AGENDA ITEM or FINAL CONTRACT REVIEW SUBMITTAL FORM

Agenda Item: Gunnison County Somerset Septic System

Action Requested: Discussion

Parties to the Agreement:

Term Begins: **Term Ends:** **Grant Contract #:**

Summary:

Somerset Sewer Discussion

Fiscal Impact:

Submitted by: Liz Mense for Marlene Crosby **Submitter's Email Address:** EMense@gunnisoncounty.org

Finance Review: (●) Required ( ) Not Required

Comments:
no concerns. ln

Reviewed by: GUNCOUNTY1\lNienhueser Discharge Date: 4/9/2020

County Attorney Review: (●) Required ( ) Not Required

Comments:
ok db 4/10/20

Reveiwed by: GUNCOUNTY1\dBaumgarten Discharge Date: 4/10/2020 Certificate of Insurance Required

Yes ( ) No (●)

County Manager Review:

Comments:

Reveiwed by: GUNCOUNTY1\emense Discharge Date: 4/10/2020

( ) Consent Agenda ( ) Regular Agenda ( ) Worksession Time Allotted: 45

Agenda Date: 4/14/2020

Revised April 2015

SOMERSET, COLORADO CONCEPTUAL ONSITE WASTEWATER TREATMENT SYSTEMS OPTIONS REPORT

To:

Board of County Commissioners
Of Gunnison County, Colorado

C/O 200 E. Virginia Ave, Suite 104
Gunnison, CO 81230
Attn: Marlene Crosby, Deputy County Manager

By:

Alpine Land Consulting, LLC
P.O. Box 234
Rico, Colorado 81332
(970) 708-0326

ALPINE LAND CONSULTING
CIVIL ENGINEERING & LAND PLANNING

February 13, 2020

Project Number: 2019026

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ENGINEER'S STATEMENT

I hereby affirm that this report for the Conceptual Onsite Wastewater Treatment Systems for Somerset, Colorado, was prepared by me and under my direct supervision in accordance with the provisions of the Gunnison County Onsite Wastewater Treatment Systems Regulations, Effective June 29, 2018, on behalf of Gunnison County for the Town of Somerset and includes conceptual sizing and estimates for shared Onsite Wastewater Treatment Systems only.

COLORADO REGISTERED
GREGORY E. ANDERSON
35736
02/17/2020
PROFESSIONAL ENGINEER

Gregory E. Anderson
Registered Professional Engineer
State of Colorado No. 35736

Town of Somerset, Colorado
Conceptual Onsite Wastewater Treatment System Options

I. GENERAL LOCATION AND DESCRIPTION

Somerset, Colorado is an existing small coal mining town located in Gunnison County along the North Fork of the Gunnison River. The town is located south of Highway 133 between Paonia and Carbondale. Currently part of the town is on shared community onsite wastewater treatment systems (OWTS). The OWTS in question is experiencing some maintenance concerns currently and has 23 homes connected to it. A plan for this system was produced by Del-Mont Consultants Inc. on 2/3/93. It appears that this system is currently operating in accordance with this plan and will be referenced further within this document. Additionally, the Oxbow mining company has facilities North of Highway 133, and is also on its own OWTS system which has a soil treatment area further west of the Town of Somerset. The existing system for Oxbow is no longer in use as mine operations at this part of the facility have ended.

For purposes of this report, it has been assumed that 12 homes are 3 bedrooms and 11 are 2 bedroom homes. This would be equivalent to 58 bedrooms and must be confirmed prior to any final designs. Additional bedrooms or water wells would affect the final OWTS system. Due to the proximity of the site to the river, it has also been assumed that this site has a long term acceptance rate (LTAR) of 0.8 or Soil Type 1; Sand or Loamy Sand. Test pits utilizing an excavator to a depth of 8 feet must be conducted to confirm these soil type assumptions prior to any further preliminary or final non-confirming OWTS designs. According to current Regulation 43 standards, the design flow is 8,700 gallons per day.

Due to ongoing maintenance and reported times of field saturation, it has been determined that the existing OWTS must be upgraded or abandoned. The purpose of this report is to conceptually determine the OWTS options and estimate of construction cost to construct with the goal of replacing existing OWTS system. A series of 4 options have been outlined in this report with approximate costs of construction for comparison purposes only. This is a replacement of an existing OWTS system and some current Regulation 43 standards may not be met due to existing site constrictions. All variances must be approved by Gunnison County and possibly the State of Colorado prior to any construction. The intent is to improve the current OWTS situation

II. OPTION 1: LIFT STATION TO OXBOW

It has been reported that Oxbow Mining Company is not currently operating at the site North of Highway 133 and that the OWTS system is currently abandoned but in operating condition. Option 1 would therefore utilize this OWTS system by connecting to the existing OWTS tank(s) uphill at the Oxbow site utilizing a sewage lift station. The existing Somerset home tanks and soil treatment area would be abandoned. All existing sanitary sewer homes from the 23 homes would be intercepted by a prefabricated fiberglass duplex lift station and pump the sewage uphill to existing tanks at Oxbow mine. Piping must be placed across the highway via an asphalt patch or boring under the highway. It is unknown at this time the capacity of the OWTS system at Oxbow mine. There would need to be a tank capacity of approximately 14,750 gallons. It has been gathered that the effluent from the Oxbow mine tanks gravity down to a site west of the Somerset homes between the river and Highway 133. The size of the existing tanks and soil treatment area must be confirmed and more investigation would be required in order to pursue this option. If chambers are used at the assumed soil type, as listed above, approximately 635 (for trenches) and 762 (for beds) of Quick 4 Standard Plus chambers would be required for 58 bedrooms equivalent. It should also be noted that the design loading is over the maximum 2,000 gpd for individual OWTS systems as outlined by Regulation 43.

Colorado Department of Public Health and Environment would need to be consulted. The crossing of the CDOT Highway would need to be coordinated as well. This option would require formal agreements with the Oxbow Mine.

III. OPTION 2: TANKS AND EFFLUENT PUMP TO OXBOW

Option 2 would also be utilizing the OWTS of the Oxbow mine in a similar fashion, however only liquid effluent would be pumped up to the existing piping. All existing Somerset tanks would be replaced with 7-2,000 gallon settling tanks and 1-1,500 3 compartment pumping tank (for a total tank capacity of over the minimum 14,750 gallons). The last tank would contain a smaller effluent pump that would be pumped up to the existing Oxbow Mine sanitary sewer line just past the highway. Therefore all solid would remain at the existing Somerset site and only liquid effluent would be pumped uphill. Piping must be placed across the highway via an asphalt patch or boring under the highway. It is unknown at this time the capacity of the OWTS system at Oxbow mine. It has been gathered, that the effluent from the Oxbow mine tanks gravity down to a site West of the Somerset homes between the river and Highway 133. This gravity pipe is the proposed connection point for the Somerset proposed pressure pipe. The size of the existing soil treatment area (field) must be confirmed and more investigation will be required in order to pursue this option. If chambers are used at the assumed soil type as listed above, approximately 635 (for trenches) and 762 (for beds) or Quick 4 Standard Plus chambers will be required for 58 bedrooms equivalent. It should also be noted that the design loading is over the maximum 2,000 gpd for individual OWTS systems as outlined by Regulation 43. Colorado Department of Public Health and Environment would need to be consulted. The crossing of the CDOT Highway would need to be coordinated as well. This option would require formal agreements with the Oxbow Mine.

IV. OPTION 3: REPLACE EXISTING TANKS AND FIELD IN PLACE

Option 3 involves utilizing the existing space to replace all OWTS tanks and soil treatment field in place. It should also be noted that the design loading is over the maximum 2,000 gpd for individual OWTS systems as outlined by Regulation 43. At this time, it is not believed that there is enough room to meet the current soil treatment size as outlined by Regulation 43. However, Regulation 43 allows for replacement of fields in same locations under failure situations and this option would improve the current situation. The tanks would be replaced with a minimum of 8-2,000 gallon tanks (for a total tank capacity of over the minimum 14,750 gallons). The effluent would then be conveyed through a distribution box to a series of piping and manifolds, to Quick4 Standard Plus chambers. The maximum number of chambers allowed in this site is approximately 613. However according to the assumed soil type, approximately 762 chamber would be required per Regulation 43. This system would be a direct replacement of the existing system in the same place. All existing piping and pump basins that convey sewage to the site are to remain in place. Colorado Public Health and Environment would need to be consulted during final design. In addition, test pits would need to be dug in the existing field during final design to confirm groundwater depth and soil type.

V. OPTION 4: WASTEWATER TREATMENT PLANT

A Sequencing Batch Reactor Wastewater Treatment plant in accordance to new State of Colorado requirements may replace the existing OWTS in the current tank location with a discharge out to the Gunnison River. But a more economical system would be to install tanks and an Orenco AX-MAX Treatment System with disinfection and

testing in separate building, with the discharge going to the river. This option would require proper state approvals and require long term maintenance. However, if an OWTS system does not work for this site, then this may be the only option that fits within the states' wastewater requirements. Final sixing and house bedroom count will need to be confirmed. CDPHE will need to be included in this final design. This option would require regular maintenance and testing of effluent and of river up and downstream from discharge point.

VI. Recommendations

Each option has its advantages and disadvantages. In regards to maintenance, an OWTS with no additional pumps or electricity would require the least amount of long term maintenance. Only tanks would need to be pumped out as needed (assumed 3-5 years); as shown in Option 3. Effluent pumps and lift stations will use some amount of electricity and may need to be replaced every 5-8 years, however it would utilize an area with less site restrictions. If the Oxbow Mine OWTS was to be used as an option, more research would be required for the sizing of the existing field and tanks. The existing OWTS soil treatment area and tanks may need to be expanded upon. However, it appears there may be more space to expand these OWTS facilities. If all these options are not satisfactory, a wastewater treatment plant or system may be the only viable option. This option does not require any variances or sharing of OWTS systems. However this may not be the most economical option. A final option may be to include this area with the rest of the town of Somerset and plan for a complete sanitary collection and treatment system that includes the entire town. It is possible that grants and low interest loan may be available from the State and Federal Agencies.

The appendix section of this report includes conceptual layout exhibits and conceptual engineer's estimate of probable construction cost for each option.

VII. REFERENCES

A. Gunnison County On-Site Wastewater Treatment Systems Regulations, Gunnison County, Colorado, Board of Health, effective: June 29, 2018.

B. Colorado Water Quality Site Application Policy, Policy No.: WQSA-6, January 29, 2007

C. Somerset, Colorado, Septic System Improvements, Del-Mont Consultants, Inc. February 3, 1993.

D. Elk Creek Surface Facilities, Bath House Leach Field, Elk Creek Mine MSHA I.D. #05-04674. December 4, 2012

VII. APPENDIX

ALPINE LAND CONSULTING
CIVIL ENGINEERING & LAND PLANNING
970-708-0326

SOMERSET, COLORADO OWTS
Conceptual Engineer's Estimate of Probable Construction Cost
COMMON OWTS SYSTEMS

Item Description	Quantity	Unit	Unit Cost	Total
OPTION 1 - Lift Station To Oxbow				
Duplex Lift Station Package	1	EA	$55,000.00	$55,000.00
Excavation for proposed Lift Station	17	CY	$95.00	$1,567.50
Disposal of Existing Lift Station	1	EA	$1,000.00	$1,000.00
Disposal of Existing Tanks in place	8	EA	$300.00	$2,400.00
6" PVC SDR 35 in place	122	LF	$31.00	$3,782.00
2" PVC SCH 40 in place	1,881	LF	$50.00	$94,050.00
Electrical Service Switch	1	EA	$1,200.00	$1,200.00
Asphalt Patch	30	SY	$45.00	$1,350.00
Reseeding	369	SY	$1.75	$645.75
Erosion Control	369	SY	$3.00	$1,107.00
Mobilization	1	LS	$10,000.00	$10,000.00
Design and Permit Fees	1	LS	$25,000.00	$25,000.00
			Sub-Total System 1 =	$197,102.25
			20% Contingency	$39,420.45
	Conceptual Total System Option 1 =			$236,522.70

OPTION 2 - Tanks and Effluent Pump to Oxbow				
2,000 gal single compartment tank	7	EA	$2,395.00	$16,765.00
1,500 gal 3 compartment tank	1	EA	$2,995.00	$2,995.00
Disposal of Existing Tanks	8	EA	$2,000.00	$16,000.00
Excavation for proposed tanks	254	CY	$95.00	$24,130.00
1.5" PVC SCH 40 in place	484	LF	$48.00	$23,232.00
6" PVC SDR 35 in place	77	LF	$31.00	$2,387.00
Connection to existing pvc sanitary pipe	1	EA	$5,500.00	$5,500.00
Effluent Pump Package	1	EA	$8,500.00	$8,500.00
Electrical Service Switch	1	EA	$1,200.00	$1,200.00
Electric Conduit	134	LF	$6.00	$804.00
Asphalt Patch	30	SY	$45.00	$1,350.00
Reseeding	260	SY	$1.75	$455.00
Erosion Control	260	SY	$3.00	$780.00
Mobilization	1	LS	$10,000.00	$10,000.00
Design and Permit Fees	1	LS	$25,000.00	$25,000.00
			Sub-Total System 2 =	$139,098.00
			20% Contingency	$27,819.60
	Conceptual Total System Option 2 =			$166,917.60

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OPTION 3 - New Tanks and Field				
2,000 gal single compartment tank	8	EA	$2,395.00	$19,160.00
1,500 gal 3 compartment tank	1	EA	$2,995.00	$2,995.00
Disposal of Existing Field	1	EA	$6,000.00	$6,000.00
Disposal of Existing Tanks	8	EA	$1,000.00	$8,000.00
Distrubution Box	1	EA	$550.00	$550.00
3'x4' Infiltrator Quick 4 Plus Chambers	613	EA	$30.00	$18,390.00
Infiltrator Quick 4 Plus End Caps	110	EA	$15.50	$1,705.00
Excavation for tanks	284	CY	$95.00	$26,980.00
Excavation for beds	1,145	CY	$35.00	$40,075.00
6" PVC SDR 35 in place	62	LF	$31.00	$1,922.00
4" PVC SDR 35 manifold pipe(s) in place	300	LF	$22.00	$6,600.00
2" PVC SCH 40 in place	65	LF	$25.00	$1,625.00
Existing Domestic Water Sleeve, 6" PVC	250	LF	$48.00	$12,000.00
Leveling Sand	572	CY	$32.00	$18,304.00
Reseeding	1,022	SY	$1.75	$1,788.50
Erosion Control	1,022	SY	$3.00	$3,066.00
Mobilization	1	LS	$10,000.00	$10,000.00
Design and Permit Fees	1	LS	$15,000.00	$15,000.00
			Sub-Total System 3 =	$194,160.50
			20% Contingency	$38,832.10
	Conceptual Total System Option 3 =			$232,992.60

OPTION 4 - Wastewater Treatment Plant				
Wastewater Treatment Orenco AX Max Units	1	EA	$320,000.00	$320,000.00
2,000 gal single compartment tank	7	EA	$2,395.00	$16,765.00
1,500 gal 3 compartment tank	1	EA	$2,995.00	$2,995.00
Excavation for tanks	254	CY	$95.00	$24,130.00
Duplex Pump Package	1	EA	$2,800.00	$2,800.00
Vuilding with UV Disinfection and Testing Ports	1	LS	$35,000.00	$35,000.00
Electrical Service Switch	1	EA	$1,200.00	$1,200.00
Electric Conduit	134	LF	$6.00	$804.00
Asphalt Patch	20	SY	$45.00	$900.00
Disposal of Existing Tanks	8	EA	$500.00	$4,000.00
6" PVC SDR 35 in place	61	LF	$31.00	$1,891.00
4" PVC SDR 35 in place	147	LF	$22.00	$3,234.00
2" PVC SCH 40 in place	64	LF	$25.00	$1,600.00
Reseeding	12	SY	$1.75	$21.00
Erosion Control	12	SY	$3.00	$36.00
Mobilization	1	LS	$10,000.00	$10,000.00
Design and Permit Fees	1	LS	$30,000.00	$30,000.00
			Sub-Total System 4 =	$455,376.00
			20% Contingency	$91,075.20
	Conceptual Total System Option 4 =			$546,451.20

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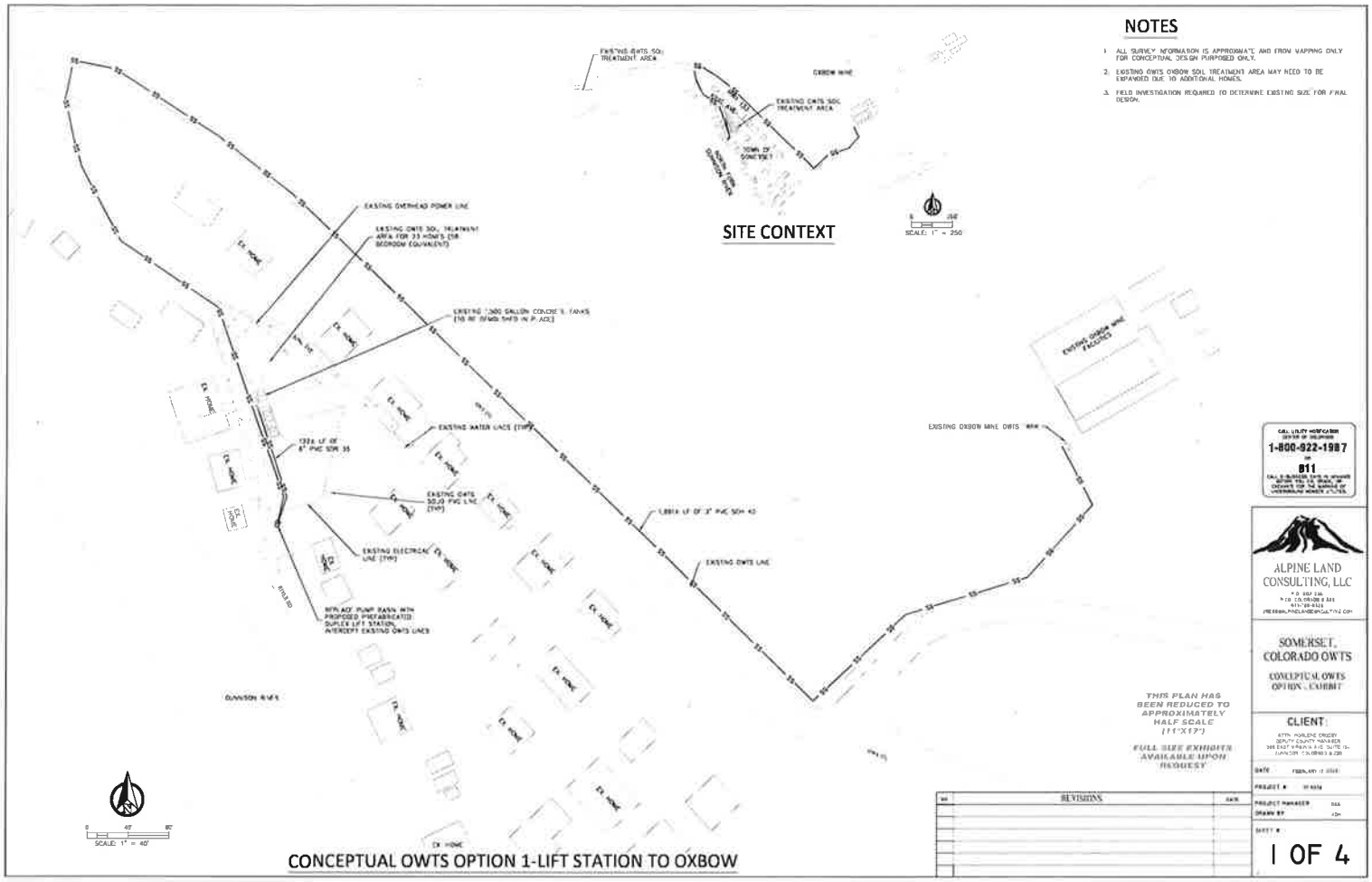
CIVIL ENGINEERING & LAND PLANNING
970-708-0326

Assumptions:
No utilities effected by construction unless unmarked utilities are found during contruction
Asphalt patch on 2 road crossings
3' deep excuvation for beds and trenches
Excavation for tanks is for tanks only
Tanks include delievery and setting
Pipe is in place with proper bedding and backfill
2' deep of leveling sand for Option 3

NOTES

1. ALL SURVEY INFORMATION IS APPROXIMATE AND FROM MAPPING ONLY FOR CONCEPTUAL DESIGN PURPOSES ONLY.
2. EXISTING OWTS OXBOW SOIL TREATMENT AREA MAY NEED TO BE EXPANDED DUE TO ADDITIONAL HOMES.
3. FIELD INVESTIGATION REQUIRED TO DETERMINE EXISTING SIZE FOR FINAL DESIGN.



CONCEPTUAL OWTS OPTION 1-LIFT STATION TO OXBOW

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
OR
811

ALPINE LAND CONSULTING, LLC

SOMERSET, COLORADO OWTS

CONCEPTUAL OWTS OPTION 1 EXHIBIT

THIS PLAN HAS BEEN REDUCED TO APPROXIMATELY HALF SCALE (11"X17")

FULL SIZE EXHIBITS AVAILABLE UPON REQUEST

CLIENT:
ATTN: MARLENE CRUDEN
DEPUTY COUNTY MANAGER
108 EAST MAIN AVE. SUITE 15
GUNNISON, COLORADO 81230

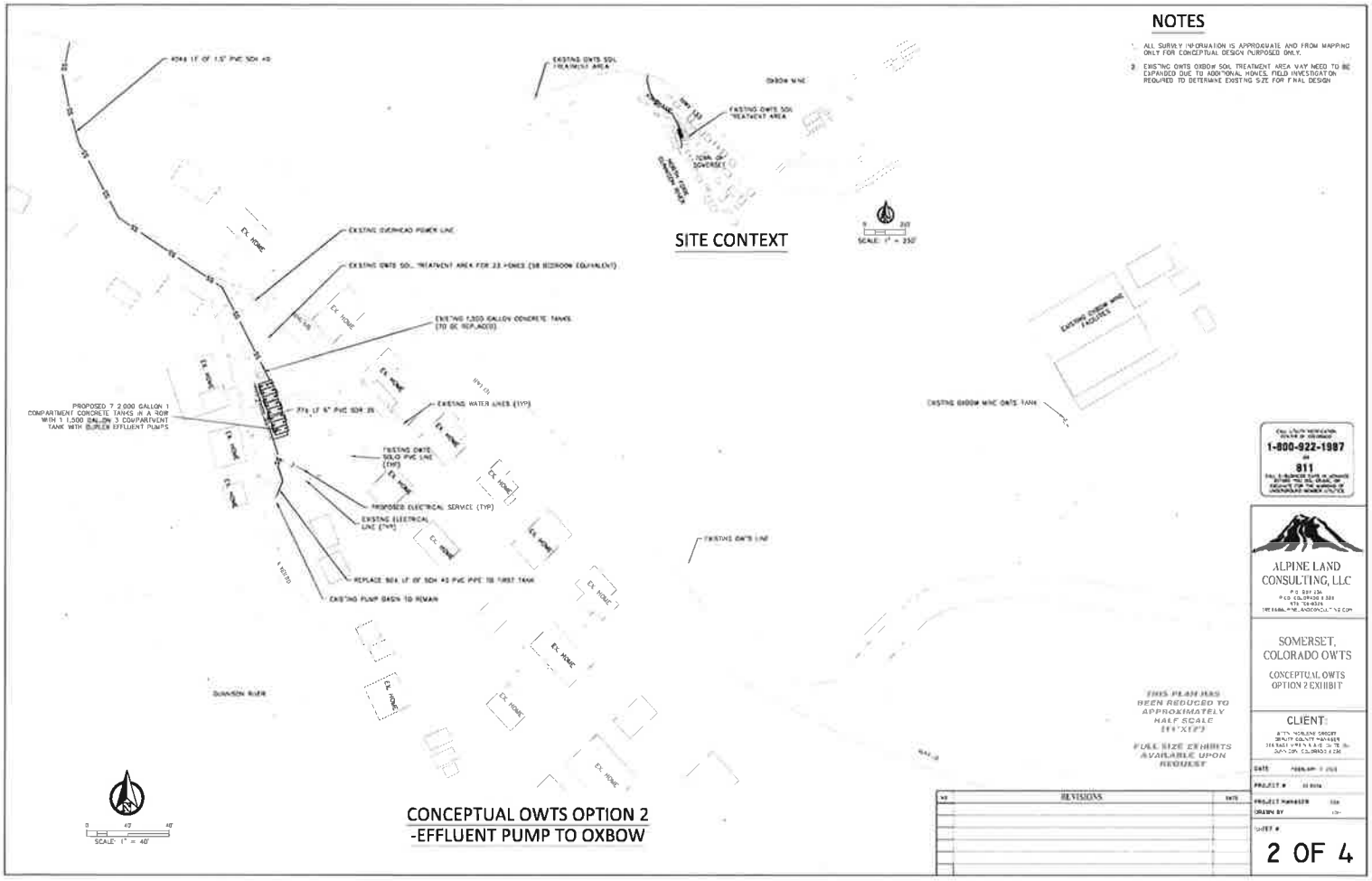
NO	REVISIONS	DATE

DATE: FEBRUARY 17, 2026
PROJECT #: 19-1434
PROJECT MANAGER: DAA
DRAWN BY: CDH
SHEET #

1 OF 4

NOTES

1. ALL SURVEY INFORMATION IS APPROXIMATE AND FROM MAPPING ONLY FOR CONCEPTUAL DESIGN PURPOSES ONLY.
2. EXISTING OWTS OXBOW SOIL TREATMENT AREA MAY NEED TO BE EXPANDED DUE TO ADDITIONAL HOMES. FIELD INVESTIGATION REQUIRED TO DETERMINE EXISTING SIZE FOR FINAL DESIGN



THIS PLAN HAS BEEN REDUCED TO APPROXIMATELY HALF SCALE (11"X17")

FULL SIZE EXHIBITS AVAILABLE UPON REQUEST

NO	REVISIONS	DATE

1-800-922-1987 OR 811

ALPINE LAND CONSULTING, LLC

SOMERSET, COLORADO OWTS

CONCEPTUAL OWTS OPTION 2 EXHIBIT

CLIENT:

DATE

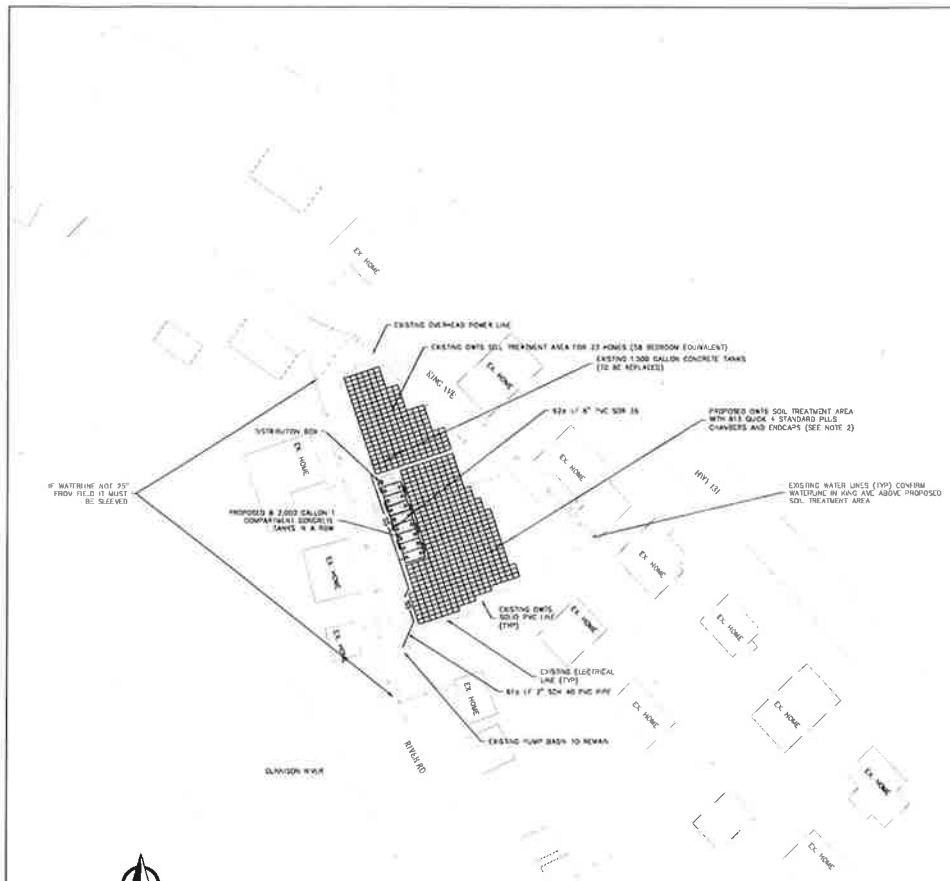
PROJECT #

PROJECT MANAGER

DRAWN BY

SHEET #

2 OF 4



CONCEPTUAL OWTS OPTION 3 - NEW OWTS SOIL TREATMENT AREA

SITE CONTEXT

NOTES

1. ALL SURVEY INFORMATION IS APPROXIMATE AND FROM MAPPING ONLY FOR CONCEPTUAL DESIGN PURPOSES ONLY.
2. THE SOIL TREATMENT AREA DESIGN DOES NOT MEET CURRENT REGULATION #43 STANDARDS, ALTHOUGH IT IS MAKING THE SYSTEM BETTER AS A WHOLE. A MINIMUM OF 762 CHAMBERS ARE REQUIRED, HOWEVER ONLY 613 (!!) ARE IN THE EXISTING AREA. ADDITIONALLY, THE FIELD SIZE DOES NOT MEET SEPARATION REQUIREMENTS
3. WATER LINES TO BE A MINIMUM OF 25 LINEAR FEET FROM ANY SOIL TREATMENT AREA OR MUST BE SLEEVED

1-800-922-1987 OR 811

THIS PLAN HAS BEEN REDUCED TO APPROXIMATELY HALF SCALE (11" X 17")

FULL SIZE EXHIBITS AVAILABLE UPON REQUEST

ALPINE LAND CONSULTING, LLC

SOMERSET, COLORADO OWTS

CONCEPTUAL OWTS OPTION 3 EXHIBIT

CLIENT:

NO	REVISIONS	DATE

DATE

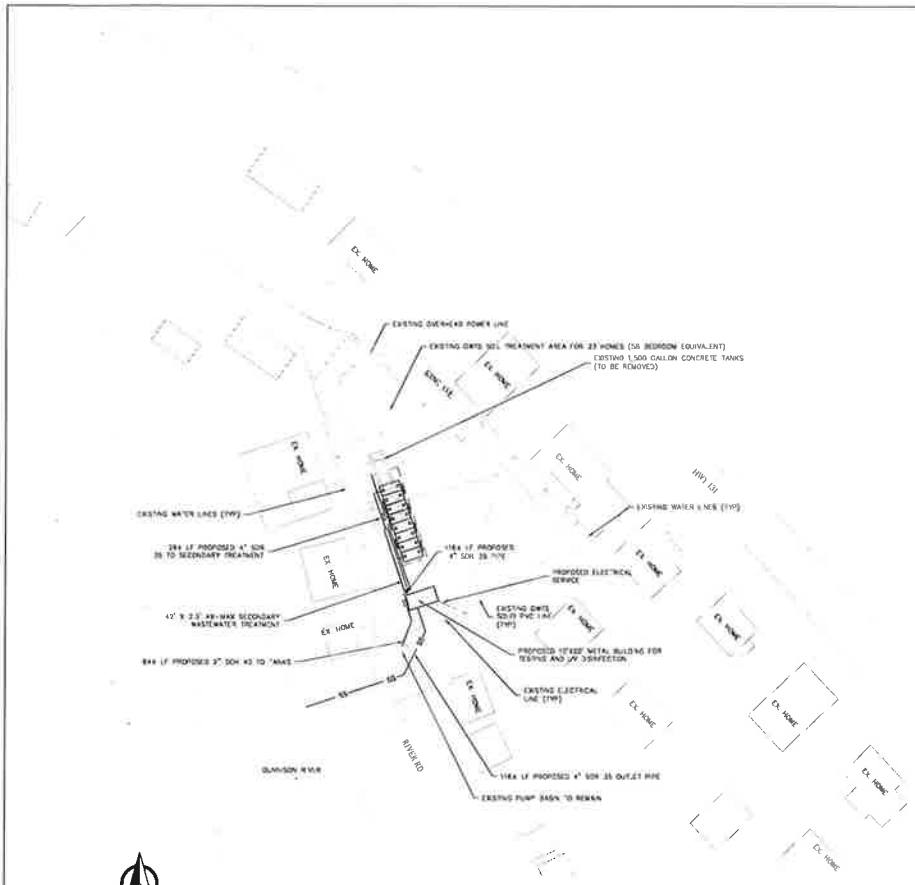
PROJECT #

PROJECT MANAGER

DRAWN BY

SHEET #

3 OF 4



CONCEPTUAL OWTS OPTION 4 - TREATMENT PLANT

SITE CONTEXT

NOTES

1. ALL SURVEY INFORMATION IS APPROXIMATE AND FROM MAPPING ONLY FOR CONCEPTUAL DESIGN PURPOSES ONLY.
2. WATER LINES TO BE A MINIMUM OF 10 LINEAR FEET FROM ANY SANITARY SEWER LINES OR MUST BE SLEEVED

CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
OR
811
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

THIS PLAN HAS BEEN REDUCED TO APPROXIMATELY HALF SCALE (11"X17")

FULL SIZE EXHIBITS AVAILABLE UPON REQUEST

ALPINE LAND CONSULTING, LLC

SOMERSET, COLORADO OWTS

CONCEPTUAL OWTS OPTION 4 EXHIBIT

CLIENT:

NO	REVISIONS	DATE

DATE

PROJECT #

PROJECT MANAGER

DRAWN BY

SHEET #

4 OF 4

Marlene Crosby

From: Gregg Anderson <gregg@alpinelandconsulting.com>
Sent: Monday, February 17, 2020 4:56 PM
To: Marlene Crosby
Cc: Robyn Zimmerman
Subject: Town of Somerset OWTS Options
Attachments: SOMERSET CONCEPTUAL OWTS OPTIONS.pdf

[PLEASE USE CAUTION OPENING LINKS OR ATTACHMENTS - This email originated from outside Gunnison County]

Marlene-

Attached is the conceptual report that we have been discussing.
This is a conceptual report on options only.
I would like your and Robyn's input before sending this to AAA Septic for their review on pricing.

If you would still like me to come to a BOCC meeting to explain and clarify the report and options please let me know the date and time so I can make arrangements.

Please call me at 970-708-0326 or email with any questions.

Respectfully,
Gregg

Gregory E. Anderson, P.E.
Alpine Land Consulting, LLC
P.O. Box 234
Rico, CO 81332
970-708-0326
www.alpinelandconsulting.com
gregg@alpinelandconsulting.com

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