

RNG WORKS

THE COALITION FOR
RENEWABLE
NATURAL GAS



TECHNICAL WORKSHOP & TRADE EXPO

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MUSIC CITY CENTER, NASHVILLE, TN

RNG Project Development: Integrating Environmental
& Engineering Services to Reduce Project Timelines
and Optimize Operational Flexibility

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Presentation Goals

- Air permitting requirements typical to RNG projects
- Regulatory hurdles that can affect project design and construction schedule
- Practical tips for minimizing regulatory requirements and optimizing operational flexibility
- An RNG developer's real-life experiences integrating environmental and project design considerations into dairy farm RNG projects

Environmental Drivers for RNG Projects

Pre-construction approvals



AIR PERMIT



ENVIRONMENTAL
REVIEW



WETLANDS

Pre-operation approvals



WASTEWATER



STORM WATER

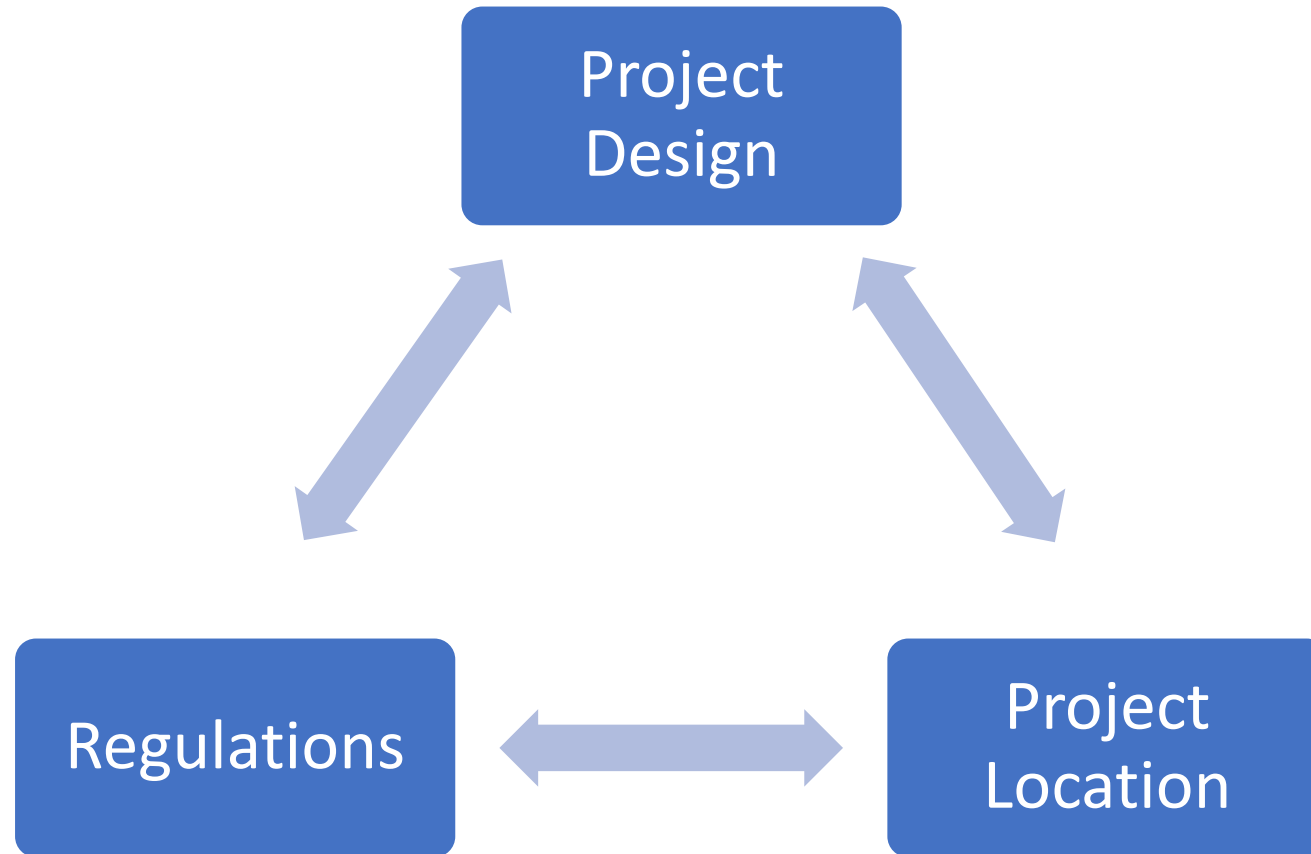


ACCIDENTAL
RELEASE



WASTE

Air Permitting Considerations for RNG Projects



Project Design Factors on Air Permitting

- Project type:
 - Dairy farm RNG projects (animal waste digesters)
 - Other digester RNG projects (food waste, wastewater)
 - Landfills (LFG to RNG projects)
- Key operating conditions:
 - Quantity and H₂S content of generated biogas (hourly and annual)
 - Efficiency of emissions control equipment
 - Engine/turbine parameters if generating electricity
 - Support (boilers, generators, pressurized truck filling, etc.)
 - Property size and equipment layout



Regulations Affecting Air Permitting

- Major source status
 - Prevention of Significant Deterioration (PSD) if SO₂, NO_x, or CO > 250 tpy
 - Best available control technology (BACT)
 - Air quality impact evaluation
 - Enhanced public participation on draft permit
 - Title V if SO₂, NO_x, or CO > 100 tpy
- Minor source permitting requirements



Project Location Affecting Air Permitting

- Nuances between state permitting programs can result in unanticipated project delays, design changes, or construction costs
- State permitting differences:
 - Air modeling requirements can drive additional control, taller stacks
 - Air toxics programs may focus on H₂S
 - Lack of experience with RNG projects (how to handle digester commissioning)
 - Public participation process
 - Construction waiver provisions
- Permit issuance can range from 3 to 12 months after application submittal



Practical Air Permitting Tips

- Evaluate state-specific permitting requirements
 - Exemptions for small emissions units (e.g., boilers)
 - Construction waiver eligibility
 - Permit processing timeline
- Conduct pre-application technical analyses early in the project
 - Modeling and control technology evaluations could affect final plant design
- Balance operational flexibility with regulatory triggers
- Engage the state regulatory authority early in the process



Practical Air Permitting Tips (Cont.)

- Permit negotiation
 - Review similar permits issued by the state agency
 - Offer to draft permit conditions
 - Don't accept a condition that you can't comply with under all operating conditions
- Public participation
 - Know the state-specific policies and/or regulatory triggers
 - If adverse public comment expected, engage affected stakeholders before draft permit issued
 - Possible key issues: Odors, truck traffic, pipeline installation



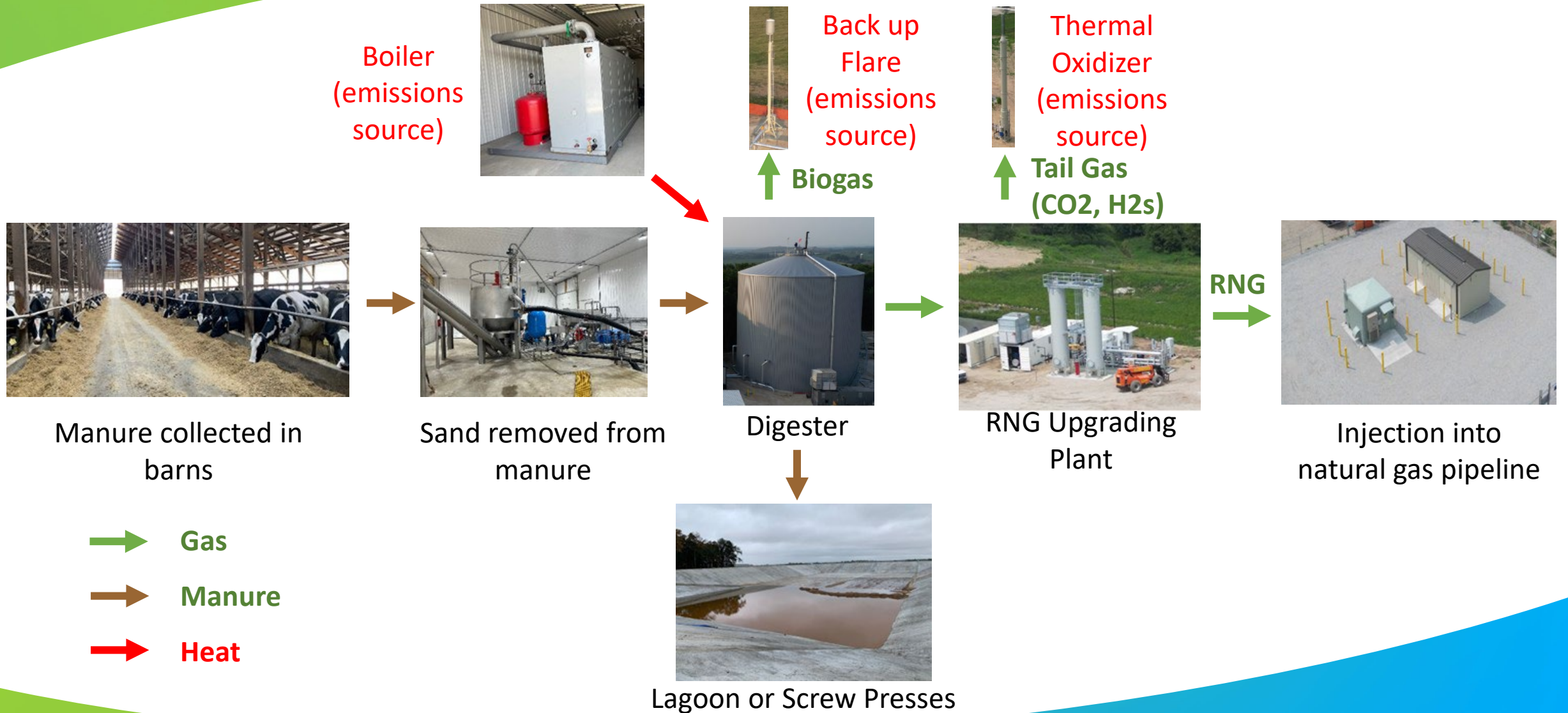
- Nationwide developer of dairy Renewable Natural gas projects
- Two projects operational Q4 2023, Two under construction, Six starting construction 2024 stretching from South Dakota to Vermont
- Over 30 Novilla employees, with management team experience leading over 35 dairy RNG and Landfill Gas projects
- Internal Development, Construction, and Engineering using Novilla Employees
- Projects originated, permitted, developed, engineered, operated, and owned by Novilla RNG.

NOVILLA RNG



Red Leaf RNG Project
Saranac, MI

How a Novilla RNG Dairy RNG Project Works



Why Air Permitting is the Most Important Part of Business Development

Air Permitting determines:

- RNG upgrading choice
- Site layout
- H₂S removal
- Is the project financially feasible
- Timeline for construction



Considerations in Air Permitting

- Current herd size and future herd sizes
- Variations in H₂S out of digester (typically 2,000 ppm to 6,000 ppm)
- Variation in gas production
- Outages and extended flaring
- Contours of land and stack heights
- Startup of digesters produces low methane and high H₂S levels

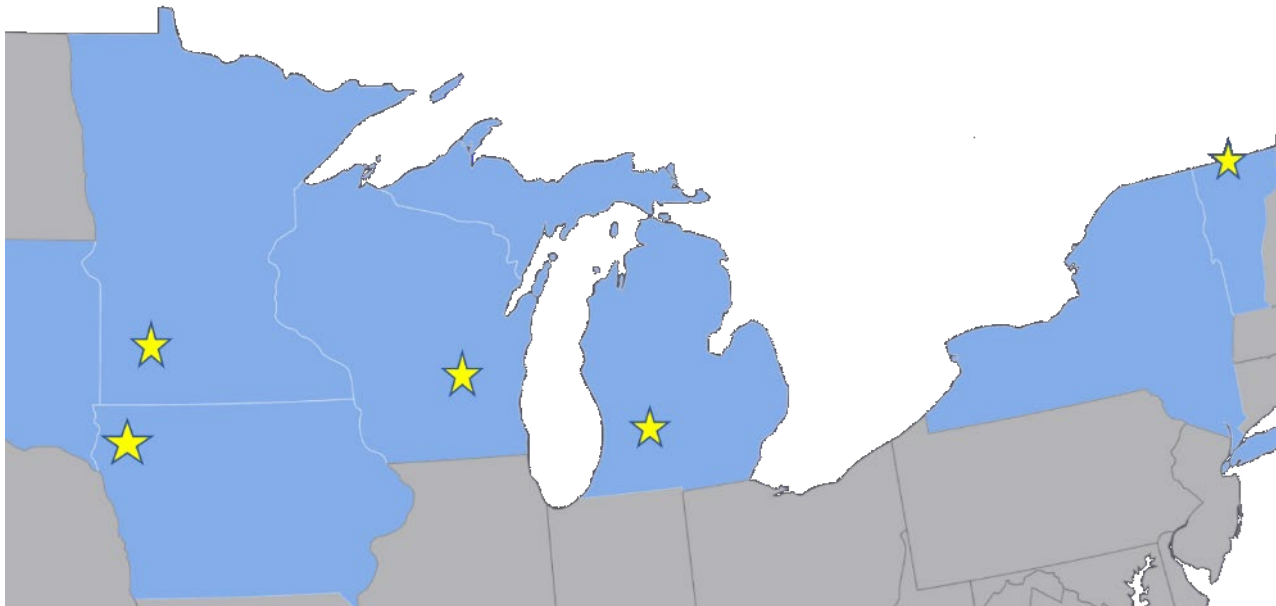


Typical Mistakes Made in Air Permitting

- Involve operations in the air permitting process
- Extended outages will happen, are you permitted to allow months of flaring?
- What happens when your H₂S treatment fails?
- Business Development takes the “easy route” and permits less SO₂ emissions than what will really occur
- Consider neighbors and light pollution
- Flares can fail to light— place in an area where venting will not create a safety issue



**Novilla RNG Air Permits Received Across
Multiple Regulatory Regimes**



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Questions?