

April 4, 2024

Rob Zuber
DRMS

RE: Soil sample data for the Technical Revision for M1986004

We are submitting a map of the pit showing numbered locations that correspond to the numbers on the attached photos. Soil sample test data is also attached that correspond to the map numbers as follows: Sample M2 was taken at photo site 2. Sample M3 was taken at photo site 3. Sample M6 taken at photo site 6 and Sample M7 at photo site 7. Sample M comp is a composite sample of sites 2,3,6 and 7, all taken inside the pit. Sample M 1+4+5 is a composite of photo sites 1, 4 and 5 which are in undisturbed areas outside the pit. In my opinion, there is as much or more vegetation within the reclaimed pit as there is in the undisturbed areas adjacent to the pit. The resources required to establish more vegetation in this soil would be detrimental to the general agricultural operation of the ranch.

Thank you for your assistance.

Michael Ripp
MVR Resources, Inc.

Brandstadt Pit

Write a description for your map.

Legend

 Pit



300 ft

 10 & 11

 9

 7

 8

 6

 5

 4

 3

 2

 1

Google Earth



Michael Ripp

P.O. Box 54
Delta, CO 81416

Lab ID: 2024S430
Sample ID: M2

Date Received: 23-Feb-2024
Date Reported: 15-Mar-2024

Soil Analysis		Units	Results	Test Rating*						
1:1 Soil pH			7.7	Strongly Acid <5.4	Moderately Acid 5.4-5.7	Slightly Acid 5.8-6.4	Neutral 6.5-7.2	Slightly Alkaline 7.3-7.6	Moderately Alkaline 7.7-7.9	Strongly Alkaline >7.9
1:1 Soluble Salts (EC)		mmho/cm	3.2	Very Low <0.2	Low 0.2-0.7	Moderate 0.8-1.2	Moderately High 1.3-2.5	High 2.6-5.0	Very High >5.0	
Excess Lime			HIGH							
Organic Matter LOI		%	1	Very Low <0.5	Low 0.5-1.5	Medium 1.6-3.0	High 3.1-5.0	Very High >5.0		
KCl Nitrate-N		ppm	6"	Very Low <5	Low 5-10	Medium 11-25	High 26-50	Very High >50	lb/ac 2.0	Recommendation lb/ac 54
Olsen Bicarbonate Phosphorus (P)		ppm	9	Very Low 0-3	Low 4-6	Medium 7-10	Optimum 11-15	High 16-20	Very High >20	Recommendation lb/ac 30 P205
Ammonium Acetate										
Potassium (K)		ppm	191	Very Low <60	Low 60-120	Medium 121-160	Optimum 161-220	High 221-280	Very High >280	Recommendation lb/ac 0
Calcium (Ca)		ppm	14380	Very Low <100	Low 100-200	Medium 201-300	Optimum 301-2500	High >2500	Very High >5000	Recommendation lb/ac 0
Magnesium (Mg)		ppm	229	Very Low <25	Low 25-50	Medium 51-75	Optimum 76-100	High 101-200	Very High >200	Recommendation lb/ac 0
Sodium (Na)		ppm	564							
Cation Exchange Capacity (CEC) or Sum of Cations		meq/100g	77	Sand 3-5	Loam 10-15	Silt Loams 15-25	Clay & Clay Loam 20-50	Organic Soils 50-100		
Base Saturation		%	100.0	H 0.0	K 1.0	Ca 94.0	Mg 2.0	Na 3.0		



Michael Ripp

P.O. Box 54
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Lab ID: 2024S430
Sample ID: M2

Date Received: 23-Feb-2024
Date Reported: 15-Mar-2024

Soil Analysis	Units	Results	Test Rating*					
Mehlich-3								
Sulfate-S	ppm	3332	Very Low <2	Low 2-5	Medium 6-10	Optimum	High 11-15	Very High >15 Recommendation lb/ac 0
DTPA								
Zinc (Zn)	ppm	0.3	Very Low <0.3	Low 0.3-0.5	Medium 0.6-0.8	Optimum 0.9-1.2	High 1.3-2.0	Very High >2.0 Recommendation lb/ac 0
Iron (Fe)	ppm	2.2	Very Low <1.0	Low 1.0-2.5	Medium 2.6-5.0	Optimum 5.1-15.0	High 15.1-30	Very High >30 Recommendation lb/ac 0
Manganese (Mn)	ppm	1.9	Very Low <0.5	Low 0.5-1.0	Medium 1.1-3.0	Optimum 3.1-6.0	High 6.1-10.0	Very High >10 Recommendation lb/ac 0
Copper (Cu)	ppm	0.4	Very Low <0.1	Low 0.1-0.2	Medium 0.3-0.4	Optimum 0.5-0.8	High 0.9-1.5	Very High >1.5 Recommendation lb/ac 0
Hot Water Extraction								
Boron (B)	ppm	3.1	Very Low <0.2	Low 0.2-0.5	Medium 0.6-0.8	Optimum 0.9-1.5	High 1.6-2.5	Very High >2.5 Recommendation lb/ac 0
Calcium Nitrate								
Chloride (Cl)	ppm							
Soil Texture								
% Sand	%							
% Silt	%							
% Clay	%							
Texture by Hydrometer								
Heavy Metals								
Arsenic (As)	ppm							
Cadmium (Cd)	ppm							
Chromium (Cr)	ppm							
Lead (Pb)	ppm							
Molybdenum (Mo)	ppm							
Selenium (Se)	ppm							
Sodium Absorption Ratio								
SAR								

*Test ratings are provided for general crop production. The ranges may be different for individual crops or for specific situations.

Comments:

Fertilizer recommendations are based on 2 ton/ac production. Apply 54 lb N and 30 lb P2O5 per acre early in the spring. There have been no confirmed deficiencies of zinc, manganese, iron, copper, iron, and boron in Colorado rangelands. Applying these nutrients may not improve range production and have return on investment.



Michael Ripp

P.O. Box 54
Delta, CO 81416

Lab ID: 2024S431
Sample ID: M3

Date Received: 23-Feb-2024
Date Reported: 15-Mar-2024

Soil Analysis	Units	Results	Test Rating*						
1:1 Soil pH		7.3	Strongly Acid <5.4	Moderately Acid 5.4-5.7	Slightly Acid 5.8-6.4	Neutral 6.5-7.2	Slightly Alkaline 7.3-7.6	Moderately Alkaline 7.7-7.9	Strongly Alkaline >7.9
1:1 Soluble Salts (EC)	mmho/cm	2.8	Very Low <0.2	Low 0.2-0.7	Moderate 0.8-1.2	Moderately High 1.3-2.5	High 2.6-5.0	Very High >5.0	
Excess Lime		HIGH							
Organic Matter LOI	%	0.9	Very Low <0.5	Low 0.5-1.5	Medium 1.6-3.0	High 3.1-5.0	Very High >5.0		
KCl Nitrate-N	ppm	6" 1	Very Low <5	Low 5-10	Medium 11-25	High 26-50	Very High >50	lb/ac 2.0	Recommendation lb/ac 54
Olsen Bicarbonate Phosphorus (P)	ppm	9	Very Low 0-3	Low 4-6	Medium 7-10	Optimum 11-15	High 16-20	Very High >20	Recommendation lb/ac 30 P2O5
Ammonium Acetate									
Potassium (K)	ppm	173	Very Low <60	Low 60-120	Medium 121-160	Optimum 161-220	High 221-280	Very High >280	Recommendation lb/ac 0
Calcium (Ca)	ppm	15890	Very Low <100	Low 100-200	Medium 201-300	Optimum 301-2500	High >2500	Very High >5000	Recommendation lb/ac 0
Magnesium (Mg)	ppm	208	Very Low <25	Low 25-50	Medium 51-75	Optimum 76-100	High 101-200	Very High >200	Recommendation lb/ac 0
Sodium (Na)	ppm	177							
Cation Exchange Capacity (CEC) or Sum of Cations	meq/100g	82	Sand 3-5	Loam 10-15	Silt Loams 15-25	Clay & Clay Loam 20-50	Organic Soils 50-100		
Base Saturation	%	100.0	H 0.0	K 1.0	Ca 96.0	Mg 2.0	Na 1.0		



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P.O. Box 54
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Lab ID: 2024S431
Sample ID: M3

Date Received: 23-Feb-2024
Date Reported: 15-Mar-2024

Soil Analysis	Units	Results	Test Rating*					
Mehlich-3								
Sulfate-S	ppm	3209	Very Low <2	Low 2-5	Medium 6-10	Optimum	High 11-15	Very High >15
DTPA								
Zinc (Zn)	ppm	0.3	Very Low <0.3	Low 0.3-0.5	Medium 0.6-0.8	Optimum 0.9-1.2	High 1.3-2.0	Very High >2.0
Iron (Fe)	ppm	2.4	Very Low <1.0	Low 1.0-2.5	Medium 2.6-5.0	Optimum 5.1-15.0	High 15.1-30	Very High >30
Manganese (Mn)	ppm	1	Very Low <0.5	Low 0.5-1.0	Medium 1.1-3.0	Optimum 3.1-6.0	High 6.1-10.0	Very High >10
Copper (Cu)	ppm	0.5	Very Low <0.1	Low 0.1-0.2	Medium 0.3-0.4	Optimum 0.5-0.8	High 0.9-1.5	Very High >1.5
Hot Water Extraction								
Boron (B)	ppm	1.3	Very Low <0.2	Low 0.2-0.5	Medium 0.6-0.8	Optimum 0.9-1.5	High 1.6-2.5	Very High >2.5
Calcium Nitrate								
Chloride (Cl)	ppm							
Soil Texture								
% Sand	%							
% Silt	%							
% Clay	%							
Texture by Hydrometer								
Heavy Metals								
Arsenic (As)	ppm							
Cadmium (Cd)	ppm							
Chromium (Cr)	ppm							
Lead (Pb)	ppm							
Molybdenum (Mo)	ppm							
Selenium (Se)	ppm							
Sodium Absorption Ratio								
SAR								

*Test ratings are provided for general crop production. The ranges may be different for individual crops or for specific situations.

Comments:

Fertilizer recommendations are based on 2 ton/ac production. Apply 54 lb N and 30 lb P2O5 per acre early in the spring. There have been no confirmed deficiencies of zinc, manganese, iron, copper, iron, and boron in Colorado rangelands. Applying these nutrients may not improve range production and have return on investment.



Michael Ripp

P.O. Box 54
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Lab ID: 2024S432
Sample ID: M6

Date Received: 23-Feb-2024
Date Reported: 15-Mar-2024

Soil Analysis	Units	Results	Test Rating*						
1:1 Soil pH		8.2	Strongly Acid <5.4	Moderately Acid 5.4-5.7	Slightly Acid 5.8-6.4	Neutral 6.5-7.2	Slightly Alkaline 7.3-7.6	Moderately Alkaline 7.7-7.9	Strongly Alkaline >7.9
1:1 Soluble Salts (EC)	mmho/cm	0.7	Very Low <0.2	Low 0.2-0.7	Moderate 0.8-1.2	Moderately High 1.3-2.5	High 2.6-5.0	Very High >5.0	
Excess Lime		LOW							
Organic Matter LOI	%	7.2	Very Low <0.5	Low 0.5-1.5	Medium 1.6-3.0	High 3.1-5.0	Very High >5.0		
KCl Nitrate-N	ppm	6"	Very Low <5	Low 5-10	Medium 11-25	High 26-50	Very High >50	lb/ac 14.0	Recommendation lb/ac 40
Olsen Bicarbonate Phosphorus (P)	ppm	97	Very Low 0-3	Low 4-6	Medium 7-10	Optimum 11-15	High 16-20	Very High >20	Recommendation lb/ac 0
Ammonium Acetate									
Potassium (K)	ppm	1175	Very Low <60	Low 60-120	Medium 121-160	Optimum 161-220	High 221-280	Very High >280	Recommendation lb/ac 0
Calcium (Ca)	ppm	2871	Very Low <100	Low 100-200	Medium 201-300	Optimum 301-2500	High >2500	Very High >5000	Recommendation lb/ac 0
Magnesium (Mg)	ppm	541	Very Low <25	Low 25-50	Medium 51-75	Optimum 76-100	High 101-200	Very High >200	Recommendation lb/ac
Sodium (Na)	ppm	148							
Cation Exchange Capacity (CEC) or Sum of Cations	meq/100g	23	Sand 3-5	Loam 10-15	Silt Loams 15-25	Clay & Clay Loam 20-50	Organic Soils 50-100		
Base Saturation	%	100.0	H 0.0	K 13.0	Ca 64.0	Mg 20.0	Na 3.0		



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P.O. Box 54
Delta, CO 81416

Lab ID: 2024S432
Sample ID: M6

Date Received: 23-Feb-2024
Date Reported: 15-Mar-2024

Soil Analysis	Units	Results	Test Rating*						
Mehlich-3									
Sulfate-S	ppm	31.6	Very Low <2	Low 2-5	Medium 6-10	Optimum	High 11-15	Very High >15	Recommendation lb/ac 0
DTPA									
Zinc (Zn)	ppm	7.3	Very Low <0.3	Low 0.3-0.5	Medium 0.6-0.8	Optimum 0.9-1.2	High 1.3-2.0	Very High >2.0	Recommendation lb/ac 0
Iron (Fe)	ppm	12.3	Very Low <1.0	Low 1.0-2.5	Medium 2.6-5.0	Optimum 5.1-15.0	High 15.1-30	Very High >30	Recommendation lb/ac 0
Manganese (Mn)	ppm	2.1	Very Low <0.5	Low 0.5-1.0	Medium 1.1-3.0	Optimum 3.1-6.0	High 6.1-10.0	Very High >10	Recommendation lb/ac 0
Copper (Cu)	ppm	0.7	Very Low <0.1	Low 0.1-0.2	Medium 0.3-0.4	Optimum 0.5-0.8	High 0.9-1.5	Very High >1.5	Recommendation lb/ac 0
Hot Water Extraction									
Boron (B)	ppm	1.4	Very Low <0.2	Low 0.2-0.5	Medium 0.6-0.8	Optimum 0.9-1.5	High 1.6-2.5	Very High >2.5	Recommendation lb/ac 0
Calcium Nitrate									
Chloride (Cl)	ppm								
Soil Texture									
% Sand	%								
% Silt	%								
% Clay	%								
Texture by Hydrometer									
Heavy Metals									
Arsenic (As)	ppm								
Cadmium (Cd)	ppm								
Chromium (Cr)	ppm								
Lead (Pb)	ppm								
Molybdenum (Mo)	ppm								
Selenium (Se)	ppm								
Sodium Absorption Ratio									
SAR									

*Test ratings are provided for general crop production. The ranges may be different for individual crops or for specific situations.

Comments:

Fertilizer recommendations are based on 2 ton/ac production. Apply 40 lb N per acre early in the spring, There have been no confirmed deficiencies of zinc, manganese, iron, copper, iron, and boron in Colorado rangelands. Applying these nutrients my not improve range production and have return on investment.



Michael Ripp

P.O. Box 54
Delta, CO 81416

Lab ID: 2024S433
Sample ID: M7

Date Received: 23-Feb-2024
Date Reported: 15-Mar-2024

Soil Analysis	Units	Results	Test Rating*						
1:1 Soil pH		8.9	Strongly Acid <5.4	Moderately Acid 5.4-5.7	Slightly Acid 5.8-6.4	Neutral 6.5-7.2	Slightly Alkaline 7.3-7.6	Moderately Alkaline 7.7-7.9	Strongly Alkaline >7.9
1:1 Soluble Salts (EC)	mmho/cm	24.6	Very Low <0.2	Low 0.2-0.7	Moderate 0.8-1.2	Moderately High 1.3-2.5	High 2.6-5.0	Very High >5.0	
Excess Lime		HIGH							
Organic Matter LOI	%	0.9	Very Low <0.5	Low 0.5-1.5	Medium 1.6-3.0	High 3.1-5.0	Very High >5.0		
KCl Nitrate-N	ppm	6" 1	Very Low <5	Low 5-10	Medium 11-25	High 26-50	Very High >50	lb/ac 2.0	Recommendation lb/ac 54
Olsen Bicarbonate Phosphorus (P)	ppm	8	Very Low 0-3	Low 4-6	Medium 7-10	Optimum 11-15	High 16-20	Very High >20	Recommendation lb/ac 30 P2O5
Ammonium Acetate									
Potassium (K)	ppm	223	Very Low <60	Low 60-120	Medium 121-160	Optimum 161-220	High 221-280	Very High >280	Recommendation lb/ac 0
Calcium (Ca)	ppm	13010	Very Low <100	Low 100-200	Medium 201-300	Optimum 301-2500	High >2500	Very High >5000	Recommendation lb/ac 0
Magnesium (Mg)	ppm	668	Very Low <25	Low 25-50	Medium 51-75	Optimum 76-100	High 101-200	Very High >200	Recommendation lb/ac 0
Sodium (Na)	ppm	9345							
Cation Exchange Capacity (CEC) or Sum of Cations	meq/100g	112	Sand 3-5	Loam 10-15	Silt Loams 15-25	Clay & Clay Loam 20-50	Organic Soils 50-100		
Base Saturation	%	100.0	H 0.0	K 1.0	Ca 58.0	Mg 5.0	Na 36.0		



Michael Ripp

P.O. Box 54
Delta, CO 81416

Lab ID: 2024S433
Sample ID: M7

Date Received: 23-Feb-2024
Date Reported: 15-Mar-2024

Soil Analysis	Units	Results	Test Rating*						
Mehlich-3									
Sulfate-S	ppm	6508	Very Low <2	Low 2-5	Medium 6-10	Optimum	High 11-15	Very High >15	Recommendation lb/ac 0
DTPA									
Zinc (Zn)	ppm	0.2	Very Low <0.3	Low 0.3-0.5	Medium 0.6-0.8	Optimum 0.9-1.2	High 1.3-2.0	Very High >2.0	Recommendation lb/ac 0
Iron (Fe)	ppm	3.6	Very Low <1.0	Low 1.0-2.5	Medium 2.6-5.0	Optimum 5.1-15.0	High 15.1-30	Very High >30	Recommendation lb/ac 0
Manganese (Mn)	ppm	3	Very Low <0.5	Low 0.5-1.0	Medium 1.1-3.0	Optimum 3.1-6.0	High 6.1-10.0	Very High >10	Recommendation lb/ac 0
Copper (Cu)	ppm	0.4	Very Low <0.1	Low 0.1-0.2	Medium 0.3-0.4	Optimum 0.5-0.8	High 0.9-1.5	Very High >1.5	Recommendation lb/ac 0
Hot Water Extraction									
Boron (B)	ppm	29.4	Very Low <0.2	Low 0.2-0.5	Medium 0.6-0.8	Optimum 0.9-1.5	High 1.6-2.5	Very High >2.5	Recommendation lb/ac 0
Calcium Nitrate									
Chloride (Cl)	ppm								
Soil Texture									
% Sand	%								
% Silt	%								
% Clay	%								
Texture by Hydrometer									
Heavy Metals									
Arsenic (As)	ppm								
Cadmium (Cd)	ppm								
Chromium (Cr)	ppm								
Lead (Pb)	ppm								
Molybdenum (Mo)	ppm								
Selenium (Se)	ppm								
Sodium Absorption Ratio									
SAR									

*Test ratings are provided for general crop production. The ranges may be different for individual crops or for specific situations.

Comments:

Fertilizer recommendations are based on 2 ton/ac production. Apply 54 lb N and 30 lb P2O5 per acre early in the spring. There have been no confirmed deficiencies of zinc, manganese, iron, copper, and boron in Colorado rangeland. Applying these nutrients may not improve range production and have return on investment.



Michael Ripp

P.O. Box 54
Delta, CO 81416

Lab ID: 2024S434
Sample ID: M comp

Date Received: 23-Feb-2024
Date Reported: 15-Mar-2024

Soil Analysis	Units	Results	Test Rating*						
1:1 Soil pH		8.4	Strongly Acid <5.4	Moderately Acid 5.4-5.7	Slightly Acid 5.8-6.4	Neutral 6.5-7.2	Slightly Alkaline 7.3-7.6	Moderately Alkaline 7.7-7.9	Strongly Alkaline >7.9
1:1 Soluble Salts (EC)	mmho/cm	9.5	Very Low <0.2	Low 0.2-0.7	Moderate 0.8-1.2	Moderately High 1.3-2.5	High 2.6-5.0	Very High >5.0	
Excess Lime		HIGH							
Organic Matter LOI	%	0.8	Very Low <0.5	Low 0.5-1.5	Medium 1.6-3.0	High 3.1-5.0	Very High >5.0		
KCl Nitrate-N	ppm	6" 1	Very Low <5	Low 5-10	Medium 11-25	High 26-50	Very High >50	lb/ac 2.0	Recommendation lb/ac 50
Olsen Bicarbonate Phosphorus (P)	ppm	8	Very Low 0-3	Low 4-6	Medium 7-10	Optimum 11-15	High 16-20	Very High >20	Recommendation lb/ac 30 P2O5
Ammonium Acetate									
Potassium (K)	ppm	189	Very Low <60	Low 60-120	Medium 121-160	Optimum 161-220	High 221-280	Very High >280	Recommendation lb/ac 0
Calcium (Ca)	ppm	15170	Very Low <100	Low 100-200	Medium 201-300	Optimum 301-2500	High >2500	Very High >5000	Recommendation lb/ac 0
Magnesium (Mg)	ppm	383	Very Low <25	Low 25-50	Medium 51-75	Optimum 76-100	High 101-200	Very High >200	Recommendation lb/ac 0
Sodium (Na)	ppm	4504							
Cation Exchange Capacity (CEC) or Sum of Cations	meq/100g	99	Sand 3-5	Loam 10-15	Silt Loams 15-25	Clay & Clay Loam 20-50	Organic Soils 50-100		
Base Saturation	%	100.0	H 0.0	K 0.0	Ca 77.0	Mg 3.0	Na 20.0		



Michael Ripp

P.O. Box 54
Delta, CO 81416

Lab ID: 2024S434
Sample ID: M comp

Date Received: 23-Feb-2024
Date Reported: 15-Mar-2024

Soil Analysis	Units	Results	Test Rating*						
Mehlich-3									
Sulfate-S	ppm	3755	Very Low <2	Low 2-5	Medium 6-10	Optimum	High 11-15	Very High >15	Recommendation lb/ac 0
DTPA									
Zinc (Zn)	ppm	0.3	Very Low <0.3	Low 0.3-0.5	Medium 0.6-0.8	Optimum 0.9-1.2	High 1.3-2.0	Very High >2.0	Recommendation lb/ac 0
Iron (Fe)	ppm	2.7	Very Low <1.0	Low 1.0-2.5	Medium 2.6-5.0	Optimum 5.1-15.0	High 15.1-30	Very High >30	Recommendation lb/ac 0
Manganese (Mn)	ppm	2.2	Very Low <0.5	Low 0.5-1.0	Medium 1.1-3.0	Optimum 3.1-6.0	High 6.1-10.0	Very High >10	Recommendation lb/ac 0
Copper (Cu)	ppm	0.4	Very Low <0.1	Low 0.1-0.2	Medium 0.3-0.4	Optimum 0.5-0.8	High 0.9-1.5	Very High >1.5	Recommendation lb/ac 0
Hot Water Extraction									
Boron (B)	ppm	12.9	Very Low <0.2	Low 0.2-0.5	Medium 0.6-0.8	Optimum 0.9-1.5	High 1.6-2.5	Very High >2.5	Recommendation lb/ac 0
Calcium Nitrate									
Chloride (Cl)	ppm								
Soil Texture									
% Sand	%								
% Silt	%								
% Clay	%								
Texture by Hydrometer									
Heavy Metals									
Arsenic (As)	ppm								
Cadmium (Cd)	ppm								
Chromium (Cr)	ppm								
Lead (Pb)	ppm								
Molybdenum (Mo)	ppm								
Selenium (Se)	ppm								
Sodium Absorption Ratio									
SAR									

*Test ratings are provided for general crop production. The ranges may be different for individual crops or for specific situations.

Comments:

Fertilizer recommendations are based on 2 ton/ac production. Apply 54 lb N and 30 lb P2O5 per acre early in the spring. There have been no confirmed deficiencies of zinc, manganese, iron, copper, and boron in Colorado rangelands. Applying these nutrients may not improve range production and have return on investment.



Michael Ripp

P.O. Box 54
Delta, CO 81416

Lab ID: 2024S435
Sample ID: M 1+4+5

Date Received: 23-Feb-2024
Date Reported: 15-Mar-2024

Soil Analysis	Units	Results	Test Rating*						
1:1 Soil pH		7.5	Strongly Acid <5.4	Moderately Acid 5.4-5.7	Slightly Acid 5.8-6.4	Neutral 6.5-7.2	Slightly Alkaline 7.3-7.6	Moderately Alkaline 7.7-7.9	Strongly Alkaline >7.9
1:1 Soluble Salts (EC)	mmho/cm	2.7	Very Low <0.2	Low 0.2-0.7	Moderate 0.8-1.2	Moderately High 1.3-2.5	High 2.6-5.0	Very High >5.0	
Excess Lime		HIGH							
Organic Matter LOI	%	1.3	Very Low <0.5	Low 0.5-1.5	Medium 1.6-3.0	High 3.1-5.0	Very High >5.0		
KCl Nitrate-N	ppm	6"	Very Low <5	Low 5-10	Medium 11-25	High 26-50	Very High >50	lb/ac 2.0	Recommendation lb/ac 54
Olsen Bicarbonate Phosphorus (P)	ppm	14	Very Low 0-3	Low 4-6	Medium 7-10	Optimum 11-15	High 16-20	Very High >20	Recommendation lb/ac 0
Ammonium Acetate									
Potassium (K)	ppm	507	Very Low <60	Low 60-120	Medium 121-160	Optimum 161-220	High 221-280	Very High >280	Recommendation lb/ac 0
Calcium (Ca)	ppm	17250	Very Low <100	Low 100-200	Medium 201-300	Optimum 301-2500	High >2500	Very High >5000	Recommendation lb/ac 0
Magnesium (Mg)	ppm	130	Very Low <25	Low 25-50	Medium 51-75	Optimum 76-100	High 101-200	Very High >200	Recommendation lb/ac
Sodium (Na)	ppm	153							
Cation Exchange Capacity (CEC) or Sum of Cations	meq/100g	89	Sand 3-5	Loam 10-15	Silt Loams 15-25	Clay & Clay Loam 20-50	Organic Soils 50-100		
Base Saturation	%	100.0	H 0.0	K 1.0	Ca 97.0	Mg 1.0	Na 1.0		



Michael Ripp

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Lab ID: 2024S435
Sample ID: M 1+4+5

Date Received: 23-Feb-2024
Date Reported: 15-Mar-2024

Soil Analysis	Units	Results	Test Rating*					
Mehlich-3								
Sulfate-S	ppm	5416	Very Low <2	Low 2-5	Medium 6-10	Optimum	High 11-15	Very High >15
DTPA								
Zinc (Zn)	ppm	0.4	Very Low <0.3	Low 0.3-0.5	Medium 0.6-0.8	Optimum 0.9-1.2	High 1.3-2.0	Very High >2.0
Iron (Fe)	ppm	2.1	Very Low <1.0	Low 1.0-2.5	Medium 2.6-5.0	Optimum 5.1-15.0	High 15.1-30	Very High >30
Manganese (Mn)	ppm	3.8	Very Low <0.5	Low 0.5-1.0	Medium 1.1-3.0	Optimum 3.1-6.0	High 6.1-10.0	Very High >10
Copper (Cu)	ppm	0.4	Very Low <0.1	Low 0.1-0.2	Medium 0.3-0.4	Optimum 0.5-0.8	High 0.9-1.5	Very High >1.5
Hot Water Extraction								
Boron (B)	ppm	1.2	Very Low <0.2	Low 0.2-0.5	Medium 0.6-0.8	Optimum 0.9-1.5	High 1.6-2.5	Very High >2.5
Calcium Nitrate								
Chloride (Cl)	ppm							
Soil Texture								
% Sand	%							
% Silt	%							
% Clay	%							
Texture by Hydrometer								
Heavy Metals								
Arsenic (As)	ppm							
Cadmium (Cd)	ppm							
Chromium (Cr)	ppm							
Lead (Pb)	ppm							
Molybdenum (Mo)	ppm							
Selenium (Se)	ppm							
Sodium Absorption Ratio								
SAR								

*Test ratings are provided for general crop production. The ranges may be different for individual crops or for specific situations.

Comments:

Fertilizer recommendations are based on 2 ton/ac production. Apply 54 lb N per acre early in the spring, There have been no confirmed deficiencies of zinc, manganese, iron, copper, and boron in Colorado rangeland. Applying these nutrients may not improve range production and have return on investment.





















