



February 23 2021

Jason Puffett
Fire Chief
Genesee Fire Rescue
23455 Curreant Drive
Golden, CO 80401
jpuffett@geneseefire.org

Re: Fire Access Roads – Concept Design Analysis

Dear Chief Puffett,

Baseline is pleased to provide the following summary of our feasibility analysis that was prepared for Genesee Fire Rescue. As outlined by the Board Baseline evaluated four proposed alignments for possible emergency access roads within the Genesee Fire District connecting with Morrison Road (Hwy 74). Baseline produced conceptual grading using LiDAR topographic contours available from the County. We utilized a 20' wide typical section for a private drive-in compliance with Jefferson County criteria and sufficient to provide emergency egress. The plans that we prepared are preliminary but were produced in compliance with Jefferson County Development Codes and Guidelines related to roadway width, alignment, slope, etc. Baseline also prepared an engineers estimate of probable construction cost for use in applying for and seeking funding for the roadway.

Final design plan preparation will be required for permitting, bidding, and construction. The scope for final design would include detailed surveying along the selected alignment for use in preparing final construction drawings. A detailed drainage analysis will also be needed to evaluate the final size, length, and location of drainage culverts. For the feasibility estimate only major drainageways were assumed for culvert placement but additional culverts may be warranted. Final design plans will be based on a detailed topographic survey that will allow for profile adjustments to ensure balanced earthwork and eliminate the need for import or export of dirtwork. Because final design has not been prepared Baseline is carrying a 20% contingency in our estimates of construction cost.

Jefferson County criteria allows for a maximum cut/fill slope of 3:1. For this feasibility it was assumed that rather than incorporating walls into the design the geology tends to support steeper slopes as evidenced by the cuts for the roadway along Hwy 74. We assumed that during final design a Geotech could evaluate and approve slopes as steep as a 0.5:1 cut slope and a 1:1 fill slope as shown on the typical road section on sheet 1 of the concept plans.

Alignment 'A'

Alignment 'A' as depicted on the Concept Exhibit starts at the treatment plant and follows the natural terrain at just over 6% and uses portions of the existing access that may have been used by PSCO in the past. The estimated construction cost of this alignment including a 20% contingency is \$854,070

Pros:

- Sits well below the existing homes and has the least impact adjacent to homeowners
- Fairly gradual slope as it follows the natural terrain and an existing access that may have been constructed by PSCO.
- No sharp curves till you approach the existing dam (impacts both Alignments)

Cons:

- Portions of the upper alignment run along the steepest terrain (cross slope).
- Slightly more expensive than Alignment 'B'

Alignment 'B'

Alignment 'B' starts from Bitterroot Lane and is depicted on the Concept Exhibit with a centerline alignment and also is shown in profile. The alignment follows the natural terrain at around 10% and ties into portions of the same existing access that may have been used by PSCO in the past and continues to follow the same path as Alignment 'A' from that point down to the tie in point at Morrison Road. The estimated construction cost of this alignment including a 20% contingency is \$736,194

Pros:

- Terrain (cross slope) is not as steep as the upper segment of Alignment 'A'
- Slightly less cost than Alignment 'A'

Cons:

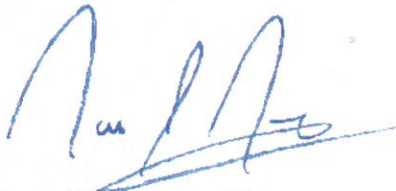
- The upper segment is very close to the existing homes in order to follow the natural terrain.
- Approaching max running slope of 10% (Steeper than Alignment 'A')
- A sharp switchback needed near Station 27+00

Alignments 'C' and 'D'

Alignments 'C' and 'D' coming off Bitterroot were in excess of 12% or were impacting property owners.

Thank you for the opportunity to assist Genesee Fire Rescue.

Sincerely



Noah J Nemmers, PE
Engineering Manager
Baseline Engineering

EVACUATION ROUTE 'A'
GENESEE FIRE ACCESS EXHIBIT
ENGINEERS ESTIMATE OF PROBABLE CONSTRUCTION COST

NO.	ITEM	TOTAL QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
1	Clearing & Grubbing	2.6	ACRES	\$5,000	13,170.95
2	Unclassified Excavation (Cut to Fill)	40558	CY	\$8	324,464.00
3	Sediment Control Logs	5350	LF	\$4.00	21,400.00
5	Seeding & Mulching	2	ACRE	\$2,750.00	6,118.18
6	Erosion Control Blankets	10768	SY	\$3.25	34,996.00
7	RAP Road (6 inch)	1981	CY	\$45.00	89,166.67
8	Road Base (6 inch)	1981	CY	\$53.50	106,009.26
9	Storm Pipe (18 inch)	30	LF	\$160.00	4,800.00
10	Storm Pipe (24 inch)	30	LF	\$200.00	6,000.00
11	Concrete FES (24 inch)	2	EACH	\$1,300.00	2,600.00
12	Construction Surveying	1	LS	\$48,000.00	48,000.00
13	Mobilization	1	LS	\$50,000.00	50,000.00
14	Construction Site Management/Temporary Stormwater Management	1	LS	\$5,000.00	5,000.00

Subtotal **\$711,725.06**

Contingency (20%) \$142,345.01

Total Construction Costs **\$854,070.07**

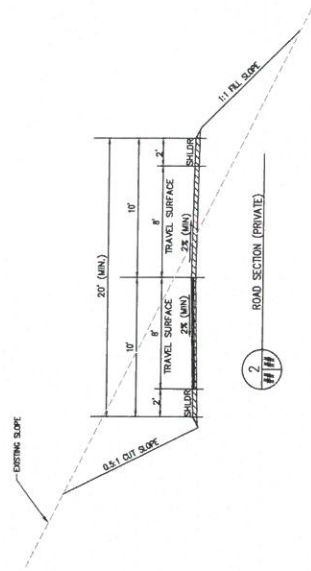
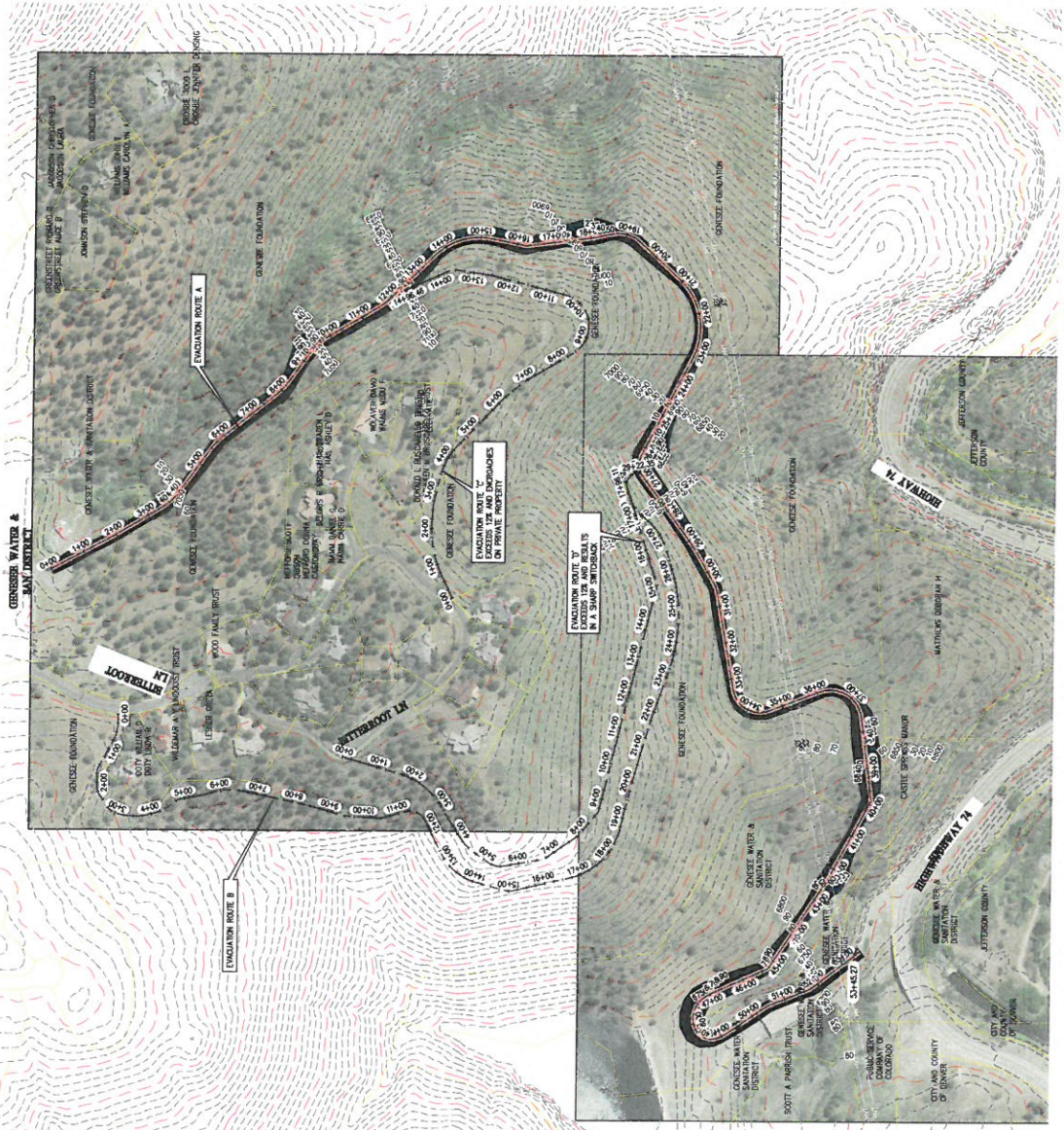
EVACUATION ROUTE 'B'
GENESEE FIRE ACCESS EXHIBIT
ENGINEERS ESTIMATE OF PROBABLE CONSTRUCTION COST

<i>NO.</i>	<i>ITEM</i>	<i>TOTAL QUANTITY</i>	<i>UNIT</i>	<i>UNIT PRICE</i>	<i>TOTAL PRICE</i>
1	Clearing & Grubbing	2.2	ACRES	\$5,000	11,000.00
2	Unclassified Excavation (Cut to Fill)	35356	CY	\$8	282,848.00
3	Sediment Control Logs	4400	LF	\$4.00	17,600.00
5	Seeding & Mulching	2	ACRE	\$2,750.00	4,950.00
6	Erosion Control Blankets	8855	SY	\$3.25	28,778.75
7	RAP Road (6 inch)	1630	CY	\$45.00	73,333.33
8	Road Base (6 inch)	1630	CY	\$53.50	87,185.19
9	Storm Pipe (18 inch)	30	LF	\$160.00	4,800.00
12	Construction Surveying	1	LS	\$48,000.00	48,000.00
13	Mobilization	1	LS	\$50,000.00	50,000.00
14	Construction Site Management/Temporary Stormwater Management	1	LS	\$5,000.00	5,000.00

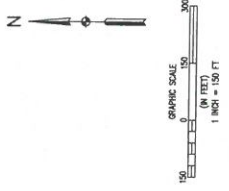
Subtotal **\$613,495.27**

Contingency (20%) **\$122,699.05**

Total Construction Costs **\$736,194.32**

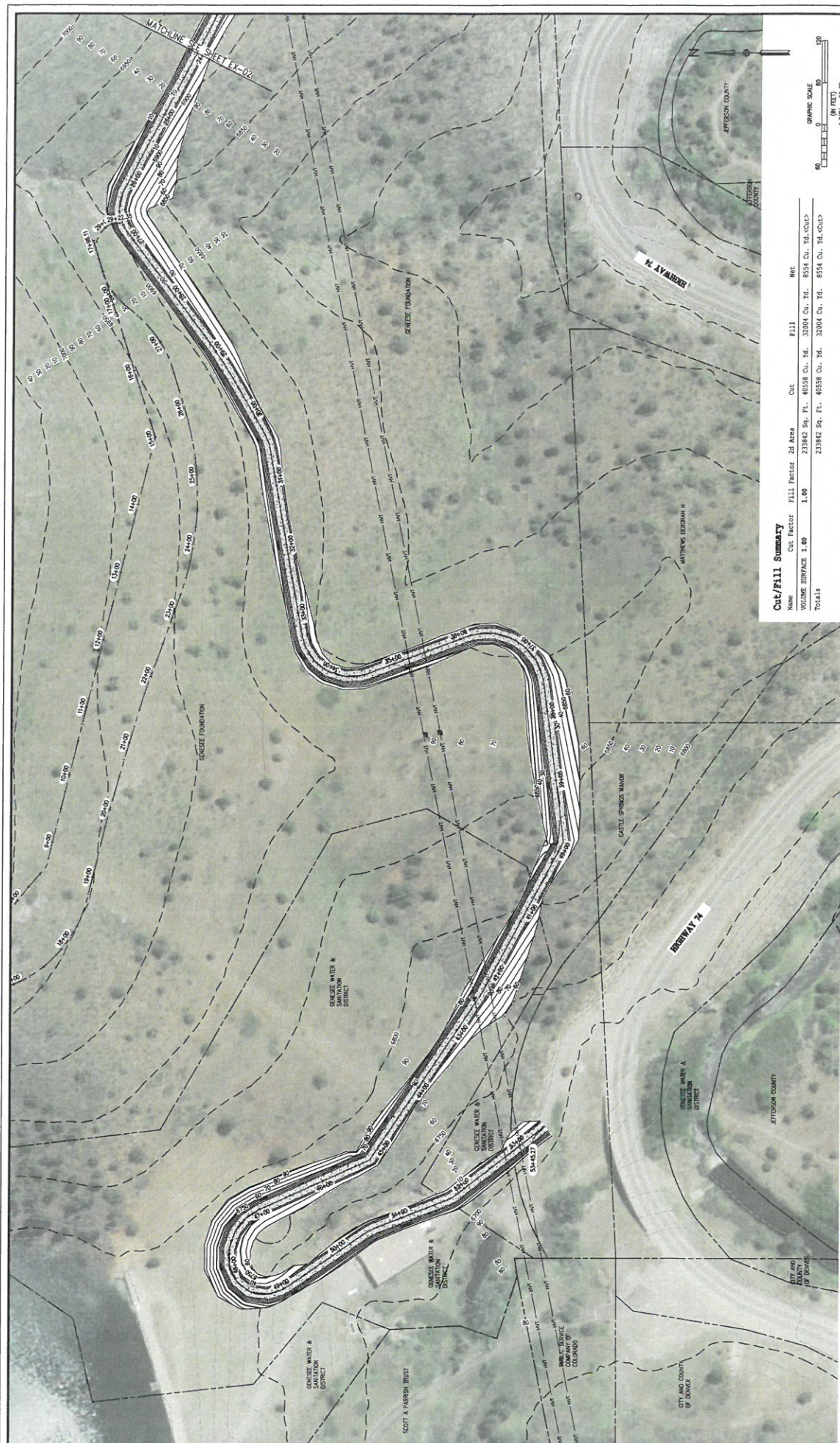


- LEGEND:**
- PROPERTY BOUNDARY
 - EX. EASEMENT
 - EX. MINOR CONTOUR
 - EX. MAJOR CONTOUR
 - PROPOSED MINOR CONTOUR
 - PROPOSED MAJOR CONTOUR
 - PROPOSED EASEMENT
 - NOMINAL SLOPE ON CUT OR FILL
 - PAVED SLOPE & DIRECTION
 - SEWAGE CONTROL LOSS
 - CHECK DAMS
 - PROPOSED ROADWAY (PRIVATE)
 - PROPOSED SHOULDER (PRIVATE)
 - VEHICLE TRACKING CONTROL
 - EROSION CONTROL BLANKET & SEEDING



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EXHIBIT
GENESEE FIRE RESCUE
 DATE PRINTED: February 15, 2021



Cut/Fill Summary

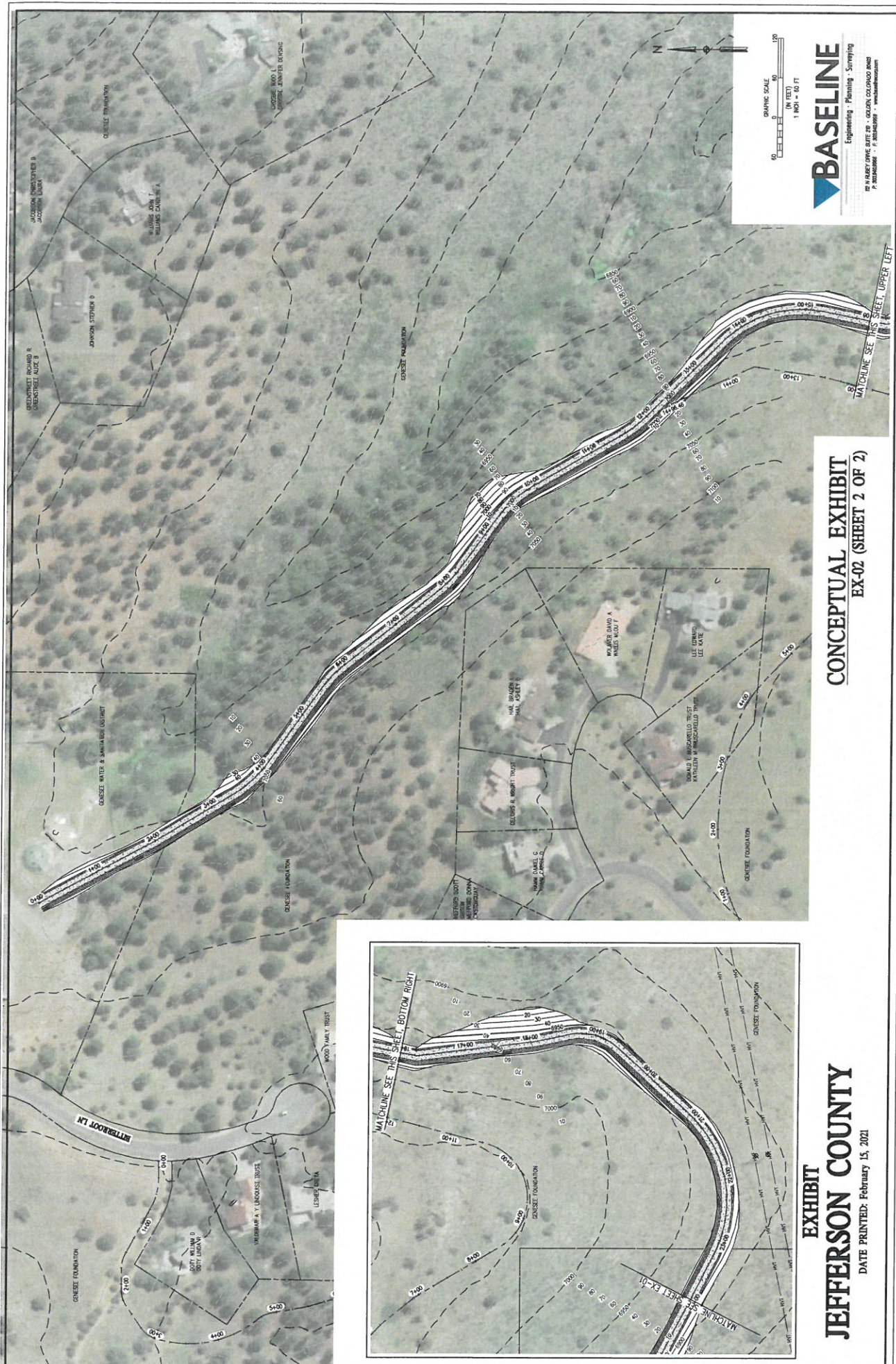
Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	NET
VOLUME SURFACE	1.00	1.00	233842 Sq. Ft.	46558 Cu. Yd.	32004 Cu. Yd.	8554 Cu. Yd. (+)
Totals			233842 Sq. Ft.	46558 Cu. Yd.	32004 Cu. Yd.	8554 Cu. Yd. (+)

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CONCEPTUAL EXHIBIT
EX-01 (SHEET 1 OF 2)

EXHIBIT
JEFFERSON COUNTY
 DATE PRINTED: February 15, 2021

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CONCEPTUAL EXHIBIT
EX-02 (SHEET 2 OF 2)

EXHIBIT
JEFFERSON COUNTY
 DATE PRINTED: February 15, 2021

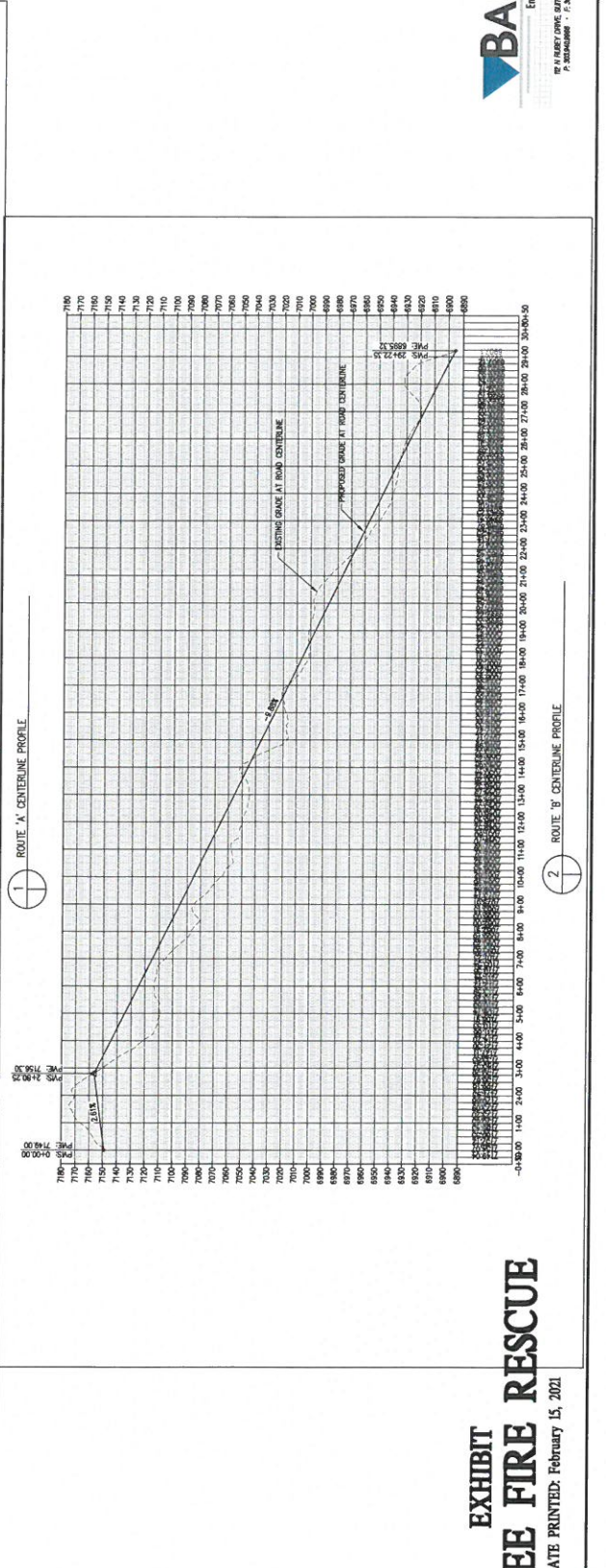
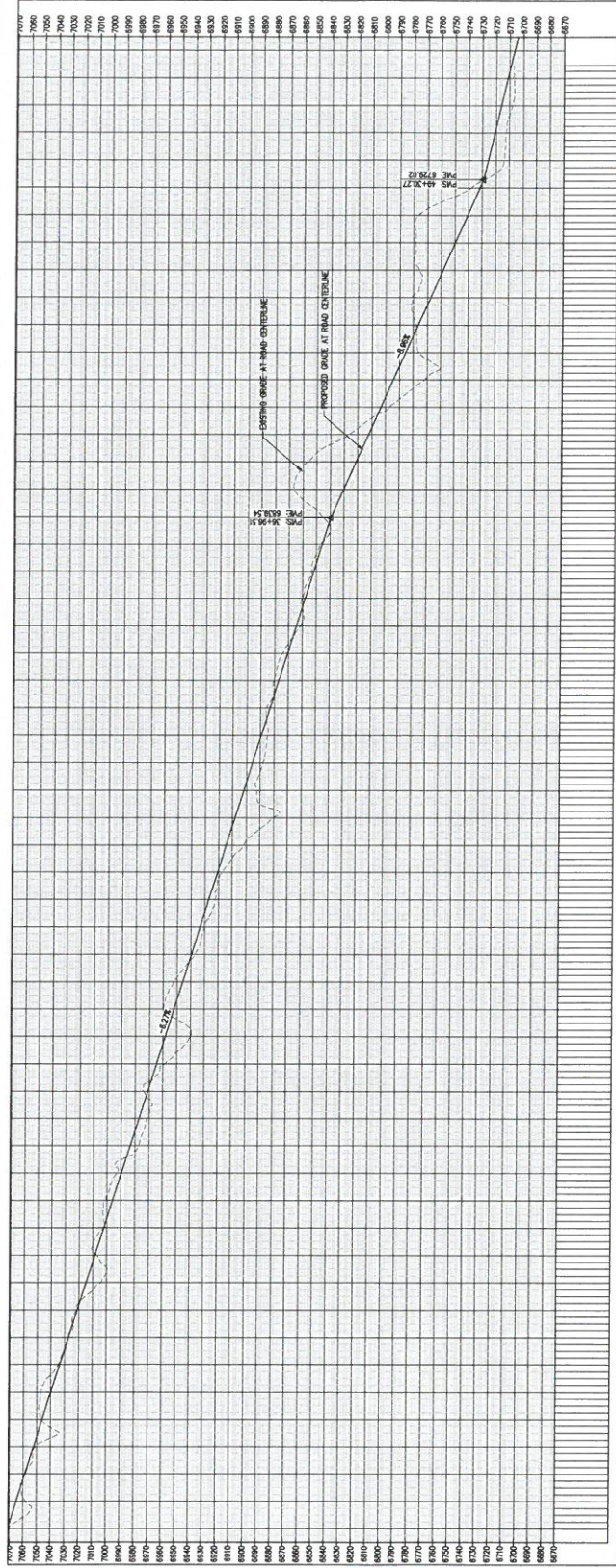


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