**Component I:** Atmospheric Emissions

- Problem Area 1: Understanding the Biological, Chemical, and Physical Mechanisms Affecting Emissions
- Problem Area 2: Emission Factors from Livestock
  Facilities Problem Statement
- Problem Area 3: Control Technologies and Strategies for Emissions
- Problem Area 4: Atmospheric Fate and Transport to Receptors

#### Component II: Nutrient Management

- Problem Area 1: Animal Feeding and Management
- Problem Area 2: Innovative Technology for Collection, Storage, and Treatment
- Problem Area 3: Nutrient Management Tools for Indexing and Evaluating Nutrient Fate and Transport
- Problem Area 4: Farming Systems and Practices for Efficient and Balanced Manure Nutrient Management

<u>Component III: Pathogens and Pharmaceutically Active</u> <u>Compounds (PACs)</u>

- Problem Area 1: Methods Assessment and Development
- Problem Area 2: Fate and Transport of Pathogens
  - Problem Area 2a: Inactivation Rates and Transport Characteristics of Pathogens from Animal Agriculture
  - Problem Area 2b: Pathogen Indicators for Fate and Transport Research
  - Problem Area 2c: Biological Source Tracking
  - Problem Area 2d: Bioaerosols
  - Problem Area 2e: Modeling Fate and Transport of Manure-borne Pathogens from "Pedon" to Watershed Scale
- Problem Area 3: Pharmaceutically Active Compounds (PACs)
- Pathogens Problem Area 4: Holistic Treatment Technologies for Nutrients, Pathogens and PACs

#### Component IV: Byproducts

- Problem Area 1: Phytoavailability and Bioavailability of Nutrients, Trace Elements and Xenobiotics in Byproducts Considered for Beneficial Use
- Problem Area 2: Protocols and Methodology Standards for Examination and Approval of Byproducts for Beneficial Uses in Agriculture and Horticulture
- Problem Area 3: Byproduct Utilization Technologies
- Problem Area 4: Energy from Byproducts