

## History

RCM Digesters, Inc. designs and builds anaerobic digester systems and supplies specialty equipment, employing proprietary technology and know-how. The technology has been tested and proven over the last 20 years. RCM is the national market leader in livestock waste anaerobic digestion technology.

## Products and Services

- ✂✂ Anaerobic digestion feasibility studies – system layout, costs and benefits
- ✂✂ Complete anaerobic digester design, construction management, startup and troubleshooting;
- ✂✂ Power Market Development
- ✂✂ By-Product Market Development
- ✂✂ Regulatory compliance and Expert witness services

## Design Approach

RCM has been designing and building farm digesters since 1982. We know farms and farmers. Farmers hire us because they expect their digester project to succeed. RCM designs 4 different types of digesters because of the differences between farms. We develop the right digester in a cost efficient configuration for each project by conducting pre-design studies on the farm. RCM designs the system, selects and supplies the equipment. RCM has OEM relationships with suppliers to control price and quality. RCM knows that the success of the system depends on owner satisfaction.

## Digester Technology Options

**RCM Covered Lagoons:** For flush collected pig and dairy wastes in warm climates.

**RCM Complete Mix Digesters:** For scraped or pull plug pig or dairy wastes in cold climates.

**RCM Heated, Mixed Covered Lagoon:** For scraped or pull plug pig or dairy wastes in moderate climates where the goal is odor control rather than optimum gas production.

**RCM Plug Flow Dairy Digester:** For scrape-collected dairy manure in any climate.

## Gas Use Options

**Internal Combustion Engines:** To produce electricity, RCM offers engine generators that are reliable and have local parts and service.

**Boilers:** Where heat is the primary energy need, RCM offers biogas boilers.

**Flares:** Where the primary goal is low cost odor control, RCM offers gas collection and flares

## International Experience

RCM has provided consulting services in Armenia, Belize, Chile, Colombia, Costa Rica, Ireland, Japan, Korea, Mexico, the Philippines, and Taiwan.

## Digester Cogeneration Systems

### Dairy

#### Plug Flow

- ✂✂ October 2002 – IL, 2,000 cow digester 240 kW, building heat, separators
- ✂✂ May 2002– Stencil Dairy, Denmark, WI, 1200 cows, 160 kW, building heat, separator
- ✂✂ January 2002– Rebuild, update and expand non-RCM digester, Koetsier Dairy, Visalia, CA 1500 cows, 210 kW, building heat, separator
- ✂✂ October 2001– DDI, Homer, NY, 1000 cows, boiler, experimental gas turbine, building heat, separator
- ✂✂ September 1999 - ICF, Inc./AgSTAR, Haubenschild Dairy, Princeton, MN - 1000 cows, 135 kW engine, building heat, separator
- ✂✂ September 1997 - ICF, Inc./AgSTAR, Freund Dairy, E. Canaan, CT, - 250 cows, boiler, building heat, separator
- ✂✂ September 1997 - ICF, Inc./AgSTAR, AA Dairy, Candor, NY - 1000 cows, 120 kW engine, boiler, building heat, separator
- ✂✂ December 1996 - Craven Dairy, Cloverdale, OR - 1000 cows, 120 kW, separator
- ✂✂ December 1985 - Luiz Dairy, Lodi, CA - Rebuild non-RCM 900 cows, 140 kW,
- ✂✂ February, 1985 - M&M Dairy, Gonzales, CA - 400 cows, 60 kW, separator
- ✂✂ June, 1983 - Frey Dairy, Conestoga, PA - 600 cows, 100 kW, separator
- ✂✂ December, 1982 - Langerwerf Dairy, Durham, CA - 500 cows, 85 kW, building heat, separator

#### Complete Mix

- ✂✂ November 2001– Matlink Dairy, Clymer, NY, 900 cows, organic wastes, 135 kW, generator, building heat, separator

#### Covered Lagoon

- ✂✂ July 1995 - 1998- Cal Poly Dairy, San Luis Obispo, CA – Process design, 400 cow capacity

#### Miscellaneous

- ✂✂ September 1989 - Cleek Dairy Farm, Kingsport, TN - Rebuild 120 cow non-RCM tank digester, 25 kW

## Swine

### Complete Mix

- ✂✂October 2002 – Western US - 5,000 sow farrow to wean, 80 kW generator
- ✂✂October 2000 – Rebuild, update and expand non-RCM digester, Rocky Knoll Farms, Lancaster, PA, 4,000 pigs and organic waste, 100 kW generator
- ✂✂September 1999 - ICF, Inc./AgSTAR, Colorado Pork, Lamar, CO - 5,000 sow farrow to wean, 80 kW generator
- ✂✂July 1999 - ICF, Inc./AgSTAR SWUSA, Thayer, IA, - 5,000 sow farrow to wean, 80 kW generator
- ✂✂October 1997 - Seoul National Technical University, 5 m<sup>3</sup> - research digester
- ✂✂October 1989 - NMP, Tokyo, Japan - Kazuno Farm - 2 digesters - 925 sow farrow to finish (21,000 hogs), 80 kW
- ✂✂January 1989 - NMP, Tokyo, Japan, Yokohama Farm, Aomori - 2 digesters, 1250 sow farrow to finish (30,000 hogs), 120 kW, building heat
- ✂✂November 1988 - Sugar Creek Hog Farm, Crawfordsville, IN - 3000 sow farrow to finish (36,000 hogs), 400 kW
- ✂✂August 1988 - Ireland, Private Client - Complete mix digester, 250 sow farrow to finish
- ✂✂March 1986 - DJ Acres, Seven Valleys, PA - 1800 sow farrow to finish (18,000 hogs), 150 kW, building heat

### Covered Lagoon

- ✂✂July 2002 - Agricola Ltda., Santiago, Chile, 90,000 finish hogs, flare
- ✂✂September 1998 - ICF, Inc./AgSTAR, Piney Woods School, Rankin County, MS, 120 pigs, flare
- ✂✂June 1998 - ICF, Inc./AgSTAR, Boland Farm, Williamsburg, IA, 2,700 nursery pigs, flare
- ✂✂April 1997 - Martin Hog Farm, S. Boston, VA - 600 sow, farrow to feeder, flare
- ✂✂December 1996 - ICF, Inc./ AgSTAR, Barham Farm, Zebulon, NC - 4000 sows, farrow-wean, 120 kW, building heat
- ✂✂October 1992 - Palmer Farm, Yell County, AR - 300 sow - farrow to feeder, flare

### Heated Mixed Covered Lagoon

- ✂✂March 2003 - Agricola Ltda., Santiago, Chile, 120,000 finish hogs, boiler
- ✂✂February 2003 - Agricola Ltda., Santiago, Chile, 207,000 finish hogs, boiler
- ✂✂December 2000 – Agricola Ltda., Santiago, Chile, 120,000 finish hogs, boiler
- ✂✂June 1998 - Apex Pork, Rio, IL, 8,900 finish hogs, boiler

## Laying Hens

### Complete Mix

- ✂✂December 1985 - Nunes Farms, Burson, CA - 175,000 hens, 105 kW

## Se wage Treatment Plant Cogeneration

### Electrical Generation Service

- ✂✂January 1986 - Salinas STP #1, Monterey Co., CA - 150 kW generator with heat recovery for administration building.

## Representative Clients - Anaerobic Digestion Consulting

### Farms

Benz Farms – IL  
Sunrise Dairy, - IA  
Devries Dairy – WA  
Seaboard Farms – MO  
LeClair– MN  
Grandview Feedlot – ID  
Prime LLC – SD  
Wyoming Premium Pork - WY  
High Plains Dairy - KS  
Langerwerf Dairy - CA  
Swine USA - Creston, IA  
Colorado Pork LLC. - Lamar, CO

### Institutions

California State University, San Luis Obispo  
California Prison Industries Authority  
Minnesota Department of Agriculture  
Water and Waste Engineering - Denver, CO  
MEAD Project, Tillamook Co., OR  
Tillamook Cooperative Creamery  
SUNY Morrisville  
E. Kentucky State University  
Unisphere – VA  
Alliant Energy – WI  
USEPA, USDA-NRCS, USDOE - AgSTAR Program

### International

Nippon Meat Packers, Japan  
Silk Roads, Ltd. Philippines  
Del Sur Hog Farm, Lipa City, Philippines  
Supercerdo, Santiago, Chile  
Poricultores de Jalisco, Mexico  
Poricultores de Colombia  
CMP - Mexico

## Mark A. Moser

President and Agricultural Engineer

Years of Professional Experience: 26

### Expertise - Manure and Nutrient Management, Methane Digester Systems

Site Specific Feasibility and Engineering Work

Technical and Analytical Work

Analytical Modeling

Outreach

### Education

1979 MS, Agricultural Engineering, Cornell University

1975 BS, Environmental Science, with Honors, University of California, Riverside

Languages - Spanish

### Employment History

1982- present Resource Conservation Management, Inc, RCM Digesters, Inc.

1995 - 1999 ICF Consulting Associates, Senior AgSTAR Technical Advisor

1981-82 Independent Agricultural Engineer

1979-81 Sheaffer and Roland, Inc., Staff Engineer

1976-78 Metcalf and Eddy, Inc., Soil Scientist / Engineer

1976 Office of the Chief Engineer, US Army Corps of Engineers, Intern

1974-75 US EPA, Industrial Effluent Guidelines Division, Intern

### Work History

Mr. Moser is one of the founders and President of the Company. He was trained as an agricultural engineer with special emphasis on livestock manure management. Over the past 21 years Mr. Moser has focused on methane production and recovery and nutrient management. He is responsible for development, design and completion of projects including: 30 anaerobic digesters for methane and on-farm electricity and heat production; 30+ farm waste storage and nutrient management plans; consulting services to public and private clients for waste management and/or methane digesters in Armenia, Belize, Chile, Colombia, Costa Rica, Ireland, Japan, Korea, Mexico, the Philippines, the United States and Taiwan. He has performed consulting tasks for the USEPA, the AgSTAR program, and USDOE on pollution potential from farm waste, farm waste management and potential recovery of energy and fertilizer from farm waste. He has designed portions of several farms including a 500 cow dairy and a 36,000 head swine facility. Other work has included environmental regulatory compliance consulting for farms and industries and expert witness services.