



CONSERVATION ENHANCEMENT ACTIVITY

E449114Z3

**CONSERVATION
STEWARDSHIP
PROGRAM**

Complete pumping plant evaluation for all pumps on a farm to determine the potential to install a variable frequency drive

Conservation Practice 449: Irrigation Water Management

APPLICABLE LAND USE: Crop (Annual & Mixed); Crop (Perennial); Pasture

RESOURCE CONCERN ADDRESSED: Insufficient Water

PRACTICE LIFE SPAN: 5 years

Enhancement Description

On branching systems, or pumps that service multiple fields, or multiple pumps, install a Variable Frequency Drive (VFD) motor controller(s) if recommended in the pump test and the simple payback in terms of energy savings is less than 10 years.

Criteria

- Pump test evaluation will include all irrigation pumps on the farm. There could be multiple pumps that are used on single or multiple fields. Minimum data necessary to complete the pumping evaluation:
 - Flow rate, instantaneous and for the season
 - Pressure at different flow rates based on partial or complete irrigations
 - Power usage before and after implementation to compute efficiency of the drive unit
 - Area and fields irrigated
 - Estimate of friction loss in pipelines based on pressure drop in lines during test



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- Cost estimate and simple payback for installing the drive
- Irrigation water management plan is followed and includes, at a minimum (as per CSP 449):
 - An irrigation system layout map showing the main pipeline(s), irrigated area, soil moisture sensor locations and depths (if used), and soils.
 - Methods used to measure or determine the flow rate or volume of the irrigation applications.
 - Documentation of the scientific method used for scheduling the timing and amount of irrigation applications.
 - Seasonal or annual planned water application volumes by crop.
 - Management allowable depletion (MAD) and depth of the managed crop root zone for each crop.
 - An estimate of the irrigation system distribution uniformity, based on testing, evaluation, or observation.
 - Information on how to recognize irrigation induced erosion and how to mitigate it.
 - The specific soil moisture monitoring objectives, if soil moisture sensors are used. Indicate how data from the soil moisture sensor locations and depths will be considered to make field-wide irrigation decisions.
 - Recordkeeping documents for the irrigator to use during operation and management.

Documentation Requirements

- Completed IWM plan, documenting guidance and landowner decisions using State specific protocol.
- Map showing location of fields and where pumps are connected to irrigation system.
- Copy of pump test evaluation.



- Documentation of energy savings based on system and VFD after implementation of enhancement. Calculated reduction of energy use as the average annual or seasonal energy reduction compared to previous operating conditions.

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