure = 1.53%
Swell potential due to water and 100 psf pressure = 0.18%
Total consolidation due to water and 2000 psf pressure = 5.15%
Estimated constant volume swell pressure = 190 psf
Estimated free swell pressure = 230 psf

Initial Moisture Content	30.8 %	Final Moisture Content	24.7 %
Initial Dry Density	90.8 pcf	Final Dry Density	94.8 pcf
Initial Wet Density	118.7 pcf	Final Saturated Density	118.2 pcf



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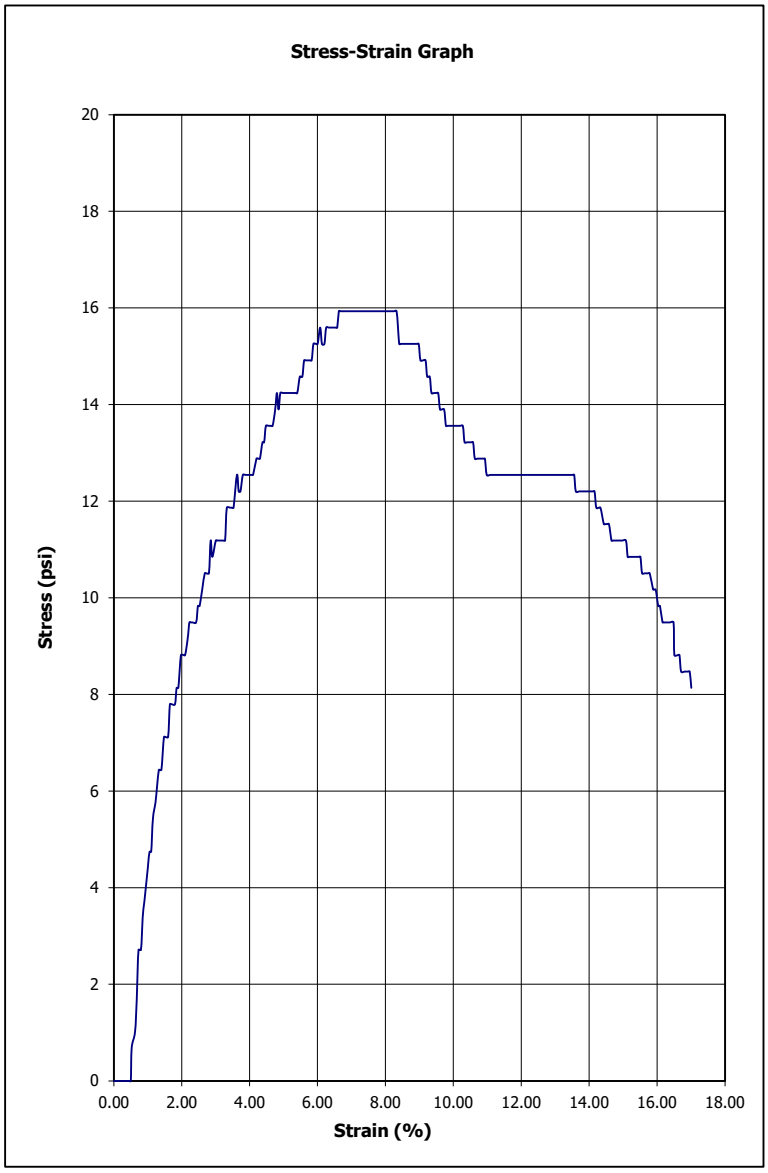
Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name	Garnet Mesa Solar Array			Date Sampled	4/5/2021
Project Location	Garnet Mesa			Sampled By	LB
Client	Citra Power			Date Received	4/6/2021
Project No.	2021-010-GEO	Sample #	DS18	Tests For	LB
Source/Depth	BH#4 @7.5-9'			Date Tested	5/6/2021
Soil Description	brown LEAN CLAY with sand		(ASTM D 2487)	Tested By	SJ
	*salts present				
Test Remarks					



Test Results

Strain Rate = 1.25%/min.
Strain at Failure = 6.6%
Unconfined Compressive Strength = 16 psi
Estimated Un-Drained Shear Strength = 8 psi
Average Height of Specimen = 3.998 in.
Average Diameter of Specimen = 1.938 in.
Height to Diameter Ratio = 2.06
Initial Dry Density = 101.5 lb/ft3
Sample moisture content = 17.7%, after testing

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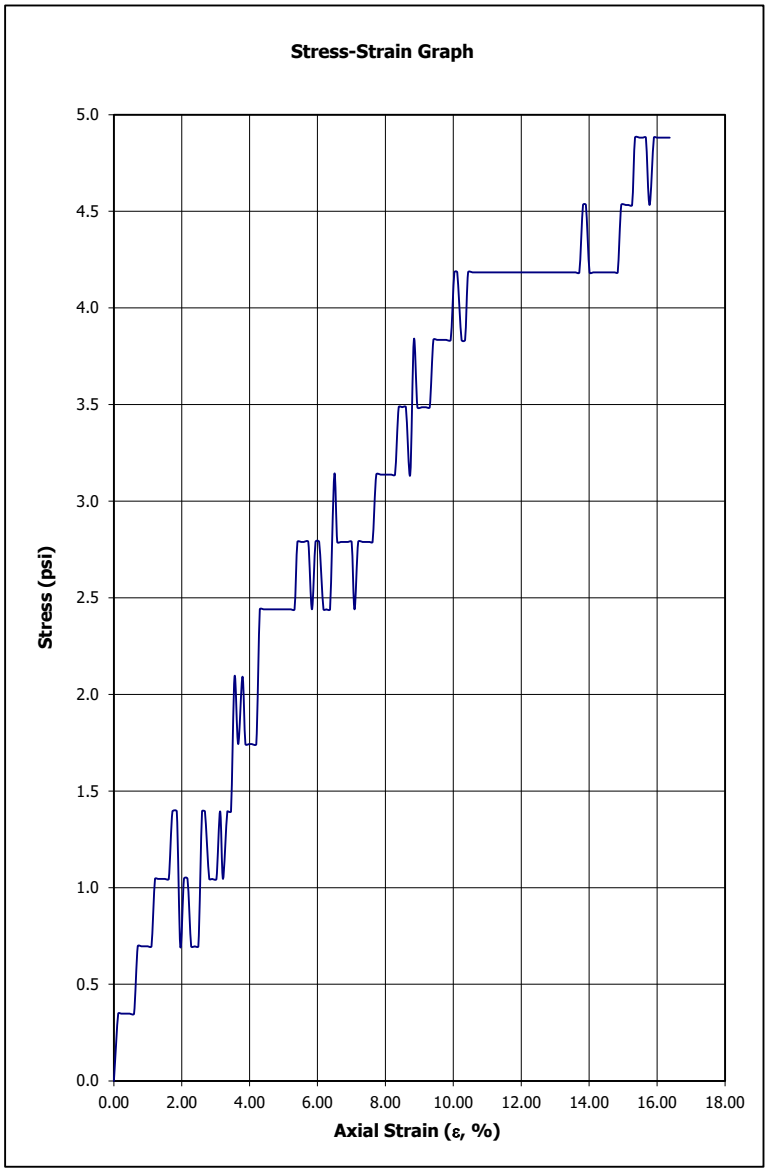
Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name	Garnet Mesa Solar Array			Date Sampled	4/5/2021
Project Location	Garnet Mesa			Sampled By	LB
Client	Citra Power			Date Received	4/6/2021
Project No.	2021-010-GEO	Sample #	DS20	Tests For	LB
Source/Depth	BH#4 @15-16.5'			Date Tested	5/6/2021
Soil Description	brown silty CLAY		(ASTM D 2488)	Tested By	SJ
	*salts present				
Test Remarks					



Test Results

Strain Rate = 1.25%/min.
Strain at Failure = 15.1%
Unconfined Compressive Strength = 5 psi
Estimated Un-Drained Shear Strength = 2 psi
Average Height of Specimen = 4.697 in.
Average Diameter of Specimen = 1.911 in.
Height to Diameter Ratio = 2.46
Initial Dry Density = 101.6 lb/ft3
Sample moisture content = 23.8%, after testing

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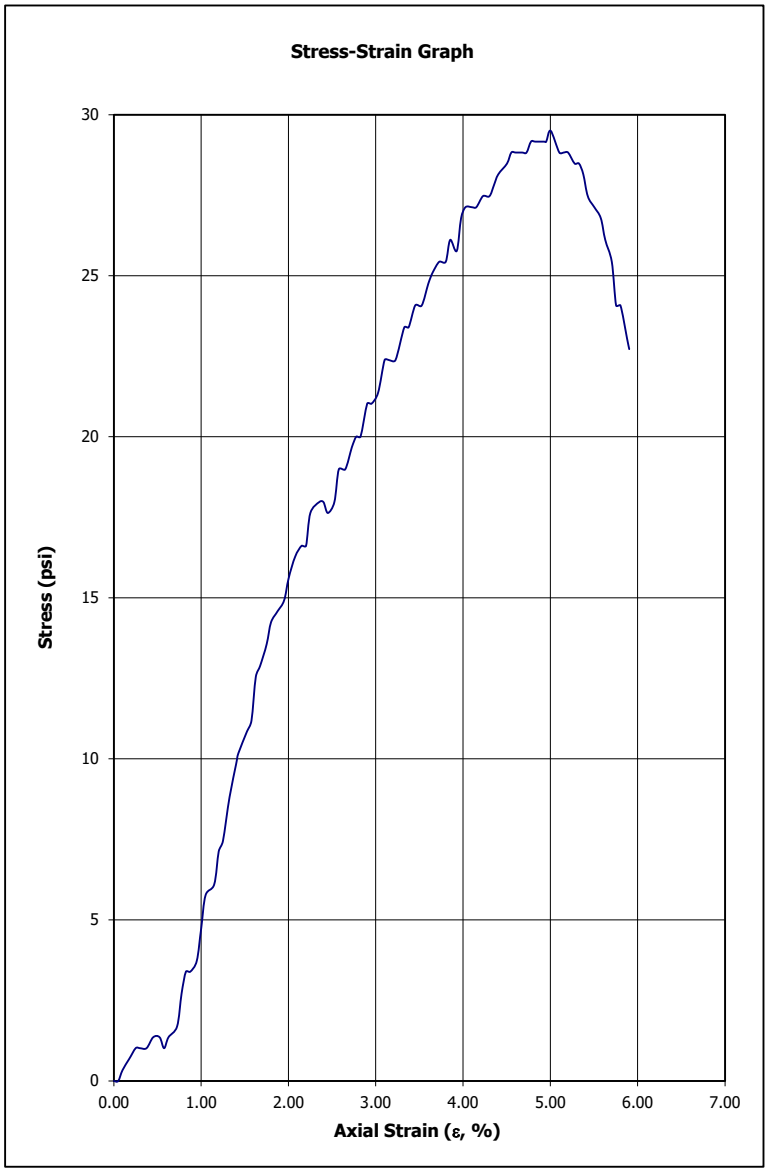
Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name	Garnet Mesa Solar Array			Date Sampled	4/5/2021
Project Location	Garnet Mesa			Sampled By	LB
Client	Citra Power			Date Received	4/6/2021
Project No.	2021-010-GEO	Sample #	DS73	Tests For	LB
Source/Depth	BH#14 @7.5-9'			Date Tested	5/6/2021
Soil Description	brown SHALE with clay		(ASTM D 2488)	Tested By	SJ
	*salts present				
Test Remarks					



Test Results

Strain Rate = 1.25%/min.
Strain at Failure = 5%
Unconfined Compressive Strength = 30 psi
Estimated Un-Drained Shear Strength = 15 psi
Average Height of Specimen = 3.998 in.
Average Diameter of Specimen = 1.938 in.
Height to Diameter Ratio = 2.06
Initial Dry Density = 113.3 lb/ft3
Sample moisture content = 10.7%, after testing

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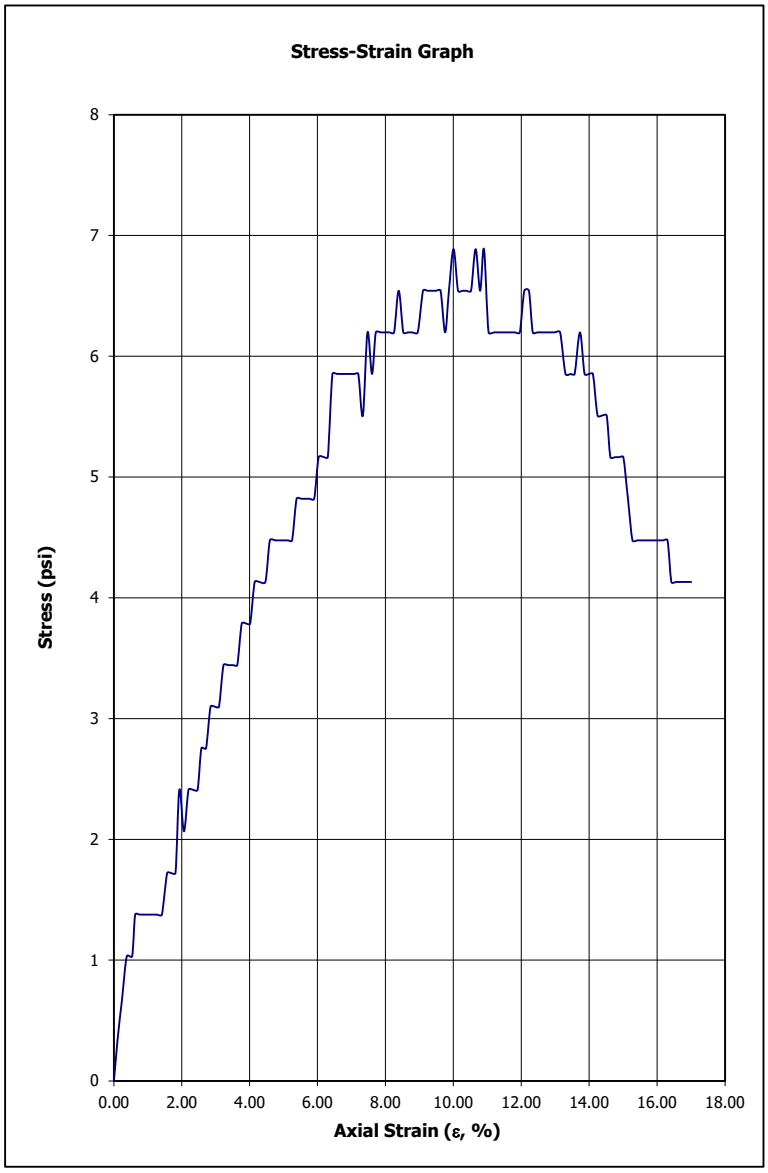
Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

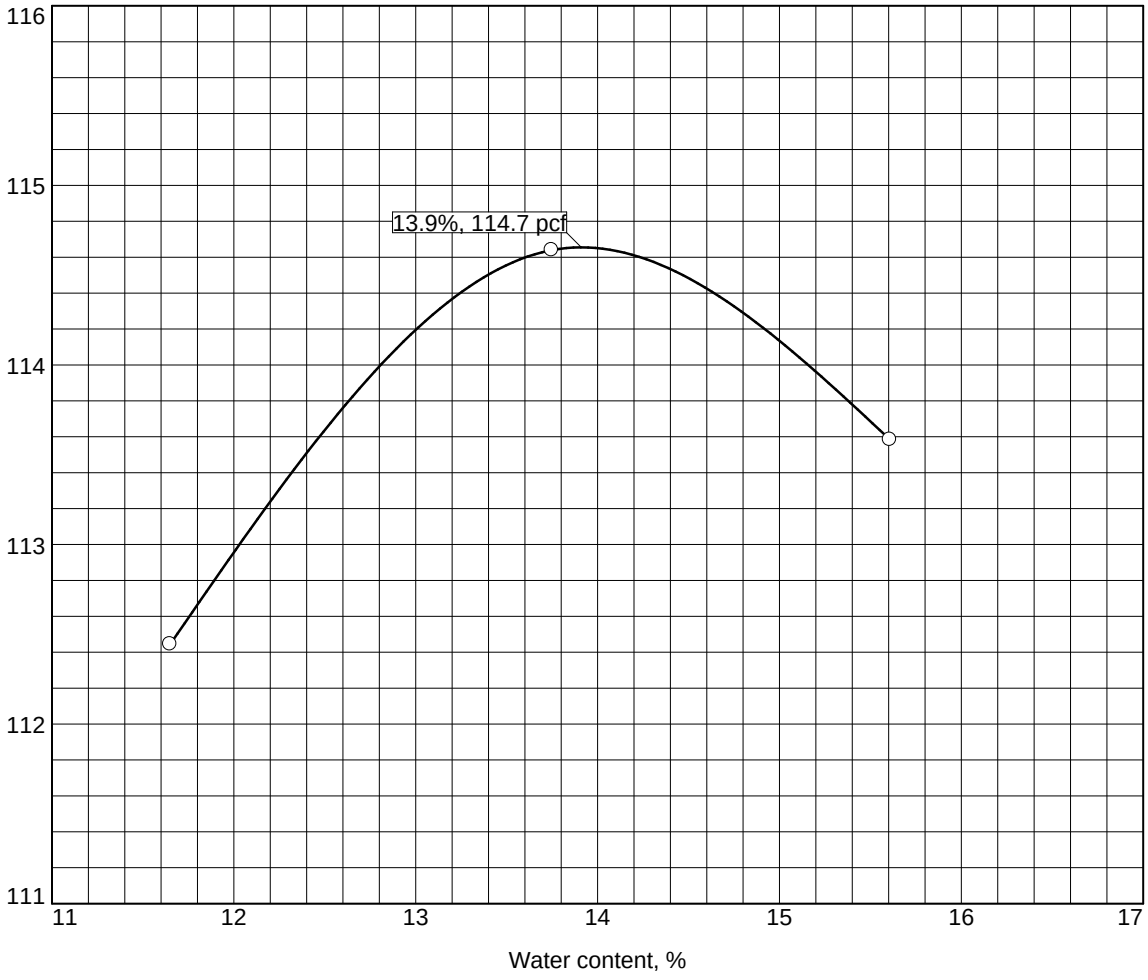
Project Name	Garnet Mesa Solar Array			Date Sampled	4/5/2021
Project Location	Garnet Mesa			Sampled By	LB
Client	Citra Power			Date Received	4/6/2021
Project No.	2021-010-GEO	Sample #	DS78	Tests For	LB
Source/Depth	BH#15 @2.5-4'			Date Tested	5/6/2021
Soil Description	brown LEAN CLAY		(ASTM D 2487)	Tested By	SJ
	*salts present				
Test Remarks					



Test Results

Strain Rate = 1.5%/min.
Strain at Failure = 10%
Unconfined Compressive Strength = 7 psi
Estimated Un-Drained Shear Strength = 3 psi
Average Height of Specimen = 4.458 in.
Average Diameter of Specimen = 1.923 in.
Height to Diameter Ratio = 2.32
Initial Dry Density = 96.6 lb/ft3
Sample moisture content = 23.9%, after testing

MOISTURE DENSITY REPORT For Curve No. BS1



Test specification: ASTM D 698-12 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
1'								

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 114.7 pcf Optimum moisture = 13.9 %	light brown silty CLAY (ASTM D2488)

Project No. 2021-010-GEO **Client:** Citra Power

Project: Garnet Mesa Solar Array

Delta, CO **Date:** 4/16/2021

○ **Source of Sample:** BH#4 **Sample Number:** BS1

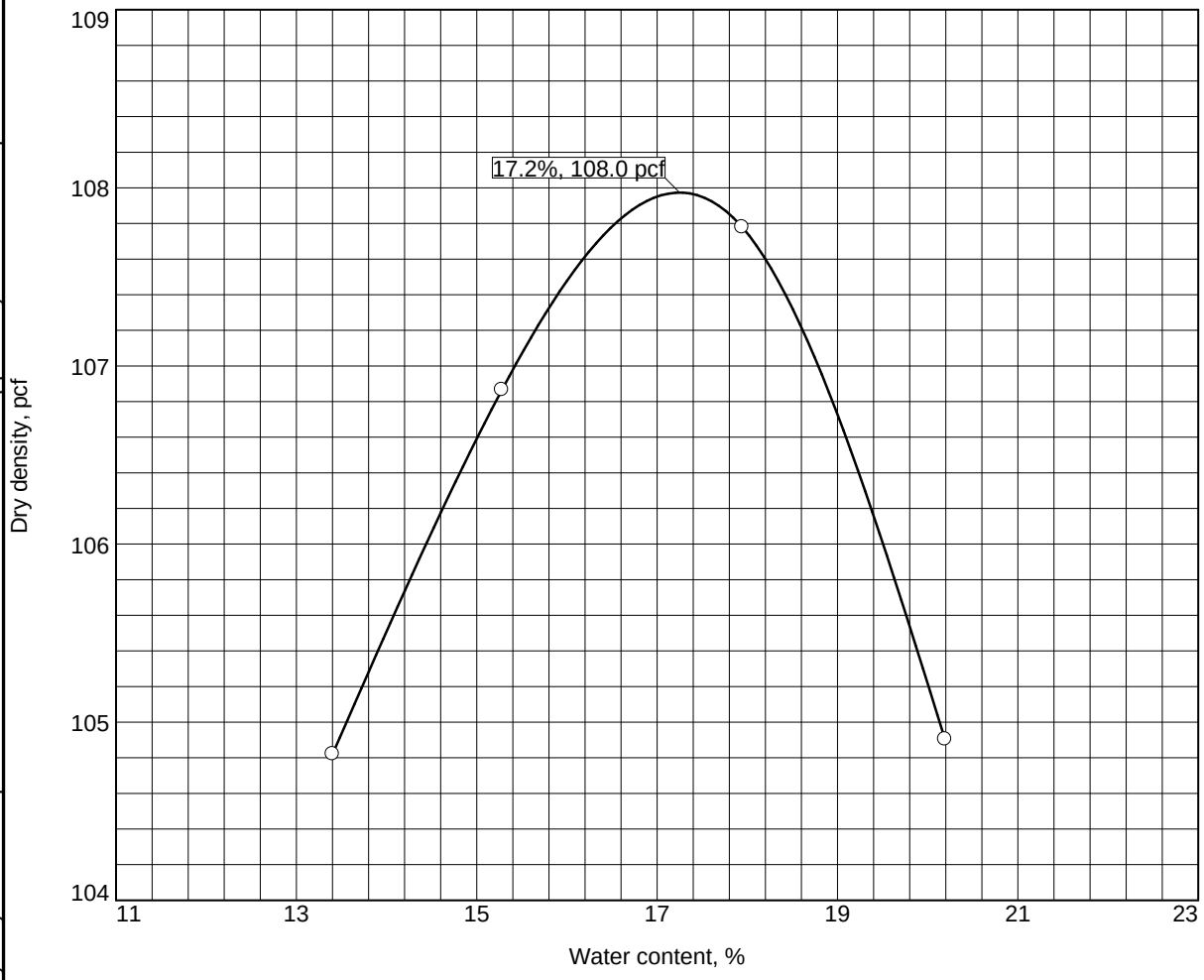
Remarks:

Buckhorn Engineering

Results are for the exclusive use of the client and apply only to the samples tested and are not indicative of apparantly identical samples.

Tested By: SJ **Checked By:** LB

MOISTURE DENSITY REPORT For Curve No. BS2/BS3 Blend



Test specification: ASTM D 698-12 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
1'								

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 108.0 pcf Optimum moisture = 17.2 %	brown silty CLAY

Project No. 2021-010-GEO **Client:** Citra Power

Project: Garnet Mesa Solar Array

Delta, CO **Date:** 4/16/2021

○ **Source of Sample:** BH#8 **Sample Number:** BS2

Remarks:

Buckhorn Engineering

Tested By: SJ **Checked By:** LB

Results are for the exclusive use of the client and apply only to the samples tested and are not indicative of apparantly identical samples.

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Dispersibility of Clayey Soils by the Crumb Test Method

ASTM D6572

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Project #	7131.75173.01	Date Received	4/5/2021
Client	Citra Power	Tests For	LB
Source/Depth	BH#1 @2.5-4' Sample # DS1	Date Tested	5/4/2021
Soil Description	light brown CLAY with some sand (ASTM D2488)	Tested By	SJ

*salts present

Specimen Type [X] Natural irregularly shaped crumb [ ] Remolded crumb cube

Moisture Content [X] Natural Moisture [ ] Air-dried [ ] Distilled water added to specimen

Curing Time _____ h. Water Used [X] Distilled [ ] Distilled and demineralized

Initial Water Temperature 15 °C

Test Date: 5/4/2021 Start Time: 912a

Sample No.	Dish ID	2 Minutes		1 Hour		6 Hours	
		Grade	°C	Grade	°C	Grade	°C
1	1	2	15	1	15	1	16
2	2	2	15	1	15	1	16
3	0	2	15	1	15	1	16
4	5	2	15	1	15	1	16

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Corrosivity Series

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Client	Citra Power	Date Received	4/6/2021
Project No.	2021-010-GEO	Tests For	LB
Source/Depth	BH#1 @2.5-4' Sample # DS1	Date Tested	5/4/2021
Soil Description	light brown CLAY with some sand (ASTM D2488)	Tested By	SJ

*salts present

Water-soluble sulfates, dry soil basis	**1.73**	**%**	CDOT CP-L 2103 - Method B
Chlorides	**0.008**	**%**	CDOT CP-L 2104 - Method B
pH	**7.6**		AASHTO T289
Electroconductivity	**1850**	**µS/cm**	

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Corrosivity Series

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Client	Citra Power	Date Received	4/6/2021
Project No.	2021-010-GEO	Tests For	LB
Source/Depth	BH#3 @2.5-4' Sample # DS11	Date Tested	5/3/2021
Soil Description	brown SHALE (ASTM D2488)	Tested By	SJ

*salts present

Water-soluble sulfates, dry soil basis	**1.57**	**%**	CDOT CP-L 2103 - Method B
Chlorides	**0.051**	**%**	CDOT CP-L 2104 - Method B
pH	**8.0**		AASHTO T289
Electroconductivity	**+3999***	**µS/cm**	*exceeds meter capabilities

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Corrosivity Series

Project Name	Garnet Mesa Solar Array			Date Sampled	4/5/2021
Project Location	Garnet Mesa			Sampled By	LB
Client	Citra Power			Date Received	4/6/2021
Project No.	2021-010-GEO			Tests For	LB
Source/Depth	BH#4 @15-16.5'	Sample #	DS20	Date Tested	5/3/2021
Soil Description	brown silty CLAY (ASTM D2488)			Tested By	SJ

*salts present

Water-soluble sulfates, dry soil basis	**1.08**	**%**	CDOT CP-L 2103 - Method B
Chlorides	**0.030**	**%**	CDOT CP-L 2104 - Method B
pH	**7.7**		AASHTO T289
Electroconductivity	**2100**	**µS/cm**	

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Corrosivity Series

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Client	Citra Power	Date Received	4/6/2021
Project No.	2021-010-GEO	Tests For	LB
Source/Depth	BH#5 @10-11.5' Sample # DS24	Date Tested	5/3/2021
Soil Description	brown SHALE with clay (ASTM D2488)	Tested By	SJ

*salts present

Water-soluble sulfates, dry soil basis	**0.84**	**%**	CDOT CP-L 2103 - Method B
Chlorides	**0.006**	**%**	CDOT CP-L 2104 - Method B
pH	**7.6**		AASHTO T289
Electroconductivity	**2136**	**µS/cm**	

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Corrosivity Series

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Client	Citra Power	Date Received	4/6/2021
Project No.	2021-010-GEO	Tests For	LB
Source/Depth	BH#6 @2.5-4' Sample # DS26	Date Tested	5/3/2021
Soil Description	dark brown to gray SHALE with clay (ASTM D2488)	Tested By	SJ

*salts present

Water-soluble sulfates, dry soil basis	**1.64**	**%**	CDOT CP-L 2103 - Method B
Chlorides	**0.045**	**%**	CDOT CP-L 2104 - Method B
pH	**7.7**		AASHTO T289
Electroconductivity	**1829**	**µS/cm**	

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Corrosivity Series

Project Name	Garnet Mesa Solar Array	Date Sampled	4/5/2021
Project Location	Garnet Mesa	Sampled By	LB
Client	Citra Power	Date Received	4/6/2021
Project No.	2021-010-GEO	Tests For	LB
Source/Depth	BH#14 @5-6.5' Sample # DS72	Date Tested	5/3/2021
Soil Description	brown CLAY with shale (ASTM D2488)	Tested By	SJ

*salts present

Water-soluble sulfates, dry soil basis	**1.56**	**%**	CDOT CP-L 2103 - Method B
Chlorides	**0.048**	**%**	CDOT CP-L 2104 - Method B
pH	**7.7**		AASHTO T289
Electroconductivity	**1910**	**µS/cm**	

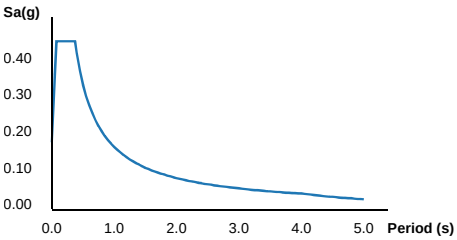
APPENDIX D – ENGINEERING ANALYSIS

Hazards by Location

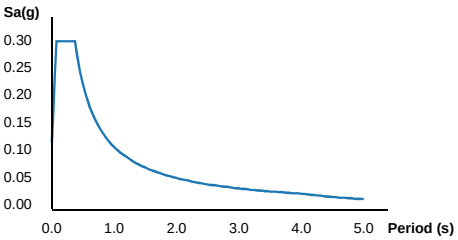
Search Information

Coordinates:	38.739506, -107.977846
Elevation:	5098 ft
Timestamp:	2021-05-18T19:00:44.652Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II
Site Class:	D

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Basic Parameters

Name	Value	Description
S_S	0.293	MCE_R ground motion (period=0.2s)
S_1	0.071	MCE_R ground motion (period=1.0s)
S_{MS}	0.459	Site-modified spectral acceleration value
S_{M1}	0.17	Site-modified spectral acceleration value
S_{DS}	0.306	Numeric seismic design value at 0.2s SA
S_{D1}	0.113	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description
SDC	B	Seismic design category
F_a	1.566	Site amplification factor at 0.2s
F_v	2.4	Site amplification factor at 1.0s
CR_S	0.942	Coefficient of risk (0.2s)
CR_1	0.932	Coefficient of risk (1.0s)
PGA	0.172	MCE_G peak ground acceleration
F_{PGA}	1.456	Site amplification factor at PGA
PGA_M	0.25	Site modified peak ground acceleration
T_L	4	Long-period transition period (s)
SsRT	0.293	Probabilistic risk-targeted ground motion (0.2s)
SsUH	0.311	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.071	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.076	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

Attachment 3-I

Emergency Response Plan

EMERGENCY RESPONSE PLAN

FOR THE GARNET MESA SOLAR PROJECT

DRAFT, AUGUST 2021

PREPARED FOR: DELTA COUNTY, COLORADO

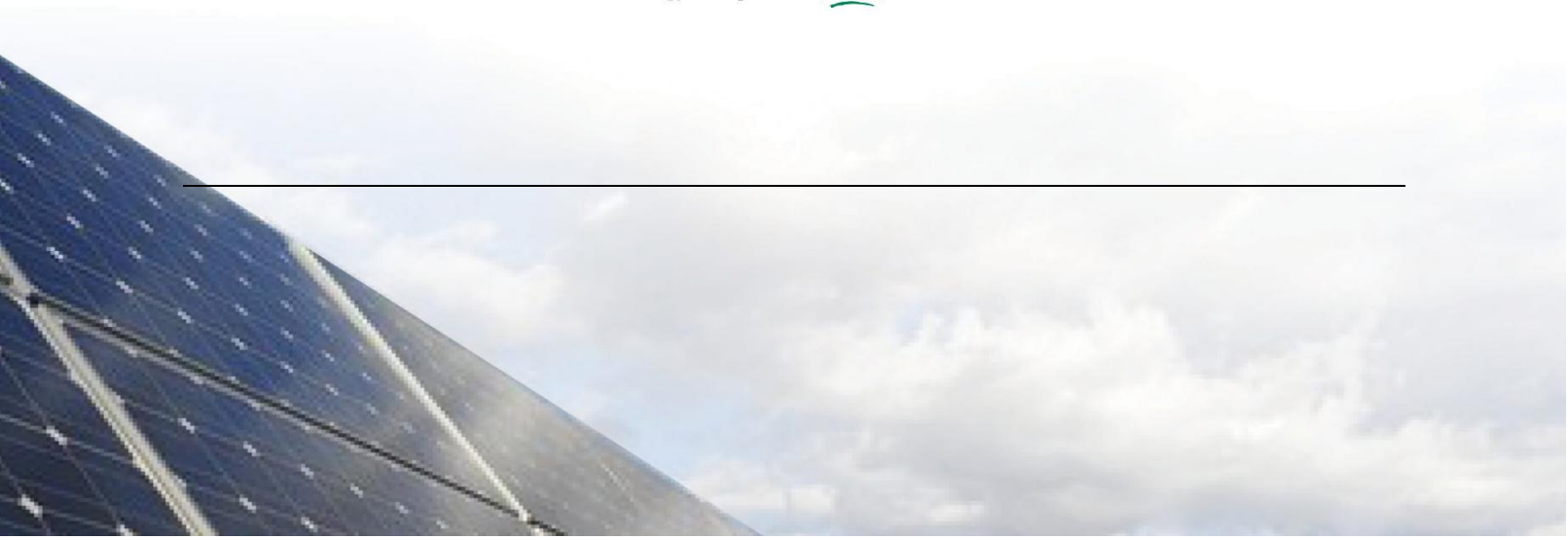
PREPARED BY: GARNET MESA SOLAR LLC

Guzman Energy

DMEA

A Touchstone Energy® Cooperative

CITRA



EMERGENCY RESPONSE PLAN

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1.0 Overview..... 3
2.0 Equipment Specifications and Layout..... 4
3.0 Solar Electrical Generation and System Shutdown..... 5
4.0 Project Contacts..... 5
5.0 Pre-Emergency Planning..... 6
6.0 Emergency Equipment and Supplies..... 7
7.0 Incident Response..... 7
8.0 Emergency Medical Treatment..... 8
9.0 Evacuation..... 8
10.0 Inclement Weather..... 9
11.0 Emergency Directions..... 10
12.0 Emergency Contacts..... 11
Attachment 1 – Site Layout..... A1
Attachment 2 – Single Line Diagram..... A2
Attachment 3 – Material Safety Data Sheets..... A3

1.0 Overview

Citra Power has prepared this Emergency Response Plan to support construction and operation of an 80-Megawatt (MW) ground mounted solar photovoltaic energy generating facility and collector substation referred to as the Garnet Mesa Solar Project in Delta County, Colorado.

The facility will be located on portions of five (5) parcels between 2200 Road on the east and 2050 Road on the west, north and south of G Road.
Solar arrays will be installed on three (3) project parcels totaling about 463 acres:

1) Parcel 345523100001 (G Road/2100 Road, 240 Acres, Zoned A-20).
2) Parcel 345523200009 (20426 G Road, 41.8 Acres of irrigated farmland with a homestead, Zoned A-20).
3) Parcel 245513100020 (6687 2200 Road, 181.5 Acres of irrigated farmland, Zoned A-20).

Two parcels are involved with easements that support the project:

4) Parcel 345513300009 (5990 2100 Road, 2.56 Acres, Zoned A-5). Easement for utility connection between Parcel #3 and Parcel #1.
5) Parcel 345513100022 (6687 2200 Road, 67.55 Acres, Zoned A-20). Easement providing access from Parcel #3 to 2200 Road. Reflected on the Norrell Ranch Survey Plat recorded March 29, 2021.

The Delta-Montrose Electric Association (DMEA) will directly purchase a portion of the energy produced by the plant and Guzman Energy will offtake the rest. Construction is anticipated to occur October 2022 to May 2023. Construction would generally occur Monday to Friday, 7am to 7pm. The system is anticipated to begin commercial operation in June 2023.

This Emergency Response Plan has been prepared to assist Delta County in addressing onsite and project related emergencies. Delta County is located in the West All Hazards Planning Region. Delta County Emergency Management works closely with Delta County staff, local and regional governments, special districts, volunteer organizations, as well as regional emergency managers and the Regional Field Manager of the Department of Homeland Security and Emergency Management (DHSEM), to develop and exercise preparedness plans and provide emergency management training.

Coordination with the Delta County Fire Protection District in regards to emergency response planning for the proposed Project has occurred. On July 22, 2021, the Fire Protection District conducted a site visit and plan review of the proposed Solar Project. The District has requested that drainage ditches on site, commonly used for flood irrigation, be kept accessible and maintained free of overgrowth and that interior roads be no less than 10-feet wide (Communication with Shannon Crespin, District Manager, Delta County Fire Protection District #1). Garnet Mesa will comply with all Delta County Fire Protection requests and has incorporated these inputs into site development.

2.0 Equipment Specifications and Layout

The project layout is provided in Attachment 1. The following equipment inventory will be installed onsite and used during operations:

Equipment Type	Quantity	Model	Manufacturer
Solar Panels	195,264	JAM72D30 525-MB *(Tentative, subject to change)*	JA Solar *(Tentative, subject to change)*
Inverters	25	HEM FS3430M *(Tentative, subject to change)*	Power Electronics *(Tentative, subject to change)*
Underground AC Cable Trenching	29,412 LF	TBD	TBD
HV Substation Transformer	1	Custom Engineered Unit	ABB

Although a solar energy facility is not a "chemical dependent" facility, there will be some products used in maintenance of equipment such as lubrication chemicals. The following chemicals may be stored or utilized on the project site during operations; corresponding Material Safety Data Sheets can be found in Attachment 3.

- Herbicides to treat high priority and priority weeds, in accordance with Delta County's Herbicide Reference Guide for Landowners (Accessed here: https://www.deltacounty.com/DocumentCenter/View/8263/Herbicide-Reference-Guide-for-Landowners?bidId=)
- Lead acid batteries (may be used in project's HV substation)
- Hydraulic Oil

Along with other permits, registrations and reporting requirements concerning hazardous materials and as required by numerous federal environmental and worker safety laws including the federal Emergency Planning and Community Right to Know Act (EPCRA) the company must track and report annually to the local emergency service providers on the quantity, locations and potential hazards of any hazardous chemicals. Included in the reporting requirements is the submittal of the Material Safety Data Sheets associated with the chemicals.

As the project is constructed and hazardous chemicals come on-site, a complete inventory and subsequent reporting will be made.

3.0 Solar Electrical Generation and System Shutdown

Solar photovoltaic panels are grouped together to form strings, which are in turn grouped into blocks. A solar PV system's voltage can reach up to 1500 volts of direct current (vdc). The power generated by an block (or a group of blocks) is carried back to the Point of Common Coupling (POCC) by an underground 34.5kV conductor. Inverters convert the direct current (DC) to alternating current (AC). Regardless of opening up the AC disconnect, the DC side of the inverter will always be energized. Hazardous voltage will always exist throughout the DC system. Use a dry chemical extinguisher is recommended on any energized components.

PV systems are addressed in the following National Fire Protection Association Codes:

- NFPA 1, Fire Code
- NFPA 70, National Electrical Code®
- NFPA 70B, Recommended Practice for Electrical Equipment Maintenance (Chapter 33)
- NFPA 70E, Standard for Electrical Safety in the Workplace®
- NFPA 5000, Building Construction and Safety Code®

In addition to an autonomous supervisory control and data acquisition (SCADA) system and automatic system protection, the Project will have a single manually operable disconnect switch that disconnects the entire system from the electrical distribution system to which it is connected. Upon disconnection from this system all electric power generation ceases within 2 seconds as required by industry standards. The manually operated switch has a design life equal to or greater than the life of the system. See attachment 2 for Single Line Diagram. The emergency disconnect switch is located at the project substation and will be clearly designated for emergency personnel.

4.0 Project Contacts

Project Emergency Response Coordinator:

Name	Phone	Email Address	Physical Address
Matthew Kosakowski	(303) 884-5598	matt@mksolarops.com	1125 17th Street, Suite 750, Denver, CO 80202, United States
Remainder of Project Contacts to be populated prior to the start of construction			

5.0 Pre-Emergency Planning

The project emergency response coordinator will serve as the onsite safety manager. The safety manager will perform applicable pre-emergency planning tasks before starting field activities and will coordinate emergency response with onsite personnel, the facility and the local emergency service providers. These activities include the following:

- Ensure that there is a good contact list for all personnel onsite.
- Verify that two way radio communications are available and serviceable.
- Verify that all emergency contact information is correct and up to date.
- Post “Exit and Fire Extinguishers” signs above exit doors and above locations of fire extinguishers, also keep areas exits and fire extinguisher access clear.
- Evaluate site condition, onsite operations, and personnel availability for emergency response procedures.
- Take an inventory of the site’s equipment, supplies and potable water.
- Visit with local fire department, EMS, coordinate with a local doctor’s office to handle advanced first-aid incidents.
- Communicate emergency procedures for site hazards such as personal injury, exposures, fires, explosions and releases.
- The Safety team will brief new workers on the emergency action plan and evaluate emergency response actions during a new hire orientation.

6.0 Emergency Equipment and Supplies

The onsite Safety Coordinator will ensure the following emergency equipment is on site and that the equipment is functional and serviceable. The Safety Coordinator will also note the locations of safety equipment and communicate that to all employees. Onsite Emergency Equipment and Supplies will include:

- Appropriate number and size of Class A, B, and C Fire Extinguisher based on construction site and construction activities
- Medical Jump Bag
- First Aid kit located in office
- AED
- Potable water
- Blood borne Pathogen Kit
- Additional equipment needed for site specific reasons
- Spill Kits
- Spill containment systems as required
- Lightning monitor
- Wet bulb globe temperature (WBGT) meter

7.0 Incident Response

In case of a fire, explosion or chemical release, the following steps will be taken:

- Alert the appropriate response personnel by dialing 911.
- Shut down operations and evacuate the immediate work area.
- Perform a head count of the designated assembly area(s).
- Assess the need for site evacuation, and evacuate the site as warranted.
- Conduct Incident Notification, Reporting and Investigation as required by OSHA and employer.
- Notify and submit reports to clients to owner and municipals as required.

Please note: Fires or spills that present a minimal safety or health hazard may be controlled with onsite spill kits or fire extinguishers without activating the sites evacuation procedure. When in doubt evacuate.

8.0 Emergency Medical Treatment

In the event that emergency medical treatment is needed whether life threatening or not, it must be immediately reported to the site safety officer. Site safety will evaluate the course of action that is needed. Major medical emergencies include injuries of severe bleeding, loss of consciousness, breathing or heart failure. A minimum of two first aid, CPR and AED trained persons shall be onsite at all times for medical emergencies. In the event of such, please follow the steps below:

- Notify Safety Officer.
- Notify 911 or other appropriate emergency response authorities that are listed at the site.
- Initiate first aid and CPR and AED if needed.
- Make certain that the injured person is accompanied by Safety personnel to the doctor or emergency room.

9.0 Evacuation

The site map should have clear detailed evacuation routes, assembly areas, severe weather shelters as well as any alternative routes and assembly locations.

- The primary Muster point is the admin trailer.
- If site evacuation is needed Delta Blake Field Airport will become the muster point.
- All members of staff will gather at the muster point upon hearing the emergency signal for evacuation.
- The Safety personnel and a “buddy” will remain on the site after the site has been evacuated, if the situation is safe to assist local responders
- The Safety team will account for all personnel in the onsite assembly area.
- A designated person will account for personnel at alternate muster area(s).
- The Safety Coordinators will follow the incident reporting protocols.

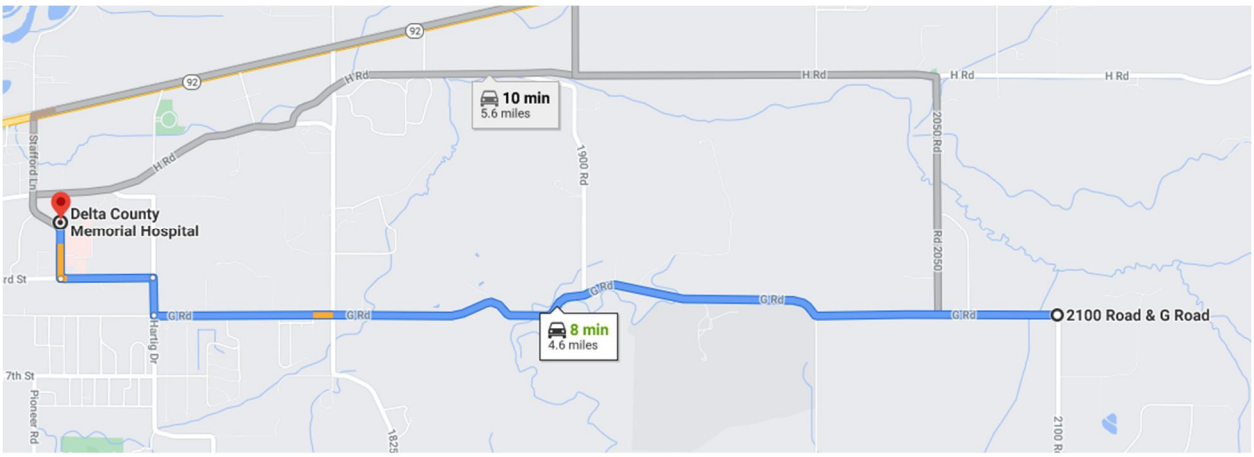
10.0 Inclement Weather

Sudden inclement weather can infringe upon field personnel. Emergency preparedness and caution are the best defense. Field crew members performing work outdoors should carry the appropriate clothing for inclement weather. Staff should pay close attention to the weather forecast on a daily basis to look for signs of inclement weather. These signs include towering thunderheads, darkening skies, or a sudden increase in wind. If stormy weather ensues, field personnel should discontinue work and seek shelter until the storm has passed. Stay away from open water, metal equipment, wire fences and metal pipes. Other general precautions include, but are not limited to:

- Know where to go and how long it will take to get there. If possible, take refuge in a large building or vehicle. Do not go into a shed in an open area.
- The inclination to see trees as enormous umbrellas is a frequent and deadly mistake. Avoid standing under large trees, poles, antennaes and towers.
- If the area is wide open, go to a valley or ravine, but be aware of flash flooding.
- If you are caught in a level open area during an electrical storm and start to feel your hair stand on top of your head then you should drop to your knees, bend forward and crouch. This technique will make you less vulnerable to electrocution.
- Do not lie down. This is dangerous and can cause the wet earth to conduct electricity.
- Do not touch the ground with your hands.
- Do not use telephones during electrical storms, except in the case of emergency.
- Remember: lightning can strike several miles from the parent cloud, so work should be stopped and restarted accordingly.
- Lightning safety recommendation is 30-30; this translates to seek protection when thunder sounds within 30 seconds after a lightening flash and do not resume work until 30 minute after the last thunder clap. Stay alert for high winds that can cause unsafe conditions. Working in high wind conditions should be avoided. If continuous high wind persists then staff should seek shelter. All employees will stand down when lightning reaches a range of 8 Miles.

11.0 Emergency Directions

Hospital Directions to Delta County Memorial Hospital from Project location:



Head west on G Rd toward Stirrup Creek Rd
3.9 mi

Turn right onto Hartig Dr
0.2 mi

Turn left onto E 3rd St/G 10 Rd
Continue to follow E 3rd St
0.4 mi

Turn right onto Stafford Ln
Destination will be on the right

12.0 Emergency Contacts

In the event there is an emergency, the air horn will sound. After the horn, there will be a message indicating the type of emergency followed by directions. In the event of an emergency, the first contact will be to 9-1-1.

FIRE:

Delta Fire Protection District 1	*Phone:* Fire Station: 970-874-9655 Burn Line: 970-399-2955	*Address*: 285 E. 5th Street Delta, CO 81416

MEDICAL/FIRST AID FACILITY:

Delta County Memorial Hospital	970-874-7681	1501 E 3rd St Delta, CO 81416

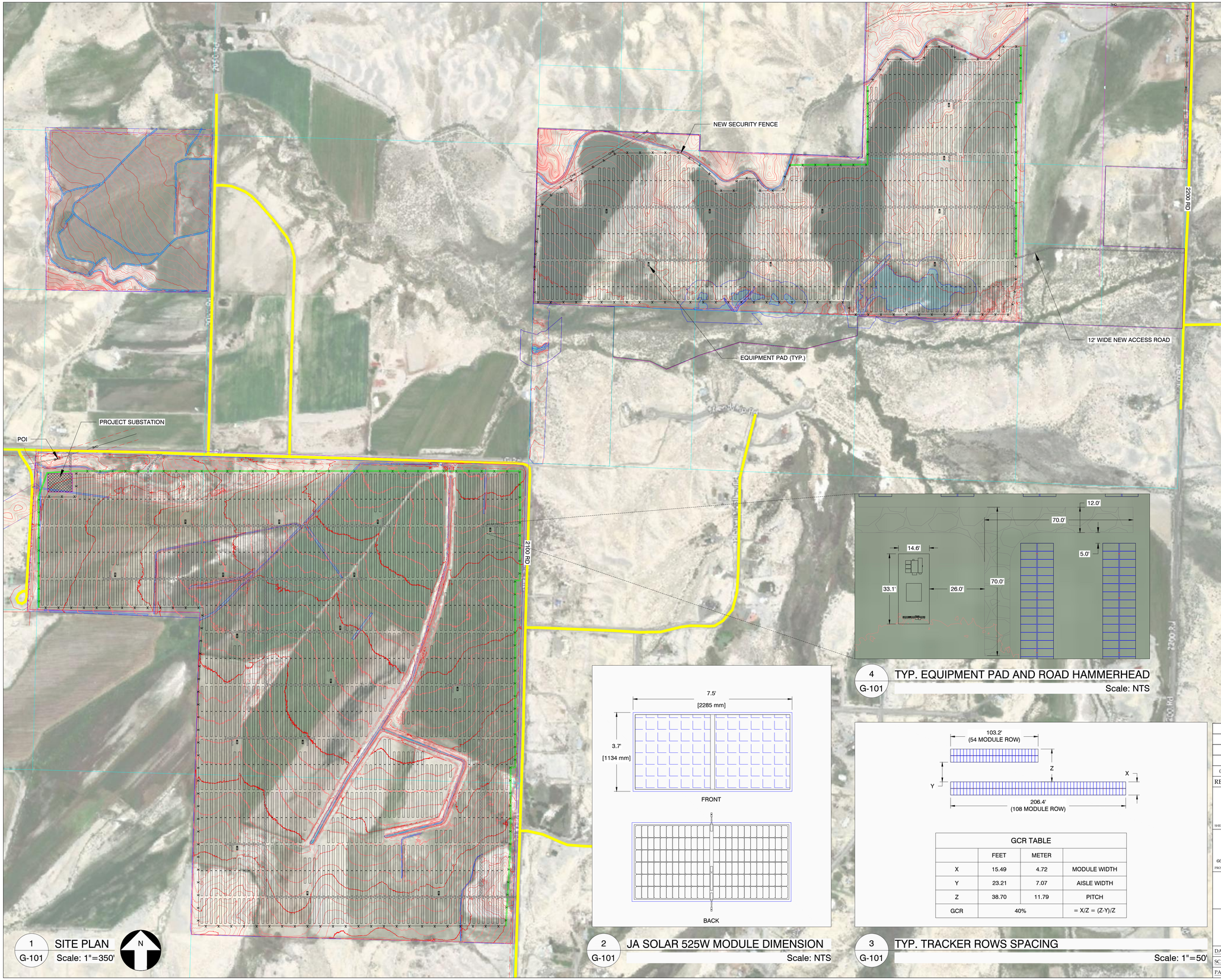
POLICE DEPARTMENT:

Delta County Sheriff	970-874-2000	555 Palmer Street Delta, CO 81416

SPILLS:

In the event of an oil or chemical spill	To report an oil or chemical spill, contact the Environmental Protection Agency (EPA) at 800-424-8802, the Delta County Dispatch at 970-874-2015, or by dialing 9-1-1.

Attachment 1 – Site Layout



1 G-101 SITE PLAN
Scale: 1"=350'

4 G-101 TYP. EQUIPMENT PAD AND ROAD HAMMERHEAD
Scale: NTS

2 G-101 JA SOLAR 525W MODULE DIMENSION
Scale: NTS

GCR TABLE			
	FEET	METER	
X	15.49	4.72	MODULE WIDTH
Y	23.21	7.07	AISLE WIDTH
Z	38.70	11.79	PITCH
GCR	40%		= X/Z = (Z-Y)/Z

3 G-101 TYP. TRACKER ROWS SPACING
Scale: 1"=50'

SYSTEM SPECIFICATIONS

SYSTEM SIZE DC	102,513.60 kW
SYSTEM SIZE AC	80,000.00 kW
DC/AC RATIO	1.28
MODULE MANUFACTURER	JA SOLAR
MODULE MODEL	JAM72D30 525-MB
MODULE RATING	525 W
TOTAL MODULE QTY	195,264
MODULES PER STRING	27
TOTAL NO. OF STRINGS	7,232
INVERTER MODEL	POWER ELECTRONICS FS3430M
INVERTER RATING	3,200 kW
INVERTER QTY	25
STEP-UP TRANSFORMER	(25) 3.55 MVA, 34.5kV/0.6kV
RACKING TYPE	FTC VOYAGER 2P HSAT
TILT	0°
AZIMUTH	180°
GCR	40%
AVAILABLE PROPERTY AREA	579.59 Ac
FENCED AREA	383.71 Ac

LEGEND

- FTC VOYAGER 2P MODULE TRACKER ROWS (1,698)
- FTC VOYAGER 2P MODULE TRACKER ROWS (220)
- POWER STATION EQUIPMENT PAD
- PROPERTY LINE
- SETBACK LINE
- MIN. 6' SECURITY FENCE
- SUBSTATION FENCE
- PROJECT SUBSTATION
- GRAVEL ACCESS ROAD
- EXISTING OVERHEAD LINE
- EXISTING ROAD
- LANDSCAPE BUFFER
- WETLAND
- NON-JURISDICTIONAL WETLAND

DRAFT
NOT FOR CONSTRUCTION

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	AA	DG	07/13/2021

SHEET TITLE: GENERAL SITE PLAN

SHEET NO.: G-101

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

SOLVIDA DESIGN ENGINEERING
1400 Boston Avenue, Suite 2
Kentucky, California 94714

soa SIERRA OVERHEAD ANALYTICS

DATE:	07/13/2021	DFTR:	LAKIR RAMBHIA
SCALE:	AS SHOWN	CHKD:	STEPHEN SMITH
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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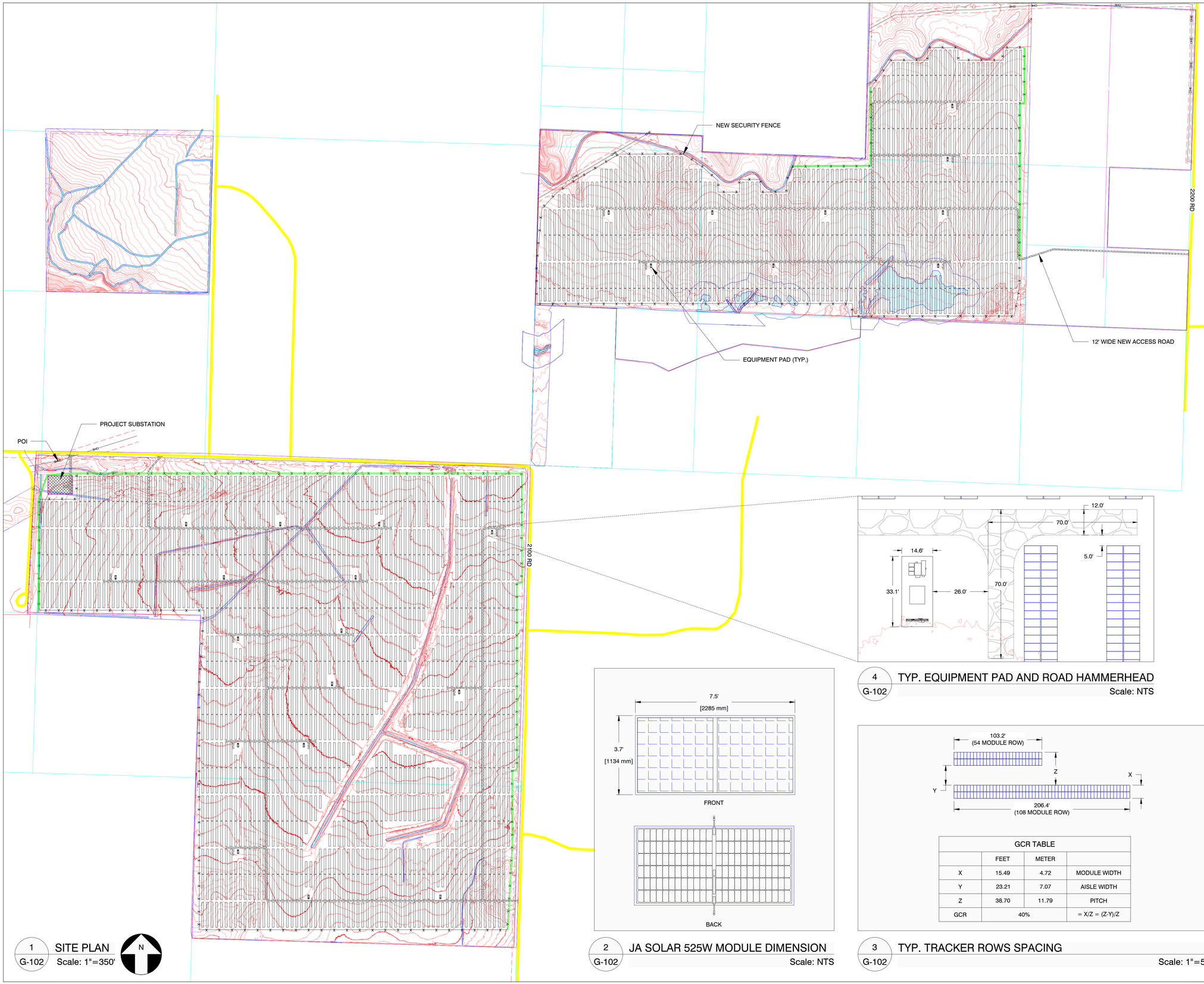

1 G-102 SITE PLAN
Scale: 1"=350'

SYSTEM SPECIFICATIONS

SYSTEM SIZE DC	102,513.60 kW
SYSTEM SIZE AC	80,000.00 kW
DC/AC RATIO	1.28
MODULE MANUFACTURER	JA SOLAR
MODULE MODEL	JAM72D30 525-MB
MODULE RATING	525 W
TOTAL MODULE QTY	195,264
MODULES PER STRING	27
TOTAL NO. OF STRINGS	7,232
INVERTER MODEL	POWER ELECTRONICS FS3430M
INVERTER RATING	3,200 kW
INVERTER QTY	25
STEP-UP TRANSFORMER	(25) 3.55 MVA, 34.5kV/0.6kV
RACKING TYPE	FTC VOYAGER 2P HSAT
TILT	0°
AZIMUTH	180°
GCR	40%
AVAILABLE PROPERTY AREA	579.59 Ac
FENCED AREA	383.71 Ac

LEGEND

- FTC VOYAGER 2P MODULE TRACKER ROWS (1,698)
- FTC VOYAGER 2P MODULE TRACKER ROWS (220)
- POWER STATION EQUIPMENT PAD
- PROPERTY LINE
- SETBACK LINE
- MIN. 6' SECURITY FENCE
- SUBSTATION FENCE
- PROJECT SUBSTATION
- GRAVEL ACCESS ROAD
- EXISTING OVERHEAD LINE
- EXISTING ROAD
- LANDSCAPE BUFFER
- WETLAND
- NON-JURISDICTIONAL WETLAND

4 G-102 TYP. EQUIPMENT PAD AND ROAD HAMMERHEAD
Scale: NTS

2 G-102 JA SOLAR 525W MODULE DIMENSION
Scale: NTS

GCR TABLE			
	FEET	METER	
X	15.49	4.72	MODULE WIDTH
Y	23.21	7.07	AISLE WIDTH
Z	38.70	11.79	PITCH
GCR	40%		= X/Z = (Z-Y)/Z

3 G-102 TYP. TRACKER ROWS SPACING
Scale: 1"=50'

DRAFT
NOT FOR CONSTRUCTION

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	AA	DG	07/13/2021

SHEET TITLE: GENERAL SITE PLAN

SHEET NO.: G-102

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

SOLVIDA DESIGN ENGINEERING
1400 Bonner Avenue, Suite 2
Berkeley, California 94704

soa SIERRA OVERHEAD ANALYTICS

DATE:	07/13/2021	DFTR:	LAKIR RAMBHIA
SCALE:	AS SHOWN	CHKD:	STEPHEN SMITH
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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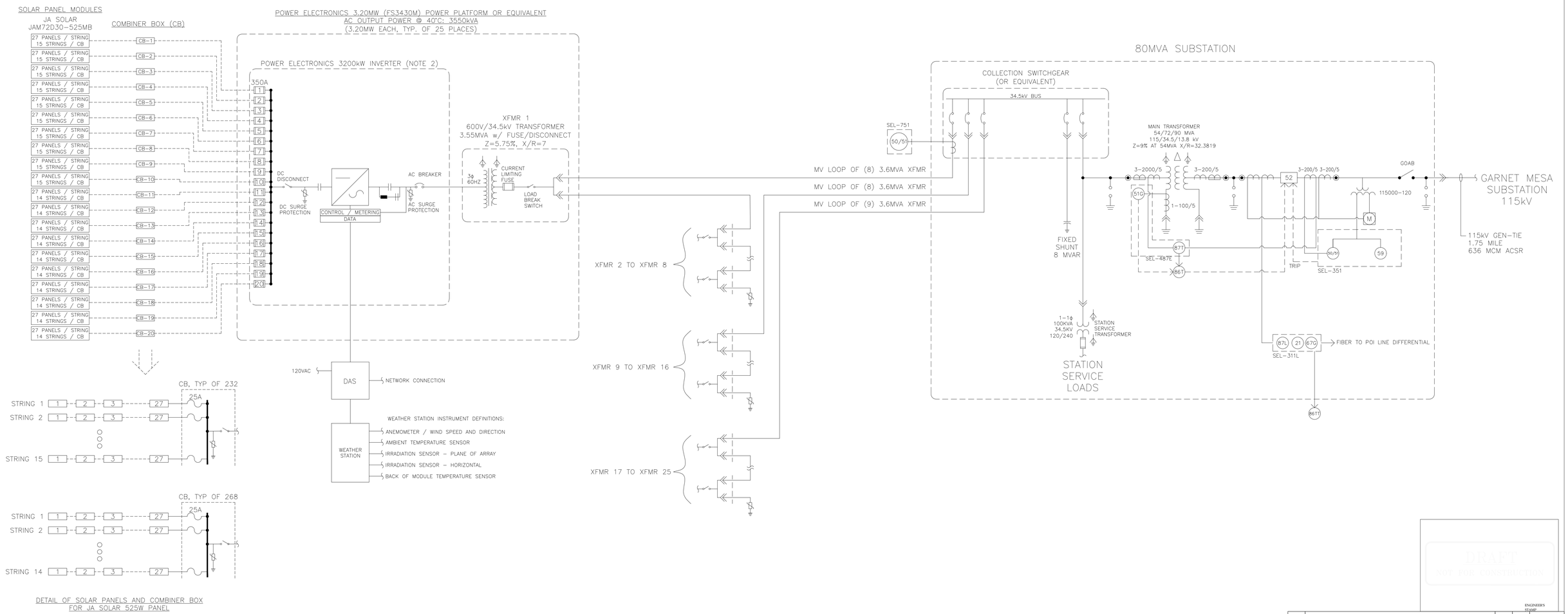
Attachment 2 – Single Line Diagram



NOTES:

1) CONCEPTUAL SCHEMATIC. NOT DEVELOPED FROM POWER ELECTRONICS INFORMATION.

2) RELAY PROTECTION EQUIPMENT OR PROTECTION FUNCTIONS SUBJECT TO CHANGE DURING SUBSTATION DESIGN.

3) SUBSTATION FULL PROTECTION SCHEMES ARE NOT SHWON IN THIS SINGLE LINE DIAGRAM.

SYSTEM SPECIFICATIONS	
SYSTEM SIZE DC	102,513.60 kW
SYSTEM SIZE AC	80,000.00 kW
DC/AC RATIO	1.28
MODULE MANUFACTURER	JA SOLAR
MODULE MODEL	JAM72D30 525-MB
MODULE RATING	525 W
TOTAL MODULE QTY	195,264
MODULES PER STRING	27
TOTAL NO. OF STRINGS	7,232
INVERTER MODEL	POWER ELECTRONICS FS3430M
INVERTER RATING	3,200 kW
INVERTER QTY	25
STEP-UP TRANSFORMER	(25) 3.55 MVA, 34.5kV/0.6kV

DRAFT
NOT FOR CONSTRUCTION

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	AA	DG	07/14/2021

SHEET TITLE: SINGLE LINE DIAGRAM

SHEET NO.: E-101

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:38.738175° / LON:-107.980153°

SOLVIDA DESIGN ENGINEERING

soa SIERRA OVERHEAD ANALYTICS

DATE:	07/14/2021	DFTR:	LAKIR RAMBHIA
SCALE:	AS SHOWN	CHKD:	STEPHEN SMITH
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

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Attachment 3 – Material Safety Data Sheets

(To be added once project equipment is finalized)

Attachment 3-J

Hydrology Study

Garnet Mesa Solar Site Hydrologic & Hydraulic Assessment

-

Completed for: Citra Power, LLC

Completed By:

Sierra Overhead Analytics, Inc.
PO Box 1716, Twain Harte, CA 95393
Phone: +1.415.413.7558

Sierra Overhead Analytics, Inc.
PO Box 1716, Twain Harte, CA 95393
Phone: +1.415.413.7558

Introduction

On behalf of Citra Power, LLC, Sierra Overhead Analytics, Inc. (SOA) has prepared this hydrology and hydraulic report (report) for the Garnet Mesa Solar Site, located in Delta County, near Delta, Colorado. The approximate center point of the project is located at: 38.739° N, -107.974° W. This report summarizes the results of the hydrology study which was performed to assess peak flows and flood risk across the project site. A rainfall-runoff model was developed using HEC-1 to determine the impacts from a 100-year recurrence interval storm event. The resulting hydrographs were used as upstream boundaries for a two-dimensional (2D) hydraulic model developed in HEC-RAS used to assess on-site depth, velocity, and scour during a 100-year recurrence interval storm event. NOAA Atlas 14 publicly available rainfall data, United States Department of Agriculture (USDA) SSURGO database soils data, National Land Cover Database (NLCD) land use mapping, and publicly available USGS topographic data was used to model infiltration, runoff, and flow depth and velocities in the study area. The methods used in this report generally follow the guidelines of the National Resource Conservation Service (NRCS), and HEC documentation. Relevant excerpts are contained in Appendix B.

1 Site Data

1.1 Existing Topography and Drainage

SOA utilized USGS 10 meter SRTM data for the region. The three site areas are located in a valley, which drains to the Relief Ditch stream channel running through it. A mesa exists to the west of Site Area 1, and a ridge exists to the north of Site Area 2. Site Area 1 has a slope of about 0.05 ft/ft from southwest to northeast. Site Area 2 has a slope of about 0.02 ft/ft from the north to the south, and Site Area 3 has a slope of about 0.015 ft/ft from the southwest to northeast. Four drainage basins south of the site contribute flow to the site. The northern portion of Site Area 2 is in FEMA Zone X – outside of the 100-year floodplain. The remaining site area is within FEMA Zone D - unknown flood hazard. Flood zones are shown in Appendix A, Figure 1.

1.2 Site Soils and Land Use

Soils data was downloaded from United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Gridded SSURGO database. Soils in the model domain are mostly silty clay loam. The soils are generally poorly draining and classified as hydrologic soil group C and D. Hydrologic soil types are shown in Appendix A, Figure 2.

The USGS National Land Cover Database (NLCD) was used to determine land use for the model domains. The site is mostly classified as Shrub/Scrub and Cultivated Crops.

1.3 Proposed Changes to Land Use and Topography

Roads will be added to the site areas, increasing impervious areas by an estimated 6%. Overall, post-construction changes to site hydraulics will be minimal.

1.4 Precipitation

NOAA Atlas 14 publicly available rainfall data was used to determine precipitation depths for the 100-year 24-hour storm event at the center of the 2D model area and at the centroid of each contributing watershed. The 100-year 24-hour precipitation depth was found to be 2.06 inches for the 2D model area, and between 2.066 and 2.085 inches for the contributing watershed areas. These precipitation amounts were temporally distributed through use of the Type-II, 24-hour storm.

2 Model Setup

2.1 1D Computational Hydrologic Modeling

HEC-1 modeling software was used to calculate the rainfall-runoff hydrographs for the contributing watersheds. Contributing watersheds impacting the site were delineated using TOPAZ software and National Map Publicly Available Data. Four upstream contributing watersheds were delineated, 1B, 2B, 3B, and 4B. Locations and boundaries of the contributing watersheds are shown in Appendix A, Figure 3. Contributing watershed curve numbers (CN) were determined using SSURGO soils data and NLCD land use data. Composite curve numbers were determined from percent areas of each soil type/land use combination, typical values for which are available in TR-55 Appendix B. The contributing watershed areas and curve numbers are shown in Table 1. Further information about each contributing watershed is provided in Appendix B.

Table 1: *Contributing Watershed Characteristic Curve Numbers and Areas*

Contributing Watershed	Area (mi^2)	CN
1B	7.96	76.5
2B	2.81	74.8
3B	0.54	74.5
4B	0.71	76.6

Lag time was calculated using the SCS Unit Hydrograph method, the equation for which is:

$$T_{lag} = \frac{L^{0.8}(S+1)^{0.7}}{1900 \cdot (\%Slope)^{0.5}} \tag{1}$$

L is the longest drainage path in feet, S = (1000/CN)-10, CN is SCS curve number, and %Slope is the average slope of the watershed, determined through topographic analysis. Time of Concentration is determined by dividing Lag Time by 0.6. Antecedent Moisture condition (AMC) is defined by the USDA as the preceding relative moisture of the pervious surfaces prior to the rainfall event. The "Average" AMC-II condition was used for the site. This resulted in no modification to the curve numbers.

2.2 2D Hydraulic Modeling

HEC-RAS was used to develop a 2D hydraulic model for the 100-year 24-hour storm event to model maximum depths and velocities across the site for the pre-construction and post-construction scenarios. Grid cells of approximately 10 feet by 10 feet were used for the main stream channel areas and grid cells

of 40 feet by 40 feet were used for the remainder of the model area. Topography was interpolated to the grid cells based on the elevation described above. A land use layer and soil layer were developed using the data described above, and combined to form an infiltration layer. Each land use was associated with a Manning's n value as shown in Table 2.

Table 2: *Land Cover Types and Associated Manning's n Values*

Land Cover	Manning's n
Cultivated Crops	0.05
Shrub/Scrub	0.05
Grassland/Herbaceous	0.04
Deciduous Forest	0.1
Evergreen Forest	0.15
Pasture/Hay	0.045
Developed, Open Space	0.035
Developed, Low Intensity	0.08
Developed, Medium Intensity	0.12
Developed, High Intensity	0.15
Shrub/Scrub	0.05
Grassland/Herbaceous	0.04
Woody Wetlands	0.07
Emergent Herbaceous Wetlands	0.045
Open Water	0.035
Barren Land Rock/Sand/Clay	0.03

Hydrologic soil group data was combined with land use data to assign a CN to each land use/hydrologic soil group combination, as shown in Table 3. These CN values were used in the infiltration layer. The average CN for the model domain was 84.4. In the post-construction scenario, the site areas were assigned an imperviousness of 6%. All other areas were assigned an imperviousness of 0%. All cells were assigned an initial abstraction value of 0.2.

The precipitation events was simulated as spatially constant across the 2D model domain using an internal precipitation boundary condition. Infiltration was modeled using the SCS Curve Number method. An external boundary conditions of normal depth where friction slope = 0.01 was added to the boundaries edge of the model domain.

Two-dimensional unsteady flow routing was performed in HEC-RAS using the Diffusion Wave Equations, as described in the HEC-RAS Hydraulic Reference Manual. Model stability was maintained through variable timestepping dictated by maximal and minimal Courant numbers where the Courant number (C) =

$$C = \frac{V \cdot \Delta T}{\Delta X} \tag{2}$$

V is the flood wave velocity, ΔT is the computational time step, ΔX is the average computational grid cell size. The maximum Courant number was set to 0.95 and the minimum was set to 0.25. The small cell size of the computational grid dictated a small timestep, on average around 1 second.

Table 3: *Curve Numbers*

	Curve Number	
Land Use	Soil Type C	Soil Type D
Cultivated Crops	87	90
Open Water	100	100
Developed, Open Space	79	84
Developed, Low Intensity	91	94
Developed, Medium Intensity	94	95
Developed, High Intensity	98	98
Deciduous Forest	57	63
Evergreen Forest	73	80
Shrub/Scrub	79	84
Grassland/Herbaceous	81	89
Pasture/Hay	79	84
Woody Wetlands	90	91
Emergent Herbaceous Wetlands	91	92
Barren Land Rock/Sand/Clay	91	94

2.3 Water Quality Modeling Methods

The Mile High Flood District's Stormwater Best Management Practice (BMP) Design Workbook was used to determine water quality control volume (WQCV) and appropriate BMPs for the project. Additionally, the Urban Storm Drainage Criteria Manual, Volume 3, was used as guidance. The site was modeled as a conventional site with HSG C and D. Tributary impervious area was calculated less than 5 acres and located within a developing watershed. Based on these criteria, grass swales and rain gardens were selected to treat the WQCV.

Due to low variation across the site, an approximately 80,000 ft2 representative area was chosen to model the overall array area. Within the array area, imperviousness comes from the pile supporting the panels. The appropriate area type for this design is an unconnected impervious area that drains to a receiving pervious area (UIA-RPA). The proposed site access roads and equipment pads were modeled as UIA-RPA area types.

3 Results

3.1 1D Hydraulic Model Results

The results of the contributing watershed modeling are shown below in Figure 1. Peak flowrates range from about 45 CFS at the outlet of Basin 3B to about 320 CFS at the outlet of Basin 1B.

3.2 2D Hydraulic Model Results

3.2.1 Pre-Construction Existing Conditions

Of the total 100-year 24-hour storm precipitation depth of 2.06 inches, on average 1.23 inches was infiltrated and 0.83 inches was runoff. Modeled infiltration depths across the model domain ranged

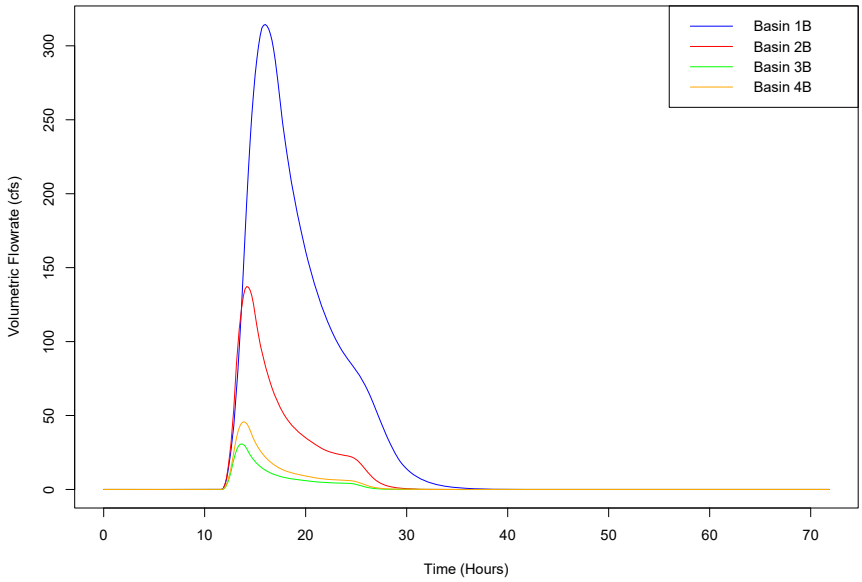


Figure 1: Hydrographs for the contributing watersheds

from 0 to 1.5 inches. HEC-RAS output for the 100-year pre-construction maximum depth, velocity, and scour is shown on Appendix A Figures 4 through 6.

Scour depth was calculated using the methods of Chapter 7 of the HEC 18 Scour Manual. K1, K2, and K3 were calculated to be 1.1, 1.3, and 1.1 respectively, and a box pile of dimensions a=1/2' and L=1/3' were used. For simplicity, the angle of attack was assumed to be zero for all piles. The proper excerpt pages are included in Appendix B.

During the 100-year storm event, flow depth reached approximately 12.7 feet in the deepest parts of the channels. Water depth is generally between 1 and 4 feet in the Relief Ditch channel, 5 to 11 feet in the tributary that enters Relief Ditch south of Site Area 2, and less than 1 foot in other areas of the site. Site flow velocities follow a similar pattern to flow depth onsite. Flow within the channels sees velocities as high as 12 feet per second, and are generally between 1 and 5 feet per second. Overland flow is generally between 0 and 2 feet per second. Scour depth is between 0.75 and 2.3 feet within the channels and less than 1.5 feet in other areas.

3.2.2 Post-Construction

HEC-RAS output for the 100-year post-construction maximum depth, velocity, and scour is shown on Appendix A Figures 7 through 9. Post-construction conditions caused minimal changes to site flow depth, velocity and scour. Some areas of the site show a very slight increase in flow depth, velocity, and scour post-construction.

Overall runoff from the site increased very slightly in the post-construction simulation. Appendix A,

Sierra Overhead Analytics, Inc.
PO Box 1716, Twain Harte, CA 95393
Phone: +1.415.413.7558

Figure 10 shows locations of flow profile lines where runoff flow profiles were calculated in HEC-RAS along the downstream boundary of the site areas. Flow hydrographs along these profile lines are shown below in Figure 2. Post-construction peak runoff increased slightly at all three locations compared to the pre-construction scenario. The volume of excess peak runoff that must be retained on-site for each site area is shown in Table 4.

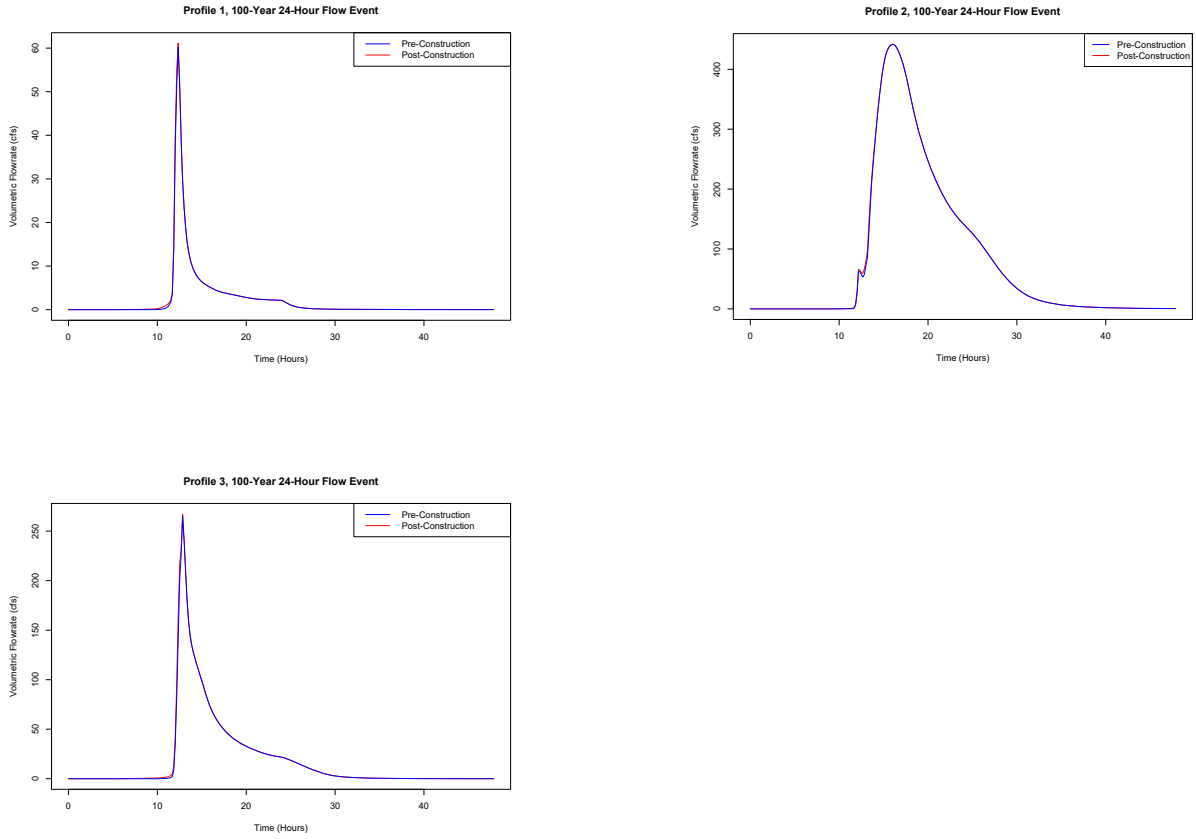


Figure 2: Hydrographs for flow profile lines along the downstream boundary of the site

Table 4: *Post-Construction Excess Peak Runoff Volume*

Site Area	Volume (cubic feet)
1	No development
2	180.72
3	1438.26

3.3 Water Quality Modeling Results

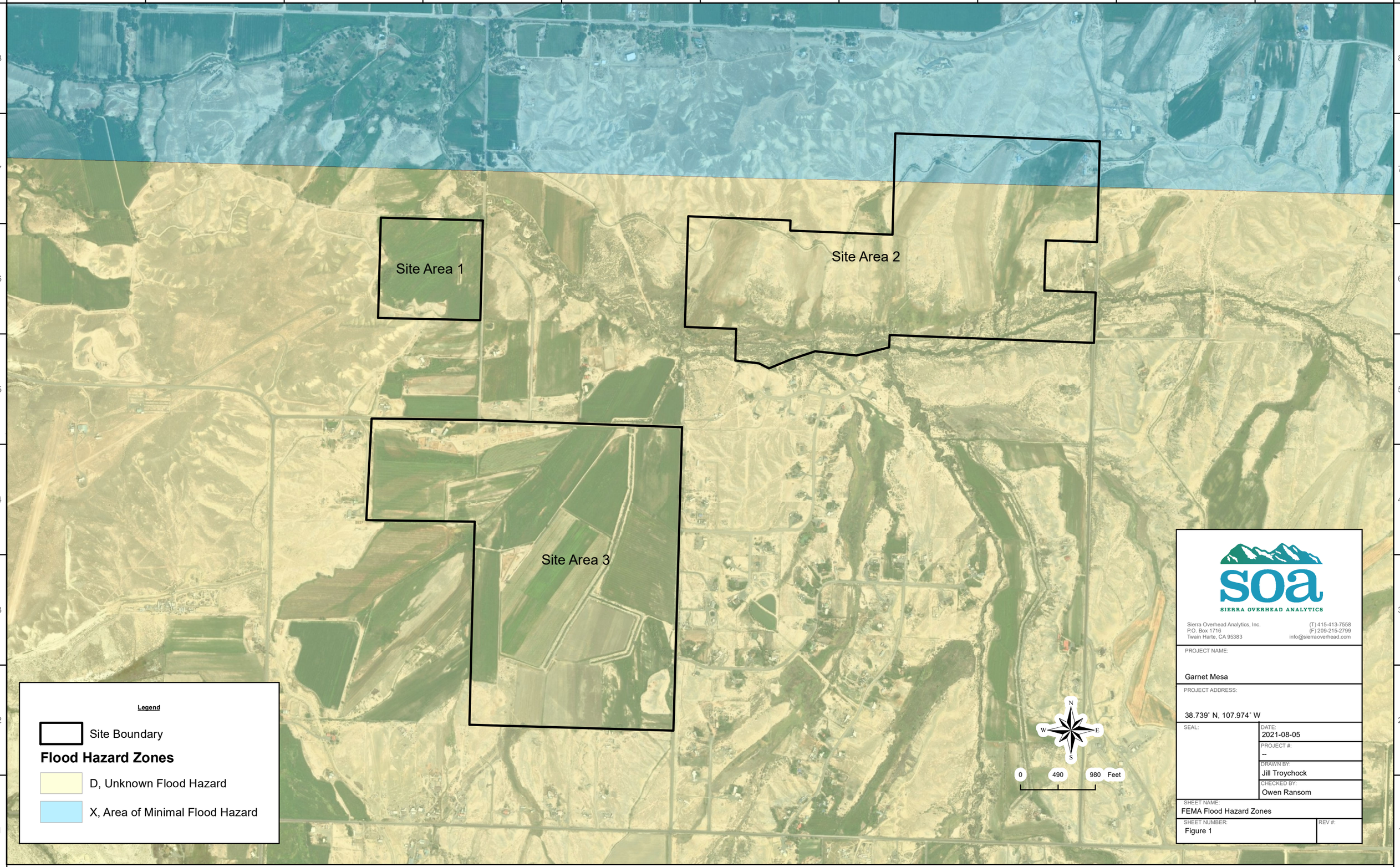
Due to the spacing of the array and maintenance of natural hydrology and hydraulics across the site, no water quality BMPs are recommended for the general array area.

Based on guidance from the Urban Storm Drainage Criteria Manual, Volume 3, grass-lined swales and raingardens are appropriate BMPs to treat WQCV from site access road runoff. Road design should incorporate a crown or slope to direct runoff to the shoulders. Grass-lined swales should be located adjacent and parallel to the shoulders and slope toward raingardens located within natural topographical low spots. The raingardens should have riprap armoring along the downslope side to allow excess volume to flow onto the site as sheet flow.

4 Assumptions

1. The elevation data has been deemed appropriate for use in pre-construction 2D hydraulic modeling (HEC-RAS)
2. To the greatest extent practical this model represents ponding and flow conditions for excess rainfall occurring on the model surface. This model is an approximation of real-life flow conditions but is limited in its accuracy by the type and accuracy of its inputs. If future calibration data is gathered, the model can be rerun using the calibration data as inputs to check the viability and accuracy of the model.

APPENDIX A - Figures



soa
SIERRA OVERHEAD ANALYTICS
Sierra Overhead Analytics, Inc.
P.O. Box 1716
Twain Harte, CA 95383
(T) 415-413-7558
(F) 209-215-2799
info@sierraoverhead.com

PROJECT NAME:
Garnet Mesa

PROJECT ADDRESS:
38.739° N, 107.974° W

SEAL:

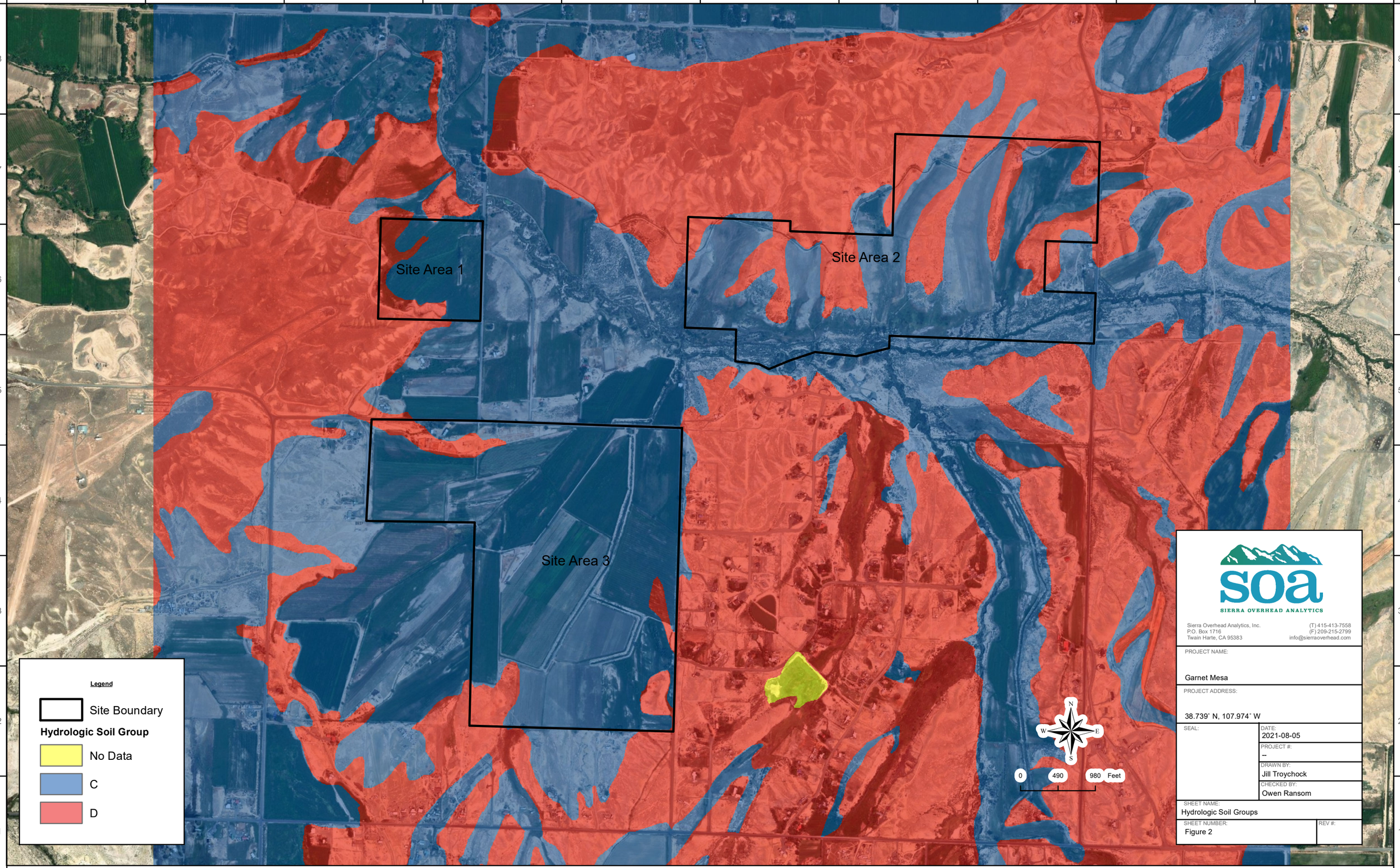
DATE: 2021-08-05
PROJECT #: --
DRAWN BY: Jill Troychock
CHECKED BY: Owen Ransom

SHEET NAME:
FEMA Flood Hazard Zones

SHEET NUMBER:
Figure 1

REV #:

Coordinate System: NAD 1983 StatePlane Colorado Central FIPS 0502 Feet Basemap Source: ESRI Land Ownership and PLSS Source: BLM SEZ Source: Argonne National Laboratory



soa
SIERRA OVERHEAD ANALYTICS

Sierra Overhead Analytics, Inc.
P.O. Box 1716
Twain Harte, CA 95383
(T) 415-413-7558
(F) 209-215-2799
info@sierraoverhead.com

PROJECT NAME:
Garnet Mesa

PROJECT ADDRESS:
38.739° N, 107.974° W

SEAL:

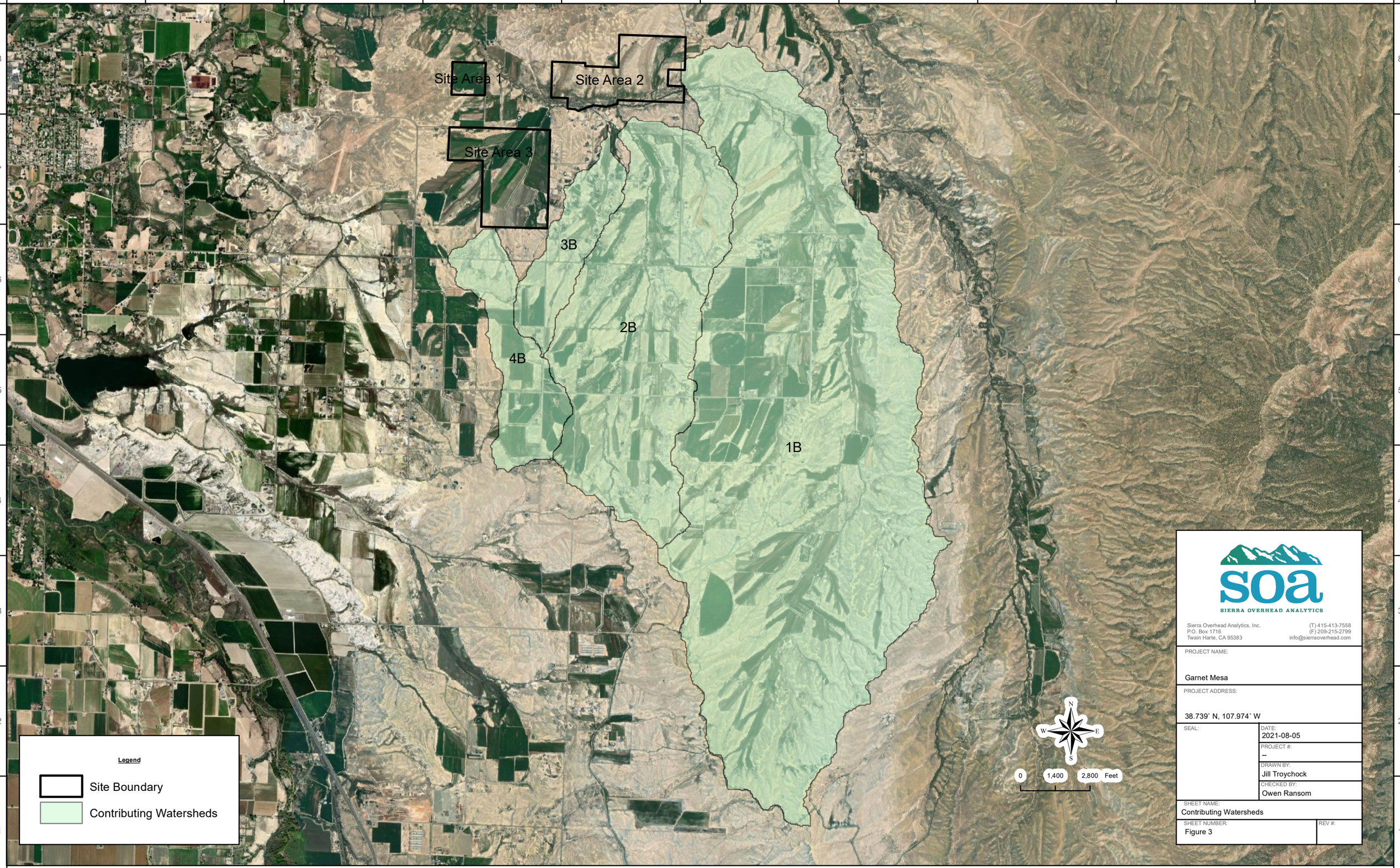
DATE: 2021-08-05
PROJECT #: --
DRAWN BY: Jill Troychock
CHECKED BY: Owen Ransom

SHEET NAME:
Hydrologic Soil Groups

SHEET NUMBER:
Figure 2

REV #:

Coordinate System: NAD 1983 StatePlane Colorado Central FIPS 0502 Feet Basemap Source: ESRI Land Ownership and PLSS Source: BLM SEZ Source: Argonne National Laboratory



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PROJECT NAME:
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PROJECT ADDRESS:
38.739° N, 107.974° W

SEAL:

DATE: 2021-08-05
PROJECT #: --
DRAWN BY: Jill Troychock
CHECKED BY: Owen Ransom

SHEET NAME: Contributing Watersheds
SHEET NUMBER: Figure 3
REV #:

Coordinate System: NAD 1983 StatePlane Colorado Central FIPS 0502 Feet Basemap Source: ESRI Land Ownership and PLSS Source: BLM SEZ Source: Argonne National Laboratory

Site Area 1

Site Area 2

Site Area 3

Legend

Site Boundary

Depth (Feet)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- > 5

N W E S

0 390 780 Feet

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PROJECT #: --

DRAWN BY: Jill Troychock

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SHEET NAME: 100-Year 24-Hour Flow Event Depth Pre-Construction

SHEET NUMBER: Figure 4

REV #:

Coordinate System: NAD 1983 StatePlane Colorado Central FIPS 0502 Feet Basemap Source: ESRI Land Ownership and PLSS Source: BLM SEZ Source: Argonne National Laboratory

Site Area 1

Site Area 2

Site Area 3

Legend

Site Boundary

Velocity (Feet per second)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 4
- > 4

N

W E

S

0 390 780 Feet

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DATE: 2021-08-05

PROJECT #: --

DRAWN BY: Jill Troychock

CHECKED BY: Owen Ransom

SHEET NAME: 100-Year 24-Hour Flow Event Velocity Pre-Construction

SHEET NUMBER: Figure 5

REV #:

Coordinate System: NAD 1983 StatePlane Colorado Central FIPS 0502 Feet Basemap Source: ESRI Land Ownership and PLSS Source: BLM SEZ Source: Argonne National Laboratory

Site Area 1

Site Area 2

Site Area 3

Legend

Site Boundary

Scour (Feet)

- 0 - 0.5
- 0.5 - 0.75
- 0.75 - 1
- 1 - 1.5
- 1.5 - 2
- > 2

N W E S

0 390 780 Feet

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PROJECT #: --
DRAWN BY: Jill Troychock
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SHEET NAME: 100-Year 24-Hour Flow Event Scour Pre-Construction

SHEET NUMBER: Figure 6
REV #:

Coordinate System: NAD 1983 StatePlane Colorado Central FIPS 0502 Feet Basemap Source: ESRI Land Ownership and PLSS Source: BLM SEZ Source: Argonne National Laboratory

Site Area 1

Site Area 2

Site Area 3

Legend

Site Boundary

Depth (Feet)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- > 5

N W E S

0 390 780 Feet

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SEAL:

DATE: 2021-08-05

PROJECT #: --

DRAWN BY: Jill Troychock

CHECKED BY: Owen Ransom

SHEET NAME: 100-Year 24-Hour Flow Event Depth Post-Construction

SHEET NUMBER: Figure 7

REV #:

Coordinate System: NAD 1983 StatePlane Colorado Central FIPS 0502 Feet Basemap Source: ESRI Land Ownership and PLSS Source: BLM SEZ Source: Argonne National Laboratory

Site Area 1

Site Area 2

Site Area 3

Legend

Site Boundary

Velocity (Feet per second)

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2
- 2 - 2.5
- 2.5 - 3
- 3 - 4
- > 4

N

W E

S

0 390 780 Feet

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SEAL:

DATE: 2021-08-05
PROJECT #: --
DRAWN BY: Jill Troychock
CHECKED BY: Owen Ransom

SHEET NAME: 100-Year 24-Hour Flow Event Velocity Post-Construction

SHEET NUMBER: Figure 8

REV #:

Coordinate System: NAD 1983 StatePlane Colorado Central FIPS 0502 Feet Basemap Source: ESRI Land Ownership and PLSS Source: BLM SEZ Source: Argonne National Laboratory

Site Area 1

Site Area 2

Site Area 3

Legend

Site Boundary

Scour (Feet)

- 0 - 0.5
- 0.5 - 0.75
- 0.75 - 1
- 1 - 1.5
- 1.5 - 2
- > 2

N W E S

0 390 780 Feet

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PROJECT ADDRESS:
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SEAL:

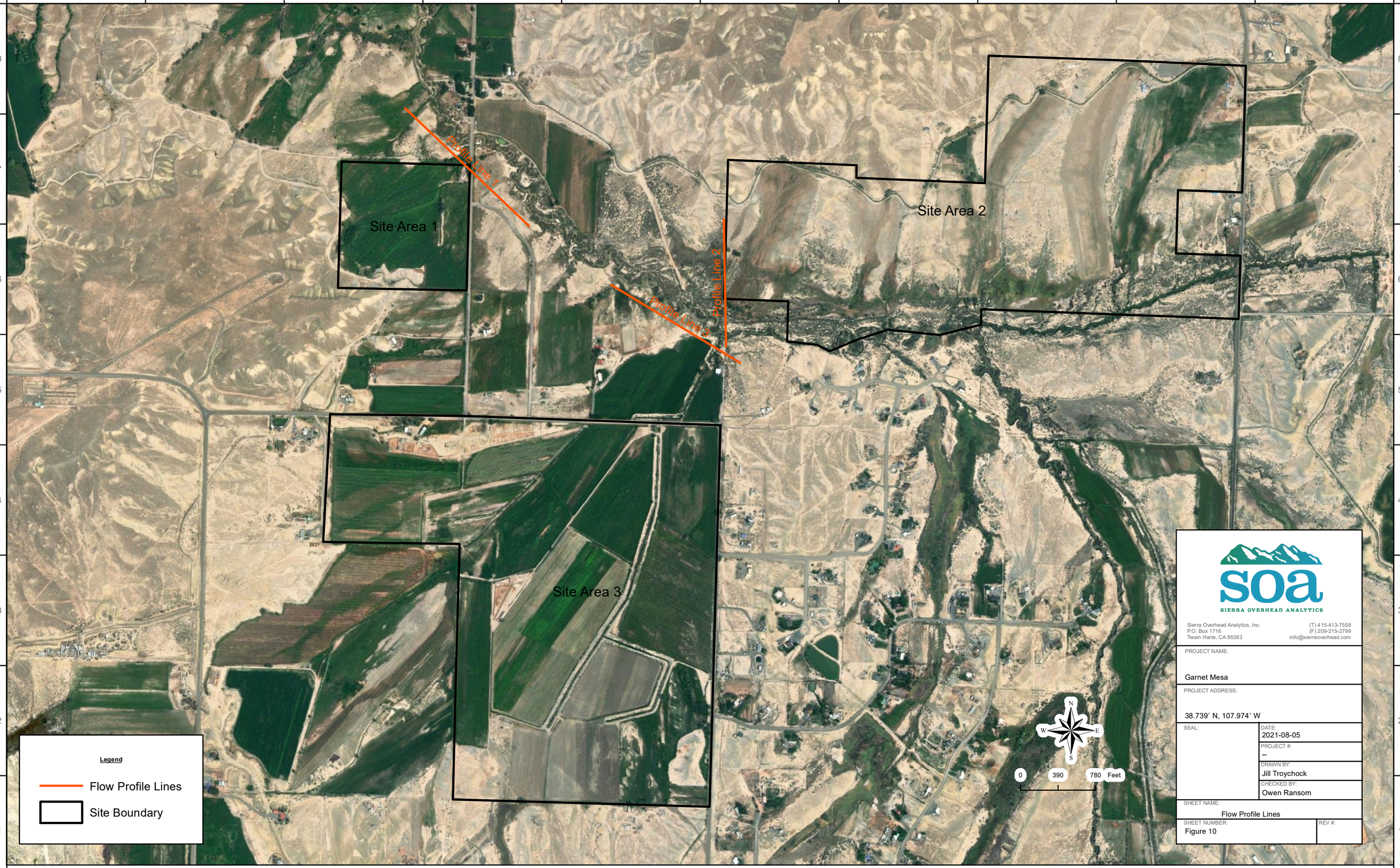
DATE: 2021-08-05
PROJECT #: --
DRAWN BY: Jill Troychock
CHECKED BY: Owen Ransom

SHEET NAME: 100-Year 24-Hour Flow Event Scour Post-Construction

SHEET NUMBER: Figure 9

REV #:

Coordinate System: NAD 1983 StatePlane Colorado Central FIPS 0502 Feet Basemap Source: ESRI Land Ownership and PLSS Source: BLM SEZ Source: Argonne National Laboratory



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SEAL:

DATE: 2021-08-05
PROJECT #: --
DRAWN BY: Jill Troychock
CHECKED BY: Owen Ransom

SHEET NAME:
Flow Profile Lines

SHEET NUMBER:
Figure 10

REV #:

Coordinate System: NAD 1983 StatePlane Colorado Central FIPS 0502 Feet Basemap Source: ESRI Land Ownership and PLSS Source: BLM SEZ Source: Argonne National Laboratory

APPENDIX B - Supporting Documentation

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description: Cover type and hydrologic condition	Average percent impervious area [2/]	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1] Average runoff condition, and $I_a = 0.2S$.

[2] The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

[3] CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

[4] Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

[5] Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b Runoff curve numbers for cultivated agricultural lands [1/]

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment [2/]	Hydrologic condition [3/]	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

[1] Average runoff condition, and I_a=0.2S

[2] Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

[3] Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good ≥ 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c Runoff curve numbers for other agricultural lands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2/]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3/]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4/]	48	65	73
Woods—grass combination (orchard or tree farm). [5/]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6/]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4/]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.

2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

3 *Poor*: <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.

4 Actual curve number is less than 30; use CN = 30 for runoff computations.

5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Table 2-2d Runoff curve numbers for arid and semiarid rangelands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition [2/]	A [3/]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

1 Average runoff condition, and I_a, = 0.2S. For range in humid regions, use table 2-2c.
2 Poor: <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: > 70% ground cover.
3 Curve numbers for group A have been developed only for desert shrub.

Figure 2-3 Composite CN with connected impervious area.

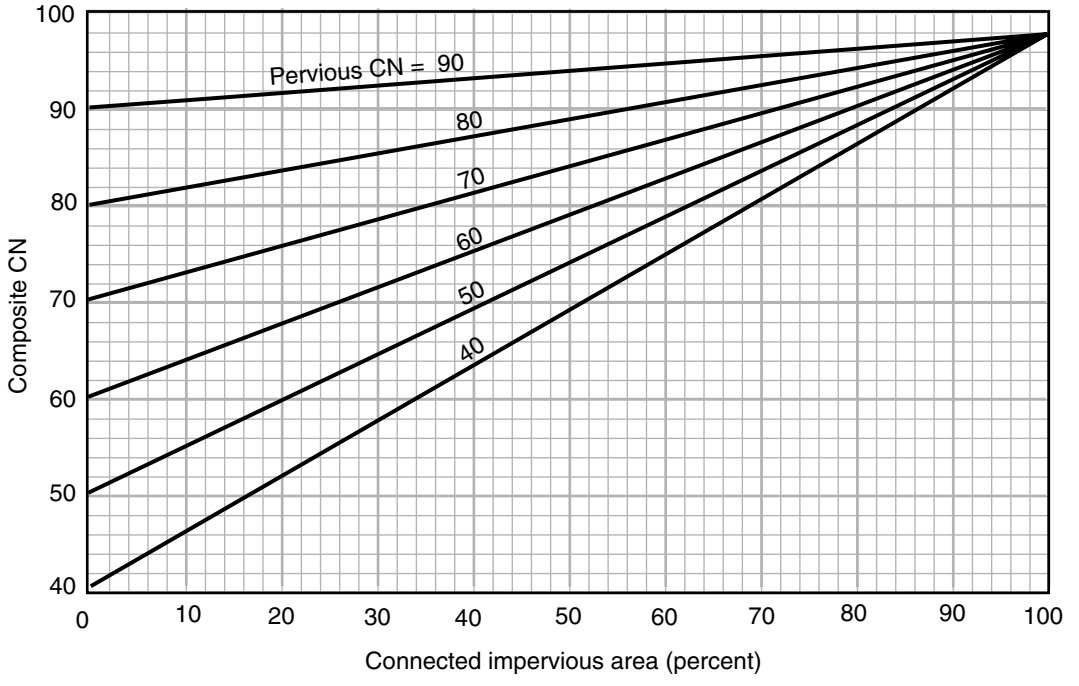
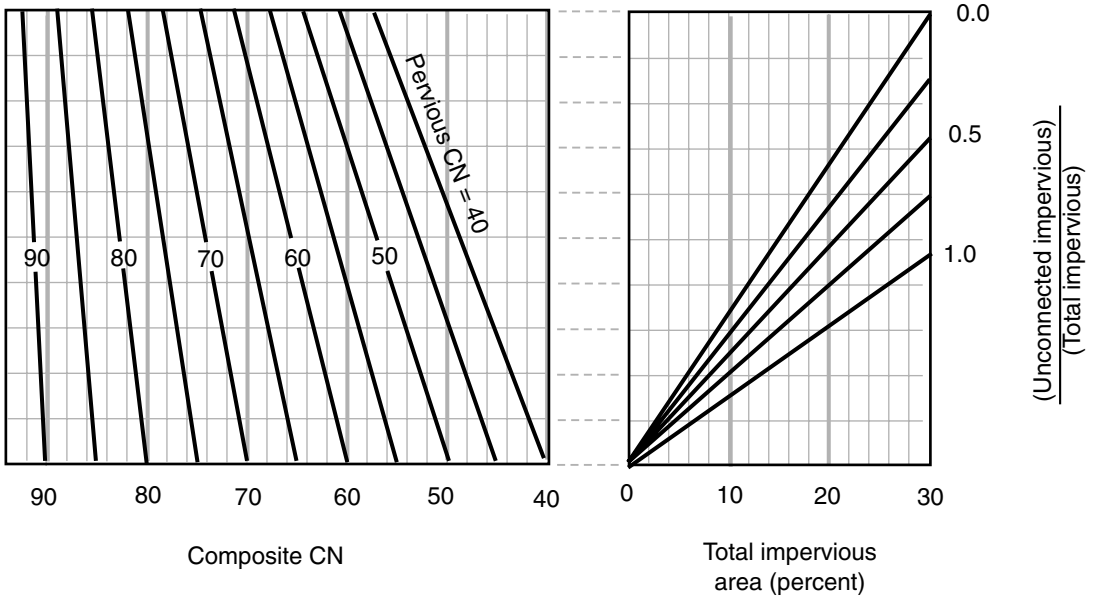


Figure 2-4 Composite CN with unconnected impervious areas and total impervious area less than 30%



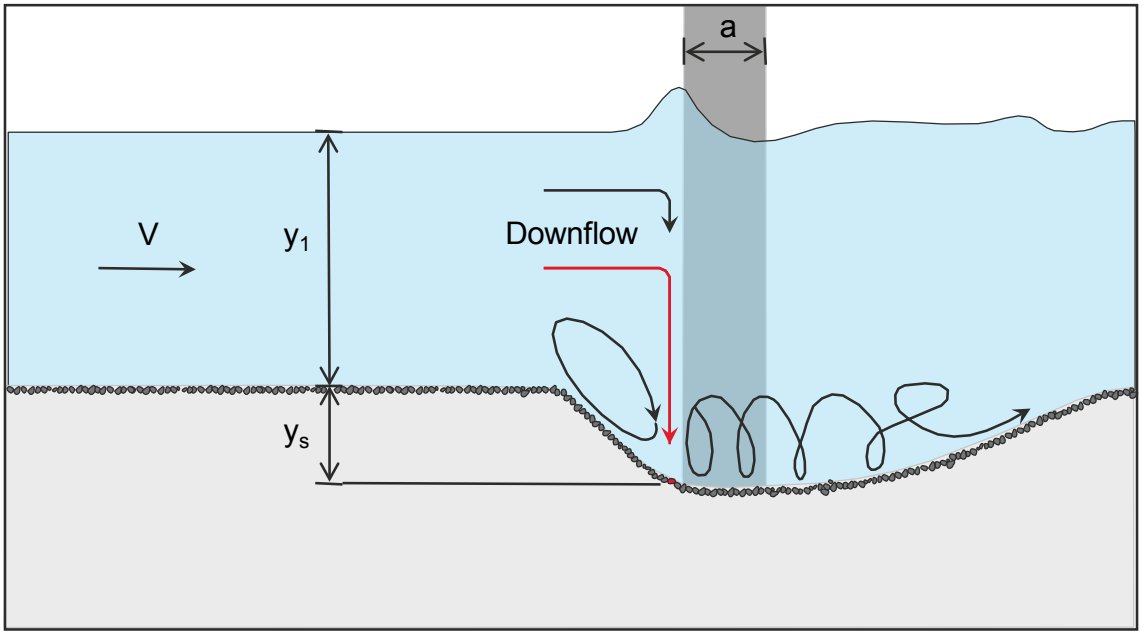


Figure 7.2. Definition sketch for pier scour.

The HEC-18 equation is:

$$\frac{y_s}{y_1} = 2.0\ K_1\ K_2\ K_3 \left(\frac{a}{y_1}\right)^{0.65} Fr_1^{0.43} \qquad (7.1)$$

As a Rule of Thumb, the maximum scour depth for round nose piers aligned with the flow is:

$y_s \leq 2.4$ times the pier width (a) for $Fr \leq 0.8$ (7.2)
$y_s \leq 3.0$ times the pier width (a) for $Fr > 0.8$

In terms of y_s/a, Equation 7.1 is:

$$\frac{y_s}{a} = 2.0\ K_1\ K_2\ K_3 \left(\frac{y_1}{a}\right)^{0.35} Fr_1^{0.43} \qquad (7.3)$$

where:

y_s = Scour depth, ft (m)
y_1 = Flow depth directly upstream of the pier, ft (m)
K_1 = Correction factor for pier nose shape from Figure 7.3 and Table 7.1
K_2 = Correction factor for angle of attack of flow from Table 7.2 or Equation 7.4
K_3 = Correction factor for bed condition from Table 7.3
a = Pier width, ft (m)
L = Length of pier, ft (m)
Fr_1 = Froude Number directly upstream of the pier = $V_1/(gy_1)^{1/2}$
V_1 = Mean velocity of flow directly upstream of the pier, ft/s (m/s)
g = Acceleration of gravity (32.2 ft/s^2) (9.81 m/s^2)

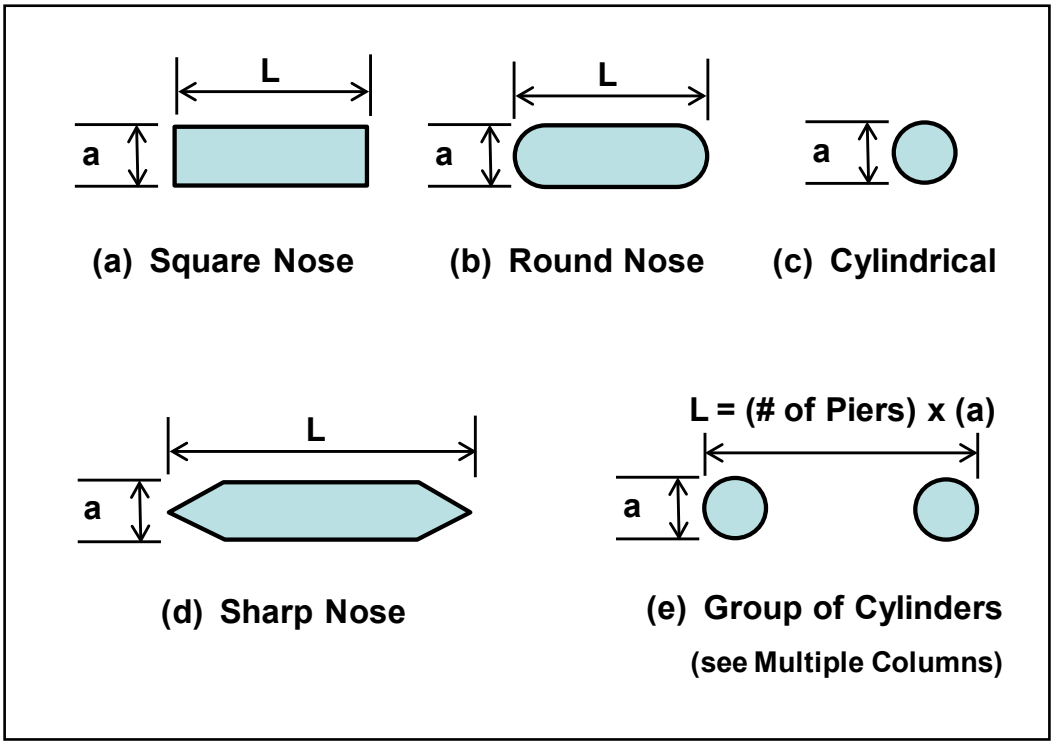


Figure 7.3. Common pier shapes.

The correction factor, K_2, for angle of attack of the flow, 2, is calculated using the following equation:

$$K_2 = (\text{Cos}\ \theta + \frac{L}{a}\ \text{Sin}\ \theta)^{0.65} \qquad (7.4)$$

If L/a is larger than 12, use L/a = 12 as a maximum in Equation 7.4 and Table 7.2. Table 7.2 illustrates the magnitude of the effect of the angle of attack on local pier scour.

Table 7.1. Correction Factor, K_1, for Pier Nose Shape.

Shape of Pier Nose	K_1
(a) Square nose	1.1
(b) Round nose	1.0
(c) Circular cylinder	1.0
(d) Group of cylinders	1.0
(e) Sharp nose	0.9

Table 7.2. Correction Factor, K_2, for Angle of Attack, 2, of the Flow.

Angle	L/a=4	L/a=8	L/a=12
0	1.0	1.0	1.0
15	1.5	2.0	2.5
30	2.0	2.75	3.5
45	2.3	3.3	4.3
90	2.5	3.9	5.0

Angle = skew angle of flow
L = length of pier

Table 7.3. Increase in Equilibrium Pier Scour Depths, K_3, for Bed Condition.		
Bed Condition	Dune Height ft	K_3
Clear-Water Scour	N/A	1.1
Plane bed and Antidune flow	N/A	1.1
Small Dunes	$10 > H \geq 2$	1.1
Medium Dunes	$30 > H \geq 10$	1.2 to 1.1
Large Dunes	$H \geq 30$	1.3

Notes:

1. The correction factor K_1 for pier nose shape should be determined using Table 7.1 for angles of attack up to 5 degrees. **For greater angles, K_2 dominates and K_1 should be considered as 1.0**. If L/a is larger than 12, use the values for L/a = 12 as a maximum in Table 7.2 and Equation 7.4.

2. The values of the correction factor K_2 should be applied only when the field conditions are such that the entire length of the pier is subjected to the angle of attack of the flow. Use of this factor will result in a significant over-prediction of scour if (1) a portion of the pier is shielded from the direct impingement of the flow by an abutment or another pier; or (2) an abutment or another pier redirects the flow in a direction parallel to the pier. For such cases, judgment must be exercised to reduce the value of the K_2 factor by selecting the effective length of the pier actually subjected to the angle of attack of the flow. **Equation 7.4 should be used for evaluation and design**. Table 7.2 is intended to illustrate the importance of angle of attack in pier scour computations and to establish a cutoff point for K_2 (i.e., a maximum value of 5.0).

3. The correction factor K_3 results from the fact that for plane-bed conditions, which is typical of most bridge sites for the flood frequencies employed in scour design, the maximum scour may be 10 percent greater than computed with Equation 7.1. In the **unusual** situation where a dune bed configuration **with large dunes** exists at a site during flood flow, the maximum pier scour may be 30 percent greater than the predicted equation value. This may occur on very large rivers, such as the Mississippi. For smaller streams that have a dune bed configuration at flood flow, the dunes will be smaller and the maximum scour may be only 10 to 20 percent larger than equilibrium scour. For antidune bed configuration the maximum scour depth may be 10 percent greater than the computed equilibrium pier scour depth.

4. Piers set close to abutments (for example at the toe of a spill through abutment) must be carefully evaluated for the angle of attack and velocity of the flow coming around the abutment.

7.3 FLORIDA DOT PIER SCOUR METHODOLOGY

Equation 7.1 has been included in all previous versions of HEC-18 and has been used for bridge scour evaluations and bridge design for countless bridges in the U.S. and worldwide. This equation, which was developed and modified over several decades, could be improved by including bed material size and a more detailed consideration of the bridge pier flow field (see Section 3.6.2). An NCHRP study (NCHRP 2011a) evaluated 22 pier scour equations and found that although the HEC-18 equation did well in comparison to the other equations, the Sheppard and Miller (2006) equation generally performed better for both laboratory and

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Runoff Curve Number Report
(Generated by WMS)

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Tue Jul 27 11:49:21 2021

Runoff Curve Number Report for Basin 1B

HSG	Land Use Description	CN	Area mi^2	Product CN x A
C	Shrub/Scrub	70	2.190	153.314
C	Grassland/Herbaceous	79	0.044	3.514
C	Pasture/Hay	79	0.141	11.129
C	Cultivated Crops	79	0.930	73.451
D	Shrub/Scrub	77	3.194	245.946
C	Developed, Low Intensity	85	0.028	2.395
D	Developed, Low Intensity	88	0.053	4.698
C	Developed, Medium Intensity	91	0.003	0.270
C	Developed, Open Space	81	0.073	5.886
B	Shrub/Scrub	56	0.025	1.412
D	Cultivated Crops	84	0.738	62.032
B	Grassland/Herbaceous	69	0.003	0.205
D	Pasture/Hay	84	0.145	12.207
D	Grassland/Herbaceous	84	0.061	5.107
D	Barren Land (Rock/Sand/Clay)	94	0.099	9.339
C	Barren Land (Rock/Sand/Clay)	91	0.027	2.429
D	Developed, Medium Intensity	93	0.012	1.103
D	Developed, Open Space	86	0.030	2.551
C	Developed High Intensity	94	0.001	0.139
C	Emergent Herbaceous Wetlands	71	0.077	5.475
D	Emergent Herbaceous Wetlands	78	0.010	0.810
B	Pasture/Hay	69	0.003	0.205
B	Barren Land (Rock/Sand/Clay)	86	0.010	0.893
C	Woody Wetlands	70	0.058	4.048
D	Woody Wetlands	77	0.003	0.228

CN (Weighted) = Total Product \ Total Area

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76.4799

Runoff Curve Number Report for Basin 2B

HSG	Land Use Description	CN	Area mi^2	Product CN x A

C	Developed, Low Intensity	85	0.044	3.769
D	Shrub/Scrub	77	0.667	51.324
D	Developed, Open Space	86	0.019	1.652
D	Cultivated Crops	84	0.188	15.766
C	Shrub/Scrub	70	1.141	79.867
C	Cultivated Crops	79	0.239	18.914
D	Grassland/Herbaceous	84	0.016	1.366
C	Developed, Open Space	81	0.028	2.275
D	Pasture/Hay	84	0.038	3.228
C	Developed, Medium Intensity	91	0.021	1.883
C	Pasture/Hay	79	0.072	5.721
D	Developed, Low Intensity	88	0.030	2.601
D	Developed, Medium Intensity	93	0.004	0.412
B	Shrub/Scrub	56	0.075	4.221
B	Cultivated Crops	69	0.041	2.855
D	Barren Land (Rock/Sand/Clay)	94	0.033	3.056
B	Pasture/Hay	69	0.021	1.428
C	Evergreen Forest	73	0.001	0.108
D	Evergreen Forest	79	0.001	0.117
D	Emergent Herbaceous Wetlands	78	0.001	0.115
C	Emergent Herbaceous Wetlands	71	0.035	2.518
C	Woody Wetlands	70	0.040	2.793
D	Woody Wetlands	77	0.001	0.114
B	Woody Wetlands	55	0.006	0.325
C	Grassland/Herbaceous	79	0.001	0.117
B	Developed, Medium Intensity	88	0.003	0.260
B	Developed, Low Intensity	77	0.003	0.228
C	Barren Land (Rock/Sand/Clay)	91	0.025	2.286
B	Barren Land (Rock/Sand/Clay)	86	0.001	0.127
B	Developed, Open Space	72	0.001	0.106
B	Grassland/Herbaceous	69	0.001	0.102
C	Developed High Intensity	94	0.004	0.417

CN (Weighted) = Total Product \ Total Area

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74.8499

Runoff Curve Number Report for Basin 3B

HSG	Land Use Description	CN	Area mi^2	Product CN x A
D	Shrub/Scrub	77	0.140	10.797
C	Cultivated Crops	79	0.032	2.565
D	Cultivated Crops	84	0.046	3.844
C	Shrub/Scrub	70	0.186	13.019
C	Developed, Open Space	81	0.015	1.196

D	Pasture/Hay	84	0.006	0.496
C	Developed, Low Intensity	85	0.016	1.380
C	Pasture/Hay	79	0.006	0.466
B	Cultivated Crops	69	0.001	0.102
C	Developed, Medium Intensity	91	0.010	0.940
D	Developed, Medium Intensity	93	0.007	0.686
D	Developed, Low Intensity	88	0.016	1.429
D	Developed, Open Space	86	0.004	0.381
B	Developed, Medium Intensity	88	0.003	0.260
D	Emergent Herbaceous Wetlands	78	0.007	0.576
B	Shrub/Scrub	56	0.010	0.579
D	Woody Wetlands	77	0.006	0.455
B	Developed, Low Intensity	77	0.001	0.114
B	Emergent Herbaceous Wetlands	58	0.001	0.086
C	Open Water	0	0.012	0.000
C	Emergent Herbaceous Wetlands	71	0.009	0.629
C	Woody Wetlands	70	0.003	0.207
D	Developed High Intensity	95	0.001	0.140
C	Developed High Intensity	94	0.001	0.139

CN (Weighted) = Total Product \ Total Area

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74.5299

Runoff Curve Number Report for Basin 4B

HSG	Land Use Description	CN	Area mi^2	Product CN x A
D	Shrub/Scrub	77	0.148	11.419
C	Developed, Medium Intensity	91	0.009	0.810
C	Shrub/Scrub	70	0.166	11.627
D	Developed, Medium Intensity	93	0.003	0.276
C	Developed, Low Intensity	85	0.010	0.882
B	Shrub/Scrub	56	0.027	1.495
C	Developed, Open Space	81	0.010	0.841
B	Developed, Low Intensity	77	0.003	0.228
B	Developed, Medium Intensity	88	0.001	0.131
C	Grassland/Herbaceous	79	0.012	0.937
C	Cultivated Crops	79	0.214	16.871
B	Woody Wetlands	55	0.001	0.082
B	Emergent Herbaceous Wetlands	58	0.001	0.086
D	Grassland/Herbaceous	84	0.004	0.374
C	Emergent Herbaceous Wetlands	71	0.001	0.105
D	Cultivated Crops	84	0.053	4.485
D	Barren Land (Rock/Sand/Clay)	94	0.001	0.139
B	Grassland/Herbaceous	69	0.001	0.102
D	Developed, Low Intensity	88	0.009	0.783

D	Developed, Open Space	86	0.007	0.638
C	Barren Land (Rock/Sand/Clay)	91	0.001	0.135
D	Pasture/Hay	84	0.019	1.619
C	Pasture/Hay	79	0.001	0.117

CN (Weighted) = Total Product \ Total Area

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76.5933

Attachment 3-K

Draft Construction Storm Water Management Plan &

Water Quality Impact Mitigation

CITRA

Draft Construction Stormwater Management Plan

Garnet Mesa Solar, LLC

Delta County, Colorado

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Appendices

Appendix A – Construction Stormwater Permits
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General Requirements

The following draft Construction Stormwater Management Plan (SWMP) covers anticipated work associated with the Garnet Mesa Solar project being conducted by Garnet Mesa Solar LLC. It was prepared in accordance with good engineering, hydrologic, and pollution control practices and developed to comply with requirements of the Colorado Discharge Permit System (CDPS) Water Quality Control Division (WQCD) General Permit for Stormwater Discharges Associated with Construction Activity, Permit Number CO400000, as modified and effective February 1, 2021 and attached in Appendix A.

This SWMP report was prepared as reference supporting material associated with the Limited Use permit application for the Garnet Mesa Solar project. This SWMP report shall not be used as the basis for the construction permit application as it is not intended to be fully complete with final design details. The project shall revise this document as needed to align with final design documents and changes in regulations prior to submitting for their SWMP permit.

The intent of this document is to demonstrate to the Delta County Planning and Community Development board the nature of the storm water management plan to be implemented by the project.

The permittee must implement the provisions of the SWMP as written and updated, from commencement of construction activity until final stabilization is complete.

Qualified Stormwater Manager

This SWMP must identify, at a minimum, one person who meets the following description of a Qualified Stormwater Manager:

"An individual knowledgeable in the principles and practices of erosion and sediment control and pollution prevention, and with the skills to assess conditions at construction sites that could impact stormwater quality and to assess the effectiveness of stormwater controls implemented to meet the requirements of this permit."

The qualified stormwater manager (QSM) is responsible for implementing the SWMP in its entirety. This role may be filled by more than one individual. Update the following table accordingly throughout the life of the project as roles and responsibilities change. Include new rows/additional sheets as necessary.

PROJECT OWNER:			
Name:	Company:	Address:	Email:
Title:	Phone:		QSM (Y/N)
PROJECT OPERATOR:			
Name:	Company:	Address:	Email:
Title:	Phone:		QSM (Y/N)
PROJECT MANAGER:			
Name:	Company:	Address:	Email:
Title:	Phone:		QSM (Y/N)
SWMP PREPARER:			
Name:	Company:	Address:	Email:
Title: Project Developer	Phone:		QSM (Y/N)
CONSTRUCTION FOREMAN/MANAGER:			
Name:			
Title:			/N)
SWMP INSPECTOR:			
Name:	Company:	Address:	Email:
Title:	Phone:		QSM (Y/N)
CONTROL MEASURE INSTALLER:			
Name:	Company:	Address:	Email:
Title:	Phone:		QSM (Y/N)
OTHER:			
Name:	Company:	Address:	Email:
Title:	Phone:		QSM (Y/N)
OTHER:			
Name:	Company:	Address:	Email:
Title:	Phone:		QSM (Y/N)

TO BE POPULATED IN FINAL SWMP PLAN

Permittee/Qualified Stormwater Manager Duties

The permittee and qualified stormwater managers defined and identified in Section 1.1 of this report are responsible for maintaining this SWMP per requirements in the general permit. Key responsibilities for management of this SWMP document are defined below.

Plan Availability and Retention

AVAILABILITY

The permittee must provide a copy of the SWMP to the WQCD, Environmental Protection Agency (EPA), and any local agency with authority for approving sediment and erosion control plans, grading plans, or local SWMPs upon request. Provide a signed certification (per Part I.A.3.e.), certifying the SWMP is complete and compliant with all terms and conditions of the permit to the requesting agency.

RETENTION

Permittee must retain a copy of the SWMP at the construction site from the date of the initiation of construction activities to the date of expiration or inactivation of permit coverage; unless another location, specified by the permittee, is approved by the WQCD.

Permittee must retain copies of documentation required by the general permit, including records of all data used to complete the application for permit coverage, for at least three years from the date the permit coverage expires or is terminated.

Reviews and Revisions

The qualified stormwater manager should continuously review and update the SWMP, which acts as a living document, as part of the overall process of assessing and managing stormwater quality issues at the site.

Qualified stormwater managers, or other onsite staff, must amend the plan, report narrative or site maps, when any of the following occurs:

- A change in design, construction, operation, or maintenance of the site requiring implementation of new or revised control measures;
- The SWMP proves ineffective in controlling pollutants in stormwater runoff in compliance with the permit conditions;
- Control measures identified in the SWMP are no longer necessary and are removed; and
- Corrective actions are taken onsite that result in a change to the SWMP.

For SWMP revisions made prior to or following changes onsite, including revisions to sections addressing site conditions and control measures, include a notation that identifies:

- Date of the site change, the control measure removed, or modified;
- Locations of those control measures; and
- Changes to the control measures.

The permittee must ensure site changes are reflected in the plan. The permittee is noncompliant with the permit until the SWMP revisions are made.

Inspections
A qualified stormwater manager must conduct regular inspections of the site beginning within seven days of commencement of construction activities at the site and until final stabilization is achieved.

The permittee is responsible for verifying that inspections are conducted by a qualified stormwater manager. Additional inspection requirements are discussed in Section 9.

ROUTINE MAINTENANCE
Maintenance must be in accordance with good engineering, hydrologic, and pollution control practices. Control measures requiring routine maintenance, as observed during an inspection or as a general observation at the site, are not subject to requirements of corrective actions (described below).

CORRECTIVE ACTIONS
Permittee must take all necessary steps to minimize or prevent discharge of pollutants until a control measure is implemented and made operational and/or an inadequate control measure is replaced or returned to effective operating condition.

If it is infeasible to install or repair a control measure immediately after discovering the deficiency, the following information must be documents and kept on record:

- Description of why it is in feasible to initiate the installation or repair immediately; and
- Provide a schedule for installing or repairing the control measure and returning it to an effective operating condition as soon as possible.

The permittee must remove and properly dispose of any unauthorized release or discharge (e.g. discharge of non-stormwater, spill, or leak not authorized by the Construction Stormwater Permit). The permittee must also clean up any contaminated surface to minimize discharges of the material in subsequent storm events.

The permittee is noncompliant with the Construction Stormwater Permit until the inadequate control measure is replaced or returned to effective operation condition.

Other Required Noncompliance Notifications
Permittee must notify the WQCD if circumstances allowing any of the following occur:

- Noncompliance which may endanger health or the environment regardless of the cause of the incident;
- Unanticipated bypass which exceeds effluent limitations in the general permit;
    - Bypass: *The intentional diversion of waste streams from any portion of a treatment facility.*
- Upset which causes exceedance of any effluent limitation in the general permit;
    - Upset: *Unintentional and temporary noncompliance with permit effluent limitations because of factors beyond the reasonable control of the permittee. Does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.*

- Daily maximum violations for any pollutants limited by Part I of the general permit, including any toxic pollutant or hazardous substance or any pollutant specifically identified as the method to control any toxic pollutant or hazardous substance.

Upon discovery, the permittee must provide verbal notification to the WQCD within 24 hours and a written report within five working days.

Spill Prevention and Response Plan

The construction contractor must provide a Spill Prevention and Response Plan (SPRP) containing the following information, at a minimum:

- Notification procedures to be used in the event of an accident. At the very least, notify the Qualified Stormwater Manager (See Section 1). Depending on the nature of the spill and the material involved, the CDPHE 24 hour spill reporting line (**877-518-5608**), downstream water users, or other agencies may also need to be notified;
- Instructions for clean-up procedures and identification of spill kit locations;
- Provisions for absorbents to be made available for use in fuel areas, and for containers to be available for used absorbents; and,
- Procedures for properly washing out concrete truck chutes and other equipment in a manner and location so that the materials and wash water cannot discharge form the site, and never into a storm drain system or stream.

Report to the CDPHE any release of any chemical, oil, petroleum product, sewage, etc., which may enter waters of the State of Colorado (including surface water, groundwater, dry gullies, or storm sewers leading to surface water).

A copy of the contractor's SPRP shall be attached to the final SWMP report prior to permit submittal in Appendix E.

Materials Handling

Site maps shall be provided in the final SWMP report in Appendix B to indicate the locations of control measures designed to minimize impacts from handling significant materials that could contribute pollutants to runoff. Information on implementation of structural and non-structural control measures associated with such are discussed in Section 5, attached in Appendix C, or shall be included on the site maps in Appendix B.

Significant materials include non-sediment pollutants such as raw materials, petroleum-based products, solvents, detergents, plastic pellets, finished raw materials (such as metallic products), raw materials used in food processing, fertilizers, pesticides, sanitary waste materials, waste from saw cutting, pothole slurry, concrete, mortar and masonry products, and any other hazardous material.

Bulk storage (55 gallons or greater) of any petroleum product or other liquid chemical must have secondary containment, or equivalent protection, in order to prevent spilled material from entering state waters. Concrete washout activities must have associated control measures

which are specifically designed for concrete washout waste.

See Good Housekeeping Practices in Appendix C.

Potential Sources of Pollution

Permittee must implement control measures to minimize discharge of pollutants from all potential pollutant sources. The following are potential sources of pollution which may reasonably expected to affect quality of stormwater discharges at the site.

Potential Source of Pollutant	**Possible at site?**
Disturbed and stored soils	Yes
Vehicle tracking of sediments	Yes
Management of contaminated soils	No
Loading and unloading operations	Yes
Outdoor storage of significant materials	Yes
Vehicle and equipment maintenance, fueling, and fuel storage	Yes
Significant dust or particulate generating processes	Yes
Routine maintenance activities involving significant materials	Yes
On-site waste management practices	Yes
Concrete truck/equipment washing	Yes
Dedicated asphalt/concrete batch plants, masonry mixing stations	No
Non-industrial waste sources: worker trash, portable toilets, etc.	Yes
Other potential sources:	No

Control measures used to manage the sources of the above listed pollutants shall be shown on the site maps in Appendix B for the final SWMP report submittal. Details depicting how each control measure is designed to prevent pollution from entering waters are included in Appendix C.

Control Measure Implementation

Selection, design, installation, and maintenance of control measures must be in accordance with good engineering, hydrologic and pollution control practices. Contractors must install control measures prior to commencing activities that may contribute pollutants, including sediment, to stormwater discharges. Control measures must effectively minimize erosion, sediment transport, and the release of other pollutants related to construction activity.

Stormwater runoff from all non-stabilized, disturbed areas and soil storage areas must flow to at least one control measure to minimize (filter, settle, strain) sediment in the discharge.

Erosion control measures prevent or minimize erosion of soil, whereas sediment control measures are designed to remove sediment from stormwater runoff before it leaves the site. Both erosion and sediment control measures will be used at the site.

In the final revision of this SWMP report, information on control measure implementation shall be included on site maps in Appendix B and in Appendix C. Additional descriptions are included in the following subsections.

When modifying this SWMP to supplement control measures, the QSM must ensure that additional control measure specifications adhere to the requirements of the general permit.

Structural Control Measures

Structural control measures are physical devices that prevent or minimize stormwater quality impacts.

Check Dam:
Check dams are generally constructed from rock or erosion logs. They are designed to slow water velocity allowing some sediment to settle. Check dams will be used in areas of concentrated flows (along drainage swales). Installation includes stacked rock or use of erosion logs so that the center of the check dam is lower than the sides. The check dam will be installed across the entire width of the drainage swale in order to function properly. Check dams will be inspected for proper installation and sediment accumulation on the up-gradient side. Accumulated sediment and debris will be removed from a control measure when the sediment level reaches one-half the height of the control measure or at any time that sediment or debris adversely impacts the functioning of the control measure. Clean and replace materials as needed to maintain function and design.

Perimeter Control:
Perimeter control serves as erosion and sediment control and, when appropriate, access control. At down gradient locations, perimeter controls will be installed where overland sheet flow has the potential to leave the site. In up-gradient areas perimeter control may be added to define project boundaries, limit on-site flows or protect off-site features. Such controls should be suitable to the application. Perimeter control may consist of any number of control measures, including, but not limited to earthen berms, erosion/sediment control logs, silt fence, etc. Perimeter control will be used around bore holes, trenches, and other locations where sediment is exposed and may accumulate. Perimeter control will remain in place until areas up-gradient of controls are stabilized. Perimeter control will be inspected for proper installation, structural integrity and accumulated sediment. Maintenance would include repairing or replacing damaged sections and removing accumulated sediment.

Silt Fence:
Silt fence consists of geotextile fabric installed with at least six inches of the fabric trenched into the soil; wooden stakes are attached on the down-gradient side. Wire-backed fence may be used or additional stakes or lathe may be added on the up-gradient side for strengthening the fence around corners or in high wind conditions. Silt fence provides sediment control by reducing water velocity and ponding water to facilitate the deposition of sediment on the up-gradient side of the fence. Silt fence applications include, but are not limited to: project perimeter control, secondary containment, back of curb protection and containment for any disturbed or staging area. Silt fence will be inspected regularly for sediment accumulation, tear or holes in the fabric, broken stakes, gaps in the fabric, or areas where the fabric needs to be re-attached to the wooden stakes. Maintenance includes repairing the items noted, removing sediment accumulation one-half the height of the fence, or replacing the fence as needed.

Vehicle Tracking Control (VTC):
Vehicle tracking control will be implemented to minimize vehicle tracking of sediment from

disturbed areas per the erosion control plan and may consist of an excavated area with a geotextile liner and gravel, metal grate, asphalt/concrete “rumble strip”, or other proprietary products. Tracking control is designed to cause soil to vibrate off equipment and vehicles as they transition from disturbed soils to paved areas and should drain to a control measure. The vehicle tracking control will remain in place until access to the areas used by the control are or no longer needed. Designated points of ingress and egress, where traffic transitions from a stabilized road surface (e.g., gravel or pavement) to disturbed soil, are likely to need vehicle tracking control or these areas must drain to a control that meets the requirements of Appendix C. Tracking control may be moved or eliminated (if no longer needed) as on-site conditions and activities change. Tracking control will be inspected for depth of gravel/rock, presence of excess soil, proper usage and the overall general condition. The most common maintenance items include the removal of accumulated soil and addition of gravel/rock. In vegetated areas where access is anticipated to minimal, turf mats or cattle guards, or proprietary products such as mud mats may be installed primarily to protect vegetation and provide a stabilized entrance. These materials will be inspected for damage and will be maintained as needed.

Erosion/sediment Control Log:
An erosion/sediment control log consists of a net or geotextile fabric filled with straw, excelsior, wood mulch or other fillers. Erosion/sediment control log applications include, but are not limited to, slope stabilization, perimeter control, check dams in swales, back of curb protection and temporary secondary containment for stockpiles, materials storage, or masonry.
Erosion/sediment control logs reduce water velocity allowing sediment to accumulate on the up-gradient side of the log. The basic installation for a net wrapped erosion/sediment control log is to prepare a shallow trench and secure the log in the trench

using a stake or landscape pin. Logs should be installed based on manufacturer’s directions. Logs should be inspected for proper installation, structural integrity and sediment accumulation. A log that has been flattened out of round may not need to be replaced if they remain sufficient to function appropriately on the up-gradient side of the log.

Sediment Basins:
A sediment basin is a temporary pond built on a construction site to capture eroded or disturbed soil transported in storm runoff prior to discharge from the site. Sediment basins are designed to capture site runoff and slowly release it to allow time for settling of sediment prior to discharge. Sediment basins are often constructed in locations that will later be modified to serve as post-construction stormwater water quality or detention features. Sediment basins are rarely utilized as a control for linear projects; however, they may be utilized for substations, plants or other PSCo facilities. Basins will be sized per the detail in Appendix C and outlets that withdraw water from or near the surface will be installed per the erosion and sediment control plan and inspected for sediment accumulation, erosion, and the outlet will be inspected to ensure it is functioning as designed.

Earth Dikes and Drainage Swales:
Earth dikes and drainage swales are temporary storm conveyance channels constructed either to divert runoff around slopes or to convey runoff to additional sediment control BMPs prior to discharge of runoff from a site. Drainage swales may be lined or unlined, but if an unlined swale

is used, it must be well compacted and capable of resisting erosive velocities. Earth dikes and drainage swales are typically used to control the flow path of runoff at a construction site by diverting runoff around areas prone to erosion, such as steep slopes. Earth dikes and drainage swales may also be constructed as temporary conveyance features. This will direct runoff to additional sediment control treatment BMPs, such as sediment traps or basins.

Additional control measures may be added as site conditions change and will be identified in the SWMP prior to installation.

Non-Structural Control Measures

Non-structural CMs include implementation of methods, practices, and procedures to minimize water quality impacts.

Crimp Mulch:
Crimp mulching uses hay or straw material that is machine crimped into the soil to provide stability. Crimp mulch may be used on its own as a temporary soil stabilization method, or in conjunction with seeding for final stabilization. Crimp mulch functions as a soil stabilizer by decreasing the velocity of sheet flow. Mulch may be hay or cereal grain straw. Mulch will likely be crimped into the soil using either a drill seeder or notched disk plow to the minimum depth of two inches and a maximum depth of four inches. To maximize effectiveness crimping equipment must run parallel to the contours of the land. Crimp mulch may not be appropriate for slopes that are equal to or greater than 3:1 or in areas with hard or rocky soil in which the crimper cannot penetrate. Inspections should look for areas where mulch is missing, thin or for areas where erosion has occurred. Maintenance items would include re-grading as necessary and reapplying as appropriate.

Seed and Stabilization (Temporary and Permanent Ground Cover):
Seeding involves the mechanical or hand application of specific seed mixes appropriate for the site location and soil type. Seeding provides plant growth to stabilize the soil reducing the likelihood of erosion or sediment transport. As soon as practical, after the completion of construction activities, soil should be properly prepared and seeded. The choice of seed mix will dictate application rates and methods. Seeding should always be accompanied by an additional control measure, such as mulching or tackifying, to protect the seed and soil from erosion during the germination and growth process. Seed areas will be inspected to ensure that the soil stabilization method (e.g., surface roughening, crimp mulch, etc.) was applied correctly and has not been compromised. The area will also be inspected for erosion and/or sediment deposition. Maintenance items would include re-grading and seeding bare or areas of thin vegetative growth and/or adding additional control measures as appropriate. If seeding cannot be accomplished due to seasonal or other constraints, temporary stabilization, such as mulch and mulch tackifier will be used. Additional discussion concerning temporary stabilization may be found in this section.

Erosion Control Blankets (ECBs) and Turf Reinforcement Mats (TRMs):
ECBs/TRMs are sheets of straw, excelsior, coconut, manmade fiber, or combination thereof, usually contained between layers of netting to provide structural integrity. ECBs/TRMs function by providing ground cover that reduces erosive action. TRMs are able to handle higher levels of concentrated flows and are used mainly in channel applications. ECBs and TRMs may be used

in conjunction with other velocity reducing control measures. ECB/TRM applications include, but are not limited to, slope and swale protection. ECBs/TRMs will be inspected for erosion underneath and at the sides of the material, sediment accumulation, rips tears and other structural problems. Maintenance will include removing sediment, re-securing material to ground and re-trenching or replacement, as needed.

Street Sweeping:
Soils deposited on paved surfaces will be swept or cleaned as needed to reduce the potential of sediment transport and tracking. Sweeping operations consist of the scraping large quantities of sediment from pavement and/or sweeping, via hand or mechanical means to remove as much deposited sediment as possible. All streets within and immediately surrounding a construction site will be cleaned of earth material when sediment has been deposited on the roadway and is being tracked off site. Scraped or swept material will not be deposited in the storm sewer. Sweeping and vacuuming may not be effective when soil is wet or muddy.

Surface Roughening:
Surface roughening consists of grooves or tracks installed in the soil surface, along the contours (not up and down the slope which promotes erosion). This is a temporary soil stabilization technique that works well in areas that will remain inactive for a short time. Surface roughening works by reducing water velocity and promoting infiltration, thus decreasing the potential for erosion to occur. Any disturbed areas with no construction activity planned for longer than 14 days may be surfaced roughened. This may include areas where scheduling prevents the immediate implementation of final stabilization practices, the sides of stockpiles or other slopes. Surface roughening may be applied by creating a continuous furrow along the contours. This can be done with the teeth on a loader bucket, ripping, disking or plowing equipment. Surface roughening can also be created by running tracked equipment up and down the slope creating track marks along the contour. Inspection of surface roughened areas would include proper implementation, structural integrity and areas of erosion or sediment accumulation. Maintenance for surface roughening would include re-applying the technique or installation of new or additional control measures.

Protection of Pre-existing Vegetation:
Protection of existing vegetation on a construction site can be accomplished through installation of a construction fence around the area requiring protection. In cases where upgradient areas are disturbed, it may also be necessary to install perimeter controls to minimize sediment loading to sensitive areas such as wetlands. Existing vegetation may be designated for protection to maintain a stable surface cover as part of construction phasing, or vegetation may be protected in areas designated to remain in natural condition under post-development conditions (e.g., wetlands, mature trees, riparian areas, open space). A 50 horizontal foot buffer of pre-existing vegetation or equivalent controls must be maintained between work areas and receiving waters unless infeasible. Maintenance may include removing sediment by hand, replacing construction fence or other plastic fencing used to limit access. If any damage were to occur to a vegetative buffer, a new or additional control measure should be considered and the SWMP will be updated to document why the vegetation could not be left undisturbed.

Wind Erosion Control:
Wind erosion and dust control may be necessary if wind is transporting soil within or off site. Wind erosion control functions to stabilize the soil surface reducing the potential for wind erosion. Wind erosion control consists of applying water and/or other dust palliatives as necessary to prevent or alleviate erosion by the forces of wind. Covering of small stockpiles or areas is an alternative to applying water or other dust palliatives. If needed, a soil tackifier can be applied to control wind erosion. Disturbed areas should be inspected for obvious signs of wind erosion and control measures implemented, if needed. Areas with wind erosion controls in place should be inspected for structural integrity and coverage and repaired or replaced as appropriate.

Training:
Employees and contractor will be trained on good housekeeping, the proper use and storage of materials, and site management practices. This should include stormwater training for all SWMP developers, erosion control measure installers, and stormwater inspectors. It is recommended that the above all hold either a CISEC or CPESC certification or are in training for either of these two certifications.

Site Management Practices:
Good housekeeping will be used to keep potential areas where pollutants exist clean and orderly. Containers, drums, and bags will be stored away from direct traffic routes to reduce the risk of accidental spills. Stack containers according to manufacturer's instructions to avoid damaging the containers from improper weight distribution. Containers will be stored on pallets or similar devices to prevent corrosion of containers that results from containers coming in contact with moisture on the ground. Liquids will be stored within curbed areas or secondary containment.

Vegetation & Topography (VT)
In limited disturbance areas, not installing a control measure (CM) may be the best approach to minimize sediment transport off site. This is based on the concept that shallow overland flow may pick-up and transport sediment that is then dropped out within a vegetative buffer and installation of a down-gradient physical CM is an unnecessary effort, expense, and disturbance that increases the amount of site restoration.

The VT will have to be inspected to verify that sediment is not being transported beyond the buffer or project control area. In the event that the VT CM is not providing the level of sediment settling necessary, physical CMs may need to be installed or practices up-gradient of the VT buffer modified. It is expected that the thin layer of sediment deposited in the VT buffer should not be removed. All control measure type modifications and movement are to be noted on the SWMP site maps. A comprehensive design guideline, citing good engineering, hydrologic, and pollutant control practices, principles and criteria is contained in the control measures details located in Appendix C.

Soil Compaction:
Soil compaction must be minimized for areas where infiltration control measures will occur or

where final stabilization will be achieved through vegetative cover.

Topsoil Preservation:
Unless infeasible, topsoil will be preserved for those areas of a site that will utilize vegetative final stabilization. Below is an outline how topsoil is to be managed on this project:

- Erosion control contractor to collect samples of surface soil for testing to support post-construction amendment and seeding recommendations. Erosion control contractor to develop amendment and seeding recommendations prior to final stabilization in consultation with Garnet Mesa Solar, LLC and the civil engineer.
- Drive-over areas NOT to be stripped assuming that topsoil is not being pushed into subgrade by rutting (ruts of greater than 4" deep) or torn out by equipment operation (i.e. substantial track turning that displaces topsoil layer). If drive-over areas disturbed, civil contractor may be required to strip topsoil to allow operation only on subsoil with post-construction topsoil respreading.
- Civil contractor to export excess subgrade material no intended to be reused on site. Excess subsoil may not be spread on-site. Contractor to spread and track compact topsoil in final finished grade lift.
- Erosion control contractor to add amendments (solid or liquid) per site conditions with the objective of getting site to grow vegetation as soon as possible. This work to be in consultation with Garnet Mesa Solar, LLC and the civil engineer.
- If necessary, erosion control contractor will be responsible for post-construction irrigation to promote germination and revegetation. This is to be done in coordination with Garnet Mesa Solar, LLC and the civil engineer.

Minimize Disturbances:
Minimize disturbances to the extent feasible especially on steep slopes.

Temporary Stabilization:
Temporary stabilization must be implemented for earth disturbing activities on any portion of the site where ground disturbing construction activity has permanently ceased, or temporarily ceased for more than 14 calendar days. Temporary stabilization methods may include, but are not limited to, tarps, soil tackifier, and hydroseed and although not specifically outlined in the permit may also include temporary hard surfaces. The permittee may exceed the 14-day schedule when either the function of the specific area of the site requires it to remain disturbed, or, physical characteristics of the terrain and climate prevent stabilization. The SWMP must document the constraints necessitating the alternative schedule, provide the alternate stabilization schedule, and identify all locations where the alternative schedule is applicable on the site map.

Other controls related to final stabilization, bulk storage, materials management, and corrective actions and releases are covered in other sections of this SWMP.

Documented Use Agreement

Project compliance relies solely upon control measures located inside the permitted area and under direct control of the permittee.

Site Description

Nature of Construction Activity at the Site

Garnet Mesa Solar, LLC intends to build a ground mounted photovoltaic (PV) array to generate power.

The project area is divided between two areas. The first area being G Rd on the north and 2100 Rd on the east, about between Highway 50 on the east and River Road on the west, about 4.5 miles directly east of the city of Delta. The second area being about 1,500 ft west of 2200 Rd, about 6 miles east of the city of Delta. Both portions of the project are located in Delta County. The East Canal, a tributary to the North Fork of the Gunnison River, runs south of the second area and runs east to west.

Construction will consist of site and access road grading and construction of PV panels.

Proposed Sequence of Major Construction Activities

The project will be phased to the extent practical to limit the amount of disturbed area that is exposed at any given time. Controls measure phasing is critical to stormwater management. Control measure implementation will be coordinated with the various stages of construction. Controls that manage erosion and sediment transport from initial site activities will be installed prior to earth disturbing activities. As work progresses and additional areas are disturbed, controls targeted for erosion and sediment transport will be implemented prior to start of earth disturbing activities in those areas. As portions of the site are completed and previously disturbed areas are stabilized or the control measure is no longer needed, control measure will be removed.

Permanent or temporary soil erosion control measures for all slopes, channels, ditches, or any disturbed land area and soil stockpiles, will be implemented as soon as practicable after final grading or the final earth disturbance has been completed. When it is not possible to permanently stabilize a disturbed area after an earth disturbance has been completed or where significant earth disturbance activity ceases, temporary erosion control measures will be implemented as soon as practicable and no more than 14 days after construction activity has temporarily or permanently ceased.

Project Phase	Controls to be implemented
Site Preparation	• Design SWMP based on site visit and design drawings. • Establish staging areas including perimeter controls, VTC, concrete washout, spoil pile area etc. • Install controls around areas that are anticipated to be disturbed • Limit access to areas that are not to be disturbed protecting existing vegetation using boundary controls. • Collect topsoil samples for analysis used to determine amendments for revegetation

Construction	• Where feasible and if present, topsoil will be preserved by stripping and segregating for use in final restoration efforts. • Establish site access as needed. • Construct sediment basins with additional CMs at outlets. • Install CMs in new drainage swales as they are constructed. • Rough grade site and track compact - export subsoil not to be reused as needed. • Implement temporary stabilization for all areas left undisturbed for 14 days. At a minimum this requires surface roughening. If areas remain inactive for more than 30 days, surface roughing, seed and mulch are required. • Implement temporary stabilization (i.e. tarps, surface roughening, or seed and mulch) for all stockpiles, including berms, which are left undisturbed for 14 days. • Construct solar array and associated electrical work • Remove temporary controls where appropriate. • Remove limited stored materials and equipment from the site. • Leave disturbed area of site in a surface roughened condition. • Protect and repair control measures as necessary. • Perform street sweeping, as needed.
Final Stabilization	• Replace topsoil layer at the surface prior to implementing final stabilization measures. • Apply topsoil amendments as determined by erosion control contractor. • Place aggregate along access road. • Perform seeding and mulching per seed mix and application rates defined in the Final Stabilization section. • Install temporary irrigation, if practicable. • Monitor regrowth of vegetation, irrigate and re-seed if necessary. • Remove all non-biodegradable temporary controls once required vegetative cover is reached. • Close permits as applicable.

Area Estimates

The total construction area at the project site comprises areas that may not be disturbed during construction, or are surface stabilized. Total construction area of the site is roughly 348 acres.

The total disturbance area at the project site comprises areas that will be cleared, excavated, graded, or otherwise impacted by construction in a manner that causes soil exposure beyond background levels. The disturbance area has been estimated to be up to 348 acres.

Existing Soil Information

The United States Department of Agriculture Natural Resources Conservation Services (NRCS) Web Soil Survey provides information for soil types and properties for the site. Primary soils present include Montrose silty clay loam and Killpack silty clay loam. Hydrologic properties, wind erodibility, and sheet/rill erosion potential are discussed below. Control measures were prescribed based on information made available by the NRCS.

Hydrologic soil groups describe runoff potential and infiltration properties of soils and range from C to D. Group C soils have slow infiltration rates when thoroughly wet, group D have slow infiltration and high runoff potential. A majority of soils on site fall into hydrologic soil group C, indicating a moderate to low rate of infiltration and moderate to high runoff potential.

Susceptibility of soils to sheet and rill erosion by water is rated by a K factor. K factors range from 0.02 to 0.69; with all other factors being equal, higher K values indicate higher susceptibility to sheet and rill erosion. Soils within the limits of disturbance at the site are rated

with a K factor ranging from 0.28 to 0.43 indicating moderate susceptibility to sheet/rill erosion.

Wind erodibility ratings range from 1 to 8 with 1 being the most susceptible to wind erosion. Soils within the disturbance limits range from 4 to 6, indicating a moderately low susceptibility to wind erosion.

Vegetative Coverage

The first project area near G Rd is located on currently irrigated grazing land. Existing vegetation in this area mainly consists of grasses. There is also a small grove of trees in the southwest and a drainage ditch mostly filled with weeds and shrubs. This portion of the project area also contains an existing home and associated ranch supporting buildings and cattle pens. The second project area is mostly irrigated, however there are portions of this land which remain undeveloped in a natural state. The vegetation in this portion of the project consists of grasses, weeds, and other small shrubs and cactus.

Pre-existing vegetation for the first project area near G Rd averages approximately 87%. Pre-existing vegetation for the second project area near 2200 Rd averages approximately 65%. In total, the average pre-existing vegetation across all acreage is 76%. Vegetation density was determined through analysis of aerial imagery and site photos, which can be seen in Appendix D. If vegetation densities are observed to be different than this prior to construction by the Qualified Stormwater Manager, densities are to be photo documented and added to the SWMP.

No wetland areas are delineated on site. However, one wetland area is delineated along an electrical collections route connecting the first and second project areas along the East Canal.

Allowable Non-Stormwater Discharges

Contractors will manage authorized non-stormwater discharges in conjunction with stormwater discharges at the site. Implemented control measures were designed to handle increased discharges due to the below allowable non-stormwater sources.

- Discharges from uncontaminated springs that do not originate from an area of land disturbance.
- Discharge to the ground of concrete washout water associated with washing of concrete tools and concrete mixer chutes. **Discharges of concrete washout water must not leave the site as surface runoff or reach receiving waters.** Controls for concrete washout shall be shown in site maps. On-site disposal of concrete waste is not authorized except in accordance with Part I.B.a.ii(b) of COR 400000.
- Landscape irrigation return flow.
- Discharges from emergency fire-fighting activities.
- Discharges from diversions of state waters within the permitted site.

All other non-stormwater discharges at the site must be covered by a separate CDPS permit or by the WQCD's Low Risk Discharge Guidance document. Plans have been developed to indicate locations of these discharges, if any, and associated control measures. Such permits, if any, are included in Appendix A.

Receiving Waters

The majority of stormwater that falls to the ground will be infiltrated into the ground on site. Most of the site runoff from the first project area near G Rd will drain to the north through existing drainage canals into the East Canal. Most of the site runoff from the second project area near 2200 Rd will drain to the south into the East Canal. The East Canal is a perennial creek and a tributary to the North Fork of the Gunnison River, which is a tributary to the Colorado River.

Stream Crossings

There is one stream crossings located within the limits of construction. The crossing shall be accomplished either overhead or underground via a directional bore.

Diversion Structures: Diversion structures are not anticipated for this project.

Alternate Temporary Stabilization Frequencies

Constraints that necessitate an alternative temporary stabilization frequency have not been identified at this time. The QSM must update this section as necessary if constraints that necessitate an alternative temporary stabilization schedule arise. Site maps will be updated to indicate locations where alternative temporary stabilization frequencies are required and to show control measures used in the interim.

Site Map

Prior to the submission of the final SWMP report, site maps shall be developed by a qualified stormwater manager to be included in Appendix B. Maps shall depict:

- Construction site boundaries;
- Flow arrows that depict stormwater flow directions on-site and runoff direction;
- All areas of ground disturbance including areas of borrow and fill;
- Areas used for storage of soil;
- Locations of all waste accumulation areas, including areas for liquid, concrete, masonry, and asphalt;
- Locations of dedicated asphalt and/or concrete batch plants, and masonry mixing stations;
- Locations of all structural control measures;
- Locations of all non-structural control measures;
- Locations of springs, streams, wetlands, and other state waters, including areas that require pre-existing vegetation be maintained within 50 feet of a receiving water, where determined feasible;
- Locations of all stream crossings located within the construction site boundary; and
    - Areas where alternate temporary stabilization frequencies are required.

Stabilization Requirements

Temporary Stabilization

Contractors must implement temporary stabilization control measures at any disturbed area within 14 days of cessation of earth disturbing activities at that area. This includes areas that will be re-disturbed outside of the 14-day time frame as well as stockpiles. Temporary stabilization measures are discussed in depth in Section 5 and/or in Appendix C.

Temporary stabilization measures include surface roughening, applying temporary seed mix, aggregate surfacing, or tarping stockpiles.

Final Stabilization

Contractors must implement final stabilization for all areas disturbed by the construction activity. The site must retain coverage under this or an alternate construction SWMP permit until all areas have reached final stabilization in the form of uniform vegetative cover with individual plant density of at least 70 percent of pre-disturbance levels is established, or equivalent permanent alternative stabilizations are implemented.

Anticipated final stabilization at the site includes maintaining necessary erosion and sediment control measures until stabilization is reached. Interim control measures, such as concrete washout areas, vehicle tracking controls, and perimeter controls, may be removed. Control measures which provide protection down-gradient of disturbances must remain in place until final stabilization is achieved. Fully biodegradable control measures may be left to deteriorate in place.

Final stabilization includes those measures taken to control pollutants in stormwater after soil disturbing activities are complete. Practices implemented to achieve final stabilization include:

- Seed mix selection and application methods;
- Soil preparation and possible amendment of the soil prior to seed application;
- Use of salvaged topsoil preserved during construction;
- Soil stabilization methods (e.g., crimped mulch or rolled erosion control products);
- Permanent pavement, hardscaping, xeriscape, stabilized driving surfaces, and other alternative stabilization practices as applicable.
- Maintenance of appropriate erosion and sediment control measures until final stabilization is achieved; and
- Removal of temporary control measures once work is completed and final stabilization achieved.

The seed mix prescribed for this site shall consist of a dryland pasture seed. The specific mix of species and application rates shall be determined prior to submission of the final SWMP plan.

Long Term Stormwater Management

Return of the site to pre-construction conditions, and stabilizing as described above, will act as long-term stormwater management for the project. No post construction water quality control measures are planned in connection with the project.

Inspection Reports

Inspection Frequency

A qualified stormwater manager will inspect the site at one of the below frequencies unless an alternate schedule, defined by the permittee, has been approved in writing by the CDPHE WQCD.

- At least once every 7 calendar days, or
- At least once every 14 calendar days, if post storm event inspections are conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion. Post-storm inspections may be used to fulfill the 14-day routine inspection requirement.

Reduced Inspection Frequency

Reduced inspection frequencies may occur when the following conditions exist:

Post-Storm Inspections at Temporarily Idle Sites

For permittees choosing to combine 14-day inspections and post-storm event inspections, if no construction activities will occur following a storm event, post-storm event inspections must be conducted prior to re-commencing construction activities, but no later than 72 hours following the storm event. The delay of any post-storm event inspection must be documented in the inspection record. Routine inspections must still be conducted at least every 14 calendar days.

Inspections at Completed Sites/Areas

When the site, or portions of a site are awaiting establishment of a vegetative ground cover and final stabilization, the permittee must conduct a thorough inspection of the stormwater management system at least once every 30 days. Post-storm event inspections are not required under this schedule. This reduced inspection schedule is allowed if all of the following criteria are met:

- All construction activities resulting in ground disturbance are complete;
- All activities required for final stabilization, in accordance with the SWMP, have been completed, with the exception of the application of seed that has not occurred due to seasonal conditions or the necessity for additional seed application to augment previous efforts; and
- The SWMP has been amended to locate those areas to be inspected in accordance with the reduced schedule allowed for in this paragraph.

Winter Conditions Inspections Exclusion

Inspections are not required for sites that meet all of the following conditions:

- Construction activities are temporarily halted,
- Snow cover exists over the entire site for an extended period, and
- Melting conditions posing a risk of surface erosion do not exist.

When this inspection exclusion is implemented, document and retain the following:

- Dates when snow cover existed;
- Date when construction activities ceased; and
- Date melting conditions began.

Inspection Scope

Qualified stormwater manager must inspect the following areas for evidence of, or potential for, pollutants leaving the construction site boundaries, entering the stormwater drainage system, or discharging to state waters:

- Construction site perimeter;
- All disturbed areas;
- Designated haul routes
- Material and waste storage areas exposed to precipitation;
- Locations where stormwater has the potential to discharge offsite; and
- Locations where vehicles exit the site.

During inspections, the qualified stormwater manager must:

- Visually verify whether all implemented control measures are in effective operational condition and are working as designed in their specifications to minimize pollutant discharges;
- Determine if there are new potential sources of pollutants;
- Assess the adequacy of control measures at the site to identify areas requiring new or modified control measures to minimize pollutant discharges; and
- Identify all areas of non-compliance with the general permit requirements and, if necessary, implement corrective action (described in Section 1.3.3.2)

At a minimum the inspection report must include the following information about the site at the time of inspection:

- Inspection date;
- Name/title of personnel conducting inspection;
- Weather conditions;
- Phase of construction;
- Estimated acreage of disturbance;
- Locations of discharges of sediment and other pollutants from the site;
- Locations of control measures requiring maintenance;
- Locations and identification of inadequate control measures;
- Locations and identification of additional control measures needed and not in place;
- Description of the minimum inspection frequency and any deviations from the minimum

inspection schedule;

- After adequate corrective actions and maintenance have taken place, or where a report does not identify any incidents requiring such, include the following statement:

> *"I verify that, to the best of my knowledge and belief, all corrective action and maintenance items identified during the inspection are complete, and the site is currently in compliance with the permit."*

Inspections must differentiate between control measures that require routine maintenance and those that warrant corrective action based on the following definitions:

Control measure requiring routine maintenance: *Any control measure that is still operating in accordance with its design and the requirements of the general permit, but requires maintenance to prevent a breach of the control measure.*

Inadequate control measure: *Any control measure that is not designed or implemented in accordance with the requirements of the general permit and/or any control measure that is not implemented to operate in accordance with its design.*

CITRA

Appendix A

Construction Stormwater Permits

STATE OF COLORADO

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Water Quality Control Division

CDPS GENERAL PERMIT STORMWATER DISCHARGES ASSOCIATED WITH

CONSTRUCTION ACTIVITY AUTHORIZATION TO DISCHARGE UNDER THE COLORADO DISCHARGE PERMIT SYSTEM (CDPS)

COR400000

In compliance with the provisions of the Colorado Water Quality Control Act, (25-8-101 et seq., CRS, 1973 as amended) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.; the "Act"), this permit authorizes the discharge of stormwater associated with construction activities (and specific allowable non-stormwater discharges in accordance with Part I.A.1. of the permit) certified under this permit, from those locations specified throughout the State of Colorado to specified waters of the State.

Such discharges shall be in accordance with the conditions of this permit. This permit specifically authorizes the facility listed on the certification to discharge in accordance with permit requirements and conditions set forth in Parts I and II hereof. All discharges authorized herein shall be consistent with the terms and conditions of this permit.

This permit becomes effective on April 1, 2019, and shall expire at midnight March 31, 2024.

Issued and signed this 28th day of January, 2021.

Meg Parish

Meg Parish, Permits Section Manager Water Quality Control Division

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Permit History
Minor Modification Issued January 28, 2021 Effective February 1, 2021
Modification Issued December 31, 2020 Effective February 1, 2021
Originally signed and issued October 31, 2018; effective April 1, 2019

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Part I

Note: At the first mention of terminology that has a specific connotation for the purposes of this permit, the terminology is electronically linked to the definitions section of the permit in Part I.E.

A. COVERAGE UNDER THIS PERMIT

1. Authorized Discharges

This general permit authorizes permittee(s) to discharge the following to state waters: stormwater associated with construction activity and specified non-stormwater associated with construction activity. The following types of stormwater and non-stormwater discharges are authorized under this permit:

a. Allowable Stormwater Discharges

i. Stormwater discharges associated with construction activity.

ii. Stormwater discharges associated with producing earthen materials, such as soils, sand, and gravel dedicated to providing material to a single contiguous site, or within ¼ mile of a construction site (e.g. borrow or fill areas).

iii. Stormwater discharges associated with dedicated asphalt, concrete batch plants and masonry mixing stations (Coverage under this permit is not required if alternative coverage has been obtained.)

b. Allowable Non-Stormwater Discharges

The following non-stormwater discharges are allowable under this permit if the discharges are identified in the stormwater management plan in accordance with Part I.C and if they have appropriate control measures in accordance with Part I.B.1.

i. Discharges from uncontaminated springs that do not originate from an area of land disturbance.

ii. Discharges to the ground of concrete washout water associated with the washing of concrete tools and concrete mixer chutes. Discharges of concrete washout water must not leave the site as surface runoff or reach receiving waters as defined by this permit. Concrete on-site waste disposal is not authorized by this permit except in accordance with Part I.B.1.a.ii(b).

iii. Discharges of landscape irrigation return flow.

iv. Discharges from diversions of state waters within the permitted site.

c. Emergency Fire Fighting

Discharges resulting from emergency firefighting activities during the active emergency response are authorized by this permit.

2. Limitations on Coverage

Discharges not authorized by this permit include, but are not limited to, the discharges and activities listed below. Permittees may seek individual or alternate general permit coverage for the discharges, as appropriate and available.

a. Discharges of Non-Stormwater

Discharges of non-stormwater, except the authorized non-stormwater discharges listed in Part

I.A.1.b., are not eligible for coverage under this permit.

b. Discharges Currently Covered by another Individual or General Permit

c. Discharges Currently Covered by a Water Quality Control Division (division) Low Risk Guidance Document

3. Permit Certification and Submittal Procedures

a. Duty to Apply

The following activities shall apply for coverage under this permit:

i. Construction activity that will disturb one acre or more; or

ii. Construction activity that is part of a common plan of development or sale; or

iii. Stormwater discharges that are designated by the division as needing a stormwater permit because the discharge:

(a) Contributes to a violation of a water quality standard; or

(b) Is a significant contributor of pollutants to state waters.

b. Application Requirements

To obtain authorization to discharge under this permit, applicants applying for coverage following the effective date of the renewal permit shall meet the following requirements:

i. Owners and operators submitting an application for permit coverage will be co- permittees subject to the same benefits, duties, and obligations under this permit.

ii. Signature requirements: Both the owner and operator (permittee) of the construction site, as defined in Part I.E., must agree to the terms and conditions of the permit and submit a completed application that includes the signature of both the owner and the operator. In cases where the duties of the owner and operator are managed by the owner, both application signatures may be completed by the owner. Both the owner and operator are responsible for ensuring compliance with all terms and conditions of the permit, including implementation of the stormwater management plan.

iii. The applicant(s) must develop a stormwater management plan (SWMP) in accordance with the requirements of Part I.C. The applicant(s) must also certify that the SWMP is complete, or will be complete, prior to commencement of any construction activity.

iv. In order to apply for certification under this general permit, the applicant(s) must submit a complete, accurate, and signed permit application form as provided by the division by electronic delivery at least 10 days prior to the commencement of construction activity, except those construction activities that are in response to a public emergency related site; public emergency related sites shall apply for coverage no later than 14 days after the commencement of construction activities. The provisions of this part in no way remove a violation of the Colorado Water Quality Control Act if a point source discharge occurs prior to the issuance of a CDPS permit.

v. The application in its entirety must be submitted via the division's online permitting system unless a waiver is granted by the division. If a waiver is granted, the application in its entirety, including signatures by both the owner and operator, must be submitted to:

Colorado Department of Public Health and Environment
Water Quality Control Division
Permits Section, WQCD-PS-B2
4300 Cherry Creek Drive South
Denver, CO 80246

vi. The applicant(s) must receive written notification that the division granted permit coverage prior to conducting construction activities except for construction activities that are in response to a public emergency related site.

c. Division Review of Permit Application

Within 10 days of receipt of the application, and following review of the application, the division may:

i. Issue a certification of coverage;

ii. Request additional information necessary to evaluate the discharge;

iii. Delay the authorization to discharge pending further review;

iv. Notify the applicant that additional terms and conditions are necessary; or

v. Deny the authorization to discharge under this general permit.

d. Alternative Permit Coverage

i. Division Required Alternative Permit Coverage:

The division may require an applicant or permittee to apply for an individual permit or an alternative general permit if it determines the discharge does not fall under the scope of this general permit, including if any additional terms and conditions are necessary in order to ensure that discharges authorized by this permit shall not cause, have the reasonable potential to cause, or measurably contribute to an exceedance of any applicable water quality standard, including narrative standards for water quality. In this case, the division will notify the applicant or permittee that an individual permit application is required.

ii. Permittee Request for Alternative Permit Coverage:

A permittee authorized to discharge stormwater under this permit may request to be excluded from coverage under this general permit by applying for an individual permit. In this case, the permittee must submit an individual application, with reasons supporting the request, to the division at least 180 days prior to any discharge. When an individual permit is issued, the permittee's authorization to discharge under this permit is terminated on the effective date of the individual permit.

e. Submittal Signature Requirements

Documents required for submittal to the division in accordance with this permit, including applications for permit coverage and other documents as requested by the division, must include signatures by **both** the owner and the operator, except for instances where the duties of the owner and operator are managed by the owner.

Signatures on all documents submitted to the division as required by this permit must meet the Standard Signatory Requirements in Part II.K of this permit in accordance with 40 C.F.R. 122.41(k).

i. Signature Certification

Any person(s) signing documents required for submittal to the division must make the following

certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

f. Compliance Document Signature Requirements

Documents which are required for compliance with the permit, but for which submittal to the division is not required unless specifically requested by the division, must be signed by the individual(s) designated as the Qualified Stormwater Manager, as defined in Part I.E.

i. Any person(s) signing inspection documents required for compliance with the permit per Part I.D.5.c.xiii must make the following statement and provide the date of the statement:

"I verify that, to the best of my knowledge and belief, that if any corrective action items were identified during the inspection, those corrective actions are complete, and the site is currently in compliance with the permit."

g. Field Wide Permit Coverage for Oil and Gas Construction

At the discretion of the division, a single permit certification may be issued to a single oil and gas permittee to cover construction activity related discharges from an oil and gas field at multiple locations that are not necessarily contiguous.

h. Permit Coverage without Application

Qualifying Local Program: When a small construction site is within the jurisdiction of a qualifying local program, the owner and operator of the construction activity are authorized to discharge stormwater associated with small construction activity under this general permit without the submittal of an application to the division. Sites covered by a qualifying local program are exempt from the following sections of this general permit: Part I.A.3.a.; Part I.A.3.b.; Part I.A.3.c.; Part I.A.3.d.; Part I.A.3.g.; Part I.A.3.i.; Part I.A.3.j.; Part I.A.3.k.

Sites covered by a qualifying local program are subject to the following requirements:

i. Local Agency Authority: This permit does not pre-empt or supersede the authority of local agencies to prohibit, restrict, or control discharges of stormwater to storm drain systems or other water courses within their jurisdiction.

ii. Permit Coverage Termination: When a site under a Qualifying Local Program is finally stabilized, coverage under this permit is automatically terminated.

iii. Compliance with Qualifying Local Program: Qualifying Local Program requirements that are equivalent to the requirements of this permit are incorporated by reference. Permittees authorized to discharge under this permit, must comply with the equivalent requirements of the Qualifying Local Program that has jurisdiction over the site as a condition of this permit.

iv. Compliance with Remaining Permit Conditions. Requirements of this permit that are in addition to or more stringent than the requirements of the Qualifying Local Program apply in addition to the requirements of the Qualifying Local Program.

v. Written Authorization of Coverage: The division or local municipality may require any permittee within the jurisdiction of a Qualifying Local Program covered under this permit to

apply for, and obtain written authorization of coverage under this permit. The permittee must be notified in writing that an application for written authorization of coverage is required.

i. Permittee Initiated Permit Actions

Permittee initiated permit actions, including but not limited to modifications, contact changes, transfers, and terminations, shall be conducted following Part II.L, division guidance and using appropriate division-provided forms.

j. Sale of Residence to Homeowner

Residential construction sites only: The permittee may remove residential lots from permit coverage once the lot meets the following criteria:

i. The residential lot has been sold to the homeowner(s) for private residential use;

ii. A certificate of occupancy, or equivalent, is maintained on-site and is available during division inspections;

iii. The lot is less than one acre of disturbance;

iv. All construction activity conducted on the lot by the permittee is complete;

v. The permittee is not responsible for final stabilization of the lot; and

vi. The SWMP was modified to indicate the lot is no longer part of the construction activity.

If the residential lot meets the criteria listed above then activities occurring on the lot are no longer considered to be construction activities with a duty to apply and maintain permit coverage. Therefore, the permittee is not required to meet the final stabilization requirements and may terminate permit coverage for the lot.

k. Permit Expiration and Continuation of Permit Coverage

Authorization to discharge under this general permit shall expire at midnight on March 31, 2024. While Regulation 61.4 requires a permittee to submit an application for continuing permit coverage 180 days before the permit expires, the division is requiring that permittees desiring continued coverage under this general permit must reapply at least 90 days in advance of this permit expiration. The division will determine if the permittee may continue to discharge stormwater under the terms of the general permit. An individual permit may be required for any facility not reauthorized to discharge under the reissued general permit.

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued and remain in force and effect. For permittees that have applied for continued permit coverage, discharges authorized under this permit prior to the expiration date will automatically remain covered by this permit until the earliest of:

i. An authorization to discharge under a reissued permit, or a replacement of this permit, following the timely and appropriate submittal of a complete application requesting authorization to discharge under the new permit and compliance with the requirements of the new permit; or

ii. The issuance and effect of a termination issued by the division; or

iii. The issuance or denial of an individual permit for the facility's discharges; or

iv. A formal permit decision by the division not to reissue this general permit, at which time the division will identify a reasonable time period for covered dischargers to seek coverage under

an alternative general permit or an individual permit. Coverage under this permit will cease when coverage under another permit is granted/authorized; or

v. The division has informed the permittee that discharges previously authorized under this permit are no longer covered under this permit.

B. EFFLUENT LIMITATIONS

1. Requirements for Control Measures Used to Meet Effluent Limitations

The permittee must implement control measures to minimize the discharge of pollutants from all potential pollutant sources at the site. Control measures must be installed prior to commencement of construction activities. Control measures must be selected, designed, installed and maintained in accordance with good engineering, hydrologic and pollution control practices. Control measures implemented at the site must be designed to prevent pollution or degradation of state waters.

a. Stormwater Pollution Prevention

The permittee must implement structural and/or nonstructural control measures that effectively minimize erosion, sediment transport, and the release of other pollutants related to construction activity.

i. Control Measures for Erosion and Sediment Control

Control measures for erosion and sediment control may include, but are not limited to, wattles/sediment control logs, silt fences, earthen dikes, drainage swales, sediment traps, subsurface drains, pipe slope drains, inlet protection, outlet protection, gabions, sediment basins, temporary vegetation, permanent vegetation, mulching, geotextiles, sod stabilization, slope roughening, maintaining existing vegetation, protection of trees, and preservation of mature vegetation.

Specific control measures must meet the requirements listed below.

(a) Structural and nonstructural vehicle tracking controls shall be implemented to minimize vehicle tracking of sediment from disturbed areas and may include tracking pads, minimizing site access, wash racks, graveled parking areas, maintaining vehicle traffic to paved areas, street sweeping and sediment control measures.

(b) Stormwater runoff from all disturbed areas and soil storage areas must utilize or flow to one or more control measures to minimize erosion or sediment in the discharge. The control measure(s) must be selected, designed, installed and adequately sized in accordance with good engineering, hydrologic and pollution control practices for the intended application. The control measure(s) must contain or filter flows in order to prevent the bypass of flows without treatment and must be appropriate for stormwater runoff from disturbed areas and for the expected flow rate, duration, and flow conditions (e.g. sheet or concentrated flow).

(c) Selection of control measures should prioritize the use of structural and nonstructural control measures that minimize the potential for erosion (i.e. covering materials). Selection should also prioritize phasing construction activities to minimize the amount of soil disturbance at any point in time throughout the duration of construction.

(d) Outlets that withdraw water from or near the surface shall be installed when discharging from basins and impoundments, unless infeasible.

(e) Maintain pre-existing vegetation or equivalent control measures for areas within 50 horizontal feet of receiving waters as defined by this permit, unless infeasible.

(f) Soil compaction must be minimized for areas where infiltration control measures will occur or where final stabilization will be achieved through vegetative cover.

(g) Unless infeasible, topsoil shall be preserved for those areas of a site that will utilize vegetative final stabilization.

(h) Minimize the amount of soil exposed during construction activity, including the disturbance of steep slopes.

(i) Diversion control measures must minimize soil transport and erosion within the entire diversion, minimize erosion during discharge, and minimize run-on into the diversion. The permittee must minimize the discharge of pollutants throughout the installation, implementation and removal of the diversion. Diversions must meet one or more of the following conditions:

(1) Lined or piped structures that result in no erosion in all flow conditions.

(2) Diversion channels, berms, and coffer dams must be lined or composed of a material that minimizes potential for soil loss in the entire wetted perimeter during anticipated flow conditions (e.g. vegetated swale, non-erosive soil substrate). The entire length of the diversion channel must be designed with all of the following considerations: maximum flow velocity for the type of material(s) exposed to the anticipated flows to ensure that the calculated maximum shear stress of flows in the channel is not expected to result in physical damage to the channel or liner and result in discharge of pollutants. Additionally, the conditions relied on to minimize soil loss must be maintained for the projected life of the diversion (i.e. a vegetated swale must be limited to a period of time that ensures vegetative growth, minimizes erosion and maintains stable conditions).

(3) An alternative diversion criteria, approved by the division prior to implementation. The diversion method must be designed to minimize the discharge of pollutants and to prevent the potential for pollution or degradation to state waters as a result of the diverted flow through the diversion structure. In addition, the alternative diversion method must minimize the discharge of pollutants throughout the installation, implementation and removal of the diversion.

ii. Practices for Other Common Pollutants

(a) Bulk storage, individual containers of 55 gallons or greater, for petroleum products and other liquid chemicals must have secondary containment, or equivalent protection, in order to contain spills and to prevent spilled material from entering state waters.

(b) Control measures designed for concrete washout waste must be implemented. This includes washout waste discharged to the ground as authorized under this permit and washout waste from concrete trucks and masonry operations contained on site. The permittee must ensure the washing activities do not contribute pollutants to stormwater runoff, or receiving waters in accordance Part I.A.1.b.ii. Discharges that may reach groundwater must flow through soil that has buffering capacity prior to reaching groundwater, as necessary to meet the effluent limits in this permit, including Part I.B.3.a. The concrete washout location must not be located in an area where shallow groundwater may be present and would result in buffering capacity not being adequate, such as near natural drainages, springs, or wetlands. This permit authorizes discharges to the ground of concrete washout waste, but does not authorize on-site waste disposal per Part I.B.3.d.

(c) In the event that water remains onsite and contains pollutants either from the

firefighting activities or picked up from the site (i.e. in a gutter, sediment basin, etc.) after active emergency response is complete, the permittee must ensure the remaining water containing pollutants is properly removed and disposed of in order to minimize pollutants from discharging from the site, unless infeasible.

iii. Stabilization Requirements

The following requirements must be implemented for each site.

(a) Temporary stabilization must be implemented for earth disturbing activities on any portion of the site where ground disturbing construction activity has permanently ceased, or temporarily ceased for more than 14 calendar days. Temporary stabilization methods may include, but are not limited to, tarps, soil tackifier, and hydroseed. The permittee may exceed the 14-day schedule when either the function of the specific area of the site requires it to remain disturbed or physical characteristics of the terrain and climate prevent stabilization. The SWMP must document the constraints necessitating the alternative schedule, provide the alternate stabilization schedule, and identify all locations where the alternative schedule is applicable on the site map. Minimum inspection frequency and scope, as directed in Part I.D., must be followed for temporarily stabilized areas.

(b) Final stabilization must be implemented for all construction sites covered under this permit. Final stabilization is reached when (1), (2), and (3) below are complete:

(1) All construction activities are complete.

(2) Permanent stabilization methods are complete. Permanent stabilization methods include, but are not limited to, permanent pavement or concrete, hardscape, xeriscape, stabilized driving surfaces, vegetative cover, or equivalent permanent alternative stabilization methods. The division may approve alternative final stabilization criteria for specific operations. Vegetative cover must meet the following criteria:

a. Evenly distributed perennial vegetation, and

b. Coverage, at a minimum, equal to 70 percent of what would have been provided by native vegetation in a local, undisturbed area or adequate reference site, and

(3) The permittee must ensure all temporary control measures are removed from the construction site once final stabilization is achieved, except when the control measure specifications allow the control measure to be left in place (i.e. bio-degradable control measures).

(c) Final stabilization must be designed and installed as a permanent feature. Final stabilization measures for obtaining a vegetative cover or alternative stabilization methods include, but are not limited to, the following as appropriate:

(1) Seed mix selection and application methods;

(2) Soil preparation and amendments;

(3) Soil stabilization methods to provide adequate protection to minimize erosion (e.g. crimped straw, hydro mulch or rolled erosion control products);

(4) Appropriate sediment control measures as needed until final stabilization is achieved;

(5) Permanent pavement, hardscape, xeriscape, stabilized driving surfaces;

(d) Other alternative stabilization practices as applicable.

b. Maintenance

The permittee must ensure that all control measures remain in effective operating condition and are protected from activities that would reduce their effectiveness. Control measures must be maintained in accordance with good engineering, hydrologic and pollution control practices. Observations leading to the required maintenance of control measures can be made during a site inspection, or during general observations of site conditions. The necessary repairs or modifications to a control measure requiring routine maintenance, as defined in Part I.E., must be conducted to maintain an effective operating condition. This section is not subject to the requirements in Part I.B.1.c below.

c. Corrective Actions

The permittee must assess the adequacy of control measures at the site, and the need for changes to those control measures, to ensure continued effective performance.

When an inadequate control measure, as defined in Part I.E., is identified (i.e., new or replacement control measures become necessary), the following corrective action requirements apply. The permittee is in noncompliance with the permit until the inadequate control measure is replaced or corrected and returned to effective operating condition in compliance with Part I.B.1 and the general requirements in Part I.B.3. If the inadequate control measure results in noncompliance that meets the conditions of Part II.L., the permittee must also meet the requirements of that section.

i. The permittee must take all necessary steps to minimize or prevent the discharge of pollutants from the permitted area and manage any stormwater run-on onto the site until a control measure is implemented and made operational and/or an inadequate control measure is replaced or corrected and returned to effective operating condition. If it is infeasible to install or repair the control measure immediately after discovering the deficiency, the following must be documented in the SWMP in Part I.D.5.c and kept on record in accordance with the recordkeeping requirements in Part II.

(a) Describe why it is infeasible to initiate the installation or repair immediately; and

(b) Provide a schedule for installing or repairing the control measure and returning it to an effective operating condition as soon as possible.

ii. If applicable, the permittee must remove and properly dispose of any unauthorized release or discharge within and from the permitted area (e.g., discharge of non-stormwater, untreated stormwater containing pollutants, spill, or leak not authorized by this permit.) The permittee must also clean up any contaminated surfaces, if feasible, to minimize discharges of the material in subsequent storm events, including water remaining from the response that contains pollutants after active emergency firefighting response is complete.

2. Discharges to an Impaired Waterbody

a. Total Maximum Daily Load (TMDL)

If the discharge from the site of permit coverage flows to or could reasonably be expected to flow to any water body for which a TMDL has been approved, and stormwater discharges associated with construction activity were assigned a pollutant-specific Wasteload Allocation (WLA) under the TMDL, the division may:

i. Ensure the WLA is implemented properly through alternative local requirements, such as by a

municipal stormwater permit; or

ii. Notify the permittee of the WLA and amend the permittee's certification to add specific effluent limits and other requirements, as appropriate. The permittee may be required to do the following:

(a) Under the permittee's SWMP, implement specific control measures based on requirements of the WLA, and evaluate whether the requirements are met through implementation of existing stormwater control measures or if additional control measures are necessary. Document the calculations or other evidence demonstrating that the requirements are expected to be met; and

(b) If the evaluation shows that additional or modified control measures are necessary, describe the type and schedule for the control measure additions or modifications.

iii. Discharge monitoring may also be required. The permittee may maintain coverage under the general permit provided they comply with the applicable requirements outlined above. The division reserves the right to require individual or alternate general permit coverage.

3. General Requirements

a. Discharges authorized by this permit shall not cause, have the reasonable potential to cause, or measurably contribute to an exceedance of any applicable water quality standard, including narrative standards for water quality.

b. The division may require sampling and testing, on a case-by-case basis, in the event that there is reason to suspect that the SWMP is not adequately minimizing pollutants in stormwater or in order to measure the effectiveness of the control measures in removing pollutants in the effluent. Such monitoring may include Whole Effluent Toxicity testing.

c. The permittee must comply with the lawful requirements of federal agencies, municipalities, counties, drainage districts and other local agencies including applicable requirements in Municipal Stormwater Management Programs developed to comply with CDPS permits. The permittee must comply with local stormwater management requirements, policies and guidelines including those for erosion and sediment control.

d. All construction site wastes must be properly managed to prevent potential pollution of state waters. This permit does not authorize on-site waste disposal.

e. This permit does not relieve the permittee of the reporting requirements in 40 CFR 110, 40 CFR 117 or 40 CFR 302. Any discharge of hazardous material must be handled in accordance with the division's Noncompliance Notification Requirements (see Part II.L of the permit).

C. STORMWATER MANAGEMENT PLAN (SWMP) REQUIREMENTS

1. SWMP General Requirements

a. A SWMP shall be developed for each construction site listed under Part I.A.3.a, including but not limited to, construction activity that will disturb one acre or more and/or are part of a common plan of development or sale covered by this permit. The SWMP must be prepared in accordance with good engineering, hydrologic and pollution control practices.

i. For public emergency related sites, a SWMP shall be created no later than 14 days after the commencement of construction activities.

b. The permittee must implement the provisions of the SWMP as written and updated, from commencement of construction activity until final stabilization is complete. The division may review the SWMP.

c. A copy of the SWMP must be retained onsite or be onsite when construction activities are occurring at the site unless the permittee specifies another location and obtains approval from the division.

2. SWMP Content

a. The SWMP, at a minimum, must include the following elements.

i. Qualified Stormwater Manager. The SWMP must list individual(s) by title and name who are designated as responsible for implementing the SWMP in its entirety and meet the definition of a Qualified Stormwater Manager. This role may be filled by more than one individual.

ii. Spill Prevention and Response Plan. The SWMP must have a spill prevention and response plan. The plan may incorporate by reference any part of a Spill Prevention Control and Countermeasure (SPCC) plan under section 311 of the Clean Water Act (CWA) or a Spill Prevention Plan required by a separate CDPS permit. The relevant sections of any referenced plans must be available as part of the SWMP consistent with Part I.C.4.

iii. Other CDPS Permits. The SWMP must list the applicable CDPS permits associated with the permitted site and the activities occurring on the permitted site (e.g. a CDPS Dewatering Permit).

iv. Materials Handling. The SWMP must describe handling procedures of all control measures implemented at the site to minimize impacts from handling significant materials that could contribute pollutants to runoff. These handling procedures can include control measures for pollutants and activities such as, exposed storage of building materials, paints and solvents, landscape materials, fertilizers or chemicals, sanitary waste material, trash and equipment maintenance or fueling procedures.

v. Potential Sources of Pollution. The SWMP must list all potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges associated with construction activity from the site. This may include, but is not limited to, the following pollutant sources:

(a) Disturbed and stored soils;

(b) Vehicle tracking of sediments;

(c) Management of contaminated soils, if known to be present, or if contaminated soils are found during construction;

(d) Loading and unloading operations;

(e) Outdoor storage activities (erodible building materials, fertilizers, chemicals, etc.);

(f) Vehicle and equipment maintenance and fueling;

(g) Significant dust or particulate generating processes (e.g., saw cutting material, including dust);

(h) Routine maintenance activities involving fertilizers, pesticides, herbicides, detergents, fuels, solvents, oils, etc.;

(i) On-site waste management practices (waste piles, liquid wastes, dumpsters);

(j) Concrete truck/equipment washing, including washing of the concrete truck chute and associated fixtures and equipment;

(k) Dedicated asphalt, concrete batch plants and masonry mixing stations;

(l) Non-industrial waste sources such as worker trash and portable toilets.

vi. Implementation of Control Measures. The SWMP must include design specifications that contain information on the implementation of all the structural and nonstructural control measures in use on the site in accordance with good engineering, hydrologic and pollution control practices; including, as applicable, drawings, dimensions, installation information, materials, implementation processes, control measure-specific inspection expectations, and maintenance requirements.

The SWMP must include a documented use agreement between the permittee and the owner or operator of any control measures located outside of the permitted area, that are utilized by the permittee's construction site for compliance with this permit, but not under the direct control of the permittee. The permittee is responsible for ensuring that all control measures located outside of their permitted area, that are being utilized by the permittee's construction site, are properly maintained and in compliance with all terms and conditions of the permit. The SWMP must include all information required of and relevant to any such control measures located outside the permitted area, including location, installation specifications, design specifications and maintenance requirements.

vii. Site Description. The SWMP must include a site description which includes, at a minimum, the following:

(a) The nature of the construction activity at the site;

(b) The proposed schedule for the sequence for major construction activities and the planned implementation of control measures for each phase. (e.g. clearing, grading, utilities, vertical, etc.);

(c) Estimates of the total acreage of the site, and the acreage expected to be disturbed by clearing, excavation, grading, or any other construction activities;

(d) A summary of any existing data and sources used in the development of the construction site plans or SWMP that describe the soil types found in the permitted area and the erodibility of the identified soil types;

(e) A description of the percent cover of native vegetation on the site if the site is undisturbed, or the percent cover of native vegetation in a similar, local undisturbed area or adequate reference area if the site is disturbed. Include the source or methodology for determining the percentage. If a percent cover is not appropriate for the site location (i.e. arid), describe the technique and justification for the identified cover of native vegetation;

(f) A description of any allowable non-stormwater discharges at the site, including those being discharged under a separate CDPS permit or a division low risk discharge guidance policy, and applicable control measures installed;

(g) A description of the drainage patterns from the site, including a description of the immediate source receiving the discharge and the receiving water(s) of the discharge, if different than the immediate source. If the stormwater discharge is to a municipal separate storm sewer system, include the name of the entity owning that system, the location(s) of the stormwater discharge, and the receiving water(s);

(h) A description of all stream crossings located within the construction site boundary; and

(i) A description of the alternate temporary stabilization schedule, if applicable (Part I.B.1.a.iii(a)).

(j) A description of the alternative diversion criteria as approved by the division, if applicable (Part I.B.1.a.i(i)(3)).

viii. Site Map. The SWMP must include a site map which includes, at a minimum, the following:

(a) Construction site boundaries;

(b) Flow arrows that depict stormwater flow directions on-site and runoff direction;

(c) All areas of ground disturbance including areas of borrow and fill;

(d) Areas used for storage of soil;

(e) Locations of all waste accumulation areas, including areas for liquid, concrete, masonry, and asphalt;

(f) Locations of dedicated asphalt, concrete batch plants and masonry mixing stations;

(g) Locations of all structural control measures;

(h) Locations of all non-structural control measures (e.g. temporary stabilization);

(i) Locations of springs, streams, wetlands, diversions and other state waters, including areas that require pre-existing vegetation be maintained within 50 feet of a receiving water, where determined feasible in accordance with Part I.B.1.a.i(e);

(j) Locations of all stream crossings located within the construction site boundary; and

(k) Locations where alternative temporary stabilization schedules apply.

ix. Temporary Stabilization, Final Stabilization and Long Term Stormwater Management.

(a) The SWMP must document the constraints necessitating an alternative temporary stabilization schedule, as referenced in Part I.B.1.a.iii(a), provide the alternate stabilization schedule, and identify all locations where the alternative schedule is applicable on the site map.

(b) The SWMP must describe and locate the methods used to achieve final stabilization of all disturbed areas at the site, as listed in Part I.B.1.a.iii(b).

(c) The SWMP must describe the measures used to establish final stabilization through vegetative cover or alternative stabilization method, as referenced in Part I.B.1.a.iii(c), and describe and locate any temporary control measures in place during the process of final stabilization.

(d) The SWMP must describe and locate any planned permanent control measures to control pollutants in stormwater discharges that will occur after construction operations are completed, including but not limited to, detention/retention ponds, rain gardens, stormwater vaults, etc.

x. Inspection Reports. The SWMP must include documented inspection reports in accordance with Part I.D.5.c.

3. SWMP Review and Revisions

Permittees must keep a record of SWMP changes made that includes the date and identification of the changes. The SWMP must be amended when the following occurs:

a. A change in design, construction, operation, or maintenance of the site requiring implementation

of new or revised control measures;

b. The SWMP proves ineffective in controlling pollutants in stormwater runoff in compliance with the permit conditions;

c. Control measures identified in the SWMP are no longer necessary and are removed; and

d. Corrective actions are taken onsite that result in a change to the SWMP.

e. The site or areas of the site qualifying for reduced frequency inspections under Part I.D.4.

For SWMP revisions made prior to or following a change(s) onsite, including revisions to sections addressing site conditions and control measures, a notation must be included in the SWMP that identifies the date of the site change, the control measure removed, or modified, the location(s) of those control measures, and any changes to the control measure(s). The permittee must ensure the site changes are reflected in the SWMP. The permittee is noncompliant with the permit until the SWMP revisions have been made.

4. SWMP Availability

A copy of the SWMP must be provided upon request to the division, EPA, and any local agency with authority for approving sediment and erosion plans, grading plans or stormwater management plans within the time frame specified in the request. If the SWMP is required to be submitted to any of these entities, the submission must include a signed certification in accordance with Part I.A.3.e, certifying that the SWMP is complete and compliant with all terms and conditions of the permit.

All SWMPs required under this permit are considered reports that must be available to the public under Section 308(b) of the CWA and Section 61.5(4) of the CDPS regulations. The permittee must make plans available to members of the public upon request. However, the permittee may claim any portion of a SWMP as confidential in accordance with 40 CFR Part 2.

D. SITE INSPECTIONS

Site inspections must be conducted in accordance with the following requirements. The required inspection schedules are a minimum frequency and do not affect the permittee's responsibility to implement control measures in effective operating condition as prescribed in the SWMP, Part I.C.2.a.vi, as proper maintenance of control measures may require more frequent inspections. Site inspections shall start within 7 calendar days of the commencement of construction activities on site.

1. Person Responsible for Conducting Inspections

The person(s) inspecting the site may be on the permittee's staff or a third party hired to conduct stormwater inspections under the direction of the permittee(s). The permittee is responsible for ensuring that the inspector meets the definition of a Qualified Stormwater Manager. The inspector may be different than the individual(s) listed in Part I.C.2.a.i.

2. Inspection Frequency

Permittees must conduct site inspections in accordance with on the following minimum frequencies, unless the site meets the requirements of Part I.D.3. All inspections must be recorded per Part I.D.5.c.

a. At least one inspection every 7 calendar days; or

b. At least one inspection every 14 calendar days, if post-storm event inspections are conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion. Post-storm inspections may be used to fulfill the 14-day routine inspection requirement.

c. When site conditions make the schedule required in this section impractical, the permittee may

petition the division to grant an alternate inspection schedule. The alternative inspection schedule must not be implemented prior to written approval by the division and incorporation into the SWMP.

3. Inspection Frequency for Discharges to Outstanding Waters

Permittees must conduct site inspections at least once every 7 calendar days for sites that discharge to a water body designated as an Outstanding Water by the Water Quality Control Commission.

4. Reduced Inspection Frequency

The permittee may perform site inspections at the following reduced frequencies when one of the following conditions exists:

a. Post-Storm Inspections at Temporarily Idle Sites

For permittees choosing an inspection frequency pursuant to Part I.D.2.b and if no construction activities will occur following a storm event, post-storm event inspections must be conducted prior to re-commencing construction activities, and no later than 72 hours following the storm event. If the post-storm event inspection qualifies under this section, the inspection delay must be documented in the inspection record per Part I.D.5.c. Routine inspections must still be conducted at least every 14 calendar days.

b. Inspections at Completed Sites/Areas

When the site, or portions of a site, are awaiting establishment of a vegetative ground cover and final stabilization, the permittee must conduct a thorough inspection of the stormwater management system at least once every 30 days. Post-storm event inspections are not required under this schedule. This reduced inspection schedule is allowed if all of the following criteria are met:

i. All construction activities resulting in ground disturbance are complete;

ii. All activities required for final stabilization, in accordance with Part I.B.1.a.iii(b) & (c) and with the SWMP, have been completed, with the exception of the application of seed that has not occurred due to seasonal conditions or the necessity for additional seed application to augment previous efforts; and

iii. The SWMP has been amended to locate those areas to be inspected in accordance with the reduced schedule allowed for in this paragraph.

c. Winter Conditions Inspections Exclusion

Inspections are not required for sites that meet all of the following conditions: construction activities are temporarily halted, snow cover exists over the entire site for an extended period, and melting conditions posing a risk of surface erosion do not exist. This inspection exception is applicable only during the period where melting conditions do not exist, and applies to the routine 7-day, 14-day and monthly inspections, as well as the post-storm-event inspections. When this inspection exclusion is implemented, the following information must be documented in accordance with the requirements in Part I.C.3 and Part I.D.5.c:

i. Dates when snow cover existed;

ii. Date when construction activities ceased; and

iii. Date melting conditions began.

5. Inspection Scope

a. Areas to Be Inspected

When conducting a site inspection the following areas, if applicable, must be inspected for evidence of, or the potential for, pollutants leaving the construction site boundaries, entering the stormwater drainage system or discharging to state waters:

i. Construction site perimeter;

ii. All disturbed areas;

iii. Locations of installed control measures;

iv. Designated haul routes;

v. Material and waste storage areas exposed to precipitation;

vi. Locations where stormwater has the potential to discharge offsite; and

vii. Locations where vehicles exit the site.

b. Inspection Requirements

i. Visually verify whether all implemented control measures are in effective operational condition and are working as designed in their specifications to minimize pollutant discharges.

ii. Determine if there are new potential sources of pollutants.

iii. Assess the adequacy of control measures at the site to identify areas requiring new or modified control measures to minimize pollutant discharges.

iv. Identify all areas of non-compliance with the permit requirements and, if necessary, implement corrective action(s) in accordance with Part I.B.1.c.

c. Inspection Reports

The permittee must keep a record of all inspections conducted for each permitted site. Inspection reports must identify any incidents of noncompliance with the terms and conditions of this permit. All inspection reports must be signed and dated in accordance with Part I.A.3.f. Inspection records must be retained in accordance with Part II.O. At a minimum, the inspection report must include:

i. The inspection date;

ii. Name(s) and title(s) of personnel conducting the inspection;

iii. Weather conditions at the time of inspection;

iv. Phase of construction at the time of inspection;

v. Estimated acreage of disturbance at the time of inspection;

vi. Location(s) and identification of control measures requiring routine maintenance;

vii. Location(s) and identification of discharges of sediment or other pollutants from the site;

viii. Location(s) and identification of inadequate control measures;

ix. Location(s) and identification of additional control measures needed that were not in place at the time of inspection;

x. Description of corrective action(s) for items vii, viii, ix, above, dates corrective action(s) were completed, including requisite changes to the SWMP, as necessary;

xi. Description of the minimum inspection frequency (either in accordance with Part I.D.2, Part I.D.3 or Part I.D.4.) utilized when conducting each inspection.

xii. Deviations from the minimum inspection schedule as required in Part I.D.2. This would include documentation of division approval for an alternate inspection schedule outlined in Part I.D.2.c;

xiii. After adequate corrective action(s) have been taken, or where a report does not identify any incidents requiring corrective action, the report shall contain a statement as required in Part I.A.3.f.

E. DEFINITIONS

For the purposes of this permit:

(1) Bypass the intentional diversion of waste streams from any portion of a treatment facility in accordance with 40 CFR 122.41(m)(1)(i) and Regulation 61.2(12).

(2) Common Plan of Development or Sale - A contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules, but remain related. The division has determined that "contiguous" means construction activities located in close proximity to each other (within ¼ mile). Construction activities are considered to be "related" if they share the same development plan, builder or contractor, equipment, storage areas, etc. "Common plan of development or sale" includes construction activities that are associated with the construction of field wide oil and gas permits for facilities that are related.

(3) Construction Activity - Ground surface disturbing and associated activities (land disturbance), which include, but are not limited to, clearing, grading, excavation, demolition, installation of new or improved haul roads and access roads, staging areas, stockpiling of fill materials, and borrow areas. Construction does not include routine maintenance to maintain the original line and grade, hydraulic capacity, or original purpose of the facility. Activities to conduct repairs that are not part of routine maintenance or for replacement are construction activities and are not routine maintenance. Repaving activities where underlying and/or surrounding soil is exposed as part of the repaving operation are considered construction activities. Construction activity is from initial ground breaking to final stabilization regardless of ownership of the construction activities.

(4) Control Measure - Any best management practice or other method used to prevent or reduce the discharge of pollutants to state waters. Control measures include, but are not limited to, best management practices. Control measures can include other methods such as the installation, operation, and maintenance of structural controls and treatment devices.

(5) Control Measure Requiring Routine Maintenance - Any control measure that is still operating in accordance with its design and the requirements of this permit, but requires maintenance to prevent a breach of the control measure. See also inadequate control measure.

(6) Dedicated Asphalt, Concrete Batch Plants and Masonry Mixing Stations – Are batch plants or mixing stations located on, or within ¼ mile of, a construction site and that provide materials only to that specific construction site.

(7) Diversion – Discharges of state waters that are temporarily routed through channels or structures (e.g. in-stream, uncontaminated springs, non-pumped groundwater, temporary rerouting of surface waters).

(8) Final Stabilization - The condition reached when construction activities at the site have been

completed, permanent stabilization methods are complete, and temporary control measures are removed. Areas being stabilized with a vegetative cover must have evenly distributed perennial vegetation. The vegetation coverage must be, at a minimum, equal to 70 percent of what would have been provided by native vegetation in a local, undisturbed area or adequate reference site.

(9) Good Engineering, Hydrologic and Pollution Control Practices: are methods, procedures, and practices that:

a. Are based on basic scientific fact(s).

b. Reflect best industry practices and standards.

c. Are appropriate for the conditions and pollutant sources.

d. Provide appropriate solutions to meet the associated permit requirements, including practice based effluent limits.

(10) Inadequate Control Measure - Any control measure that is not designed or implemented in accordance with the requirements of the permit and/or any control measure that is not implemented to operate in accordance with its design. See also Control Measure Requiring Routine Maintenance.

(11) Infeasible – Not technologically possible, or not economically practicable and achievable in light of best industry practices.

(12) Minimize - reduce or eliminate to the extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice.

(13) Municipality - A city, town, county, district, association, or other public body created by, or under, State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or a designated and approved management agency under section 208 of CWA (1987).

(14) Municipal Separate Storm Sewer System (MS4) - A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

a. Owned or operated by a State, city, town, county, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or a designated and approved management agency under section 208 of the CWA that discharges to state waters;

i. Designed or used for collecting or conveying stormwater;

ii. Are not a combined sewer; and

iii. Are not part of a Publicly Owned Treatment Works (POTW). See 5 CCR 1002-61.2(62).

(15) Municipal Stormwater Management Program - A stormwater program operated by a municipality, typically to meet the requirements of the municipalities MS4 discharge certification.

(16) Operator - The party that has operational control over day-to-day activities at a project site which are necessary to ensure compliance with the permit. This party is authorized to direct individuals at a site to carry out activities required by the permit (i.e. the general contractor).

(17) Outstanding Waters - Waters designated as outstanding waters pursuant to Regulation 31, Section 31.8(2)(a). The highest level of water quality protection applies to certain waters that constitute an outstanding state or national resource.

(18) Owner - The party that has overall control of the activities and that has funded the implementation of the construction plans and specifications. This is the party that may have ownership of, a long term lease of, or easements on the property on which the construction activity is occurring (e.g. the developer).

(19) Permittee(s) - The owner and operator named in the discharge certification issued under this permit for the construction site specified in the certification.

(20) Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. Point source does not include irrigation return flow. See 5 CCR 102-61.2(75).

(21) Pollutant - Dredged spoil, dirt, slurry, solid waste, incinerator residue, sewage, sewage sludge, garbage, trash, chemical waste, biological nutrient, biological material, radioactive material, heat, wrecked or discarded equipment, rock, sand, or any industrial, municipal or agricultural waste. See 5 CCR 1002-61.2(76).

(22) Presentation of credentials – a government issued form of identification, if in person; or (ii) providing name, position and purpose of inspection if request to enter is made via telephone, email or other form of electronic communication. A Permittee's non-response to a request to enter upon presentation of credentials constitutes a denial to such request, and may result in violation of the Permit.

(23) Process Water - Any water which, during manufacturing or processing, comes into contact with or results from the production of any raw material, intermediate product, finished product, by product or waste product.

(24) Public Emergency Related Site - a project initiated in response to an unanticipated emergency (e.g., mud slides, earthquake, extreme flooding conditions, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services.

(25) Qualified Stormwater Manager - An individual knowledgeable in the principles and practices of erosion and sediment control and pollution prevention, and with the skills to assess conditions at construction sites that could impact stormwater quality and to assess the effectiveness of stormwater controls implemented to meet the requirements of this permit.

(26) Qualifying Local Program - A municipal program for stormwater discharges associated with small construction activity that was formally approved by the division as a qualifying local program.

(27) Receiving Water - Any classified or unclassified surface water segment (including tributaries) in the State of Colorado into which stormwater associated with construction activities discharges. This definition includes all water courses, even if they are usually dry, such as borrow ditches, arroyos, and other unnamed waterways.

(28) Severe Property Damage - substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. See 40 CFR 122.41(m)(1)(ii).

(29) Significant Materials - Include, but not limited to, raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in

food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the permittee is required to report under section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA); fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharges.

(30) Small Construction Activity - The discharge of stormwater from construction activities that result in land disturbance of equal to, or greater than, one acre and less than five acres. Small construction activity also includes the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale, if the larger common plan ultimately disturbs equal to, or greater than, one acre and less than five acres.

(31) Spill - An unintentional release of solid or liquid material which may pollute state waters.

(32) State Waters - means any and all surface and subsurface waters which are contained in or flow in or through this state, but does not include waters in sewage systems, waters in treatment works of disposal systems, waters in potable water distribution systems, and all water withdrawn for use until use and treatment have been completed.

(33) Steep Slopes: where a local government, or industry technical manual (e.g. stormwater BMP manual) has defined what is to be considered a “steep slope”, this permit’s definition automatically adopts that definition. Where no such definition exists, steep slopes are automatically defined as those that are 3:1 or greater.

(34) Stormwater - Precipitation runoff, snow melt runoff, and surface runoff and drainage. See 5 CCR 1002-61.2(103).

(35) Total Maximum Daily Loads (TMDLs) -The sum of the individual wasteload allocations (WLA) for point sources and load allocations (LA) for nonpoint sources and natural background. For the purposes of this permit, a TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL includes WLAs, LAs, and must include a margin of safety (MOS), and account for seasonal variations. See section 303(d) of the CWA and 40 C.F.R. 130.2 and 130.7.

(36) Upset - an exceptional incident in which there is unintentional and temporary noncompliance with permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation in accordance with 40 CFR 122.41(n) and Regulation 61.2(114).

F. MONITORING

The division may require sampling and testing, on a case-by-case basis. If the division requires sampling and testing, the division will send a notification to the permittee. Reporting procedures for any monitoring data collected will be included in the notification.

If monitoring is required, the following applies:

1. The thirty (30) day average must be determined by the arithmetic mean of all samples collected during a thirty (30) consecutive-day period; and

2. A grab sample, for monitoring requirements, is a single “dip and take” sample.

G. OIL AND GAS CONSTRUCTION

Stormwater discharges associated with construction activities directly related to oil and gas exploration, production, processing, and treatment operations or transmission facilities are regulated under the Colorado Discharge Permit System Regulations (5 CCR 1002-61), and require coverage under this permit in accordance with that regulation. However, references in this permit to specific authority under the CWA do not apply to

stormwater discharges associated with these oil and gas related construction activities, to the extent that the references are limited by the federal Energy Policy Act of 2005.

Part II: Standard Permit Conditions

A. DUTY TO COMPLY

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Water Quality Control Act and is grounds for:

1. Enforcement action;

2. Permit termination, revocation and reissuance, or modification; or

3. Denial of a permit renewal application.

B. DUTY TO REAPPLY

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain authorization as required by Part I.A.3.k. of the permit.

C. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. DUTY TO MITIGATE

A permittee must take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. PROPER OPERATION AND MAINTENANCE

A permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by the permittee only when the operation is necessary to achieve compliance with the conditions of this permit. This requirement can be met by meeting the requirements for Part I.B., I.C., and I.D. above. See also 40 C.F.R. § 122.41(e).

F. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause. The permittee request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition. Any request for modification, revocation, reissuance, or termination under this permit must comply with all terms and conditions of Regulation 61.8(8).

G. PROPERTY RIGHTS

In accordance with 40 CFR 122.41(g) and 5 CCR 1002-61, 61.8(9):

1. The issuance of a permit does not convey any property or water rights in either real or personal property, or stream flows or any exclusive privilege.

2. The issuance of a permit does not authorize any injury to person or property or any invasion of personal rights, nor does it authorize the infringement of federal, state, or local laws or regulations.

3. Except for any toxic effluent standard or prohibition imposed under Section 307 of the Federal act or any standard for sewage sludge use or disposal under Section 405(d) of the Federal act, compliance with a permit during its term constitutes compliance, for purposes of enforcement, with Sections 301,

302, 306, 318, 403, and 405(a) and (b) of the Federal act. However, a permit may be modified, revoked and reissued, or terminated during its term for cause as set forth in Section 61.8(8) of the Colorado Discharge Permit System Regulations.

H. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the division, within a reasonable time, any information which the division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the division, upon request, copies of records required to be kept by this permit in accordance with 40 CFR 122.41(h) and/or Regulation 61.8(3)(q).

I. INSPECTION AND ENTRY

The permittee shall allow the division and the authorized representative, upon the presentation of credentials as required by law, to allow for inspections to be conducted in accordance with 40 CFR 122.41(i), Regulation 61.8(3), and Regulation 61.8(4):

1. To enter upon the permittee's premises where a regulated facility or activity is located or in which any records are required to be kept under the terms and conditions of this permit;

2. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit;

3. At reasonable times, inspect any monitoring equipment or monitoring method required in the permit; and

4. To enter upon the permittee's premises in a reasonable manner and at a reasonable time to inspect or investigate, any actual, suspected, or potential source of water pollution, or any violation of the Colorado Water Quality Control Act. The investigation may include: sampling of any discharges, stormwater or process water, taking of photographs, interviewing site staff on alleged violations and other matters related to the permit, and assessing any and all facilities or areas within the site that may affect discharges, the permit, or an alleged violation.

   The permittee shall provide access to the division or other authorized representatives upon presentation of proper credentials. A permittee's non-response to a request to enter upon presentation of credentials constitutes a denial of such request, and may result in a violation of the permit.

J. MONITORING AND RECORDS

1. Samples and measurements taken for the purpose of monitoring must be representative of the volume and nature of the monitored activity.

2. The permittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date the permit expires or the date the permittee's authorization is terminated. This period may be extended by request of the division at any time.

3. Records of monitoring information must include:

   a. The date, exact place, and time of sampling or measurements;

   b. The individual(s) who performed the sampling or measurements;

   c. The date(s) analyses were performed

d. The individual(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of such analyses.

4. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in the permit.

K. SIGNATORY REQUIREMENTS

1. Authorization to Sign:

All documents required to be submitted to the division by the permit must be signed in accordance with the following criteria:

a. For a corporation: by a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means:

i. A president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or

ii. The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

c. For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a federal agency includes

i. The chief executive officer of the agency, or

ii. A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency. (e.g. Regional Administrator of EPA)

2. Electronic Signatures

For persons signing applications for coverage under this permit electronically, in addition to meeting other applicable requirements stated above, such signatures must meet the same signature, authentication, and identity-proofing standards set forth at 40 CFR § 3.2000(b) for electronic reports (including robust second-factor authentication). Compliance with this requirement can be achieved by submitting the application using the Colorado Environmental Online Service (CEOS) system.

3. Change in Authorization to Sign

If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization must be submitted to the division, prior to the re-authorization, or together with any reports, information, or applications to be signed by an authorized representative.

L. REPORTING REQUIREMENTS

1. Planned Changes

The permittee shall give advance notice to the division, in writing, of any planned physical alterations or additions to the permitted facility in accordance with 40 CFR 122.41(l) and Regulation 61.8(5)(a). Notice is required only when:

a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.41(a)(1).

2. Anticipated Non-Compliance

The permittee shall give advance notice to the division, in writing, of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements. The timing of notification requirements differs based on the type of non-compliance as described in subparagraphs 5, 6, 7, and 8 below.

3. Transfer of Ownership or Control

The permittee shall notify the division, in writing, ten (10) calendar days in advance of a proposed transfer of the permit. This permit is not transferable to any person except after notice is given to the division.

a. Where a facility wants to change the name of the permittee, the original permittee (the first owner or operators) must submit a Notice of Termination.

b. The new owner or operator must submit an application. See also signature requirements in Part II.K, above.

c. A permit may be automatically transferred to a new permittee if:

i. The current permittee notifies the division in writing 30 calendar days in advance of the proposed transfer date; and

ii. The notice includes a written agreement between the existing and new permittee(s) containing a specific date for transfer of permit responsibility, coverage and liability between them; and

iii. The division does not notify the existing permittee and the proposed new permittee of its intent to modify, or revoke and reissue the permit.

iv. Fee requirements of the Colorado Discharge Permit System Regulations, Section 61.15, have been met.

4. Monitoring reports

Monitoring results must be reported at the intervals specified in this permit per the requirements of 40 CFR 122.41(l)(4).

5. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule in the permit, shall be submitted on the date listed

in the compliance schedule section. The fourteen (14) calendar day provision in Regulation 61.8(4)(n)(i) has been incorporated into the due date.

6. Twenty-four Hour Reporting

In addition to the reports required elsewhere in this permit, the permittee shall report the following circumstances orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances, and shall mail to the division a written report containing the information requested within five (5) working days after becoming aware of the following circumstances:

a. Circumstances leading to any noncompliance which may endanger health or the environment regardless of the cause of the incident;

b. Circumstances leading to any unanticipated bypass which exceeds any effluent limitations in the permit;

c. Circumstances leading to any upset which causes an exceedance of any effluent limitation in the permit;

d. Daily maximum violations for any of the pollutants limited by Part I of this permit. This includes any toxic pollutant or hazardous substance or any pollutant specifically identified as the method to control any toxic pollutant or hazardous substance.

e. The division may waive the written report required under subparagraph 6 of this section if the oral report has been received within 24 hours.

7. Other Non-Compliance

A permittee must report all instances of noncompliance at the time monitoring reports are due. If no monitoring reports are required, these reports are due at least annually in accordance with Regulation 61.8(4)(p). The annual report must contain all instances of non-compliance required under either subparagraph 5 or subparagraph 6 of this subsection.

8. Other Information

Where a permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to the Permitting Authority, it has a duty to promptly submit such facts or information.

M. BYPASS

1. Bypass Not Exceeding Limitations

The permittees may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Part II.M.2 of this permit. See 40 CFR 122.41(m)(2).

2. Notice of Bypass

a. Anticipated bypass. If the permittee knows in advance of the need for a bypass, the permittee must submit prior notice, if possible at least ten days before the date of the bypass. ee 40 CFR §122.41(m)(3)(i) and/or Regulation 61.9(5)(c).

b. Unanticipated bypass. The permittee must submit notice of an unanticipated bypass in accordance with Part II.L.6. See 40 CFR §122.41(m)(3)(ii).

3. Prohibition of Bypass

Bypasses are prohibited and the division may take enforcement action against the permittee for bypass, unless:

a. The bypass is unavoidable to prevent loss of life, personal injury, or severe property damage;

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

c. Proper notices were submitted to the division.

N. UPSET

1. Effect of an upset

An upset constitutes an affirmative defense to an action brought for noncompliance with permit effluent limitations if the requirements of Part II.N.2. of this permit are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review in accordance with Regulation 61.8(3)(j).

2. Conditions Necessary for Demonstration of an Upset

A permittee who wishes to establish the affirmative defense of upset shall demonstrate through properly signed contemporaneous operating logs, or other relevant evidence that:

a. An upset occurred and the permittee can identify the specific cause(s) of the upset;

b. The permitted facility was at the time being properly operated and maintained; and

c. The permittee submitted proper notice of the upset as required in Part II.L.6.(24- hour notice); and

d. The permittee complied with any remedial measure necessary to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. In addition to the demonstration required above, a permittee who wishes to establish the affirmative defense of upset for a violation of effluent limitations based upon water quality standards shall also demonstrate through monitoring, modeling or other methods that the relevant standards were achieved in the receiving water.

3. Burden of Proof

In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

O. RETENTION OF RECORDS

1. Post-Expiration or Termination Retention

Copies of documentation required by this permit, including records of all data used to complete the application for permit coverage to be covered by this permit, must be retained for at least three years from the date that permit coverage expires or is terminated. This period may be extended by request of EPA at any time.

2. On-site Retention

The permittee must retain an electronic version or hardcopy of the SWMP at the construction site from

the date of the initiation of construction activities to the date of expiration or inactivation of permit coverage; unless another location, specified by the permittee, is approved by the division.

P. REOPENER CLAUSE

1. Procedures for Modification or Revocation

   Permit modification or revocation of this permit or coverage under this permit will be conducted according to Regulation 61.8(8).

2. Water Quality Protection

   If there is evidence indicating that the stormwater discharges authorized by this permit cause, have the reasonable potential to cause or contribute to an excursion above any applicable water quality standard, the permittee may be required to obtain an individual permit, or the permit may be modified to include different limitations and/or requirements.

Q. SEVERABILITY

The provisions of this permit are severable. If any provisions or the application of any provision of this permit to any circumstances, is held invalid, the application of such provision to other circumstances and the application of the remainder of this permit shall not be affected.

R. NOTIFICATION REQUIREMENTS

1. Notification to Parties

   All notification requirements, excluding information submitted using the CEOS portal, shall be directed as follows:

   a. Oral Notifications, during normal business hours shall be to:
      Clean Water Compliance Section
      Water Quality Control Division
      Telephone: (303) 692-3500

   b. Written notification shall be to:
      Clean Water Compliance Section
      Water Quality Control Division
      Colorado Department of Public Health and Environment
      WQCD-WQP-B2
      4300 Cherry Creek Drive South
      Denver, CO 80246-1530

S. RESPONSIBILITIES

1. Reduction, Loss, or Failure of Treatment Facility

   The permittee has the duty to halt or reduce any activity if necessary to maintain compliance with the effluent limitations of the permit. It shall not be a defense for a permittee in an enforcement action that it would be necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

T. OIL AND HAZARDOUS SUBSTANCE LIABILITY

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 (Oil and Hazardous Substance Liability) of the CWA.

U. EMERGENCY POWERS

Nothing in this permit shall be construed to prevent or limit application of any emergency power of the division.

V. CONFIDENTIALITY

Any information relating to any secret process, method of manufacture or production, or sales or marketing data which has been declared confidential by the permittee, and which may be acquired, ascertained, or discovered, whether in any sampling investigation, emergency investigation, or otherwise, shall not be publicly disclosed by any member, officer, or employee of the Water Quality Control Commission or the division, but shall be kept confidential. Any person seeking to invoke the protection of this section shall bear the burden of proving its applicability. This section shall never be interpreted as preventing full disclosure of effluent data.

W. FEES

The permittee is required to submit payment of an annual fee as set forth in the 2016 amendments to the Water Quality Control Act. Section 25-8-502 (1.1) (b), and the Colorado Discharge Permit System Regulations 5 CCR 1002-61, Section 61.15 as amended. Failure to submit the required fee when due and payable is a violation of the permit and will result in enforcement action pursuant to Section 25-8-601 et. seq., C.R.S.1973 as amended.

X. DURATION OF PERMIT

The duration of a permit shall be for a fixed term and shall not exceed five (5) years. If the permittee desires to continue to discharge, a permit renewal application shall be submitted at least ninety (90) calendar days before this permit expires. Filing of a timely and complete application shall cause the expired permit to continue in force to the effective date of the new permit. The permit's duration may be extended only through administrative extensions and not through interim modifications. If the permittee anticipates there will be no discharge after the expiration date of this permit, the division should be promptly notified so that it can terminate the permit in accordance with Part I.A.3.i.

Y. SECTION 307 TOXICS

If a toxic effluent standard or prohibition, including any applicable schedule of compliance specified, is established by regulation pursuant to Section 307 of the Federal Act for a toxic pollutant which is present in the permittee's discharge and such standard or prohibition is more stringent than any limitation upon such pollutant in the discharge permit, the division shall institute proceedings to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition

CITRA

Appendix B

Site Maps

The final project design is subject to change as a result of decisions made by the Delta County planning board as part of the Limited Use permitting process. Therefore, detailed site maps depicting stormwater management measure are not yet provided. These maps will be populated to support the full and final SWMP permit submittal prior to commencing construction.

CITRA

Appendix C

Control Measure Details

Surface Roughening (SR) EC-1

Description

Surface roughening is an erosion control practice that involves tracking, scarifying, imprinting, or tilling a disturbed area to provide temporary stabilization of disturbed areas. Surface roughening creates variations in the soil surface that help to minimize wind and water erosion. Depending on the technique used, surface roughening may also help establish conditions favorable to establishment of vegetation.

Photograph SR-1. Surface roughening via imprinting for temporary stabilization.

Appropriate Uses

Surface roughening can be used to provide temporary stabilization of disturbed areas, such as when revegetation cannot be immediately established due to seasonal planting limitations. Surface roughening is not a stand-alone BMP, and should be used in conjunction with other erosion and sediment controls.

Surface roughening is often implemented in conjunction with grading and is typically performed using heavy construction equipment to track the surface. Be aware that tracking with heavy equipment will also compact soils, which is not desirable in areas that will be revegetated. Scarifying, tilling, or ripping are better surface roughening techniques in locations where revegetation is planned. Roughening is not effective in very sandy soils and cannot be effectively performed in rocky soil.

Design and Installation

Typical design details for surfacing roughening on steep and mild slopes are provided in Details SR-1 and SR-2, respectively.

Surface roughening should be performed either after final grading or to temporarily stabilize an area during active construction that may be inactive for a short time period. Surface roughening should create depressions 2 to 6 inches deep and approximately 6 inches apart. The surface of exposed soil can be roughened by a number of techniques and equipment. Horizontal grooves (running parallel to the contours of the land) can be made using tracks from equipment treads, stair-step grading, ripping, or tilling.

Fill slopes can be constructed with a roughened surface. Cut slopes that have been smooth graded can be roughened as a subsequent operation. Roughening should follow along the contours of the slope. The tracks left by truck mounted equipment working perpendicular to the contour can leave acceptable horizontal depressions; however, the equipment will also compact the soil.

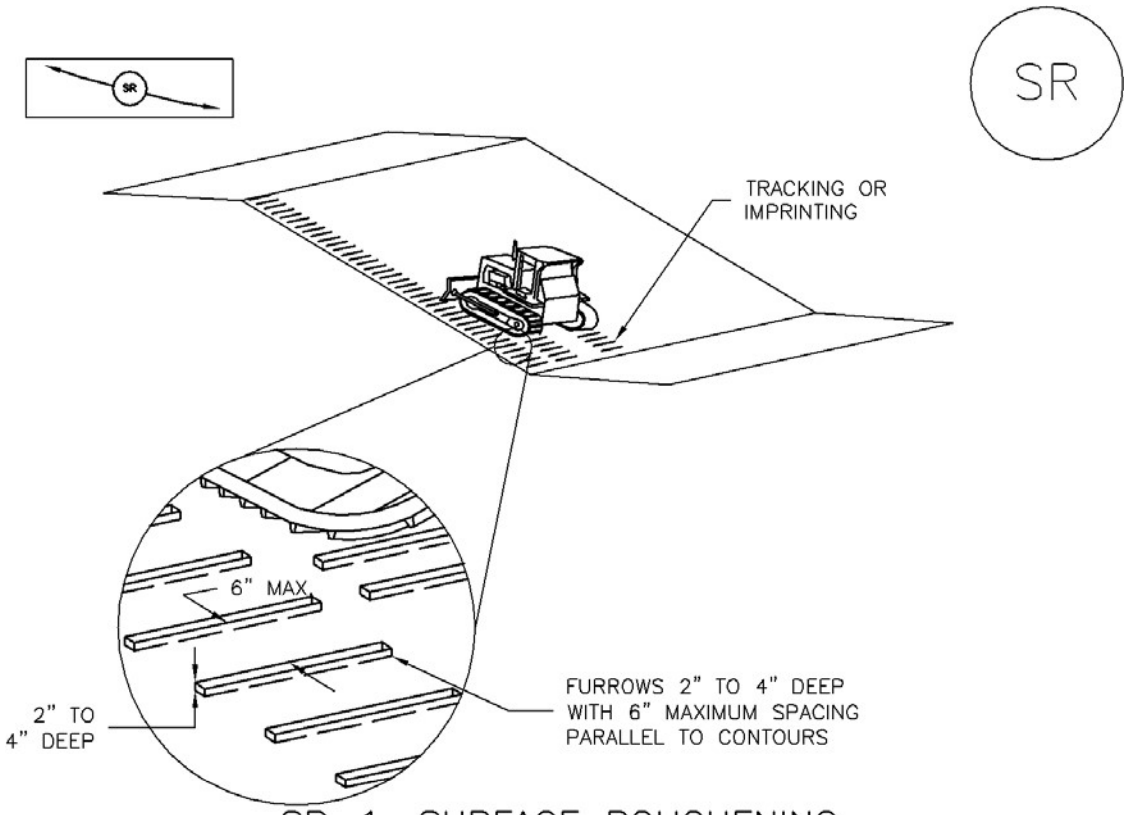
Surface Roughening	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	No

Maintenance and Removal

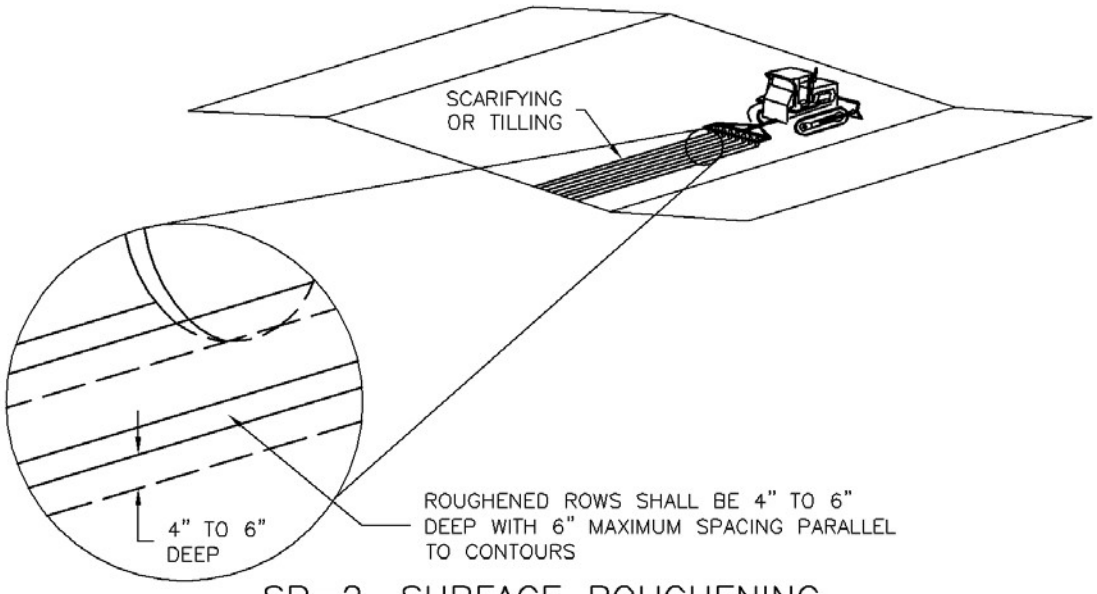
Care should be taken not to drive vehicles or equipment over areas that have been surface roughened. Tire tracks will smooth the roughened surface and may cause runoff to collect into rills and gullies.

Because surface roughening is only a temporary control, additional treatments may be necessary to maintain the soil surface in a roughened condition.

Areas should be inspected for signs of erosion. Surface roughening is a temporary measure, and will not provide long-term erosion control.



SR–1. SURFACE ROUGHENING
FOR STEEP SLOPES (3:1 OR STEEPER)



SR–2. SURFACE ROUGHENING
FOR LOW SLOPES (LESS THAN 3:1)

SURFACE ROUGHENING INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION(S) OF SURFACE ROUGHENING.

2. SURFACE ROUGHENING SHALL BE PROVIDED PROMPTLY AFTER COMPLETION OF FINISHED GRADING (FOR AREAS NOT RECEIVING TOPSOIL) OR PRIOR TO TOPSOIL PLACEMENT OR ANY FORECASTED RAIN EVENT.

3. AREAS WHERE BUILDING FOUNDATIONS, PAVEMENT, OR SOD WILL BE PLACED WITHOUT DELAY IN THE CONSTRUCTION SEQUENCE, SURFACE ROUGHENING IS NOT REQUIRED.

4. DISTURBED SURFACES SHALL BE ROUGHENED USING RIPPING OR TILLING EQUIPMENT ON THE CONTOUR OR TRACKING UP AND DOWN A SLOPE USING EQUIPMENT TREADS.

5. A FARMING DISK SHALL NOT BE USED FOR SURFACE ROUGHENING.

SURFACE ROUGHENING MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACE UPON DISCOVERY OF THE FAILURE.

4. VEHICLES AND EQUIPMENT SHALL NOT BE DRIVEN OVER AREAS THAT HAVE BEEN SURFACE ROUGHENED.

5. IN NON-TURF GRASS FINISHED AREAS, SEEDING AND MULCHING SHALL TAKE PLACE DIRECTLY OVER SURFACE ROUGHENED AREAS WITHOUT FIRST SMOOTHING OUT THE SURFACE.

6. IN AREAS NOT SEEDED AND MULCHED AFTER SURFACE ROUGHENING, SURFACES SHALL BE RE-ROUGHENED AS NECESSARY TO MAINTAIN GROOVE DEPTH AND SMOOTH OVER RILL EROSION.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Temporary and Permanent Seeding (TS/PS) EC-2

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 at final grade that will not be otherwise stabilized. Effective seeding includes preparing a seedbed, selecting an appropriate seed mixture, using proper planting techniques, and protecting the seeded area with mulch, geotextiles, or other appropriate measures.

Photograph TS/PS -1. Equipment used to drill seed. Photo courtesy of Douglas County.

Appropriate Uses

When the soil surface is disturbed and will remain inactive for an extended period (typically determined by local government requirements), proactive stabilization measures, including planting a temporary seed mix, should be implemented. If the inactive period is short-lived (on the order of two weeks), techniques such as surface roughening may be appropriate. For longer periods of inactivity of up to one year, temporary seeding and mulching can provide effective erosion control. Permanent seeding should be used on finished areas that have not been otherwise stabilized.

The USDCM Volume 2 *Revegetation* Chapter contains suggested annual grains and native seed mixes to use for temporary seeding. Alternatively, local governments may have their own seed mixes and timelines for seeding. Check jurisdictional requirements for seeding and temporary stabilization.

Design and Installation

Effective seeding requires proper seedbed preparation, selecting an appropriate seed mixture, using appropriate seeding equipment to ensure proper coverage and density, and protecting seeded areas with mulch or fabric until plants are established.

The USDCM Volume 2 *Revegetation* Chapter contains detailed seed mixes, soil preparation practices, and seeding and mulching recommendations that should be referenced to supplement this Fact Sheet.

Drill seeding is the preferred seeding method. Hydroseeding is not recommended except in areas where steep slopes prevent use of drill seeding equipment, and even in these instances it is preferable to hand seed and mulch. Some jurisdictions do not allow hydroseeding or hydromulching.

Temporary and Permanent Seeding	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	No

Seedbed Preparation

Prior to seeding, ensure that areas to be revegetated have soil conditions capable of supporting vegetation. Overlot grading can result in loss of topsoil and compaction, resulting in poor quality subsoils at the ground surface that

have low nutrient value, little organic matter content, few soil microorganisms, rooting restrictions, and conditions less conducive to infiltration of precipitation. As a result, it is typically necessary to provide stockpiled topsoil, compost, or other soil amendments and rototill them into the soil to a depth of 6 inches or more.

Topsoil should be salvaged during grading operations for use and spread on areas to be revegetated later. Topsoil should be viewed as an important resource to be utilized for vegetation establishment, due to its water-holding capacity, structure, texture, organic matter content, biological activity, and nutrient content. The rooting depth of most native grasses in the semi-arid Denver metropolitan area is 6 to 18 inches. If present, at a minimum of the upper 6 inches of topsoil should be stripped, stockpiled, and ultimately respread across areas that will be revegetated.

Where topsoil is not available, subsoils should 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, which is typically inexpensive, should be completed to determine and optimize the types and amounts of amendments that are required.

If the disturbed ground surface is compacted, rip or rototill the upper 12 inches of the surface prior to placing topsoil. If adding compost to the existing soil surface, rototilling is necessary. Surface roughening will assist in placing a stable topsoil layer on steeper slopes, and allow infiltration and root penetration to greater depth. Topsoil should not be placed when either the salvaged topsoil or receiving ground are frozen or snow covered.

Prior to seeding, the soil surface should be rough and the seedbed should be firm, but neither too loose nor compacted. The upper layer of soil should be in a condition suitable for seeding at the proper depth and conducive to plant growth. Seed-to-soil contact is the key to good germination.

Refer to MHFD's Topsoil Management Guidance for detailed information on topsoil assessment, design, and construction.

Temporary Vegetation

To provide temporary vegetative cover on disturbed areas which will not be paved, built upon, or fully landscaped or worked for an extended period (typically 30 days or more), plant an annual grass appropriate for the time of planting and mulch the planted areas. Temporary grain seed mixes suitable for the Denver metropolitan area are listed in Table TS/PS-1. Native temporary seed mixes are provided in USDCM Volume 2, Chapter 13, Appendix A. These are to be considered only as general recommendations when specific design guidance for a particular site is not available. Local governments typically specify seed mixes appropriate for their jurisdiction.

Permanent Revegetation

To provide vegetative cover on disturbed areas that have reached final grade, a perennial grass mix should be established. Permanent seeding should be performed promptly (typically within 14 days) after reaching final grade. Each site will have different characteristics and a landscape professional or the local jurisdiction should be contacted to determine the most suitable seed mix for a specific site. In lieu of a specific recommendation, one of the perennial grass mixes appropriate for site conditions and growth season listed in seed mix tables in the USDCM Volume 2 *Revegetation* Chapter can be used. The pure live seed (PLS) rates of application recommended in these tables are considered to be absolute minimum rates for seed applied using proper drill-seeding equipment. These are to be considered only as general

recommendations when specific design guidance for a particular site is not available. Local governments typically specify seed mixes appropriate for their jurisdiction.

If desired for wildlife habitat or landscape diversity, shrubs such as rubber rabbitbrush (*Chrysothamnus nauseosus*), fourwing saltbush (*Atriplex canescens*) and skunkbrush sumac (*Rhus trilobata*) could be added to the upland seed mixes at 0.25, 0.5 and 1 pound PLS/acre, respectively. In riparian zones, planting root stock of such species as American plum (*Prunus americana*), woods rose (*Rosa woodsii*), plains cottonwood (*Populus sargentii*), and willow (*Salix spp.*) may be considered. On non-topsoiled upland sites, a legume such as Ladak alfalfa at 1 pound PLS/acre can be included as a source of nitrogen for perennial grasses.

Timing of seeding is an important aspect of the revegetation process. For upland and riparian areas on the Colorado Front Range, the suitable timing for seeding is from October through May. The most favorable time to plant non-irrigated areas is during the fall, so that seed can take advantage of winter and spring moisture. Seed should not be planted if the soil is frozen, snow covered, or wet.

Seeding dates for the highest success probability of perennial species along the Front Range are generally in the spring from April through early May and in the fall after the first of September until the ground freezes. If the area is irrigated, seeding may occur in summer months, as well. See Table TS/PS-2 for appropriate seeding dates.

Table TS/PS-1. Minimum Drill Seeding Rates for Various Temporary Annual Grasses

Species[a] (Common name)	Growth Season[b]	Pounds of Pure Live Seed (PLS)/acre[c]	Planting Depth (inches)
1. Oats	Cool	35 - 50	1 - 2
2. Spring wheat	Cool	25 - 35	1 - 2
3. Spring barley	Cool	25 - 35	1 - 2
4. Annual ryegrass	Cool	10 - 15	½
5. Millet	Warm	3 - 15	½ - ¾
6. Winter wheat	Cool	20–35	1 - 2
7. Winter barley	Cool	20–35	1 - 2
8. Winter rye	Cool	20–35	1 - 2
9. Triticale	Cool	25–40	1 - 2

[a] Successful seeding of annual grass resulting in adequate plant growth will usually produce enough dead-plant residue to provide protection from wind and water erosion for an additional year. This assumes that the cover is not disturbed or mowed closer than 8 inches.

Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1 or where access limitations exist. When hydraulic seeding is used, hydraulic mulching should be applied as a separate operation, when practical, to prevent the seeds from being encapsulated in the mulch.

[b] See Table TS/PS-2 for seeding dates. Irrigation, if consistently applied, may extend the use of cool season species during the summer months.

[c] Seeding rates should be doubled if seed is broadcast, or increased by 50 percent if done using a Brillion Drill or by hydraulic seeding.

Table TS/PS-2. Seeding Dates for Annual and Perennial Grasses

	Annual Grasses (Numbers in table reference species in Table TS/PS-1)		Perennial Grasses	
Seeding Dates	**Warm**	**Cool**	**Warm**	**Cool**
January 1–March 15			✓	✓
March 16–April 30		1,2,3	✓	✓
May 1–May 15			✓	
May 16–June 30	5			
July 1–July 15	5			
July 16–August 31				
September 1–September 30		6, 7, 8, 9		
October 1–December 31			✓	✓

Mulch

Cover seeded areas with mulch or an appropriate rolled erosion control product to promote establishment of vegetation. Anchor mulch by crimping, netting or use of a non-toxic tackifier. See the USDCM Volume 2 *Revegetation* Chapter and Volume 3 Mulching BMP Fact Sheet (EC-04) for additional guidance.

Maintenance and Removal

Monitor and observe seeded areas to identify areas of poor growth or areas that fail to germinate. Reseed and mulch these areas, as needed.

If a temporary annual seed was planted, the area should be reseeded with the desired perennial mix when there will be no further work in the area. To minimize competition between annual and perennial species, the annual mix needs time to mature and die before seeding the perennial mix. To increase success of the perennial mix, it should be seeded during the appropriate seeding dates the second year after the temporary annual mix was seeded. Alternatively, if this timeline is not feasible, the annual mix seed heads should be removed and then the area seeded with the perennial mix.

An area that has been permanently seeded should have a good stand of vegetation within one growing season if irrigated and within three growing seasons without irrigation in Colorado. Reseed portions of the site that fail to germinate or remain bare after the first growing season.

Seeded areas may require irrigation, particularly during extended dry periods. Targeted weed control may also be necessary.

Protect seeded areas from construction equipment and vehicle access.

Description

Soil binders include a broad range of treatments that can be applied to exposed soils for temporary stabilization to reduce wind and water erosion. Soil binders may be applied alone or as tackifiers in conjunction with mulching and seeding applications.

Acknowledgement: This BMP Fact Sheet has been adapted from the 2003 California Stormwater Quality Association (CASQA) Stormwater BMP Handbook: Construction (www.cabmphandbooks.com).

Photograph SB-1. Tackifier being applied to provide temporary soil stabilization. Photo courtesy of Douglas County.

Appropriate Uses

Soil binders can be used for short-term, temporary stabilization of soils on both mild and steep slopes. Soil binders are often used in areas where work has temporarily stopped, but is expected to resume before revegetation can become established. Binders are also useful on stockpiled soils or where temporary or permanent seeding has occurred.

Prior to selecting a soil binder, check with the state and local jurisdiction to ensure that the chemicals used in the soil binders are allowed. The water quality impacts of some types of soil binders are relatively unknown and may not be allowed due to concerns about potential environmental impacts. Soil binders must be environmentally benign (non-toxic to plant and animal life), easy to apply, easy to maintain, economical, and should not stain paved or painted surfaces.

Soil binders should not be used in vehicle or pedestrian high traffic areas, due to loss in effectiveness under these conditions.

Site soil type will dictate appropriate soil binders to be used. Be aware that soil binders may not function effectively on silt or clay soils or highly compacted areas. Check manufacturer's recommendations for appropriateness with regard to soil conditions. Some binders may not be suitable for areas with existing vegetation.

Design and Installation

Properties of common soil binders used for erosion control are provided in Table SB-1. Design and installation guidance below are provided for general reference. Follow the manufacturer's instructions for application rates and procedures.

Soil Binders	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	Moderate

Table SB-1. Properties of Soil Binders for Erosion Control (Source: CASQA 2003)

Evaluation Criteria	Binder Type			
	Plant Material Based (short lived)	**Plant Material Based (long lived)**	**Polymeric Emulsion Blends**	**Cementitious-Based Binders**
Resistance to Leaching	High	High	Low to Moderate	Moderate
Resistance to Abrasion	Moderate	Low	Moderate to High	Moderate to High
Longevity	Short to Medium	Medium	Medium to Long	Medium
Minimum Curing Time before Rain	9 to 18 hours	19 to 24 hours	0 to 24 hours	4 to 8 hours
Compatibility with Existing Vegetation	Good	Poor	Poor	Poor
Mode of Degradation	Biodegradable	Biodegradable	Photodegradable/ Chemically Degradable	Photodegradable/ Chemically Degradable
Specialized Application Equipment	Water Truck or Hydraulic Mulcher	Water Truck or Hydraulic Mulcher	Water Truck or Hydraulic Mulcher	Water Truck or Hydraulic Mulcher
Liquid/Powder	Powder	Liquid	Liquid/Powder	Powder
Surface Crusting	Yes, but dissolves on rewetting	Yes	Yes, but dissolves on rewetting	Yes
Clean Up	Water	Water	Water	Water
Erosion Control Application Rate	Varies	Varies	Varies	4,000 to 12,000 lbs/acre Typ.

Factors to consider when selecting a soil binder generally include:

- **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. Frequent applications could lead to high costs. Application frequency may be minimized if the soil binder has good penetration, low evaporation, and good longevity. Consider also that frequent application will require frequent equipment clean up.

An overview of major categories of soil binders, corresponding to the types included in Table SB-1 follows.

Plant-Material Based (Short Lived) Binders

- **Guar**: A non-toxic, biodegradable, natural galactomannan-based hydrocolloid treated with dispersant agents for easy field mixing. It should be mixed with water at the rate of 11 to 15 lbs per 1,000 gallons. Recommended minimum application rates are provided in Table SB-2.

Table SB-2. Application Rates for Guar Soil Stabilizer

	Slope (H:V)				
	Flat	4:1	3:1	2:1	1:1
Application Rate (lb/acre)	40	45	50	60	70

- **Psyllium**: Composed of the finely ground muciloid coating of plantago seeds that is applied as a wet slurry to the surface of the soil. It dries to form a firm but rewettable membrane that binds soil particles together but permits germination and growth of seed. Psyllium requires 12 to 18 hours drying time. Application rates should be from 80 to 200 lbs/acre, with enough water in solution to allow for a uniform slurry flow.

- **Starch**: Non-ionic, cold-water soluble (pre-gelatinized) granular cornstarch. The material is mixed with water and applied at the rate of 150 lb/acre. Approximate drying time is 9 to 12 hours.

Plant-Material Based (Long Lived) Binders

- **Pitch and Rosin Emulsion**: Generally, a non-ionic pitch and rosin emulsion has a minimum solids content of 48 percent. The rosin should be a minimum of 26 percent of the total solids content. The soil stabilizer should be a non-corrosive, water dilutable emulsion that upon application cures to a water insoluble binding and cementing agent. For soil erosion control applications, the emulsion is diluted and should be applied as follows:

    - For clayey soil: 5 parts water to 1 part emulsion

- For sandy soil: 10 parts water to 1 part emulsion

Application can be by water truck or hydraulic seeder with the emulsion and product mixture applied at the rate specified by the manufacturer.

Polymeric Emulsion Blend Binders

- **Acrylic Copolymers and Polymers**: Polymeric soil stabilizers should consist of a liquid or solid polymer or copolymer with an acrylic base that contains a minimum of 55 percent solids. The polymeric compound should be handled and mixed in a manner that will not cause foaming or should contain an anti-foaming agent. The polymeric emulsion should not exceed its shelf life or expiration date; manufacturers should provide the expiration date. Polymeric soil stabilizer should be readily miscible in water, non-injurious to seed or animal life, non-flammable, should provide surface soil stabilization for various soil types without inhibiting water infiltration, and should not re-emulsify when cured. The applied compound should air cure within a maximum of 36 to 48 hours. Liquid copolymer should be diluted at a rate of 10 parts water to 1 part polymer and the mixture applied to soil at a rate of 1,175 gallons/acre.

- **Liquid Polymers of Methacrylates and Acrylates**: This material consists of a tackifier/sealer that is a liquid polymer of methacrylates and acrylates. It is an aqueous 100 percent acrylic emulsion blend of 40 percent solids by volume that is free from styrene, acetate, vinyl, ethoxylated surfactants or silicates. For soil stabilization applications, it is diluted with water in accordance with manufacturer's recommendations, and applied with a hydraulic seeder at the rate of 20 gallons/acre. Drying time is 12 to 18 hours after application.

- **Copolymers of Sodium Acrylates and Acrylamides**: These materials are non-toxic, dry powders that are copolymers of sodium acrylate and acrylamide. They are mixed with water and applied to the soil surface for erosion control at rates that are determined by slope gradient, as summarized in Table SB-3.

Table SB-3. Application Rates for Copolymers of Sodium Acrylates and Acrylamides

	Slope (H:V)		
	Flat to 5:1	5:1 to 3:1	2:2 to 1:1
Application Rate (lb/acre)	3.0-5.0	5.0-10.0	10.0-20.0

- **Polyacrylamide and Copolymer of Acrylamide**: Linear copolymer polyacrylamide is packaged as a dry flowable solid. When used as a stand-alone stabilizer, it is diluted at a rate of 11 lb/1,000 gal. of water and applied at the rate of 5.0 lb/acre.

- **Hydrocolloid Polymers**: Hydrocolloid Polymers are various combinations of dry flowable polyacrylamides, copolymers, and hydrocolloid polymers that are mixed with water and applied to the soil surface at rates of 55 to 60 lb/acre. Drying times are 0 to 4 hours.

Cementitious-Based Binders

- **Gypsum**: This formulated gypsum based product readily mixes with water and mulch to form a thin protective crust on the soil surface. It is composed of high purity gypsum that is ground, calcined and processed into calcium sulfate hemihydrate with a minimum purity of 86 percent. It is mixed in a hydraulic seeder and applied at rates 4,000 to 12,000 lb/acre. Drying time is 4 to 8 hours.

Installation

After selecting an appropriate soil binder, the untreated soil surface must be prepared before applying the soil binder. The untreated soil surface must contain sufficient moisture to assist the agent in achieving uniform distribution. In general, the following steps should be followed:

- Follow manufacturer's written recommendations for application rates, pre-wetting of application area, and cleaning of equipment after use.
- Prior to application, roughen embankment and fill areas.
- Consider the drying time for the selected soil binder and apply with sufficient time before anticipated rainfall. Soil binders should not be applied during or immediately before rainfall.
- Avoid over spray onto roads, sidewalks, drainage channels, sound walls, existing vegetation, etc.
- Soil binders should not be applied to frozen soil, areas with standing water, under freezing or rainy conditions, or when the temperature is below 40°F during the curing period.
- More than one treatment is often necessary, although the second treatment may be diluted or have a lower application rate.
- Generally, soil binders require a minimum curing time of 24 hours before they are fully effective. Refer to manufacturer's instructions for specific cure time.
- For liquid agents:
    - Crown or slope ground to avoid ponding.
    - Uniformly pre-wet ground at 0.03 to 0.3 gal/yd^{2}or according to manufacturer's recommendations.
    - Apply solution under pressure. Overlap solution 6 to 12 in.
    - Allow treated area to cure for the time recommended by the manufacturer, typically at least 24 hours.
    - Apply second treatment before first treatment becomes ineffective, using 50 percent application rate.
    - In low humidity, reactivate chemicals by re-wetting with water at 0.1 to 0.2 gal/yd^2.

Maintenance and Removal

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.

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.

Most binders biodegrade after exposure to sun, oxidation, heat and biological organisms; therefore, removal of the soil binder is not typically required.

Description

Mulching consists of evenly applying straw, hay, shredded wood mulch, rock, bark or compost to disturbed soils and securing the mulch by crimping, tackifiers, netting or other measures. 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.

Mulch can be applied either using standard mechanical dry application methods or using hydromulching equipment that hydraulically applies a slurry of water, wood fiber mulch, and often a tackifier.

Photograph MU-1. An area that was recently seeded, mulched, and crimped.

Appropriate Uses

Use mulch in conjunction with 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 tacked, or seeded, mulched and tacked promptly after final grade is reached (typically within no longer than 14 days) on portions of the site not otherwise permanently stabilized.

Standard dry mulching is encouraged in most jurisdictions; however, hydromulching may not be allowed in certain jurisdictions or may not be allowed near waterways.

Do not apply mulch during windy conditions.

Design and Installation

Prior to mulching, surface-roughen areas by 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.

A variety of mulches can be used effectively at construction sites. Consider the following:

Mulch	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material Management	No

- Clean, weed-free and seed-free cereal grain straw should be applied evenly at a rate of 2 tons per acre and must be tacked or fastened by a method suitable for the condition of the site. Straw mulch must be anchored (and not merely placed) on the surface. This can be accomplished mechanically by crimping or with the aid of tackifiers or nets. 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 a depth of 3 inches without cutting them. An agricultural disk, while not an ideal substitute, may work if the disk blades are dull or blunted and set vertically; however, the frame may have to be weighted to afford proper soil penetration.

- Grass hay may be used in place of straw; however, because hay is comprised of the entire plant including seed, mulching with hay may seed the site with non-native grass species which might in turn out-compete the native seed. Alternatively, native species of grass hay may be purchased, but can be difficult to find and are more expensive than straw. Purchasing and utilizing a certified weed-free straw is an easier and less costly mulching method. When using grass hay, follow the same guidelines as for straw (provided above).

- On small areas sheltered from the wind and heavy runoff, spraying a tackifier on the mulch is satisfactory for holding it in place. For steep slopes and special situations where greater control is needed, erosion control blankets anchored with stakes should be used instead of mulch.

- Hydraulic mulching consists of wood cellulose fibers mixed with water and a tackifying agent and should be applied at a rate of no less than 1,500 pounds per acre (1,425 lbs of fibers mixed with at least 75 lbs of tackifier) with a hydraulic mulcher. For steeper slopes, up to 2000 pounds per acre may be required for effective hydroseeding. Hydromulch typically requires up to 24 hours to dry; therefore, it should not be applied immediately prior to inclement weather. Application to roads, waterways and existing vegetation should be avoided.

- Erosion control mats, blankets, or nets are recommended to help stabilize steep slopes (generally 3:1 and steeper) and waterways. Depending on the product, these may be used alone or in conjunction with grass or straw mulch. Normally, use of these products will be restricted to relatively small areas. Biodegradable mats made of straw and jute, straw-coconut, coconut fiber, or excelsior can be used instead of mulch. (See the ECM/TRM BMP for more information.)

- Some tackifiers or binders may be used to anchor mulch. Check with the local jurisdiction for allowed tackifiers. Manufacturer's recommendations should be followed at all times. (See the Soil Binder BMP for more information on general types of tackifiers.)

- Rock can also be used as mulch. It provides protection of exposed soils to wind and water erosion and allows infiltration of precipitation. An aggregate base course can be spread on disturbed areas for temporary or permanent stabilization. The rock mulch layer should be thick enough to provide full coverage of exposed soil on the area it is applied.

Maintenance and Removal

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

Rolled Erosion Control Products (RECP) EC-6

Description

Photograph RECP-1. Erosion control blanket protecting the slope from erosion and providing favorable conditions for revegetation.

Rolled Erosion Control Products (RECPs) include a variety of temporary or permanently installed manufactured products designed to control erosion and enhance vegetation establishment and survivability, particularly on slopes and in channels. For applications where natural vegetation alone will provide sufficient permanent erosion protection, temporary products such as netting, open weave textiles and a variety of erosion control blankets (ECBs) made of biodegradable natural materials (e.g., straw, coconut fiber) can be used. For applications where natural vegetation alone will not be sustainable under expected flow conditions, permanent rolled erosion control products such as turf reinforcement mats (TRMs) can be used. In particular, turf reinforcement mats are designed for discharges that exert velocities and sheer stresses that exceed the typical limits of mature natural vegetation.

Appropriate Uses

RECPs can be used to control erosion in conjunction with revegetation efforts, providing seedbed protection from wind and water erosion. These products are often used on disturbed areas on steep slopes, in areas with highly erosive soils, or as part of drainageway stabilization. In order to select the appropriate RECP for site conditions, it is important to have a general understanding of the general types of these products, their expected longevity, and general characteristics.

The Erosion Control Technology Council (ECTC 2005) characterizes rolled erosion control products according to these categories:

- **Mulch control netting**: A planar woven natural fiber or extruded geosynthetic mesh used as a temporary degradable rolled erosion control product to anchor loose fiber mulches.
- **Open weave textile**: A temporary degradable rolled erosion control product composed of processed natural or polymer yarns woven into a matrix, used to provide erosion control and facilitate vegetation establishment.
- **Erosion control blanket (ECB)**: A temporary degradable rolled erosion control product composed of processed natural or polymer fibers which are mechanically, structurally or chemically bound together to form a continuous matrix to provide erosion control and facilitate vegetation establishment. ECBs can be further differentiated into rapidly degrading single-net and double-net types or slowly degrading types.

Rolled Erosion Control Products	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	No

- **Turf Reinforcement Mat (TRM)**: A rolled erosion control product composed of non-degradable synthetic fibers, filaments, nets, wire mesh, and/or other elements, processed into a permanent, three-dimensional matrix of sufficient thickness. TRMs, which may be supplemented with degradable components, are designed to impart immediate erosion protection, enhance vegetation establishment and provide long-term functionality by permanently reinforcing vegetation during and after maturation. Note: TRMs are typically used in hydraulic applications, such as high flow ditches and channels, steep slopes, stream banks, and shorelines, where erosive forces may exceed the limits of natural, unreinforced vegetation or in areas where limited vegetation establishment is anticipated.

Tables RECP-1 and RECP-2 provide guidelines for selecting rolled erosion control products appropriate to site conditions and desired longevity. Table RECP-1 is for conditions where natural vegetation alone will provide permanent erosion control, whereas Table RECP-2 is for conditions where vegetation alone will not be adequately stable to provide long-term erosion protection due to flow or other conditions.

Table RECP-1. ECTC Standard Specification for Temporary Rolled Erosion Control Products
(Adapted from Erosion Control Technology Council 2005)

Product Description	Slope Applications*		Channel Applications*	Minimum Tensile Strength[1]	Expected Longevity
	Maximum Gradient	C Factor[2,5]	Max. Shear Stress[3,4,6]		
Mulch Control Nets	5:1 (H:V)	≤0.10 @ 5:1	0.25 lbs/ft^2 (12 Pa)	5 lbs/ft (0.073 kN/m)	Up to 12 months
Netless Rolled Erosion Control Blankets	4:1 (H:V)	≤0.10 @ 4:1	0.5 lbs/ft^2 (24 Pa)	5 lbs/ft (0.073 kN/m)	
Single-net Erosion Control Blankets & Open Weave Textiles	3:1 (H:V)	≤0.15 @ 3:1	1.5 lbs/ft^2 (72 Pa)	50 lbs/ft (0.73 kN/m)	
Double-net Erosion Control Blankets	2:1 (H:V)	≤0.20 @ 2:1	1.75 lbs/ft^2 (84 Pa)	75 lbs/ft (1.09 kN/m)	
Mulch Control Nets	5:1 (H:V)	≤0.10 @ 5:1	0.25 lbs/ft^2 (12 Pa)	25 lbs/ft (0.36 kN/m)	24 months
Erosion Control Blankets & Open Weave Textiles (slowly degrading)	1.5:1 (H:V)	≤0.25 @ 1.5:1	2.00 lbs/ft^2 (96 Pa)	100 lbs/ft (1.45 kN/m)	24 months
Erosion Control Blankets & Open Weave Textiles	1:1 (H:V)	≤0.25 @ 1:1	2.25 lbs/ft^2 (108 Pa)	125 lbs/ft (1.82 kN/m)	36 months

***** C Factor and shear stress for mulch control nettings must be obtained with netting used in conjunction with pre-applied mulch material. (*See Section 5.3 of Chapter 7 Construction BMPs for more information on the C Factor*.)

[1] Minimum Average Roll Values, Machine direction using ECTC Mod. ASTM D 5035.

[2] C Factor calculated as ratio of soil loss from RECP protected slope (tested at specified or greater gradient, H:V) to ratio of soil loss from unprotected (control) plot in large-scale testing.

[3] Required minimum shear stress RECP (unvegetated) can sustain without physical damage or excess erosion (> 12.7 mm (0.5 in) soil loss) during a 30-minute flow event in large-scale testing.

[4] The permissible shear stress levels established for each performance category are based on historical experience with products characterized by Manning's roughness coefficients in the range of 0.01 - 0.05.

[5] Acceptable large-scale test methods may include ASTM D 6459, or other independent testing deemed acceptable by the engineer.

[6] Per the engineer's discretion. Recommended acceptable large-scale testing protocol may include ASTM D 6460, or other independent testing deemed acceptable by the engineer.

Table RECP-2. ECTC Standard Specification for Permanent[1] Rolled Erosion Control Products
(Adapted from: Erosion Control Technology Council 2005)

Product Type	Slope Applications	Channel Applications	
	Maximum Gradient	Maximum Shear Stress[4,5]	Minimum Tensile Strength[2,3]
TRMs with a minimum thickness of 0.25 inches (6.35 mm) per ASTM D 6525 and UV stability of 80% per ASTM D 4355 (500 hours exposure).	0.5:1 (H:V)	6.0 lbs/ft^2 (288 Pa)	125 lbs/ft (1.82 kN/m)
	0.5:1 (H:V)	8.0 lbs/ft^2 (384 Pa)	150 lbs/ft (2.19 kN/m)
	0.5:1 (H:V)	10.0 lbs/ft^2 (480 Pa)	175 lbs/ft (2.55 kN/m)

[1] For TRMs containing degradable components, all property values must be obtained on the non-degradable portion of the matting alone.

[2] Minimum Average Roll Values, machine direction only for tensile strength determination using ASTM D 6818 (Supersedes Mod. ASTM D 5035 for RECPs)

[3] Field conditions with high loading and/or high survivability requirements may warrant the use of a TRM with a tensile strength of 44 kN/m (3,000 lb/ft) or greater.

[4] Required minimum shear stress TRM (fully vegetated) can sustain without physical damage or excess erosion (> 12.7 mm (0.5 in.) soil loss) during a 30-minute flow event in large scale testing.

[5] Acceptable large-scale testing protocols may include ASTM D 6460, or other independent testing deemed acceptable by the engineer.

Design and Installation

RECPs should be installed according to manufacturer's specifications and guidelines. Regardless of the type of product used, it is important to ensure no gaps or voids exist under the material and that all corners of the material are secured using stakes and trenching. Continuous contact between the product and the soil is necessary to avoid failure. Never use metal stakes to secure temporary erosion control products. Often wooden stakes are used to anchor RECPs; however, wood stakes may present installation and maintenance challenges and generally take a long time to biodegrade. Some local jurisdictions have had favorable experiences using biodegradable stakes.

This BMP Fact Sheet provides design details for several commonly used ECB applications, including:

ECB-1 Pipe Outlet to Drainageway

ECB-2 Small Ditch or Drainageway

ECB-3 Outside of Drainageway

Staking patterns are also provided in the design details according to these factors:

- ECB type
- Slope or channel type

For other types of RECPs including TRMs, these design details are intended to serve as general guidelines for design and installation; however, engineers should adhere to manufacturer's installation recommendations.

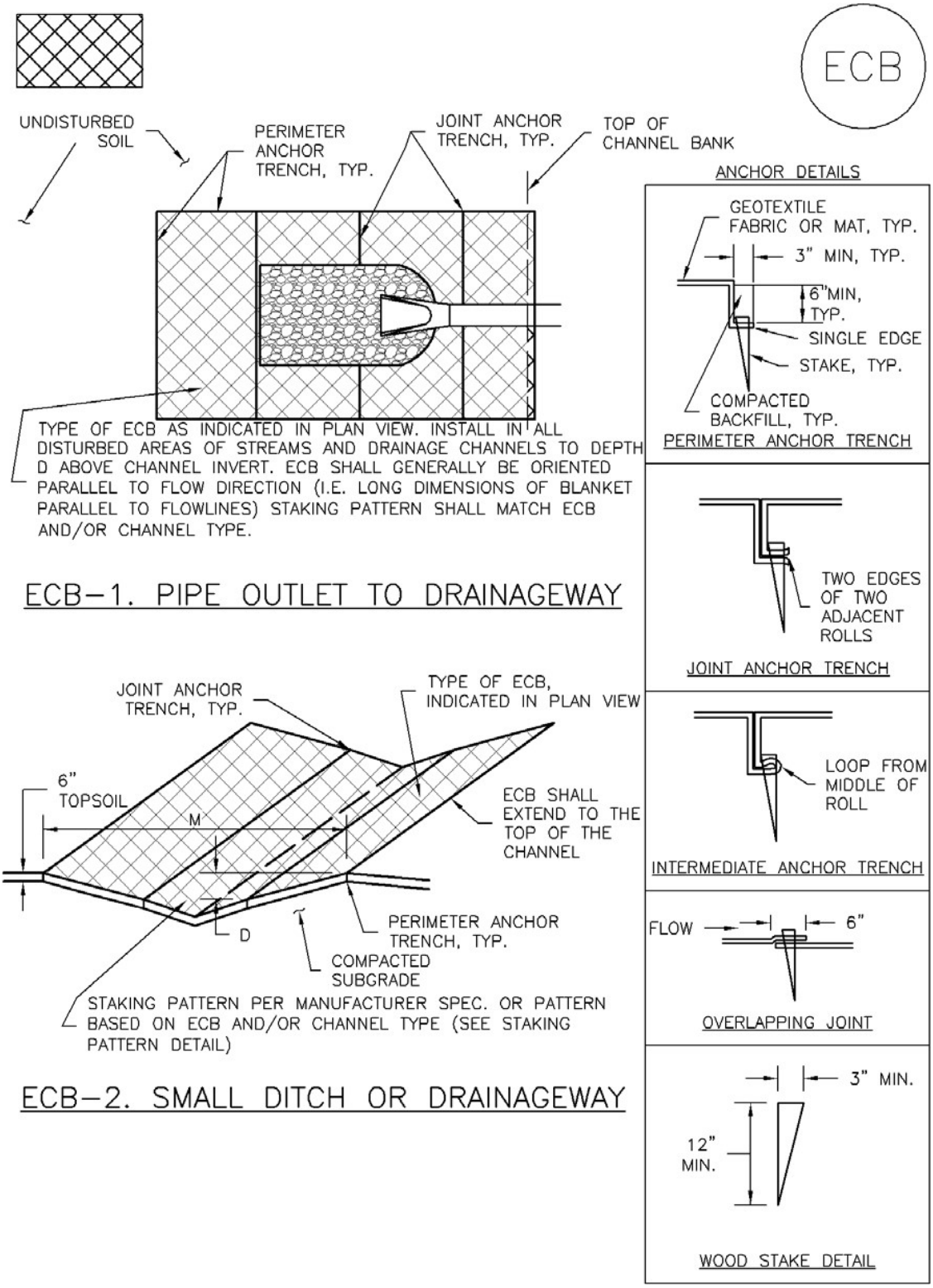
Maintenance and Removal

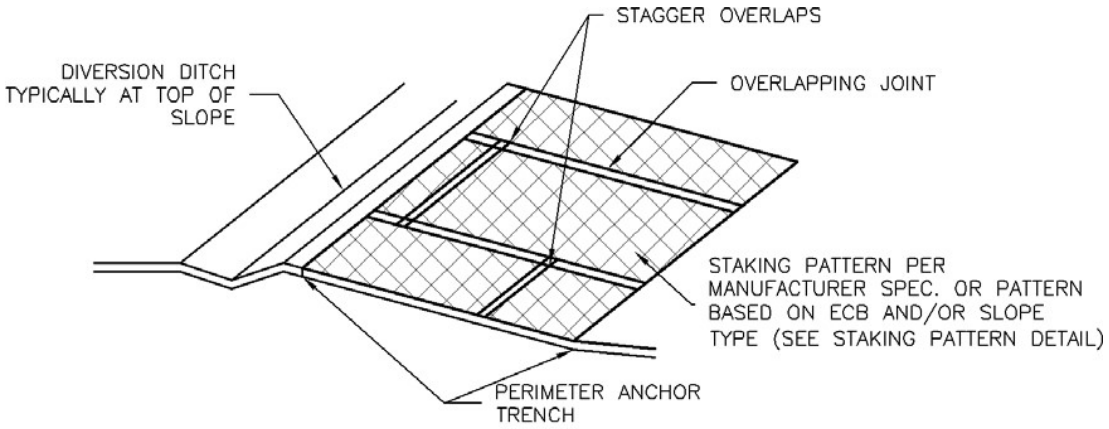
Inspection of erosion control blankets and other RECPs includes:

- Check for general signs of erosion, including voids beneath the mat. If voids are apparent, fill the void with suitable soil and replace the erosion control blanket, following the appropriate staking pattern.
- Check for damaged or loose stakes and secure loose portions of the blanket.

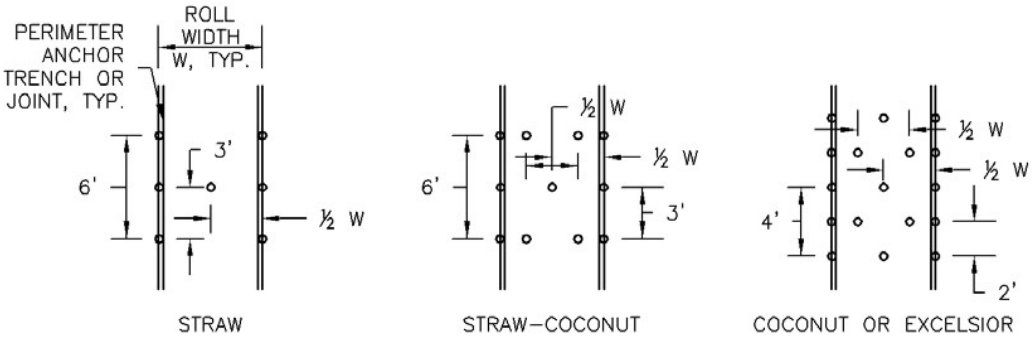
Erosion control blankets and other RECPs that are biodegradable typically do not need to be removed after construction. If they must be removed, then an alternate soil stabilization method should be installed promptly following removal.

Turf reinforcement mats, although generally resistant to biodegradation, are typically left in place as a dense vegetated cover grows in through the mat matrix. The turf reinforcement mat provides long-term stability and helps the established vegetation resist erosive forces.

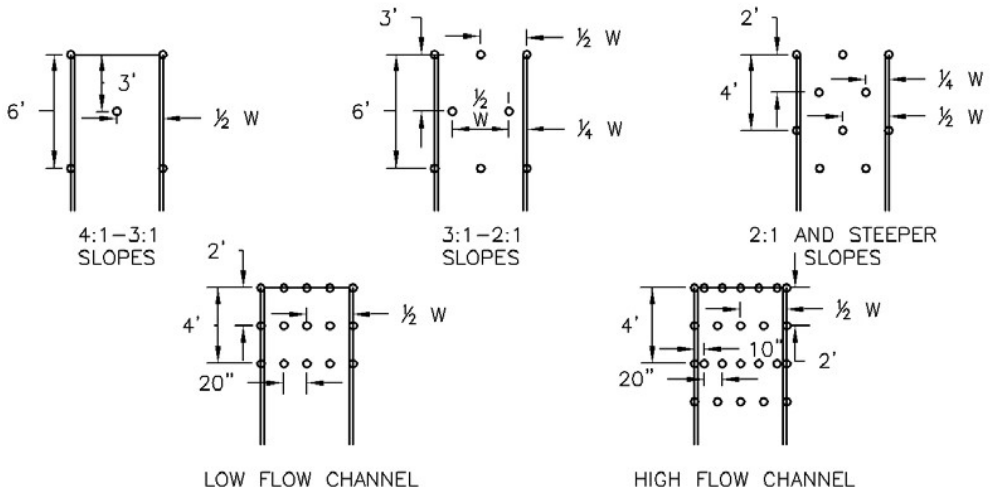

ECB
UNDISTURBED SOIL
PERIMETER ANCHOR TRENCH, TYP.
JOINT ANCHOR TRENCH, TYP.
TOP OF CHANNEL BANK
TYPE OF ECB AS INDICATED IN PLAN VIEW. INSTALL IN ALL DISTURBED AREAS OF STREAMS AND DRAINAGE CHANNELS TO DEPTH D ABOVE CHANNEL INVERT. ECB SHALL GENERALLY BE ORIENTED PARALLEL TO FLOW DIRECTION (I.E. LONG DIMENSIONS OF BLANKET PARALLEL TO FLOWLINES) STAKING PATTERN SHALL MATCH ECB AND/OR CHANNEL TYPE.
ECB–1. PIPE OUTLET TO DRAINAGEWAY
JOINT ANCHOR TRENCH, TYP.
TYPE OF ECB, INDICATED IN PLAN VIEW
6" TOPSOIL
M
ECB SHALL EXTEND TO THE TOP OF THE CHANNEL
D
PERIMETER ANCHOR TRENCH, TYP.
COMPACTED SUBGRADE
STAKING PATTERN PER MANUFACTURER SPEC. OR PATTERN BASED ON ECB AND/OR CHANNEL TYPE (SEE STAKING PATTERN DETAIL)
ECB–2. SMALL DITCH OR DRAINAGEWAY
ANCHOR DETAILS
GEOTEXTILE FABRIC OR MAT, TYP.
3" MIN, TYP.
6"MIN, TYP.
SINGLE EDGE
STAKE, TYP.
COMPACTED BACKFILL, TYP.
PERIMETER ANCHOR TRENCH
TWO EDGES OF TWO ADJACENT ROLLS
JOINT ANCHOR TRENCH
LOOP FROM MIDDLE OF ROLL
INTERMEDIATE ANCHOR TRENCH
FLOW
6"
OVERLAPPING JOINT
3" MIN.
12" MIN.
WOOD STAKE DETAIL



ECB–3. OUTSIDE OF DRAINAGEWAY



STAKING PATTERNS BY ECB TYPE



STAKING PATTERNS BY SLOPE OR CHANNEL TYPE

EROSION CONTROL BLANKET INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - –LOCATION OF ECB.
   - –TYPE OF ECB (STRAW, STRAW–COCONUT, COCONUT, OR EXCELSIOR).
   - –AREA, A, IN SQUARE YARDS OF EACH TYPE OF ECB.

2. 100% NATURAL AND BIODEGRADABLE MATERIALS ARE PREFERRED FOR RECPs, ALTHOUGH SOME JURISDICTIONS MAY ALLOW OTHER MATERIALS IN SOME APPLICATIONS.

3. IN AREAS WHERE ECBs ARE SHOWN ON THE PLANS, THE PERMITTEE SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING AND MULCHING. SUBGRADE SHALL BE SMOOTH AND MOIST PRIOR TO ECB INSTALLATION AND THE ECB SHALL BE IN FULL CONTACT WITH SUBGRADE. NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.

4. PERIMETER ANCHOR TRENCH SHALL BE USED ALONG THE OUTSIDE PERIMETER OF ALL BLANKET AREAS.

5. JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF ECBs TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL ECBs EXCEPT STRAW WHICH MAY USE AN OVERLAPPING JOINT.

6. INTERMEDIATE ANCHOR TRENCH SHALL BE USED AT SPACING OF ONE–HALF ROLL LENGTH FOR COCONUT AND EXCELSIOR ECBs.

7. OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF ECBs TOGETHER FOR ECBs ON SLOPES.

8. MATERIAL SPECIFICATIONS OF ECBs SHALL CONFORM TO TABLE ECB–1.

9. ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING ECBS SHALL BE RESEEDED AND MULCHED.

10. DETAILS ON DESIGN PLANS FOR MAJOR DRAINAGEWAY STABILIZATION WILL GOVERN IF DIFFERENT FROM THOSE SHOWN HERE.

TABLE ECB–1. ECB MATERIAL SPECIFICATIONS

TYPE	COCONUT CONTENT	STRAW CONTENT	EXCELSIOR CONTENT	RECOMMENDED NETTING**
STRAW*	–	100%	–	DOUBLE/ NATURAL
STRAW–COCONUT	30% MIN	70% MAX	–	DOUBLE/ NATURAL
COCONUT	100%	–	–	DOUBLE/ NATURAL
EXCELSIOR	–	–	100%	DOUBLE/ NATURAL

*STRAW ECBs MAY ONLY BE USED OUTSIDE OF STREAMS AND DRAINAGE CHANNEL.
**ALTERNATE NETTING MAY BE ACCEPTABLE IN SOME JURISDICTIONS

EROSION CONTROL BLANKET MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ECBs SHALL BE LEFT IN PLACE TO EVENTUALLY BIODEGRADE, UNLESS REQUESTED TO BE REMOVED BY THE LOCAL JURISDICTION.

5. ANY ECB PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE REPAIRED OR REINSTALLED. ANY SUBGRADE AREAS BELOW THE GEOTEXTILE THAT HAVE ERODED TO CREATED A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE ECB REINSTALLED.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO AND TOWN OF PARKER COLORADO, NOT AVAILABLE IN AUTOCAD)

Temporary Slope Drains (TSD) EC-7

Description

A temporary slope drain is a pipe or culvert used to convey water down a slope where there is a high potential for erosion. A drainage channel or swale at the top of the slope typically directs upgradient runoff to the pipe entrance for conveyance down the slope. The pipe outlet must be equipped with outlet protection.

Photograph TSD-1. A temporary slope drain installed to convey runoff down a slope during construction. Photo courtesy of the City of Aurora.

Appropriate Uses

Use on long, steep slopes when there is a high potential of flow concentration or rill development.

Design and Installation

Effective use of temporary slope drains involves design of an effective collection system to direct flows to the pipe, proper sizing and anchoring of the pipe, and outlet protection. Upgradient of the temporary slope drain, a temporary drainage ditch or swale should be constructed to collect surface runoff from the drainage area and convey it to the drain entrance. The temporary slope drain must be sized to safely convey the desired flow volume. At a minimum, it should be sized to convey the 2-year, 24-hour storm.

Temporary slope drains may be constructed of flexible or rigid pipe, riprap, or heavy (30 mil) plastic lining. When piping is used, it must be properly anchored by burying it with adequate cover or by using an anchor system to secure it to the ground.

The discharge from the slope drain must be directed to a stabilized outlet, temporary or permanent channel, and/or sedimentation basin.

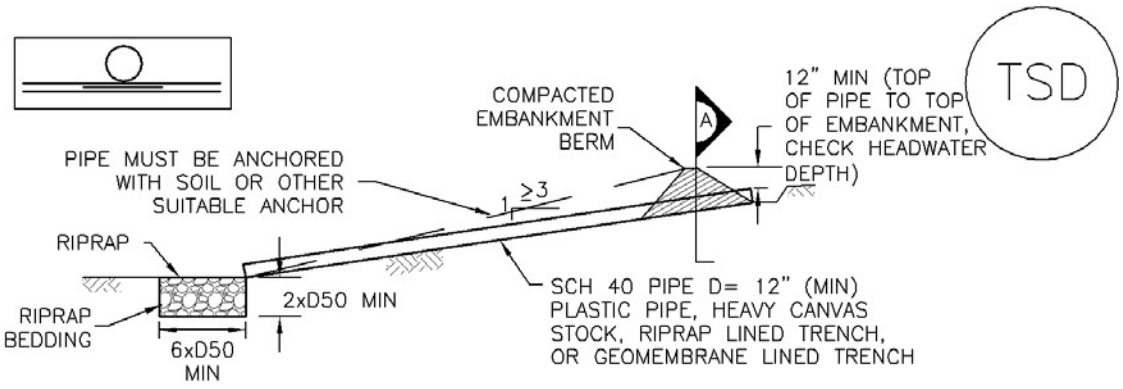
See Detail TSD-1 for additional sizing and design information.

Temporary Slope Drains	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	No

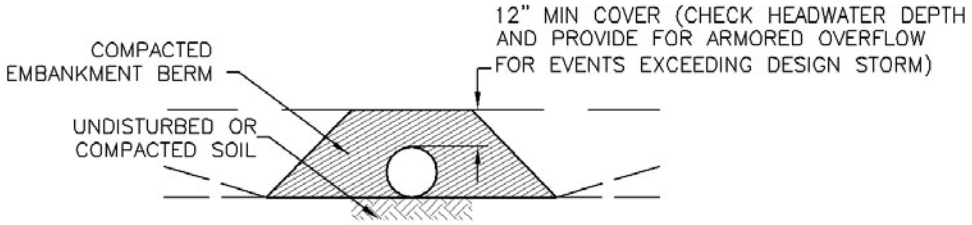
Maintenance and Removal

Inspect the entrance for sediment accumulation and remove, as needed. Clogging as a result of sediment deposition at the entrance can lead to ponding upstream causing flooding or overtopping of the slope drain. Inspect the downstream outlet for signs of erosion and stabilize, as needed. It may also be necessary to remove accumulated sediment at the outfall. Inspect pipe anchors to ensure that they are secure. If the pipe is secured by ground cover, ensure erosion has not compromised the depth of cover.

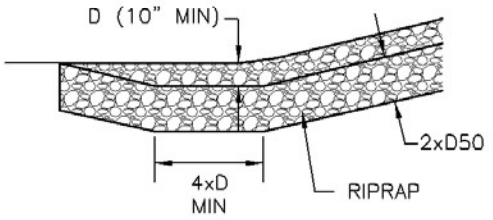
Slope drains should be removed when no longer needed or just prior to installation of permanent slope stabilization measures that cannot be installed with the slope drain in place. When slope drains are removed, the disturbed areas should be covered with topsoil, seeded, mulched or otherwise stabilized as required by the local jurisdiction.



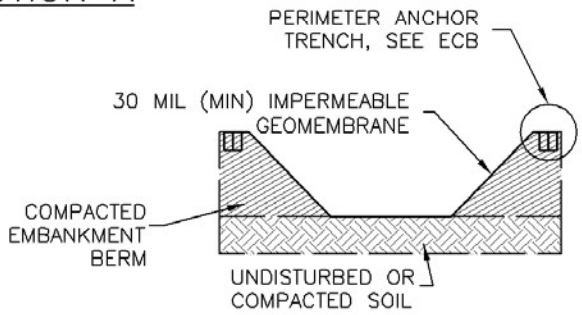
TEMPORARY SLOPE DRAIN PROFILE



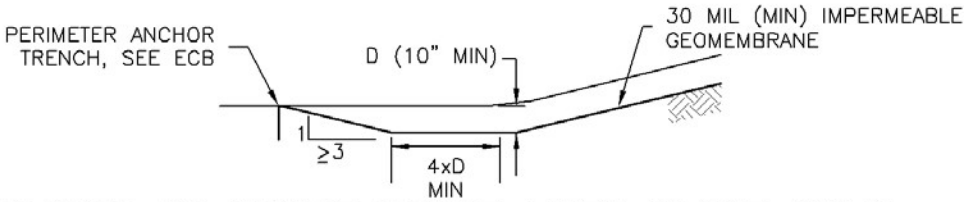
SECTION A



TERMINATION OF RIPRAP LINED SLOPE DRAIN



GEOMEMBRANE LINED SLOPE DRAIN



TERMINATION OF GEOMEMBRANE LINED SLOPE DRAIN

TSD–1. TEMPORARY SLOPE DRAIN PROFILE

SLOPE DRAIN INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION AND LENGTH OF SLOPE DRAIN
   –PIPE DIAMETER, D, AND RIPRAP SIZE, D50.

2. SLOPE DRAIN SHALL BE DESIGNED TO CONVEY PEAK RUNOFF FOR 2–YEAR 24–HOUR STORM AT A MINIMUM. FOR LONGER DURATION PROJECTS, LARGER MAY BE APPROPRIATE.

3. SLOPE DRAIN DIMENSIONS SHALL BE CONSIDERED MINIMUM DIMENSIONS; CONTRACTOR MAY ELECT TO INSTALL LARGER FACILITIES.

4. SLOPE DRAINS INDICATED SHALL BE INSTALLED PRIOR TO UPGRADIENT LAND–DISTURBING ACTIVITIES.

5. CHECK HEADWATER DEPTHS FOR TEMPORARY AND PERMANENT SLOPE DRAINS. DETAILS SHOW MINIMUM COVER; INCREASE AS NECESSARY FOR DESIGN HEADWATER DEPTH.

6. RIPRAP PAD SHALL BE PLACED AT SLOPE DRAIN OUTFALL.

7. ANCHOR PIPE BY COVERING WITH SOIL OR AN ALTERNATE SUITABLE ANCHOR MATERIAL.

SLOPE DRAIN MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. INSPECT INLET AND OUTLET POINTS AFTER STORMS FOR CLOGGING OR EVIDENCE OF OVERTOPPING. BREACHES IN PIPE OR OTHER CONVEYANCE SHALL BE REPAIRED AS SOON AS PRACTICABLE IF OBSERVED.

5. INSPECT RIPRAP PAD AT OUTLET FOR SIGNS OF EROSION. IF SIGNS OF EROSION EXIST, ADDITIONAL ARMORING SHALL BE INSTALLED.

6. TEMPORARY SLOPE DRAINS ARE TO REMAIN IN PLACE UNTIL NO LONGER NEEDED, BUT SHALL BE REMOVED PRIOR TO THE END OF CONSTRUCTION. WHEN SLOPE DRAINS ARE REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, SEEDED, MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF COLORADO SPRINGS, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Temporary Outlet Protection (TOP) EC-8

Description

Outlet protection helps to reduce erosion immediately downstream of a pipe, culvert, slope drain, rundown or other conveyance with concentrated, high-velocity flows. Typical outlet protection consists of riprap or rock aprons at the conveyance outlet.

Photograph TOP-1. Riprap outlet protection.

Appropriate Uses

Outlet protection should be used when a conveyance discharges onto a disturbed area where there is potential for accelerated erosion due to concentrated flow. Outlet protection should be provided where the velocity at the culvert outlet exceeds the maximum permissible velocity of the material in the receiving channel.

Note**:** This Fact Sheet and detail are for temporary outlet protection, outlets that are intended to be used for less than 2 years. For permanent, long-term outlet protection, see the *Major Drainage* chapter of Volume 1.

Design and Installation

Design outlet protection to handle runoff from the largest drainage area that may be contributing runoff during construction (the drainage area may change as a result of grading). Key in rock, around the entire perimeter of the apron, to a minimum depth of 6 inches for stability. Extend riprap to the height of the culvert or the normal flow depth of the downstream channel, whichever is less. Additional erosion control measures such as vegetative lining, turf reinforcement mat and/or other channel lining methods may be required downstream of the outlet protection if the channel is susceptible to erosion. See Design Detail OP-1 for additional information.

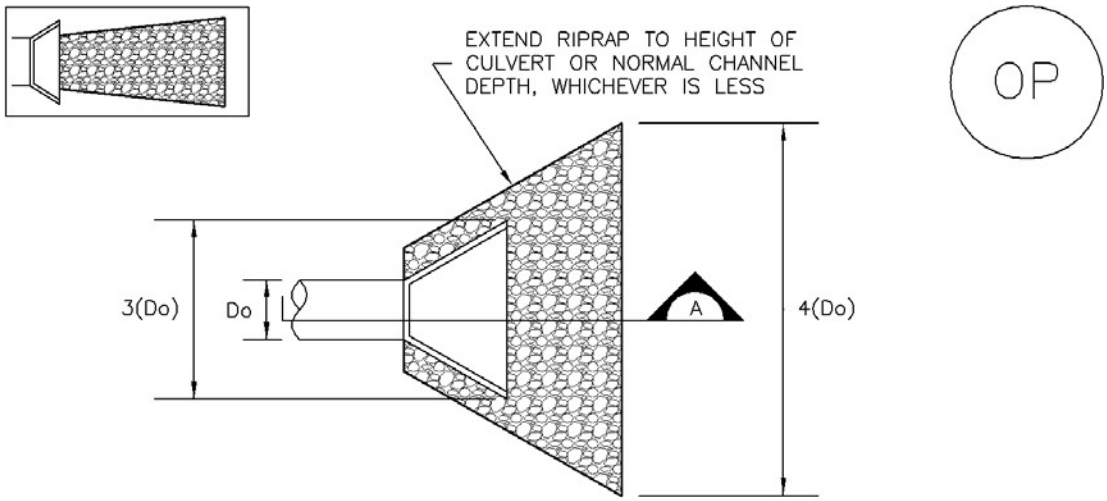
Maintenance and Removal

Inspect apron for damage and displaced rocks. If rocks are missing or significantly displaced, repair or replace as necessary. If rocks are continuously missing or displaced, consider increasing the size of the riprap or deeper keying of the perimeter.

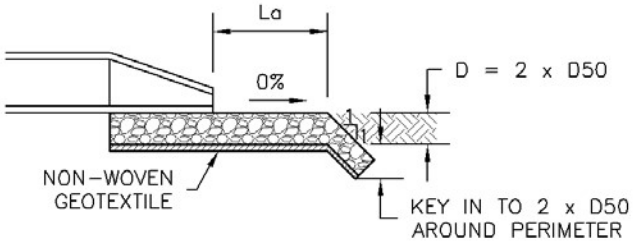
Remove sediment accumulated at the outlet before the outlet protection becomes buried and ineffective. When sediment accumulation is noted, check that upgradient BMPs, including inlet protection, are in effective operating condition.

Outlet protection may be removed once the pipe is no longer draining an upstream area, or once the downstream area has been sufficiently stabilized. If the drainage pipe is permanent, outlet protection can be left in place; however, permanent outlet protection should be designed and constructed in accordance with the requirements of the *Major Drainage* chapter of Volume 2.

Outlet Protection	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material Management	No



TEMPORARY OUTLET PROTECTION PLAN



SECTION A

TABLE OP-1. TEMPORARY OUTLET PROTECTION SIZING TABLE			
PIPE DIAMETER, Do (INCHES)	DISCHARGE, Q (CFS)	APRON LENGTH, La (FT)	RIPRAP D50 DIAMETER MIN (INCHES)
8	2.5 5	5 10	4 6
12	5 10	10 13	4 6
18	10 20 30 40	10 16 23 26	6 9 12 16
24	30 40 50 60	16 26 26 30	9 9 12 16

OP-1. TEMPORARY OUTLET PROTECTION

TEMPORARY OUTLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF OUTLET PROTECTION.
   –DIMENSIONS OF OUTLET PROTECTION.

2. DETAIL IS INTENDED FOR PIPES WITH SLOPE ≤ 10%. ADDITIONAL EVALUATION OF RIPRAP SIZING AND OUTLET PROTECTION DIMENSIONS REQUIRED FOR STEEPER SLOPES.

3. TEMPORARY OUTLET PROTECTION INFORMATION IS FOR OUTLETS INTENDED TO BE UTILIZED LESS THAN 2 YEARS.

TEMPORARY OUTLET PROTECTION INSPECTION AND MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM AURORA, COLORADO AND PREVIOUS VERSION OF VOLUME 3, NOT AVAILABLE IN AUTOCAD)

Earth Dikes and Drainage Swales (ED/DS) EC-10

Description

Earth dikes and drainage swales are temporary storm conveyance channels constructed either to divert runoff around slopes or to convey runoff to additional sediment control BMPs prior to discharge of runoff from a site. Drainage swales may be lined or unlined, but if an unlined swale is used, it must be well compacted and capable of resisting erosive velocities.

Photograph ED/DS-1. Example of an earth dike used to divert flows at a construction site. Photo courtesy of CDOT.

Appropriate Uses

Earth dikes and drainage swales are typically used to control the flow path of runoff at a construction site by diverting runoff around areas prone to erosion, such as steep slopes. Earth dikes and drainage swales may also be constructed as temporary conveyance features. This will direct runoff to additional sediment control treatment BMPs, such as sediment traps or basins.

Design and Installation

When earth dikes are used to divert water for slope protection, the earth dike typically consists of a horizontal ridge of soil placed perpendicular to the slope and angled slightly to provide drainage along the contour. The dike is used in conjunction with a swale or a small channel upslope of the berm to convey the diverted water. Temporary diversion dikes can be constructed by excavation of a V-shaped trench or ditch and placement of the fill on the downslope side of the cut. There are two types of placement for temporary slope diversion dikes:

- A dike located at the top of a slope to divert upland runoff away from the disturbed area and convey it in a temporary or permanent channel.
- A diversion dike located at the base or mid-slope of a disturbed area to intercept runoff and reduce the effective slope length.

Depending on the project, either an earth dike or drainage swale may be more appropriate. If there is a need for cut on the project, then an excavated drainage swale may be better suited. When the project is primarily fill, then a conveyance constructed using a berm may be the better option.

All dikes or swales receiving runoff from a disturbed area should direct stormwater to a sediment control BMP such as a sediment trap or basin.

Earth Dikes and Drainage Swales	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material Management	No

Unlined dikes or swales should only be used for intercepting sheet flow runoff and are not intended for diversion of concentrated flows.

Details with notes are provided for several design variations, including:

ED-1. Unlined Earth Dike formed by Berm

DS-1. Unlined Excavated Swale

DS-2. Unlined Swale Formed by Cut and Fill

DS-3. ECB-lined Swale

DS-4. Synthetic-lined Swale

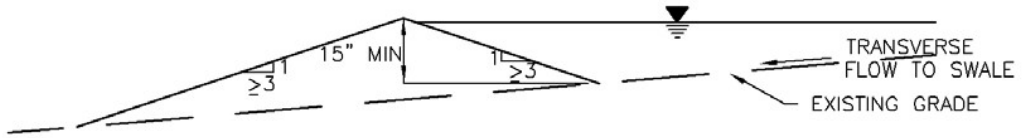
DS-5. Riprap-lined Swale

The details also include guidance on permissible velocities for cohesive channels if unlined approaches will be used.

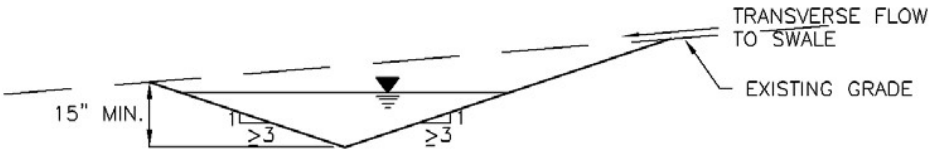
Maintenance and Removal

Inspect earth dikes for stability, compaction, and signs of erosion and repair. Inspect side slopes for erosion and damage to erosion control fabric. Stabilize slopes and repair fabric as necessary. If there is reoccurring extensive damage, consider installing rock check dams or lining the channel with riprap.

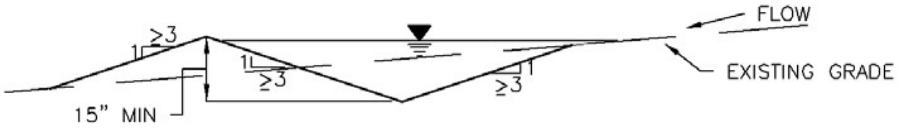
If drainage swales are not permanent, remove dikes and fill channels when the upstream area is stabilized. Stabilize the fill or disturbed area immediately following removal by revegetation or other permanent stabilization method approved by the local jurisdiction.



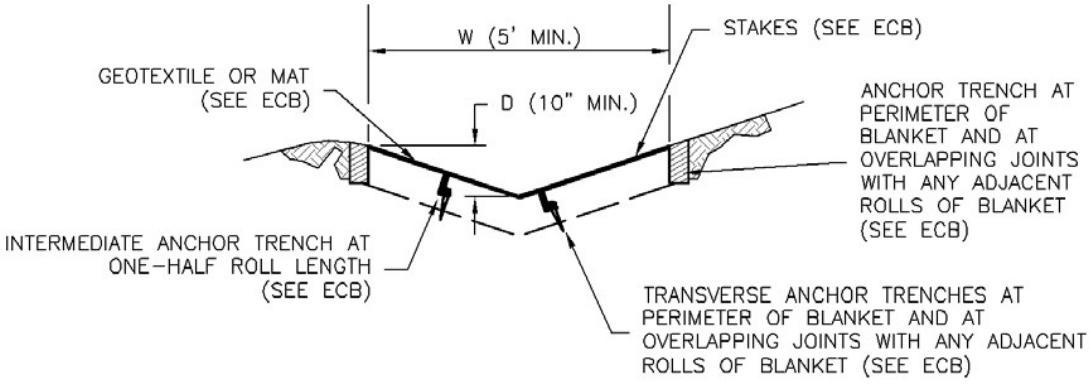
ED–1. COMPACTED UNLINED EARTH DIKE FORMED BY BERM



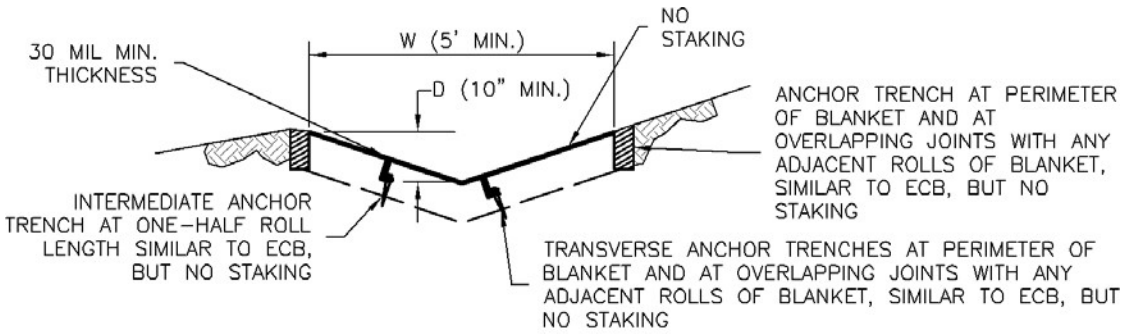
DS–1. COMPACTED UNLINED EXCAVATED SWALE



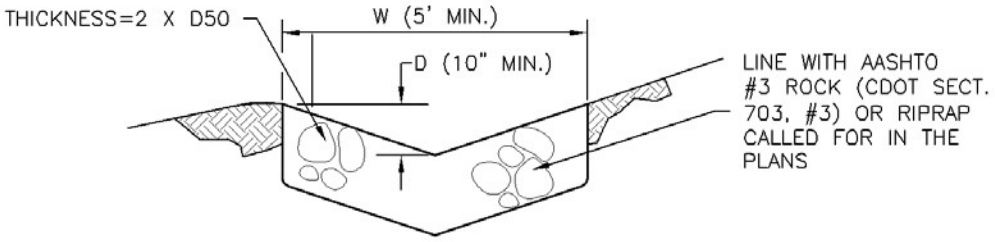
DS–2. COMPACTED UNLINED SWALE FORMED BY CUT AND FILL



DS–3. ECB LINED SWALE (CUT AND FILL OR BERM)



DS-4. SYNTHETIC LINED SWALE



DS-5. RIPRAP LINED SWALE

EARTH DIKE AND DRAINAGE SWALE INSTALLATION NOTES

1. SEE SITE PLAN FOR:
   - LOCATION OF DIVERSION SWALE
   - TYPE OF SWALE (UNLINED, COMPACTED AND/OR LINED).
   - LENGTH OF EACH SWALE.
   - DEPTH, D, AND WIDTH, W DIMENSIONS.
   - FOR ECB/TRM LINED DITCH, SEE ECB DETAIL.
   - FOR RIPRAP LINED DITCH, SIZE OF RIPRAP, D50.

2. SEE DRAINAGE PLANS FOR DETAILS OF PERMANENT CONVEYANCE FACILITIES AND/OR DIVERSION SWALES EXCEEDING 2-YEAR FLOW RATE OR 10 CFS.

3. EARTH DIKES AND SWALES INDICATED ON SWMP PLAN SHALL BE INSTALLED PRIOR TO LAND-DISTURBING ACTIVITIES IN PROXIMITY.

4. EMBANKMENT IS TO BE COMPACTED TO 90% OF MAXIMUM DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT ACCORDING TO ASTM D698.

5. SWALES ARE TO DRAIN TO A SEDIMENT CONTROL BMP.

6. FOR LINED DITCHES, INSTALLATION OF ECB/TRM SHALL CONFORM TO THE REQUIREMENTS OF THE ECB DETAIL.

7. WHEN CONSTRUCTION TRAFFIC MUST CROSS A DIVERSION SWALE, INSTALL A TEMPORARY CULVERT WITH A MINIMUM DIAMETER OF 12 INCHES.

EARTH DIKE AND DRAINAGE SWALE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SWALES SHALL REMAIN IN PLACE UNTIL THE END OF CONSTRUCTION; IF APPROVED BY LOCAL JURISDICTION, SWALES MAY BE LEFT IN PLACE.

5. WHEN A SWALE IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF COLORADO SPRINGS, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Check Dams (CD) EC-12

Description

Check dams are temporary grade control structures placed in drainage channels to limit the erosivity of stormwater by reducing flow velocity. Check dams are typically constructed from rock, gravel bags, sand bags, or sometimes, proprietary devices. Reinforced check dams are typically constructed from rock and wire gabion. Although the primary function of check dams is to reduce the velocity of concentrated flows, a secondary benefit is sediment trapping upstream of the structure.

Photograph CD-1. Rock check dams in a roadside ditch. Photo courtesy of WWE.

Appropriate Uses

Use as a grade control for temporary drainage ditches or swales until final soil stabilization measures are established upstream and downstream. Check dams can be used on mild or moderately steep slopes. Check dams may be used under the following conditions:

- As temporary grade control facilities along waterways until final stabilization is established.
- Along permanent swales that need protection prior to installation of a non-erodible lining.
- Along temporary channels, ditches or swales that need protection where construction of a non-erodible lining is not practicable.
- Reinforced check dams should be used in areas subject to high flow velocities.

Design and Installation

Place check dams at regularly spaced intervals along the drainage swale or ditch. Check dams heights should allow for pools to develop upstream of each check dam, extending to the downstream toe of the check dam immediately upstream.

When rock is used for the check dam, place rock mechanically or by hand. Do not dump rocks into the drainage channel. Where multiple check dams are used, the top of the lower dam should be at the same elevation as the toe of the upper dam.

When reinforced check dams are used, install erosion control fabric under and around the check dam to prevent erosion on the upstream and downstream sides. Each section of the dam should be keyed in to reduce the potential for washout or undermining. A rock apron upstream and downstream of the dam may be necessary to further control erosion.

Check Dams	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material Management	No

Design details with notes are provided for the following types of check dams:

- Rock Check Dams (CD-1)
- Reinforced Check Dams (CD-2)

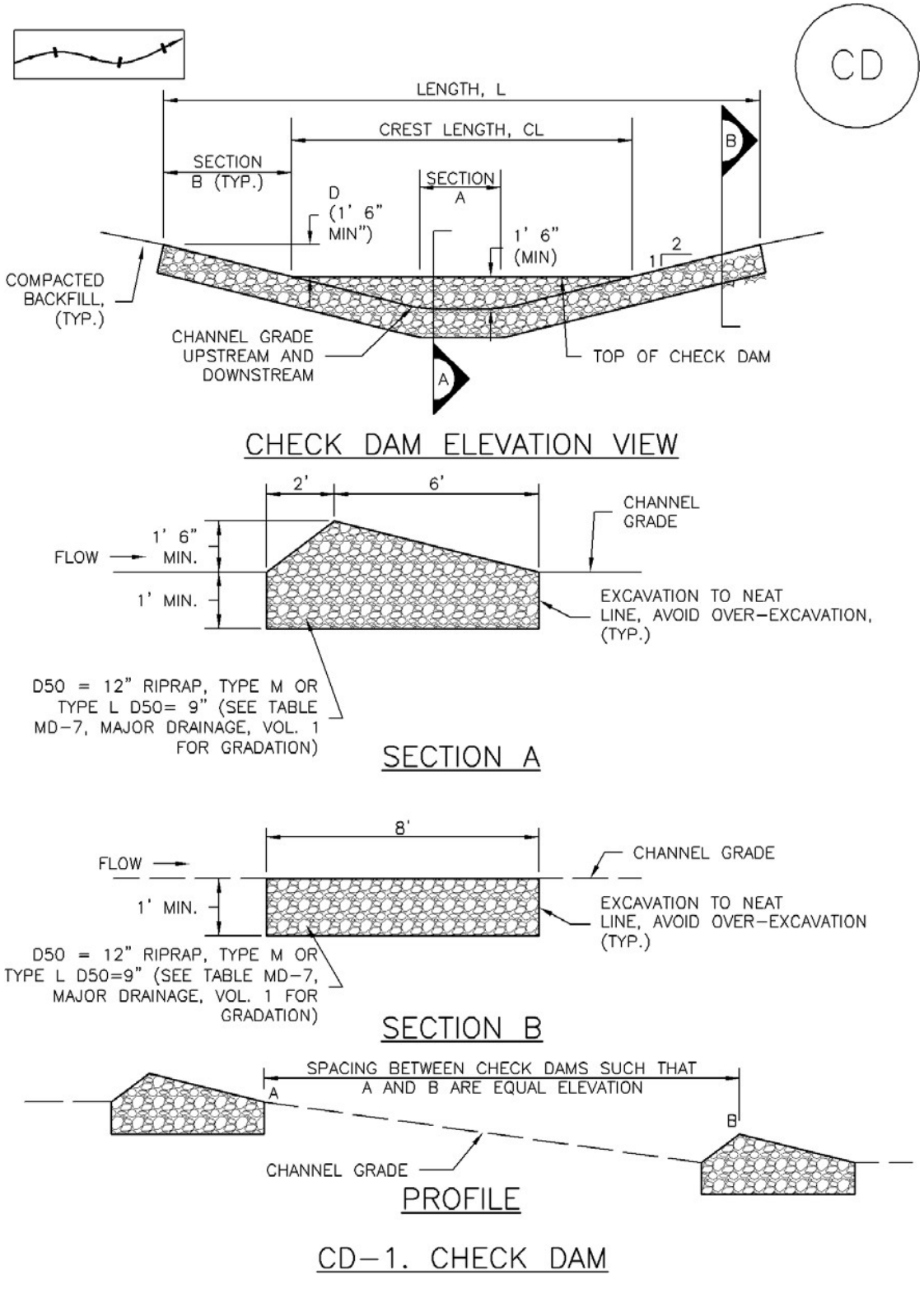
Sediment control logs may also be used as check dams; however, silt fence is not appropriate for use as a check dam. Many jurisdictions also prohibit or discourage use of straw bales for this purpose.

Maintenance and Removal

Replace missing rocks causing voids in the check dam. If gravel bags or sandbags are used, replace or repair torn or displaced bags.

Remove accumulated sediment, as needed to maintain BMP effectiveness, typically before the sediment depth upstream of the check dam is within ½ of the crest height. Remove accumulated sediment prior to mulching, seeding, or chemical soil stabilization. Removed sediment can be incorporated into the earthwork with approval from the Project Engineer, or disposed of at an alternate location in accordance with the standard specifications.

Check dams constructed in permanent swales should be removed when perennial grasses have become established, or immediately prior to installation of a non-erodible lining. All of the rock and accumulated sediment should be removed, and the area seeded and mulched, or otherwise stabilized.



CD-1. CHECK DAM

CHECK DAM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - –LOCATION OF CHECK DAMS.
   - –CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
   - –LENGTH (L), CREST LENGTH (CL), AND DEPTH (D).

2. CHECK DAMS INDICATED ON INITIAL SWMP SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND DISTURBING ACTIVITIES.

3. RIPRAP UTILIZED FOR CHECK DAMS SHOULD BE OF APPROPRIATE SIZE FOR THE APPLICATION. TYPICAL TYPES OF RIPRAP USED FOR CHECK DAMS ARE TYPE M (D50 12") OR TYPE L (D50 9").

4. RIPRAP PAD SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'.

5. THE ENDS OF THE CHECK DAM SHALL BE A MINIMUM OF 1' 6" HIGHER THAN THE CENTER OF THE CHECK DAM.

CHECK DAM MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

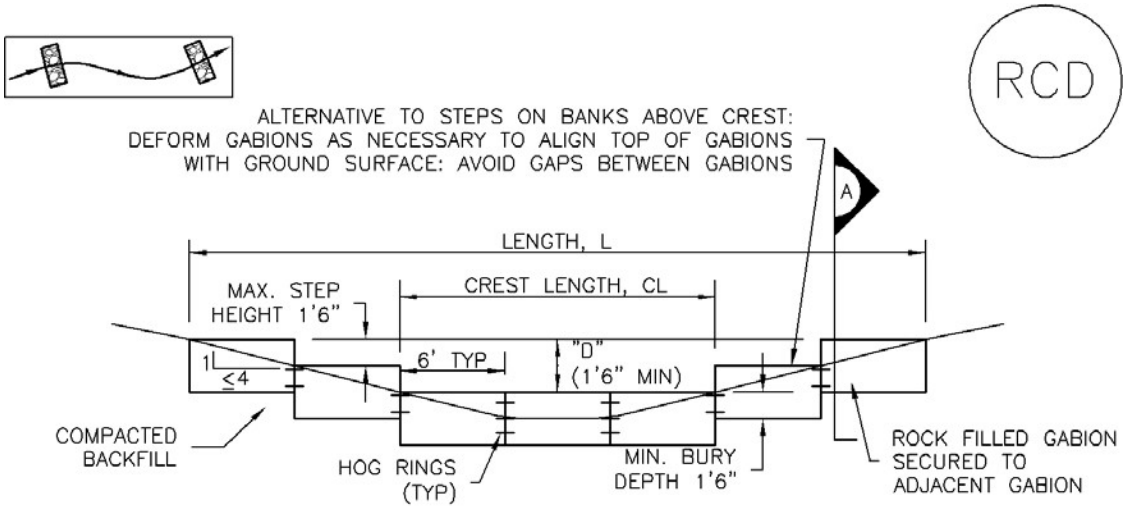
4. SEDIMENT ACCUMULATED UPSTREAM OF THE CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS WITHIN ½ OF THE HEIGHT OF THE CREST.

5. CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

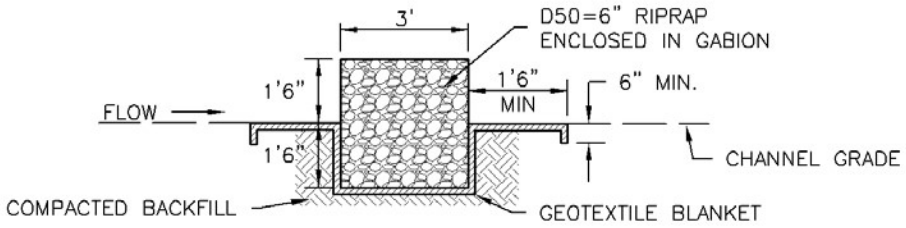
6. WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACKFILL. DISTURBED AREA SHALL BE SEEDED AND MULCHED AND COVERED WITH GEOTEXTILE OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.



REINFORCED CHECK DAM ELEVATION VIEW



SECTION A

REINFORCED CHECK DAM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - –LOCATIONS OF CHECK DAMS.
   - –CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
   - –LENGTH (L), CREST LENGTH (CL), AND DEPTH (D).

2. CHECK DAMS INDICATED ON THE SWMP SHALL BE INSTALLED PRIOR TO AN UPSTREAM LAND–DISTURBING ACTIVITIES.

3. REINFORCED CHECK DAMS, GABIONS SHALL HAVE GALVANIZED TWISTED WIRE NETTING WITH A MAXIMUM OPENING DIMENSION OF 4½" AND A MINIMUM WIRE THICKNESS OF 0.10". WIRE "HOG RINGS" AT 4" SPACING OR OTHER APPROVED MEANS SHALL BE USED AT ALL GABION SEAMS AND TO SECURE THE GABION TO THE ADJACENT SECTION.

4. THE CHECK DAM SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1' 6".

5. GEOTEXTILE BLANKET SHALL BE PLACED IN THE REINFORCED CHECK DAM TRENCH EXTENDING A MINIMUM OF 1' 6" ON BOTH THE UPSTREAM AND DOWNSTREAM SIDES OF THE REINFORCED CHECK DAM.

CD–2. REINFORCED CHECK DAM

REINFORCED CHECK DAM MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF REINFORCED CHECK DAMS SHALL BE REMOVED AS NEEDED TO MAINTAIN THE EFFECTIVENESS OF BMP, TYPICALLY WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN ½ THE HEIGHT OF THE CREST.

5. REPAIR OR REPLACE REINFORCED CHECK DAMS WHEN THERE ARE SIGNS OF DAMAGE SUCH AS HOLES IN THE GABION OR UNDERCUTTING.

6. REINFORCED CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN REINFORCED CHECK DAMS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED, AND COVERED WITH A GEOTEXTILE BLANKET, OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Wind Erosion/Dust Control (DC) EC-14

Description

Wind erosion and dust control BMPs help to keep soil particles from entering the air as a result of land disturbing construction activities. These BMPs 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. For construction roadways, road watering and stabilized surfaces should be considered.

Photograph DC-1. Water truck used for dust suppression. Photo courtesy of Douglas County.

Appropriate Uses

Dust control measures should be used on any site where dust poses a problem to air quality. Dust control is important to control for the health of construction workers and surrounding waterbodies.

Design and Installation

The following construction BMPs can be used for dust control:

- An irrigation/sprinkler system can be used to wet the top layer of disturbed soil to help keep dry soil particles from becoming airborne.
- Seeding and mulching can be used to stabilize disturbed surfaces and reduce dust emissions.
- Protecting existing vegetation can help to slow wind velocities across the ground surface, thereby limiting the likelihood of soil particles to become airborne.
- Spray-on soil binders form a bond between soil particles keeping them grounded. Chemical treatments may require additional permitting requirements. Potential impacts to surrounding waterways and habitat must be considered prior to use.
- Placing rock on construction roadways and entrances will help keep dust to a minimum across the construction site.
- Wind fences can be installed on site to reduce wind speeds. Install fences perpendicular to the prevailing wind direction for maximum effectiveness.

Wind Erosion Control/ Dust Control	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	Moderate

Maintenance and Removal

When using an irrigation/sprinkler control system to aid in dust control, be careful not to overwater. Overwatering will cause construction vehicles to track mud off-site.

Concrete Washout Area (CWA) MM-1

Description

Concrete waste management involves designating and properly managing a specific area of the construction site as a concrete washout area. A concrete washout area can be created using one of several approaches designed to receive wash water from washing of tools and concrete mixer chutes, liquid concrete waste from dump trucks, mobile batch mixers, or pump trucks. Three basic approaches are available: excavation of a pit in the ground, use of an above ground storage area, or use of prefabricated haul-away concrete washout containers. Surface discharges of concrete washout water from construction sites are prohibited.

Photograph CWA-1. Example of concrete washout area. Note gravel tracking pad for access and sign.

Appropriate Uses

Concrete washout areas must be designated on all sites that will generate concrete wash water or liquid concrete waste from onsite concrete mixing or concrete delivery.

Because pH is a pollutant of concern for washout activities, when unlined pits are used for concrete washout, the soil must have adequate buffering capacity to result in protection of state groundwater standards; otherwise, a liner/containment must be used. The following management practices are recommended to prevent an impact from unlined pits to groundwater:

- The use of the washout site should be temporary (less than 1 year), and
- The washout site should be not be located in an area where shallow groundwater may be present, such as near natural drainages, springs, or wetlands.

Design and Installation

Concrete washout activities must be conducted in a manner that does not contribute pollutants to surface waters or stormwater runoff. Concrete washout areas may be lined or unlined excavated pits in the ground, commercially manufactured prefabricated washout containers, or aboveground holding areas constructed of berms, sandbags or straw bales with a plastic liner.

Although unlined washout areas may be used, lined pits may be required to protect groundwater under certain conditions.

Concrete Washout Area	
Functions	
Erosion Control	No
Sediment Control	No
Site/Material Management	Yes

Do not locate an unlined washout area within 400 feet of any natural drainage pathway or waterbody or within 1,000 feet of any wells or drinking water sources. Even for lined concrete washouts, it is advisable to locate the facility away from waterbodies and drainage paths. If site constraints make these

setbacks infeasible or if highly permeable soils exist in the area, then the pit must be installed with an impermeable liner (16 mil minimum thickness) or surface storage alternatives using prefabricated concrete washout devices or a lined aboveground storage area should be used.

Design details with notes are provided in Detail CWA-1 for pits and CWA-2 for aboveground storage areas. Pre-fabricated concrete washout container information can be obtained from vendors.

Maintenance and Removal

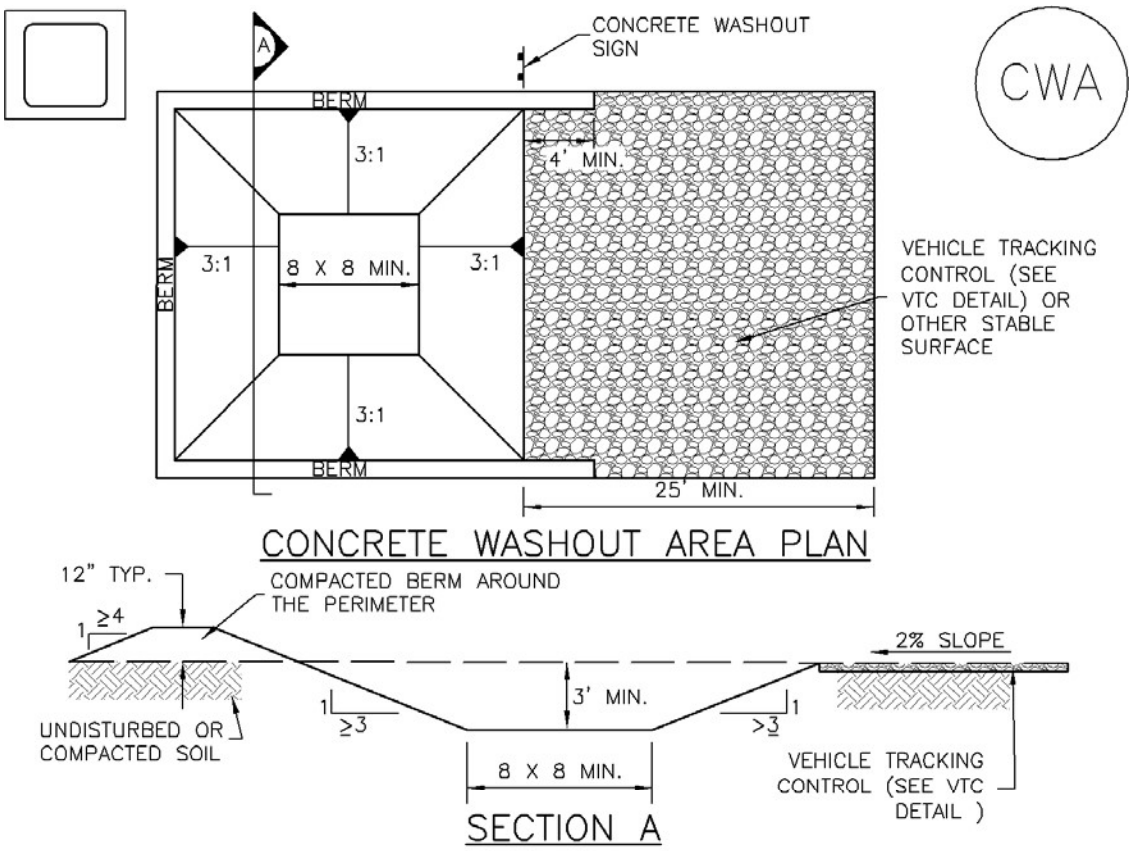
A key consideration for concrete washout areas is to ensure that adequate signage is in place identifying the location of the washout area. Part of inspecting and maintaining washout areas is ensuring that adequate signage is provided and in good repair and that the washout area is being used, as opposed to washout in non-designated areas of the site.

Remove concrete waste in the washout area, as needed to maintain BMP function (typically when filled to about two-thirds of its capacity). Collect concrete waste and deliver offsite to a designated disposal location.

Upon termination of use of the washout site, accumulated solid waste, including concrete waste and any contaminated soils, must be removed from the site to prevent on-site disposal of solid waste. If the wash water is allowed to evaporate and the concrete hardens, it may be recycled.

Photograph CWA-2. Prefabricated concrete washout. Photo courtesy of CDOT.

Photograph CWA-3. Earthen concrete washout. Photo courtesy of CDOT.



CWA–1. CONCRETE WASHOUT AREA

CWA INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –CWA INSTALLATION LOCATION.

2. DO NOT LOCATE AN UNLINED CWA WITHIN 400' OF ANY NATURAL DRAINAGE PATHWAY OR WATERBODY. DO NOT LOCATE WITHIN 1,000' OF ANY WELLS OR DRINKING WATER SOURCES. IF SITE CONSTRAINTS MAKE THIS INFEASIBLE, OR IF HIGHLY PERMEABLE SOILS EXIST ON SITE, THE CWA MUST BE INSTALLED WITH AN IMPERMEABLE LINER (16 MIL MIN. THICKNESS) OR SURFACE STORAGE ALTERNATIVES USING PREFABRICATED CONCRETE WASHOUT DEVICES OR A LINED ABOVE GROUND STORAGE ARE SHOULD BE USED.

3. THE CWA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.

4. CWA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8' SLOPES LEADING OUT OF THE SUBSURFACE PIT SHALL BE 3:1 OR FLATTER. THE PIT SHALL BE AT LEAST 3' DEEP.

5. BERM SURROUNDING SIDES AND BACK OF THE CWA SHALL HAVE MINIMUM HEIGHT OF 1'.

6. VEHICLE TRACKING PAD SHALL BE SLOPED 2% TOWARDS THE CWA.

7. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CWA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CWA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.

8. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

CWA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. THE CWA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS, ACCUMULATED IN PIT, SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF 2'.

5. CONCRETE WASHOUT WATER, WASTED PIECES OF CONCRETE AND ALL OTHER DEBRIS IN THE SUBSURFACE PIT SHALL BE TRANSPORTED FROM THE JOB SITE IN A WATER–TIGHT CONTAINER AND DISPOSED OF PROPERLY.

6. THE CWA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.

7. WHEN THE CWA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, SEED AND MULCH OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD).

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Good Housekeeping Practices (GH) MM-3

Description

Implement construction site good housekeeping practices to prevent pollution associated with solid, liquid and hazardous construction-related materials and wastes. Stormwater Management Plans (SWMPs) should clearly specify BMPs including these good housekeeping practices:

- Provide for waste management.
- Establish proper building material staging areas.
- Designate paint and concrete washout areas.
- Establish proper equipment/vehicle fueling and maintenance practices.
- Control equipment/vehicle washing and allowable non-stormwater discharges.
- Develop a spill prevention and response plan.

Acknowledgement: This Fact Sheet is based directly on EPA guidance provided in *Developing Your Stormwater Pollution Prevent Plan* (EPA 2007).

Photographs GH-1 and GH-2. Proper materials storage and secondary containment for fuel tanks are important good housekeeping practices. Photos courtesy of CDOT and City of Aurora.

Appropriate Uses

Good housekeeping practices are necessary at all construction sites.

Design and Installation

The following principles and actions should be addressed in SWMPs:

- **Provide for Waste Management.** Implement management procedures and practices to prevent or reduce the exposure and transport of pollutants in stormwater from solid, liquid and sanitary wastes that will be generated at the site. Practices such as trash disposal, recycling, proper material handling, and cleanup measures can reduce the potential for stormwater runoff to pick up construction site wastes and discharge them to surface waters. Implement a comprehensive set of waste-management practices for hazardous or toxic materials, such as paints, solvents, petroleum products, pesticides, wood preservatives, acids, roofing tar, and other materials. Practices should include storage, handling, inventory, and cleanup procedures, in case of spills. Specific practices that should be considered include:

  Solid or Construction Waste

  - Designate trash and bulk waste-collection areas on-site.

Good Housekeeping	
Functions	
Erosion Control	No
Sediment Control	No
Site/Material Management	Yes

- Recycle materials whenever possible (e.g., paper, wood, concrete, oil).
- Segregate and provide proper disposal options for hazardous material wastes.
- Clean up litter and debris from the construction site daily.
- Locate waste-collection areas away from streets, gutters, watercourses, and storm drains. Waste-collection areas (dumpsters, and such) are often best located near construction site entrances to minimize traffic on disturbed soils. Consider secondary containment around waste collection areas to minimize the likelihood of contaminated discharges.
- Empty waste containers before they are full and overflowing.

Sanitary and Septic Waste

- Provide convenient, well-maintained, and properly located toilet facilities on-site.
- Locate toilet facilities away from storm drain inlets and waterways to prevent accidental spills and contamination of stormwater.
- Maintain clean restroom facilities and empty portable toilets regularly.
- Where possible, provide secondary containment pans under portable toilets.
- Provide tie-downs or stake-downs for portable toilets.
- Educate employees, subcontractors, and suppliers on locations of facilities.
- Treat or dispose of sanitary and septic waste in accordance with state or local regulations. Do not discharge or bury wastewater at the construction site.
- Inspect facilities for leaks. If found, repair or replace immediately.
- Special care is necessary during maintenance (pump out) to ensure that waste and/or biocide are not spilled on the ground.

Hazardous Materials and Wastes

- Develop and implement employee and subcontractor education, as needed, on hazardous and toxic waste handling, storage, disposal, and cleanup.
- Designate hazardous waste-collection areas on-site.
- Place all hazardous and toxic material wastes in secondary containment.

Photograph GH-3. Locate portable toilet facilities on level surfaces away from waterways and storm drains. Photo courtesy of WWE.

- Hazardous waste containers should be inspected to ensure that all containers are labeled properly and that no leaks are present.

- **Establish Proper Building Material Handling and Staging Areas**. The SWMP should include comprehensive handling and management procedures for building materials, especially those that are hazardous or toxic. Paints, solvents, pesticides, fuels and oils, other hazardous materials or building materials that have the potential to contaminate stormwater should be stored indoors or under cover whenever possible or in areas with secondary containment. Secondary containment measures prevent a spill from spreading across the site and may include dikes, berms, curbing, or other containment methods. Secondary containment techniques should also ensure the protection of groundwater. Designate staging areas for activities such as fueling vehicles, mixing paints, plaster, mortar, and other potential pollutants. Designated staging areas enable easier monitoring of the use of materials and clean up of spills. Training employees and subcontractors is essential to the success of this pollution prevention principle. Consider the following specific materials handling and staging practices:

  - Train employees and subcontractors in proper handling and storage practices.

  - Clearly designate site areas for staging and storage with signs and on construction drawings. Staging areas should be located in areas central to the construction site. Segment the staging area into sub-areas designated for vehicles, equipment, or stockpiles. Construction entrances and exits should be clearly marked so that delivery vehicles enter/exit through stabilized areas with vehicle tracking controls (See Vehicle Tracking Control Fact Sheet).

  - Provide storage in accordance with Spill Protection, Control and Countermeasures (SPCC) requirements and plans and provide cover and impermeable perimeter control, as necessary, for hazardous materials and contaminated soils that must be stored on site.

  - Ensure that storage containers are regularly inspected for leaks, corrosion, support or foundation failure, or other signs of deterioration and tested for soundness.

  - Reuse and recycle construction materials when possible.

- **Designate Concrete Washout Areas**. Concrete contractors should be encouraged to use the washout facilities at their own plants or dispatch facilities when feasible; however, concrete washout commonly occurs on construction sites. If it is necessary to provide for concrete washout areas on-site, designate specific washout areas and design facilities to handle anticipated washout water. Washout areas should also be provided for paint and stucco operations. Because washout areas can be a source of pollutants from leaks or spills, care must be taken with regard to their placement and proper use. See the Concrete Washout Area Fact Sheet for detailed guidance.

  Both self-constructed and prefabricated washout containers can fill up quickly when concrete, paint, and stucco work are occurring on large portions of the site. Be sure to check for evidence that contractors are using the washout areas and not dumping materials onto the ground or into drainage facilities. If the washout areas are not being used regularly, consider posting additional signage, relocating the facilities to more convenient locations, or providing training to workers and contractors.

  When concrete, paint, or stucco is part of the construction process, consider these practices which will help prevent contamination of stormwater. Include the locations of these areas and the maintenance and inspection procedures in the SWMP.

- Do not washout concrete trucks or equipment into storm drains, streets, gutters, uncontained areas, or streams. Only use designated washout areas.
- Establish washout areas and advertise their locations with signs. Ensure that signage remains in good repair.
- Provide adequate containment for the amount of wash water that will be used.
- Inspect washout structures daily to detect leaks or tears and to identify when materials need to be removed.
- Dispose of materials properly. The preferred method is to allow the water to evaporate and to recycle the hardened concrete. Full service companies may provide dewatering services and should dispose of wastewater properly. Concrete wash water can be highly polluted. It should not be discharged to any surface water, storm sewer system, or allowed to infiltrate into the ground in the vicinity of waterbodies. Washwater should not be discharged to a sanitary sewer system without first receiving written permission from the system operator.

- **Establish Proper Equipment/Vehicle Fueling and Maintenance Practices**. Create a clearly designated on-site fueling and maintenance area that is clean and dry. The on-site fueling area should have a spill kit, and staff should know how to use it. If possible, conduct vehicle fueling and maintenance activities in a covered area. Consider the following practices to help prevent the discharge of pollutants to stormwater from equipment/vehicle fueling and maintenance. Include the locations of designated fueling and maintenance areas and inspection and maintenance procedures in the SWMP.
  - Train employees and subcontractors in proper fueling procedures (stay with vehicles during fueling, proper use of pumps, emergency shutoff valves, etc.).
  - Inspect on-site vehicles and equipment regularly for leaks, equipment damage, and other service problems.
  - Clearly designate vehicle/equipment service areas away from drainage facilities and watercourses to prevent stormwater run-on and runoff.
  - Use drip pans, drip cloths, or absorbent pads when replacing spent fluids.
  - Collect all spent fluids, store in appropriate labeled containers in the proper storage areas, and recycle fluids whenever possible.

- **Control Equipment/Vehicle Washing and Allowable Non-Stormwater Discharges.** Implement practices to prevent contamination of surface and groundwater from equipment and vehicle wash water. Representative practices include:
  - Educate employees and subcontractors on proper washing procedures.
  - Use off-site washing facilities, when available.
  - Clearly mark the washing areas and inform workers that all washing must occur in this area.
  - Contain wash water and treat it using BMPs. Infiltrate washwater when possible, but maintain separation from drainage paths and waterbodies.

- Use high-pressure water spray at vehicle washing facilities without detergents. Water alone can remove most dirt adequately.
- Do not conduct other activities, such as vehicle repairs, in the wash area.
- Include the location of the washing facilities and the inspection and maintenance procedures in the SWMP.

- **Develop a Spill Prevention and Response Plan.** Spill prevention and response procedures must be identified in the SWMP. Representative procedures include identifying ways to reduce the chance of spills, stop the source of spills, contain and clean up spills, dispose of materials contaminated by spills, and train personnel responsible for spill prevention and response. The plan should also specify material handling procedures and storage requirements and ensure that clear and concise spill cleanup procedures are provided and posted for areas in which spills may potentially occur. When developing a spill prevention plan, include the following:
  - Note the locations of chemical storage areas, storm drains, tributary drainage areas, surface waterbodies on or near the site, and measures to stop spills from leaving the site.
  - Provide proper handling and safety procedures for each type of waste. Keep Material Safety Data Sheets (MSDSs) for chemical used on site with the SWMP.
  - Establish an education program for employees and subcontractors on the potential hazards to humans and the environment from spills and leaks.
  - Specify how to notify appropriate authorities, such as police and fire departments, hospitals, or municipal sewage treatment facilities to request assistance. Emergency procedures and contact numbers should be provided in the SWMP and posted at storage locations.
  - Describe the procedures, equipment and materials for immediate cleanup of spills and proper disposal.
  - Identify personnel responsible for implementing the plan in the event of a spill. Update the spill prevention plan and clean up materials as changes occur to the types of chemicals stored and used at the facility.

Spill Prevention, Control, and Countermeasure (SPCC) Plan

Construction sites may be subject to 40 CFR Part 112 regulations that require the preparation and implementation of a SPCC Plan to prevent oil spills from aboveground and underground storage tanks. The facility is subject to this rule if it is a non-transportation-related facility that:

- Has a total storage capacity greater than 1,320 gallons or a completely buried storage capacity greater than 42,000 gallons.
- Could reasonably be expected to discharge oil in quantities that may be harmful to navigable waters of the United States and adjoining shorelines.

Furthermore, if the facility is subject to 40 CFR Part 112, the SWMP should reference the SPCC Plan. To find out more about SPCC Plans, see EPA's website on SPPC at www.epa.gov/oilspill/spcc.htm.

Reporting Oil Spills

In the event of an oil spill, contact the National Response Center toll free at 1-800-424- 8802 for assistance, or for more details, visit their website: www.nrc.uscg.mil.

Maintenance and Removal

Effective implementation of good housekeeping practices is dependent on clear designation of personnel responsible for supervising and implementing good housekeeping programs, such as site cleanup and disposal of trash and debris, hazardous material management and disposal, vehicle and equipment maintenance, and other practices. Emergency response "drills" may aid in emergency preparedness.

Checklists may be helpful in good housekeeping efforts.

Staging and storage areas require permanent stabilization when the areas are no longer being used for construction-related activities.

Construction-related materials, debris and waste must be removed from the construction site once construction is complete.

Design Details

See the following Fact Sheets for related Design Details:

MM-1 Concrete Washout Area

MM-2 Stockpile Management

SM-4 Vehicle Tracking Control

Design details are not necessary for other good housekeeping practices; however, be sure to designate where specific practices will occur on the appropriate construction drawings.

Silt Fence (SF) SC-1

Description

A silt fence is a woven geotextile fabric attached to wooden posts and trenched into the ground. It is designed as a sediment barrier to intercept sheet flow runoff from disturbed areas.

Photograph SF-1. Silt fence creates a sediment barrier, forcing sheet flow runoff to evaporate or infiltrate.

Appropriate Uses

A silt fence can be used where runoff is conveyed from a disturbed area as sheet flow. Silt fence is not designed to receive concentrated flow or to be used as a filter fabric. Typical uses include:

- Down slope of a disturbed area to accept sheet flow.
- Along the perimeter of a receiving water such as a stream, pond or wetland.
- At the perimeter of a construction site.

Design and Installation

Silt fence should be installed along the contour of slopes so that it intercepts sheet flow. The maximum recommended tributary drainage area per 100 lineal feet of silt fence, installed along the contour, is approximately 0.25 acres with a disturbed slope length of up to 150 feet and a tributary slope gradient no steeper than 3:1. Longer and steeper slopes require additional measures. This recommendation only applies to silt fence installed along the contour. Silt fence installed for other uses, such as perimeter control, should be installed in a way that will not produce concentrated flows. For example, a "J-hook" installation may be appropriate to force runoff to pond and evaporate or infiltrate in multiple areas rather than concentrate and cause erosive conditions parallel to the silt fence.

See Detail SF-1 for proper silt fence installation, which involves proper trenching, staking, securing the fabric to the stakes, and backfilling the silt fence. Properly installed silt fence should not be easily pulled out by hand and there should be no gaps between the ground and the fabric.

Silt fence must meet the minimum allowable strength requirements, depth of installation requirement, and other specifications in the design details. Improper installation of silt fence is a common reason for silt fence failure; however, when properly installed and used for the appropriate purposes, it can be highly effective.

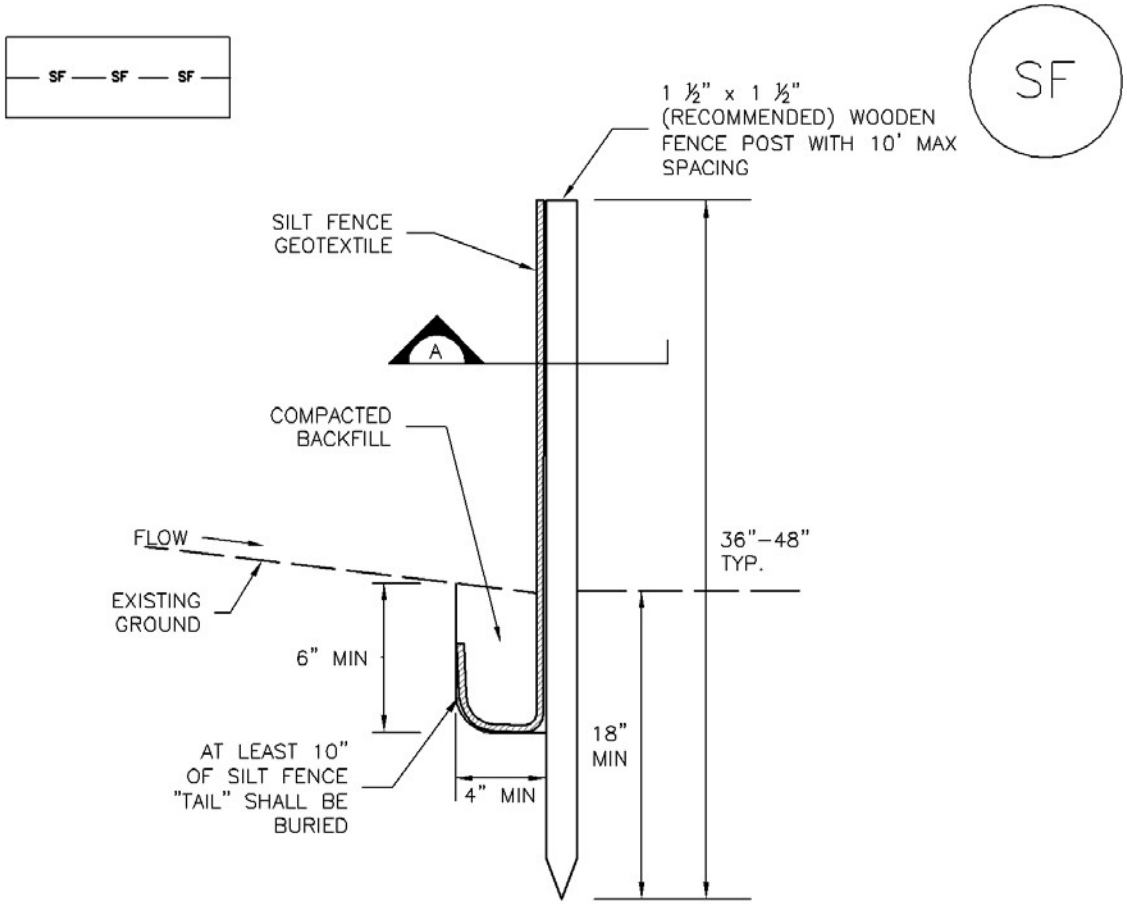
Silt Fence	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

Maintenance and Removal

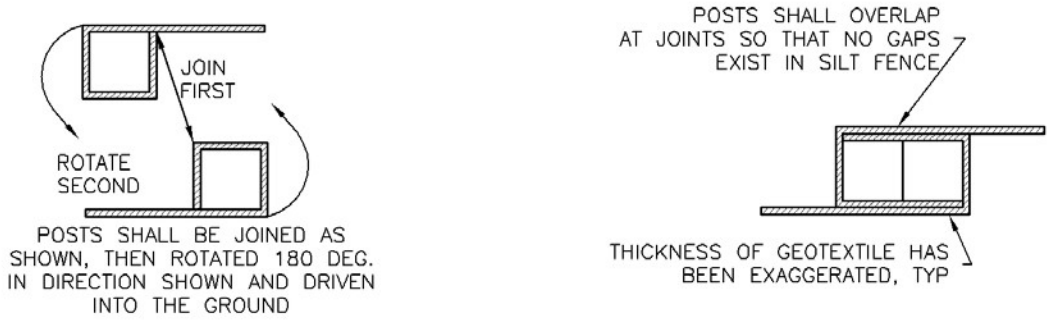
Inspection of silt fence includes observing the material for tears or holes and checking for slumping fence and undercut areas bypassing flows. Repair of silt fence typically involves replacing the damaged section with a new section. Sediment accumulated behind silt fence should be removed, as needed to maintain BMP effectiveness, typically before it reaches a depth of 6 inches.

Silt fence may be removed when the upstream area has reached final stabilization.

Photograph SF-2. When silt fence is not installed along the contour, a "J-hook" installation may be appropriate to ensure that the BMP does not create concentrated flow parallel to the silt fence. Photo courtesy of Tom Gore.



SILT FENCE



SECTION A

SF–1. SILT FENCE

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2–5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.

2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.

3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.

4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.

5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.

6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J–HOOK." THE "J–HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' – 20').

7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".

5. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.

6. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.

7. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Sediment Control Log (SCL) SC-2

Description

A sediment control log is a linear roll made of natural materials such as straw, coconut fiber, or compost. The most common type of sediment control log has straw filling and is often referred to as a "straw wattle." All sediment control logs are used as a sediment barrier to intercept sheet flow runoff from disturbed areas.

Photographs SCL-1 and SCL-2. Sediment control logs used as 1) a perimeter control around a soil stockpile; and, 2) as a "J-hook" perimeter control at the corner of a construction site.

Appropriate Uses

Sediment control logs can be used in the following applications to trap sediment:

- As perimeter control for stockpiles and the site.
- As part of inlet protection designs.
- As check dams in small drainage ditches. (Sediment control logs are not intended for use in channels with high flow velocities.)
- On disturbed slopes to shorten flow lengths (as an erosion control).
- As part of multi-layered perimeter control along a receiving water such as a stream, pond or wetland.

Sediment control logs work well in combination with other layers of erosion and sediment controls.

Design and Installation

Sediment control logs should be installed along the contour to avoid concentrating flows. The maximum allowable tributary drainage area per 100 lineal feet of sediment control log, installed along the contour, is approximately 0.25 acres with a disturbed slope length of up to 150 feet and a tributary slope gradient no steeper than 3:1. Longer and steeper slopes require additional measures. This recommendation only applies to sediment control logs installed along the contour. When installed for other uses, such as perimeter control, it should be installed in a way that will not produce concentrated flows. For example, a "J-hook" installation may be appropriate to force runoff to pond and evaporate or infiltrate in multiple areas rather than concentrate and cause erosive conditions parallel to the BMP.

Sediment Control Log	
Functions	
Erosion Control	Moderate
Sediment Control	Yes
Site/Material Management	No

Although sediment control logs initially allow runoff to flow through the BMP, they can quickly become a barrier and should be installed as if they are impermeable.

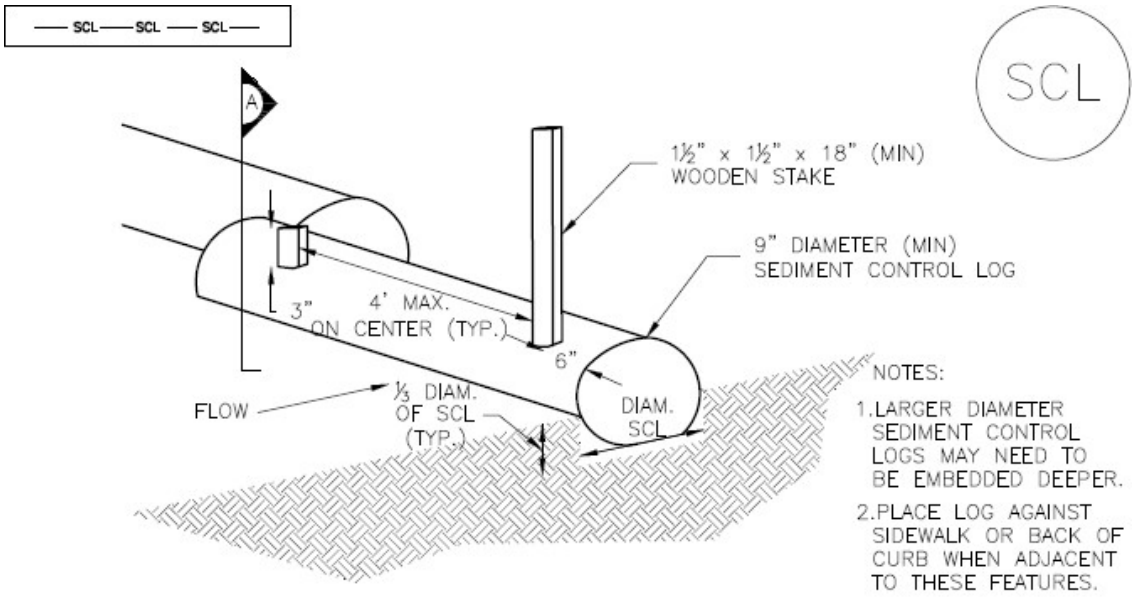
Design details and notes for sediment control logs are provided in the following details. Sediment logs must be properly installed per the detail to prevent undercutting, bypassing and displacement. When installed on slopes, sediment control logs should be installed along the contours (i.e., perpendicular to flow).

Improper installation can lead to poor performance. Be sure that sediment control logs are properly trenched (if lighter than 8 lb/foot), anchored and tightly jointed.

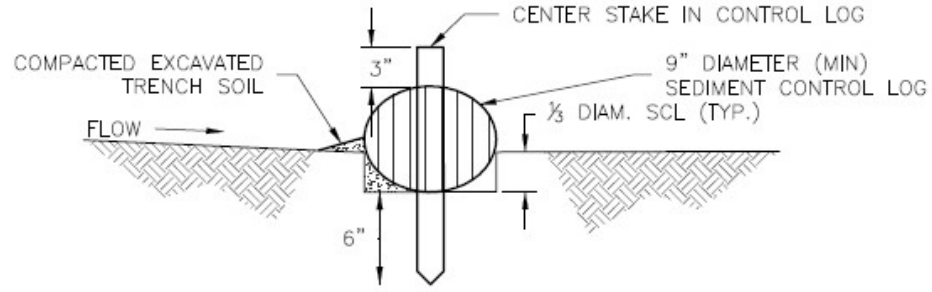
Maintenance and Removal

Be aware that sediment control logs will eventually degrade. Remove accumulated sediment before the depth is one-half the height of the sediment log and repair damage to the sediment log, typically by replacing the damaged section.

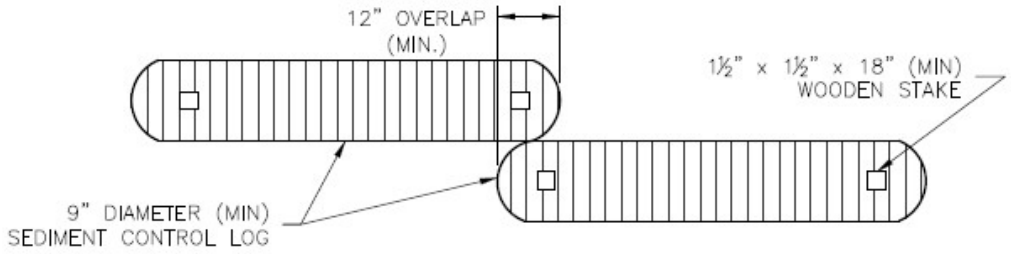
Once the upstream area is stabilized, remove and properly dispose of the logs. Areas disturbed beneath the logs may need to be seeded and mulched. Sediment control logs that are biodegradable may occasionally be left in place (e.g., when logs are used in conjunction with erosion control blankets as permanent slope breaks). However, removal of sediment control logs after final stabilization is typically appropriate when used in perimeter control, inlet protection and check dam applications. Compost from compost sediment control logs may be spread over the area and seeded as long as this does not cover newly established vegetation.



TRENCHED SEDIMENT CONTROL LOG

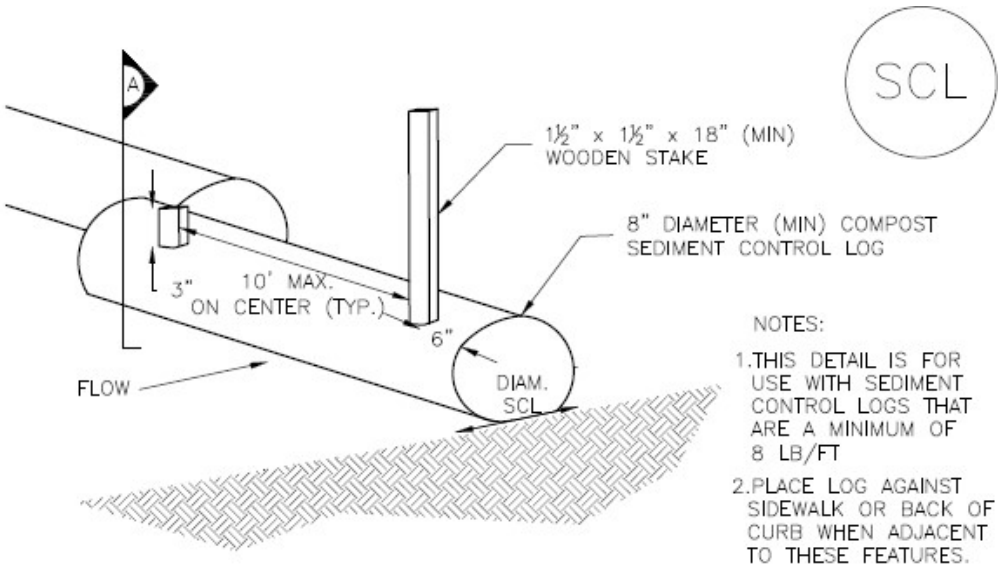


SECTION Ⓐ
TRENCHED SEDIMENT CONTROL LOG

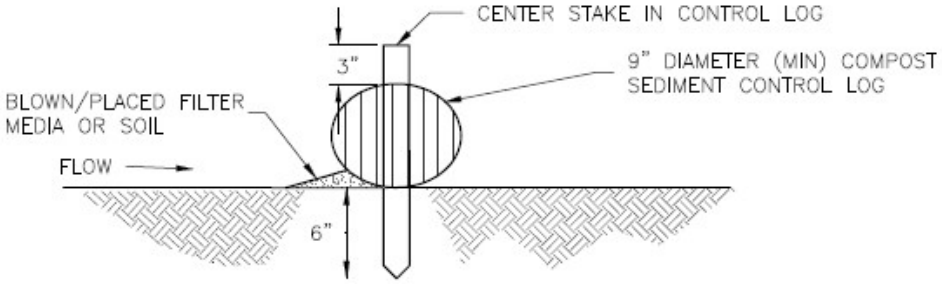


LOG JOINTS

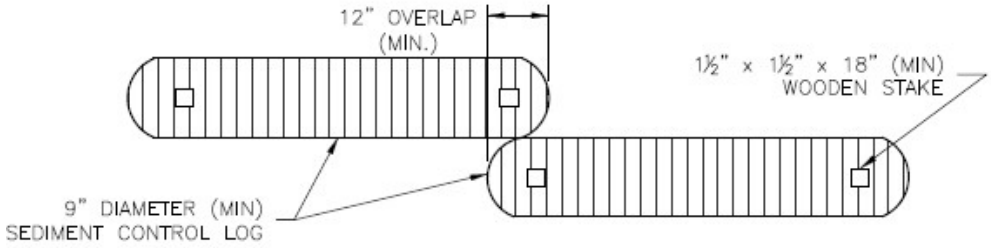
SCL–1. TRENCHED SEDIMENT CONTROL LOG



COMPOST SEDIMENT CONTROL LOG (WEIGHTED)

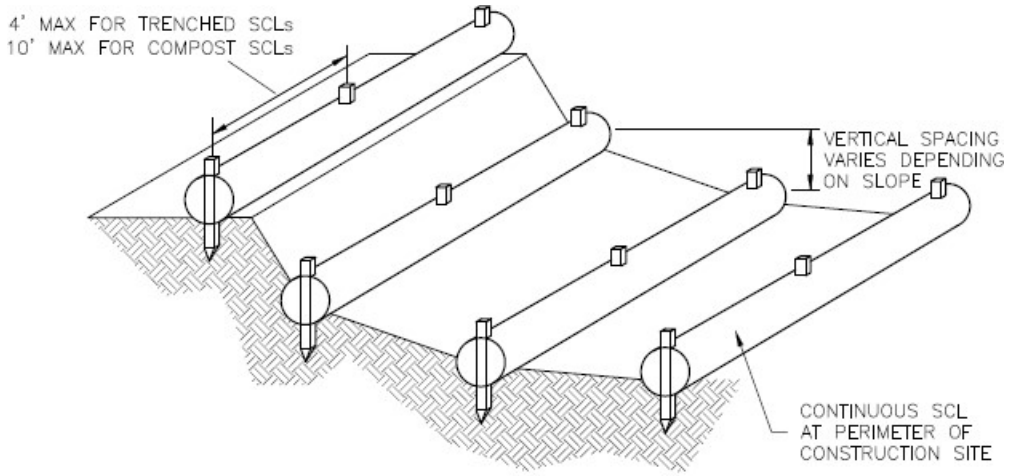


SECTION (A)
COMPOST SEDIMENT CONTROL LOG



LOG JOINTS

SCL–2. COMPOST SEDIMENT CONTROL LOG (WEIGHTED)



SCL–3. SEDIMENT CONTROL LOGS TO CONTROL SLOPE LENGTH

SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION AND LENGTH OF SEDIMENT CONTROL LOGS.

2. SEDIMENT CONTROL LOGS THAT ACT AS A PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND–DISTURBING ACTIVITIES.

3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE OF ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.

4. SEDIMENT CONTROL LOGS MAY BE USED AS SMALL CHECK DAMS IN DITCHES AND SWALES. HOWEVER, THEY SHOULD NOT BE USED IN PERENNIAL STREAMS.

5. IT IS RECOMMENDED THAT SEDIMENT CONTROL LOGS BE TRENCHED INTO THE GROUND TO A DEPTH OF APPROXIMATELY ⅓ OF THE DIAMETER OF THE LOG. IF TRENCHING TO THIS DEPTH IS NOT FEASIBLE AND/OR DESIRABLE (SHORT TERM INSTALLATION WITH DESIRE NOT TO DAMAGE LANDSCAPE) A LESSER TRENCHING DEPTH MAY BE ACCEPTABLE WITH MORE ROBUST STAKING. COMPOST LOGS THAT ARE 8 LB/FT DO NOT NEED TO BE TRENCHED.

6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL OR FILTER MATERIAL THAT IS FREE OF ROCKS AND DEBRIS. THE SOIL SHALL BE TIGHTLY COMPACTED INTO THE SHAPE OF A RIGHT TRIANGLE USING A SHOVEL OR WEIGHTED LAWN ROLLER OR BLOWN IN PLACE.

7. FOLLOW MANUFACTURERS' GUIDANCE FOR STAKING. IF MANUFACTURERS' INSTRUCTIONS DO NOT SPECIFY SPACING, STAKES SHALL BE PLACED ON 4' CENTERS AND EMBEDDED A MINIMUM OF 6" INTO THE GROUND. 3" OF THE STAKE SHALL PROTRUDE FROM THE TOP OF THE LOG. STAKES THAT ARE BROKEN PRIOR TO INSTALLATION SHALL BE REPLACED. COMPOST LOGS SHOULD BE STAKED 10' ON CENTER.

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.

5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION.COMPOST FROM COMPOST LOGS MAY BE LEFT IN PLACE AS LONG AS BAGS ARE REMOVED AND THE AREA SEEDED. IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, JEFFERSON COUNTY, COLORADO, DOUGLAS COUNTY, COLORADO, AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Sediment Basin (SB) SC-7

Description

A sediment basin is a temporary pond built on a construction site to capture eroded or disturbed soil transported in storm runoff prior to discharge from the site. Sediment basins are designed to capture site runoff and slowly release it to allow time for settling of sediment prior to discharge. Sediment basins are often constructed in locations that will later be modified to serve as post-construction stormwater basins.

Photograph SB-1. Sediment basin at the toe of a slope. Photo courtesy of WWE.

Appropriate Uses

Most large construction sites (typically greater than 2 acres) will require one or more sediment basins for effective management of construction site runoff. On linear construction projects, sediment basins may be impractical; instead, sediment traps or other combinations of BMPs may be more appropriate.

Sediment basins should not be used as stand-alone sediment controls. Erosion and other sediment controls should also be implemented upstream.

When feasible, the sediment basin should be installed in the same location where a permanent post-construction detention pond will be located.

Design and Installation

The design procedure for a sediment basin includes these steps:

- **Basin Storage Volume**: Provide a storage volume of at least 3,600 cubic feet per acre of drainage area. To the extent practical, undisturbed and/or off-site areas should be diverted around sediment basins to prevent "clean" runoff from mixing with runoff from disturbed areas. For undisturbed areas (both on-site and off-site) that cannot be diverted around the sediment basin, provide a minimum of 500 ft^3/acre of storage for undeveloped (but stable) off-site areas in addition to the 3,600 ft^3/acre for disturbed areas. For stable, developed areas that cannot be diverted around the sediment basin, storage volume requirements are summarized in Table SB-1.

- **Basin Geometry:** Design basin with a minimum length-to-width ratio of 2:1 (L:W). If this cannot be achieved because of site space constraints, baffling may be required to extend the effective distance between the inflow point(s) and the outlet to minimize short-circuiting.

- **Dam Embankment**: It is recommended that embankment slopes be 4:1 (H:V) or flatter and no steeper than 3:1 (H:V) in any location.

Sediment Basins	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No

- **Inflow Structure**: For concentrated flow entering the basin, provide energy dissipation at the point of inflow.

Table SB-1. Additional Volume Requirements for Undisturbed and Developed Tributary Areas Draining through Sediment Basins

Imperviousness (%)	Additional Storage Volume (ft^3) Per Acre of Tributary Area
Undeveloped	500
10	800
20	1230
30	1600
40	2030
50	2470
60	2980
70	3560
80	4360
90	5300
100	6460

- **Outlet Works**: The outlet pipe shall extend through the embankment at a minimum slope of 0.5 percent. Outlet works can be designed using one of the following approaches:

  - **Riser Pipe (Simplified Detail):** Detail SB-1 provides a simplified design for basins treating no more than 15 acres.

  - **Orifice Plate or Riser Pipe**: Follow the design criteria for Full Spectrum Detention outlets in the EDB Fact Sheet provided in Chapter 4 of this manual for sizing of outlet perforations with an emptying time of approximately 72 hours. In lieu of the trash rack, pack uniformly sized 1½ - to 2-inch gravel in front of the plate or surrounding the riser pipe. This gravel will need to be cleaned out frequently during the construction period as sediment accumulates within it. The gravel pack will need to be removed and disposed of following construction to reclaim the basin for use as a permanent detention facility. If the basin will be used as a permanent extended detention basin for the site, a trash rack will need to be installed once contributing drainage areas have been stabilized and the gravel pack and accumulated sediment have been removed.

  - **Floating Skimmer**: If a floating skimmer is used, install it using manufacturer's recommendations. Illustration SB-1 provides an illustration of a Faircloth Skimmer Floating Outlet™, one of the more commonly used floating skimmer outlets. A skimmer should be designed to release the design volume in no less than 48 hours. The use of a floating skimmer outlet can increase the sediment capture efficiency of a basin significantly. A floating outlet continually decants cleanest water off the surface of the pond and releases cleaner water than would discharge from a perforated riser pipe or plate.

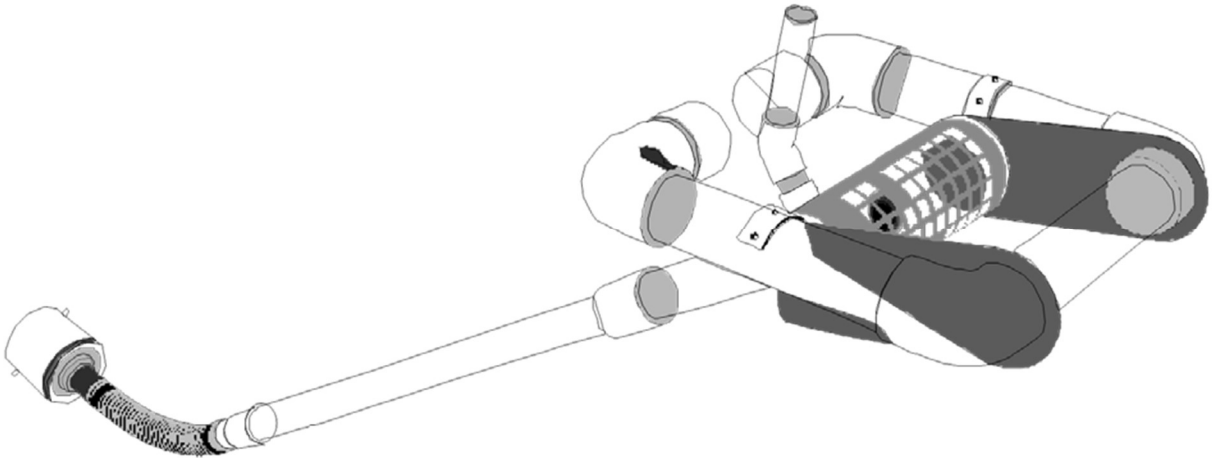


Illustration SB-1. Outlet structure for a temporary sediment basin - Faircloth Skimmer Floating Outlet. Illustration courtesy of J. W. Faircloth & Sons, Inc., FairclothSkimmer.com.

- **Outlet Protection and Spillway:** Consider all flow paths for runoff leaving the basin, including protection at the typical point of discharge as well as overtopping.
  - **Outlet Protection:** Outlet protection should be provided where the velocity of flow will exceed the maximum permissible velocity of the material of the waterway into which discharge occurs. This may require the use of a riprap apron at the outlet location and/or other measures to keep the waterway from eroding.
  - **Emergency Spillway:** Provide a stabilized emergency overflow spillway for rainstorms that exceed the capacity of the sediment basin volume and its outlet. Protect basin embankments from erosion and overtopping. If the sediment basin will be converted to a permanent detention basin, design and construct the emergency spillway(s) as required for the permanent facility. If the sediment basin will not become a permanent detention basin, it may be possible to substitute a heavy polyvinyl membrane or properly bedded rock cover to line the spillway and downstream embankment, depending on the height, slope, and width of the embankments.

Maintenance and Removal

Maintenance activities include the following:

- Dredge sediment from the basin, as needed to maintain BMP effectiveness, typically when the design storage volume is no more than one-third filled with sediment.
- Inspect the sediment basin embankments for stability and seepage.
- Inspect the inlet and outlet of the basin, repair damage, and remove debris. Remove, clean and replace the gravel around the outlet on a regular basis to remove the accumulated sediment within it and keep the outlet functioning.
- Be aware that removal of a sediment basin may require dewatering and associated permit requirements.
- Do not remove a sediment basin until the upstream area has been stabilized with vegetation.

Final disposition of the sediment basin depends on whether the basin will be converted to a permanent post-construction stormwater basin or whether the basin area will be returned to grade. For basins being converted to permanent detention basins, remove accumulated sediment and reconfigure the basin and outlet to meet the requirements of the final design for the detention facility. If the sediment basin is not to be used as a permanent detention facility, fill the excavated area with soil and stabilize with vegetation.

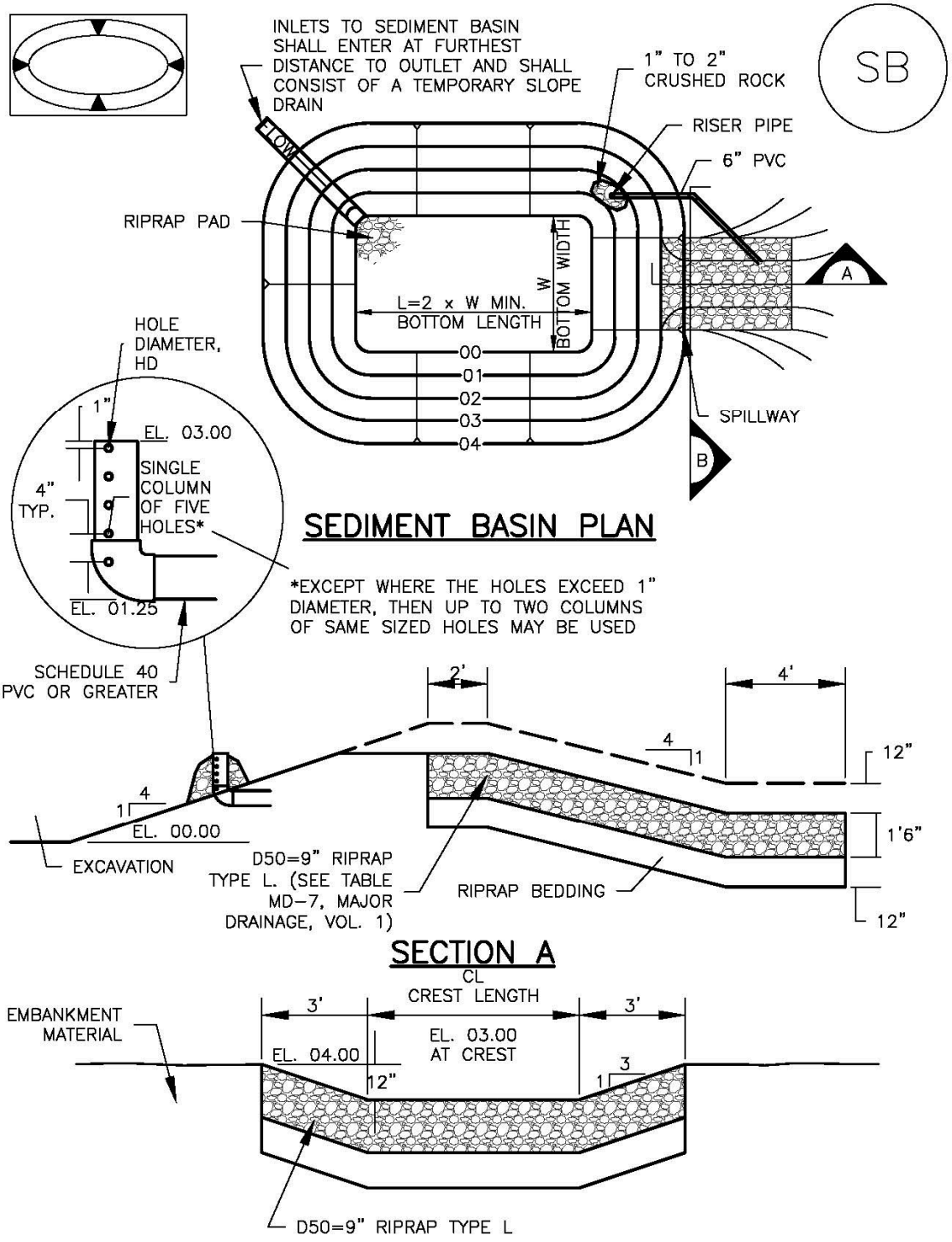

INLETS TO SEDIMENT BASIN SHALL ENTER AT FURTHEST DISTANCE TO OUTLET AND SHALL CONSIST OF A TEMPORARY SLOPE DRAIN
FLOW
1" TO 2" CRUSHED ROCK
SB
RISER PIPE
6" PVC
RIPRAP PAD
W BOTTOM WIDTH
L=2 x W MIN. BOTTOM LENGTH
00
01
02
03
04
A
B
SPILLWAY
HOLE DIAMETER, HD
1"
EL. 03.00
SINGLE COLUMN OF FIVE HOLES*
4" TYP.
EL. 01.25
SEDIMENT BASIN PLAN
*EXCEPT WHERE THE HOLES EXCEED 1" DIAMETER, THEN UP TO TWO COLUMNS OF SAME SIZED HOLES MAY BE USED
SCHEDULE 40 PVC OR GREATER
2'
4'
4
1
12"
4
1
EL. 00.00
1'6"
EXCAVATION
D50=9" RIPRAP TYPE L. (SEE TABLE MD-7, MAJOR DRAINAGE, VOL. 1)
RIPRAP BEDDING
12"
SECTION A
CL
CREST LENGTH
3'
3'
EMBANKMENT MATERIAL
EL. 04.00
EL. 03.00 AT CREST
12"
3
1
D50=9" RIPRAP TYPE L

TABLE SB–1. SIZING INFORMATION FOR STANDARD SEDIMENT BASIN			
Upstream Drainage Area (rounded to nearest acre), (ac)	Basin Bottom Width (W), (ft)	Spillway Crest Length (CL), (ft)	Hole Diameter (HD), (in)
1	12 ½	2	9/32
2	21	3	13/16
3	28	5	½
4	33 ½	6	9/16
5	38 ½	8	21/32
6	43	9	21/32
7	47 ¼	11	25/32
8	51	12	27/32
9	55	13	⅞
10	58 ¼	15	15/16
11	61	16	31/32
12	64	18	1
13	67 ½	19	1 1/16
14	70 ½	21	1 ⅛
15	73 ¼	22	1 3/16

SEDIMENT BASIN INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - –LOCATION OF SEDIMENT BASIN.
   - –TYPE OF BASIN (STANDARD BASIN OR NONSTANDARD BASIN).
   - –FOR STANDARD BASIN, BOTTOM WIDTH W, CREST LENGTH CL, AND HOLE DIAMETER, HD.
   - –FOR NONSTANDARD BASIN, SEE CONSTRUCTION DRAWINGS FOR DESIGN OF BASIN INCLUDING RISER HEIGHT H, NUMBER OF COLUMNS N, HOLE DIAMETER HD AND PIPE DIAMETER D.

2. FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.

3. SEDIMENT BASINS SHALL BE INSTALLED PRIOR TO ANY OTHER LAND–DISTURBING ACTIVITY THAT RELIES ON ON BASINS AS AS A STORMWATER CONTROL.

4. EMBANKMENT MATERIAL SHALL CONSIST OF SOIL FREE OF DEBRIS, ORGANIC MATERIAL, AND ROCKS OR CONCRETE GREATER THAN 3 INCHES AND SHALL HAVE A MINIMUM OF 15 PERCENT BY WEIGHT PASSING THE NO. 200 SIEVE.

5. EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.

6. PIPE SCH 40 OR GREATER SHALL BE USED.

7. THE DETAILS SHOWN ON THESE SHEETS PERTAIN TO STANDARD SEDIMENT BASIN(S) FOR DRAINAGE AREAS LESS THAN 15 ACRES. SEE CONSTRUCTION DRAWINGS FOR EMBANKMENT, STORAGE VOLUME, SPILLWAY, OUTLET, AND OUTLET PROTECTION DETAILS FOR ANY SEDIMENT BASIN(S) THAT HAVE BEEN INDIVIDUALLY DESIGNED FOR DRAINAGE AREAS LARGER THAN 15 ACRES.

SEDIMENT BASIN MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED IN BASIN SHALL BE REMOVED AS NEEDED TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN SEDIMENT DEPTH REACHES ONE FOOT (I.E., TWO FEET BELOW THE SPILLWAY CREST).

5. SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS ACCEPTED BY THE LOCAL JURISDICTION.

6. WHEN SEDIMENT BASINS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Construction Phasing/Sequencing (CP) SM-1

Description

Photograph CP-1. Construction phasing to avoid disturbing the entire area at one time. Photo courtesy of WWE.

Effective construction site management to minimize erosion and sediment transport includes attention to construction phasing, scheduling, and sequencing of land disturbing activities. On most construction projects, erosion and sediment controls will need to be adjusted as the project progresses and should be documented in the SWMP.

Construction phasing refers to disturbing only part of a site at a time to limit the potential for erosion from dormant parts of a site. Grading activities and construction are completed and soils are effectively stabilized on one part of a site before grading and construction begins on another portion of the site.

Construction sequencing or scheduling refers to a specified work schedule that coordinates the timing of land disturbing activities and the installation of erosion and sediment control practices.

Appropriate Uses

All construction projects can benefit from upfront planning to phase and sequence construction activities to minimize the extent and duration of disturbance. Larger projects and linear construction projects may benefit most from construction sequencing or phasing, but even small projects can benefit from construction sequencing that minimizes the duration of disturbance.

Typically, erosion and sediment controls needed at a site will change as a site progresses through the major phases of construction. Erosion and sediment control practices corresponding to each phase of construction must be documented in the SWMP.

Design and Installation

BMPs appropriate to the major phases of development should be identified on construction drawings. In some cases, it will be necessary to provide several drawings showing construction-phase BMPs placed according to stages of development (e.g., clearing and grading, utility installation, active construction, final stabilization). Some municipalities in the Denver area set maximum sizes for disturbed area associated with phases of a construction project. Additionally, requirements for phased construction drawings vary among local governments within the UDFCD boundary. Some local governments require separate erosion and sediment control drawings for initial BMPs, interim conditions (in active construction), and final stabilization.

Construction Scheduling	
Functions	
Erosion Control	Moderate
Sediment Control	Moderate
Site/Material Management	Yes

Typical construction phasing BMPs include:

- Limit the amount of disturbed area at any given time on a site to the extent practical. For example, a 100-acre subdivision might be constructed in five phases of 20 acres each.
- If there is carryover of stockpiled material from one phase to the next, position carryover material in a location easily accessible for the pending phase that will not require disturbance of stabilized areas to access the stockpile. Particularly with regard to efforts to balance cut and fill at a site, careful planning for location of stockpiles is important.

Typical construction sequencing BMPs include:

- Sequence construction activities to minimize duration of soil disturbance and exposure. For example, when multiple utilities will occupy the same trench, schedule installation so that the trench does not have to be closed and opened multiple times.
- Schedule site stabilization activities (e.g., landscaping, seeding and mulching, installation of erosion control blankets) as soon as feasible following grading.
- Install initial erosion and sediment control practices before construction begins. Promptly install additional BMPs for inlet protection, stabilization, etc., as construction activities are completed.

Table CP-1 provides typical sequencing of construction activities and associated BMPs.

Maintenance and Removal

When the construction schedule is altered, erosion and sediment control measures in the SWMP and construction drawings should be appropriately adjusted to reflect actual "on the ground" conditions at the construction site. Be aware that changes in construction schedules can have significant implications for site stabilization, particularly with regard to establishment of vegetative cover.

Table CP-1. Typical Phased BMP Installation for Construction Projects

Project Phase	BMPs
Pre-disturbance, Site Access	▪ Install sediment controls downgradient of access point (on paved streets this may consist of inlet protection). ▪ Establish vehicle tracking control at entrances to paved streets. Fence as needed. ▪ Use construction fencing to define the boundaries of the project and limit access to areas of the site that are not to be disturbed. **Note: it may be necessary to protect inlets in the general vicinity of the site, even if not downgradient, if there is a possibility that sediment tracked from the site could contribute to the inlets.**
Site Clearing and Grubbing	□ Install perimeter controls as needed on downgradient perimeter of site (silt fence, wattles, etc). □ Limit disturbance to those areas planned for disturbance and protect undisturbed areas within the site (construction fence, flagging, etc). □ Preserve vegetative buffer at site perimeter. □ Create stabilized staging area. □ Locate portable toilets on flat surfaces away from drainage paths. Stake in areas susceptible to high winds. □ Construct concrete washout area and provide signage. □ Establish waste disposal areas. □ Install sediment basins. □ Create dirt perimeter berms and/or brush barriers during grubbing and clearing. □ Separate and stockpile topsoil, leave roughened and/or cover. □ Protect stockpiles with perimeter control BMPs. Stockpiles should be located away from drainage paths and should be accessed from the upgradient side so that perimeter controls can remain in place on the downgradient side. Use erosion control blankets, temporary seeding, and/or mulch for stockpiles that will be inactive for an extended period. □ Leave disturbed area of site in a roughened condition to limit erosion. Consider temporary revegetation for areas of the site that have been disturbed but that will be inactive for an extended period. □ Water to minimize dust but not to the point that watering creates runoff.

Project Phase	BMPs
Utility And Infrastructure Installation	**In Addition to the Above BMPs:** ▪ Close trench as soon as possible (generally at the end of the day). ▪ Use rough-cut street control or apply road base for streets that will not be promptly paved. ▪ Provide inlet protection as streets are paved and inlets are constructed. ▪ Protect and repair BMPs, as necessary. ▪ Perform street sweeping as needed.
Building Construction	**In Addition to the Above BMPs:** ▪ Implement materials management and good housekeeping practices for home building activities. ▪ Use perimeter controls for temporary stockpiles from foundation excavations. ▪ For lots adjacent to streets, lot-line perimeter controls may be necessary at the back of curb.
Final Grading	**In Addition to the Above BMPs:** ▪ Remove excess or waste materials. ▪ Remove stored materials.
Final Stabilization	**In Addition to the Above BMPs:** ▪ Seed and mulch/tackify. ▪ Seed and install blankets on steep slopes. ▪ Remove all temporary BMPs when site has reached final stabilization.

Protection of Existing Vegetation (PV) SM-2

Description

Protection of existing vegetation on a construction site can be accomplished through installation of a construction fence around the area requiring protection. In cases where upgradient areas are disturbed, it may also be necessary to install perimeter controls to minimize sediment loading to sensitive areas such as wetlands. Existing vegetation may be designated for protection to maintain a stable surface cover as part of construction phasing, or vegetation may be protected in areas designated to remain in natural condition under post-development conditions (e.g., wetlands, mature trees, riparian areas, open space).

Photograph PV-1. Protection of existing vegetation and a sensitive area. Photo courtesy of CDOT.

Appropriate Uses

Existing vegetation should be preserved for the maximum practical duration on a construction site through the use of effective construction phasing. Preserving vegetation helps to minimize erosion and can reduce revegetation costs following construction.

Protection of wetland areas is required under the Clean Water Act, unless a permit has been obtained from the U.S. Army Corps of Engineers (USACE) allowing impacts in limited areas.

If trees are to be protected as part of post-development landscaping, care must be taken to avoid several types of damage, some of which may not be apparent at the time of injury. Potential sources of injury include soil compaction during grading or due to construction traffic, direct equipment-related injury such as bark removal, branch breakage, surface grading and trenching, and soil cut and fill. In order to minimize injuries that may lead to immediate or later death of the tree, tree protection zones should be developed during site design, implemented at the beginning of a construction project, as well as continued during active construction.

Design and Installation

General

Once an area has been designated as a preservation area, there should be no construction activity allowed within a set distance of the area. Clearly mark the area with construction fencing. Do not allow stockpiles, equipment, trailers or parking within the protected area. Guidelines to protect various types of existing vegetation follow.

Protection of Existing Vegetation	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material Management	Yes

Surface Cover During Phased Construction

Install construction fencing or other perimeter controls around areas to be protected from clearing and grading as part of construction phasing.

Maintaining surface cover on steep slopes for the maximum practical duration during construction is recommended.

Open Space Preservation

Where natural open space areas will be preserved as part of a development, it is important to install construction fencing around these areas to protect them from compaction. This is particularly important when areas with soils with high infiltration rates are preserved as part of LID designs. Preserved open space areas should not be used for staging and equipment storage.

Wetlands and Riparian Areas

Install a construction fence around the perimeter of the wetland or riparian (streamside vegetation) area to prevent access by equipment. In areas downgradient of disturbed areas, install a perimeter control such as silt fence, sediment control logs, or similar measure to minimize sediment loading to the wetland.

Tree Protection[1]

- Before beginning construction operations, establish a tree protection zone around trees to be preserved by installing construction fences. Allow enough space from the trunk to protect the root zone from soil compaction and mechanical damage, and the branches from mechanical damage (see Table PV-1). If low branches will be kept, place the fence outside of the drip line. Where this is not possible, place fencing as far away from the trunk as possible. In order to maintain a healthy tree, be aware that about 60 percent of the tree's root zone extends beyond the drip line.

Table PV-1
Guidelines for Determining the Tree Protection Zone
(Source: Matheny and Clark, 1998; as cited in GreenCO and WWE 2008)

	Distance from Trunk (ft) per inch of DBH		
Species Tolerance to Damage	*Young*	*Mature*	*Over mature*
Good	0.5'	0.75'	1.0'
Moderate	0.75'	1.0'	1.25'
Poor	1.0'	1.25'	1.5'
Notes: DBH = diameter at breast height (4.5 ft above grade); Young = <20% of life expectancy; Mature = 20%-80% of life expectancy; Over mature =>80% of life expectancy			

- Most tree roots grow within the top 12 to 18 inches of soil. Grade changes within the tree protection zone should be avoided where possible because seemingly minor grade changes can either smother

[1] Tree Protection guidelines adapted from GreenCO and WWE (2008). *Green Industry Best Management Practices (BMPs) for the Conservation and Protection of Water Resources in Colorado: Moving Toward Sustainability, Third Release*. See www.greenco.org for more detailed guidance on tree preservation.

roots (in fill situations) or damage roots (in cut situations). Consider small walls where needed to avoid grade changes in the tree protection zone.

- Place and maintain a layer of mulch 4 to 6-inch thick from the tree trunk to the fencing, keeping a 6-inch space between the mulch and the trunk. Mulch helps to preserve moisture and decrease soil compaction if construction traffic is unavoidable. When planting operations are completed, the mulch may be reused throughout planting areas.

- Limit access, if needed at all, and appoint one route as the main entrance and exit to the tree protection zone. Within the tree protection zone, do not allow any equipment to be stored, chemicals to be dumped, or construction activities to take place except fine grading, irrigation system installation, and planting operations. These activities should be conducted in consultation with a landscaping professional, following Green Industry BMPs.

- Be aware that soil compaction can cause extreme damage to tree health that may appear gradually over a period of years. Soil compaction is easier to prevent than repair.

Maintenance and Removal

Repair or replace damaged or displaced fencing or other protective barriers around the vegetated area.

If damage occurs to a tree, consult an arborist for guidance on how to care for the tree. If a tree in a designated preservation area is damaged beyond repair, remove and replace with a 2-inch diameter tree of the same or similar species.

Construction equipment must not enter a wetland area, except as permitted by the U.S. Army Corps of Engineers (USACE). Inadvertent placement of fill in a wetland is a 404 permit violation and will require notification of the USACE.

If damage to vegetation occurs in a protected area, reseed the area with the same or similar species, following the recommendations in the USDCM *Revegetation* chapter.

Construction Fence (CF) SM-3

Description

A construction fence restricts site access to designated entrances and exits, delineates construction site boundaries, and keeps construction out of sensitive areas such as natural areas to be preserved as open space, wetlands and riparian areas.

Photograph CF-1. A construction fence helps delineate areas where existing vegetation is being protected. Photo courtesy of Douglas County.

Appropriate Uses

A construction fence can be used to delineate the site perimeter and locations within the site where access is restricted to protect natural resources such as wetlands, waterbodies, trees, and other natural areas of the site that should not be disturbed.

If natural resource protection is an objective, then the construction fencing should be used in combination with other perimeter control BMPs such as silt fence, sediment control logs or similar measures.

Design and Installation

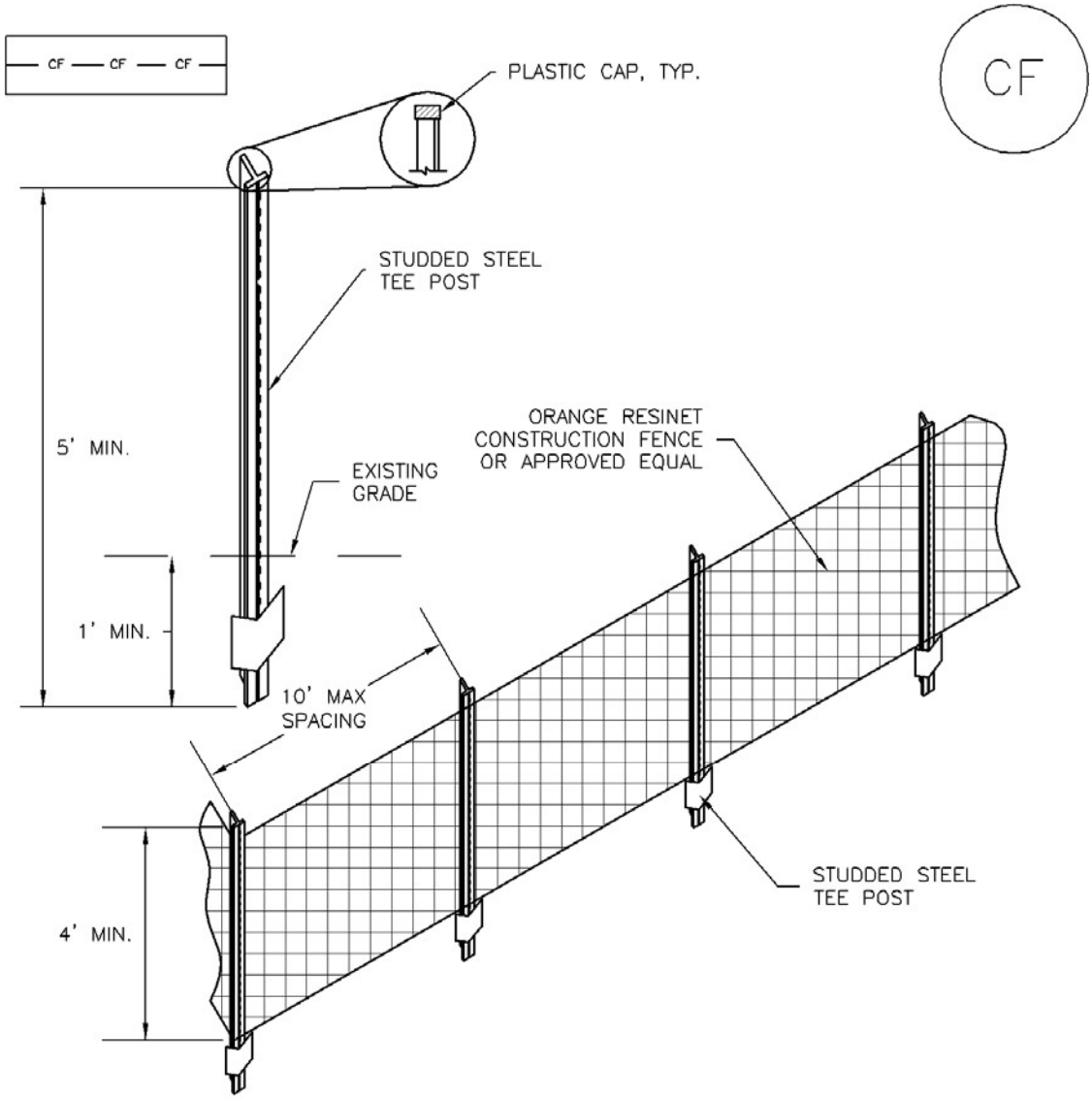
Construction fencing may be chain link or plastic mesh and should be installed following manufacturer's recommendations. See Detail CF-1 for typical installations.

Do not place construction fencing in areas within work limits of machinery.

Maintenance and Removal

- Inspect fences for damage; repair or replace as necessary.
- Fencing should be tight and any areas with slumping or fallen posts should be reinstalled.
- Fencing should be removed once construction is complete.

Construction Fence	
Functions	
Erosion Control	No
Sediment Control	No
Site/Material Management	Yes



CF–1. PLASTIC MESH CONSTRUCTION FENCE

CONSTRUCTION FENCE INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION OF CONSTRUCTION FENCE.

2. CONSTRUCTION FENCE SHOWN SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

3. CONSTRUCTION FENCE SHALL BE COMPOSED OF ORANGE, CONTRACTOR–GRADE MATERIAL THAT IS AT LEAST 4' HIGH. METAL POSTS SHOULD HAVE A PLASTIC CAP FOR SAFETY.

4. STUDDED STEEL TEE POSTS SHALL BE UTILIZED TO SUPPORT THE CONSTRUCTION FENCE. MAXIMUM SPACING FOR STEEL TEE POSTS SHALL BE 10'.

5. CONSTRUCTION FENCE SHALL BE SECURELY FASTENED TO THE TOP, MIDDLE, AND BOTTOM OF EACH POST.

CONSTRUCTION FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. CONSTRUCTION FENCE SHALL BE REPAIRED OR REPLACED WHEN THERE ARE SIGNS OF DAMAGE SUCH AS RIPS OR SAGS. CONSTRUCTION FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

5. WHEN CONSTRUCTION FENCES ARE REMOVED, ALL DISTURBED AREAS ASSOCIATED WITH THE INSTALLATION, MAINTENANCE, AND/OR REMOVAL OF THE FENCE SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

Vehicle Tracking Control (VTC) SM-4

Description

Vehicle tracking controls provide stabilized construction site access where vehicles exit the site onto paved public roads. An effective vehicle tracking control helps remove sediment (mud or dirt) from vehicles, reducing tracking onto the paved surface.

Photograph VTC-1. A vehicle tracking control pad constructed with properly sized rock reduces off-site sediment tracking.

Appropriate Uses

Implement a stabilized construction entrance or vehicle tracking control where frequent heavy vehicle traffic exits the construction site onto a paved roadway. An effective vehicle tracking control is particularly important during the following conditions:

- Wet weather periods when mud is easily tracked off site.
- During dry weather periods where dust is a concern.
- When poorly drained, clayey soils are present on site.

Although wheel washes are not required in designs of vehicle tracking controls, they may be needed at particularly muddy sites.

Design and Installation

Construct the vehicle tracking control on a level surface. Where feasible, grade the tracking control towards the construction site to reduce off-site runoff. Place signage, as needed, to direct construction vehicles to the designated exit through the vehicle tracking control. There are several different types of stabilized construction entrances including:

VTC-1. Aggregate Vehicle Tracking Control. This is a coarse-aggregate surfaced pad underlain by a geotextile. This is the most common vehicle tracking control, and when properly maintained can be effective at removing sediment from vehicle tires.

VTC-2. Vehicle Tracking Control with Construction Mat or Turf Reinforcement Mat. This type of control may be appropriate for site access at very small construction sites with low traffic volume over vegetated areas. Although this application does not typically remove sediment from vehicles, it helps protect existing vegetation and provides a stabilized entrance.

Vehicle Tracking Control	
Functions	
Erosion Control	Moderate
Sediment Control	Yes
Site/Material Management	Yes

VTC-3. Stabilized Construction Entrance/Exit with Wheel Wash. This is an aggregate pad, similar to VTC-1, but includes equipment for tire washing. The wheel wash equipment may be as simple as hand-held power washing equipment to more advance proprietary systems. When a wheel wash is provided, it is important to direct wash water to a sediment trap prior to discharge from the site.

Vehicle tracking controls are sometimes installed in combination with a sediment trap to treat runoff.

Maintenance and Removal

Inspect the area for degradation and replace aggregate or material used for a stabilized entrance/exit as needed. If the area becomes clogged and ponds water, remove and dispose of excess sediment or replace material with a fresh layer of aggregate as necessary.

With aggregate vehicle tracking controls, ensure rock and debris from this area do not enter the public right-of-way.

Remove sediment that is tracked onto the public right of way daily or more frequently as needed. Excess sediment in the roadway indicates that the stabilized construction entrance needs maintenance.

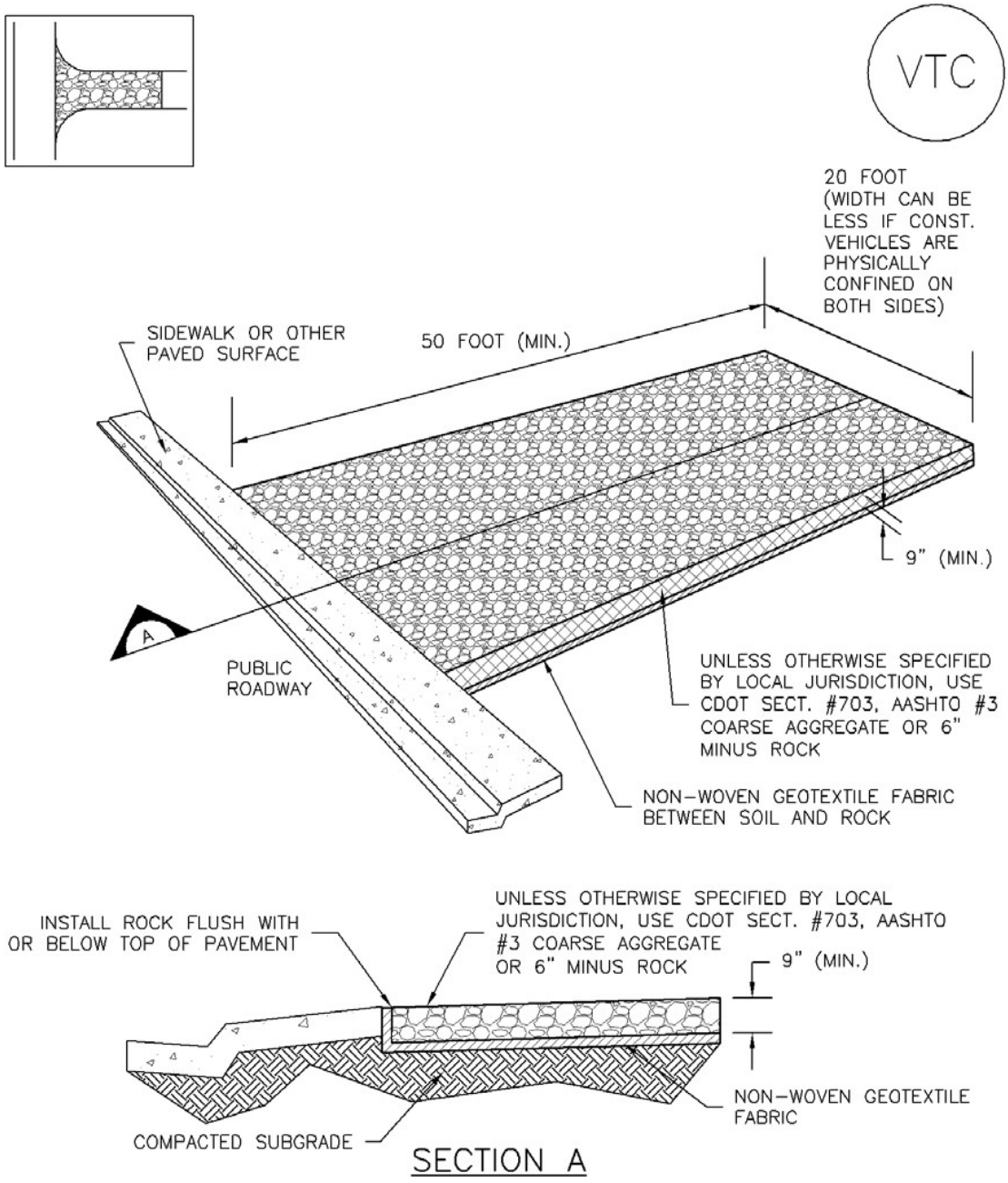
Ensure that drainage ditches at the entrance/exit area remain clear.

Photograph VTC-2. A vehicle tracking control pad with wheel wash facility. Photo courtesy of Tom Gore.

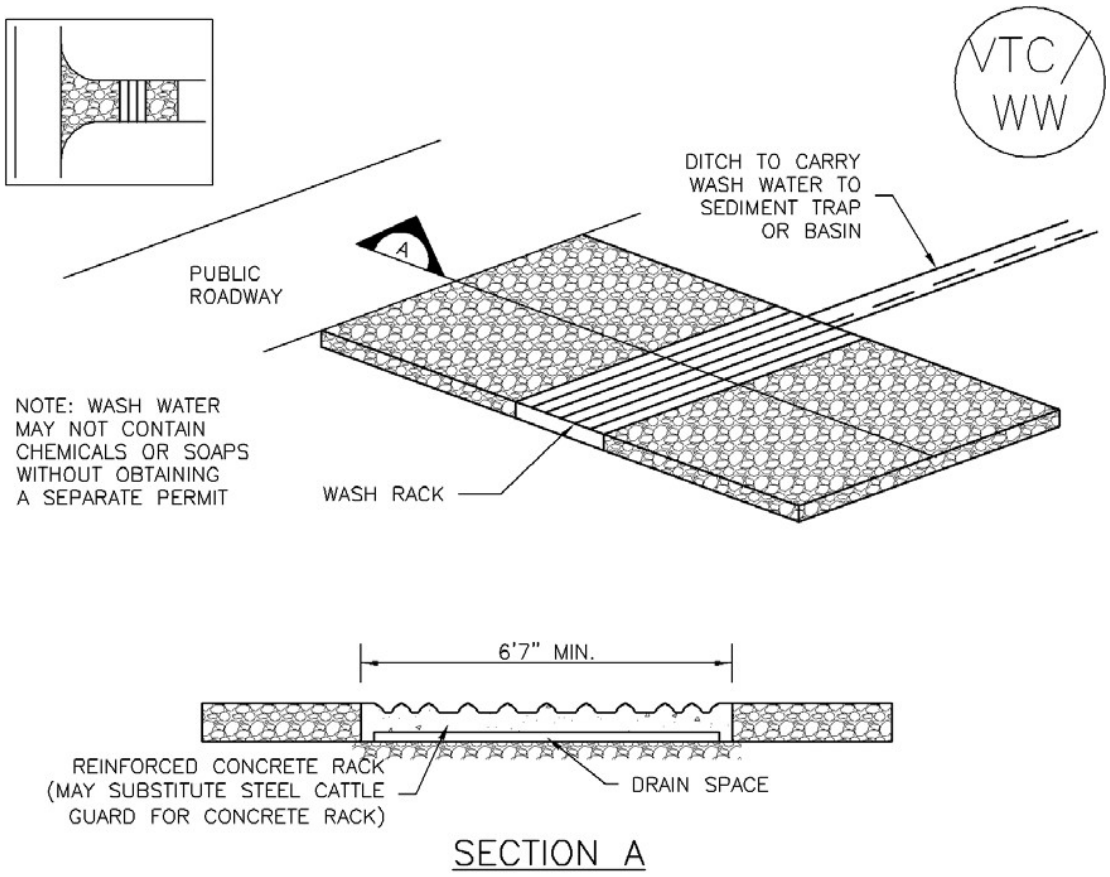
A stabilized entrance should be removed only when there is no longer the potential for vehicle tracking to occur. This is typically after the site has been stabilized.

When wheel wash equipment is used, be sure that the wash water is discharged to a sediment trap prior to discharge. Also inspect channels conveying the water from the wash area to the sediment trap and stabilize areas that may be eroding.

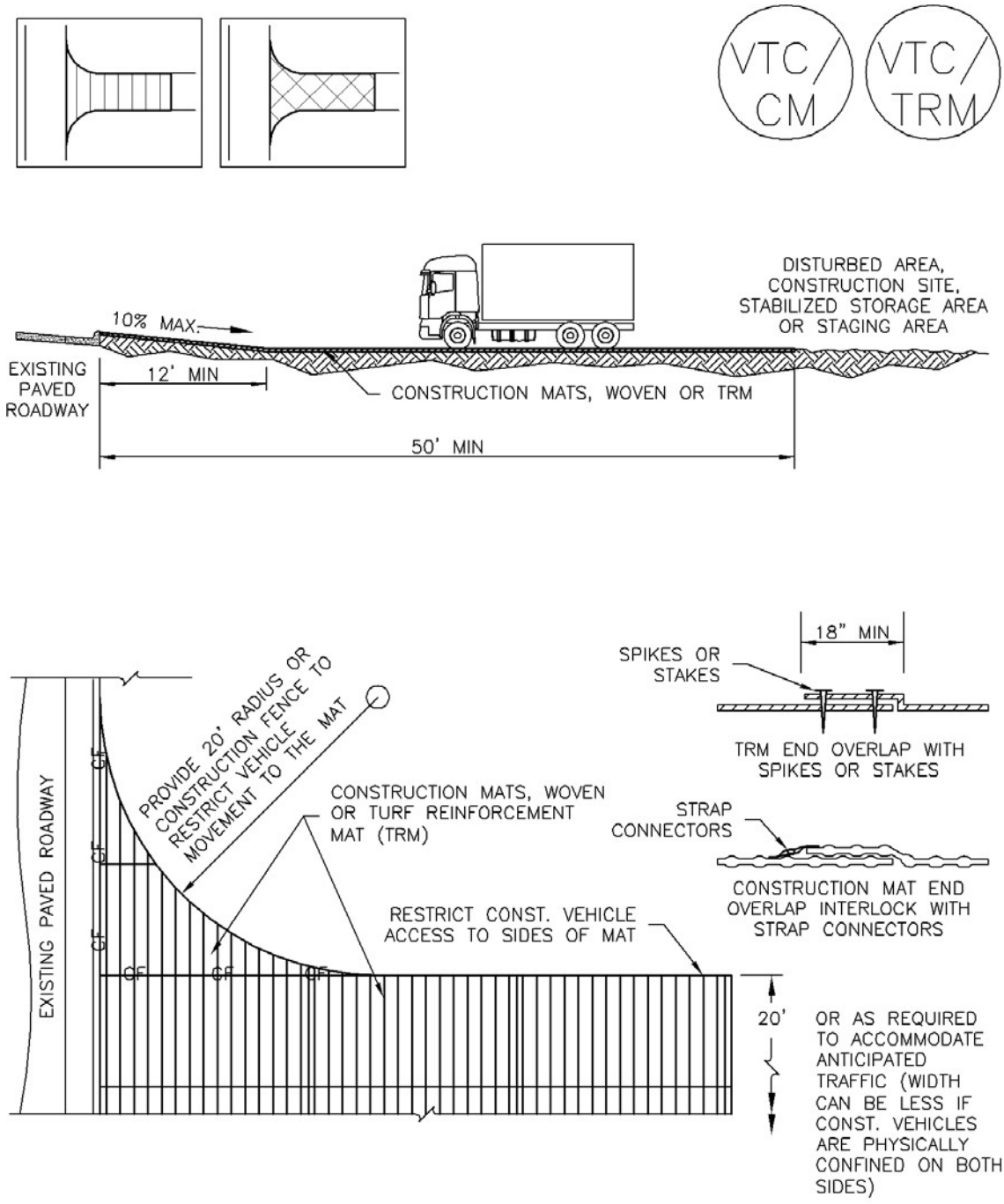
When a construction entrance/exit is removed, excess sediment from the aggregate should be removed and disposed of appropriately. The entrance should be promptly stabilized with a permanent surface following removal, typically by paving.



VTC-1. AGGREGATE VEHICLE TRACKING CONTROL



VTC–2. AGGREGATE VEHICLE TRACKING CONTROL WITH WASH RACK



VTC–3. VEHICLE TRACKING CONTROL W/ CONSTRUCTION MAT OR TURF REINFORCEMENT MAT (TRM)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   -LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S).
   -TYPE OF CONSTRUCTION ENTRANCE(S)/EXITS(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).

2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.

3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.

4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.

6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.

5. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM CITY OF BROOMFIELD, COLORADO, NOT AVAILABLE IN AUTOCAD)

Stabilized Staging Area (SSA) SM-6

Description

A stabilized staging area is a clearly designated area where construction equipment and vehicles, stockpiles, waste bins, and other construction-related materials are stored. The contractor office trailer may also be located in this area. Depending on the size of the construction site, more than one staging area may be necessary.

Photograph SSA-1. Example of a staging area with a gravel surface to prevent mud tracking and reduce runoff. Photo courtesy of Douglas County.

Appropriate Uses

Most construction sites will require a staging area, which should be clearly designated in SWMP drawings. The layout of the staging area may vary depending on the type of construction activity. Staging areas located in roadways due to space constraints require special measures to avoid materials being washed into storm inlets.

Design and Installation

Stabilized staging areas should be completed prior to other construction activities beginning on the site. Major components of a stabilized staging area include:

- Appropriate space to contain storage and provide for loading/unloading operations, as well as parking if necessary.
- A stabilized surface, either paved or covered, with 3-inch diameter aggregate or larger.
- Perimeter controls such as silt fence, sediment control logs, or other measures.
- Construction fencing to prevent unauthorized access to construction materials.
- Provisions for Good Housekeeping practices related to materials storage and disposal, as described in the Good Housekeeping BMP Fact Sheet.
- A stabilized construction entrance/exit, as described in the Vehicle Tracking Control BMP Fact Sheet, to accommodate traffic associated with material delivery and waste disposal vehicles.

Over-sizing the stabilized staging area may result in disturbance of existing vegetation in excess of that required for the project. This increases costs, as well as requirements for long-term stabilization following the construction period. When designing the stabilized staging area, minimize the area of disturbance to the extent practical.

Stabilized Staging Area	
Functions	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material	Yes

Minimizing Long-Term Stabilization Requirements

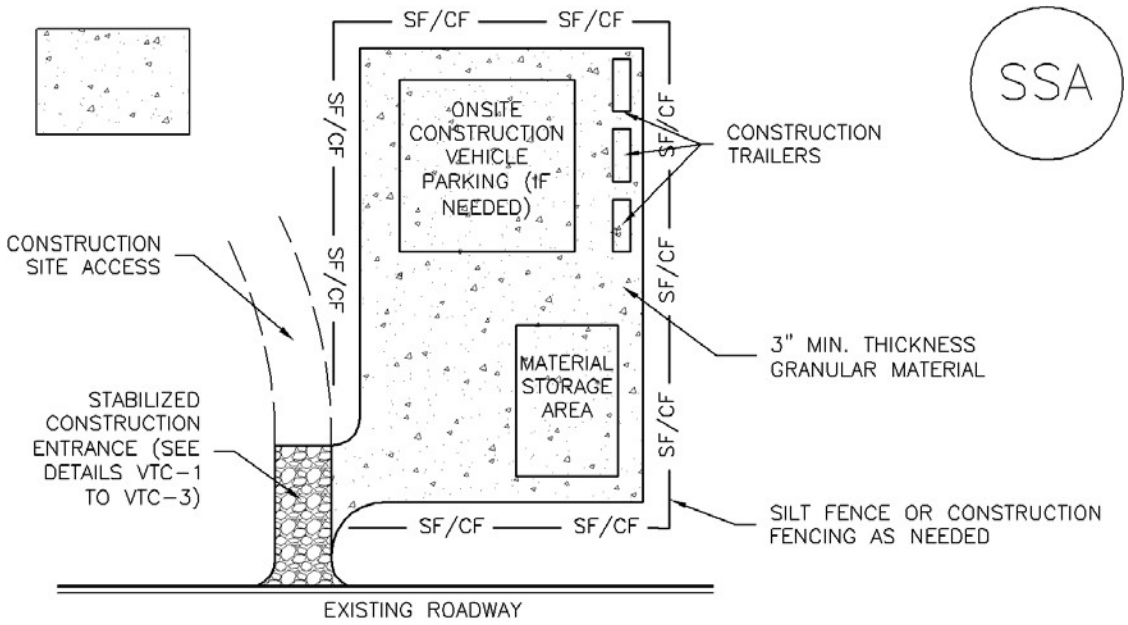
- Utilize off-site parking and restrict vehicle access to the site.
- Use construction mats in lieu of rock when staging is provided in an area that will not be disturbed otherwise.
- Consider use of a bermed contained area for materials and equipment that do not require a stabilized surface.
- Consider phasing of staging areas to avoid disturbance in an area that will not be otherwise disturbed.

See Detail SSA-1 for a typical stabilized staging area and SSA-2 for a stabilized staging area when materials staging in roadways is required.

Maintenance and Removal

Maintenance of stabilized staging areas includes maintaining a stable surface cover of gravel, repairing perimeter controls, and following good housekeeping practices.

When construction is complete, debris, unused stockpiles and materials should be recycled or properly disposed. In some cases, this will require disposal of contaminated soil from equipment leaks in an appropriate landfill. Staging areas should then be permanently stabilized with vegetation or other surface cover planned for the development.



SSA–1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF STAGING AREA(S).
   –CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.

2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.

3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.

4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.

5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

STABILIZED STAGING AREA MAINTENANCE NOTES

5. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.

6. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

NOTE: MANY MUNICIPALITIES PROHIBIT THE USE OF RECYCLED CONCRETE AS GRANULAR MATERIAL FOR STABILIZED STAGING AREAS DUE TO DIFFICULTIES WITH RE-ESTABLISHMENT OF VEGETATION IN AREAS WHERE RECYCLED CONCRETE WAS PLACED.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

Street Sweeping and Vacuuming (SS) SM-7

Description

Street sweeping and vacuuming remove sediment that has been tracked onto roadways to reduce sediment transport into storm drain systems or a surface waterway.

Photograph SS-1. A street sweeper removes sediment and potential pollutants along the curb line at a construction site. Photo courtesy of Tom Gore.

Appropriate Uses

Use this practice at construction sites where vehicles may track sediment offsite onto paved roadways.

Design and Installation

Street sweeping or vacuuming should be conducted when there is noticeable sediment accumulation on roadways adjacent to the construction site. Typically, this will be concentrated at the entrance/exit to the construction site. Well-maintained stabilized construction entrances, vehicle tracking controls and tire wash facilities can help reduce the necessary frequency of street sweeping and vacuuming.

On smaller construction sites, street sweeping can be conducted manually using a shovel and broom. Never wash accumulated sediment on roadways into storm drains.

Maintenance and Removal

- Inspect paved roads around the perimeter of the construction site on a daily basis and more frequently, as needed. Remove accumulated sediment, as needed.
- Following street sweeping, check inlet protection that may have been displaced during street sweeping.
- Inspect area to be swept for materials that may be hazardous prior to beginning sweeping operations.

Street Sweeping/ Vacuuming	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	Yes

CITRA

Appendix D

Pre-Construction Photos

In order to capture the most accurate pre-construction condition of the land, photos shall be added to this Appendix D at a later date, prior to permit submittal.

CITRA

Appendix E

Reference Documents

This Appendix E to be populated prior to the final SWMP permit submittal.

CITRA

Appendix F

Reference Documents

This Appendix F to be populated prior to the final SWMP permit submittal

Attachment 3-L

Vegetation and Noxious Weed Control Plan

Part 1	Project Preliminary Vegetation Control Plan
Part 2	Third Party Engineer Vegetation Recommendations

Attachment 3-L

Vegetation and Noxious Weed Control Plan

Part 1

Project Preliminary Vegetation Control Plan

CITRA

Preliminary Vegetation Management Plan

Garnet Mesa Solar, LLC

Delta County, Colorado

Revision	Date
Initial Draft	*7/15/2021*

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Appendix 1: Example Photos of Sheep Grazing at Solar Projects 1

Executive Summary

The purpose of this document is to outline the preliminary vegetation management strategy of the Garnet Mesa Solar Project, which will be updated and expanded as the project's engineering design is completed. This preliminary overview will guide the final detailed vegetation management plan that the project and operators will utilize to manage the land cover within the project area for the life of the facility.

Preliminary Plan Overview

Introduction

Garnet Mesa Solar is an 80 MW_{AC} photovoltaic solar project, which will be constructed on approximately 350 acres of agricultural land in Delta County, Colorado. The objective of the vegetation management plan is to restore and maintain a healthy habitat throughout the project area, which is resistant to noxious weeds and preserves the aesthetics and agricultural use of the land.

The project area was previously used for cattle grazing and was partially irrigated using flood irrigation. To keep a similar agricultural use during the life of the solar project, grazing sheep will be utilized throughout the fenced boundary during the operations phase of the project. This approach will help maintain vegetative cover throughout the project area, minimize bare soil or "desert like" conditions, and increase community partnership with local farmers and ranchers.

Site Preparation

During construction activities, the ground may be disturbed and/or cleared and will be reseeded (and overseeded) with a dryland pasture seed mix. The seed mix will be designed specifically for the project's location and soil type with the intent of producing a drought tolerant ground cover that does not require irrigation and which can be grazed at least once per year. Local and regional qualified natural resource professionals will be consulted in the development of the seed mixture and long-term maintenance practices. Locally sourced seed mixes will be used where feasible.

The seed mixture will likely be composed primarily of grasses and will be planted during the growing season after construction has completed. The seed mix will be broadcast over the site or mechanically spread between arrays and within the fenced boundary.

Initial Maintenance (Years 1-3)

The long-term goal of the vegetation management plan is to provide a consistent ground cover that can mostly be maintained through regular sheep grazing. However, since the seed mixture may take between 12-36 months to fully establish, multiple methods of vegetation control may be required in the initial few years of operation. Localized mechanical mowing may be required to prevent the growth of noxious weeds and allow the newly planted seeds more opportunity to establish. These methods may also be used in areas outside of the fence line or areas that cannot be easily reached by the sheep.

After the newly planted seeds have sufficiently been established, sheep will be rotated throughout the project area to maintain crop height and fertilize the soil. With a low growth dryland seed mix, we are anticipating a single grazing per year for approximately 3 months. This plan will be refined depending on the final project design and seed mixture.

Long-Term Maintenance and Monitoring

Once the seed mixture has fully established, we plan to utilize sheep grazing for the majority of the vegetation management with a minimum of one grazing per year throughout the project life. The ground cover will be monitored for vegetative health and re-seeding will occur annually on an as-needed basis. If noxious weeds or invasive species are identified, mechanical mowing methods may be used for localized control; however, the intent is to rely on the sheep grazing as much as possible.

Sheep Grazing

The Colorado Wool Growers Association has been contacted for potential farming partnerships and we have had positive initial discussions with sheep grazers in the vicinity of the project. The solar project will provide the local sheep farmers closer access to grazing fields, more economical grazing options, and fields with built-in shading structures to allow a more comfortable grazing environment for the sheep.

Appendix 1 below presents multiple examples of sheep grazing used at similar solar projects in the United States.

Appendix 1: Example Photos of Sheep Grazing at Solar Projects

Attachment 3-L

Vegetation and Noxious Weed Control Plan

Part 2

Third Party Engineer Vegetation Recommendations

Revegetation Recommendations for

Garnet Mesa Solar LLC

Delta County, Colorado

AUGUST 2021 | VERSION 1

Prepared By:

Kimley»Horn

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EXISTING CONDITIONS

The proposed Garnet Mesa Solar Project consists of the construction and operation of an 80-Megawatt (MW) ground mounted solar photovoltaic energy generating facility and collector substation in Delta County, Colorado. The proposed project will be located on approximately 463 acres, which includes portions of three parcels between 2200 Road on the east and 2050 Road on the west, north and south of G Road in Delta County, Colorado (project area). Conditions of the project area were evaluated in a Geotechnical Study (Buckhorn Engineering 2021) and in a Wetlands and Biological Report (ERO 2021). Relevant summaries of these studies are provided below:

- East Canal flows from east to west in the project area and converges with the North Fork of the Gunnison River about 3 miles north of the project area. The drainage is a steep-banked arroyo with a narrow wetland fringe. Small patches of riparian vegetation with trees and shrubs as described below occur along ditches and East Canal.

- The majority of the project area is irrigated pasture. Pasture fields contain alfalfa and grasses for grazing are irrigated and drained by a series of field/ephemeral ditches, constructed drains, and intermittent ditches.

- Non-irrigated and upland areas primarily support a sparse, salt desert scrub and sagebrush vegetation communities. Soils in these areas were observed as cracked and are considered dry.

- Soils in the project area generally consist of variably silty, lean clay loams containing 83-91% fines (silt plus clay). The soils are fine-grained valley fill (mud flow) and residual soils derived from the weathering of Mancos Shale with moderate plasticity, low to moderate density and a weak structure, and have low to high swell potential and swelling pressure as well as collapse potential. The soils are considered susceptible to erosion.

- Soils in topographically low positions in the project area display abundant salts accumulated at the surface and shallow groundwater (at 2 feet). Upland, non-irrigated soils in the project area are typically outcrops of shale at the surface with a thin layer of residual soil at the surface.

REVEGETATION RECOMMENDATIONS

Construction of the proposed project is anticipated to occur October 2022 to May 2023. The system is anticipated to begin commercial operation in June 2023. Recommendations to facilitate revegetation to support continued pasture and grazing on the site and to promote pollinator habitat are described below.

TOP SOIL

For the purposes of salvage, topsoil is generally defined as the upper 6 to 12 inches (15 to 30 cm). Below this depth biological activity is usually limited. During grading, topsoil should be separated and stored apart from lower subsurface materials in order to maintain the structure and biota of the soil.

Topsoil should be salvaged when moist, but not wet. Salvage of wet soils, particularly those with fine texture, often severely damages or destroys soil structure. The result is a giant “mud pie” that may dry as a massive brick. Salvage of completely dry topsoil may also damage soil structure, though not as severely, and will result in nearly complete loss of living plant material (CPW 1998).

Topsoil should be stored less than one year and, in a weed-free location. Storage piles should be shallow (less than 2 feet is best) to leave more of the soil exposed to air so that soil organisms aren’t suffocated.

The manner in which the soil is returned to the site is just as important as the way it is salvaged and stored. Topsoil should be replaced with a minimum number of machine passes. “Sloppy work” mimics natural systems which have variable topsoil depths. Variability of topsoil depth should be valued in lieu of seeking very uniform topsoil thickness through extended machine work. Topsoil should be placed only when there is an assurance that the area will be seeded within a few days. Each day that the topsoil remains bare gives weedy species a chance to invade the site and allows erosion from wind and rain. This makes establishment of perennial native species much more difficult. If topsoil is imported from another location, the source should be carefully and thoroughly inspected for noxious weeds and undesirable plants and rejected if weeds are found (CPW 1998).

Specific recommendation for the project area are summarized below:

- Topsoil in highly disturbed areas (areas adjacent to roads, drains and canals) should not be preserved, as invasive weeds (e.g., cheatgrass, halogeton, Russian thistle, Russian knapweed, Canada thistle, and rubber rabbitbrush) are prevalent in these areas. Effort should be made to till soil in these areas by cutting through and turning over the soil to relieve both soil compaction and to plow under the weed systems so that their roots are exposed to the sun to die. This will help prevent invasive weed establishment across the project area. In particular, halogeton can be toxic to grazing sheep.

- The upper 6-8 inches of topsoil in pasture areas should be salvaged when moist and stored in shallow piles (less than 2 feet) for less than one year. This soil should be replaced as soon as practicable following construction in a manner that mimics natural site features.

- Soil amendments should be added prior to seeding. Effective amendments can include imported certified weed-free topsoil or organic matter and mycorrhizae, vesicular-arbuscular (VA) mycorrhiza to increase drought tolerance and plant growth. Seeding should occur within a few days of replacement.

SEEDING

Mixing native species of legumes and grasses in a pasture can increase total forage production by up to 30%. Additionally, certain native plants are known to fix nitrogen in association with a bacterium. These are mostly legumes such as alfalfa, which often fixes the most nitrogen; clovers and other legumes fix somewhat less. Growing grasses and legumes together improves the seasonal distribution of forage (CSU 2018). Legumes can make more growth in the summer than cool-season grasses. The addition of legumes usually improves the forage quality factors of palatability, digestibility, and nutrient content (CSU 2018).

If grass-legume stands are grazed by cattle or sheep, keep the percentage of legumes that cause bloat to 25% or less. These legumes cause gases to build up and become trapped in the rumen and can lead to rapid death. Bloating legumes are alfalfa and the various clovers. Grazing of mixed grass-legume stands requires particular attention to grazing management. Legumes often are preferred by livestock and will be grazed out of the pasture if not provided the opportunity to regrow sufficiently (CSU 2018).

Avoid mixing cool and warm season grasses and native and introduced species with one another as particular species will quickly outcompete others in both situations.

Because cool-season grasses have already been identified onsite, the reseeding recommendation for the project area includes a mixture of cool-season grasses and legumes for dryland (non-irrigated) sites. Desirable seed species for the project area include:

- Cool-season grasses (80%): smoothe brome, wheatgrass (crested, intermediate, tall, western)

- Legumes (20%): alfalfa, sainfoin, trefoil

Seed of individual species, unmixed, should be purchased whenever possible and the restoration contractor will mix the seeds onsite to prevent blending of undesired components.

Seeds should be free of weeds, recently tested for the ability to germinate, and have a high germination rate. Some native species germinate best when seeds are several years old. To obtain the best possible seed:

- Plan seed orders early, at least 120 days prior to the planting time.
- Buy seed approximately 90 days prior to planned use. This will allow enough time to examine the seed tags and the seed.
- Check the seed tags and bag labels to verify you are receiving what you ordered. Seed quality can be improved dramatically by requesting certified seed.
- The only way to tell for certain is to receive your desired variety in the original bag with the Certified Seed Blue Tag.

Avoid seeds with the following characteristics: "Variety Not Stated (VNS)", "seed from a certified field," or "no tags available yet," or "just as good as certified." In Colorado, bags of certified seed will have certified seed tags (CPW 1998).

Accept only seed with a complete analysis label on the bag and a current germination test conducted by an accredited laboratory. Total germination may include the sum of all seeds germinated plus hard seed and dormant seed. Dormant seed is viable but requires time or a physiological stimulus to induce germination. Hard seed is alive but has a thick seed coat that must be scarified, either mechanically, thermally, or biologically, before it will germinate. The higher the total germination, the better the seed quality. In general, the germination of a given graminoid species should not be lower than 60 percent, while the germination percentages for various shrub and forb types vary widely by species (CPW 1998).

Most species are sold on a Pure Live Seed (PLS) basis, with the price adjusted accordingly. PLS equals the percent purity times percent germination. When given a choice between buying on a PLS or bulk basis, PLS is always preferable.

When seed is planted in non-irrigated conditions, the planting season must be chosen to take advantage of natural moisture. Seeding success is greatly influenced by temperature and precipitation; the best germination occurs when temperatures are above freezing, and precipitation is high. In Colorado, seasons that reflect these conditions for cool season species are usually the early spring and late fall; seeding should not be done when the ground is frozen. For warm season species, seeding in late spring or early summer is more likely to accompany temperatures warm enough to support germination.

Recommended grass species for site:

Site and Species	Growth Habit*	Season of Growth	Origin**
Clay and Loam Soils			
Crested wheatgrass	B	Cool	I
Russian wildrye	B	Cool	I
Green needlegrass	B	Cool	N
Western wheatgrass	S	Cool	N
Int/Pub wheatgrass	S	Cool	I

Notes: S=sod-former, B=bunchgrass, N=Native, I=Introduced
Source: CSU 2018

Recommended seeding rates:

PLANT	ESTIMATED[1] PLS%	PLS/ACRE[2] DRYLAND	PLS/ACRE[2] IRRIGATED
Brome			
Meadow	85	NR	17(7)[3]
Smooth	85	6.5(4)[3]	10(6)[3]
Wheatgrass			
Ephraim	85	5.0(4)[3]	NR
Fairway	77	3.0(2)[3]	NR
Hycrest	80	8.0(6)[3]	15(8)[3]
Int/pub	90	10.0(7)[3]	15(8)[3]
Nordan	77	5.0(4)[3]	NR
Tall	86	11.0(8)[3]	17(10)[3]
Thickspike	77	5.5(4)[3]	NR
Western	77	8.0(6)[3]	NR
Alfalfa	89	8(2)[4]	10 to 15
Trefoil, Birdsfoot	79	NR	4(2)[4]

Notes: PLS=Percent Live Seed. When buying seed, figure exact PLS by multiplying the percentage germination by the percent purity numbers on the seed bag tag.
Source: CSU 2018

Drill seeding is preferrable on relatively flat surfaces (3:1 slopes or flatter), while broadcast seeding is preferable on steeper slopes. In general, drill seeding to a depth of 0.25 to 0.5 inches (0.6 to 1.3 centimeters) should be adequate. Seeding should be conducted along the contour to avoid erosion from water flowing down drill furrows (CPW 1998).

Broadcast seeding requires double or triple the seeding rate of drill seeding, and calibration of seeding rates is less precise than with drill seeding Soils “accept” broadcast seed much better if they have been very recently raked or harrowed to eliminate crusting. Seeding should not occur on windy days. After broadcasting the seed, cover the seed by harrowing, chaining, raking or using a similar technique. Raking or harrowing immediately before and after broadcast is highly recommended.

Hydroseeding is not recommended for the project area unless irrigation throughout the growing season is applied, as the results are generally unsuccessful on hard soils which receive less than 20 inches of precipitation per year (CPW 1998).

Mulch, including certified weed-free hay or bonded fiber mats, applied after seeding will protect the seeds from erosion.

Newly established dryland grasses should not be grazed until after they set seed, which depends on soil moisture availability, climatic conditions, and individual species. Native plants do not

establish quickly and will need two to four years of growth before being grazed. Introduced grasses on dryland will need at least one year from seeding before being ready for grazing.

PLANTINGS

For plantings, use of containerized plants will be more successful than use of bareroot plants for the project area. Though containerized plants are more expensive than bareroot plants, they have deeper root systems and increased survival rates and can be planted in the spring or fall.

Containerized plants should be ordered 1-2 years in advance of planting to ensure they are available and properly hardened prior to planting.

Ideal ages of containerized stock

herbaceous plants	1 to 3 years
woody plants/shrubs	3 to 5 years
trees	5 to 10 years

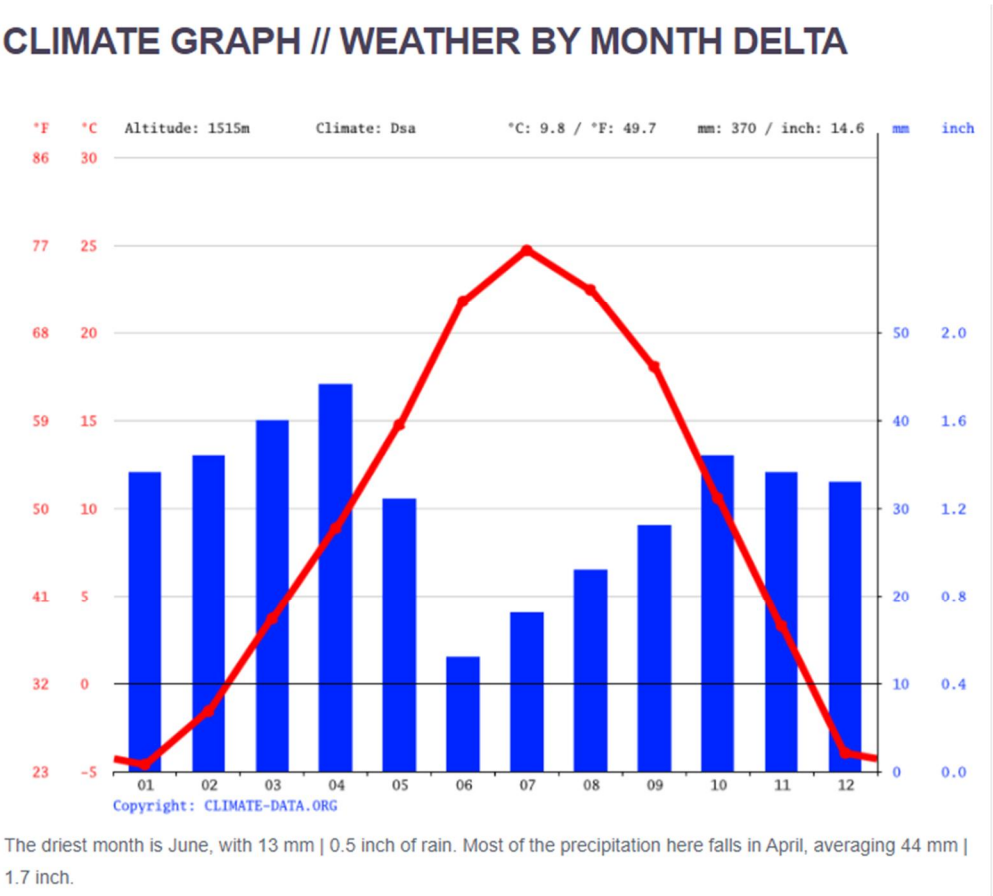
Source: CPW 1998

All temperate western plantings require supplemental moisture at the time of planting, unless they are being transplanted into a wetland or riparian habitat. Whenever possible, soil moisture reserves should be built up prior to plant establishment. This can be accomplished through the use of irrigation and/or snow-fencing on the windward side of the planting area (CPW 1998). As a general rule, properly hardened transplants should be planted in early spring, as soon as the ground has thawed and while moisture is available. At least one gallon of water is generally needed per containerized plant will be needed at the time of planting.

Supplemental irrigation will be needed until the plantings are established. A monitoring and management plan should be implemented for the first 3 years of growth following planting, or until desired vegetation is established.

IRRIGATION AND GRAZING

The winter months are much rainier than the summer months in Delta, Colorado. About 14.6 inches of precipitation falls annually in the City and County (see summary graph, below). Thickspike wheatgrass does better in areas receiving 12 to 13 inches of moisture than will its closely related cousin, western wheatgrass. Grass species options increase as precipitation rises above 14 inches per year (CSU 2018). If best management practices regarding topsoil and seeding are followed as described above, supplemental irrigation of pastureland in the project area should not be required.



As important as irrigation for the project area is the establishment of a site-specific grazing management plan (CSU 2018). Overgrazing is the main reason for pasture decline. It results from not allowing grazed plants adequate time for regrowth, and not reducing the grazing pressure (time and/or animal numbers) during drought. Overgrazing reduces plant health and eventually causes desirable forage plants to die. In addition, pastures degrade through increased soil erosion and loss of soil organic matter, reduced water infiltration, and increased weed invasion.

Small acreage dryland pastures can fall rapidly into poor condition from overgrazing. Forages must have an opportunity to regrow and replenish their root and stem base food reserves. They do this best by having enough leaf area left after grazing to capture sunlight and convert the light energy into food. For this to occur, the leaf area must be present when temperatures and soil moisture are adequate for plant growth. The food is then transported inside the plants to roots and new leaves (CSU 2018).

Overgrazing during drought greatly increases the risk of grass mortality. To reduce this risk, it is recommended that grazing management be conservative during both the drought period and the growing season following drought. This means grazing fewer animals for shorter periods of time, leaving more leaves and stems for plant survival and regrowth.

NOXIOUS WEEDS

Noxious weeds are non-native plants which lack normal biological controls such as insects, diseases, and animals and have developed specialized mechanisms of survival allowing them to spread at an alarming rate. Because noxious weeds tend to be highly invasive and harmful to native vegetation, they can quickly dominate many sites and often cause permanent damage to plant communities. Without an effective integrated weed management plan these aggressive, noxious plants will continue to infest and degrade the lands we value.

The intent of the Colorado Noxious Weed Act is to restrict the degradation of our valued environment by implementing Noxious Weeds Management to stop the spread of noxious weeds. The challenge for all involved is to develop management systems, support, and direction for preventing the spread of weeds before the growth of weeds in the transmission build construction areas.

ENACTMENT AUTHORITY

The Colorado Weed Management Act (C.R.S. 35-5.5-101, et. seq.) was signed into state law in 1990 and amended in 1996. Now known as the Colorado Noxious Weed Act, it states that noxious weeds pose a threat to the natural resources of Colorado. The Act also directs that the Board of County Commissioners of each county shall adopt a Noxious Weed Management Plan for all unincorporated land within the county. Municipalities shall adopt a weed management plan for all lands within their boundaries. The county and municipalities may cooperate, through an intergovernmental agreement, for the powers and authorities of the Act.

NOXIOUS WEEDS IDENTIFICATION

The State of Colorado has three noxious weed lists designated by rule of the Colorado Department of Agriculture. The state has designated 79 plants as State Noxious Weeds, effective as of October 2020 (CDA, 2020).

List A species are rare and have not established in Colorado or occur in limited areas. List A species are designated by the Commissioner for eradication.

List B species are well established in defined areas throughout the state. They are species for which the Commissioner, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, develops and implements state noxious weed management plans designed to stop the continued spread of these species.

List C species are widespread and well established, often considered naturalized. These are species for which the Commissioner, in consultation with the state noxious weed advisory committee, local governments, and other interested parties, will develop and implement state noxious weed management plans designed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands.

Based on observed vegetation in the Wetland and Biological Delineation Report (ERO, 2021), there are no identified List A Weed Species in the project area. List B Weed Species identified include Russian knapweed (*Acroptilon repens*) and Canada thistle (*Cirsium arvense*). List C

species identified include halogeton (*Halogeton glomerata*). The noxious weed species identified onsite are associated with previously highly disturbed areas, including roads, drains and ditches.

NOXIOUS WEEDS CONTROL

This section identifies management goals for control of noxious weeds during construction and operation of the proposed project.

INTEGRATED WEEDS MANAGEMENT

Management techniques may include mechanical, biological and chemical strategies. The optimum method(s) for weed management will vary depending on a number of site-specific variables, including soil type and stability, grade, associated vegetation, existing and proposed land use, proximity to water, availability of irrigation water, existing uses by livestock, weed type and stage of growth, and severity of infestation.

Mechanical management methods will be favored where applicable. Chemical methods will be used on larger, isolated populations where mechanical methods are either ineffective or impractical.

In all cases, prevention is the most effective method of weed management and will be highly prioritized.

PREVENTION AND DETECTION

Preventing the spread of weed species to non-infested land is the most effective weed management technique. The spread of noxious weeds is most likely to occur where soil has been disturbed by construction, operation and maintenance activities. Disturbed land provides opportunity for noxious weeds and can allow inactive seeds in the subsurface to germinate. Known methods of weed introduction include:

- Contaminated seed, feed grain, hay, straw, and mulch;
- Movement of contaminated equipment, cars, bikes, etc. across uncontaminated lands;
- Animal fur, fleece, human clothing; and
- Dried vegetative waste.

Prevention is best accomplished by ensuring that new weed species seed or vegetative reproductive plant parts of weeds are not introduced into new areas and by early detection of any new weed species before they become widespread.

Strategies that may be used to prevent the introduction or establishment of noxious weeds in areas not already infested include:

- Limitation of disturbances to soils within the project area;
- Prevention of weed seed dispersal across the project area;
- Identification and eradication of new, small-scale area infestations;
- Continuous monitoring and evaluation to prevent recurrence;

- Identification of existing conditions, disturbances, and activities that represent a potential threat to native habitat;
- Identification and eradication of recently introduced weed species that represent a future threat;
- Timely revegetation and reclamation of disturbed sites using appropriate native plant species;
- The use of certified weed-free seeds and mulch; and
- Prioritization of weed management along areas of entry and dispersal.

REFERENCES

Buckhorn Engineering 2021. Preliminary Geotechnical Report for Garnet Mesa Solar. Delta County, Colorado. May 27, 2021.

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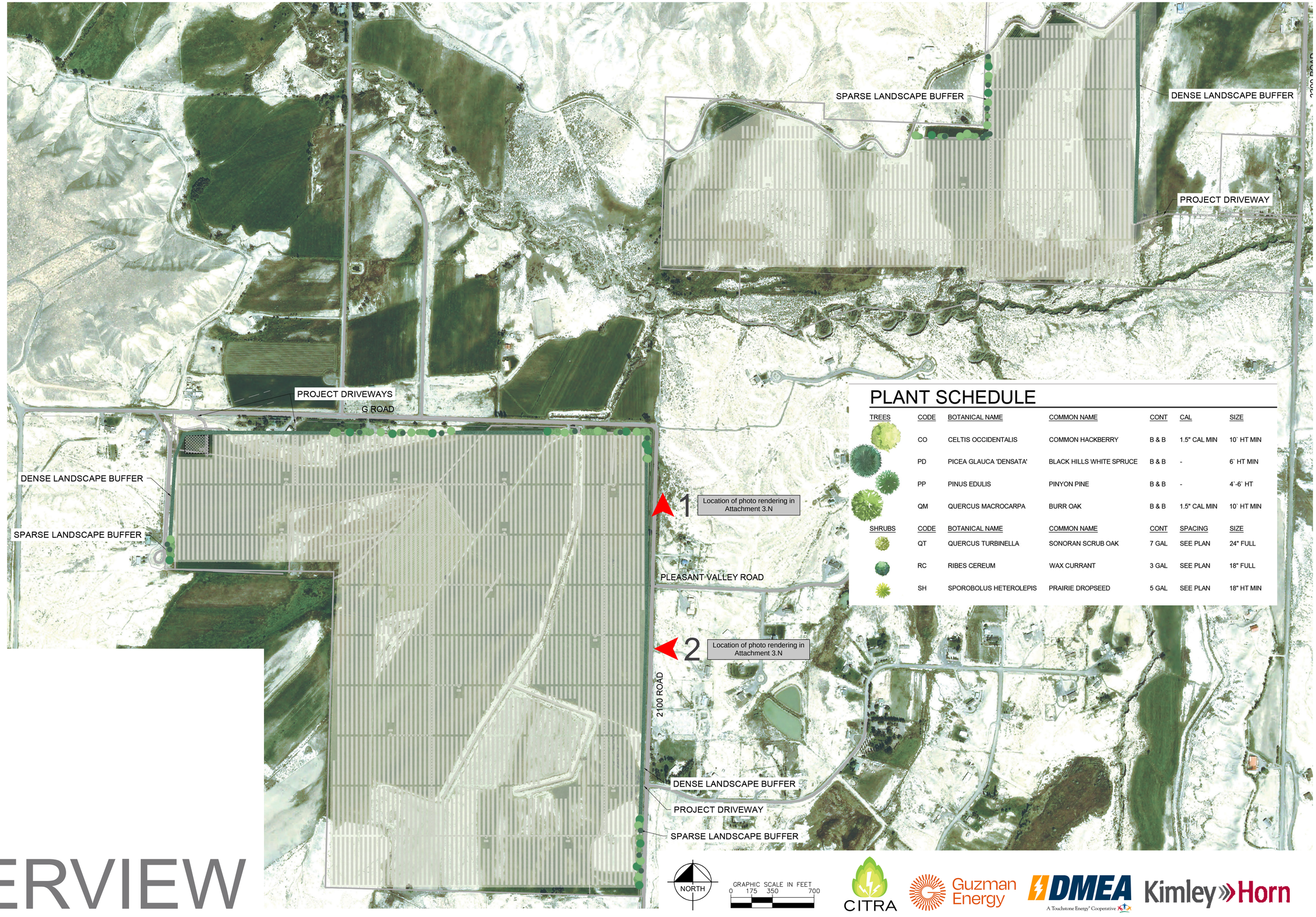
CSU 2018. Colorado State University Extension. Colorado Forage Guide. Last updated June 2018 Accessed at: https://sam.extension.colostate.edu/wp-content/uploads/sites/2/2016/07/forage-guide.pdf

ERO 2021. Wetland Delineation and Biological Delineation Report. Garnet Mesa Solar Development Project. Delta County, Colorado. June 21, 2021.

Attachment 3-M

Landscape Screening Plan



PLANT SCHEDULE

TREES	CODE	BOTANICAL NAME	COMMON NAME	CONT	CAL	SIZE
	CO	CELTIS OCCIDENTALIS	COMMON HACKBERRY	B & B	1.5" CAL MIN	10` HT MIN
	PD	PICEA GLAUCA 'DENSATA'	BLACK HILLS WHITE SPRUCE	B & B	-	6` HT MIN
	PP	PINUS EDULIS	PINYON PINE	B & B	-	4`-6` HT
	QM	QUERCUS MACROCARPA	BURR OAK	B & B	1.5" CAL MIN	10` HT MIN
SHRUBS	**CODE**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SPACING**	**SIZE**
	QT	QUERCUS TURBINELLA	SONORAN SCRUB OAK	7 GAL	SEE PLAN	24" FULL
	RC	RIBES CEREUM	WAX CURRANT	3 GAL	SEE PLAN	18" FULL
	SH	SPOROBOLUS HETEROLEPIS	PRAIRIE DROPSEED	5 GAL	SEE PLAN	18" HT MIN

OVERVIEW

CITRA · Guzman Energy · DMEA A Touchstone Energy® Cooperative · Kimley»Horn

COMMON HACKBERRY

WHITE SPRUCE

PINYON PINE

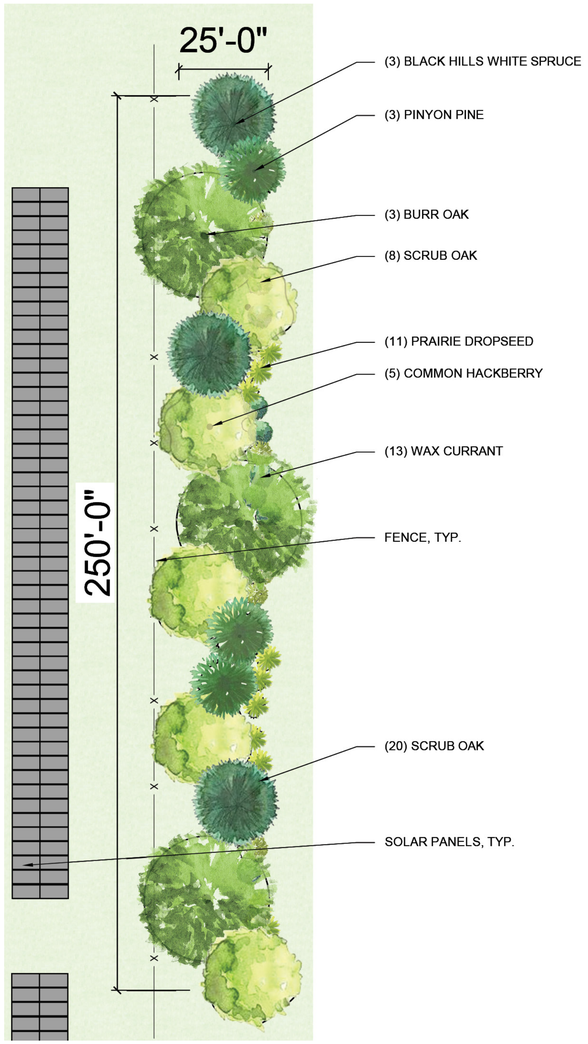
BURR OAK

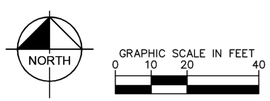
PRAIRIE DROPSEED

SCRUB OAK

WAX CURRANT

TYPICAL 250' DENSE LANDSCAPE BUFFER ENLARGEMENT





PLANT SCHEDULE

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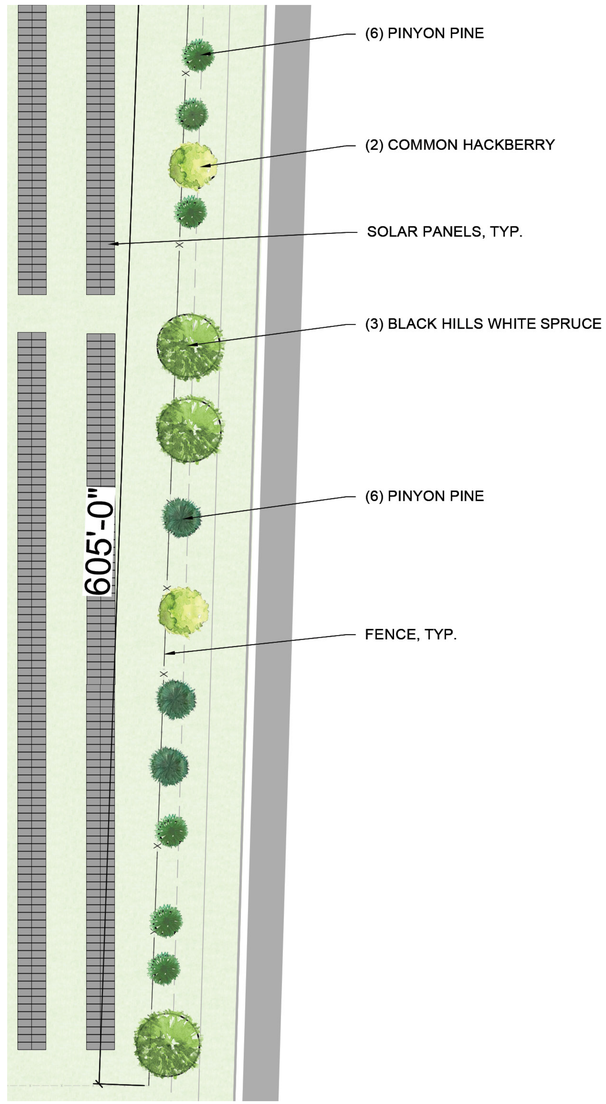
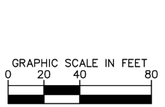
SHRUBS	CODE	BOTANICAL NAME	COMMON NAME	CONT	SPACING	SIZE
	QT	QUERCUS TURBINELLA	SONORAN SCRUB OAK	7 GAL	SEE PLAN	24" FULL
	RC	RIBES CEREUM	WAX CURRANT	3 GAL	SEE PLAN	18" FULL
	SH	SPOROBOLUS HETEROLEPIS	PRAIRIE DROPSEED	5 GAL	SEE PLAN	18" HT MIN

CONCEPTUAL SPARSE LANDSCAPE BUFFER ENLARGEMENT





LANDSCAPE

CITRA

Guzman Energy

DMEA
A Touchstone Energy® Cooperative

Kimley»Horn

Attachment 3-N

Project Renderings

Part 1	2100 Rd Looking North
Part 2	2100 Rd Looking West

Attachment 3-N

Project Renderings

Part 1

2100 Rd Looking North

2100 RD LOOKING NORTH - EXISTING CONDITIONS

2100 RD LOOKING NORTH - 2P TRACKER - NO SCREENING

2100 RD LOOKING NORTH - 2P TRACKER - 1ST YEAR PLANTING

2100 RD LOOKING NORTH - 2P TRACKER - 10 YEARS OF GROWTH

2100 RD LOOKING NORTH - 1P TRACKER - NO SCREENING

2100 RD LOOKING NORTH - 1P TRACKER - 1ST YEAR PLANTING

2100 RD LOOKING NORTH - 1P TRACKER - 10 YEARS OF GROWTH

Attachment 3-N

Project Renderings

Part 2

2100 Rd Looking West

2100 RD LOOKING WEST - EXISTING CONDITIONS

2100 RD LOOKING WEST - 2P TRACKER - NO SCREENING

2100 RD LOOKING WEST - 2P TRACKER - 1ST YEAR PLANTING

2100 RD LOOKING WEST - 2P TRACKER - 10 YEARS OF GROWTH

2100 RD LOOKING WEST - 1P TRACKER - NO SCREENING

2100 RD LOOKING WEST - 1P TRACKER - 1ST YEAR PLANTING

2100 RD LOOKING WEST - 1P TRACKER - 10 YEARS OF GROWTH

Attachment 3-O

Construction Traffic Plan

Kimley»Horn

July 23, 2021

Matthew Kosakowski
Garnet Mesa Solar, LLC
1125 17th Street, Suite 740
Denver, CO 80202

Re: Traffic Study Letter
Garnet Mesa Solar
Delta County, Colorado

Dear Mr. Kosakowski:

This traffic letter documents the results of a trip generation, trip distribution, and traffic assignment for the proposed Garnet Mesa Solar project to be located at the southwest corner of the intersection of G Road and 2100 Road and near the northwest corner of the intersection of Arroyo Drive and 2200 Road in Delta County, Colorado. A vicinity map illustrating the location of the solar field and the proposed accesses is attached in **Figure 1** while a conceptual site plan is also attached. Garnet Mesa Solar proposes to develop an approximate 360-acre ground mounted solar photovoltaic generating facility and collector substation. As seen in Figure 1, the project is divided into two development areas defined as the northeast and southwest areas.

Duration of construction activity for the solar facility may vary based on phasing and the size of the phase. Construction will generally follow these steps:

- Mobilization
- Civil/site preparation
- Cable plow/foundations construction
- Post install
- Racking install
- Substation construction
- Set major equipment
- Module installation
- Testing, commissioning, and energization
- Demobilization

It is believed that construction will occur over a period of eight (8) months beginning in October 2022 and ending with the completion of the solar facility by May 2023. The peak construction traffic activity is anticipated to occur Monday through Friday from 7:00 am to 7:00 pm.

Regional access to Garnet Mesa Solar will be provided by State Highway 92 (SH-92) and US Highway 50 (US-50). Primary access to the site will be provided by 2050 Road, F Road, and 2200 Road. Direct access to the site will be provided from two full movement accesses along the south side of G Road (the west access along G Road will access the substation), one full movement access along the west side of 2100 Road, and one full movement access along the west side of 2200 Road. The area surrounding the site is mainly vacant land with some farmland.

Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. The number of trips was determined for the Garnet Mesa Solar facility based on anticipated construction

activity and operations. In order to study the effect of construction traffic created by the solar facility, the expected trips during the peak period of construction were used as the basis for this study. The peak construction traffic activity is anticipated to occur over an eight-month duration between October 2022 and May 2023.

Construction Traffic Generation

The typical construction peak season workday will see workers arriving during a three-hour window between 7:00 am and 10:00 am and departing during a four-hour window between 3:00 pm and 7:00 pm. The standard construction hours are anticipated to be 7:00 am to 7:00 pm. The highest proportion of workers are anticipated to arrive to the site between 7:00 and 8:00 am and depart between 4:00 pm to 5:00 pm, although the volume will be fairly uniform during the arrival and departure hours. It is important to note the truck trip generation also includes the volume adjusted for the three (3) passenger car equivalents (PCE) per truck. The following table identifies the peak construction activity trip generation for the construction of Garnet Mesa Solar facility.

Garnet Mesa Solar Project – Peak Construction Activity Traffic Generation

	Weekday Vehicles Trips						
		AM Peak Hour			PM Peak Hour		
User	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Delivery Trucks (10)	20	2	0	2	0	1	1
Water Trucks (10)	20	1	0	1	0	1	1
Total Trucks	40	3	0	3	0	2	2
PCE Trips	*120*	*9*	*0*	*9*	*0*	*6*	*6*
Passenger Vehicles (225 construction workers)	**450**	**125**	0	**125**	0	**75**	**75**
Total Vehicles	**490**	**128**	**0**	**128**	**0**	**77**	**77**
Total PCE	***570***	***134***	***0***	***134***	***0***	***81***	***81***

As shown in the table, the Garnet Mesa Solar project is expected to generate approximately 490 daily trips with 128 of these trips occurring during the morning peak hour and 77 of these trips occurring during the afternoon peak hour during construction currently planned for October 2022 to May 2023. This volume of daily traffic of 490 trips are expected to be the highest volume generated during construction of the solar facility.

Trip Distribution and Traffic Assignment

Trip distribution is based on the anticipated arrival location of employees along with anticipated the delivery route to be used for truck traffic. It is anticipated that 50 percent of the traffic will be to and from the northeast development and 50 percent to and from the southwest development. Cross access will not be provided between the two areas as shown in the vicinity map. Attached **Figure 2** illustrates the anticipated trip distribution. The project traffic assignment for vehicles and passenger car equivalents is shown in attached **Figure 3** and **Figure 4**, respectively.

Solar Facility Operational Phase Traffic Generation

After the Garnet Mesa Solar project has been constructed, the number of trips generated by the solar plant is expected to be significantly less than during the construction period. The project will be an unmanned facility with weekly site visits by operational personnel, not exceeding 10 trips per month. On the occasional day when a site visit occurs, the trip generation is anticipated to be one employee entering and exiting at each access throughout the day. Therefore, as it relates to trip generation there would be a total of eight (8) trips during a day when the site visit occurs with the employee entering and exiting once at all four (4) accesses. Therefore, traffic impacts related to the operation of the solar plant facility will be negligible and insignificant.

Recommendations

Based on the analysis presented in this report, Kimley-Horn and Associates, Inc. believes the construction and operational phases of the Garnet Mesa Solar project will be successfully incorporated into the existing roadway network. All access locations should operate with stop control and R1-1 "STOP" signs should be installed on the exiting approaches of these access intersections. The project can install temporary construction warning signs of trucks entering and exiting the highway along G Road, 2100 Road, and 2200 Road if desired by Delta County.

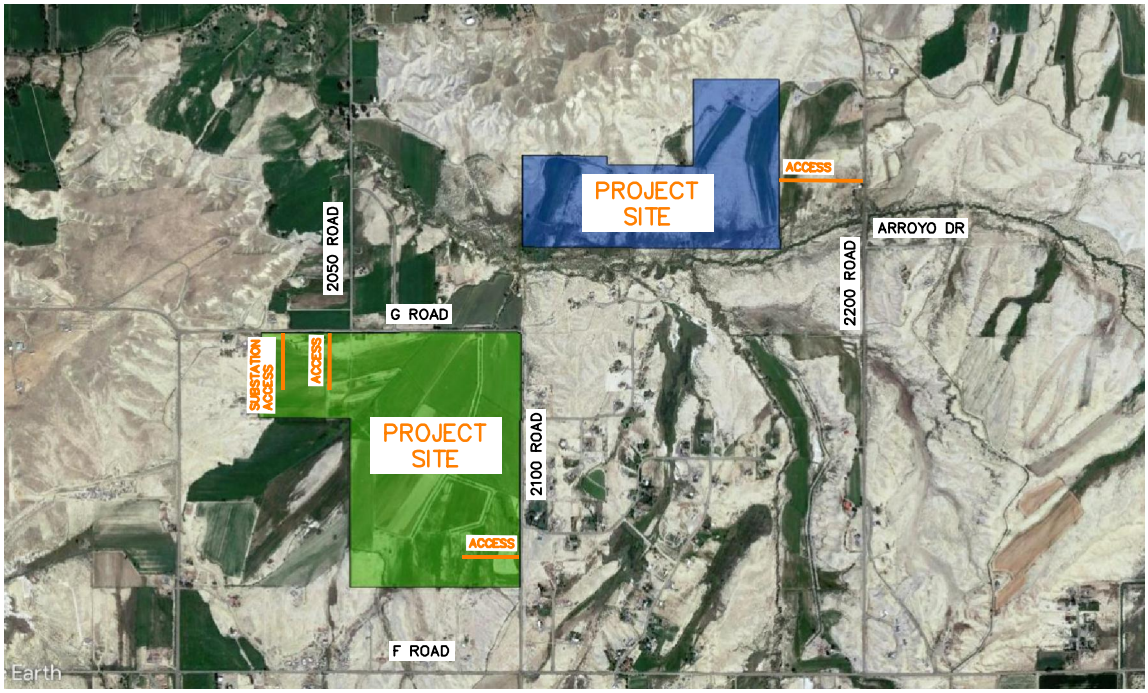
If you have any questions or require anything further, please feel free to call me at (720) 943-9962.

Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.

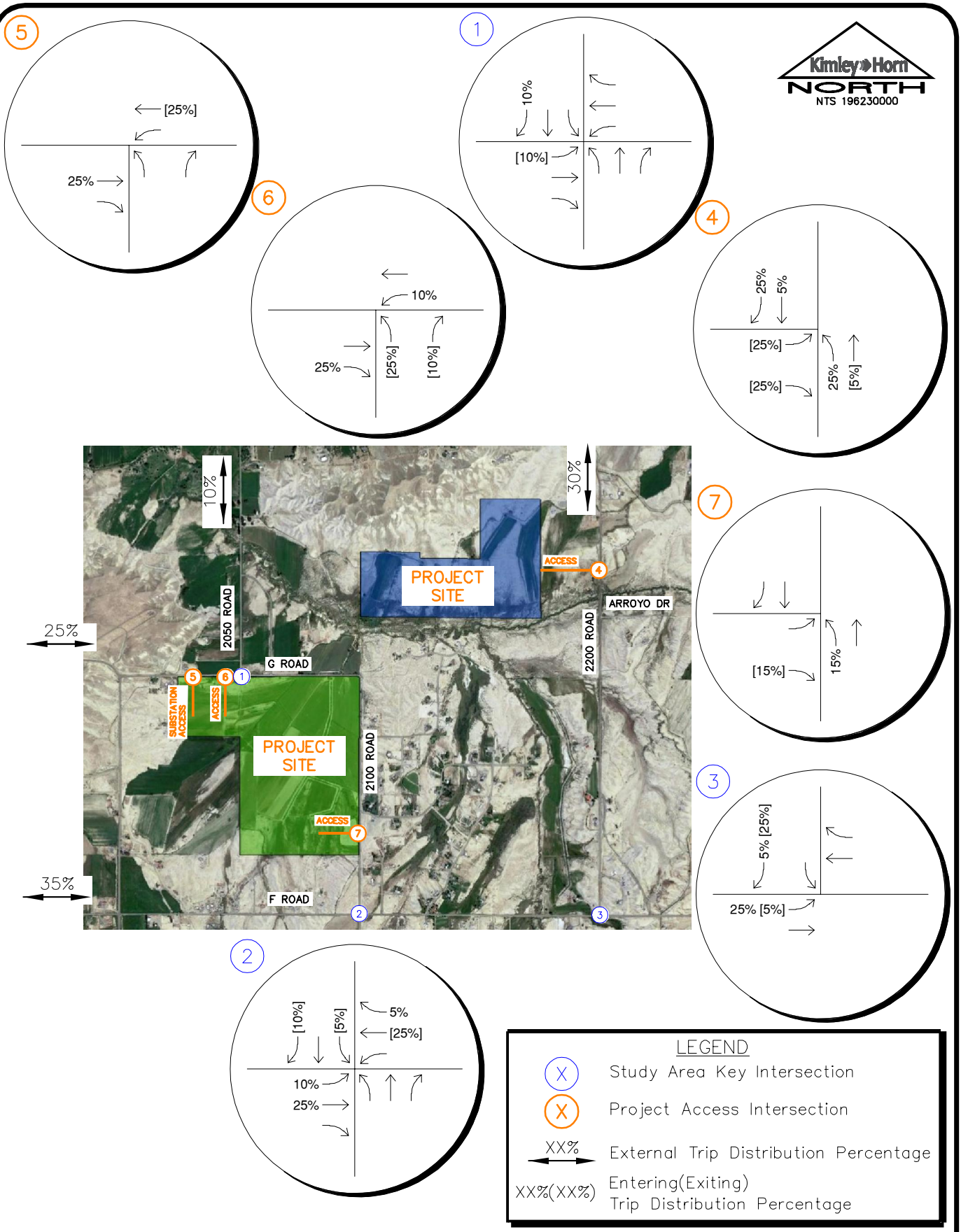
Jeffrey R. Planck

Jeffrey R. Planck, P.E.
Project Manager



GARNET MESA SOLAR
DELTA COUNTY, COLORADO
VICINITY MAP

FIGURE 1

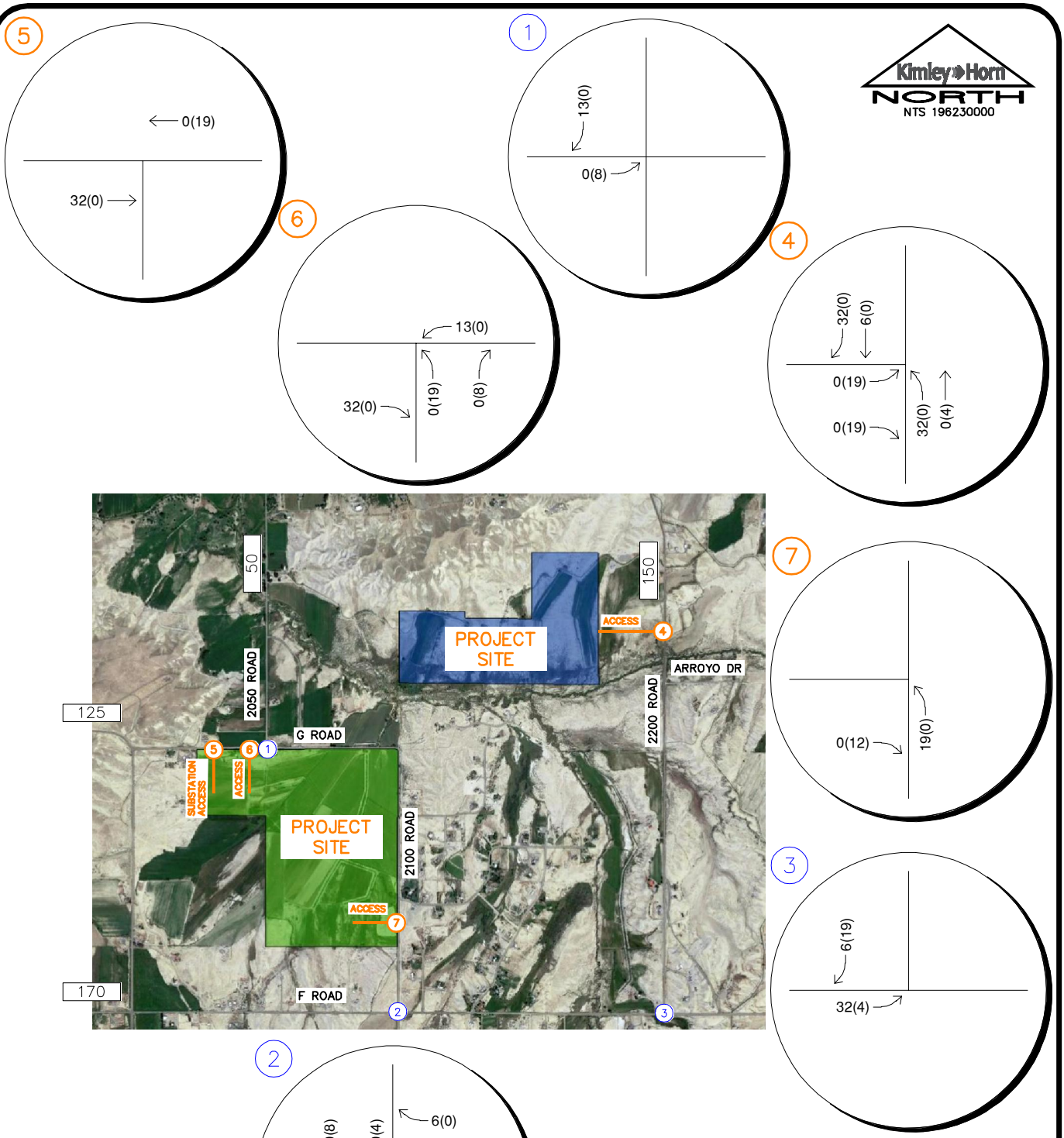


LEGEND

X	Study Area Key Intersection
X	Project Access Intersection
XX%	External Trip Distribution Percentage
XX%(XX%)	Entering(Exiting) Trip Distribution Percentage

GARNET MESA SOLAR
DELTA COUNTY, COLORADO
PROJECT TRAFFIC DISTRIBUTION

FIGURE 2



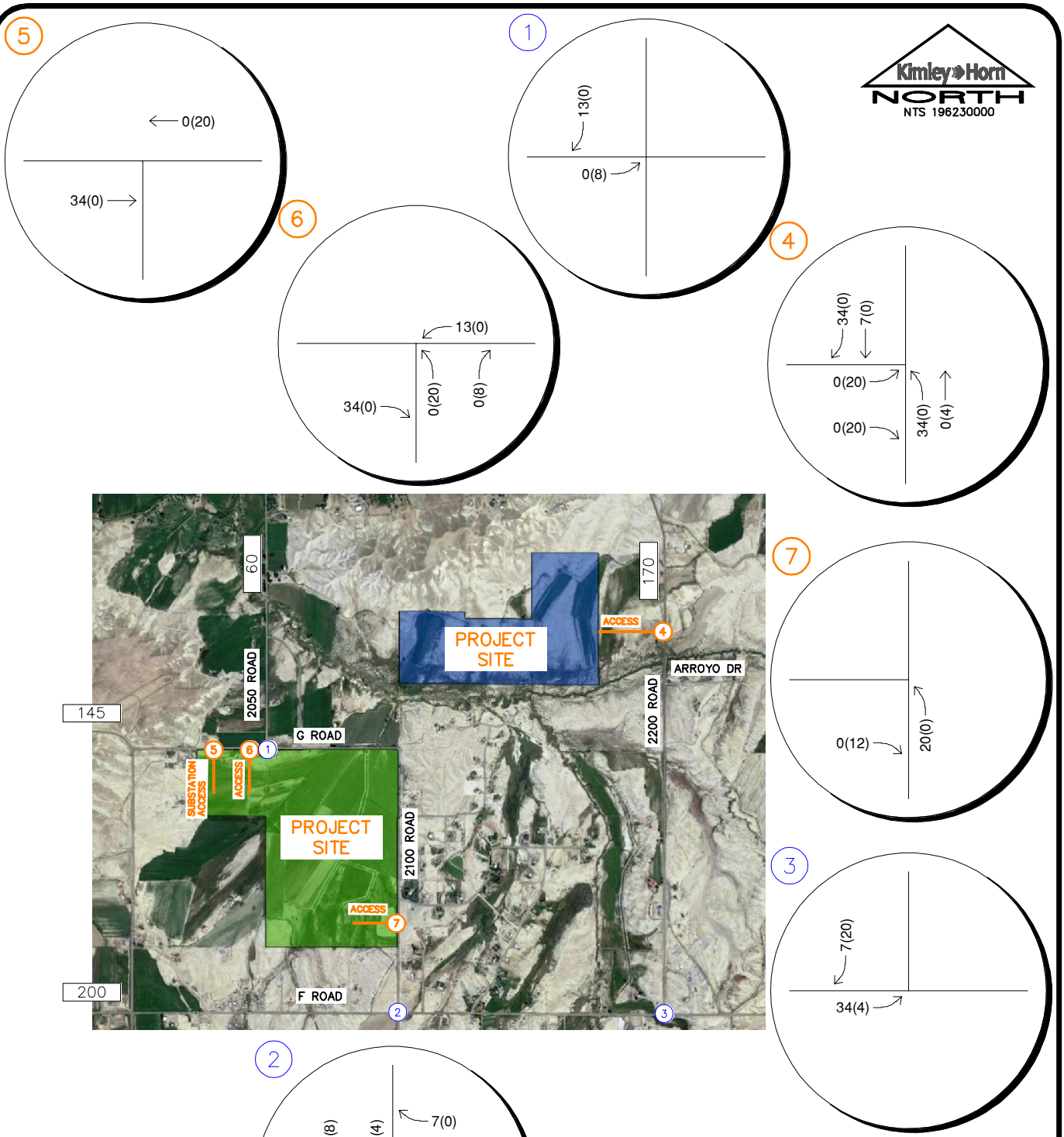
NTS 196230000

LEGEND

X	Study Area Key Intersection
X	Project Access Intersection
XXX(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,XOO	Estimated Daily Traffic Volume

GARNET MESA SOLAR
DELTA COUNTY, COLORADO
PROJECT TRIP ASSIGNMENT–VEHICLES

FIGURE 3



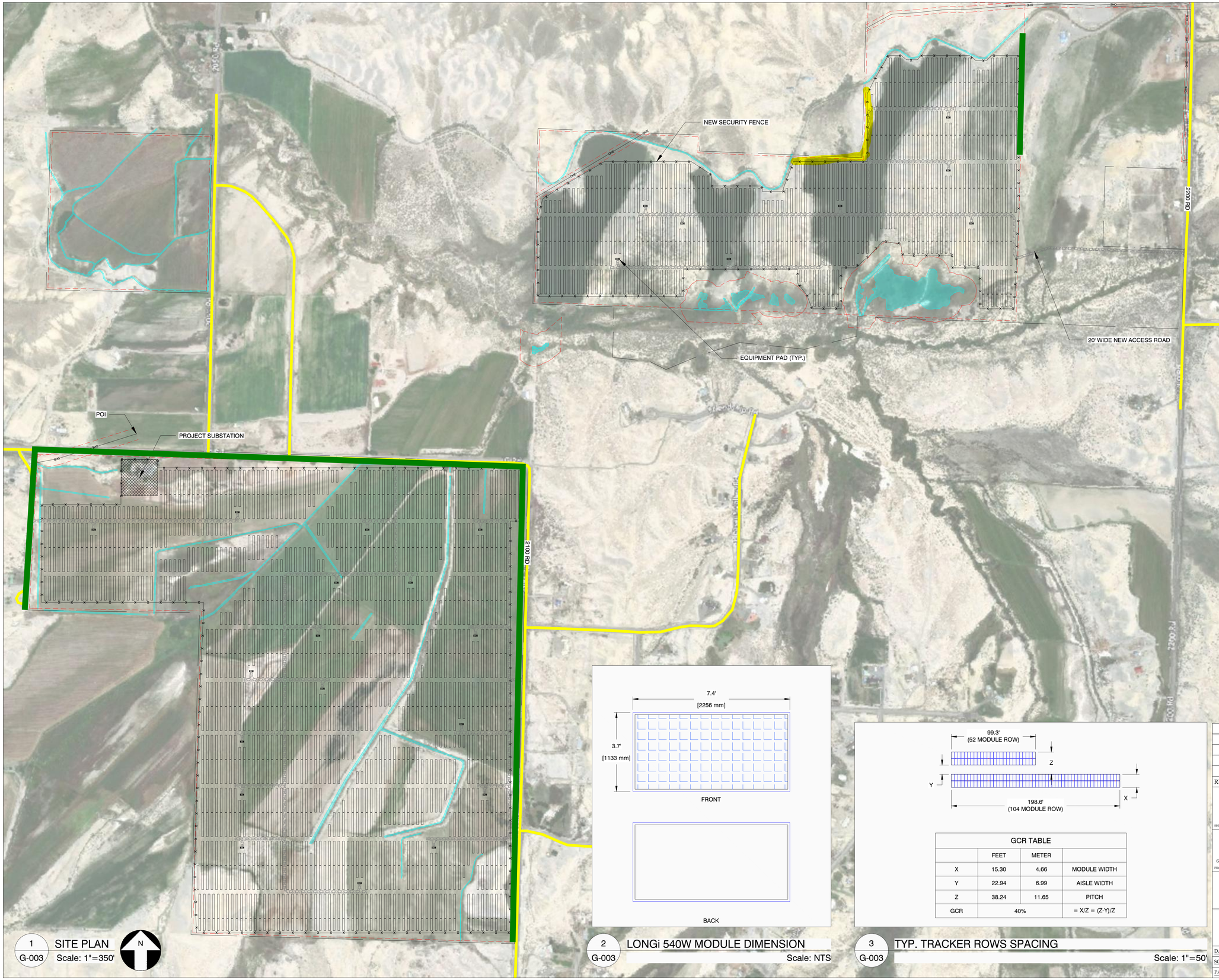
LEGEND

X	Study Area Key Intersection
X	Project Access Intersection
XXX(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,XOO	Estimated Daily Traffic Volume

GARNET MESA SOLAR
DELTA COUNTY, COLORADO
PROJECT TRIP ASSIGNMENT–PCE

FIGURE 4

Kimley»Horn



1 G-003 SITE PLAN
Scale: 1"=350'

2 G-003 LONGi 540W MODULE DIMENSION
Scale: NTS

GCR TABLE			
	FEET	METER	
X	15.30	4.66	MODULE WIDTH
Y	22.94	6.99	AISLE WIDTH
Z	38.24	11.65	PITCH
GCR	40%		= X/Z = (Z-Y)/Z

3 G-003 TYP. TRACKER ROWS SPACING
Scale: 1"=50'

SYSTEM SPECIFICATIONS	
SYSTEM SIZE DC	92,664.00 kW
SYSTEM SIZE AC	80,000.00 kW
DC/AC RATIO	1.16
MODULE MANUFACTURER	LONGi SOLAR
MODULE MODEL	LR5-72-HBD-540M-BIFACIAL
MODULE RATING	540 W
TOTAL MODULE QTY	171,600
MODULES PER STRING	26
TOTAL NO. OF STRINGS	6,600
INVERTER MODEL	POWER ELECTRONICS FS3430M
INVERTER RATING	3,200 kW
INVERTER QTY	25
STEP-UP TRANSFORMER	(25) 3.55 MVA, 34.5kV/0.6kV
RACKING TYPE	FTC VOYAGER 2P HSAT
TILT	0°
AZIMUTH	180°
GCR	40%
AVAILABLE PROPERTY AREA	579.59 Ac
FENCED AREA	365.00 Ac

LEGEND

- FTC VOYAGER 2P MODULE TRACKER ROWS (1,507)
- FTC VOYAGER 2P MODULE TRACKER ROWS (286)
- POWER STATION EQUIPMENT PAD
- PROPERTY LINE
- SETBACK LINE
- MIN. 6' SECURITY FENCE
- PROJECT SUBSTATION
- GRAVEL ACCESS ROAD
- EXISTING OVERHEAD LINE
- EXISTING ROAD
- WETLAND

DRAFT
NOT FOR CONSTRUCTION

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	AA	DG	05/25/2021

SHEET TITLE: GENERAL SITE PLAN

SHEET NO.: G-003

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

SOLVIDA DESIGN + ENGINEERING
1400 Shattuck Avenue, Suite 3
Berkeley, California 94709

soa SIERRA OVERHEAD ANALYTICS

DATE: 05/25/2021
SCALE: AS SHOWN
PAPER SIZE: 24" X 36"
DFTR: LAKIR RAMBHIA
CHKD: STEPHEN SMITH
ENGR: DARIN GALLOWAY

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Attachment 3-P

Decommissioning Plan

Part 1	Garnet Mesa Solar Decommissioning Plan
Part 2	Decommissioning Plan Engineer Commentary for Delta County Planning Board

Attachment 3-P

Decommissioning Plan

Part 1

Garnet Mesa Solar Decommissioning Plan

Kimley»Horn

08/06/2021

Matthew Kosakowski
Garnet Mesa Solar, LLC
1125 17th St, Suite 750
Denver, CO 80202

RE: ***Garnet Mesa Decommissioning Plans Request***

Dear Matthew,

Pursuant to your request for a decommissioning narrative associated with the Solar Project in Delta County, CO please refer to the following pages. Should you have any questions, please contact me directly at 303-226-6805 or erik.strock@kimley-horn.com.

Sincerely,
KIMLEY-HORN

Erik Strock, PE
Project Manager

GARNET MESA SOLAR
DECOMMISSIONING PLAN
8/2/2021

Purpose

This decommissioning plan is provided by Garnet Mesa Solar, LLC (the "Project Company") and will detail the projected decommissioning demands associated with the proposed project.

The purpose of this decommissioning plan is to provide procedures and an opinion of probable construction cost for partial or full closure of the solar facility. Delta County has requested a decommissioning plan and performance guarantees to supplement plans submitted as part of a Site Plan package. This decommissioning plan details provisions for facility deconstruction and site restoration to satisfy Delta County requirements. This decommissioning plan shall take effect upon facility abandonment, discontinuation of operation, or expiration of the use permit per Delta County.

Site Location

Garnet Mesa Solar proposes to build a photovoltaic (PV) solar facility ("Solar Facility") with a nameplate capacity of approximately 80 MW_{AC} ("Project"), in Delta County, Colorado. The Facility is located on seven parcels between 2200 Road on the east and 2050 Road on the west, north and south of G Road and within tax parcel identification numbers 345523100001 (240 acres), 345523200009 (41.8 acres), 245513100020 (181.5 acres), 345513300009 (2.56 acres), 345513100022 (67.55 acres), 345514300008 (40 acres), and 345513300020 (15 acres) totaling 579.59 acres ("Property").

Anticipated Service Life of the Project

Unless the system is purchased by Delta County or other entity, the facility shall be decommissioned in accordance with this decommissioning plan ("Plan"), restoring the site to as close to its agreed-upon post-decommissioned state as practicably possible upon expiration or termination of the Power Purchase Agreement with Delta-Montrose Electric Association ("DMEA"). The expected useful life of the Project is forty (40) years and is expected to be operational for the full forty (40) years.

Decommissioning responsibilities include the removal of: any perimeter fences, any concrete or steel foundations, metal structures (mounting racks and trackers), photovoltaic (PV) modules, aboveground and underground cables, access roadways, transformers, inverters, fans, switch boxes, fixtures, etc. and otherwise restoring the premises to its original position or mutually-agreed upon state. Other Plan activities include the management of materials and waste, projected costs, and a decommissioning fund agreement overview.

Commencement of Decommissioning

This Plan assumes that the Facility will be decommissioned under the following conditions:

1. The system does not produce power for sale for a consecutive 12-month period, except in the instance of a force majeure event in which the Project is being repaired and/or restored.
2. The system is damaged and will not be repaired or replaced.

Removal of Nonutility Owned Equipment

To decommission the Solar Facility, the Project will include at a minimum:

- Disconnection from the utility power grid
- Removal of Facility components: panels, inverters, wire, cable, combiner boxes, transformers, racks, trackers, tracker motors, weather monitoring, control system apparatus, etc….
- Removal of non-utility owned equipment (at point of interconnection), conduits, structures, fencing, and foundations to a depth of at least three feet below grade.
- Restoration of property to a condition reasonably similar to its condition prior to Facility installation, or as initially agreed upon.
- Plant vegetation suitable for the location, native to the region, and which matches surrounding vegetation.

This decommissioning plan is based on current best management practices and procedures. This Plan may be subject to revision based on new standards and emergent best management practices at the time of decommissioning. Permits will be obtained as required and notification will be given to necessary stakeholders prior to decommissioning.

The decommissioning process will maximize the recycling, reuse and salvage of applicable facility components, which are outlined in the opinion of probable construction costs. Based on the extent of decommissioning, prior to beginning construction activities, the developer will submit applicable demolition and construction plans and permit applications which will outline the schedule and extents of demolition. Decommissioning activities will not begin prior to issuance of approved permits by local regulatory agencies with appropriate jurisdiction.

Restoration of Property

In order to adequately restore the site to its previous condition, documentation using pre-construction video and/or digital photography will be performed prior to construction activities. This information will be reviewed prior to preparation of decommissioning demolition documents and included in the submittal to the County. Pre-construction documentation will also consist of detailed descriptions of existing vegetative and soil conditions as well as existing topography and drainage patterns.

At the time of decommissioning, the Project Company will restore the Solar Facility to current (2021) conditions and land use practices. Waste and excess materials will be disposed of in accordance with

municipal, state, and federal regulations. Waste that can be recycled under municipal programs will be recycled accordingly. Provided, however, the Project Company shall not be required to replace structures that were removed to build the Solar Facility.

Mass grading is not anticipated since the initial project will not alter topography significantly. The Project Company will provide dust control during site restoration. At the end of the project, the area will be restored and returned as close as practicable to the original or initially agreed-upon condition. The exterior landscaping will be left in place. The future use of the land will for agricultural purposes. Deciding factors will be influenced by County land use and comprehensive plans and regulations at such time in the future.

The developer will coordinate with the County to monitor vegetation and drainage following restoration until permanent vegetation is established. Erosion and sediment control, re-seeding, soil stabilization, weed control and fertilization will be provided by the developer as needed until the site is stabilized and approved to be completed by the County.

Upon completion of the site restoration, a final report of activities will be submitted to the County documenting the process and results.

Time Period to Complete Decommissioning

The Project Company will have twelve (12) months from the date decommissioning commences to complete decommissioning. Provided, however, the Project Company shall be able to request an extension of an additional six (6) months if it is in good faith diligently decommissioning and is delayed due to weather conditions or other items outside its control.

Party Responsible for Decommissioning

The Project Company is responsible for this decommissioning, provided however that the Project Company may contract with a third-party to perform the decommissioning on its behalf. Nothing in this plan relieves any obligation that the real estate property owner may have to remove the Facility as outlined in the Garnet Mesa Solar Limited Use Permit in the event the operator of the Facility does not fulfill this obligation.

Decommissioning Cost Estimate and Bonding

An engineer's opinion of probable construction cost and analysis of material salvage value were prepared as part of this decommissioning plan. Exhibit A summarizes the probable costs and salvage values associated with decommissioning. Exhibit B summarizes probable costs associated with trucking panels to approved recycling facilities.

Garnet Mesa Solar, LLC will provide a faithful performance bond as a financial guarantee for proper decommissioning. This bond is separate from, and in addition to, required performance bonding submitted for permitting. Furthermore, Garnet Mesa Solar, LLC will submit detailed engineering plans at the time of decommissioning, and obtain construction permits as required by appropriate authorities.

Industry standard prices in 2021 for removal costs (labor, material, and equipment) were determined using RSMeans cost data. Removal cost includes materials, contractor installation/demolition, mobilization, and demobilization, overhead and profit, performance bonding, contingency, and engineering plans and permitting.

Total probable cost of decommissioning (without salvage) is estimated to be **$4,483,375.28**

Resale/Salvage Value Estimate

There is a robust secondary market for resale of solar PV panels worldwide and a network of facilities available for recycling panels. Solar PV panels are estimated to degrade less than 0.5% per year, meaning they're expected to operate at 90% of capacity after 20 years. Panel manufacturers will guarantee the performance for each individual module and replace defective modules per the terms of warranty. Panels can therefore be sold for a price higher than their scrap value.

The solar facility's additional supporting components, such as inverters, transformers, racking and piles, can be dismantled and resold for scrap value. Inverters and transformers are comprised of salvageable materials such as copper, aluminum, and silver. Piles and other steel components can likewise be recovered and salvaged. Resale values of equipment of significant value were calculated with straight-line depreciation of the original material cost.

Total probable benefit of decommissioning (with salvage) is estimated to be **$2,977,941.33**

	Total Price (incl. markups)	Total Price (incl. markups and salvage)
Subtotal:	$2,535,724.51	($1,895,298.35)
Contingency (5%):	$126,800.00	$126,800.00
Inflation (1.5%):	$1,820,850.77	($1,209,442.98)
Total:	$4,483,375.28	($2,977,941.33)

Table 1 - Decommissioning Costs - See Appendix A for further detail

Conclusion

This decommissioning plan describes the procedures and provides an opinion of probable cost to restore the project area to as close as practicable to original or initially agreed-upon condition. The Owner provided site plan and material take offs have been used to generate material quantities. Current RS Means cost data, readily available material prices, and Kimley-Horn prior experience on similar projects has been used to generate the cost estimates. These estimates have been prepared by Erik Strock, CO PE #53883.

EXHIBIT A

Garnet Mesa Solar
Delta County, CO
Detailed Decommissioning Estimate for 2P Option

				Labor Markup: 1.58 CCI: 89.1			Material Markup: 1.34 CCI: 129.0		Equipment Markup: 1.35 CCI: 90.9		Salvage/Scrap Value				
Item	Quantity	Unit	Notes	Productivity (units/hr)	Labor ($/hr)	Unit Labor ($/unit)	Bare Material ($/unit)	Unit Material ($/unit)	Equipment Cost ($)	Unit Equipment Cost ($/unit)	Salvage Value ($/unit)	Total Salvage ($)	Unit Price (incl. markups)	Total Price (incl. markups)	Total Price (incl. markups and salvage)
Mobilization	1	LS	5% of subtotal, excl. salvage											$116,930.00	$116,930.00
Supervision	210	HR	10% of Total Hours, Constructon Manager @ $55/hr	1	$ 55.00	$ 78.00							$ 78.00	$16,380.00	$16,380.00
Temporary Facilities	1	LS	Assume 0.62% of subtotal, excl. salvage											$14,500.00	$14,500.00
Safety	1	LS	Assume 0.42% of subtotal, excl. salvage											$9,830.00	$9,830.00
Legal Expenses	1	LS	Assume 0.11% of subtotal, excl. salvage											$2,580.00	$2,580.00
General Liability Insurance	1	LS	Assume 0.45% of subtotal, excl. salvage											$10,530.00	$10,530.00
Contractor's G&A	1	LS	Assume 0.85% of subtotal, excl. salvage											$19,880.00	$19,880.00
Contractor's Profit	1	LS	Assume 0.28% of subtotal, excl. salvage											$6,550.00	$6,550.00
SWPPP, Erosion Control Measures	1	LS	$300/ac assumed (list E&S measures)										$135,000.00	$135,000.00	$135,000.00
Seeding	22	Ac	B66 crew (1 equip operator @ $57/hr, loader-backhoe@ $2,500/month), fescue erosion mix, 5% of site	0.15	$ 57.00	$ 535.00	$ 800.00	$ 1,382.88	$ 2,500.00	$ 138.00			$ 2,055.88	$45,948.92	$45,948.92
Tilling 6" topsoil/scarifying access road and rough grading existing soil	7	Ac	Tilling/removal: B66 crew (1 equip operator @ $57/hr, loader-backhoe @$2,000/2wks, 2 dump trucks @ $2,500/2wks each) Grading: B11L crew (1 Construction laborer (Clab) @ $42/hr, 1 light equip operator at $57/hr, 1 grader @ $3,000/2 wks)	0.4	$ 156.00	$ 550.00			$ 3,750.00	$ 658.00			$ 1,208.00	$8,456.00	$8,456.00
Remove and Recyle Chainlink Fence, 12' High	28,250	LF	B6 crew (2 Clab @ $42/hr, 1 equip operator @ $57/hr, loader-backhoe @ $1500/month each)	50	$ 141.00	$ 4.00			$ 4,500.00	$ 0.20	$ 0.46	$ 13,130.60	$ 4.20	$118,522.18	$105,391.58
Disconnection and Demolition of Switchyard/Substation Equipment	1	EA	5 Electricians @ $46/hr, 1 equip operator @ $57/hr, 1 Clab @ $42/hr; 1 crane, 1 demo excavator, 1 crew cab for 3.5 wk @ $22,750 total	0.007	$ 329.00	$ 66,166.00			$ 22,750.00	$ 27,918.00	$ 18,816.80	$ 18,816.80	$ 94,084.00	$94,084.00	$75,267.20
Removal and Recycle AC Cables	88,250	LF	Trenching: B54 crew (1 equip operator at $54/hr, 1 chain trencher @ $4,500/6wk); Demo cable: 1 Electrician @ $46/hr	725	$ 46.00	$ 0.09			$ 4,500.00	$ 0.06	$ 0.17	$ 22,493.60	$ 0.15	$13,404.77	($9,088.82)
Remove and Recycle DC Cables	1,009,257	LF	Trenching: B54 crew (1 equip operator at $54/hr, 1 chain trencher @ $4,500/6wk) Demo cable: 1 Electrician @ $46/hr;	1325	$ 46.00	$ 0.05			$ 3,500.00	$ 0.00	$ 0.17	$ 22,493.60	$ 0.05	$53,621.32	$31,127.73
Backfill AC and DC trenches	131,158	LF	B10R crew (1 equip operator @$54/hr, 0.5 Clab@$42/hr, 1 FE Loader@$2,800/5wks)	610	$ 82.00	$ 0.19			$ 2,800.00	$ 0.03			$ 0.22	$28,256.70	$28,256.70
Remove and Recycle Inverters	25	EA	Incl. 12'x7'x6" pad demo (B38 crew (1 foreman @ $44/hr, 2 Clab@$42/hr, 2 equip operators @$54/hr; 1 backhoe loader @ $600/wk, 1 hyd. hammer @$1000/wk, 1 FE loader@$2,000/wk, 1 bucket@$64/day)) ; 1 Electrician @ $46/hr	2	$ 282.00	$ 199.00			$ 3,664.00	$ 180.00	$ 900.00	$ 22,500.00	$ 379.00	$9,475.00	($13,025.00)
Removed and Recycle Photovoltaic Modules	195,264	EA	6 Clab @ $42/hr each, 1 equip operator at $54/hr; trucking and off-road forklift @ $2,500/4 weeks; resell panels @ $0.05/max rated watt	180	$ 306.00	$ 2.40			$ 183,200.00	$ 1.16	$18.94	$ 3,698,543.94	$ 3.56	$695,139.84	($3,003,404.10)
Remove and Recycle Piles (10' W6x7 piles @ 25' OC assumed)	12,983	EA	B19 crew (1 Pile Driver Foreman @$56/hr, 4 Pile Drivers @ $54/hr, 2 Equip. Oper. (crane) @$59/hr, 1 Equip. Oper. @ $54/hr; 1 Crawler Crane, 40 Ton@$1,200/day, 1 Lead, 90' High@ $400/day, 1 Hammer, Diesel, @ $440/day)	60	$ 444.00	$ 11.00			$ 81,600.00	$ 7.80	$ 0.58	$ 120,689.97	$ 18.80	$244,080.40	$123,390.43
Remove and Recycle Support Assemblies	6,172,944	LB	10 Clab @ $42/hr, 1 equip operator at $54/hr; dump truck @$3,800/8wk	5000	$ 474.00	$ 0.13			$ 15,200.00	$ 0.01	$ 0.08	$ 512,354.35	$ 0.14	$885,555.39	$373,201.03
Contaminated Soils Testing	1	LS	$2,000 allowance of 3rd party soil sample collection, analysis and reporting											$2,000.00	$2,000.00
Reclamation Monitoring and Maintenance	1	LS	$5,000 allowance											$5,000.00	$5,000.00

Subtotal:	$2,535,724.51	($1,895,298.35)
Contingency (5%):	$126,800.00	$126,800.00
Inflation (1.5%):	$1,820,850.77	($1,209,442.98)
Total:	$4,483,375.28	($2,977,941.33)

Notes:

1. A site of similar size was used to derive potential quantities for erosion and sediment control(scaling 36MW to 80MW). Quantities were determined by comparing "unit/MW" quantities directly.
2. Labor productivity and unit rates were derived from RSMeans Online (Heavy Construction, 2020 data).
3. Material salvage values were based off of current US salvage exchange rates.
4. Equipment rental rates were determined from local rental facilities.
5. Photovoltaic Module material salvage rate is based on straight-line depreciation of modules (-0.5%/year): See Figure 1 in Appendix A of the Decom. Narrative
6. For PV Module Removal/Recycle labor and equipment costs are computed at present values, while salvage value is computed at 20 year depreciated values.
7. Material salvage values was determined using the most prevalent salvageable metal in each component: Copper Wire @$0.17/LF (AC and DC Cables) and Steel @ $0.46/LF of fence, @ $0.58/pile, and @ $0.08/LB.
8. Inverter resale value is dependent on the assumption that all inverters will be decommssioned and resold half way through their useful life (every 5 years).
9. Labor, material, and equipment rates are based on the RSMeans City Cost Index (CCI) for Grand Junction, CO.

Garnet Mesa Solar
Delta County, CO
Decommissioning Estimate Pro Forma w/ Salvage

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs. LS = Lump Sum, HR = Hours, EA = Each, LF = Linear Feet.

Item	Quantity	Unit	Unit Price	Total Price
Mobilization	1	LS		$116,930
Supervision	210	HR	$78.00	$16,380
Temporary Facilities	1	LS		$14,500
Safety	1	LS		$9,830
Legal Expenses	1	LS		$2,580
General Liability Insurance	1	LS		$10,530
Contractor's G&A	1	LS		$19,880
Contractor's Profit	1	LS		$6,550
SWPPP, Erosion Control Measures	1	LS	$135,000.00	$135,000
Seeding	22	Ac	$2,055.88	$45,949
Tilling 6" topsoil/scarifying access road and rough grading existing soil	7	Ac	$1,208.00	$8,456
Remove and Recyle Chainlink Fence, 12' High	28,250	LF	$4.20	$105,392
Disconnection and Demolition of Switchyard/Substation Equipment	1	EA	$94,084.00	$75,267
Removal and Recycle AC Cables	88,250	LF	$0.15	($9,089)
Remove and Recycle DC Cables	1,009,257	LF	$0.05	$31,128
Backfill AC and DC trenches	131,158	LF	$0.22	$28,257
Remove and Recycle Inverters	25	EA	$379.00	($13,025)
Removed and Recycle Photovoltaic Modules	195,264	EA	$3.56	($3,003,404)
Remove and Recycle Piles (10' W6x7 piles @ 25' OC assumed)	12,983	EA	$18.80	$123,390
Remove and Recycle Support Assemblies	6,172,944	LB	$0.14	$373,201
Contaminated Soils Testing	1	LS		$2,000
Reclamation Monitoring and Maintenance	1	LS		$5,000
			Subtotal:	($1,895,298)
			Contingency (5%):	$126,800
			Inflation (1.5%/year):	($1,209,443)
			Total:	($2,977,941)

Notes:
1. A site of similar size was used to derive potential quantities for erosion and sediment control(scaling 36MW to 80MW). Quantities were determined by comparing "unit/MW" quantities directly.
2. Labor productivity and unit rates were derived from RSMeans Online (Heavy Construction, 2020 data).
3. Material salvage values were based off of current US salvage exchange rates.
4. Equipment rental rates were determined from local rental facilities.
5. Photovoltaic Module material salvage rate is based on straight-line depreciation of modules (-0.5%/year): See Figure 1 in Appendix A of the Decom. Narrative
6. For PV Module Removal/Recycle labor and equipment costs are computed at present values, while salvage value is computed at 20 year depreciated values.
7. Material salvage values was determined using the most prevalent salvageable metal in each component: Copper Wire @$0.17/LF (AC and DC Cables) and Steel @ $0.46/LF of fence, @ $0.58/pile, and @ $0.08/LB.
8. Inverter resale value is dependent on the assumption that all inverters will be decommssioned and resold half way through their useful life (every 5 years).
9. Labor, material, and equipment rates are based on the RSMeans City Cost Index (CCI) for Grand Junction, CO.

Garnet Mesa Solar
Delta County, CO
Decommissioning Salvage/Resale Values

Table 1. Material Salvage Values

Line Item	Quantity	Unit	Quantity	Unit	Unit Density (Lb/unit)	Weight (Lb)	Price/Lb	Unit Price	Total Price
Copper Wire			131158	lf	0.05	6,558	$ 3.43	$ 0.17	$ 22,493.60
Steel									
Piles	12983	EA	207728	lf	7	1,454,096	$ 0.08	$ 0.58	$ 120,689.97
Racks	80	MW			77161.8	6,172,944	$ 0.08	$ 6,404.43	$ 512,354.35
Fence	28250	LF	28250	ft	5.6	158,200	$ 0.08	$ 0.46	$ 13,130.60

Table 2. Equipment Resale Values

Line Item	Quantity	Unit	Unit Price	Original Total Cost	Instant Depreciation	End of Life Salvage Value	Useful Life	Age of Component at Decommissioning	Resale Value
Modules	195264	EA	$18.94	$ 28,000,000.00	$ 20,000,000.00	$ 3,698,543.94	30	20	$ 3,698,543.94
Inverters	25	EA	18000	$ 450,000.00	$ 225,000.00	$ 45,000.00	10	5	$ 22,500.00

References: Site Work & Landscape Costs with RSMeans Data, 36th annual ed. 2017
RS Means Heavy Construction Cost Data, 29th Edition

Garnet Mesa Solar
Delta County, CO
Estimated PV Panel Valuation

Project Size 80,000,000 W

Year	Panel Efficiency	Assumed Value ($/W)	Assumed Value ($)
0	100.00%	$0.35	$28,000,000
1	99.50%	$0.25	$20,000,000
2	99.00%	$0.23	$18,300,000
3	98.51%	$0.21	$16,744,500
4	98.01%	$0.19	$15,321,218
5	97.52%	$0.18	$14,018,914
6	97.04%	$0.16	$12,827,306
7	96.55%	$0.15	$11,736,985
8	96.07%	$0.13	$10,739,342
9	95.59%	$0.12	$9,826,498
10	95.11%	$0.11	$8,991,245
11	94.64%	$0.10	$8,226,989
12	94.16%	$0.09	$7,527,695
13	93.69%	$0.09	$6,887,841
14	93.22%	$0.08	$6,302,375
15	92.76%	$0.07	$5,766,673
16	92.29%	$0.07	$5,276,506
17	91.83%	$0.06	$4,828,003
18	91.37%	$0.06	$4,417,622
19	90.92%	$0.05	$4,042,125
20	90.46%	$0.05	$3,698,544

Figure 1 - PV Panel Valuation Graph

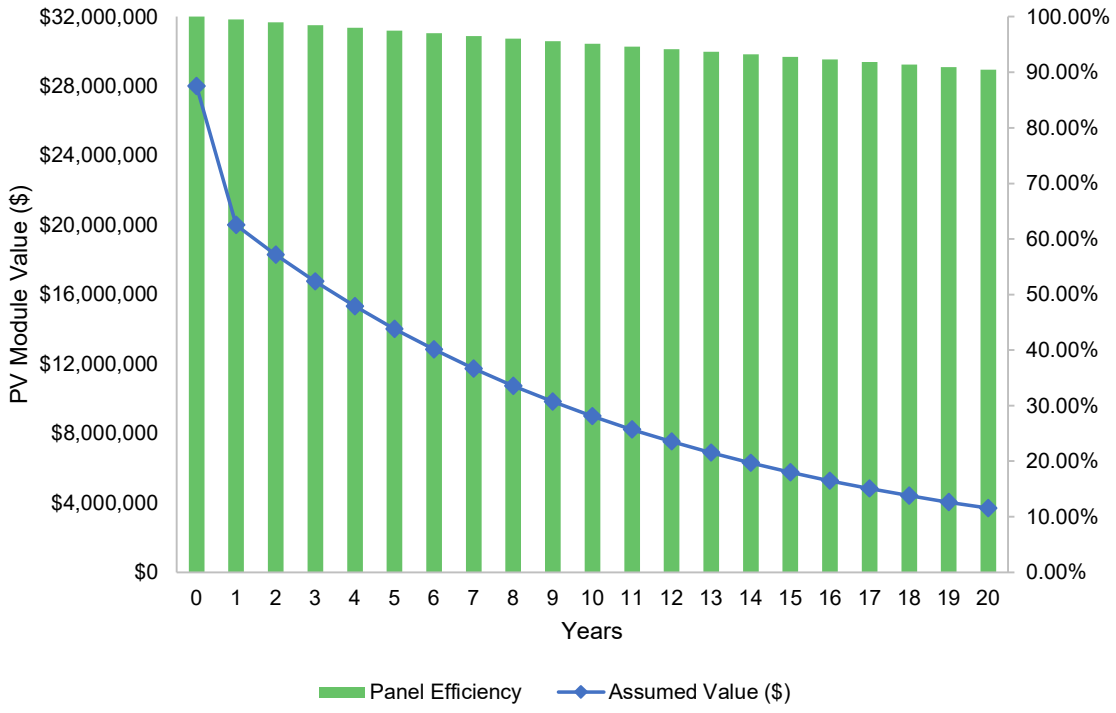


EXHIBIT B

Garnet Mesa Solar
Delta County, CO
Panel Trucking Costs

$/mo/truck rental	$	4,000
$/mo/truck labor (FT+benefits)*	$	5,000
$/mo/truck maintenance	$	500
$/mo/truck insurance	$	1,000
Total $/mo/truck cost	$	10,500.00
$/gallon gas	$	3.00
miles /gallon		8
Mileage (Delta, CO to Phoeniz, AZ) roundtrip		1100
Total fuel cost per trip	$	412.50
Capacity in tons per trip		40
total number of panels		195,264
panel weight (tons)		5,858
Misc. Waste (tons)		20
Total trips		147
Loading/unloading hours per trip		1
road hours per trip		12.0
hours per day		10
days/month		21
trips per month per truck		16.2
Total truck months		10
Subtotal of Truck and Labor Cost	$	105,000
Fuel Cost	$	60,638
Total Trucking Cost	**$**	**165,638**

*Assumes truck labor only works half of the month at standard heavy truck operator rates

Attachment 3-P

Decommissioning Plan

Part 2

Decommissioning Plan Engineer Commentary for Delta County Planning Board

Kimley»Horn

8/6/2021

Delta County
Planning and Community Development Office
295 W 6th Street
Delta, Colorado 81416

RE: ***Garnet Mesa Solar***
Decommissioning Cost Estimate
Kimley-Horn #196230000

Members of the Department:

The purpose of this letter is to provide a summary of Kimley-Horn's experience with solar energy facilities, the preparation of decommissioning costs associated with these facilities, and an overview of our estimating methodology.

Kimley-Horn has experience providing consultation for more than 45 GW of solar energy development across the country, ranging in size from <1 MW to over 500 MW. Many of these solar facilities are in Colorado and the western United States.

There is little current data available regarding the actual costs to decommission a solar facility because there have been few (if any) decommissioned facilities. This is because the average expected life span of a solar facility is approximately 35 years. However, we have combined our extensive experience in estimating sitework construction costs with the experience of our solar energy clients in the construction of all aspects of these facilities to develop quantifiable and defendable unit costs.

Quantities for the racking system, solar modules, inverters, and transformers were provided to us by Garnet Mesa Solar, LLC for this decommissioning cost estimate. Quantities for site-related items listed were estimated using the preliminary site plan for Garnet Mesa Solar. Salvage values of the various metal components were estimated using current scrap metal prices for steel, copper, and aluminum obtained from the US salvage exchange rates.

As you will see, the attached decommissioning cost estimate results in a positive net surplus. The benefit of the salvage value resulting in a positive net surplus is that the decommissioning of the solar farm will likely result in a "buy job." The owner of the solar farm will issue RFP's (Request for Proposals) to Recycling/Restoration companies to provide their bid to restore the site to its original conditions and sell the items of value to recyclers and dispose of items with no value in a landfill. The cost estimate shows that the net surplus is a positive value:

	Total Price (incl. markups)	Total Price (incl. markups and salvage)
Subtotal:	$2,535,724.51	($1,895,298.35)
Contingency (5%):	$126,800.00	$126,800.00
Inflation (1.5%):	$1,820,850.77	($1,209,442.98)
Total:	$4,483,375.28	($2,977,941.33)

Table 1 - Decommissioning Costs - See Appendix A for further detail

Additionally, with assumed inflation of 1.5% per year over an estimated 35-year life of the project, the net surplus would increase. This means the companies will be "buying" the right to perform the work and will be able to make a profit based off the salvage value of the recyclable items from the site. Please see the attached Decommissioning Cost and Salvage Value estimates.

Please contact me at 303-226-6805 or erik.strock@kimley-horn.com should you have any questions or concerns.

Sincerely,
KIMLEY-HORN

Erik Strock

Erik Strock, PE
Project Manager

Attachment 3-Q

Construction Costs Summary

Construction Costs Summary

Garnet Mesa Solar, LLC
Delta County, Colorado

The table below is a summary of expected project construction costs as of the date of this permit submission. These numbers are estimates based on current market pricing and are subject to change prior to the start of construction in late 2022. The Garnet Mesa Solar project team will coordinate with Delta County and provide updated valuation estimates, as is customary, prior to the issuance of any building permits.

Solar Project Major Equipment	**$47,130,000**
Modules	$28,000,000
Equipment Pads (Inverters and Transformers)	$4,600,000
Tracker Structure and Foundations	$10,730,000
Shipping	$2,400,000
Sales Tax	$1,400,000
Construction	**$28,870,000**
Balance of System Materials	$5,800,000
Civil and Site Materials & Installation	$3,200,000
Assembly & Installation	$7,600,000
Construction Amin. & General Conditions	$5,940,000
Engineering	$830,000
Project Substation and Transmission Line Upgrades	$5,500,000
Total Estimated Construction Costs	**$76,000,000**

Attachment 3-R

Construction Schedule

CITRA

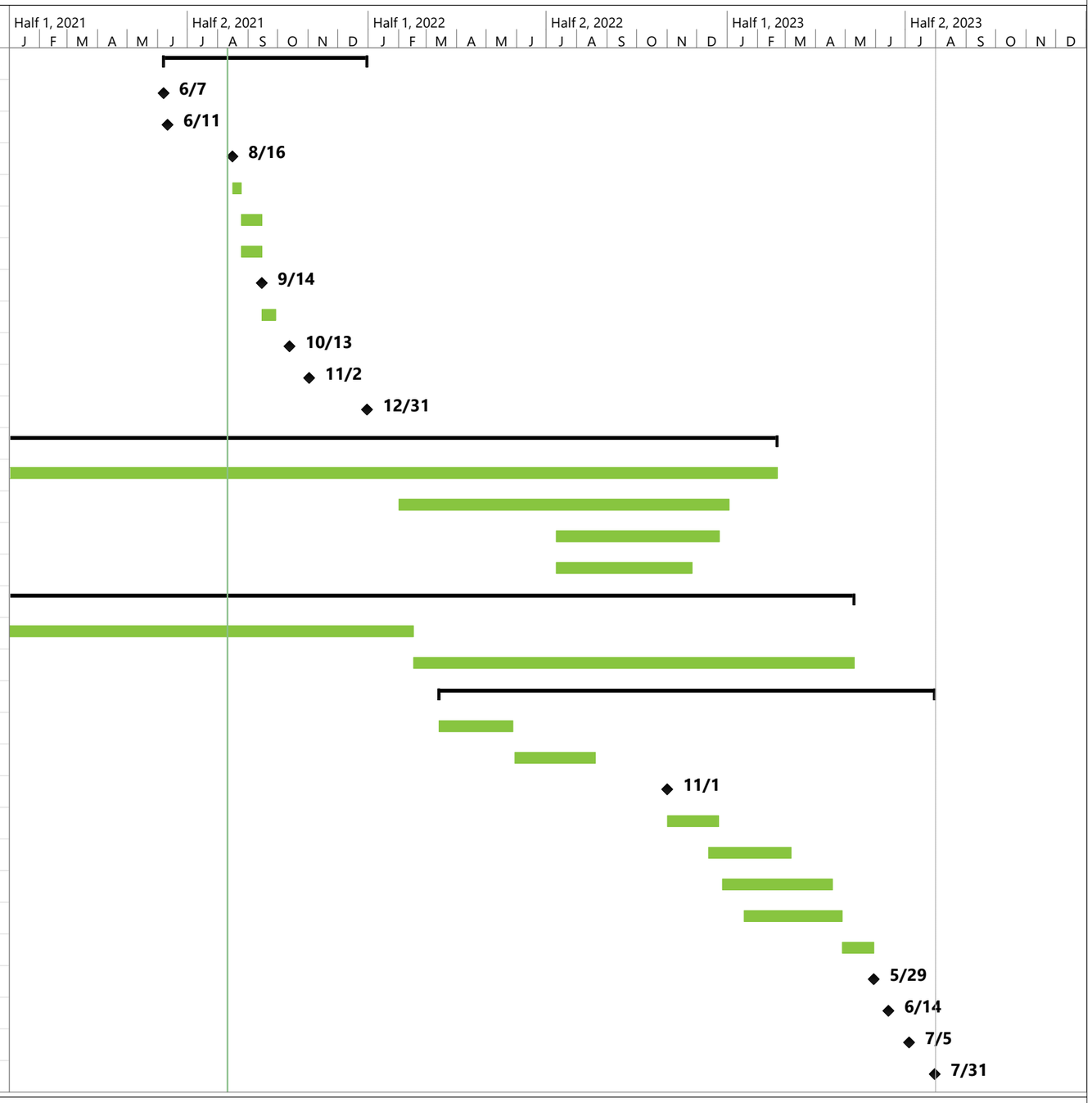
Garnet Mesa Solar

Preliminary Permitting and Construction Schedule

Issued for Limited Use Permit Application

August, 2021

ID	Task Name	Duration	Start	Finish
1	**Land Use Permitting Process**	**149 days**	**6/7/2021**	**12/31/2021**
2	Pre-Application Conference	0 days	6/7/2021	6/7/2021
3	Application Checklist Delivered	0 days	6/11/2021	6/11/2021
4	Limited Use Permit Application Submitted	0 days	8/16/2021	8/16/2021
5	Completeness Review	7 days	8/16/2021	8/24/2021
6	Applicable Agency Review	3 wks	8/25/2021	9/14/2021
7	Adjacent Property Owner Notices	3 wks	8/25/2021	9/14/2021
8	Comments (if any) Provided	0 days	9/14/2021	9/14/2021
9	Time Reserved for Addressing Comments	2 wks	9/15/2021	9/28/2021
10	Planning Commission Public Hearing (Date TBD)	0 days	10/13/2021	10/13/2021
11	Board of County Commissioners Meeting (Date TBD)	0 days	11/2/2021	11/2/2021
12	Target Date to Receive Limited Use Permit Approval	0 days	12/31/2021	12/31/2021
13	**Procurement**	**600 days**	**11/3/2020**	**2/20/2023**
14	Transformer	30 mons	11/3/2020	2/20/2023
15	Modules	12 mons	2/1/2022	1/2/2023
16	Inverters	24 wks	7/11/2022	12/23/2022
17	Structure	20 wks	7/11/2022	11/25/2022
18	**Utility Interconnection Process**	**640 days**	**11/25/2020**	**5/9/2023**
19	Interconnection Study Process	320 days	11/25/2020	2/15/2022
20	Utility System Upgrades	16 mons	2/16/2022	5/9/2023
21	**Design & Construction**	**360 days**	**3/14/2022**	**7/31/2023**
22	Contracting	11 wks	3/14/2022	5/27/2022
23	Construction Engineering	12 wks	5/30/2022	8/19/2022
24	Construction Mobilization	0 days	11/1/2022	11/1/2022
25	Civil Construction	38 days	11/1/2022	12/22/2022
26	Foundation Installation	60 days	12/13/2022	3/6/2023
27	Structure Installation	80 days	12/27/2022	4/17/2023
28	Module Installation	72 days	1/18/2023	4/27/2023
29	Terminations, Testing, & Close-Out	22 days	4/28/2023	5/29/2023
30	Mechanical Completion	0 days	5/29/2023	5/29/2023
31	Commercial Operations Date	0 days	6/14/2023	6/14/2023
32	Substantial Completion	0 days	7/5/2023	7/5/2023
33	Final Completion	0 days	7/31/2023	7/31/2023



Attachment 4-A

Agriculture Management Plan

The Garnet Mesa Solar Project team has developed a plan to continue the agricultural use of the properties during the operations phase of the solar generating facility. The project has engaged with the American Solar Grazing Association (https://solargrazing.org/) and the Colorado Wool Growers Association (https://www.coloradosheep.org/) to aid in developing a solution which satisfies the community desire to keep agriculture active in the area.

The project has entered into a Letter of Intent with Sperry Livestock Corporation, who will be the project's partner in overseeing a herd of sheep to be used to maintain site vegetation in lieu of mowing.

The project shall provide interior fencing to allow for the safe containment and herding of the sheep around the array to prevent overgrazing any individual area. The project shall also provide watering locations and other necessary facilities as required by Sperry Livestock Corp. to ensure the sheep remain safe and healthy while on the site.

Sperry Livestock will transport the sheep to and from the site and be responsible for managing the herd while on the project site.

The project's operations and maintenance team and Sperry Livestock will work collaboratively as development progresses to ensure the needs of both parties are fully captured in all operational documents prior to the commencement of grazing.

Non-Binding Letter of Intent ("LOI")
For Sheep Grazing
Preliminary Details

Project/Owner	Garnet Mesa Solar LLC
Grazer/Farmer	~~[Joe Sperry]~~, Sperry Livestock Corp. JAB
Intent	The parties desire to enter into a potential Sheep Grazing Agreement to facilitate the grazing of Farmer's sheep on the Grazing Area for the purpose of vegetation management. The Project and Farmer plan to work together to develop the grazing plan and ensure that the project design is compatible with Farmer's sheep grazing operation, and vice versa.
Project Site	The Project Site is in Sections 13 and 23, T15S, R95W; of the Sixth Principal Meridian in Delta County, Colorado (Appendix 1). The longitude/latitude of the project area is 107.97133°W/ 38.743123°N. The elevation of the Project Site is approximately 5,080 feet above sea level, and the Project Site is shown on the U.S. Geological Survey (USGS) Olathe NW and Orchard City, CO Quadrangles.
Grazing Area	The Grazing Area would be approximately 350 acres across two contiguously fenced areas. The Project Site would be fenced with an agricultural fence ~~at least 7' high,~~ SKS which would allow safe containment of the sheep herds. Watering locations and facilities would be coordinated between Farmer and Project and reflected in a potential final, binding Sheep Grazing Agreement between the parties.
Seed Mixture / Crop	Specific seed mixture to be developed by Project/Owner in coordination with local/regional natural resource consultant.
Term	To be determined
Responsibilities	Farmer would be responsible for the transportation to/from and management of sheep within the Grazing Area for the length of the Term. Farmer would graze sheep within Grazing Area at least once per year or on an as needed basis to maintain proper vegetation growth. Farmer would be responsible for any damage or liability caused by the sheep or the Farmer's activity on the Project Site.

	Project/Owner would be responsible for maintaining project facilities and ensuring that perimeter fencing, and access gates are in proper working condition.
Compensation	To be determined

The foregoing non-binding terms are provided for the limited purpose of outlining the general terms of a potential Sheep Grazing Agreement to be negotiated between the parties. Any binding agreement between the parties would be subject to the prior approval of Garnet Mesa Solar LLC's board of directors and senior management.

Hereby acknowledged:

Garnet Mesa Solar LLC

By: Robin Lunt

Name: Robin Lunt

Title: Chief Strategy Officer

Date: 7/19/2021

~~JHS [Joe Sperry]~~ Sperry Livestock Corp.

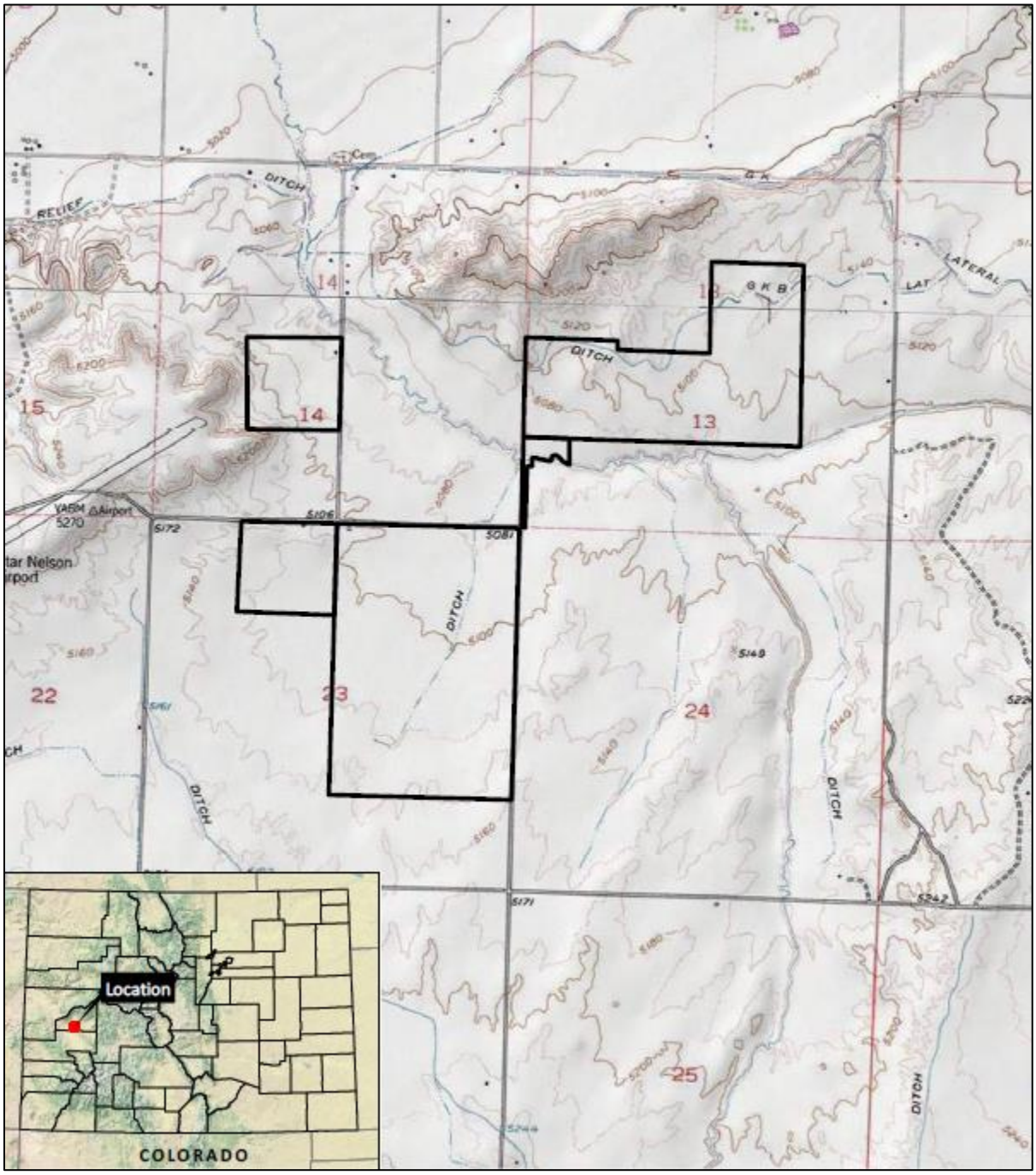
By: Joe H. Sperry

Name: Joe H. Sperry

Title: President

Date: 7/19/2021

Exhibit 1



Attachment 4-B

Drainage Access Plan

There are two drainage ditches which cross the project properties. The **GKB Lateral Ditch** crosses the north-east property and the **GHA Lateral Ditch** crosses the south-west property.

The GKB Lateral Ditch will remain wholly outside of the project fence. The project will not prevent any party requiring access to this shared resource from accessing the ditch.

The GHA Lateral Ditch will be behind the project fence, and access will be limited to only those parties with a demonstrable need for access. Access will need to be scheduled ahead and all third parties will require an escort from plant operations personnel. It is standard practice for signage with contact information to be placed at a set frequency around the project site. This phone number for the project will be manned 24/7, and any individual requiring access to the ditch will be able to coordinate directly with plan operators using this method.

Since the GHA Lateral Ditch is a feature which originates on project property, there are no upstream property owners which may be impacted the project. The primary, and likely only, third party that will occasionally require access will be the Uncompahgre Valley Water Users Association. Since the project operations personnel will be managing the solar property in a similar fashion to our grazing and farming neighbors, the project anticipates no conflicts and intends to maintain the relationship in the same fashion as all other members of the association.

Attachment 4-C

Wetlands Confirmation of No Impact

In response to the Planning Board's questions relating to agency requirements on the underground bore crossing of the Arroyo wetland and any required setbacks, the following memo was prepared by the project's environmental consultant, ERO Resources Corp.

ERO Resources Corp.
Celebrating 40 Years!

August 11, 2021

TO: Matt Kosakowski, Garnet Mesa Solar LLC

FROM: Aleta Powers, ERO Resources Corporation

RE: Garnet Mesa Solar Development Project

Garnet Mesa Solar LLC retained ERO Resources Corporation (ERO) to provide a wetland delineation for the Garnet Mesa Solar Development Project (project area; Figure 1). Garnet Mesa Solar LLC plans to install a solar farm in the project area. Project details have not been disclosed. ERO conducted a wetland delineation as described in this report to facilitate compliance with the Clean Water Act (CWA).

The CWA protects the chemical, physical, and biological quality of waters of the U.S. The U.S. Army Corps of Engineers' (Corps) Regulatory Program administers and enforces Section 404 of the CWA. Under Section 404, a Corps permit is required for the discharge of dredged or fill material into wetlands and other waters of the U.S. (streams, ponds, and other waterbodies). On June 22, 2020, the Environmental Protection Agency (EPA) and Corps' Navigable Waters Protection Rule (NWPR) to define "waters of the United States" became effective in 49 states and in all U.S. territories. On April 23, 2021, the NWPR applied in Colorado as well.

When evaluating the need for a Section 404 permit, the Corps asks two primary questions:

1. Is there a jurisdictional water/wetland?
2. Is there a regulated activity?

For the first question, the response for the Garnet Mesa Solar Development Project is "Yes": there are small areas of jurisdiction—specifically, about 0.083 acres of wetlands along East Canal, and about 0.074 acres of the East Canal itself. These areas are the limits of the Corps' regulatory authority over this project.

The response to the second question is "No". Boring under the arroyo and placing fill outside of the limits of the regulated waters does not represent "discharge of dredged or fill material" and therefore is not a regulated activity. There are no fill/discharge setbacks from wetlands or waters required by the Corps. It is ERO's opinion that Section 404 authorization is not needed for this project.

Denver
1842 Clarkson St.
Denver, CO 80218
303.830.1188

Durango
1015 ½ Main Avenue
Durango, CO 81301
970.422.2136

Hotchkiss
P.O. Box 932
161 South 2nd St.
Hotchkiss, CO 81419
970.872.3020

Idaho
4001 East Main Street
Emmett, ID 83617
208.365.7684

www.eroresources.com

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Attachment 4-D

Operational Noise Assessment

Part 1	Garnet Mesa Solar Noise Assessment
Part 2	Garnet Mesa Solar Noise Setback Map

In response to the Planning Board's question relating to system noise during operations, Kimley-Horn Engineering completed a noise study to determine a minimum setback required for the project's inverter and transformer equipment to satisfy Colorado Revised Statute § 25-12-103 for *Maximum Permissible Noise Levels*.

The assessment concluded that the inverter and transformer equipment must be located at least 150 ft from a property boundary to satisfy the requirement set by code in a residential area. The map attached as **Part 2** to this **Attachment 4-D** shows this 150 ft setback applied to the project layout and all inverter and transformer stations being located in excess of the 150 ft minimum setback.

The project trackers, which move the panels to follow the sun during the day, are the other piece of noise generating equipment on site. The noise generated by this equipment is typically under 30 dBA, and is therefore always under the Colorado statute limitation of 55 dBA.

Attachment 4-D

Operational Noise Assessment

Part 1

Garnet Mesa Solar Noise Assessment

July 14, 2021

Prepared For: Matthew Kosakowski
Garnet Mesa Solar LLC

Prepared By: Tad Hardy, P.E.
Kimley-Horn

Subject: ***Garnet Mesa - Noise Assessment***
Delta County, CO

Executive Summary

The purpose of this technical memorandum is to evaluate potential noise levels associated with the operational equipment likely to be installed at the proposed Garnet Mesa Solar Site in Delta County, CO. The proposed solar photovoltaic project site will be located approximately 5 miles east of Delta.

Project Description

The proposed Garnet Mesa Solar Site will be developed on approximately 360 acres of privately owned land within Delta County, CO. The solar site will consist of solar arrays and inverters throughout the project area.

Noise Regulations

The Garnet Mesa Solar Site is in Delta County, CO. According to Chapter 2, Section 5 of the Delta County Land Use Code, "noise that is generated by development shall not exceed the thresholds set out in C.R.S. § 25-12-103, *Maximum Permissible Noise Levels*."

Title 25 (Health), Article 12 (Noise Abatement), Section 103 (Maximum Permissible Noise Levels) of the Colorado Revised Statutes (C.R.S.) establishes limits for allowable noise levels for daytime hours (7:00 am to 7:00 pm) and nighttime hours (7:00 pm to 7:00 am) at the property boundary of various land use zones. See **Table 1** below.

Table 1: Maximum Permissible Noise Levels

Zone	7:00 am to 7:00 pm	7:00 pm to 7:00 am
Residential	55 dB(A)	50 dB(A)
Commercial	60 dB(A)	55 dB(A)
Light Industrial	70 dB(A)	65 dB(A)
Industrial	80 dB(A)	75 dB(A)

It was assumed that the Garnet Mesa Solar Site would not be operational during nighttime hours; therefore, the daytime noise limit for residential zones of 55 dB(A) was used for this assessment.

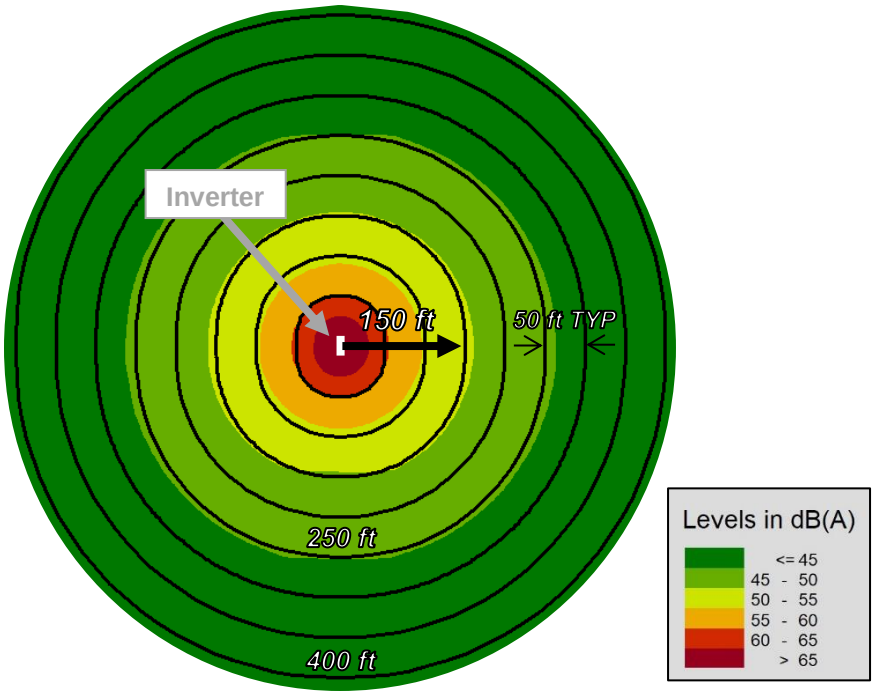
Noise Assessment

Noise levels from anticipated operational equipment likely to be installed at the Garnet Mesa Solar Site were evaluated to assist with determining a conservative distance that the equipment should be located from the edge of the project boundary.

Inverters

Photovoltaic (PV) inverter equipment generates steady, unvarying noise that can create issues when located near noise-sensitive uses. It was assumed that PV inverters would be distributed throughout the solar site. Based on typical noise emission levels for inverter equipment, a reference sound level of 79 dB(A) at 1 meter for a PV inverter was assumed, which is typical for this type of equipment. The anticipated noise level contours from the operation of PV inverter equipment are shown in **Figure 1**.

Figure 1: Anticipated Noise Level Contours for Inverter Operations



Recommendations

While noise generated from an inverter is not anticipated to significantly contribute to the operational site noise, it is recommended that the equipment be located at least 150 feet or greater from the edge of the project boundary in order to reduce the potential for exceeding the maximum permissible noise levels established by the C.R.S.

Conclusions

The proposed solar photovoltaic project site will be located approximately 5 miles east of Delta and will be developed on approximately 360 acres of privately owned land within Delta County, CO.

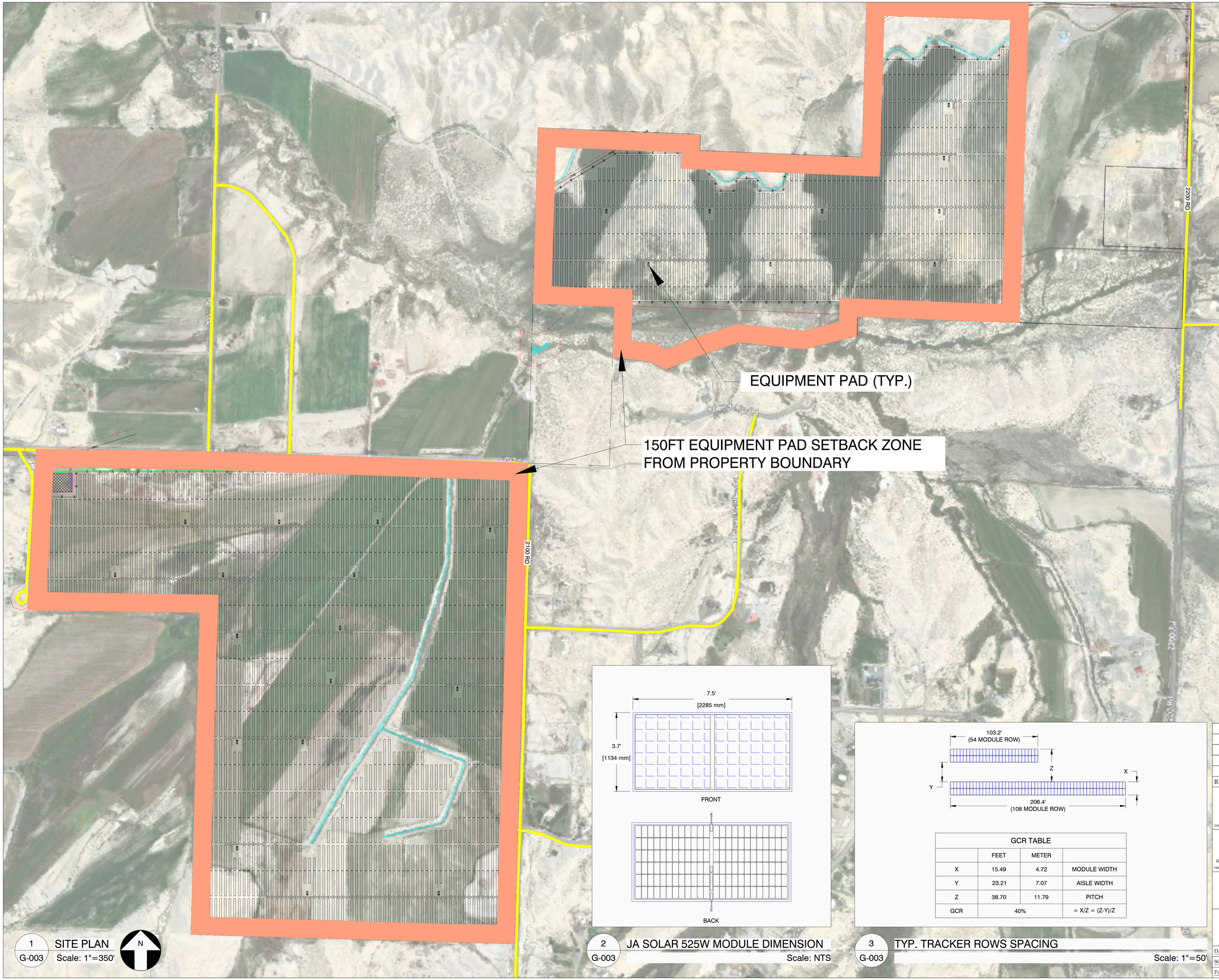
After analyzing the noise levels from anticipated operational equipment likely to be installed at the Garnet Mesa Solar Site, it was determined that the equipment should be located at least 150 feet or greater from the edge of the project boundary in order to reduce the potential for exceeding the maximum permissible noise levels at residential zones established by the C.R.S.

Attachment 4-D

Operational Noise Assessment

Part 2

Garnet Mesa Solar Noise Setback Map



1 G-003 SITE PLAN
Scale: 1"=350'

2 G-003 JA SOLAR 525W MODULE DIMENSION
Scale: NTS

GCR TABLE			
	FEET	METER	
X	15.49	4.72	MODULE WIDTH
Y	23.21	7.07	AISLE WIDTH
Z	38.70	11.79	PITCH
GCR	40%		= X/Z = (Z-Y)/Z

3 G-003 TYP. TRACKER ROWS SPACING
Scale: 1"=50'

INDICATIVE SYSTEM SPECIFICATIONS	
SYSTEM SIZE DC	102,513.60 kW
SYSTEM SIZE AC	80,000.00 kW
DC/AC RATIO	1.28
MODULE MANUFACTURER	JA SOLAR
MODULE MODEL	JAM72D30 525-MB
MODULE RATING	525 W
TOTAL MODULE QTY	195,264
MODULES PER STRING	27
TOTAL NO. OF STRINGS	7,232
INVERTER MODEL	POWER ELECTRONICS FS3430M
INVERTER RATING	3,200 kW
INVERTER QTY	25
STEP-UP TRANSFORMER	(25) 3.55 MVA, 34.5kV/0.6kV
RACKING TYPE	FTC VOYAGER 2P HSAT
TILT	0°
AZIMUTH	180°
GCR	40%
AVAILABLE PROPERTY AREA	579.59 Ac
FENCED AREA	383.71 Ac

LEGEND

- FTC VOYAGER 2P MODULE TRACKER ROWS (1,698)
- FTC VOYAGER 2P MODULE TRACKER ROWS (220)
- POWER STATION EQUIPMENT PAD
- PROPERTY LINE
- SETBACK LINE
- MIN. 6' SECURITY FENCE
- SUBSTATION FENCE
- PROJECT SUBSTATION
- GRAVEL ACCESS ROAD
- EXISTING OVERHEAD LINE
- EXISTING ROAD
- LANDSCAPE BUFFER
- WETLAND

ENGINEER'S STAMP

REV	DESCRIPTION	BY	CHK	DATE
0	DRAFT	AA	DG	07/13/2021

SHEET TITLE: GENERAL SITE PLAN INVERTER SETBACK EXHIBIT

SHEET NO.: G-003

GARNET MESA

PROJECT DETAILS: 6687 2200 ROAD, DELTA, CO 81416-9374 LAT:TBD / LON:W84°50'15.97"

SOLVIDA DESIGN + ENGINEERING
1400 Shoreline Avenue, Suite 2
Monterey, California 93940

soa SIERRA OVERHEAD ANALYTICS

DATE:	07/13/2021	DFTR:	LAKIR RAMBHIA
SCALE:	AS SHOWN	CHKD:	STEPHEN SMITH
PAPER SIZE:	24" X 36"	ENGR:	DARIN GALLOWAY

CONFIDENTIALITY STATEMENT
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Attachment 4-E

Existing Property Conversion Plan

The project intends to retain the existing home at 20426 G Rd. The home would be remodeled and repurposed to support the plant operations team on a drop-in basis and shall not be utilized as a full-time residence.

Bedrooms will be repurposed into temporary office spaces. Living spaces will be repurposed into a breakroom. The kitchen and restroom facilities will remain.

On a day-to-day basis, we expect at least one operations manager to always be on site during normal working hours. For the majority of the day, the site manager will be performing quality control assessments and repairs of the plant facilities. However, this manager will have additional duties which require the use of an office space in the residence.

Additionally, when grazing is ongoing, personnel from Sperry Livestock will be present on site to oversee the herd and we anticipate sharing space in the residence with their team.

It is typical for solar projects of this size to have minimal facilities for operations personnel—and such typical facilities never have fully functional kitchens and bathrooms. Site managers typically work off laptops in their trucks and drive to local facilities for restrooms and food.

The project team is thrilled to be able to leverage the existing home for future project use, which will greatly improve day-to-day working conditions for our project team.

DELTA COUNTY
ENGINEERING

Timothy McCracken
County Engineer

Memo

To: Planning Department

From: Tim McCracken

CC: File

Date: June 7, 2021

Re: Engineering Comments for PLN21-030 Garnet Mesa LLC

---

1. G Road is classified as a Local Access Road with a 60' right-of-way width.
    a. Existing 60' Right-of-Way per Road Petition Book B Page 6, Dated 1/2/1892.
2. 2100 Road is classified as a Local Access Road with a 60' right-of-way width.
    a. Existing 40' Right-of-Way per Road Petition Book C page 95, Dated 5/4/1914.
    b. Existing 30' Right-of-Way on the east side of centerline per following:
        i. Reception Number 638988 – Hood Mobile Home Subdivision.
        ii. Reception Number 575503 – Phase 1 Pleasant Valley Major Subdivision.
    c. Additional Right-of-Way needed on the west side of 2100 Road.
3. 2050 Road is classified as a Local Access Road with a 60' right-of-way width.
    a. Existing 60' Right-of-Way per Road Petition Book B Page 41, Dated 7/25/1898.
4. Setbacks are 25' on front 15' on back and sides per Land Use Code.
5. This review is not meant to be fully comprehensive and additional requirements may arise at further reviews.

Engineering Department
295 W. 6th Street
Delta, Colorado 81416
tmccracken@deltacounty.com
970.874.2035(o)

COLORADO
Parks and Wildlife
Department of Natural Resources

Montrose Service Center
2300 South Townsend Avenue
Montrose, Colorado 81401
P 970.252.6000 | F 970.252.6053

October 5, 2021

Delta County Planning and Community Development
Kate Kelly
295 W. 6th St, Delta, CO 81416

RE: PLN21-030 Garnet Mesa Solar LLC Renewable Energy Facility

Dear Ms. Kelly,

This letter is in response to a request for comments regarding a proposed renewable energy facility east of Delta in Delta County, Colorado.

One of our goals at Colorado Parks and Wildlife (CPW) is to provide complete and timely information to all entities who request our input on matters within our statutory authority and our mission, which is to perpetuate the wildlife resources of the state, to provide a quality state parks system, and to provide enjoyable and sustainable outdoor recreation opportunities that educate and inspire current and future generations to serve as active stewards of Colorado's natural resources.

The Garnet Mesa Solar facility proposed by Garnet Mesa Solar LLC will be an 80.0 MWac, approximately 102.5 Mega Watt DC solar photovoltaic project. The facility will be using single-axis tracking panels as well as central power inverters and transformers to convert the DC power to AC electricity. The overall project site includes seven different parcels of land; three parcels totaling approximately 463 acres will be used for the development of the solar arrays, and will be surrounded by security fencing. Two parcels of roughly 70 acres are involved with easements to support the project as utility connections and access roads. The last two parcels of about 55 acres are included as contingency land where no development is currently proposed.

Construction is planned to occur over an eight-month period from October 2022 to May 2023. Once construction is completed, there will be the solar arrays, four new gravel access roads tied into current infrastructure, and one project substation. The project site is already adjacent to existing transmission lines and a Power Purchase agreement is in place with Delta-Montrose Electric Association (DMEA). The total projected life of the project is forty (40) years.

The proposed project area for this solar power array has traditionally been used as irrigated cropland production and livestock grazing, and is surrounded by adobe hills and established residential properties. It is not located in CPW-mapped High Priority Habitat areas (i.e. migration corridors, concentration areas, etc.) however with the presence of agriculture lands, it does get some use by a variety of wildlife species, such as mule deer, bobcats, raptors, and multiple small game species. There is also the East Canal riparian corridor that

Dan Prenzlow, Director, Colorado Parks and Wildlife • Parks and Wildlife Commission: Carrie Besnette Hauser, Chair • Charles Garcia, Vice-Chair
Luke B Schafer, Secretary • Taishya Adams • Karen Bailey • Betsy Blecha • Marie Haskett • Dallas May • Duke Phillips, IV • James Jay Tutchton • Eden Vardy

runs along the edge of one of the parcels, with one part of this creek (measuring less than a tenth of an acre) identified as a wetland area that may be impacted by the development of this solar array. Riparian areas are of particular concern to CPW due to the limited availability of this habitat in this area and the proportionally high use by many different wildlife species.

CPW has several recommendations to help minimize and mitigate impacts to wildlife from this project. Habitat loss and fragmentation are significant concerns regarding solar development, so we support and encourage the plans to utilize established buildings and other infrastructure within the project area. CPW would recommend consulting our publication "Fencing with Wildlife in Mind" and adhering to the recommendations for exclusionary fencing that is safe for wildlife, as well as ensuring that efforts are taken to avoid entrapping wildlife within the facility during construction. This could be accomplished by fencing the project area before the rest of construction begins, or designing jump outs along the fence line. The solar facility should be checked regularly in the unlikely event that wildlife may become trapped in the facility.

The exclusionary fencing and conversion of agricultural land to an industrial facility will prevent utilization and movement of this area by most wildlife species. CPW supports the current plan to avoid placing the security fencing around the riparian area. However, we encourage and recommend that the site design be modified to avoid the riparian area and to include a development buffer approximately 300 feet from the riparian area edge. This would help to minimize impacts to wildlife habitat and movement in the riparian area. CPW also recommends that any security lighting is designed to minimize light pollution and reduce impacts to wildlife throughout the whole project area, and particularly along the riparian corridor.

Wildlife monitoring is very important for large-scale solar projects. While some surveys have already been conducted in preparation of this project, CPW recommends conducting surveys again closer to the construction start date to identify any utilization of the property by wildlife species of concern and implementing necessary protections for said species. In particular, conducting raptor nest surveys pre-construction would be strongly recommended to ensure no nests were missed or have been recently established since the original wildlife surveys were conducted. Post-construction monitoring is just as critical to identify issues and be proactive in efforts to address wildlife concerns. In particular, CPW would encourage the development of a program that monitors avian and bat fatalities due to collision with solar panels or other infrastructure. The proximity of this project site to a riparian corridor, and to trees that can provide habitat for wintering roosts for bald eagles can increase this risk of avian mortalities.

During construction of this project, CPW recommends the construction plan minimize the amount of exposed or open trenches. If trenches are to be open for extended periods of time, CPW recommends installing trench plugs, earth ramps or other means to ensure that wildlife does not become trapped in the trenches. During the operational phase, we also recommend the operator provides staff training on documenting wildlife mortalities and the process for notifying local wildlife officials in a timely manner.

The documents provided for this project identified established overhead power lines on-site. CPW recommends that any new transmission lines be incorporated into these existing transmission lines or infrastructure corridors whenever possible. Of high concern regarding

transmission lines is the potential for collisions and raptor electrocution. CPW recommends consulting best management practices (BMP's) developed by The Edison Electric Institute, Avian Power Line Interaction Committee, and USFWS for design considerations to minimize avian electrocutions. Consulting these BMP's for methods for improving the established transmission lines, and minimizing impacts to avian species, would be strongly supported by CPW. The documents containing these BMP's can be found on the Edison Electric Institute website (www.eei.org) or can be downloaded at the Avian Power Line Interaction Committee website (www.aplic.org).

Post-construction, the project documents identified several different methods for handling noxious weeds and reclamation efforts. CPW supports the plan of the solar project company to enact noxious weed management strategies that comply with the Colorado Noxious Weed Act. This project also has outlined reclamation efforts that will be conducted post-construction, which includes reseeding efforts and plant growth control with domestic sheep grazing. While the project site has traditionally been used in the growing of agriculture crops, CPW prefers that native vegetation be used for reclamation efforts on site as habitat for wildlife and to ensure successful reclamation efforts. Areas should be reclaimed with seed for native vegetation that is appropriate for the site based off of the recommendation of the Natural Resources Conservation Service (NRCS). CPW would also welcome the opportunity to review the proposed seed mixture before application occurs.

The use of domestic sheep for grazing inside the solar array facility is a unique management tool to control the growth of plants around the solar panels. CPW would encourage both the solar power company and the livestock owner to conduct monitoring efforts pre- and post-grazing to look for the introduction of noxious weeds by livestock. CPW would also encourage that sheep only be allowed to graze within the security fence, and not graze along the riparian corridor and exacerbate the erosion issues of the creek banks. In the unlikely event that wildlife were to get in the fenced area with the sheep, plans should be in place on documenting these incidents and notifying appropriate CPW staff.

CPW appreciates the opportunity to provide comments on this proposed solar array project. We would also encourage you to consult our Solar Best Management Practice document throughout the planning and construction of this project for additional resources and direction: https://cpw.state.co.us/Documents/Conservation-Resources/Energy-Mining/Solar-Energy-BMPs.pdf. If you have any questions or would like further input from the agency, please contact Area Wildlife Manager Rachel Sralla at (970) 252-6010 or at rachel.sralla@state.co.us

Thank you,

Rachel Sralla
Area Wildlife Manager

THE GUNNISON TUNNEL PROJECT
The Uncompahgre Valley Water Users Association
601 North Park Ave. * P.O. Box 69 * Montrose, CO 81402-0069
Phone: 970-249-3813 Fax: 970-249-6830

September 27, 2021

Delta County Planning and Community Development
295 W 6th Street
Delta, CO 81416

RE: PLN21-030 / Garnet Mesa Solar LLC Renewable Energy Facility
20426 G Road, Delta
Limited Use Zoning Permit for a Renewable Energy Facility

Dear Land Use Personnel:

Uncompahgre Valley Water Users Association has reviewed the Application for a Limited Use Zoning Permit for a Renewable Energy Facility in Delta County on seven (7) parcels between 2200 Road on the east and 2050 Road on the west, north and south of G Road and is located approximately 2.89 miles easterly of Delta.

This acreage has irrigation water delivered by the Uncompahgre Valley Water Users Association. No new water delivery structures will be constructed for the proposed subdivision. The irrigation water for this tract of land will be delivered through the existing headgates. **The parcel owners/sellers shall be responsible for any necessary easements or water delivery systems and for the removal of tail/wastewater back to the U.V.W.U.A. water delivery system for each lot.**

AREAS OF CONCERN:

- **UVWUA'S "GKB" lateral is within the N1/2SW1/4 of Section 13, T15S, R95W. UVWUA requires a 50-foot easement for the "GKB" lateral (25 feet each side of center).**
- **UVWUA's "GHA" lateral is within the NE1/4SW1/4 of Section 14, T15S, R95W. UVWUA requires a 50-foot easement for the "GHA" lateral (25 feet each side of center).**
- **UVWUA's "HC" Drain is within the NE1/4, and the N1/2SE1/4 of Section 23, T15S, R95 W. UVWUA requires a 100-foot easement for the "HC" Drain (50 feet each side of center).**
- **UVWUA's "Hc18" Drain is with the NE1/4, and the N1/2SE1/4 of Section 23, T15S, R95 W. UVWUA requires a 100-foot easement for the "Hc18" Drain (50 feet each side of center).**

Thank you for your consideration in this matter.

Sincerely,

Cheryl A. DeJulio

Cheryl A. DeJulio
Business Manager