



Northern New Mexico Stockman's Association

Dennis Gallegos, President

P.O. Box 306 Abiquiu, NM 87510



**The Future of Livestock Grazing on New Mexico's National Forests
Northern New Mexico Stockman's Association**

**El Rito Lobato West Allotment
Assessment 2023**

Project Team:

Dr. Cristóbal Valencia, (PI) Northern New Mexico Stockman's Association

Donald Martinez, (Co-PI) Rio Arriba County Extension NMSU

Dr. Casey Spackman, (Co-PI) Range Improvement Task Force NMSU

Carlos Salazar, Producer Representative Northern New Mexico Stockman's Association

"This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2022-38640-37490 through the Western Sustainable Agriculture Research and Education program under project number SW23-953. USDA is an equal opportunity employer and service provider. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture."

 **National Institute of Food and Agriculture**
U.S. DEPARTMENT OF AGRICULTURE

**WESTERN
SARE**

Sustainable Agriculture
Research & Education

EL RITO LOBATO WEST ALLOTMENT

Area: 71,000 acres
54,702 grazable

Allotment Owners: 9

Total Permitted Livestock: 448 head
Possible Stocking Rate: 4,491 head (based on 40% of 2023 forage production)

Allotment is permitted at 10% of actual carrying capacity.
Permitted livestock are consuming 4% of allowable use forage.

Transects: Llano de los Juanes
Escondido
Quemazon
Amarillo
Cañada de la Sierra

Monitoring dates: 5/16/23
7/20/23
8/4/23
9/5/23
10/20/23
10/21/23
11/08/23

Participants: Dr. Cristóbal Valencia (Principal Investigator)
Dr. Casey Spackman (Co-PI)
Donald Martinez (Co-PI/Producer)
Steve Archuleta (Producer)
Robert Archuleta (Producer)
Levi Lucero (Producer)
Carlos Salazar (Producer)

Methodology: Qualitative data was systematically gathered using ethnographic methods: face-to-face accompaniment in diverse social, political, and economic contexts of everyday life (Valencia 2015). The Project Team conducted participant-observation (DeWalt and DeWalt 2002) prior to livestock entry, during livestock grazing, and after livestock exit. The Project Team also attended cattle association meetings, annual feast days, fiestas, local county fair events, and meetings between producers and management agencies. During participant-observation the Project Team paid close attention to producers' descriptions, interpretations, and explanations of rangeland conditions and impacts on their livestock operations. The Project Team also focused on ranchers' management practices and decision-making processes. Dr. Valencia kept ethnographic field notes (Emerson et al. 2011) of participant-observation, recording what is meaningful and important to producers, how producers grapple with sustainability, how understandings of conditions and impacts emerge and change over time, and what knowledge ranchers rely on to make assessments and management decisions. Dr. Valencia also conducted structured and unstructured interviews (Warren and Karner 2015, Brinkmann 2013, Weiss 2004) with producers focusing on their descriptions, interpretations, and explanations of climate and rangeland conditions and impacts on livestock operations. Additionally, the Project Team conducted participatory mapping exercises (Robinson et al. 2016) with producers to plot forage, water, and wildlife observations. The Project Team also used visual and audio methods to record qualitative data (Warren and Karner 2015).



Objective: Qualitative data produces culturally situated understandings of rangeland conditions and impacts on livestock operations. It supports the development of better management targets and more inclusive decision-making processes.

SUMMARY

- Utilization for the 2023 grazing season exceeded the allocated 40 percent use guideline on all allotments required to sustain or improve rangeland conditions and optimize livestock productivity. Utilization for the 2023 grazing season was 48.6%.
- However, permitted livestock are consuming 4% of allowable use forage.
- Allotment is permitted at 10% of actual carrying capacity.
- Dead and down trees decrease forage production throughout the allotment and obstruct livestock access to forage.
- Tree encroachment especially oak reduces forage production and availability.
- Abundant cheat grass in lower pastures decreases animal performance.
- Unauthorized roads and recreational vehicles negatively impact forage availability and production.
- Producers used their knowledge of the growth and life cycle of native trees and plants to make assessments regarding forage, water, and wildlife.

- The amount of precipitation is not directly related to forage production. A small amount of precipitation can produce abundant grass in burn scars.
- Water is being consumed by *chamisa* choking out grass production.
- Water infrastructure causes poor water quality, loss of water and pasture availability all of which negatively impact livestock operations.
- Destruction by *tusas* make management by horseback an impossibility.
- Mandatory rotational grazing benefits elk over livestock negatively impacting livestock operations.
- Poor access to the allotment decreases producers ability to conduct maintenance.
- The current rotation imposed by the USFS has a negative impact on livestock performance.
- Cattle guard cleaning and maintenance are a costly burden for producers. Current conditions allow trespassing livestock to eat out permitted livestock.

CONDITIONS



The El Rito Lobato West allotment is made up of small narrow meadows, a vast burn scar, and lower plains. Grazing is limited to alongside livestock trails, in the wooded canopy, across a vast burn scar with late-season forage, and to a few lower pastures dominated by *chamisa*. In late July the Comanche fire was still burning. In late summer producers described the bare ground in the lower plains LLANO de los JUANES, ESCONDIDO, and QUEMAZON as *tierra quemada* or scorched earth. However, producers planned on a late rainfall to make these areas grazable in October and extend the grazing season by as much as one month. Many of the arid areas throughout the allotment such as QUEMAZON have abundant forage in the fall and winter and come to life quickly with little precipitation. Thus, the amount of precipitation is not a direct relationship to forage. One producer remarked that extending the grazing season by two weeks could save his operation \$2,000.00 in hay. The lower plains are dominated by *chamisa* that is 4ft to 6ft tall inhibiting grass production. Grass production is also low due to dead and down trees littering the forest floor and a lack of

sunlight as a result of no forest thinning. Dead and down trees and other forest litter are beyond removal and make it difficult for livestock to pass through the forest canopy. Producers

recommend letting wildfires burn hot to replenish soil and boost grass production. The QUEMAZON area was previously not grazed because of dense forest canopy. Following the fire grass production in El QUEMAZON remains the best in the allotment as a whole. However, the area is only used for two weeks by livestock at the beginning and end of the season. The remaining time is reserved for elk and elk calving. There is noticeable encroachment by oak on mountainsides that would otherwise be grazeable acres. In areas such as CAÑADA de la SIERRA there is abundant Timothy Grass late in the fall which producers interpret as a sign of a healthy area. Lower transects are dominated by cheat grass which decreases animal performance. In CAÑADA de la SIERRA grass is significantly impacted from roads and UTV's. Producers used their knowledge of the growth and life cycle of native trees and plants to make assessments regarding forage, water, and wildlife. One producer explained how *piñones* can produce each year depending on water. If the flower has enough water it will form a *piña*. Too much water and it will produce *vanos*. Sufficient water and heat will produce *piñon*. Similarly, the height of *chamisa* indicated water availability for forage. Producers use the growth cycle of *piñones* and *piñabete* to gauge precipitation, water use, and heat conditions. In the upper transects including CAÑADA de la SIERRA and AMARILLO precipitation amounts are less than half inside the canopy than outside. By October the lower half of the El Rito Lobato West allotment LLANO de los JUANES, ESCONDIDO, and QUEMAZON are dry including the earthen dams and stock ponds.



The allotment relies on water infrastructure to make use of most pastures. Some areas lack water infrastructure and have been taken out of use. Some water infrastructure is 70+ years old and has not been addressed in the lifetime of the current producers. In late summer 2023 a 30,000 gallon water tank that fills from the artificial catchment rotted through and producers lost the entire 30,000 gallons of stored water restricting their use of the lower part of the allotment on which they rely to end the season. The water quality in the LA CIENEGUITA, LA CROCHA, LLANO LARGO NORTE, and

AMARILLO were of concern. The lab analysis showed extremely high iron likely due to improper equipment function resulting in increased microbial growth and biofilm buildup in watering equipment. High iron in drinking water may also reduce water intake which can directly reduce feed intake or milk production. This water may impart an off-taste to the meat of young animals (e.g., veal calves) or to milk. Excess absorbed iron from drinking water can lead to cellular oxidative stress, can inhibit copper and zinc absorption, and reduced growth or production. Producers are advised to seek professional advice regarding use of this water for livestock. The lab also showed that manganese was extremely high in LA CROCHA, LLANO LARGO NORTE, and AMARILLO likely due to improper equipment functions resulting in increased microbial growth and biofilm buildup rather than specific livestock health problems. Manganese may impart an off-taste to meat of young animals (e.g., veal calves).

There is significant damage by *tusas* in lower allotment areas LLANO de los JUANES, ESCONDIDO, and QUEMAZON. There is an increased presence of elk and deer in late fall in all parts of the allotment. Wildlife cameras in CAÑADA de la SIERRA show elk and deer using livestock trails and grazing in the early morning ahead of livestock and in the evening after livestock. Depredation hunt scheduled for March is not effective due to lack of access to areas where elk winter.



A lack of access to the allotment, rotational grazing, and deteriorating and unmaintained infrastructure affected rangeland conditions and impacted livestock operations negatively. Producers were locked out of the allotment two weeks before the beginning of the grazing season and on the May 1, 2023 entry date. Locked gates limited producers' ability to make repairs, do maintenance, and make upgrades to fences, corrals, cattle gates, and stock water infrastructure; to prepare for the grazing season in general.

Recreational users, however, had vandalized the gate and made roads around it to gain access. The mandated practice of subdividing allotments, rotational grazing, setting areas of the allotment aside for later entry or seasonal deferral. Producers described these conditions as harrassment. Producers also described these conditions, especially deteriorating infrastructure, as abandonment. They explained that these conditions discourage livestock grazing. Cattle guards across the allotment are so clogged up that they create a bridge for cattle rather than a gate. When the cattle



guards are in these conditions cows from adjoining allotments can eat out out permitted livestock. Producers paid \$600.00 to a private party to lift and clean the cattle guards and waited four months to be reimbursed, Producers discussed how rangelands are national infrastructure just like roads and bridges that contribute to overall economic growth and well being. Wondering, what would rangeland conditions look like if they were considered infrastructure like roads and bridges? Producers raised the question: For whom is the forest being managed?

PRACTICES

- Producers erect makeshift barbed-wire fences and gates on top of clogged cattle guards to try and stop livestock from crossing onto areas out of rotation or other producers livestock from trespassing.
- When there is no water in the lower pastures producers must leave cattle in the high country where there is water and drive livestock down later before snow conditions and freezing temperatures.
- Producers ween on the allotment when there is water and a one month extension at the end of the season.
- Producers ween off the allotment when there is a lack of water and return to the allotment if there is an extension and producers have capacity.

RECOMMENDATIONS

- Extend the grazing season by two weeks to take advantage of grasses on lower pastures.
- Treat *chamisa* and reseed areas.
- Run water lines to lower pastures.
- Manage wildfires to catalyze native grass growth.
- Develop new water infrastructure.
- Lower the height of drinkers for calves.
- Improve oversight of water project engineering and construction.
- Improve and enlarge corrals.
- Reschedule depredation hunts for a time of the year when there is access for hunters.
- Thin forest to increase water availability for forage.
- Deepen earthen tanks.
- Coordinate better with Conservation District for funding for infrastructure.
- Establish water in areas that are out of use (MANZANARES, COMANCHE, BULL CANYON).
- Make meadow improvements.
- End the seasonally deferred rotation.

POSSIBLE IMPACTS OF RECOMMENDATIONS

- Extending the grazing season by two weeks could save producers \$2,000.00 each on feed.
- Native grasses will return stronger after fire.
- Water availability close to key areas will increase animal performance especially weight gain.

Works Cited

Brinkmann, Svend

2022 *Qualitative interviewing*. New York: Oxford University Press.

DeWalt, Kathleen, and Billie DeWalt

2011 *Participant Observation: A guide for fieldworkers*. Walnut Creek, CA: AltaMira Press

Emerson, Robert, Rachel Fretz, and Linda Shaw

2011 *Writing Ethnographic Fieldnotes*. Chicago: University of Chicago Press.

Ortner, Sherry

2006 *Anthropology and Social Theory: Culture, Power, and the Acting Subject*. Durham: Duke University Press.

Robinson, Catherine et al.

2016 Participatory mapping to negotiate indigenous knowledge used to assess environmental risk. *Sustainable Science* 11:115–126.

Valencia, Cristóbal

2015 *We are the State! Barrio activism in Venezuela's Bolivarian Revolution*. Tucson: University of Arizona Press.

Warren, Carol and Tracy Xavia Karner

2015 *Discovering Qualitative Methods: ethnography, interviews, documents, and images*. New York: Oxford University Press.

Weiss, Richard

2004 In Their Own Words: Making the Most of Qualitative Interviews. *Contexts* 3:4. Pp. 44-51.

The following information is a summary of the data collected over the 2023 grazing season. Data was collected using the Rapid Assessment Methodology (RAM; Spackman et al., 2022). Summaries were produced using the Rangeland Data Analysis and Record program (RaDAR; rangelandradar.app) and include individual pasture assessments and the allotment averages for each collection period. This is a single year of data and should not be used to make long-term management decisions or increases/decreases in stocking rates. Multiple years of monitoring is required (minimum of 3-5 years) to begin developing management decisions (Holecheck et al., 2011). An explanation of report contents is explained below.

Biomass Availability (also called standing crop or production residuals) is the amount of vegetation, expressed as a weight per area, present during a given point in time, not excluded from grazing activity. Five clippings were taken along the transect, dried, and weighed. The five weights were then converted to pounds per acre based on a 0.96 ft² hoop and averaged to obtain biomass availability +/- standard error (variability in weights). It can be used as a grazing intensity guide during the season, if location and number of samples are representative of the landscape, to make temporary adjustments in livestock distribution.

Annual Forage Production is plant material collected from grazing exclusion cages, expressed as a weight per area, and used to assess forage production for an entire year. This an estimate of what the land can produce without grazing. Three cages were placed near each transect at the beginning of the grazing season. Samples were collected at the end of the season by clipping forage within a 0.96 ft² hoop, which was placed in the middle of each cage. Each sample was subsequently dried, weighed and converted to pounds per acre. The three clippings were averaged and a standard error calculated.

Estimated Stocking Rate is the calculation of animal unit equivalents (AUE) that the allotment could support for a duration of one month (AUM). Mid-season stocking rates were not calculated as stocking rates can only be estimated from annual forage production. Furthermore, individual pasture stocking rates were not calculated as grazable acres were only known for the whole allotment. Estimates are based upon the average collected annual forage production across the allotment, forest service provided grazable acres (pasture size in report), cattle forage demand of 26 pounds per day (SRM 1998), a conservative 40 percent forage use allocation (Holechek & Galt 2000), and a 30 day grazing period (Holecheck et al., 2011; Vallentine 2001). The AUM calculation equation is:

$$\frac{(annual\ production \times grazable\ acres \times use\ allocation)}{animal\ forage\ demand \times 30\ days} = AUM$$

Percent Cover is the proportion of the ground surface that is covered by vegetation, litter, rocks, bare soil, or other attributes. It is used to assess distribution and composition of different material covering the ground. The assessment was done along a transect using the step-point method. At each step basal cover was recorded at the tip of the boot until 100 readings were taken. Each cover type was summed to give a percent. Percent cover is slow to change and should be looked at over several years (5 to 10 years) to provide insights about vegetation density, potential erosion, and livestock management (Holechek et al., 2011).

Vegetation Cover – Grasses is the percentage of grasses (grazing forage) by common name and scientific abbreviation (symbol) based on the amount of percent cover of vegetation along the transect. The percentage provides the land manager with species forage composition and diversity. Furthermore, changes in composition can be used as an indicator of grazing impact and vegetation trends over time.

Other Vegetation Cover is the percentage of vegetation that are not grasses based on percent cover of vegetation along the transect. This is similar to vegetation cover – grasses and can also be used as an indicator of forage and habitat for wildlife.

Forage Composition is the percentage of all grass species found along the transect even if cover was not vegetation; where nearest grass species was recorded on the datasheet. Additionally, height of each species is recorded by extending leaves upward and recording the average leaf lengths of all leaves. This provides an inventory and relative abundance (vegetation cover) or diversity of all grasses including their stubble heights. It identifies the specific combination and distribution of different species and helps assess the overall forage biodiversity within the plant community. Furthermore, the stubble heights give an estimate of grazing intensity and potential insight to make mid-season adjustments to grazing strategies (i.e., animal distribution and duration). Species are listed by their common name, scientific abbreviation (symbol), percent, with the addition of height and their minimum height grazing guideline (Holechek and Galt 2000).

Fecal Counts are used to estimate and monitor relative presence or absence of animals. It is not used to assess animal abundance but can be used generally as an indicator of increases or decreases in animal visitations over time (years).

Photos are used as a qualitative assessment to support quantitative information. They can be used as an illustrative record of the conditions that occurred at a given point in time. Ground photos when accompanied with a scaled ruler can be used to quantify cover or species composition, but are limited unless multiple ground photos are taken. Landscape photos can be used to demonstrate grazing intensity and correlated to the quantitative data.

Utilization

A summary of production and utilization is provided at the end of the reports (Table 1). Utilization is a guide and should not be used as a standard or threshold for range management decisions (SRM-RAMC 2018; Ruyle et al., 2007). Conservative grazing (30-40 percent utilization) is the recommended in the southwest to sustain or improve rangeland conditions and optimize livestock productivity (Holechek and Galt 2000). The following equation was used to calculate percent utilization:

$$\frac{(\text{annual production} - \text{available biomass})}{\text{annual production}} \times 100 = \text{percent utilization}$$

Physical Constraint of Animal Intake

Utilization is a very useful guide when all grazing species are accounted for. When multiple grazing species or uncontrolled grazers such as wildlife are present, it becomes difficult if not

impossible to determine how much each species has consumed in relation to utilization. This concept, known as resource partitioning, is an ongoing issue for rangeland managers. Currently there is no direct measurement to partition use on rangelands. However, forage intake of range cattle has been extensively researched (Vallentine 1990, McKown et al., 1991, and Holechek et al 2011) and a 1,000-pound mature cow consumes on average 26 pounds of dry forage per day (SRM 1998). Intake can vary depending on other factors such as reproductive status or environmental conditions but the scientifically accepted intake is between 2 and 2.6 percent of the animals body weight (NASEM 2016). Thus, a physical constraint of intake model can be used to calculate approximate cattle use on rangelands. This calculation uses the stocking rate equation, described previously, rearranging the parameters to solve for the desired utilization rather than animal units. It is worth noting that this is a calculation, not a direct measurement of utilization, and should be used as an approximate use level by cattle. A calculated estimate of cattle use can be found in Table 2. The equation used was:

$$\frac{(\text{animal demand} \times \text{grazing duration} \times \text{permitted animals})}{(\text{animal production} \times \text{grazable acres})} \times 100 = \text{percent utilization}$$

Similarly, the equation can be rearranged to determine how much an individual animal would consume daily (animal demand) to account for the observed utilization level. This equation helps determine if there is any disparity between physical constraint of intake and the observed utilization level on the allotment. Excess intake above 26 pounds can be contributed to other grazing animals and environmental influences.


$$\frac{(\text{annual production} \times \text{grazable acres} \times \text{observed utilization})}{(\text{grazing duration} \times \text{permitted animals})} = \text{animal demand or daily intake}$$

Works Cited

- Holechek, J.L., Pieper, R. D., & Herbel, C. H., 2011. Range Management: Principles and Practices. Prentice Hall.
- Holechek, J. L., & Galt, D., 2000. Grazing intensity guidelines. Rangelands, 22(3), 11-14.
- McKown, C.D., Walker, J.W., Stuth, J.W. and Heitschmidt, R.K., 1991. Nutrient intake of cattle on rotational and continuous grazing treatments. Rangeland Ecology & Management/Journal of Range Management Archives, 44(6), pp.596-601.
- National Academies of Sciences, Engineering, and Medicine (NASEM). 2016. Nutrient requirements of beef cattle, 8th revised ed. Washington, D.C.: The National Academies Press. doi: 10.17226/19014.
- Ruyle, G.B., Smith, L., Maynard, J., Barker, S., Stewart, D., Meyer, W., Couloudon, B. and Williams, S., 2007. Principles of obtaining and interpreting utilization data on rangelands.
- Society of Range Management (SRM), 1998. Glossary of terms used in range management. Forth edition. Society of Range Management. Rangeland Assessment and Monitoring Committee (SRM-RAMC), 2018. Utilization and residual measurements: tools for adaptive rangeland management. Rangelands 40(5):146-151. doi:10.1016/j.rala.2018.07.003.
- Spackman, C.N., Smallidge, S.T., Cram, D.S., Ward, M.A., 2022. Annotated instructions for rangeland monitoring using the rapid assessment methodology. New Mexico State University Cooperative Extension Service. RITF 88.
- Vallentine, J. F., 2001. Grazing Management (2nd ed.). Academic Press, San Diego, CA.

RaDAR - Rangeland Data Analysis & Record

Producer Name:	El Rito	Pasture Name:	Llano de los Juanes
Date:	8/4/2023	Collector Names:	NNMSA, FS
Transect Number:	1	GPS Coordinates:	36.31083. -106.2325 (282°)

Notes:	tierra quemada	

Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
269.0 ± 81.1 lbs per acre	58403 acres	n/a AUM	n/a

Percent Cover		Vegetation Cover - Grasses			Other Vegetation Cover	
		<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Common Name</u>	<u>Percent</u>
Bare Ground	26					
Litter	4	Blue Grama	BOGR	32	Forb Unknown	4
Vegetation	69	Crested Wheatgrass	AGCR	28	Juniper spp.	1
Rock (>3/4")	1	Cheatgrass	BRTE	4		
	100			64		5

Forage Composition				
<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Avg. Height (inches)</u>	<u>Minimum Stubble Height Guideline</u>
Crested Wheatgrass	AGCR	53	4.2	2.5
Blue Grama	BOGR	40	3.1	1.5
Cheatgrass	BRTE	7	3.7	
		100	3.7	


Fecal Counts							
Horse	0	Elk	1	Cattle	0	Deer	0

Photos



RaDAR - Rangeland Data Analysis & Record

Producer Name:	El Rito	Pasture Name:	Llano de los Juanes
Date:	10/20/2023	Collector Names:	NNMSA, FS
Transect Number:	1	GPS Coordinates:	36.31083. -106.2325 (282°)

Notes:		

Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
319.6 ± 100.7 lbs per acre	58403 acres	n/a AUM	632.7 ± 50 lbs per acre

Percent Cover		Vegetation Cover - Grasses			Other Vegetation Cover	
		<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Common Name</u>	<u>Percent</u>
Bare Ground	22	Crested Wheatgrass	AGCR	34	Forb Unknown	4
Litter	0	Blue Grama	BOGR	25	Clover spp.	
Vegetation	78	Cheatgrass	BRTE	15	Iris spp.	
Rock (>3/4")	0				Plantain spp.	
					Dandelion	
					Moss spp.	
	100			74		4

Forage Composition				
<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Avg. Height (inches)</u>	<u>Minimum Stubble Height Guideline</u>
Crested Wheatgrass	AGCR	52	6.5	2.5
Blue Grama	BOGR	28	7.6	1.5
Cheatgrass	BRTE	20	6.5	
		100	6.8	


Fecal Counts							
Horse	0	Elk	2	Cattle	0	Deer	0

Photos



RaDAR - Rangeland Data Analysis & Record

Producer Name:	El Rito	Pasture Name:	Quemazon
Date:	8/4/2023	Collector Names:	NNMSA, FS
Transect Number:	1	GPS Coordinates:	36.34967, -106.2405 (70°)

Notes:		

Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
835.6 ± 432.5 lbs per acre	58403 acres	n/a AUM	n/a

Percent Cover		Vegetation Cover - Grasses			Other Vegetation Cover	
		<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Common Name</u>	<u>Percent</u>
Bare Ground	47	Blue Grama	BOGR	12	Ragweed spp.	2
Litter	25	Crested Wheatgrass	AGCR	4	Broom Snakeweed	1
Vegetation	25	Needle and Thread	STCO	4		
Rock (>3/4")	3	Galleta	PLJA	2		
	100			22		3

Forage Composition				
<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Avg. Height (inches)</u>	<u>Minimum Stubble Height Guideline</u>
Blue Grama	BOGR	22	3.1	1.5
Needle and Thread	STCO	22	5.8	4
Crested Wheatgrass	AGCR	16	3.9	2.5
Interm. Wheatgrass	AGIN	13	9.1	4
Sand Dropseed	SPCR	9	11.3	4
West. Wheatgrass	AGSM	6	7.4	2.5
		88	6.0	


Fecal Counts							
Horse	0	Elk	0	Cattle	0	Deer	0

Photos



RaDAR - Rangeland Data Analysis & Record

Producer Name:	El Rito	Pasture Name:	Quemazon
Date:	10/20/2023	Collector Names:	NNMSA, FS
Transect Number:	1	GPS Coordinates:	36.34967, -106.2405 (70°)

Notes:		

Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
1094.8 ± 275.3 lbs per acre	58403 acres	n/a AUM	1561.3 ± 550 lbs per acre

Percent Cover		Vegetation Cover - Grasses			Other Vegetation Cover	
		<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Common Name</u>	<u>Percent</u>
Bare Ground	26	Blue Grama Crested Wheatgrass	BOGR AGCR	32	Forb Unknown	1
Litter	25			16	Clover spp.	
Vegetation	49				Iris spp.	
Rock (>3/4")	0				Plantain spp.	
	100			48	Dandelion	
					Moss spp.	
					1	

Forage Composition				
<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Avg. Height (inches)</u>	<u>Minimum Stubble Height Guideline</u>
Blue Grama	BOGR	66	6.8	1.5
Crested Wheatgrass	AGCR	34	8.0	2.5
		100	7.2	


Fecal Counts							
Horse	0	Elk	0	Cattle	1	Deer	0

Photos



RaDAR - Rangeland Data Analysis & Record

Producer Name:	El Rito	Pasture Name:	Amarillo
Date:	8/4/2023	Collector Names:	NNMSA, FS
Transect Number:	1	GPS Coordinates:	36.41397, -106.2916 (289°)

Notes:		

Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
253.4 ± 63.9 lbs per acre	58403 acres	n/a AUM	n/a

Percent Cover		Vegetation Cover - Grasses			Other Vegetation Cover	
		<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Common Name</u>	<u>Percent</u>
Bare Ground	1	Sedge	Carex	13		
Litter	72	Kentucky Bluegrass	POPR	5		
Vegetation	24	Brome spp.	BRMO	4		
Rock (>3/4")	3	Prairie Junegrass	KOMA	1		
		Texas Bluegrass	POAR	1		
	100			24		0

Forage Composition					
<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Avg. Height (inches)</u>	<u>Minimum Stubble Height Guideline</u>	
Sedge	Carex	52	5.9	1.5	
Brome spp.	BRMO	24	10.1	4	
Kentucky Bluegrass	POPR	17	9.1	2.5	
Prairie Junegrass	KOMA	1	5.0	2.5	
Thurber's Fescue	FETH	1	15.0	4	
Texas Bluegrass	POAR	1	4.5	4	
		96	7.7		


Fecal Counts							
Horse	0	Elk	3	Cattle	0	Deer	0

Photos



RaDAR - Rangeland Data Analysis & Record

Producer Name:	El Rito	Pasture Name:	Amarillo
Date:	10/20/2023	Collector Names:	NNMSA, FS
Transect Number:	1	GPS Coordinates:	36.41397, -106.2916 (289°)

Notes:	0.4 inches precip	
	0	

Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
363.8 ± 113 lbs per acre	58403 acres	n/a AUM	685.3 ± 110 lbs per acre

Percent Cover		Vegetation Cover - Grasses			Other Vegetation Cover	
		<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Common Name</u>	<u>Percent</u>
Bare Ground	0	Kentucky Bluegrass	POPR	4	Forb Unknown	1
Litter	91	Sedge	Carex	2		
Vegetation	9	Smooth Brome	BRIN	1		
Rock (>3/4")	0	Thurber's Fescue	FETH	1		
100		8			1	

Forage Composition				
<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Avg. Height (inches)</u>	<u>Minimum Stubble Height Guideline</u>
Sedge	Carex	61	5.9	1.5
Kentucky Bluegrass	POPR	30	6.1	2.5
Smooth Brome	BRIN	6	6.2	4
Thurber's Fescue	FETH	2	30.0	4
West. Wheatgrass	AGSM	1	11.0	2.5
100		6.5		

Fecal Counts							
Horse	0	Elk	6	Cattle	0	Deer	0


Photos



El Rito Allotment
Amaullo Postbox
10-10-2023

RaDAR - Rangeland Data Analysis & Record

Producer Name:	El Rito	Pasture Name:	Escondido
Date:	8/4/2023	Collector Names:	NNMSA, FS
Transect Number:	1	GPS Coordinates:	36.32428, -106.2479 (339°)

Notes:		

Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
457.8 ± 21.5 lbs per acre	58403 acres	n/a AUM	n/a

Percent Cover		Vegetation Cover - Grasses			Other Vegetation Cover	
		<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Common Name</u>	<u>Percent</u>
Bare Ground	42	Blue Grama	BOGR	25	Fourwing Saltbush	1
Litter	17	Crested Wheatgrass	AGCR	8		
Vegetation	39	Cheatgrass	BRTE	4		
Rock (>3/4")	2	Sand Dropseed	SPCR	1		
	100			38		1

Forage Composition				
<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Avg. Height (inches)</u>	<u>Minimum Stubble Height Guideline</u>
Blue Grama	BOGR	51	3.2	1.5
Crested Wheatgrass	AGCR	38	5.0	2.5
Sand Dropseed	SPCR	6	6.0	4
Cheatgrass	BRTE	5	4.2	
		100	4.1	


Fecal Counts							
Horse	0	Elk	0	Cattle	0	Deer	0

Photos



RaDAR - Rangeland Data Analysis & Record

Producer Name:	El Rito	Pasture Name:	Escondido
Date:	10/20/2023	Collector Names:	NNMSA, FS
Transect Number:	1	GPS Coordinates:	36.32428, -106.2479 (339°)

Notes:		
--------	--	---

Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
135.4 ± 73.2 lbs per acre	58403 acres	n/a AUM	505.0 ± 170 lbs per acre

Percent Cover		Vegetation Cover - Grasses			Other Vegetation Cover	
		<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Common Name</u>	<u>Percent</u>
Bare Ground	58				Forb Unknown	1
Litter	6	Cheatgrass	BRTE	24	Clover spp.	
Vegetation	36	Crested Wheatgrass	AGCR	6	Iris spp.	
Rock (>3/4")	0	Kentucky Bluegrass	POPR	5	Plantain spp.	
					Dandelion	
					Moss spp.	
	100			35		1

Forage Composition				
<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Avg. Height (inches)</u>	<u>Minimum Stubble Height Guideline</u>
Cheatgrass	BRTE	74	2.9	
Kentucky Bluegrass	POPR	17	3.8	2.5
Crested Wheatgrass	AGCR	9	3.1	2.5
		100	3.1	


Fecal Counts							
Horse	0	Elk	3	Cattle	0	Deer	1

Photos



RaDAR - Rangeland Data Analysis & Record

Producer Name:	El Rito	Pasture Name:	Sierra
Date:	8/4/2023	Collector Names:	NNMSA, FS
Transect Number:	1	GPS Coordinates:	36.45772, -106.3059 (282°)

Notes:		

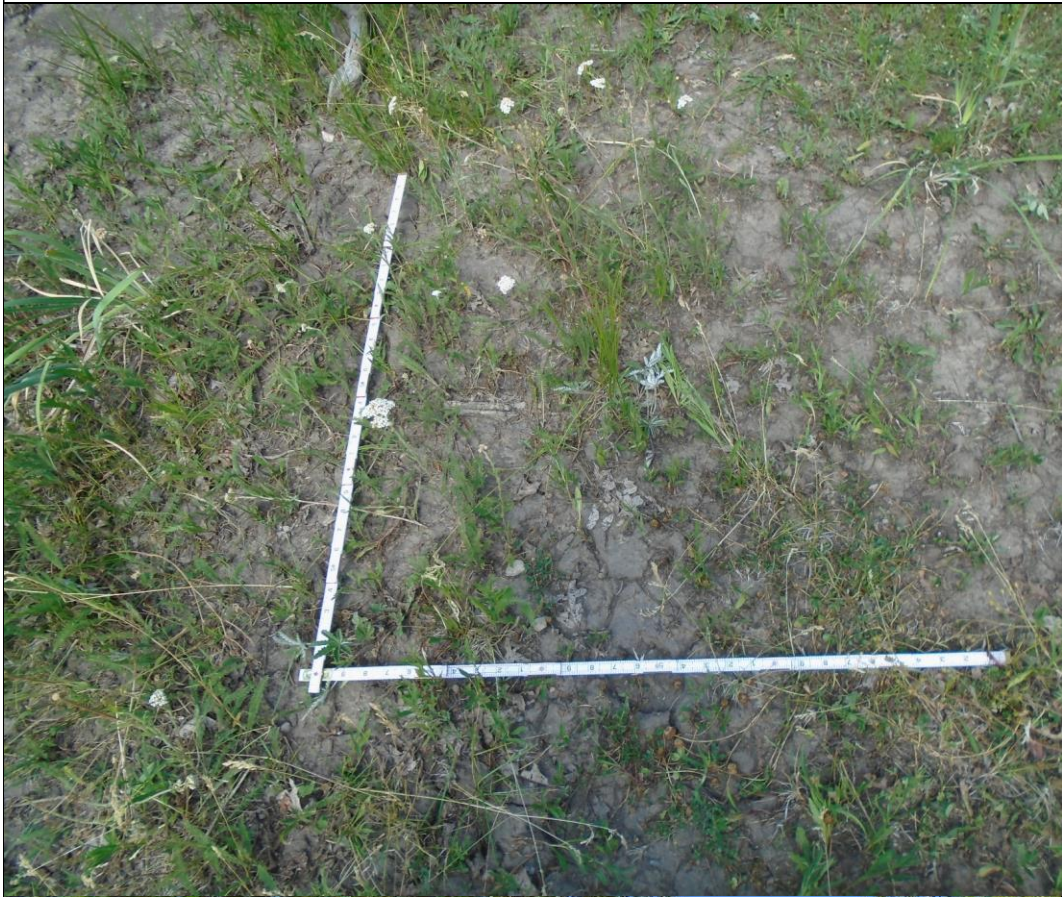
Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
835.8 ± 466.9 lbs per acre	58403 acres	n/a AUM	n/a

Percent Cover		Vegetation Cover - Grasses			Other Vegetation Cover	
		<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Common Name</u>	<u>Percent</u>
Bare Ground	15	Kentucky Bluegrass	POPR	47	Rayless Goldenrod	1
Litter	11	Timothy	PHPR	15		
Vegetation	72	Smooth Brome	BRIN	5		
Rock (>3/4")	2	West. Wheatgrass	AGSM	2		
		Squirreltail	ELEL	2		
	100			71		1

Forage Composition				
<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Avg. Height (inches)</u>	<u>Minimum Stubble Height Guideline</u>
Kentucky Bluegrass	POPR	66	5.8	2.5
Timothy	PHPR	21	7.6	4
West. Wheatgrass	AGSM	5	6.8	2.5
Smooth Brome	BRIN	5	7.2	4
Squirreltail	ELEL	2	7.8	4
Sedge	Carex	1	8.0	1.5
		100	6.3	


Fecal Counts							
Horse	0	Elk	0	Cattle	2	Deer	0

Photos



RaDAR - Rangeland Data Analysis & Record

Producer Name: El Rito	Pasture Name: Sierra
Date: 10/20/2023	Collector Names: NNMSA, FS
Transect Number: 1	GPS Coordinates: 36.45772, -106.3059 (282°)

Notes:	0.28 inches of precip	

Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
812.8 ± 289.3 lbs per acre	58403 acres	n/a AUM	1114.3 ± 50 lbs per acre

Percent Cover		Vegetation Cover - Grasses			Other Vegetation Cover	
Cover Type	Percent	<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Common Name</u>	<u>Percent</u>
Bare Ground	10	Kentucky Bluegrass	POPR	14	Forb Unknown	2
Litter	64			10		
Vegetation	26	Timothy	PHPR	10		
Rock (>3/4")	0					
100				24		2

Forage Composition

<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Avg. Height (inches)</u>	<u>Minimum Stubble Height Guideline</u>
Kentucky Bluegrass	POPR	78	4.9	2.5
Timothy	PHPR	20	5.0	4
West. Wheatgrass	AGSM	2	12.5	2.5
		100	5.1	

Fecal Counts

Horse	0	Elk	2	Cattle	1	Deer	0
-------	---	-----	---	--------	---	------	---

Photos



RaDAR - Rangeland Data Analysis & Record

Producer Name:	El Rito	Pasture Name:	n/a
Date:	8/4/2023	Collector Names:	n/a
Transect AVERAGES	1,2,3,4,5	GPS Coordinates:	n/a

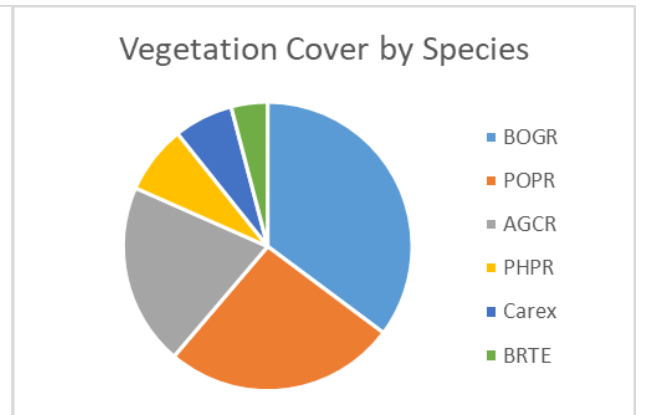
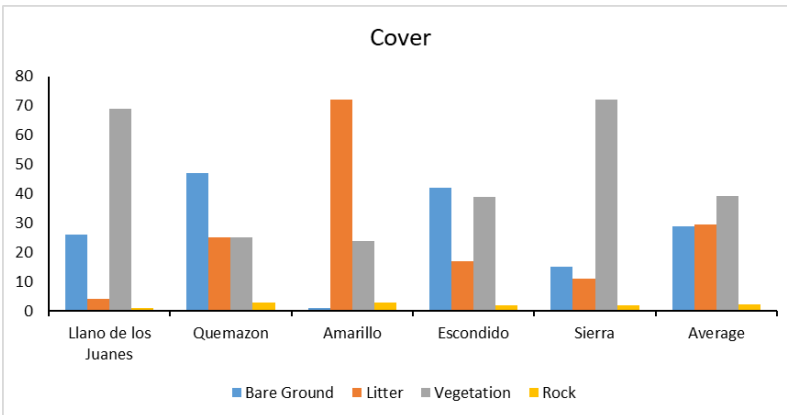
Notes:	AVERAGES	
--------	----------	--

Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
530.3 ± 129.2 lbs per acre	58403 acres	n/a AUM	n/a

Percent Cover		Vegetation Cover - Grasses			Other Vegetation Cover	
		<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Common Name</u>	<u>Percent</u>
Bare Ground	29	Blue Grama	BOGR	12	Forb Unknown	0.7
Litter	30	Kentucky Bluegrass	POPR	9	Ragweed spp.	0.3
Vegetation	39	Crested Wheatgrass	AGCR	7	Juniper spp.	0.2
Rock (>3/4")	2	Timothy	PHPR	3	Broom Snakeweed	0.2
		Sedge	Carex	2	Fourwing Saltbush	0.2
		Cheatgrass	BRTE	1	Rayless Goldenrod	0.2
	100			34		2

Forage Composition					
<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Avg. Height (inches)</u>	<u>Minimum Stubble Height Guideline</u>	
Blue Grama	BOGR	23	3.1	1.5	
Crested Wheatgrass	AGCR	21	4.4	2.5	
Kentucky Bluegrass	POPR	17	6.4	2.5	
Sedge	Carex	11	6.0	1.5	
Brome spp.	BRMO	5	10.1	4	
Needle and Thread	STCO	4	5.8	4	
		81	5.6		

Fecal Counts									
Horse	0	Elk	4	Cattle	2	Deer	0		0



RaDAR - Rangeland Data Analysis & Record

Producer Name:	El Rito	Pasture Name:	n/a
Date:	10/20/2023	Collector Names:	n/a
Transect AVERAGES	1,2,3,4,5	GPS Coordinates:	n/a

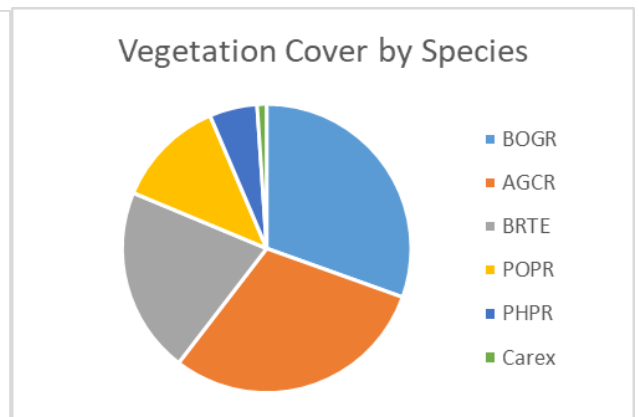
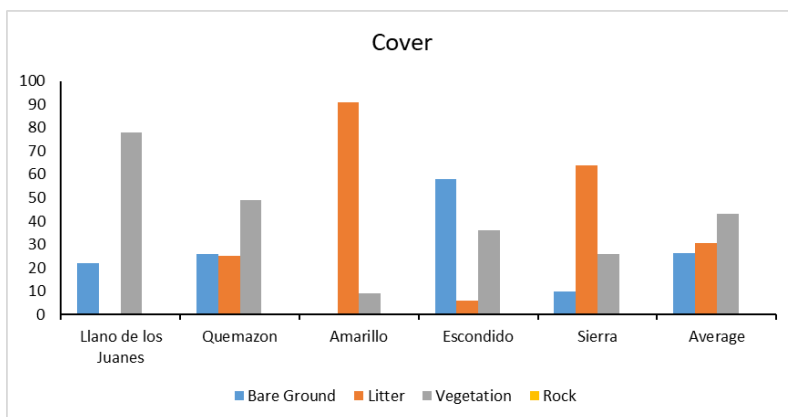
Notes:	AVERAGES	
--------	----------	--

Biomass Availability	Pasture Size	Estimated Stocking Rate	Annual Forage Production
545.3 ± 107.1 lbs per acre	58403 acres	26947.2 AUM	899.7 ± 165.6 lbs per acre

Percent Cover		Vegetation Cover - Grasses			Other Vegetation Cover	
		<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Common Name</u>	<u>Percent</u>
Bare Ground	27	Blue Grama	BOGR	12	Forb Unknown	2
Litter	31	Crested Wheatgrass	AGCR	12	Clover spp.	
Vegetation	43	Cheatgrass	B RTE	8	Iris spp.	
Rock (>3/4")	0	Kentucky Bluegrass	POPR	5	Plantain spp.	
		Timothy	PHPR	2	Dandelion	
		Sedge	Carex	0	Moss spp.	
	100	Smooth Brome	BRIN	41		2

Forage Composition				
<u>Common Name</u>	<u>Symbol</u>	<u>Percent</u>	<u>Avg. Height (inches)</u>	<u>Minimum Stubble Height Guideline</u>
Kentucky Bluegrass	POPR	25	5.0	2.5
Crested Wheatgrass	AGCR	19	6.7	2.5
Blue Grama	BOGR	19	7.1	1.5
Cheatgrass	B RTE	19	3.7	
Sedge	Carex	12	5.9	1.5
Timothy	PHPR	4	5.0	4
		98	5.7	

Fecal Counts					
Horse	0	Elk	13	Cattle	2
		Deer	1		0



	Mid-Year Biomass (lbs/acre)	Year-End Biomass (lbs/acre)	Annual Production (lbs/acre)	Utilization as a Percent
Llano de los Juares	269.0 ± 81.1	319.6 ± 100.7	632.7 ± 50.0	49.5
Quemazon	835.6 ± 432.5	1094.8 ± 275.3	1561.3 ± 550.0	29.9
Amarillo	253.4 ± 63.9	363.8 ± 113.0	685.3 ± 110.0	46.9
Escondido	457.8 ± 21.5	135.4 ± 73.2	505.0 ± 170.0	73.2
Sierra	835.8 ± 466.9	812.8 ± 289.3	1114.3 ± 50.0	27.1
Averages	530.3 ± 129.2	545.3 ± 107.1	899.7 ± 165.6	45.3 ± 8.3

	Observed Utilization as a Percent	Cattle Utilization as a Percent	Other Utilization as a Percent	Cow Intake for Observed Utilization (pounds/day)
Allotment Average	45.3	4.0	41.3	295.2

El Rito Lobato West Precipitation

Elevation	Transect	Date	Measurement
	Cañada de la Sierra	8/4/2023	hang
		9/5/2023	0.97
		9/20/2023	2.04
		10/20/2023	0.28
		Total	3.29
9166 ft	Amarillo	9/5/2023	hang
		9/12/2023	rehang
		9/17/2023	1
		10/20/2023	0.41
		Total	1.41
7490 ft	Quemazon	6/13/2023	hang
		9/5/2023	0.47
		9/16/2023	1
		10/21/2023	0.38
		Total	1.85
7375 ft	Escondido	6/13/2023	hang
		8/4/2023	rehang
		9/5/2023	0.56
		9/22/2023	1.058
		10/21/2023	0.05
		Total	1.668
7122 ft	Llano de los Juanes	6/13/2023	hang
		9/5/2023	0.33
		9/22/2023	1.03
		10/21/2023	0
		Total	1.36



6921 S. Bell • Amarillo, TX 79109
www.servitech.com

Phone: 806.677.0093

800.557.7509

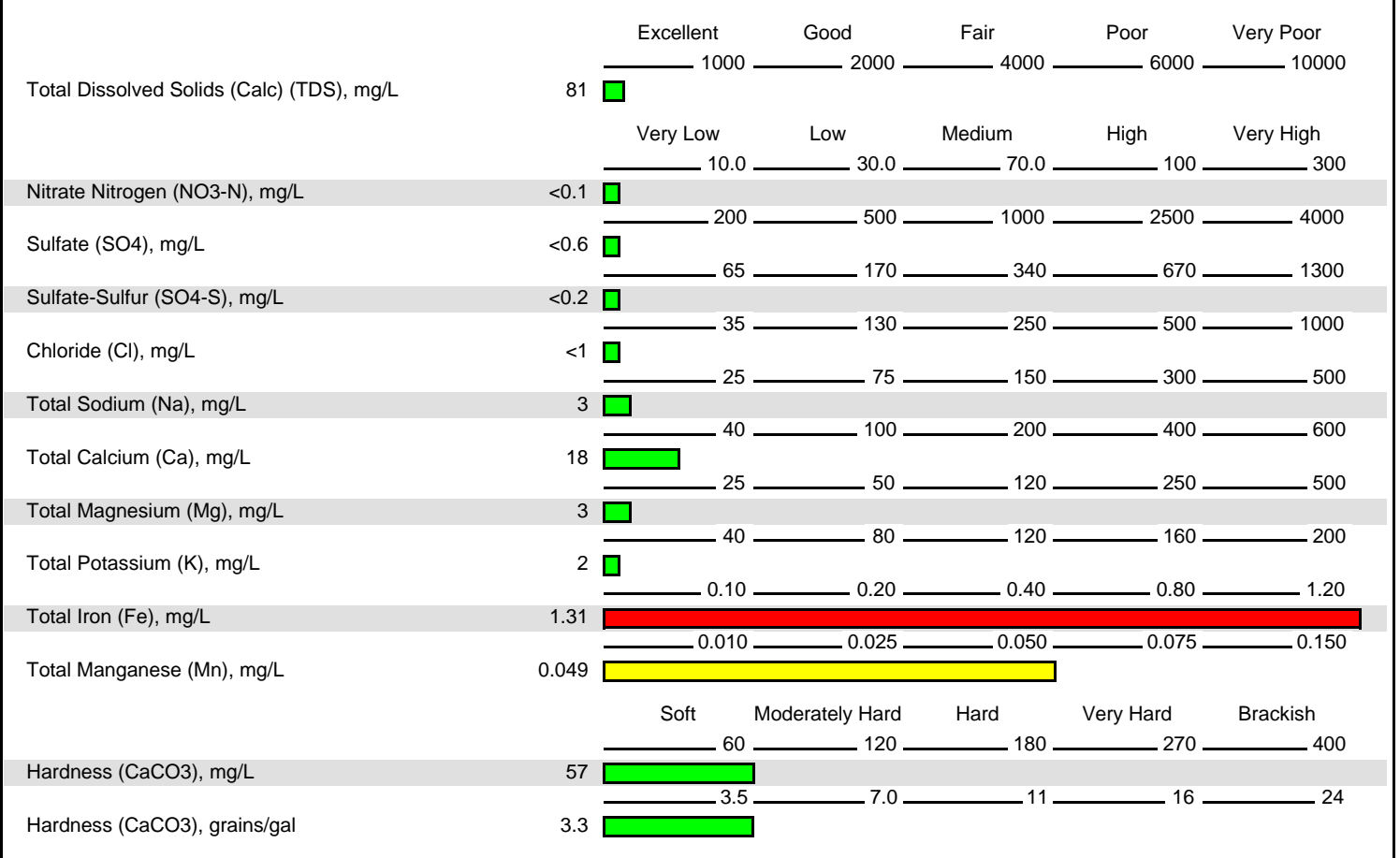
Fax: 806.677.0329

Lab No.: 3955 **LABORATORY ANALYSIS RESULTS** **Date Reported: 08/18/2023**

Send To: 55267	TIERRA GRANDE RESEARCH AND CONSULTING DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102	 Amy Meier Data Review Coordinator
--------------------------	--	--

Sample ID:	LA CIENEGUETA	Date Received:	
Client Name:		Invoice No:	423654
Location:		P.O. #:	DR CRISTOBAL VALENCIA
Date/Time Sampled:	08/04/2023	Name of Sampler:	C VALENCIA
Date/Time Submitted:	08/09/2023	Name of Submitter:	UPS
Subject:	Livestock Water Lab Analysis	Depth:	

Livestock



Additional Tests

Electrical Conductivity (EC @ 25C), µmho/cm	127
---	-----

The reported analytical results apply only to the sample as it was supplied.
The report may not be reproduced, except in full, without permission of ServiTech.

Your opinion is valuable to us. Please let us know what you think about our services! Send an email to feedback@servitech.com.



6921 S. Bell • Amarillo, TX 79109
www.servitech.com

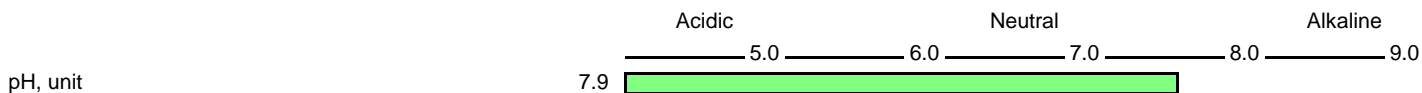
Phone: 806.677.0093
800.557.7509
Fax: 806.677.0329

Lab No.: 3955 LABORATORY ANALYSIS RESULTS Date Reported: 08/18/2023

Send To: 55267	TIERRA GRANDE RESEARCH AND CONSULTING DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102	 Amy Meier Data Review Coordinator
--------------------------	--	--

Sample ID:	LA CIENEGUETA	Date Received:	
Client Name:		Invoice No:	423654
Location:		P.O. #:	DR CRISTOBAL VALENCIA
Date/Time Sampled:	08/04/2023	Name of Sampler:	C VALENCIA
Date/Time Submitted:	08/09/2023	Name of Submitter:	UPS
Subject:	Livestock Water Lab Analysis	Depth:	

Livestock



INTERPRETATIONS for GENERAL LIVESTOCK PRODUCTION The following statements are general interpretations for a wide range of common livestock and poultry animals. The actual effect of a particular water source on health or performance depends on many factors, including diet, animal activity, air temperature, animal size, and condition. Interpretations for specific livestock types are available on request, including: *beef cattle, beef calves, dairy cattle, dairy calves, mature hogs, young pigs, poultry, horses, or sheep/goats.*

TOTAL DISSOLVED SOLIDS, CONDUCTIVITY: EXCELLENT QUALITY ("fresh" water): Low salinity level. Suitable for all classes of livestock and poultry.

NITRATE-NITROGEN: VERY LOW: Should have no effect on animal health or performance.

SULFATE: VERY LOW: Considered safe for all classes of livestock. No problems are expected. Could possibly affect poultry performance at upper end of range when sodium, magnesium, or chloride levels are high.

CHLORIDE: VERY LOW: Chloride is considered a dissolved solid. See TDS comments. Levels greater than 15 to 25 mg/L might affect poultry production when sodium exceeds 50 mg/L.

SODIUM: VERY LOW: Presents little or no risk to livestock or poultry.

CALCIUM: VERY LOW: No effect expected for livestock or poultry use. Calcium mineral supplementation may be needed in certain cases.

MAGNESIUM: VERY LOW: Presents little or no risk to livestock or poultry.

POTASSIUM: VERY LOW: This water is considered satisfactory for all classes of animals.

The reported analytical results apply only to the sample as it was supplied.
The report may not be reproduced, except in full, without permission of ServiTech.

Your opinion is valuable to us. Please let us know what you think about our services! Send an email to feedback@servitech.com.



6921 S. Bell • Amarillo, TX 79109
www.servitech.com

Phone: 806.677.0093

800.557.7509

Fax: 806.677.0329

Lab No.: 3955 LABORATORY ANALYSIS RESULTS Date Reported: 08/18/2023

Send To: 55267	TIERRA GRANDE RESEARCH AND CONSULTING DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102	 Amy Meier Data Review Coordinator
--------------------------	--	--

Sample ID:	LA CIENEGUETA	Date Received:	
Client Name:		Invoice No:	423654
Location:		P.O. #:	DR CRISTOBAL VALENCIA
Date/Time Sampled:	08/04/2023	Name of Sampler:	C VALENCIA
Date/Time Submitted:	08/09/2023	Name of Submitter:	UPS
Subject:	Livestock Water Lab Analysis	Depth:	

IRON: EXTREMELY HIGH: Performance likely to be affected by improper equipment function, due to high iron concentration resulting in increased microbial growth and biofilm buildup in watering equipment. High iron in drinking water may also reduce water intake which can directly reduce feed intake or milk production. This water may impart off-taste to meat of young animals (e.g., veal calves) or to milk. Excess absorbed iron from drinking water can lead to cellular oxidative stress, can inhibit copper and zinc absorption, and reduced growth or production. Seek professional advice regarding use of this water for livestock consumption.

MANGANESE: MEDIUM (0.025 - 0.050 mg/L): No production problems expected for livestock consuming this water.

HARDNESS: SOFT: "Soft" water has no direct effect on drinking water safety or animal health, but may influence equipment, plumbing, and fixture performance.

AVERAGE DAILY WATER CONSUMPTION (gallons per day)

Beef cattle	7 to 12 per head	Sheep, goats	2 to 4 per head
Dairy cattle	10 to 40 per head	Chickens	8 to 10 per hundred birds
Swine	2 to 8 per head	Turkeys	10 to 15 per hundred birds
Horses	8 to 12 per head		

(Note: Water consumption may increase by 1½ to 2 times when temperatures exceed 80°F.)

The reported analytical results apply only to the sample as it was supplied.
The report may not be reproduced, except in full, without permission of ServiTech.

Your opinion is valuable to us. Please let us know what you think about our services! Send an email to feedback@servitech.com.



6921 S. Bell • Amarillo, TX 79109
www.servitech.com

Phone: 806.677.0093

800.557.7509

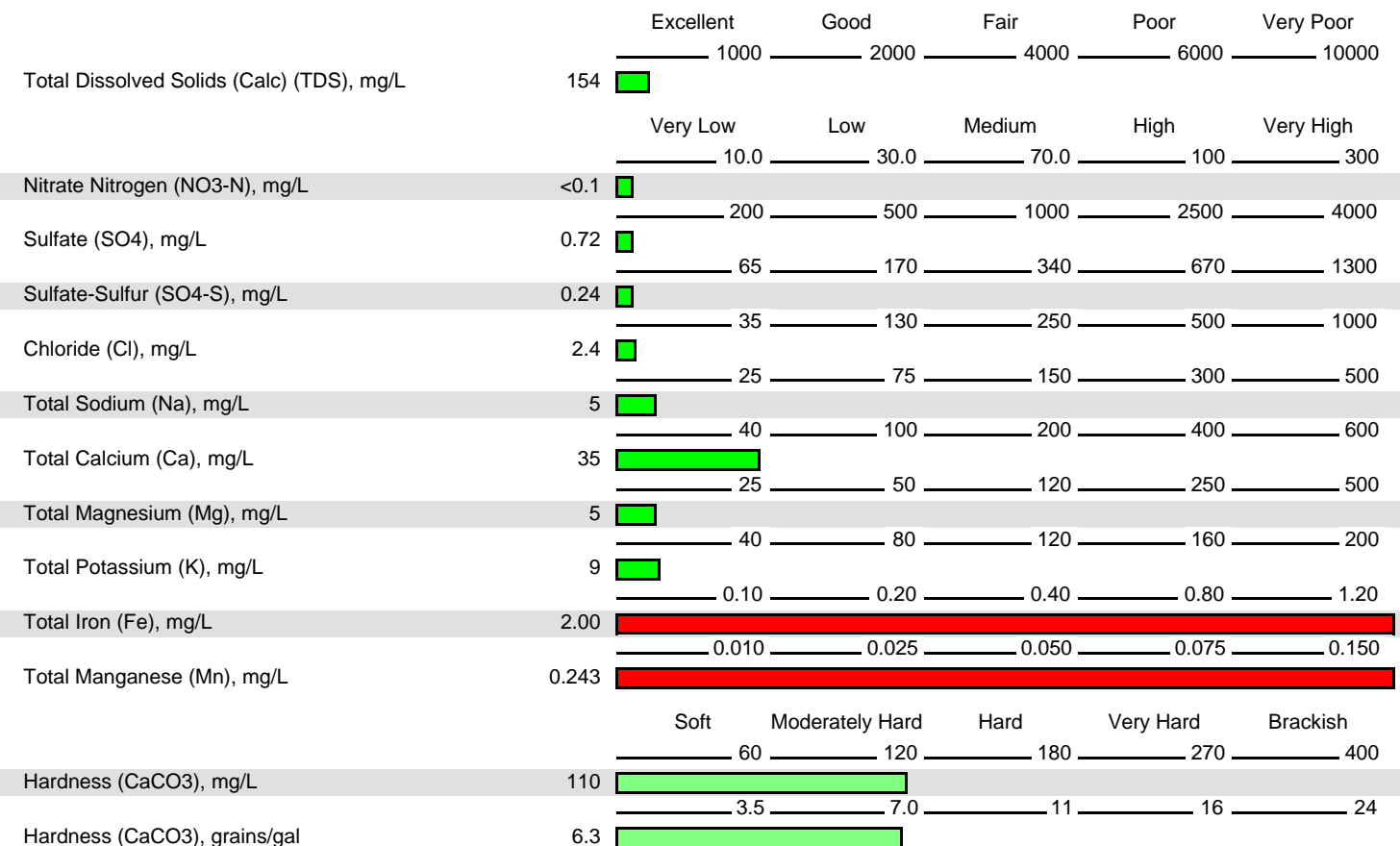
Fax: 806.677.0329

Lab No.: 3956 **LABORATORY ANALYSIS RESULTS** **Date Reported: 08/18/2023**

Send To: 55267	TIERRA GRANDE RESEARCH AND CONSULTING DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102	 Amy Meier Data Review Coordinator
--------------------------	--	--

Sample ID:	LA CROCHA	Date Received:	
Client Name:		Invoice No:	423654
Location:		P.O. #:	DR CRISTOBAL VALENCIA
Date/Time Sampled:	08/04/2023	Name of Sampler:	C VALENCIA
Date/Time Submitted:	08/09/2023	Name of Submitter:	UPS
Subject:	Livestock Water Lab Analysis	Depth:	

Livestock



Additional Tests

Electrical Conductivity (EC @ 25C), µmho/cm	241
---	-----

The reported analytical results apply only to the sample as it was supplied.
The report may not be reproduced, except in full, without permission of ServiTech.

Your opinion is valuable to us. Please let us know what you think about our services! Send an email to feedback@servitech.com.



6921 S. Bell • Amarillo, TX 79109
www.servitech.com

Phone: 806.677.0093

800.557.7509

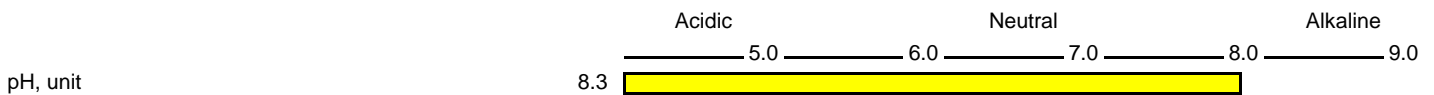
Fax: 806.677.0329

Lab No.: 3956 **LABORATORY ANALYSIS RESULTS** Date Reported: 08/18/2023

Send To: 55267	TIERRA GRANDE RESEARCH AND CONSULTING DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102	 Amy Meier Data Review Coordinator
--------------------------	--	--

Sample ID:	LA CROCHA	Date Received:	
Client Name:		Invoice No:	423654
Location:		P.O. #:	DR CRISTOBAL VALENCIA
Date/Time Sampled:	08/04/2023	Name of Sampler:	C VALENCIA
Date/Time Submitted:	08/09/2023	Name of Submitter:	UPS
Subject:	Livestock Water Lab Analysis	Depth:	

Livestock



INTERPRETATIONS for GENERAL LIVESTOCK PRODUCTION The following statements are general interpretations for a wide range of common livestock and poultry animals. The actual effect of a particular water source on health or performance depends on many factors, including diet, animal activity, air temperature, animal size, and condition. Interpretations for specific livestock types are available on request, including: *beef cattle, beef calves, dairy cattle, dairy calves, mature hogs, young pigs, poultry, horses, or sheep/goats.*

TOTAL DISSOLVED SOLIDS, CONDUCTIVITY: EXCELLENT QUALITY ("fresh" water): Low salinity level. Suitable for all classes of livestock and poultry.

NITRATE-NITROGEN: VERY LOW: Should have no effect on animal health or performance.

SULFATE: VERY LOW: Considered safe for all classes of livestock. No problems are expected. Could possibly affect poultry performance at upper end of range when sodium, magnesium, or chloride levels are high.

CHLORIDE: VERY LOW: Chloride is considered a dissolved solid. See TDS comments. Levels greater than 15 to 25 mg/L might affect poultry production when sodium exceeds 50 mg/L.

SODIUM: VERY LOW: Presents little or no risk to livestock or poultry.

CALCIUM: VERY LOW: No effect expected for livestock or poultry use. Calcium mineral supplementation may be needed in certain cases.

MAGNESIUM: VERY LOW: Presents little or no risk to livestock or poultry.

POTASSIUM: VERY LOW: This water is considered satisfactory for all classes of animals.

The reported analytical results apply only to the sample as it was supplied.
The report may not be reproduced, except in full, without permission of ServiTech.


Your opinion is valuable to us. Please let us know what you think about our services! Send an email to feedback@servitech.com.



6921 S. Bell • Amarillo, TX 79109
www.servitech.com

Phone: 806.677.0093
800.557.7509
Fax: 806.677.0329

Lab No.: 3956 LABORATORY ANALYSIS RESULTS Date Reported: 08/18/2023

Send To: 55267	TIERRA GRANDE RESEARCH AND CONSULTING DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102	 Amy Meier Data Review Coordinator
--------------------------	--	---

Sample ID:	LA CROCHA	Date Received:	
Client Name:		Invoice No:	423654
Location:		P.O. #:	DR CRISTOBAL VALENCIA
Date/Time Sampled:	08/04/2023	Name of Sampler:	C VALENCIA
Date/Time Submitted:	08/09/2023	Name of Submitter:	UPS
Subject:	Livestock Water Lab Analysis	Depth:	

IRON: EXTREMELY HIGH: Performance likely to be affected by improper equipment function, due to high iron concentration resulting in increased microbial growth and biofilm buildup in watering equipment. High iron in drinking water may also reduce water intake which can directly reduce feed intake or milk production. This water may impart off-taste to meat of young animals (e.g., veal calves) or to milk. Excess absorbed iron from drinking water can lead to cellular oxidative stress, can inhibit copper and zinc absorption, and reduced growth or production. Seek professional advice regarding use of this water for livestock consumption.

MANGANESE: EXTREMELY HIGH (over 0.0150 mg/L): Performance likely to be affected by improper equipment functions due to high manganese concentration (resulting in increased microbial growth and biofilm buildup) rather than specific livestock health problems. May impart off-taste to meat of young animals (e.g., veal calves).

HARDNESS: MODERATELY HARD: Hardness has no direct effect on drinking water safety or animal health.

AVERAGE DAILY WATER CONSUMPTION (gallons per day)

Beef cattle	7 to 12 per head	Sheep, goats	2 to 4 per head
Dairy cattle	10 to 40 per head	Chickens	8 to 10 per hundred birds
Swine	2 to 8 per head	Turkeys	10 to 15 per hundred birds
Horses	8 to 12 per head		

(Note: Water consumption may increase by 1½ to 2 times when temperatures exceed 80°F.)

The reported analytical results apply only to the sample as it was supplied.
The report may not be reproduced, except in full, without permission of ServiTech.

Your opinion is valuable to us. Please let us know what you think about our services! Send an email to feedback@servitech.com.



6921 S. Bell • Amarillo, TX 79109
www.servitech.com

Phone: 806.677.0093

800.557.7509

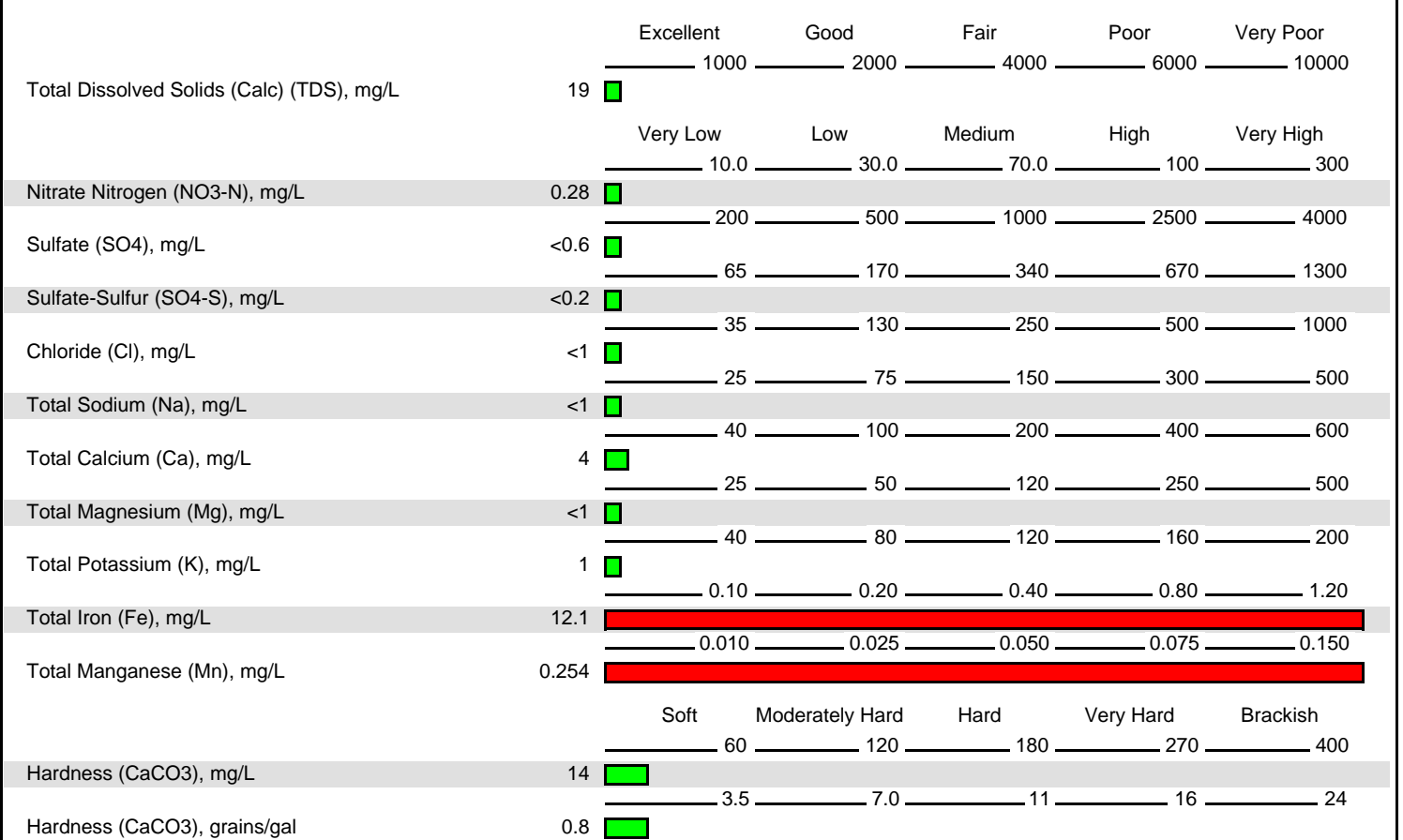
Fax: 806.677.0329

Lab No.: 3957 LABORATORY ANALYSIS RESULTS Date Reported: 08/18/2023

Send To: 55267	TIERRA GRANDE RESEARCH AND CONSULTING DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102	 Amy Meier Data Review Coordinator
--------------------------	--	--

Sample ID: LLANO LARGO NORTE	Date Received:
Client Name:	Invoice No: 423654
Location:	P.O. #: DR CRISTOBAL VALENCIA
Date/Time Sampled: 08/04/2023	Name of Sampler: C VALENCIA
Date/Time Submitted: 08/09/2023	Name of Submitter: UPS
Subject: Livestock Water Lab Analysis	Depth:

Livestock



Additional Tests

Electrical Conductivity (EC @ 25C), µmho/cm	30.4
---	------

The reported analytical results apply only to the sample as it was supplied.
The report may not be reproduced, except in full, without permission of ServiTech.

Your opinion is valuable to us. Please let us know what you think about our services! Send an email to feedback@servitech.com.



6921 S. Bell • Amarillo, TX 79109
www.servitech.com

Phone: 806.677.0093
800.557.7509
Fax: 806.677.0329

Lab No.: 3957 **LABORATORY ANALYSIS RESULTS** Date Reported: 08/18/2023

Send To: 55267	TIERRA GRANDE RESEARCH AND CONSULTING DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102	 Amy Meier Data Review Coordinator
--------------------------	--	--

Sample ID:	LLANO LARGO NORTE	Date Received:	
Client Name:		Invoice No:	423654
Location:		P.O. #:	DR CRISTOBAL VALENCIA
Date/Time Sampled:	08/04/2023	Name of Sampler:	C VALENCIA
Date/Time Submitted:	08/09/2023	Name of Submitter:	UPS
Subject:	Livestock Water Lab Analysis	Depth:	

Livestock



INTERPRETATIONS for GENERAL LIVESTOCK PRODUCTION The following statements are general interpretations for a wide range of common livestock and poultry animals. The actual effect of a particular water source on health or performance depends on many factors, including diet, animal activity, air temperature, animal size, and condition. Interpretations for specific livestock types are available on request, including: *beef cattle, beef calves, dairy cattle, dairy calves, mature hogs, young pigs, poultry, horses, or sheep/goats.*

TOTAL DISSOLVED SOLIDS, CONDUCTIVITY: EXCELLENT QUALITY ("fresh" water): Low salinity level. Suitable for all classes of livestock and poultry.

NITRATE-NITROGEN: VERY LOW: Should have no effect on animal health or performance.

SULFATE: VERY LOW: Considered safe for all classes of livestock. No problems are expected. Could possibly affect poultry performance at upper end of range when sodium, magnesium, or chloride levels are high.

CHLORIDE: VERY LOW: Chloride is considered a dissolved solid. See TDS comments. Levels greater than 15 to 25 mg/L might affect poultry production when sodium exceeds 50 mg/L.

SODIUM: VERY LOW: Presents little or no risk to livestock or poultry.

CALCIUM: VERY LOW: No effect expected for livestock or poultry use. Calcium mineral supplementation may be needed in certain cases.

MAGNESIUM: VERY LOW: Presents little or no risk to livestock or poultry.

POTASSIUM: VERY LOW: This water is considered satisfactory for all classes of animals.

The reported analytical results apply only to the sample as it was supplied.
The report may not be reproduced, except in full, without permission of ServiTech.

Your opinion is valuable to us. Please let us know what you think about our services! Send an email to feedback@servitech.com.




6921 S. Bell • Amarillo, TX 79109
www.servitech.com

Phone: 806.677.0093

800.557.7509

Fax: 806.677.0329

Lab No.: 3957		LABORATORY ANALYSIS RESULTS		Date Reported: 08/18/2023																
Send To: 55267	TIERRA GRANDE RESEARCH AND CONSULTING DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102		 Amy Meier Data Review Coordinator																	
Sample ID:	LLANO LARGO NORTE	Date Received:																		
Client Name:		Invoice No:	423654																	
Location:		P.O. #:	DR CRISTOBAL VALENCIA																	
Date/Time Sampled:	08/04/2023	Name of Sampler:	C VALENCIA																	
Date/Time Submitted:	08/09/2023	Name of Submitter:	UPS																	
Subject:	Livestock Water Lab Analysis	Depth:																		
<p>IRON: EXTREMELY HIGH: Performance likely to be affected by improper equipment function, due to high iron concentration resulting in increased microbial growth and biofilm buildup in watering equipment. High iron in drinking water may also reduce water intake which can directly reduce feed intake or milk production. This water may impart off-taste to meat of young animals (e.g., veal calves) or to milk. Excess absorbed iron from drinking water can lead to cellular oxidative stress, can inhibit copper and zinc absorption, and reduced growth or production. Seek professional advice regarding use of this water for livestock consumption.</p>																				
<p>MANGANESE: EXTREMELY HIGH (over 0.0150 mg/L): Performance likely to be affected by improper equipment functions due to high manganese concentration (resulting in increased microbial growth and biofilm buildup) rather than specific livestock health problems. May impart off-taste to meat of young animals (e.g., veal calves).</p>																				
<p>HARDNESS: SOFT: "Soft" water has no direct effect on drinking water safety or animal health, but may influence equipment, plumbing, and fixture performance.</p>																				
<p>AVERAGE DAILY WATER CONSUMPTION (gallons per day)</p> <table border="0"> <tr> <td>Beef cattle</td> <td>7 to 12 per head</td> <td>Sheep, goats</td> <td>2 to 4 per head</td> </tr> <tr> <td>Dairy cattle</td> <td>10 to 40 per head</td> <td>Chickens</td> <td>8 to 10 per hundred birds</td> </tr> <tr> <td>Swine</td> <td>2 to 8 per head</td> <td>Turkeys</td> <td>10 to 15 per hundred birds</td> </tr> <tr> <td>Horses</td> <td>8 to 12 per head</td> <td></td> <td></td> </tr> </table> <p>(Note: Water consumption may increase by 1½ to 2 times when temperatures exceed 80°F.)</p>					Beef cattle	7 to 12 per head	Sheep, goats	2 to 4 per head	Dairy cattle	10 to 40 per head	Chickens	8 to 10 per hundred birds	Swine	2 to 8 per head	Turkeys	10 to 15 per hundred birds	Horses	8 to 12 per head		
Beef cattle	7 to 12 per head	Sheep, goats	2 to 4 per head																	
Dairy cattle	10 to 40 per head	Chickens	8 to 10 per hundred birds																	
Swine	2 to 8 per head	Turkeys	10 to 15 per hundred birds																	
Horses	8 to 12 per head																			

The reported analytical results apply only to the sample as it was supplied.
The report may not be reproduced, except in full, without permission of ServiTech.

Your opinion is valuable to us. Please let us know what you think about our services! Send an email to feedback@servitech.com.




6921 S. Bell • Amarillo, TX 79109
www.servitech.com

Phone: 806.677.0093

800.557.7509

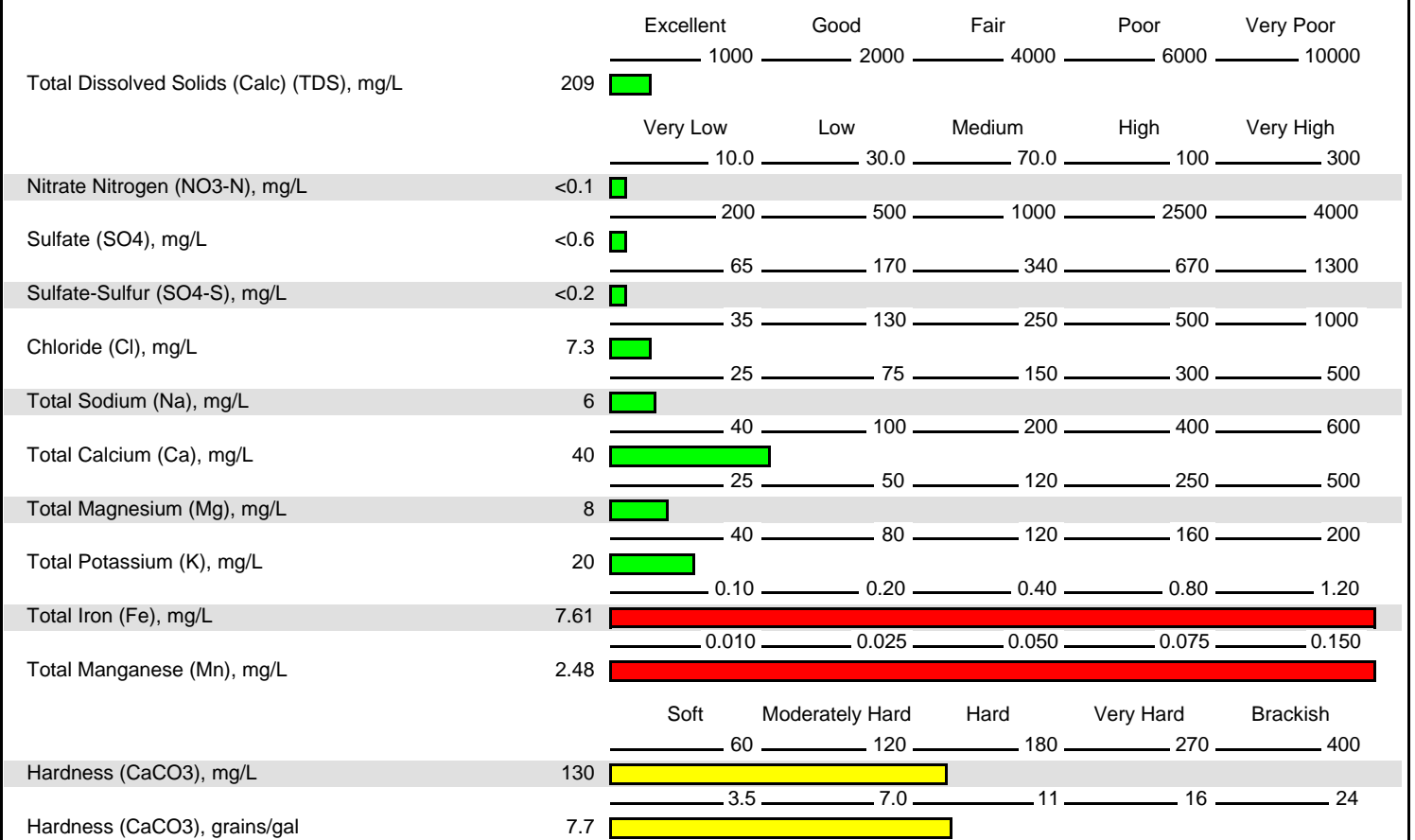
Fax: 806.677.0329

Lab No.: 347 **LABORATORY ANALYSIS RESULTS** **Date Reported: 10/30/2023**

Send To: 55267	NORTHERN NM STOCKMANS ASSOC DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102	 Amy Meier Data Review Coordinator
--------------------------	--	---

Sample ID: AMARILLO - EL RITO COBATO	Date Received:
Client Name:	Invoice No: 424247
Location:	P.O. #:
Date/Time Sampled: 10/20/2023	Name of Sampler:
Date/Time Submitted: 10/24/2023	Name of Submitter:
Subject: Livestock Water Lab Analysis	Depth:

Livestock



Additional Tests

Electrical Conductivity (EC @ 25C), µmho/cm	326
---	-----

The reported analytical results apply only to the sample as it was supplied.
The report may not be reproduced, except in full, without permission of ServiTech.

Your opinion is valuable to us. Please let us know what you think about our services! Send an email to feedback@servitech.com.



6921 S. Bell • Amarillo, TX 79109
www.servitech.com

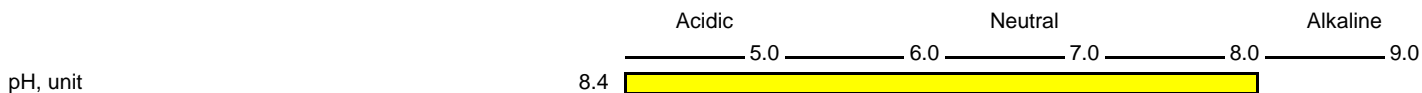
Phone: 806.677.0093
800.557.7509
Fax: 806.677.0329

Lab No.: 347 LABORATORY ANALYSIS RESULTS Date Reported: 10/30/2023

Send To: 55267	NORTHERN NM STOCKMANS ASSOC DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102	 Amy Meier Data Review Coordinator
--------------------------	--	--

Sample ID:	AMARILLO - EL RITO COBATO	Date Received:	
Client Name:		Invoice No:	424247
Location:		P.O. #:	
Date/Time Sampled:	10/20/2023	Name of Sampler:	
Date/Time Submitted:	10/24/2023	Name of Submitter:	
Subject:	Livestock Water Lab Analysis	Depth:	

Livestock



INTERPRETATIONS for GENERAL LIVESTOCK PRODUCTION The following statements are general interpretations for a wide range of common livestock and poultry animals. The actual effect of a particular water source on health or performance depends on many factors, including diet, animal activity, air temperature, animal size, and condition. Interpretations for specific livestock types are available on request, including: *beef cattle, beef calves, dairy cattle, dairy calves, mature hogs, young pigs, poultry, horses, or sheep/goats.*

TOTAL DISSOLVED SOLIDS, CONDUCTIVITY: EXCELLENT QUALITY ("fresh" water): Low salinity level. Suitable for all classes of livestock and poultry.

NITRATE-NITROGEN: VERY LOW: Should have no effect on animal health or performance.

SULFATE: VERY LOW: Considered safe for all classes of livestock. No problems are expected. Could possibly affect poultry performance at upper end of range when sodium, magnesium, or chloride levels are high.

CHLORIDE: VERY LOW: Chloride is considered a dissolved solid. See TDS comments. Levels greater than 15 to 25 mg/L might affect poultry production when sodium exceeds 50 mg/L.

SODIUM: VERY LOW: Presents little or no risk to livestock or poultry.

MAGNESIUM: VERY LOW: Presents little or no risk to livestock or poultry.

POTASSIUM: VERY LOW: This water is considered satisfactory for all classes of animals.

IRON: EXTREMELY HIGH: Performance likely to be affected by improper equipment function, due to high iron concentration resulting in increased microbial growth and biofilm buildup in watering equipment. High iron in drinking water may also reduce water intake which can directly reduce feed intake or milk production. This water may impart off-taste to meat of young animals (e.g., veal calves) or to milk. Excess absorbed iron from drinking water can lead to cellular oxidative stress, can inhibit copper and zinc absorption, and reduced growth or production. Seek professional advice regarding use of this water for livestock consumption.

The reported analytical results apply only to the sample as it was supplied.
The report may not be reproduced, except in full, without permission of ServiTech.

Your opinion is valuable to us. Please let us know what you think about our services! Send an email to feedback@servitech.com.




6921 S. Bell • Amarillo, TX 79109
www.servitech.com

Phone: 806.677.0093

800.557.7509

Fax: 806.677.0329

Lab No.: 347 LABORATORY ANALYSIS RESULTS Date Reported: 10/30/2023

Send To: 55267	NORTHERN NM STOCKMANS ASSOC DR CRISTOBAL VALENCIA 1116 SILVER AVE SW UNIT I ALBUQUERQUE, NM 87102	 Amy Meier Data Review Coordinator
--------------------------	--	---

Sample ID:	AMARILLO - EL RITO COBATO	Date Received:	
Client Name:		Invoice No:	424247
Location:		P.O. #:	
Date/Time Sampled:	10/20/2023	Name of Sampler:	
Date/Time Submitted:	10/24/2023	Name of Submitter:	
Subject:	Livestock Water Lab Analysis	Depth:	

MANGANESE: EXTREMELY HIGH (over 0.0150 mg/L): Performance likely to be affected by improper equipment functions due to high manganese concentration (resulting in increased microbial growth and biofilm buildup) rather than specific livestock health problems. May impart off-taste to meat of young animals (e.g., veal calves).

HARDNESS: HARD: Hardness has no direct effect on drinking water safety or animal health. It can cause scale buildup and clogging of pipes and drinkers, leading to reduced water consumption and associated problems.

AVERAGE DAILY WATER CONSUMPTION (gallons per day)

Beef cattle	7 to 12 per head	Sheep, goats	2 to 4 per head
Dairy cattle	10 to 40 per head	Chickens	8 to 10 per hundred birds
Swine	2 to 8 per head	Turkeys	10 to 15 per hundred birds
Horses	8 to 12 per head		

(Note: Water consumption may increase by 1½ to 2 times when temperatures exceed 80°F.)

The reported analytical results apply only to the sample as it was supplied.
The report may not be reproduced, except in full, without permission of ServiTech.

Your opinion is valuable to us. Please let us know what you think about our services! Send an email to feedback@servitech.com.