

**STATEMENT OF WORK****Anaerobic Digester**

CODE (366)

**DESIGN**

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**Deliverables:**

1. Design documentation that will demonstrate that the criteria in NRCS practice standard have been met and are compatible with other planned and applied practices.
  - a. Practice purpose(s) as identified in a comprehensive nutrient management plan
  - b. List of required permits to be obtained by the client, along with other participant (client) responsibilities (Reference Form CO-ENG-13, Notification of Participant Responsibilities).
  - c. Compliance with NRCS national and state utility safety policy (NEM Part 503-Safety, Subpart A - Engineering Activities Affecting Utilities 503.00 through 503.06)
  - d. Practice standard criteria related computations and analyses to develop plans and specifications including but not limited to:
    - i. Geology and soil mechanics (NEM Subpart 531a)
    - ii. Storage volume and hydraulic retention time
    - iii. Structural, mechanical and appurtenance design
    - iv. Environmental considerations, such as air quality and bio-security
    - v. Safety considerations (NEM Part 503-Safety, Subpart A, 503.10 through 503.12)
    - vi. A process flow diagram detailing flow rates, volumes, and energy transfer
2. Plans and Specifications including construction drawings sufficient in detail to install the practice. All applicable State and Federal (OSHA) safety requirements shall be addressed in the plans and specifications where appropriate.
3. Design Report and Inspection Plan as appropriate (NEM Part 511, Subpart B Documentation, 511.11 and Part 512, Subpart D Quality Assurance Activities, 512.30 through 512.32).
  - a. General description of work
  - b. Items of work requiring inspection or testing
  - c. Timing of inspections or tests
  - d. Skills or certifications required by inspectors
4. Operation and Maintenance Plan for the system
5. Emergency Action Plan, including emergency contact information
6. Certification that the design meets practice standard criteria and comply with applicable laws and regulations (NEM Subpart A, 505.03 (a) (3)). For jobs completed by NRCS employees, affix the approval signature of the individual with delegated engineering job approval authority to the drawings. For jobs completed by non-NRCS employees, affix a Colorado Professional Engineer's seal to design and construction documents, when required by state laws and regulations.
7. Itemized cost estimate and list of materials.
8. Detailed list of any design modifications during installation.
9. As-built drawings and support documentation.

**INSTALLATION**

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**Deliverables**

1. Pre-Installation conference with client/cooperator and contractor. (Reference Form CO-ENG-13, Notification of Participant Responsibilities).
2. Verification that client/cooperator has obtained required permits
3. Staking and layout according to plans and specifications including applicable layout notes

4. Installation inspection (according to inspection plan as appropriate)
  - a. Actual materials used (Part 512, Subpart D Quality Assurance Activities, 512.33)
  - b. Inspection records such as notes, photographs, etc.
5. Facilitate and implement required modifications with client and designer
6. Advise client/NRCS on compliance issues with all federal, state, tribal, and local laws, regulations and NRCS policies during installation
7. Certification that the installation process and materials meets design and permit requirements. Form CO-ENG-1 may be used for this certification.

## CHECK OUT

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### Deliverables

1. As-Built documentation.
  - a. Extent of practice units applied
  - b. As-built drawings showing deviations from approved plans
  - c. Final quantities
2. Certification that the installation meets NRCS standards, project design specifications, and all design requirements, and is in compliance with any required permits (NEM Subpart A, 505.03 (c) (1)). Form CO-ENG-12 may be used for this certification.
3. Progress reporting.

## REFERENCES

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### NRCS:

- NRCS Field Office Technical Guide (eFOTG), Section IV, Conservation Practice Standard - Anaerobic Digester (366), January, 2009
- CO-ENG Forms: eFOTG Section IV, Tools
- NRCS National Engineering Manual (NEM), May 2008
- NRCS National Environmental Compliance Handbook, November 2006
- NRCS National Cultural Resources Procedures Handbook, December 2006
- [Technical Note 1, An Analysis of Energy Production Costs from Anaerobic Digestion Systems on U.S. Livestock Production Facilities](#), October, 2007

### OTHER:

- [Guide to Anaerobic Digesters](#), US EPA AgSTAR Program, April 2008.
- [Methane Recovery from Animal Manures: The Current Opportunities Casebook](#), P. Lusk, Resource Development Associates, Washington, DC, September 1998, NREL/SR-580-25145