



**Planning and Community
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**DEVIATION REQUEST
 AND DECISION FORM**

Updated: 6/26/2019

PROJECT INFORMATION

Project Name :	Eagle Rising PCD File No. SP205 & SF2225
Schedule No.(s) :	52290-00-034 & 52290-00-035
Legal Description :	See Attached

APPLICANT INFORMATION

Company :	MyPad, Inc., General Partner, Casas Limited Partnership #4
Name :	Stephen J. Jacobs, Jr., President
	<input checked="" type="checkbox"/> Owner <input type="checkbox"/> Consultant <input type="checkbox"/> Contractor
Mailing Address :	P.O. Box 2076 Colorado Springs, CO 80901
Phone Number :	(719) 359-1473
FAX Number :	
Email Address :	strijeljacobsg@gmail.com

ENGINEER INFORMATION

Company :	M.V.E., Inc.	Colorado P.E. Number :	31672
Name :	David Gorman		
Mailing Address :	1903 Lelaray St, Ste 200		
Phone Number :	(719) 635-5736		
FAX Number :			
Email Address :	daveg@mvecivil.com		

OWNER, APPLICANT, AND ENGINEER DECLARATION

To the best of my knowledge, the information on this application and all additional or supplemental documentation is true, factual and complete. I am fully aware that any misrepresentation of any information on this application may be grounds for denial. I have familiarized myself with the rules, regulations and procedures with respect to preparing and filing this application. I also understand that an incorrect submittal will be cause to have the project removed from the agenda of the Planning Commission, Board of County Commissioners and/or Board of Adjustment or delay review until corrections are made, and that any approval of this application is based on the representations made in the application and may be revoked on any breach of representation or condition(s) of approval.

_____ *Steph Jacobs Jr* _____ ^{1/5/24}
 Signature of owner (or authorized representative) Date

Engineer's Seal, Signature
 And Date of Signature



DEVIATION REQUEST (Attach diagrams, figures, and other documentation to clarify request)

A deviation from the standards of or in Section(s) **ECM 3.3.3 B and C** of the Engineering Criteria Manual (ECM) is requested.

Identify the specific ECM standard which a deviation is requested:

ECM 3.3.3.B: Conformance with DCM Volume 1 Sections 6.5.2, Table 10-4 Channel Velocity,

Concrete, riprap, or soil cement linings as approved by the City/County shall be used where channel bottom velocities exceed 6.0 ft/sec. Grass lined channels shall not be used where velocity exceeds permissible velocities in Table 10-4, or the Froude number is greater than 0.9 for the 100-year storm.

DCM Volume 1 Sections 10.2.1 Soft Lined Channels

Grass lined channels are the preferred means of conveying storm water runoff because of their desirability from the standpoint of erosion protection, maintainability, accessibility, and aesthetics.

Grasses typically used for channel lining are Bermudagrass, Kentucky bluegrass, orchardgrass, redtop, Stalian ryegrass, and buffalograss.

ECM 3.3.3.C Channel Types

1. Soft-Lined Channels
2. Hard-Lined Channels

State the reason for the requested deviation:

Table 10-4 and DCM Volume 1 Section 10.2.1 do not include provisions or standards for the type of willow, sedge, rush and reed vegetation present in Cottonwood Creek within the project reach. Excellent stream stabilization exists within the subject reach of Cottonwood Creek consisting of mature dense vegetation (grasses, sedges, rushes, reeds, 6 species of willows, numerous shrubs and trees), pond embankments which support wetland vegetation and provide stormwater storage, and large boulder grade check and pond bank lining. For more than a decade, the owners, Entech Engineering, Inc. and ERO Resources Corporation consultants have observed and reported on the natural conditions of stream and riparian corridor within the site. All referenced parties want to preserve the creek in its existing stabilizing and well-vegetated state. See reports uploaded in Applicants submittal.

“Natural Channel” is not listed as a channel type in ECM 3.3.3.C

Other sections of the DCM refer to “natural channels” however it is not included as a channel type in the ECM standard.

In the DCM Open Channels and Structures 10.1 General Statement “Generally speaking, a stabilized natural channel, or the man-made channel which most nearly conforms to the character of a stabilized natural channel, is the most efficient and the most desirable.”

DCM 2.2.1 Channelization “A stable natural channel reaches “equilibrium” over many years.”

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

Utilize the stabilizing value of the existing established pond embankments, existing willow vegetation and existing boulder placements as fully adequate stabilization and not require additional stabilization where hydraulic analysis indicates channel velocities are less than 6 fps, Froude Number values are lower than 1.0 in accordance with the criteria of DCM Section 6.5.2.

Compared to a stable grade, this is 2 to 4 times higher →

The Cottonwood Creek channel within the Eagle Rising Preliminary Plan contains two existing constructed ponds with stabilized embankments, existing boulder creek bed and pond embankment stabilization, and established dense willow growth that supports established wetlands which provide natural aesthetic qualities, wildlife habitat, erosion control, and pollutant removal. The two ponds constitute stabilizing features that provide the added benefits of controlling flow rates in the creek. Also, an important engineering consideration is that the slope of the creek for the project reach is insignificant at only 1% to 2% with an average of 1.2%. The existing pond spillway at DP 104 will require additional riprap installation at time of final plat as noted on the Drainage Plan to protect the spillway during severe storm water overflows from the pond to the downstream creek drainageway. The Spillway at DP 126 has adequate existing riprap in place. The ponds and creek bed have withstood repeated significantly sized rainfall events throughout decades of existence including the events of the 2015 500-year to 1000-year storms and the 2023 100-year storms.

regrade the riprap spillway?

The creek bed, wetland areas and riparian overstory of Cottonwood Creek throughout the site are well vegetated native grasses, shrubs and trees as illustrated by the photos contained in the appendix of this report. The Natural Resources Assessment by ERO Resources Corporation lists with botanic specificity the various plants found. The ERO report also contains photographic documentation of the plants and site conditions. Wetland areas feature native grasses such as Nebraska Sedge, Baltic Rush, Redtop and Broadleaf Cattail. The wetlands also contain mature, dense and well-established willows which serve to anchor the soil of the creek bed throughout the site. Specific willow species include Sandbar Willow, Greenleaf Willow, Peachleaf Willow, Strapleaf Willow, Park Willow and Shining Willow. The riparian overstory is described as containing Peachleaf Willow and Plains Cottonwood trees. Shrubs present in the riparian corridor through the site include Snowberry, Wood’s Rose, Golden Current, and Chokecherry. All these species act together to preserve the existing creek alignment and grades that are observed at the site and documented by photographic evidence.

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

shear stresses modeled are higher in several areas; address those

Supplemental information concerning permissible velocities and permissible shear stresses for channel lining materials is included in the appendix. The information includes suggested permissible values for the native grasses, willows and trees that grow in the project reach. Live willow stakes are included and listed to have permissible velocities of 3 to 10 f/sec with permissible shear stress of 2.10 to 3.10 lbs/sf. However, the supplemental information assumes that the vegetation is newly planted, as in Reed Plantings, Hardwood Tree Plantings and Live Willow Stakes. In this case, the vegetative cover throughout the site is not plantings or stakes, but well established, robust, and dense cover that has served to stabilize the creek bed and banks for decades. The upper end (and beyond) of the permissible value range applies in this project reach.

as-built plans will need to be approved to verify usefulness

The results of the hydraulic analysis contained in this report indicate four locations that exhibit channel flow velocities that approach or exceed 6 fps and/or have Froude Number values that equal or exceed 1.0. The affected locations include the pond emergency spillways which are protected with riprap as indicated on the Drainage Map. The presence of dense vegetation throughout the project reach serves to provide additional stabilization. The existing boulder structure, located upstream of the pond at DP 104 provides stabilization. Portions of the banks inside the DP 104 pond are lined with large boulders. The boulders have been in place for many years and are well embedded and incorporated into the creek terrain. No further improvements are needed in the creek assuming the existing vegetation is preserved. The vegetation is naturally occurring and has been in place for many years. During this time, it has survived various meteorologic cycles. Additionally, with the present level of development in the upstream watershed, the amount of runoff in this section of Cottonwood Creek is not likely to be altered in the future. Considering all these factors, the exiting vegetation is persistent and not in danger of failing. The owners will preserve the vegetation.

The allowances in Section 6.5.2 and Table 10-4 do not account for the types and condition of the vegetation present in the creek channel and are not applicable to this case. Furthermore, hydraulic analysis results for the channel reach comply with the provision of Section 6.5.2 except where expected at the armored pond spillways.

Alternative Information is provided in the form of attached Table 2 containing Permissible Velocity and Shear Stress values for Long Native Grasses, Hardwood Tree Plantings and Live Willow Stakes complete with a list of sources including documentation from U.S. Army Engineer Research and Development Center, U.S. Dept. of Transportation, Federal Highway Administration, and others.

The DCM provides that concrete, riprap, or soil cement linings as approved by the City/County shall be used where channel bottom velocities exceed 6.0 ft/sec. Grass lined channels shall not be used where velocity exceeds permissible velocities in Table 10-4 or the Froude number is greater than 0.9 for the 100-year storm. Table 10-4 does not account for the type of vegetation present in the creek throughout the project reach. Alternatively, M.V.E., Inc. recommends the allowable velocities for willow staking and native grasses as included in the Appendix of this report. Long Native Grasses have permissible velocities of 4 fps to 6 fps, while Live Willow Stakes have permissible velocities of up to 10 fps. Allowable Shear stresses are also noted in the cited sources of up to 3.10 lbs. per sf. Certain locations exceed 3.10 lbs. per sf. However, these locations also have velocities and Froude Number that complies with the DCM. Furthermore, the actual vegetation on the site is well established and exhibits dense growth. The existing plants possess stabilizing characteristics far beyond those of recent plant stakings. Although the hydraulic analysis of the creek reach indicates acceptable velocities in accordance with the DCM, except at pond spillways, a Deviation Request is submitted in support of the higher allowable velocities for the specific type of creek vegetation found at the site.

Natural well-established creeks typically don't require maintenance. The creek bed and banks within this subdivision are very well established with dense vegetation as detailed above. The owners elect ECM 3.3.3.K.2. This access alternative allows lot line easements to serve as access pathways and omits construction of 15' wide access roads which would unnecessarily deface and destabilize the creekside and interfere with the use and enjoyment of the private residential lots. The 15' access road may be omitted in recognition that the available corridors through the lot line easements are adequate with regard to available travel width and the traversable terrain. See the attached Creek Access Exhibit These access conditions meet the criteria and intent of ECM 3.3.3.K.2.

LIMITS OF CONSIDERATION

(At least one of the conditions listed below must be met for this deviation request to be considered.)

- deselect this box
- The ECM standard is inapplicable to the particular situation.
 - Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
 - A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

Provide justification:

The allowances in Section 6.5.2 and Table 10-4 do not account for the types and condition of the vegetation present in the creek channel and are not applicable to this case. The supplemental information provided with this deviation request with allowable flow velocities and **shear stresses** are more closely applicable to the type of vegetation found within the subject creek reach and site. The results of hydraulic analysis using this appropriate supplemental engineering data show that all sections of the creek channel comply with the provision of Section 6.5.2. The two pond overflow spillways, as expected do not and are armored.

Furthermore the U.S. Army Core of Engineers has, after staff viewing if the site, recommended that the existing wetlands and natural channel and features not be disturbed, seeing no beneficial outcomes to further structural stabilization. The application of the requested data to this project will preserve the existing stabilizing vegetation and natural terrain for the benefit of the site, natural aesthetics, wildlife and future lot owners.

CRITERIA FOR APPROVAL

Per ECM section 5.8.7 the request for a deviation may be considered if the request is **not based exclusively on financial considerations**. The deviation must not be detrimental to public safety or surrounding property. The applicant must include supporting information demonstrating compliance with **all of the following criteria**:

The deviation will achieve the intended result with a comparable or superior design and quality of improvement.

The requested deviation preserves the existing terrain and vegetation, which provides the current natural stabilization of the creek bed and banks. Current structures on the creek include the two ponds and boulder placements. These were installed prior to the time of current ownership. The owners want to preserve the natural features of the existing riparian creek, wetlands and its wildlife. Furthermore, the owners do not wish to see the creek destabilized or the existing terrain, plantings, and natural beauty of the creek harmed or destroyed by the mechanized interventions required to install unnecessary, functionally inferior and maintenance intensive hard drainage structures.

The deviation will not adversely affect safety or operations.

The existing vegetation already fulfills all stabilization requirements for creek. The allowance of the deviation will not adversely affect safety or operations. Allowance of the deviation is superior to the level of stabilization available from other stabilization options.

State that the creek will be privately maintained in accordance with a channel maintenance agreement.

The deviation will not adversely affect maintenance and its associated cost.

All observation and preservation of the creek and riparian corridor within the Drainage Easement will be undertaken by the owners and the Owners Association. The deviation will not adversely affect maintenance or maintenance costs.

It is understood that "Grass lined channels" are dependent upon continuous growth of "grass." As noted above, the native willow and other dense vegetation in place is significantly superior to grass and is already very well established. It is naturally occurring and has been in place for many decades. During this time, it has survived various meteorologic cycles from drought to overly wet seasons. Additionally, with the present level of development in the upstream watershed, the amount of runoff in this section of Cottonwood Creek is not likely to be altered in the future. Considering all these factors, the existing vegetation is vigorously persistent and not in danger of failing. The owners agree to continue to observe the waterway and to take appropriate steps to preserve the vegetation if its survival is threatened. No maintenance is anticipated, and no maintenance costs will be transferred to El Paso County.

The deviation will not adversely affect aesthetic appearance.

The natural aesthetic appearance of the site will remain intact and in place. Conversely, the engineering comment request for additional constructed stabilization would irreparably harm the site's biodynamic stability and aesthetic appearance.

The deviation meets the design intent and purpose of the ECM standards.

The supporting documentation provided in this deviation request and the MDDP/Preliminary Drainage Report shows that the existing vegetation has served and will serve as the required stabilization within the creek. The purpose of the ECM standard is met.

The deviation meets the control measure requirements of Part I.E.3 and Part I.E.4 of the County's MS4 permit, as applicable.

- The proposed deviation request meets the control measure requirements specified by the County's MS4 Permit.
- The allowance of this deviation will avoid and prevent disturbance of the creek bed and banks and therefore prevent erosion and sedimentation within the creek.
- Stormwater quality treatment for the development site will be provided as required.
- Appropriate stormwater control measures will be implemented for any land disturbance as required in accordance with an approved Grading and Erosion Control Plan.

REVIEW AND RECOMMENDATION:

Approved by the ECM Administrator

This request has been determined to have met the criteria for approval. A deviation from Section _____ of the ECM is hereby granted based on the justification provided.

Γ Γ

L J

Denied by the ECM Administrator

This request has been determined not to have met criteria for approval. A deviation from Section _____ of the ECM is hereby denied.

Γ Γ

L J

ECM ADMINISTRATOR COMMENTS/CONDITIONS:

[Empty box for ECM Administrator Comments/Conditions]

1.1. PURPOSE

The purpose of this resource is to provide a form for documenting the findings and decision by the ECM Administrator concerning a deviation request. The form is used to document the review and decision concerning a requested deviation. The request and decision concerning each deviation from a specific section of the ECM shall be recorded on a separate form.

1.2. BACKGROUND

A deviation is a critical aspect of the review process and needs to be documented to ensure that the deviations granted are applied to a specific development application in conformance with the criteria for approval and that the action is documented as such requests can point to potential needed revisions to the ECM.

1.3. APPLICABLE STATUTES AND REGULATIONS

Section 5.8 of the ECM establishes a mechanism whereby an engineering design standard can be modified when if strictly adhered to, would cause unnecessary hardship or unsafe design because of topographical or other conditions particular to the site, and that a departure may be made without destroying the intent of such provision.

1.4. APPLICABILITY

All provisions of the ECM are subject to deviation by the ECM Administrator provided that one of the following conditions is met:

- The ECM standard is inapplicable to a particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship on the applicant, and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

1.5. TECHNICAL GUIDANCE

The review shall ensure all criteria for approval are adequately considered and that justification for the deviation is properly documented.

1.6. LIMITS OF APPROVAL

Whether a request for deviation is approved as proposed or with conditions, the approval is for project-specific use and shall not constitute a precedent or general deviation from these Standards.

1.7. REVIEW FEES

A Deviation Review Fee shall be paid in full at the time of submission of a request for deviation. The fee for Deviation Review shall be as determined by resolution of the BoCC.

NORTH PORTION – (10195 KURIE ROAD)

LEGAL DESCRIPTION:

THAT PORTION OF SECTION 29, TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6TH P.M., EL PASO COUNTY, COLORADO DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF THE NORTHEAST ONE-QUARTER OF THE NORTHWEST ONE-QUARTER OF SAID SECTION 29, SAID POINT BEING ON THE SOUTHERLY BOUNDARY OF PARK FOREST ESTATES FILING NO 2 (PLAT BOOK B-2 AT PAGE 52); THENCE S 00° 13'40"E ON THE WEST LINE OF THE EAST HALF OF SAID SECTION 29, A DISTANCE OF 1413.98 FEET TO THE TRUE POINT OF BEGINNING; THENCE N 00° 13'40"W, 1413.98 FEET; THENCE N89° 14'16"E, ON THE SOUTHERLY BOUNDARY OF SAID PARK FOREST ESTATES, A DISTANCE OF 375.32 FEET TO THE SOUTHEAST CORNER OF LOT 14, BLOCK 18 OF SAID PARK FOREST ESTATES; THENCE N89° 13'46"E ALONG SAID SOUTHERLY BOUNDARY, A DISTANCE OF 60.00 FEET TO THE EAST LINE OF KURIE ROAD; THENCE N89°33'17"E ALONG SAID SOUTHERLY BOUNDARY, A DISTANCE OF 237.50 FEET; THENCE N89°20'43"E ALONG SAID SOUTHERLY BOUNDARY, A DISTANCE OF 149.96 FEET; THENCE S00°39'26"E, DEPARTING SAID SOUTHERLY BOUNDARY OF PARK FOREST ESTATES, A DISTANCE OF 231.57 FEET; THENCE S43°12'03"E, A DISTANCE OF 433.08 FEET; THENCE S43°12'03"E, A DISTANCE OF 56.61 FEET; THENCE N88°33'24"E, A DISTANCE OF 0.10 FEET TO THE NORTHWEST CORNER OF LOT 1 POCO SUBDIVISION ACCORDING TO THE TO THE OFFICIAL MAP THEREOF FILED IN THE OFFICE OF THE COUNTY RECORDER OF EL PASO COUNTY, COLORADO, AS RECEPTION NO. 2406425; THENCE SOUTHERLY ALONG THE WESTERLY LINE OF SAID LOT 1 THE FOLLOWING SIX (6) COURSES:

S16°04'20"E, 158.01 FEET;

S02°43'41"W, 265.73 FEET:

N84°46'48"W, 71.67 FEET;

S00°11'34"W, 147.46 FEET;

N88°32'26"E, 150.00 FEET;

S01°27'34"E, 275.63 FEET;

THENCE S89°45'28"W DEPARTING SAID WESTERLY LINE OF SAID LOT 1, A DISTANCE OF 766.08 FEET; THENCE N00°14'32"W, 100.00 FEET; THENCE S89°45'28"W, 152.00 FEET; THENCE S00°14'32"E, 200.00 FEET; THENCE S89°45'28"W, 152.00 FEET; THENCE N00°14'32"W, 100.00 FEET; THENCE S89°45'28"W, 201.18 FEET TO A POINT ON SAID WEST LINE OF THE EAST HALF OF SAID SECTION 29, SAID POINT BEING THE TRUE POINT OF BEGINNING.

DESCRIPTION PREPARED BY:

M & S CIVIL CONSULTANTS, INC.
102 EAST PIKES PEAK AVE. STE.306
COLORADO SPRINGS, COLORADO

SOUTH PORTION –(10115 KURIE ROAD)

LEGAL DESCRIPTION:

THAT PORTION OF SECTION 29, TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6TH P.M., EL PASO COUNTY, COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF THE NORTHEAST ONE-QUARTER OF THE NORTHWEST ONE-QUARTER OF SAID SECTION 29, SAID POINT BEING ON THE SOUTHERLY BOUNDARY OF PARK FOREST ESTATES FILING NO. 2 (PLAT BOOK B-2 AT PAGE 52), THENCE N89°14'16"E, ON THE SOUTHERLY BOUNDARY OF SAID PARK FOREST ESTATES, A DISTANCE OF 375.32 FEET TO THE SOUTHEAST CORNER OF LOT 14, BLOCK 18 OF SAID PARK FOREST ESTATES; THENCE N89°13'46"E ALONG SAID SOUTHERLY BOUNDARY, A DISTANCE OF 60.00 FEET TO THE EAST LINE OF KURIE ROAD; THENCE N89°33'17"E ALONG SAID SOUTHERLY BOUNDARY, A DISTANCE OF 237.50 FEET; THENCE N89°20'43"E ALONG SAID SOUTHERLY BOUNDARY, A DISTANCE OF 149.96 FEET; THENCE S00°39'26"E, DEPARTING SAID SOUTHERLY BOUNDARY OF PARK FOREST ESTATES, A DISTANCE OF 231.57 FEET; THENCE S43°12'03"E, A DISTANCE OF 433.08 FEET; THENCE S43°12'03"E, A DISTANCE OF 56.61 FEET; THENCE N88°33'24"E, A DISTANCE OF 0.10 FEET TO THE NORTHWEST CORNER OF LOT 1 POCO SUBDIVISION ACCORDING TO THE TO THE OFFICIAL MAP THEREOF FILED IN THE OFFICE OF THE COUNTY RECORDER OF EL PASO COUNTY, COLORADO, AS RECEPTION NO. 2406425; THENCE SOUTHERLY ALONG THE WESTERLY LINE OF SAID LOT 1 THE FOLLOWING SIX (6) COURSES:

S16°04'20"E, 158.01 FEET;

S02°43'41"W, 265.73 FEET;

N84°46'48"W, 71.67 FEET;

S00°11'34"W, 147.46 FEET;

N88°32'26"E, 150.00 FEET;

S01°27'34"E, A DISTANCE OF 275.63 FEET TO THE TRUE POINT OF BEGINNING; THENCE S01°27'34"E, A DISTANCE OF 178.87 FEET; THENCE S34°54'56"W, A DISTANCE OF 563.22 FEET; THENCE S00°00'00"E, A DISTANCE OF 344.55 FEET; THENCE N90°00'00"E, A DISTANCE OF 87.56 FEET; THENCE S00°00'00"E, A DISTANCE OF 459.65 FEET; THENCE S89°59'26"W, A DISTANCE OF 1035.05 FEET TO A POINT ON THE WEST LINE OF THE EAST HALF OF SAID SECTION 29; THENCE N00°13'40"W, ALONG SAID WEST LINE, A DISTANCE OF 1439.98 FEET TO A POINT WHICH IS DRAWN S 89° 45'28" W FROM THE POINT OF BEGINNING; THENCE N 89°45'28"E, A DISTANCE OF 201.18 FEET; THENCE S00°14'32"E, 100.00FEET; THENCE N89°45'28"E, 152.00 FEET; THENCE N00°14'32"W, 200.00 FEET; THENCE N89°45'28"E, 152.00 FEET; THENCE S00°14'32"E, 100.00 FEET; THENCE N89°45'28"E, 766.08 FEET, MORE OR LESS TO THE TRUE POINT OF BEGINNING.

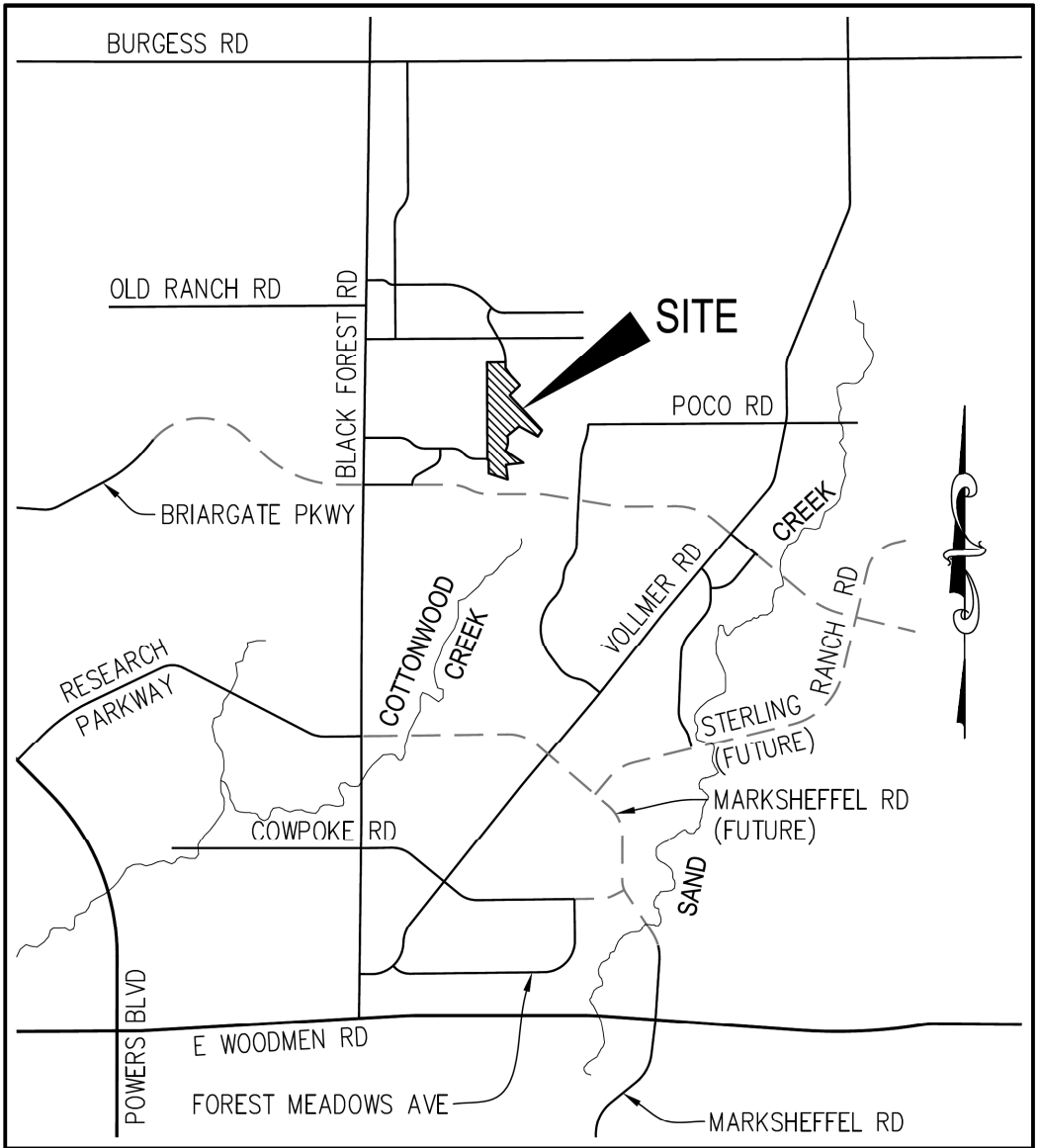
DESCRIPTION PREPARED BY:

M & S CIVIL CONSULTANTS, INC.

102 EAST PIKES PEAK AVE. STE 306

COLORADO SPRINGS, COLORADO

80903



VICINITY MAP

N.T.S.

Table 2. Permissible Shear and Velocity for Selected Lining Materials¹

Boundary Category	Boundary Type	Permissible Shear Stress (lb/sq ft)	Permissible Velocity (ft/sec)	Citation(s)
<u>Soils</u>	Fine colloidal sand	0.02 - 0.03	1.5	A
	Sandy loam (noncolloidal)	0.03 - 0.04	1.75	A
	Alluvial silt (noncolloidal)	0.045 - 0.05	2	A
	Silty loam (noncolloidal)	0.045 - 0.05	1.75 – 2.25	A
	Firm loam	0.075	2.5	A
	Fine gravels	0.075	2.5	A
	Stiff clay	0.26	3 – 4.5	A, F
	Alluvial silt (colloidal)	0.26	3.75	A
	Graded loam to cobbles	0.38	3.75	A
	Graded silts to cobbles	0.43	4	A
	Shales and hardpan	0.67	6	A
<u>Gravel/Cobble</u>	1-in.	0.33	2.5 – 5	A
	2-in.	0.67	3 – 6	A
	6-in.	2.0	4 – 7.5	A
	12-in.	4.0	5.5 – 12	A
<u>Vegetation</u>	Class A turf	3.7	6 – 8	E, N
	Class B turf	2.1	4 - 7	E, N
	Class C turf	1.0	3.5	E, N
	Long native grasses	1.2 – 1.7	4 – 6	G, H, L, N
	Short native and bunch grass	0.7 - 0.95	3 – 4	G, H, L, N
	Reed plantings	0.1-0.6	N/A	F, N
	Hardwood tree plantings	0.41-2.5	N/A	E, N
<u>Temporary Degradable RECPS</u>	Jute net	0.45	1 – 2.5	E, H, M
	Straw with net	1.5 – 1.65	1 – 3	E, H, M
	Coconut fiber with net	2.25	3 – 4	E, M
	Fiberglass roving	2.00	2.5 – 7	E, H, M
<u>Non-Degradable RECPS</u>	Unvegetated	3.00	5 – 7	E, G, M
	Partially established	4.0-6.0	7.5 – 15	E, G, M
	Fully vegetated	8.00	8 – 21	F, L, M
<u>Riprap</u>	6 – in. d ₅₀	2.5	5 – 10	H
	9 – in. d ₅₀	3.8	7 – 11	H
	12 – in. d ₅₀	5.1	10 – 13	H
	18 – in. d ₅₀	7.6	12 – 16	H
	24 – in. d ₅₀	10.1	14 – 18	E
<u>Soil Bioengineering</u>	Wattles	0.2 – 1.0	3	C, I, J, N
	Reed fascine	0.6-1.25	5	E
	Coir roll	3 - 5	8	E, M, N
	Vegetated coir mat	4 - 8	9.5	E, M, N
	Live brush mattress (initial)	0.4 – 4.1	4	B, E, I
	Live brush mattress (grown)	3.90-8.2	12	B, C, E, I, N
	Brush layering (initial/grown)	0.4 – 6.25	12	E, I, N
	Live fascine	1.25-3.10	6 – 8	C, E, I, J
	Live willow stakes	2.10-3.10	3 – 10	E, N, O
<u>Hard Surfacing</u>	Gabions	10	14 – 19	D
	Concrete	12.5	>18	H

¹ Ranges of values generally reflect multiple sources of data or different testing conditions.

A. Chang, H.H. (1988).

B. Florineth. (1982)

C. Gerstgraser, C. (1998).

D. Goff, K. (1999).

E. Gray, D.H., and Sotir, R.B. (1996).

F. Julien, P.Y. (1995).

G. Kouwen, N.; Li, R. M.; and Simons, D.B., (1980).

H. Norman, J. N. (1975).

I. Schiechl, H. M. and R. Stern. (1996).

J. Schoklisch, A. (1937).

K. Sprague, C.J. (1999).

L. Temple, D.M. (1980).

M. TXDOT (1999)

N. Data from Author (2001)

O. USACE (1997).

Fischenich, C. (2001). "Stability Thresholds for Stream Restoration Materials," EMRRP Technical Notes Collection (ERDC TN-EMRRP-SR-29), U.S. Army Engineer Research and Development Center, Vicksburg, MS.
www.wes.army.mil/el/emrrp

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USACE TR EL 97-8

Eagle Rising Hydraulic Analysis Results

Velocity, Froude Number & Shear Stress at Selected Channel Sections

Hydraulic Data from HEC-RAS Analysis, M.V.E., Inc.

Shear Stress $\tau = \gamma RS$

τ = Shear Stress (Lbs/sf)

γ = Weight Density of Water (lb/cf) = 62.4

R = Hydraulic Radius = Area/Wetted Perimeter (ft)

S = Energy Grade Slope (ft/ft)

$$Fr = \frac{V}{\sqrt{gD}}$$

V = Channel Velocity (ft/sec)

D = Hydr Depth = Flow Area / Top Width

g = Acceleration of gravity = 32.2 ft/sec²

Channel Section	Q100 (cfs)	S Energy Slope (ft/ft)	Max Channel Depth (ft)	D Hydraulic (Ave) Depth (ft)	P Wetted Perimeter (ft)	R Hydraulic Radius R (ft)	A Flow Area (sf)	W Top Width (ft)	V Channel Velocity (ft/sec)	Fr Froude No.	τ Shear Stress (lbs/sf)	Notes:
3800	410	0.013	3.3	2.5	72	2.5	180	71	2.3	0.25	1.98	dense vegetation existing
3700	410	0.026	3.5	2.5	49	2.4	119	48	3.3	0.37	3.98	dense vegetation existing
3600	410	0.007	4.1	3.1	73	3.1	222	72	1.9	0.19	1.26	dense vegetation existing
3500	470	0.079	3.0	2.2	71	2.1	152	70	3.1	0.38	10.52	dense vegetation existing
3400	470	0.010	3.3	2.5	88	2.5	223	88	2.1	0.23	1.58	dense vegetation existing
3300	470	0.011	2.5	1.9	95	1.9	184	94	2.6	0.32	1.34	dense vegetation existing
3200	470	0.008	2.1	1.5	115	1.5	175	115	2.7	0.39	0.79	boulder check existing
3100	470	0.001	3.5	2.2	210	2.2	464	210	1.0	0.12	0.10	native grasses and pond existing
3000	560	0.001	3.7	2.9	188	2.9	536	187	1.1	0.11	0.10	native grasses and pond existing
2900	560	0.000	5.4	3.7	223	3.6	814	223	0.7	0.06	0.04	native grasses and pond existing
2801	560	0.000	6.9	5.0	278	4.9	1372	277	0.4	0.03	0.01	native grasses and pond existing
2745	700	0.005	2.1	1.2	303	1.2	354	303	2.2	0.36	0.37	native grasses and pond existing
2722	700	0.018	1.7	1.4	139	1.4	190	139	3.7	0.56	1.56	native grasses and pond existing
2703	700	0.057	1.8	1.0	122	1.0	123	122	6.1	1.06	3.62	spillway riprap proposed
2669	700	0.036	3.0	1.6	65	1.6	106	64	7.9	1.09	3.66	spillway riprap proposed
2451	700	0.015	3.7	2.4	125	2.4	295	124	2.4	0.27	2.25	dense vegetation existing
2200	700	0.013	3.2	2.7	115	2.7	311	114	2.3	0.24	2.23	dense vegetation existing
2101	750	0.024	3.4	2.9	84	2.8	238	83	3.2	0.33	4.22	dense vegetation existing
2000	750	0.011	3.9	2.2	144	2.2	318	144	2.2	0.27	1.48	dense vegetation existing
1900	820	0.020	3.4	2.5	117	2.5	291	116	2.8	0.31	3.19	dense vegetation existing
1800	820	0.012	3.9	3.2	107	3.2	340	106	2.4	0.24	2.33	dense vegetation existing
1700	820	0.018	3.4	3.0	100	3.0	298	99	2.8	0.28	3.26	dense vegetation existing
1600	820	0.010	5.1	3.7	85	3.6	309	84	2.7	0.25	2.33	dense vegetation existing
1500	820	0.026	4.6	3.1	80	3.1	244	79	3.4	0.34	5.01	dense vegetation existing
1400	820	0.035	4.6	2.5	129	2.4	315	128	2.6	0.30	5.34	dense vegetation existing
1299	820	0.005	4.4	3.5	105	3.5	369	104	2.2	0.21	1.19	dense vegetation existing
1200	820	0.036	3.1	1.6	113	1.6	183	113	4.5	0.62	3.64	dense vegetation existing
1099	820	0.005	1.9	1.5	243	1.5	375	243	2.3	0.32	0.51	native grass existing
1000	820	0.000	4.9	3.3	293	3.3	963	293	1.0	0.10	0.06	native grasses and pond existing
791	820	0.000	6.9	5.3	393	5.3	2092	392	0.4	0.03	0.01	native grasses and pond existing
598	820	0.000	9.0	6.4	321	6.4	2045	320	0.5	0.03	0.01	native grasses and pond existing
449	820	0.000	4.9	4.0	409	4.0	1626	409	0.5	0.05	0.02	native grasses and pond existing
409	820	0.059	2.9	1.8	62	1.7	108	62	7.6	1.01	6.42	spillway riprap
374	820	0.062	1.8	1.5	77	1.5	116	77	7.0	1.01	5.82	spillway riprap
300	820	0.003	3.7	2.7	121	2.7	326	121	2.6	0.28	0.55	dense vegetation existing
200	820	0.008	3.3	2.5	157	2.5	391	156	1.8	0.20	1.19	dense vegetation existing
100	820	0.050	1.6	1.5	184	1.5	282	183	2.9	0.42	4.77	dense vegetation existing

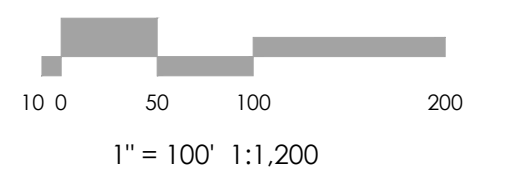
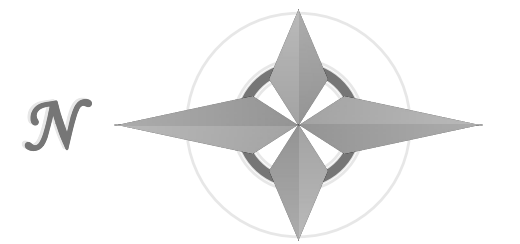
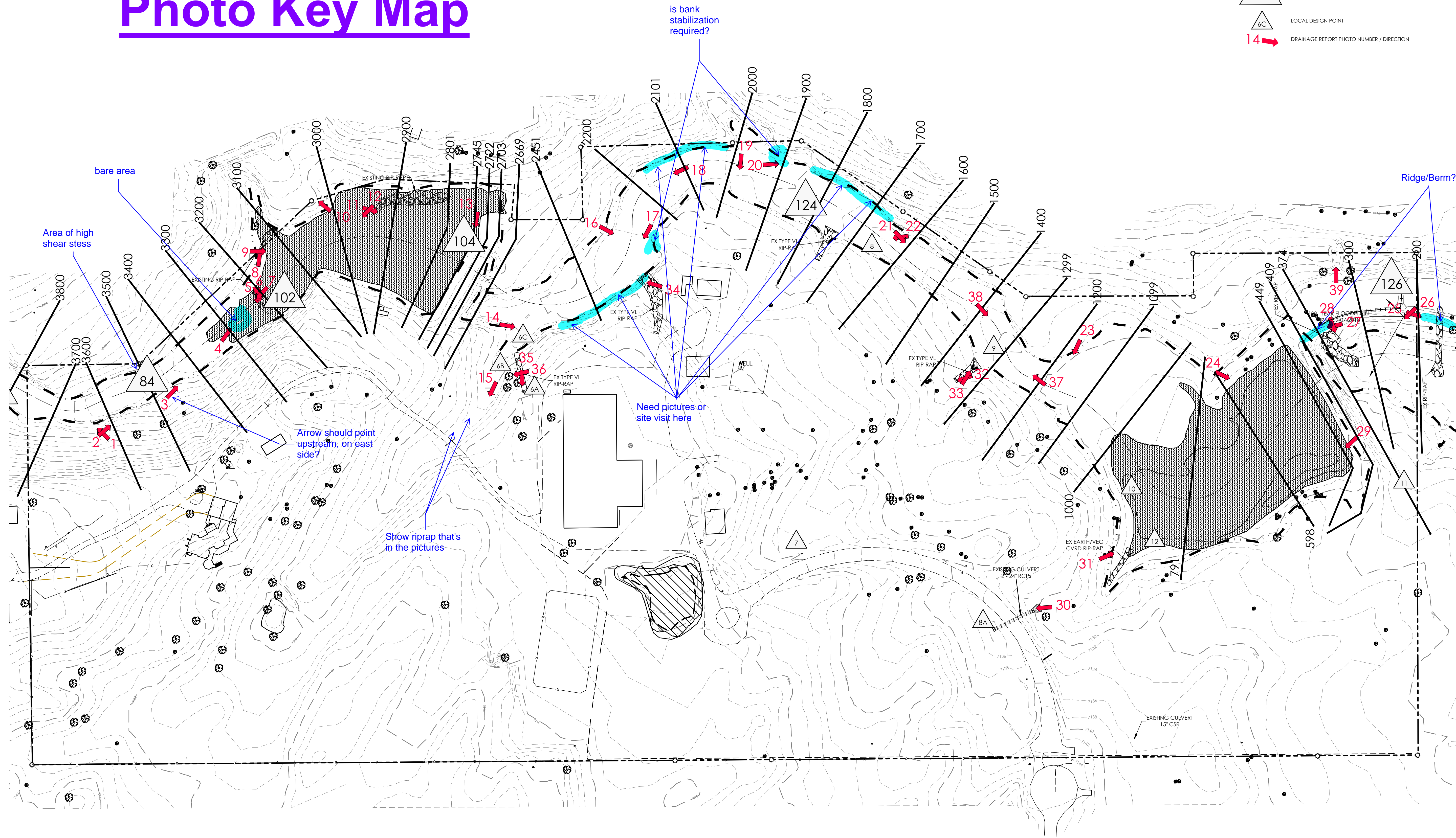
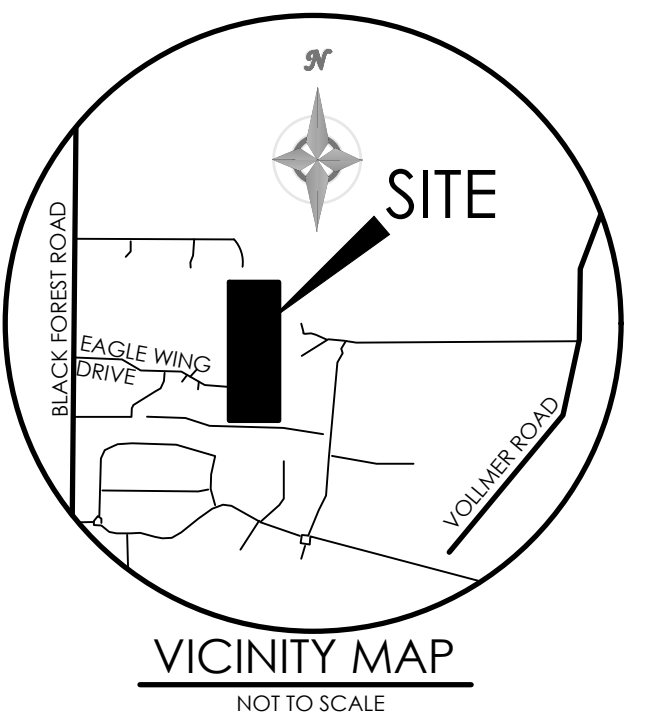
HEC-RAS Cross Section Location and Photo Key Map

LEGEND

- PROPERTY LINE
- EASEMENT LINE
- LOT LINE

EXISTING

- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- DBPS DESIGN POINT
- LOCAL DESIGN POINT
- DRAINAGE REPORT PHOTO NUMBER / DIRECTION



MVE, INC.
ENGINEERS, SURVEYORS

1903 Leamy Street, Suite 200, Colorado Springs, CO 80909 719.635.5736

REVISIONS

DESIGNED BY _____
DRAWN BY _____
CHECKED BY _____
AS-BUILT BY _____
CHECKED BY _____

EAGLE RISING
FILING NO.1

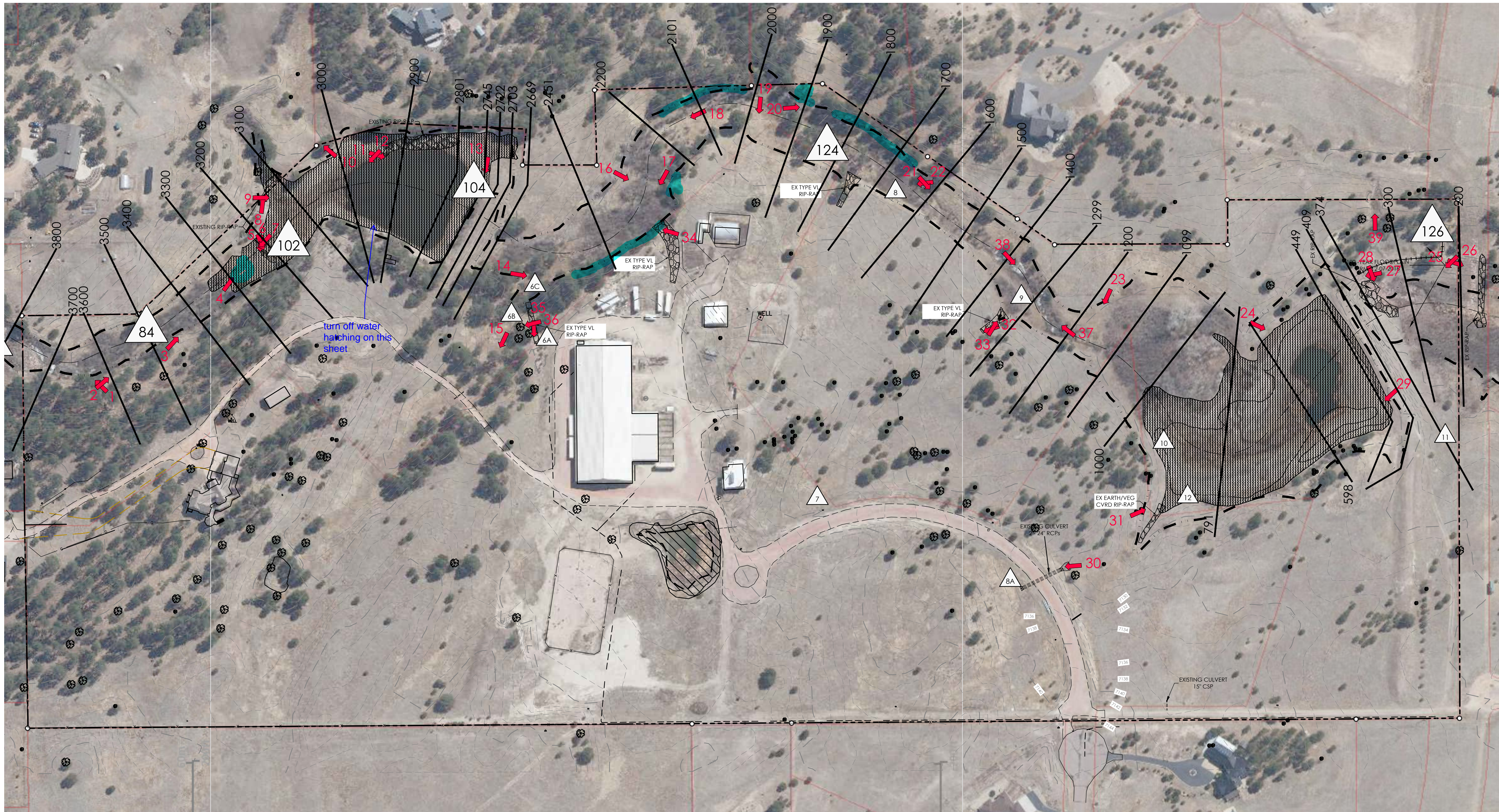
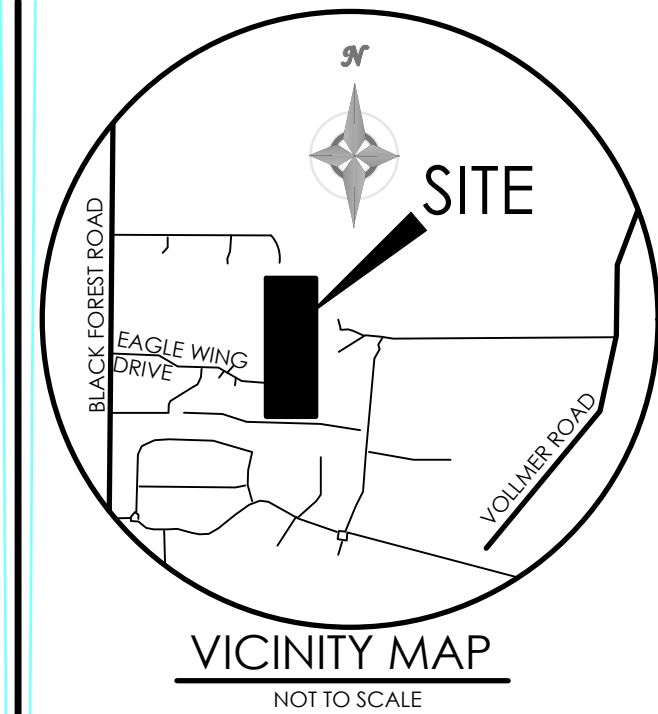
STREAM VEGETATION
PHOTO LOCATIONS

MVE PROJECT 61145
MVE DRAWING DRN-MAP-HECRAS

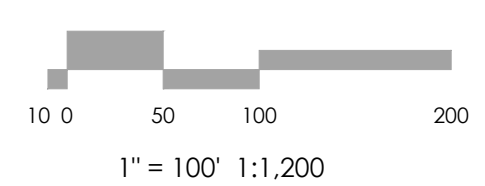
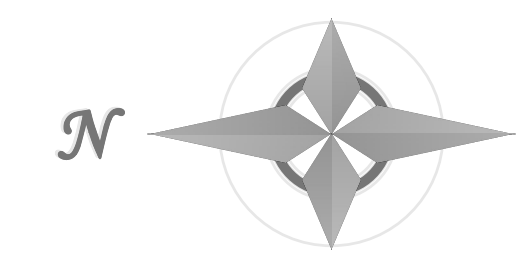
OCTOBER 31, 2023
SHEET 1 OF 1

LEGEND

- PROPERTY LINE
- - - EASEMENT LINE
- - - LOT LINE
- EXISTING**
- - - INDEX CONTOUR
- - - INTERMEDIATE CONTOUR
- ▲ 104 DBPS DESIGN POINT
- ▲ 6C LOCAL DESIGN POINT
- ➔ 14 DRAINAGE REPORT PHOTO NUMBER / DIRECTION



BENCHMARK



MVE, INC.
ENGINEERS, SURVEYORS

1903 Leary Street, Suite 200 Colorado Springs, CO 80909 719.635.5736

REVISIONS

DESIGNED BY _____
DRAWN BY _____
CHECKED BY _____
AS-BUILT BY _____
CHECKED BY _____

EAGLE RISING
FILING NO.1

STREAM VEGETATION
PHOTO LOCATIONS

MVE PROJECT 61145
MVE DRAWING DRN-MAP-HECRAS

OCTOBER 31, 2023
SHEET 1 OF 1



1

Looking downstream,
from 250 feet
downstream of
Cottonwood Creek
DBPS Design Point
82.

September 27, 2022



2

Looking upstream,
from 250 feet
downstream of
Cottonwood Creek
DBPS Design Point
82.

September 27, 2022



3

Looking upstream,
from Cottonwood
Creek DBPS Design
Point 84.

September 27, 2022



4

Looking downstream,
from 200 feet
downstream of
Cottonwood Creek
DBPS Design Point
84.

September 27, 2022



5

Looking upstream,
from Cottonwood
Creek DBPS Design
Point 102.

September 27, 2022



6

Looking upstream,
from Cottonwood
Creek DBPS Design
Point 102.

September 27, 2022



7

Looking upstream,
from Cottonwood
Creek DBPS Design
Point 102.

September 27, 2022



8

Looking upstream
tributary stream, from
Cottonwood Creek
DBPS Design Point
102.

September 27, 2022



9

Looking downstream,
from Cottonwood
Creek DBPS Design
Point 102.

September 27, 2022



10

Looking northeast,
from 100 feet
downstream of
Cottonwood Creek
DBPS Design Point
102.

September 27, 2022



11

Looking downstream,
from 200 feet
downstream of
Cottonwood Creek
DBPS Design Point
102. Emergency
spillway on left
corner of pond.

September 27, 2022



12

Looking upstream,
from 200 feet
downstream of
Cottonwood Creek
DBPS Design Point
102.

September 27, 2022



13

Buried and partially buried riprap at emergency overflow, from Cottonwood Creek DBPS Design Point 104.

September 27, 2022



14

Looking at heavy vegetation downstream, from Design Point 6C.

September 27, 2022



15

Looking at riprap
upstream tributary
flow, from Design
Point 6B.

September 27, 2022



16

Looking southwest
across stream, from
450 feet downstream
of Cottonwood Creek
DBPS Design Point
104.

September 27, 2022



17

Looking up stream,
from 450 feet
downstream of
Cottonwood Creek
DBPS Design Point
104.

September 27, 2022



18

Looking upstream,
from 300 feet
upstream of
Cottonwood Creek
DBPS Design Point
124.

September 27, 2022



19

Looking west across channel, from 100 feet upstream of Cottonwood Creek DBPS Design Point 124.

September 27, 2022



20

Looking downstream at the upper banks, from 100 feet upstream of Cottonwood Creek DBPS Design Point 124.

September 27, 2022



21

Looking upstream,
from Design Point 8.

September 27, 2022



22

Looking downstream,
from Design Point 8.

September 27, 2022



23

On the east side of the creek looking west, from 200 feet downstream of Design Point 9.

September 27, 2022



24

Looking southwest towards pond embankment, from 400 feet downstream of Design Point 10.

September 27, 2022



25

Looking downstream towards offsite pond and riprap, from Cottonwood Creek DBPS Design Point 126.

September 27, 2022



26

Looking upstream, from Cottonwood Creek DBPS Design Point 126.

September 27, 2022



27

Looking upstream towards riprap for emergency overflow, from east bank 550 feet downstream of Design Point 10.

September 27, 2022



28

Looking across channel, from east bank 550 feet downstream of Design Point 10.

September 27, 2022



29

Looking upstream,
from the west bank
500 feet downstream
of Design Point 10.

September 27, 2022



30

Looking north at
culverts, on the east
side of the road from
100 feet south of
Design Point 8A.

September 27, 2022



31

Riprap lining
downstream from
DP8A, from 100 feet
north of Design Point
12.

September 27, 2022



32

Looking northwest up
tributary stream, from
100 feet northwest of
Design Point 9.

September 27, 2022



33

Looking east, on west bank of creek, from 100 feet northwest of Design Point 9.

September 27, 2022



34

Riprap lined swale from barn area to creek, in need of additional riprap, from 450 feet downstream of Cottonwood Creek DBPS Design Point 104.

September 27, 2022



35

Looking west,
existing riprap lined
swale in need of
additional riprap from
Design Point 6A.

September 27, 2022



36

Looking at riprap on
tributary flow
upstream of DP6B,
from Design Point
6A.

September 27, 2022



37

Looking northeast
from the centerline of
the creek at
HECRAS Station
1200.

December 11, 2023



38

Looking southwest
from the centerline of
the creek at
HECRAS Station
1400.

December 11, 2023

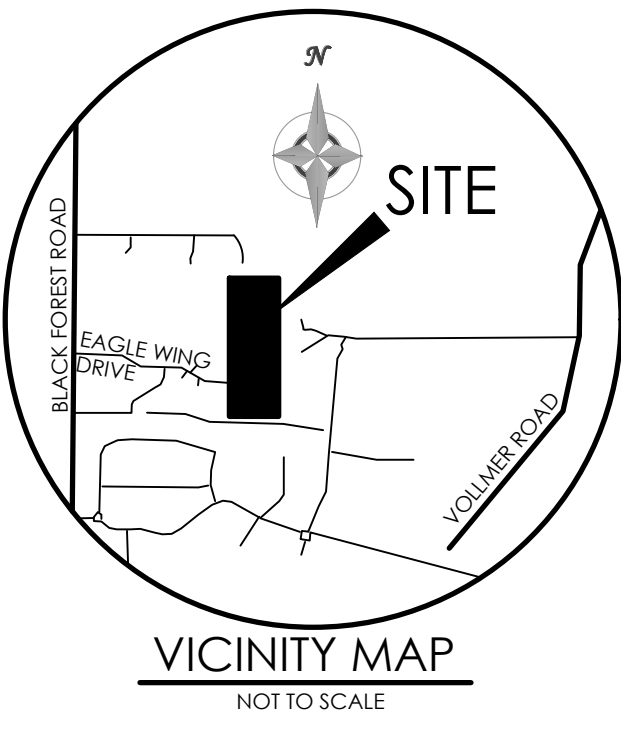


39

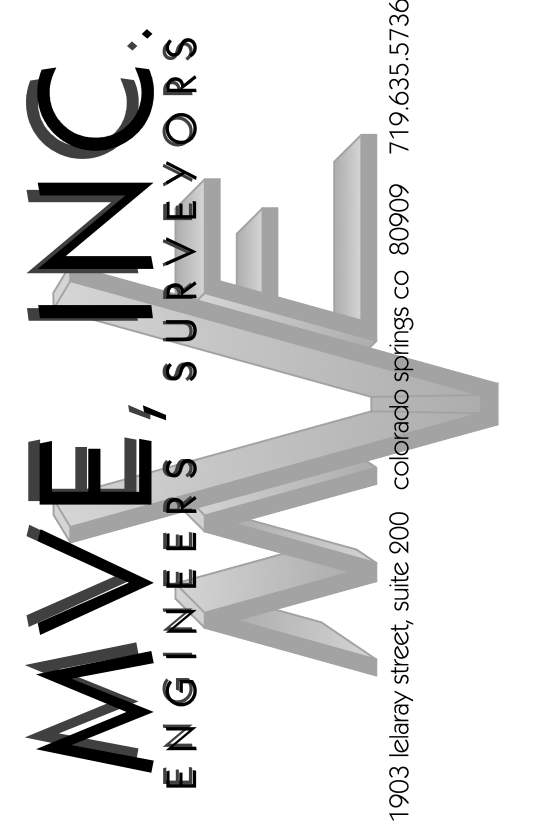
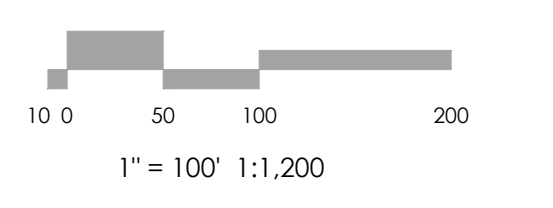
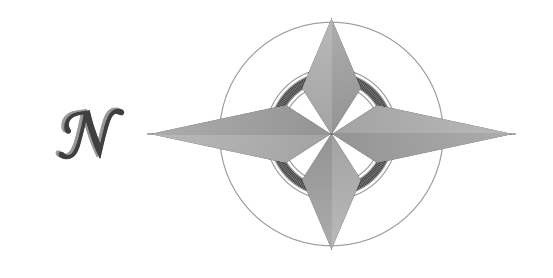
Looking east at east
property line at
approximately
HECRAS station
300.

December 11, 2023

LEGEND	
---	PROPERTY LINE
- - - -	EASEMENT LINE
---	NBL NO BUILD LIMIT LINE
---	LOT LINE
- - - -	EXISTING INDEX CONTOUR
- - - -	PROPOSED INDEX CONTOUR
- - - -	INTERMEDIATE CONTOUR
- - - -	100 YEAR STORM WATER FLOOD LEVEL
█	POSSIBLE ACCESS PATH



BENCHMARK



REVISIONS

DESIGNED BY _____
 DRAWN BY _____
 CHECKED BY _____
 AS-BUILTS BY _____
 CHECKED BY _____

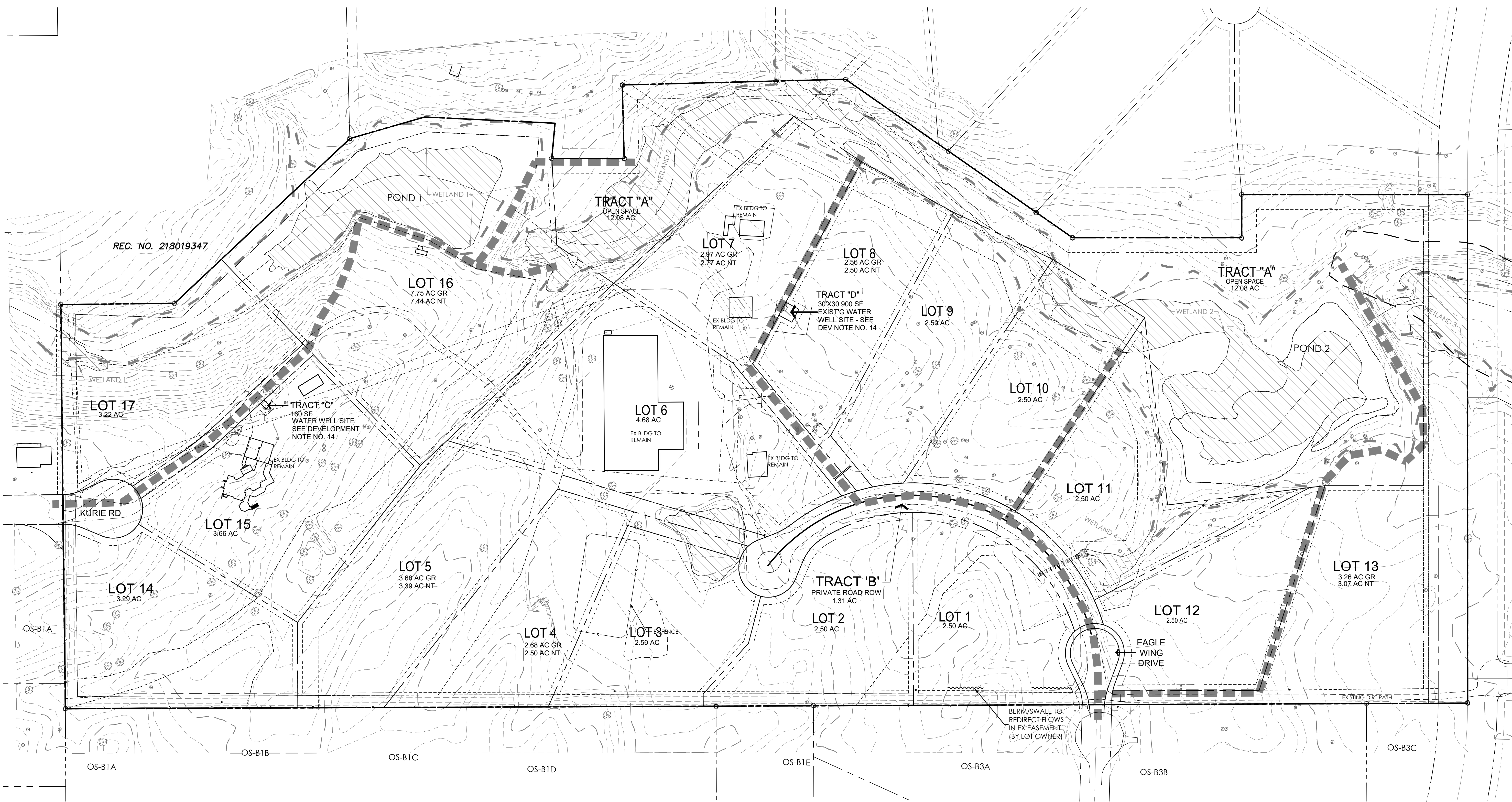
**EAGLE RISING
 PRELIMINARY PLAN**

CREEK ACCESS

EXHIBIT

MVE PROJECT 61145
 MVE DRAWING DRN-MAP-DEV

DECEMBER 12, 2023
SHEET 1 OF 1



REC. NO. 218019347

LOT 17
3.22 AC

LOT 15
3.66 AC

LOT 14
3.29 AC

LOT 5
3.68 AC GR
3.39 AC NT

LOT 4
2.68 AC GR
2.50 AC NT

LOT 3
2.50 AC

LOT 2
2.50 AC

LOT 1
2.50 AC

LOT 12
2.50 AC

LOT 13
3.26 AC GR
3.07 AC NT

LOT 10
2.50 AC

LOT 9
2.50 AC

LOT 8
2.56 AC GR
2.50 AC NT

LOT 7
2.97 AC GR
2.79 AC NT

TRACT "A"
OPEN SPACE
12.08 AC

TRACT "A"
OPEN SPACE
12.08 AC

TRACT "D"
30'X30' 900 SF
EXIST'G WATER
WELL SITE - SEE
DEV NOTE NO. 14

LOT 6
4.68 AC
EX BLDG TO
REMAIN

TRACT "C"
160 SF
WATER WELL SITE
SEE DEVELOPMENT
NOTE NO. 14

TRACT "B"
PRIVATE ROAD ROW
1.31 AC

OS-B1A

OS-B1B

OS-B1C

OS-B1D

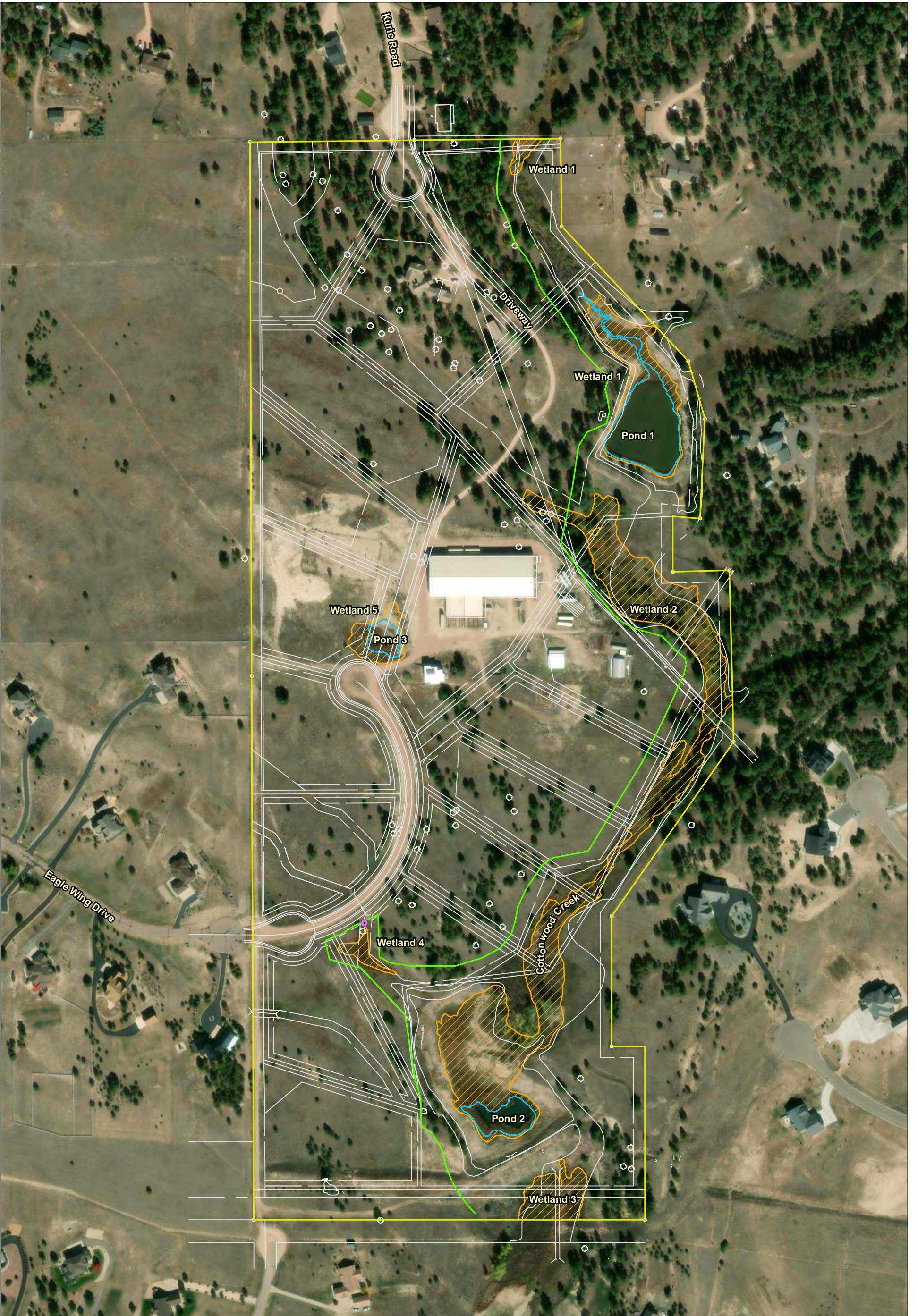
OS-B1E

OS-B3A

OS-B3B

OS-B3C

BERM/SWALE TO
REDIRECT FLOWS
IN EX EASEMENT
(BY LOT OWNER)



Eagle Rising 2022 Natural Resources Assessment



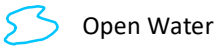


-  Culvert
-  Construction/Disturbance Limit
-  Open Water
-  Project Area Boundary
-  Wetland

Image Source: Maxar Technologies©, October 14, 2022

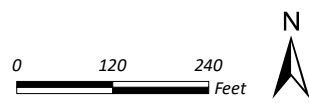


Figure 3
Proposed Subdivision

Prepared for: Steve Jacobs
File: 22_113 Figure 3.mxd (GS)
August 25, 2023



be impacted by development of the project area and to identify any significant changes in natural resources since the assessment conducted in 2012.

The project area has been continually influenced by human activities for more than 100 years. Timber was a major industry in the Black Forest in the late 1800's with numerous lumber mills scattered through the area. Grazing and agriculture dominated the land use in the early 1900's, eventually giving way to summer homes, and full-time residences (El Paso County Land Use Department 1987).

Methods

During the 2022 site visits, ERO conducted an updated natural resources assessment of the project area. In addition to the information gathered during the 2022 site visits, natural resource information was obtained from existing databases and sources such as aerial photography, the Colorado Natural Diversity Information Source (NDIS), U.S. Fish and Wildlife Service (Service) National Wetlands Inventory database, U.S. Geological Survey (USGS) National Hydrography Dataset (NHD), and other sources ("Google, Inc." 2022; Natural Diversity Information Source 2021; U.S. Fish and Wildlife Service, n.d.; U.S. Geological Survey 2022). Based on the information gathered from existing sources and the initial site visit, ERO verified existing vegetation communities and identified important wildlife attributes of the project area.

Project Area Description

The National Land Cover Database maps five land cover types in the project area (U.S. Geological Survey 2016). Grassland/Herbaceous is the most dominant and occurs throughout the majority of the western portion of the project area. The other land cover types in the project area include evergreen forest, scrub/shrub, open water, and barren land.

The project area is on the southern edge of the Black Forest, northeast of Colorado Springs (Figure 1). Vegetation in the project area consists of upland grasslands, patches of ponderosa pine (*Pinus ponderosa*) and upland shrubs, and wetland/riparian vegetation along drainages. Three tributaries to Cottonwood Creek converge at the eastern project area boundary. In the project area, Cottonwood Creek generally flows from north to south and primarily consists of wetlands throughout the channel (Figure 2; Photos 5a through 7a, 5b, 6b). Two ponds (Ponds 1 and 2) occur along Cottonwood Creek in the project area that are contained behind earthen dams (Photos 1a through 4a). As a result of water rights negotiations and drought, the wetlands along Cottonwood Creek and the two ponds were drier in 2022 than what was observed in 2012 (Photos 1b through 4b). A third pond (Pond 3), that was excavated in uplands occurs in the west, central portion of the project area (Figure 2; Photos 6a and 6b)). Wetlands occur in the channel and on benches and terraces along Cottonwood Creek and as small fringes along the ponds. A depressional area and swale consisting of wetland vegetation (Wetland 4) occurs downstream of a culvert in the project area northwest of Pond 2 (Figure 2). Wetlands in the project area are dominated by Nebraska sedge (*Carex nebrascensis*), Baltic rush (*Juncus balticus*), redtop (*Agrostis gigantea*), broadleaf cattail (*Typha angustifolia*), sandbar willow (*Salix exigua*), strapleaf willow

(*Salix ligulifolia*), park willow (*Salix monticola*), and shining willow (*Salix lucida* subsp. *caudata*). The riparian overstory along Cottonwood Creek is dominated by peachleaf willow (*Salix amygdaloides*) and plains cottonwood (*Populus deltoides* subsp. *monilifera*) trees. Upland shrubs in the riparian corridor include snowberry (*Symphoricarpos occidentalis*), Woods' rose (*Rosa woodsii*), golden currant (*Ribes aureum*), and chokecherry (*Padus virginiana*) (Photo 10). The soils in the project area primarily consist of Pring coarse sandy loam, 3 to 8 percent slopes (Natural Resources Conservation Service 2022).

The project area is one of the last remaining nonresidential tracts of land along Cottonwood Creek. Rural residential development (2- to 5-acre lots) surrounds the entire project area. Two existing homes are located in the northwest corner of the project area and a large barn, corral, and disturbed area occurs in the north-central portion of the project area (Photo 8a). The uplands in the project area are a mixture of native grassland and disturbed areas (Photos 9a and 9b). The project area has historically been used for cattle grazing, and some limited grazing continues in the southeast corner of the project area. The native upland areas are dominated by blue grama (*Bouteloua gracilis*), sand dropseed (*Sporobolus cryptandrus*), threeawn (*Aristida* sp.), soapweed yucca (*Yucca glauca*), Canada wildrye (*Elymus canadensis*), intermediate wheatgrass (*Thinopyrum intermedium*), sideoats grama (*Bouteloua curtipendula*), muhly (*Muhlenbergia* sp.), and ponderosa pine (Photos 9a and 9b). The disturbed uplands are dominated by smooth brome (*Bromus inermis*), diffuse knapweed (*Centaurea diffusa*), Canada thistle (*Cirsium arvensis*), musk thistle (*Carduus nutans*), common mullein (*Verbascum thapsus*), common teasel (*Dipsacus fullonum*), and kochia (*Bassia scopara*).

Conclusions

On behalf of the project proponent, ERO is requesting an approved JD for the old stock pond and upland vegetated swale in the northeastern portion of the project area, Pond 3 and associated Wetland 5, and Wetland 4. Based on the information in this report, if the Corps determines that the wetlands and waters are not jurisdictional, ERO would appreciate a written determination of this request confirming that no further consultation under Section 404 is required.

If you have any questions or need additional information, please do not hesitate to contact me at 303-830-1188 or by email at cmarne@eroresources.com. I look forward to hearing from you.

Sincerely,



Courtney Marne
Biologist/Associate

cc: David Jones - Land Resource Associates
Stephen Jacobs - MyPad, Inc.

Attachments: Figures 1 and 2; Photo Log; Routine Wetland Determination Forms; JD Form

References

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Photo 1a - Cottonwood Creek at the southern boundary of the project area. View is to the south.



Photo 1b - Cottonwood Creek at the southern boundary of the project area. View is to the south.



Photo 2a - Wetlands along Cottonwood Creek in the project area. View is to the south.



Photo 2b - Wetlands along Cottonwood Creek in the project area. View is to the south.



Photo 3a - Pond 1 in the project area. View is to the east.



Photo 3b - Immediately upstream of Pond 1 in the project area. View is to the east.

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Photo 4a - Pond 2 in the project area.
View is to the northwest.



Photo 4b - Pond 2 in the project area.
View is to the northwest.



Photo 5a - Vegetated swale upstream of Cottonwood Creek
in the project area. View is to the northwest.



Photo 5b - Vegetated swale upstream of Cottonwood Creek
in the project area. View is to the northwest.



Photo 6a - Pond 3 in the project area.
View is to the northwest.



Photo 6b - Pond 3 and associate Wetland 5 in the project area.
View is to the northwest.

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Photo 7a - Wetland 9 in the project area.
View is to the southeast.

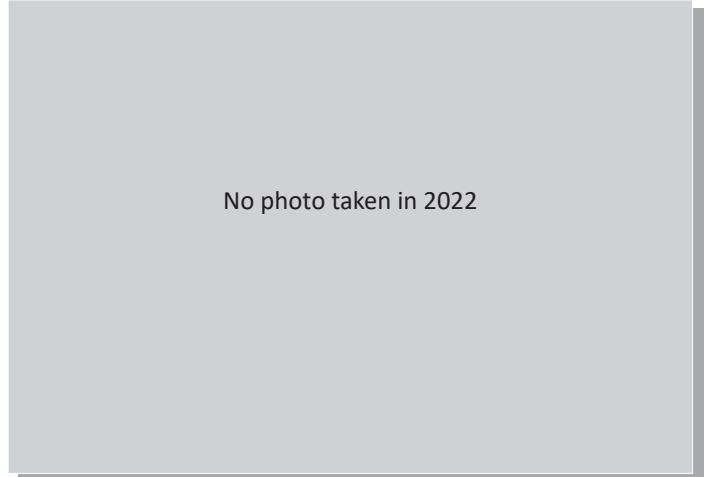


Photo 7b - Wetland 9 in the project area.
View is to the southeast.



Photo 8a - Disturbed uplands and barn in the project area.
View is to the northeast.



Photo 8b - Disturbed uplands and barn in the project area.
View is to the northeast.



Photo 9a - Native uplands in the project area.
View is to the northeast.



Photo 9b - Native uplands in the project area.
View is to the northeast.

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Photo 10a - Riparian corridor in the project area.
View is to the southeast.



Photo 10b - Riparian corridor in the project area.
View is to the southeast.

Publication indicating the utilization of willow for stream stabilization

 <p>Colorado State Parks</p>	<p>COLORADO STATE PARKS STEWARDSHIP PRESCRIPTION</p>	
<p>Date Created: April 10, 2002 Revised: April 1, 2005 Author: Mindy Wheeler Parks Affected: Most</p>	<p>Cottonwood and Willow Management ^{Stewardship} Rx</p>	

This and everything following is not needed in the deviation request; add it to the PDR if you want to include it, and just keep the title pages as reference or a list of references in the deviation request.

