North Carolina Energy Audit Criteria Checklist
(For ALL Energy Audits)

Purpose: Provide guidance for elements that shall be included in a Natural Resources Conservation Service (NRCS) compliant energy audit. This checklist is required to be used by NRCS review staff and is recommended for use by auditors as a guide when developing an energy audit in North Carolina. **NRCS staff** shall use the checklist for administrative review of the energy audit to ensure compliance with the North Carolina Energy Audit Criteria. **Auditors** shall use the checklist for general guidance of elements to include in the plan, but it is still the auditor's responsibility to follow the audit criteria for specific elements and the detail of each element to be included.

Instructions:

- **Conservation Activity Plan (CAP) 122 Agricultural Energy Management Plan (AgEMP) - Headquarters Audits:** Technical Service Providers (TSPs) shall submit the hardcopy and electronic copy of the participant's plan to the local NRCS field office for administrative review. Additionally, an electronic copy of the participant's plan shall be submitted to the North Carolina NRCS State Office, attention Steven G. Smith, Civil Engineer, steven.g.smith@nc.usda.gov.

- **Non-CAP 122 Audits**: Local NRCS field office staff shall review audits that are not part of a CAP to ensure they meet the North Carolina Audit Criteria. Because ALL audits have the potential to lead to future Environmental Quality Incentives Program (EQIP) contracts, it is imperative that any audit being considered for the Farmstead Energy Improvement (374) conservation practice standard shall meet the requirements of this checklist.

- **All Audits:** Local NRCS field office staff shall complete the checklist for administrative review and place the completed checklist in the participant's file. Administrative review involves a review of the content of the plan to ensure all required elements are present, but does not involve technical review for correctness. Please note, if a technical review is needed, the completed checklist and participant plan shall be forwarded to the appropriate area office for review by engineering staff.

NRCS-North Carolina Audit Criteria Checklist		
County:		**Date Plan Submitted:**
Participant:		**Auditor:**

Definition: An Agricultural Energy Management Plan - Headquarters (AgEMP) is a detailed documentation of the energy consuming activities and components of the current operation; the previous year's on-farm energy consumption; and the strategy by which the participant will explore and address their on-farm energy conservation concerns, objectives, and opportunities.

Minimum components of an AgEMP shall include:

A. General Criteria	☐	An AgEMP shall be developed by a certified TSP or person/entity with the same qualifications of a certified TSP. For detailed instructions on how to find a list of certified TSP's for CAP 122, please see ***Appendix A***. For a list of required experience and qualifications please visit the following link: http://techreg.sc.egov.usda.gov/PopRptCriteria.aspx?ID=105&Type=Category.
	☐	The AgEMP - Headquarters will meet the Type 2 on-farm energy audit minimum criteria established in the *ANSI/ASABE S612 July 2009 Performing On-farm Energy Audits* standard (also referred to as the industry standard).
B. Criteria for Specific Elements of AgEMP	**1.**	**Cover Page: The AgEMP must have a cover page providing the following:**
	☐	a. Farm Identification: i. Farm name, participant name (if different from farm), street address, county/state ii. Primary phone number of participant iii. Primary enterprise of the farm
	☐	b. Auditor Identification: name, mailing address, and primary phone number.
	☐	c. Date AgEMP was finalized.
	2.	**Summary Reporting of Recommended Measures**: The summary tables illustrated in ***Appendix B*** must be presented (in their exact formats) near the beginning of the AgEMP report. Summary Table 1 will contain each of the various recommended measures, prioritized according to pay-back period.
	☐	a. The estimated reduction in energy use (electricity, propane, other), estimated energy savings, estimated installation cost, estimated energy cost savings, and estimated reduction in greenhouse gas emissions and air pollutants must be provided for each energy improvement measure.
	☐	b. The "Payback in Years" column determines the sequence in which the recommended measures shall be listed in the Summary Table. This sequence can provide guidance to the participant on the recommended sequence of implementation—from shortest time of payback to longest time of payback.
	☐	c. Recommended measures with payback periods exceeding 10 years may be presented in the body of the report but shall not be included in the Summary of Energy Efficiency Improvements.

	☐	d. Tables 1 and 2 included and formatted as shown in ***Appendix B***. *(Note: The tables in Appendix B are being provided as examples for formatting purposes only and DO NOT need to be filled in as part of this checklist.)*
	3.	**Background and Site Information:** The AgEMP will provide a narrative for:
	☐	a. Name of participant.
	☐	b. Facility location(s).
	☐	c. Type, size, and overall management scheme of the operation (e.g., a description of the poultry, dairy, or swine, etc., production levels, and any unusual factors that affect energy use).
	☐	d. Participant concerns and objectives for the enterprise (i.e., description of why the participant wants an on-farm energy audit and their specific objectives).
	4.	**Current Equipment and Baseline Energy Use:** The AgEMP will provide comprehensive documentation of the prior year energy consumption for the primary farm enterprise, as a minimum. The evaluation of energy usage must be broken down by the major activities listed in, but not limited to, the ASABE S612 standard for the primary farm enterprise.
	☐	a. The report must at a minimum provide, for the primary farm enterprise, the usage and costs for the prior year energy consumption shown by energy resource.
	☐	b. The AgEMP must document all major activities associated with the primary enterprise being audited by: i. Manufacturer of equipment ii. Component equipment factory ratings (hp, BTU input, BTU output, efficiency) iii. Management use efficiencies (eg. manual/automatic systems)
	☐	c. Provide an estimate of the annual energy usage of the activity.
	☐	d. The report must address all major activities for the primary farm enterprise even though the auditor may not have an improvement recommendation for every activity. The report must note any major activity which has no opportunity for improved energy use.
	5.	**Energy Improvement Measures:** The AgEMP will examine possible energy improvement measures that potentially reduce energy use and address the energy management concerns of the agricultural operation. The AgEMP must provide appropriate energy savings (relative to the baseline energy use) for each examined improvement measure. See ***Appendix C*** for additional items that shall be considered regarding energy improvement measures. For each measure examined, the report must present:
	☐	a. The estimated energy savings—first in the common sale units (kWh, gallons, etc.) and secondly in the energy units of millions of British Thermal Units (mBTU)
	☐	b. The estimated energy cost savings.
	☐	c. The estimated installed cost.
	☐	d. The simple payback period in years.
	☐	e. The estimated reductions in emissions with specific estimates for CO_2, N_2O, CH_4, SO_2, and NO_x. (Guidance on how to calculate greenhouse gas emission reductions and air pollutant co-benefits is provided in ***Appendix D.***)
	☐	f. Equipment product information associated with recommendations and/or comparisons of specific products. (Provide size, model numbers here; specifications, more detail, etc. can be provided in references.)

	6.	**Signature Page**: The AgEMP must have a signature page providing the following:
	☐	a. Farm identification: Farm name, participant name (if different from farm), street address, county, primary enterprise of the farm.
	☐	b. Auditor Certification Statement: i. A statement indicating that the auditor possesses the technical expertise and experience to perform on-farm energy audits and that the report meets all the requirements of ASABE S612 (per §6.1) and the North Carolina Energy Audit Criteria. ii. Auditor Signature and date.
	☐	c. Participant Certification Statement: A statement stating that the Plan correctly lists the farm identifying information (participant name, street address, primary contact phone number, etc.); addresses the primary farm enterprise under the Participant's control; adequately represents the baseline conditions (current equipment, utility usage, etc.) of the farm enterprise; and adequately represents the Participant's concerns and objectives, and that the Participant has received a final copy of the Plan.
	☐	d. NRCS Certification Statement: i. The statement "I have administratively reviewed this Agricultural Energy Management Plan – Headquarters, and the Plan meets all the criteria of North Carolina Audit Criteria. ii. Spaces for the signature of an authorized NRCS Representative, and date.
	☐	e. Placement: The recommended placement of the signature page is immediately behind the last page of the audit report, but preceding any appendices/references.
	7.	**References**: The AgEMP must include technical documentation of sources used for the Headquarters AgEMP. The report shall include the actual documents or web sites that contain technical information used to gain energy savings in the report, such as:
	☐	Fact sheets, existing component product information or manufacturer product information sheets, product recommendations and or comparisons of specific products, journal articles, etc.
	Important Note: The items listed below in sections 8 and 9 are only for audits produced as part of a CAP by a TSP. If your audit is not part of a CAP, please skip to "Checklist Approval".	
	8.	**Deliverables from the TSP to the Participant include:**
	☐	a. A complete hardcopy and/or electronic copy of the finalized AgEMP-Headquarters report, with the TSP signature.
	☐	b. A detachable or separate hardcopy signature page, signed by the TSP. This hardcopy signature page is to be signed by the participant and forwarded to the NRCS field office for the official files. A second complete hardcopy may be substituted for this single signature page.
	9.	**Deliverables from the TSP for NRCS field office include**:
	☐	A complete electronic copy of the finalized AgEMP Headquarters report. The preferred format is PDF, using software digital conversion rather than scanning, except for the signature page. Microsoft Word format is also acceptable.

Checklist Approval		
YES ☐	**NO** ☐	I have administratively reviewed this audit and it meets all the North Carolina Audit Criteria. **Note: If "No" is checked, include reasons for denial, comments, missing items that need to be added, etc.):**

NRCS Representative Name and Title (print or type):		
NRCS Representative Signature		Date:

Reset Form

Appendix A: Finding a Certified TSP

Complete the following steps to find a certified TSP:

a. Go to http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/tsp/.
b. Click on "Find a TSP" (green button in the middle of the page).
c. Click on the State (North Carolina).
d. Click on all counties at the top of the page where it says, "Please click on the map below or to select all counties, click here".
e. Under "Select Category", select "CAP – Agricultural Energy Management Plan (122) – Headquarters Plan Development". Be sure "Select County" has "All Counties" selected, and that "Select Service" has "All Services" selected.
f. A list of certified TSP's for CAP 122 in North Carolina should display.

Appendix B: Examples of Tables 1 and 2

Table 1. Summary of Energy Efficiency Improvements

		Estimated Reduction in Energy Use				Estimated Costs, Savings, Payback, and Prioritization for Implementation			Environmental Benefits				
									Greenhouse Gases[3]			Air Pollutant Co-Benefits[3]	
Recommended Measure[1]	Electric Savings (kWh)	Natural Gas Savings (ccf)	Propane Savings (Gal)	Other[4]	Energy Savings[2] (mBTU)	Installed Cost [a]	Energy Cost Savings [b]	Payback in Years [a / b]	Estimated CO_2 (lbs)	Estimated N_2O (lbs)	Estimated CH_4 (lbs)	Estimated SO_2 (lbs)	Estimated NO_x (lbs)
Example: Lighting	25,210				8	$1,740	$2,094	0.8	30,988	0.562		0.038	0.020
Example: Seal Air Leaks			477		4	$1,500	$809	1.9	5,962	0.043		0.000	0.003
Example: Insulate Brood Curtain			9 8		9	$450	$167	2.7	1,226	0.009		0.000	0.001
Example: Exposed Foundation Wall Insulation			383		3	$5,621	$651	8.6	4,788	0.034		0.000	0.002
Example: Curtain to Solid Insulated Sidewalls			444		4	$7,168	$754	9.5	5,550	0.040		0.000	0.003
Total	**25,210**		**1,402**		**21**	**$16,478**	**$4,475**	**3.7**	**48,514**	**0.688**		**0.038**	**0.029**

Table 1 Notes

1) This example table was developed from data on a poultry operation.
2) A portion of the benefits for some of the improvements offset the benefits of others. For example, insulating side walls will actually seal up some of the air leaks and reduce the heat load in the winter.
3) CO_2 is a green-house gas; SO_2 and NO_x are ambient air contaminants.
4) Major energy resources used on the farm shall have a separate column. 'Other' is provided only to capture and aggregate less significant uses of the energy resources.

Table 2. Energy Savings of Recommendations

Fuel	Current Usage	MBtu Usage	Savings	MBtu	% Savings
Electricity (KWh)	135,920	464	1,903	6	1.4%
Natural Gas (ccf)	4,214	430	0	0	0
Propane (Gal)					
Other					
Totals		894		6	0.7%

Appendix C: Energy Improvement Measures, Additional Considerations

a. The audit must reflect non-discounted prices for reporting the installation cost and payback period. Do not factor in EQIP payments or state energy incentives in installation cost. However, the mention of these separately and the recognition that these will shorten the payback period is encouraged.
b. The auditor must keep recommendations to those closely linked to energy efficiency improvements. Some improvements are primarily production improvement related. While it is worthwhile to note these, exclude such recommendations from the energy analyses.
c. From the possible energy improvement measures examined, the report must clearly distinguish those measures which the auditor actually recommends. The auditor shall explain why the others are not recommended.
d. Documentation for recommended improvement measures must be sufficient to allow for a third party to evaluate the recommendation and install equipment or practices that achieve similar results (e.g., references to support assumptions of the percent savings; brand and model numbers to allow checking of efficiency; savings claims; etc.).
e. The auditor is encouraged to consider all improvement measures that are viable at the time of the audit without regard for which measures may be eligible for private or government financial assistance at the time of the audit or in the future.
f. The auditor is encouraged to organize the analyses by enterprise and major activity as listed in Table 1 of the ASABE S612 standard.

Appendix D: Environmental Benefits

Guidance on how to determine values for greenhouse gases and air pollutant co-benefits environmental benefits.

In order to estimate the environmental benefits associated with estimated energy savings, NRCS has developed a Quick Energy Calculator that transforms energy saving measures for fuels and electricity into atmospheric emission reductions. The Quick Energy Tool relies on EPA's state-level aggregated emission factors for electricity to generate estimates of emissions savings. The Quick Energy Tool relies on the EPA Energy Information Agency's emission factors for liquid and gaseous fuels to generate estimates of emissions savings for those types of fuels.

The web link to the NRCS COMET Quick Energy Calculator for converting Energy Savings into Emissions Reductions is located at: http://www.comet2.colostate.edu/.