

AGRICULTURE AND COALBED METHANE (CBM) PRODUCED WATER IN LAS ANIMAS COUNTY

ECONOMIC SNAPSHOT

Las Animas County has approximately 600 farms and ranches, occupying over 2.1 million acres of the county (71% of total county acreage). Just as agriculture makes up a large portion of land use in the county, it is also a real contributor to the local economy. Below is a snapshot of the agricultural economy in Las Animas County*:

- Proprietor and non-proprietor farm employment of **579 people in 2010** (7% of total county employment)
- Total non-proprietor farm employee earnings amounted to over **\$3 million in 2010**, (about 1.1% of total county-wide earnings)
- Cattle and calf sales amounted to **\$21.9 million in 2007**, making up 87% of the total value of all agricultural products sold
- Crop sales amounted to **\$3.4 million in 2007**, or an average of about \$113 per harvested acre

*All data is the most recent available data

Agricultural Operations

Las Animas County farmland makes up about 7% of farmland in Colorado. County agriculture is mostly dedicated to raising livestock and growing crops to feed those livestock. About 320 farms include cattle and calf operations, with an average of 153 head per farm. Many of the County's cattle operations are relatively small; more than 50% of operations have less than 50 head.



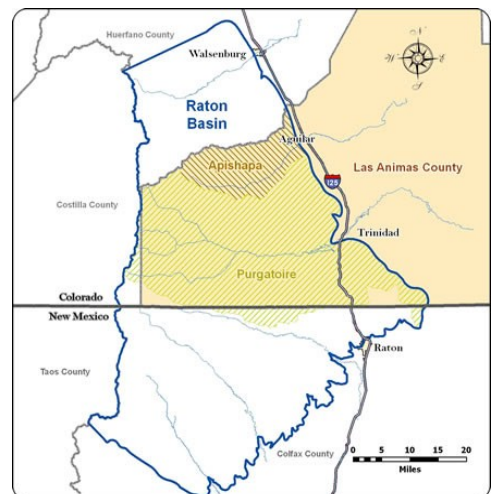
About 5% of Las Animas County farmland is cropland, mainly dry land. However, the county does have more than 18,000 irrigated acres, generally located east of I-25. Irrigated production focuses on forage, mainly grass and hay, which supports cow/calf operations. Other crops grown include wheat, sorghum and corn. Aside from local rancher use, hay from irrigated land is sold to dry land cattle operators outside the area.

Agricultural Water Use

About 80 to 85% of total water use in Las Animas County goes towards agriculture. No irrigated cropland exists on tributaries to the Purgatoire River west of I-25. The majority of agricultural water use occurs downstream of Trinidad Reservoir for crop irrigation.

Water requirements for irrigation amount to more than 41,000 acre-feet (AF) per year. Based upon historical diversions, irrigated acres, crop mix and irrigation water requirements, the average annual shortage for irrigation exceeds 14,000 AF. Surface water is about three times over appropriated in Las Animas County; many water rights are unfulfilled due to lack of a sufficient supply.

In Las Animas County, livestock consume more than 950 AF of water per year. Access to a sufficient supply of drinking water supports overall cattle health, including body temperature regulation, digestion, and reproduction, and also promotes growth and weight gain.



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Role of CBM Produced Water in Agriculture

Between 7,000 and 8,000 acre-feet of CBM produced water is discharged into tributaries of the Purgatoire River yearly. Some of this water flows into ponds for livestock watering which helps disperse cattle grazing and improve the overall condition of rangeland vegetation.

About 4,000 acre-feet of CBM water reaches the mainstem of the Purgatoire River each year, where it becomes available to downstream users. The quality of produced water in the tributaries is suitable for livestock watering and, once it reaches the mainstem, also becomes suitable for crop irrigation. CBM produced water is available year-round, making it an important source of water to cattle ranchers in winter months and farmers during the late season growing period as well as in drier years.

Economic Importance of CBM Produced Water to Agricultural Operations

CBM water represents about 8% of total Purgatoire River flow. Applying that figure to County agricultural production demonstrates the contribution of CBM companies to this economic sector. The availability of CBM water adds nearly \$2.0 million to Las Animas County agricultural sales each year, resulting in roughly \$3.5 million in total annual local economic activity. In 2010, CBM produced water helped support more than 40 agricultural jobs and over 80 total jobs in the County, with associated total personal income of about \$630,000.

Sources: Harvey Economics obtained data and information from federal and state agencies, CBM operators and interviews with local groups and landowners.

Future of CBM Produced Water and Agriculture

The Raton Basin has an estimated 20 to 40 years of productive life remaining. The pace and amount of annual CBM extraction and water production depends on:

- ◆ Gas prices – natural gas prices are volatile
- ◆ Production costs, including drilling, materials and transportation costs
- ◆ Costs of produced water treatment and injection

Regulation of produced water impacts disposal costs, and affects the amount of gas and water production. Changes in permit limits or other regulations could result in re-injection of all CBM produced water in the County or the shutting in of some wells, meaning CBM water would not be available to agriculture.

Without water from CBM wells, County agricultural operations would be adversely affected:

- ◆ Reduced irrigated acreage for crop production, by as many as 2,600 acres (14% of current irrigated acres)
- ◆ Livestock inventory might be reduced, especially on ranches near Purgatoire River tributaries
- ◆ A decrease of almost \$2.0 million in livestock and crop sales, \$3.5 million in total economic activity, over 80 total jobs and \$630,000 in income throughout the County

