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

2024 Rangeland Assessment: YOUNGSVILLE ALLOTMENT

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U.S. DEPARTMENT OF AGRICULTURE

WESTERN SARE
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PRODUCER ASSESSMENT
YOUNGSVILLE ALLOTMENT
2024 GRAZING SEASON

Area: 10,545 grazable acres

Allotment owners: 15

Total Permitted Livestock: 769 cow/calf pairs and bulls

Estimated Stocking Rate: 1137 (based on 40% of 2023 forage production)

Allotment is permitted 67.6% of actual carrying capacity.

Permitted livestock consumed 27.1% of allowable use forage.

Transects:
Punta de la Sierra/Lookout
El Valle (South)
Rincon
Cerro de Grants
Cañada de Grants

Field Days:

6/1/24	6 participants
8/10/24	5 producer participants and 2 USFS participants
10/26/24	5 producer participants and 2 USFS participants
2/16/25	9 producers

Methodology: Qualitative data was systematically gathered using ethnographic methods: face-to-face accompaniment in diverse social, political, and economic contexts of everyday life. Dr. Valencia conducted Participant-observation (DeWalt and DeWalt 2002) prior to livestock entry, during livestock grazing, and after livestock exit. Dr. Valencia also attended cattle association meetings, feast days, fiestas, county fair events, and meetings between producers and management agencies. During participant-observation close attention was paid to producers' descriptions, interpretations, and explanations of rangeland conditions and impacts on their livestock operations, on ranchers' management practices and decision-making processes. Ethnographic field notes were made (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. Participatory mapping exercises (Robinson et al. 2016) were also conducted with producers to plot forage, water, and wildlife observations. Dr. Valencia used visual and audio methods to record qualitative data (Warren and Karner 2015). Qualitative data produces culturally situated understandings of rangeland conditions and impacts on livestock operations from the perspective of Hispano and Native American livestock producers. It supports the development of better management targets and more inclusive decision-making processes.

The Project Team also met with producers and USFS staff to conduct quantitative rangeland assessments using the Rapid Assessment Methodologies and to review end of season summary reports (RAM; Spackman et al. 2022, Allison et al. 2007). Dr. Spackman served as a consultant for producer-led RAM training and data entry through the online Rangeland Data Analysis and Records (RaDAR) program, as well as compiling and producing RaDAR end of season reports.

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Figure 1Producers discussing conditions and data collection methods during field day, June 3, 2024, Cañada de Grants. Photo: C. Valencia

FORAGE

During the mid-season observation one exclusion cage was pushed in and forage was consumed in Cañada de Grants. A repair was made. In Cañada de Grants, Cerro de Grants, and El Valle Sur high elk presence was reflected in decreased forage availability and stubble heights along the transect. Throughout the season producers observed increased forage damage from recreational users, mainly UTVs. Producers noted the presence of larger camps for longer periods of time. Also, pack animals were corralled on the allotment for part of the grazing season causing damage to forage. Overall, producers noted the presence of more outsiders or users not from the community or families of the allotment owners.

After reviewing the mid-season quantitative data, minimum stubble heights guideline for each grass species except POPR in Cerro de Grants were met or exceeded. Available forage from clippings along the transect at mid-season were slightly lower than 2023 especially IN

those areas where producers observed increased and prolonged resident elk presence throughout the grazing season. End-of-season forage availability was just over 100 pounds per acre lower compared to mid-season and over half the amount available in 2023. However, 2024 annual forage production was similar to that of the previous year at approximately 1150 pounds per acre. utilization rose 20% from the previous year to 85.9%. Nevertheless, livestock only accounted for 27.1%, the same as the previous year. Producers attributed similar annual production to observed increases in soil moisture in all transects even with below normal forage availability. At the end of season producers remarked how conditions showed significant wildlife use through the late summer and fall following the removal of livestock.

WATER

Producers observed less water at the beginning of the season in the tanques and earthen dams than in the previous year. While stock water availability was less than in 2023, ground moisture was not noticeably different. However, producers observed impacts to forage growth at the beginning of the season included a slower spring forage growth. Impacts of less water availability were potential early withdraw of cattle for individual producers. Producers were seeking refunds of grazing fees and/or credits for early withdrawal due to water availability in 2023.

Substantial precipitation was widespread throughout the allotment during all parts of the season. Overall, 51.03 inches of rain were recorded over the grazing season. This is a significant increase in precipitation from 2023 (19.71 inches total). Producers observed that although there was substantially more rain, precipitation was inconsistent over the season. Rains fell heavy at once. A second observation was that there were warmer temperatures in between rains especially toward the end of the season. This combination may have contributed to less regrowth of forage.

All water sources rated EXCELLENT quality fresh water suitable for all classes of livestock in terms of total dissolved solids (TSD). Two sources Pavo Spring and Valdez Spring tested EXTREMELY HIGH for iron during Spring. With possible consequences for livestock including reduced 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. One water source at Lookout tested VERY HIGH for Iron and MEDIUM for manganese with limited to no impact on livestock health or production. The Ojo de Leche water source went from Very High in iron and manganese in the Spring with limited to no impact on livestock health or production to EXTREMELY HIGH for both in the mid-season with possible consequences for livestock including reduced water intake which can directly reduce feed intake or milk production. Producers reported no problems with water quality or impact to livestock health.

Figure 2 Early Season water conditions at Ojo de Leche described by producers as low. Cañada de Grants, June 3, 2024. Photo: C. Valencia

WILDLIFE

At the beginning of the year through the end of July elk were grazing alongside cattle day and night seven days a week. All transects during this time showed head counts of 25+ in the field of vision of the camera alone. Elk presence dropped slightly to 3-5 days a week day/night in most transects over the mid-season and 1-3 days a week day/night during the late season. Head counts in the camera field of vision decreased from 25+ (early season) to 5-10 (mid-season) and 1-3 (late season) by the end of the season.

During the middle season high elk presence continued across allotment. There were also a lot of grasshoppers in El Valle Sur during the mid-season. At year's end elk utilization in Cerro de Grants was described by producers as very heavy. Producers noted year-round elk presence with no migration, essentially resident herds. Producers observe that the impact of elk grazing on forage availability in Youngsville is the single biggest factor in rangeland conditions and accounts for nearly 60% of overall forage utilization.

A good example of elk grazing frequency can be found in the analysis of the wildlife camera images from the Rincon transect. Elk grazed the Rincon pasture day and night 6-7 days a week for five of the sixteen-week livestock grazing season, 3-5 days a week day/night for four weeks, and 1-3 times a week for seven weeks. Head counts within the camera's field of view only were 25+ for six weeks, 5-10 head for two weeks, and 1-5 head for eight weeks.

Figure 3 Elk grazing on Rincon pasture captured by motion-sensing camera. Camera date is an error. Actual date is 06-07-2024.

Wildlife Analysis on Rincon Pasture

Frequency	Days/Nights per week	# Weeks
High	6-7	5
Medium	3-5	4
Low	1-3	7

Intensity	Head Count[1]	# Weeks
H+	25	6
H	11-25	0
M	1-10	2
L	1-5	8

[1] Head count is within camera field of vision only (50°x110ft maximum range) and not a true head count of what is on the entire pasture at the time of the photo.

WHAT'S MISSING?

Producers would like data from land management agencies regarding elk head counts and migrations. Producers would also like temperature data and analysis to analyze and correlate to forage, water, and wildlife data.

RECOMMENDATIONS:

Producers suggest adding more transects to support findings and producer observations as well as concerns.

The following information is a summary of the quantitative data collected over the 2024 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 are required (minimum of 3-5 years) to begin developing management decisions (Holecheck et al., 2011). An explanation of the report contents is explained below.

Biomass Availability (also called standing crop or residual biomass) 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 each transect, dried, and weighed. The five weights were then averaged and converted to pounds per acre based on a 0.96 ft^2 hoop conversion factor of 100 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 is 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, clipping forage within a 0.96 ft^2 hoop, which was placed in the middle of each cage. Each sample was subsequently dried, weighed, and averaged together. The average was then converted to pounds per acre based on a 0.96 ft^2 hoop conversion factor of 100 to obtain annual forage production +/- standard error (variability in weights).

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. Individual pasture stocking rates were calculated but used whole allotment grazable acres and are only produced to give an AUM range, not compute actual stocking rate. Estimates are based upon the average collected annual forage production across the allotment, forest service provided grazable acres (pasture size in report) based on the environmental assessment, 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 composition 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 2). 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 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:

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

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 3.

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.

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RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Youngsville**	**Pasture Name:**	**Canada de Grants**	
Date:	**8/10/2024**	**Collector Names:**	**NNMSA**	
Transect Number:	**1**	**GPS Coordinates:**	**36.02083, -106.57083**	**(80°)**

Notes: Lots of elk and livestock grazing at time of monitoring

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
246.6 ± 59.8 lbs per acre	10545 acres	AUM	

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
		Common Name	*Symbol*	*Percent*	*Common Name*	*Percent*
Bare Ground	20.0	Kentucky Bluegrass	POPR	26	Clover spp.	11
Litter	23.0	Sedge	Carex	9	Forb Unknown	9
Vegetation	57.0	Needlegrass	STIPA	2		
Rock (>3/4")	0.0					
	100			37		20

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*
Kentucky Bluegrass	POPR	71	2.8	2.5
Sedge	Carex	26	3.5	1.5
Needlegrass	STIPA	3	4.3	4
		100	3.0	

Fecal Counts

Horse	0	Elk	9	Cattle	11	Deer	0

Ground Photo

Landscape Photo

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Youngsville**	**Pasture Name:**	**Cerro de Grants**	
Date:	**8/10/2024**	**Collector Names:**	**NNMSA**	
Transect Number:	**2**	**GPS Coordinates:**	**36.00917, -106.53944**	**(274°)**

Notes:

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
151.4 ± 32.5 lbs per acre	10545 acres	AUM	

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
		Common Name	*Symbol*	*Percent*	*Common Name*	*Percent*
Bare Ground	15.0	Kentucky Bluegrass	POPR	41	Forb Unknown	18
Litter	13.0	Sedge	Carex	9		4
Vegetation	72.0					
Rock (>3/4")	0.0					
	100			50		22

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*	
Kentucky Bluegrass	POPR	84	2.4	2.5	Below Minimum Height
Sedge	Carex	15	3.3	1.5	
Needlegrass	STIPA	1	9.0	4	
		100	2.6		

Fecal Counts

Horse	0	Elk	17	Cattle	8	Deer	0

Ground Photo

Landscape Photo

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Youngsville**	**Pasture Name:**	**El Valle**	
Date:	**8/10/2024**	**Collector Names:**	**NNMSA**	
Transect Number:	**3**	**GPS Coordinates:**	**36.07461, -106.56447**	**(340°)**

Notes: Forage correlation to elk and livestock grazing

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
350.8 ± 43.7 lbs per acre	10545 acres	AUM	

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
		Common Name	*Symbol*	*Percent*	*Common Name*	*Percent*
Bare Ground	18.2	Sedge	Carex	1	Forb Unknown	38
Litter	42.4					
Vegetation	39.4					
Rock (>3/4")	0.0					
	100			1		38

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*	
Sedge	Carex	87	2.8	1.5	
Kentucky Bluegrass	POPR	12	2.5	2.5	Below Minimum Height
Interm. Wheatgrass	AGIN	1	11.0	4	
		100	2.8		

Fecal Counts

Horse	0	Elk	30	Cattle	10	Deer	0	

Ground Photo

Landscape Photo

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Youngsville**	**Pasture Name:**	**Rincon**	
Date:	**8/10/2024**	**Collector Names:**	**NNMSA**	
Transect Number:	**4**	**GPS Coordinates:**	**36.04989, -106.55314**	**(331°)**

Notes:

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
363.0 ± 34.4 lbs per acre	10545 acres	AUM	

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
Bare Ground	23.0	*Common Name*	*Symbol*	*Percent*	*Common Name*	*Percent*
Litter	5.0	Kentucky Bluegrass	POPR	32		27
Vegetation	72.0	Sedge	Carex	13		
Rock (>3/4")	0.0					
	100			45		27

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*
Kentucky Bluegrass	POPR	65	3.0	2.5
Sedge	Carex	35	3.5	1.5
		100	3.2	

Fecal Counts

Horse	0	Elk	10	Cattle	5	Deer	0	

Ground Photo

Landscape Photo

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Youngsville**	**Pasture Name:**	**Punta de la Sierra**	
Date:	**8/10/2024**	**Collector Names:**	**NNMSA**	
Transect Number:	**5**	**GPS Coordinates:**	**36.12583, -106.548899,**	**(330°)**

Notes:

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
293.0 ± 51 lbs per acre	10545 acres	AUM	

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
		Common Name	*Symbol*	*Percent*	*Common Name*	*Percent*
Bare Ground	33.0	Kentucky Bluegrass	POPR	15		12
Litter	32.0	Sedge	Carex	6		
Vegetation	33.0					
Rock (>3/4")	2.0					
	100			21		12

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*
Sedge	Carex	50	3.8	1.5
Kentucky Bluegrass	POPR	50	4.3	2.5
		100	4.1	

Fecal Counts

Horse	0	Elk	3	Cattle	8	Deer	0	

Ground Photo

Landscape Photo

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Youngsville**	**Pasture Name:**	**n/a**	
Date:	**8/10/2024**	**Collector Names:**	**n/a**	
Transect AVERAGES	**1,2,3,4,5**	**GPS Coordinates:**	**n/a**	**n/a**

Notes: **AVERAGES**

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
281.0 ± 24.3 lbs per acre	10545 acres	AUM	

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
Bare Ground	21.8	*Common Name*	*Symbol*	*Percent*	*Common Name*	*Percent*
Litter	23.0	Kentucky Bluegrass	POPR	23	Forb Unknown	21
Vegetation	54.7	Sedge	Carex	8	Clover spp.	3
Rock (>3/4")	0.4	Needlegrass	STIPA	0		
	100			31		24

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*
Kentucky Bluegrass	POPR	57	3.0	2.5
Sedge	Carex	42	3.3	1.5
Needlegrass	STIPA	1	5.5	4
Interm. Wheatgrass	AGIN	0	11.0	4
		100	3.16 ± 0.06	

Fecal Counts

Horse	0	Elk	69	Cattle	42	Deer	0		0

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Youngsville**	**Pasture Name:**	**Canada de Grants**	
Date:	**10/26/2024**	**Collector Names:**	**NNMSA**	
Transect Number:	**1**	**GPS Coordinates:**	**36.02083, -106.57083**	**(80°)**

Notes:

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
234.2 ± 60.7 lbs per acre	10545 acres	17265.0 AUM	3192.7 ± 280 lbs per acre

Percent Cover

Bare Ground	8.0
Litter	54.0
Vegetation	38.0
Rock (>3/4")	0.0
	100

Vegetation Cover - Grasses

Common Name	*Symbol*	*Percent*
Kentucky Bluegrass	POPR	36
		36

Other Vegetation Cover

Common Name	*Percent*
Clover spp.	2
Iris spp.	
	2

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*	
Kentucky Bluegrass	POPR	89	1.4	2.5	Below Minimum Height
Sedge	Carex	11	3.3	1.5	
		100	1.6		

Fecal Counts

Horse	0	Elk	3	Cattle	4	Deer	0

Ground Photo

Landscape Photo

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Youngsville**	**Pasture Name:**	**Cerro de Grants**	
Date:	**10/26/2024**	**Collector Names:**	**NNMSA**	
Transect Number:	**2**	**GPS Coordinates:**	**36.00917, -106.53944**	**(274°)**

Notes:

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
28.2 ± 8 lbs per acre	10545 acres	3962.0 AUM	732.7 ± 350 lbs per acre

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
Bare Ground	15.0	*Common Name*	*Symbol*	*Percent*	*Common Name*	*Percent*
Litter	51.0	Kentucky Bluegrass	POPR	20	Clover spp.	11
Vegetation	33.0	Sedge	Carex	2		
Rock (>3/4")	1.0					
	100			22		11

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*	
Kentucky Bluegrass	POPR	96	1.1	2.5	Below Minimum Height
Sedge	Carex	4	1.5	1.5	
		100	1.1		

Fecal Counts

Horse	0	Elk	14	Cattle	1	Deer	0	

Ground Photo

Landscape Photo

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Youngsville**	**Pasture Name:**	**El Valle**	
Date:	**10/26/2024**	**Collector Names:**	**NNMSA**	
Transect Number:	**3**	**GPS Coordinates:**	**36.07461, -106.56447**	**(340°)**

Notes:

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
121.2 ± 21.9 lbs per acre	10545 acres	4131.5 AUM	764.0 ± 10 lbs per acre

Percent Cover

Bare Ground	7.1
Litter	79.8
Vegetation	13.1
Rock (>3/4")	0.0
	100

Vegetation Cover - Grasses

Common Name	*Symbol*	*Percent*
Sedge	Carex	5
Kentucky Bluegrass	POPR	3
		8

Other Vegetation Cover

Common Name	*Percent*
Forb Unknown	5
	5

Forage Composition

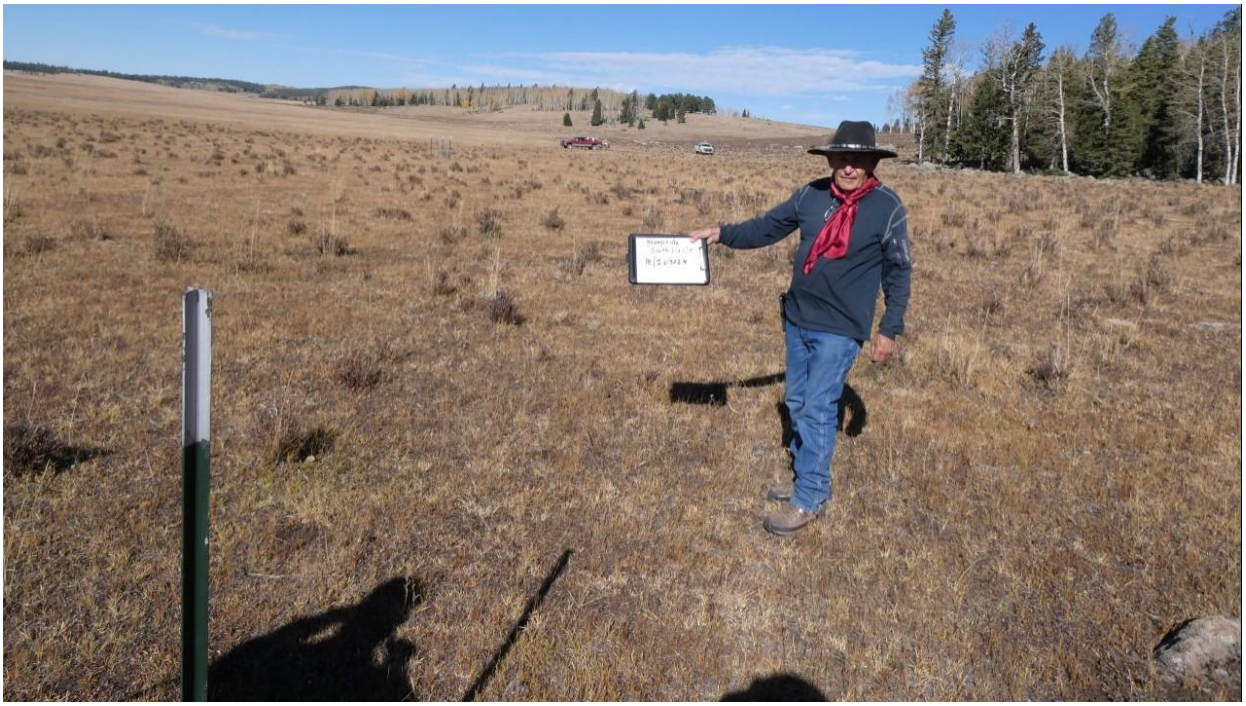
Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*	
Sedge	Carex	86	2.2	1.5	
Kentucky Bluegrass	POPR	14	1.1	2.5	Below Minimum Height
		100	2.1		

Fecal Counts

Horse	0	Elk	4	Cattle	0	Deer	0

Ground Photo

Landscape Photo



RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Youngsville**	**Pasture Name:**	**Rincon**	
Date:	**10/26/2024**	**Collector Names:**	**NNMSA**	
Transect Number:	**4**	**GPS Coordinates:**	**36.04989, -106.55314**	**(331°)**

Notes:

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
186.0 ± 38.7 lbs per acre	10545 acres	3383.4 AUM	625.7 ± 150 lbs per acre

Percent Cover

Bare Ground	13.0
Litter	46.0
Vegetation	39.0
Rock (>3/4")	2.0
	100

Vegetation Cover - Grasses

Common Name	*Symbol*	*Percent*
Kentucky Bluegrass	POPR	13
Sedge	Carex	3
		16

Other Vegetation Cover

Common Name	*Percent*
	23
	23

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*	
Kentucky Bluegrass	POPR	73	1.4	2.5	Below Minimum Height
Sedge	Carex	27	3.4	1.5	
		100	1.9		

Fecal Counts

Horse	0	Elk	0	Cattle	0	Deer	0

Ground Photo

Landscape Photo

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Youngsville**	**Pasture Name:**	**Punta de la Sierra**	
Date:	**10/26/2024**	**Collector Names:**	**NNMSA**	
Transect Number:	**5**	**GPS Coordinates:**	**36.12583, -106.548899,**	**(330°)**

Notes:

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
245.6 ± 34.7 lbs per acre	10545 acres	2521.8 AUM	466.3 ± 140 lbs per acre

Percent Cover

Bare Ground	8.0
Litter	60.0
Vegetation	29.0
Rock (>3/4")	3.0
	100

Vegetation Cover - Grasses

Common Name	*Symbol*	*Percent*
Kentucky Bluegrass	POPR	5
Sedge	Carex	4
		9

Other Vegetation Cover

Common Name	*Percent*
	20
	20

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*	
Kentucky Bluegrass	POPR	60	1.9	2.5	Below Minimum Height
Sedge	Carex	40	2.3	1.5	
		100	2.1		

Fecal Counts

Horse	0	Elk	2	Cattle	1	Deer	0

Ground Photo

Landscape Photo

RaDAR - Rangeland Data Analysis & Record

Producer Name:	**Youngsville**	**Pasture Name:**	**n/a**	
Date:	**10/26/2024**	**Collector Names:**	**n/a**	
Transect AVERAGES	**1,2,3,4,5**	**GPS Coordinates:**	**n/a**	**n/a**

Notes: **AVERAGES**

Biomass Availability	**Pasture Size**	**Estimated Stocking Rate**	**Annual Forage Production**
163.0 ± 22.4 lbs per acre	10545 acres	6252.7 AUM	1156.3 ± 294 lbs per acre

Percent Cover		**Vegetation Cover - Grasses**			**Other Vegetation Cover**	
Bare Ground	10.2	*Common Name*	*Symbol*	*Percent*	*Common Name*	*Percent*
Litter	58.1	Kentucky Bluegrass	POPR	15	Forb Unknown	10
Vegetation	30.5	Sedge	Carex	3	Clover spp.	3
Rock (>3/4")	1.2					
	100			18		12

Forage Composition

Common Name	*Symbol*	*Percent*	*Avg. Height (inches)*	*Minimum Stubble Height Guidline*	
Kentucky Bluegrass	POPR	66	1.4	2.5	Below Minimum Height
Sedge	Carex	34	2.5	1.5	
		100	1.73 ± 0.05		

Fecal Counts

Horse	0	Elk	23	Cattle	6	Deer	0		0

Table 1. Allotment summary and operational conditions based on US Forest Service Environmental Assessment.

	Total Allotment Acres	Grazable Acres	†Adjusted Grazable Acres	Allotment Elevation (feet)	Permitted Livestock (AUE)	Grazing Duration (days)	Entry Date	Exit Date
Youngsville	30456	10545	18729	6700 to 9800	769	165	May 16	Oct 31

†adjustments to grazable acres based on 2024 GIS assessment provided by US Forest Service; AUE = Animal Unit Equivalent.

Table 2. Allotment Production and Use for 2024 grazing season (mean ± standard error).

	Mid-Year Biomass (lbs/acre)	Year-End Biomass (lbs/acre)	Annual Production (lbs/acre)	Utilization as a Percent[1]
Canada de Grants	246.6 ± 59.8	234.2 ± 60.7	3192.7 ± 280.0	92.7
Cerro de Grants	151.4 ± 32.5	28.2 ± 8.0	732.7 ± 350.0	96.2
El Valle	350.8 ± 43.7	121.2 ± 21.9	764.0 ± 10.0	84.1
Rincon	363.0 ± 34.4	186.0 ± 38.7	625.7 ± 150.0	70.3
Punta de la Sierra	293.0 ± 51.0	245.6 ± 34.7	466.3 ± 140.0	47.3
Averages	281.0 ± 24.3	163.0 ± 22.4	1156.3 ± 293.9	85.9 ± 8.9

$$\frac{(annual\ production - year\ end\ biomass)}{annual\ production} \times 100 = percent\ utilization^{1}$$

Table 3. Youngsville allotment utilization for 2024 grazing season, partitioned use, and expected cow intake based on the Physical Constraint of Intake model for cattle.

*Grazable Acres			
Utilization as a Percent[1]	Cattle Utilization as a Percent[2]	Other Utilization as a Percent	Cow Intake from Observed Utilization (lbs/day)[3]
85.9	27.1	58.8	82.5
†Adjusted Grazable Acres			
85.9	15.2	70.7	146.6

*based on 2008 US Forest Service Environmental Assessment; †based on 2024 GIS assessment provided by US Forest Service.

$$\frac{(annual\ production - year\ end\ biomass)}{annual\ production} \times 100 = percent\ utilization^{1}$$

$$\frac{(animal\ demand \times grazing\ duration \times permitted\ animals)}{(annual\ production \times grazable\ acres)} \times 100 = percent\ utilization^{2}$$

$$\frac{(annual\ production \times grazable\ acres \times observed\ utilization)}{(grazing\ duration \times permitted\ animals} = animal\ demand\ or\ daily\ intake^{3}$$

Youngsville Allotment

2024

Key Area	Date	Amount	Reported by
Lookout	6/14/2024	0.47	Earl Valdez
	7/4/2024	2.65	Earl Valdez
	7/22/2024	0.6	Philip Madrid
	8/10/2024	1.66	
	8/11/2024	0.62	Earl Valdez
	10/26/2024	3.4	
		9.4	
Cañada de Grants	6/20/2024	1.25	Cornelio Salazar
	7/12/2024	1.9	Cornelio Salazar
	7/21/2024	0.6	Cornelio Salazar
	8/10/2024	1.08	
	8/14/2024	0.71	Cornelio Salazar
	8/28/2024	0.5	Cornelio Salazar
	10/10/2024	1.3	Carlos Salazar
	10/26/2024	1.13	Cornelio Salazar
		8.47	
Cerro de Grants	6/20/2024	1.6	Cornelio Salazar
	7/12/2024	1.3	Cornelio Salazar
	7/21/2024	0.55	Cornelio Salazar
	8/10/2024	3	
	8/14/2024	0.61	Cornelio Salazar
	8/28/2024	0.5	Cornelio Salazar
	10/10/2024	1.6	Carlos Salazar
	10/26/2024	1.41	Cornelio Salazar
		10.57	
Rincon			
	7/12/2024	1.3	Cornelio Salazar
	7/21/2024	1	Cornelio Salazar
	8/10/2024	2.38	

	8/14/2024	1.1	Cornelio Salazar
	10/10/2024	2.6	Carlos Salazar
	10/26/2024	1.21	
		9.59	
El Valle South	7/7/2024	2.3	Earl Valdez
	7/22/2024	1.1	Philip Madrid
	8/10/2024	2.73	
	10/26/2024	6.87	
		13	

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Fax: 806.677.0329

Lab No.: 3432

LABORATORY ANALYSIS RESULTS

Date Reported: 06/18/2024

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:	LOOKOUT	**Date Received:**	
Client Name:		**Invoice No:**	425740
Location:		**P.O. #:**	
Date/Time Sampled:	06/01/2024	**Name of Sampler:**	
Date/Time Submitted:	06/11/2024	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock

		Excellent	Good	Fair	Poor	Very Poor
		1000	2000	4000	6000	10000
Total Dissolved Solids (Calc) (TDS), mg/L	68					
		Very Low	Low	Medium	High	Very High
		10.0	30.0	70.0	100	300
Nitrate Nitrogen (NO3-N), mg/L	<0.1					
		200	500	1000	2500	4000
Sulfate (SO4), mg/L	<0.6					
		65	170	340	670	1300
Sulfate-Sulfur (SO4-S), mg/L	<0.2					
		35	130	250	500	1000
Chloride (Cl), mg/L	1.8					
		25	75	150	300	500
Total Sodium (Na), mg/L	2					
		40	100	200	400	600
Total Calcium (Ca), mg/L	10					
		25	50	120	250	500
Total Magnesium (Mg), mg/L	4					
		40	80	120	160	200
Total Potassium (K), mg/L	10					
		0.10	0.20	0.40	0.80	1.20
Total Iron (Fe), mg/L	0.89					
		0.010	0.025	0.050	0.075	0.150
Total Manganese (Mn), mg/L	0.030					
		Soft	Moderately Hard	Hard	Very Hard	Brackish
		60	120	180	270	400
Hardness (CaCO3), mg/L	41					
		3.5	7.0	11	16	24
Hardness (CaCO3), grains/gal	2.4					

Additional Tests

Electrical Conductivity (EC @ 25C), µmho/cm	106

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Lab No.: 3432

LABORATORY ANALYSIS RESULTS

Date Reported: 06/18/2024

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:	LOOKOUT	**Date Received:**	
Client Name:		**Invoice No:**	425740
Location:		**P.O. #:**	
Date/Time Sampled:	06/01/2024	**Name of Sampler:**	
Date/Time Submitted:	06/11/2024	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock

		Acidic			Neutral			Alkaline
		5.0		6.0		7.0		8.0		9.0
pH, unit	7.9							

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.

IRON: VERY HIGH: Livestock performance may be affected by improper equipment function rather than health problems. High iron concentration may result in increased microbial growth and biofilm buildup in watering equipment. May impart off-taste to milk or to meat of young animals (e.g., veal calves).

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

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LABORATORY ANALYSIS RESULTS

Date Reported: 06/18/2024

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:	LOOKOUT	**Date Received:**	
Client Name:		**Invoice No:**	425740
Location:		**P.O. #:**	
Date/Time Sampled:	06/01/2024	**Name of Sampler:**	
Date/Time Submitted:	06/11/2024	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

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.)

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Lab No.: 3435

LABORATORY ANALYSIS RESULTS

Date Reported: 06/18/2024

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:	OJO DE LECHE	**Date Received:**	
Client Name:		**Invoice No:**	425740
Location:		**P.O. #:**	
Date/Time Sampled:	06/01/2024	**Name of Sampler:**	
Date/Time Submitted:	06/11/2024	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock

		Excellent	Good	Fair	Poor	Very Poor
		1000	2000	4000	6000	10000
Total Dissolved Solids (Calc) (TDS), mg/L	83					

		Very Low	Low	Medium	High	Very High
		10.0	30.0	70.0	100	300
Nitrate Nitrogen (NO3-N), mg/L	<0.1					
		200	500	1000	2500	4000
Sulfate (SO4), mg/L	3.0					
		65	170	340	670	1300
Sulfate-Sulfur (SO4-S), mg/L	1.0					
		35	130	250	500	1000
Chloride (Cl), mg/L	2.6					
		25	75	150	300	500
Total Sodium (Na), mg/L	5					
		40	100	200	400	600
Total Calcium (Ca), mg/L	13					
		25	50	120	250	500
Total Magnesium (Mg), mg/L	4					
		40	80	120	160	200
Total Potassium (K), mg/L	12					
		0.10	0.20	0.40	0.80	1.20
Total Iron (Fe), mg/L	0.99					
		0.010	0.025	0.050	0.075	0.150
Total Manganese (Mn), mg/L	0.150					

		Soft	Moderately Hard	Hard	Very Hard	Brackish
		60	120	180	270	400
Hardness (CaCO3), mg/L	48					
		3.5	7.0	11	16	24
Hardness (CaCO3), grains/gal	2.8					

Additional Tests

Electrical Conductivity (EC @ 25C), µmho/cm	129

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LABORATORY ANALYSIS RESULTS

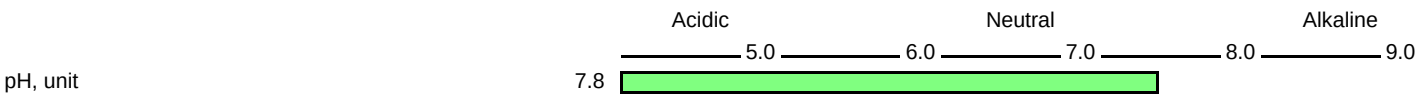
Date Reported: 06/18/2024

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:	OJO DE LECHE	**Date Received:**	
Client Name:		**Invoice No:**	425740
Location:		**P.O. #:**	
Date/Time Sampled:	06/01/2024	**Name of Sampler:**	
Date/Time Submitted:	06/11/2024	**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.

IRON: VERY HIGH: Livestock performance may be affected by improper equipment function rather than health problems. High iron concentration may result in increased microbial growth and biofilm buildup in watering equipment. May impart off-taste to milk or to meat of young animals (e.g., veal calves).

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Lab No.: 3435

LABORATORY ANALYSIS RESULTS

Date Reported: 06/18/2024

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:	OJO DE LECHE	**Date Received:**	
Client Name:		**Invoice No:**	425740
Location:		**P.O. #:**	
Date/Time Sampled:	06/01/2024	**Name of Sampler:**	
Date/Time Submitted:	06/11/2024	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

MANGANESE: VERY HIGH (0.075 - 0.150 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: 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.)

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Lab No.: 3434

LABORATORY ANALYSIS RESULTS

Date Reported: 06/18/2024

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:	PAVO SPRING	**Date Received:**	
Client Name:		**Invoice No:**	425740
Location:		**P.O. #:**	
Date/Time Sampled:	06/01/2024	**Name of Sampler:**	
Date/Time Submitted:	06/11/2024	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock

		Excellent	Good	Fair	Poor	Very Poor
		1000	2000	4000	6000	10000
Total Dissolved Solids (Calc) (TDS), mg/L	37					
		Very Low	Low	Medium	High	Very High
		10.0	30.0	70.0	100	300
Nitrate Nitrogen (NO3-N), mg/L	0.41					
		200	500	1000	2500	4000
Sulfate (SO4), mg/L	4.2					
		65	170	340	670	1300
Sulfate-Sulfur (SO4-S), mg/L	1.4					
		35	130	250	500	1000
Chloride (Cl), mg/L	2.7					
		25	75	150	300	500
Total Sodium (Na), mg/L	4					
		40	100	200	400	600
Total Calcium (Ca), mg/L	6					
		25	50	120	250	500
Total Magnesium (Mg), mg/L	1					
		40	80	120	160	200
Total Potassium (K), mg/L	2					
		0.10	0.20	0.40	0.80	1.20
Total Iron (Fe), mg/L	1.28					
		0.010	0.025	0.050	0.075	0.150
Total Manganese (Mn), mg/L	0.020					
		Soft	Moderately Hard	Hard	Very Hard	Brackish
		60	120	180	270	400
Hardness (CaCO3), mg/L	19					
		3.5	7.0	11	16	24
Hardness (CaCO3), grains/gal	1.1					

Additional Tests

Electrical Conductivity (EC @ 25C), µmho/cm	58.2

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Fax: 806.677.0329

Lab No.: 3434

LABORATORY ANALYSIS RESULTS

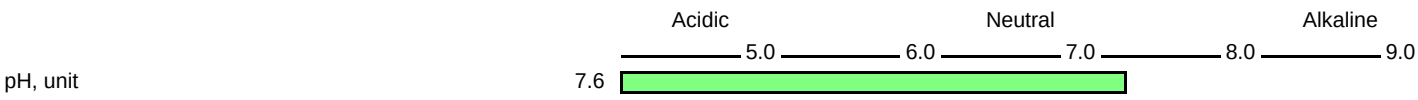
Date Reported: 06/18/2024

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:	PAVO SPRING	**Date Received:**	
Client Name:		**Invoice No:**	425740
Location:		**P.O. #:**	
Date/Time Sampled:	06/01/2024	**Name of Sampler:**	
Date/Time Submitted:	06/11/2024	**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.

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LABORATORY ANALYSIS RESULTS

Date Reported: 06/18/2024

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:	PAVO SPRING	**Date Received:**	
Client Name:		**Invoice No:**	425740
Location:		**P.O. #:**	
Date/Time Sampled:	06/01/2024	**Name of Sampler:**	
Date/Time Submitted:	06/11/2024	**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: LOW (0.010 to 0.025 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.)

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Lab No.: 3433

LABORATORY ANALYSIS RESULTS

Date Reported: 06/18/2024

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:	VALDEZ	**Date Received:**	
Client Name:		**Invoice No:**	425740
Location:		**P.O. #:**	
Date/Time Sampled:	06/01/2024	**Name of Sampler:**	
Date/Time Submitted:	06/11/2024	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock

		Excellent	Good	Fair	Poor	Very Poor
		1000	2000	4000	6000	10000
Total Dissolved Solids (Calc) (TDS), mg/L	49					
		Very Low	Low	Medium	High	Very High
		10.0	30.0	70.0	100	300
Nitrate Nitrogen (NO3-N), mg/L	<0.1					
		200	500	1000	2500	4000
Sulfate (SO4), mg/L	<0.6					
		65	170	340	670	1300
Sulfate-Sulfur (SO4-S), mg/L	<0.2					
		35	130	250	500	1000
Chloride (Cl), mg/L	<1					
		25	75	150	300	500
Total Sodium (Na), mg/L	1					
		40	100	200	400	600
Total Calcium (Ca), mg/L	7					
		25	50	120	250	500
Total Magnesium (Mg), mg/L	3					
		40	80	120	160	200
Total Potassium (K), mg/L	9					
		0.10	0.20	0.40	0.80	1.20
Total Iron (Fe), mg/L	1.21					
		0.010	0.025	0.050	0.075	0.150
Total Manganese (Mn), mg/L	0.010					
		Soft	Moderately Hard	Hard	Very Hard	Brackish
		60	120	180	270	400
Hardness (CaCO3), mg/L	29					
		3.5	7.0	11	16	24
Hardness (CaCO3), grains/gal	1.7					

Additional Tests

Electrical Conductivity (EC @ 25C), µmho/cm	76.3

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Lab No.: 3433

LABORATORY ANALYSIS RESULTS

Date Reported: 06/18/2024

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:	VALDEZ	**Date Received:**	
Client Name:		**Invoice No:**	425740
Location:		**P.O. #:**	
Date/Time Sampled:	06/01/2024	**Name of Sampler:**	
Date/Time Submitted:	06/11/2024	**Name of Submitter:**	UPS
Subject:	Livestock Water Lab Analysis	**Depth:**	

Livestock

		Acidic 5.0	6.0	Neutral 7.0	8.0	Alkaline 9.0
pH, unit	7.9					

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*.

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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.

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Lab No.: 3433

LABORATORY ANALYSIS RESULTS

Date Reported: 06/18/2024

Send To:
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NORTHERN NM STOCKMANS ASSOC
DR CRISTOBAL VALENCIA
1116 SILVER AVE SW UNIT I
ALBUQUERQUE, NM 87102

Amy Meier
Data Review Coordinator

Sample ID:	VALDEZ	**Date Received:**	
Client Name:		**Invoice No:**	425740
Location:		**P.O. #:**	
Date/Time Sampled:	06/01/2024	**Name of Sampler:**	
Date/Time Submitted:	06/11/2024	**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.

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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.)

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Lab No.: 4747

LABORATORY ANALYSIS RESULTS

Date Reported: 08/19/2024

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:	OJO DE LECHE	**Date Received:**	
Client Name:		**Invoice No:**	426207
Location:		**P.O. #:**	
Date/Time Sampled:	08/10/2024	**Name of Sampler:**	C VALENCIA
Date/Time Submitted:	08/13/2024	**Name of Submitter:**	
Subject:	Drinking Water Lab Analysis	**Depth:**	

Livestock

		Excellent	Good	Fair	Poor	Very Poor
		1000	2000	4000	6000	10000
Total Dissolved Solids (Calc) (TDS), mg/L	144					
		Very Low	Low	Medium	High	Very High
		10.0	30.0	70.0	100	300
Nitrate Nitrogen (NO3-N), mg/L	<0.1					
		200	500	1000	2500	4000
Sulfate (SO4), mg/L	<0.6					
		65	170	340	670	1300
Sulfate-Sulfur (SO4-S), mg/L	<0.2					
		35	130	250	500	1000
Chloride (Cl), mg/L	4.5					
		25	75	150	300	500
Total Sodium (Na), mg/L	5					
		40	100	200	400	600
Total Calcium (Ca), mg/L	28					
		25	50	120	250	500
Total Magnesium (Mg), mg/L	6					
		40	80	120	160	200
Total Potassium (K), mg/L	22					
		0.10	0.20	0.40	0.80	1.20
Total Iron (Fe), mg/L	7.05					
		0.010	0.025	0.050	0.075	0.150
Total Manganese (Mn), mg/L	1.81					
		Soft	Moderately Hard	Hard	Very Hard	Brackish
		60	120	180	270	400
Hardness (CaCO3), mg/L	94					
		3.5	7.0	11	16	24
Hardness (CaCO3), grains/gal	5.5					

Additional Tests

Electrical Conductivity (EC @ 25C), µmho/cm	225

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LABORATORY ANALYSIS RESULTS

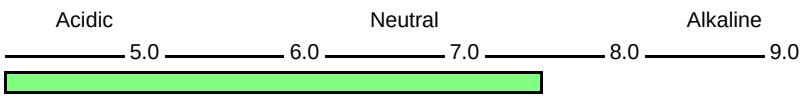
Date Reported: 08/19/2024

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:	OJO DE LECHE	**Date Received:**	
Client Name:		**Invoice No:**	426207
Location:		**P.O. #:**	
Date/Time Sampled:	08/10/2024	**Name of Sampler:**	C VALENCIA
Date/Time Submitted:	08/13/2024	**Name of Submitter:**	
Subject:	Drinking Water Lab Analysis	**Depth:**	

Livestock



More information is available at **cropfile.servitech.com**, 5.00.000 Water Resource Management (panel), 5.03 Livestock Water Quality (dropdown) and 5.03 Livestock Water Surveys (dropdown).

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*.

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Date/Time Submitted:	08/13/2024	**Name of Submitter:**	
Subject:	Drinking 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	

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