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AG BMP IMPLEMENTATION VERIFICATION

OBJECTIVES

- Develop an agricultural BMP verification protocol report by January 31, 2013.
- AgWG is currently developing a verification matrix that could potentially provide the partnership with multiple verification options while denoting varying levels of data confidence.

Draft Agricultural Verification Protocol Concept

Chesapeake Bay Program Agriculture Workgroup (AgWG)

6/15/2012

Ag Protocol Category	BMP Inventory Assessment Method	Cost-Share Information				BMP Functionality Information					Verification Methodology	Verification Issues	Relative Cost	Relative Data Confidence	Relative Data Credit
		Federal Cost Share	State Cost Share	NGO Cost Share	Private Funded	Meets Specs	Functional Equivalent	Partially Effective	Not Effective	Installation Date			Low: < $1/acre Medium:$1 to $3/acre High: > $3/acre	Annual BMP / Structural BMP (5=maximum, 1=minimum)	Annual BMP / Structural BMP (% of Approved BMP Effectiveness Value)
On-farm Assessment	Farm inventory by trained federal, state, and/or county agency personnel.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Through on-site visit by trained personnel, collecting data, check databases, check on-farm records	Accredited data source through training/certification	High	5 / 5	
On-farm Assessment		Yes	Yes	Yes	Yes	Yes			Yes	Yes	Through on-site visit by trained personnel, collecting data, check databases, check on-farm records	Accredited data source through training/certification	High		

BMP Functionality Information

BMP Inventory Assessment Method	Cost-Share Information	Meets Specs	Functional Equivalent	Partially Effective	Not Effective	Installation Date	Relative Cost	Relative Data Confidence	Relative Data Credit
	Federal Cost Share						Low: < $1/acre Medium:$1 to $3/acre High: > $3/acre	Annual BMP / Structural BMP (5=maximum, 1=minimum)	Annual BMP / Structural BMP (% of Approved BMP Effectiveness Value)
Farm inventory by trained federal, state, and/or county agency personnel.	Yes						High	5 / 5	

OBJECTIVES

- Currently, options identified by the AgWG fall into five categories:
  - On-farm assessment by trained personnel;
  - Farmer self-assessment, with or without spot check by agency personnel;
  - Review of existing agency or on-farm records;
  - Statistical sampling; and
  - Remote sensing

OBJECTIVES

- For each option, the AgWG hopes to assign
  - Relative data confidence
  - Relative data credit
  - (The 2 rightmost columns in the draft data matrix.)

- Why?
  - Relative data confidence will provide an indication of how reliable the data are (i.e., what is the level of assurance that the BMPs are implemented, maintained and operated to result in pollutant reductions of a specified magnitude)
  - Relative data credit is one option that may provide the modeling response to this data confidence.

OBJECTIVES

- In response to the recent AgWG request for assistance, Tetra Tech is providing technical assistance to help obtain scientifically defensible verification references from which to base the data confidence levels.

PROCESS

- Information search
  - Peer-reviewed literature
  - Agency literature
  - CTIC's crop residue transect surveys
  - NACD's draft verification protocols for non-cost-shared BMPs
  - Anything we can find

PROCESS

- Early indications are that the literature is very thin, so…
- Interviews are essential.
  - Tt will interview up to 15 experts identified by the AgWG from August 1 to August 17, 2012.
  - Questionnaire sent in advance
  - 1-hour call
  - Review and approval by interviewee

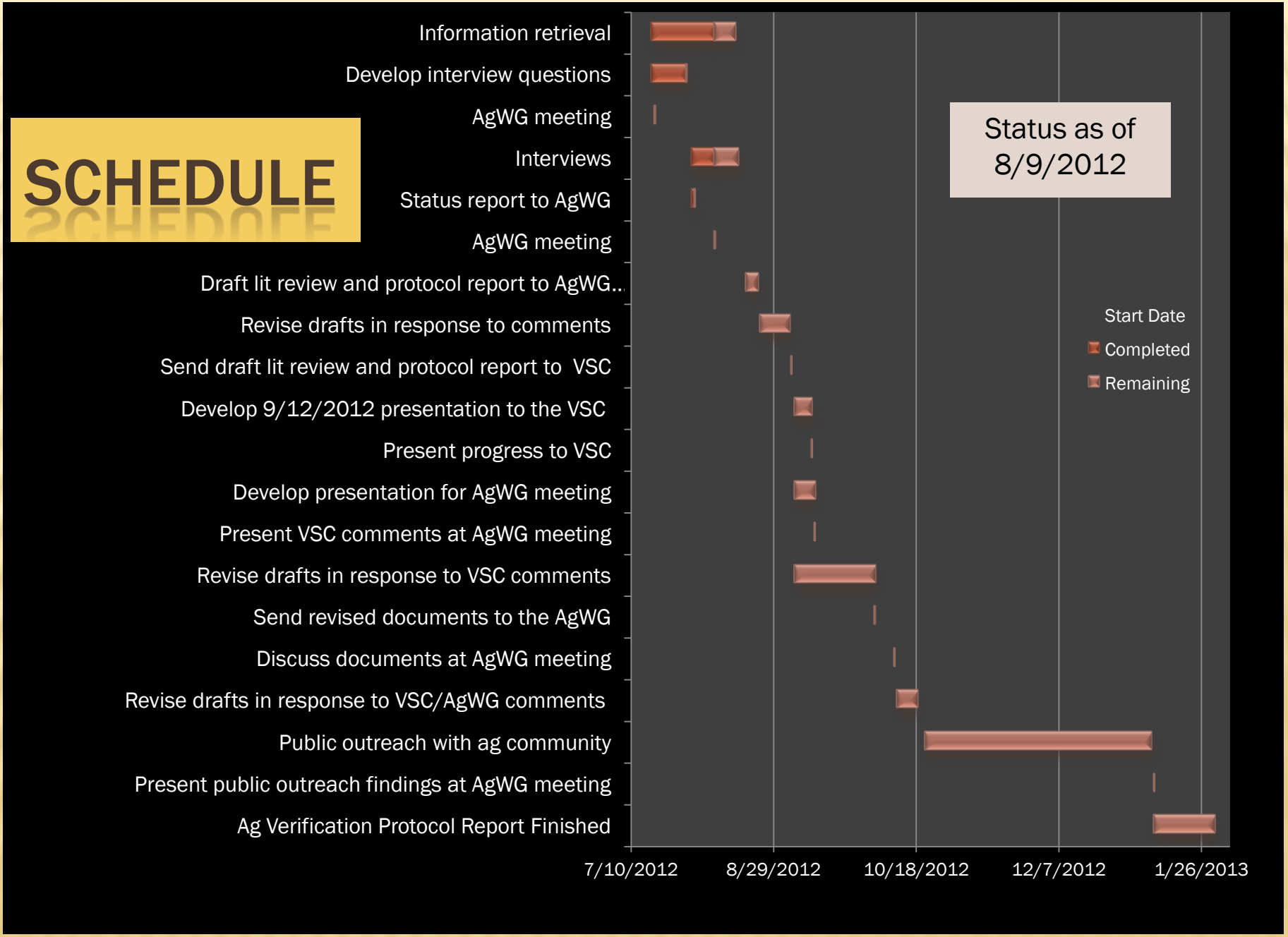
PROCESS

- Drafts of literature/interview summaries and verification protocol report will be presented to and discussed with AgWG and Verification Steering Committee (VSC) in concert with regularly scheduled meetings of both.
- Drafts revised between meetings and comment periods (see schedule).

PROCESS

- Provide technical assistance with public outreach period with agriculture community mid-to-late October through early January 2013
- Assist with findings of public outreach to be reported to AgWG in January
- Final documents by end of January

SCHEDULE


Information retrieval
Develop interview questions
AgWG meeting
Interviews
Status report to AgWG
AgWG meeting
Draft lit review and protocol report to AgWG..
Revise drafts in response to comments
Send draft lit review and protocol report to VSC
Develop 9/12/2012 presentation to the VSC
Present progress to VSC
Develop presentation for AgWG meeting
Present VSC comments at AgWG meeting
Revise drafts in response to VSC comments
Send revised documents to the AgWG
Discuss documents at AgWG meeting
Revise drafts in response to VSC/AgWG comments
Public outreach with ag community
Present public outreach findings at AgWG meeting
Ag Verification Protocol Report Finished
Status as of 8/9/2012
Start Date
Completed
Remaining
7/10/2012
8/29/2012
10/18/2012
12/7/2012
1/26/2013

PRELIMINARY FINDINGS FROM LITERATURE

- On-farm/trained personnel
  - MD
  - Water Stewardship, Inc. – VA, MD
  - Retrospective – Black Creek, IN (Bracmort et al. 2006)
- Farmer self-assessment/with or without check
  - MN – survey/selected field audits
  - Everglades – field verification of farmer-submitted BMP plans
  - FL – tracking filed NOI

PRELIMINARY FINDINGS FROM LITERATURE

- **Agency/On-farm records**
  - GA – ARS watershed BMP database from NRCS files and maps
  - MS – BMP database from EQIP, CRP records
- **Surveys and statistical sampling**
  - FL, VA, OK, Canada – farmer surveys
  - CEAP ARMS – NRI
  - CTIC tillage survey (roadside transect)
  - EPA Ag Tracking Guidance (2000) statistically rigorous

PRELIMINARY FINDINGS FROM LITERATURE

- Remote Sensing
  - CBW – cover cropping (Hively)
  - GA – satellite mapping of conservation tillage

PRELIMINARY FINDINGS FROM LITERATURE

- Hybrid approaches can be robust
  - IA – NRCS records, aerial photography, field-by-field drive-by (Tomer et al. 2008)
  - IN – Agency records, producer interviews, aerial photography → no one approach documented all BMPs (Grady et al. 2012)
- Essentially no quantitative documentation of accuracy/confidence has been reported

PRELIMINARY FINDINGS FROM LITERATURE

- Verification of structural, annual, and management practices will likely require different methods, have different information content and accuracy
- Hybrid approaches probably have best potential to provide complete and accurate information

PRELIMINARY FINDINGS FROM LITERATURE

- **Studies show that BMP function cannot be assumed even if presence verified in records**
  - UT – 16% of "implemented" BMPs never installed; 20% abandoned(mostly management) (Jackson-Smith et al. 2010)
  - IN – 1/3 of BMPs no longer exist; remainder partially functional with efficiency << originally rated (Bracmort et al. 2006)
  - Concentrated flow significantly degrades performance of riparian buffers (Dosskey et al. 2002)
  - BMP reduction efficiencies are site specific, vary with topography, hydrology, land use → danger of assigning absolute values (Sharpley et al. 2009)

PRELIMINARY FINDINGS FROM INTERVIEWS

- All practices – c/s and non-c/s – should be subject to same verification standards to get full credit
- Incentives are important – Nutrient Trading and TMDL encourage effective verification
- Conservation and ag professionals should play key roles; training 3rd parties can be effective
- Farmer self-assessment may work, but clear definitions of BMPs are required

PRELIMINARY FINDINGS FROM INTERVIEWS

- Mix of protocols required – large-scale practices like cc, tillage can be verified with statistical sampling, remote sensing, but verification of management must come from on-the-ground presence
- All verification protocols must be scientifically and statistically defensible