Pre-Assessment Checklist

It is important that you are contacting the producer in the weeks leading up to your assessment. The purpose of the pre-assessment check in is to gather information about the site, complete pre-assessment forms, and to answer any questions the producer may have. This checklist will guide you through this process.

1. Contact the producer to explain the benefits and process of the E3 assessment. Answer any questions the producer might already have and invite them to contact you with any further questions. Set the date of the assessment and send them the Benefits to Producers Fact Sheet.

2. When your assessment is about a month away, contact your producer to request billing data, energy audit data, past utility information. Also send them the pre-assessment questionnaire material. Confirm your assessment date.

3. Before your assessment, analyze the information sent to you by the producer and incorporate that information into your data collection sheets. Look for missing information and highlight some energy hogs to further investigate.

4. Research the Web Soil Survey data (http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx) for the area. An address is sufficient for finding the soil data for the site.

5. Check out flow meter (if the producer is interested)

6. Make copies of forms and factsheets for the producer.

7. Review forms and questions; research any information you might not understand.

8. One week prior to your assessments set a schedule with the producer to outline the order you will do your assessment

Myla Kelly, Project Coordinator
(406) 994-6948
myla.kelly@montana.edu

Scoring the "Hazardous Waste Management: Assessing Drinking Water Contamination Risk" Worksheet

Step 1: Begin by determining the overall hazardous waste risk ranking. Total the rankings for the categories completed and divide by the number of categories ranked: _____ divided by _____ equals
3.6–4=low risk, 2.6–3.5=low to moderate risk, 1.6–2.5=moderate to high risk, 1–1.5=high risk

This ranking gives you an idea of how hazardous waste practices as a whole might be affecting the producer's drinking water. This ranking should serve only as a very general guide, not a precise diagnosis. Because it represents an averaging of many individual rankings, it can mask any individual rankings (such as 1's or 2's) that should be of concern. (See Step 2.)
Enter the boxed hazardous waste risk ranking on page 1 of the worksheet.

Step 2: Look over your rankings for individual activities:
• Low-risk practices (4's): ideal; should be the goal despite cost and effort
• Low-to-moderate-risk practices (3's): provide reasonable groundwater protection
• Moderate-to-high-risk practices (2's): inadequate protection in many circumstances
• High-risk practices (1's): inadequate; pose a high risk of polluting groundwater
Regardless of the overall risk ranking, any individual rankings of "1" require immediate attention. Some concerns can be taken care of right away; others could be major—or costly—projects, requiring planning and prioritizing before taking action.
Find any activities that you identified as 1's and list them under "High-Risk Activities" and write up a recommendations sheet to be discussed with the producer.

If the producer ranked in a box with italic lettering, this signals that some of their activities may be illegal. Ask the producer to describe these activities and suggest legal alternatives. Have the cost of non-compliance on hand to share. Do not report the producer to a regulating agency.

Myla Kelly, Project Coordinator
(406) 994-6948
myla.kelly@montana.edu

Sample Data Summary Table and Final Report Guidelines

When presenting assessment results to the producer, recommendations should be presented in both written and table form. It is recommended that when creating your recommendations table, you follow the following format:

Table 1. Summary of Estimated Annual Energy Efficiency Improvements

	Estimated Reduction in Energy Use			Estimated Costs, Savings, Payback, and Prioritization for Implementation			Environmental Benefits				
							Greenhouse Gases			Air Pollutant Co-Benefits	
Recommended Measure	Electric Savings (kWh)	Diesel Savings (Gal.)	Energy Savings (mBTU)	Installed Cost [a]	Energy Cost Savings [b]	Payback in Years [a/b]	Est. CO2 (lbs)	Est. N2O (lbs)	Est. CH4 (lbs)	Est. SO2 (lbs)	Est. NOx (lbs)
Upgrade the Lighting in the Shop and Grain Facility	5,217		17.81	$1,100	$626	1.8	4,480.31	0.07	0.09	6.71	7.57
Totals	**5,217**		**17.81**	**$1,100**	**$626**	**1.8**	**4,480.31**	**0.07**	**0.09**	**6.71**	**7.57**

Table 2. Energy Savings of Recommendations

Fuel	Current Usage	mBtu Usage	Savings	mBtu Savings	% Savings
Electricity (kWh)	9,272	31.65	5,217	17.81	56.3%
Totals		31.65		17.81	56.3%

It is also recommended that you create different sections of the report for different types of recommendations. For example: group all energy related projects in one section and all waste management projects in another.

Reports should include recommendations (backed up by data analysis or research) for any aspect of the producer's production practices that you identify that could result in energy savings or pollution reduction.

In general, the reports should be clean, concise, and present the information to the in a way that is straightforward. You should include copies of your data sheets as an addendum to the final report.

If you are recommending a type of equipment to the producer, feel free to give a list of brands or models as long as this is practical and beneficial for the producer.

Myla Kelly, Project Coordinator
(406) 994-6948
myla.kelly@montana.edu

How to Collect Irrigation Data

1. Before arriving, ask the producer what types of motors and pumps he/she is using. If the producer has multiple systems, you will need a data collection form for each type of system. Use this information to familiarize yourself with the style and operation of the pump. Review the "Irrigation Efficiency Training" and "Irrigation Part 2: Data Collection and Pump Savings" recorded slideshows on e3.peakstoprairies.org to refresh your memory on irrigation pumps. Identify the type of irrigation system being used and ask the local utility if they offer any incentives for switching to a different type of system. Reserve the flow meter for your visit.

2. Using the Irrigation Data Collection Form, work with the producer onsite to confirm the type of pump and motor used. The producer should know the majority of this information. It is recommended that you bring a tape measure. Be sure to collect data for both the pump and the pump motor. Take a picture of the motor and pump (if present) nameplates. Complete the Irrigation Data Collection Form to the fullest extent possible.

3. Use the Pump Savings Calculator to analyze data collected onsite (Yellow boxes= data input) and review results. If the producer is interested in installing a VFD, use the VFD Pump Savings Calculator to determine the costs and benefit. You can also use the VFD Energy Savings tool.

4. Find the Pump Curve for the specific system that is in use and determine where the maximum pump efficiency falls.

5. Present information to producer with recommendations and remain available to answer questions.

Myla Kelly, Project Coordinator
(406) 994-6948
myla.kelly@montana.edu

Using the Greyline Flow Meter

To check out the Greyline Flow Meter, contact Joel Schumacher (Montana State University). He will coordinate with you how to get the flow meter to your location. Joel is available by phone or email at (406) 994 – 6637 or jschumacher@montana.edu. Reserve the flow meter early to ensure availability.

Box Contains:

- ✓ Flow meter unit
- ✓ Sensors in plastic bubble wrap with 12 ft cables attached (2)
- ✓ Sensor brackets (2)
- ✓ USB connector
- ✓ Charger
- ✓ Alignment bar (2 pieces)
- ✓ Data logging CD
- ✓ User's Guide
- ✓ Silicone jelly/coupling compound
- ✓ Power adaptors (Euro, UK, and Australia)
- ✓ Tape measurer
- ✓ Adjustable stainless steel pipe clamp (3)

Important Notes About the Greyline Flow Meter

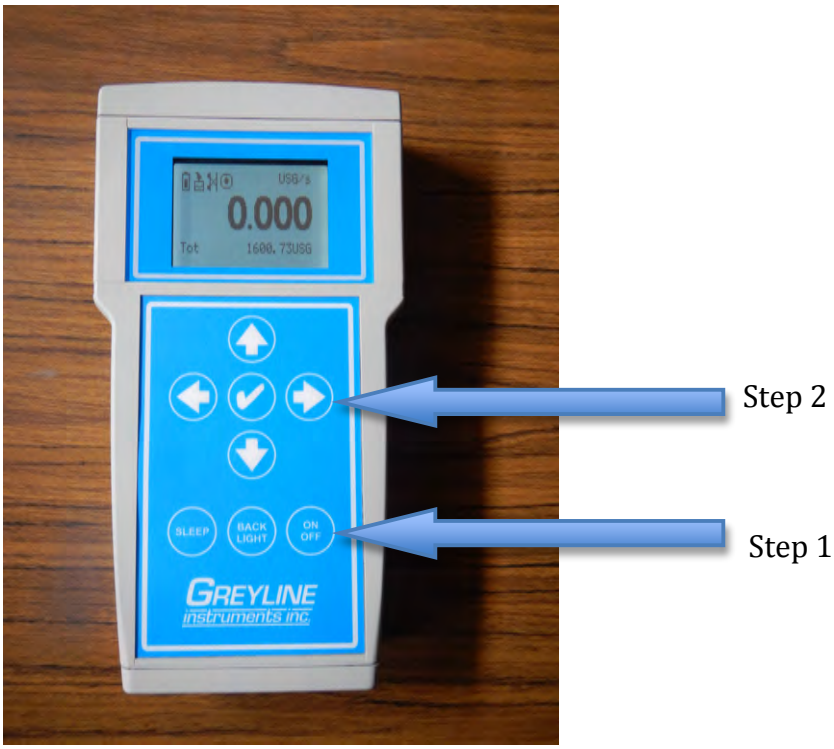
- The pipe being measured must be filled with water, the system will not work on an empty pipe
- The pipe must have a diameter greater than 2 inches
- The pipe wall thickness can be approximated using the chart in the User's Guide included with the flow meter
- An estimation of the water temperature is fine
- The meter is not designed to get wet.
- Do not assign a new password to the meter (current is 0000)
- The meter is designed for applications other than irrigation, follow set up instructions carefully to ensure accurate readings
- The meter is set up to measure using the English measuring system (inches, feet). It is possible to set the meter to us the Metric measuring system
- The battery lasts 36 hours. It takes 6 hours to fully charge the battery. Please charge the battery fully before returning the unit
- When finished, please wipe the coupling agent off the sensors, wrap cords carefully, and return all pieces to the orange case
- The sensors are type: SE16B

Myla Kelly, Project Coordinator
(406) 994-6948
myla.kelly@montana.edu

- This kit includes two (2) SE16B sensors.
- When finished with sensors, rewrap in bubble wrap.
- Sensors are Fragile. Take care not to drop or knock the sensors against other objects
- Sensors use ultrasound technology and therefore must have the silicone jelly/coupling compound applied to the face of the sensor for conductivity. Remove this when finished
- Sensors can be submerged in water for short periods of time, but this is not recommended. Use the coupling compound to seal the plastic cable jackets will further protect the unit from water damage if submersion is unavoidable

Meter Set-Up:

1. Turn the unit on using the ON/OFF button located at the bottom right of the keypad.
2. Press the Right arrow key to begin set up. You will be prompted with the Password Screen. The numbers 0000 should be entered. Press the right arrow key four times without changing any of the numbers. This should lead you to the menu.



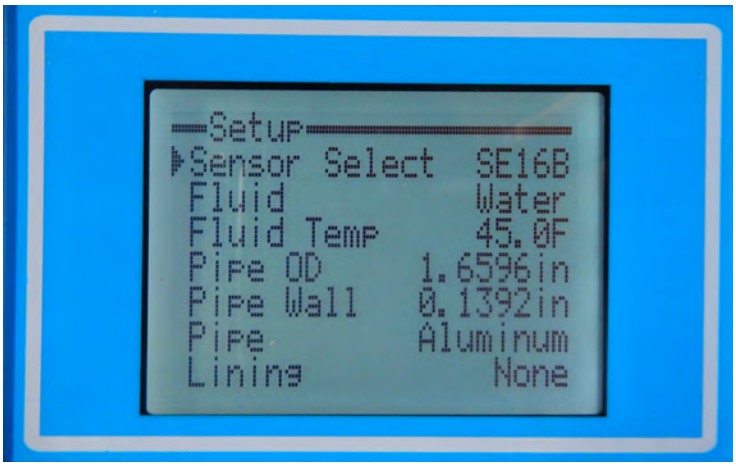
Myla Kelly, Project Coordinator
(406) 994-6948
myla.kelly@montana.edu

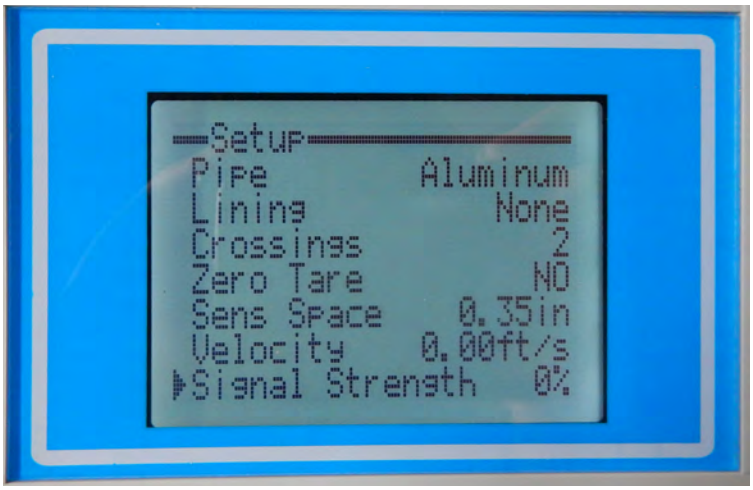
3. From this menu, you are able to:
    a. Change the unit options
    b. Set the device up for use
    c. Calibrate the unit for other applications
    d. Log data
    e. Change device language, password, and totals
    f. Run a test to ensure device is working properly
    g. Customize the configuration
4. Select menu options by using the up or down arrows to navigate between different submenus. Use the right arrow to select a menu option. To exit, press either the check mark or the left arrow key
5. To set up the meter, select Set up from the first menu.

    a. Sensor: SE16B
    b. Fluid: water
    c. Fluid Temp: estimate, the water temperature (it not need to be exact.)
    d. Pipe OD (Outer Diameter): use the right and left arrows to select the digits that need changing. Use the up and down arrows to change the digit.
    e. Pipe Wall: enter thickness of the pipe using the same technique as Pipe OD. If pipe wall is not accessible for an exact measurement, refer to the chart of common thicknesses for different pipe types and sizes located in the User's Guide.
    f. Pipe: select the material that the pipe is constructed with using the up and down arrow keys.

Myla Kelly, Project Coordinator
(406) 994-6948
myla.kelly@montana.edu

g. Lining: if the pipe is lined, select the material that the line is made with. If the pipe is unlined, select none.
h. Crossings: If using a "Z" mount, select 1, if using a "V" mount, select 2.
i. Zero Tare: If pipe is full but under zero flow conditions, select yes. Otherwise select no.
j. Sens Space: displays the calculated spacing between the sensors.
k. Velocity: displays the measured velocity.
l. Signal Strength: displays the order of magnitude being receive by the ultrasonic sensor. Will remain at 0 until all parts of the flow meter are properly set up.





Myla Kelly, Project Coordinator
(406) 994-6948
myla.kelly@montana.edu

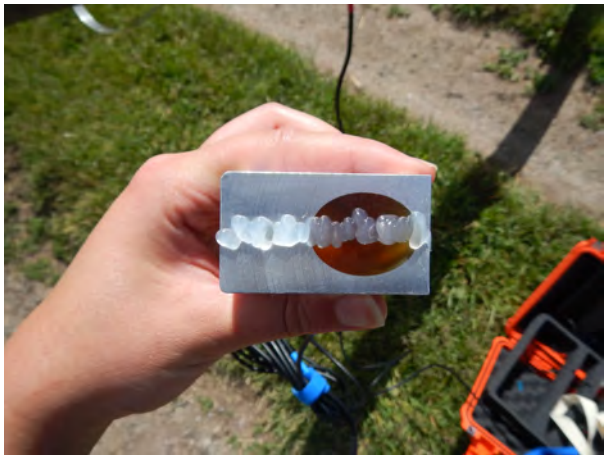
Sensor Installation:

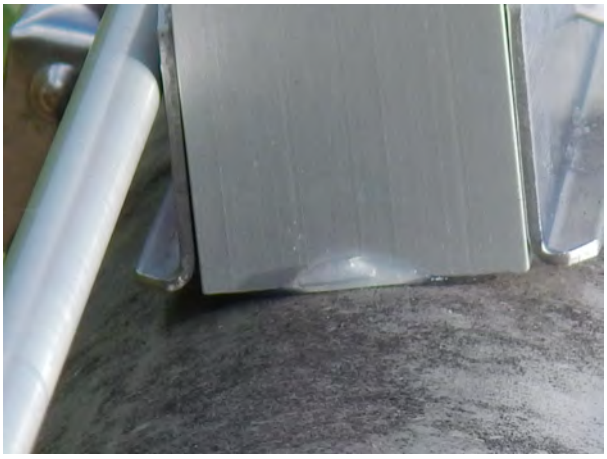
1. Select a section of pipe to mount sensors. Before mounting the brackets, set up the meter using the above directions.
    a. On a horizontal pipe, select a segment 3 feet away from any bends, elbows or fittings or any velocity and turbulence increasing devices. Sensors will not work when mounted on anything other than a straight segment of pipe.
    b. On a vertical pipe, sensors can be mounted anywhere on pipe, as long as it is 3 feet away from any velocity and turbulence increasing devices.
2. Prepare a 4 foot long section of pipe by removing loose paint, scale, and rust.
3. Use the mounting kit provided to install the sensors
4. Using the alignment bar and adjustable pipe clamps, install the mounting brackets on the pipe. The separation distance between the brackets is given on the meter in the set up menu. Measure this distance exactly using the measuring tape included in the kit. Mount the brackets levelly with the center of the bracket inline with the middle of the pipe. Avoid mounting the sensors at the top/bottom of the pipe, as shown below.

5. Once the mounted brackets are installed, apply the silicon coupling compound to the face of the sensor (look for the orange oval). Apply the

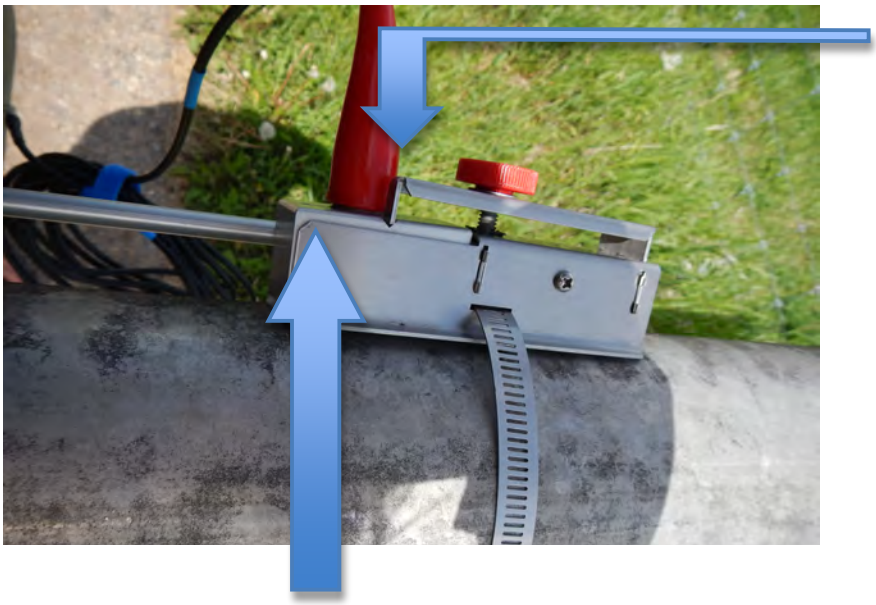
Myla Kelly, Project Coordinator
(406) 994-6948
myla.kelly@montana.edu

compound as you would toothpaste on a toothbrush. If too much or too little coupling agent is applied, errors or loss of signal between the sensors can occur. Over time, it may be necessary to reapply the coupling agent, especially if warm temperatures, moisture or vibrations are present. Expect a small amount of coupling agent to ooze out from under the sensor.





6. Secure the sensors in the bracket but do not over tighten and crush the sensor.



Be sure to align bracket clamps with the grooves on the sensor

Check to see that arrow on top of sensor points inward

Myla Kelly, Project Coordinator
(406) 994-6948
myla.kelly@montana.edu

7. Plug the sensor cables into the flow meter unit. Make sure that the cable connected to the sensor on the right is connected to the plug on the right on top of the flow meter. The cables are marked with blue and red tape to make this easy to see. The final setup should look something like this picture.

At this point, the flow meter is properly installed and calibrated. For more information on data collection, refer to the User's Guide included with the flow meter.

Myla Kelly, Project Coordinator
(406) 994-6948
myla.kelly@montana.edu

Frequently Asked Questions

How much will an assessment cost me?
Through the E3 in Montana Agriculture Initiative, all assessments are free for the producer. Similar assessments through the NRCS and other agencies can cost between $1,900 and $3,000 depending on the type of assessment and the agency completing the assessment.

How long does the assessment take?

What data/records will need to be made available?

Who do I contact to schedule an assessment?

What time of year should I schedule my assessment for?

What kind of outcomes can I expect from my assessment?

What is reviewed in an assessment?

Who completes the assessment?

What is a Technical Service Provider?
Technical Service Providers (TSPs) are individuals or businesses that have technical expertise in conservation planning and design for a variety of conservation activities. TSPs are typically hired by farmers, ranchers, private businesses, nonprofit organizations, or public agencies to provide these services on behalf of the Natural Resources Conservation Service (NRCS). Each certified TSP is listed on the NRCS TSP online registry, TechReg. The TSP registration and approval process involves required training and verification of essential education, knowledge, skill, and abilities.

What kind of work can a TSP do?
TSP's provide conservation technical services to NRCS clients in two broad areas: Conservation Activity Plan (CAP) and Conservation Practice design, installation, and checkout. There are 16 separate CAPs and several different practice categories, each with individual TSP eligibility requirements.

Myla Kelly, Project Coordinator
(406) 994-6948
myla.kelly@montana.edu

E3 IN MONTANA AGRICULTURE

e3.peakstoprairies.org

What are Conservation Activity Plans (CAPs)?

A Conservation Activity Plan or CAP can be developed for producers to identify conservation practices needed to address a specific natural resource need. Typically, these plans are specific to certain kinds of land use such as: transitioning to organic operations, grazing land, and forest land. A CAP can also address a specific resource need, such nutrient management or an air quality concern. With a CAP plan, producers can then apply for financial assistance to implement the needed conservation practices.

How Do CAP Costs and Payments Work?

The Farm Bill statute allows EQIP payments based upon the estimated incurred cost of practice implementation, which for a CAP will be the labor costs typically associated with development of a plan meeting agency standards and requirements. The payment is increased for qualifying historically underserved producers. NRCS approves CAPs and contract payment rates offered through EQIP every fiscal year. Producers should check with their local NRCS office where located to find out which CAPs are offered in their State; each State may support only specific CAPs. Eligible producers may apply at their local NRCS office. EQIP payments are made directly to program participants for development of a CAP. These CAP plans may only be developed by an NRCS-certified Technical Service Provider (TSP). Although NRCS personnel are prohibited from developing CAPs, they can assist with the development of conservation plans to address identified resource concerns.

What is an AgEMP Headquarters Plan (CAP 122)?

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

What is an AgEMP Landscape Plan (CAP 124)?

A Landscape Energy Plan is a detailed report/audit documenting the energy consuming components and practices of the current operation's on-farm field energy consumption involved in the cropland, pasture/hayland, range, and woodland activities with recommended strategies to conserve energy resources.

Myla Kelly, Project Coordinator
(406) 994-6948
myla.kelly@montana.edu