DRAFT

West Virginia Plan for Verification and Validation of Nutrient Reduction Strategies

Chesapeake Bay Program

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1. INTRODUCTION

Nutrient and sediment pollution from states surrounding the Chesapeake Bay have had a substantial impact on water quality in the Bay. These states—one of which is West Virginia—have joined together to develop strategies to reduce the nutrient and sediment loading each contributes to the Bay watershed. Previously, each state developed a strategy, known as a Watershed Implementation Plan (WIP) to reduce the flow of pollutants to the Chesapeake Bay waters. Many of the nutrient reduction strategies outlined for West Virginia are in place and data is routinely collected and submitted to the Chesapeake Bay Program. To ensure that the state is meeting its nutrient reduction requirements, all data used to assess load reductions must undergo verification and validation.

This document describes the strategies utilized by West Virginia agencies to verify that practices that are reported to the Chesapeake Bay Program are in place and functioning as intended. It also describes how the agencies ensure the accuracy of data collection and reporting methods used to measure the efficiency of nutrient attenuation practices implemented in the state. Strategies for the following six sectors are described in subsequent chapters:

1. Agriculture
2. Forestry
3. Stormwater
4. Stream restoration
5. Wastewater
6. Wetland restoration

2. AGRICULTURE

Currently, NRCS cost-share programs have been the major driver of agriculture projects in the Chesapeake Bay watershed of West Virginia.

Verification for Cost Shared Practices

- Annual data collection occurs approximately July through November each year (due on December 1), gathering data about implementation that occurred the previous (July through June) year. WVDA will request annual USDA NRCS & FSA data to be submitted by November 1 each year.

- Verification for other practices is ongoing throughout the year

Annually, West Virginia will continue to submit data from all available sources including Federal and State Agencies. All BMPs submitted annually will comply with current Federal Program Standards except for programs which do not currently have Federal Standards such as manure transport. All BMPs in Table 1, except nutrient management and a portion of manure transport, are cost shared practices as well. NRCS standards and specifications are described in Appendices B & H.

West Virginia will rely solely on Federal Verification Programs already in place until each BMP has reached the end of its lifespan, see Table 1. After each BMP's lifespan has expired, State Agencies and NGOs will be 100% responsible for ongoing verification of the following practices each year until the practices can no longer be credited. For more detail see the Standard Operating Procedures for Tracking, Reporting, and Verification of Agricultural BMPs (also known as the Quality Assurance Project Plan or QAPP) in Attachment A. QAPP Appendices are included as attachments B through H in this document.

BMPs that have been approved by the Chesapeake Bay Program for modeled credit are listed in the table below (Table 1).

Table 1: West Virginia Agriculture BMPs for Priority Verification

WIP Priority	BMP Name / Grouping	BMP Type	Method	Lifespan
High	Pasture Fencing	Structural	Visual	20
High	Forest Buffer	Structural / Agronomic	Visual	15
High	Grass Buffer	Structural / Agronomic	Visual	5
High	AWMS	Structural	Visual	15
High	Barnyard Runoff Control	Structural	Visual	15
High	Composters	Structural	Visual	15
High	Nutrient Management	Management	Paperwork Review	1 Year NRCS, 3 Year State
High	Conservation Till	Annual	Visual	1
High	Cover Crops	Annual	Visual	1
Medium	Manure Transport	Annual	Paperwork Review	1
Medium	Precision Rotational Grazing/Prescribed Grazing	Management	Paperwork Review	1 (Most are for 3 Years)
Medium	Tree Planting	Structural / Agronomic	Visual	15
Medium	Pasture Alternative Watering/Watering Facility	Structural	Visual	20
High	Stream Restoration	Structural	Visual	20
Medium	Wetland Restoration	Structural	Visual	15

West Virginia is also planning to collect Resource Improvement (RI) BMP data and begin working with Chesapeake Bay Program staff to get model credit for these practices. For more information on the R.I. Protocol, see section IV of the QAPP. (Attachments A and H)

While all BMP data will be collected at the site specific scale including latitude and longitude, West Virginia will only be reporting information to the Bay Program at the county level.

a) Changes in management actions include: implementation of a new BMP; maintenance of an existing BMP (not to be reported as a new practice); or renewed practices such as nutrient management plans.
b) Changes in management actions do not include the reporting existing practices in a new year under a new BMP name.
c) BMPs units will be tracked directly. Units should not be calculated by estimating a percentage of total acres available.

2.1.1 *Federal Agency Verification Protocol (USDA, NRCS, & FSA)*

Upon installation of new Best Management Practices, Federal Agencies verify that every practice was installed according to existing standards. After installation, NRCS maintains a 5% check on each practice (5% of fence, 5% of structures, etc.). For more information on Conservation Technical Assistance (CTA), (see

Appendix C of the QAPP in Attachment D to this document). If an inspection reveals that an installed BMP does not meet its relevant standard, the producer will bring it up to standard. This would trigger a re-check.

Practices implemented as NRCS Conservation Technical Assistance (CTA) projects did not receive cost-share from USDA. CTA project data generally receive a lower level of QA/QC than data for other practices. CTA practices are included in conservation plans, but have not previously been reported by most states.

Initial inspections of Conservation Reserve Program/Conservation Reserve Enhancement Program (CRP/CREP) projects are mostly visual field inspections completed by the agency, however, landowners are given the option of self-reporting. Next, a two year status report is completed and then projects are spot checked according to an established protocol, which is described in Appendix D of the QAPP (Attachment E of this document). There are no other requirements for annual reporting. When participants re-enlist in CREP, this prompts a new inspection. For more information on CRP Compliance see Appendix D of the QAPP in Attachment E of this document.

WV USDA NRCS has agreed to share with the West Virginia Department of Agriculture (WVDA) (under a 1619 Agreement) all agricultural data from their Performance Results System (PRS System) back to 2004. This includes latitudes and longitudes of practices which will greatly assist other agencies with future verification as practice lifespans expire. USDA data prior to 2004 will be very difficult to collect. This will have to be done manually with staff visiting county field offices to verify data by hard copy.

2.1.2 *State Agency / Non-Governmental Organizations Protocol*

After Practices expire and are no longer being reviewed by Federal Agencies, State Agencies will take over and follow the same protocol as Federal Agencies employing a 5% verification rate for the following High and Medium Priority Best Management Practices after their lifespan expires. (For acronyms, refer to guide immediately below this list.)

- Pasture Fencing (FI)
- Forest Buffer (FI & RS)
- Grass Buffer (FI)
- AWMS (FI & RS)
- Barnyard Runoff Control (FI)
- Composters (FI & RS)
- Nutrient Management (FR)
- Conservation Till (FR, TS, AS)
- Cover Crops (FR, TS, AS)
- Manure Transport (FR)
- Precision Rotational Grazing/Prescribed Grazing (FR & AS)
- Tree Planting (FI)
- Pasture Alternative Watering/Watering Facility (FI & RS)
- Stream Restoration (FI)
- Wetland Restoration (FI)

Farm Inventory (FI)

A survey or listing of physical BMPs completed by certified, trained technical staff, or by the producer. The survey or listing is based on physical inspection. The reliability of the information and the level of verification depends upon the intensity and frequency of the survey, the training of the person completing the survey, and whether the person completing the survey must certify to its accuracy with penalties for false

information. Producer completed inventories without third-party verification are not considered an adequate method for verification.

Office/farm Records (FR)

An evaluation of paperwork on record at the conservation district office or the farm operation itself rather than an on-site inspection of physical BMPs. Records alone are not considered an adequate method for verification, but can be a critical compliment to other methods, especially when associated with non-visual assessment BMPs.

Transect Survey (TS)

An inspection of a statistical-based sampling of BMPs. A transect survey is appropriate for a single year visual assessment of practices such as tillage management. The reliability of this method is based on the sampling and inspection methods and the training and independence of the inspectors. Transect surveys as a visual verification method are not considered an adequate method for verifying non-visual BMPs, or multi-year visual BMPs which require direct inspection, office/farm records, or certified training and engineering.

Agency-sponsored Surveys (AS)

A survey of a statistical sampling of farms. Limitations on the reliability of data are similar to those for farm inventory and office/farm records. Periodic surveys and associated reports published by the National Agricultural Statistics Service (NASS), Conservation Effects Assessment Program (CEAP) and Natural Resources Inventory (NRI) are examples of this type of survey.

Remote Sensing (RS)

A science-based review of images or photographic signatures verified through aerial photography, satellite imagery, or similar methods to identify physical practices on the landscape. This method may involve site-by-site imaging or statistical sampling. Implementing a sufficient land-based sampling validation protocol is necessary for ensuring the analysis of the remote images or photographic signatures are calibrated to actual conditions.

Data to be collected during inspections:

- Organization who collected data
- Farm/Site Name
- County
- BMP Name
- BMP Details (varies by BMP, i.e. Cover Crop Type, Planting Date, Number of Animals etc.)
- Lat/Long
- Units
- Farm/Tract/Field
- Progress Year
- BMP Status
- Date of Collection
- Date of Implementation
- BMP Lifespan
- Adjusted Lifespan (for future verification)
- Prior Land Use
- Post Land Use
- Cost Shared (yes/no)

- Meets NRCS Standards (yes/no)
- Photos or other documents to attach (optional)

After original practice lifespans have expired, any practice must be verified to be credited, and will then have adjusted lifespans applied to each practice based on the type of practice (i.e. structural, etc.).

2.1.3 *ADJUSTED LIFESPANS (to be reviewed by agencies before distribution)*

10 YEARS

- AWMS
- Composters
- Pasture Alternative Watering/Watering Facility
- Stream Restoration*
- Wetland Restoration*

**BMPs covered under Section 5 Stream Restoration and Section 7 Wetland Restoration*

5 YEARS

- Pasture Fencing
- Barnyard Runoff Control
- Tree Planting**

***BMPs covered under Section 3 Forestry*

3 YEARS

- Forest Buffer**
- Grass Buffer

***BMPs covered under Section 3 Forestry*

1 YEAR

- Nutrient Management
- Conservation Till
- Cover Crops
- Manure Transport
- Precision Rotational Grazing/Prescribed Grazing

2.1.4 *Programmatic Constraint*

West Virginia's Verification Program is based on voluntary principles and will work to verify agricultural practices on farms whose owners are willing to share information with Federal and State Agencies and Non-Governmental Organizations.

The program goal is to verify 100% of practices on the landscape, but this will take several years. West Virginia proposes to only sunset practices that are no longer on the ground or functioning properly. Currently, the WV program is not planning to extrapolate across the entire universe of practices.

At this time West Virginia has no plans to assess BMP performance. This may be something that could be explored down the road.

2.1.5 *Verification Methods and Procedures (for R.I. Practices)*

Resource Improvement practices information will be collected during farm visits for future inclusion in the Bay model. See Attachment H for more information.

2.1.6 *Verification Training Program*

Upon approval of West Virginia's Verification Program, West Virginia will begin to assemble and train the "West Virginia Agriculture Verification Program Implementation Team". These individuals, who are already professionals in the conservation field, will lead the State effort in tracking, reporting, and verification of agricultural BMPs. These individuals will be required to participate in a training session to become fully certified in West Virginia to verify and report agricultural BMPs.

These individuals will be required to:

> Attend a one day training course which will be sponsored by the West Virginia Conservation Agency (WVCA), the West Virginia Department of Agriculture (WVDA), the USDA Natural Resources Conservation Service (NRCS), and Farm Service Agency (FSA). This one day training session will provide all attendees the knowledge to determine NRCS and FSA practice names, and specifications. During this training, a professional previously trained in NRCS Best Management Practices, will review attendees work after they have documented a pre-determined number of practices. West Virginia is considering holding this one day training session at the WVU Reymann Memorial Farm in Wardensville, WV, where several Best Management Practices have been implemented.

A future training program for non-professionals (those who are not well versed in conservation programs) will be developed over the next two years. It is anticipated that non-professionals will be able to assist in verifying a subset of the priority practices, for which data are simpler to collect, such as animal waste structures and composters.

2.1.7 *Verification Pilot Project*

West Virginia will begin a verification pilot project shortly after the Verification Program has been approved by EPA. This pilot project will include three certified individuals representing the West Virginia Department of Agriculture, West Virginia Conservation Agency, and a Conservation District. This team will be tasked with collecting detailed information on a minimum of three BMPs. These three individuals will then log in to the Agriculture Database and enter required information.

The three test BMPS will utilize the following verification techniques (one each):

- Visual Assessment
- Remote Sensing
- Review of Farm Records

State and Federal Agency personnel will then review data collected and entered into the database for accuracy. If the review shows that there are any shortcomings in data collected, then retraining by Federal and State agency staff will commence. This pilot project will be completed by December 31, 2015.

2.1.8 *BMP Grouping*

The agriculture workgroup BMPs are organized into four separate BMP categories, and each is described in the following sections.

- Structural
- Structural/Agronomic

- Management
- Annual

Note: Stream restoration and wetland restoration are not covered by the agriculture workgroup and are included in Sections 5 and 7.

2.2 Structural BMPS

Structural BMPs include:

1) **Pasture Fencing:** Stream access control with fencing involves excluding a strip of land with fencing along the stream corridor to provide protection from livestock. The fenced areas may be planted with trees or grass, or left to natural plant succession, and can be of various widths. (SB 8.4.27) This BMP excludes animals from streams. It incorporates both alternative watering and installation of fencing that eliminates livestock access to narrow strips of land along stream. (MAWP 414)
2) **Alternative Waste Management Systems:** Practices designed for proper handling, storage, and utilization of wastes generated from confined animal operations. (SB 8.4.1)
3) **Barnyard Runoff Containment:** Includes the installation of practices to control runoff from barnyard areas. This includes practices such as roof runoff control, diversion of clean water from entering the barnyard and control of runoff from barnyard areas. (SB 8.4.2)
4) ***Composters: (has not been reported through 2012):*** *A physical structure and process for disposing of dead poultry. Composted material is combined with poultry litter and land applied using nutrient management plan recommendations. (SB 8.4.6) Mortality composters involve composting routine mortality in a designed, on-farm facility, with subsequent land application of the compost. This prevents the necessity to bury dead animals that could result in nutrient leachate, or rendering of dead animals for processing into animal feeds or incineration. Mortality composting can be, and is applied, to various species including poultry, swine and dairy calves (p. 395 MAWP).*
5) **Pasture Alternative Watering/Watering Facility**: Alternative watering facilities typically involves the use of permanent or portable livestock water troughs placed away from the stream corridor. The source of water supplied to the facilities can be from any source including pipelines, spring developments, water wells, and ponds. In-stream watering facilities such as stream crossings or access points are not considered in this definition (Scenario Builder documentation 8.4.26). This BMP requires the use of alternative drinking water sources away from streams to reduce the time livestock spends near and in streams and streambanks reducing direct manure deposition to streambeds and banks and also reducing erosion and nutrient deposition to riparian areas. (MAWP p. 414)

2.2.1 *BMP verification*

West Virginia's structural BMPs are driven by cost-share and non-cost-share programs. Five percent (5%) of structural BMPs will be inspected, based upon current NRCS protocols. 1-5 above, each will be inspected one time post construction. If not up to standard, the producer is required to bring the practice up to standard and NRCS conducts a follow up inspection. If cost shared under West Virginia's Section 319 program, structural practices will be inspected once per year for 5 years. The inspection method will be visual and will be conducted by the funder, which could be NRCS, WVDA, or WVCA. These staff members will be trained as outlined in **Error! Reference source not found.**. The staff members will ensure that each structural BMP meets the Federal standards. Information will be recorded in WVDA's database, spreadsheets, and written files.

The inspection process will be documented in and checked against the QAPP (Attachment A). Results will be reported to USEPA and/or the public by county.

2.2.2 *BMP validation*

The WVDA will prevent double-counting by performing a database/paper check of an adequate statistical sample.

2.2.3 *BMP performance*

Agriculture group indicated that this is not applicable

2.3 Structural/Agronomic

This grouping of BMPs includes:

- **Forest Buffer:** Agricultural riparian forest buffers are linear wooded areas along rivers, stream and shorelines. Forest buffers help filter nutrients, sediments, and other pollutants from runoff as well as remove nutrients from groundwater. The recommended buffer width for agricultural riparian forest buffers is 100 feet, with a 35 feet minimum width required. min width = 35', recommended 100' … defined as having a vegetative cover of 60% or greater (SB 8.4.9).
- **Grass Buffers:** Grass buffers are grass plantings between fields and rivers and streams. They are linear strips of vegetation along rivers and streams, helping to filter nutrients, sediment, and other pollutants carried in runoff. Min width = 35', recommended 100' (SB 8.4.10).
- **Tree Planting:** (Row Crop): Any tree plantings on any site except those along rivers and streams. Tree plantings do not include reforestation. Targets land that is highly erodible or identified as a critical resource area. Density should be sufficient to produce forest-like cover over time. CRP planting given as an example (SB 8.4.4).

2.3.1 *BMP verification*

West Virginia's Structural/Agronomic BMPs are driven by cost-share and non-cost-share programs. Five percent (5%) of Structural/Agronomic BMPs will be inspected through aerial coverage and will all be reviewed annually. The verification is decided by CREP, WVCA, WVDOF, and NGO protocols. The Structural/Agronomic BMPs described above will be inspected according to the protocols listed below. Details on verification strategy for each agency are included in Section 2.1.1.

- Forest Buffer - CREP, WVCA, WVDOF and NGO protocols
- Grass Buffer - CREP, WVDOF protocols
- Tree Planting - Once post practice

The inspection method will be visual and will be conducted by NRCS, WVCA, WVDOC, NGO depending on the BMP and/or funder. These staff members will be trained as outlined in Section 2.1.6. The staff members will ensure that each structural BMP meets the Federal standards. Information will be recorded in written notes and an electronic form. The inspection process will be documented in and checked against the Agricultural Workgroup QAPP, Attachment A. Results will be reported to USEPA and/or public by county.

2.3.2 *BMP validation*

The WVDA will prevent double-counting by performing a database/paper check of an adequate statistical sample. Additional checks for accuracy are defined by BMP in Section II. of the QAPP, Attachment A.

2.3.3 *BMP performance*

Agriculture group indicated that this is not applicable

2.4 Management

- **Precision Rotational Grazing:** This practice utilizes a range of pasture management and grazing techniques to improve the quality and quantity of the forages grown on pastures and reduce the impact of animal travel lanes, animal concentration areas or other degraded areas (SB 8.4.29); part of proposed Pasture Management BMP in MAWP p. 746.
- **Nutrient Management:** Application of nutrients to croplands [although WVDA also keeps track of nutrient management plans' pasture and hay acreage, as well, so these can be reported separately]. Details type, rate, timing, and placement of nutrients for each crop. Soil, plant tissue, manure and/or sludge tests used to assure optimal application. Revised every 2-3 years (SB 8.4.8). *Note:short-term expert panel recommendations were approved October 2013.*

2.4.1 *BMP verification*

Management BMPs are driven by cost-share and non-cost-share programs. These BMPs are inspected through paperwork reviews. The Management BMPS will be inspected as follows:

- One hundred percent (100%) of the Nutrient Management BMPs will be inspected by NRCS annually, and by the state one time every 3 years.
- Five percent (5%) of the Precision Rotational Grazing BMPs will be inspected once a year for 3 years.

The inspection method will be paperwork-based and will be conducted by the funder, which could be NRCS, WVDA, NGO, or WVCA. These staff members will be trained as outlined in 5.1.6. The staff members will ensure that each structural BMP meets the Federal and/or State standards. Information will be recorded in written notes and electronic files. The inspection process will be documented in and checked against the Agricultural Workgroup QAPP, Attachment A. Results will be reported to USEPA and/or public by county.

2.4.2 *BMP validation*

The WVDA will prevent double-counting by performing a database/paper check of an adequate statistical sample.

2.4.3 *BMP performance*

Agriculture group indicated that this is not applicable

2.5 Annual

- **Manure Transport:** Participation in a litter transfer program, also voluntary broker participation.
- **Cover Crops:** Planting and growing of cereal crops (non-harvested) with minimal disturbance of the surface soil. The crop is seeded directly into vegetative cover or crop residue with little disturbance of the surface soil (8.4.19). Non-harvested winter cereal cover crops, including wheat, rye and barley, designed for nutrient removal (MAWP p. 99). *Note: short-term expert panel recommendations were approved October 2013.*
- **Conservation Till:** Conservation tillage involves planting and growing crops with minimal disturbance of the surface soil. Conservation tillage requires two components, (a) a minimum 30% residue coverage at the time of planting and (b) a non-inversion tillage method (SB 8.4.12) *Note: short-term expert panel recommendations were approved October 2013*

2.5.1 *BMP verification*

BMPs in the annual category are driven by cost-share and non-cost-share programs. Annual BMPs are inspected through visual reviews except for manure transport, which is inspected through a paperwork review. All Annual BMPs are inspected one time after the practice occurs. The inspection method will be visual and will be conducted by the funder, which could be NRCS, WVDA, or WVCA according to the funder's protocol (See Section 2.1.1). These staff members will be trained as outlined in 2.1.6. The staff members will ensure that each structural BMP meets the federal, state, or individual standards. Information will be recorded in written notes and electronic files. The inspection process will be documented in and checked against the QAPP, Attachment A. Results will be reported to USEPA and/or the public by county.

2.5.2 *BMP validation*

The WVDA will prevent double-counting by performing a database/paper check of an adequate statistical sample.

2.5.3 *BMP performance*

Agriculture group indicated that this is not applicable.

Table 2: Summary of Agricultural BMP verification program

A. Program Component	B. Program Elements	C.1 Structural BMPs Verification Program	C.2 Structural/ Agronomic BMPs Verification Program	C.3 Management BMPs Verification Program	C.4 Annual BMPs Verification Program
i. BMP Verification	1. What was the driver for BMP installation?	Cost-share and Non-Cost-Share	Cost-share and Non-Cost-Share	Cost-share and Non-Cost-Share	Cost-share and Non-Cost-Share
	2. How many BMPs will be inspected?	Percentage - 5%	Percentage - 5%	100% Nutrient Management, 5% Precision Rotational	N/A
	3. How is inspection frequency and location determined?	Based upon current protocols	Based upon current protocols	Based upon current protocols	Based upon current protocols
	4. How often are BMPs/groups of BMPs inspected?	1 time post construction and as needed (EXCEPT FOR Pasture Alternative Water - 1 time post construction and as needed (319 once per year for 5 years) ; Stream Restoration - WVCA once during build, then annually 5 years, NRCS 1 time post construction (CORPS requirement also) ; Wetland Restoration - 1 time post construction (easements every year) WVCA annually for life of contract)	Forest Buffer - CREP, WVCA, WVDOF and NGO protocols (DEFINE); Grass Buffer - CREP, WVDOF protocols(DEFINE) ; Tree Planting - Once post practice)	Nutrient management - NRCS every year, State 1 time every 3 years ; Precision Rotational Grazing- Once per year for three years	Once post practice
	5. What is the method of inspection?	Visual	Visual	Paperwork Review	Visual and Paperwork Review for Manure Transport

	6. Who will conduct the inspection and is he/she certified/trained?	NRCS, WVCA, WVDA	NRCS, WVCA, WVDA, WVDOC, WVCA, NGO, depending on BMP	NRCS, WVDA WVCA NGO et.al.	NRCS, WVDA WVCA NGO et.al.
	7. What needs to be recorded for each inspection?	If it meets Federal Standards	If meets federal standards	If it meets Federal/State standards	If meeting Federal/State/Individual Producer standards
	8. Is execution of the inspection process documented in and checked against an updated quality assurance (QA) plan?	Yes	Yes	Yes	Yes
	9. How is collected data recorded?	Written Notes and Electronic Files	Written Notes and Electronic Files	Written notes and electronic files	Written notes and electronic files
	10. At what resolution are results reported to EPA and/or the public?	By County	By County	By County	By County
ii. BMP Data Validation	11. What is the QA/QC process to prevent double-counting or counting of BMPs no longer in place?	Database/paper check of adequate statistical sample	Database/paper check of adequate statistical sample	Database/paper check of adequate statistical sample	Database/paper check of adequate statistical sample
	12. What is the method used to validate state's ability to collect and report correct data?	Database/paper check of adequate statistical sample	Database/paper check of adequate statistical sample	Database/paper check of adequate statistical sample	Database/paper check of adequate statistical sample

	13. If data is provided by external independent party or industry, what method is used to provide adequate QA for acceptance by the Chesapeake Bay Program?	Database/paper check of adequate statistical sample	Database/paper check of adequate statistical sample	Database/paper check of adequate statistical sample	Database/paper check of adequate statistical sample
	14. Who conducts data validation?	WVDA	WVDA	WVDA	WVDA
iii. BMP Performance	15. What is the process to collect data to assess BMP performance and confirm consistency with the Chesapeake Bay Program's approved BMP efficiencies?	N/A	N/A	N/A	N/A
	16. Who collects BMP effectiveness data?	N/A	N/A	N/A	N/A

3. FORESTRY

Forests cover the majority of the landscape in each Bay state. Protection of forested lands and restoration of trees in priority areas, such as riparian forest buffers (RFBs) along streams and shorelines, are vital for Bay watershed water quality and ecological health. The CBP Executive Council adopted an ambitious, science-based RFB goal in 2007 as part of the Forest Conservation Directive. Riparian forest buffers planted on agricultural land are one of the BMPs on which the states are most relying to achieve Bay water quality goals in their Phase II Watershed Implementation Plans. In addition to RFBs, other forestry BMPs play an increasingly important role, especially in the urban sector (see Section VI.).

Forests are not generally pollution sources. Instead, they absorb and use nutrients (greatly reducing nutrients from airborne sources, for example) and retain and use sediment, thus aiding pollution prevention. Four of the five Forestry BMPs covered by this guidance are types of tree planting designed to improve environmental and water quality conditions in currently nonforested areas, including tree planting in riparian areas. These tree planting practices apply to agricultural and urban landscapes. The forest harvesting BMPs are the only BMPs applied specifically to current forest landscapes at this time.

Generally speaking, forest planting BMPs (riparian forest buffers and tree planting) are intended to last for a very long time. After verifying that buffer and tree planting projects have been installed and surviving according to plans, and after performing site inspection and maintenance during the initial growth period or until considered established), forest BMPs will become easier to verify by aerial photography and inexpensive to maintain over the long term compared with other types of BMPs. Once the tree planting is established, the principal remaining concern is whether effectiveness of buffers will be undermined by concentrated flow or channelization circumventing the benefits of the buffer.

The five forestry BMPs for which verification guidance is presented are: a) agricultural riparian forest buffers; b) agricultural tree planting; c) expanded tree canopy; d) urban riparian forest buffers; and e) forest harvesting BMPs. Because of similarities in how the two agricultural BMPs are implemented, and how the urban forestry BMPs are implemented, they are grouped accordingly. This guidance is for use by the Chesapeake Bay states and, in general applies to federal installations as well, so they may use it to write Protocols for verification. The Forestry Workgroup is mindful of the extensive resources needed to support BMP verification, and fully supports the "verification intensity" concept recommended by the CBPVRP (2013). The intensity of verification efforts should be in direct proportion to contribution that a BMP makes to overall TMDL pollutant reduction in a state's Watershed Implementation Plan. The basic notion is to prioritize local and state verification resources on the BMPs that produce the greatest modeled load reduction in each state as reported in their annual progress runs to CBP. The converse also applies: less verification resources should be devoted to BMPs that make minor contributions to overall load reductions.

Riparian Forest Buffers and Tree Planting BMPs are verified and counted by the Agriculture BMPs and practices are discussed in Section 2.3.

3.1 Forest Harvesting BMPs

Forest Harvest BMPs Description: Forest harvesting practices are a suite of BMPs that minimize the environmental impacts of logging, including road building and site preparation. These practices can greatly reduce the suspended sediments and other pollutants that can enter waterways as a result of timber operations. The CB model currently assumes an average of 1% of forest is harvested in any given year, unless more accurate data are supplied by the state. The modeled pollution load from forest harvesting is reduced based on the annual number of acres of forest harvesting BMPs reported.

Current procedure: All States have adopted recommended BMPs for timber harvesting and forest management activities (also called Silvicultural BMPs) that have the potential to impact water quality. These water quality BMPs have common elements although they may vary from state-to-state and their use is site dependent. For the purposes of monitoring, BMPs are grouped by area of concern such as:

- Roads and timber loading areas
- Stream crossings
- Stream Management Zones or Riparian areas
- Wetlands
- Use of chemicals

3.1.1 *Forest Harvesting BMP verification*

WV's Logging and Sediment Control Act (LSCA) (WV Code 19-1B-12) requires all timber harvest operations to notify the WV Division of Forestry (WVDOF). Additionally, timber operators must complete an initial BMP course and refresher courses every 3 years.

All BMPs associated with registered timber harvest operations on public and private land will be inspected at least three times according to IAW DOF policy. WV law mandates only a final inspection for reclamation. It depends upon whether all LSCA positions are filled, whether additional inspections are completed.

Trained WVDOF LCSA Foresters will conduct inspections. Timber operators also receive training on BMPs, and must refer to the BMP manual. WVDOF LCSA Foresters will record whether BMPs are in place, meet prescribed standards, and are functioning as designed. If any of these are lacking, it will be recorded.

Table 3: Prescribed standards by Forest Harvesting BMP type

General Forest Harvesting BMPs	Haul/skid Roads and timber loading areas	Streamside Management Zones (wetlands managed same way)	Stream Crossings
Reclamation on all areas after harvest is complete.	Road surface and grades, proximity to streams, good drainage practices including culvert size/waterbars. Landings, location and water control structures.	Landing and roads offsets. No equipment allowed except for crossing at 90 degrees with water structures. Seeding and mulching after construction	Water structures standardized, Seeding and mulching after construction

There is no QA plan in place to check against.

The collected data is recorded in the LONIE (Logging Operation Notification, Investigation and Enforcement) database. The following information is digitally entered in the LONIE database: First visit: "Notification Form;" Second and subsequent visits: "Investigation Form;" Final visit: "Final Inspection Form." If problems are found with the BMPs during the process, "Compliance Orders" and hard-copy "Tickets" are issued, and "Suspensions" and "Suspension Releases" are used as needed.

The acres of forest registered as timber operations are aggregated by county and entered into the NEIEN (National Environmental Information Exchange Network) for annual progress reporting.

3.1.2 *Forest Harvesting BMP validation*

By law, all timber harvest operations are required to notify the WVDOF prior to beginning operations. The notifications include, among other items, acreage to be harvested, what type of harvest, location, and time

period. Data from the notifications are entered into the LONIE system. The system was developed by the Appalachian Hardwood Center at West Virginia University.

The procedure used to compile data is the LONIE system, which can be queried to report on a number of different requests and compile them as an Excel spreadsheet. For acreage reporting, we use job start dates only to avoid double counting. WVDOF reports acres to WVDEP staff.

Ninety eight percent (98%) of the registered acres with BMPs applied are reported. The rationale for this is that occasionally, we do have illegal logging activity that is discovered after the fact and does not get reported. We do not track these because there are others that we never discover. 2% is an estimate of unknown illegal activity that may or may not have BMP's applied. Therfore, the WVDOF adds this 2% to the total number of known harvest acreage.

The process to prevent double counting is basic. First, we are certain of not double-counting because only unique close-out dates are queried. Second, there is a database check of the query to ensure that the same tract of harvested timber was not reported by two or more harvest companies.

WVDOF is the regulatory agency that will conduct the data validation. They employ three LSCA foresters. Staff includes supervisor of LCSA foresters and the Assistant State Forester. These positions are fully staffed.

3.1.3 *Forest Harvesting BMP performance*

Assessment of BMP performance and consistency with the Chesapeake Bay Program's approved BMP efficiency will be conducted by the Region 1 LSCA Specialist.

The BMP manual is revised at least every 5 years by a committee including university researchers, WVDEP, and industry representatives. Also, Federal (USFS) Fernow Research Forest provides recent information through committee networks. WVDOF staff participate in Chesapeake Bay Program Office (CBPO) Forestry Workgroup.

The WVDOF will collect BMP effectiveness data.

3.2 Forest Conservation BMPs

There are currently many agencies coordinating land conservation in the West Virginia Potomac drain counties. The WVDOF works with the Forest Legacy Program. Other NGO's involved include: Potomac Conservancy, Cacapon & Lost River Land Trust, Land Trust of the Eastern Panhandle, Nature Conservancy, and Conservation Fund. Also each county has a Farmland Protection Board. In addition, other land is protected through programs such as the American Battlefield Protection Plan and The Outdoor Heritage Conservation Fund.

3.2.1 *Forest Conservation BMP verification*

The 2007 Forest Conservation directive is the driver for BMP installation. Inspections will be completed by the managing organization. Inspections will occur one time after conservation, and additional inspections will vary depending on the agency. The number of acres of forestland conserved will be inspected. The first inspection will be completed through aerial coverage and the method of subsequent year inspections will be determined by the controlling agency.

WVDOF staff contacts the region's land trusts and other local organizations involved in conserving land, e.g. county farmland protection agencies, to determine the number of acres conserved in each county. WVDOF attempts to track location of acres reported, or a property name, so they will not be double counted in the future. WVDOF staff will also conduct aerial coverage analyses.

Data will be maintained by the managing organization. Information recorded describing each conservation project and QA varies by managing organization.

The collected data, acres of forestland conserved, is recorded by county in an excel spreadsheet by WVDOF. This information is currently reported annually by the WVDOF to the US Forest Service.

Forest Conservation acreage is expected in perpetuity.

3.2.2 *Forest Conservation BMP validation*

The WVDOF staff will contact the region's land trusts and other local organization to verify.

The location of acres reported, and/or property names are recorded so that acres will not be double counted. The region is small therefore, if an unreasonably large number of acres in any of those categories are reported by agencies, the locations could be questioned.

3.2.3 *Forest Conservation BMP performance*

WVDOF staff will collect the data to assess the BMP performance and confirm consistency with the Chesapeake Bay Program approved BMP efficiencies by contacting the region's land trusts and other local organizations involved in conserving land, e.g. county farmland protection agencies, to determine acreages to report in this category.

3.3 Expanded Tree Canopy

Expanding tree canopy involves increasing the overall percent of tree cover in a geographically defined locality on developed land. Credit is applied according to the number of new acres (net gain) of tree cover, i.e., amount of canopy expansion. If trees are not planted in a contiguous area, such as for street trees, then number of trees can be converted to acres using the following conversion factor: 100 trees = 1 acre of new tree cover. All tree planting data is aggregated and submitted to the state by a locality for further aggregation to the CB model per land-river segment.

3.3.1 *Expanded Tree Canopy BMP verification*

BMP installation was/is driven by the Forest Restoration Strategy.

All tree canopy expansion areas will be inspected. Every 5 years, a locality should re-assess the tree canopy in its defined boundaries to show that there has not been a decrease in overall canopy.

Cacapon Institute, in cooperation with the WV Chesapeake Bay Forester and WV Urban & Community Forestry Council, will determine frequency and locations to be inspected. WV Bay Program aggregates all BMP reporting through the WVDEP. Any Tree Canopy Expansion will be evaluated for each municipality reporting tree plantings. (Note: The CBP Forestry Workgroup is working on an Urban Tree Canopy landcover map for the entire Bay Watershed that could be completed as early as 2018. Thereafter, every five years, a new UTC landcover map will be produced. The verification method discussed here and in the riparian forest section are intended to be stop-gap measures to ensure verification interim, prior to the improved verification anticipated under the Forestry Work Groups plan.)

This is important especially since tree canopy losses may occur despite good policies and practices for urban forestry. Ongoing problems for tree canopy are the expansion of invasive pests such as emerald ash borer, required tree trimming for electrical reliability standards, and natural aging of trees.

Tree canopy will be assessed every two years by Cacapon Institute using iTree Canopy or similar human-eye interpretation of aerial imagery. iTree Canopy produces a statistical assessment of landcover and can be

used to evaluate aerial imagery. Similar tools are available in Arc GIS. Statistical assessment does NOT map tree canopy, it projects the likelihood of landcover change over time. Expanded Tree Canopy will cover only developed lands, not forest, agriculture, or riparian areas. "Developed lands" are determined by the Chesapeake Bay Program and the GIS shapefiles are available from CBP. Riparian areas will be clipped, or removed, from the study area using CBP shapefiles for HUD stream data sets by setting 35' riparian buffers aside. (These will be assessed separately – see Urban Riparian Forest Buffers below).

The method of inspection is as follows. iTree Canopy type surveys utilize NAIP (National Agriculture Inventory Program) <2 meter resolution natural color aerial imagery for human-eye landcover interpretation. Landcover will be assessed using the USDA Forest Service-University of Vermont 7-landcover sets: canopy, green space, bare soil, water, building, road/railroad, and transportation-other (impervious). From this classification of points, a statistical estimate of the amount or percent cover in each cover class can be calculated along with an estimate of uncertainty of the estimate (standard error (SE)). iTree explains this as follows:

"To illustrate how this is done, let us assume 1,000 points have been interpreted and classified within a city as either "tree" or "non-tree" as a means to ascertain the tree cover within that city, and 330 points were classified as "tree". To calculate the percent tree cover and SE, let:

N = total number of sampled points (i.e., 1,000)
n = total number of points classified as tree (i.e., 330), and
p = n/N (i.e., 330/1,000 = 0.33)
q = 1 – p (i.e., 1 - 0.33 = 0.67)"

To ensure a rigorous assessment/analysis a Standard Error (SE) of >90 (i.e. +/- 5%) is desirable.

Standard Error (SE) = √ (pq/N) (i.e., √ (0.33 x 0.67 / 1,000) = 0.0149)

Using iTree Canopy in the most recent NAIP a set of data points will be established. These can be compared to NAIP imagery from six years prior (NAIP is collected on odd-numbered years). The analysis will show, statistically speaking, if Tree Canopy is expanding or declining.

Cacapon Institute has been conducting iTree Canopy inventories since 2006. iTree Canopy is provided by the USDA Forest Service. WVU and Shepherd University graduate and undergraduate students, and WVDEP or WVDOF personnel, even volunteers may assist in the analysis but the iTree Canopy report will be managed and produced by Cacapon Institute for the WVDOF and WVDEP. Cacapon Institute is the WV DEP Bay Program partner endorsed to represent WV urban forestry issues to the CBP Forestry Work Group. WVDEP and WVDOF will have oversight.

In addition to two-year iTree Canopy statistical analysis there will be annual inspection of new plantings. Since the Expanded Tree Canopy goal, ultimately, is measured by iTree Canopy type statistical analysis, the annual tree inspections are not a final conclusion. However, annual, on-the-ground, inspections are crucial to detecting early problems with tree establishment or mortality. The iTree statistical analysis is not intended as a management tool and does not provide insight into site-specific challenges. Therefore, annual inspection is required. As the number of tree planting sites increases a random sampling regiment will be required. Annual inspection of every site newer than three years is required. Once a sites has been in place for four or more years it should be moved into an inspection routine of random sites (i.e., only 20% of sites >4 years old are physically inspected).

Table 4: Data to record for expanded tree canopy projects

New plantings	Natural Regeneration Areas	Voluntary Acres
For new plantings, the following information should be collected: 1. Date of planting 2. Location 3. Number of trees by: a. Species b. Stock size (i.e., tree size at time of planting) Anticipated management regime (e.g., care will be weekly watering and care , monthly, annually, or "plant-and-forget") Urban tree canopy plantings can be credited once planting is confirmed. Plantings that fail must be replanted (no additional credit) or removed from the NEIEN database.	Natural regeneration will show in the iTree Canopy assessment. On the ground verification is not required. However, if areas are delineated and intentionally set aside for natural regeneration they should be inspected annually and the regeneration documented with photographs.	Like natural regeneration, voluntary planting on private land will present increased tree canopy in the iTree Canopy assessment. Volunteers should be encouraged to report private land plantings. WV is adopting a SMART Tool type of online volunteer reporting mechanism. Volunteer, self-reported, plantings should be inspected on a random basis based on resources available. A rate of 20% inspections of self-reported volunteer plantings is a minimum if credit is claimed.

The Expanded Tree Canopy data for urban and developed lands, will be collected by Cacapon Institute in partnership with the WVDOF and reported to the WVDEP who will, in turn, report the information to the EPA Chesapeake Bay Program.

3.3.2 *Expanded Tree Canopy BMP validation*

To provide accountability, state forestry agencies regularly spot-check a subset of a locality/urban forest partner BMP project files and/or 5-year assessments of net gain for accuracy and thoroughness.

This may also entail site visits to tree planting sites on record.

The state oversight process needs to be transparent and publicly accessible so that NGOs, watershed groups and other stakeholders can be confident that BMP implementation is real. Improvements on reporting are suggested. The state forestry agency should coordinate with the state MS4 oversight program, where local partners are implementing tree planting BMPs regulated by that program.

Cacapon Institute's work will be validated by the WV Urban & Community Forestry Council; the WV State Urban Forester, and WV Chesapeake Bay Forester. Cacapon Institute will maintain a public and accessible program under oversight from WVDOF, WVDEP, and the Bay Forestry Workgroup.

3.3.3 *Expanded Tree Canopy BMP performance*

Cacapon Institute, with WVDOF and WV DEP Bay Program Partners will collect data and assess BMP performance. WVDEP, as state lead in BMP reporting, will inspect and verify the BMP inspection process to ensure it conforms to, and is consistent with, the Chesapeake Bay Program's approved BMP efficiencies.

3.4 Urban Riparian Forest Buffers

Urban forest buffers are described as an area of trees at least 35 feet wide on one side of a stream, usually accompanied by trees, shrubs and other vegetation that is adjacent to a body of water. An urban riparian forest buffer is any riparian buffer not in an agriculture or forest setting—it is on developed land.

3.4.1 *Urban Riparian Forest Buffer BMP verification*

Assessment of total urban forest buffer cover in a locality will be completed every 5 years to ascertain that there is not a net loss of urban buffer. iTree Canopy will be used to assess the urban riparian forest buffers (see Expanded Tree Canopy verification method above).

The inspection will be completed by an urban forest partner. The partner would be endorsed by WVDOF, which provides oversight and support with training, tools, etc. In turn, urban forest partners can provide outreach and technical assistance on urban tree planting, tree care, and other issues that arise.

The urban forest partner should maintain information at a local level of each new urban riparian forest buffer.

- For new plantings, data to be recorded should include:
  - location (lat/long) and name of property
  - acres planted (if appropriate) and width,
  - and date(s) planted.
- For natural regeneration acres, data to be recorded should include:
  - location,
  - acres of treatment,
  - width, and
  - date started.

Naturally regenerating urban buffers are reported after 4 years of establishment if there are 100 or more live native trees per acre. For this practice, iTree Canopy data points would be located in the riparian area of a given locality. Other software may be equally useful in demonstrating there has not been a loss of buffer. If a loss of urban buffer in a locality is detected, the credits received over that 5-year period will be deducted by the same amount.

3.4.2 *Urban Riparian Forest Buffer BMP validation*

To provide accountability, state forestry agencies will regularly spot-check a locality/urban forest partner BMP project files on urban forest buffer establishment and/or 5-year assessments of net gain in for accuracy and thoroughness. This may also entail site visits to buffer sites on record.

The state oversight process needs to be transparent and publicly accessible so that NGOs, watershed groups and other stakeholders can be confident that BMP implementation is real. An oversight report should be communicated with the locality/urban forest partner to underscore what is being done well and what needs improvement.

3.4.3 *BMP performance*

<No data provided>

Table 5: Verification strategies for forestry sector BMPs

A. Program Component	B. Program Elements	Forest harvesting BMPs	Forest conservation	Expanded tree canopy	Urban riparian forest buffers
i. BMP Verification	1. What was the driver for BMP installation?	Regulation	Forest Conservation directive	Forest Restoration Strategy	
	2. How many BMPs will be inspected?	All registered timber harvest operations will be inspected	All	All	All
	3. How is inspection frequency and location determined?	All are inspected at least once due to law. If all inspector positions are filled, additional inspections will be completed.	All are inspected at the time it enters a conservation agreement. Depending on the managing agency's capacity and policies, some are inspected on additional occasions.	Determined by Cacapon Institute in collaboration with the WV Chesapeake Bay Forester and WV Urban & Community Forestry Council, will follow Forestry Workgroup guidance when it is completed	All assessments are completed every 5 years. Naturally regenerating buffers are reported after 4 years of establishment
	4. How often are BMPs/groups of BMPs inspected?	At least once following reclamation, and possibly up to 3 times during the duration of harvest operations.	At least once at the time the conservation agreement begins. Additional inspections vary in frequency.	Localities re-assess their tree canopy cover every 5 years, All new plantings are inspected annually, Cacapon Institute performs an aerial imagery review every 2 years	All assessments are completed every 5 years
	5. What is the method of inspection?	Field visual	Aerial coverage review, some field inspections by managing organizations	Field inspection of new plantings, iTree Canopy statistical assessment by Cacapon Institute	iTree Canopy. See Section 3.3.1 above.

	6. Who will conduct the inspection and is he/she certified/trained?	WV Division of Forestry LCSA Foresters	Managing organization staff and/or WVDOF staff WVDOF staff are trained	Cacapon Institute staff with assistance from WVU and Shepherd University graduate and undergraduate students. They are all trained.	Urban Forest Partners, who would be endorsed and trained by WVDOF
	7. What needs to be recorded for each inspection?	Whether BMPs are in place, meet standards, and are functioning as designed	Acres and location or property name	iTree Canopy reports include a statistical estimate of the amount or percent of cover in a variety of land cover categories (See Section 3.3.1 above) For new plantings date, location, and number of trees by species and stock are reported.	New plantings: location, property name, acres planted, width of buffer, date planted Natural regeneration: location, acres of treatment, width, date started
	8. Is execution of the inspection process documented in and checked against an updated quality assurance (QA) plan?	No, but the inspecting agency does have a BMP manual	No	No	No
	9. How is collected data recorded?	Logging Operation Notification, Investigation, and Enforcement (LONIE) database	WVDOF staff collect acreages in conservation from all managing organizations	Database and spreadsheets	iTree Canopy
	10. At what resolution are results reported to EPA and/or the public?	County	County		

ii. BMP Data Validation	11. What is the QA/QC process to prevent double-counting or counting of BMPs no longer in place?	Database query	Acreages are reported for a specific location or property name. Only one acreage value will be counted per location.	WVDOF staff spot-check of partner agency project files	WVDOF staff spot-check of partner agency project files
	12. What is the method used to validate state's ability to collect and report correct data?	Database query	Data review	Data review	Data review
	13. If data is provided by external independent party or industry, what method is used to provide adequate QA for acceptance by the Chesapeake Bay Program?	NA	Data review	Cacapon Institute will maintain and collect all data, and WVDOF and WVDEP will provide oversight and will review data submitted	WVDOF staff spot-check of partner agency project files
	14. Who conducts data validation?	WV Department of Forestry	WV Department of Forestry with support from managing organizations	WV Department of Forestry, WV Department of Environmental Protection, the Bay Forestry Workgroup	WV Department of Forestry
iii. BMP Performance	15. What is the process to collect data to assess BMP performance and confirm consistency with the Chesapeake Bay Program's approved BMP efficiencies?	WV Department of Forestry staff inspectors will collect data during field inspections at the outset of reclamation	WV Department of Forestry staff will perform a data review and seek confirmation of accuracy of conservation easements in place from managing organizations	Cacapon Institute, with oversight from WVDOF and WVDEP, will collect data and assess performance	
	16. Who collects BMP effectiveness data?	WV Department of Forestry staff	WV Department of Forestry staff	Cacapon Institute	

4. STORMWATER

Stormwater runoff is one of the most significant contributors of sediment and nutrients to waterways in developed areas. Stormwater best management practices (BMPs) are implemented to promote reuse, evapotranspiration, infiltration, and/or intercept, filter, and treat surface runoff prior to discharging the runoff at a controlled rate to reduce environmental impacts on receiving waters. Stormwater managed by strategies covered in this chapter includes runoff from developed land uses identified in the Chesapeake Bay Watershed Model (CBWM). For the Phase 6 CBWM, this includes impervious surfaces, such as parking lots, rooftops, or roads; pervious surfaces, such as turf, tree canopy, or open space; and construction areas. A wide variety of BMPs are applied in stormwater management. Some examples include urban filter strips, rain gardens, bioswales, vegetated roofs, and permeable pavement.

The WV BMP Verification Guidance document follows closely the recommendations provided by the Urban Stormwater Workgroup (USWG) and the Chesapeake Bay Program (CBP). To enable consistency across the Bay watershed, definitions, wording, and procedures were, by reference or verbatim, developed through the Chesapeake Bay Program efforts. For example, modified excerpts from the CBP Urban Stormwater Workgroup's BMP Verification Guidance identify the needs, goals, and methods of urban BMP verification in West Virginia quite well.

Definitions of stormwater BMPs as described in the CBP Urban Stormwater Workgroup's BMP Verification Guidance document are listed below.

Urban BMPs: In this context, they are defined as stormwater practices for which definitions and removal rates have been developed and approved through the Bay Program BMP review protocol (WQGIT, 2010). These urban BMPs fall into four broad categories:

1. *Traditional stormwater BMPs* that were historically installed through a local stormwater plan review process in response to state stormwater requirements (primarily stormwater treatment (ST) practices as defined by Stormwater Performance Standards Expert Panel report (SPSEP, 2012).

2. *New runoff reduction BMPs* that will be implemented in the future to meet new state stormwater performance standards that typically go through a local stormwater review process (primarily runoff reduction (RR) practices as defined by SPSEP, 2012).

3. *Non-structural or operational BMPs* that are typically applied by a municipal agency (e.g., street sweeping, urban nutrient management, illicit discharge elimination).

4. *Restoration BMPs* installed by localities to treat existing impervious cover (e.g., stormwater retrofits and stream restoration).

Stormwater BMPs have been grouped into the following four categories for the development of verification strategies:

- Regulated (MS4 Communities) BMPs,
- Semi-Regulated BMPs,
- Non-regulated BMPs, and
- Legacy BMPs.

Currently, inspections of stormwater management projects are completed by state agency, trained third parties, and/or inspectors from MS4 municipalities. However, a consistent training program is currently being developed which will provide a population of qualified inspectors who can relieve the burden of inspection from public agencies. WV partners are working together with Blue Ridge Community and Technical College on developing certificate/certification programs that include inspection and verification aspects of

Stormwater Management. Our goal is to have a certification program approved by EPA/CBP that is accepted not only in WV, but also surrounding states.

4.1 Regulated BMPs (MS4s)

Regulated BMPs include any BMP that is installed in a jurisdiction that has a Phase 2 (also Phase 1 if ever applicable in WV) Municipal Separate Storm Sewer System (MS4) permit. These permits establish a requirement that a locality have a BMP maintenance program and the capacity to inspect all of their BMPs within two permit cycles (typically 10 years). In addition, MS4 communities have an annual BMP reporting requirement, and provide aggregate information to the WV DEP on the number and type of BMPs that are installed during the reporting period.

4.1.1 *BMP verification*

BMPs constructed within MS4 communities as part of an ordinance or permit requirement will be validated according to the existing MS4 inspection and maintenance framework. Protocols specific to each BMP will vary somewhat, but in general a designated inspector from the MS4 permitted community will review engineering documents prior to construction and will inspect each BMP within the permittee's jurisdictional boundary upon its completion to ensure that it is fully functional. Follow-up inspections will be completed for each BMP every other permit cycle (five year permit cycles) following its installation to ensure that it has been properly maintained and is still operational. Visual inspections will be used to confirm that the BMP still exists, is adequately maintained, and is operating as designed. The framework developed by the Chesapeake Stormwater Network will be utilized to guide inspections (CSN, 2013). Maintenance will be completed in accordance with CBP recommendations and current research findings and performance will be verified every ten years.

MS4 permittees are responsible for adequate training of inspectors. Taking advantage of training opportunities provided by third parties approved by WVDEP and the CBP is encouraged. It is anticipated that educational institutions such as the Blue Ridge Community and Technical College will provide certificate/certification programs in the near future. In the meantime, training opportunities provided by WVDEP are available to MS4s upon request covering various aspects of meeting MS4 permit requirements, including a three-hour training session for inspectors.

The initial verification inspection should confirm feasibility that reported BMP parameters (impervious/pervious acres treated) are accurate.

Complete inspection reports shall include:

1. Facility type,
2. Inspection date,
3. Name and signature of inspector,
4. GIS location and nearest street address,
5. Management practice ownership information (name, address, phone number, fax, and email),
6. A description of the stormwater BMP condition including the quality of: vegetation and soils; inlet and outlet channels and structures; embankments, slopes, and safety benches; spillways, weirs, and other control structures; and sediment and debris accumulation in storage and forebay areas as well as in and around inlet and outlet structures,
7. Photographic documentation of all critical stormwater BMP components, and
8. Specific maintenance items or violations that need to be corrected by the owner/operator along with deadlines and re-inspection dates.

BMP data reported to WVDEP is listed in the CBP WV Tracking spreadsheet and includes:

1. Responsible Party
2. Project/site name
3. BMP type/names (bioretention, permeable pavement, etc.)
4. Project type (new/re development, retrofit, new, converted, enhanced, restored)
5. Units (dependent on BMP, usually acres)
6. Total units treated
7. Location (lat/long)
8. Location type (BMP center, inlet, outlet; project center)
9. Date installed and date inspected
10. Performance standard/Runoff depth managed (usually 1 inch capture)
11. Predominant method for managing runoff (stormwater treatment or runoff reduction)
12. Runoff storage volume
13. Impervious acres treated
14. Pervious acres treated
15. Turf
16. Tree canopy
17. Open space
18. Other acres treated (forest, crop, hay, etc. if applicable)
19. Practice duration/lifetime (if different from standard listed in QAPP)

All MS4 communities provide reports describing BMP inspections in their jurisdictions to the WVDEP on an annual basis. WVDEP has a quality assurance plan (Standard Operating Procedures for Managing Nonpoint Source BMP Data) in place, which is assessed regularly for compliance with the CBP requirements and amended as needed. All data reported to WVDEP is listed in the CBP WV Tracking spreadsheet, which is maintained in a database and GIS platform at WVDEP. Structural BMP data is submitted to USEPA at a site specific resolution. Non-structural BMP data is summarized and reported at the County level.

4.1.2 *BMP validation*

Data for reported regulated BMPs is validated by the WVDEP staff stormwater BMP database administrator. Because all BMPs are field verified upon installation, quality assurance and quality control is limited to an annual database review of 10% of new BMPs. If discrepancies are found for greater than 10% of entries, data will be reviewed for all entries. Additionally, BMPs located within 200 feet of each other will be reviewed to avoid double counting.

Data collected by a third party and submitted to WVDEP are also spot checked in-field. To meet CPB quality assurance requirements data are spot checked by WVDEP staff and data are compared to data from similar communities. If discrepancies are identified, 10% of all submitted records will be reviewed and field verified. Should there be an error rate greater than 10% of those records reviewed, a thorough review of the data collection process and all records will be completed.

4.1.3 *BMP performance*

WVDEP staff and/or trained third party partners will assess BMP performance through visual field assessments and review of calculated efficiency data for 10% of all BMPs. MS4 permittees are also required to conduct performance verification for all BMPs every 10 years.

4.2 Semi-regulated BMPs

The semi-regulated category includes any BMP that is installed locally under a state construction general permit (CGP) or local ordinance outside of a MS4 community. CGP Erosion and Sediment Control (ESC) BMPs are inspected at least once during the construction phase by WVDEP Environmental Enforcement (EE) staff

through field verification. CGP post-construction BMPs in the Chesapeake Bay watershed are currently verified by WVDEP Watershed Improvement Branch (formerly NPS) staff after EE approves the Notice of Termination for CGP projects.

Adoption of stormwater ordinances by local governments outside MS4 areas increases BMP implementation. While permit applicant must sign an agreement that they will maintain the BMP, some non-MS4 communities do not have an inspection program to enforce BMP implementation and maintenance. These communities rely on WV DEP or third parties to complete inspections.

4.2.1 *BMP verification*

Currently, all semi-regulated post-construction BMPs identified on state CGPs CB Addendum (see WVDEP, 2015a) are inspected by WVDEP staff by field visual inspection. In the future, this task may be designated to a third party or local government. Semi-regulated BMPs located in MS4s are also regulated BMPs and should be included in the MS4 reporting requirements. Post-construction BMPs inspected by WV DEP inside MS4 boundaries are carefully checked against MS4 reports to avoid double counting. It is anticipated that MS4s will eventually perform all post-construction BMP inspections inside their jurisdiction, at which point WV DEP will discontinue post-construction BMP inspections in such areas. All CGP reported post-construction BMPs are inspected upon completion of installation, and it is recommended that all BMPs are re-verified either by WVDEP, local government, or designated third parties at least toward the end of the prescribed credit duration of the BMP (usually 10 years). The party responsible for verification of semi-regulated BMPs may elect to reduce the scope of their visual inspections by sub-sampling a representative fraction of their local BMPs and applying the results to their entire population of BMPs that are credited in the CBWM. The sub-sampling method must be designed to have at least an 80% confidence level that the BMPs are reported accurately. The party responsible may choose from several well accepted approaches to determining the sample size. These include using a census for a small population of BMPs, imitating a sample size of similar studies, using published tables, and/or applying formulas to calculate a sample size. The Statistical Sampling Approach for Initial and Follow Up Verification (Attachment J) and the Sample Size Estimation for BMP Verification (Appendix K) can be used as guides.

Information that should be documented during inspections and reported to WVDEP is listed in Section 4.1.1. Data can be reported to WVDEP using the CB WV Tracking spreadsheet. At a minimum, data reported must include the following items:

1. Project type/category (new/re development, retrofit (new, converted, enhanced, restored))
2. BMP name(s)
3. Predominant method for managing runoff (stormwater treatment or runoff reduction)
4. Volume of water treated at a site
5. Impervious acres treated by the practice(s)
6. Total site acres treated by the practice(s)
7. Location (lat/long)
8. Date installed
9. Date inspected
10. Practice duration (if different from QAPP, 10 years for most urban BMPs)

WVDEP has a quality assurance plan in place, which is assessed regularly for compliance with the CBP requirements and amended as needed. All data reported to WVDEP is listed in the CBP WV Tracking spreadsheet, which is maintained in a database and GIS platform at WVDEP. Data is submitted to USEPA at a site specific resolution for structural BMPs, and at a county level for non-structural BMPs.

In the future, for BMPs in rural counties (population <30,000 outside MS4 communities), WV DEP/third party may conduct a sub-sample statistical analysis to verify BMPs reported within several non-MS4 communities, and apply the results to reported BMP data in other comparable non-MS4s.

If a local government or third party fails to perform verification inspections, it will receive a gradual downgrade in BMP performance over time. Full performance credit will be given for the first 5 years, followed by a 20% downgrade each year over the next five years, such that entire BMP credits expire after 10 years.

WVDEP Standard Post Construction Stormwater BMP Evaluation and Extended Post Construction BMP Evaluation forms are included in attachments L and M.

4.2.2 *BMP validation*

Data for semi-regulated BMPs is validated by the WVDEP staff stormwater BMP database administrator. Because all BMPs are field verified upon installation, quality assurance and quality control is limited to database review of 10% of new BMPs. If discrepancies are found for greater than 10% of entries, data will be reviewed for all entries. Additionally, all BMPs located within 200 feet of each other will be review to avoid double counting.

Data collected by a third party and submitted to WVDEP is also spot checked in-field. To meet CPB quality assurance requirements data are spot checked by WVDEP staff and data are compared to data from similar communities. If discrepancies are identified, 10% of all submitted records will be reviewed and field verified. Should there be an error rate greater than 10% in those records reviewed, a thorough review of the data collection process and all records will be completed.

4.2.3 *BMP performance*

WVDEP staff and trained third party partners will assess BMP performance through visual field assessments and review of calculated efficiency data for 10% of all BMPs.

4.3 Non-regulatory BMPs

Non-regulatory BMPs are those that are voluntarily installed in a community that were not triggered by an explicit MS4 requirement or stormwater regulation. Examples might include rain gardens built by homeowners or demonstration BMPs constructed through grants. The credit duration for homeowner BMPs is 5 years. The credit can be renewed based on verification that the practice still exists and is working. The basic premise is to simplify the landowner BMP reporting process while still retaining a high degree of verification rigor through the process described below.

4.3.1 *Verification*

Non-regulated BMPs are installed voluntarily usually by private landowners. The actual installation of each homeowner BMP should be field-verified by the local government or designated third party at the time of construction, and homeowner submitted BMP data will require validation by spot checking it against typical default values for the practice. If an appropriately trained individual is not available during all stages of the construction process, pictures of the various construction stages should be provided by the installer or homeowner.

For re-verification after 5 year, local governments or designated third parties may opt to use the sub-sampling approach outlined above (Section 4.1.1). Alternatively, they may request homeowners to submit digital photos to confirm their practices, with the final decision on BMP condition made by the locality.

Information that should be documented during inspections is listed in Section 4.1.1.

Localities or third party inspectors can aggregate individual homeowner BMP data into a single practice at the county level, which is then reported to the state without any specific geographic location data (apart from the river-basin segment in which it occurred). To receive credit, local governments or a designated third party must maintain records for each individual homeowner BMP, including contact information and geographic information (lat/long or street address). Usage of the SMART tool is encouraged to identify voluntary BMPs. Data can be reported to WVDEP using the CB WV Tracking spreadsheet. At a minimum, data reported must include

1. Project type/category (new/re development, retrofit (new, converted, enhanced, restored))
2. BMP name(s)
3. Predominant method for managing runoff (stormwater treatment or runoff reduction)
4. Performance standard (1 inch capture preferred)
5. Volume of water treated at a site
6. Impervious acres treated by the practice(s)
7. Total site acres treated by the practice(s)
8. Location (lat/long)
9. Date installed
10. Date inspected
11. Practice duration (5 years for most voluntary structural BMPs)

4.3.2 *BMP validation*

Data for non-regulatory BMPs is validated by the WVDEP staff stormwater BMP database administrator. Because all BMPs are field verified upon installation, quality assurance and quality control is limited to database review of 10% of new BMPs. If discrepancies are found for greater than 10% of entries, data will be reviewed for all entries. Additionally, all BMPs located within 200 feet of each other will be review to avoid double counting.

Data collected by a third party and submitted to WVDEP is also spot checked in-field. To meet CPB quality assurance requirements data are spot checked by WVDEP staff in accordance with CBP recommendations. If discrepancies are identified, 10% of all submitted records will be reviewed and field verified. Should there be an error rate greater than 10% in those records reviewed, a review of the data collection process and records will be completed.

4.3.3 *BMP performance*

WVDEP staff and trained third party partners will assess BMP performance through visual field assessments and review of calculated efficiency data for 10% of all BMPs.

4.4 Legacy BMPs

The legacy BMPs category includes the population of urban BMPs in a community that the state has reported to EPA for inclusion into any past version of the CBWM for sediment or nutrient reduction credit within the previous two decades. Legacy BMPs fall into three categories:

1. *Actual BMPs with a geographic address*
2. *Actual BMPs that lack a specific geographic address*
3. *Estimated BMPs* that were projected based on some assumed level of development activity and compliance with state stormwater regulations.

WVDEP's long term goal is to clean up local and/or state BMP databases so that all entries are actual BMPs with a geographic address that can be subject to inspection verification. Assembling an actual BMP inventory from historical data is a major task, and may take several years in some communities. Localities may benefit when they clean up their BMP inventory because it is likely they will discover BMPs that were installed in the past but were never reported to the state for credit in the CBWM. They may also find cost-effective retrofit opportunities involving BMP conversion, enhancement or restoration.

MS4 communities should seek to assess their entire BMP population within two MS4 permit cycles using the methods outlined in the Stormwater Performance Standards Expert Panel report (SPSEP, 2012). The burden of assessing legacy BMPs could be sharply reduced if the most problematic older BMPs were targeted first.

An example of a strategy that could be followed by an MS4 community to assess its functional BMP population is as follows:

- Assess all pre-2000 BMPs during the first permit cycle, and focus on pre-1990 BMPs in the first two years of that cycle.
- Initially sub-sample their population of BMPs by type and year installed to look for problematic BMP types and design eras, and then focus inspection efforts on the problem BMPs in future years.
- Focus initial efforts to confirm whether estimated BMPs actually exist, and what their current condition is.

Table 6: Stormwater sector verification strategy

Program Component	Program Elements	Regulated BMPs	Semi-regulated BMPs	Non-regulated BMPs
i. BMP Verification	1. What was the driver for BMP installation?	Regulations, permit requirements, and WIP	Regulations, permit requirements, and WIP	Voluntary
	2. How many BMPs will be inspected?	Inspection of all BMPs is strongly encouraged. All regulated BMPs are inspected in accordance with the MS4 permit requirements. Currently, this means that all BMPs are inspected. For CBP reporting purposes, a jurisdiction/designated third party may develop a sub sampling protocol for semi- and non- regulated BMPs in accordance with current CBP recommendations if a statistical analysis seems applicable. Any such sub sampling protocol must be approved by WV DEP prior to implementation. Sub sampling results must have an 80% confidence level. This does not relieve the permittee of any MS4 requirements.	Inspection of all BMPs is strongly encouraged. A jurisdiction/designated third party may develop a sub sampling protocol for semi regulated BMPs in accordance with current CBP recommendations if a statistical analysis seems applicable. Any such sub sampling protocol must be approved by WV DEP prior to implementation. Sub sampling results must have an 80% confidence level.	Inspection of all BMPs is strongly encouraged. A jurisdiction/designated third party may develop a sub sampling protocol for non-regulated BMPs in accordance with current CBP recommendations if a statistical analysis seems applicable. Any such sub sampling protocol must be approved by WV DEP prior to implementation. Sub sampling results must have an 80% confidence level.
	3. How is inspection frequency and location determined?	MS4 permit requirements, CBP USWG guidance, expert panel reports, and peer reviewed research findings. Current MS4s are required to inspect every BMP at least once every ten years (two permit cycles)	CBP USWG guidance, expert panel reports, and peer reviewed research findings. Currently all BMPs are inspected at least once every ten years.	CBP USWG guidance, expert panel reports, and peer reviewed research findings. All non-regulated BMPs are inspected at least once every five years.
	4. How often are BMPs/groups of BMPs inspected?	Inspections occur at the completion of construction and again within 10 years	Inspections occur at the completion of construction and again within 10 years	Within 5 years
	5. What is the method of inspection?	Field visual.	Field visual.	Field visual.

	6. Who will conduct the inspection and is he/she certified/trained?	MS4 permittees/designated third parties inspect regulated BMPs installed within their jurisdictional boundaries that are part of permit/ordinance requirements. MS4s may also assign the initial verification inspection responsibility to the BMP designer. WV DEP provides trainings that serve as a temporary certification using training materials that are in line with CBP recommendations. Certification/certificate program development through Community College education is currently in progress.	WV DEP conducts inspections on semi-regulated post-construction BMPs identified on NPDES stormwater construction permits in the CB watershed that are not located within MS4 boundaries (for CB watershed all but Berkeley County). Until MS4s inspect and report BMPs adequately, WV DEP performs inspections inside MS4 boundaries as well. WV DEP may designate trained third parties to perform inspections. CGP ESCs are inspected by WV DEP EE at least once during the construction phase. WV DEP provides trainings that serve as a temporary certification using training materials that are in line with CBP recommendations. Certification/certificate program development through Community College education is currently in progress.	In collaboration with the local authority, trained third parties, local governments, and WV DEP will conduct inspections of non-regulated BMPs not being captured through permitting/ordinance processes. WV DEP provides trainings that serve as a temporary certification using training materials that are in line with CBP recommendations. Certification/certificate program development through Community College education is currently in progress.
	7. What needs to be recorded for each inspection?	An appropriate inspection form, which varies for different BMPs, is used. Information that should be documented during inspections and reported to WVDEP is listed in Section 4.1.1.	An appropriate inspection form, which varies for different BMPs, is used. Information that should be documented during inspections and reported to WVDEP is listed in Section 4.1.1.	An appropriate inspection form, which varies for different BMPs, is used. Information that should be documented during inspections and reported to WVDEP is listed in Section 4.1.1.
	8. Is execution of the inspection process documented in and checked against an updated quality assurance (QA) plan?	QA plan in place, program checked and amended to ensure compliance The QA is described in the Standard Operating Procedures for Managing Nonpoint Source BMP Data document.	QA plan in place, program checked and amended to ensure compliance	QA plan in place, program checked and amended to ensure compliance
	9. How is collected data recorded?	Spreadsheet, database, and GIS platform maintained by WVDEP for inspections performed by WV DEP. MS4s maintain their own records through the use of spreadsheets, database, and/or GIS.	Spreadsheet, database, and GIS platform maintained by WVDEP. Potential third party spreadsheet/database/GIS maintenance in accordance with CBP recommendations.	Spreadsheet, database, and GIS platform maintained by WVDEP, local government, and/or third party. WVDEP only maintains limited data. Detailed information for each individual BMP is maintained on the local level by the

				county or a third party.
	10. At what resolution are results reported to EPA and/or the public?	Site specific (GPS) for structural BMPs. County for non-structural BMPs	Site specific (GPS) for structural BMPs. County for non-structural BMPs	County at minimum. Site specific when possible.
ii. BMP Validation	11. What is the QA/QC process to prevent double-counting or counting of BMPs no longer in place?	Considering all BMPs should have been field verified in the first place, the QA/QC is limited to a database review of 10% of new BMPs. If discrepancies exceed 10%, all data will be reviewed. The stormwater BMP data base administrator will also review entries within 200 feet of each other to prevent double counting.	Considering all BMPs should have been field verified in the first place, the QA/QC is limited to a database review of 10% of new BMPs. If discrepancies exceed 10%, all data will be reviewed. The stormwater BMP data base administrator will also review entries within 200 feet of each other to prevent double counting.	Considering all BMPs should have been field verified in the first place, the QA/QC is limited to a database review of 10% of new BMPs. If discrepancies exceed 5%, all data will be reviewed. For BMPs reported with lat/long, the stormwater BMP data base administrator or designated third party will also review entries within 200 feet of each other to prevent double counting.
	12. What is the method used to validate state's ability to collect and report correct data?	Database review of 10% of new BMPs. See Standard Operating Procedures for Managing Nonpoint Source BMP Data (QAPP) for details.	Database review of 10% of new BMPs. See QAPP for details.	Database review of 10% of new BMPs. See QAPP for details.
	13. If data is provided by external independent party or industry, what method is used to provide adequate QA for acceptance by the Chesapeake Bay Program?	Review of data collection procedures. Comparison to data from similar jurisdictions/communities. Spot check by WV DEP and/or trained partners. If discrepancies are identified, review and field verify 10% of submitted records. Error >10% during that review triggers thorough review of data and process.	Review of data collection procedures. Comparison to data from similar jurisdictions/communities. Spot check by WV DEP and/or trained partners. If discrepancies are identified, review and field verify 10% of submitted records. Error >10% during that review triggers thorough review of data and process.	Review of data collection procedures. Comparison to data from similar jurisdictions/communities. Spot check by WV DEP and/or trained partners. If discrepancies are identified, review and field verify 10% of submitted records. Error >10% during that review triggers thorough review of data and process.
	14. Who conducts data validation?	WVDEP	WVDEP	WVDEP
iii. BMP Performance	15. What is the process to collect data to assess BMP performance and confirm consistency	Visual field assessment and review of specs of 10% of BMPs.	Visual field assessment and review of specs of 10% of BMPs.	Visual field assessment and review of specs of 10% of BMPs.

	with the Chesapeake Bay Program's approved BMP efficiencies?			
	16. Who collects BMP effectiveness data?	WVDEP and trained partners.	WVDEP and trained partners.	WVDEP and trained partners.

Legacy BMPs are not included in this table because at this time a verification strategy is not in place. Recommendations for accounting for these BMPs in the future are discussed in Section 4.4.

5. STREAM RESTORATION

Erosion of streambanks contributes excess nutrients and sediment to surface waters; therefore, returning stream reaches with erosion problems to more natural conditions through stream restoration projects alleviates the contribution of these pollutants to surface waters by eroding streambanks. Stream restoration projects are implemented in both urban and rural, undeveloped areas and are a component of West Virginia's strategy for meeting nutrient reduction goals in the Chesapeake Bay watershed. Verification of these projects is necessary to confirm that each project is functional and working to remove sediment and nutrients from waterways in which they are constructed.

Stream restoration projects are regulated by a suite of permits, including National Pollutant Discharge Elimination System (NPDES) Construction Stormwater permits, U.S. Army Corps of Engineers (USACE) permits, and West Virginia Department of Natural Resources permits. These permits have requirements for field monitoring and reporting. These inspections focus on ensuring that the restoration projects were installed properly and on their long-term integrity and functionality.

5.1 BMP verification

USACE permits require that all stream restoration projects be inspected during the first five years following completion of construction. Inspections are carried out by West Virginia Conservation Agency (WVCA) or NRCS staff, depending upon how the project is funded. Each restoration project may have different specific monitoring requirements; however, there are consistencies that are useful for verification. These consistencies are listed below:

- All permits require as-built drawings of the completed project, with structures, cross-sections, and photo points labeled.
- Permanent cross-sections to be utilized during field inspections, must be installed at a frequency of two cross-sections per 1,000 linear feet and should consist of approximately 50% riffle and 50% pools.
- Longitudinal profiles should be surveyed through cross-sectional reaches, and should include a complete riffle-pool sequence upstream and downstream of the cross-section.
- All reports should include information regarding the stability of stream banks and structures. Some projects require simple water quality information, EPA habitat assessments and vegetative sampling results to be included in reports.

For state funded projects, to comply with these permit conditions, WVCA staff install permanent cross-sections with capped rebar located at the beginning and end of each cross-section. Staff also install a capped rebar to represent the "0" station for every longitudinal profile required, this keeps the starting point consistent year to year. Information regarding the stability of structures is obtained from a simple visual inspection to look for any deficiencies or evidence of erosion or piping. The stability of banks will come from the cross-sections, photo points and Bank Erosion Hazard Index (BEHI) surveys to estimate sediment loss. Some permits, mainly those related to mitigation projects, require more information: bank height ratios, depositional patterns, and information gathered through detailed surveys.

For NRCS funded projects, the site is inspected once following construction and as USACE permits require. The sites then fall into the 5% inspection protocol established for cost shared programs.

All of the above information is collected and reported for the required five years set forth by the USACE. When the five year period is over, and the project has met the intended goals, there is no other work required. The responsible Corp district will either release the permittee or require corrective measures and additional monitoring until the project is stable.

Once a project has gone through the monitoring cycle with no major failures, it is likely that it will be successful over a long period of time. WV plans to adopt a follow up strategy that includes:

- Reporting of site conditions with attention paid to stability of stream banks, in-stream structures and project specific goals. (This could be satisfied with a visual inspection, simple surveying or a combination of the two.)
- If the project appears to be unstable, or there is an area of concern, an appropriate survey should be conducted to determine the site functionality. (This would be accomplished through BEHI or re-survey of cross-sections and longitudinal profile.)
- If the project is found to be deficient, corrective measures should be recommended that will allow any credit to be retained.

5.2 BMP validation

Data describing wetland restoration projects is reviewed by the WVDEP staff state data contact as it is received from each reporting agency. The total number of projects is small enough that the data contact is easily able to review all data received to detect any instances of misinformation reporting or project double counting. WVDEP staff run annual progress reports and compare the results to reports from previous years. If any anomalies are noticed, the state data contact will investigate the source of the issue. Additionally, Trout Unlimited is in the process of developing a database that will document the specific funding source for each project entered. This system will help identify any instances of double counting.

5.3 BMP performance

None at this time.

Table 7: Stream restoration sector verification strategy

Program Component	Program Elements	WV's strategy
i. BMP Verification	1. What was the driver for BMP installation?	Permit
	2. How many BMPs will be inspected?	All state and NRCS funded projects
	3. How is inspection frequency and location determined?	All are inspected during the first five years following installation, as required by USACE permits
	4. How often are BMPs/groups of BMPs inspected?	Annually during the first five years following installation, as required by USACE permits For state funded projects – once every five years following closure of the permit.
	5. What is the method of inspection?	Field visual
	6. Who will conduct the inspection and is he/she certified/trained?	West Virginia Conservation Agency staff if state funded. NRCS staff if federally funded.
	7. What needs to be recorded for each inspection?	Information describing the stability of stream banks and structures for all. Some require simple water quality information, EPA habitat assessments, and vegetative sampling. Some permits, usually related to mitigation projects, require bank height ratios, depositional patterns, and detailed survey data are reported.
	8. Is execution of the inspection process documented in and checked against an updated quality assurance (QA) plan?	No
	9. How is collected data recorded?	WVDA database if federally funded on agriculture land. Excel spreadsheet and written report for state funded projects
	10. At what resolution are results reported to EPA and/or the public?	Sjte specific for state funded. County level for federally funded cost shared practice.
ii. BMP Validation	11. What is the QA/QC process to prevent double-counting or counting of BMPs no longer in place?	The number of projects is relatively small. All are inspected during the first five years following installation. None are double counted and should a project become dysfunctional, it will be discovered during the inspection and documented on the report.
	12. What is the method used to validate state's ability to collect and report correct data?	The state data contact (WVDEP staff) reviews all data upon submission. The total number of projects is small enough that the data contact would notice incorrect information. WVDEP runs reports for annual progress and compares them to reports from previous years. Any anomalies are investigated.
	13. If data is provided by external independent party or industry, what method is used to provide adequate QA for acceptance by the Chesapeake Bay Program?	See above.
	14. Who conducts data validation?	WVDEP, non-regulatory state agency
iii. BMP Performance	15. What is the process to collect data to assess BMP performance and confirm consistency with the Chesapeake Bay Program's approved BMP efficiencies?	
	16. Who collects BMP effectiveness data?	

6. WASTEWATER

The TMDL provides individual wasteload allocations for significant facilities. Significant facilities include publicly and privately owned sewage treatment facilities with design flows greater than 400,000 gallons per day and select industrial wastewater treatment facilities for which discharges of nitrogen and phosphorus are appreciable. West Virginia's strategy to reduce the nutrient loading from these facilities involved the incorporation of enforceable discharge limits on the amount of total nitrogen and total phosphorus in National Pollutant Discharge Elimination System (NPDES) permits for significant facilities. In many instances, the limitations require installation and operation of additional treatment technologies to reduce nitrogen and phosphorus. Certain facilities are already compliant and others have projects underway such that compliance is expected in the near future. WVDEP's implementation strategy is to ensure installation of necessary nutrient reduction treatment technology at significant facilities by December 31, 2015, and all are anticipated to be compliant by the end date of the period for the 2017 progress assessment (6/30/2017).

Pollutant reductions by non-significant facilities are not prescribed in the West Virginia Watershed Implementation Plan. In the TMDL, authority to discharge was provided by grouped wasteload allocations in which individual facility components were calculated based upon facility design flow and default nutrient concentrations (18 mg N/L, 3 mg P/L). "BMP" tracking/verification is not directly applicable to this source category and permits generally do not require nutrient self-monitoring and reporting. However, WVDEP tracks NPDES permits for nonsignificant facilities and annually reports loads equal to wasteload allocation components for all active facilities.

Compliance verification/data validation

The primary mechanisms for verifying compliance are the self-monitoring requirements included in the NPDES permits issued to significant facilities. Permits require regular and frequent submission of effluent analytical data to WVDEP to verify compliance with effluent limitations via monthly Discharge Monitoring Reports (DMRs). Permits also contain procedures for facilities to calculate monthly loads by averaging nutrient results and coupling those with measured total monthly flow. Generally, 1/week nitrogen and phosphorus composite sampling and continuous flow measurement are required. These self-reported data are maintained in a database by WVDEP staff and are the intended basis for annual progress reporting.

Trained WVDEP Division of Water and Waste staff performs regular assessments of the data received from the facilities. During these reviews WVDEP staff looks for and attempts to rectify any anomalies in the data (ex. incorrect reporting units, incorrect load calculations, etc.) This process is completed in accordance with an updated quality assurance plan (Attachment N). Prior to submitting data to the CBP, WVDEP staff performs QA/QC review in accordance with the recommended methods described in the *CBP Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements* guidance document (Attachment O).

In addition to the self-monitoring and reporting mechanisms, WVDEP independently assesses/compels compliance with permits through inspections and the use of enforcement actions in response to noncompliance. The number, type and frequency of inspections performed conform to the guidance provided by the USEPA's Compliance Monitoring Strategy (CMS). Systematic escalation of enforcement is pursued to resolve noncompliant facilities in the shortest time possible.

6.1 BMP verification

The primary mechanisms for verifying compliance are the self-monitoring requirements included in the NPDES permits issued to significant facilities. Permits require regular and frequent submission of effluent analytical data to WVDEP to verify compliance with effluent limitations via monthly Discharge Monitoring Reports (DMRs). Permits also contain procedures for facilities to calculate monthly loads by averaging nutrient results and coupling those with measured total monthly flow. Generally, 1/week nitrogen and phosphorus composite sampling and continuous flow measurement are required. These self-reported data are maintained in a database by WVDEP staff and are the intended basis for annual progress reporting.

6.2 BMP validation

Trained WVDEP Division of Water and Waste staff performs regular assessments of the data received from the facilities. During these reviews WVDEP staff looks for and attempts to rectify any anomalies in the data (ex. incorrect reporting units, incorrect load calculations, etc.) This process is completed in accordance with an updated quality assurance plan (Attachment N). Prior to submitting data to the CBP, WVDEP staff performs QA/QC review in accordance with the recommended methods described in the *CBP Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements* guidance document (Attachment O).

In addition to the self-monitoring and reporting mechanisms, WVDEP independently assesses/compels compliance with permits through inspections and the use of enforcement actions in response to noncompliance. The number, type and frequency of inspections performed conform to the guidance provided by the USEPA's Compliance Monitoring Strategy (CMS). Systematic escalation of enforcement is pursued to resolve noncompliant facilities in the shortest time possible.

6.3 BMP performance

The WVDEP database of DMR data is primarily utilized to assess compliance with TMDL wasteload allocations.

Table 8: Wastewater sector verification strategy

Program Component	Program Elements	Wastewater treatment plant data verification
i. BMP Verification	1. What was the driver for BMP installation?	Permit
	2. How many BMPs will be inspected?	For all significant facilities, DMR self-monitoring submissions are reviewed and field inspections are performed
	3. How is inspection frequency and location determined?	DMRs are reviewed upon receipt and comprehensively at annual progress submission intervals; Inspection frequency in accordance with USEPA Compliance Monitoring Strategy
	4. How often are BMPs/groups of BMPs inspected?	Inspection frequency in accordance with USEPA Compliance Monitoring Strategy
	5. What is the method of inspection?	DMR review, database review and field inspections
	6. Who will conduct the inspection and is he/she certified/trained?	WVDEP trained permit and enforcement staff
	7. What needs to be recorded for each inspection?	See attached inspection form (Attachment P)
	8. Is execution of the inspection process documented in and checked against an updated quality assurance (QA) plan?	Yes. See Attachment N.
	9. How is collected data recorded?	DMR data is submitted through an online form and maintained in a database. Online form guidance is included in Attachment Q.
	10. At what resolution are results reported to EPA and/or the public?	Site-level
ii. BMP Validation	11. What is the QA/QC process to prevent double-counting or counting of BMPs no longer in place?	Only active facilities are reported; permit database allows activity tracking
	12. What is the method used to validate state's ability to collect and report correct data?	Annual review of data collected for all facilities.
	13. If data is provided by external independent party or industry, what method is used to provide adequate QA for acceptance by the Chesapeake Bay Program?	All DMR data is submitted by the permittee under a statement certifying that the data is true and accurate. Analytical laboratories must also be certified to perform permit self-monitoring analyses
	14. Who conducts data validation?	WVDEP
iii. BMP Performance	15. What is the process to collect data to assess BMP performance and confirm consistency with the Chesapeake Bay Program's approved BMP efficiencies?	Effluent limitations, self-monitoring and reporting under NPDES permit requirements that are consistent with the TMDL wasteload allocations.
	16. Who collects BMP effectiveness data?	WVDEP

7. WETLAND RESTORATION

Excess nutrients are held in place by vegetation in functional wetlands, thus attenuating the flow of sediments and nutrients to downstream waterways. Wetland restoration projects re-establish the natural hydraulic condition in a field that existed prior to the installation of subsurface or surface drainage. Projects may include restoration, creation and enhancement acreage. Restored wetlands may be any wetland classification including forested, scrub-shrub or emergent marsh (SB 8.4.11). Currently, all wetland restoration projects in West Virginia's Chesapeake Bay watershed are implemented by Trout Unlimited (TU) and Natural Resources Conservation Service (NRCS) through NRCS cost-share programs. These agencies submit BMP documentation data to the data manager at WVDEP.

Any wetland restoration projects designed to address stormwater in MS4 communities are not included in this section, but would fall under the Regulated BMPs category discussed in the Stormwater Chapter. See Section 4 for more information. West Virginia has only non-tidal wetlands.

7.1 BMP verification

Currently, NRCS cost-share programs have been the major driver of wetland restoration projects in the Chesapeake Bay watershed of West Virginia. All projects are field inspected at the time of project completion. In addition, Trout Unlimited provides landowners the opportunity to have wetland restoration projects inspected periodically to ensure that they are still functional. A few wetland restoration projects have been completed as part of a conservation easement held by the Potomac Conservancy; these wetlands are required to be inspected annually.

Trout Unlimited, NRCS, and Partners for Fish and Wildlife provide staff who has completed wetlands courses or other training courses offered by the US Forest Service to complete inspections of wetlands restoration projects. Inspectors record at least the acreage, location, and functionality of each restoration site and in some cases additional information such as hydrology, presence of wetlands plant species, and soil type is documented. Currently, there is not a quality assurance plan followed by all data collection agencies, however, the NRCS does have an established protocol for documentation of wetlands restoration projects.

NRCS reports acres of restored wetland by county to the state data contact (WVDEP staff) using Toolkit. Toolkit is the primary conservation planning tool used by NRCS and affiliates and is used for conservation planning and design, layout, and evaluation of approved conservation practices. Trout Unlimited staff enter information for individual practices into an electronic database and submit data at the county level to the state data contact.

7.2 BMP validation

Data describing wetland restoration projects is reviewed by the WVDEP staff state data contact as it is received from each reporting agency. The total number of projects is small enough that the data contact is easily able to review all data received to detect any instances of misinformation reporting or project double counting. WVDEP staff run annual progress reports and compare the results to reports from previous years. If any anomalies are noticed, the state data contact will investigate the source of the issue. Additionally, Trout Unlimited is in the process of developing a database that will document the specific funding source for each project entered. This system will help identify any instances of double counting.

7.3 BMP performance

State agency staff routinely participate in CBP Wetland Working Group meetings and will follow their guidance to assess wetland restoration project performance and efficiencies.

Table 9: Wetland restoration sector verification strategy

Program Component	Program Elements	WV's strategy
i. BMP Verification	1. What was the driver for BMP installation?	Cost-share
	2. How many BMPs will be inspected?	All are inspected at the time of project completion. Some are inspected in the following years.
	3. How is inspection frequency and location determined?	Projects inspected on more occasions than at the time of completion are chosen due to landowner willingness and enrollment in a conservation easement program, which requires annual inspections.
	4. How often are BMPs/groups of BMPs inspected?	All are inspected when project construction is completed. Willing landowners participating in Trout Unlimited restoration projects are inspected one or more times following completion and projects that are part of Potomac Conservancy conservation easements are inspected annually.
	5. What is the method of inspection?	Field visual
	6. Who will conduct the inspection and is he/she certified/trained?	Trout Unlimited, NRCS, or Partners for Fish and Wildlife staff perform inspections. All have completed wetlands training courses or other trainings offered by the US Forest Service.
	7. What needs to be recorded for each inspection?	At a minimum functionality, acreage, and location are documented. In some cases hydrology, presence of wetlands plant species, and soil type are recorded.
	8. Is execution of the inspection process documented in and checked against an updated quality assurance (QA) plan?	No universal plan for inspectors from all agencies. NRCS inspectors follow a plan developed by that agency.
	9. How is collected data recorded?	Toolkit for NRCS data. Electronic database for Trout Unlimited
	10. At what resolution are results reported to EPA and/or the public?	NRCS: Acres of restored wetland operations are requested by/reported to state data contact by county and entered into NEIEN for annual progress reporting. Trout Unlimited: Individual practices are entered but only county (not lat/long) is known by the state data contact.
ii. BMP Validation	11. What is the QA/QC process to prevent double-counting or counting of BMPs no longer in place?	State data contact reviews all data as it is submitted, and due to the low number of total projects will be able to notice any double counting. TU is developing a database that will list funding source and assist in identification of double-counted projects.
	12. What is the method used to validate state's ability to collect and report correct data?	The state data contact (WVDEP staff) reviews all data upon submission. The total number of projects is small enough that the data contact would notice incorrect information. WVDEP runs reports for annual progress and compares them to reports from previous years. Any anomalies are investigated.
	13. If data is provided by external independent party or industry, what method is used to provide adequate QA for acceptance by the Chesapeake Bay Program?	See above.
	14. Who conducts data validation?	WVDEP, non-regulatory state agency

iii. BMP Performance	15. What is the process to collect data to assess BMP performance and confirm consistency with the Chesapeake Bay Program's approved BMP efficiencies?	State agency staff participate in the CBP Wetland Workgroup and will follow their guidance.
	16. Who collects BMP effectiveness data?	None at this time. (Assuming on-site analytical data collection)

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ATTACHMENT A: STANDARD OPERATING PROCEDURES FOR TRACKING, REPORTING, AND VERIFICATION OF AGRICULTURAL BEST MANAGEMENT PRACTICES

Standard Operating Procedures
For Tracking, Reporting and Verification
of Agricultural Best Management Practices
Within West Virginia's Portion of the Chesapeake Bay Watershed

West Virginia

Revised June 5, 2015

I. Verification Program Development:

West Virginia's Agriculture Verification Program Development Team:

West Virginia Department of Agriculture (WVDA) – **Matt Monroe**, Assistant Director - Environmental Programs will assist in overseeing West Virginia's Verification Program. **Cindy Shreve** is the WVDA Agriculture Outreach Specialist and will be directly overseeing West Virginia's Verification Database and Annual Submittal of agricultural data to EPA's Chesapeake Bay Program. **Andy Yost,** WVDA's Environmental Technician, is West Virginia's representative on the Chesapeake Bay Agriculture Workgroup. **Ashley Davey-Karlson** and **Natasha Keplinger** are certified Nutrient Management Planners. **Johnny Halterman** is a CAFO Specialist who will assist in writing Nutrient Management Plans and will assist in field verification efforts.

West Virginia Conservation Agency (WVCA) – **Carla Hardy** serves as the Watershed Program Coordinator and oversees data collection for the agency including litter transport from private vendors and other grant- and state-funded agricultural BMP programs. **Barbara Elliott**, Watershed Specialist, assists with the submission of agricultural BMP data from the Agricultural Enhancement Program (AgEP) in the Eastern Panhandle Conservation District. **Ben Heavner**, Conservation Specialist in the Potomac Valley assists with the agricultural BMP data collection for the AgEP Program within the Potomac Valley Conservation District.

West Virginia Division of Forestry (WVDOF) - **Herb Peddicord**, Chesapeake Watershed Forester, collects and reports forest buffer plantings, tree planting, forest harvesting BMPs, and forest conservation data. He participates in the Chesapeake Bay Program's Forestry Workgroup.

WVU Extension – Tom Basden is a WVU Extension Specialist, Nutrient Management and Extension Clinical Associate Professor.

West Virginia Department of Environmental Protection (WVDEP) - **Alana Hartman**, Potomac Basin Coordinator (PBC) works with all sectors in implementation of the State's WIP and assists with annual data submittal to the Bay Program. **Teresa Koon**, Assistant Director for Water and Waste Management is a technical contact on this project. **David Montali** is a Technical Analyst Sr. in the Division of Water and Waste Management and is a technical contact on this project.

USDA Natural Resources Conservation Service (NRCS) – **Bill O'Donnell** is the Assistant State Conservationist – Programs. Bill will assist in collection and interpretation of USDA NRCS data and will assist with providing USDA NRCS data to State Agencies for inclusion in the annual submittal to the Bay Program.

USDA Farm Service Agency (FSA) – **Mike Taylor** supports the collection and interpretation of FSA data.

Verification Program Background:

From *Strengthening Verification of Best Management Practices Implemented in the Chesapeake Bay Watershed: A Basinwide Framework…*

> *"The Bay Program partners must view verification as the means to strengthen our confidence in local implementation efforts. The Bay Program partners must have confidence that these reported practices are actually being implemented, are functioning and are preventing and reducing pollution runoff to local streams, groundwater and the Bay. The implementation of the verification protocols described here will not only increase public certainty in the reported practices, but it will help ensure those practices are operating in the intended ways to reduce nutrient and sediment pollutant loads to local streams, groundwater and Bay tidal waters. The Bay Program partners want to make sure all jurisdictions are fully accounting for all nutrient and sediment pollutant reduction actions taken across the watershed. For example, we know partners are under accounting the non-cost shared practices that agricultural producers are implementing without government funding. Furthermore, verifying what's on the ground and is functioning gives everyone confidence that Bay Program partners will achieve the expected nitrogen, phosphorus and sediment pollution reductions over time."*

With this in mind, West Virginia's objective is to collect and report annual, agricultural Best Management Practice implementation data to EPA for inclusion in the Chesapeake Bay Watershed Model (CBWM) for annual progress evaluations. The aim is to count as accurately as possible the number and types of BMPs being implemented in the eight-county Potomac Basin of West Virginia. One reason is to obtain credit for and document in one place the worthy water quality improvement work carried out by multiple public and private entities in West Virginia. Another reason is so that the CBWM will reflect reality as closely as possible, and any assessments made by using the model will be as accurate as possible.

Funding for the Verification Program will come from various sources including State Agency funding and Funds from EPA's Chesapeake Bay Regulatory and Accountability Program (CBRAP) Grant.

West Virginia will continue collecting and reporting annual practices and will ramp up the verification of past practices over the next two years, making refinements to the program based on funding, staff availability, producer willingness to participate, and other programmatic constraints.

Verification Principles

PRINCIPLE 1: PRACTICE REPORTING
Verification is required for practices, treatments, and technologies reported for nitrogen, phosphorus, and/or sediment pollutant load reduction credit through the Chesapeake Bay Program (CBP) partnership.

Verification protocols may reflect differing tools and timelines for measurement, as appropriate, for a specific BMP. For example:

- A permit (e.g., MS4) may establish periodic inspections for a regulatory BMP;
- A contract may govern examinations of a cost-shared structural (e.g., manure storage structure) or annual (e.g., cover crops) BMPs; or
- A statistical sampling may best define measurement for non-cost shared structural, annual and/or management BMPs.

Verification protocols will ensure that under normal operating conditions:

- Structural practices are properly designed, installed, and functionally maintained to ensure that they are achieving the expected nitrogen, phosphorus, and sediment pollutant load reductions reviewed and approved to by the CBP Partnership;
- Practices, including annual practices, meet the CBP Partnership's implementation and management definitions;
- Practices are consistent with or functionally equivalent to established practice definitions and/or standards;
- Practices are not double counted; and
- Practices are currently functional at the time of seeking credit and not removed from the landscape.

For verified practices not consistent with, nor fully or partially functionally equivalent to, established practice definitions and/or standards, partners and stakeholders can seek CBP Partnership approval for crediting through the established CBP Partnership's BMP review protocol.

Any practice, treatment, and technology (or partial or full equivalency) approved by the CBP Partnership that is properly tracked, verified, and reported will be incorporated into the CBP Partnership's models and credited in the accounting of progress toward the jurisdictions' milestones and in the interpretation of observed trends in monitoring data.

PRINCIPLE 2: SCIENTIFIC RIGOR
Verification of practices assure effective implementation through scientifically rigorous and defensible, professionally established and accepted sampling, inspection, and certification protocols regardless of funding source (cost share versus non-cost share), source sector (agriculture, urban, etc.), and jurisdiction (state, local). A method and schedule for confirmations to account for implementation progress over time will help ensure scientific rigor. Verification shall allow for varying methods of data collection that balance scientific rigor with cost-effectiveness and the significance of or priority placed upon the practice in achieving pollution reduction.

PRINCIPLE 3: PUBLIC CONFIDENCE
Verification protocols incorporate transparency in both the processes of verification and tracking and reporting of the underlying data. Levels of transparency will vary depending upon source sector, acknowledging existing legal limitations and the need to respect individual confidentiality to ensure access to non-cost shared practice data.

PRINCIPLE 4: ADAPTIVE MANAGEMENT
Advancements in Practice Reporting and Scientific Rigor, as described above, are integral to assuring desired long-term outcomes while reducing the uncertainty found in natural systems and human behaviors. Verification protocols will recognize existing funding and allow for reasonable levels of flexibility in the allocation or targeting of those funds. Funding shortfalls and process improvements will be identified and acted upon when feasible.

PRINCIPLE 5: SECTOR EQUITY
Each jurisdiction's program should strive to achieve equity in the measurement of functionality and effectiveness of the implemented BMPs among and across the source sectors.

II. Data Acquisition and Management

BMPs for Agricultural Land Uses

Beginning in Progress Year 2012, we now use some of the data provided to us by NRCS and FSA Details about its source and aggregation principles are in Appendix B. The USDA database is not set up to match the BMPs definitions approved by the CBP. Therefore, we have assigned NRCS and FSA practice codes to CBP-defined practice names, as listed below. This source is denoted by "Aggregated NRCS/FSA data," below.

Numbers such as (8.4.12) or (SB 8.4.12) below refer to the section of Scenario Builder documentation ("*Estimates of county-level nitrogen and phosphorus data for use in modeling pollutant reduction; Documentation for Scenario Builder version 2.2" December 2010)* from which we used language in the definition.

"MAWP" refers to "*Developing best management practice definitions and effectiveness estimates for nitrogen, phosphorus and sediment in the Chesapeake Bay watershed*" December 2009, by Dr. Thomas Simpson and Sarah Weammert, University of Maryland Mid-Atlantic Water Program.

See also "Custom_082613_SRS_neien_nps_bmp…" PDF file of (NEIEN) Appendix A, but cropped and annotated for West Virginia's use

West Virginia will assign the most recent NPS BMPs codes for NEIEN input tables. The most recent version is the NEIEN Chesapeake Node Codes List – Version 2.11 (Dec. 2013).

1. BMP name: **Alternative Watering Facility** (Scen. Builder documentation 8.4.26) **Off Stream Watering without Fencing (MAWP report p. 417)**
Definition(s): Alternative watering facilities typically involves the use of permanent or portable livestock water troughs placed away from the stream corridor. The source of water supplied to the facilities can be from any source including pipelines, spring developments, water wells, and ponds. In-stream watering facilities such as stream crossings or access points are not considered in this definition (Scen. Builder documentation 8.4.26) This BMP requires the use of alternative drinking water sources away from streams to reduce the time livestock spends near and in streams and streambanks reducing direct manure deposition to streambeds and banks and also reducing erosion and nutrient deposition to riparian areas. (MAWP p. 414)
NRCS practice(s) counted: 614 (Watering facility)
Source of data: "Aggregated NRCS/FSA data"
Procedure used to compile data: Staff enters numbers into a table by county
Data analysis: *NEIEN converts to feet?*
Checks for accuracy:
Units: number

2. BMP name: **Animal Access Control with Fencing / Stream Access Control with Fencing (SB 8.4.27) Off StreamWatering with Fencing (MAWP p. 414)**
Definition(s): Stream access control with fencing involves excluding a strip of land with fencing along the stream corridor to provide protection from livestock. The fenced areas may be planted with trees or grass, or left to natural plant succession, and can be of various widths. (SB 8.4.27) This BMP excludes animals

from streams. It incorporates both alternative watering and installation of fencing that eliminates livestock access to narrow strips of land along stream. (MAWP 414)
FSA practice(s) counted: CP22
Source of data: "Aggregated NRCS/FSA data"
Procedure used to compile data:
Data analysis: Acres are reported
Checks for accuracy: Cross-checked with FSA's reporting form regarding CREP fencing projects
Units: acres; we can now also enter length and width as separate measurements for the same BMP in NEIEN.

3. BMP name: **Animal Waste Management Systems- Livestock (SB 8.4.1)**
Definition(s): Practices designed for proper handling, storage, and utilization of wastes generated from confined animal operations. (SB 8.4.1)
NRCS practice(s) counted: 313 (Waste storage facility), [359 (Waste treatment lagoon) – usually not done in WV but should check just to be sure]
Source of data: "Aggregated NRCS/FSA data," plus emailed request to local NRCS staff to provide the number of animals associated with each system.
Procedure used to compile data:
Data analysis: Number of animals is converted into animal units by NEIEN
Checks for accuracy: Confirmed with local NRCS staff
Units: number of animals → animal units

4. BMP name: **Animal Waste Management Systems-Poultry (SB 8.4.1)**
Definition(s): Practices designed for proper handling, storage, and utilization of wastes generated from confined animal operations. (SB 8.4.1)
NRCS practice(s) counted: 313 (Waste storage facility),
Source of data: "Aggregated NRCS/FSA data," plus emailed request to local NRCS staff to provide the number of animals associated with each system.
Procedure used to compile data:
Data analysis: Number of animals is converted into animal units by NEIEN
Checks for accuracy: Confirmed with local NRCS staff
Units: number of animals → animal units

5. BMP name: **Barnyard Runoff Control (8.4.2)**
Definition(s): Includes the installation of practices to control runoff from barnyard areas. This includes practices such as roof runoff control, diversion of clean water from entering the barnyard and control of runoff from barnyard areas. (SB 8.4.2)
NRCS practice(s) counted: 558 (Roof runoff structures), 575 (Animal trails and walkways), and possibly Roof Runoff Management
Source of data: "Aggregated NRCS/FSA data"
Procedure used to compile data:
Data analysis: The two practices would have to be reported separately, because # 575 is in feet.
Checks for accuracy:
Units: # of systems; # 575 is in feet.

6. BMP name: **Conservation Tillage (8.4.12)**
Definition(s): Conservation tillage involves planting and growing crops with minimal disturbance of the surface soil. Conservation tillage requires two components, (a) a minimum 30% residue coverage at the

time of planting and (b) a non-inversion tillage method (SB 8.4.12) *Note:short-term expert panel recommendations were approved October 2013.*
NRCS practice(s) counted: 329 (Residue and Tillage Management, No-Till/Strip Till/Direct Seed); 344 (Residue Management, Seasonal); 345 (Residue and Tillage Management, Mulch Till)
Source of data: "Aggregated NRCS/FSA data"
Procedure used to compile data: staff enters acreages into a table by county
Data analysis: Sum the three NRCS practices by county. [Past method: Since this is a practice that keeps happening for a number of years after it is first counted as new acreage, from 2005 to 2007 we managed the numbers in the following way: multiply cumulative total acreage from past years by 75%, then add most recent year's new acreage. In 2007 the reporting period changed and this method no longer made sense, so we started only reporting the numbers as recorded from NRCS.]
Checks for accuracy:
Units: acres

8. BMP name: **Cover Crops**
Definition(s): Planting and growing of cereal crops (non-harvested) with minimal disturbance of the surface soil. The crop is seeded directly into vegetative cover or crop residue with little disturbance of the surface soil (8.4.19). Non-harvested winter cereal cover crops, including wheat, rye and barley, designed for nutrient removal (MAWP p. 99). *Note:short-term expert panel recommendations were approved October 2013.*
NRCS practice(s) counted: 340 (Cover crops)
Source of data: "Aggregated NRCS/FSA data", WVCA's AgEP Program (both generate very specific data)
Procedure used to compile data: staff enters acreages into a table by county.
Data analysis:
Checks for accuracy:
Units: acres

9. BMP name: **Commodity Cover Crops**
Definition(s): Cover crops which may be harvested for grain or silage; they may receive nutrient applications**,** but only after March 1 of the spring following their establishment. *Note:short-term expert panel recommendations were approved October 2013.*
NRCS practice(s) counted: 340 (Cover crops)
Source of data: "Aggregated NRCS/FSA data", WVCA's AgEP Program (both generate very specific data)
Procedure used to compile data: staff enters acreages into a table by county.
Data analysis: Checks for accuracy:
Units: acres

10. BMP name: **Grass Buffers**
Definition(s): Grass plantings between fields and rivers and streams. Linear strips of vegetation along rivers and streams, helping to filter nutrients, sediment, and other pollutants carried in runoff. Min width = 35', recommended 100' (SB 8.4.10).
NRCS practice(s) counted: 390 (Riparian Herbaceous Cover), 393 (Filter Strip), 412 (Grassed Waterway)
Source of data: "Aggregated NRCS/FSA data, " WVCA may also have acreages from its own projects to add.
Procedure used to compile data: staff enters acreages into a table by county
Data analysis: Acreages are summed by county.

Checks for accuracy: Cross checked with FSA reporting sheet to local Conservation Districts for CREP projects
Units: acres; we can now also enter length and width as separate measurements for the same BMP in NEIEN.

12. BMP name: ***Animal Mortality Composting*** *(has not been reported through 2012)*
Definition(s): A physical structure and process for disposing of dead poultry. Composted material is combined with poultry litter and land applied using nutrient management plan recommendations. (SB 8.4.6) Mortality composters involve composting routine mortality in a designed, on-farm facility, with subsequent land application of the compost. This prevents the necessity to bury dead animals that could result in nutrient leachate, or rendering of dead animals for processing into animal feeds or incineration. Mortality composting can be, and is applied, to various species including poultry, swine and dairy calves (p. 395 MAWP).
NRCS practice(s) counted: 316 (Animal Mortality Composters) also 317 manure (and other organic byproducts) composters
Source of data: "Aggregated NRCS/FSA data"
Procedure used to compile data:
Data analysis:
Checks for accuracy:
Units: systems, but animal units seems more appropriate

13. BMP name**: Non-urban Stream Restoration**
Definition(s): A collection of site specific engineering techniques used to stabilize an eroding streambank and channel. These are areas not associated with animal entry (SB 8.4.5)
NRCS practice(s) counted: 395 (stream habitat improvement and management)
Source of data: "Aggregated NRCS/FSA data" with follow-up to NRCS staff to learn what kind of project it was. Combined with county level WVCA data, with staff follow-up to learn type of project.
Procedure used to compile data: staff enters feet into a table by county
Data analysis: Number of acres of practice #395 reported separately from the number of feet treated by other projects
Checks for accuracy:
Units: acres of #395; other known projects reported in feet.

14. BMP name: **Nutrient Management Plan**
Definition(s): Application of nutrients to croplands [although WVDA also keeps track of nutrient management plans' pasture and hay acreage, as well, so these can be reported separately]. Details type, rate, timing, and placement of nutrients for each crop. Soil, plant tissue, manure and/or sludge tests used to assure optimal application. Revised every 2-3 years (SB 8.4.8). *Note:short-term expert panel recommendations were approved October 2013.*
NRCS practice(s) counted: 590 (Nutrient management)
Source of data: Beginning in 2014, all certified nutrient management planners are required to submit an annual report to WVDA to enable WVDA to count nutrient management plans in which its staff were not involved and prevent double-counting.
Procedure used to compile data: staff enters acreages into a table by county
Data analysis: Acreages provided by WVDA are added across all 8 counties by landuse (crop, hay, and pasture). The percentages of NMP on crop vs. hay vs. pasture are calculated, and these percentages are applied to the NRCS acreages as well. Then the NMP acreages are entered by county, land use, and source agency (NRCS, WVDA).
Checks for accuracy:

Units: acres

15. BMP name: **Prescribed Grazing**
Definition(s): This practice utilizes a range of pasture management and grazing techniques to improve the quality and quantity of the forages grown on pastures and reduce the impact of animal travel lanes, animal concentration areas or other degraded areas (SB 8.4.29); part of proposed Pasture Management BMP in MAWP p. 746.
NRCS practice(s) counted: 528 (prescribed grazing) & 528A
Source of data: "Aggregated NRCS/FSA data"
Procedure used to compile data: staff enters acreages into a table by county
Data analysis: Acreages are summed by county.
Checks for accuracy:
Units: acres

16. BMP name: **Riparian Forest Buffers (ag)**
Definition(s): Agricultural riparian forest buffers are linear wooded areas along rivers, stream and shorelines. Forest buffers help filter nutrients, sediments and other pollutants from runoff as well as remove nutrients from groundwater. The recommended buffer width for riparian forest buffers (agriculture) is 100 feet, with a 35 feet minimum width required. min width = 35', recommended 100' … defined as having a vegetative cover of 60% or greater (SB 8.4.9). *Note: expert panel recommendations are expected in 2014.*
NRCS practice counted: 391 (Riparian Forest Buffer)
FSA practice counted: CP-22
Source of data: "Aggregated NRCS/FSA data;" more detailed info provided by FSA. WVCA and WVDOF may also have acreages from their own projects to add. If so, specific location and other information may be available for separate entry.
Procedure used to compile data: staff enters acreages into a table by county or enters data separately if appropriate. If FSA provides length and width, and width is 35' or greater, and confirms they're on pasture, then report this as Forest Buffers TRP.
Data analysis: If length and width are provided, acreage is calculated. Acreages are summed by county, or in the case of projects whose details are known and that are assured to be not double-counted, they are entered individually.
Checks for accuracy: WVDOF staff uses lat/long reading to plot each project on Terrain Navigator map; WVDOF staff checks for double-counting by consulting with soil conservationists at the county Field Offices of NRCS. Cross checked with FSA reporting sheet to local Conservation Districts for CREP projects.
Units: acres; we can now also enter length and width as separate measurements for the same BMP in NEIEN.

17. BMP name: **Tree planting (ag)**
Definition(s): (Row Crop): Any tree plantings on any site except those along rivers and streams. Tree plantings do not include reforestation. Targets land that is highly erodible or identified as critical resource area. Density should be sufficient to produce forest-like cover over time. CRP planting given as an example (SB 8.4.4). *Note: expert panel recommendations are expected in 2014.*
NRCS practice(s) counted: 612 (Tree/Shrub Establishment)/666 (Forestland Re-established or Improved)
Source of data: "Aggregated NRCS/FSA data", WVDOF might have projects to add.
Procedure used to compile data: staff enters acreages into a table by county
Data analysis: Acreages are summed by county.

Checks for accuracy:
Units: acres; we can now also enter length and width, or number of trees planted, as separate measurements for the same BMP in NEIEN.

18. BMP name: **Wetland Restoration**
Definition(s): Agricultural wetland restoration activities re-establish the natural hydraulic condition in a field that existed prior to the installation of subsurface or surface drainage. Projects may include restoration, creation and enhancement acreage. Restored wetlands may be any wetland classification including forested, scrub-shrub or emergent marsh (SB 8.4.11).
NRCS practice(s) counted: 646 (Shallow Water Development & Management), 657 (Wetland Restoration); According to wetland workgroup participants 11/6/13, 656 and 658 are also possibilities. Nita mentioned 657 might include rehabilitation.
Source of data: "Aggregated NRCS/FSA data", USFWS's Partners for Fish and Wildlife Program might also have some of these to report.
Procedure used to compile data: staff enters acreages into a table by county
Data analysis: Acreages are summed by county.
Checks for accuracy:
Units: acres

21. BMP name: **Poultry Litter Transport**
Definition(s): participation in a litter transfer program, also voluntary broker participation
Source of data: NRCS field offices in West Virginia (n= ~30) except those over 200 miles from the Potomac Basin, also voluntary broker participation
Procedure used to compile data: WVCA and/or WVDA staff contacts each field office and asks for the tonnage, type, sending county (often this is simply the field office contacted) and receiving county. Private vendors are also contacted by and data is collected based on litter type, tonnage, county of production and end use location (county). WVCA staff enters tonnages into a table by county.
Data analysis: All data are reported to Chesapeake Bay Program with receiving county specified, even if it is within the Chesapeake Bay watershed. Tons are summed by county.
Checks for accuracy:
Units: tons (=2000 lbs)

III. Verification Methods and Procedures (Cost Shared Practices):

- **Annual data collection occurs approximately July through November each year** (due on December 1), gathering data about implementation that occurred the previous (July through June) year. WVDA will request annual USDA NRCS & FSA data to be submitted by November 1 each year.

- **Verification for other practices is ongoing throughout the year**

Annually, West Virginia will continue to submit data from all available sources including Federal and State Agencies. All BMPs submitted annually will comply with current Federal Program Standards except for programs which do not currently have Federal Standards such as Manure Transport. All BMPs in this list except Nutrient Management and a portion of Manure Transport are cost shared practices as well. For NRCS standards and specs, refer to Appendices B & H.

West Virginia will rely solely on Federal Verification Programs already in place until each BMP has reached the end of its lifespan. **After each BMP's lifespan has expired, State Agencies and NGOs will be 100% responsible for ongoing verification of the following practices each year until the practices can no longer be credited** (for more detail see Appendix A).

All BMPs in this list have been approved by the Chesapeake Bay Program for modeled credit.

WIP Priority	BMP Name / Grouping	BMP Type	Method	Lifespan
High	**Pasture Fencing**	Structural	Visual	20
High	**Forest Buffer**	Structural / Agronomic	Visual	15
High	**Grass Buffer**	Structural / Agronomic	Visual	5
High	**AWMS**	Structural	Visual	15
High	**Barnyard Runoff Control**	Structural	Visual	15
High	**Composters**	Structural	Visual	15
High	**Nutrient Management**	Management	Paperwork Review	1 Year NRCS, 3 Year State
High	**Conservation Till**	Annual	Visual	1
High	**Cover Crops**	Annual	Visual	1
Medium	**Manure Transport**	Annual	Paperwork Review	1
Medium	**Precision Rotational**	Management	Paperwork	1 (Most are for 3 Years)

	Grazing/Prescribed Grazing		Review	
Medium	**Tree Planting**	Structural / Agronomic	Visual	15
Medium	**Pasture Alternative Watering/Watering Facility**	Structural	Visual	20
High	**Stream Restoration**	Structural	Visual	20
Medium	**Wetland Restoration**	Structural	Visual	15

(West Virginia is also planning to collect Resource Improvement (R.I.) BMP data and begin working with Chesapeake Bay Program staff to get model credit for these practices. For more information on the R.I. Protocol, see section IV of this document.)

While all BMP data will be collected at the site specific scale including latitude and longitude, West Virginia will only be reporting information to the Bay Program at a County scale.

a. Changes in management actions include: implementation of a new BMP; maintenance of an existing BMP (not to be reported as a new practice); or renewed practices such as nutrient management plans.

b. Changes in management actions *do not* include the reporting existing practices in a new year under a new BMP name.

c. BMPs units will be tracked directly. Units should not be calculated by estimating a percentage of total acres available.

Federal Agency Verification Protocol (USDA NRCS & FSA)

Upon installation of new Best Management Practices, Federal Agencies verify that every practice was installed according to existing standards.

After installation, NRCS maintains a 5% check on each practice (5% of fence, 5% of structures etc.). For more information on CTA, (see Appendix C). If not up to standard, producer will bring up to standard and would trigger a re-check.

CRP/CREP initial inspections are mostly visual or there is the option of self-reporting. Next is a two year status report and then spot check procedure based on established protocol (Appendix D). There are no other requirements for annual reporting. When participants re-enlist in CREP, this prompts a new inspection. For more information on CRP Compliance see Appendix D.

WV USDA NRCS has agreed to share with the West Virginia Department of Agriculture (under a 1619 Agreement) all agricultural data from their PRS System back to 2004. This includes Latitudes and Longitudes of practices which will greatly assist other agencies with future verification as practice lifespan expire. USDA Data prior to 2004 will be very difficult to collect. This will have to be done manually with staff visiting county field offices to verify data by hard copy.

State Agency / Non-Governmental Organizations Protocol

After Practices expire and are no longer being checked by Federal Agencies, State Agencies will take over and follow the same protocol as Federal Agencies employing a 5% verification rate for the following High and Medium Priority Best Management Practices after their lifespan expires. (For acronyms, refer to guide immediately below this list)

- Pasture Fencing (FI)
- Forest Buffer (FI & RS)
- Grass Buffer (FI)
- AWMS (FI & RS)
- Barnyard Runoff Control (FI)
- Composters (FI & RS)
- Nutrient Management (FR)
- Conservation Till (FR, TS, AS)
- Cover Crops (FR, TS, AS)
- Manure Transport (FR)
- Precision Rotational Grazing/Prescribed Grazing (FR & AS)
- Tree Planting (FI)
- Pasture Alternative Watering/Watering Facility (FI & RS)
- Stream Restoration (FI)
- Wetland Restoration (FI)

Farm Inventory (FI)
A survey or listing of physical BMPs completed by certified, trained technical staff, or by the producer. The survey or listing is based on physical inspection. The reliability of the information and the level of verification depends upon the intensity and frequency of the survey, the training of the person completing the survey, and whether the person completing the survey must certify to its accuracy with penalties for false information. Producer completed inventories without third-party verification are not considered an adequate method for verification.

Office/farm Records (FR)
An evaluation of paperwork on record at the conservation district office or the farm operation itself rather than an on-site inspection of physical BMPs. Records alone are not considered an adequate method for verification, but can be a critical compliment to other methods, especially when associated with non-visual assessment BMPs.

Transect Survey (TS)
An inspection of a statistical-based sampling of BMPs. A transect survey is appropriate for a single year visual assessment of practices such as tillage management. The reliability of this method is based on the sampling and inspection methods and the training and independence of the inspectors. Transect surveys as a visual verification method are not considered an adequate method for verifying non-visual BMPs, or multi-year visual BMPs which require direct inspection, office/farm records, or certified training and engineering.

Agency-sponsored Surveys (AS)
A survey of a statistical sampling of farms. Limitations on the reliability of data are similar to those for farm inventory and office/farm records. Periodic surveys and associated reports published by the National Agricultural Statistics Service (NASS), Conservation Effects Assessment Program (CEAP) and Natural Resources Inventory (NRI) are examples of this type of survey.

Remote Sensing (RS)
A science-based review of images or photographic signatures verified through aerial photography, satellite imagery, or similar methods to identify physical practices on the landscape. This method may involve site-by-site imaging or statistical sampling. Implementing a sufficient land-based sampling validation protocol is necessary for ensuring the analysis of the remote images or photographic signatures are calibrated to actual conditions.

Data to be collected:

Organization who collected data
Farm/Site Name
County
BMP Name
BMP Details (varies by BMP, i.e. Cover Crop Type, Planting Date, Number of Animals etc.)
Lat/Long
Units
Farm/Tract/Field
Progress Year
BMP Status
Date of Collection
Date of Implementation
BMP Lifespan
Adjusted Lifespan (for future verification)
Prior Land Use
Post Land Use
Cost Shared (yes/no)
Meets NRCS Standards (yes/no)
Photos or other documents to attach (optional)

After original practice lifespans have expired, any practice must be verified to be credited, and will then have adjusted lifespans applied to each practice based on the type of practice it is (i.e. structural etc.)

ADJUSTED LIFESPANS (to be reviewed by agencies before distribution)

10 YEARS

- AWMS
- Composters
- Pasture Alternative Watering/Watering Facility
- Stream Restoration
- Wetland Restoration

5 YEARS

- Pasture Fencing
- Barnyard Runoff Control
- Tree Planting

3 YEARS

- Forest Buffer
- Grass Buffer

1 YEAR

- Nutrient Management
- Conservation Till
- Cover Crops
- Manure Transport
- Precision Rotational Grazing/Prescribed Grazing

Programmatic Constraint…….West Virginia's Verification Program is based on voluntary principles and will work to verify agricultural practices on farms whose owners are willing to share information with Federal and State Agencies and Non-Governmental Organizations

Goal is to verify 100% of practices on the landscape but will take several years. West Virginia proposes to only sunset practices that are no longer on the ground or functioning properly. Not planning to extrapolate across entire universe of practices.

Unsure at this time exactly how findings be handled / applied to address further sampling or sunsetting

At this time West Virginia has no plans to assess BMP performance. This may be something down the road that could be explored.

IV. Verification Methods and Procedures (for R.I. Practices)

Resource Improvement practices information will be collected during farm visits for future inclusion in the Bay model.

See Appendix G

V. Verification Training Program

Upon approval of West Virginia's Verification Program, West Virginia will begin to assemble and train the "West Virginia Agriculture Verification Program Implementation Team". These individuals, who are already professionals in the Conservation field will lead the State effort in Tracking, Reporting and Verification of agricultural BMP's.

These individuals will be required to participate in a training session to become fully certified in West Virginia to verify and report agricultural BMPs.

These individuals will be required to:

1. Attend a one day training course which will be sponsored by the West Virginia Conservation Agency, the West Virginia Department of Agriculture, the USDA Natural Resources Conservation Service and Farm Service Agency. This one day training session will give all attendees the knowledge to determine NRCS and FSA practice names, and specifications. During this training, a professional previously trained in NRCS Best Management Practices, will review attendees work after they have documented a pre-determined number of practices. West Virginia is considering holding this one day training session at the WVU Reymann Memorial Farm in Wardensville, WV, where several Best Management Practices have been implemented.

A future training program for Non Professionals (those who are not well versed in conservation programs) will be developed over the next two years. It is anticipated that nonprofessionals will be able to assist in verifying a subset of the priority practices that are simpler to collect data on such as Animal Waste Structures and Composters.

Instruction Manual – See Appendix H

VI. Electronic Data Collection and Reporting System

The West Virginia Department of Agriculture, West Virginia Conservation Agency and West Virginia Department of Environmental Protection joined contracted with Tetra Tech to develop a comprehensive database that can be used by multiple individuals in West Virginia to store collected agricultural BMP data.

The West Virginia Department of Agriculture will take the lead on the maintenance and support of the database as well as the annual submittal of agriculture data to EPA via the NEIEN. West Virginia Department of Agriculture plans to enter into an annual agreement with Tetra Tech of ongoing maintenance and support of the agricultural database.

Individuals from multiple agencies and nonprofits will have the ability to collect and enter data. This data can be entered in one record at a time or as a larger batch. The database is designed to allow queries to assist in determining if BMPs are "expiring" and need to be re-verified.

See Appendix F for Tetra Tech user's manual for database

WVDA will take the lead in training on database usage and QA of the data

Reporting data to EPA:
WVDA will submit a "NPS BMP Database" xml file through WVDEP's node to the National Environmental Information Exchange Network (NEIEN).

National Environmental Information Exchange Network (NEIEN):
West Virginia is using a "full refresh" approach, where previous NEIEN submissions are overwritten by re-submitting the same data again, with modifications based on new knowledge.

The most recent version is the NEIEN Chesapeake Node Codes List - Version 2.11 (Dec. 2013).

To ensure our entries use the proper titles of BMPs and measurement names, we refer to the "NEIEN NPS BMP CBP data flow Appendix A", which is often updated and shared with CBP partners via the website, e.g.: http://www.chesapeakebay.net/calendar/event/20844
See also "Custom_082613_SRS_neien_nps_bmp…" PDF file of (NEIEN) Appendix A, but cropped and annotated for WV's use.

Documentation and Records Retention
Maybe on computer and backup on server
Maybe with database on Guthrie Server, discuss backup plan

d. Explain how your agency plans to access federal cost-share practice data, i.e., an existing, updated or future 1619 data sharing agreement with the U.S. Department of Agriculture.

VII. Verification Pilot Project

West Virginia will begin a verification pilot project shortly after the Verification Program has been approved by EPA. This pilot project will include three certified individuals representing the West Virginia Department of Agriculture, West Virginia Conservation Agency and a Conservation District, who will be tasked with collecting detailed information on a minimum of three Best Management Practices. These three individuals will then log in to the Agriculture Database and enter required information.

The three test BMPS will utilize the following verification techniques (one each):

- Visual Assessment
- Remote Sensing
- Review of Farm Records

State and Federal Agency personnel will then review data collected and entered into the database for accuracy. If the review shows that there are any shortcomings in data collected, then retraining by Federal and State agency staff will commence. This pilot project will be completed by December 31, 2015.

VIII. Communications Strategy

The West Virginia Department of Agriculture and West Virginia Conservation Agency plan to do a joint outreach campaign beginning this summer to help the public become aware of the State's Verification Program. Avenues for outreach may include:

- Newspapers
- WVDA Market Bulletin
- WV Poultry Association
- Farm Bureau

To encourage voluntary participation in the State's Verification Program, WVDA's Agriculture Outreach Specialist has developed a one page flyer to be distributed to agricultural producers via Conservation District Staff, Integrator Service Techs, Nutrient Management Planners, and possibly at County Fairs, farm supply stores and stockyards.

Cumulative versus annual:
Measurements of "annual" BMPs submitted through NEIEN are considered to represent the number on the ground during that progress year. In contrast, measurements of "cumulative" BMPs submitted through NEIEN should be added to the cumulative total of BMPs from the previous year's submission. The CBP's Scenario Builder team maintains a list of each type of BMP that WV submits, in the file "AnnCumulBMPsWV.xlsx"

Reasonableness of each BMP's implementation level:
Reports are circulated to lead staff in various sectors so they can review the final totals and/or subsets of the data for reasonableness. Also refer to the procedures outlined under "Data review and verification process," above. Errors in units or other database-related errors may be revealed during the Progress Review period, when the CBP modeling team provides NEIEN reports and schedules review meetings with the PBC and other staff to discuss BMP levels that seem too high or too low.

CTA: The NRCS Conservation Technical Assistance (CTA) data are included solely for your information. Those practices implemented as CTA did not receive cost-share from USDA. While not strictly voluntary because NRCS did recommend the practice, NRCS has indicated that CTA generally receives a lower level of QA/QC than practices installed under EQIP, CREP, or other cost-share programs. The practices implemented under CTA are generally those that are included in conservation plans anyway and have not previously been reported by most, if not all, states.

ATTACHMENT B: APPENDIX A OF SOP: AGRICULTURE VERIFICATION PROGRAM DESIGN

NRCS/FSA/State Agency Current Cooperator - Practices Under Current Contract and Program

WIP Priority	BMP Name / Grouping	BMP Type
High	**Pasture Fencing**	Structural
High	**Forest Buffer**	Structural / Agronomic
High	**Grass Buffer**	Structural / Agronomic
High	**AWMS**	Structural
High	**Barnyard Runoff Control**	Structural
High	**Composters**	Structural
High	**Nutrient Management**	Management
High	**Conservation Till**	Annual
High	**Cover Crops**	Annual
Medium	**Manure Transport**	Annual
Medium	**Precision Rotational Grazing/Prescribed Grazing**	Management
Medium	**Tree Planting**	Structural / Agronomic
Medium	**Pasture Alternative Watering/Watering Facility**	Structural
High	**Stream Restoration**	Structural
Medium	**Wetland Restoration**	Structural

	Initial Inspection				
BMP Name / Grouping	**Method**	**Frequency**	**Who Inspects**	**Documentation**	**Standard**
Pasture Fencing	Visual	1 time post construction and as needed	NRCS and WVCA	Written Notes and Electronic Files	Federal
Forest Buffer	Visual	CREP, WVCA, WVDOF and NGO protocols	NRCS FSA WVDOF WVCA NGO	Written Notes and Electronic Files	Federal
Grass Buffer	Visual	CREP, WVDOF protocols	NRCS/FSA	Written Notes and Electronic Files	Federal
AWMS	Visual	1 time post construction and as needed	NRCS	Written Notes and Electronic Files	Federal
Barnyard Runoff Control	Visual	1 time post construction and as needed	NRCS	Written Notes and Electronic Files	Federal
Composters	Visual	1 time post construction and as needed	NRCS	Written Notes and Electronic Files	Federal
Nutrient Management	Paperwork Review	NRCS every year, State 1 time every 3 years	NRCS/WVDA/ WVCA	Written Notes and Electronic Files	Federal / State
Conservation Till	Visual	Once post practice	NRCS	Written Notes and Electronic Files	Federal
Cover Crops	Visual	Once post practice	NRCS WVCA	Written Notes and Electronic Files	Federal / State
Manure Transport	Paperwork Review	Once post practice	WVDA WVCA NRCS	Written Notes and Electronic Files	Federal / State / Individual Producer
Precision Rotational Grazing/Prescribed Grazing	Paperwork Review	Once per year for three years	NRCS	Written Notes and Electronic Files	Federal
Tree Planting	Visual	Once post practice	NRCS WVDOF	Written Notes and Electronic Files	Federal
Pasture Alternative Watering/Watering Facility	Visual	1 time post construction and as needed (319 once per year for 5 years)	NRCS WVCA	Written Notes and Electronic Files	Federal
Stream Restoration	Visual	WVCA once during build, then annually 5 years, NRCS 1 time post construction (CORPS requirment also	NRCS WVCA (319 grants NGOs)	Written Notes and Electronic Files	Federal / State (PE signature)
Wetland Restoration	Visual	1 time post construction (easem	NRCS WVCA	Written Notes and Electronic Files	Federal / NGO

			Follow Up Check		
BMP Name / Grouping	**BMP Type**	**Follow Up Inspection**	**tistical Sub-Sam**	**Response if Problem**	**Lifespan**
Pasture Fencing	Structural	WVDA WVCA WVDOF NGO et.al.	5%	Refer to Technical Resource or Sunset	20
Forest Buffer	Structural / Agronomic	WVDA WVCA WVDOF NGO et.al.	Aerial Coverage	Refer to Technical Resource or Sunset	15
Grass Buffer	Structural / Agronomic	WVDA WVCA NGO et.al.	Aerial Coverage	Refer to Technical Resource or Sunset	5
AWMS	Structural	WVDA WVCA NGO et.al.	5%	Refer to Technical Resource or Sunset	15
Barnyard Runoff Control	Structural	WVDA WVCA NGO et.al.	5%	Refer to Technical Resource or Sunset	15
Composters	Structural	WVDA WVCA NGO et.al.	5%	Refer to Technical Resource or Sunset	15
Nutrient Management	Management	WVDA WVCA	100%	Refer to Technical Resource	1 year NRCS, 3 year state
Conservation Till	Annual	WVDA WVCA NGO et.al.	N/A	N/A	1
Cover Crops	Annual	WVDA WVCA NGO et.al.	N/A	N/A	1
Manure Transport	Annual		N/A	N/A	1
Precision Rotational Grazing/Prescribed Grazing	Management	WVDA WVCA NGO et.al.	5%	N/A	1 (most are for 3 years)
Tree Planting	Structural / Agronomic		Aerial Coverage	Refer to Technical Resource or Sunset	15
Pasture Alternative Watering/Watering Facility	Structural	WVDA WVCA NGO et.al.	5%	Refer to Technical Resource or Sunset	20
Stream Restoration	Structural	WVCA NGO	5%	Refer to Technical Resource or Sunset	20
Wetland Restoration	Structural	WVCA NRCS Easement NGO	5%	Will be corrected if Federal Easement; if not, refer to Technical Resource	15

	Initial Inspection				
BMP Name / Grouping	**Method**	**Frequency**	**Who Inspects**	**Documentation**	**Standard**
Pasture Fencing	Visual	1 time post construction and as needed	NRCS and WVCA	Written Notes and Electronic Files	Federal
Forest Buffer	Visual	CREP, WVCA, WVDOF and NGO protocols	NRCS FSA WVDOF WVCA NGO	Written Notes and Electronic Files	Federal
Grass Buffer	Visual	CREP, WVDOF protocols	NRCS/FSA	Written Notes and Electronic Files	Federal
AWMS	Visual	1 time post construction and as needed	NRCS	Written Notes and Electronic Files	Federal
Barnyard Runoff Control	Visual	1 time post construction and as needed	NRCS	Written Notes and Electronic Files	Federal
Composters	Visual	1 time post construction and as needed	NRCS	Written Notes and Electronic Files	Federal
Nutrient Management	Paperwork Review	NRCS every year, State 1 time every 3 years	NRCS/WVDA/ WVCA	Written Notes and Electronic Files	Federal / State
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Precision Rotational Grazing/Prescribed Grazing	Paperwork Review	Once per year for three years	NRCS	Written Notes and Electronic Files	Federal
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Pasture Alternative Watering/Watering Facility	Visual	1 time post construction and as needed (319 once per year for 5 years)	NRCS WVCA	Written Notes and Electronic Files	Federal
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Wetland Restoration	Visual	1 time post construction (easem	NRCS WVCA	Written Notes and Electronic Files	Federal / NGO

			Follow Up Check		
BMP Name / Grouping	**BMP Type**	**Follow Up Inspection**	**tistical Sub-Sam**	**Response if Problem**	**Lifespan**
Pasture Fencing	Structural	WVDA WVCA WVDOF NGO et.al.	5%	Refer to Technical Resource or Sunset	20
Forest Buffer	Structural / Agronomic	WVDA WVCA WVDOF NGO et.al.	Aerial Coverage	Refer to Technical Resource or Sunset	15
Grass Buffer	Structural / Agronomic	WVDA WVCA NGO et.al.	Aerial Coverage	Refer to Technical Resource or Sunset	5
AWMS	Structural	WVDA WVCA NGO et.al.	5%	Refer to Technical Resource or Sunset	15
Barnyard Runoff Control	Structural	WVDA WVCA NGO et.al.	5%	Refer to Technical Resource or Sunset	15
Composters	Structural	WVDA WVCA NGO et.al.	5%	Refer to Technical Resource or Sunset	15
Nutrient Management	Management	WVDA WVCA	100%	Refer to Technical Resource	1 year NRCS, 3 year state
Conservation Till	Annual	WVDA WVCA NGO et.al.	N/A	N/A	1
Cover Crops	Annual	WVDA WVCA NGO et.al.	N/A	N/A	1
Manure Transport	Annual		N/A	N/A	1
Precision Rotational Grazing/Prescribed Grazing	Management	WVDA WVCA NGO et.al.	5%	N/A	1 (most are for 3 years)
Tree Planting	Structural / Agronomic		Aerial Coverage	Refer to Technical Resource or Sunset	15
Pasture Alternative Watering/Watering Facility	Structural	WVDA WVCA NGO et.al.	5%	Refer to Technical Resource or Sunset	20
Stream Restoration	Structural	WVCA NGO	5%	Refer to Technical Resource or Sunset	20
Wetland Restoration	Structural	WVCA NRCS Easement NGO	5%	Will be corrected if Federal Easement; if not, refer to Technical Resource	15

ATTACHMENT C: APPENDIX B OF SOP: NRCS NPPH EDITION 1

United States Department of Agriculture

Natural Resources Conservation Service

National Planning Procedures Handbook (NPPH), Edition 1

(180-600-H, 1st Ed., Amend. 6, Nov 2014)

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Non-Discrimination Statement

Non-Discrimination Policy

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If you wish to file an employment complaint, you must contact your agency's EEO Counselor within 45 days of the date of the alleged discriminatory act, event, or in the case of a personnel action. Additional information can be found online at http://www.ascr.usda.gov/complaint_filing_file.html

To File a Program Complaint

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Persons with Disabilities

Individuals who are deaf, hard of hearing or have speech disabilities and you wish to file either an EEO or program complaint please contact USDA through the Federal Relay Service at (800) 877-8339 or (800) 845-6136 (in Spanish).

Persons with disabilities, who wish to file a program complaint, please see information above on how to contact us by mail or by email. If you require alternative means of communication for program information (e.g., Braille, large print, audiotape, etc.), please contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

Supplemental Nutrition Assistance Program

For any other information dealing with Supplemental Nutrition Assistance Program (SNAP) issues, persons should either contact the USDA SNAP Hotline Number at (800) 221-5689, which is also in Spanish, or call the State Information/Hotline Numbers.

All Other Inquires

For any other information not pertaining to civil rights, please refer to the listing of the USDA Agencies and Offices.

Part 600 – National Planning Procedures Handbook

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600.13 Planning Directives
600.14 Preplanning Activities

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Part 600 – National Planning Procedures Handbook

Subpart A – General

600.0 Purpose

A. NRCS is USDA's technical agency for providing assistance to private land managers, conservation districts, Tribes, and other organizations in planning and carrying out conservation activities and programs. The purpose of this handbook is to provide guidance on the planning process used by the NRCS and many of its partners for developing, implementing, and evaluating individual conservation plans and areawide conservation plans.

Figure 600-A1: Conservation Planning Pamphlet

B. A conservation plan is the record of decisions and supporting information for treatment of a unit of land meeting planning criteria for one or more identified natural resource concerns as a result of the planning process. The plan describes the schedule of implementation for practices and activities needed to solve identified natural resource concerns and takes advantage of opportunities. The plan may include component plans that address one or more resource concerns. Example component plans include: comprehensive nutrient management plan, grazing plan, integrated pest management plan, wildlife management plan, etc. The needs of the client, the resources, and Federal, State, Tribal, territorial, and local requirements will be met.

C. NRCS provides conservation planning and technical assistance to individuals, groups, Tribes, and units of government to help plan and carry out conservation decisions to meet their objectives. This help includes onsite planning assistance in developing conservation plans. Conservation plans are

developed and implemented to protect, conserve, or enhance natural resources within the client's social and economic interests and abilities.

D. Natural resources are defined by NRCS to include soil, water, air, plants, animals, energy and human considerations (SWAPAE +H).

E. In 1947, Hugh Hammond Bennett identified the principles of conservation planning in his text, *Elements of Soil Conservation*. According to Bennett, an effective conservation planner must adhere to the following principles:

(1) Consider the needs and capabilities of each acre within the plan
(2) Consider the client's facilities, machinery, and economic situation
(3) Incorporate the client's willingness to try new practices
(4) Consider the land's relationship to the entire farm, ranch, or watershed
(5) Ensure the conservationist's presence out on the land

Figure 600-A2: Hugh Hammond Bennett (right)

F. This handbook reaffirms these principles throughout the planning process for all land uses.

G. Planning involves more than considering individual resources. It focuses on the natural systems and ecological processes that sustain the resources. Ultimately, the Earth is one ecological system, embodying all the smaller subsystems into one interconnected system. The relationship between living organisms and the environment are part of an ecological system's complexity and are not fully understood. Predicting both onsite and offsite effects upon ecological components is essential and is an inherent part of conservation planning.

H. The role of humans is considered in the formulation and delivery of planning activities. Human values and activities influence the structure and functions of ecological systems. Human actions result in direct and indirect effects on natural resources, both detrimental and beneficial. The

challenge in conservation planning is to balance the short-term demands for goods and services with the long-term sustainability of ecological systems. A conservation plan facilitates a client to operate in an ecologically sustainable, economically sound, and socially acceptable manner within the client's social values.

I. Conservation planning can be implemented successfully using current knowledge and technology, while recognizing that the art and science of natural resource management will continue to evolve and will never be complete or finished. The planner strives to balance natural resource issues with economic and social needs through the development of the conservation plan.

J. When working with Tribal, Native Hawaiian, or Native Pacific Islander clients (indigenous peoples), NRCS can offer technical assistance to help increase their capacity to use the best of both agency methods and indigenous stewardship. The *Indigenous Stewardship Methods and NRCS Conservation Practices Guidebook* focused on Tribes and were developed to provide a sensitive process in which knowledge is shared, allowing planners to incorporate the indigenous knowledge into NRCS's assistance through its conservation practices. The indigenous perspective of living in harmony with the Earth and the agency perspective of scientific and experiential learning are portrayed in the words of the guidebook. Indigenous peoples' traditional resource management systems are based on a combination of traditional knowledge and contemporary resource management needs. Traditional knowledge is sustained and validated by continued application and adaptation, but without a contemporary operating context—our conservation practice standards—valuable traditional knowledge and traditional stewardship practices may be lost to all producers. NRCS's conservation planning procedures facilitate incorporation of traditional indigenous stewardship practices into producers' daily work.

K. The conservation planning process helps the planner and client accomplish the following:

(1) Help protect, conserve, and enhance natural resources
(2) Design alternatives that meet local resource planning criteria for identified resource issues
(3) Include human concerns for achieving sustainable agricultural systems
(4) Consider the effects of planned actions on interrelated geographical areas (i.e., looking offsite, beyond the planning unit boundary)
(5) Consider and explain the interaction between ecological communities and society
(6) Focus on ecological principles
(7) Consider the effects, risks, and interactions of planned systems and practices on the natural resources, as well as economic and social considerations
(8) Identify where indigenous stewardship methods might be needed or explored
(9) Assist with development of plans, regardless of scale, which will help achieve the client's and society's objectives
(10) Identify where knowledge, science, and technology need to be advanced
(11) Assist with meeting requirements for NEPA, which is incorporated into all steps and activities of the conservation planning process (see Section 600.41, "Integrating NEPA into the Planning Process," for additional information)

L. The planning process establishes a framework for planning and applying conservation systems on individual land units for individuals and businesses, as well as, geographic areas involving multiple ownerships, with stakeholder input, for the development of areawide conservation plans.

M. Planning is complex and dynamic. Successful planning requires not only a high level of knowledge, skill, and ability on the part of the planner, but also the use of professional judgment.

N. To gain or maintain the knowledge, skills, and abilities needed for conservation planning, this handbook may be used both for training purposes and as a reference guide.

O. Users of this handbook also need to become familiar with NRCS planning policy (Title 180, General Manual (GM), Part 409), program manuals, discipline manuals (agronomy, biology, economics, engineering, range, etc.), official soils data and interpretive information, the Field Office Technical Guide (FOTG), and user guides for approved automated planning tools. In addition, users need to be thoroughly familiar with NRCS policy and procedures for complying with NEPA and related environmental concerns (190-GM, Part 410, "Compliance with NEPA"; Title 190, National Environmental Compliance Handbook, Part 610); the Land Use Manual (see 310-GM); and the Farmland Protection Policy Act (see Title 440,Conservation Programs Manual (CPM), Part 523).

P. Planning by its nature is both progressive and adaptive. A first-time client may only be interested in a single practice to meet one of their resource concerns. By introducing the planning process, the client is presented a range of alternatives to address multiple resource concerns and ideally, to develop and implement an RMS. Planners and clients work closely together based on the client's knowledge level and where they are in the planning process. It is important to continue assisting the client in addressing resource concerns by increasing the level of planning and implementation over time and ultimately achieving planned goals.

600.1 References

A. Public Laws.—Numerous Federal laws or regulations effect actions or activities relating to natural resource management. Some laws pertain only where public lands are part of the planning area and others are inclusive of all Federal actions, regardless of ownership. Information is available from a number of sources. This is not an all-inclusive list. States are encouraged to supplement this handbook by creating a list of Federal, State, Tribal, and local laws, regulations, etc., that effect natural resource management in their planning area. Examples include the following:

(1) Public Law 95-341, the American Indian Religious Freedom Act of 1978
(2) Public Law 96-95, the Archaeological Resources Protection Act of 1979
(3) Public Law 95-95, the Clean Air Act
(4) Public Law 100-4, the Clean Water Act
(5) Public Law 101-508, the Coastal Zone Management Act
(6) Public Law 104-231, the Electronic Freedom of Information Act Amendments of 1996
(7) Public Law 93-205, the Endangered Species Act of 1973
(8) Public Law 97-98, the Farmland Protection Policy Act of 1981
(9) Public Law 107-17, the Farm Security and Rural Investment Act of 2002
(10) Public Law 104-127, the Federal Agriculture Improvement and Reform Act of 1996
(11) Public Law 101-624, the Food, Agriculture, Conservation, and Trade Act of 1990 (FACTA)
(12) Public Law 110-234, the Food, Conservation, and Energy Act of 2008
(13) Public Law 99-198, the Food Security Act of 1985 (FSA) as Amended
(14) Public Law 89-487, the Freedom of Information Act of 1966
(15) Public Law 99-570, the Freedom of Information Reform Act of 1986
(16) Public Law 95-265, the Magnuson-Stevens Fishery Conservation and Management Act
(17) 16 U.S.C. Sections 703-712, the Migratory Bird Treaty Act of 1918
(18) Public Law 91-190, the National Environmental Policy Act of 1969 (NEPA)
(19) Public Law 89-665, the National Historic Preservation Act of 1966 (NHPA), Amended 2006
(20) Public Law 101-601, the Native American Graves Protection and Repatriation Act of 1990
(21) 54 Stat. Section 250, the Protection of Bald and Golden Eagles Act of 1990
(22) Public Law 93-502, the Privacy Act of 1974
(23) 30 Stat. Section 1121, the Rivers and Harbors Act of 1899
(24) Public Law 95-192, the Soil and Water Resources Conservation Act of 1977
(25) Public Law 106-229, the U.S. Electronic Signatures in Global and National Commerce Act (ESIGN) of 2000

(26) Public Law 90-542, the Wild and Scenic Rivers Act of 1968

B. Executive Orders.—Official documents, numbered consecutively, through which the President of the United States manages the operation of the Federal Government.

(1) Executive Order 12898, Environmental Justice
(2) Executive Order 11988, Floodplain Management, May 1977
(3) Executive Order 11990, Protection of Wetlands
(4) Executive Order 13007, Indian Sacred Sites
(5) Executive Order 13089, Coral Reef Protection
(6) Executive Order 13112, Invasive Species
(7) Executive Order 13175, Consultation and Coordination With Indian Tribal Governments
(8) Executive Order 13392, Improving Agencies Disclosure of Information

C. Other References to Assist in Planning

(1) Catalogue of Federal Domestic Assistance
(2) USDA Departmental Directives and Mandates
(3) Other laws or regulations listed in NRCS program manuals
(4) Indigenous Stewardship Methods and NRCS Conservation Practices Guidebook,
(5) Coordinated Resource Management Guidelines, published by the Society for Range Management
(6) *The Art of Communication* published by the Grazing Lands Technology Institute, available from the NRCS Distribution Center for Publications

D. Manuals.—Type of directive used by National Headquarters and State-level offices to issue policies and procedures on a specific subject.

(1) General Manual
  (i) 180-GM, Conservation Planning and Application
  (ii) 190-GM, Ecological Sciences
  (iii) 420-GM, Part 401, "Historic and Cultural Properties"
(2) Manuals
  (i) Conservation Planning and Application
    Title 180, National Food Security Act Manual (NFSAM), Parts 510 to 520
    Title 180, National Operation and Maintenance Manual, Part 500
  (ii) Ecological Sciences
    Title 190, Rangeland Interagency Ecological Site Manual, Part 500
    Title 190, National Agronomy Manual, Parts 500 to 509
    Title 190, National Biology Manual, Parts 510 to 514
    Title 190, National Forestry Manual, Parts 535 to 538
    Title 190, National Plant Materials Manual, Parts 539 to 542
  (iii) Engineering
    Title 210, National Engineering Manual, Parts 500 to 506
  (iv) Project Development and Maintenance
    Title 390, National Watershed Program Manual
  (v) Programs
    Title 440, Conservation Programs Manual (CPM)
      - Part 500, "Locally Led Conservation"
      - Part 501, "USDA Conservation Program Delivery"
      - Part 502, "Terms and Abbreviations Common to all Programs"
      - Part 503, "Commodity Credit Corporation (CCC) Procedures"
      - Part 504, "Technical Service Provider Assistance"

- Part 506, “Conservation Programs Long Term Contracting”
- Part 508, “Conservation Stewardship Program (CSP)”
- Part 509, “Equitable Relief from Ineligibility for Conservation Programs”
- Part 510, “Appeals and Mediation”
- Part 511, “Healthy Forests Reserve Program (HFRP)”
- Part 512, “Conservation Program Contracting”
- Part 513, “Resource Conservation and Development Program (RC&D)”
- Part 514, “Wetland Reserve Program (WRP)”
- Part 515, “Environmental Quality Incentives Program (EQIP)”
- Part 517, “Wildlife Habitat Incentives Program (WHIP)”
- Part 518, “Conservation Security Program (CSP)”
- Part 519, “Farm and Ranch Lands Protection Program (FRPP)”
- Part 520, ‘Forestry Incentives Program (FIP)”
- Part 521, “Agricultural Management Assistance (AMA)”
- Part 523, “Farmland Protection Policy Act”
- Part 524, “Grasslands Reserve Program (GRP)”
- Part 525, Conservation Technical Assistance Program (CTA)”
- Part 526, “NRCS Grants”
- Part 527, “Easement Common Provisions”

E. Handbooks.—Type of directive used by National Headquarters and State-level offices to issue detailed “how-to” procedures and processes on a specific subject. National program managers and technical specialists primarily generate these handbooks.

(1) Conservation Planning and Application
  (i) Title 180, National Planning Procedures Handbook, Part 600
  (ii) Title 180, Technical Service Provider Handbook, Part 610
(2) Ecological Sciences
  (i) Title 190, National Cultural Resources Procedures Handbook, Part 601
  (ii) Title 190, National Biology Handbook
  (iii) Title 190, National Environmental Compliance Handbook
  (iv) Title 190, National Forestry Handbook
  (v) Title 190, National Range and Pasture Handbook
  (vi) Title 190, Comprehensive Nutrient Management Planning Handbook, Part 620
(3) Economics
  Title 200, National Resource Economics Handbook
(4) Engineering
  Title 210, National Engineering Handbook Series
(5) Project Development and Maintenance
  Title 390, National Watershed Program Handbook
(6) Soil Survey
  Title 430, National Soil Survey Handbook
(7) Technology
  (i) Title 450, National Handbook of Conservation Practices
  (ii) Title 450, National Water Quality Handbook

F. Other

(1) Bennett, Hugh H. 1947. Elements of Soil Conservation. McGraw-Hill, New York
(2) Leopold, A. 1949. A Sand County Almanac. Oxford University Press

600.2 Definitions

This section defines terms that govern the conservation planning process. These terms are used by NRCS personnel and others to describe processes, activities, clients, and products of NRCS technical assistance. Other terms, used exclusively by certain NRCS disciplines, are defined in disciplinary manuals and handbooks and are not repeated here. Similarly, definitions of specific data elements used in information management systems are included in data dictionaries. For terms used to administer NRCS programs, see the abbreviations and terms in the 440-CPM, Part 502.

(1) **Agricultural Land**.—Cropland, rangeland, pastureland, forest land, and other land on which crops, livestock, food, fiber, and other agricultural products are produced. This also includes tree farms and horse operations.

(2) **Agricultural Operation**.—A parcel or parcels of land, whether contiguous or noncontiguous, constituting a cohesive management unit for agricultural purposes.

(3) **Air Quality**.—An NRCS resource concern that includes airborne soil and smoke particulates that can cause safety-related problems, machinery and structure damage, health problems, deposition of airborne sediment in water conveyances, airborne chemical drift, odors, and fungi, molds, and pollen.

(4) **Alternatives**.—One or more options provided to the client to solve resource concerns or address opportunities and achieve proper management of the resources.

(5) **Alternative System**.—A conservation system that is presented to a client during the planning process as one of multiple alternatives to address resource concerns or opportunities. When a client decides which of the offered alternative systems will be implemented, the selected alternative becomes the planned system.

(6) **Application (Financial Assistance Program)**.—A written request for financial assistance for implementing conservation practices.

(7) **Application (Practice)**.—The act of installing planned conservation treatments and management measures that are documented in plans and case files. (See also "implementation.")

(8) **Areawide Conservation Plan**.—A plan developed with a client for a watershed or other geographical area as defined by the client and stakeholders. The areawide conservation plan addresses all resources identified, contains alternative solutions that meet the minimum planning criteria for each resource, and addresses applicable laws and regulations.

(9) **Assessment**.—The act of assessing the physical condition or extent of management applied.

(10) **Assessment Level**.—A statement describing the physical condition or extent of management applied that is used by planners to determine if the resource concern planning criteria have been met. There are two levels of assessment:

(i) Screening Level.—Simple true-false statements of easily observable conditions planners can use to identify sites that have little or no probability of needing additional treatment to address the specific resource concern. If the site meets the screening level criteria, then no other assessment is needed to document that planning criteria are met on this site.

(ii) Basic Assessment Level.—Criteria used when a site does not pass the screening level or when no screening level criteria are defined.

(11) **Assessment Methods**

(i) Procedural.—For some resources, planners use well-defined procedures to acquire data used to determine the resource condition. An example of this approach is determining the ecological health of rangeland using the Interpreting Indicators of Rangeland Health protocol. The summary chart (Figure 600-C1, "Inventory Methods") lists the procedural method for several resource concerns where a standard inventory and assessment

procedures exist. The appropriate discipline handbook or manual may be consulted for more information.

(ii) Predictive.—The condition of some resources is best assessed using models created to predict the probability of an outcome. Estimating sheet and rill erosion rates using RUSLE2 or WEPS to model wind erosion are examples of predictive modeling tools.

(iii) Observation.—Where standard procedures to measure or model the condition of resources do not exist, planners often rely on direct observation or information provided by the client through an interview. Classic gully is an example where observation is the accepted method of evaluating resource conditions. Through observation, the planner discerns the stability of side slopes, head-cutting activity, or erosion in the gully bottom. Observation always implies onsite investigation.

(iv) Deduction.—When it is impractical to measure, model, or observe resource conditions, planners may rely on reason to deduce the status of a resource. Often, the deductive approach is related to treatment standards. In this case, the planner must assume that a certain condition is met if specific treatment is applied, and, conversely, if the specific treatment is not applied, a less desirable condition will result. Planners must frequently rely on deductive methods to address offsite effects. For example, the delivery of dissolved nutrients to groundwater may not be a practical resource concern to measure, and until predictive tools are readily available, the planner can deduce whether or not a problem exists based on other sources of information. If a client utilizes all reasonable nutrient management techniques and has significantly modified the rate, timing, or both of nutrients applied to a field, the planner may deduce that the field in question is no longer a significant source of nutrients entering the groundwater.

(12) **Assistance Notes**.—Notes maintained by planners in the case file for each client receiving planning and implementation assistance. These notes are to be a concise, factual, and chronological narrative of significant conservation activities and may summarize progress in planning and implementation. Assistance notes include both planner-entered and system-generated notes and may include text, audio, video, or photographic formats.

(13) **Benchmark Condition**.—The present condition of identified resource and special environmental concerns that is used as a point of reference to measure changes in resource conditions resulting from conservation treatment. In addition to the benchmark condition, other points of reference are sometimes used for discussion and comparison purposes, especially in an areawide conservation planning situation (i.e., forecasting the resource conditions expected at some point in the future by maintaining current levels of resource management and treatment).

(14) **Benchmark Narrative**.—A written statement of the benchmark condition. The narrative includes a description of the current conditions, crops, soils, major resource concerns, etc. It includes existing conservation practices that meet NRCS standards and those that do not. For areawide conservation plans, the narrative also includes information on future conditions if the problems are not treated.

(15) **Benchmark Practices**.—Existing conservation practices included in the current management system for the planning unit. These practices meet NRCS standards and specifications.

(16) **Break-Even Analysis**.—Estimates target values that would just cover the costs of production (i.e., “break-even”). For example, a client may want to know what the “break-even” yield is, given the cost of production and an expected price per unit of production. Break-even yield = (Total cost per acre)/(Price per bushel). Or a client may want to know at what price he or she will cover the costs of production given a yield. Break-even price = (Total cost per acre)/(Yield per acre).

(17) **Brief Technical Assistance**.—Direct request from a client for natural resource information, data, or technical products received through office visits, phone calls, or written or electronic

communication. Assistance is generally a single transaction or related to a specific site and does not result in a conservation plan.

(18) **Case File**.—The record of resource information, decisions, and technical assistance for a specific client. A case file is established and maintained by the NRCS field office for each client that NRCS is providing continuing technical assistance. The case file will be maintained electronically to the greatest extent possible. Information not amenable to electronic format will be maintained in a hardcopy file.

(19) **Certified Conservation Planner**.—A person who possesses the necessary skills, training, and experience to implement the NRCS nine-step planning process to meet client objectives of solving natural resource concerns. The certified conservation planner has demonstrated skill in assisting clients to identify resource concerns, to document the client's objectives, to propose feasible solutions to identified resource concerns, and to lead the client to choose and implement an effective alternative that treats the resource concerns and meets the client's objectives.

(20) **Client**.—An individual, business, group, or unit of government that is the recipient of NRCS technical and financial assistance. NRCS clients, generally fall into two broad categories: individual owners, managers, partners or businesses, with primary responsibility for their business dealings with NRCS, and groups or local sponsoring organizations or other government officials, responsible for fulfilling requirements or exercising judgments consistent with law, Executive order, and established Federal policy. Examples of the first group include persons, groups, Tribes, corporations, and organizations. Examples of the second group include conservation districts and units of government.

(21) **Common Land Unit (CLU)**.—Closely related to the Farm Service Agency's definition of a field, a CLU is the smallest land unit that has a permanent, contiguous boundary, common land cover and land management, common owner, and common producer association.

(22) **Comprehensive Nutrient Management Plan (CNMP)**.—Any combination of structural practices, management activities, or land management practices associated with crop or livestock production that collectively ensures that the purposes of crop or livestock production and preservation of natural resources (especially the conservation of air, soil, and water quality) are compatible.

(23) **Comprehensive Plan**.—A plan for an area under the jurisdiction of a unit of government that may include, but is not limited to, policies, goals, and interrelated plans for private and public land use, transportation systems, community facilities, and capital improvements. The plan represents the decisions of local people as expressed through units of government. This type of plan may also be called a general plan, master plan, or a regional development plan.

(24) **Comprehensive Planning**.—A continuing process by a unit of government that includes preparation of a comprehensive plan and adoption of the administrative and regulatory measures to implement and maintain the plan.

(25) **Conservation**.—The use and management of natural resources according to principles that assure their sustained productivity.

(26) **Conservation District**.—A subdivision of a State, Indian Tribe, or territory, organized pursuant to the State or territorial soil conservation district law, as amended, or Tribal law. They may be called soil conservation districts, soil and water conservation districts, resource conservation districts, land conservation committees, natural resource districts, or similarly legally constituted body.

(27) **Conservation District Cooperator**.—Any client who has entered into a working relationship or cooperative agreement with a conservation district to work together in planning and carrying out natural resource use, development, and conservation on a specific land area.

(28) **Conservation Effects**.—The anticipated or experienced results of applying one or more conservation treatments on a planning unit in a particular resource setting. They include both

onsite and offsite results of applied conservation treatments. They are measures of a level of outcome and may be expressed in ecological, economic, or social terms.

(29) **Conservation Effects Process**.—A process that supports the NRCS planning process. It uses worksheets, client case studies, and other technologies to document and estimate effects of benchmark systems and resource management systems, evaluate impacts, and gauge advantages and disadvantages to help the end user make informed conservation decisions.

(30) **Conservation Management Unit (CMU)**.—A field, CLU, group of fields, or other land units of the same land use and having similar treatment needs and planned management. A CMU, made up of one or more planning land units (PLU), has definite boundaries, such as fence, drainage, vegetation, topography, soil lines, or land use, and is used by the planner to simplify planning activities and facilitate development of management systems.

(31) **Conservation Partners**.—Conservation districts, State or Tribal conservation agencies, and other cooperating groups of organizations at the field, State, regional, and national levels having common interests dealing with natural resource conservation.

(32) **Conservation Plan**.—A record of the client's decisions and supporting information for treatment of a unit of land meeting planning criteria for one or more identified natural resource concerns as a result of the planning process. The plan describes the schedule of implementation for practices and activities needed to solve identified natural resource concerns and takes advantage of opportunities. The plan may include components such as comprehensive nutrient management plan, grazing plan, integrated pest management plan, etc. The needs of the client, the resources, and Federal, State, Tribal, and local requirements will be met.

(33) **Conservation Planning**.—The activity of NRCS and others in helping a client use the planning process, which is intended to result in a conservation plan or an areawide conservation plan.

(34) **Conservation Practice**.—A specific treatment, such as a structural or vegetative measure, or management technique, commonly used to meet specific needs in planning and implementing conservation, for which standards and specifications have been developed. Conservation practices are contained in the FOTG, Section IV, which is based on the National Handbook of Conservation Practices (NHCP).

(35) **Conservation Practice Certification**.—The process of confirming and documenting a conservation practice is installed and maintained according to the practice standard and specification.

(36) **Conservation Practices Physical Effects (CPPE) Matrix**.—The matrix in the FOTG, Section V, that gives the physical effects of conservation practices on natural resources.

(37) **Conservation System**.—A combination of conservation practices and resource management for the treatment of resource concerns.

(38) **Conservation Treatment**.—Conservation practices, management measures, and works of improvement to solve or reduce the severity of natural resource use concerns or take advantage of resource opportunities.

(39) **Coordinated Resource Management (CRM)**.—A specific application of the planning process that utilizes a variety of clients, stakeholders, organizations, agencies, and others, and a variety of land ownerships, to address a multitude of resource or resource related problems, opportunities, or concerns. CRM is frequently accomplished through "consensus" involving participants that may or may not be land managers or have decision-making authority for the planning area involved. The planning area encompasses the geographical area defined by the parties involved in the CRM effort.

(40) **Cost-Return Analysis**.—Comparison of the costs to returns (revenue) in an agricultural enterprise. Also referred to as the return on investment.

(41) **Cultural Resource/Historic Property**.—Any prehistoric or historic district, site, building, structure or object included in or eligible for inclusion in the National Register of Historic

Places (NRHP), including associated records and artifacts. These properties are taken into account and protected under section 106 of the National Historic Preservation Act (NHPA).

(42) **Cumulative Effect**.—The effect on the environment that results from the incremental effects of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

(43) **Decisionmaker**.—An individual, business, group, unit of government, or other entity that has the authority by ownership, position, office, delegation, or otherwise to decide on a course of action.

(44) **Desired Future Condition**.—A quantitative or qualitative expression of an ecological, economic, or social condition one is attempting to achieve. It is the goal to compare with the predicted outcomes of alternative implementation options.

(45) **Ecological System**.—The organization and interactions of communities of living things, including humans, together with the chemical and physical factors in their environment.

(46) **Environmental Assessment (EA)**.—A concise public document that briefly provides sufficient evidence and analysis for determining whether to prepare a more comprehensive environmental impact statement or a finding of no significant impact.

(47) **Environmental Evaluation (EE)**.—A concurrent part of the planning process in which the potential long-term and short-term impacts of an action on people, their physical or social surroundings, and nature are evaluated and alternative actions explored.

(48) **Environmental Impact Statement (EIS)**.—A document detailing the environmental impact of a proposed law, construction project, or other major action that may significantly affect the quality of the environment. The National Environmental Policy Act (NEPA) and various State environmental laws may require an EIS.

(49) **Environmental Justice**.—Requires, per Executive Order 12898, that no program, procedure, or activity be carried out that has disproportionately adverse human health or environmental effects on minority or low-income populations.

(50) **Erosion**.—The wearing away of the land surface by running water, waves, or moving ice and wind, or by such processes as mass wasting and corrosion (solution and other chemical processes). The term "geologic erosion" refers to natural erosion processes occurring over long (geologic) time spans. "Accelerated erosion" generically refers to erosion that exceeds what is presumed or estimated to be naturally occurring levels and that is a direct result of human activities (e.g., cultivation and logging).

(51) **Facilitating Practice**.—A conservation practice that facilitates management or the function of another practice, or both, but does not achieve the desired effects on its own. Example: A fence is a facilitating practice for prescribed grazing. Prescribed grazing helps improve forage for livestock.

(52) **Field Office Technical Guide (FOTG)**.—The official NRCS guidelines, criteria, and standards for planning and applying conservation treatments (450-GM, Part 401).

(53) **Follow-up**.—The act of maintaining contact with the client to provide timely assistance in implementing decisions, keeping current with new technology, encouraging continued implementation, updating objectives and decisions in a conservation plan, and determining the conservation effects experienced.

(54) **Geographic Database**.—A collection of spatial data and its attributes, organized for efficient storage and retrieval.

(55) **Geospatial**.—Pertaining to the geographic location and characteristics of natural or constructed features and boundaries on, above, or below the earth's surface; especially referring to data that is geographic and spatial in nature

(56) **Guidance Documents**.—Documents contained in the FOTG, Section III. They are examples of RMS options to treat the most commonly identified resource concerns and opportunities for each locally applicable major land use.

(57) **Highly Erodible Land**.—A field where highly erodible land is predominant. HEL is considered to be predominant if either 33.33 percent or more of the total field acreage is identified as soil map units that are highly erodible or 50 or more acres in such a field are identified as soil map units that are highly erodible. For a specific definition of a highly erodible field as it relates to the Conservation Reserve Program, please consult 2-CRP.

(58) **Historically Underserved**.—Underserved individuals and groups include those who have not participated in or have received limited benefits from USDA or NRCS programs that may improve their quality of life or the environment. Historically, the underserved are land managers who are socially disadvantaged, have limited resources, are beginning farmers or ranchers, or are American Indians or Alaskan Natives.

(59) **Human Considerations**.—The potential social, economic, and cultural resource/historic property factors that are considered in the conservation planning process.

(60) **Implementation**.—The act of installing planned conservation treatment and management measures that are documented in plans and case files. (See also "application.")

(61) **Indian Tribe**.—Any federally recognized Indian Tribe, band, nation, or other organized group or community, including any Alaska Native village or regional or village corporation as defined in or established pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. Section 1601 et seq.) that is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

(62) **Indigenous**.—For purposes of this document, "indigenous" refers to populations or communities and their conservation technologies. According to a common definition used by many governments, indigenous peoples are those who inhabited a country or a geographical region at the time when people of different cultures or ethnic origins arrived.

(63) **Indigenous Stewardship Methods**.—Indigenous stewardship methods include the traditional manipulation (including spiritual interactions) of natural surroundings by indigenous people with the purpose of increasing production, improving plant and animal biodiversity, increasing soil health, and numerous other human and ecological benefits. This reciprocal use hinges on respect and spiritual interconnectedness with all of nature. These methods incorporate traditional knowledge generally defined as longstanding traditions and practices of certain regional, indigenous, or local communities.

(64) **Interdisciplinary Planning**.—An interdisciplinary planning approach in which specialists and groups having different technical expertise act as a team to jointly evaluate existing and future environmental quality. The interdisciplinary group considers structure and function of natural resource systems, complexity of problems, and the economic, social, and environmental effects of alternative actions. Public participation is an essential part of effective interdisciplinary planning. Even if an NRCS employee provides direct assistance to an individual land user, the basic data used are a result of interdisciplinary development of guide and planning criteria.

(65) **Internal Rate of Return**.—A financial analysis tool that estimates the interest rate which would make the present value of a stream of net cash revenues equal to zero. The resulting interest rate can be compared to the internal rate of returns of other investment alternatives to determine the alternative with the highest rate of return.

(66) **Inventory**.—The identification of attributes, features, and other data pertaining to natural resources and special environmental concerns on and surrounding a planning area.

(67) **Land Unit**.—Any area of land or water that is of concern in the planning process. (See also "planning land unit.")

(68**)** **Land Use Designation**.--NRCS has developed the following land use designations to be used by planners and modelers at the field and landscape level.

i. **Crop**.—Land used primarily for the production and harvest of annual or perennial field, forage, food, fiber, horticultural, orchard, vineyard, or energy crops.

ii. **Forest**.—Land on which the historic and or introduced vegetation is predominantly is tree cover managed for production of wood products or nontimber forest products.

iii. **Range**.—Land on which the historic and/or introduced vegetation is predominantly grasses, grass-like plants, forbs or shrubs managed as a natural ecosystem. Range land may include natural grasslands, savannas, shrublands, tundra, alpine communities, marshes and meadows..

iv. **Pasture**.—Land composed of introduced or domesticated native forage species that is used primarily for the production of livestock. Pastures receive periodic renovation and cultural treatments, such as tillage, fertilization, mowing, weed control, and may be irrigated. Pastures are not in rotation with crops.

v. **Farmstead**.—Land used for facilities and supporting infrastructure where farming, forestry, animal husbandry, and ranching activities are often initiated. This may include dwellings, equipment storage, plus farm input and output storage and handling facilities. Also includes land dedicated to the facilitation and production of high-intensity animal agriculture in a containment facility where daily nutritional requirements are obtained from other lands or feed sources.

vi. **Designated Protected Area**.—Land or water used for the preservation, protection, and observation of the existing resources, archaeological or historical interpretation, resource interpretation, or for aesthetic value. These areas are officially designated by legislation or other authorities. Examples: legislated natural or scenic areas and rural burial plots.

vii. **Developed Land**.—Land occupied by buildings and related facilities used for residences, commercial sites, public highways, airports, and open space associated with towns and cities.

viii. **Water**.—Geographic area whose dominant characteristic is open water or permanent ice or snow. May include intermingled land, including tidal-influenced coastal marsh lands.

ix. **Associated Agriculture Lands**.—Land associated with farms and ranches that are not purposefully managed for food, forage, or fiber and are typically associated with nearby production or conservation lands. This could include incidental areas, such as idle center pivot corners, odd areas, ditches and watercourses, riparian areas, field edges, seasonal and permanent wetlands, and other similar areas.

x. **Other**.—Land that is barren, sandy, rocky, or that is impacted by the extraction of natural resources, such as minerals, gravel or sand, coal, shale, rock, oil, or natural gas.

(69) **Land Use Modifier** -The restructuring effort introduces the use of land use modifiers to more accurately define the land's actual use. Modifiers provide another level of specificity and help denote what the land is actually managed for. The modifiers are:

i. **Irrigated**.—Used when an operational system is present and managed to supply water.

ii. **Wildlife**.—Used when the client is actively managing for wildlife.

iii. **Grazed**.—Used when grazing animals impact how land is managed.

(70) **Land Use/Cover**.—A term that includes categories of land cover and categories of land use. Land cover is the vegetation or other kind of material that covers the land surface. Land use is the purpose of human activity on the land; it is usually, but not always, related to land cover.

(71) **Land Treatment Area (CNMP)**.—Includes any land under control of the AFO owner or operator, whether it is owned, rented, or leased, and to which manure or process wastewater is, or might be, applied for crop, hay, pasture production, or other uses.

(72) **Least-Cost Analysis (Cost-Effectiveness)**.—Least-cost analysis identifies the least costly alternative (compared to all other alternatives), with the stipulation that all alternatives satisfy the client's objective.

(73) **Local**.—Pertaining to a specific location or area within a larger boundary. Examples include a county, a portion of a county, a watershed, or a multicounty region,

(74) **Locally Led Conservation**.—A process used by local people to assess their natural resource conditions and needs, set goals, identify programs and other resources to solve those needs, develop proposals and recommendations, implement solutions, and measure their success.

(75) **Local Work Group**.—A group made up of representatives of local offices of the Farm Service Agency, the National Institute of Food and Agriculture (NIFA), the conservation districts, and other Federal, State, Tribal, and local government agencies, including, Tribes, with expertise in natural resources who advise NRCS on decisions related to implementation of USDA conservation programs.

(76) **Low-Initial-Cost Structures**.—Structures for treating resource concerns that are specifically designed for low initial cost for certain situations, recognizing that the operation and maintenance costs may be higher than those for conventional structures.

(77) **Major Land Resource Area (MLRA)**.—Broad geographic areas that are characterized by a particular pattern of geology – soils, climate, water resources, vegetation, and land use. Each MLRA in which rangeland and forestland occur is further broken into ecological sites.

(78) **Management Measure**.—One or more specific actions that are not conservation practices described in the FOTG Section IV, but actions that have the effect of alleviating problems or improving the treatment of the resources.

(79) **Management Practice**.—A conservation practice that requires regular input from the land manager. Examples include nutrient management, residue management, integrated pest management, etc. (See also "structural practice.")

(80) **Map Unit**.—A collection of areas defined and named the same in terms of their soil components or miscellaneous areas, or both.

(81) **Measurement and Assessment Tools**.—Description of the technology or process for determining if assessment criteria are met.

(82) **Minimum Level of Treatment**.—The specific conservation treatment NRCS requires that addresses a resource concern to a level that meets or exceeds the planning criteria according to NRCS technical guides.

(83) **Mitigate (Mitigation)**.—To moderate or alleviate the degree of effect on resource quality or condition. Mitigation includes the following:

(i) Avoiding the impact altogether by not taking a certain action or parts of an action

(ii) Minimizing impacts by limiting the degree or magnitude of the action and its implementation

(iii) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment

(iv) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action

(v) Compensating for the impact by replacing or providing substitute resources or environments

(84) **National Environmental Policy Act (NEPA)**.—The 1970 law that requires Federal agencies to consider the effects on the environment of proposed Federal actions. This act established the requirement for conducting environmental evaluations and for the preparation of environmental assessments and environmental impact statements.

(85) **National Historic Preservation Act (NHPA)**.—The 1966 law that is intended to preserve historical and archaeological sites in the United States of America. The act created the National Register of Historic Places, the list of national historic landmarks, and the State historic preservation offices, and requires that Federal agencies take into account the effects of their funded and permitted projects on historic properties (buildings, sites, structures, etc.) through a process known as "section 106 review."

(86) **Natural Resource**.—Any naturally occurring resource needed by an organism, population, or ecological system. NRCS applies this term to soil, water, air, plants, animals, energy, and humans (SWAPAE+H).

(87) **Natural Resources Conservation Service (NRCS)**.—An agency of the U.S. Department of Agriculture formerly called the Soil Conservation Service.

(88) **Net Present Value Analysis**.—Net present value analysis converts future flows of benefits and costs to the present, thus allowing for comparisons of alternatives on a common time basis.

(89) **Network Diagrams**.—NRCS prepares network diagrams of featured practices or related sets of practices that act together to achieve desired purposes. Network diagrams are flow charts of direct, indirect, and cumulative effects resulting from installation of the practices. Completed network diagrams are an overview of expert consensus on the direct, indirect, and cumulative effects of installing proposed practices. They show the potential positive and negative outcomes of practice installation and are useful as a reference point for next steps and as a communication tool with partners and the public.

(90) **No-Action Alternative**.—The projected future course of action that will occur if NRCS assistance is not provided.

(91) **Nontechnical Soil Description**.—A layman's description of soil properties and soil interpretations specific to a geographical location.

(92) **Objectives**.—Objectives are quantitative or qualitative statements of desired future conditions as determined by the client.

(92) **Offsite**.—Locations outside the planning area on which conservation treatment is being considered. It also refers to areas outside the planning unit that are considered for potential effects.

(94) **Onsite**.—Locations within the planning area on which conservation treatment has direct effect.

(95) **Operation and Maintenance (O&M)**.—Work performed by the land manager to keep the applied conservation practice functioning for the intended purpose during its lifespan. Operation includes the administration, management, and performance of nonmaintenance actions needed to keep the completed practice safe and functioning as intended. Maintenance includes work to prevent deterioration of the practice, repairing damage, or replacement of the practice to its original condition if one or more components fail.

(96) **Outreach**.—Activities to ensure that all programs and services are made fairly and equitably accessible to all customers.

(97) **Partial Budgeting**.—Partial budgeting analysis is used to analyze only the change in costs and returns associated with the agricultural enterprise affected by the adoption of proposed alternatives.

(98) **Personally Identifiable Information (PII)**.—Information that can be used to uniquely identify, contact, or locate a single person or can be used with other sources to uniquely identify a single individual.

(99) **Plan Map**.—A photograph, sketch or GIS document of a land area developed during the planning process that shows property boundaries, land unit boundaries, land use, physical features, location of planned and applied practices, and other features that are useful to the client in plan implementation.

(100) **Planner**.—A person, qualified by training and experience, who effectively assists the client in completing the planning process. (See also "certified conservation planner.")

(101) **Planning Criteria**.—A quantitative or qualitative statement of a treatment level required to achieve a minimum level of treatment for a given resource concern for a particular land area. It is established in accordance with local, State, Tribal, territorial, and Federal programs and regulations in consideration of ecological, economic, and social effects. (See also "quality criteria.")

(102) **Planning Land Unit (PLU)**.—A PLU is a unique geographic area, defined by a polygon, that has common land use and is owned, operated, or managed by the same client or clients. The PLU is the minimum unit for planning. (See also "land unit.")

(103) **Planning Process**.—The three-phase, nine-step process used by NRCS to help clients plan and apply conservation treatments or make land use and treatment decisions.

(i) Phase I – Collection and Analysis
Step 1: Identify Problems and Opportunities
Step 2: Determine Objectives
Step 3: Inventory Resources
Step 4: Analyze Resource Data

(ii) Phase II – Decision Support
Step 5: Formulate Alternatives
Step 6: Evaluate Alternatives
Step 7: Make Decisions

(iii) Phase III – Application and Evaluation
Step 8: Implement the Plan
Step 9: Evaluate the Plan

(104) **Planning Standard**.—The minimum quality level to which each step in the planning process must be carried out in order to help the client develop a successful plan. The standard establishes the condition expected to exist at the successful completion of each planning step.

(105) **Planning Area**.—A planning area is generally the entire operating unit, but it can be a group (or groups) of fields with similar land use and management (see "conservation management unit") in which the decision has been made to initiate the planning process. A field is normally the smallest increment for planning resource management systems or practices. However, in rare instances, a subfield (a field within a field – for example, the drainage area into a waterway and the outlet area below the waterway) may be appropriate. The planning area must be large enough to encompass the area that influences, and the area that is impacted by, the resource management system or practice being planned. (See "conservation management unit.")

(106) **Practice**.—Same as conservation practice.

(107) **Practice Narrative**.—A brief, nontechnical description of the planned practice.

(108) **Practice Specification**.—Practice specifications are detailed requirements for installing the practice in a State.

(109) **Practice Standard**.—Practice standards define the practice and where it applies, and prescribes the minimum level of application and quality of materials.

(110) **Private Land**.—Land that is not owned by a local, State, Tribal, territorial, or Federal governmental entity.

(111) **Producer**.—An owner, operator, manager, landlord, tenant, or sharecropper who shares the risk of producing a crop and is entitled to share in the crop available for marketing from a farm or who would have shared, had the crop been produced (ERS definition).

(112) **Production Area (CNMP)**.—Includes the animal confinement, feed and other raw materials storage areas, animal mortality facilities, and the manure handling containment or storage areas.

(113) **Progressive Planning and Implementation**.—The conservation planning process is progressive when a client addresses only a limited number of resource concerns—or even a single resource concern alone, but does not achieve an RMS level of treatment. The rate of progress in moving to an RMS level will depend on the client's desires and constraints.

(114) **Public Participation**.—An integral part of areawide conservation planning, it provides opportunities for the public to be involved in the interchange of data and ideas.

(115) **Quality Criteria**.—A descriptive statement of desired resource condition and management, representing a level of use that is sustainable over the long term. Due to scientific and technical limitations, the establishment of quality criteria for all the NRCS resource concerns is an elusive goal. However, NRCS remains committed to using the latest tools and techniques that will continually move planning criteria in the direction of increased sustainability and the eventual establishment of true quality criteria for all resource concerns.

(116) **Ranch**.—An area of landscape, including various structures, traditionally used for the grazing and production of domestic livestock or wildlife. A ranch may also have nontraditional uses and produce other goods and services as well as environmental and social benefits.

(117) **Receipt for Services**.—Official agency record of service provided to, or of service refused or delayed by the agency, that is provided upon request of the client.

(118) **Record of Decisions (Planning Term)**.—A part of the conservation plan and case file documents that contain the decisions for the PLUs.

(119) **Record of Decision (NEPA Term)**.—A concise written rationale by the responsible Federal official regarding implementation of a proposed action requiring an environmental impact statement.

(120) **Resource Concern**.—An expected degradation of the soil, water, air, plant, or animal resource base to the extent that the sustainability or intended use of the resource is impaired. Because NRCS quantifies or describes resource concerns as part of a comprehensive conservation planning process, that includes client objectives, human and energy resources are considered components of the resource base. See Exhibit 6 for a list and descriptions of specific resource concerns.

(121) **Resource Management System (RMS)**.—An RMS is a combination of conservation practices and resource management activities for the treatment of all identified resource concerns for SWAPAE+H resources that meets or exceeds the planning criteria in the FOTG.

(122) **Resource Problem**.—The resource condition that does not meet the minimum acceptable condition levels as established by resource planning criteria shown in the FOTG, Section III.

(123) **Resource Setting**.—A description of ecological characteristics, land use, and management important for comparison of resource information among planning units. Such background information also provides better understanding of the relative magnitude of resource concerns. An adequate description may include such information as dominant soils, range sites, important topographic or geomorphic characteristics, major land resource area, precipitation patterns, seasonal land use, climate, current resource conditions, type of operation, and relationships to streams, lakes, and aquifers.

(124) **Risk Management**.—Risk management is the process of identifying potential risks from various courses of action or nonaction, gathering pertinent information relative to the risk, and then taking appropriate action to eliminate or minimize the risk as much as possible.

(125) **Revised Universal Soil Loss Equation 2 (RUSLE2)**.—A computer model containing both empirical and process-based science that predicts rill and interrill erosion by rainfall and runoff.

(126) **Scoping**.—Scoping is the early, upfront, and open process to determine the extent of the significant issues, such as resource problems and concerns, regulatory requirements, etc., to be addressed in the planning process.

(127) **Screening**.—The process to select, reject, consider, or group data, people, objects, or ideas by examining them systematically.

(128) **Site-Specific Practice Effect**.—The expected effect that a particular conservation practice has on defined resource concerns or opportunities in a site-specific situation. This data represents the planner's refinement of more general effects shown in the CPPE matrix in the FOTG, Section V.

(129) **Soil Description**.—A listing of soil properties, both site and profile, specific to a geographical location.

(130) **Soil Health**.—Soil health is used synonymously with soil quality. (See definition for "soil quality.")

(131) **Soil Quality**.—Soil quality is the capacity of a soil to perform functions critical to its intended use. In other words, how well a soil does what we want and need it to do. Soil quality is assessed by evaluating the physical, chemical, and biological characteristics of soil. Specific tests or indicators can be used to individually and holistically to assess the soils overall quality or health. The terms soil quality and soil health are used synonymously. Soil quality has two main components:

(i) Inherent soil quality is the capacity to function based on soil forming factors at a geologic time scale.

(ii) Dynamic soil quality represents changes in function in response to human management or disturbance at a human (years, decades, or centuries) time scale. Soil health is a synonym of soil quality and usually refers to only the dynamic portion of soil quality.

(132) **Spatial Data**.—Information about the location and shapes of geographic features, and the relationship between them, usually stored as coordinates and topology.

(133) **Special Environmental Concern (SEC)**.—Concerns (including human considerations) that are protected by law, Executive order, or agency policy and will need to be analyzed according to the laws, regulations, or Executive orders established to protect them. For example, a description of wetland impacts describe not only the acres involved, but the functions of those wetlands, based on a hydrogeomorphic model, and perhaps their value as wildlife habitat, according to the results of habitat evaluation procedures or habitat appraisal guides, as well. There might also be a need to discuss and support impacts on downstream water quality and any other effects the wetland may have within the ecosystem. The list of NRCS special environmental concerns is included on the NRCS-CPA-52 worksheet.

(134) **Stakeholder**.—An individual or group of clients who may or may not be decisionmakers and who have an interest in or may be impacted by actions recommended through application of the planning process.

(135) **State**.—Any of the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, the Freely Associated States of the Pacific Islands Area or any territory or possession of the United States. Or, a condition of an ecological site's characteristics. As characteristics change, there is a transition to a new state. (See "vegetation state and transition pathway.")

(136) **Structural Practice**.—A practice that involves a constructed facility, land shaping, or permanent vegetative cover designed to preserve soil; reduce runoff of nutrients, sediment, and pesticides; enhance wildlife habitat; or for other purposes. Examples include animal waste facilities, terraces, grassed waterways, contour grass strips, filter strips, tail water pits,

permanent wildlife habitat, and constructed wetlands. (ERS Definition) (See also "management practice.")

(137) **Sustainable Agriculture**.—Agriculture that involves the use of technologies to produce food and fiber in farming systems that are ecologically, economically, and socially beneficial.

(138) **System**.—See "conservation system."

(139) **System Narrative**.—A description of the existing, proposed, or planned conservation practices and management measures associated with specific land units for a client and business. The description defines how well the system meets planning criteria, if at all. Alternative, planned, and completed systems meet planning criteria specified in the FOTG. Benchmark systems may not meet FOTG specifications; deficiencies may be noted in the description and system evaluation records.

(140) **Technical Assistance**.—Help provided by NRCS and employees of other entities or agencies under the technical supervision of NRCS to clients to address opportunities, concerns, and problems related to natural resource use.

(141) **Technical Service Provider (TSP)**.—An individual, private-sector entity, or public agency certified or approved by NRCS to provide technical services through NRCS or directly to program participants, as defined in 7 CFR Part 652.

(142) **Technical Specialist**.—A person, qualified by training and experience, who effectively assists NRCS planners in completing the planning process. Examples: area and State soil scientists, biologists, engineers, economists, water quality specialists, or resource conservationists.

(143) **Topology**.—The spatial relationship between connecting or adjacent features in a geographic data layer.

(144) **Tribal Lands**.—All lands within the exterior boundaries of any Indian reservation and all dependent Indian communities. This definition is consistent with the definition in the NHPA; other statutes use alternate definitions.

(145) **Unit of Government**.—A State, Tribal, or territorial government, together with its planning commissions, boards, agencies, and representatives. A municipality, county, town, parish, or other political subdivision of a State or territory, including its planning commissions, boards, agencies, and representatives having planning responsibility and concern over lands that it may or may not directly own or control.

(146) **Values**.—Ideals, customs, attitudes, and beliefs used to judge the effects of conservation treatments as favorable or unfavorable. Includes individual client values as well as collective values of groups and society as a whole.

(147) **Water Quality**.—Resource concerns or opportunities, including such concerns as excessive nutrients, pesticides, sediment, contaminants, and pathogens in surface waters and excessive nutrients and pesticides in ground waters.

(148) **Watershed**

(i) A total area of land above a given point on a waterway that contributes runoff water to the flow at that point.

(ii) A major subdivision of a drainage basin.

(149) **Wind Erosion**.—The process of detachment, transport, and deposition of soil by wind.

(150) **Wind Erosion Prediction System (WEPS)**.—A model that simulates weather, field conditions, and wind erosion. Used for assessing soil loss by wind from agricultural fields and to assess plant damage, calculate suspension loss, and estimate PM-10 emissions from a field.

(151) **Zoning**.—A means by which governmental authority is used to promote a specific use of land under certain circumstances. This power traditionally resides in the State, and the power to regulate land uses by zoning is usually delegated to minor units of government, such as towns, municipalities, and counties, through an enabling act that specifies powers granted and the conditions under which these are to be exercised.

Part 600 – National Planning Procedures Handbook

Subpart B – Framework for Planning

600.10 Overview of Conservation Planning

A. This section provides an overview of the process NRCS uses to assist clients (individuals, groups, businesses, and units of government) in developing, implementing, and evaluating conservation plans on agricultural lands, urban areas, or other land uses. The process is used, regardless of the expected outcome, scope, size of the planning area, complexity of natural resource concerns and opportunities, or source of funding to be used for implementation.

B. Conservation planning is a natural resource problem solving and management process. The process integrates economic, social (cultural resource and historic property are included with social), and ecological considerations to meet private and public needs. This approach, which emphasizes desired future conditions, helps improve natural resource management, minimize conflict, and address identified resource concerns and opportunities.

C. The success of conservation planning and implementation depends on the voluntary participation of clients. While participation is voluntary, NRCS personnel must carry out outreach activities to reach underserved customers, such as Tribes, minority producers, and small producers with limited resources, to ensure that services are offered to them on an equal basis with traditional customers. It is imperative that all clients be treated fairly and equitably, and with dignity and respect.

D. The planning process used by NRCS is based on the premise that clients will make and implement sound decisions if they understand their resources, natural resource concerns and opportunities, and the effects of their decisions.

E. Conservation planning helps clients, conservationists, and others view the environment as a living system of which humans are an integral part. Conservation planning enables clients and planners to analyze and work with complex natural processes in definable and measurable terms.

F. The conservation planning process, as described in this handbook, consists of nine steps divided into three phases. It is a process that considers people and the resources they use or manage.

G. Conservation planning is based on a desired future condition that is developed by the client for an individual conservation plan, or by the client and stakeholders, in the case of an areawide conservation plan.

H. Locally led conservation is a process based on the principle that community stakeholders are best suited to identify and resolve local natural resource problems. See Title 440, Conservation Programs Manual, Part 500, for detailed guidance. To provide conservation planning direction and help ensure a balance of natural resource issues with economic and social needs, NRCS employees work with conservation districts to establish objectives that reflect current resource issues and priorities in the district. These objectives will help define a desired future condition for these resources in terms of what the local people want.

I. To supplement data from other agencies or groups, the district and NRCS rely on local knowledge, specific discipline input, and existing public information that relates to the local area. The locally led process utilizes the local work group to meet with stakeholders interested in resource issues. This public information can help identify other resource issues or human considerations that have not previously been a focus of interest in the area.

J. Once these data and objectives are collected and analyzed, alternatives developed and analyzed, and decisions are made, the information may be incorporated into the conservation district's long-range plan or other plan, as appropriate. As areawide conservation plans are developed, and if additional objectives are defined for specific portions of the district, the long-range plan or other plans may be updated.

K. Local objectives are integrated with the FOTG and may form the basis for developing additional technical guidance material. This is accomplished by ensuring that—

(1) New or existing planning criteria support identified objectives.
(2) Guidance documents reflect local resource issues.
(3) Management systems in the FOTG, Section III, serve as examples that work toward accomplishing the identified human considerations for that area.

L. As conservation plans are implemented, progress is made toward accomplishing the agreed-upon desired future state of the resources and the needs of the people. The challenge in conservation planning is to balance the short-term demands for production of goods and services with long-term sustainability of a quality environment.

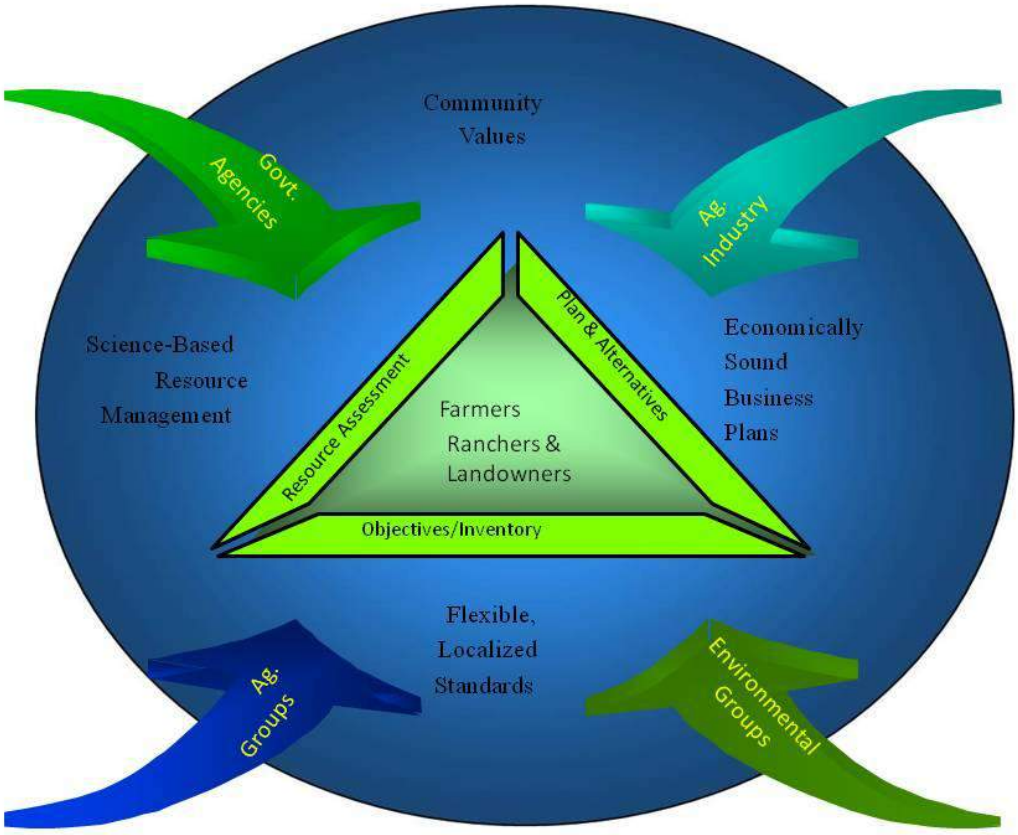

Figure 600-B1: Planning framework diagram

M. Natural resource concerns and opportunities are usually expressed in terms of human values. In achieving a desired natural resource condition, human values determine the scope and extent of problems and the associated corrective actions to be taken.

N. When providing conservation planning assistance, the planner will—

(1) Recognize the interconnections between the planning unit, larger areas outside of or encompassing the planning unit (e.g., watersheds), and smaller areas within the planning unit (e.g., riparian corridors).
(2) Think of the planning area in terms beyond its administrative, jurisdictional, and geographic boundaries.
(3) Consider the short-term, long-term, and cumulative effects of actions.
(4) Mitigate adverse and unintended effects to the maximum extent practicable.
(5) Consider the client's and society's economic needs and goals.
(6) Consider all of the client's enterprises and the interactions between them.
(7) Respect the rights and responsibilities of private land managers.
(8) Facilitate the creation of a desired future condition that meets individual and societal needs.
(9) Recognize that human welfare depends on the sustainability of natural resources.
(10) Base assistance on the best available knowledge, science, and technology (including indigenous stewardship methods).
(11) Incorporate the knowledge gained from previous planning, implementation, and evaluation efforts.
(12) Collaborate with others in collecting, assembling, and evaluating data.
(13) Leverage the resources and expertise of others.
(14) Identify, prevent, and mitigate, to the greatest extent practicable, disproportionately high and adverse human health or environmental effects of planning assistance on minority and low-income populations.
(15) Comply with all applicable Federal, State, Tribal, and local laws, regulations, and policies.

O. In summary, conservation planning deals with complete systems, rather than just parts of systems. The expected physical effects of conservation systems and practices are assessed in the context of ecological, economic, and social considerations as documented locally in the FOTG. The expected outcomes of those effects on natural resource quality, economic needs, and social objectives are then used to help develop and evaluate management alternatives.

600.11 The Planning Process

A. Planning areas generally exist in a hierarchy. Each planning unit is contained within a larger planning unit. An areawide conservation plan may be developed for a watershed, a watershed contains individual farms and ranches, individual farms and ranches contain land units. Planning at each level is completed in appropriate degrees of detail, taking into account the objectives of those associated larger and smaller planning areas.

B. The planning process provides the framework for developing a conservation plan on the basis of client objectives, as well as ecological, economic, social, legal, and policy considerations. Technical, educational, and financial assistance programs from NRCS or other sources are used to implement the plans.

C. The same planning process is used to develop conservation plans and areawide conservation plans, but different activities are required to complete each step of the process. Guidance in this handbook is separated accordingly into conservation planning and areawide conservation planning.

D. Onsite visits with the client are an integral part of the planning process.

E. In most instances, conservation plans are developed with an individual decisionmaker. An areawide conservation plan reflects the desired future conditions developed in conjunction with the client and other stakeholders in the area. The stakeholders may be decisionmakers for implementing planned activities, but probably are not.

F. The planning process used by NRCS is a three-phase, nine-step process. Although the nine steps are shown in sequence, the process is very dynamic. The process could start with any of the first three steps or even step nine. Cycling back to previous steps is often necessary. For example, step one and two may not be finalized until step four is completed. Also some planning activities may overlap planning steps, and some activities may not necessarily occur in a particular planning step each time.

(1) Phase I – Collection and Analysis (Understanding the Problems and Opportunities)
  (i) Step 1 – Identify problems and opportunities
  (ii) Step 2 – Determine objectives
  (iii) Step 3 – Inventory resources
  (iv) Step 4 – Analyze resource data
(2) Phase II – Decision Support (Understanding the Solutions)
  (i) Step 5 – Formulate alternatives
  (ii) Step 6 – Evaluate alternatives
  (iii) Step 7 – Make decisions
(3) Phase III – Application and Evaluation (Understanding the Results)
  (i) Step 8 – Implement the plan
  (ii) Step 9 – Evaluate the plan

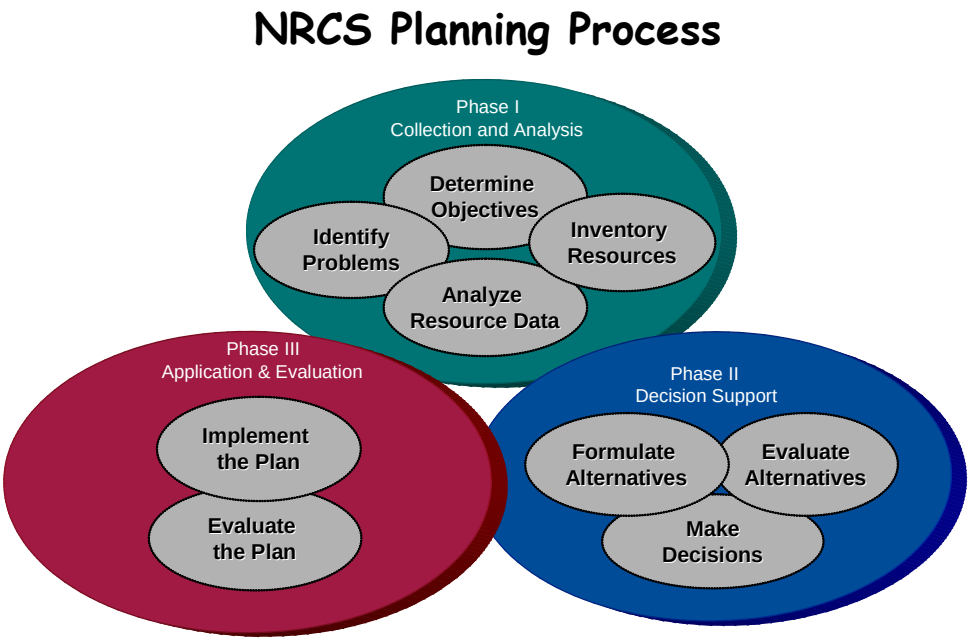

Figure 600-B2: An illustration of the dynamic nature of the planning process

600.12 Concepts in Conservation Planning

A. Conservation planning helps identify and address resource concerns. Whether through screening, assessment, or by client and planner identification, addressing resource concerns is a dynamic and adaptive process. Technology improvements, on-farm management changes, and new resource considerations come into play, while others may no longer be relevant. Clearly presenting alternative

solutions is critical to assisting land users when making key decisions on the land. Conservation planning and additional support concepts and strategies are presented here.

B. This guidance includes identifying and assessing resource concerns as part of the planning process. Technical assistance is key to identifying and assessing benchmark conditions, resource concerns, and effects of the current conditions; and developing, evaluating, and selecting an alternative solution to the concerns. Financial assistance conservation programs exist, such as those contained within the Food Security Act of 1985, as amended, that may define more specific levels of planning for specific resource issues.

(1) Conservation Plans

(i) Individual-Level Plans.—These plans are voluntary, site-specific, comprehensive, and action-oriented. A conservation plan is developed for one or more planning land units and documents the land manager's selected alternative. The plan contains natural resource information, supporting documents, and a record of decisions made by the client. It describes the schedule of operations and activities needed to solve identified natural resource concerns while taking advantage of opportunities to enhance resources.

- Using the planning process to develop the conservation plan helps ensure the needs of the client and the resources are achieved and that Federal, State, Tribal, territorial, and local requirements are met. Conservation planning is flexible and plans may include all contiguous and noncontiguous land that is a part of the client's enterprise, including owned and rented land, or may include only a portion of the enterprise.
- Conservation plans may include component plans to address one or more resource concerns. Examples include comprehensive nutrient management plans, grazing plans, integrated pest management pans, and irrigation water management plans etc. See subpart G for additional guidance.
- When two or more decisionmakers need assistance on planning, installing, and maintaining a conservation system that may cross land unit boundaries, the planner may utilize a group planning process. For example, solving problems associated with a stream that flows through several properties requires the coordinated, cooperative efforts of all of the individuals involved. The group may serve as the decisionmaker. However, a conservation plan is developed for each of the land units involved in of this type of group planning effort. Group plans are generally owned or directly controlled by the individuals involved.

(ii) Comprehensive Plans With Units of Government.—A comprehensive plan is developed for an area under the jurisdiction of a unit of government that may include, but is not limited to, policies, goals, and interrelated plans for private and public land use, transportation systems, community facilities, and capital improvements. The plan represents the decisions of local people as expressed through units of government. This type of plan also may be called a general plan, master plan, community plan, or a regional development plan. NRCS may serve as a technical advisor for the development of these types of plans. NRCS primarily provides natural resource information and related technical data to the unit of government, or to a professional planner, who may use their own planning process.

(iii) Areawide Plans.—Areawide conservation plans are voluntary, comprehensive plans for a watershed or other large geographic area. Areawide conservation planning will consider all natural resources within the planning area, as well as social and economic considerations. Plan development follows the established planning process to assist local people, through a voluntary locally led effort, to assess their natural resource conditions and needs; set goals; identify programs, alternative actions, and other resources to solve those needs; develop proposals and recommendations to address those needs; implement solutions; and measure their success. A locally led effort considers all pertinent Federal,

State, Tribal, territorial, and local conservation programs and private sector programs, singly and in combination, as tools to solve natural resource concerns.

C. Resource Concerns

(1) Natural Resource Concerns.—Identified natural resource concerns and opportunities are discussed during the planning process. Resource concerns may be identified by the client through the resource inventory process and by screening and assessment of individual concerns. The NRCS objective in conservation planning is to help the client manage resources for sustained use and productivity while considering economic and social needs.

Figure 600-B3: Soil erosion – water: sheet, rill and gully

Figure 600-B4: Soil erosion – wind

Figure 600-B5: Soil erosion – excessive bank erosion from stream, shorelines or water conveyance

Figure 600-B6: Soil quality degradation - compaction

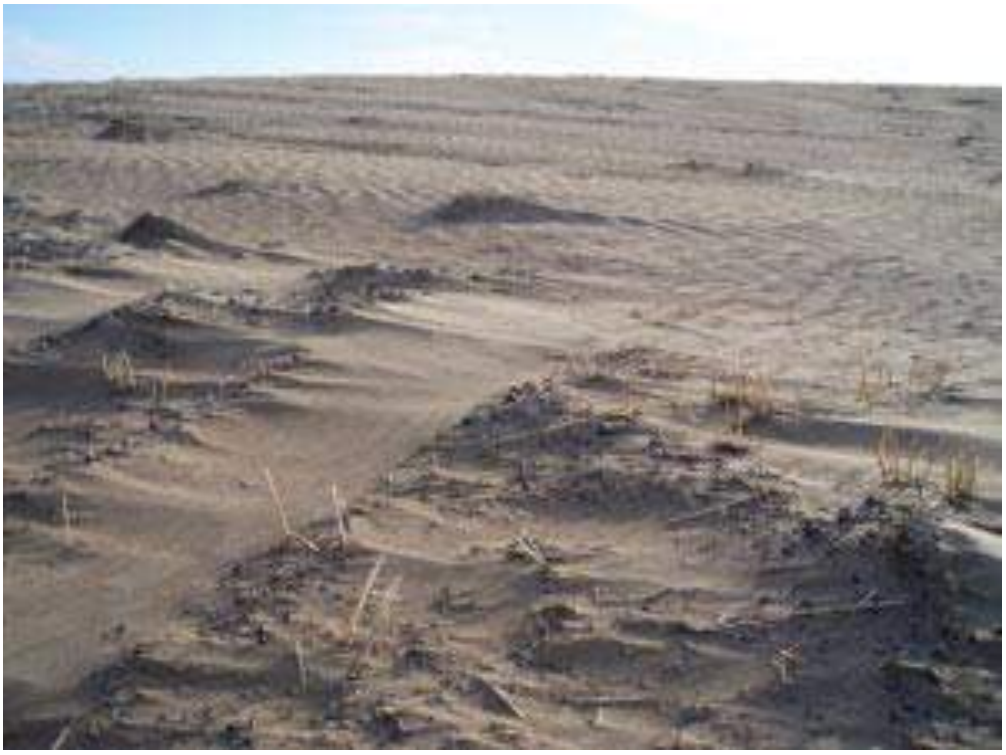

Figure 600-B7: Soil quality degradation – Organic Matter Depletion

Figure 600-B8: Soil quality degradation – Concentration of salts or other chemicals

Figure 600-B9: Degraded plant condition – undesirable plan productivity

Figure 600-B10: Degraded plant condition – wildfire excessive biomass accumulation

Figure 600-B11: Inadequate habitat for fish and wildlife – habitat degradation

Figure 600-B12: Water quantity – Insufficient moisture management

Figure 600-B13: Water quality degradation – excessive nutrients in surface waters

(2) Social and Economic Resource Considerations and Concerns.—One of the keys to successful conservation planning and implementation is understanding the behavior and way of life of clients and stakeholders. The term "human considerations" refers to the social and economic considerations that are addressed in the planning process. Cultural resources and historic properties are included in this concept. Human considerations will be considered early in the planning process since they can help guide the planner in providing the information the client needs to make informed decisions. Economic and social issues are important in formulating resource management systems since they are closely linked to human behavior. For a more complete discussion of economic and social topics, and their relationship to client behavior, see Subpart D, Section 600.42, "Working With Individuals and Groups."

(i) Social considerations include public health and safety, as well as social, family, ethic, ethnic, spiritual, and religious values. They also include societal goals, client characteristics, risk tolerance or aversion, tenure or time availability, and the presence of cultural resources and historic properties.

(ii) Differing social, ethnic, or religious backgrounds may also effect the adoption of conservation practices. Such differences must be recognized and accounted for early in the planning process. Some groups may have land-use ethics or social customs that conflict with some NRCS conservation practices.

(iii) Economic considerations in planning are closely linked to individual or group behavior. In most cases, planning will include economic goals, such as preserving income, minimizing costs, or reducing risk. By understanding the economic goals of decisionmakers, planners can identify barriers to, and opportunities associated with, adopting conservation. Onsite economic considerations may include operational income and expenses, conservation system costs, credit availability, yield effects, or base acreage effects. When considering changing inputs and outputs of an operation, assessing the overall return on investment will highlight the effects of each change. For example no-till may result in a yield reduction, but due to fewer trips across a field, increased organic matter levels etc., there may be an overall economic savings, producing a higher return on their investment. On a larger scale, economic considerations could include water supply costs, flood damage reduction, recreation enhancement, or regional effects, such as job creation or changes in tax revenue.

(iv) Social and economic considerations can be evaluated by referring to information in the FOTG, Section I (costs), Section III, and Section V (effects information and case studies); reviewing census data; consulting with farm managers, advisors, and other agency experts; modeling; and by experience. Cultural resource and historic property can be located and assessed with the help of cultural resource coordinators or specialists.

(v) Planners must take steps to ensure that outreach activities are conducted to identify and reach underserved customers, such as Tribes, minority producers, and small producers with limited resources. Planners must also be aware that traditional outreach activities often do not reach the underserved customer. There are a host of personal, social, cultural, and economic barriers that serve as deterrents to underserved customers coming forward and asking for technical assistance for conservation planning and implementation.

(vi) Several outreach methods, such as on-farm demonstrations, education meetings, increased cost-share rates, one-on-one assistance, involving local leaders, and making technical assistance available may help to successfully address some of the barriers faced by underserved customers.

(3) Legal and Statutory Requirements

(i) Confidentiality and Privacy.—Client records are confidential, except for those that are subject to the Freedom of Information Act. NRCS policy on the Freedom of Information Act and the Privacy Act are contained in National Instruction 120-310 and Title 120,

GM, Part 408. No one outside of NRCS, except those specifically authorized by NRCS, such as certain conservation district employees, is permitted access to client data. The conservation plan is a confidential document, and no person or agency other than NRCS may access it without written authorization by the client. The conservation plan does not provide public access to the property.

(ii) Personally Identifiable Information (PII).—USDA holds a vast amount of data on its employees and clients. Some of these data are readily available to the public and, in fact, is mandated to be made available through various legislative and legal vehicles. However, some data are sensitive and may never be made public, such as personally identifiable information.

- PII refers to information that can be used to distinguish or trace an individual's identity. PII can include information or combinations of information, such as Social Security numbers (in complete or truncated form), place of birth, date of birth, mother's maiden name, biometric record, fingerprint, iris scan, DNA, medical history, medical conditions, financial information, credit card numbers, bank account numbers, etc.
- USDA is committed to protecting PII for both employees and clients. USDA has a toll-free PII Incident Hotline at 1 (877) PII-2YOU. The hotline is available 24 hours a day, 7 days a week. There is also an Incident Hotline at 1 (888) 926-2373.

(iii) NEPA and Other Environmental Requirements.—Title 190, National Environmental Compliance Handbook, Part 610, contains detailed information on complying with NEPA. All NRCS planning activities will be conducted in compliance with NEPA and other applicable requirements for the protection of the environment. Subpart D, section 600.41, provides recommended sources for additional planning process support guidance to assist planners in incorporating NEPA and other requirements into the planning process.

600.13 Planning Directives

A. Direction for applying the planning process is derived from five major sources.

(1) Policy.—NRCS conservation planning policy is detailed in the 180-GM, Part 409, "Conservation Planning Policy." 450-GM, Part 401, "Technical Guides," describes NRCS policy for development of technical guides in support of the planning policy. NRCS policy for compliance with NEPA is located in the 190-GM, Part 410, "Compliance With NEPA."

(2) Procedures.—Title 180, National Planning Procedures Handbook, Part 600, supports the planning policy by describing the planning process and the how-to guidance used by NRCS to carry out that process. Title 190, National Environmental Compliance Handbook, Part 610, provides guidance on integrating the requirements of NEPA and other special environmental concerns into the planning process.

(3) Technical Guidance.—The FOTGs are the primary technical reference for NRCS and are localized to apply specifically to an identified geographic area. The FOTG contains five sections supporting the technical aspects of conservation planning activities as identified below (see 450-GM, Part 401, Sections 401.3 to 401.7, for content of FOTG):

(i) I – General Resource References
(ii) II – Natural Resources Information
(iii) III – Resource Management Systems and Planning Criteria
(iv) IV – Practice Standards and Specifications
(v) V – Conservation Effects

(4) Tools.—User guides for specific tools contain information for use and maintenance of conservation planning tools.

(5) Program Guidance.—Manuals contain policy and guidance for administering programs that can facilitate implementation of planned measures.

600.14 Preplanning Activities

A. This handbook describes the planning process in detail and provides guidance on carrying out each planning step. However, the process itself is preceded by preplanning activities, which can play a critical role in the outcome and effectiveness of plan development.

Figure 600-B14: Conservationist and client reviewing conservation plan information in a field office

B. Preplanning activities set the stage for conservation planning with the client by ensuring that basic information is obtained from the client and that background information, necessary to initiate the planning process, is assembled.

C. The activities leading up to planning normally begin in one of three ways:

(1) The potential client may contact the conservation district or NRCS to seek assistance in solving identified natural resource concerns or opportunities.
(2) NRCS, conservation district, or partner personnel may contact a potential client for the purpose of initiating planning activities.
(3) Proactive citizens may contact partners, the conservation district, or NRCS for planning assistance to prevent potential problems from occurring or to take advantage of opportunities.

D. Regardless of how the client and the planner are brought together, several items can be addressed before planning activities begin. Preplanning activities—

(1) Identify the principal client or clients that will participate in the planning process and their respective roles. Update client information. Determine who has decisionmaking authority for the planning area.

(2) Describe to the client in general terms the planning process and the expected benefits of having a conservation plan.
(3) Explain to the client the roles and responsibilities of the client and NRCS.
(4) Explain the role of the conservation district and the relationship the district program has in making technical assistance available to land users.
(5) Define the planning area on a map and geospatial layers.
(6) Assemble all needed information and data for use in planning. The FOTG is a principal source of reference material pertinent to the field office.
(7) Identify other sources of information or technical assistance that may be available from other agencies, organizations, etc.
(8) Identify tools and supplies that will be needed in the field and have them available for the first field visit.
(9) As necessary, perform some reconnaissance and collect some basic data before the initial planning session is held.
(10) Schedule an initial planning session with the client.

Part 600 – National Planning Procedures Handbook

Subpart C – NRCS Planning Process

600.20 Planning Steps

A. The conservation planning process consists of nine steps, divided into three phases, which cover development, implementation, and evaluation of a conservation plan. The planning process is not linear, but dynamic and iterative, and previously completed steps may be revisited and refined as more information is gathered and the process proceeds. Complete and proper documentation is critical at each step of the planning process. The three phases and nine steps are briefly explained below.

(1) Phase I – Collection and Analysis
  (i) Step 1 – Identify Problems and Opportunities.—Identify existing resource problems and concerns and potential opportunities in the planning area.
  (ii) Step 2 – Determine Objectives.—Identify and document the client's objectives.
  (iii) Step 3 – Inventory Resources.—Inventory and document the natural resources and their current onsite and offsite conditions and effects, as well as the economic and social considerations related to the resources.
  (iv) Step 4 – Analyze Resource Data.—Analyze the resource information gathered in Step 3, "Inventory Resources," to clearly define the existing natural resource conditions, along with economic and social issues related to the resources. Information from this step will help to further define and clarify problems, concerns, and opportunities.

(2) Phase II – Decision Support
  (i) Step 5 – Formulate Alternatives.—Formulate alternatives that will achieve the client's objectives, solve identified natural resource concerns, and take advantage of opportunities to improve or protect resource conditions, and demonstrate a variety of technical and economic implementation strategies.
  (ii) Step 6 – Evaluate Alternatives.—Evaluate the alternatives to determine their effects in addressing the client's objectives and the identified natural resource concerns and opportunities. Evaluate the projected effects on social, economic, and ecological concerns. Special attention must be given to those ecological values protected by law or Executive order.
  (iii) Step 7 – Make Decisions.—The client selects their preferred alternatives and works with the planner to schedule the conservation system and practice implementation.

(3) Phase III – Application and Evaluation
  (i) Step 8 – Implement the Plan.—The client implements the selected alternatives. The planner or technical expert provides the land manager with detailed practice implementation information, including engineered designs. Conservation staff will also provide practice layout, construction inspection, and certification. Each land manager directs the implementation of each practice. The planner provides encouragement to the client for continued implementation.
  (ii) Step 9 – Evaluate the Plan.—Evaluate the effectiveness of the plan in solving the resource concerns as it is implemented and work with the client to make adjustments as needed.

B. The next portion of the handbook describes the details for carrying out the nine steps of planning. Each step contains a planning standard, a list of inputs, and a list of products. The planning standard sets the minimum quality level for each step. The inputs provide sources of information to plug into

the process, while the products describe the outputs of each step. These lists are not all-inclusive; therefore, planners are encouraged to supplement them as needed.

C. A detailed description is included of "what" items occur during each planning step along with recommendations on "how" to accomplish the items.

600.21 Step 1 – Identify Problems and Opportunities

A. Description.—Onsite visits are required to identify existing, potential, and perceived natural resource problems, opportunities, and concerns in the planning area. This also provides the first opportunity to determine associated resource concerns and opportunities in interrelated planning areas. The identified problems and opportunities and the client objectives guide the remainder of the planning process and are the basis for the purpose and need for action that are documented on Form CPA-52, "Environmental Evaluation Worksheet." Initially, the client and planner may identify only one or two resource concerns. As planning progresses and additional information is gathered, other resource concerns and opportunities may be identified.

B. General.—Problem identification frequently begins the planning process and continues through the resource inventory and data analysis steps. Initial problems and opportunities are identified onsite based on readily available information and discussion with the client. The planner may have additional information available relating to natural resource needs based on information available from the conservation district or an areawide conservation plan. Generally, this step will not be finalized until the resource data are analyzed in Step 4, "Analyze Resource Data," although additional problems, opportunities, and concerns may be identified throughout the entire planning process. Some conservation alternatives may create additional indirect resource related issues and concerns that will need to be addressed by the planner and client.

Figure 600-C1: Conservationist and client discussing concerns and opportunities in the field

C. Planning Standard.—The client's resource problems, concerns, and opportunities are identified and documented.

D. Inputs

(1) Client information regarding their goals and objectives, description of their agricultural operations, etc.
(2) The planner's experience and knowledge of the area
(3) Planning and implementation information from other locally associated clients
(4) Conservation district long-range plan, annual plan, and priorities
(5) Locally led assessments
(6) Areawide conservation plans
(7) Information from other sources, such as State, Tribal, Territorial, and Federal agency; colleges and universities; or centers of research
(8) Resource data for the planning area and adjacent areas (soils, hydrography, hydrology, climate, land use and land cover, etc.)
(9) Discipline manuals and handbooks
(10) FOTG, Sections I, II, III, and V
(11) State resource assessments

E. Products

(1) Identification and documentation of problems, opportunities, and concerns in the case file; this becomes the basis for the statements of purpose and need in the Form CPA-52, "Environmental Evaluation Worksheet," and any required NEPA documents
(2) Communication with the client
(3) Assistance notes

F. Step 1: Identify Problems and Opportunities – Activities – Conservation Plan

WHAT	**HOW**
1. Complete an initial determination of the client's problems, opportunities, and concerns related to natural resources and human considerations and identify the planning area.	• Identify the clients associated with the planning area and their relationship to the business, land, and the planning process (decisionmaking, ownership, and business association). • Elicit initial information about the client's problems, opportunities, and concerns through email or other electronic contact, office or field visit, or phone conversation between the client and the NRCS. • Gain, and continue to refine, a good general awareness of the kinds of problems that occur within your field office area, as well as the surrounding area. • Utilize sections I and III of the FOTG and any existing locally led assessments, or areawide conservation plans, or similar plans to enhance your understanding of the area's resource issues and potential solutions.

2. Begin recording identified problems, opportunities, and concerns.	• Make a complete record of the client's problems, opportunities, and concerns associated with all natural resources. • Record and organize natural resource problems and opportunities into clear concise statements, using agency planning software and resource concern worksheets. • Document EE data per State, Tribal, Territorial, and Federal guidance (see section 600.71). • Document discussions between planner and client in assistance notes.
3. Discuss the process involved in conducting an inventory and evaluation of the resources.	• Describe to the client the onsite nature of the conservation planning process and the benefits of having the land owner, manager, or operator, who will make planning decisions, present for at least the initial field visit. • Agree to how access to the property will be granted to the planner and if the client always wants to be present. • Discuss any hunting, fishing, or other seasonal impacts to accessing the property.

600.22 Step 2 – Determine Objectives

A. Description.—Determining a client's planning objectives requires developing an understanding with the client of the desired future conditions for the planning area as compared to the existing conditions. This is the purpose for the client to take action. It includes the desired resource uses, resource problem reductions, onsite and offsite ecological protection, and production concerns. As resources are inventoried, their interactions are analyzed, and alternatives formulated, objectives may need to be reviewed and modified.

(1) There may be times when withdrawal of technical assistance becomes necessary.
   (i) Technical assistance may be withdrawn when a client's objectives will result in a negative effect on natural resources, onsite or offsite.
   (ii) Technical assistance may also be withdrawn if a client fails to comply with or will not agree to actions required to be taken by NRCS to comply with local, State, Tribal, Territorial, or Federal regulatory requirements.
(2) For additional information about withdrawing assistance, see Title 440, CPM, Part 525, Subpart A, Section 525.4.

B. General.—The purpose of this planning step is to determine the client's planning objectives, based on the client's needs and values regarding the use, treatment, and management of the planning area.

(1) Help the client think more broadly about the onsite and offsite problems and opportunities for natural resource protection or enhancement and to consider policy issues, such as State, Tribal, Territorial, and Federal laws or mandates.
(2) Assist the client in making informed decisions that result in the wise use and conservation of resources. Due to the dynamic nature of the planning process, objectives may not be finalized until later in the planning process.

Figure 600-C2: Client and conservationist discussing objectives

C. Planning Standard.—The client's objectives are clearly stated and documented.

D. Inputs

(1) Client input
(2) Conservation district long-range plan, annual plan, and priorities
(3) The need for action – the list of problems, opportunities, and concerns to be analyzed
(4) Records from previous planning efforts
(5) Resource data for the planning area and adjacent areas
  (i) Critical resource data (soils, hydrography, hydrology, climate, landuse/landcover, etc.)
  (ii) Additional resource information from partnering organizations
  (iii) FOTG, Sections I and II
(6) Documentation of public concerns from locally led assessments or areawide conservation plans, where they exist

E. Products

(1) A list of the client's objectives recorded in the case file
(2) Assistance notes

F. Step 2 – Determine Objectives, Activities, and Conservation Plan

WHAT	**HOW**
1. Reach agreement on the client's expectations for the planning effort.	• Identify the client's production and business goals for the operation. • Identify the client's desired future conditions for the planning area

WHAT	HOW
	as compared to existing conditions. • Identify the client's recognized or perceived resource problems, concerns, and opportunities. • Identify values the client holds regarding natural resource use and protection, and the client's desires for improving the quality of life. • Identify financial constraints and the client's willingness to accept risk.
2. Document the client's objectives.	• Record and document the client's objectives in terms of the above expectations. • Document discussions between planner and client in assistance notes. • Continue to document the client's objectives as they are better defined and understood, by the planner and client, throughout the planning process.
3. Determine whether the client's objectives are consistent with those of the conservation district and NRCS.	• Utilize the NRCS strategic plan, Chief's priorities, State resource assessment (SRA), district long-range plan, local work group priorities, and other local and State assessments to determine NRCS resource priorities. • If a particular planning area resides within a defined areawide conservation planning area, review the objectives of the larger plan. This activity provides an opportunity to determine if the client's objectives could be broadened to consider the larger area's objectives. • Explain NRCS priorities and targets to the client, so that it is understood why NRCS may need to withdraw assistance if the client's objectives result in a negative effect for other onsite or offsite resources. • Document EE data per State, Tribal, Territorial, and Federal guidance. See section 600.71.
4. Determine if NRCS has appropriate technology or resources.	• Assess the technology and resources needed for this planning effort and their availability from NRCS. • Identify an appropriate agency, group, or other entity to participate as a partner in the planning process, when NRCS does not possess the appropriate technology or resources.
5. Determine the need to continue the planning process.	• Review the stated objectives and available resources with the client and determine if the planning process will continue, be put on hold, or be discontinued.
6. Determine the next steps and	• Schedule a convenient time for the client to meet the planner in the

WHAT	HOW
a schedule to complete the planning process.	field to start resource inventory process. • Discuss with the client, the tasks that need to be accomplished and the timelines for completing the planning process.

600.23 Step 3 – Inventory Resources

A. Description.—Collect appropriate natural resource, economic, and social information about the planning area and related areas. Use this information to—

(1) Identify existing or potential resource concerns or opportunities.
(2) Further define known existing and potential resource concerns and opportunities.
(3) Clarify resource concerns.
(4) Formulate and evaluate alternatives.
(5) Gather pertinent information concerning the affected resources, the human considerations, and operation and management.

B. General.—The resource inventory is the identification of SWAPAE+H resources and special environmental concerns (SECs) that are present and are the basis of all planning efforts. This information furthers the understanding of the presence of the natural resources in the planning area. Planners will inventory all applicable resources (see section 600.75). The inventory will provide the planner the understanding of the existing natural resource conditions necessary to convey resource conditions to the client in a knowledgeable manner. Step 1, "Identify Problems and Opportunities," and Step 2, "Determine Objectives," are normally the planner's best guides to inventory needs and the degree of detail. Objectives relating to the client's enterprises, planned land uses, production, or economic returns provide guidance for the amount of detail needed and the extent of resource inventories.

Figure 600-C3: Conservationist collecting data in the field with client

C. Planning Philosophy – Inventory with the Client.—The basic concepts described require that the client fully participate in the entire planning step, if possible. It is a good practice for the planner to develop a personal goal regarding the client that can be expressed in terms of, "If I am working on your land, I want you with me." It is essential that clients understand their resources and the resource conditions. This is best accomplished in the field while resource conditions are being inventoried. Inventory resources activities:

(1) Assemble general inventory data and information about the planning area before the planning process begins. Information relating to ground water and surface water quality, cultural resources and historic properties, threatened and endangered species, laws and local ordinances, utility rights-of-way, buried utilities, and other ecological considerations are located in section II of the FOTG. The FOTG, Section II, and the certified soils data provide information relating to all land uses in terms of soil interpretations and ecological site descriptions.

(2) Review this information prior to meeting with the client. Be prepared to relate to resource questions and to raise the client's awareness of issues influencing the planning process. The planning process is an educational effort whereby the client and planner acquire additional knowledge regarding the client's enterprises and the resources, and share that knowledge. The inventory phase of planning is a critical part of that educational process.

(3) Different land uses normally require different inventory approaches, and the emphasis changes from one land use to another. For example, both cropland and grazed range require a strong emphasis on soils, but grazed range also requires a more detailed description of the plant community and the factors that affect it.

(4) Use a variety of technical worksheets to inventory specific land uses or modifiers and to assess resource concerns. At a minimum, screen for and assess the required resource concern for the landuse and those flagged as a client objective.

(5) Work together with the client, onsite, to develop a picture of existing conditions, trends, resource concerns, and opportunities. The description of existing conditions, known as the "benchmark condition," may include a description of current crops, farming practices, livestock type, and available equipment and technology. Also document any previously installed or implemented conservation practices that are maintained to NRCS standards and specifications, known as benchmark practices. The benchmark condition will be used in estimating the effects and identifying outcomes of conservation planning efforts.

(6) Though an initial inventory will be completed early in the planning process, be prepared to collect additional resource data during later stages of planning, particularly Step 4, "Analyze Resource Data," and Step 5, "Formulate Alternatives," to more completely refine the resource concerns and opportunities in the planning area, and effects of the alternatives.

(7) Consider all natural and human resources during the inventory process, regardless of complexity or land uses involved. Recognize that some resource concerns will require further assessment. Resource concerns are identified by comparing present conditions with the planning criteria established for the particular natural resource consideration.

(8) Gather sufficient information during the inventory phase to determine the status of the resources. The actual determination as to whether or not current conditions are acceptable is part of planning Step 4, "Analyze Resource Data."

(9) Review the pertinent local, State, Tribal, Territorial, and Federal programmatic and other statutory requirements that could have an effect on current or potential activities of the client. While it is ultimately the responsibility of the client to be aware of and comply with all pertinent Federal, State, Tribal, Territorial, and local laws and regulations, help the client in making conservation planning decisions by providing relevant information to the client. Begin to consider the client's ability and willingness to meet the financial obligations necessary to implement conservation systems.

(10) Obtain information needed to comply with NEPA and other environmental laws, (see Section 600.1, "References"), and to satisfy specific State, Tribal, Territorial, or Federal program requirements (e.g., State nonpoint source pollution abatement mandates).

(11) If not properly equipped to discuss a client's resources, it is best for the planner to admit that he or she "doesn't know," and offer to find out more and get back to the client with the needed information.

(12) Share natural resource and related information with the client. This opportunity must not be missed. In most cases, the landowner or client also has a great deal of knowledge about the planning unit to share with the planner. By involving the client in inventory activities, the planner can take advantage of the client's experience and knowledge to understand the resources more completely.

(13) When beginning planning Step 3, "Inventory Resources," take the opportunity to enhance the client's knowledge of natural resource conservation principles, utilizing the land unit or plant community. The natural environment is often the best-equipped classroom available to demonstrate effects of erosion, costs of overgrazing, or benefits of water management to the client. These concepts cannot be as effectively discussed or demonstrated in an office or kitchen as they can while looking at, measuring, digging, comparing, or evaluating the real thing.

(14) Utilize the inventory process to acquire the information and data necessary to assist the client in planning for the correct use of the resources. Use this opportunity to demonstrate your technical ability and earn the professional respect of the client. This will promote the client's confidence in your professional skills and lead to a higher quality of planning.

D. Planning Standard.—Sufficient data and information are gathered for analysis.

E. Inputs

(1) Knowledgeable land managers, past and present
(2) Stated objectives, and resource problems and opportunities identified
(3) Imagery
(4) Inventory tools and procedures, including discipline-specific manuals and procedural documentation (see subpart D, section 600.40)
(5) State, Tribal, Territorial, and Federal reports and evaluations (e.g., soil surveys, highly erodible land determinations, and census data).
(6) Areawide plans, including State resource assessments, rapid watershed assessments, and watershed plans.
(7) Previous resource inventories completed by NRCS or others
(8) Field observations and measurements
(9) FOTG resource references, soils information, planning criteria, and practice standards, sections I, II, III, and IV

F. Products

(1) Detailed resource inventories of the planning unit, as well as related offsite information
(2) Information on human considerations
(3) Identification of special environmental concerns, such as threatened and endangered species
(4) Identification of cultural resource and historic property and areas of potential impacts
(5) Planning land units, locations, determinations, and client-land relationships described
(6) Onsite soil investigation report prepared by the planner or the resource soil scientist
(7) Identification of infrastructure physical features, such as roads, houses, fences, power lines and other utilities, right of ways, and easements
(8) Identification of how the client manages resources, including kinds, amounts, and timing of management activities
(9) Benchmark data for the planning area, including benchmark practices
(10) Assistance notes for completing the inventory step.
(11) Receipts for service (upon request by client)

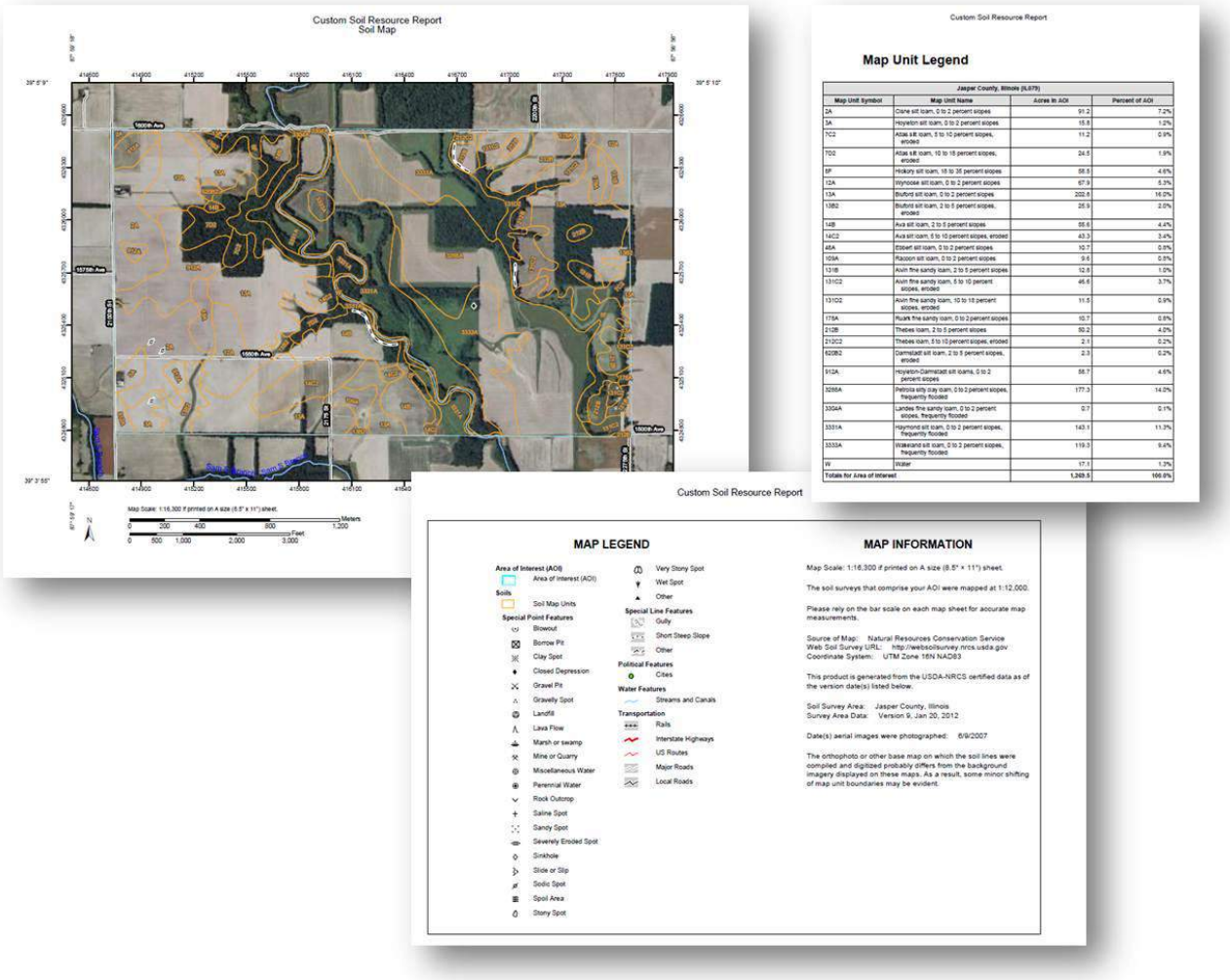

Figure 600-C4: Example of a resource inventory map with legends

G. Tools and Support Information

(1) Inventory Collection Tools and Procedures.—Each discipline has acceptable procedures and tools for conducting resource inventories. Many of these are described in detail in discipline manuals and handbooks, such as the National Agronomy Manual, National Biology Manual, National Forestry Manual, National Range and Pasture Handbook, the Stream Visual Assessment Protocol (SVAP2), and soil quality/health score card or test kit.

(2) GIS Tools and Resource Models.—GIS and resource models are valuable tools to assist the planner in assembling data and predicting resource conditions. The information gathered and documented during the inventory process can benefit the planner and client in analysis and evaluation of the resources.

(3) Reference and Support Materials.—Reference and support materials are essential tools for the planner. The FOTG is the basic support document for all NRCS technical assistance to land users.

(4) Natural Teaching Tools.—In addition to the more common, traditional tools listed above are those of perhaps the greatest importance, the "natural teaching tools." Planners need to know how best to use these tools to their advantage. This includes using the clients' existing

natural resources as teaching aids or tools to increase the client's understanding and knowledge of resource management needs and potentials. The best time to carry out this vital element of planning is while the resource inventory is being conducted.

(5) The planning criteria established by the States (FOTG, Section III) provide guidance as to the appropriate inventory or assessment method or combination of methods to use for each resource consideration. Some of these are shown in Figure 600-C6, "Inventory Methods," with brief notes describing the most common approaches to inventory methods, reference to guidance sources, and basic data that must be collected during the inventory process. Methods and terminology indicated are shown from an NRCS field perspective and do not imply that procedures, models, or methods used by other agencies or research institutions are not adequate. The information in this figure is not to be considered complete or definitive. It may vary between States. Methods listed in Figure 600-C6, "Inventory Methods," may be used in combination or separate. Some professional judgment must be exercised in determining which method or combination of methods shown will be most appropriate for the field conditions the planner is experiencing.

H. General Inventory and Assessment Methods

(1) Procedural
(2) Predictive
(3) Observation
(4) Deduction

I. Special Environment Concerns (SECs)

(1) Clean Air Act
(2) Clean Water Act and waters of the United States
(3) Coastal zone management areas
(4) Coral reefs
(5) Cultural resources and historic properties
(6) Endangered and threatened species
(7) Environmental justice
(8) Essential fish habitat
(9) Floodplain management
(10) Invasive species
(11) Migratory birds and the Bald and Golden Eagle Protection Act
(12) Prime and unique farmlands
(13) Riparian areas
(14) Wetlands
(15) Wild and scenic rivers

J. Step 3 – Inventory Resources, Activities, and Conservation Plan

WHAT	**HOW**
1. Establish the types of inventories and degree of detail needed in the inventory.	• Review the objectives developed in planning Step 2, "Determine Objectives," as they relate to land uses, production goals, problems, opportunities, and other concerns. • Select the appropriate inventories for each proposed land use, using the appropriate discipline handbooks for detailed guidance. • Tailor the level of inventory detail to the complexity of the resource setting and the identified problems, opportunities, and objectives.
2. Collect available information.	• Establish a list of potential resource concerns and opportunities by reviewing the conservation district long-range plan, other available plans and information, locally led assessments, any areawide conservation plans that exist, and appropriate FOTG, Section III, guidance documents. • Utilize the resources and expertise of others. • Identify factors that could hinder plan development and implementation, such as the client's financial constraints, managerial skill levels, or commitment. • Develop a list of State, Tribal, Territorial, and Federal mandates that currently affect or could affect existing operations. The FOTG, Section I, can be used to help develop the list. • Use available and applicable soil survey information and other resource data.
3. Maintain good communications between the client and the planner through the resource inventory process.	• Discuss the purpose and importance of the inventory process with the client. • Emphasize to the client the importance of their knowledge of the planning area and associated resources. Emphasize that their input is essential. • Explain what will be done during the inventory process and why. • Estimate how much time is required to carry out the field inventories. • Always obtain permission from the client before conducting onsite visits.

WHAT	HOW
4. Conduct the inventory onsite. Include the client in the field inventory activities.	• Familiarize yourself with the resource inventory methods described in Figure 600-C6, "Inventory Methods." • Follow inventory procedures as described in appropriate discipline handbooks and manuals. • Use procedures and guidelines available for specific resource inventories, such as the Water Quality Indicators Guide and other assessment tools listed in the FOTG, Section I. • Collect the information necessary to describe the benchmark condition (e.g., resources; kinds, amounts, and timing of operations and activities) and document. • Document EE data per State, Tribal, Territorial and Federal guidance. See section 600.71. • Determine the effectiveness of existing management measures and practices in addressing resource concerns.
5. Use natural resources as teaching aids while in the field with the client.	• Encourage the client to experience "hands-on" participation in the inventory process by helping with data collection. This provides an opportunity for the client to learn conservation principles. • Encourage the client to conduct actual measurements, such as clipping vegetation, checking soil conditions, boring trees, and recording information.

WHAT	HOW
6. Record the resource inventory data to facilitate analysis in Step 4, "Analyze Resource Data."	• Identify the client's planning land units. • Review, and update as necessary, planning land units with key information, including current land use. • Update information on the relationships of the clients to planning land units determined in planning Step 1, "Identify Problems and Opportunities," and Step 2, "Determine Objectives." • Record utilities, easements, legal constraints, and determinations. • Review soils information for each planning land unit. • Document the existing conservation practices found, using the standardized NRCS practice symbols. Include both those that do and do not meet NRCS standards, as appropriate, to facilitate the current planning effort. Include estimates of quantities and the approximate implementation date, if known. • Record benchmark data, including— o Current crop rotation data. o Pasture inventory. o Range inventory. o Forest management inventory. o Developed land inventory. o Associated land inventory. o Cultural resource and historic property inventory. • Document natural resource information on the appropriate technical worksheet. • Document discussion between planner and client in assistance notes.

600.24 Step 4 – Analyze Resource Data

A. Description.—Study the resource data and clearly define the existing natural resource conditions, including any limitations to their use and potentials. This step provides the information needed to determine resource concerns to be addressed and formulate alternatives. The analyses clearly establish the cause-and-effect relationships and provide information about existing and future conditions.

B. General.—To use the information gathered during the inventory process to full advantage, the planner must interpret the inventory data. Analysis is done to provide insight into natural resource information for the planner and to present that information in a meaningful and understandable form to the client. The format in which information is presented to the client has a significant influence on the decisionmaking process.

(1) For some resources, analysis methods are well established. They are described in corresponding discipline handbooks and manuals. The FOTG, Section I, provides a list of technical references that relate to natural resource analysis. Approved automated analysis tools and reports generated can provide the planner and client with basic inventory analysis information.

(2) Often each of the first four steps, "Identifying Problems and Opportunities," "Determining Objectives," "Inventorying Resources," and "Analyzing Resource Data," are very closely associated and occur concurrently and iteratively, before a complete analysis of resource concerns is accomplished. While resource concerns and opportunities initially identified by the client and planner during Step 1, "Identify Problems and Opportunities," result in collecting and analyzing certain data, other resource concerns and opportunities may come to light during the inventory and analysis steps.

(3) At this point in the planning process, there must be agreement between the planner and the client on resource concerns, opportunities, and objectives. It may also be discovered that perceived problems are not resource concerns when compared to planning criteria. Upon completion of this planning step, the planning process moves into phase II. If other issues are identified, the planner may need to return to previous planning steps.

Figure 600-C5: Client and conservationist viewing data from laptop in the field.

C. Planning Standard.—The benchmark condition is documented by describing the current condition, crops, soils, existing conservation practices, and identified resource concerns in a benchmark narrative. The causes of the resource concerns are identified.

D. Inputs

(1) Client's objectives
(2) Identified problems, opportunities, and concerns
(3) Resource inventory data
(4) FOTG, Sections I, II, III and V
(5) Results from various resource evaluation tools (e.g., RUSLE2, WEPS, etc.)

E. Products

(1) An analysis of all resources inventoried
(2) A clear statement of the benchmark condition (benchmark narrative)
(3) Environmental evaluation data to meet NEPA requirements
(4) Cultural resource and historic property evaluation data
(5) Endangered Species Act (ESA) resources evaluation data
(6) Other program and legal evaluation data
(7) A complete definition of resource concerns and opportunities identified
(8) Identification of the causes or conditions that contribute to the resource concerns
(9) A complete statement of objectives
(10) Assistance notes

F. Step 4 – Analyze Resource Data Activities – Conservation Plan

WHAT	HOW
1. Determine the method of analyses to be completed.	• Determine the types of analyses to be completed by reviewing the client's objectives, resource concerns, SECs, land and resource uses, and the location of the planning area. • Identify the resource considerations and determine the best method of calculating resource effects and outcomes. For example, use soil capability data, ecological site descriptions, and vegetative production information to determine land carrying capacity to assist the producer in establishing initial stocking rates or use applicable models to evaluate water quality (see FOTG, Section I). • Ask an appropriate agency, group, or entity for assistance after obtaining the decision-maker's permission, in instances where the kind or extent of resource problems exceeds the expertise or resources available.
2. Establish scope, intensity, degree of accuracy, and procedures to be used, utilizing discipline specialists as needed.	• Review the findings of the cultural resource/historic property inventory. • Recognize cause and effect relationships between planning areas. • Identify resource stressors, which are either natural or human-induced actions or events that cause changes in the existing condition of an ecological system. • Use examples, pictures, and visits to similar planning units to help the client develop an understanding of conservation principles and options available to solve the stated resource concerns. Interpretive information from the FOTG, Section III, can aid in defining the elements listed above.
3. Conduct the analysis.	• Use procedures in appropriate discipline handbooks or manuals and automated analysis tools (e.g., RUSLE2, WEPS, etc.). See Figure 600-C6, "Inventory Methods."
4. Compare the results of the analysis with planning criteria, problems, opportunities, and objectives.	• Compare the results of the analysis with the planning criteria in the FOTG, Section III, and with the problems, opportunities, and objectives determined in planning Step 1, "Identify Problems and Opportunities," and Step 2, "Determine Objectives." • Use the inventory data that were collected, based on client objectives, to determine the kind, amount, and extent of existing and potential resource concerns.

WHAT	HOW
5. Describe and record the benchmark condition	• Describe and record the benchmark condition, including existing practices, identified resource concerns, human resources, and special environmental concerns. Include the kind, amount, and location. Quantities are shown in standard units (e.g., tons per acre per year, parts per volume of water, yield per acre, etc.). • Document EE data per State, Tribal, Territorial, and Federal guidance. See section 600.71. • Document discussion between planner and client in assistance notes.
6. Produce resource maps and reports.	• Display the resource information on maps, showing the location and the extent of the condition.

Figure 600-C6: Inventory Methods

Note: Methods and terminology indicated are shown from an NRCS field perspective and do not imply that procedures, models, or methods used by other agencies or research institutions are not adequate. The information in this figure is not to be considered complete or definitive. States are encouraged to make adjustments to this information to meet local needs.

SOIL

Resource Consideration or Concern	Measurement and Assessment Tools
Soil Erosion	
Sheet & Rill, Wind	Predictive (RUSLE2, WEPS) Procedural (RHA) Observation
Concentrated Flow	Observation
Streambank, Shoreline, Conveyance Channels	Procedural (SVAP2) Observation
Soil Quality/Health Degradation	**Measurement and Assessment Tools**
Subsidence	Observation Deduction
Compaction	Procedural (PCS, RHA) Observation Deduction
Organic Matter Depletion	Procedural (PCS, RHA) Predictive (RUSLE2) Observation Deduction

Resource Consideration or Concern	Measurement and Assessment Tools
Concentration of Salts or Other Chemicals	Observation Deduction

WATER

Resource Consideration or Concern	Measurement and Assessment Tools
Excess Water	
Seeps, Runoff, Flooding, or Ponding	Observation Deduction
Insufficient Water	
Inefficient Moisture Management	Procedural (RHA) Observation Deduction
Inefficient Use of Irrigation Water	Procedural (IWI)
Water Quality Degradation	
Nutrients	Procedural (PCS) Deduction Leaching Index Phosphorus Index Water Quality Index
Pesticides	Predictive (WinPST) Deduction
Excess Pathogens and Chemicals From Manure, Bio-solids, or Compost Applications	Observation Deduction
Salts	Observation Deduction Soil Test
Petroleum, Heavy Metals, and Other Pollutants	Observation Deduction
Sediment	Procedural (RUSLE2, WEPS, PCS, RHA, SVAP2)) Observation Deduction
Elevated Water Temperature	Procedural (SVAP2) Observation Deduction

AIR

Resource Consideration or Concern	Measurement and Assessment Tools
Air Quality Impacts	

Resource Consideration or Concern	Measurement and Assessment Tools
Emissions of Particulate Matter (PM) and PM Precursors	Predictive (WEPS) Observation Deduction
Emissions of Ozone Precursors	Observation Deduction
Emissions of Greenhouse Gases	Observation Deduction
Objectionable Odors	Observation Deduction

PLANTS

Resource Consideration or Concern	Measurement and Assessment Tools
Degraded Plant Condition	
Undesirable Plant Productivity and Health	Procedural (WEPS) Deduction
Inadequate Structure and Composition	Procedural (RHA) Observation Deduction
Excessive Plant Pest Pressure	Procedural (PCS) Observation Deduction
Wildfire Hazard, Excessive Biomass Accumulation	Observation Deduction

ANIMALS

Resource Consideration or Concern	Measurement and Assessment Tools
Fish and Wildlife - Inadequate Habitat	
Food, Cover/Shelter, Water, Space Continuity	Procedural (WHEG, WHSI, SVAP2) Observation Deduction
Livestock Production Limitation	
Inadequate Feed and Forage	Procedural (GRAS) Observation Deduction
Inadequate Shelter	Procedural (GRAS) Observation Deduction
Inadequate Water	Procedural (GRAS) Observation

Resource Consideration or Concern	Measurement and Assessment Tools
	Deduction

ENERGY

Inefficient Energy Use	
Equipment and Facilities	Predictive (Online Energy Tools) Observation Deduction
Farming/Ranching Practices and Field Operations	Predictive (RUSLE2, Online Energy Tools) Observation Deduction

ECONOMIC

Resource Consideration or Concern	Measurement and Assessment Tools
Land	
Land Use, Land Available for Production, Farm Program Eligibility (base)	Observation Deduction
Capital	
Total Investment, Annual Cost ,Cost Per Unit of Production	Observation Deduction
Labor	Observation Deduction
Management	Observation Deduction
Risk	Observation Deduction
Profitability	Observation Deduction

SOCIAL

Resource Consideration or Concern	Measurement and Assessment Tools
Cultural Resources and Historic Property	Procedural Predictive Observation Deduction
Client Characteristics	

Resource Consideration or Concern	**Measurement and Assessment Tools**
Education, Health, Family Values, Attitudes	Observation Deduction
Community Characteristics	
Recreational Opportunities, Cultural Opportunities (theater, music, shopping, civic organizations, higher education, etc.), Crime, Community Health	Observation Deduction

600.25 Step 5 – Formulate Alternatives

A. Description.—Develop alternatives that will achieve the objectives of the client, solve the identified resource concerns, take advantage of opportunities, and prevent or lessen the possibility of additional problems occurring.

(1) A broad range of technically feasible alternatives will be developed with the client. Alternatives may include an appropriate mix of structural conservation practices, such as terraces, dams, and waterways; nonstructural conservation practices, such as crop residue management, or livestock exclusion; market-based measures, such as cost-sharing, easements, and local tax incentives; and institutional measures, such as zoning or local regulations, and State, Tribal, Territorial, and Federal laws and regulations.

(2) Some conservation practices are primary, resulting in treatment of the identified resource concerns. Others are supporting – they facilitate a primary conservation practice and may not have a direct effect on the identified resource concern (however, they must meet the primary practice standard and achieve the desired treatment). An example of a primary conservation practice is a terrace. When needed for the terrace to function effectively, an underground outlet is an example of a supporting practice that facilitates a primary practice. Because the primary practice will not function properly without the supporting practice or practices, the primary conservation practice will not be certified as complete until all supporting practices are installed.

(3) When developing alternatives, include conservation practices and management measures that mitigate potential adverse effects on the resources. Consider the potential to address regulatory requirements, based on the client's desires and objectives.

Figure 600-C7: Client and conservationist discussing resource data in the field.

B. General.—This planning step begins phase II of the planning process. Revisit earlier steps if new objectives or resource concerns are identified. The purpose of formulating alternatives is to provide a variety of effective, efficient, and economical conservation treatments that meet planning criteria and are acceptable to the client in solving resource concerns, addressing opportunities, and meeting the stated objectives. These alternatives relate to the identified problems, opportunities, and resource concerns, and are developed in view of the cultural, social, ecological, and economic conditions of the planning area.

(1) Include the client in the formulation of alternatives. This enhances practical alternative formulation, improves decisionmaking, and enhances the chances of successful implementation. It also helps ensure that low initial cost measures are developed in limited resource situations where cost is a critical issue.
(2) Develop enough alternatives to provide the client with the opportunity to consider several possibilities. If incorrect or insufficient data has been assembled for formulating alternatives, the planner needs to return to planning Step 3, "Inventory Resources," and Step 4, "Analyze Resource Data," before proceeding.
(3) The planner and the client must have a clear understanding of the resource concerns, including their cause and effect relationships. If the resource concerns and their cause and effect relationships are not clearly understood by the client, return to planning Step 4, "Analyze Resource Data," and review these concerns with the client.

C. Planning Standard.—Alternative treatments are developed to meet the resource needs, objectives of the client, and planning criteria for the identified resource concern.

(1) One or more action alternatives will be developed, included in the case file, and presented to the client.

(2) Conservation planning is conducted with the client, working progressively towards an RMS level of management.

D. Inputs

(1) List of resource problems, opportunities, and concerns from Step 1, "Identify Problems and Opportunities"
(2) The client's objectives from Step 2, "Determining Objectives"
(3) Physical, cultural resource and historic property, social, economic, and ecological information pertaining to the planning area and related areas
(4) Resource data and analysis from Step 3, "Inventory Resources," and Step 4, "Analyze Resource Data"
(5) FOTG, Sections II, III, IV, and V

E. Products

(1) A set of alternatives that are compatible with client and NRCS objectives and address the identified resource concerns
(2) Assistance notes

F. Step 5 – Formulate Alternatives Activities – Conservation Plan

WHAT	**HOW**
1. Build the conservation system alternatives.	• Become familiar with resource concerns identified in Step 3, "Inventory Resources," and Step 4, "Analyze Resource Data," and the types of systems commonly used to address those concerns. • Solicit assistance from technical specialists at NRCS or other agencies and organizations if the complexity of resource issues or specific responsibility for certain resource issues requires their input. • Include all requirements to comply with existing laws and special environmental concerns. • Designate the proposed primary land use for each alternative in terms of both the client's and NRCS's designation. • Select the potential practices to meet the client's specific needs and address the identified resource concerns. Take into account existing practices or management measures that do not currently meet NRCS standards. • List the practices and estimated planned amounts for each necessary to meet the planned level of treatment. • Create additional alternatives to provide the client with multiple feasible approaches to address their objectives and identified resource concerns. • Document EE data per State, Tribal, Territorial, and Federal guidance. See section 600.71. • Enter assistance notes, as appropriate, to capture discussions between the client and planner during the development of

WHAT	HOW
	alternatives.

600.26 Step 6 – Evaluate Alternatives

A. Description.—Evaluate the alternatives to determine their effectiveness in addressing the client's identified resource concerns, opportunities, and objectives. Attention must be given to those ecological values protected by law or Executive order. See Section 600.1, "References."

B. General.—The purpose of evaluating alternatives is to provide the client with the information needed to select the desired alternative. This provides the client further opportunity to be involved in the planning process and maximizes the likelihood of full implementation, including proper operation and maintenance. During the evaluation of alternatives, careful consideration must be given to social, economic, and ecological resource factors that influence planning and decisionmaking. The planner may need to revisit any or all of the previous steps during discussions with the client or during any part of the evaluation.

Figure 600-C8: Conservationists and client evaluating forage in pasture.

C. Environmental Evaluation.—Federal law requires NRCS planners to consider the environmental consequences of recommended actions and to provide decisionmakers information about the actions that might significantly affect the human environment. Therefore, planners must assess the physical effects of planned actions during the planning process. Planning to address issues with the natural resources and their interrelationships is complex. A conservation practice with a positive effect on one resource may have a negative effect on another. Therefore, planners must be aware of and consider the effects of recommended actions on all resources even when the assistance provided only addresses individual resource concerns.

D. Purpose.—This guidance emphasizes the reality that resources are interrelated and that the treatment of one resource may affect another. It also shows the importance of formulating alternative conservation systems in recognition of these interrelationships by providing a process that—

(1) Starts with identified client objectives and the determination of resource concerns.
(2) Considers the effects of practices on each resource.
(3) Facilitates combining complementary practices in the alternative systems.
(4) Helps evaluate the potential options against the planning criteria.
(5) Provides a scientific and economic basis for decisions.

E. Conservation Effects.—The conservation effects process is useful in formulating and evaluating conservation system alternatives. Using the CPPE matrix and the Conservation Practice Network Diagrams helps planners communicate with decisionmakers the physical effects of conservation practices, so they can determine if proposed alternative systems solve identified resource concerns, while being reasonably certain that the recommended treatment will not create new problems. See section 600.72.

F. Network Diagrams.—Network diagrams, found in the National Handbook of Conservation Practices, are flow charts that represent an overview of expert consensus on the direct, indirect, and cumulative effects of installing proposed practices. Network Diagrams show the potential positive and negative outcomes of practice installation and are useful as a reference point for evaluating the effects of alternative systems.

G. Conservation Practice Physical Effects (CPPE).—The CPPE documents, found in the FOTG, Section V, and the National Handbook of Conservation Practices, display in subjective terms the physical effects conservation practices have on the natural resources and their associated problems or concerns. See also Subpart E, 600.40, "Support Guidance for Conservation Effects." Technical specialists document in the CPPE the practice effects based on their experience and available technical information. See 450-GM, Part 401, Subpart A, Section 401.1A(5), for additional information.

(1) When creating the CPPE, the question is presented, "When this practice is installed in accordance with NRCS practice standards and is fully functional, what effect will it have on the various resource concerns?" The answer is in the form of a rating that represents the practice's effect on the resource concern, and the magnitude of the effect.

(i) The following terms define "effect" values:

- No Effect.—The conservation practice being evaluated has no discernible effect on the resource concern identified.
- Worsening.—The conservation practice further deteriorates the condition of the resource
- Improvement.—The conservation practice improves the condition of the resource

(ii) The following terms express the magnitude of the effects:

- Slight.—Some effect (positive or negative) of the practice on the resource, but not enough to influence the decision to select the practice to solve the problem.
- Moderate.—A measurable effect (positive or negative) of the practice on the resource.
- Substantial.—A significant measurable effect (positive or negative) of the practice on the resource.

(2) National technical specialists with responsibility for a given practice establish CPPE values for each conservation practice. The effects listed in the national CPPE represent general conditions nationwide.

Example: The national agronomist determines that generally, the implementation of Residue and Tillage Management, No Till/Strip Till/Direct Seed (329) will significantly reduce the sheet and rill erosion problem because of increased surface cover and decreased soil disturbance. Therefore, a value is entered as "Substantial Improvement" to the Soil Erosion – Sheet and Rill Erosion resource concern. However, the implementation of 329 may cause a slight increase in soluble nitrate nitrogen infiltration depending on the time and method of application, rainfall, nutrient form, organic matter, soil texture, and depth to water table, and therefore a value is entered as "Moderate Worsening" to the Water Quality Degradation – Nutrients in Groundwater resource concern.

(3) Since data on the CPPE are national in scope, State-level offices are encouraged to review and localize the information as necessary to reflect those effects expected to occur under local conditions. Each State will review and, if needed, edit the values in the national CPPE based on local knowledge and experience to reflect typical conditions in their State. It is imperative that States use an interdisciplinary group to refine existing entries to ensure proper consideration of all effects to all of the resource concerns.

(4) If a State modifies the national CPPE, the State will provide a description of the local conditions and a depiction of the typical practice installation to justify the change. A well-written description of the typical practice installation will aid the planner when it comes time to conduct site-specific analysis.

Example: The national agronomist determined that, in general, the implementation of Residue Management, Seasonal (344) results in a "Slight to Moderate Reduction" in the Soil Erosion – Wind problem. However, a State agronomist observes that with the implementation of Residue Management, Seasonal (344) the reduction of wind erosion is significant because the critical wind erosion period occurs when the soil is covered with residue or crop. The State agronomist will change the value to "Substantial Improvement" in the Soil Erosion – Wind resource concern, with a rationale statement as to why the practice has been deemed to have a "Significant" rather than a "Slight to Moderate" reduction in the wind erosion resource concern.

H. SmarTech Version of CPPE

(1) A spreadsheet version of the CPPE displaying the effects values in a numerical format is stored in the SmarTech database accessible through the FOTG, Section V, or through the "Technology" tab of the My.NRCS intranet site. Various programs and databases rely on this rendering of the effects data. See 450-GM, Part 401, Subpart A, Section 401.7, for additional information.

(2) The following conversion establishes the national values in the SmarTech CPPE matrix:

(i) Substantial Improvement	+5
(ii) Moderate to Substantial Improvement	+4
(iii) Moderate Improvement	+3
(iv) Slight to Moderate Improvement	+2
(v) Slight Improvement	+1
(vi) No Effect	0
(vii) Slight Worsening	-1
(viii) Slight to Moderate Worsening	-2
(ix) Moderate Worsening	-3

(x) Moderate to Substantial Worsening -4
(xi) Substantial Worsening -5

I. Use the Effects Concept and CPPE in Conservation Planning

(1) After planners formulate an alternative conservation system, they use their State's CPPE and the Conservation Practice Network Diagrams as guides to refine the evaluation of effects of practices to reflect the site-specific environmental conditions and practice design. (See Exhibit 3)

(2) Planners also use the CPPE and Network Diagrams to identify potential negative effects on resources that may result from the implementation of practices. If the CPPE indicated the potential for a negative effect or, if through experience, planners discern that a practice may result in a negative effect, planners may need to add one or more additional practices to the system in order to mitigate for predictable degradation of resources. In such situations, planners will add these newly selected practices to the alternative system and once again evaluate the site-specific practice effects on the identified resource concerns. Planners will repeat this process until they develop a combination of practices that—
(i) Meets the client's objectives.
(ii) Meets the planning criteria for the identified resource concerns.
(iii) Has mitigated all negative effects.

(3) When a client considers a land use change as an option, the planner will evaluate the effects of practices used to facilitate the land use change against present conditions. The planner will evaluate the effects of practices necessary to manage the new land use based on the new land use.

Example: Where cropland is to be converted to pasture, initially evaluate the effects of pasture planting for the resource concerns identified on the crop field. Pasture planting will significantly reduce sheet and rill erosion that occurs with the existing cropping system. Then, evaluate the potential resource concerns that may occur after conversion to pasture. Pasture grazing may cause a water quality concern indicating the need for filter strips and fencing.

(4) Displaying the positive and negative effects of alternative conservation systems allows the decisionmaker to compare the various alternatives and better understand the benefits of all their options so they can select the one that best meets their objectives.

Example: Alternative #1 is very effective in treating soil related resource concerns and is not quite as effective in treating one or more of the other resources. In contrast, alternative #2 is very effective in treating the water and animal resources and not quite as effective in treating the soil resource concerns.

(5) Site-specific evaluations of the effects of conservation system alternatives are required.

J. Cumulative Effects.—When clients apply systems that address the same resource concern to several PLUs in a watershed, significant cumulative or synergistic effects are probable. Planners may consult the Conservation Practice Network Diagrams as they consider the outcomes of treatment applied to surrounding land when conducting effects evaluations. The CPPE does not reflect the potential of cumulative effects.

Example: The evaluation of effects of a conservation system treating a single PLU may indicate a slight improvement to the concern over sediment in surface waters. However, in a watershed consisting of several PLUs treated to reduce sediment delivery to a water body, an evaluation of the cumulative effect may indicate a moderate or significant positive reduction in the amount of sediment reaching the water body.

K. Planning Standard.—The effects of each alternative are evaluated and the results are described. The alternatives are compared to benchmark conditions to evaluate their ability to solve problems, meet planning criteria, and meet the client's objectives. The analysis includes evaluation of the direct, indirect, and cumulative effects.

L. Inputs

(1) List of problems and opportunities developed during Step 1, "Identify Problems and Opportunities"
(2) The client's objectives from Step 2, "Determine Objectives"
(3) Benchmark data from Step 4, "Analyze Resource Data"
(4) List of alternatives from Step 5, "Formulate Alternatives"
(5) FOTG, Sections I, II, III, IV, and V
(6) National Handbook of Conservation Practices – Network Diagrams
(7) Environmental and cultural resource and historic property evaluations
(8) Program information and requirements

M. Products

(1) An evaluation for each alternative that displays the effects (including the rationale supporting the effects determination) for the client to consider and use as a basis for decisionmaking for the conservation plan
(2) Technical assistance notes reflecting discussions between the planner and the client
(3) Cost estimate for each alternative
(4) List of applicable financial assistance programs

N. Step 6 – Evaluate Alternatives Activities – Conservation Plan

WHAT	**HOW**
1. Determine the effects of each alternative.	• Compare the effects of each alternative to the benchmark condition to estimate expected outcomes and determine the degree to which the client's resource objectives will be met by the implementation of each alternative. • Express effects in narrative terms or quantify in physical terms (e.g., tons per acre, parts per million, bushels per acre). Record the effects for each resource concern. • Verify that each alternative would comply with existing national, State, Territorial, local, and Tribal laws and regulations, as appropriate.

WHAT	HOW
2. Evaluate each alternative for potential negative effects.	• Evaluate each alternative for potential negative effects. If an alternative is likely to result in an adverse effect to any resource (environmental, cultural resource/historic property, or human) modify alternative to mitigate potential damage and to conform to client objectives. • Evaluate the risk and uncertainty associated with each alternative. • Obtain State-level technical support in situations where an offered alternative leads to a program, procedure, or activity that has disproportionately adverse human health or environmental effects on minority or low-income populations (environmental justice not being positively served).
3. Identify potential sources of financial assistance.	• Identify sources of financial assistance through NRCS programs, or through other Federal, State, Territorial, Tribal, and local agencies or public interest groups. Awareness of these sources can aid the client in making decisions.
4. Review the alternatives and their effects with the client.	• Prepare an effects summary of each alternative that clearly displays the long-term and short-term ecological, economic, and social outcomes (i.e., land, labor, capital, and management). • Use a format that meets the needs of the client. Effects may be expressed using a range of formats from a simple narrative comparison to a complex, detailed accounting of the effects using automated tools. Often, a limited amount of detailed information is sufficient. • Consider the personal, social, and community background of the client to determine which effects have the most influence on the choice of an alternative. Values that cannot be quantified may be the most important to the client. • If requested by client, express the effects of alternatives in monetary terms. Estimate the monetary effects using least-cost (cost-effectiveness) analysis, cost-return analysis (return on investment), partial budgeting, net present value analysis, break-even analysis, or internal rate of return. Cost information is available in the FOTG, Section I, from discipline specialists, and other sources. • Document environmental evaluation (EE) data per State, Tribal, Territorial, and Federal guidance. See section 600.71. • Document discussions between the client and planner in assistance notes.

600.27 Step 7 – Make Decisions

A. Description.—The client determines which alternatives to implement and the planner prepares the necessary documentation. Documentation includes recording the decision and preparing the conservation plan, the CPA-52, "Environmental Evaluation Worksheet," and any necessary additional NEPA or consultation documents.

B. General.—The planner assists the client in selecting conservation treatment alternatives. This step involves comparing conservation alternatives and the client selecting one or more for implementation.

Figure 600-C9: Conservationist and client shaking hands in crop field.

C. Planning Standard.—A conservation system is selected based on the client's clear understanding of the effects for each alternative. The selection is recorded in the client's plan.

D. Inputs

(1) The analysis of all resources inventoried
(2) A set of evaluated alternatives
(3) Conservation effects information
(4) FOTG, Section V

E. Products

(1) The plan document with the selected alternative, including potential program or implementation opportunities, and operation and maintenance with approval by a certified conservation planner
(2) Schedule of conservation system and practice implementation
(3) NEPA documentation

(4) Revised conservation effects information
(5) Assistance notes

F. Step 7 – Make Decisions Activities – Conservation Plan

WHAT	**HOW**
1. Discuss the alternatives.	• Set a date with the client to discuss the alternatives. • Discuss the advantages and disadvantages of each alternative, including constraints imposed by law. • Point out the beneficial and adverse effects for each alternative to aid the client in reaching a decision. • If the client chooses one or more of the alternatives, proceed to Item 2, "The client makes decisions." • If the client chooses to implement only part of an alternative and a resource concern is not addressed, return to Step 6, "Evaluate Alternatives Activities," and evaluate the client's selected portion. • If the client does not choose one of the alternatives, yet is interested in exploring more options, return to one or more of the previous planning steps. • Discuss financial assistance options.
2. The client makes decisions.	• Record the selected alternative as the planned system. • Schedule selected practices for implementation. • Explain the interdependency of certain practices as practice scheduling is completed. • Explain any Federal, State, Territorial, Tribal, or local regulations that may apply and potential permit requirements. • Adjust effects, if needed. • Inform client that if NRCS funding or other implementation assistance is sought, NRCS may need to meet consultation requirements and that some activities may be modified as a result. • Record assistance notes reflecting discussions with the client.

3. After the client selects an alternative to implement, prepare the plan documents.	Prepare the plan documents. General guidance is provided below. However, detailed training and experience are necessary to understand proper sequence and scheduling of conservation practices, operation and maintenance requirements, and other facets of planning. • Prepare the conservation plan map, in accordance with Section 600.31, "Conservation Plan." • Prepare the conservation plan, in accordance with Section 600.31, "Conservation Plan." • Include appropriate forms, practice overview sheets with practice specifications, and implementation requirements. • Update the environmental evaluation if necessary • Revise conservation effects, if needed. • Include an operation and maintenance plan or information. • As appropriate, refer to specific program requirements.
4. Deliver the plan to the client.	• Schedule a time to meet in person with the client. • Review plan with the client and discuss implementation. • Encourage the client to sign the plan. While optional at the national level, it is recommended as an acknowledgement of decisions. • Ensure that a certified conservation planner signs the plan for NRCS. • Provide copies of plan documents to client. • Document discussions with the client in the assistance notes.
5. Discuss the next follow-up or implementation assistance.	• Discuss need for followup assistance. • Discuss applicable compliance and program status review requirements.

600.27 Step 8 – Implement the Plan

A. Description.—Implementing the plan includes providing technical assistance, and in many instances, financial assistance, for installing conservation practices and management systems. Implementation includes obtaining needed permits, funding, land rights, surveys, initial and final designs, inspections and certifications. It also includes the operation, maintenance, and management needed by the client to assure proper functioning of practices following installation.

B. General.—Implementing a plan is the process of carrying out the conservation treatments that make up the planned conservation systems. Well-documented and understood decisions are a prerequisite to implementation of the plan. The client may be able to implement the plan without additional technical assistance. However, additional technical assistance is usually necessary, and plan revisions may be warranted. Additional information or documentation may be required by an implementation program or funding authority. Thorough and high-quality planning sets the stage for providing efficient and effective technical and financial assistance.

(1) Implementation includes the design, layout, construction, inspection and certification, management, operation, and maintenance of planned systems and practices.
(2) Specific financial assistance conservation program requirements and deadlines may also be involved and need to be considered when scheduling assistance with the client.

Figure 600-C10: Conservationist and contractor reviewing practice design in the field

C. Planning Standard.—The client has adequate information and understanding to implement, operate, and maintain the planned conservation systems. Practices implemented with NRCS technical assistance will be installed in accordance with NRCS standards and specifications.

D. Inputs

(1) Conservation plan
(2) Case file data
(3) Technical studies
(4) Environmental evaluations and documents
(5) Technical assistance
(6) Financial assistance conservation program requirements
(7) FOTG, Section IV, "Practice Standards and Specifications"
(8) National Engineering Handbook
(9) Communication with clients and stakeholders

E. Products

(1) Practice designs and job sheets
(2) Survey notes
(3) All necessary permits
(4) Practice certification notes
(5) Conservation practices applied
(6) Conservation systems applied
(7) Technical assistance notes
(8) Financial Assistance Conservation Program contract, where applicable

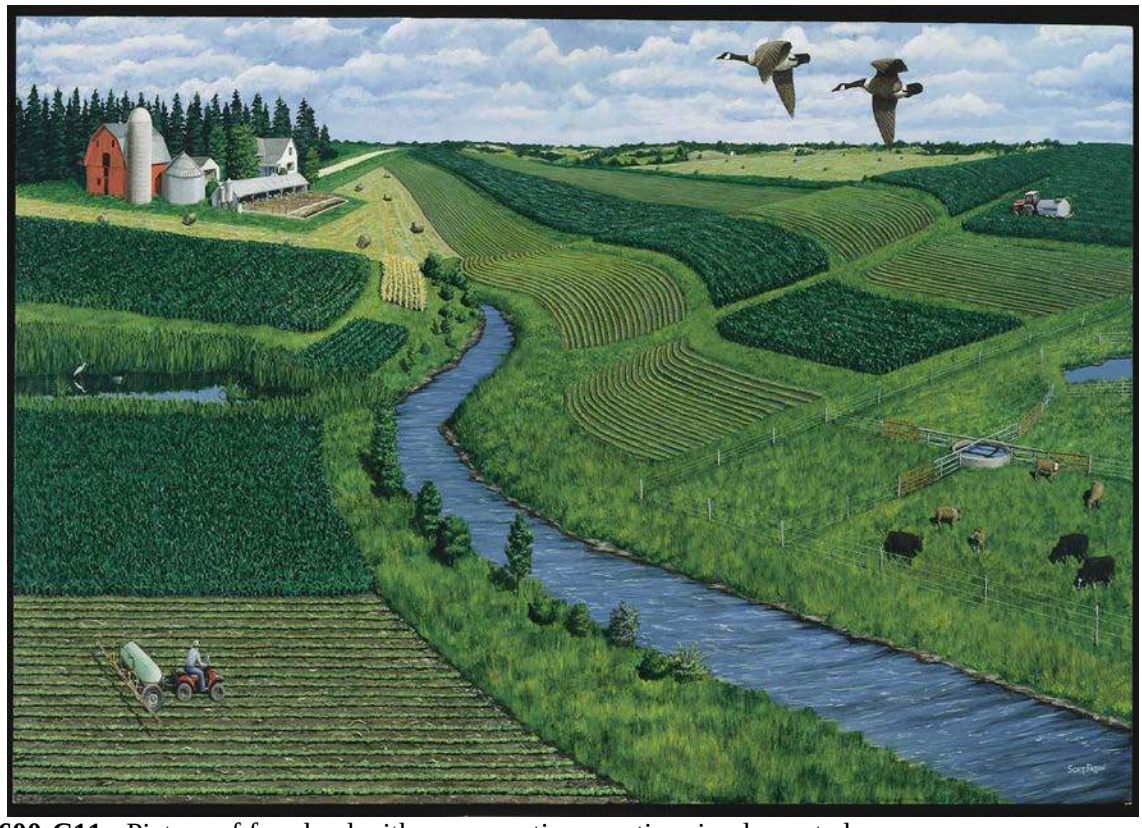

Figure 600-C11: Picture of farmland with conservation practices implemented.

F. Step 8 – Implement the Plan Activities – Conservation Plan

WHAT	**HOW**
1. Initiate NRCS assistance to install practices.	• A personal contact may be initiated by the client, NRCS or cooperating agency. It may be in the form of a letter, telephone call, agency Web tool, email, etc.
2. Become familiar with the conservation plan.	• Review the client's decisions and assistance notes. • Discuss the plan with the person who last updated the plan, if that person is available. If not, discuss with others in your field office familiar with the client or land. • Review the resource data, soils, topography, the environmental assessment, etc.
3. Review the plan with the client. If necessary, revise the existing plan or develop a new plan.	• Contact the client to schedule an appointment. Reconfirm before the date scheduled. • Discuss: o Client objectives o The implementation schedule o Costs o Financial assistance o Sequence of practice implementation o Operation and maintenance o Followup o Other factors • Track progress towards implementing the conservation plan. • Update the plan any time practices are considered for conservation program enrollment, so practice information, such as planned dates and amounts, meet program requirements. • If a plan revision is required, document the reason in assistance notes. Repeat the planning process, beginning with the appropriate planning step.
4. Complete the field data collection, including surveys (if not already done) for practice design.	• Determine the type and intensity of field data needed for design purposes. • Develop job sheets. • Discuss the practices scheduled to be applied. • Discuss needed easements, land rights, and permits. • Discuss timeframes of each step of the implementation process.

WHAT	HOW

5. Complete practice designs and job sheets.	• Verify the practices, as designed, with the appropriate practice standards in the FOTG, Section IV.
	• Design the practice design, using available agency automated design tools.
	  o National (e.g., hydrology, open channel hydraulics, and surveying)
	  o State-approved software
	• Identify the need for area or State office specialist assistance and request it accordingly. Otherwise, have a qualified member of the field office staff complete the design. Obtain and document required practice job approval authority.
	• If cultural resources or historic properties are present, consult with the NRCS cultural resource coordinator or specialist. Alternative designs or practices may be necessary.
	• If threatened or endangered (T&E) species are present, consult with the NRCS T&E specialist.

6. Review the designs, practice job sheets, practice specifications, and estimated costs with the client.	• Schedule an appointment with the client to review the designs. • Encourage the client to involve the contractor and anyone to be involved in managing the practice, in the review of designs and specifications. • Discuss the practice specifications and practice job sheets, in detail, with the client and the contractor. • Discuss permits, easements, and land rights, if needed. • Discuss roles of client, contractor, and NRCS staff during practice implementation. In most cases, clients will hire contractors that will work cooperatively with the client and NRCS staff. • Ensure the client is informed and directing the contractor's progress as needed.
7. Stake the treatment area as needed to define the location and extent of the practice or structure.	• Refer to discipline handbooks as listed in the reference section for procedures. • Involve the client, the contractor and all other appropriate parties in the practice layout. **Remember, however, that the land manager and contractor are not the clients. They are responsible to the client, not to NRCS!** • Make any needed adjustments in practice location, practice extent, and other specifications. • Consider the many safety issues that may be important in the design, layout and construction of conservation practices. See detailed guidance in the Title 210, National Engineering Manual, Part 503,

WHAT	HOW
	"Safety," and Title 210, National Engineering Handbook. • Inform the client of their responsibility to contact all applicable utilities in the project area, or a coordinated entity, such as 811, State One Call system, MISS UTILITY, DIG SAFE, etc., to check for any buried utilities and arrange for having identified utilities marked prior to construction.
8. Provide practice implementation inspections, as needed.	• Perform inspections throughout conservation practice construction or implementation. This activity may extend over 2 or 3 years on some management practices. • Take photographs of all underground components of practices prior to covering to document installation. • Some clients may do their own work and may need more detailed assistance than an experienced contractor would need. This may be especially true when they are constructing practices or dealing with management practices, such as prescribed grazing. • If, at any time during practice installation, it is determined that NRCS specifications, including safety standards, are not being followed, immediately notify the client orally and in writing as to what corrective action is needed. If corrective action is not taken, NRCS assistance will be withdrawn.
9. Conduct a final certification of the practice.	• Conduct the final inspection of the practice and record the installation data. Verify that each practice has been installed and meets standards and specifications, as designed. • Complete the needed measurements to determine the extent of the practices applied using approved methods that meet acceptable standards for accuracy. Example: feet of terraces or acres seeded or planted.
10. Document the completed practice.	• Sign and date the appropriate form certifying that the practice meets standards and specifications consistent with 450-GM, Part 407. • Document, in the case file, the extent of the practice certified and the date the practice was certified. Document only those practices that meet NRCS specifications. • Enter the applied/certified amounts of all completed practices in the practice schedule, using agency approved planning software. • Document all certified practices on plan map with correct symbology. • If financial assistance is involved, forward certification result to appropriate staff.
11. Review the operation and maintenance requirements with	• Explain the need for and the benefits of proper operation and maintenance of the applied conservation practices.

WHAT	HOW
the client.	• Explain that periodic inspections are needed to ensure that the structural practices are functioning properly and to identify any need for repair.
12. Schedule followup assistance.	• Review the planned sequence of practice implementation. • Schedule next practice to be implemented, if possible. • Agree on the implementation dates with the client and record them in the case file. • Revise plan, if necessary.
13. Document technical assistance notes.	• Record all significant activities in assistance notes. • Ensure that discussions with the clients and contractors are adequately documented to reflect agreements. • Include implementation, maintenance, and followup information in assistance notes.

600.29 Step 9 – Evaluate the Plan

A. Description.—Evaluate the effectiveness of the implemented plan to ensure that it is functioning as planned and achieving the objectives. Identify reasons for lack of progress in plan implementation, if applicable. Obtain information on the results of the applied treatment and where the actual results differ from those anticipated, and provide feedback into the planning process. This could include revision of planning criteria, changes to current practice standards and specifications, revision of other FOTG data, and modifications to the plan. Also take the opportunity to encourage the client to continue plan implementation.

B. General.—Conservation planning is an ongoing process that continues after the plan has been implemented. Continue contact with the client to evaluate operation and maintenance needs and to determine if management systems and practices are performing properly and meeting both the client's and NRCS's objectives. Onsite visits are a required part of this process.

(1) Technology may be developed through field observation of practices that have been implemented. Every planning area serves as a potential laboratory to help in the continuous process of improving alternative treatments for natural resource problems and concerns, and to take advantage of opportunities. This type of information can also help to focus on research needed.
(2) The process of monitoring, evaluating, and experimenting in order to add to resource management information and modify decisions is known as adaptive management.
(3) The key to successfully evaluating the results of a plan is to take advantage of the synergistic effect of the client, planner, and technical specialists working together as they make observations and record the data. The planner can enlist the help of the technical specialists and nonagency partners, as appropriate.

Figure 600-C12: Conservationists and client discussing a plan in the field.

C. Planning Standard.—The planner maintains contact with the client to determine whether the implementation results are meeting ecological, economic, and social objectives and solving resource concerns in a manner satisfactory to the client and beneficial to the resources. Resource effects that are different from those predicted are fed back into the FOTG development process (adaptive management).

D. Inputs

(1) The conservation plan
(2) Results of previous evaluations
(3) Onsite observation and data available from the client
(4) New or modified objectives or needs of the client
(5) Appropriate new technology
(6) FOTG, Sections I, II, III, IV, and V

E. Products

(1) Operations and maintenance (O&M) reports
(2) Outline of maintenance needs or other changes
(3) A decision to update or revise the plan, if needed
(4) Technical assistance notes, indicating the effectiveness of the plan
(5) Case studies, if appropriate, following the guidance provided in the FOTG, Section V
(6) Recommendations for changes in practice standards, specifications, or designs
(7) Recommendations for changes in FOTG materials
(8) A decision to revise or expand implementation strategies
(9) Updated conservation plan effects
(10) Updated CPPE and guidance documents

F. Step 9 – Evaluate the Plan Activities – Conservation Plan

WHAT	**HOW**
1. Meet with the client to evaluate the plan.	• Schedule an appointment with the client to evaluate the plan activities. • This may be initiated by NRCS, the conservation district, TSP, or the client, by means of personal contact, letter, Internet, electronically, email, or telephone call. • If a TSP or other third party service provider was involved in developing the plan or component plans, they will be asked to participate in the evaluation.
2. Prepare for followup and evaluation with the client.	• Review the conservation plan, planning and assistance notes, and the resource concerns for which the system was developed. • Review the client's objectives. • Review the resource data. • Discuss the plan with the last person to provide technical assistance, if possible. • Review the practice implementation information, including designs and construction notes. • Review the operation and maintenance plan. • Confirm the date scheduled with the client.
3. Review and evaluate the plan with the client.	• Observe the performance of each applied conservation practice in the field for structural practices and review component management plans for management practices. • Determine if the practices and management systems are solving the identified resource concerns and meeting ecological, economic, and social objectives. • Solicit feedback from the client concerning the effectiveness of applied practices and management systems. Discuss with the client routine operation and maintenance as well as needed maintenance of damaged or nonfunctioning practices. • Determine the type of technical assistance needed to restore a practice, if needed. • Encourage the client to make repairs promptly, so the function of the practices is not further impaired. • Encourage the client to complete any additional planned conservation practices on schedule. • Revisit the plan and determine if the client is ready to progress to a higher level of planning.

WHAT	HOW
4. Determine if adjustments are needed for management practices or systems.	• Compare the actual effects of practices with the planned effects. • Consider the effects in terms of ecological, economic, and social factors considered important by the client and NRCS. • Determine the actual effects of applied conservation treatment by measurement, judgment, models, and observation. • Review the effects, onsite and offsite. • Where the effects are significantly different than anticipated, submit a summary of the effects to the State Conservationist for possible inclusion into the FOTG. • Adjust the conservation system evaluations to reflect actual or predicted effects of the system. • Determine the client's acceptance of and satisfaction with, the conservation treatment applied and the technical assistance provided. • Determine if the client's objectives have been met.
5. Evaluate the status of conservation district cooperator working arrangements.	• Inform the conservation district of the client's progress in carrying out planning and implementation consistent with district program objectives, NRCS program objectives, or both. • Keep the conservation district informed of any problems.
6. Determine the need for a plan revision, development of a new plan, or cancellation of the plan.	• Determine if the client no longer owns or operates the land included in the conservation plan. Make changes as necessary. • If the conservation plan needs revision, or a new plan is needed, repeat Step 1, "Identify Problems and Opportunities," through Step 7, "Make Decisions."
7. Revise the plan	• Revise the plan if necessary.
8. Update the assistance notes.	• Enter assistance notes to capture planner interactions with the client.
9. Conduct a case study, if appropriate.	• Follow the procedures in the FOTG, Section V. Utilize assistance from other agencies, etc., as appropriate.

Part 600 – National Planning Procedures Handbook

Subpart D – Plan Format and Content

600.30 Introduction

A. The conservation plan is developed jointly by the client and the planner, for the client's and planner's use to record decisions for natural resource protection, conservation, and enhancement. The NRCS copy of the plan is maintained in hardcopy or electronically, as appropriate.

Figure 600-D1: Client and conservationist discuss a conservation plan.

B. Decisions and resource information needed during implementation and maintenance of the plan are recorded throughout the planning process. The plan narrative and supporting documents provide guidance for implementation and may serve as a basis for compliance and program funding through Federal, State, Tribal, Territorial, or local financial support initiatives. Assistance notes are recorded at each step in the planning process to document important points or discussions with the client.

C. The following guidance helps to maintain quality and provide appropriate documentation of a plan. Though this section outlines required items to be included in a plan, the plan content will be tailored to the client's needs.

600.31 Conservation Plan

A. The plan document provided to the client must be a quality document containing meaningful information for the client. The document may be provided to the client electronically or as hardcopy. It must include the following items:

(1) A folder, binder, or other means to assemble the contents of the plan (if hardcopy).
(2) A conservation plan map. This may consist of several map documents to account for the entire planning area.
(3) Soils maps and other resource maps, as needed, with appropriate interpretations, such as soil descriptions or land cover descriptions.
(4) At a minimum, each map will include the following:
  (i) Title block showing the following:
    - Title, "Plan Map"
    - Client's name (individual or business)
    - "Prepared with assistance from USDA – Natural Resources Conservation Service" and "ASSISTED BY [planners name]"
    - Name of the applicable conservation district, county, and State
    - Date prepared
  (ii) Scale of the map
  (iii) Information needed to locate the planning area, such as geographic coordinates, public land survey coordinates, etc.
  (iv) North arrow
  (v) Appropriate map symbols and a map symbol legend on the map or as an attachment
(5) The "Plan Map" will specifically include the following items:
  (i) Boundary lines for the PLUs with labels (name, number, or both)
  (ii) Land-use designation and applicable land use modifiers for each PLU
  (iii) Acreage for each PLU
(6) Location of planned and applied conservation practices, using NRCS map symbols (see Title 170, National Map Symbol Handbook, Part 601)
(7) If the conservation plan includes non-private lands, such as Federal or Tribal lands, a land status map must be included to display land ownership categories (Private, State Trust, BLM, Tribal, and Territorial, etc.)
(8) A record of the client's decisions, which includes the following:
  (i) PLU label (name, number, or both)
  (ii) NRCS practice name and code
  (iii) Amount or estimated amount to be applied (update amount when practice design is completed and when financial assistance is requested)
  (iv) Brief description of the practice (practice narrative)
  (v) Date the planned practice is scheduled to be implemented (update when financial assistance is requested)
  (vi) Certified amount of practice applied (after implementation)
  (vii) Date practice was certified (after implementation)
(9) Appropriate worksheets developed with the client. Worksheets include such things as forage inventories, erosion estimates, and cost estimates
(10) As needed, applicable "Conservation Practice Overview" sheets, specifications and implementation requirements (job sheets), and other prepared material
(11) Operation and maintenance agreements and procedures
(12) Practice designs, if completed at this time. Some designs may also be kept in the office file under the client's name when size limits duplication
(13) Conservation district cooperative agreement, where applicable
(14) Available maps, sketches, and designs resulting from the planning process that will be useful to the client in implementing the plan
(15) Information reflecting site-specific practice effects, based on onsite visits

B. Some component plans and resource concerns have specific plan requirements in addition to the items listed above. See subpart G, 600.60, for policy guidance to address these special plan requirements.

C. The NRCS case file contains the following, as applicable:

(1) Client information
(2) Client's objectives
(3) Conservation plan and record of decisions (practice schedule)
(4) Assistance notes
(5) Geospatial layers for PLU, practices, resource inventory, etc.
(6) Maps – conservation plan, soils, etc.
(7) Forms and worksheets used in developing and evaluating alternatives
(8) Conservation district information related to the plan
(9) Inventory and analysis information
(10) Practice design documentation and job sheets
(11) Engineering notes
(12) Operation and maintenance agreements and plans
(13) Documentation of applied practices
(14) Photographs, audio and video files
(15) Environmental documentation – CPA-52, "Environmental Evaluation Worksheet," and any other documents needed to meet the requirements of NEPA or other applicable environmental requirements, such as the Endangered Species Act.
(16) Financial contract documents
(17) Product documents resulting from the planning process
(18) Determinations (highly erodible land, wetland, etc.)
(19) Receipt for services
(20) Other appropriate supporting documents

600.32 Documentation of the Electronic Case File

A. NRCS will document and maintain conservation plan data using agency approved tools and the official planning database, National Planning and Agreements Database (NPAD). See Title 130, General Manual, Part 408, for mandatory electronic field office business tools.

B. The following terms are important to maintain electronic conservation plan data.

(1) Planning Land Unit (PLU).—A PLU is a unique geographical area defined by a polygon, which has a common land use and land use modifier and is owned, operated, or managed by the same client.
(2) Special Data.—Information about the location and shapes of geographical features, and the relationship between them; usually stored as coordinates and topography.
(3) Topology.—The special relationship between connecting or adjacent features in a geographic dat layer.
(4) Geographic database.—A collection of special data and its attributes, organized for efficient storage and retrieval.

C. To ensure data integrity and implement a national planning database that is current, accurate, and useful for modeling and reporting purposes:

(1) The PLUs for all active conservation planning will be spacially located (digitized and attributed) in the proper geographic data layer (active PLU layer) in the agency's official conservation planning database.

(2) Each PLU in the active PLU layer will be associated with a unique geospatial boundary (polygon).
(3) The following horizontal topology is required for PLUs in the active PLU layer:
(i) No overlapping of adjacent PLU boundaries (polygons)
(ii) No stacking of PLUs (polygons)

D. Conservation Practices

All planned conservation practices must be spacially located with its standard geometry (point, line, or polygon) in the proper geographic data layer (practice layer) in the agency's official conservation planning database.

Part 600 – National Planning Procedures Handbook

Subpart E – Support Guidance

600.40 Support Guidance for Conservation Effects

A. Purpose and Scope.—Planners must display and evaluate the effects of various conservation alternatives available to the client. The conservation effects process helps planners assist clients with their conservation decisions by—

(1) Providing a framework in which to organize and present information that facilitates comparison of the positive (gains) and negative (losses) effects of a conservation alternative.
(2) Permitting consideration of all ecological, economic, and social values pertinent to the evaluation.
(3) Encouraging the employment of analytical tools at appropriate levels of sophistication to provide information.
(4) Capitalizing on the knowledge and experience of planners and clients to foster interaction throughout the decisionmaking process.

B. Framework.—Effective conservation is in part dependent on the ability of the planner to integrate information from many disciplines, so the client can make a comprehensive evaluation. In essence, the conservation effects' role in conservation planning is to help systematically record and display effects information, so the client understands the implications of his or her decisions. Effects are defined as the measurable and describable results of treatments, practices, and systems.

C. The conservation effects process requires three categories of information, which include descriptions of—

(1) The resource setting (e.g., predominant soils, rainfall, relationships to other planning areas).
(2) The production and conservation systems expressed as the kinds, amounts, and timing of actions (e.g., crops, farming operations, conservation practices).
(3) The effects of the production and conservation systems on ecological, economic, and social considerations (e.g., erosion rates, net income, habitat values).

D. The resource setting, kinds, amounts, and timing of actions and the effects of those actions are recorded in the case file.

E. Conservation Effects Concepts

(1) Benchmark.—Planning efforts always identify the present condition of the planning area, which is known as the "benchmark condition." The planner and client work together to develop a picture of existing enterprises, resource conditions, trends, resource concerns, opportunities, and objectives. The assistance provided is based upon SWAPAE+H resources. The description of benchmark conditions could include other inventories and evaluations as needed. It may include a description of current crops, farming practices, livestock type and condition, and available equipment. Consideration of sociological and economic characteristics is also needed. Planning objectives and the complexity of each situation determine the level of detail necessary for inventories and evaluations.
   (i) For areawide conservation planning, points of reference other than the benchmark condition are sometimes used for discussion and comparison purposes. For instance, it is beneficial to forecast the resource conditions expected at some point in the future by just maintaining the current levels of resource management and treatment.

(ii) The objectives of the client affect the kind and amount of information gathered and evaluated. However, the formulation of planning objectives requires that the objectives of society as well as those of the client be considered. The planning process must also identify opportunities. This creates a broader view that goes beyond the search for resource problems to recognize where resource enhancements may be achieved. For example, if a given area does not have a significant soil resource concern onsite, opportunities may still exist to make on-farm improvements that could increase efficiency and profitability, while at the same time reducing negative water or air quality effects offsite.

(2) Alternatives.—Alternatives that meet both client and societal objectives need to be considered after the benchmark situation and expected future trends are noted.

(i) An alternative treats one or more resource concerns. It may be a single practice or a RMS. Proposed alternatives must be consistent with the FOTG, Sections II, III and IV. Apart from the FOTG, the experience and knowledge of the planner and decisionmaker are the main sources of information used for selection of the preferred alternative.

(ii) Certain steps or actions need to be taken to achieve a specific alternative. Examples include a change in cropping sequence; land use; time of seeding, tillage, or cultivation; structural improvements to the farm; or simply reducing the speed of a single tillage operation.

(iii) One of the most useful learning experiences for planners and clients is to visit land managers who have successful conservation treatments already applied. If successful on-farm experiences are documented and shared, such as case studies, the knowledge base of others, inside and outside the agency, could also be easily enhanced. Such experiences will be recorded first in physical and biological terms, rather than monetary ones, because monetary values are simply a translation of the former and can be expressed in current dollars at any time.

(3) Effects.—The proposed alternatives are compared with the benchmark condition to estimate the outcome of the actions. The effect of conservation alternatives is the difference between the benchmark and the proposed alternative. Quantification of the effects depends upon the degree of detail used to describe or measure the benchmark and expected alternative conditions. The effect will be described in narrative form, in qualitative terms, at a minimum, and in quantitative terms to the extent possible. It will also be recorded in an easy-to-understand manner for consideration by the decisionmaker.

Differences in erosion rates, habitat values, water quality, acres farmed, bushels harvested, labor and fuel requirements, pesticides used, and other such information will all be documented to the extent that such information is needed by the client or is required by the agency. The timeframe when the effect occurs might also be identified, because certain actions, such as pasture improvements, can result in immediate costs, but the resulting yield increases may be delayed and then occur for an extended period of time.

(4) Values.—Each individual's values affect the relative merits of an effect. Ten additional quail may be a positive effect to one person and a negative one to another. An individual's values may be in harmony with society's best interest, or they may be in direct conflict. Once values have been applied to the effects, the positive and negative points may be listed. This listing can start out in a general manner and can then be expanded to more and more detailed levels. The procedure may involve traveling back through the decisionmaking process or producing increasingly sophisticated levels of detail on the same effect. The process is continued until the client has enough detail to make an informed decision. In most cases, the planner will estimate the costs and describe necessary maintenance for each of the alternatives. Often, a

limited amount of detailed information is sufficient. Occasionally, however, a more complex analysis is needed. This is where the concepts presented in this handbook may help.

F. Case Studies.—Information regarding the effects of conservation can be collected from any source, but in the absence of extensive research results or local expert knowledge, a case study is a convenient and relevant way to collect this information. A case study enables the conservation planner to document conservation systems currently used in a specific farming or ranching community, along with the motivations that led to their adoption. Having ready data about the effect of conservation systems enhances the client's ability to implement effective conservation technologies.

G. A case study is also a way to record conservation effects information. Resulting case studies become part of the FOTG, Section V, Part B (Conservation Effects).

(1) Types of Case Studies.—The three types of case studies are as follows:
   (i) A comparison of the "before and after treatment" conditions on a single site
   (ii) A comparison of two separate but comparable resources and land use situations (sites) on different farms or even on the same farm (e.g., one site with and one without treatment)
   (iii) A simple recording of client experiences with treatment on a single site regardless of the earlier conditions

(2) Procedure.—The FOTG, Section V, contains procedural references on guidance for the development and use of case studies as a source of conservation effects information. This is a useful reference for those interested in developing their own case study files.

H. The Conservation Effects Assessment Project (CEAP) is a multiagency effort to quantify the environmental effects of conservation practices and programs and develop the science base for managing the agricultural landscape for environmental quality. Project findings will be used to guide USDA conservation policy and program development and help conservationists and clients make more informed conservation decisions.

600.41 Integrating NEPA into the Planning Process

A. NEPA requirements will be incorporated into all steps and activities of the planning process as applicable and will not be considered as a separate process or requirement. The level of NEPA documentation will depend on findings during the scoping process or the environmental evaluation. EEs, which may lead to an EA or EIS, will be conducted for all NRCS planning activities and will be used to help determine the level of NEPA documentation required. Planners will identify the level of NEPA documentation required for each planning activity as early in the planning process as possible, and incorporate activities into each planning step to ensure that information required for NEPA documentation is developed simultaneously with the plan document. (Note that some programs such as the Watershed Program (PL-566) have specific planning procedures and plan content and format requirements. See the National Watershed Program Manual and Handbook).

B. Specific guidance related to general NRCS environmental compliance for NEPA, as well as all special environmental concerns (SECs) listed on the Form NRCS-CPA-52, "Environmental Evaluation Worksheet," can be found in section 600.71 and in Title 190, National Environmental Compliance Handbook (NECH), Part 610, in eDirectives.

(1) NRCS administers Federal assistance within the overall environmental policies outlined in 190-GM, Part 410, Subpart A, Section 410.3. It is important to note that NRCS policy is to consider environmental quality equal to economic, social, and other factors in decisionmaking. These policies were developed to comply with the requirements established by the CEQ, which requires Federal agencies to follow a systematic process when a Federal

action is proposed. CEQ regulations that implement NEPA also require that Federal agencies promulgate their own regulations that implement NEPA for their actions.

(2) NRCS regulations and policy implementing NEPA identify categories of activities that normally are categorically excluded, normally require an EA, and normally require an EIS. (See NRCS implementing regulations for NEPA in 7 CFR Part 650 and NRCS environmental compliance policy in 190-GM, Part 410.)

(3) Refer to the NRCS NEPA compliance flowchart in the National Environmental Compliance Handbook (190-NECH, Part 610, Subpart H, Section 610.100).

C. Applicability of the Environmental Evaluation in the Conservation Planning Process.—NRCS is required to conduct an EE for all planning and financial assistance, including, but not limited to the following:

(1) Development of individual conservation plans (including component plans, such as nutrient management plans and CNMPs)
(2) Areawide and watershed planning
(3) Financial assistance in the form of grants (e.g., Conservation Innovation Grants (CIGs))
(4) Conservation planning activities contracted to entities outside of NRCS (e.g., technical service providers (TSPs)).
(5) All NRCS conservation programs, including financial assistance
(6) Other State, Tribal, Territorial, or local programs that require NRCS approval (e.g., State cost-share program requiring NRCS approval of conservation practice completion)
(7) The establishment of new structures associated with Snowpack Telemetry (SNOTEL) sites, plant material facilities, etc.
(8) Propagation and release of plant materials
(9) Emergency Watershed Program (EWP) damage survey reports (DSRs) (using the DSR form in the EWP Manual)
(10) NRCS-assisted programs through outside agencies (e.g., FSA for CRP, BCAP, etc.)
(11) Infrastructure projects on NRCS easements (e.g., pipelines crossing easements)

D. The EE is used to determine the need for an EA or an EIS. The results of the EE are documented on the NRCS-CPA-52, "Environmental Evaluation Worksheet." Among other things, the NRCS-CPA-52 is used to document the appropriate use of a categorical exclusion and existing environmental analysis. The form, instructions and the worksheet can be found on the NRCS National Environmental Compliance Web site. A copy of the blank form is in section 600.71 Exception: An EE is not required when making Food Security Act highly erodible land (HEL) determinations or wetland determinations.

E. As a result of the EE process, the conclusions ("findings") that may be reached include any of the following:

(1) There is no Federal action, as defined by NEPA, subject to NRCS Federal regulations occurring that requires a NEPA document (see 190-NECH, Subpart D, Section 610.43, "The National Environmental Policy Act").
(2) The action is a Federal action that is categorically excluded with no extraordinary circumstances present so no further documentation is needed (see 190-NECH, Subpart D, Section 610.46, "The National Environmental Policy Act").
(3) There is an existing NRCS State, Tribal , Territorial, regional, or national programmatic NEPA document that has sufficiently analyzed the particular Federal action and there are no predicted significant adverse effects or extraordinary circumstances (see 190-NECH, Subpart F, Section 610.81, "NEPA Tools for Efficiency").

(4) Another Federal agency's NEPA document (EA or EIS) has been formally adopted by NRCS that sufficiently analyzes the specific action (see 190-NECH, Subpart F, Section 610.83, "NEPA Tools for Efficiency").
(5) The proposed action is a Federal action that has not been sufficiently analyzed or may involve predicted significant adverse environmental effects or extraordinary circumstances and may require an EA or EIS.

600.42 Working With Individuals and Groups

A. One of the key elements of an effective voluntary conservation program is the planner's understanding of the factors that influence client behavior. This is true for both individuals and groups. Partnerships and alliances can play a role to identify behavioral characteristics but the individual makes the change.

B. Working With Individuals.—There are myriad factors within the human and physical environment that can shape individuals' decisions relative to the adoption of conservation practices and systems. Personal values, as well as client needs and concerns, are shaped and reshaped by factors, such as community characteristics (agribusiness support), agency and organizational assistance (training), regulation, and changing climate conditions. In dialoguing with the client throughout the nine-step planning process, the planner must stay abreast of changing needs and conditions that influence the conservation decision process.

(1) From a financial standpoint, the planner must be aware of the economic factors that affect or result from conservation decisions, such as interest rates, market uncertainty, commodity prices, land tenure, taxes, land rights, customary rental agreements, costs, and farm programs. In addition, many personal characteristics, such as experience, education, background, and the working relationship with NRCS, partners, or the conservation district affect behavior.
(2) Throughout the planning process, and especially in the inventory phase, the planner seeks to broaden his or her understanding of the client's willingness to adopt conservation plans. Listening and observing will reveal the barriers and incentives to a client's adoption of conservation systems and practices. It is the planner's responsibility to be aware of this information in order to help the client, as appropriate, address the barriers and seek incentives. The planner can discover why a client may be able or willing to adopt a conservation plan by considering questions, such as the following:
   (i) Is there sufficient ecological, economic, and social information available for the client to make sound decisions, such as alternative systems, effects, impacts, and risks?
   (ii) Is the system too complex for the client to install and operate?
   (iii) Are adequate resources available, such as land and labor?
   (iv) Is the planning and evaluation horizon of the client long enough to realize the benefits of the system?
   (v) Is there a supporting network of agribusiness, agencies, or citizen groups to help the client install and manage the system?
   (vi) Does the system require increased management skill to install, operate, and maintain, and if so, is training available to help bridge the gap?
   (vii) Does NRCS information conflict with other agency or private sector information?
   (viii) Is the system compatible with existing production goals and enterprises?
   (ix) Are there any incentives or barriers to changing production methods?
   (x) Are there USDA or other programs that influence the client?
   (xi) Can the system be implemented on a small scale? On a large scale?
   (xii) Are the effects visible?
   (xiii) Have the risk and uncertainty in the analysis of the system been presented to the client?

C. Working with Groups.—Building alliances and partnerships is another important component of successful voluntary conservation programs. This approach is based on encouraging local land managers and stakeholders to take a greater responsibility for managing the Nation's resources. This, in turn, can empower local people, reduce the Nation's dependence on regulation, leverage both dollars and human resources, and reduce duplication of personnel and programs across Federal, State, Tribal, Territorial, and local agencies. The overarching objective is to create a forum in which individual and group interests can be expressed and reconciled, thereby changing the attitudes and behavior of clients and stakeholders.

(1) Coordinated Resource Management (CRM) is a collaborative, non-adversarial decision-making process. It is an example of one process that can be used for resource planning, problem solving, and conflict resolution and which allows for direct participation of everyone concerned with natural resource management in a given planning area.
(2) CRM is based on the concept that coordinating the use and management of resources results in improving resource management, minimizing conflict, and solving problems. It focuses on resource needs, and is not limited by individual, agency, or political boundaries.
(3) A guiding principle of CRM is that those who live, work, and recreate on a given piece of land are the people most interested in and capable of developing plans for its use. They assume ownership of the resulting plan.
(4) The CRM process is well suited to developing areawide conservation plans. For more information on this process, see the Coordinated Resource Management Guidelines published by the Society for Range Management.
(5) Developing a desired future condition held by a broad range of land managers, stakeholders, and agencies is essential for this approach to succeed. An interdisciplinary planning approach, where specialists and groups having different technical expertise act as a team to jointly evaluate existing and future environmental quality, can be very effective in bringing people with different interests together. In addition, the local team must identify critical success indicator or planning criteria to measure progress. Success can be measured using indicators, such as attitude changes, acceptance of involvement in an integrated planning process, significant ecological improvements, leveraged funds and personnel, and inputs by other agencies.

D. Historically Underserved Customers.—In working with both individuals and groups, planners must be proactive in identifying historically underserved customers, such as minority, small producers with limited resources, beginning farmers and ranchers, and Tribes. They will ensure that program benefits offered to them are on an equal basis with traditional customers. Also, planners must be aware that barriers may exist that prohibit or discourage participation by these individuals and groups. Those barriers must be identified and addressed in order to ensure equity in program development and participation, and in the delivery of program benefits or services under both federally assisted and federally conducted programs.

(1) Examples of Barriers
  (i) Limited Resources
  (ii) Educational Background or Training
  (iii) Lack of Equipment, Labor, or Capital
  (iv) Language
  (v) Culture
  (vi) Farm Size
  (vii) Lack of Access to Information
  (viii) Limited Cash Flow
  (ix) Discrimination
  (x) Alternatives not culturally relevant

(2) Examples of Actions to Overcome Barriers
  (i) Educational meetings
  (ii) Door-to-door contact
  (iii) Videos
  (iv) Focus group meetings
  (v) Printing publications in the local language
  (vi) Working with community leaders and Tribal elders
  (vii) Conducting local demonstration projects
  (viii) Learning about the client's culture
  (ix) Increased cost-share level
  (x) Matching conservation alternatives with client's needs and capabilities
  (xi) Allowing in-kind labor or equipment for the client's contribution
(3) These barriers and actions are not all-inclusive. They are meant to stimulate thought and action for identifying and effectively working with underserved customers.

E. Risk Management.—Clients make conservation and production decisions in an environment dominated by risk and uncertainty. Risks arise from weather variability, price fluctuations in both inputs and outputs, changes in government programs, regulations, pest infestations, new technology, marketing strategies, financial conditions, and lack of information. The planner must be aware of these risks, how clients manage their risk, and how conservation effects information can help reduce risk.

(1) The overriding problem in risk management is the lack of relevant, accurate information about probable outcomes. Clients react to the risk problem by using decision rules that mitigate risk (e.g., select the strategy with the best of the worst outcomes, the strategy that provides the least change, or the strategy that ensures survival because loans can be repaid). Clients also seek to reduce production risk by diversifying, selecting more stable enterprises, irrigating, and purchasing insurance (especially crop insurance).
(2) Market risk can be reduced by spreading sales over time, hedging on the commodity futures market, contracting sales with processors, or participating in various programs. Financial risk can be mitigated by maintaining a cash reserve, using self-liquidating loans (loans that can be paid off with income from collateral; for example, loans for feeder livestock), and steadily increasing net worth.
(3) Many conservation practices affect a client's risk level. For example, installing terraces may increase the producer's debt, reduce his or her income, and reduce options related to future equipment purchases. On the other hand, terraces can reduce the producer's risk by increasing water availability and preventing soil loss and the formation of gullies that lead to the loss of production and costly equipment repairs. Agronomic practices will have similar risk-increasing or risk-decreasing effects. In all cases, the conservation planner must work with the client to understand his or her risk tolerances and the effects of the conservation system on risk.
(4) One of the key points to remember is that the risk of a conservation decision can be significantly reduced by providing the decisionmaker with clear, relevant information on what is needed to install and operate the conservation system, its costs, and the onsite and offsite ecological, economic, and social effects.

F. Stewardship.—The term "stewardship" has been used since the beginning of the conservation movement. Webster defines stewardship as "the individual's responsibility to his life and property with proper regard to the rights of others." In this sense, stewardship implies that land managers view their actions in terms of how they affect their neighbors, their grandchildren, and all those that might be influenced by their production and conservation decisions.

Seen in this light, stewardship is about being responsible. It is about changing attitudes, forging local shared visions of the desired state for private and public natural resources, and facilitating the actions needed to realize the desired future condition. Institutionally, stewardship is about assisting land users to care for the resources.

G. Land Ethic.—The three broad motives for conservation are self-interest, legislation, and ethics. Although self-interest and legislative motivations for conservation are most often addressed by the client and the conservation planner, the land or environmental ethic can play a powerful role in conservation adoption. Understanding the land ethic requires an appreciation of the role of ethics in day-to-day life.

(1) In a formal sense, ethics is the science of moral duty that deals with idealized human behavior as it relates to achieving the greatest good. In a practical sense, ethics is expressed as a set of moral rules associated with how an individual interacts with other people and society. Whereas instincts impel a person to compete within the community, ethics induce him or her to cooperate within the community.
(2) In a natural resource setting, ethics can be applied to the relationship between humans and nature. In this context, the land ethic is associated with limitations on the range of actions that might be taken to maximize short-run profits or goals.
(3) Developing an ethical relationship with the environment or land depends on individuals and society understanding the ecological interconnectedness of the world. As our understanding of natural and human processes improves, the land ethic will evolve from a focus on individual resources, such as soil and water, to a focus on the biotic and abiotic community as a whole.
(4) In Aldo Leopold's words, "....a system of conservation based solely on economic self-interest is hopelessly lopsided. It tends to ignore, and thus eventually to eliminate, many elements in the land community that lack commercial value, but that are (as far as we know) essential to its healthy functioning. It assumes, falsely, I think, that the economic parts of the biotic clock will function without the uneconomic parts. It tends to relegate to government many functions eventually too large, too complex, or too widely dispersed to be performed by government. An ethical obligation on the part of the private owner is the only visible remedy for these situations." (Aldo Leopold, A Sand County Almanac, 1949)

600.43 Training Courses and Self-Development Opportunities

A. Conservation planning related training courses: Refer to the National Employee Development Center (NEDC) Web page for a NEDC course listing.

(1) C: Classroom
(2) S: Self-paced
(3) W: Web-based
(4) W(AC): Webinar

NRCS National Courses	**Type**	**Contact**
Introduction to NRCS (S,W)	NEDC	NEDS
Conservation Planning: Part I Modules 1-5(W)	NEDC	NEDS
Areawide Conservation Planning (C)	NEDC	NEDS
Economics of Conservation Planning (C)	NEDC	NEDS

Introduction to Ecological Principles: A Basic Ecology Course (S)	NEDC	NEDS
Introduction to Conservation Planning on Cropland (W,S)	NEDC	NEDS
Introduction to Water Quality (S)	NEDC	NEDS
Nutrient and Pest Management Considerations in Conservation Planning (W)	NEDC	NEDS
Environmental Compliance for Conservation Assistance (W)	NEDC	NEDS
Working Effectively with American Indians (C)	NEDC	NEDS
Working Effectively with Alaska Natives (C)	NEDC	NEDS

NRCS Regional and State Courses	**Type**	**Contact**
Conservation Planning Part II Modules 6-8 (C)	State	State
Conservation Planning Part III	Local	Local

B. Regions and States are encouraged to supplement this listing of training courses and self-development opportunities to assist the planner with the planning process, team building, conflict resolution, working with clients and stakeholders, etc.

C. Training Resources

(1) Aglearn
(2) S&T Training Library

Part 600 – National Planning Procedures Handbook (NPPH)

Subpart F – Areawide Conservation Planning

600.50 Areawide Conservation Planning

A. This handbook describes the planning process in detail and provides guidance on carrying out each planning step. The process itself is preceded by preplanning activities, which can play a critical role in the outcome and effectiveness of plan development.

B. What is an Areawide Conservation Plan?

(1) Areawide conservation plans are voluntary, comprehensive plans for watersheds or other broad-based geographical areas. Areawide conservation plan development considers all natural resources in the planning area as well as relevant social and economic considerations. Plan development follows the established nine-step planning process to assist local people, through a voluntary locally led effort, to assess their natural resource conditions and needs, set goals, identify programs and other resources to achieve those goals, develop proposals and recommendations, implement solutions, and measure their success. The locally led effort should consider all Federal, State, and local conservation programs and private sector programs, singly and in combination, as tools to solve natural resource concerns.

(2) The goal in an areawide conservation planning effort is to develop and implement an areawide conservation plan. Throughout the rest of this handbook, the term "areawide conservation plan" is used for that purpose. Where an areawide conservation planning effort is underway without authorized decisionmakers available, the product through planning step six is an areawide conservation assessment.

C. Who Develops an Areawide Conservation Plan?

NRCS may serve as the planner for areawide conservation plans or assessments, or may only provide technical assistance. Technical assistance may include resource information or analysis from discipline specialist. Areawide conservation plans may be developed with informal or formal groups. These groups may include any combination of the following: landowners or operators with agricultural land uses, urban landowners, homeowner associations, agencies, groups, various entities, conservation clubs, schools, or any combination of these or other individuals or organizations. In an informal group, the group is generally the decisionmaker if they have the authority to make decisions and implement the plan. The decisionmaker in a formal group, such as an irrigation district or a watershed district, is generally a board of elected or appointed officials who have responsibility under law for developing and implementing areawide conservation plans.

D. Preplanning Activities and Considerations

(1) Preplanning activities set the stage for conservation planning with the decisionmakers by ensuring that basic information is obtained and that background information, necessary to initiate the planning process, is assembled.

(2) The activities leading up to planning normally begin in one of three ways: Stakeholders from the potential planning area may contact the conservation district or NRCS to seek assistance in solving identified natural resource concerns or opportunities; NRCS, conservation district, or partner personnel may contact decisionmakers in potential planning area for the purpose of initiating planning activities; or proactive citizens may contact partners, the conservation district, or NRCS for planning assistance to prevent potential problems from occurring or to take advantage of opportunities.

(3) Preplanning activities are important to set the stage for areawide planning. Several items should be addressed before planning steps are undertaken.

(i) Identify the decision makers and stakeholders who will participate in the planning process and their respective roles.

(ii) Establish an interdisciplinary team as appropriate to assist with preplanning activities. Obtain assistance from key individuals in the planning area to identify stakeholders within each underserved user group; limited resource, beginning, and socially disadvantaged and veteran land users and residents.

(iii) Invite all interested or effected agencies, organizations, and interest groups to participate. Broad involvement is the cornerstone to successful areawide planning. Their input is vital to the process. Leaving any of them out may cause problems later in the planning process.

(iv) Assess the statutory and policy requirements that are required or may affect the planning process.

(v) Assess the available resources, tools, and data sources that are available to assist in the planning process.

(vi) Describe in general terms the planning process and the expected benefits of having a conservation plan to the stakeholders.

(vii) Explain to the decisionmakers the roles and responsibilities of the decisionmakers and stakeholders and NRCS.

(viii) Explain the role of the conservation district and the relationship the district program has in making technical assistance available to land users.

(ix) Define the planning area on a map and geospatial layers.

(x) Assemble all needed information and data for use in planning. The FOTG is a principal source of reference material pertinent to the field office.

(xi) Identify other sources of information or technical assistance that may be available from other agencies, organizations, etc.

E. People, Partnerships, and Communities

(1) Strengthening Public Involvement

Complex natural resource issues and concerns are inevitable in any community. A variety of State and Federal programs are designed to respond to natural resource needs within the parameters of limited budgets and changing political support. NRCS was founded on the principle of having local landowners identify their goals, assist in developing conservation alternatives, and make decisions to meet their goals. Today, the agency, through locally led conservation and other processes, continues to utilize public involvement as a way to effectively help people conserve soil, water, and other resources.

Figure 600-F1

Areawide planning engages participants from the public, private, and nonprofit sectors. The commitment of stakeholders should be obtained before the planning process begins.

The participants in areawide planning are important also for the resources they bring to the table. People who have expertise in conservation science, landscape architecture, and related areas; political power and connections; or financial resources or an understanding of how to tap needed resources may be particularly helpful in moving an areawide planning process forward.

Possible decisionmakers…

Possible stakeholders in areawide planning include—

- *Elected officials of the State, regional, and local governments*
- *Planners, managers, and other employees of the State, regional, and local governments*
- *Conservation and water resource districts*
- *Indian Tribes*
- *Research scientists, including conservation biologists, landscape architects, etc.*
- *Nonprofit conservation organizations*
- *State or Federal natural resources or other related agencies*
- *Professors and graduate students in related departments of local universities (e.g., landscape architecture, regional planning, wildlife ecology, landscape ecology, etc.)*
- *Representatives of large and small landowner interests*
- *Industry representatives*
- *Real estate developers*
- *Citizens*

(2) Working With Community Leaders

(i) Identifying and working with community leaders can be extremely beneficial when promoting conservation through locally led and watershed planning activities. It is even more crucial when working with underserved communities that have not previously worked with NRCS. The advantage of working with a community leader is that you will be working with someone who has already earned the community's trust. Gaining the community's trust will be a major hurdle for you to overcome. In some instances, it can take a period of months, if not years, for you to earn a community's trust. Identifying the right person or leader to work with you can help decrease the length of time it takes to accomplish your goals. If you do not work closely with a community leader, he or she can easily hamper your efforts.

(ii) Leaders tend to stand out from other community members. Remember, the public is only marginally involved in most issues. Only about 5 percent of community members are directly involved in decisionmaking, and not all of these people are community leaders. Research suggests that leaders might possess some, but certainly not all, of the following characteristics: good at giving instructions, empathetic, talkative, persistent, self-confident, popular, and original or creative.

(3) Developing and Maintaining a Network

A network is a system of relationships in which people exchange information and resources to achieve common goals or serve common interests. Networks are easy to join or leave and tend to be informal. However, networking can also take place through planned meetings. These meetings may or may not occur regularly and may or may not pursue joint initiatives. Networking is a process for expanding resources while maintaining your organizational autonomy. For most, the motivating factor for being in a network is the access to valuable

information and the expertise of others in the group. With more people involved, creativity and options increase. Networks can also provide a strong support system.

(4) Understanding Community Power Structures

Power in a community is the ability to affect the decisionmaking process and the use of resources, both public and private, within a community or watershed group. Power is simply the capacity to bring about change. It is the energy that gets things done. All levels of the conservation partnership need to know about community power structures in order to more effectively implement and maintain locally led conservation initiatives. A community can be defined as a watershed, region, town, county, or other geographic or geopolitical boundary. Examining the concept of power involves looking at the sources and structures that influence local communities and exploring the relationships that shape cooperative efforts. The conservationist who has a basic understanding of social power and who can identify the power actors in a community can enhance the opportunity for success in conservation.

(5) Working With People of Different Cultures

(i) NRCS offices across the continental United States, Alaska, Hawaii, and many U.S. territories constantly work with people of different cultures. While much of working successfully with people of different cultures is best learned on the job, there are some concepts and methods that have been shown to ease cross-cultural communications. Using such proven concepts and methods to work with people of other cultures will improve NRCS service delivery and build better relations with our expanding customer base.

(ii) American society is changing rapidly. We are witnessing a growing number of different ethnic and racial groups in America. This increase affects agriculture and NRCS in two primary ways:

- There is an increase in the number of producers who belong to different cultural groups.
- The NRCS workforce is growing more culturally diverse.

(6) Using a Multidisciplinary Approach to Conduct a Situational Analysis

(i) As a conservation planner, do you have a clear and detailed understanding of the social and natural resource processes operating in a geographic area or with a particular group of producers? If not, you may want to conduct a situational analysis. By conducting a situational analysis, conservation planners can discover needs and problems facing stakeholders. Determining the myriad of factors facing stakeholders allows you to customize the conservation planning process. This fact sheet will help you assess the internal and external factors that influence conservation activities, while meeting the goals of the producers and the community. (ii) Additional Information regarding working with people, partnerships, and communities is contained in exhibit 11.

F. National Environmental Policy Act (NEPA)

(1) NEPA is a law that became effective on January 1, 1970. NEPA was written to ensure that Federal decisionmakers take into account the environmental effects of their proposed actions and consider ways to avoid, minimize, or mitigate adverse effects before implementing the action. This is also the purpose of the NRCS environmental evaluation process.

(2) USDA regulation 7 CFR Subtitle A, Part 1b, sets forth departmental policy related to NEPA. The regulation states that—

(i) All policies and programs of the various USDA agencies must be planned, developed, and implemented so as to achieve the goals and to follow the procedures declared by NEPA in order to assure responsible stewardship of the environment for present and future generations.

(ii) Each USDA agency is responsible for compliance with this part, the regulations of Council on Environmental Quality (CEQ), and NEPA. Compliance will include the preparation and implementation of specific procedures and processes relating to the programs and activities of the individual agency, as necessary.

Figure 600-F2

NRCS Compliance with NEPA (i) All planning activities will be conducted in compliance with NEPA. See 180-NPPH, Part 600, Subpart D, Section 600.41, for more information on NEPA. This NPPH section provides additional planning guidance to assist planners in incorporating NEPA and other requirements into the planning process. NRCS policy for compliance with NEPA is located in the Title 190, General Manual, Part 410, "Compliance with NEPA."

(ii) NEPA will be incorporated into all steps and activities of the planning process and should not be considered as a separate process or requirement. The level of NEPA documentation will depend on findings during the scoping process or the environmental evaluation. Environmental evaluations, which may lead to an environmental assessment or environmental impact statement, will be conducted for all NRCS planning activities and will be used to help determine the level of NEPA documentation required.

(iii) Planners should identify the level of NEPA documentation required for each planning activity as early in the planning process as possible and incorporate activities into each planning step to ensure that information required for NEPA documentation is developed simultaneously with the plan document.

(iv) Following the guidance in this handbook will provide much of the information required for NEPA documentation. NEPA documentation may be published as a separate document or incorporated into the plan document. NRCS's programmatic NEPA documents may also contain additional NEPA compliance guidance for specific programs.

(v) The agency's specific responsibilities under NEPA and related laws (like the National Historic Preservation Act (NHPA) and the Endangered Species Act) vary depending upon the level of agency involvement and control. The agency's NEPA policy is designed to help planners meet the requirements of federal law and regulations and must be incorporated throughout the planning process, and likely revisited frequently, particularly as agency actions are defined and redefined.

G. Farmland Protection Policy Act (FPPA)

(1) Pursuant to the Farmland Protection Policy Act, the Secretary of Agriculture, in cooperation with other Federal agencies, is required to—
   (i) Use the criteria to identify and take into account the adverse effects of their programs on the preservation of farmland.
   (ii) Consider alternative actions, as appropriate, that could lessen adverse effects.
   (iii) Ensure that programs, to the extent practicable, are compatible with State, local governmental, and private programs and policies to protect farmland.

(2) The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It ensures that, to the extent possible, Federal programs are administered to be compatible with State, local governmental, and private programs and policies to protect farmland. Federal agencies are required to develop and review their policies and procedures to implement the FPPA every 2 years.

(3) The FPPA does not authorize the Federal Government to regulate the use of private or nonfederal land or, in any way, affect the property rights of owners.

(4) For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest, pasture, crop, or associated ag land.

Figure 600-F3

Farmland Conversion Impact Rating Form

NRCS uses a land evaluation and site assessment (LESA) system to establish a farmland conversion impact rating score on proposed sites of federally funded and assisted projects. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level.

The assessment is completed on Form AD-1006. The sponsoring agency completes the site assessment portion of the AD-1006, which assesses non-soil-related criteria such as the potential for impact on the local agricultural economy if the land is converted to nonfarm use and compatibility with existing agricultural use.

H. Land Evaluation Site Assessment

(1) The land evaluation and site assessment (LESA) system helps State and local officials make sound decisions about land use. Combined with forest measures and rangeland parameters, LESA can provide a technical framework to numerically rank land parcels based on local resource evaluation and site considerations.

(2) Land Evaluation

(i) In agricultural land evaluation, soils are rated and placed into groups ranging from the best to the least suited for a specific agricultural use, such as cropland, forestland, or rangeland. Then, a relative value is determined for each group. For example, the best group may be assigned a value of 100, while all other groups are assigned lower values. The land evaluation is based on data from the National Cooperative Soil Survey, often called the largest and most valuable natural resource database in the world.

(ii) LESA activities, such as measuring land and productivity, assist landowners and others prior to making land use conversions to nonagricultural uses.

(3) Site Assessment

(i) Site assessment involves three major areas:

- Non-soil factors related to agricultural use of a site
- Factors related to development pressures
- Other public values of a site

(ii) Each factor selected is assigned a range of possible values according to local needs and objectives. This process provides a rational, consistent, sound basis for making land use decisions.

(4) Local Committee or Work Group

In most cases, one or more committees or work groups should be organized to assist and guide the development of a LESA system. In areas where an agricultural land protection committee already exists, no new committee should be needed.

Figure 600-F4

Land Evaluation and Site Assessment System Design

When LESA is applied, a value for land evaluation is combined with a value for site assessment to determine the total value of a specific site for agriculture. The higher the total value of a site, the higher the capabilities of that site for agricultural use.

The LESA system can help units of government meet the following two overall objectives:

- *Facilitate identification and protection of important agricultural land*
- *Assist in implementing farmland protection policies*

LESA systems should be designed for consistent use in all applications. LESA provides a framework where land evaluation and site assessment procedures are documented before individual sites are considered. This process allows different individuals to evaluate sites consistently, without bias.

LESA systems are based on existing knowledge, but should be flexible enough to accommodate differences within States, counties, or areas. A LESA system may be developed at various levels of government—State, county, or township—or for an area such as a USDA-designated major land resource area (MLRA). LESA utilizes soil survey information and interpretations that are widely available throughout the United States, and planning concepts and principles that are regularly used by community planners.

LESA systems do not take away the power of local or State officials to make land use decisions, but help them make rational, consistent, and sound land use decisions. To do this, LESA systems include local values and objectives identified by a local work group or committee that helps develop the system. For this reason, a LESA system should be developed at the governmental level where it will be used—State, county, township, or town.

Finally, LESA systems need to be dependable. Planners and others need a reliable system to evaluate land and to determine under what conditions agricultural land should or should not be converted to nonagricultural uses. Soil survey information provides technically sound data for the land evaluation part of LESA. Thorough documentation of the site assessment part of LESA provides reliable information. Involving a local work group in the development phase also lends credibility to the system.

Additional Information regarding working with LESA is contained in exhibit 11.
A full description design and use of LESA systems may be found in the Land Evaluation Site Assessment Guidebook

I. Areawide Conservation Planning Steps

(1) The planning process for areawide conservation plans is the same as for individual conservation plans except for scope and scale that would add to both human and natural resource complexities. The process consists of nine steps, divided into three phases, which cover development, implementation, and evaluation. The planning process is not linear, but

dynamic and iterative, and previously completed steps may be revisited and refined as more information is gathered and the process proceeds. Complete and proper documentation is critical at each step of the planning process.

(2) The next portion of subpart F describes the details for carrying out the nine steps of areawide planning. The planning standard sets the minimum quality level for each step. The inputs provide sources of information to plug into the process, while the products describe the outputs of each step. These lists are not all-inclusive; therefore, planners are encouraged to supplement them as needed.

(3) Below is a detailed description of what items occur during each planning step along with recommendations on how to accomplish the items.

600.51 Phase I – Collection and Analysis

A. Step 1 – Identify Problems and Opportunities.—Identify existing resource problems and concerns and potential opportunities in the planning area.

(1) Description

Identify existing, potential, and perceived natural resource problems, opportunities, and concerns in the planning area. This also provides the first opportunity to determine associated resource concerns and opportunities in interrelated planning areas. The identified problems and opportunities and the decisionmaker and stakeholder objectives guide the remainder of the planning process and are the basis for the purpose and need for action that are documented on Form CPA-52, "Environmental Evaluation Worksheet." Initially, the decisionmakers, stakeholders, and planner may identify a limited number resource concerns. As planning progresses and additional information is gathered, other resource concerns and opportunities may be identified. Additionally the CPA-52 provides documentation that may be required in the development of NEPA documentation.

(2) General

Problem identification frequently begins the planning process and continues through the resource inventory and data analysis steps. Initial problems and opportunities are identified onsite based on readily available information and discussion with the decisionmakers and stakeholders. The planner may have additional information available relating to natural resource needs based on information available from the conservation district or other areawide conservation plans. Generally, this step will not be finalized until the resource data are analyzed in Step 4, "Analyze Resource Data," although additional problems, opportunities, and concerns may be identified throughout the entire planning process. Some conservation alternatives may create additional indirect resource related issues and concerns that will need to be addressed by the planner and decisionmakers and stakeholder.

(3) Planning Standard

The decisionmakers' resource problems, opportunities, and concerns are identified and documented.

(4) Inputs

(i) Decision maker and stakeholder input
(ii) The planner's experience and knowledge of the area
(iii) Common resource area information
(iv) Conservation district long-range plan, annual plan, and priorities
(v) Locally led assessments
(vi) Other areawide conservation plans, or comprehensive plans where they exist

(vii) Information available from other sources, such as State and Federal agencies, universities, or centers of research
(viii) Soil survey
(ix) Discipline manuals and handbooks
(x) FOTG, Sections I, II, III, and V

(5) Products
(i) Identification and documentation of problems, opportunities, and concerns in the case file assistance notes
(ii) Communication with the decisionmakers
(iii) Mapping format, scale, precision, and role of technology
(iv) Base map with planning boundary
(v) Preliminary identification of SWAPAE+H resource problems and opportunities documented on base maps and short reports

Figure 600-F5

What	How	Resources and Tools
Identify the planning area and stakeholders.	• Identify the decisionmakers and stakeholders associated with the planning area.	• NRCS past clients, conservation and water resource districts, other Federal, State, Tribal, and local government agencies
Complete an initial assessment of the planning area's problems, opportunities related to natural resources and human considerations.	• Gather initial information about the area's problems, and opportunities • Gather data on planning area existing conditions • Identify resource concerns • Identify stakeholders that may contribute to planning effort	• Interviews with decisionmakers, meetings with stakeholders • Existing plans that include the planning area and any previous NRCS assessments and conservation plans
Establish an interdisciplinary planning team.	• The planning team should consist of NRCS and non-NRCS technical specialists who have the expertise to effectively evaluate existing natural and cultural resource conditions and to make recommendations for the resolution of natural resource problems.	• Meetings with decisionmaker, meetings with stakeholders • Planner's knowledge of available technical specialist in the area
Complete an initial reconnaissance of the planning area.	• Conduct a field investigation of the planning area with the stakeholders. This should be done by the interdisciplinary team. Representatives of other agencies should be encouraged to participate.	• Interdisciplinary team's knowledge of planning area • Initial assessment of planning area problems and opportunities
Record identified problems, opportunities, and concerns.	• Develop a database of the decisionmakers and stakeholder's problems, opportunities, and concerns	• Nominal group process or other facilitated group process

	associated with all natural resources. • Record and organize natural resource problems and opportunities into clear concise statements, resource concern worksheets. • Document EE data per State, Tribal, Territorial, and • Federal guidance (see section 600.71). • Document stakeholder and decisionmaker meetings in assistance notes.	
Garner stakeholder support the process involved in conducting an inventory and evaluation of the resources.	• Describe to stakeholders the steps of the conservation planning process. • Gain consensus on moving forward with the planning process.	NRCS Social Sciences Team information and training

B. Step 2 – Determine Objectives.—Identify and document the project objectives.

(1) Description

Determining decisionmaker's and stakeholder's planning objectives requires developing an understanding with the decisionmakers and stakeholder of the desired future conditions for the planning area as compared to the existing conditions. This is the purpose for the decisionmakers and stakeholders to take action. It includes the desired resource uses, resource problem reductions, onsite and offsite ecological protection, and production concerns. As resources are inventoried, their interactions are analyzed, and alternatives formulated, objectives may need to be reviewed and modified.

- There may be times when withdrawal of technical assistance becomes necessary.
- Technical assistance may be withdrawn when decisionmaker's and stakeholder's objectives will result in a negative effect on natural resources, onsite or offsite.
- Technical assistance may also be withdrawn if a decisionmakers and stakeholder fails to comply with or will not agree to actions required to be taken by NRCS to comply with local, State, Tribal, Territorial, or Federal regulatory requirements.
- For additional information about withdrawing assistance, see Title 440, Conservation Programs Manual (CPM), Part 525, Subpart A, Section 525.4.

(2) General

The purpose of this planning step is to determine the stakeholders' planning objectives, based on the stakeholders' needs and values regarding the use, treatment, and management of the planning area.

- Help the stakeholders think more broadly about the onsite and offsite problems and opportunities for natural resource protection or enhancement and to consider policy issues, such as State, Tribal, Territorial, and Federal laws or mandates
- Assist the decisionmakers and stakeholder in making informed decisions that result in the wise use and conservation of resources. Due to the dynamic nature of the planning process, objectives may not be finalized until later in the planning process.
- Review the pertinent local, State, and regional program and legal requirements that could have an impact on current or potential activities of the decisionmakers. The

purpose is to be more proactive in providing relevant information for the decisionmakers to make decisions. Begin to consider the decisionmakers' ability and willingness to meet the financial obligations necessary to implement conservation systems.

- Obtain information needed to comply with NEPA and other environmental laws, and to satisfy specific State or Federal program requirements (i.e., State non-point source pollution abatement mandates, USDA farm program eligibility requirements).

(3) Planning Standard

Sufficient data and information are gathered to analyze and understand the natural resource conditions in the planning area.

(4) Inputs

(i) Knowledgeable residents, for an areawide conservation planning situation
(ii) Stated objectives, and resource problems and opportunities identified
(iii) Aerial photography, soils maps, and other data collected during Step 1
(iv) Inventory tools and procedures (see 180-NPPH, Part 600, Subpart C, Section 600.20C)
(v) State and Federal reports and evaluations (e.g., soil surveys, highly erodible land determinations, and census data).
(vi) Previous resource inventories completed by NRCS or others
(vii) Field observations and measurements
(viii) FOTG resource references, soils information, planning criteria, and practice standards, sections I, II, III, and IV

(5) Products

(i) A list of the client's objectives recorded in the case file

(ii) Assistance notes Figure 600-F6

What	How	Resources and Tools
1. Reach consensus on the decisionmakers and stakeholder expectations for the planning effort.	• Identify the decisionmakers and stakeholder desired future conditions for the planning area as compared to existing conditions. • Identify project financial constraints and possible sources of funding.	Decisionmaker and stakeholder meetings
2. Document the decisionmaker and stakeholder objectives.	• Record and document the decisionmaker and stakeholder objectives in terms of the above expectations. • Document decisionmaker and stakeholder meetings in assistance notes. • Continue to document the decisionmaker and stakeholder objectives as they are better defined and understood, by the planner, decisionmakers, and stakeholders throughout the planning process.	Nominal group process or other facilitated group process

3. Determine whether the decisionmaker and stakeholder objectives are consistent with those of the conservation district and NRCS.	• Utilize the NRCS strategic plan, Chief's priorities, State resource assessment (SRA), district long-range plan, local work group priorities, and other local and State assessments to determine NRCS resource priorities. • Explain NRCS priorities and targets to the stakeholders, so that it is understood why NRCS may need to withdraw assistance if the decisionmakers and stakeholder objectives result in a negative effect for other onsite or offsite resources. • Document EE data per State, Tribal, Territorial, and Federal guidance. See section 600.71.	NRCS strategic plan Existing NRCS priorities State, Tribal, and Federal guidance
4. Determine if NRCS has appropriate technology or resources.	• Assess the technology and resources needed for this planning effort and their availability from NRCS. • Identify appropriate agencies, groups, or other entities to participate as a partner in the planning process, when NRCS does not possess the appropriate technology or resources.	NRCS staff Other Federal, State and local staff
5. Determine the need to continue the planning process.	• Review the stated objectives and available resources with the stakeholders to determine if the NRCS planning process will continue, if other organization will assume lead for project, or if project will be discontinued. •	Decisionmaker and stakeholder meetings
6. Determine the next steps and a schedule to complete the planning process.	• Determine what information and tool resources will be needed to start resource inventory process. • Discuss with the stakeholders the tasks that need to be accomplished and the proposed timelines for completing the planning process.	Decisionmaker and stakeholder meetings

C. Step 3 – Inventory Resources.—Inventory and document the natural resources and their current onsite and offsite conditions and effects, as well as the economic and social considerations related to the resources.

(1) Description

Collect appropriate natural resource, economic, and social information about the planning area and related areas. Use this information to—

- Identify existing or potential resource concerns or opportunities.
- Further define known existing and potential resource concerns and opportunities.
- Clarify resource concerns.
- Formulate and evaluate alternatives.
- Gather pertinent information concerning the affected resources, the human considerations, and operation and management.

(2) General

Identify of SWAPAE+H resources and special environmental concerns (SECs) that are present and are the basis of all planning efforts. This information furthers the understanding of the presence of the natural resources in the planning area. Planners will inventory all applicable resources (see section 600.75). The inventory will provide the planner the understanding of the existing natural resource conditions necessary to convey resource conditions to the stakeholders in a knowledgeable manner.

(3) Planning Standard

Sufficient data and information are gathered to analyze and understand the natural resource conditions in the planning area.

(4) Inputs
(i) Knowledgeable stakeholders, for an areawide conservation planning situation
(ii) Stated objectives, and resource problems and opportunities identified
(iii) Aerial photography
(iv) Inventory tools and procedures (see 180-NPPH, Part 600, Subpart C, Section 600.20 C)
(v) State and Federal reports and evaluations (e.g., soil surveys, highly erodible land determinations, and census data).
(vi) Previous resource inventories completed by NRCS or others
(vii) Field observations and measurements
(viii) FOTG resource references, soils information, planning criteria, and practice standards, sections I, II, III, and IV

(5) Products
(i) Detailed resource inventories of the planning unit, as well as related offsite information completed through self-assessment screening tools or workbook online programs
(ii) Information on human considerations
(iii) Identification of other ecological concerns, such as threatened and endangered species
(iv) Identification of cultural resources
(v) Identification of visual resources
(vi) Land units, locations, determinations, and decisionmakers and land relationships described
(vii) Identification of infrastructure physical features such as roads, houses, fences, power lines and other utilities
(viii) Identification of how the decisionmakers manage resources, including kinds, amounts, and timing of management activities
(ix) Benchmark data for the planning area
(x) Assistance notes for technical services provided to the decisionmakers

Figure 600-F7

What	How	Resources and Tools
1. Establish the types of inventories and degree of detail needed in the inventory.	• Review the objectives developed in planning Step 2, "Determine Objectives," as they relate to land uses, production goals, problems, opportunities, and other concerns. • Select the appropriate inventories for each proposed land use, using the appropriate discipline handbooks for detailed guidance. • Tailor the level of inventory detail to the complexity of the resource setting and the identified problems, opportunities, and objectives.	Discipline specialist and literature reviews.
2. Collect available information.	• Establish a list of potential resource concerns and opportunities by reviewing existing plans for the area. • Identify factors that could hinder plan development and implementation, such as the project's financial constraints, managerial skill levels, or commitment. • Develop a list of State, Tribal, Territorial, and Federal mandates that currently affect or could affect existing operations.	• Soil Survey and other geographic information • Conservation district long-range plans • Previous areawide plans • Existing watershed plans • FOTG, Sections I and III • State and local existing regional or other land use plans

		• Resources and expertise of others
3. Maintain good communications between the stakeholders and the planner through the resource inventory process.	• Discuss the purpose and importance of the inventory process with the stakeholders. • Emphasize to the stakeholders the importance of their knowledge of the planning area and associated resources. Emphasize that their input is essential. • Explain what will be done during the inventory process and why. • Estimate how much time is required to carry out the field inventories. • Always obtain permission from landowners before conducting onsite visits.	Meetings with stakeholders
4. Conduct the inventory onsite. Include the stakeholders in the field inventory activities.	• Familiarize yourself with the resource inventory methods described in Figure 600-C6, "Inventory Methods." • Follow inventory procedures as described in appropriate discipline handbooks and manuals. • Use procedures and guidelines available for specific resource inventories, such as the Water Quality Indicators Guide and other assessment tools listed in the FOTG, Section I. • Collect the information necessary to describe the benchmark condition (e.g., resources; types, amounts, and timing of operations and activities) and document. • Document EE data per State, Tribal, Territorial, and Federal guidance. See section 600.71. • Determine the effectiveness of existing management measures and practices in addressing resource concerns.	
5. Use natural resources as teaching aids while in the field with the stakeholders.	• Encourage the stakeholders to experience "hands-on" participation in the inventory process by helping with data collection. This provides an opportunity for the stakeholders to learn conservation principles. • Encourage the stakeholders to conduct actual measurements, such as clipping vegetation, checking soil conditions, boring trees, and recording information.	
6. Record the resource inventory data to facilitate analysis in Step 4, "Analyze Resource Data."	• Identify planning land units. • Review, and update as necessary, planning land units with key information, including current land use. • Update information on the relationships of the stakeholders on planning land units determined in planning Step 1, "Identify Problems and Opportunities," and Step 2, "Determine Objectives." • Record utilities, easements, legal constraints, and determinations. • Review soils information for each planning land unit. • Record benchmark data • Document discussion between planner and stakeholders in assistance notes.	

D. Step 4 – Analyze Resource Data.—Analyze the resource information gathered in Step 3, "Inventory Resources," to clearly define the existing natural resource conditions, along with economic and social issues related to the resources. Information from this step will help to further define and clarify problems, concerns, and opportunities.

(1) Description

Study the resource data and clearly define the natural resource conditions, including limitations to their use and potentials. This step provides the information needed to formulate and evaluate alternatives. The analyses should clearly establish the cause and effect relationships and provide information about existing and future conditions.

(2) General

(i) To use the information gathered during the inventory process to full advantage, the planner must interpret the inventory data. Analysis is done to provide insight into natural resource information for the planner and to present that information in a meaningful and understandable form to the decisionmakers. The format in which information is presented to the decisionmakers has a significant influence on the decisionmaking process.

(ii) For some resources, analysis methods are well established. They are described in corresponding NRCS technical discipline handbooks and manuals. The FOTG, Section I, provides a list of technical references that relate to natural resource analysis. NRCS-approved automated analysis tools and reports generated can provide the planner and decisionmakers with basic inventory analysis data.

(iii) Analysis of the natural resource data will help clarify the products from planning steps 1 and 2. When developing an areawide conservation plan or updating a conservation partner long-range plan, if it is determined that new objectives will not be addressed by application of existing planning criteria, new localized criteria may be developed and submitted to the NRCS State specialists, through the local field office, for approval. These additional criteria, developed with guidance from NRCS, will be based on appropriate scientific guidance, local conditions, and input from partners, as needed.

(iv) At this point in the planning process, there should be agreement on problems, opportunities, and objectives. Upon completion of this planning step, the planning process moves into phase II (if other issues are identified, the planner may need to return to previous planning steps).

(3) Planning Standard

The benchmark condition is documented. Results are displayed in easily understood formats depicting current natural resource conditions, physical characteristics of the planning unit, and comparisons between existing and potential conditions. The causes of the resource problems are identified. An environmental evaluation is documented.

(4) Inputs

(i) Decision makers' objectives
(ii) Identified problems, opportunities, and concerns
(iii) Resource inventory data
(iv) FOTG, Sections I, II, III and V
(v) Resource evaluation tools (RUSLE, WEQ, etc.)

(5) Products

(i) A complete analysis of all resources inventoried
(ii) A clear statement of the benchmark condition of the planning unit and related areas
(iii) Environmental evaluation data
(iv) Cultural resources evaluation data
(v) Other program and legal evaluations data
(vi) Identification of the causes or conditions that resulted in the resource problems
(vii) A complete definition of problems, opportunities, and concerns (planning step 1 is completed to the extent that the decisionmakers and planner reach agreement)
(viii) A complete statement of objectives (planning step 2 is completed to the extent that the decisionmakers and planner reach agreement)
(ix) New planning criteria are established as needed

Figure 600-F8

What	How	Resources and Tools
1. Determine the method of analyses to be completed.	• Determine the types of analyses to be completed by reviewing the project's objectives, resource concerns, SECs, land and resource uses, and the location of the planning area. • Identify the resource considerations and determine the best method of calculating resource effects and outcomes. • Request appropriate agency, group, or entity for assistance after obtaining the decision maker's concurrence, in instances where the type or extent of resource problems exceeds the expertise or resources available.	• FOTG, Section I • Stakeholders and other resource agencies and groups.
2. Establish scope, intensity, degree of accuracy, and procedures to be used, utilizing discipline specialists as needed.	• Review the findings of the cultural resource/historic property inventory. • Recognize cause and effect relationships between planning areas. • Identify resource stressors, which are either natural or human-induced actions or events that cause changes in the existing condition of an ecological system.	Discipline specialist and literature reviews
3. Conduct the analysis.	• Use procedures in appropriate discipline handbooks or manuals and automated analysis tools (e.g., RUSLE2, WEPS, etc.). See Figure 600-C6, "Inventory Methods."	
4. Compare the results of the analysis with planning criteria, problems, opportunities, and objectives.	• Compare the results of the analysis with the planning criteria in the FOTG, Section III, and with the problems, opportunities, and objectives determined in planning Step 1, "Identify Problems and Opportunities," and Step 2, "Determine Objectives." • Use the inventory data that were collected, based on project objectives, to determine the type, amount, and extent of existing and potential resource concerns.	• FOTG, Section III • Collected Data
5. Describe and record the benchmark condition.	• Describe and record the benchmark condition, including existing practices, identified resource concerns, human resources, and special environmental concerns. Include the type, amount, and location. Quantities are shown in standard units (e.g., tons per acre per year, parts per volume of water, yield per acre, etc.). • Document EE data per State, Tribal, Territorial, and Federal guidance. See section 600.71. • Document discussion between planner stakeholders in assistance notes.	
6. Produce resource maps and reports.	• Display the resource information on maps, showing the location and the extent of the condition.	

600.52 Phase II – Decision Support

A. Step 5 – Formulate Alternatives.—Formulate alternatives that will achieve the objectives, solve identified natural resource concerns, and take advantage of opportunities to improve or protect resource conditions, and demonstrate a variety of technical and economic implementation strategies.

(1) Description

(i) Develop alternatives that will achieve the objectives of the decisionmakers, solve the identified problems, take advantage of opportunities, and prevent additional problems from occurring.

(ii) A broad range of technically feasible alternatives should be developed with the stakeholders. Alternatives may include an appropriate mix of structural and nonstructural measures.

(iii) Include measures that mitigate potential adverse impacts on the resources. Also consider the potential to address regulatory requirements, based on the decisionmakers' desires and objectives.

(2) General

(i) This planning step begins phase II of the planning process. Revisit earlier steps if new objectives or concerns are identified.

(ii) 180-NPPH, Part 600, Subpart B, Section 600.21, "Guidance for Planning Resource Management Systems (RMS)," outlines the thought process the planner should use with the decisionmakers. The purpose of formulating alternatives is to provide the most effective, efficient, and economical conservation treatments that meet planning criteria and are acceptable to the decisionmakers in solving problems, addressing opportunities, and meeting the stated objectives. These alternatives relate to identified problems and opportunities and are developed in view of the cultural, social, ecological, and economic conditions of the planning area.

(iii) During the alternative formulation process, the planner should use the associated conservation system guides developed and located in the local FOTG, Section III, located at http://www.nrcs.usda.gov/technical/efotg/. Identify the State and county in which the plan is being developed to reference localized conservation system guides.

(iv) Include the stakeholders in the formulation of alternatives. This allows practical alternative formulation, improves decisionmaking, and enhances the chances of successful implementation. For areawide conservation plans, it is essential that stakeholders, the public, special interest groups, and State and Federal agencies participate in the development of alternatives.

(v) Develop enough alternatives to provide the decisionmakers with the opportunity to consider several possibilities.

(vi) If incorrect or insufficient data has been assembled for formulating alternatives, the planner needs to return to planning steps 3 and 4 before proceeding.

(vii) The planner must have a clear understanding of the problems, including cause and effect relationships. If it is noted that the problem is not clearly identified or defined, return to planning step 4 and review these concerns with the decisionmakers.

(3) Planning Standard

Alternative treatments are developed to meet planning criteria, the objectives of the decisionmakers, in conjunction with the stakeholders.

(4) Inputs

(i) The decisionmakers and stakeholder objectives from planning step 2

(ii) Physical, cultural resource, social, economic, and ecological information pertaining to the planning area and related areas

(iii) List of resource problems, opportunities and concerns, from planning step 1

(iv) Resource data and analysis from planning steps 3 and 4

(v) FOTG, Sections II, III, IV, and V

(5) Products

A description of the alternatives available to the decisionmakers

Figure 600-F9

What	How	Resources and Tools
1. Identify conservation systems and other treatments that will address the objectives from planning step 2, and the problems and opportunities from planning step 1. Consider both land treatment (nonstructural and structural) and preventive measures.	• Obtain input from the public, special interest groups, Indian Tribes, and local, State, and Federal agencies.	• Public meetings, Federal Register notices, and personal contacts with colleagues in other agencies.
2. Develop alternatives.	• Make a preliminary evaluation of the effects of each system or practice. Formulate scenarios of future conditions if no accelerated action is taken. Group complementary measures that have a positive effect into alternatives. Each alternative should provide results that meet planning criteria.	Conservation Practice Physical Effects (CPPE) , Conservation Effects Assessment Project (CEAP)
3. Estimate the costs and effects of each alternative.	• Develop conceptual designs and cost estimates. Complete an initial estimate of ecological, social, and economic effects. Establish the acceptability of the alternatives to the stakeholders, the public, Indian tribes, and State and Federal agencies. Check to determine that the alternative is complete (contains all components, including operation and maintenance) to ensure that it will function as planned and will produce the desired effects. Include measures needed to mitigate any potential ecological damages.	Title 190, General Manual (GM), Part 410
4. Obtain decisionmakers and stakeholder input.	• Keep the stakeholders involved in the process of developing alternatives. Discuss progress made toward alternative development with the stakeholders. Involve the stakeholders in identifying and formulating alternatives. For each alternative, evaluate the likelihood of acceptance.	Public involvement techniques
5. Record the alternatives	• Make a record of the alternatives using a format that meets the needs of the stakeholders. Planners may use CPA-52 in the NPPH for documentation or a similar format.	

B. Step 6 – Evaluate Alternatives.—Evaluate the alternatives to determine their effects in addressing the project objectives and the identified natural resource concerns and opportunities. Evaluate the projected effects on social, economic, and ecological concerns. Special attention must be given to those ecological values protected by law, treaty or Executive order.

(1) Description

Evaluate the alternatives to determine their effectiveness in addressing the decisionmakers' problems, opportunities and objectives. Attention must be given to those ecological values protected by law, treaty or Executive order.

(2) General

(i) The purpose of evaluating alternatives is to provide the decisionmakers with the information needed to make sound decisions. This provides the decisionmakers further opportunity to be involved in the planning process and maximizes the likelihood of full implementation, including proper operation and maintenance.

(ii) During the evaluation of alternatives, careful consideration must be given to social, economic, and ecological resource factors that influence planning. The planner may discover a need to revisit any or all of the previous steps during discussions with the decisionmakers or during any part of the evaluation.

(3) Planning Standard

The effects of each alternative are evaluated and the impacts are described. The alternatives are compared to benchmark conditions to evaluate their ability to solve problems, meet planning criteria, and meet the decisionmakers' objectives.

(4) Inputs

(i) The decisionmakers' objectives from planning step 2
(ii) FOTG/eFOTG, Sections I, II, III, IV, and V
(iii) List of problems and opportunities developed during planning step 1
(iv) Benchmark data from planning step 4
(v) List of alternatives from planning step 5
(vi) Environmental and cultural resource evaluations
(vii) Program information and requirements

(5) Products

(i) A set of practical RMS alternatives that is compatible with decisionmakers and NRCS objectives
(ii) A record of public participation for areawide conservation planning
(iii) An evaluation, for each alternative, displaying the effects and impacts for the decisionmakers to consider and use as a basis for decisionmaking for the conservation plan
(iv) Technical assistance notes reflecting discussions between the planner and the decisionmakers

Figure 600-F10

What	How	Resources and Tools
1. Quantify the effects on the physical resources, where possible, both for the benchmark and each alternative.	• Quantification of the effects should be done according to the action plan or as agreed-to by the interdisciplinary team. The level of detail in the evaluation of the effects for each alternative will vary, and become more refined, as needed, in the selection process. The decisionmakers, stakeholders, Indian Tribes, other agencies, and interest groups should be included in the quantification process.	• The FOTG, Section V, "Conservation Effects," and associated materials, such as references and technical notes; CPPE, "Site-Specific Practice Effects" worksheets; "Resource Management Systems Options" worksheets; and case studies. • Research publications, experiment station reports, water resource documents. • Simulation models. • Effect quantities should be shown in standard

		units. (e.g., tons per acre per year, parts per volume of water or concentrations, a visibility index, yield per acre, or number per acre)
2. Quantify effects of each alternative on social and economic considerations. Describe, in qualitative terms, effects that cannot be quantified.	• Consider the consequences of actions on larger and smaller planning areas. See in section 600.11 (9) for a partial listing of economic and social considerations. • If cultural resources are present, an evaluation is conducted according to policy	• Interviews with stakeholders provide insight into the effects of the benchmark and proposed alternatives on human considerations. • 420-GM, Part 401 • 200-GM , Part 400
3. Convert effects to monetary terms. Detail is determined by the decisionmakers and stakeholder's desires. Consider the tradeoffs between short-term profit needs and long-term sustainability.	• Estimate the costs of other effects must be estimated. The type, amount, and timing of actions included in the alternative should be included.	FOTG, Section I
4. Determine the beneficial and adverse impacts of each alternative.	• Compare the effects of each alternative to the benchmark. The stakeholders decide if the impacts are desirable or undesirable. • Evaluate the risk and uncertainty associated with each alternative.	
5. Present the evaluations in a manner easily understood by the stakeholders.	The same format should be used for the benchmark and all alternatives, and should contain the following: • A description of the resource setting • A description of the management system • A complete list of the type, amount, and timing of actions involved in the management system that may change as a result of the plan • Effects of the actions on the resources and human considerations, and • Impacts of each alternative in comparison to the benchmark.	• FOTG, Section V • Conservation Effects • Program Manuals
6. Identify NRCS programs, programs of other agencies, and other implementation and funding opportunities that may be available to implement the alternatives.	• Evaluate program and funding opportunities inside and outside of NRCS for potential implementation opportunities. • Develop a list of USDA programs with a brief description of each. • Solicit input from other agencies, stakeholders, and decisionmakers for additional programs or funding opportunities available.	• Stakeholder meetings • USDA and other Federal, State and local funding opportunity listings

	• Evaluate the potential for specific programs or other funding to implement proposed actions. • Record and review the information with the stakeholders.	

C. Step 7 – Make Decisions.—The decisionmakers and stakeholders reach consensus on their preferred alternatives and work with the planner to schedule the conservation system and practice implementation.

(1) Description

The decisionmakers determine which alternatives to implement and the planner documents the decisions. Public review and comment are obtained, if needed, before a decision is reached. Documentation includes recording the decision and preparing the conservation plan or areawide conservation plan, NEPA documents, required cultural resources documents.

(2) General

The planner assists the decisionmakers in selecting conservation treatment alternatives. In this planning step, the planner reviews the conservation alternatives and the decisionmakers select one or more for implementation.

(3) Planning Standard

Plan alternatives are selected based on the decisionmakers' clear understanding of the impacts of each alternative. The selected alternative is recorded in the decisionmakers' plan.

(4) Inputs
(i) A set of evaluated alternatives
(ii) Conservation effects and impacts information

(5) Products
(i) Conservation plan document with the selected alternative, including potential program or implementation opportunities, and operation and maintenance
(ii) Record of public participation for areawide conservation plans
(iii) Environmental compliance documentation, including NEPA and NHPA.
(iv) Cultural resource documents, including findings and negative findings reports
(v) Revised conservation effects and impacts information

Figure 600-F11

What	How	Resources and Tools
1. Present the alternatives and evaluations.	• Review the alternatives and evaluation data from planning step 6 with the stakeholders. • Discuss the advantages and disadvantages of each alternative, including the social, cultural resource, economic, and ecological effect and constraint imposed by treaty; Federal, State and local laws; and regulations. Point out the beneficial and adverse impacts to aid the stakeholders in reaching a decision.	Decisionmaker and stakeholder meetings
2. Provide the opportunity for public response.	Prepare notices, and schedule public meetings to solicit public response.	• Public meetings • Mailings • Review of NEPA documents • Federal Register notices, as appropriate.

3. The decisionmaker makes decisions.	• If the decisionmakers choose one or more of the alternatives, proceed to item 4. • If the decisionmakers choose to implement only part of an alternative, planning assistance will continue on a progressive basis toward applying alternatives that meet planning criteria. Return to planning step 6 and evaluate the decisionmakers' selected portion. • If the decisionmakers do not choose one of the alternatives, yet are interested in exploring more options, return to one or more of the previous planning steps.	
4. Record the selected alternatives and schedule practices.	Complete the following items: • Record the selected alternatives as the planned systems. • Schedule practice application for implementation (This may include initiating the planning process for individual conservation plans within the areawide conservation plan). • Adjust effects and impacts, if needed. • Record assistance notes reflecting discussions with the decisionmakers not otherwise captured in the plan development. • Explain the interdependency of certain practices as practice scheduling is completed.	

600.53 Phase III – Application and Evaluation

A. Step 8 – Implement the Plan.—The areawide stakeholders or the decisionmakers of individual conservation plans implement the selected alternatives. The planner or technical expert provides the land manager with detailed practice implementation information, including engineered designs. Conservation staff will also provide practice layout, construction inspection, and certification. Each land manager directs the implementation of each practice. The planner provides encouragement to the stakeholders for continued implementation.

(1) Description

Implementing the plan includes providing technical assistance to plan and implement conservation practices that support the areawide plan and obtaining needed permits, funding, land rights, surveys, final designs, and inspections for structural practices. It also includes the operation, maintenance, and management needed by the areawide or individual decisionmakers to assure proper functioning of practices following installation.

(2) General

(i) Implementing a plan is the process of carrying out the conservation treatments that make up the planned conservation systems. The decisionmakers must have a clear understanding of the selected alternatives in order to effectively implement the plan. The decisionmakers may be able to implement the plan without additional technical or financial assistance. Generally, additional technical assistance is necessary, and plan revisions are occasionally warranted. Additional information or documentation may be required by a specific financial assistance program. Thorough planning is essential for providing efficient and effective technical assistance, and minimizes plan revisions.

(ii) Most areawide conservation plans require the involvement of numerous disciplines, various NRCS office levels, and sponsoring entities, as well as local, State, and Federal agencies.

(iii) Implementation includes the design, layout, construction, inspection, management, operation, and maintenance of planned systems and practices. Specific program

requirements and deadlines may also be involved and need to be considered when scheduling assistance with areawide or individual decisionmakers.

(3) Planning Standard

The decisionmakers have adequate information and understanding to implement, operate, and maintain the plan alternatives. Practices implemented with NRCS technical assistance will be installed according to NRCS standards and specifications.

(4) Inputs
(i) Conservation plan or areawide conservation plan
(ii) Case file data
(iii) Technical studies
(iv) Environmental evaluations and documents
(v) All necessary permits
(vi) Statements of work
(vii) Job sheets
(viii) Conservation practice standards and specifications
(ix) Conservation practice designs
(x) Technical assistance
(xi) Program requirements
(xii) FOTG, Section IV

(5) Products
(i) Conservation practices applied
(ii) Resource management systems applied
(iii) Communication with the stakeholders
(iv) Updated plan document
(v) Technical assistance notes
(vi) Conservation contract where applicable

Figure 600-F12

What	How	Resources and Tools
1. Review the plan with the decisionmakers and update it to meet current conditions.	Meet with the decisionmakers to ensure that the plan continues to represent current conditions and will achieve the plan objectives. This activity may result in a plan modification.	
2. Develop an implementation strategy.	Work with the stakeholders to develop an implementation strategy. The extent of the strategy will depend on the complexity of the plan to be implemented. (2c) The decisionmakers decide which programs or funding authorities to pursue. Implementation through a specific program or funding authority will require following the guidelines and procedures for that program or authority. Where individual conservation plans will be developed and implemented in the planning area to carry out the areawide	The strategy should identify who, what, where, when, why, and how as appropriate. Specific items to consider include: • Form implementation committee from stakeholders • Environmental requirements and documentation • Detailed implementation schedule, funding programs or authorities, program or funding requirements, guidance, and procedures • Permits • Agreements (i.e., operation and maintenance, project)

	conservation plan, follow the guidance for developing a conservation plan under Subpart C, 600.20 – 600.29.	• Mitigation of lost environmental values • Land rights • Treaty rights • Practice design, layout, installation, inspection, and certification • Contracting

B. Step 9 – Evaluate the Plan.—Evaluate the effectiveness of the plan in solving the resource concerns as it is implemented and work with the stakeholders to make adjustments as needed.

(1) Description

The planner obtains information on the results of the alternative implementation, evaluates the effectiveness of the implemented plan to ensure that it is functioning as planned and achieving the objectives, identifies reasons for the lack of progress in plan implementation or variances in sequence completion, and, if applicable, revises the implementation schedule or modifies the conservation plan. Where the actual results differ from those anticipated, provide feedback into the planning process. This could include revision of planning criteria, modification of indicators and target values, changes to current practice standards and specifications, revision of other FOTG data, and modifications to the plan. Also take the opportunity to encourage the decisionmakers to continue plan implementation.

(2) General

(i) Conservation planning is an ongoing process that continues after the plan has been implemented. Continue contact with the decisionmakers to evaluate operation and maintenance needs and to determine if management systems and practices are performing properly and meeting the decisionmakers' and NRCS's objectives. Onsite visits are a part of this process.

(ii) Technology may be developed through field observation of practices that have been implemented. Every planning area serves as a potential laboratory to help in the continuous process of improving alternative treatments for natural resource problems and concerns, and to take advantage of opportunities. This type of information can also help to focus on research needed.

(iii) The process of monitoring, evaluating, and experimenting in order to add to resource management information and modify decisions is known as adaptive management.

(iv) The key to successfully evaluating the results of a plan is to take advantage of the synergistic effect of the decisionmakers, planner, and technical specialists working together as they make observations and record the data. The planner should enlist the help of the technical specialists and nonagency partners, as appropriate.

(3) Planning Standard

The planner maintains contact with the decisionmakers to determine whether the implementation results are meeting ecological, economic, and social objectives and solving conservation problems in a manner satisfactory to the decisionmakers and beneficial to the resources. Resource impacts that are different from those predicted are fed back into the FOTG development process (adaptive management).

(4) Inputs

(i) Copy of the conservation plan or areawide conservation plan
(ii) Results of previous evaluations
(iii) Onsite observation and data available from the decisionmakers
(iv) New or modified objectives or needs of the decisionmakers
(v) Appropriate new technology
(vi) FOTG, Sections I, II, III, IV, & V

(5) Products
(i) O&M reports
(ii) Outline of maintenance needs or other changes
(iii) A decision to update or revise the plan, if needed
(iv) Technical assistance notes indicating the effectiveness of the plan
(v) Case studies, if appropriate, following the guidance provided in the FOTG, Section V
(vi) Recommendations for changes in practice standards, specifications, or designs
(vii) Recommendations for changes in FOTG materials
(viii) A decision to revise or expand implementation strategies
(ix) Updated CPPE and guidance documents
(x) Environmental Management Systems (EMS)

Figure 600-F13

What	How	Resources and Tools
Determine if adjustments are needed for management practices or systems.	• Compare the actual effects of conservation efforts with the planned effects. • Determine the decisionmakers' satisfaction with, the conservation treatment applied and the technical assistance provided.	Consider the effects and satisfaction in terms of ecological, economic, and social factors considered important by the decisionmakers and NRCS.
Determine the need for a plan revision, development of a new plan of the plan.	• If the conservation plan needs revision, or a new plan is needed, repeat planning steps 1 through 7.	
Update the assistance notes.	• Enter assistance notes to capture planner and decisionmaker interaction.	
Conduct a case study, if appropriate.	• Follow the procedures in the FOTG, Section V. Utilize assistance from other agencies, etc., as appropriate.	FOTG, Input from stakeholders.

Part 600 – National Planning Procedures Handbook

Subpart G – Component Planning Technical Guidance

600.60 Guidance

A. Conservation plans may include component plans to provide greater detail in addressing one or more resource concerns. The following is a partial list of some examples of component plans and references to assist in developing them.

(1) Comprehensive Nutrient Management Planning (CNMP).—As a subset of a conservation plan that is unique to animal feeding operations (AFOs), a CNMP addresses natural resource concerns to the water quality criteria established in the FOTG.
   (i) NRCS policy on preparing CNMPs is located in the Title 190, GM, Part 405.
   (ii) NRCS policy on CNMP certification is located in the 180-GM, Part 409
   (iii) Title 190, Comprehensive Nutrient Management Field Handbook, Part 620
   (iv) National Instruction 190-304, "CNMP Technical Criteria"

(2) Nutrient Management Planning
   (i) 190-GM, Part 402
   (ii) National Instruction 190-302

(3) Integrated Pest Management Planning
   (i) 190-GM, Part 404
   (ii) Certified specialist in IPM, 180-GM, Part 409

(4) Prescribed Burn Planning

   190-GM, Part 413

(5) Irrigation Water Management Planning

   Title 210, National Engineering Handbook, Part 652, Chapter 10, "Conservation Management Systems and Irrigation Planning"

(6) Grazing Management Planning

   Title 190, National Range and Pasture Handbook

B. Some resource concerns have additional policy guidelines for addressing within a conservation plan.

(1) Addressing Invasive Species within the Conservation Plan

   190-GM, Part 414

(2) Addressing Pollinators within the Conservation Plan

   190-GM, Part 416

Part 600 – National Planning Procedures Handbook

Subpart H – Exhibits

600.70 Exhibit 1 – Sample Resource Concern Checklist

Tailor to Meet State, Tribal, Territorial or Local Needs

Note: Items protected by Federal Law, Executive Order, etc., such as threatened and endangered species, cultural resources/historical properties, and other items of like nature must remain on the checklist.

Checklist of Resource Concerns – *Examples in Italics*

Soil Erosion – Sheet and Rill, Wind, Concentrated Flow, Shoreline, Bank, and Channel

Concern	**Extent**
Sheet and Rill	*Visible rills in 50 percent of the crop fields*
Streambank	*Tillage operations within 5 feet of Streambank, few random trees*

Soil Quality/Health – Subsidence, Compaction, Organic Matter Depletion, Salts and Chemicals

Concern	**Extent**
Organic Matter Depletion	*Residue regularly harvested from corn fields for livestock bedding*

Water Quality – Excess Nutrients, Pesticides, Pathogens, Excess Salt, Petroleum, Heavy Metals, Excess Sediment, Elevated Temperature

Concern	**Extent**
Elevated Temperature	*Trout steam void of shade trees*

Water Quantity – Ponding, Flooding, Drifted Snow, Seeps, Inefficient Moisture Management, Inefficient Use of Irrigation Water

Concern	Extent
No evidence of a concern	

Air Quality – Particulate Matter, Greenhouse Gases (GHGs), Ozone Precursors, Odors

Concern	Extent
Odors	*Client reports neighbors complain when the manure pit is agitated*

Plants – Plant Productivity and Health, Inadequate Structure and Composition, Excessive Pest, Wildfire Hazard

Concern	Extent
Excessive Pest	*Noxious weeds present throughout pasture*

Animals – Wildlife Habitat Degradation, Inadequate Livestock Feed and Forage, Inadequate Livestock Shelter, Inadequate Livestock Water

Concern	Extent
Inadequate Livestock Feed and Forage	*Supplemental livestock feeding begins in June*
Wildlife Habitat Degradation	*Client interested in improving trout stream habitat*

Energy – Equipment and Facilities, Field Operations

Concern	Extent
Field Operations	*Client concerned about rising fuel costs, open to reduced tillage alternatives*

Human – Economics – Land, Labor, Capital, Management Level, Risk, Profitability, Other

Concern	Extent
Risk	*Client concerned about nutrient management regulations preventing historic nutrient application levels and timing*

Human – Social – Cultural Resource or Historic Property, Client Characteristics, Community Characteristics, Other

Concern	Extent
Community Characteristics	*Client's community prohibits participation in financial assistance programs. Limited to technical assistance.*

600.71 Exhibit 2 – Environmental Effects for Conservation Plans and Areawide Conservation Plans

A. Form NRCS-CPA-52, instructions and a worksheet can be found on the NRCS National Environmental Compliance Web site.

B. Copy of the blank form NRCS-CPA-52

U.S. Department of Agriculture Natural Resources Conservation Service	NRCS-CPA-52 6/2010	A. Client Name:	
ENVIRONMENTAL EVALUATION WORKSHEET		B. Conservation Plan ID # (as applicable): Program Authority (optional):	
D. Client's Objective(s) (purpose):		C. Identification # (farm, tract, field #, etc as required):	
E. Need for Action:	G. Alternatives		
	No Action √ if RMS ☐	*Alternative 1* √ if RMS ☐	*Alternative 2* √ if RMS ☐

Resource Concerns						
In Section "F" below, analyze, record, and address concerns identified through the Resources Inventory process. (See FOTG Section III - Resource Quality Criteria for guidance).						
F. Resource Concerns and Existing / Benchmark Conditions (Analyze and record the existing/benchmark conditions for each identified concern)	H. Effects of Alternatives					
	No Action		*Alternative 1*		*Alternative 2*	
	Amount, Status, Description (short and long term)	√ if does NOT meet QC	Amount, Status, Description (short and long term)	√ if does NOT meet QC	Amount, Status, Description (short and long term)	√ if does NOT meet QC
SOIL						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC

F. Resouce Concerns and Existing / Benchmark Conditions (Analyze and record the existing/benchmark conditions for each identified concern)	H. (continued)					
	No Action		*Alternative 1*		*Alternative 2*	
	Amount, Status, Description (short and long term)	√ if does NOT meet QC	Amount, Status, Description (short and long term)	√ if does NOT meet QC	Amount, Status, Description (short and long term)	√ if does NOT meet QC
AIR						
		NOT meet ☐		NOT meet ☐		NOT meet ☐

[redacted]

Special Environmental Concerns: Environmental Laws, Executive Orders, policies, etc.						
In Section "I" complete and attach applicable Environmental Procedures Guide Sheets for documentation. Items with a "•" may require a federal permit or consultation/coordination between the lead agency and another government agency. In these cases, effects may need to be determined in consultation with another agency. Planning and practice implementation may proceed for practices not involved in consultation.						
I. Special Environmental Concerns (Document compliance with Environmental Laws, Executive Orders, policies, etc.)	**J. Impacts to Special Environmental Concerns**					
	No Action		***Alternative 1***		***Alternative 2***	
	Status and progress of compliance. (Complete and attach Guide Sheets as applicable)	√ if needs further action	Status and progress of compliance. (Complete and attach Guide Sheets as applicable)	√ if needs further action	Status and progress of compliance. (Complete and attach Guide Sheets as applicable)	√ if needs further action
•Clean Air Act		☐		☐		☐
•Clean Water Act / Waters of the U.S.		☐		☐		☐
•Coastal Zone Management		☐		☐		☐
Coral Reefs		☐		☐		☐
•Cultural Resources / Historic Properties		☐		☐		☐
•Endangered and Threatened Species		☐		☐		☐
Environmental Justice		☐		☐		☐
•Essential Fish Habitat		☐		☐		☐
Floodplain Management		☐		☐		☐
Invasive Species		☐		☐		☐
•Migratory Birds/Bald and Golden Eagle Protection Act		☐		☐		☐
Prime and Unique Farmlands		☐		☐		☐
Riparian Area		☐		☐		☐
•Wetlands		☐		☐		☐
•Wild and Scenic Rivers		☐		☐		☐
K. Other Agencies and Broad Public Concerns	***No Action***		***Alternative 1***		***Alternative 2***	
Easements, Permissions, Public Review, or Permits Required and Agencies Consulted.						

K. (continued) Other Agencies and Broad Public Concerns		*No Action*	*Alternative 1*	*Alternative 2*
Cumulative Effects Narrative (Describe the cumulative impacts considered, including past, present and known future actions regardless of who performed the actions)				
L. Mitigation				
M. Preferred Alternative	√ preferred alternative	☐	☐	☐
	Supporting reason			

N. Context (Record context of alternatives analysis)

The significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality.

O. Determination of Significance or Extraordinay Circumstances

Intensity: Refers to the severity of impact. Impacts may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

If you answer ANY of the below questions "yes" then contact the State Environmental Liaison as there may be extraordinary circumstances and significance issues to consider and a site specific NEPA analysis may be required.

Yes	No	
☐	☐	• Is the preferred alternative expected to cause significant effects on public health or safety?
☐	☐	• Is the preferred alternative expected to significantly effect unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?
☐	☐	• Are the effects of the preferred alternative on the quality of the human environment likely to be highly controversial?
☐	☐	• Does the preferred alternative have highly uncertain effects or involve unique or unknown risks on the human environment?
☐	☐	• Does the preferred alternative establish a precedent for future actions with significant impacts or represent a decision in principle about a future consideration?
☐	☐	• Is the preferred alternative known or reasonably expected to have potentially significant environment impacts to the quality of the human environment either individually or cumulatively over time?
☐	☐	• Will the preferred alternative likely have a significant adverse effect on ANY of the special environmental concerns? Use the Evaluation Procedure Guide Sheets to assist in this determination. This includes, but is not limited to, concerns such as cultural or historical resources, endangered and threatened species, environmental justice, wetlands, floodplains, coastal zones, coral reefs, essential fish habitat, wild and scenic rivers, clean air, riparian areas, natural areas, and invasive species.
☐	☐	• Will the preferred alternative threaten a violation of Federal, State, or local law or requirements for the protection of the environment?

P. The information recorded above is based on the best available information:

In the case where a non-NRCS person (i.e. a TSP) assists with planning they are to sign the first signature block and then NRCS is to sign the second block as the responsible federal agency for the planning action.

Signature (TSP if applicable)	Title	Date
Signature (NRCS)	**Title**	**Date**

The following sections are to be completed by the Responsible Federal Official (RFO)		
Q. NEPA Compliance Finding (check one)		
The preferred alternative:		**Action required**
☐	1) is **not a federal action** where the agency has control or responsibility.	Document in "R.1" below. No additional analysis is required
☐	2) is a federal action that is **categorically excluded** from further environmental analysis **and** there are no extraordinary circumstances.	Document in "R.2" below. No additional analysis is required
☐	3) is a federal action that has been **sufficiently analyzed** in an existing Agency state, regional, or national NEPA document **and** there are no predicted significant adverse environmental effects or extraordinary circumstances.	Document in "R.1" below. No additional analysis is required.
☐	4) is a federal action that has been sufficiently analyzed in another Federal agency's NEPA document (EA or EIS) that addresses the proposed NRCS action and its' effects **and has been formally adopted by NRCS**. NRCS is required to prepare and publish the agency's own Finding of No Significant Impact for an EA or Record of Decision for an EIS when adopting another agency's EA or EIS document. **Note: This box is not applicable to FSA.**	Contact the State Environmental Liaison for list of NEPA documents formally adopted and available for tiering. Document in "R.1" below. No additional analysis is required
☐	5) is a federal action that has **NOT** been sufficiently analyzed or may involve predicted significant adverse environmental effects or extraordinary circumstances and may require an EA or EIS.	Contact the State Environmental Liaison. Further NEPA analysis required.

R. Rationale Supporting the Finding	
R.1 Findings Documentation	
R.2 Applicable Categorical Exclusion(s) (more than one may apply)	

I have considered the effects of the alternatives on the Resource Concerns, Economic and Social Considerations, Special Environmental Concerns, and Extraordinary Circumstances as defined by Agency regulation and policy.

S. Signature of Responsible Federal Official:

Signature	Title	Date

Additional notes

C. List of Special Environmental Concerns

Clean Air Act, Criteria Pollutants
Clean Air Act, Regional Visibility Degradation
Clean Water Act
Coastal Zone Management Areas
Coral Reefs
Cultural Resources
Endangered and Threatened Species
Environmental Justice
Essential Fish Habitat
Floodplain Management
Invasive Species
Migratory Birds
Prime and Unique Farmlands
Riparian Areas
Wetlands
Wild and Scenic Rivers

Special Environmental Concerns

Clean Air Act
Criteria Pollutants

Clean Air Act
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Essential Fish Habitat

Floodplain Management

Invasive Species

Migratory Birds

Prime and Unique Farmlands

Riparian Areas

Wetlands

Wild and Scenic Rivers

CLEAN AIR ACT - Criteria Pollutants

"Criteria pollutants" for agriculture are excessive concentrations of particulate matter and ozone in the atmosphere that may adversely impact human health.

What is it?

Criteria pollutants are those contaminants in the atmosphere for which U.S. EPA has used health-based criteria to establish National Ambient Air Quality Standards (NAAQS). The U.S. EPA has currently promulgated NAAQS for six criteria air pollutants, but the primary criteria pollutants of concern for agriculture are particulate matter and ozone.

Why is it important?

The NAAQS are intended to represent the maximum concentration of a particular pollutant in the ambient air that will not adversely impact public health or welfare, which includes aesthetic, economic, and other non-health effects. Areas that are designated as nonattainment, meaning that concentrations of a criteria pollutant are not in compliance with the NAAQS, are subject to greater regulatory scrutiny than areas that are in compliance with the NAAQS (i.e., attainment areas). Sources that are considered to contribute to an area's nonattainment status will be subject to more stringent control and permitting requirements. Requirements for each nonattainment area vary and are tailored to the specific needs of the nonattainment area.

What can be done about it?

Ozone is not typically emitted directly from air pollutant emission sources. Rather, it is formed in the atmosphere by chemical reactions. As such, emissions of oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) are regulated as precursors to ozone formation instead. Particulate matter may be either emitted directly, such as dust or smoke, or formed in the atmosphere from other pollutants, such as ammonia, NO_x, VOCs, and sulfur dioxide (SO_2). Agriculture does not produce significant amounts of SO_2, so reducing emissions of directly-emitted particulate matter, NO_x, ammonia, and VOCs from agricultural sources will help to mitigate agriculture's contribution to concentrations of particulate matter and ozone in the ambient air.

Clean Air Act - Criteria Pollutants at a Glance

Problems / Indicators - Nonattainment area for ozone and/or particulate matter	
Causes	**Solutions**
• Dust emissions • Poor smoke management • Wind erosion • Ammonia release • VOC emissions • NO_x emissions	• Dust control, windbreaks • Proper smoke management • Maintain surface residue/cover • Proper manure management • Proper nutrient management • Follow state/local permitting guidance and procedures

Special Environmental Concerns

Clean Air Act
Regional Visibility Degradation

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility Degradation

Clean Water Act

Coastal Zone Management Areas

Coral Reefs

Cultural Resources

Endangered and Threatened Species

Environmental Justice

Essential Fish Habitat

Floodplain Management

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Migratory Birds

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Riparian Areas

Wetlands

Wild and Scenic Rivers

CLEAN AIR ACT - Regional Visibility Degradation

The Clean Air Act recognizes the issue of "regional visibility degradation" as excessive concentrations of particulate matter and other pollutants in the atmosphere that degrade visibility in national parks and other "Class I areas".

What is it?

Regional visibility degradation occurs when concentrations of particulate matter, oxides of nitrogen (NO_x), and sulfur dioxide (SO_2) in the atmosphere hinder the ability to view distant objects or vistas. Of these, the primary visibility-degrading pollutants of concern for agriculture are particulate matter and NO_x.

Why is it important?

Class I areas are areas of national or regional natural, scenic, recreational, or historic value that are given special protection under the Clean Air Act. One of these special protections is preservation of the visibility of scenic vistas within the Class I areas. EPA has developed the Regional Haze Rule that directs states to establish goals for improving visibility in national parks and wilderness areas. States are required to develop long-term strategies for reducing emissions of air pollutants that cause visibility impairment. The goals and requirements vary by state and by Class I area.

What can be done about it?

Reducing agricultural emissions that contribute to increased concentrations of particulate matter and NO_x in the air, especially from sources near a Class I area, will help mitigate agriculture's contribution to regional haze issues. These emissions include directly-emitted particulate matter, such as dust and smoke, and NO_x. Additionally, emissions of ammonia and volatile organic compounds (VOCs), as well as NO_x, can contribute to fine particulate matter formation in the atmosphere. Many common NRCS practices can be used address agriculture's contribution to regional visibility degradation by reducing emissions of these pollutants.

Clean Air Act - Regional Visibility Degradation at a Glance

Problems / Indicators - Regional haze and poor visibility of scenic areas	
Causes	**Solutions**
• Dust emissions • Poor smoke management • Wind erosion • NO_x emissions • Ammonia emissions • VOC emissions	• Dust control, windbreaks • Proper smoke management • Maintain surface residue/cover • Proper maintenance and operation of combustion sources • Proper nutrient and manure management • Reductions in pesticide use

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Clean Water Act

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility Degradation

Clean Water Act

Coastal Zone Management Areas

Coral Reefs

Cultural Resources

Endangered and Threatened Species

Environmental Justice

Essential Fish Habitat

Floodplain Management

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Migratory Birds

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Wild and Scenic Rivers

CLEAN WATER ACT AND WATERS OF THE U.S.

The Federal Water Pollution Control Act of 1972 is today known as the Clean Water Act (CWA). The U.S. Army Corps of Engineers (Corps) and the States administer the various sections of the CWA with the oversight of the Environmental Protection Agency (EPA).

What is it?

The CWA established several programs to regulate and reduce discharges of pollutants into waters of the United States (including wetlands). Although the list of pollutants is long, those most frequently associated with the term include fill material, sediment, excess nutrients, and harmful bacteria. Although the landowner is responsible for obtaining appropriate permits prior to project implementation, NRCS often assists to expedite the coordination process.

Why is it important?

Section 404 of the CWA is the section that most often affects NRCS activities, although consideration must also be given to Sections 401, 402, and 303. Close coordination throughout the planning process can prevent significant delays in processing the permit application.

Section 404: Established a permit program to regulate the discharge of dredged and fill material into waters of the U.S. Discharge of dredged or fill material into waters of the U.S. is prohibited unless the action is exempted or is authorized by a permit issue by the Corps or by the State.

Section 401: Requires that before a 404 permit can be issued for an activity, the State (or Tribe) in which the activity will occur must certify that the activity will not violate State water quality standards (Section 401 State Water Quality Certification)

Section 402: Establishes the National Pollutant Discharge Elimination System (NPDES) Program, which the States also administer. This requires a permit for sewer discharges and storm water discharges from developments, construction sites, or other areas of soil disturbance.

Section 303: Requires States, territories, and Tribes to identify "impaired waters" and to establish total maximum daily loads (TMDLs).

What can be done about it?

To effectively fulfill our Section 404 responsibilities to the CWA and to prevent project delays, coordination with the Corps, EPA and/or appropriate State agencies is essential. Along with ensuring that the landowner obtains appropriate permits, NRCS should also consider impacts of proposed actions on streams included on States' 303(d) lists and plan accordingly.

Clean Water Act and Waters of the U.S. at a Glance

Problems / Indicators - Potential discharges of pollutants into waters of the U.S.	
Causes	**Solutions**
• Ground disturbing activities near U.S. Waters • Riparian activities • In-stream/aquatic activities • Wetland conversions/alterations/land clearing • Water or waste discharges	• Maintaining adequate surface cover/residue • Follow permitting guidance and procedures • Consultation with USFWS and/or NMFS • Proper nutrient and pest management • Incorporate mitigation measures in conservation plan

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Coastal Zone Management Areas

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility Degradation

Clean Water Act

Coastal Zone Management Areas

Coral Reefs

Cultural Resources

Endangered and Threatened Species

Environmental Justice

Essential Fish Habitat

Floodplain Management

Invasive Species

Migratory Birds

Prime and Unique Farmlands

Riparian Areas

Wetlands

Wild and Scenic Rivers

COASTAL ZONE MANAGEMENT AREAS

Coastal zone management areas (CZMAs) are areas located within or near the officially designated "coastal zone" of a State. The National Oceanic and Atmospheric Administration's (NOAA's) Office of Coastal Zone Management approves coastal programs, and not all coastal States have a CZMA.

What is it?

CZMAs are: 1) coastal waters and adjacent shorelines, including the lands or waters inside and under those zones, and 2) areas that strongly influence adjacent coastal zones of the 35 States that have coastal zone management programs. Examples include "transitional" and intertidal areas, such as salt marshes, freshwater wetlands, and beaches, and also connecting waters, harbors, and estuarine areas, such as bays, shallows, and marshes, as well as those waters adjacent to the shorelines, including but not limited to sounds, bays, lagoons, bayous, ponds, and the estuaries themselves. CZMAs can extend seaward to the outer limit of the United States territorial sea (generally 200 miles). Inland, the coastal area extends only to the extent necessary to control land uses that have a direct and significant impact (effect) on coastal waters.

Why is it important?

Section 307 of the Coastal Zone Management Act specifies that actions or activities within the coastal zone done by a Federal agency or on behalf of or through a Federal agency must be consistent with the State's coastal zone management plan. Therefore, NRCS planning must be consistent with the State's coastal plan and be in concert with the goals, tenets, and objectives of that plan. On March 9, 1993, a letter was jointly signed by the Soil Conservation Service, the Agricultural Stabilization and Conservation Service, and the Extension Service setting forth the policies for enforcement and adoption of science- and technology-based land-management measures that eliminate or control nonpoint sources of pollution.

What can be done about it?

A current registry of CZMAs in each state should be kept in the Technical Guide. Guidance on nonpoint source pollution matters in the coastal zone is contained in EPA's "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters" (EPA 840-B-92-002), issued in response to the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990.

Coastal Zone Management Areas at a Glance

Problems / Indicators - Proposed action is inconsistent with State's coastal zone management plan	
Causes	**Solutions**
• Soil Erosion (short and/or long term) • CAFO contaminates (or other point sources) • Improper nutrient and/or pesticide application • Improper livestock grazing management • Improper irrigation water management • Other point and non-point source pollution	• Residue Management • Cover Crops • Comprehensive Nutrient Management Plan • NPDES permit • Irrigation Water Management • Prescribed Grazing

Special Environmental Concerns

Coral Reefs

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility
Degradation

Clean Water Act

Coastal Zone
Management
Areas

Coral Reefs

Cultural
Resources

Endangered
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Species

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Essential Fish
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Species

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CORAL REEFS

The term "Coral reefs" is defined as the species, habitats, and other natural resources associated with coral reefs in all maritime areas and zones subject to the jurisdiction or control of the United States (e.g., Federal, State, territorial, or commonwealth waters), including reef systems in the South Atlantic, Caribbean, Gulf of Mexico, and Pacific Ocean. Coral reefs are also waters of the U.S. as defined in the Clean Water Act and are subject to Section 404 permit requirements.

What is it?

Coral reefs are among the most diverse and valuable ecosystems on Earth. They are extremely vulnerable to harmful environmental changes, particularly those resulting from human activities. One of the primary threats to U.S. coral reefs is pollution from land-based sources, including runoff of nutrients and sediments from watersheds adjacent to near-shore coral reef ecosystems. Present estimates are that 10 percent of all coral reefs are degraded beyond recovery; 30 percent are in critical condition and may die within 10 to 20 years, and if current conditions continue unabated another 30 percent may perish completely by 2050.

Why is it important?

Executive Order (E.O.) 13089, Coral Reef Protection, was issued in 1998 in recognition of the importance of conserving coral reef ecosystems. The E.O. created a Coral Reef Task Force whose membership is comprised of 11 Federal agencies, including the Secretary of Agriculture. The E.O. policy states that agencies will utilize their programs and authorities to protect and enhance the conditions of coral reef ecosystems and, to the extent permitted by law, ensure that any actions authorized, funded, or carried out by the agency will not degrade these ecosystems.

What can be done about it?

Maintaining current information regarding Local Action Strategies (LASs) that identify priority actions needed to reduce key threats to valuable coral reef resources is very helpful. Florida, Hawaii, Guam, the U.S. Virgin Islands, American Samoa, Puerto Rico, and the Commonwealth of the Northern Mariana Islands created specific local action strategies for select locally relevant threats. NRCS should ensure that proposed actions consider impacts to coral reefs and, as appropriate, include conservation considerations that would enhance this valuable resource.

Coral Reefs at a Glance

Problems / Indicators - Nutrient and sediment runoff from near-shore watersheds	
Causes	**Solutions**
• Soil Erosion (short and/or long term) • CAFO contaminates (or other point sources) • Improper nutrient and/or pesticide application • Improper livestock grazing management • Improper irrigation water management • Other point and non-point source pollution	• Residue Management • Cover Crops • Comprehensive Nutrient Management Plan • NPDES permit • Irrigation Water Management • Prescribed Grazing

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Cultural Resources

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility
Degradation

Clean Water Act

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CULTURAL RESOURCES

In 1966, Congress passed the National Historic Preservation Act (NHPA) and directed all Federal agencies to establish a historic preservation program. NRCS has established policy, procedural references and guidance to comply with NHPA and several related authorities, including the American Indian Religious Freedom Act (42 U.S.C. Section 1996); Native American Graves Protection and Repatriation Act (25 U.S.C. Sections 3001-3013); Executive Order (EO) 13175, Consultation and Coordination with Indian Tribal Governments (2000); EO 13007, Indian Sacred Sites (1996); and a range of Executive Orders, Presidential memoranda, and secretarial memoranda.

What is it?

The term "cultural resources" as used by NRCS is considered equivalent to "historic properties" as defined by the NHPA (16 U.S.C. Section 470 et seq.) and regulations for compliance with section 106 of the NHPA (36 CFR Part 800). They include any prehistoric or historic district, site, building, structure, or object listed in or eligible for listing in the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior. They also include all records, artifacts, and physical remains associated with the NRHP-eligible historic properties. The term also includes properties of traditional cultural and religious importance to an Indian Tribe or Native Hawaiian organization that meet national register criteria. They may consist of the traces of the past activities and accomplishments of people.

Why is it important?

NRCS is required to consider the effects of our actions and undertakings on NRHP eligible cultural resources and historic properties in consultation with specific parties. Consultation with State historic preservation officers (SHPO), Tribal historic preservation officers (THPO) and Federally recognized Tribes, including Native Hawaiians, as appropriate, as well as other interested parties, is required when an agency action may alter the characteristics that qualify a historic property for inclusion in the NRHP. NRCS is also required to mitigate potential adverse impacts, for example through avoidance or minimization, as appropriate.

What can be done about it?

When protected cultural resources, such as contemporary cultural properties, traditional cultural values, landscapes, or features having religious importance, may be impacted, NRCS must consult with concerned parties to ensure that historic preservation issues and the views of the public are fully considered during project planning. The outcomes of consultation are documented according to the statutes and authorities under which the cultural resources are considered.

Cultural Resources at a Glance

Problems / Indicators - Potential impacts to cultural resources and/or historic properties ("Undertakings")	
Causes	**Solutions**
• Ground disturbing practices • Watershed/Area-Wide/Complex projects • Proposed land-use changes/conversions • Construction discoveries	• Complete cultural resources investigation for site • Initiate EARLY consultation with appropriate State/Tribal entity, as needed • Incorporate mitigation measures, as needed, in project design and specifications

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Endangered & Threatened Species

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility Degradation

Clean Water Act

Coastal Zone Management Areas

Coral Reefs

Cultural Resources

Endangered and Threatened Species

Environmental Justice

Essential Fish Habitat

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Migratory Birds

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ENDANGERED & THREATENED SPECIES & STATE/TRIBAL SPECIES OF CONCERN

Consistent with legal requirement of the Endangered Species Act of 1973 and NRCS policy regarding State and Tribal Species of concern, NRCS is fully committed to supporting the conservation of formally designated Federal (including "candidate" and "proposed" species), State and Tribal species of concern.

What is it?

When Congress enacted the ESA in 1973, it made several findings regarding the disappearance of various plant and animal species of the United States, the importance of these species to the Nation and its people, and the obligation of the Federal Government to conserve to the extent practicable the various species of fish, wildlife, and plants facing extinction. NRCS policy (190-GM, Part 410) also requires consideration of impacts to species protected by State or Tribal laws or regulations.

Why is it important?

Section 7(a) of ESA requires NRCS, in consultation with and with the assistance of the US Fish and Wildlife Service (USFWS) and/or NOAA National Marine Fisheries Service (NMFS), to advance the purposes of the Act by implementing programs for the conservation of endangered and threatened species, and to ensure that its actions and activities do not jeopardize the continued existence of threatened and endangered species or result in the destruction or adverse modification of the species' critical habitat. NRCS must also consult with State and/or Tribal entities when considering impacts to species of concern protected by State or Tribal laws or regulations.

What can be done about it?

In working with landowners, NRCS planners should identify and recommend alternative actions to avoid or minimize adverse impacts to at-risk species that are present or may be present within the project area and to benefit these species whenever possible. NRCS must make an initial effects determination for any endangered or threatened species, designated critical habitats, proposed species or habitats, candidate species, or State or Tribal species of concern protected by State or Tribal law or regulation. Once the effects determination has been completed, there may be a need to initiate consultation with the USFWS or NOAA-NMFS that would result in the development of negotiated "reasonable and prudent measures" (RPMs) to mitigate potential negative impacts.

Endangered & Threatened Species & State/Tribal Species of Concern at a Glance

Problems / Indicators - Potential negative impacts to Federal, State, and Tribal Species of Concern	
Causes	**Solutions**
• Land use changes/conversions • In-stream and upland restoration projects • Ground disturbing practices • Timing of project implementation • Management activities in occupied habitat	• Mitigation to eliminate potential impacts during planning process • Consultation with USFWS and/or NMFS • Incorporate RPMs and conservation measures into project specifications • Establish monitoring protocols

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Environmental Justice

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility Degradation

Clean Water Act

Coastal Zone Management Areas

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Endangered and Threatened Species

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ENVIRONMENTAL JUSTICE

Executive Order 12898, issued February 11, 1994, requires each Federal agency to make environmental justice a part of its mission. Agencies must identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations, low-income populations, and Indian Tribes.

What is it?

The term "environmental justice" means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on proposed Federal actions. Furthermore, the principles of environmental justice require that populations are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by government programs and activities affecting human health or the environment.

Why is it important?

Environmental justice must be addressed throughout the U.S., its territories and possessions, the District of Columbia, and the Commonwealths of Puerto Rico and the Mariana Islands. These issues encompass a broad range of impacts covered by NEPA, including impacts on the natural or physical environment and related social, cultural, and economic impacts.

What can be done about it?

The primary means to attain compliance with environmental justice considerations are: 1) assessing the presence of environmental justice communities in a project area that may experience disproportionately high and adverse human health or environmental effects, and 2) the inclusion of low-income, minority, Tribal, or other specified populations in the planning process. There may be a need to develop separate Government to Government consultations to address any environmental justice issues for Tribal Governments (contact your State American Indian Emphasis Program manager). The USDA Departmental Regulation (DR) 5600-002, Environmental Justice, provides detailed determination procedures for NEPA and non-NEPA activities and suggests social and economic effects to consider when assessing whether there are disproportionately high and adverse human health or environmental effects to environmental justice communities in a project area.

Environmental Justice at a Glance

Problems / Indicators - Disproportionately high or adverse impacts to specific populations	
Causes	**Solutions**
• Land use changes/conversions • Area-wide/watershed/complex projects • Projects involving broad scope of impacts – local/regional/national • Controversial projects • Human health or environmental effects that may be disproportionately high or adverse	• Collect demographic data from EPA, Census Bureau, other sources • Initiate early government-to-government consultation with Tribes, as necessary • Conduct public meeting(s) • Conduct specific outreach to EJ communities • Create Agreements, as needed

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Essential Fish Habitat

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility
Degradation

Clean Water Act

Coastal Zone
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ESSENTIAL FISH HABITAT

The Magnuson-Stevens Act was originally enacted in 1976 and amended several times, the latest of which was 2006. It is the primary law governing marine fisheries management in the U.S. In 1996, the Act was amended to incorporate essential fish habitat (EFH) and rules were published in the Federal Register. It calls for heightened consideration of fish habitat in resource management decisions and direct action to stop or reverse the continued loss of fish habitats. The National Marine Fisheries Service (NMFS) implements and enforces the management measures through fisheries management plans.

What is it?

Essential fish habitats (EFHs) are areas identified as being vital for sustaining marine or anadromous fish populations. They include the waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. As amended in 1986, the Magnuson Act requires regional fisheries management councils to evaluate the effects of habitat loss or degradation on their fishery stocks and take actions to mitigate such damage.

Why is it important?

The act requires cooperation among NMFS, the councils, fishing interests, Federal and State agencies, and others in achieving the EFH goals of habitat protection, conservation, and enhancement. NRCS must consult with NMFS regarding any action or proposed action that may adversely affect an EFH.

What can be done about it?

Information of all EFH areas in each applicable state is located in Section II of the FOTG. NRCS must first assess whether a proposed action or alternative will result in short or long-term disruptions or alterations that may result in an "adverse effect" to EFH. If yes, NRCS may first consider if and how the action or alternative can be modified to mitigate potential adverse effects. If that is not possible, NRCS will have to consult with NMFS to determine measures to conserve such habitat. Following consultation, NRCS is responsible for detailing the measures that will be taken to mitigate any adverse effects to EFH and explain reasons for any actions inconsistent with the NMFS EFH recommendations.

Essential Fish Habitat at a Glance

Problems / Indicators - Potential negative impacts to essential fish habitat	
Causes	**Solutions**
• Land use changes/conversions • In-stream and upland restoration projects • Ground disturbing practices • In-stream work/practices • Timing of project implementation	• Mitigation to eliminate potential impacts during planning process • Consultation with NMFS • Incorporate conservation measures into project specifications • Establish monitoring protocols

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Floodplain Management

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility
Degradation

Clean Water Act

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FLOODPLAIN MANAGEMENT

Executive Order (E.O.) 11988, Floodplain Management, was signed by President Jimmy Carter on May 24, 1977. NRCS policy on floodplains (190-GM, Part 410, Subpart B, Section 410.25) reflects the requirement of the E.O. that decisions by Federal agencies must recognize that floodplains have unique and significant public values.

What is it?

Floodplains are defined as lowlands or relatively flat areas adjoining inland or coastal waters, including at a minimum areas subject to a chance of flooding of 1 percent or greater in any given year. The "base" floodplain is set equal to the "100-year" floodplain (the so-called "1-percent chance floodplain"). The "critical action" floodplain is defined as the 500-year floodplain (the "0.2-percent chance floodplain") where certain facilities are present, such as a school, hospital, nursing home, utility, or a facility producing volatile, toxic, or water-reactive materials. Floodplains may be shown on maps produced by the Federal Emergency Management Agency (FEMA) and on NRCS watershed plans and floodplain management studies.

Why is it important?

The objectives of E.O. 11988 are to avoid, to the extent possible, the long- and short-term adverse impacts associated with occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development where there is a practical alternative.

What can be done about it?

Through proper planning, floodplains can be managed to reduce the threat to human life, health and property in ways that are environmentally sensitive. Most floodplains contain areas with valuable assets that sustain and enhance human existence. Some of these assets are agricultural and forest lands, food and fiber, fish and wildlife, temporary floodwater storage, parks and recreation, and environmental values. NRCS provides leadership and takes actions where practicable to conserve, preserve, and restore existing natural and beneficial functions and values in base (100-year) floodplains as part of the technical and financial assistance program that it administers.

Floodplain Management at a Glance

Problems / Indicators - Potential negative impacts to floodplains	
Causes	**Solutions**
• Land use changes/conversions in floodplain • Ground-disturbing project within floodplain • Infrastructure development in floodplain • Activities requiring a NPDES permit • Construction of flood walls, dikes, etc., for purpose of flood control	• Consult HUD/FEMA flood insurance maps and/or other available floodplain data • Mitigation to eliminate potential impacts during planning process • Incorporate conservation/mitigation measures into project specifications, as needed • Establish monitoring protocols

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Invasive Species

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility
Degradation

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INVASIVE SPECIES

Executive Order (E.O.) 13112, Invasive Species (February 3, 1999) directs Federal agencies to "prevent the introduction of invasive species, provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species cause." NRCS policy (190-GM, Part 414) is consistent with this E.O. and also requires that no action be authorized, funded, or carried out that is believed or likely to cause or promote the introduction or spread of invasive species in the U.S. or elsewhere.

What is it?

The National Invasive Species Council (NISC) and Invasive Species Advisory Committee (ISAC) were formed to define how the objectives of the E.O. will be carried out. As defined in E.O. 13112, invasive species are species, not native to a particular ecosystem, whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species may include all terrestrial and aquatic life forms, including plants, animals, fungi, and microbial organisms. NRCS policy further defines a plant species as "invasive" only when it occurs on the Federal or State-specific noxious weed list or a list developed by the State-specific Department of Agriculture with their partners and approved by the State Technical Committee which prohibits or cautions its use due to invasive qualities.

Why is it important?

Invasive species are reducing the economic productivity and ecological integrity of our Nation's lands and waters. The rate of introduction of such species has risen markedly in recent years with costs to society growing commensurately. Invasive species harm native species and their habitats, degrade renewable resources, and diminish productive capacity of agricultural lands including cropland, forestlands, rangelands, and pasturelands. They negatively impact a wide variety of human activities and needs.

What can be done about it?

Recognizing and addressing the presence of invasive species is an integral part of the conservation planning process and implementing NRCS policy and any existing county, State, or Federal regulations concerning noxious and/or invasive species. At a minimum, the conservation plan includes: 1) an inventory of invasive species; 2) a map outlining the affected areas; 3) identification of control/restoration strategies; and 4) analysis of their impacts.

Invasive Species at a Glance

Problems / Indicators - Presence of invasive species	
Causes	**Solutions**
• Land use changes/conversions without appropriate vegetative cover plan • Ground-disturbing projects • Improper livestock grazing management • Restoration projects (upland and aquatic) without appropriate measures to ensure vegetative cover • Accidental transport and introduction via equipment	• Critical Area Planting • Pasture and Hayland Planting • Prescribed Grazing • Streambank & Shoreline Protection • Restoration & Management of Rare & Declining Habitats • Integrated Pest management • Establish monitoring protocols

Special Environmental Concerns

Migratory Birds

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility Degradation

Clean Water Act

Coastal Zone Management Areas

Coral Reefs

Cultural Resources

Endangered and Threatened Species

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MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, is the domestic law that affirms, or implements, the United States' commitment to four international conventions (with Canada, Japan, Mexico, and Russia) for the protection of a shared migratory bird resource. Executive Order (E.O.) 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, requires NRCS to consider the impacts of planned actions on migratory bird populations and habitats for all planning activities. The Bald and Golden Eagle Protection Act of 1940, as amended, also prohibits the take of bald and golden eagles and their nests.

What is it?

Migratory birds are essentially all wild birds found in the United States, except the house sparrow, starling, feral pigeon, and resident game birds, such as pheasant, grouse, quail, and wild turkeys. Resident game birds are managed separately by each State. A list of migratory birds is found in 50 CFR Part 10. There are also other requirements protecting certain migratory birds. The Bald and Golden Eagle Protection Act (BGEPA) provides protection to all Bald and Golden Eagles by prohibiting all commercial activities and some noncommercial activities involving bald or golden eagles, including their feathers or parts.

Why is it important?

The MBTA fully protects all migratory birds and their parts (including eggs, nests, and feathers). Thus, the act makes it unlawful, unless permitted by regulation, for anyone to kill, capture, collect, possess, buy, sell, trade, ship, import, or export any migratory bird, including feathers, parts, nests, or eggs. This prohibition applies to Federal agencies as well as private individuals. Also, under the BGEPA, the "taking" of bald and golden eagles and their nests is prohibited. The definition of "take" under this law includes disturbance.

What can be done about it?

MBTA, BGEPA, and E.O. 13186 require NRCS to consider the impacts of planned actions on migratory bird populations and habitats for all planning activities. This may require cooperation with the U.S. Fish and Wildlife Service if the action will result in a measurable negative effect on migratory bird populations. If, for example, a proposed action can potentially kill or injure a migratory bird resulting in an intentional or unintentional "take" to the birds, nests, or eggs, or disturbance of eagles or their nests will occur, conservation measures must be considered to mitigate adverse impacts.

Migratory Birds at a Glance

Problems / Indicators - Proposed action may adversely impact migratory birds	
Causes	**Solutions**
• Land use changes/conversions • Ground-disturbing projects • Vegetation management during the nesting season • Land clearing or obstruction removal • Sod-busting • Forest harvest activities	• Timing of practice installation/harvest • Prescribed Grazing/timing of grazing • Cooperation with USFWS to establish conservation measures • Restoration & Management of Rare & Declining Habitats • Establish monitoring protocols • Avoidance of specific areas/setbacks

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Prime and Unique Farmlands

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility
Degradation

Clean Water Act

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PRIME AND UNIQUE FARMLANDS

The Farmland Protection Policy Act (FPPA) was passed by Congress as part of the Agriculture and Food Act of 1981 (Public law 97-98). The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance.

What is it?

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary of Agriculture. It may include lands currently used to produce livestock and/or timber. **Unique farmland** is land other than prime farmland that is used for production of specific high-value food and fiber crops, as determined by the Secretary. Examples of such crops include citrus, tree nuts, olives, cranberries, fruits, and vegetables. **Farmland that is of statewide or local importance other than prime or unique farmland** is used for the production of food, feed, fiber, forage, or oilseed crops, as determined by the appropriate State or unit of local government agency or agencies, with the approval of the Secretary of Agriculture.

Why is it important?

Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a Federal agency or with assistance from a Federal agency, including NRCS.

What can be done about it?

NRCS must use the criteria provided in regulations found at 7 CFR Section 658.5 to identify and take into account the adverse effects of Federal programs on the protection of farmland. As well as evaluating the effects of our own actions upon farmland, NRCS must assist Federal agencies to consider alternative actions, as appropriate, that could lessen such adverse effects on farmland conversion to nonagricultural uses. NRCS uses a land evaluation and site assessment (LESA) system to establish a farmland conversion impact rating scores. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level.

Prime and Unique Farmlands at a Glance

Problems / Indicators - Proposed farmland conversion	
Causes	**Solutions**
• Proposed land use changes/conversion of agricultural lands • Ground disturbing/land clearing activities • Construction of infrastructure projects • Exurban development	• Conduct LESA for conversion impact score • Share result with cooperating Federal agency proposing action (normally for NEPA analysis) • Offer alternatives (relocation) for consideration if adverse impacts to prime, unique, or locally important agricultural lands

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Riparian Areas

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility Degradation

Clean Water Act

Coastal Zone Management Areas

Coral Reefs

Cultural Resources

Endangered and Threatened Species

Environmental Justice

Essential Fish Habitat

Floodplain Management

Invasive Species

Migratory Birds

Prime and Unique Farmlands

Riparian Areas

Wetlands

Wild and Scenic Rivers

RIPARIAN AREAS

NRCS policy (190-GM, Part 411) requires NRCS to integrate riparian area management into all plans and alternatives. Although Federal law does not specifically regulate riparian areas, portions of riparian areas, such as wetlands and other waters of the U.S. may be subject to Federal regulation under provisions of the Food Security Act, Clean Water Act, NEPA, and State, Tribal, and local legislation.

What is it?

Riparian areas are ecotones that occur along streams, rivers, lakes, ponds, and wetlands. They are distinctively different from the surrounding lands because of unique soil and vegetative characteristics that are strongly influenced by free or unbound water in the soil. Riparian ecosystems occupy the transitional area between the terrestrial and aquatic ecosystems. Typical examples include floodplains, stream banks, and lakeshores. Riparian areas may exist within all land uses, such as cropland, hay land, pastureland, rangeland, and forestland.

Why is it important?

Although riparian areas constitute only a fraction of the total land area, they are generally more productive in terms of plant and animal species, diversity, and biomass. Riparian areas are vital components of the ecosystems in which they occur and are extremely important for flood attenuation, hydrologic function (water quantity, quality, and timing), and fish and wildlife diversity. NRCS policy requires conservation plans to maintain or improve water quality/quantity as well as fish and wildlife benefits. It also requires the development of alternatives when the client's objectives conflict with the conservation of these areas.

What can be done about it?

Conservation planning in riparian areas requires special considerations. A resource problem within the riparian area may be the manifestation of upland management decisions. Planners working with riparian areas should consider soils, the present plant community, the site potential, geomorphology of both stream and the watershed, hydrologic regime, fish and wildlife needs, the management of the upland areas of the watershed, and the producer's objectives. For supplemental guidance relating to riparian areas, see *NRCS/RCA Issue Brief 11 (USDA-NRCS. August 1996)*.

Riparian Areas at a Glance

Problems / Indicators - Degraded riparian area	
Causes	**Solutions**
• Improper livestock grazing management • Presence of invasive species • Stream channel modifications • Stream channel aggradation or degradation • Structural modifications (e.g., diversions, ditches, dam, etc.) • Land use/vegetation changes	• Streambank and Shoreline Protection • Stream Crossing • Riparian Forest Buffers and/or Herbaceous Cover • Critical Area Planting • Fence/access control • Prescribed Grazing • Integrated Pest Management

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Wetlands

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility
Degradation

Clean Water Act

Coastal Zone
Management
Areas

Coral Reefs

Cultural
Resources

Endangered
and Threatened
Species

Environmental
Justice

Essential Fish
Habitat

Floodplain
Management

Invasive
Species

Migratory Birds

Prime and
Unique
Farmlands

Riparian Areas

Wetlands

Wild and Scenic
Rivers

WETLANDS

Executive Order (E.O.) 11990 requires that Federal agencies take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the beneficial functions of wetlands when "providing federally undertaken, financed or assisted construction and improvements." NRCS policy for implementing the E.O. can be found at 190-GM, Part 410, Subpart B, Section 410.26. In addition, activities that impact wetlands often require a Clean Water Act, Section 404 permit from the Corps. Activities in wetlands that occur in the 100 or 500-yr floodplain are also subject to review under NRCS floodplain management policy (190-GM Section 510.25).

What is it?

Wetlands are defined differently within various Federal and State programs and for identification, delineation, and classification purposes. NRCS wetland protection policy defines wetlands as areas, natural or artificial, that have hydric soil, hydrophytic vegetation, and indicators of wetland hydrology. Generally, wetlands include swamps, marshes, bogs, many bottomland hardwood areas and similar areas.

Why is it important?

It is the policy of the NRCS to protect and promote wetland functions and values in all NRCS planning and application assistance. NRCS activities must comply with E.O. 11990, Protection of Wetlands, and with NRCS policy for protection of wetlands. Wetlands serve a variety of significant biological functions important to the food chain, general habitat, and nesting, spawning, and rearing sites.

What can be done about it?

Since wetlands are highly variable and can be dry for most of the year, wetland delineation training is important. If wetlands will be impacted by a proposed activity, NRCS will identify whether practicable alternatives exist that either enhance wetland functions and values, or avoid or minimize harm to wetlands. If such alternatives exist, the client will be given the opportunity to select one of those alternatives. If the client selects a practicable alternative, the NRCS may continue technical assistance for the conversion activity as well as the development of the mitigation plan. If a practicable alternative is not selected, NRCS may assist with the development of an acceptable mitigation plan, but no further financial or technical assistance for the wetland conversion activity may be provided.

Wetlands at a Glance

Problems / Indicators - Wetlands with impaired functions	
Causes	**Solutions**
• Past or current draining • Removal of native vegetation • Presence of invasive species • Changes in local hydrology • Dredge and fill activities • Adjacent stream channel modifications • Pollution from point sources (e.g., CAFO)	• Wetland Restoration • Tree/Shrub Establishment • Riparian Forest Buffers and/or Herbaceous Cover • Shallow Water Development and Management • Fish Passage • Incorporate 404 Permit conservation measures into planning design

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Wild and Scenic Rivers

Clean Air Act
Criteria Pollutants

Clean Air Act
Regional Visibility Degradation

Clean Water Act

Coastal Zone Management Areas

Coral Reefs

Cultural Resources

Endangered and Threatened Species

Environmental Justice

Essential Fish Habitat

Floodplain Management

Invasive Species

Migratory Birds

Prime and Unique Farmlands

Riparian Areas

Wetlands

Wild and Scenic Rivers

WILD AND SCENIC RIVERS

The National Wild and Scenic Rivers Act of 1968 (Public Law 90-542) was created by Congress to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. A listing of designated streams and stream segments can be found on the National Park Service's Wild and Scenic Rivers Web site.

What is it?

Rivers may be designated by Congress or, if certain requirements are met, the Secretary of the Interior. Each river is administered by either a federal or state agency. Designated segments need not include the entire river and may include tributaries. For federally administered rivers, the designated boundaries generally average one-quarter mile on either bank in the lower 48 states and one-half mile on rivers outside national parks in Alaska in order to protect river-related values. Designated rivers are classified as wild, scenic, or recreational.

Why is it important?

The designation of a river or river segment under the Wild and Scenic Rivers Act provides legal protections from adverse development and provides a mechanism for management of the river's resources. In addition to the river segments designated as wild and scenic, many more segments are believed to possess one or more outstanding or remarkable natural or cultural values judged to be of more than local or regional significance. Under a 1979 Presidential directive, and related CEQ procedures, all Federal agencies must also seek to avoid or mitigate actions that would adversely affect one or more National River Inventory (NRI) stream segments.

What can be done about it?

Federal agencies must consider the values of these segments prior to taking actions that could exclude them from future wild, scenic, or recreational status. Generally, timber harvests and agricultural operations on privately owned lands are unaffected in wild, scenic, and recreational river designations. However, some activities may require permits or may be covered under special provisions of the management plan. Each designated river has a Federal river manager who may assist and cooperate with States or local organizations, landowners, and individuals to plan, protect, and manage river resources. The assistance may include limited financial assistance.

Wild and Scenic Rivers at a Glance

Problems / Indicators - Proposed action may adversely impact a designated river or river segment	
Causes	**Solutions**
• Land use changes adjacent to river segment • Riparian modifications • Changes in local hydrology (e.g., adjacent wetland draining activities) • Dredge and fill activities • Pollution from point sources (e.g., CAFO)	• Mitigation during the planning process • Wetland Restoration • Riparian Forest Buffers and/or Herbaceous Cover • Forest Harvest Management/BMPs • Prescribed Grazing • Consult with NPS to coordinate mitigation plan

600.72 Exhibit 3 – System Effects Worksheet

Example System Effects Worksheet.—This example shows the effects of an alternative system on a cropland field for seven identified resource concerns.

Management System Options		Client: Ira Farmer Land Use: Crop						
		Soil Erosion		Soil Quality/Health Degradation		Water Quality Degradation		Degraded Plant Condition
Field or PLU	3/Conservation Practices	2/Sheet, Rill and Wind	Concentrated Flow : Classic Gully and Ephemeral	Organic Matter Depletion	Compaction	Excess Nutrients in Groundwater	Excess Nutrients in Surface Water	Excessive Plant Pressure
5	Alternative #1	4/						
	Crop Residue Use 20%	+2	+1	+1	0	-1	2	0
	Terraces (Storage) Underground Outlet	+5 0	+3 0	0 0	-1 0	-1 0	0 0	0 0
	Contour Farming	+4	+2	+2	0	-1	+3	0
	Nutrient Management	0	0	+2	0	+5	+5	+1
	Integrated Pest Management	0	0	0	+1	+5	+5	+5
Meets Planning Criteria?		Yes	Yes	Yes	Yes	Yes	Yes	Yes

1/ Enter the broad resource considerations illustrated in the CPPE matrix located in FOTG, Section V.

2/ Enter identified resource concerns.

3/ Develop alternative systems by listing combinations of practices logically used to address an identified resource concern on a given land use.

4/ Express the effects of selected practices. Refer to CPPE matrix located in FOTG, Section V.

Effects on the **problem**:

- Substantial Improvement +5
- Moderate to Substantial Improvement +4
- Moderate Improvement +3
- Slight to Moderate Improvement +2
- Slight Improvement +1
- No Effect 0
- Slight Worsening -1
- Slight to Moderate Worsening -2
- Moderate Worsening -3
- Moderate to Substantial Worsening -4
- Substantial Worsening -5

600.73 Exhibit 4 – Relationship of the Planning Process and FOTG

Planning Process		**FOTG**
Preplanning Activities		Sections I, II, III, and V Reference Material Soils Information Guidance Documents Case Studies
Step 1	Identify Problems	Sections I, II, III, and V Reference Material Soils Information Guidance Documents Case Studies
Step 2	Determine Objectives	Sections I and II Reference Material Soils Information
Step 3	Inventory Resources	Sections I, II, III, and IV Reference Material Soils Information Guidance Documents Practice Standards

Planning Process		**FOTG**
Step 4	Analyze Resource Data	Sections I, II, III, and V Reference Material Soils Information Guidance Documents Conservation Effects
Step 5	Formulate Alternatives	Sections II, III, IV, and V Soils Information Resource Management Systems Guidance Documents Conservation Practice Descriptions Conservation Effects
Step 6	Evaluate Alternatives	Sections I, II, III, IV, and V Conservation Practice Physical Effects (CPPE) Matrix Reference Material Soils Information Resource Management Systems Predictive Tools and Models Practice Standards Conservation Effects
Step 7	Make Decisions	Section V Conservation Effects
Step 8	Implement Plan	Section IV Practice Standards and Specifications
Step 9	Evaluate Plan	Sections I, II, III, IV, and V Conservation Effects Case Study Potential new data for some or all sections

600.74 Exhibit 5 – Relationship of the Planning Process and RMS Tools

Planning Process	Tools	Actions
Phase I		
Step 1 Identify Problems	Conservation Practice Physical Effects (CPPE)	Provides a list of resource considerations, problems, practices, and effects
Step 2 Determine Objectives		
Step 3 Inventory Resources	Conservation Effects for Decision Making Worksheet (CED)	Documentation of the benchmark conditions
Step 4 Analyze Resource Data		Documentation of land uses, resources, resource considerations, resource concerns, practices, and site-specific effects

Planning Process	Tools	Actions
Phase II		
Step 5 Formulate Alternatives		Combining conservation practices into systems that adequately treat identified resource concerns
Step 6 Evaluate Alternatives	CPPE, System Effects Worksheet CED	Determination and display of the expected effects of options
Step 7 Make Decisions	CED	Use of the CED by the client to evaluate options and select desired option

Planning Process	Tools	Actions
Phase III		
Step 8 Implement Plan	N/A	N/A

Step 9 Evaluate Plan	CED	Comparison of actual effects to benchmark conditions and projected effects, and providing feedback into the FOTG, electronic tools, NPPH, policy, and programs

600.75 Exhibit 6 – Resource Concerns and Planning Criteria

A. List of Resource Concerns

SOIL EROSION

- Sheet, Rill, & Wind Erosion
- Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion)
- Excessive bank erosion from streams, shorelines, or water conveyance channels

SOIL QUALITY DEGRADATION

- Subsidence
- Compaction
- Organic Matter Depletion
- Concentration of Salts and other Chemicals

EXCESS / INSUFFICIENT WATER

- Ponding, Flooding, Seasonal High Water Table, Seeps, and Drifted Snow
- Inefficient Moisture Management
- Inefficient Use of Irrigation Water

WATER QUALITY DEGRADATION

- Excess Nutrients in surface and ground waters
- Pesticides transported to surface and ground waters
- Excess Pathogens and Chemicals from manure, bio-solids, or compost applications in surface waters and ground waters
- Excessive Salts in surface waters and ground waters
- Petroleum, Heavy metals, and other pollutants, transported to waters
- Excessive Sediment in surface waters
- Elevated Water Temperature

DEGRADED PLANT CONDITION

- Undesirable Plant Productivity and Health
- Inadequate Structure and Composition
- Excessive Plant Pest Pressure
- Wildfire Hazard, Excessive Biomass Accumulation

INADEQUATE HABITAT FOR FISH AND WILDLIFE

- Habitat Degradation (Food, Water, Cover/Shelter, and Habitat Continuity/Space)

LIVESTOCK PRODUCTION LIMITATION

- Inadequate Feed and Forage
- Inadequate Livestock Shelter
- Inadequate Livestock Water

AIR QUALITY IMPACTS

- Emissions of Particulate Matter (PM) and PM Precursors
- Emissions of Greenhouse Gases (GHGs)
- Emissions of Ozone Precursors
- Objectionable Odors

INEFFICIENT ENERGY USE

- Equipment and Facilities
- Farming/Ranching Practices and Field Operations

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Equipment and Facilities

INEFFICIENT ENERGY USE - Equipment and Facilities

The inefficient use of energy increases costs and dependence on non-renewable energy sources.

What is it?

Inefficient energy use occurs whenever facilities, equipment, or machinery operate more hours than needed to meet production goals. It may also occur when facilities, equipment, or machinery become worn out, outdated, or are poorly controlled or maintained.

Why is it important?

High energy prices have put considerable pressure on the U.S. economy. High input costs and the inability to set prices leave the agricultural sector with limited options to be economically viable. Reducing energy use helps our nation to be energy independent and reduces costs, helping producers stay competitive in the marketplace.

What can be done about it?

There are two ways to reduce energy related production costs: 1) increase energy efficiency of the operation and 2) increase use of energy sources produced on the farm. For increased energy efficiency, NRCS Energy Estimator and Assessment tools gauge potential energy savings for a wide variety of efficiency upgrades. If these tools show energy saving opportunities, or if there are concerns about energy use and cost, NRCS staff will likely recommend an energy audit. During an energy audit, energy experts evaluate the farming operation and recommend changes to improve energy use. Common recommendations include changes to lighting, ventilation, heating and cooling of livestock facilities, drying/curing, milk cooling, irrigation pumping, and manure handling. An energy analyst evaluates the age and condition of facilities, equipment, and machinery, and how they are operated and maintained. For on-farm renewable energy, the Energy tools provide a similar gauge of renewable energy resources. NRCS staff can help identify ways, for example, to better use solar and wind resources, take advantage of geothermal or micro-hydropower potential, and use waste for bio-energy to leverage increased efficiency efforts.

Equipment and Facilities at a Glance

Problems / Indicators - Unacceptably high energy costs	
Causes	**Solutions**
• Unvented, propane-fired heat poultry houses • Throttling valves to control water flow • Using incandescent or T12 lights	• Convert to radiant heating • Add a Variable Frequency Drive, and upgrade inefficient pump and/or motor • Upgrade to T8, LED, or CFL lighting

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Field Operations

Soil

Water

Air

Plants

Animals

Energy

Inefficient Use

Equipment and Facilities

Field Operations

INEFFICIENT ENERGY USE - Field Operations

The inefficient use of energy increases costs and dependence on non-renewable energy sources.

What is it?

Inefficient energy use occurs whenever equipment or machinery operates more hours than needed to meet production goals. It may also occur when equipment or machinery becomes worn out, outdated, or poorly controlled.

Why is it important?

High energy prices have put considerable pressure on the U.S. economy. High input costs and the inability to set prices leave the agricultural sector with limited options to be economically viable. Reducing energy use helps our nation to be energy independent and reduces costs, helping producers stay competitive in the marketplace.

What can be done about it?

Money can be saved and energy dependency can be reduced by improving the efficiency of field operations, and by adopting practices that help reduce energy-intensive inputs, such as soil amendments, fertilizers, or pesticides. For improved efficiency, Natural Resources Conservation Service (NRCS) staff will most likely start by evaluating field operations used to till, plant, cultivate, and harvest crops. This assessment helps identify steps to take to reduce field operations or improve efficiency. The NRCS Residue Management Energy Estimator tool can be used to estimate potential energy savings associated with changes in tillage, cultivation, and fertilizer use. By using a guidance system on tractors and equipment, application overlaps can be reduced and application rates can be optimized to account for variability in soil types, elevation, soil chemistry, fertility, and productivity within fields. These steps can reduce the need for fuel, fertilizer, herbicide, and insecticide, and save money. For reduced inputs, adoption of Integrated Pest Management techniques of prevention, avoidance, monitoring, and suppression can reduce pesticide and fuel use and lower environmental risk. Substituting manure for commercial fertilizer, or using nitrogen-fixing legumes as cover crops or in crop rotations can reduce the use of fossil fuel-based commercial fertilizer. Tractor operations are likely to increase, but usually money is saved. Overall energy use is lower because less natural gas will be used to produce commercial nitrogen fertilizer (that was not purchased).

Field Operations at a Glance

Problems / Indicators - Unacceptably high energy costs	
Causes	**Solutions**
• Unnecessary trips across the field • Overlap when applying fertilizer, pesticides • High use of commercial fertilizer	• Switch to conservation tillage • Use Global Positioning System guided spraying equipment • Incorporate nitrogen-fixing legumes into rotation or as cover crop

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

ANIMALS

Feed and Forage

Soil
Water
Air
Plants
Animals
Inadequate Habitat for Fish and Wildlife
Livestock Production Limitation
Feed and Forage
Livestock Shelter
Livestock Water
Energy

LIVESTOCK PRODUCTION LIMITATION - Feed and Forage

Feed and forage quality or quantity is inadequate for nutritional needs and production goals of the kinds and classes of livestock.

What is it?

Livestock require five major classes of nutrients: energy, protein, minerals, vitamins, and water. All five are essential for normal health and production. Next to water, the greatest requirement is for energy, followed by protein, with minerals and vitamins needed in very small amounts. Without adequate energy from feed or forage, utilization of all other nutrients is impaired.

Why is it important?

Providing sufficient feed and forage helps to ensure animal health and performance. To sustain the resource base, it is critical to balance the required feed and kind of forage with the number and type of animals in the operation. Stocking rates must be adjusted and supplements provided, as needed, for livestock grazing pasture or rangeland. Improving animal feed and forage can improve livestock productivity and farm income.

What can be done about it?

Applying the principles of forage production for livestock requires an understanding of how plants interact with soil and climate, as well as understanding the nutritional needs of the animals. Prescribed Grazing is the management of grazing land to adjust intensity, frequency, timing, and duration of grazing and/or browsing to meet the desired objectives for the plant communities and the grazing and/or browsing animal. A proper system manages animal number, grazing distribution, and length and time of grazing periods to provide grazed plants sufficient recovery time for regrowth and plant health. Feed and forage balance sheets and forage growth curves are used to make decisions about stocking rates and timing of grazing rotations based on plant growth and animal demands. Fencing and placement of livestock water can facilitate proper grazing management. Conservation practices, such as Forage and Biomass Planting and Forage Harvest Management, provide guidance to improve the forage base to support the prescribed grazing system.

Feed and Forage at a Glance

Problems / Indicators - Feed and forage not adequate to support the livestock operation	
Causes	Solutions
• Insufficient livestock feed • Overstocking of livestock • Inadequate distribution of livestock grazing • Poor feed quality • Weed, insect, or disease problems	• Prescribed grazing systems • Adequate water distribution • Production of high quality feed and forage • Forage analysis for nutrient quantity and quality

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

ANIMALS

Livestock Shelter

Soil
Water
Air
Plants
Animals
Inadequate Habitat for Fish and Wildlife
Livestock Production Limitation
Feed and Forage
Livestock Shelter
Livestock Water
Energy

LIVESTOCK PRODUCTION LIMITATION - Livestock Shelter

Livestock lack adequate shelter from climatic conditions to maintain health or production goals.

What is it?

Natural vegetation or landscape features are not adequate to provide shelter for livestock during periods of severe climatic circumstances.

Why is it important?

Livestock performance is reduced during periods of high heat or extreme cold weather. Providing sufficient shelter to offset these climatic conditions can be beneficial to animal performance and health. Without adequate upland shelter, livestock may seek shelter in low-lying areas, such as streams, which may cause riparian area deterioration and/or water quality issues.

What can be done about it?

Shelters or windbreaks can be provided using natural vegetation or constructed sanctuaries to give animals sufficient protection from harsh climatic conditions. When livestock shelter is constructed or planted with ample buffer distances from riparian areas or water bodies, and in locations not susceptible to runoff and erosion, environmental risks associated with livestock concentration are minimized. Further, use of portable structures that are periodically moved helps prevent areas of heavy use and increased erosion possibilities.

Livestock Shelter at a Glance

Problems / Indicators - Vegetative, landscape, and/or structural options for livestock shelter do not exist; livestock are exposed to severe climatic conditions	
Causes	Solutions
• Exposure to extreme wind and cold in system that supports tree growth • Historical shelterbelt is partially functioning • Exposure to extreme wind and cold in area where plant options are limited or temporary shelter is preferred	• Permanent windbreak establishment using native or naturally occurring plant materials • Renovate partially existing shelter belt • Portable season-long fabricated shelter

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

ANIMALS

Livestock Water

Soil

Water

Air

Plants

Animals

- Inadequate Habitat for Fish and Wildlife
- Livestock Production Limitation
  - Feed and Forage
  - Livestock Shelter
  - Livestock Water

Energy

LIVESTOCK PRODUCTION LIMITATION - Livestock Water

Quantity, quality, and/or distribution of drinking water are insufficient to maintain health or production goals for the kinds and classes of livestock.

What is it?

Water is an important but often overlooked nutrient for livestock. Water makes up over 98 percent of all molecules in the body and is necessary for regulation of body temperature, growth, reproduction, lactation, digestion, lubrication of joints, eyesight, and as a cleansing agent. Livestock water requirements are influenced by several factors, including rate of gain, pregnancy, lactation, activity, type of diet, feed intake, and environmental temperature.

Why is it important?

Water quality for livestock consumption can be detrimental based on several parameters, such as nitrates, sulfates, salinity, bacteria, pH, pesticides, and total dissolved solids. Water quantity and distribution of suitable water sources can affect livestock based on the basic need to meet daily intake requirements and issues related to grazing patterns and travel distance to water that may result in surplus/deficient forage availability and excessive/insufficient plant utilization. All of these ultimately affect livestock health and resource stability.

What can be done about it?

Water quality concerns, for both livestock health and the environment, can be addressed by limiting livestock access to ponds and water bodies or by installing watering facilities. Proper layout of water facilities will provide more even distribution of grazing that will enhance forage utilization. Animals do not graze or utilize areas that are remote from water sources and the size of the facility should be designed to avoid crowding. Having watering sites as evenly distributed as possible in a grazing system will help circumvent overused or underused areas of the pasture.

Livestock Water at a Glance

Problems / Indicators - Lack of water, poor water quality, poor distribution can affect livestock health	
Causes	**Solutions**
• Water availability is limited • Spring area trampled by livestock • Livestock in stream or pond creating potential health concerns	• Inventory, evaluate, and plan watering system for livestock type • Develop spring for livestock water and outlet for wet area for native plants and wildlife • Establish select watering points and construct watering facilities to move livestock away from streams and ponds

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Plant Pests

Soil

Water

Air

Plants

- Degraded Plant Condition
  - Plant Productivity and Health
  - Structure and Composition
  - Plant Pests
  - Wildfire Hazard

Animals

Energy

DEGRADED PLANT CONDITION - Plant Pests

Excessive pest damage to plants including that from undesired plants, diseases, animals, soil borne pathogens, and nematodes.

What is it?

Plants provide food for many forms of life. Human beings and grazing animals depend on plants for food. It is important to note that large numbers of other much smaller creatures, such as insects and their larvae, also feed on plants. Other plants, fungi, bacteria, and viruses use plants as a host during part of their life cycle. Generally, these interactions are normal, predictable, and benign. However, we apply the term "pest" to any animal, insect, bacteria, or virus when any of these interactions become unbalanced and unacceptable plant damage results. Pests can also take the form of any organism that competes for space, nutrients, or water (e.g., weeds). Pests can vary from place to place, crop to crop, year to year.

Why is it important?

For plants to produce the expected yield, preferred products, or desired environmental outcomes, they must be protected from unchecked animal, weed, insect, and disease pests.

What can be done about it?

Management is the key to keeping damage from plant pests within tolerable limits. Integrated Pest Management is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. Set Thresholds - Before taking any pest control action, set a point at which pest populations or environmental conditions indicate that pest control action must be taken. Monitor and Identify Pests - Not all insects, weeds, and other living organisms require control. Identify pests accurately so appropriate control decisions can be made in conjunction with action thresholds. Prevention - As a first line of pest control, manage to prevent pests from becoming a threat. Rotate crops and select pest-resistant varieties. Control - If pest control is required, evaluate control methods for effectiveness and risk. Use less risky pest controls first, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then employ additional pest control methods such as targeted spraying of pesticides. Use broadcast spraying of non-specific pesticides only as a last resort.

Plant Pests at a Glance

Problems / Indicators - Animal, insect, and/or disease damage, or competition from common weeds or invasive plants substantially reduces yield or growth	
Causes	**Solutions**
• Plants suffer from attacks by pests or disease • Weeds or invasive plants out compete desired crop	• Use Integrated Pest Management to employ early detection, avoidance, and treatment of pests • Consider brush management, vegetative weed control, mulching, or prescribed grazing or burning

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Plant Productivity and Health

PLANTS

Soil

Water

Air

Plants

- Degraded Plant Condition
  - Plant Productivity and Health
  - Structure and Composition
  - Plant Pests
  - Wildfire Hazard

Animals

Energy

DEGRADED PLANT CONDITION - Plant Productivity and Health

Plant productivity, vigor and/or quality negatively impacts other resources or does not meet yield potential due to improper fertility, management or plants not adapted to site.

What is it?

Plants established in the wrong climate or soil may be under stress and may never thrive, no matter how much fertilizer or water you supply. Natural events, such as drought, or mismanagement can cause plant stress. Plants under stress are more susceptible to disease and insect damage. Symptoms of poor plant vigor and health may include slow growth, discoloration of leaves, wilting or drooping of foliage, leaf drop, leaves covered with a sticky substance, and/or brown colored roots.

Why is it important?

For plants to produce the expected yield, preferred products, or desired environmental outcomes they must be adapted to the site on which they are growing, provided with the appropriate amounts of nutrients, water, and sunshine, and protected from unchecked animal, weed, insect, and disease pests.

What can be done about it?

Management is the key to maintaining plant productivity and health. Check that the desired plant is suited to the climate and soil type. Set realistic yield goals based on soil productivity information, historical yield data, climatic conditions, level of management, and/or local research on similar soil and cropping systems. The NRCS Web Soil Survey (http://websoilsurvey.nrcs.usda.gov) is an excellent source for information about soils and their limitations for growing various crops. University Extension agents are a great resource for learning about the nutritional, cultural, and management practices needed to keep plants healthy and productive. The Nutrient Management practice will specify the amount, timing, and method of application of nutrients needed to achieve realistic production goals. The Integrated Pest Management practice will specify techniques to detect, avoid, and treat pests and diseases. Some causes of poor health and vigor may require the use of cover crops, the adoption of new crop rotations, or changes to tillage methods to address soil quality issues, such as soil compaction, poor drainage, low organic matter, or the presence of contaminants in the soil.

Plant Productivity and Health at a Glance

Problems / Indicators - Yield or growth is substantially less than expected, plants are disease and/or pest-ridden, plants fail to thrive	
Causes	**Solutions**
• Plants receive inadequate nutrition during critical growth periods • Plants fail to thrive due to poor soil conditions • Plants wilt, freeze or rot even during normal climate conditions	• Use nutrient management to address the form, rate, placement, and timing of nutrient application • Consider crop rotations, deep rooted cover crops, drainage, and deep tillage • Consider alternate crops or different plant varieties

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Structure and Composition

Soil
Water
Air
Plants
Degraded Plant Condition
Plant Productivity and Health
Structure and Composition
Plant Pests
Wildfire Hazard
Animals
Energy

DEGRADED PLANT CONDITION - Structure and Composition

Plant communities have insufficient composition and structure to achieve ecological functions and management objectives. Inadequate structure and composition also includes degradation of wetland habitat, targeted ecosystems, or unique plant communities.

What is it?

A stand of plants and associated organisms (bacteria, fungi, animals) that share a defined area or environment lack the diversity, density, distribution patterns, and three-dimensional structure necessary to produce the preferred products or desired environmental outcomes.

Why is it important?

If landowners hope to achieve their production or environmental objectives, it is critical that they understand and work with the processes that affect structure and composition of plant communities. The interaction between plants, other organisms, and environmental factors such as soil, climate, and topography influence how a plant community functions to cycle nutrients, capture and release water, protect and build soil, nurture wildlife, or produce useable products.

What can be done about it?

Addressing inadequate structure and composition is a complex problem that varies with the natural plant community that is desired. All human activities have the potential to impact natural communities, whether it is land use changes, drainage activities, controlling fires, or the introduction of different animal and plant species. Activities can include removal of unwanted plants to provide more space for desired species to increase in number or size. Desired plants can be reintroduced that are missing from the community. Practices such as grazing, mowing, fertilization, and burning can be used to promote and/or repress growth of target plants to attain the desired structure and composition.

Structure and Composition at a Glance

Problems / Indicators - Inadequate structure and composition	
Causes	**Solutions**
• Stress, disease and/or mismanagement reduces and/or eliminates key components of plant community • Plant community is allowed to grow to late succession stage and fails to produce desired habitat for wildlife and/or insects that depend on early succession habitat • Invasive species outcompete desired plants creating a monoculture • Loss of fire regime	• Employ or modify use of cultural practices (e.g., grazing, burning, mowing) • Treat or remove vegetation to reestablish early seral stage habitat • Exterminate invasive species, reestablish desired plant community, and utilize integrated pest management techniques to maintain stand

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

PLANTS

Wildfire Hazard

Soil

Water

Air

Plants

Degraded Plant Condition

Plant Productivity and Health

Structure and Composition

Plant Pests

Wildfire Hazard

Animals

Energy

DEGRADED PLANT CONDITION - Wildfire Hazard

Accumulated plant residue (biomass) creates wildfire hazards that pose risks to human safety, structures, plants, animals, and air resources.

What is it?

All plants produce litter from leaves, stalks, or stems. Normally, this residue is either left to decompose and nourish the next generation of plants and animals, or it is harvested and used for straw, mulch, bio-fuel, pulp, etc. When the rate of utilization and/or decomposition is slower than the rate of biomass production, residues can accumulate to the point of becoming a fire hazard.

Why is it important?

While fire is an important and often beneficial part of the natural ecosystem, uncontrolled or "wild" fire poses a threat to life, health, and property. In addition, the secondary effects of wildfires, including erosion, landslides, introduction of invasive species, and changes in water quality, are often more disastrous than the fire itself.

What can be done about it?

The amount of flammable biomass can be reduced to decrease the incidence of wildfires; the distribution of biomass can be manipulated to influence the direction and rate at which wildfires spread; and precautionary steps can be taken to protect life and property to lessen the impacts of wildfires.

Wildfire Hazard at a Glance

Problems / Indicators - Excess biomass, biomass distribution, lack of preparedness	
Causes	**Solutions**

• Overstocked forest increases the risk of fire outbreak
• Unbroken expanse of flammable biomass increases the risk of the spread of fire
• Lack of a plan on how to respond to fire increases risk to life and property
	• Thin excess trees and brush
	• Treat or remove vegetation, debris, and detritus
	• Create and implement a wildfire plan:
	  • post fire control agency phone numbers
	  • locate and map water sources
	  • map out evacuation routes
	  • equip vehicles with fire fighting tools

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Concentrated Flow Erosion

SOIL

Soil

Soil Erosion

Sheet, Rill and Wind Erosion

Concentrated Flow Erosion

Shoreline, Bank and Channel Erosion

Soil Quality Degradation

Water

Air

Plants

Animals

Energy

SOIL EROSION - Concentrated Flow Erosion

Untreated classic gullies may enlarge progressively by head cutting and/or lateral widening. Ephemeral gullies occur in the same flow area and are obscured by tillage. This includes concentrated flow erosion caused by runoff from rainfall, snowmelt, or irrigation water.

What is it?

Ephemeral and classic gully are forms of erosion created by the concentrated flow of water. They are easily identified through visual observation. An ephemeral cropland gully is larger than a rill and smaller than a classic gully. They usually result from the junction of rills that form a dendritic (branching or tree-like) pattern of channels. Ephemeral gullies usually appear on cultivated fields during the planting or growing season, but are temporarily removed by cultivation. Ephemeral gullies can reappear at or near the same location on a yearly basis because the surface topography of the field does not change appreciably. Classic gully erosion generally occurs in well defined drainage ways and generally is not obliterated by tillage. In some situations, headcuts are present and aid in advancing the gully upstream.

Why is it important?

Concentrated flow erosion removes surface soil, which often has the highest biological activity and most soil organic matter. Nutrients removed by erosion are no longer available to support plant growth on-site, and when they accumulate in water, algal blooms, lake eutrophication, and high dissolved oxygen levels can occur. Deposition of eroded materials can obstruct roadways and fill drainage channels. Gullies can impact farm operations by creating barriers that change traffic patterns and create hazards that can damage farm equipment.

What can be done about it?

Ephemeral erosion can be controlled using a conservation cropping system that includes residue management. High residue crops and maintaining soil cover throughout the year are effective means for controlling ephemeral erosion and aid in the control of classic gully erosion. Gully formations can be difficult to control if remedial measures are not designed and properly constructed. Correcting concentrated flow erosion involves mitigating the damage and addressing the cause. The cause of increased water flow across the landscape must be considered and the corrective action usually requires a system of conservation practices. Conservation tillage and cropping practices that increase water infiltration into the soil result in less runoff and protect land from erosion.

Concentrated Flow Erosion at a Glance

Problems / Indicators - Branching or tree-like pattern of rills, gullies, headcuts	
Causes	Solutions
• Bare or unprotected soil • Excess runoff • Inadequate outlet for water	• Residue Management • Cover Crops • Terraces • Grassed Waterway • Grade Stabilization Structure • Lined Waterway or Outlet • Water and Sediment Control Basin

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Sheet, Rill and Wind Erosion

SOIL

Soil

Soil Erosion

Sheet, Rill and Wind Erosion

Concentrated Flow Erosion

Shoreline, Bank and Channel Erosion

Soil Quality Degradation

Water

Air

Plants

Animals

Energy

SOIL EROSION - Sheet, Rill and Wind Erosion

Detachment and transportation of soil particles caused by rainfall runoff/splash, irrigation runoff, or wind that degrades soil quality.

What is it?

Wind or water erosion is the physical wearing of the earth's surface. Erosion is not always readily visible, even when soil loss exceeds unsustainable levels. Symptoms of soil erosion by water may be identified by small rills and channels on the soil surface, soil deposited at the base of slopes, sediment in streams, lakes, and reservoirs, and pedestals of soil supporting pebbles and plant material. Water erosion is most obvious on steep, convex landscape positions. Symptoms of wind erosion may be identified by dust clouds, soil accumulation along fence lines or snowbanks, and a drifted appearance of the soil surface.

Why is it important?

Erosion removes surface soil material (topsoil), reduces levels of soil organic matter, and contributes to the breakdown of soil structure. This creates a less favorable environment for plant growth. Loss of only 1/32 of an inch can represent a 5 ton/acre soil loss. In soils that have restrictions to root growth, erosion decreases rooting depth, which decreases the amount of water, air, and nutrients available to plants. Erosion removes surface soil, which often has the highest biological activity and greatest amount of soil organic matter. Nutrients removed by erosion are no longer available to support plant growth on-site, and when they accumulate in water, algal blooms, lake eutrophication, and high dissolved oxygen levels can occur. Deposition of eroded materials can obstruct roadways and fill drainage channels. Blowing dust can affect human health and create public safety hazards.

What can be done about it?

Soil erosion can be avoided by maintaining a protective cover on the soil and modifying the landscape to control runoff amounts and rates. To avoid water erosion, include high residue, perennial, and sod crops in the cropping system, grow cover crops, manage crop residues, and shorten the length and steepness of slopes. To avoid wind erosion, keep soil covered with plants or residue, plant windbreaks, use stripcropping, increase surface roughness, cultivate on the contour, and maintain soil aggregates at a size less likely to be carried by wind.

Sheet, Rill and Wind Erosion at a Glance

Problems / Indicators - Changes in soil horizon thickness, soil deposition in fields and water, and decreased organic matter	
Causes	**Solutions**
• Bare or unprotected soil • Long and steep slopes • Intense rainfall or irrigation events when residue cover is at a minimum • Decreased infiltration by compaction	• Residue Management • Crop Rotation • Cover Crops • Terraces • Contour Farming • Stripcropping • Windbreaks

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Shoreline, Bank and Channel Erosion

SOIL

Soil

Soil Erosion

Sheet, Rill and Wind Erosion

Concentrated Flow Erosion

Shoreline, Bank and Channel Erosion

Soil Quality Degradation

Water

Air

Plants

Animals

Energy

SOIL EROSION - Shoreline, Bank and Channel Erosion

Sediment from banks, shorelines or conveyance channels threatens to degrade water quality and limit use for intended purposes.

What is it?

Stream stability is an active process, and while streambank erosion is a natural part of this process, it is often accelerated by altering the stream system. Streambank erosion is that part of channel erosion in which material is eroded from the streambank and deposited at the base of the slope or in the channel. Streambank erosion is usually associated with erosion of the streambed. It occurs along perennial, intermittent, and ephemeral streams.

Why is it important?

The benefits of proper streambank stabilization go far beyond preventing loss of land and keeping sediment out of streams. Streambank erosion increases sediment in the stream degrading water quality and resulting in the loss of fertile bottomland. The quality of wildlife habitat is impacted both on land and in the stream. Streambank erosion increases the stream's sediment load and changes its shape and function. When this happens the stream loses its ability to transport sediment which causes it to become wide and shallow. The stream channel can become braided, quality habitat is lost and the increased sediment can reduce overall biological productivity.

What can be done about it?

Determining the cause of accelerated streambank erosion is the first step in solving the problem. Development in the watershed often alters the stream equilibrium by changing rainfall-runoff relationships. Many of the traditional methods of dealing with streambank erosion, such as rock revetments, are expensive to install and maintain. While hard solutions are often needed to protect infrastructure, these treatments may solve the problem at the expense of habitat and stream corridor aesthetics. There are some promising developments in the area of streambank stabilization and stream restoration. Greener and more natural treatment alternatives are being more widely adopted. Soil bioengineering practices, native material revetments, combinations of rock and vegetation, and in-stream structures help to stabilize eroding banks. These techniques can be used to move a stream toward a healthy, stable and self-maintaining system.

Shoreline, Bank and Channel Erosion at a Glance

Problems / Indicators - Eroding Banks, degrading streambed, and manipulated stream channels	
Causes	**Solutions**
• Increased runoff due to land use changes in the watershed • Eroding or unstable streambanks • Exposed tree roots along banks • Large runoff events • Degraded riparian areas • Uncontrolled livestock access	• Bank armor and protection • Soil bioengineering practices • In-stream structures • Native material revetments • Riparian areas with native or locally adapted vegetation • Control livestock access to the water bodies

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

SOIL Compaction

Soil

Soil Erosion

Soil Quality Degradation

Subsidence

Compaction

Organic Matter

Salts and Chemicals

Water

Air

Plants

Animals

Energy

SOIL QUALITY DEGRADATION - Compaction

Management induced soil compaction resulting in decreased rooting depth that reduces plant growth, animal habitat and soil biological activity.

What is it?

Compaction occurs when soil particles are pressed together, reducing pore space between the particles and pushing out the air normally located there. It is manifested as an increase in bulk density. A severely compacted soil can become effectively impermeable. Soils are either naturally compacted (heavy, clay soil) or compaction is caused by management activities. Compaction is assessed using measurements of bulk density, penetration resistance, porosity, and root growth patterns.

Why is it important?

Compaction reflects the soil's ability to function for structural support, water and solute movement, and soil aeration. It may cause restrictions to root growth, and poor movement of air and water through the soil. Compaction can result in shallow plant rooting and poor plant growth, influencing crop yield and reducing vegetative cover available to protect soil from erosion. By reducing water infiltration into the soil, compaction can lead to increased runoff and erosion from sloping land or waterlogged soils in flatter areas. In general, some soil compaction to restrict water movement through the soil profile is beneficial under arid conditions, but under humid conditions compaction decreases yields.

What can be done about it?

Long-term solutions to soil compaction problems revolve around decreasing soil disturbance and increasing soil organic matter. A system that uses cover crops, crop residues, perennial sod, and/or reduced tillage results in increased soil organic matter, less disturbance and reduced bulk density. Additionally, the use of multi-crop systems involving plants with different rooting depths can help break up compacted soil layers. Grazing systems that minimize livestock traffic and loafing, provide protected heavy use areas, and adhere to recommended minimum grazing heights reduce bulk density by preventing compaction and providing soil cover.

Compaction at a Glance

Problems / Indicators - Bulk density, penetration resistance, porosity, root growth patterns	
Causes	**Solutions**
• Working wet soil • Excess traffic, machinery or livestock • Heavy machinery • Repeated tillage at same depth • Poor aggregation • Low organic matter	• Avoid working wet soil • Reduce traffic/tillage operations, rotate • Use controlled traffic patterns • Subsoil or rip compacted areas • Diversify cropping system • Use conservation tillage • Grow cover crops • Add animal manures • Use non-compacting tillage

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

SOIL Organic Matter

Soil

Soil Erosion

Soil Quality Degradation

Subsidence

Compaction

Organic Matter

Salts and Chemicals

Water

Air

Plants

Animals

Energy

SOIL QUALITY DEGRADATION - Organic Matter

Soil organic matter is not adequate to provide a suitable medium for plant growth, animal habitat, and soil biological activity.

What is it?

Soil organic matter is carbon-rich material that includes plant, animal, and microbial residue in various stages of decomposition. Live soil organisms and plant roots are part of the carbon pool in soil but are not considered soil organic matter until they die and begin to decay. The quantity and composition of soil organic matter vary significantly among major ecosystems. Soil in arid, semiarid, and hot, humid regions commonly has less organic matter than soil in other environments.

Why is it important?

Many soil properties impact soil quality, but organic matter deserves special attention. It affects several critical soil functions, can be manipulated by land management practices, and is important in most agricultural settings across the country. Because organic matter improves soil structure and enhances water and nutrient holding capacity, managing for soil carbon can enhance soil productivity and environmental quality, and it can reduce the severity and costs of natural phenomena, such as drought, flood, and disease. In addition, increasing soil organic matter levels can reduce atmospheric CO_2 levels that contribute to climate change, and improved soil quality reduces dust, allergens, and pathogens in the air. Ground and surface water quality improve because better structure, infiltration, and biological activity make soil a more effective filter. For example, organic matter may bind pesticides, making them less active.

What can be done about it?

The most practical way to enhance soil quality, and as a result air and water quality, is to promote better management of soil organic matter or carbon. Practices that increase organic matter include: leaving crop residues in the field, choosing crop rotations that include high residue plants, using optimal nutrient and water management practices to grow healthy plants with large amounts of roots and residue, growing cover crops, applying manure or compost, using low or no tillage systems, and mulching.

Organic Matter at a Glance

Problems / Indicators - Compaction, slaking, soil crusting, crop moisture stress, poor soil structure	
Causes	**Solutions**
• Soil disturbance • Intensive tillage systems • Low crop biomass (surface and subsurface) • Burning, harvesting or otherwise removing crop residues	• Diverse, high biomass crop rotations • Cover crops • Reduced tillage • Rotational or prescribed grazing • Perennials in rotations • Maintain crop residues on soil surface • Use of animal manure and compost • Water table management

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Salts and Chemicals

SOIL

Soil

- Soil Erosion
- Soil Quality Degradation
  - Subsidence
  - Compaction
  - Organic Matter
  - Salts and Chemicals

Water

Air

Plants

Animals

Energy

SOIL QUALITY DEGRADATION - Salts and Chemicals

Concentration of salts leading to salinity and/or sodicity reducing productivity or limiting desired use. The resource concern is also applicable to concentrations of other chemicals impacting productivity or limiting desired use.

What is it?

Salinity is a process by which water-soluble salts accumulate in the soil. Saline soils are indicative of inadequate drainage to leach salts from the soil or upward migration of salt from shallow ground water. Sodic soils are high in sodium relative to concentrations of calcium and magnesium. Salinity or sodicity occurs naturally or may result from management practices. Soil formed on parent material high in salts, such as marine deposits, and with inadequate drainage, will be high in salts. Fertilizers, soil amendments (gypsum, lime), and manure may contribute to salinity problems, as well. Applications of saline and/or sodic water without adequate leaching or in the presence of a high water table will increase soil electrical conductivity over time, eventually resulting in saline soil. Soils can also become saline through the process of saline seeps.

Why is it important?

Since few plants grow well on saline/sodic soils, cropping options on these soils may be limited. Salts in the soil can negatively affect water uptake by plants, and saline soils tend to inhibit germination and plant emergence. Growth patterns in cropped fields can be poor, with spotty stand establishment. Under severe salt stress, herbaceous crops appear bluish-green. Leaf tip burn and die-off of older leaves in cereal grains can result from salinity or related drought stress. Salinization degrades the quality of shallow ground water and surface water resources, such as ponds, sloughs, and dugouts.

What can be done about it?

Reducing the severity and extent of soil salinity is accomplished primarily with recharge and discharge water management. Recharge management is used on areas that contribute excess water to the soil and includes decreasing infiltration of excess saline/sodic water and irrigation to maintain salts at a level below the root zone. Discharge management is used on areas where excess water comes to the soil surface and includes growing salt tolerant crops, reducing deep tillage and eliminating seepage.

Salts and Chemicals at a Glance

Problems / Indicators - White crusting of soil, irregular crop growth, and lack of plant vigor	
Causes	**Solutions**
• Naturally occurring in soils with high concentrations of soluble salts, e.g., sodium, calcium, and magnesium sulfates • Inadequate drainage to leach salt from the soil • Upward migration of salt from shallow ground water • Application of saline and/or sodic water	• Proper use of irrigation water • Use of salt-tolerant crops • Removal of excess water from recharge areas • Maintenance of the water table at safe levels • Use of cropping and tillage systems that promote adequate infiltration and permeability • Reducing deep tillage

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

SOIL Subsidence

Soil

Soil Erosion

Soil Quality Degradation

Subsidence

Compaction

Organic Matter

Salts and Chemicals

Water

Air

Plants

Animals

Energy

SOIL QUALITY DEGRADATION - Subsidence

Loss of volume and depth of organic soils due to oxidation caused by above normal microbial activity resulting from excessive water drainage, soil disturbance, or extended drought. This excludes karst / sinkholes issues or depressions caused by underground activities.

What is it?

Subsidence is a gradual lowering of the surface elevation of an organic soil, or a reduction in the thickness of organic matter. Organic soils (Histosols) are those that are predominantly organic soil materials. They are commonly called bogs, moors, or peats and mucks. The most important cause of organic soil subsidence is a process commonly termed "oxidation." A high water table creates anaerobic conditions that slow the breakdown of organic materials. The balance between accumulation and decomposition of organic material shifts dramatically when soil is drained. Oxidation under aerobic conditions converts the organic carbon in the plant tissue to carbon dioxide gas and water. Aerobic decomposition under drained conditions is much more efficient thereby causing the loss of organic matter.

Why is it important?

Soil subsidence is usually irreversible. The natural rate of accumulation of organic soil is on the order of a few inches per 100 years; the rate of loss of drained organic soil can be 100 times greater, up to a few inches per year in extreme cases. Thus, deposits that have accumulated over hundreds of years can disappear relatively quickly in response to human activity. In time, the remaining organic material becomes diluted through the incorporation of the organic layer into the mineral subsoil. This reduces the productivity of the soil.

What can be done about it?

Once oxidation depletes the organic matter, it generally cannot be restored. The oxidation rate of organic matter can be minimized by managing water table levels to reduce aeration. In non-crop situations, keep the water table as close to the soil surface as possible. During the cropping season, maintain the water table at the optimum level for the crop being grown. Use cover crops to keep the soil covered and to return organic matter to the soil.

Subsidence at a Glance

Problems / Indicators - Loss of volume and depth of organic soils	
Causes	**Solutions**
• Drainage • Cultivation / Soil disturbance	• Water table management • Diverse, high biomass crop rotations • Cover crops • Reduced tillage • Perennials in rotations

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

WATER

Nutrients

Soil

Water

- Excess Water
- Insufficient Water
- Water Quality Degradation
  - Nutrients
  - Pesticides
  - Pathogens
  - Salts
  - Petroleum and Heavy Metals
  - Sediment
  - Elevated Water Temperature

Air

Plants

Animals

Energy

WATER QUALITY DEGRADATION - Nutrients

Nutrients (organics and inorganics) are transported to receiving waters through surface runoff and/or leaching into shallow ground waters in quantities that degrade water quality and limit use for intended purposes.

What is it?

Water bodies require nutrients, such as nitrogen and phosphorus, to be healthy, but too many nutrients can be harmful. Many of our nation's waters, including streams, rivers, wetlands, estuaries, and coastal waters, are affected by excess nutrients. The effect of nutrients for a given water body depends on its ecoregion and the source of nutrients.

Why is it important?

High levels of nitrogen and phosphorus in waters can produce harmful algal blooms. In turn, these blooms can produce "dead zones" in water bodies where dissolved oxygen levels are so low that most aquatic life cannot survive. This condition in water bodies is referred to as hypoxia.

What can be done about it?

Management is the key to protecting water quality from excess nutrients. Nutrient management shall specify the source, amount, timing and method of application of nutrients on each field to achieve realistic production goals, while minimizing movement of nutrients and other potential contaminants to surface and/or ground waters. Realistic yield goals shall be established based on soil productivity information, historical yield data, climatic conditions, level of management and/or local research on similar soil, cropping systems, and soil and manure/organic by-products tests. Areas contained within established minimum application setbacks (e.g., sinkholes, wells, or rapidly permeable soil areas) should not receive direct application of nutrients. Nutrients may also be lost due to erosion, runoff, irrigation and drainage, so applicable practices should be installed to address these concerns.

Nutrients at a Glance

Problems / Indicators - Algae blooms, mass death of fish or aquatic organisms, dissolved oxygen concentrations, hypoxia	
Causes	**Solutions**
• Overusing fertilizer (both residential and agricultural usage) • Erosion of nutrient-laden soil • Rainfall flowing over cropland, animal feeding operations and pastures, picking up animal waste and depositing it in water bodies • Low organic matter	• Use nutrient management to address the form, rate, placement and timing of nutrient application • Grow cover crops • Use crop rotations • Increase crop diversity

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

WATER Pathogens

Soil

Water

- Excess Water
- Insufficient Water
- Water Quality Degradation
  - Nutrients
  - Pesticides
  - Pathogens
  - Salts
  - Petroleum and Heavy Metals
  - Sediment
  - Elevated Water Temperature

Air

Plants

Animals

Energy

WATER QUALITY DEGRADATION - Pathogens

Pathogens, pharmaceuticals, and other chemicals are carried by soil amendments that are applied to the land and are subsequently transported to receiving waters in quantities that degrade water quality and limit use for intended purposes. This resource concern also includes the off-site transport of leachate and runoff from compost or other organic materials of animal origin.

What is it?

Many potential pathogens (disease-causing microorganisms) can be found in manure. These pathogens include bacteria, protozoa, and viruses. If effected soil amendments are not adequately treated and contained, pathogens may enter ground or surface water posing a potential risk to human and animal health.

Why is it important?

Pathogens can be transmitted to humans directly through contact with animals and animal waste or indirectly through contaminated water or food. Human illness and death has resulted from exposure to pathogens from livestock and poultry manure. Pathogens can also be transmitted to domestic and wild animals with similar results.

What can be done about it?

The most effective tool in eliminating pathogens from manure, from both practical and economic standpoints, is time. If manure is allowed to sit undisturbed in storage or in soil, the concentration of pathogens will decrease with time as they die off or are overgrown by native microbes. Managing manure for pathogens is approached in two phases: 1) collection and storage and 2) land treatment. In the collection and storage of manure, pathogens can be addressed by biological control (composting, anaerobic digesters, etc.), chemical methods, and control of runoff and leaching. It is also important to manage livestock access to streams, rivers and water bodies. Land application is commonly a critical process in manure management. Pathogens from manure can threaten humans who are exposed to runoff, have direct contact with manure, or consume food or water contaminated with manure. Application rate and seasonal conditions are important factors contributing to the transfer of pathogens from lands where manure has recently been applied to nearby surface water. Managing the rate, timing and method of application of manure are critical elements in managing for pathogens. Keeping a buffer zone or setback distance between manure application areas and water bodies is a common practice that greatly decreases the transport of pathogens to those water bodies.

Pathogens at a Glance

Problems / Indicators - Storage, handling, and application of manure, bio-solids, or compost	
Causes	**Solutions**
• Collection, handling and storage of manure • Land application of manure	• Biological treatment (anaerobic storage, composting, anaerobic digesters) • Vegetative filter strips, setbacks and buffer zones • Managing livestock access to water • Managing the rate, timing, and method of application of manure

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

WATER

Salts

Soil

Water

- Excess Water
- Insufficient Water
- Water Quality Degradation
  - Nutrients
  - Pesticides
  - Pathogens
  - Salts
  - Petroleum and Heavy Metals
  - Sediment
  - Elevated Water Temperature

Air

Plants

Animals

Energy

WATER QUALITY DEGRADATION - Salts

Irrigation or rainfall runoff transports salts to receiving waters in quantities that degrade water quality and limit use for intended purposes.

What is it?

Salinity is a process by which water-soluble salts accumulate in the soil and water. Nearly all waters contain dissolved salts and trace elements, many of which result from the natural weathering of the earth's surface. In addition, drainage waters from irrigated lands and effluent from city sewage and industrial waste water can impact water quality. In most irrigation situations, the primary water quality concern is salinity levels since salts can affect both the soil structure and crop yield. Most salinity problems in agriculture result directly from the salts carried in irrigation water.

Why is it important?

Salinity increases the cost of treating water for drinking, reduces the availability of water for irrigation, and renders farmland useless, costing the economy millions each year. Salinity is an ecological factor, influencing the types of organisms that live in a body of water. It influences the kinds of plants that will grow either in a water body, or on land fed by irrigation water or groundwater. If water containing too much salt is applied during irrigation, salt tends to build up in the soil, reducing the amount of water available to plants. Salts in the soil increase the efforts by plant roots to take in water and can make water unavailable to plants at higher salt levels. Few plants grow well on saline soils; often restricting options for cropping in a given land area.

What can be done about it?

Salinity as a water quality issue is addressed through soil management activities. Reducing the severity and extent of salinity is accomplished primarily with recharge and discharge water management. Recharge management is used on areas that contribute excess water to the soil and includes decreasing infiltration of excess saline water and irrigation to maintain salts at a level below the root zone. Discharge management is used on areas where excess water comes to the soil surface and includes growing salt tolerant crops, reducing deep tillage and eliminating seepage.

Salts at a Glance

Problems / Indicators - White crusting of soil, irregular crop growth, and lack of plant vigor	
Causes	**Solutions**
• Naturally occurring in soils with concentrations of soluble salts, such as sulfates of sodium, calcium, and magnesium in the soil • Inadequate drainage to leach salt from the soil • Upward migration of salt from shallow ground water • Application of saline water	• Proper use of irrigation water • Use of salt-tolerant crops • Removal of excess water from recharge areas • Maintain the water table at a safe levels • Use cropping and tillage systems that promote adequate infiltration and permeability • Reducing deep tillage

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

WATER Sediment

Soil

Water

- Excess Water
- Insufficient Water
- Water Quality Degradation
  - Nutrients
  - Pesticides
  - Pathogens
  - Salts
  - Petroleum and Heavy Metals
  - Sediment
  - Elevated Water Temperature

Air

Plants

Animals

Energy

WATER QUALITY DEGRADATION - Sediment

Off-site transport of sediment from sheet, rill, gully, and wind erosion into surface water that threatens to degrade surface water quality and limit use for intended purposes.

What is it?

Wind or water erosion is the physical and chemical wearing of the earth's surface and is a natural ecosystem process. Problems arise when excess fine sediment enters surface water at rates and volumes greater than under natural conditions, resulting in turbidity and sedimentation. Typically, erosion related to human activities generates excessive sediment and should be controlled to acceptable levels.

Why is it important?

Sediment can have a significant impact on water quality and aquatic habitat. Not only does sediment carry nutrients and pesticides that can negatively impact water quality, but the physical characteristics of sediment can clog stream channels, silt in reservoirs, cover fish spawning grounds, and reduce downstream water quality. Sediment makes the water more turbid and restricts light penetration into the water, which impacts the ability of aquatic plants to perform photosynthesis. Suspended sediments can clog the gills of aquatic organisms and cause death. Sediment build up on the stream bottom can lead to the suffocation of fish eggs and macro invertebrates and impact natural spawning. Additionally, with an increased amount of particles in the water, dissolved oxygen levels may be reduced due to elevated water temperatures. Excessive sediment also impacts coastal area water quality as it can smother and kill coral tissue and reduces light levels and food supplied to the coral by symbiotic algae.

What can be done about it?

The issue of excessive sediments for water quality is managed by addressing the source and/or transport of soil. Controlling the source of soil erosion involves maintaining a protective cover on the soil and modifying the landscape to control runoff amounts and rates. Specific practices include growing perennial crops in rotation or as permanent cover, growing cover crops, managing crop residue, shortening the length and steepness of slopes, and increasing water infiltration rates. Controlling the transport of soil into water bodies involves buffers and edge of field treatments. Specific practices include grassed waterways, field borders, filter strips, and riparian forest/herbaceous buffers.

Sediment at a Glance

Problems / Indicators - Cloudy or muddy water, stream/water body soil deposition	
Causes	**Solutions**
• Bare or unprotected soil • long and steep slopes, • Intense rainfall or irrigation events when residue cover is at a minimum, • Decreased infiltration by compaction	• Residue management • Crop rotations with high biomass crops • Cover crops • Terraces • Strip Cropping • Windbreaks • Buffers and filter strips to address the transport of sediment

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Elevated Water Temperature

WATER

Soil

Water

- Excess Water
- Insufficient Water
- Water Quality Degradation
  - Nutrients
  - Pesticides
  - Pathogens
  - Salts
  - Petroleum and Heavy Metals
  - Sediment
  - Elevated Water Temperature

Air

Plants

Animals

Energy

WATER QUALITY DEGRADATION - Elevated Water Temperature

Surface water temperatures exceed State/Federal standards and/or limit use for intended purposes.

What is it?

Temperature has an important influence on water chemistry. As water temperature rises, there is a corresponding decrease in the availability of oxygen, carbon dioxide, and other gases important to aquatic life. Elevated water temperature also results in increases of dissolved minerals that can further degrade water quality. In some areas, Federal and/or State law regulate the temperature of surface water.

Why is it important?

Water temperature has extremely important ecological consequences. The metabolic rate of organisms rises with increasing water temperatures, resulting in increased oxygen demand. This is coupled with the reduced amount of oxygen that is available as the water temperature increases. During extended periods of warming, water may lose its potential to support healthy populations of fish and other aquatic organisms and may even kill desired species or lead to a change in species diversity. Warm water also has the potential to increase the presence of dissolved toxic substances that may restrict the suitability of water for human use.

What can be done about it?

There is actually very little an individual landowner can do to cool surface waters. Most conservation actions designed to address water temperature issues reduce additions of heat energy. Heat can enter surface water through direct sunlight and by the air directly above the water. Reestablishing or protecting riparian vegetation is often the first step to address water temperature issues. While riparian vegetation does not cool the water, on small water bodies it can block much of the sun and keep the air in direct contact with the water surface cooler. Groundwater inflow and outflow, precipitation, runoff, and evaporation are also responsible for heat energy exchange. Water entering a water body from below ground flows tends to be much cooler than the surface water. Actions that conserve or increase shallow groundwater may increase the amount of cool water entering a water body. The sediment load of a water body also plays a role in water temperature. When the sediment load increases, water tends to spread out over a larger area. Shallow, wide channels provide more surface area for solar energy to enter the stream, potentially increasing water temperature. In addition, turbidity raises water temperature because the suspended particles absorb the sun's heat. Actions to reduce sediment reaching a water body will help reduce warming of surface water.

Elevated Water Temperature at a Glance

Problems / Indicators - Water temperature exceeds legal standard, threatens the health of aquatic organisms, or limits the intended use by the client.	
Causes	**Solutions**
• Surface water unprotected from direct sunlight • Little or no groundwater contribution to water body • Sediment laden runoff reaching water body	• Reestablish riparian vegetation • Brush management, residue management, terraces to reduce transpiration, evaporation and/or increase infiltration of upland water • Buffers and filter strips to intercept sediment

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Ponding, Flooding, Other Excess

WATER

Soil

Water

- Excess Water
  - Ponding, Flooding, Other Excess
- Insufficient Water
- Water Quality Degradation

Air

Plants

Animals

Energy

EXCESS WATER - Ponding, Flooding, Other Excess

Surface water or poor subsurface drainage restricts land use and management goals. Wind-blown snow accumulates around and over surface structures, restricting access to humans and animals.

What is it?

Water can flood or pond and restrict plant growth and land use. Water may flow into or around buildings if they are constructed over or near a spring or seep. If the soil has a dense layer, especially a layer of clay, flow of water through the soil may be restricted and water may pond.

Why is it important?

Flooding and ponding impacts plant grow and land use. Plant growth is essential for improving soil quality and increasing soil organic matter. Saturated soils increase the likelihood of diseases, significant losses of soil nitrogen due to denitrification and leaching of nitrate N, and soil damage due to heavy equipment. Seeps and high water tables must be taken into account for conservation plantings and when evaluating sites for construction. Excess water can affect structures and slope stability while drifting snow may prevent access to livestock or farmsteads. Drifting snow can block access.

What can be done about it?

Using a systems approach can help address excess water. Strategies include managing for drainage, conveyance, and multiple uses for crops and wildlife. Drainage systems must be compatible with crops grown, field layouts, and cultural practices such as crop rotation and cultivation. System choices include open ditches, tile drains, mole drains, and land forming for increased surface runoff. Planned systems can include diverting excess water and infiltration basins combined with roof runoff management systems. Restored and enhanced wetlands can also be key components in water management.

Ponding, Flooding, Other Excess at a Glance

Problems / Indicators - Little to no established vegetation due to excess water, wet areas due to restrictive soil layers, flood prone buildings and structures	
Causes	**Solutions**
• Ponding and seeps • Stormwater runoff • Flood prone areas	• Drainage management and structures for water control • Roof runoff structures and capture for reuse methods • Floodplain management • Wetland restoration or enhancement • Windbreak placement for protection and to provide access

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Inefficient Use of Irrigation Water

WATER

Soil

Water

Excess Water

Insufficient Water

Inefficient Moisture Management

Inefficient Use of Irrigation Water

Water Quality Degradation

Air

Plants

Animals

Energy

INSUFFICIENT WATER - Inefficient Use of Irrigation Water

Irrigation water is not stored, delivered, scheduled and/or applied efficiently. Aquifer or surface water withdrawals threaten sustained availability of ground or surface water. Available irrigation water supplies have been reduced due to aquifer depletion, competition, regulation and/or drought.

What is it?

Inefficient use of irrigation water impacts on- and off-site water quantity and quality. Irrigation systems and water management practices can waste water and negatively affect farm profitability.

Why is it important?

Irrigated agriculture is essential in meeting the nation's food and fiber production needs. Agriculture is the nation's largest water user, accounting for more than 85% of the nation's annual water consumption. Emerging problems that further complicate resource protection and water allocation include: serious long-term drought conditions, critical ground water declines occurring in agricultural production areas, saltwater intrusion into ground water supplies, and competition for water among a multitude of water users, including power generation, drinking water supplies, minimum stream flows, etc.

What can be done about it?

Solutions are available to address many of the competing water resource needs. Choices generally include conservation of the water used, conversion to other crops that utilize less water, and conversion to other sources of water. Conserving water could include improvements in irrigation water use efficiencies, off stream storage of water during periods of excess runoff, water re-use and water recycling, and ground water recharge.

Inefficient Use of Irrigation Water at a Glance

Problems / Indicators - Irrigated crops, plant stress, insufficient water supply	
Causes	**Solutions**
• Open earthen ditches • Irrigation water allowed to run off of fields • Losses due to improper system design, installation, or maintenance	• Line ditches or install pipe; improve water transport systems • Manage applications to reduce runoff; tailwater return systems • Audit system and retrofit or replace where warranted

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Inefficient Moisture Management

WATER

Soil

Water

Excess Water

Insufficient Water

Inefficient Moisture Management

Inefficient Use of Irrigation Water

Water Quality Degradation

Air

Plants

Animals

Energy

INSUFFICIENT WATER - Inefficient Moisture Management

Natural precipitation is not optimally managed to support desired land use goals or ecological processes.

What is it?

In dryland conditions, management of available water is critical to production and to maintain natural systems.

Why is it important?

Water is important to farming and natural systems. In cropland, poor yields may be related to an insufficiency of soil moisture rather than an insufficiency of rainfall. Inefficient moisture management can result in increased runoff and reduced soil moisture. In some grassland systems, available water can be tied up by brush.

What can be done about it?

Managing residue and cover will aid in utilizing available soil moisture. Establish mulch and residue management systems to conserve soil moisture. New weed control techniques and tools, along with cover crops can help manage available water for crops. Minimize soil compaction to maintain water movement through the soil by reducing soil hydraulic properties such as infiltration. In some grassland systems, brush management can help restore a natural water regime. Using plants that are more tolerant of drought conditions is an effective measure in optimize existing soil moisture.

Inefficient Moisture Management at a Glance

Problems / Indicators - Dryland farming in low rainfall areas	
Causes	**Solutions**
• No soil cover in the winter to prevent moisture loss • Excess soil tillage and disturbance destroys soil organic matter and structure • Unchecked brush growth creating potential for less available moisture for desired plants	• Cover Crops • Mulch or No-till farming systems • Brush Management

600.76 Exhibit 7 – Example Products (Reserved)

600.77 Exhibit 8 – Example Plan (Reserved)

600.78 Exhibit 9 – People, Partnerships, and Communities

People, Partnerships, and Communities

The purpose of the People, Partnerships, and Communities series is to assist The Conservation Partnership to build capacity by transferring information about social science related topics

USDA Natural Resources Conservation Service

Social Sciences Team

Developing and Maintaining a Network

What is a Network?

A network is a system of relationships in which people exchange information and resources to achieve common goals or serve common interests. Networks are easy to join or leave and tend to be informal. However, networking can also take place through planned meetings. These meetings may or may not meet regularly and may or may not pursue joint initiatives.

Networking is a process for expanding resources while maintaining your organizational autonomy. For most, the motivating factor for being in a network is the access to valuable information and the expertise of others in the group. With more people involved, creativity and options increase. Networks can also provide a strong support system.

Why Should I Network?

The Conservation Partnership at all levels can use networking to enhance its involvement with various customer sectors, including expansion of contacts to include non-traditional customer groups. Networking also helps to identify and meet customer needs. It promotes understanding of groups and their respective missions. Networking can raise people's awareness of their relationship to the environment and community. Networking can keep The Conservation Partnership's diverse customer base aware of its stake in the USDA.

Financial advisors suggest that we put aside 10 percent of our income as an investment for our future needs, including retirement. What investments in the form of time and people contacts are you making for the future of conservation work? With a decreasing percentage of the population actively involved in farming, it is in the best interest of groups and agencies that once considered agriculture their primary customer to expand their definition of "customer" to include a broader base. A diverse network of people that know and support our mission will help to sustain that mission even as technology changes the world and the way that work gets done. What if you spent just one or two percent more of your time in building

Why Should I Network, con't.

relationships, public relations, or marketing your agency or organization to people who currently do not know you? You would certainly increase the size of your network. This type of social investment will yield stronger public support both now and in the future.

With Whom Should I Network?

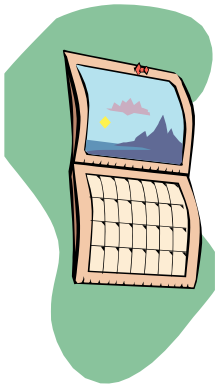
Answer the following questions to help you identify people and organizations that share your goals and that might benefit from participation in your network.

1. **Who shares our issue?**
2. **Who shares our customers?**
3. **Who has resources we need?**
4. **Who needs our resources?**
5. **Who has a similar mission / vision?**
6. **Who might be a "resistor"?**

Assemble a list to include community leaders and representatives from organizations outside traditional conservation groups. Evaluate who in different sectors of the community should be part of your network. Remember to scan your Rolodex and/or address book. Acting on these lists can expand your network.

When Should I Network?

Prepare in advance. Start networking now! It is important to establish your network before you need it. Building a network takes time and requires you to be proactive. Do not wait until the last minute to start building a network. Waiting until



the need is crucial can reduce your effectiveness and integral community leaders may be less available or receptive. If you wait until the last minute, your contacts may consider you a "user" rather than a colleague.

Steps in Building a Network

To help yourself prepare for networking, outline your goals. Decide what outcomes you want from the network relationships and, from there, determine who are potential network members. Prospective members must believe there will be some benefit to them to be part of the network and to actively participate. In a network, resources are shared on a reciprocal basis. ("I'm willing to share with you because you share with me.")

An important step is an information exchange. Discuss mutual interests and determine what you can do for each other. At an initial meeting bring one or two key information pieces, such as a brochure that outlines your Agency's or organization's mission, purpose, and main services or activities. Do not be hesitant to identify potential resources for them in your growing network. Explore with them aspects of their networks and the contacts they have.

Once networking has begun, decide the mode(s) of communication for keeping in contact. Some potential ways to maintain contacts in a network are telephone calls, face-to-face visits, e-mail, newsletters, listserves, presentations, meeting attendance, fairs, etc. Follow up regularly so that members of the network do not lose the feeling or awareness of an active connection. Consider developing a time schedule to remain on track. In the beginning, more frequent contacts may be appropriate- but once established, impersonal or personal contacts every few months should be sufficient to maintain a relationship.

Keep track of your networking contacts with a Rolodex or a computer. In addition to names and numbers, it is helpful to note the role of the contact in their organization and the nature of their needs as well as their resources. Noting the date and content of the most recent contact will help you determine the timing for follow-up. In order to maintain the networking relationship, continuing contact is important even if various people in the network are not involved in an active issue.

Create Opportunities for Networking

Join a club or organization that will expand your network. Be selective, target your networking where you see new opportunities to expand awareness of your agency or organization's expertise or to build a partner- ship. Perhaps your objective might be to diversify your contacts and future clientele.

Consider hosting a local Chamber of Commerce "after hours" networking event, as was done by a Michigan USDA Service Center. Provide updates of your activities with public officials, such as county commissioners, city officials, the mayor, school superintendents, chamber of commerce executives, or other community leaders. If you sponsor an exhibit, be friendly and outgoing to the customers your exhibit attracts.

Ask professional colleagues, members of organizations to which you belong, and acquaintances to introduce you to their friends and people with whom they work. It is usually easy to establish a rapport with a friend of a friend. Volunteer to help on a community event or project. At a professional group meeting assume a leadership role if needed. Again, target those relationships you want to build and the opportunities you have to cultivate awareness.

Create Opportunities, con't.

Develop a program that raises awareness about the Agency's mission and your activities. Select at least two community groups who are unfamiliar with your agency or organization. Contact the president of the organization and offer to provide a 5, 10, or 30-minute presentation. Consider PTAs, senior citizen groups, local union groups, National Association for the Advancement of Colored People, neighborhood associations, watershed groups, civic organizations and church groups.

Characteristics of a Person Who Networks Effectively

Above all, networking is an attitude – yours and the other person or organization. It is a "win-win" perspective. A successful networker is always open to conversations with people about what they need and then is willing to share resources, information, and contacts.

As you get others to see you, NRCS, and The Conservation Partnership as helpful resources, they will tell others about you, and your functional network will expand. People in your network will be there when you need their support for the development and implementation of conservation initiatives. To be most effective in networking a person needs to relate well to diverse people, listen to others, accept their ideas, be optimistic, and develop good oral and written communication skills.

"I use not only all the brains I have, but all I can borrow."
-Woodrow Wilson
28th U.S. President

How to Manage Conflict in Networks

People will disagree and networks are not immune from conflict. After accepting that conflict may happen, provide the opportunity for the conflicting parties to explain their respective viewpoints and support efforts for a joint resolution. It is also helpful to give honest feedback to minimize areas where conflict may erupt. Often the problem can be worked out if everyone participates in a discussion of the situation and looks for the common ground on which to build a consensus. If this does not work, a mediator may be needed to help clarify each party's responsibilities and assist with settlement of differences. It is important to work on only one conflict at a time. If multiple issues are being addressed, the focus can get clouded and make a satisfactory conclusion more difficult.

Tips on Maintaining an Effective Network

Networking involves repeated interactions among people in an effort to build rapport and trust. You need to invest your time in order to gain benefits from a network. Remember, the heart of networking is awareness, communication, and mutual benefits.

1. Network with everyone all the time.
2. Don't neglect your existing networks.
3. Seek out the most useful contacts.
4. Join professional associations, civic groups, or other local groups and devote time and energy to them.
5. Make sure the group is the right organization for you.
6. Follow up, follow up, follow up!
7. Develop or distribute informational pamphlets that you think will be of interest.
8. Get on newsletter distribution lists.
9. Create your own newsletter.
10. Keep in touch by e-mail and other methods. Don't just contact people when you need something.
11. Share information with others in your network. Consider exchanging reports, announcements, brochures, books, tapes, or videos with others in your network.
12. Offer your services, attend, co-sponsor, and sponsor conferences, workshops, seminars, lectures, field days, and annual meetings.
13. Present papers or give presentations to traditional and non-traditional customers.
14. Read local, as well as national and international newspapers, and journals. Many key individuals are discovered and then contacted through local publications.
15. Develop joint training opportunities or projects.
16. Keep your message focused and upbeat.
17. Say "thank you"! An e-mail message works, but a hand-written note of thanks is more effective.

Examples of Networks

It is not the title of a group but, rather, the form of relationships that evolve and the purpose of the exchange that determines whether the team form is a network, a partnership, or a collaboration. Here are some examples of networks:

- Professional colleagues in and outside your organization that you approach for information
- Breakfast update sessions, open houses, coffee circles, or a Chamber of Commerce's Business After Hours meeting that you attend and that are held by elected officials or organizations for the purpose of sharing information
- Ongoing network meetings you convene with community members to regularly exchange ideas or information
- Persons you telephone, e-mail, or otherwise make contact with on a frequent basis to gain perspective, get feedback, and share ideas
- Networking groups or organizations you might join and whose monthly or occasional meetings you attend, such as Ducks Unlimited, Pheasants Forever, Rotary Club, Chamber of Commerce, Business and Professional Women, Jaycees, General Federation of Women's Clubs, Lions Club, or other civic or special interest groups including environmental or conservation groups.

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People, Partnerships, and Communities

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USDA Natural Resources Conservation Service

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Locations:

North Carolina A&T State University

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University of Arizona

Charleston, South Carolina

University of Wisconsin

Requesting and Preparing for a Meeting with a Community Leader

Meetings generally are held to achieve a purpose or goal. The success or failure of a meeting depends on whether you achieve the objectives you had hoped to complete. Thus, because your objectives are usually different, you cannot set up a meeting the same way every time.

Why should you use this information?

The success of your meeting and the future of your relationship with the community leader could depend on how you request the meeting, how well you prepare for it, and how well you succeed in having the meeting benefit both the leader and yourself.

Who should use this information?

Anyone who plans to schedule or attend a meeting with a community leader can benefit. People who want to build relationships with a community leader of an association, organization, or group will find this information useful.

Community organizations

Community leaders include, among others, elected and appointed officials and formal and informal figures of community organizations. There are many different kinds of community organizations. Some are very formal groups with paid members and elected officers and perhaps paid staff. Other organizations may be informal groups with no paid members, officers, or staff. Titles may also vary. The president of one organization may be a volunteer, but in another organization the president could be a paid staff member. Community leaders often belong to multiple associations that range from formal and officious to informal and familiar.

How do you request a meeting?

Before you actually request or schedule a meeting, you should research the organizations and groups that the leader is associated with. You should know the size of the organizations, their priorities and key issues. Also, if the leader is elected, find out the length of their term of office. Finally, you should attempt to get some information about the leader's personal style. People have different styles of communicating and while one person may immediately want to discuss business, another may expect to start with social conversation such as the weather, crops, sports, etc. If you are unable to gather this kind of information about the person prior to the meeting, your best course is to follow

(continued on reverse side)

relates to them.

- Bring materials about your watershed, district, RC&D, NRCS and/or the issue you plan to discuss. However, don't overwhelm the leader with materials.

- Avoid using jargon. Be prepared to present your case in terms your audience will understand.

- Don't interpret difficult questions as hostility. Try to anticipate inquiries and prepare responses.

How do you build relationships with community leaders?

- Bring your business card or offer those you are meeting with a number of ways they can stay in touch with you.

- After the meeting remember to send a "thank you" note and continue to stay in contact with those you met with — you never know when you may be working with them again. Promptly provide any information you promised to send.

- Reflect on the meeting. Consider what went well and make it a part of your next interaction.

- Think about your next meeting now. You want to build an effective long-term relationship. Community leaders don't like to hear from people only when they have a problem. Provide periodic updates on conservation activities.

Different meetings have different purposes. Each style of meeting may not be appropriate to meet all of your needs. When preparing for a meeting it is important to keep in mind the purpose or goal in order to prepare for the correct type of meeting. Listed below are five different types of meetings you might schedule with a community leader. The purposes of these meetings are also listed.

Fact Finding- collect specific kinds of data or studies.

Advisory- give or seek advise on policy, technical matters, programs, procedures, studies, and so forth.

Program- plan a program for specific events including demonstrations, a conservation fair, educational activities, etc.

Public Relations- keep the public informed about the purposes, goals, activities, and accomplishments of the organization or agency.

Coordinating- mesh the activities of two or more organizations, committees, or other groups.

Where do I find more information?

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People, Partnerships, and Communities

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USDA Natural Resources Conservation Service

Social Sciences Team

Understanding Community Power Structures

What is power in a community?

Power in a community is the ability to affect the decisionmaking process and the use of resources, both public and private, within a community or watershed group. Power is simply the capacity to bring about change. It is the energy that gets things done. All levels of The Conservation Partnership need to know about community power structures in order to more effectively implement and maintain locally led conservation initiatives. A community can be defined as a watershed, region, town, county, or other geographic or geopolitical boundary.

Examining the concept of power involves looking at the sources and structures that influence local communities and exploring the relationships that shape cooperative efforts. The conservationist who has a basic understanding of social power and who can identify the power actors in a community can enhance the opportunity for success in conservation initiatives.

Power is Not a "Dirty" Word

Often when people identify words they associate with power, negative responses dominate. Power is seen as manipulative, coercive, and destructive. A once-popular idea was that a few key people used power to block changes that benefited others, and that "nice" people stayed away from power. Attention focused on the idea of ***power over*** people. Increasingly, the concept of ***shared power*** is being recognized as representing a more sustainable and effective approach. Power, used in implementing locally led conservation, should be viewed as the ability of citizens and civic leaders to bring together diverse community members in initiatives that lead to real, measurable change in the lives of their community.

Why should you use this information?

A conservationist's ability to identify and understand the power structures in a watershed group or community and the relationships among the people that fortify them will significantly contribute to the achievement of conservation goals.

As you encounter issues that routinely challenge organizations, agencies, communities, regions, or states, it is important to ask questions such as:

- *Who seems the most powerful in this situation and why?*
- *What are the influences that might change the power structure in a group?*
- *What type of power do you and others working with you bring to the situation?*

CONNECTIONS

"Social networks have value – is the core idea of social capital theory. Just as a screwdriver (physical capital) or a college education (human capital) can increase productivity (both individual and collective), so too social contacts affect the productivity of individuals and groups.

Whereas physical capital refers to physical objects and human capital refers to properties of individuals, ***social capital refers to connections among individuals*** – social networks and the norms of reciprocity and trustworthiness that arise from them. In that sense social capital is closely related to what some have called "civic virtue." The difference is that "social capital" calls attention to the fact that civic virtue is most powerful when embedded in a dense network of reciprocal social relations. A society of many virtuous but isolated individuals is not necessarily rich in social capital."

Robert D. Putnam ***Bowling Alone, 2001***

What are the sources of community power?

Power can come from a variety of places. The following sources of power are not mutually exclusive and can be most effective when used in some combination. Conservationists who learn to recognize the power base(s) of a key leader or a community group can maximize the benefit that the power base can offer.

• **Connections** - the ability to network and build useful relationships with other powerful individuals and organizations. For example, occasionally one hears the expression, "S/he's really well connected.

• **Large numbers of people** - provide evidence of support for an idea. A recent increase in membership of a watershed group, for example, could have an impact on a county commissioner.

• **Rewards** - the ability to give recognition, visibility, money, or other tangible items. For example, an agency, a community foundation, county commission, or financially powerful individual or business may have monies or other assets that can be distributed to a conservation initiative that meets their mission or priorities.

• **Personal traits** - an individual's charisma, creativity, charm, leadership abilities or some combination of these characteristics can foster the respect and loyalty of others.

• **Legitimate power** - the position (office, title) of the leader. Usually, the higher the office, the more powerful the person. The city manager, for example, holds a higher position and has more power than the city engineer. Or, the chief of an American Indian tribe has traditional and legitimate power.

• **Expertise** - knowledge, skill, and talent, combined with respect for the skill. A district conservationist can bring valuable skills to a conservation initiative.

• **Information** - the ability to channel - or withhold - information. The mass media has this type of power.

• **Coercion** - the attempt to influence others using a negative style, such as using intimidation or manipulation. This contributed to the concept of power as a "dirty word" and is now less accepted.

Who are the people with power?

Social systems of all types - communities, political parties, etc. - have certain people or groups of people who control decisionmaking functions. These people can be called key leaders of power actors.

Even the most distressed community has some business activity. In addition, there is a combination of public and nonprofit institutions such as schools, parks, libraries, police stations, social service agencies, community colleges, and hospitals. These groups can and do influence the changes made in the community. Power actors or key leaders are the individuals who direct these organizations, either formally or informally.

When community social action projects initiated by change agents (conservationists, public action groups, etc.) fail, it is often because they did not recognize and/or appropriately involve key people in the community or the community at large. An individual concerned with one segment of the community, such as agriculture, may not know the key people in other segments of the community. The key people involved in community decisionmaking can vary depending on the issue.

Key people–*power actors*–are aware of and value their position. Most will work hard to keep it. They do this by either supporting or opposing projects and by providing or denying resources.

The key leaders' position often depends on:

- **What** the proposal involves
- **When** they were informed
- **How** they were informed
- **Who** informed them

How do individuals get power in a community?

Authority is the power held by a person in an elected or appointed "office." No matter who holds the office the authority is the same, unless the law changes. Presidents of the United States have had the same authority but have differed in their focus and their personal influence.

Influence is the power that resides with an individual or an organization based on a person's perception of their competence and ability. Their influence may be based on their skills in guiding and directing people, their specialized knowledge, their reputation, or their control of and/or access to money and resources (e.g., credit and jobs).

Those with the most power in a community have that power primarily because of their influence, not just their positions of authority, so we must find ways to identify power actors that do not depend on titles and offices alone.

In most communities, the following characteristics are most often identified as a basis for influence and power:

• past achievements • source of ideas • human relations skills • contact with others (in and outside of the community) • access to needed resources • influence within community organizations • past participation in community groups• length of residence in the community • occupation • education • control of jobs, wealth, credit, and mass media

Control of credit or jobs may involve local businesses such as banks, manufacturing plants, and the media. Evidence suggests that the control of credit, money, jobs, and mass media is very important when combined with other bases of influence.

What Is a Power Structure?

A ***power structure*** in a community or watershed group is key leaders (power actors) acting together to affect what gets done and how it gets done. However, the nature of the relationships among the individual power actors can vary from one community to another.

- Some communities have a power structure centered on one person who is surrounded by "lieutenants."
- Other communities have a small, tightly knit group – the power elite – that controls policy-making for the community.
- Another structure is the "split community." Examples include Republican-Democrat, Protestant-Catholic, liberal-conservative, labor-management, rural-urban, and others.
- The "power pool" involves a combination of all three. Essentially, there is a "pool" of 10 to 25 people who are the top community power actors.
- In some communities, tradition or elders are the powerful members.
- Finally, some culturally diverse communities base their power almost totally on democratic principles and unanimity.

The "power pool" may be the most common kind of power structure. The other structures are special cases found in communities with unique characteristics. The "power pool" has at least the following implications for conservationists and other change agents:

1. The same power actors may not be relevant to every issue, so each issue needs to identify appropriate power actors.
2. There are communication networks within the pool. A discussion with one or more power actors provides an indirect method for communicating a message to several other power actors. It also provides a means for communicating to other people in the community.
3. Members of the power pool change over time. In addition, the power of one individual relative to another may change, so the assessment of power actors cannot be viewed as a one-time task.

What Are Informal and Formal Power Structures?

There are two kinds of power structures: formal and informal. The formal power structure is easily recognized and includes elected and appointed government officials and leaders of civic organizations. The informal power structure, which exists together with the formal power structure, is harder to identify and may hold a greater influence over a community's development.

Four methods have been developed that will help conservationists identify the community's formal and informal power structures.

1. Positional method - This method merely involves making a list of key government and civic leaders. It is a simple, but flawed, approach. It presumes that people in official positions actually execute power, and it does not recognize those power actors who work behind the scenes and operate on the base of personal influence.

2. Reputational method - Ask knowledgeable citizens to list the most influential people in the community or watershed. The same names should reappear on several lists. People to interview should include chamber of commerce executives, city managers, utility managers, media executives, economic developers, and business executives, among others.

3. Decisionmaking method – Study the history of community decisionmaking to determine the power actors who actively participate in community actions. Sources of information include meeting minutes, press reports, and participant interviews. It is possible to determine members of a general power structure using this method, and whether specialized power structures exist that deal with single issues.

4. Social Participation method - Develop a list of active participants (officers, committee chairs, etc.) in voluntary associations. This method assumes that activists in organizations will be the same people who are active in community decisionmaking. This method is useful when determining future community leaders who are working their way up through volunteer participation.

For more information on identifying the key leaders in a community, refer to People, Partnerships, and Communities series, Issue 43, "Working With Community Leaders."

How Do You Put It to Work?

Successful implementation of natural resource goals cannot succeed without the active participation of the community power structure. By working together, everyone can benefit.

The following is a summary of the steps to take when assessing power structures and identifying key leaders in a community or watershed group.

- **Identify the members of both the formal and the informal power structures**

- **Find the important relationships.** Which people are personal friends? Who are adversaries, competitors, or antagonists? Who can effectively influence others?

- **Determine the kind of power the key leaders exercise** (refer to the "What are the sources of community power?" section). After determining what bases of power the leader uses, you can decide on an appropriate approach to take when working for or with them.

- **Establish trust and gain the confidence of key leaders.** Maintain a focus on each other's backgrounds, interests, values, and priorities. A climate of cooperation and trust is essential if a group expects the change process to sustain momentum.

- **Learn what motivates each member of the power structure.** Are they motivated by power, such as power over resources? Money? Do they have a desire for recognition, such as wanting to run for public office or other high profile position? Do they have a strong sense of social responsibility? What causes are "hot buttons" for them?

- **Ask leaders for their counsel and advice.** Obtain the support of key leaders before pursuing a course of action. It will make your job easier and the project will have a better chance to be successful.

- **Do not back key leaders and power actors into a corner.** Always provide a face-saving means for power actors to join with the initiative group despite any initial opposition they may have expressed.

Where to look for more information:

- Chrislip, David D. "The Collaborative Leadership Fieldbook." San Francisco: Joey-Bass Publishers, 2002.

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- Powers, Ronald C. "Identifying the Community Power Structure." *North Central Regional Extension*, Publication 19. Ames, Iowa: Iowa State University of Science and Technology Cooperative Extension Service, November 1975.

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- Shively, Robert W. "Community Power Structures." *Economic Development Review* (Summer 1994): 13-15.

- USDA-NRCS "People, Partnerships, and Communities." Issue 43, *Working With Community Leaders*. Grand Rapids, Michigan: Social Sciences Institute, October 1999.

- Tolbert, Charles et al. "Civic Community in Small-Town America: How Civic Welfare is Influenced by Local Capitalism and Civic Engagement." *Rural Sociology* 67, no 1 (March 2002): 90-113.

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Establishment

The Natural Resources Conservation Service established the Social Sciences Team (SST) in September 2004 in order to more fully integrate the social sciences into Agency programs and activities. The goal is to more effectively serve our rural and urban customers and to increase adoption of conservation.

Mission

The Social Sciences Team integrates customer opinion and field work with science based analysis to discover how the social and economic aspects of human behavior can be applied to natural resource conservation programs, policies, and activities.

Vision

The Social Sciences Team will be a recognized leader in developing and transferring practical social sciences technology to assist in the productive, equitable, and environmentally sound use of our global natural resources.

People, Partnerships, and Communities

The purpose of the People, Partnership, and Communities series is to assist The Conservation Partnership to build capacity by transferring information about social science related topics.

USDA Natural Resources Conservation Service

Social Sciences Team

Working with Community Leaders

Background

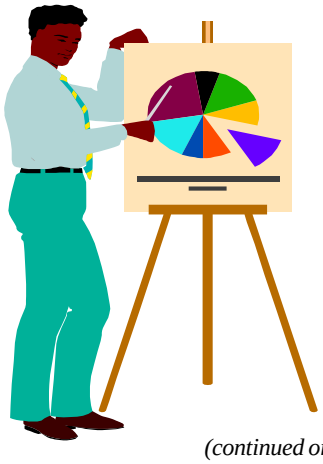
Identifying and working with community leaders can be extremely beneficial when promoting conservation through locally-led and watershed planning activities. It is even more crucial when working with underserved communities that have not previously worked with the Natural Resources Conservation Service (NRCS). The advantage of working with a community leader is that you will be working with someone who has already earned the community's trust. Gaining the community's trust will be a major hurdle for you to overcome. In some instances, it can take a period of months if not years for you to earn a community's trust. Identifying the right person/leader to work with you can help decrease the length of time it takes to accomplish your goals. The danger of not working closely with a community leader is he/she can easily hamper your efforts.

Leaders tend to stand out from other community members. Remember, the public is only marginally involved in most issues. Only about 5 percent of community members are directly involved in decision making and not even all of these people are community leaders. Indicators based on research suggest that leaders might possess some, but certainly not all, of the following characteristics: good at giving instructions, empathetic, talkative, persistent, self-confident, popular, and original/creative.

Methods of Identification

The first step in identifying a community leader is to consult with agencies and organizations who have successfully worked with the community. These organizations may include small farmer cooperatives, churches, county Extension Service, other USDA agencies, and land-grant universities. The Conservation District and Resource Conservation and Development board members are typically leaders themselves and they can be a source of information. They also can lead you to community leaders or to people who can help you determine who the leaders are in the community.

There are four traditional methods to identify a community leader. The methods are position, reputation, event analysis, and social participation. While the methods of identification are the same for traditional and non-traditional communities, the examples have been customized for small underserved communities.



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In the **position method**, you identify people in authority. In small communities the local government officials may be mayors, sheriffs, or school board representatives. Keep in mind that all leaders do not have to be in positions of authority and this method fails to identify informal leaders such as respected elderly community members, parents, coaches, and athletes.

In the **reputation method**, you are looking for those members of the community who are the most respected. Different racial and cultural groups more than likely will identify someone from their group as a leader. It is unwise to ask someone from a majority group to identify a minority leader. Simply ask about five community members who they feel are "the three most respected people in the community." When you begin to hear the same names repeated you will know that these people are the leaders in this particular community.

In the **event analysis method**, leaders are those persons who most actively influence specific community decisions. Some people more consistently influence decisions by actively pursuing decisions they consider to positively influence the community.

The **social participation** method entails finding those persons who occupy positions of authority in the greatest number of organizations such as heads of community- based organizations. One example would be a person who is all of the following: District Supervisor, Rotary club officer, treasurer in the Veterans of Foreign Wars, church deacon, local president of the National Association for the Advancement of Colored People, and a member of the local school board.

The Importance of the Community Leader

You want to identify a leader with outstanding community leadership traits. He/she should want to work toward positive change in the community. He/she should be able to work with other people, encourage others, plan work, conduct meetings, bring forth new ideas, find resources, speak out for the community, seek information, listen attentively, and most importantly, persistently work on behalf of the community.

Once you have identified the leader(s) which you want to move forward with, the very crucial next step is to develop a strategy to help that person(s) understand and support natural resource management issues. Be prepared when you meet with the leader to educate the individual about how NRCS can provide services and resources that can improve the community's quality of life. Ultimately, you want that leader to serve as a spokesperson, a catalyst for change, and a bridge for you to establish a positive and productive working relationship with the whole community.

What Do You Want the Leader To Do?

1. Ensure that the leader buys into your plan by being available to answer questions, visiting successful farms, and establishing trust (refer to Gaining Trust with Small Farmers fact sheet)
2. Persuade him/her to adopt conservation practices and systems
3. Encourage the leader to host demonstrations, take farmers to farms with conservation plans, and share visual information such as pictures and videos
4. Sponsor group meetings
5. Be available to speak at official and unofficial community gatherings
6. Provide testimonials
7. Introduce you to other community leaders
8. Participate in locally-led and area-wide activities
9. Become acquainted with the Conservation District and Resource Conservation and Development board members
10. Provide you with feedback on your activities

People, Partnerships, and Communities

The purpose of the People, Partnerships, and Communities series is to assist The Conservation Partnership to build capacity by transferring information about social science related topics

USDA Natural Resources Conservation Service

Social Sciences Team

Why is Understanding Cultural Difference Important?

The Natural Resources Conservation Service, with offices across the continental United States, Alaska, Hawaii, and many US territories, is constantly working with people of different cultures. While much of working successfully with people of different cultures is best learned "on the job", there are some concepts and methods that have been shown to ease cross-cultural communications. Using such proven concepts and methods to work with people of other cultures will improve NRCS service delivery and build better relations with our expanding customer base.

American society is changing rapidly. We are witnessing a growing number of different ethnic and racial groups in America. This increase affects agriculture and NRCS in two primary ways: (1) there is an increase in the number of producers who belong to different cultural groups[1] and (2) the NRCS workforce is growing more culturally diverse[2].

What is "Culture"?

"Culture" is a term that is widely used, and misused, in America today. Newspapers, magazines, television, and the Internet all abound with discussions of different "cultures." Many things are called cultures that are really just small parts of everyday life, or the most recent focus of media attention. Culture provides an interpretive framework that affects all decisions that people make, all the time. When viewed from this perspective, it is obvious that the "fashion culture," or the "youth culture" are simply media tags for short-lived social phenomena. It is unlikely that many parents teach their children about the importance of a "corporate culture."

Culture, for the purposes of this discussion, may be defined as: "A complex, learned, shared, system of human behavior. Culture is taken for granted by its users, and participants in a culture assume that the codes, habits, customs, and understandings of their particular culture are "normal," relative to the behavior of members of other cultures."

Culture is learned, and may be thought of as something that is passed from one generation to the next. Stop for a moment and remember your childhood; think of instances in which you learned the "correct" way to behave, either formally, such as in Sunday school, or informally, such as when you were teased by friends for being "different." Think of the ways each type of learning influenced your behavior. These learned behaviors are all part of your culture, and determine many of the ways you relate to other people today. At the time you learned these "correct" behaviors, you probably didn't consciously question their "correctness" too much, and soon learned to assume that what you learned was "right," and that other kinds of behavior were "strange" or "wrong."

[1] www.ssi.nrcs.usda.gov/customdata/default.asp
[2] www.nrcs.usda.gov/intranet/FWP/diversirty.html

(What is "Culture" con't)

Everyone is a member of a culture. A person cannot simply cease being a member of the culture in which they were raised. All of the complex, basic, ideas of daily life, including conceptions of right and wrong, good and bad, correct and incorrect, were instilled in each of us as a child and most of these conceptions are reinforced on a daily basis. Just as it is impossible to simply cease being a member of a particular culture, it is equally impossible to simply "know" how members of other cultures will react to your actions.

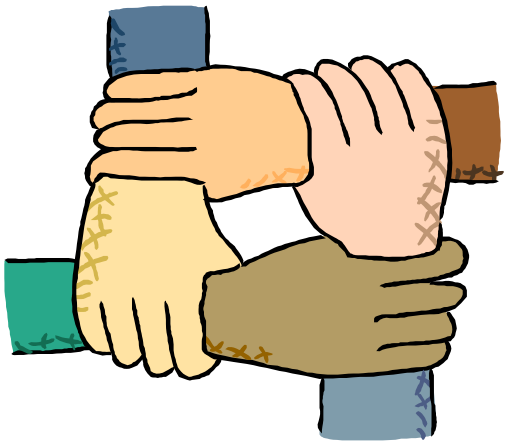
All of us tend to base our interactions with other people on what our culture tells us is "correct" behavior. One of the most fascinating things about cultural differences is the incredibly wide variety of "correct" responses to any given situation. A person can usually learn what members of another culture consider good or correct by careful observation, thoughtful behavior, and what most Americans consider "tact," or considerate, unassuming, interaction.

When Should This Information be Used?

Cultural differences should always be kept in mind when working with people who appear to think or behave differently than you do. What may appear to be "odd" or "wrong" to you may simply be a cultural difference. Keep in mind that your behavior may appear to be just as "wrong" to members of another culture. There is rarely any way to usefully define what is "right" and "wrong" when working with people of a different culture. The basic assumptions all people have of what is correct and incorrect are learned, and as such, vary widely between cultures. To attempt to "correct" the behavior of members of another culture based on your own assumptions is almost always seen as rude and overbearing.

Who Should Use This Information?

Any NRCS employee who works with people of other cultures should find this information useful. Additionally, partner organizations may find this information useful when establishing or expanding relations with other cultural or ethnic groups.



How Do You Work with People of Other Cultures?

Perhaps the most fundamental thing to remember when working with people of other cultures is that there is no "right" or "superior" culture. Your own culture is no more and no less than a way of interpreting the world. Every person's culture is valid, and no culture is "better" than another. Remember, value judgments are a direct result of what you learn is "good or bad," within the context of your culture. However, some social scientists feel that "extreme" elements of some cultures can be detrimental to the survival of the species and to basic human survival.

There are no specific methods of working across cultural lines that will apply in all situations with all people. There are, however, some general concepts and approaches that have been shown to be useful. Some of these are:

Look for "Common Ground"

While all cultures are basically different ways of viewing the world, there are usually common interests that may serve as starting points for discussion. Although a new client may be a member of another culture, that person may have an interest in natural resource management. Their ideas about what constitutes "good" management may differ from yours, at least initially, but this common interest is a good point at which to start discussions and the mutual learning process. In some instances, "common ground" may be difficult to find, particularly if someone's cultural background is very different from your own. In these instances, do your best to make sure the other person understands your perspective. This may very well include discussing things that may not be a normal part of day-to-day operations, such as private property rights and cash economies.

Become More Self-Aware

Your culture provides you with a "framework" that you use every day to determine very basic parts of your behavior. What you learned as part of your culture when you were growing up determines what is "wrong" or "different," or "bad." These culturally determined assessments of value are often made unconsciously. The next time you are working with someone from a different culture, try to "step back" and examine your own behavior. Are you making value judgments of the other person's behaviors or attitudes? Try and remember that the other person's behavior may be perfectly acceptable by his or her own cultural standards, but "bad," "wrong," "incorrect," or "offensive" to yours (and vice versa).

Working successfully with people of other cultures requires learning from all people involved in a situation. You must be willing to examine some basic ideas and explain them. You must also be open to new ideas and interpretations. People of other cultures will probably view things differ- ently than you do, and may have different ideas of what is important. They are not "wrong," and you are probably not "right," all the time. You must become more aware of the many ways in which your culture biases your viewpoints, and be willing to recognize and work around often very subtle, unconscious, stumbling blocks.

Be Careful of Your Assumptions

Your culture provides you with a whole series of assumptions about the way things are "supposed" to work. For example, your culture provides you with appropriate behavior to be used when meeting another person for the first time. You assess the person's status based on a number of factors, such as age, sex, appearance, physical size, or any combination of these things. Your greeting and response to the other person is subtly and completely influenced by what your cultural assumptions of what is an "appropriate" way to relate to the other person.

Most Americans think that shaking hands and smiling openly is an appropriate way to greet someone for the first time. This may not be the case; some Asian cultures do not encourage physical contact, and many cultures think that eye contact between strangers ranges from inappropriate to openly rude and challenging. Your cultural assumptions of "correct" behavior may not be those of the other person. Your behavior may seem too familiar, or not respectful enough. In turn, the other person's behavior may seem very "cold" to you. By becoming more aware of the assumptions that influence your behaviors, you will gradually become better able to work with people of different cultural and ethnic backgrounds. This awareness will also allow you to interact with members of other cultures in a more thoughtful, and less easily misinterpreted, manner.

Develop a Sense of Humor

Humor, and what is considered funny, often varies greatly between cultures. Anyone who works with people of another culture must, however, develop a "thicker skin." Often, remarks made in complete good faith are considered to be funny by members of other cultures, or worse, offensive. If and when this situation arises, remember that there may be no offensive intent involved. Responding in a good-natured manner, while being careful not to "make fun" of another person's culture, may be a good way to further relations.

It is also important to remember that the other person may be trying to use humor to bridge the cultural gap. If you "don't get" a joke, ask for an explanation, and take the time to try and see it from their perspective. This, and similar, tactics often result in great learning experiences, and gives everyone the opportunity to "lighten up."

Be Tolerant

Don't immediately assume what certain actions or types of "body language" mean. Physical, non-verbal, forms of communication are a very important and subtle part of culturally dictated behaviors. In modern America, speaking clearly, audibly, and often during a meeting is considered a sign of an "outgoing" and "successful" person. This type of "take-charge" personality is usually thought of as "good," regardless of what age the person may be, or what experience that person has. In many cultures, only those people of a certain age or level of experience are expected to voice opinions during meetings. To do otherwise would be considered presumptuous and overbearing.

If something that you do causes a misunderstanding, based on cultural difference, be patient. The situation may resolve itself, but if not, ask members of the other cultural group what would be the most appropriate course of action. Don't immediately assume that you can "fix" the situation by further unilateral action. If you are being made fun of, this actually may be an indication that the other group is accepting you, and your relationship is improving. Patience, tolerance, and good humor are valuable tools to have at your command when working cross-culturally.

Where can I find more Information?

The Social Sciences Team (SST) offers customized training for working with people of other cultures and societies. Members of the SSI staff will work with you to develop sources of data and training that are specific to your individual situation. For additional information contact

Additional resources on this topic include:

Module 2 of the NRCS National Employee Development Center training course Consultation with American Indian Governments, entitled "Cultural Differences," provides an extended discussion, with several examples and exercises, of how to work between different cultures. Contact

The Social Sciences Team offers a training course entitled "*Developing your Skills to Involve Communities in Implementing Locally Led Conservation.*" Developed in cooperation with Michigan State University and the Michigan State University Extension, Module 7 of this course "Preparing to Work with Underserved Audiences," will provide useful information to people working across cultural lines.

The Anthropological Lens: Harsh Light, Soft Focus. By James L. Peacock, Cambridge University Press, New York, 1986.

The Art of Crossing Cultures. By Craig Storti, Intercultural Press, 1990.

The American Anthropological Association. World Wide Web site: www.aaanet.org. Current information and multiple links to virtually all things anthropological.

The Society for Applied Anthropology. World Wide Web site: www.sfaa.net. This web site has the latest information and links to a wide variety of practical applications of anthropological methods and theories.

Issue 26, Updated June 2005

600.79 Exhibit 10 – Land Evaluation Site Assessment (LESA)

LESA is an analytical tool to assist Federal, State and local agencies in assessing, planning for, and preserving agricultural lands through land use planning policies, or other techniques. Use of LESA helps to strengthen the local economy through providing a sound basis to support property tax assessments, tax incentives and agricultural development programs.

LESA systems can be applied before or during the areawide planning process and provide systematic and objective procedures to access and rank sites for agricultural importance to assist land use and conservation decision making. LESA systems can address questions including—

- What lands uses should be designated for agricultural use in areawide or master plans, or zoning ordinances?
- How adjacent land uses impact farmlands
- How can agricultural land be consistently and objectively ranked into multiple land classes?
- Which farm sites should be given priority for purchase of development rights?
- What would be the potential impact to agriculture of proposed zoning changes
- Which infrastructure and development alternatives have the least impact on agricultural lands?

Although they are often grouped together, a LESA system consists of two distinct components: the Land Evaluation (LE) system and the Site Assessment (SA) system. The Land Evaluation system must provide a consistent methodology to evaluate and rank parcels of land, typically on the basis of their inherent agricultural production potential. LE systems are most often based on properties and conditions that are deemed to be steady over the long term and are typically grounded in soil attributes that related to agricultural productivity. In contrast, the Site Assessment (SA) component of the LESA system addresses this issues related directly to the particular site of interest and that change over shorter time periods. It provides a way to systematically assess the differences between multiple sites that may possess the same underlying level of soil productivity, but have different characteristics based on their location and the availability of related services (such as irrigation or transportation infrastructure).

The impetus to consider developing a LESA system for State or local use can come from various sources including State and local planners, planning commissions, local elected or appointed officials, USDA agency staff, conservation districts or other stakeholders. In all cases, developing a LESA system should be seen as a cooperative endeavor between many government and potentially non-government entities that are interested in and involved with land manager.

Regardless of the entity that takes the lead in the development of a LESA system, the first step in LESA development is to conduct t an assessment of potential users and applications for the system. There are federally mandated applications of a LESA system including the requirement in the Farmland Protection Policy Act (FPPA) that a LESA system be used to assess the potential impact of proposed farmland conversions. But, system developers should also identify other user needs and potential applications for the proposed LESA system. An appropriate initial assessment will lead to a better understanding of the existing relevant local, State and federal policies, and the funding and staff requirement for development and maintenance of the LESA system.

The most common process used to develop a LESA system begins with a decision by a State or local government jurisdiction that a new LESA system or an update to an existing LESA system is needed. Once that determination is made, a LESA committee is appointed to develop the system. The following steps are required to successfully develop and implement the system:

- Specify multiple factors that will allow soils to be ranked based on soil quality for the Land Evaluation (LE) component. The NRCS State office should assist in this step.
- Specify another set of factors relating to non-soil conditions for the Site Assessment (SA) component.
  - Develop a rating scale for each factor.
  - Assign weights to each of the factors.
  - Note that National Site Assessment (SA) criteria with weightings are provided in the FPPA (listed in Title 7 Code Federal Regulation Chapter VI – and replicated in the FPPA Handbook (*available on eDirectives*)

- Tally the weighted factors to obtain a LESA score for the sites analyzed.
- Prepare score thresholds for decision making.

In most cases, a Land Evaluation (LE) system is developed for an entire political jurisdiction (county or State) which rates soils from 0 (lowest quality) to 100 (highest quality). The Site Assessment (SA) protocol is then applied on a case-by-case basis to compare alternative sites. Another option is to use the SA criteria to develop ratings of a "standard" group of sites or of larger geographic areas. This method is preferred if decision makers are interested in comparing a large number of sites over a large geographic area (e.g. to support zoning and local/regional planning). Soil and other site factors can be systematically combining them to produce a score for each site and sites with similar scores can be group based on established thresholds for recommended actions.

LESA Committees

Because of the potentially wide ranging application of LESA information, the most successful LESA efforts nationwide have been those where state and local officials and other appropriate stakeholders have been directly involved in the identification and appointment of committee members. Ideally, the composition of the committee should provide a range of state and local expertise to help develop a sound LESA system. A well-accepted committee can also establish public creditability and political acceptability for the system. One of the key LESA concepts is to include knowledgeable people in formulating the local system. The expertise and experience of producers and those working on farms is essential in establishing an effective LESA system. Additionally, a person trained in LESA is essential to coordination of project activities and assisting the LESA committee in developing the system.

LESA Scaling and Evaluation Factors

The Land Evaluation (LE) component of the Land Evaluation and Site Assessment (LESA) system rates the soil based qualities of a site for agricultural use. The four most common kinds of classifications used for LE are:

- Land capability class (LCC)
- Soil productivity ratings such as National Commodity Crop Productivity Index (NCCPI)
- Soil potential ratings and
- Prime, Unique and Important farmland classifications

In most cases, NRCS staff or other soil scientists will play a major role in selecting and scaling LE factors. Although much of the LE formulation is technical in nature, decisions about relative weights of LE factors should be made by the committee. It is important that local stakeholders with recognized knowledge of agriculture participate in and understand the LE component in order to ensure that the system accurately reflects local circumstances. Local involvement throughout the process will also increase the perceived accuracy and legitimacy of the resulting rating/ranking system.

The LE component should meet the following objectives:

- LE should be understandable to policy makers and other users.
- LE should establish relative soil classes of soil-based quality to assist decision makers in setting priorities for sites to be protected for agricultural use.
- LE should be based on the best available data, in conformance with established NRCS procedures for soil classification systems.
- LE should give consistent results within the given area.
- LE should be appropriate for the level of government for which the LESA system will be used.

The Site Assessment (SA) system rates non-soil factors affecting the site's relative suitability and importance for agricultural use. In general SA factors are grouped into the following three types:

- SA-1 factors measure non-soil site characteristics related to potential agricultural productivity.
- SA-2 factors measure development or conservation pressures on the site.
- SA-3 factors measure other public values of a site, such as historical, cultural, scenic or environmental values.

That national list of factors and associated weighting factors can be accepted "as is" or can be changed to reflect location conditions and preferences.

If a local system is desired, SA committee should choose specific factors reflecting the purpose for which the LESA system is to be used. The SA committee must also decide how to combine the SA factors. Factor selection, combination and weighting will depend on the intended LESA use. There are however a number of important considerations to be used in selection, defining and weighting SA factors including:

- Weight factors so that the more desirable attributes indicate a stronger argument for keeping the site in agriculture.
- Develop definitions and instructions that are clear so that each user should obtain the same result when assessing the same site.
- Link factor weights to data and be sure that factor weights correspond to the range of data for the area.
- Generally select factors that apply to most sites.
- It is recommended that each factor be on a scale of 1-100 and then weighted for uniformity in scales and standardization in computation.

SA addresses a much broader range of considerations than LE. Between three and ten SA factors may be needed. Committees formulating SA should be aware that the more factors are included, the more costly it will be to apply the LESA system and the more difficult it will be to explain to stakeholders. Care should be taken to ensure that two or more factors are not measuring the same underlying concern in different ways.

Typically SA factors fall into three classifications:

- SA-1. Agricultural Productivity
- SA-2. Development Pressures Impacting a Site's Agricultural Use
- SA-3. Other Public Values Supporting Retention of Agriculture

The factors and weights should be accepted only if they, and the resulting LESA scores, make sense to local stakeholders and decision makers. With the help of the LESA committee, a proposed LESA system should be thoroughly field checked and adjusted accordingly before it is adopted.

Combining and Weighting LESA Factors

- Once LE and SA factors are selected and assigned a factor scale, the next task is to decide how to combine the factors into a LESA system. In most cases, sites are assigned one LE rating and one combined SA rating. This is the approach used within the purview of the the Farmland Protection Policy Act (FPPA). Other options for combining LE and SA factors can be used to better capture local preferences. The common alternative methodologies are: Integration of the LE and SA-1 factors into the basic system with separate suitability Ratings for SA-2 and Sa-3 factors.
- Integration of the LE and SA-1 Factors into the basic system with Detractor/Bonus Points for SA-2 and SA-3 Factors.
- Integration of LE, SA-1, SA-2 and SA-3 Factors into the LESA System.

The local committee must decide the approach that best fits the conditions.

Evaluating the LESA System

After the LESA committee has prepared a draft of the LE and SA factors, factor scales, and weights; and made a decision on how to combine the factors, it is essential that the system be evaluated before it is used to inform decision making. The process should include preliminary and field testing of the LESA system.

The following steps are recommended for the preliminary testing:

- Select a sample of sites representing the range of characteristic in the planning area.
- Evaluate the focus of the LESA system including factors, scales, and relative weights to ensure a good fit with the sites to be evaluated.
- Document the data sources for each factor.
- Evaluate the factors for redundancy.
- Evaluate the "reproducibility" of the LESA procedures and factors to determine if similar ratings are achieved by different reviewers.

- Evaluate the “relocalability” for the LESA procedures and factors to determine if similar ratings are achieved for different sites with similar characteristics.

Once preliminary testing is completed and any necessary adjustments are made, the system should be field tested by the committee. The overall goal is to achieve simplicity of use while including the maximum practicable information. The increasing availability of spatial referenced digital data (satellite photos, infrastructure grids, etc.) has made it much easier to evaluate the ratings that result from the application of a LESA system. However, the ready availability of this type of data does not eliminate the need for “on the ground’ testing and validation of any proposed LESA system.

Interpreting LESA Ratings for Decision Making

LESA scores can be used as a tool to help plan and set policy or make other land use decisions. While LESA scores may be arrayed, ranked and compared for several sites, it may be useful to devise thresholds for applying scores to decision making. It is important to note that LESA ratings are best used as a component of a multi-faceted system that takes into account this physical, economic and social aspects and likely impacts of current and future land management decisions.

ATTACHMENT D: APPENDIX C OF SOP: CTA INFORMATION

Subpart C - Providing Conservation Technical Assistance

525.20 Delivering Conservation Technical Assistance (CTA)

A. General Information

Through the CTA Program, NRCS provides conservation technical assistance to individuals and groups of decisionmakers, communities, conservation districts and other units of State and local government, Tribes, and other Federal agencies to help them voluntarily conserve, maintain, and improve natural resources.

B. Purpose

The purpose of conservation technical assistance is to help decisionmakers voluntarily conserve, maintain, and improve natural resources to ensure their sustained use and productivity, while considering the associated environmental and cultural resources and the client's economic and social needs. NRCS helps decisionmakers with the conservation planning process ranging from site-specific for individuals to community, watershed, or area wide plans for groups of land managers.

C. Individuals, Groups, Tribes, and Units of Government

NRCS provides conservation technical assistance to individuals, entities, groups, Tribes, units of government, and others who are responsible for making decisions and setting policies that influence land use, conservation treatment, and natural resource management. Conservation technical assistance furnished by NRCS includes conservation planning, practice and system application, technical consultations, and assistance in the technical phases of USDA and State cost-share programs. Individuals, groups, Tribes, and units of government requesting CTA Program assistance include, but are not limited to—

(i) Farmers, ranchers, and other decisionmakers concerned with the conservation of the land and natural resources.
(ii) County and other local government units, such as park authorities; departments of public works; planning, zoning, school and institution boards; universities; highway departments; and tax assessors.
(iii) Citizen groups, youth groups, recreation groups, and garden clubs.
(iv) State and local units of government (highway, health, recreation, water resources, and regional planning), and Tribal governments involved in establishing public policy regarding the use of natural resources.
(v) Federal Departments and agencies such as Defense, Housing and Urban Development, Transportation, Health and Human Services, and Interior.
(vi) Professional consultants who provide engineering, planning, environmental assessment, tax assessment, and natural resource management services.

D. Conservation Planning Assistance

(1) NRCS, through the CTA Program, helps decisionmakers with the conservation planning process. CTA Program clients range from individuals, communities, groups, to units of government.
(2) Through the CTA Program, clients develop conservation plans that may serve as a basis for them to enter into financial assistance and easement conservation programs. More specifically, the CTA Program will be used to assist decisionmakers with conservation planning prior to the commitment or approval of a participant's funding for financial assistance or easement conservation programs. State Conservationists and the Directors of the Caribbean and Pacific Basin Areas may use conservation plans as part of the qualification criteria for participating in financial assistance and easement conservation programs.
(3) Conservation planning is a natural resource problem-solving and management process. The process integrates economic, social, cultural, and ecological considerations to meet private and public needs. This approach, which emphasizes desired future conditions, helps improve natural resource management, minimize conflict, and address problems and opportunities. The success of conservation planning and implementation depends on the voluntary participation of clients. NRCS uses a nine-step conservation planning process, as follows:
(i) Identify problems and opportunities
(ii) Determine objectives
(iii) Inventory resources
(iv) Analyze resources data

(v) Formulate alternatives
(vi) Evaluate alternatives
(vii) Make decisions
(viii) Implement the plan
(ix) Evaluate the plan

(4) Guidance for the nine steps of conservation planning is in Title 180, National Planning Procedures Handbook, Part 600, Subpart B, Section 600.20. The Customer Service Toolkit is the official conservation planning software for NRCS. Agency conservationists will use this software to assist clients in the conservation planning process.

E. Conservation Practice Application

(1) Conservation application assistance is provided to help decisionmakers apply and maintain planned conservation work. NRCS technical assistance for applying the plan includes—

(i) Guidance for the onsite adjustments needed to implement the selected management alternatives and conservation practices needed to protect natural resources.
(ii) Design and advice on the construction, operation, and maintenance of conservation practices.
(iii) Certification that practices applied meet NRCS conservation practice standards and specifications.

(2) NRCS has established management control of conservation application assistance in Title 210, National Engineering Manual, Part 501, Subpart A, Section 501.4, commonly referred to as engineering job approval. Employees must have training to qualify them for certain engineering job approvals for conservation practices and systems.

F. Conservation Technical Consultation

Technical consultation is technical assistance provided to individuals, groups, and units of government that does not lead to the development of a conservation plan. This technical consultation assistance includes—

(i) Assistance in meetings to support locally led efforts.
(ii) Responses to requests for information or other technical products.
(iii) Resource inventories and evaluations that may lead to conservation practice recommendations.
(iv) Assistance provided when there is a single transaction involving a service or product.
(v) Technical consultation and assistance in the distribution, interpretation, application, and use of soil survey.

G. Conservation Follow-up Assistance

Follow-up assistance is needed to maintain contact with clients to help ensure their progress in implementing conservation plans. Conservationists must ensure that enough time is scheduled to provide cooperators with adequate technical assistance in applying planned conservation practices and systems and in keeping their conservation plans current. This may include updating objectives and decisions, keeping plans current with new technology and regulations, and determining the effects of implemented practices. The CTA Program also is available to assist clients with maintenance of conservation plans, practices, and systems that resulted through expired or completed financial assistance contracts.

H. Conservation Technical Assistance on Land Units That Cross Tribal Land, State, County, or Field Office Boundaries

NRCS technical assistance on an individual land unit that crosses a Tribal land, State, county, parish, or field office boundary is the responsibility of the field office where the headquarters for the land unit is located or as otherwise agreed upon by the customer and respective State Conservationists. For assistance to individuals, groups, or units of government on a land unit that crosses a State boundary, refer to the Title 180, General Manual (GM), Part 409, Section 409.4.

I. Conservation Technical Assistance with International Impacts

Assistance with international impacts must comply with National Instruction 280-301, International Conservation Assistance. State Conservationists and Directors of the Caribbean and Pacific Basin Areas will provide instructions for affected field offices as appropriate.

525.21 Conservation Districts

A. NRCS, through the CTA Program, provides assistance to conservation districts within available resources. This conservation technical assistance includes providing resource inventory data and identifying conservation problems and needs in order for conservation districts to develop annual plans and a long-range conservation program to solve natural resource problems.

B. NRCS is invited to assist a conservation district through a formal request of an established conservation district board. The purpose for this arrangement is to ensure that the locally led process is integrated with CTA Program's national natural resource conservation objectives and priorities. As such, conservation districts are vital partners with the CTA Program.

C. Conservation technical assistance is provided on individual land units through conservation districts, including Tribal conservation districts, based on mutual, cooperative working, and operational agreements (180-GM, Part 401). NRCS may enter into agreements with conservation districts and other organizations and units of government to provide conservation program assistance as mutually agreed upon. State Conservationists and Directors of the Caribbean or Pacific Basin Areas determine the level of NRCS conservation technical assistance to be provided in areas without conservation districts.

525.22 Conservation Technical Assistance to Federal Agencies

A. General

(1) Conservation technical assistance provided by NRCS to Federal agencies usually encompasses types for which NRCS has special expertise. Technical assistance to Federal agencies that require a significant amount of NRCS resources are based on an agreement that provides for reimbursement of NRCS services. State Conservationists and Directors of the Caribbean or Pacific Basin Areas determine when an agreement is required.

(2) The types of services provided may include—

(i) Conservation program information.
(ii) FOTG information and expertise.
(iii) Natural resource information and related technical data.
(iv) Training on NRCS programs and conservation practice standards and specifications.
(v) Natural resource inventories, evaluations, and studies.
(vi) Technical information in preparation of conservation project proposals.
(vii) Conservation planning, design, and implementation assistance.

B. Reimbursable Agreements

Substantive conservation technical assistance to Federal agencies will be based on an agreement that provides for reimbursement of NRCS services. The agreement is to be developed in accordance with the Economy Act and ensure that policies and guidelines of the agencies are met. Guidance for developing agreements is located in Title 120, Federal Grants and Cooperative Agreements Handbook, Part 600.

C. Coordinated Resource Management (CRM)

(1) States are encouraged to develop memorandums of understanding to implement the CRM process where there are mixed private, public, or Tribal landownership; multiple natural resource uses; or both.

(2) Many States have established policies and general guidelines through a memorandum of understanding for CRM process implementation in collaboration with such agencies as the Bureau of Land Management; U.S. Forest Service; Cooperative State Research, Education, and Extension Service; National Park Service; the U.S. Army Corps of Engineers; U.S. Fish and Wildlife Service; and American Indian Tribal governments. Through the CRM process, these agencies coordinate resource planning, management, and education activities directed toward working with State and local agencies, private landowners, and others in developing and implementing sound resource management and conservation programs on Federal and non-Federal lands.

525.23 Conservation Technical Assistance to Private Individuals on Federal Lands

Substantive CTA Program technical assistance may be provided to private individuals on Federal lands through agreement with the Federal agency including but not limited to the use of the CRM process through a memorandum of understanding.

525.24 Conservation Technical Assistance to Tribal, State, and Local Governments

A. NRCS provides technical assistance to Tribal, State, and local governments. This technical assistance is provided in accordance with memorandums of agreement, enabling legislation, and available resources. Refer to 440-GM, Part 401, for more information about providing assistance to Tribal, State, and local governments.

B. NRCS will provide technical assistance to Tribal, State, and local governments for programs mandated by Congress in the absence of a cooperative working agreement with the conservation district or in the absence of

a conservation district.

C. NRCS has a "trust" responsibility to deliver CTA Program assistance to Tribes through a government-to-government relationship. Laws, policies, Executive orders, and other directives require or authorize this government-to-government relationship. For example, Executive memoranda direct Federal agencies to remove procedural impediments to working effectively with Tribal governments in the delivery of programs and services and to develop the best mechanism for delivering programs and services to Tribes through the consultative process (see Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (November 6, 2000); Executive Order 13007, American Indian Sacred Sites (May 24, 1996); Executive Order 12898, Environmental Justice in Minority Populations (1994); and American Indian Religious Freedom Act).

D. Through the CTA Program, the State Conservationist will consult with federally-recognized Tribes to determine the optimum means of delivering NRCS programs and services. Every effort will be made by NRCS to fulfill its government-to-government relationships with federally recognized Tribes.

525.25 Conservation Technical Assistance on a Larger Geographic Area

A. General

Through the CTA Program, NRCS provides collaborative community, watershed, and area-wide technical assistance to groups and units of government so they can develop and implement plans that conserve, maintain, and improve natural resources consistent with the Agency's national conservation mission.

B. Area-wide, Community, and Watershed Conservation Plans

(1) Through the CTA Program, NRCS provides community, watershed, and area-wide conservation planning assistance to local, State, Federal and Tribal governments. NRCS also may provide resource information for community, watershed, and area-wide planning efforts by others, including non-government consultants. These plans are developed with a client for a watershed or other geographic area defined by the client and stakeholders. This broad scale conservation plan addresses all resource problems identified, and contains alternative solutions that meet the minimum quality criteria identified in the FOTG for each natural resource, and meets the requirement of applicable laws and regulations.
(2) All community, watershed, and area-wide conservation planning activities will include a public participation component to the extent determined by the State Conservationist. Public participation activities are to be consistent with the requirements of applicable Federal statutes, such as National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the National Historic Preservation Act (NHPA) and implementing regulations for Section 106 of this Act, and Civil Rights requirements and State statutes. See the National Planning Procedures Handbook for guidance on developing community, watershed, and area-wide conservation plans.

C. Comprehensive Plans with a Unit of Government

(1) A comprehensive plan is developed for an area under the jurisdiction of a unit of government that may include, but is not limited to, policies, goals, and interrelated plans for private and public land use, transportation systems, community facilities, and capital improvements. The plan represents the decisions of local people as expressed through units of government. This type of plan also may be called a general plan, master plan, community plan, or a regional development plan.
(2) NRCS may serve as a technical advisor for the development of these types of plans. NRCS primarily provides natural resource information and related technical data to the unit of government, or to a professional planner, who may use their own planning process.
(3) The plan may result in changes in local ordinances or other actions that are implemented by the owners of land within the jurisdiction of the unit of government. An example would be a county plan for protection of open space in selected areas of the county. NRCS policy for compliance with the Farmland Protection Policy Act and Land Evaluation Site Assessment guidance is located in General Manual, Title 310, and Conservation Programs Manual, Title 440, Part 523.

ATTACHMENT E: APPENDIX D OF SOP: FSA COMPLIANCE REVIEW AND SPOT CHECK

Section 2 (Withdrawn--Amend. 41)

344 (Withdrawn--Amend. 41)

345 (Withdrawn--Amend. 33)

346-348 (Withdrawn--Amend. 41)

Section 2.5 Performing Compliance Reviews and Spot Checks

349 (Withdrawn--Amend. 66)

350 CRP Compliance Reviews

A CRP Maintenance Reviews

The national producer selection process for compliance described in subparagraph 322 A shall be used for CRP compliance. CRP spot checks shall be performed on all contracts where selected producers have a share. When completing spot checks, County Offices shall collect information sufficient to answer the National Compliance Review Database questions and document that information on FSA-578. This information shall be recorded in the National Compliance Review Database according to paragraphs 360 and 361. The questions included in the National Compliance Review Database are as follows.

- Has an approved cover been maintained according to the conservation plan? **Yes or No.** If "No", select all of the following that apply.
  - Did COC determine that the participant made a good faith effort to comply with the terms and conditions of CRP-1?
  - Is the finding currently in the process of being appealed?
  - Was a violation found on all or a portion of the contract?

350 CRP Compliance Reviews (Continued)

A CRP Maintenance Reviews (Continued)

- Has the producer(s) performed required management activities according to the conservation plan? **Yes or No**. If "No", select all of the following that apply.
  - Did COC determine that the participant made a good faith effort to comply with the terms and conditions of CRP-1?
  - Is the finding currently in the process of being appealed?
  - Was a violation found on all or a portion of CRP-1?
- Has the approved cover been harvested or grazed without authorization or has other commercial use has been made of the forage (exception: emergency haying or grazing)? **Yes or No**. If "Yes", select all of the following that apply.
  - Did COC determine that the participant made a good faith effort to comply with the terms and conditions of CRP-1?
  - Is the finding currently in the process of being appealed?
  - Was a violation found on all or a portion of CRP-1?

***--350 CRP Compliance Reviews (Continued)**

A CRP Maintenance Reviews (Continued)

- Has an unauthorized crop such as an agricultural commodity has been planted on acreage under CRP-1? **Yes or No**. If "Yes", select all of the following that apply.
  - Did COC determine that the participant made a good faith effort to comply with the terms and conditions of CRP-1?
  - Is the finding is currently in the process of being appealed?
  - Was a violation found on all or a portion of CRP-1?
- Has the producer(s) conducted an activity on CRP acres without authorization, including unauthorized treatment, such as mowing, spraying, or burning of CRP under the primary nesting or brood rearing season? **Yes or No**. If "Yes", select all the following that apply.
  - Did COC determine that the participant made a good faith effort to comply with the terms and conditions of CRP-1?
  - Is the finding currently in the process of being appealed?
  - Was a violation found on all or a portion of CRP-1?
- Have trees been harvested or sold, or other commercial use been made of trees, including the shearing or shaping of trees for Christmas trees or removal of pine straw? **Yes or No**. If "Yes", select all of the following that apply.
  - Did COC determine that the participant made a good faith effort to comply with the terms and conditions of CRP-1?
  - Is the finding currently in the process of being appealed?
  - Was a violation found on all or a portion of CRP-1?
- Have undesirable weeds, plants, insects, or pests, as determined by COC, not been controlled on the designated acreage? **Yes or No**. If "Yes", select all of the following that apply.
  - Did COC determine that the participant made a good faith effort to comply with the terms and conditions of CRP-1?
  - Is the finding currently in the process of being appealed?
  - Was a violation found on all or a portion of CRP-1?--*

*--350 CRP Compliance Reviews (Continued)

A CRP Maintenance Reviews (Continued)

- Has a satisfactory cover or required practice been established or re-established within the time prescribed? **Yes or No**. If "No", has an extension of time to complete the practice been authorized? If "No" to both, select all of the following that apply.

  - Did COC determine that the participant made a good faith effort to comply with the terms and conditions of CRP-1?

  - Is the finding currently in the process of being appealed?

  - Was a violation found on all or a portion of CRP-1?

  Note: The reverse side of FSA-578 may be used as an additional remarks section.

B CRP Acreage/Practice Reviews

Perform spot-check inspections on CRP acres as follows.

- CRP acres are not subject to spot check until NRCS has completed the final status review.

  Exception: Spot-check before the final status review if emergency use is authorized.

- After final NRCS status review has been received, perform spot-checks through on-site inspections for participating producers selected according to subparagraph 322 B to verify that CRP acreage and practices are being maintained according to 2-CRP.--*

Part 3 Compliance Reviews and Spot Checks

Section 1 General Guidelines, Applicable Programs, and Selection Process

321 Introduction

A Purpose

County Offices are required to conduct farm inspections to ensure that producers comply with FSA program requirements.

Producers are selected for compliance reviews and spot check through a national selection process. Producers selected shall be spot checked and reviewed for the following programs/activities:

- ACRE
- ALAP
- BCAP
- CRP maintenance and practice checks
- *--CTAP--*
- DCP
- ELAP
- FSA-578's
- HELC/WC compliance
- LDP's/MAL's
- LFP, LIP
- MILC
- NAP
- RTCP
- SURE
- TAAF
- TAP.

*--**Notes:** ACRE, ALAP, and DCP are applicable to compliance reviews and spot checks for 2013 and prior years only.

CTAP is applicable beginning with 2014 compliance reviews and spot checks.--*

B Time of Inspection

County Offices shall conduct inspections on producers selected through the national selection process at times applicable for the specific program/activity involved. County Offices shall follow applicable program procedure for timing of inspections.

322 National Compliance Review and Spot Check Selections

A National Producer Selection Process

Rather than selecting individual farms, loans, contracts, etc., for compliance reviews, a nationwide selection of producers will be made annually by the National Office using a statistical sampling method. Producers will be selected based on their participation in various programs. FSA employees, committee members, and other required producers are included in the national selection.

Note: Because FSA employees, STC and COC members and other "required producers" are included in the national selection, County Offices shall no longer conduct separate spot checks on required producers.

Early each calendar year, the National Office will post the listing of producers selected for annual compliance reviews on the Intranet at
--http://fsaintranet.sc.egov.usda.gov/ffas/farmbill/ccc/default.htm.--

The national producer selection list will be broken down by State and county. Under each county, the list will display the following:

- producer first and last name and/or business name
- tax ID type ("E"ntity or "S"ocial).

Notes: In some cases, there may be multiple producers in the county with the same name. If County Offices have concerns about which producer has been selected for spot check and review, the County Office shall contact the State Office. The State Office shall contact the National Office for TIN for the selected producer.

Producers may operate as an individual and an entity. The national producer selection list will identify the tax ID type associated with the selected producer. County Offices shall only review farms, loans, contracts, etc., associated with the tax ID type listed.

Example: Joe Farmer farms as an individual and also farms as a member of a partnership. Joe Farmer was selected for 2007 compliance reviews. The national producer selection list included his first and last name and the tax ID type S. In this example Joe Farmer was selected as an individual (based on his tax ID type). Therefore, County Offices shall only check/review farms, loans, and contacts he is associated with as an individual.

Producers will be listed for each State/county they are associated; thus, compliance reviews and spot checks may be performed for a producer in multiple States/counties depending on the scope of the operation.

County Offices shall print and maintain the list of producers selected in their county. The National Office will **not** make another selection of producers for the year.

Note: Not all States and counties may have producers selected for spot check and review.

322 National Compliance Review and Spot Check Selections (Continued)

B DD Concurrence for Nonparticipating Selected Producers

Because the national selection process is based in part on prior years' payments and program participation, some producers selected may not be farming or participating in FSA programs for the current year.

If a County Office determines a producer is not farming for the current year, the County Office shall:

- notate "N/A" by the producer's name on the national producer selection list to indicate that the producer is not participating in FSA programs for the year
- forward the list to DD for review and concurrence.

DD's shall review, initial, and date the list indicating their agreement that the producer is not farming or participating in FSA programs for the year.

C Adding Additional Producers for Spot Check/Review

Only the producers identified on the national producer selection list are required to be spot checked and reviewed for the programs listed in subparagraph A. However, State and County Offices may spot check any producer not identified on the national producer selection list if there is reason to question the producer's compliance with any program provisions.

D County Office Responsibilities

County Offices shall:

- continue to flag all required producers in the name and address file in the System 36 according to 1-CM * * *

  Notes: Although separate inspections will not be conducted on required producers, all required producers must be flagged in the System 36 to ensure they are included in the national selection process. Separate inspections for required producers shall **not** be conducted unless the producer has been selected for spot check under the national selection process.

  Required producers include the following:

  - State level FSA employees, including SED's, STC members, DD's, and their spouse and minor children
  - County level FSA employees, including CED's, COC members, Federal employees employed in the County Office, and their spouse and minor children
  - producers with controlling interest in a firm, such as a gin or warehouse, if the records of the firm are used to substantiate production for other producers.

322 National Compliance Review and Spot Check Selections (Continued)

D County Office Responsibilities (Continued)

- perform compliance reviews on all producers selected under the national selection process throughout the year for all programs listed in subparagraph 321 A

  Note: County Offices shall follow Section 2.5 when performing compliance reviews/spot checks.

•*--when conducting compliance reviews and spot checks, County Offices shall check:

- for FSA-578 spot checks, the current year FSA-578, as well as any prior year FSA-578 that has been revised since the last spot check list

  Note: When reviewing prior year FSA-578's, County Offices shall ensure that the correct documentation is on file according to 2-CP.

- for all other programs, any application/contract that has been approved for payment since the last spot check list

- document questions from each program area to record in the National Compliance Review Database according to paragraphs 360 and 361.

E Available Resources

County Offices may use the following resources as tools to assist them in identifying the specific programs selected producers are participating in:

- web-based FSA application reports

  Note: Approved application reports are available for most web-based applications, including ACRE, DCP, LFP, LIP, and TAP, and identify producers with approved applications.

- farm records to identify active farms for selected producers

- NPS to identify program payments selected producers received

- FWDM will identify LDP, MAL, and MILC program payments received by selected producers

- APSS will identify MAL and LDP payments producers received in a specific county--*

322 National Compliance Review and Spot Check Selections (Continued)

*--E Available Resources (Continued)

- SORS to identify outstanding MAL's for a selected producer
- System 36 which contains numerous reports identifying producers with active CRP contracts
- COC meeting minutes to identify applications/contracts approved for various programs.--*

323 Refusals to Permit Farm Entry

A Producer Refuses Entry

If a producer refuses to permit an FSA representative to enter the farm, the representative shall:

- immediately notify CED
- document the following on FSA-578, remarks section:
  - refusal date
  - reason for refusal
  - acreage estimate, if obtainable
- sign and date FSA-578, remarks section.

B County Office Action

When advised of a refusal to permit entry, the County Office shall immediately notify the farm operator, in writing, of the following:

- refusal date
- person who made the refusal
- person who was refused entry
- consequences of refusal to permit entry. See subparagraph C.

After notifying the farm operator of the situation and the options available, the FSA representative shall make no further effort to enter the farm.

If the producer does not respond to the letter, or continues to refuse entry, consider all producers on the farm ineligible for program benefits.

Part 17 Compliance and Spot Checks

601 General Provisions

A Participant Responsibilities

All signatories on CRP-1 are jointly and severally responsible for complying with the term and conditions of CRP as stated on:

- CRP-1
- CRP-1 Appendix
- the approved conservation plan
- any other CRP forms.

Exception: Only signatories that receive a share of the payment are responsible for compliance.

B Annual Status Review

NRCS or TSP will complete a status review with the participant and a COC representative, if available, on up to 10 percent of all CRP-1's before the end of each FY until all practices in the plan are applied and the approved cover is established. The 10 percent required will be based on the total number of CRP-1's approved in the previous FY. Vegetative and tree cover establishments are reported to FSA by a status review labeled "Final."

Note: FSA and NRCS or TSP shall work together to prioritize and select the contracts and practices on which to complete an annual status review.

The State Forestry Agency will provide NRCS or TSP with 2 listings by name and CRP-1 number for contracts having tree plantings that:

- do not have adequate tree cover established or require replanting
- have established adequate tree cover and have not been reported as established
- have not been thinned according to the conservation plan.

Note: Certain participants agreed to thin tree stands to receive additional environmental benefits index points when the acreage was offered for enrollment.

NRCS or TSP will provide a copy of this list to FSA indicating "Final Status Review" for these CRP-1's.

601 General Provisions (Continued)

B Annual Status Review (Continued)

Progress of the practice establishment shall be documented, including:

- implementation of the approved conservation plan, including tree thinning, if applicable
- condition of installed practices
- need for revisions
- additional assistance.

NRCS or TSP shall use:

- NRCS-LTP-013, or its related electronic form, for required status reviews

- NRCS-LTP-03, or its related electronic form, to document completion of the annual status review.

NRCS or TSP will provide COC signed copies of the annual status reviews and the following information, if applicable:

- the reason why the practices have not been established
- why the practice does not meet the design standards and specifications
- what action **must** be taken for the practice to meet the standards and specifications
- the estimated time it will take to meet the standards and specifications.

601 General Provisions (Continued)

C FSA County Office Action

FSA County Offices shall:

- file the annual status review copies in CRP folders
- follow up on noncompliance cases
- conduct annual spot checks according to 2-CP **after** NRCS or TSP certifies on a final status review that the practice is established
- conduct annual spot checks on at least 10 percent of CRP-1's, including CREP, approved for:
  - spot treatment during the primary nesting or brood rearing season according to paragraph 427
  - early land preparation according to paragraph 637.

If NRCS or TSP certifies that a practice has not been established in the final performance review, COC shall determine necessary action. Action may include, but is not limited to:

- terminating CRP-1 according to paragraph 571
- determining that erosion is being controlled adequately with existing cover according to subparagraph 603 D
- participant working with NRCS or TSP to establish an approved cover.

602 Certifying Compliance

A Certification of Compliance

Before CRP annual rental payments are issued, a certification of compliance shall be filed on either FSA-578 or CRP-817U by 1 of the following:

- owner on CRP-1
- operator on CRP-1
- person authorized by power of attorney.

Notes: See subparagraph B for completing CRP-817U.

Substitute forms are not authorized. State and County Offices shall not develop substitute forms for FSA-578 or CRP-817U.

A current AD-1026 and applicable payment limitation forms shall be on file for all participants earning CRP benefits before CRP annual rental payments are issued.

At least 15 calendar days before the end of the reporting period, COC shall notify each CRP participant to file FSA-578 or return CRP-817U.

602 Certifying Compliance (Continued)

B Completing CRP-817U

County Offices shall complete CRP-817U according to the following.

Step	Action
1	Enter FSN in item 1.
2	Enter CRP-1 number in item 2. **Note:** Use one CRP-817U for each CRP-1.
3	Enter the program year for the certification in item 3. Do not enter the CRP-1 year.
4	Enter applicable CRP practices and the associated number of acres in item 4.
5	Provide a deadline for returning CRP-817U to the County Office.
6	Mail CRP-817U to CRP participant.

7	When the participant returns CRP-817U:
	
	• ensure that participant signed and dated CRP-817U in item 5
	• update the following in the System 36:
	
	  • FSA-578 according to 2-CP
	  • eligibility flags according to 6-CP and 2-PL.

602 Certifying Compliance (Continued)

C Example of CRP-817U

The following is an example of CRP-817U.

CRP-817U
(07-23-10)

U.S. DEPARTMENT OF AGRICULTURE
Farm Service Agency

CERTIFICATION OF COMPLIANCE FOR CRP

Producers name and address

County Office Address, City, State, Zip and Telephone number

Dear Producer:

Our records indicate that all of the following applied to you in the previous year:

1. That all or a portion of the land of your farm was enrolled in the Conservation Reserve Program (CRP).

2. That you certified compliance with Highly Erodible Land Conservation and Wetland Conservation provisions and have an approved farm operating plan for payment eligibility review (form CCC-502) or CCC-902 as applicable.

If the above statements remain true for the current year, please sign and date the CRP-817U and **return it to this office by** _____ so your CRP rental payment may be processed.
(Return date)

IMPORTANT INFORMATION – PLEASE READ AND RETURN BY DATE SPECIFIED SHOWN ABOVE		
1. Farm Number	2. CRP Contract No.	3. Program Year of Certification
4. Practice Identification and Acres		

I hereby certify that: (1) the information shown above is correct; (2) I have and will continue to comply with **ALL** the terms and conditions of the indicated CRP contract, including the applicable appendix and any addendums; (3) I am in compliance with **ALL** Highly Erodible Land Conservation (HELC) and Wetland Conservation (WC) provisions set forth in 7 CFR Part 12; (4) I have filed an approved farm operating plan for payment eligibility review (form CCC-502 or CCC-902, as applicable), in accordance with 7 CFR Part 1400 and there have been no changes in my farming operation; and (5) USDA representatives are authorized to enter upon and inspect the farm indicated above for the purpose of confirming this certification.

Contact this office immediately if any information shown is incorrect or if farming interests identified on the farm operating plan referred to above have changed.

5A. Producer's Signature (By)	5B. Title/Relationship of the Individual Signing in the Representative Capacity	5C. Date

NOTE: *The following statement is made in accordance with the Privacy Act of 1974 (5 USC 552a - as amended). The authority for requesting the information identified on this form is 7 CFR Part 1410, the Food Security Act of 1985 (16 U.S.C. 3831 et seq.), the Commodity Credit Corporation Charter Act (15 U.S.C. 714 et seq.), and the Food, Conservation, and Energy Act of 2008 (Pub. L. 110-246). The information will be used to certify compliance with all terms and conditions indicated on the CRP contract. The information collected on this form may be disclosed to other Federal, State, Local government agencies, Tribal agencies, and nongovernmental entities that have been authorized access to the information by statute or regulation and/or as described in applicable Routine Uses identified in the System of Records Notice for USDA/FSA-2, Farm Records File (Automated). Providing the requested information is voluntary. However, failure to furnish the requested information will result in a determination of ineligibility to certify compliance with all terms and conditions indicated on the CRP contract which will prevent the processing of the CRP payment.*

The information collection is exempted from the Paperwork Reduction Act, as it is required for administration of the Food, Conservation, and Energy Act of 2008 (see Pub. L. 110-246, Title III, Subtitle J – Miscellaneous Conservation Provisions). The provisions of appropriate criminal and civil fraud, privacy, and other statutes may be applicable to the information provided. ***RETURN THIS COMPLETED FORM TO YOUR COUNTY FSA OFFICE.***

The U.S. Department of Agriculture (USDA) prohibits discrimination in all of its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Assistant Secretary for Civil Rights, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, S.W., Stop 9410, Washington, DC 20250-9410, or call toll-free at (866) 632-9992 (English) or (800) 877-8339 (TDD) or (866) 377-8642 (English Federal-relay) or (800) 845-6136 (Spanish Federal-relay). USDA is an equal opportunity provider and employer.

603 Noncompliance

A Noncompliance Cases

Notify participant in writing of noncompliance issue according to 4-CP.

Noncompliance cases shall be handled promptly before CRP payments are made for the year.

COC shall determine whether a participant who is in violation of CRP-1 terms and conditions:

- made a good faith effort to comply
- did **not** make a good faith effort to comply.

B Examples of Noncompliance

COC shall consider a producer to be out of compliance if:

- the approved cover has been harvested or grazed or other commercial use has been made of the forage

  Exception: Managed harvesting, routine grazing, or emergency haying or grazing, as authorized.

- an unauthorized crop, such as an agricultural commodity, has been planted on acreage under CRP-1

- trees have been harvested or sold, or other commercial use has been made of trees, including the shearing or shaping of trees for Christmas trees or removal of pine straw

  Exception: Customary forestry activities are authorized.

- producer conducted an activity on CRP acres without authorization, including unauthorized treatment, such as mowing, spraying, and burning of CRP during the primary nesting or brood rearing season

- the State or local noxious weed commission determines that the participant is violating noxious weed provisions and notifies COC that the noxious weeds are not controlled on the designated acres

- the approved cover has not been maintained according to the conservation plan

603 Noncompliance (Continued)

B Examples of Noncompliance (Continued)

- the producer has not performed required management activities according to the conservation plan
- other undesirable weeds, plants, insects, or pests, as determined by COC, are not controlled on the designated acreage
- a satisfactory cover or a required practice has not been established or re-established within the time prescribed
- the producer has not complied with landlord and tenant provisions
- there has been a scheme or device that tends to defeat the program
- a false claim has been filed
- a violation of the terms and conditions of CRP-1 has occurred.

C Joint and Several Liability

If the farm is in violation of CRP-1 terms and conditions, all signatories to CRP-1 are jointly and severally liable for any payment reduction or refunds that may become due to CCC because of noncompliance.

CRP participants with zero interest in the annual rental payment are not responsible for contract compliance.

D Participant's Good Faith Effort

If COC determines that the participant made a good faith effort to comply with the terms and conditions of CRP-1 and:

- a practice failed because of natural disaster or through no fault of the participant, do not use this subparagraph

  Note: See subparagraph 493 B.

603 Noncompliance (Continued)

D Participant's Good Faith Effort (Continued)

- noncompliance has occurred for reasons other than a practice failing because of natural disaster or through no fault of the participant, COC shall:

  - assess a standard payment reduction on the affected acres not to exceed the annual rental payments for CRP-1 on which the violation occurred

    Note: See subparagraph 604 A.

  - advise the participant that subsequent violations may result in terminating CRP-1.

If noncompliance because of practice failure occurs after the fifth year of CRP-1, COC may determine whether CRP-1 shall be:

- continued without additional C/S, if a permanent cover has failed and adequate cover exists to prevent erosion

  Note: Adequate cover to prevent soil erosion does not satisfy tree planting requirements.

- terminated according to paragraph 571.

When determining whether to terminate CRP-1, COC shall consider factors, such as the age of CRP-1 and the cost-effectiveness of re-establishing the practice.

Example: COC terminates CRP-1 because, in the eighth year of CRP-1, the producer inadvertently applied a herbicide that killed all ground cover.

603 Noncompliance (Continued)

E Good Faith Effort Not Determined

If COC determines there was not a good faith effort to comply with the terms and conditions of CRP-I and:

- the participant's request for termination of part of the land under CRP-1 was not approved, COC shall terminate **all** land under CRP-I according to subparagraph 571 A

  Example: Participant has 100 acres enrolled in CRP. Participant requests to terminate part of the acres under CRP-1 to return to crop production. The request is not approved. Producer plants part of the acres under CRP-I to corn. COC shall terminate all land (100 acres) under CRP-1.

- there was no request to terminate part of the land under CRP-1, COC shall terminate only land in violation according to subparagraph 571 B.

COC **must** determine there is not a good faith effort to comply with the terms and conditions of CRP-1 if:

- unauthorized grazing is discovered and producer refuses to remove livestock from CRP acreage

- unauthorized haying is discovered and producer refuses to destroy or donate the hay

  Note: If the unauthorized hay has already been sold or used by the time the violation is discovered, COC may determine the producer made a good faith effort to comply with the terms and conditions of CRP-1. Burning is not an authorized method for destruction of the hay. Donation must be to a third-party.

- unauthorized planting or harvesting of a crop is discovered and producer refuses to destroy the crop.

  Note: If the unauthorized crop has already been sold or used by the time the violation is discovered, COC may determine the producer made a good faith effort to comply with the terms and conditions of CRP-I.

604 Payment Reductions

A Assessment of Payment Reduction

The participant shall be assessed payment reductions as follows:

- according to 4-CP for maintenance defaults and unauthorized haying or grazing

  Notes: To ensure equity in payment reduction for unauthorized grazing only, COC may:

  - pre-establish payment reduction rates
  - prorate the payment reduction based on the days, weeks, or months the violation occurred.

  See subparagraph 603 E if producer refuses to remove livestock or destroy hay.

- for unauthorized planting or harvesting of a crop, such as annually tilled crops, pine straw, etc., acres in default times current market value times the lesser of the following:

  - established yield for the crop times 2
  - actual yield for the crop times 2

  Note: See subparagraph E if producer refuses to destroy unauthorized crop.

- for unauthorized treatment, such as mowing, spraying, and burning, during the primary nesting or brood rearing season, an amount equal to the annual rental payment for the acreage in violation.

Standard payment reductions shall not exceed the annual rental payments for CRP-1 on which the violation occurred.

When the violation results in termination of acres in violation, participants shall refund payments, according to paragraph 571.

605 Request for Waiver of Payment Reductions

A Waiver or Reduction of Standard Payment Reduction

COC shall:

- authorize a waiver or reduction of the standard payment reduction only if the request is received from participants, in writing

  Note: It is the participant's responsibility to request a waiver or reduction of refunds.

- ensure that participants are provided applicable appeal rights according to 1-APP

- thoroughly document requests for waiver or reduction of standard payment reduction refunds in COC minutes

- submit requests for waiver or reduction of standard payment reduction to STC only if COC determines that the action is justified based on documented and verifiable facts of the individual case

- *--provide a report of waivers or reductions of the standard payment reduction, no later than December 1 for each FY according to subparagraph B.--*

  Notes: Each case is unique. Determinations shall be made on a case-by-case basis based on the facts of the individual case.

  COC's may waive up to 50 percent of the assessed standard payment reduction.

STC shall:

- thoroughly review each request for waiver or reduction of standard payment reduction

- thoroughly document requests for waiver or reduction of standard payment reduction in STC minutes

- *--provide a report of waivers or reductions of standard payment reduction, no later than December 1 for each FY according to subparagraph B.--*

Note: Each case is unique. Determinations shall be made on a case-by-case basis based on the facts of the individual case.

STC's may waive up to 100 percent of the assessed standard payment reduction.

605 Request for Waiver of Payment Reductions (Continued)

B Reports

STC's and COC's must provide a report to the State Office of all waivers of the standard *--payment reduction during the previous FY. The report must include the following:--*

- State and county code
- CRP participant name
- CRP contract number
- calculated standard payment reduction amount
- amount waived
- reason waived.

--State Offices must provide a compilation of the STC and COC reports to the CRP program manager no later than December 1 each year.--

The following is an example of the report.

Standard Payment Reduction Waiver Report					
State and County Code	**CRP Participant Name**	**CRP Contract Number**	**Calculated Standard Payment Reduction**	**Amount Waived**	**Reason Waived**
Total			$	$	

606-625 (Reserved)

ATTACHMENT F: APPENDIX E OF SOP: CREDIT DURATION BMPS

LongName	ShortName	WV
Poultry Litter Treatment (alum, for example)	Alum	1
Animal Waste Management System	AWMS	10
Barnyard Runoff Control	BarnRunoffCont	10
Biofilters	Biofilters	1
Irrigation Water Capture Reuse	CaptureReuse	10
Alternative Crops	CarSeqAltCrop	10
Commodity Cover Crop Early-Planting Aerial Corn Barley	ComCovCropEAB	1
Commodity Cover Crop Early Arial Rye	ComCovCropEAR	1
Commodity Cover Crop Early-Planting Aerial Soy Barley	ComCovCropEASB	1
Commodity Cover Crop Early-Planting Aerial Soy Rye	ComCovCropEASR	1
Commodity Cover Crop Early-Planting Aerial Soy Wheat	ComCovCropEASW	1
Commodity Cover Crop Early Arial Wheat	ComCovCropEAW	1
Commodity Cover Crop Early Drilled Barley	ComCovCropEDB	1
Commodity Cover Crop Early Drilled Rye	ComCovCropEDR	1
Commodity Cover Crop Early Drilled Wheat	ComCovCropEDW	1
Commodity Cover Crop Early-Planting Other Barley	ComCovCropEOB	1
Commodity Cover Crop Early Other Rye	ComCovCropEOR	1
Commodity Cover Crop Early Other Wheat	ComCovCropEOW	1
Commodity Cover Crop Late-Planting Drilled Rye	ComCovCropLDR	1
Commodity Cover Crop Late-Planting Drilled Wheat	ComCovCropLDW	1
Commodity Cover Crop Late-Planting Other Rye	ComCovCropLOR	1
Commodity Cover Crop Late Other Wheat	ComCovCropLOW	1
Commodity Cover Crop Standard-Planting Drilled Barley	ComCovCropSDB	1
Commodity Cover Crop Standard Drilled Rye	ComCovCropSDR	1
Commodity Cover Crop Standard-Planting Drilled Wheat	ComCovCropSDW	1
Commodity Cover Crop Standard-Planting Other Barley	ComCovCropSOB	1
Commodity Cover Crop Standard Other Rye	ComCovCropSOR	1
Commodity Cover Crop Standard Other Wheat	ComCovCropSOW	1
Soil Conservation and Water Quality Plans	ConPlan	10
Conservation Tillage - Additional Acres	ConserveTillAddAcres	1
Conservation Till Without Nutrients	ConserveTillom	1
Conservation Tillage - Total Acres	ConserveTillTotAcres	1
Annual Ryegrass, Early, Aerial	CoverCropEAAR	1
Cover Crop Early Arial Barley	CoverCropEAB	1
Forage Radish, Early, Aerial	CoverCropEAFR	1
Forage Radish + Grass, Early, Aerial	CoverCropEAFRG	1
Winter Hardy Brassica, Early, Aerial	CoverCropEAHB	1
Winter Hardy Oats, Early, Aerial	CoverCropEAHO	1
Winter Killed Oats, Early, Aerial	CoverCropEAKO	1
Annual Legume, Early, Aerial	CoverCropEAL	1
Annual Legume + Grass, Early, Aerial	CoverCropEALG	1
Annual Legume + Grass, Early, Aerial, After Soy	CoverCropEALSG	1
Cover Crop Early Arial Rye	CoverCropEAR	1
Annual Ryegrass, Early, Aerial, After Soy	CoverCropEASAR	1
Cover Crop Early-Planting Aerial Soy Barley	CoverCropEASB	1
Forage Radish, Early, Aerial, After Soy	CoverCropEASFR	1

Forage Radish + Grass, Early, Aerial, After Soy	CoverCropEASFRG	1
Winter Hardy Brassica, Early, Aerial, After Soy	CoverCropEASHB	1
Winter Hardy Oats, Early, Aerial, After Soy	CoverCropEASHO	1
Winter Killed Oats, Early, Aerial, After Soy	CoverCropEASKO	1
Annual Legume, Early, Aerial, After Soy	CoverCropEASL	1
Cover Crop Early-Planting Aerial Soy Rye	CoverCropEASR	1
Triticale, Early, Aerial, After Soy	CoverCropEAST	1
Cover Crop Early-Planting Aerial Soy Wheat	CoverCropEASW	1
Triticale, Early, Aerial	CoverCropEAT	1
Cover Crop Early Arial Wheat	CoverCropEAW	1
Annual Ryegrass, Early, Drilled	CoverCropEDAR	1
Cover Crop Early-Planting Drilled Barley	CoverCropEDB	1
Forage Radish, Early, Drilled	CoverCropEDFR	1
Forage Radish + Grass , Early, Drilled	CoverCropEDFRG	1
Winter Hardy Brassica, Early, Drilled	CoverCropEDHB	1
Winter Hardy Oats, Early, Drilled	CoverCropEDHO	1
Winter Killed Oats, Early, Drilled	CoverCropEDKO	1
Annual Legume, Early, Drilled	CoverCropEDL	1
Annual Legume + Grass, Early, Drilled	CoverCropEDLG	1
Cover Crop Early Drilled Rye	CoverCropEDR	1
Triticale, Early, Drilled	CoverCropEDT	1
Cover Crop Early Drilled Wheat	CoverCropEDW	1
Annual Ryegrass, Early, Other	CoverCropEOAR	1
Cover Crop Early-Planting Other Barley	CoverCropEOB	1
Forage Radish, Early, Other	CoverCropEOFR	1
Forage Radish + Grass, Early, Other	CoverCropEOFRG	1
Winter Hardy Brassica, Early, Other	CoverCropEOHB	1
Winter Hardy Oats, Early, Other	CoverCropEOHO	1
Winter Killed Oats, Early, Other	CoverCropEOKO	1
Annual Legume, Early, Other	CoverCropEOL	1
Annual Legume + Grass, Early, Other	CoverCropEOLG	1
Cover Crop Early Other Rye	CoverCropEOR	1
Triticale, Early, Other	CoverCropEOT	1
Cover Crop Early Other Wheat	CoverCropEOW	1
Cover Crop Late Drilled Rye	CoverCropLDR	1
Triticale, Late, Drilled	CoverCropLDT	1
Cover Crop Late-Planting Drilled Wheat	CoverCropLDW	1
Cover Crop Late-Planting Other Rye	CoverCropLOR	1
Triticale, Late, Other	CoverCropLOT	1
Cover Crop Late Other Wheat	CoverCropLOW	1
Annual Ryegrass, Normal, Drilled	CoverCropSDAR	1
Cover Crop Standard Drilled Barley	CoverCropSDB	1
Forage Radish + Grass, Normal, Drilled	CoverCropSDFRG	1
Winter Hardy Oats, Normal, Drilled	CoverCropSDHO	1
Annual Legume, Normal, Drilled	CoverCropSDL	1
Annual Legume + Grass, Normal, Drilled	CoverCropSDLG	1
Cover Crop Standard Drilled Rye	CoverCropSDR	1

Triticale, Normal, Drilled	CoverCropSDT	1
Cover Crop Standard Drilled Wheat	CoverCropSDW	1
Annual Ryegrass, Normal, Other	CoverCropSOAR	1
Cover Crop Standard Other Barley	CoverCropSOB	1
Forage Radish + Grass, Normal, Other	CoverCropSOFRG	1
Winter Hardy Oats, Normal, Other	CoverCropSOHO	1
Annual Legume, Normal, Other	CoverCropSOL	1
Annual Legume + Grass, Normal, Other	CoverCropSOLG	1
Cover Crop Standard Other Rye	CoverCropSOR	1
Triticale, Normal, Other	CoverCropSOT	1
Cover Crop Standard Other Wheat	CoverCropSOW	1
Cropland Irrigation Management	Cropirrmgmt	1
Dairy Precision Feeding and/or Forage Management	DairyPrecFeed	1
Dirt & Gravel Road Erosion & Sediment Control - Driving Surface Aggregate + Raising the Roadbed	DirtGravelDSA	10
Dirt & Gravel Road Erosion & Sediment Control - with Outlets	DirtGravelDSAOut	10
Dirt & Gravel Road Erosion & Sediment Control - Outlets only	DirtGravelnoDSA	10
Sorbing Materials in Ag Ditches	DitchFilter	1
Tier 1 Crop Group Nutrient Application Management Efficiency Version	EffNutMan	1
Decision Agriculture Efficiency Version	EffNutManDecAg	1
Enhanced Nutrient Application Management Efficiency Version	EffNutManEnhance	1
Forest Buffers	ForestBuffers	10
Streamside Forest Buffers	ForestBuffersTrp	10
Narrow Forest Buffer	ForestBuffNarrow	10
Grass Buffers; Vegetated Open Channel - Agriculture	GrassBuffers	10
Streamside Grass Buffers	GrassBuffersTrp	10
Narrow Grass Buffer	GrassBuffNarrow	10
Horse Pasture Management	HorsePasMan	10
Continuous, High Residue, Minimum Soil Disturbance Tillage Management	HRTill	1
Lagoon Covers	LagoonCovers	1
Land Retirement to hay without nutrients (HEL)	LandRetireHyo	10
Land Retirement to pasture (HEL)	LandRetirePas	10
Dairy Manure Injection	LiquidInjection	1
Loafing Lot Management	LoafLot	10
Manure Transport	ManureTransport	1
Mortality Composters	MortalityComp	10
Non Urban Stream Restoration	NonUrbStrmRest	10
Off Stream Watering Without Fencing	OSWnoFence	10
Stream Access Control with Fencing	PastFence	1
Poultry Litter Injection	PoultryInjection	1
Poultry Phytase	PoultryPhytase	1
Prescribed Grazing	PrecRotGrazing	3
Shoreline Erosion Control	ShoreAg	10
Swine Phytase	SwinePhytase	1

Tree Planting	TreePlant	10
Precision Intensive Rotational Grazing	UpPrecIntRotGraze	3
Water Control Structures	WaterContStruc	10
Wetland Restoration	WetlandRestore	10
Streamside Wetland Restoration	WetlandRestoreTrp	10

ATTACHMENT G: APPENDIX F OF SOP: WV AGRICULTURE BMP USER GUIDE

WV Ag BMP Database

User Guide for Version 1

March 2015

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1. Introduction

1.1. *About this Guide*

Welcome to Agricultural BMP Database System for the state of West Virginia. This online database serves as a means of reporting and tracking Best Management Practices (BMPs). The use of this tool will allow for a more streamlined approach for generating reports needed for agricultural BMP assessment and monitoring purposes. Additionally, this database is used to submit data for inclusion to the National Environmental Information Exchange Network (NEIEN). Individual organizations are responsible for entering their practices with their provided login information and will only be permitted to review their own data.

This brief document is a basic user guide to familiarize users with the technical aspects of the application and its functions. Most frequent users of the system will find it to be intuitive and will not need to review this guide once they begin to use it regularly.

This guide will offer example of most functions within the system, and will depict many screens. Each screen will be shown only once in the guide.

1.2. *Getting Started*

Request an Account

Accounts in the system are managed by system administrators Contact your system administrators to request an account, or to change your access privileges.

Requirements

Use of the Agricultural BMP Database System requires the following technologies on users' computers.

- A computer with Internet access to Web sites.
- A Web browser (Mozilla Firefox 10.0 or newer, Microsoft Internet Explorer 9.0 or newer).
- Microsoft Office 2007 or newer (to open the Excel import templates in .xlsx format, or open the attached documents)
- Any other software needed to view attach documents
- A valid username and password

Logging In

The Agricultural BMP Database System is housed on WV servers. The Ag BMP Database System password should be kept confidential. If you cannot remember your username or password, select the Forgot Password link on the Sign In page. The image below is example of the information you need to login.

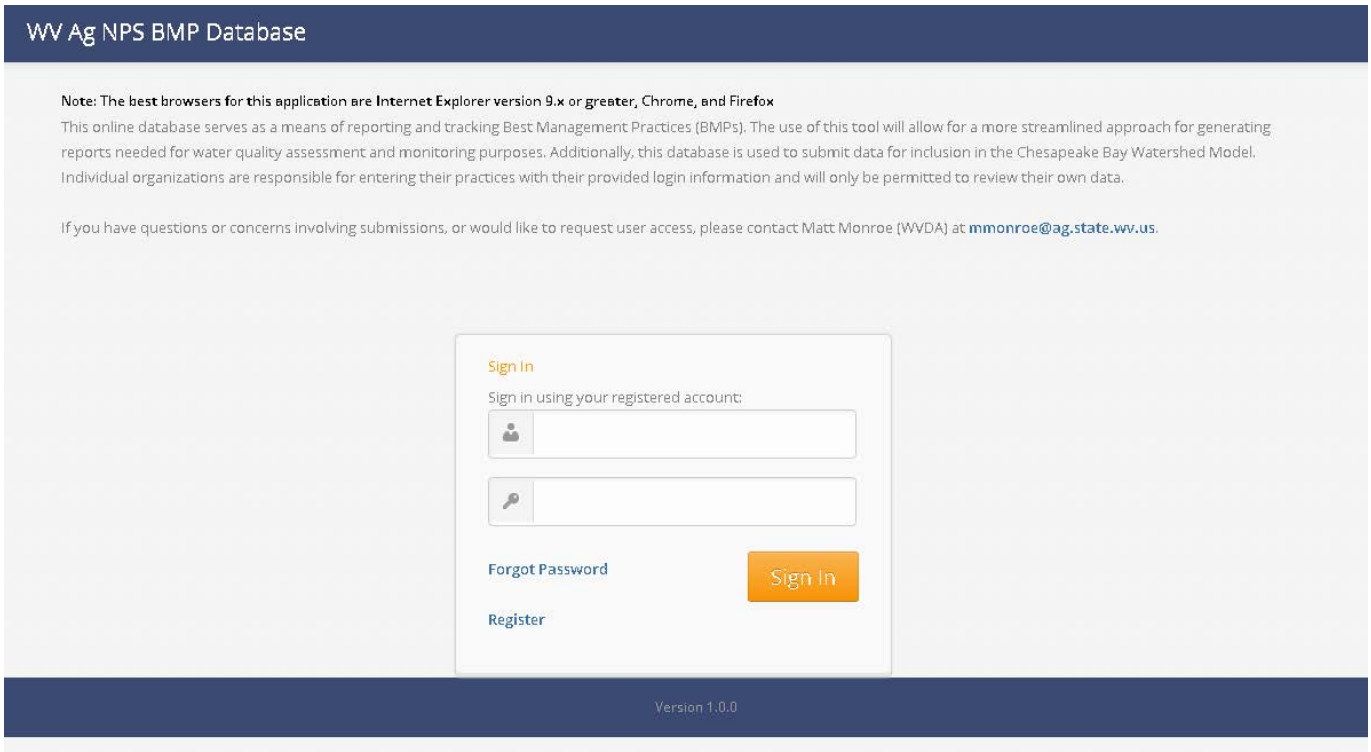


Figure 1.2.1 A basic username and password is needed for login

Overall Screen Structure

The screen is broken into several regions whose names may be used throughout this guide. The figure below highlights these regions.

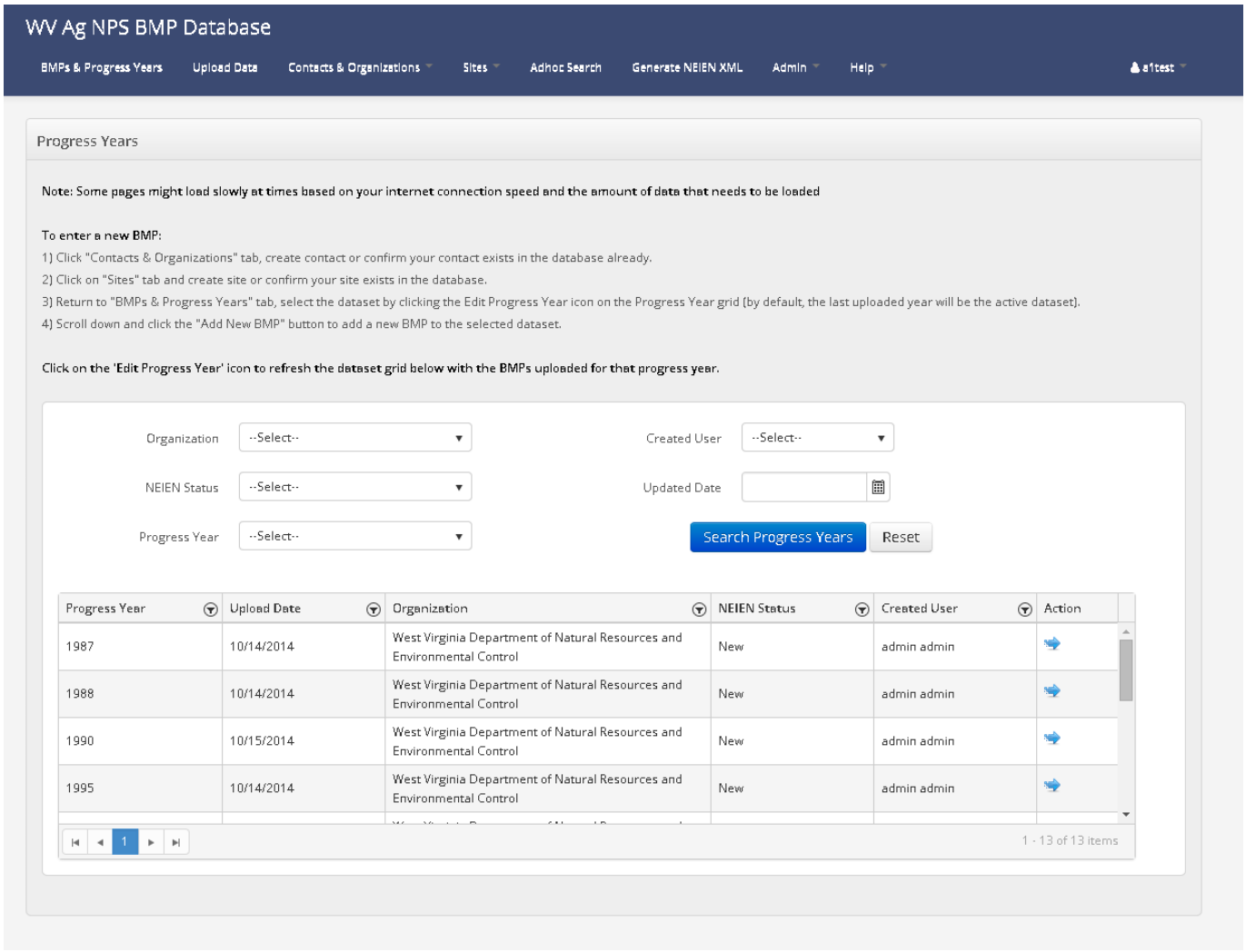


Figure 1.2.2. Screen region names

- **The Menu Bar** is always available on all screens and regardless of a user's role. However, some items on the Menu Bar may not be available for use by certain users based on their assigned user roles within the system.
- **The Page** is the current screen where record details are displayed and may be edited. Users navigate to different Page screens via items in the Menu Bar, or from within other pages.
- **The Footer** is also visible on all screens and simply displays information to the user. Currently, the system version number is provided. Submit the version information presented in the footer whenever notifying the system administrator of problems.

Permissions

All users must login to the system to see any usable portion of it. Users are assigned a role which determines the types of actions that users may perform or information that they may see.

The following are the user roles currently provided and a summary of the operations these roles can perform. The further details and the meaning of the roles listed below will be explained later in this document.

- **Admin** – Admin user can access all functionality of the system. Admin will approve the registration and assign a role & organization before the user can log in for the self-register users.
- **Super User** – Super user has access to data across all organizations but do not have access to admin functions like managing users, and generating the NEIEN XML.
- **General User** – General user can edit and view only their own organization's data. They will have no access to admin functions like managing users, and generating the NEIEN XML.

1.3. *Screen Conventions*

Data Grids

First Name	Last Name	Work Phone	Cell Phone	Email	
Amy	Zollinger	123-444-5555	567-890-1234 X123		
Brent	Wood	578-444-3456	459-345-2345	bwood@gmail.com	
Brian	Smith	304-538-2399		bsmith@gmail.com	
Celin	Diaz	550-233-4543	550-334-8765	cd@lcc.com	
Fatema	Faizullabhoy	703-385-1595			
General	User 5			gu5@tt.com	
General	User 3			gu3@tt.com	

1 - 20 of 20 items

Figure 1.3.1 Conventions in data grids

The Ag BMP Database system refers to tables of information as “data grids.” Data grids are used throughout the system to list information and provide access to functions. The image above is a typical data grid example. User can use the blue button on the top left corner of the data grid to create (add) a new record.

The bottom left corner can be used to page through the results. The I◀ button navigates the user on the first page of the results on the data grid. The ◀ takes the user to the previous page. The ▶ button navigates to the next page and ▶I button navigates to the last page of the search results. The number in blue tells the user on which results page they are. The bottom right corner message indicates the total number of records from the search results. The pencil icon in the last column is to edit that record and red circle minus sign is to delete that record.

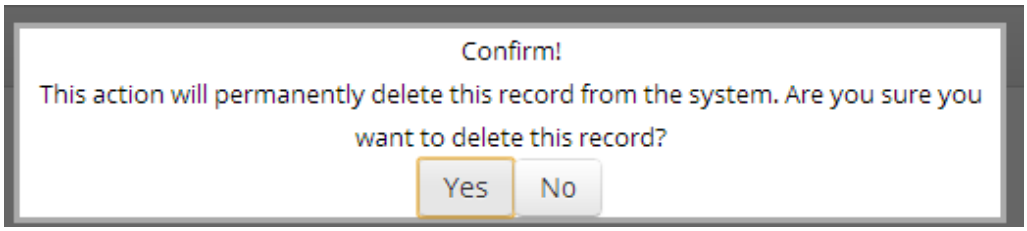


Figure 1.3.2 Delete record warning

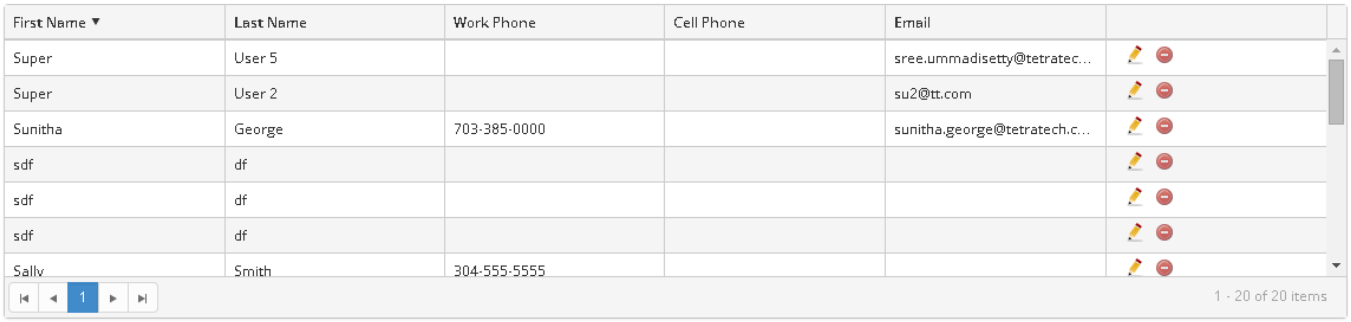
Certain users have the rights to delete particular records. The application will warn users before attempting to delete records (example image above).

First Name ▲	Last Name	Work Phone	Cell Phone	Email	
Amy	Zollinger	123-444-5555	567-890-1234 X123		
Brent	Wood	578-444-3456	459-345-2345	bwood@gmail.com	
Brian	Smith	304-538-2399		bsmith@gmail.com	
Celin	Diaz	550-233-4543	550-334-8765	cd@lcc.com	
Fatema	Faizullabhoy	703-385-1595			
General	User 5			gu5@tt.com	
General	User 3			gu3@tt.com	

1 - 20 of 20 items

Figure 1.3.3 Sorting data grid values

All column heading names may be clicked to sort the values in the grid in ascending order (see example above sorting on WSF ID).



First Name ▼	Last Name	Work Phone	Cell Phone	Email	
Super	User 5			sree.ummadisetty@tetratec...	
Super	User 2			su2@tt.com	
Sunitha	George	703-385-0000		sunitha.george@tetratech.c...	
sdf	df				
sdf	df				
sdf	df				
Sally	Smith	304-555-5555			

1 - 20 of 20 items

Figure 1.3.4 Sorting data grid values, the other way

The heading name may be clicked again to sort the values in descending order (see example above sorting on WSF ID).

Data Value Validations

Many fields throughout the system are mandatory. All mandatory fields in the system are marked with the red asterisk '*'. Some of the fields in the system limit what can be entered in order to protect the quality of data stored. Invalid or missing entries will trigger red error messages on the screen and allow you to correct.

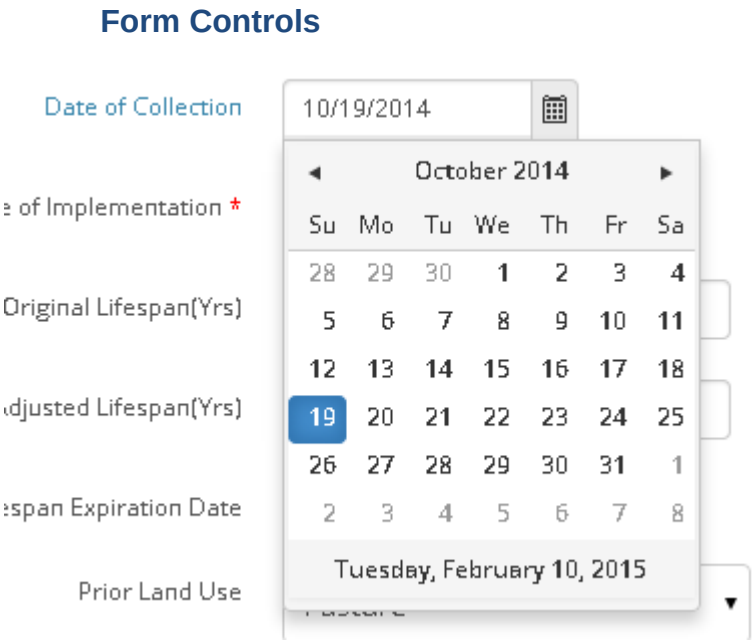


Figure 2 Form controls (date fields)

This is typical date and time picker used in the application. User can select the date by clicking a small calendar icon. User can also type the date and time in the field provided.

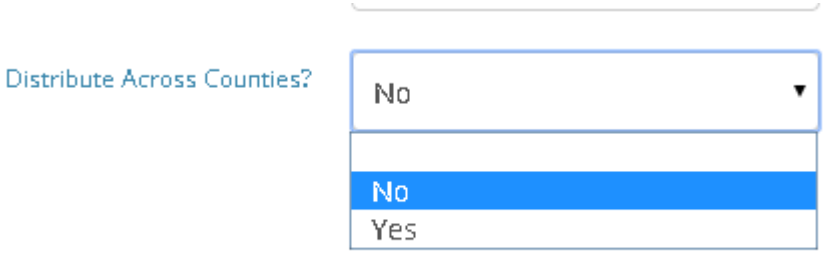


Figure 3.6 Form controls (single-select)

The image above gives an example of single select fields. The field is the single select where user can only select one value from the dropdown.

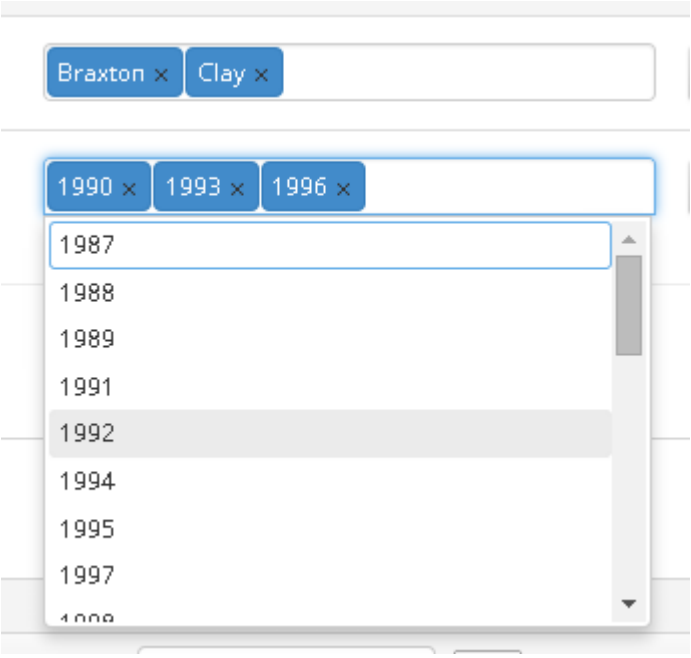


Figure 4.7 Form controls (multi-select)

The image above gives an example of multi select fields. The field is the multi select where user can select multiple values from the dropdown.

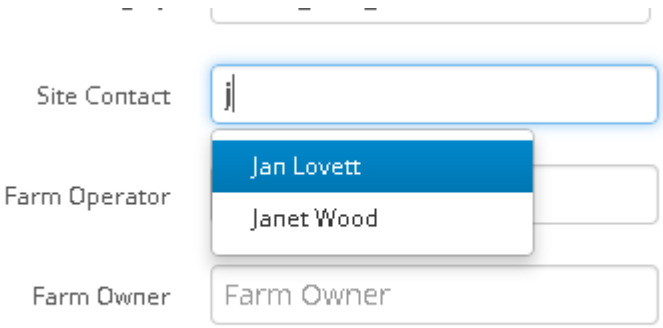


Figure 5.8 Form controls (Auto-complete)

The image above gives an example of the “auto-complete” function. Users may begin typing some portion of the expected value then the control will list possible matches that maybe refined by additional typing. The options may be selected by the user at any time

Icon Conventions

The icons presented in the table below are used throughout the application. Most often they will appear in the rightmost column of tables of information.

Control/Flag	Function/Indication
	Edit
	Delete
	View

2. Instructions

2.1. Home Page

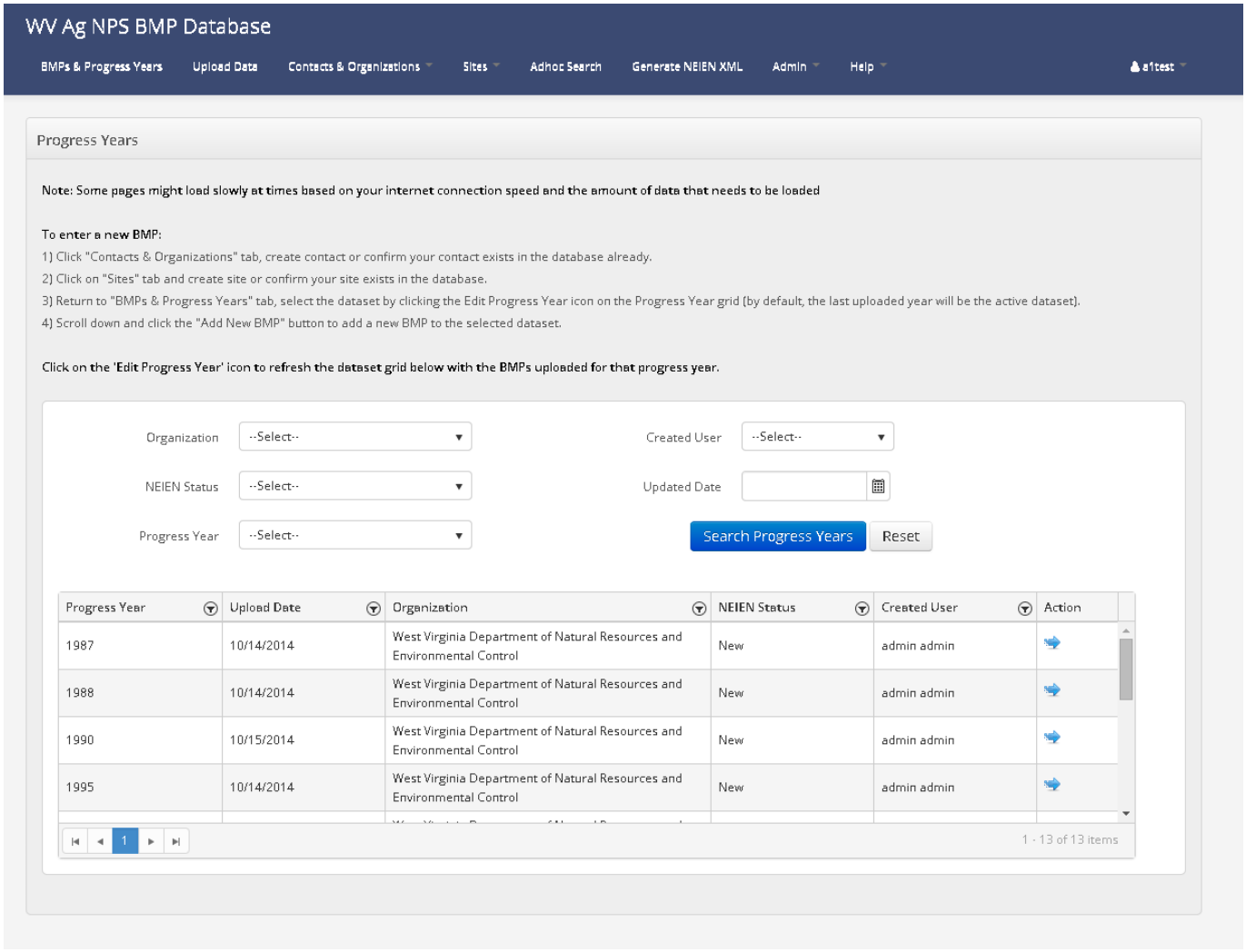


Figure 2.1.1 Home Page

The home page (see image above) gives users access to different functions of Ag BMP Database and you can track the progress of each year and all the BMPs of the that year can be seen on the Home page.

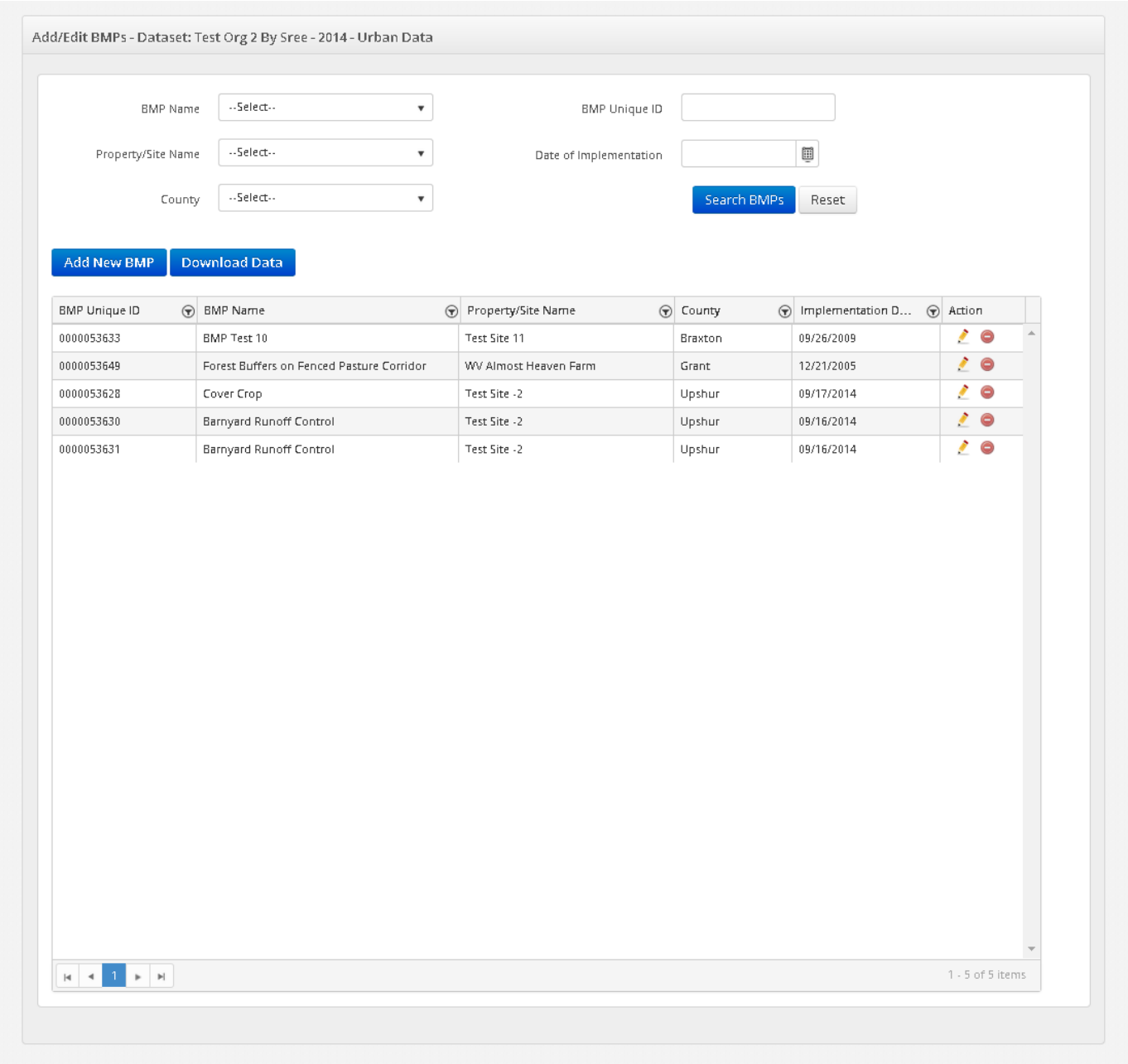


Figure 2.1.2 Home Page (contd..)

BMPs and Progress Year page serves as the home page for WV Ag BMP Database system.

The Home page is divided into sections – Progress Years and Add/Edit BMPs

User can search submissions by 'Organization', 'NEIN Status', 'Progress Year', 'Created User' and 'Updated Date'. The results of this search will be displayed in the grid below. BMPs for each submission can be viewed by clicking the blue arrow button in the Add/Edit BMPs section of the page.

2.2. BMPs & Submissions

Submissions

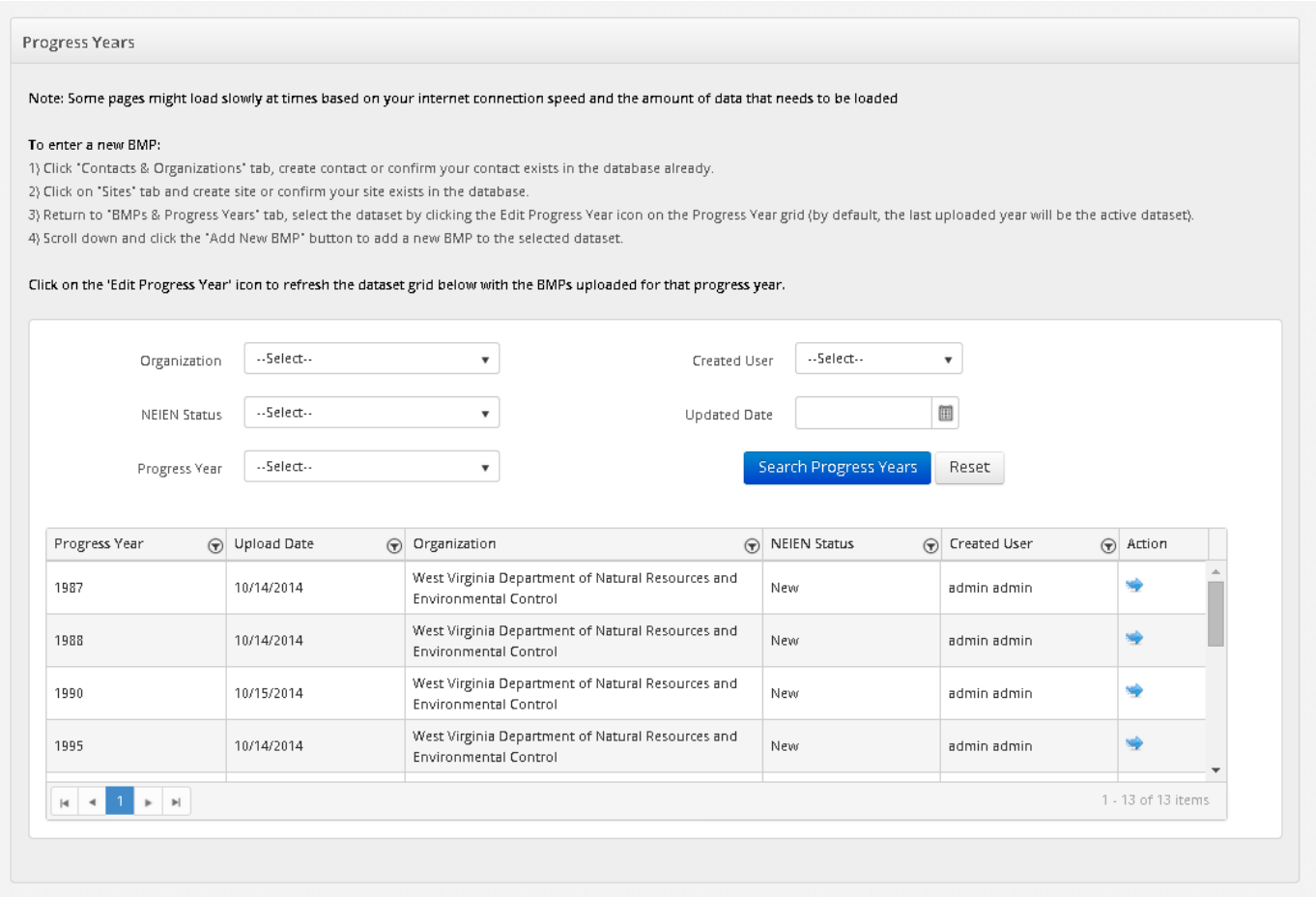


Figure 2.2.1 Submission Listings

This page is divided into sections – Progress Years and Add/Edit BMPs

User can search submissions by 'Organization', 'NEIN Status', 'Progress Year', 'Created User' and 'Updated Date'. The results of this search will be displayed in the grid below. BMPs for each submission can be viewed by clicking the blue arrow button in the Add/Edit BMPs section of the page.

BMPs

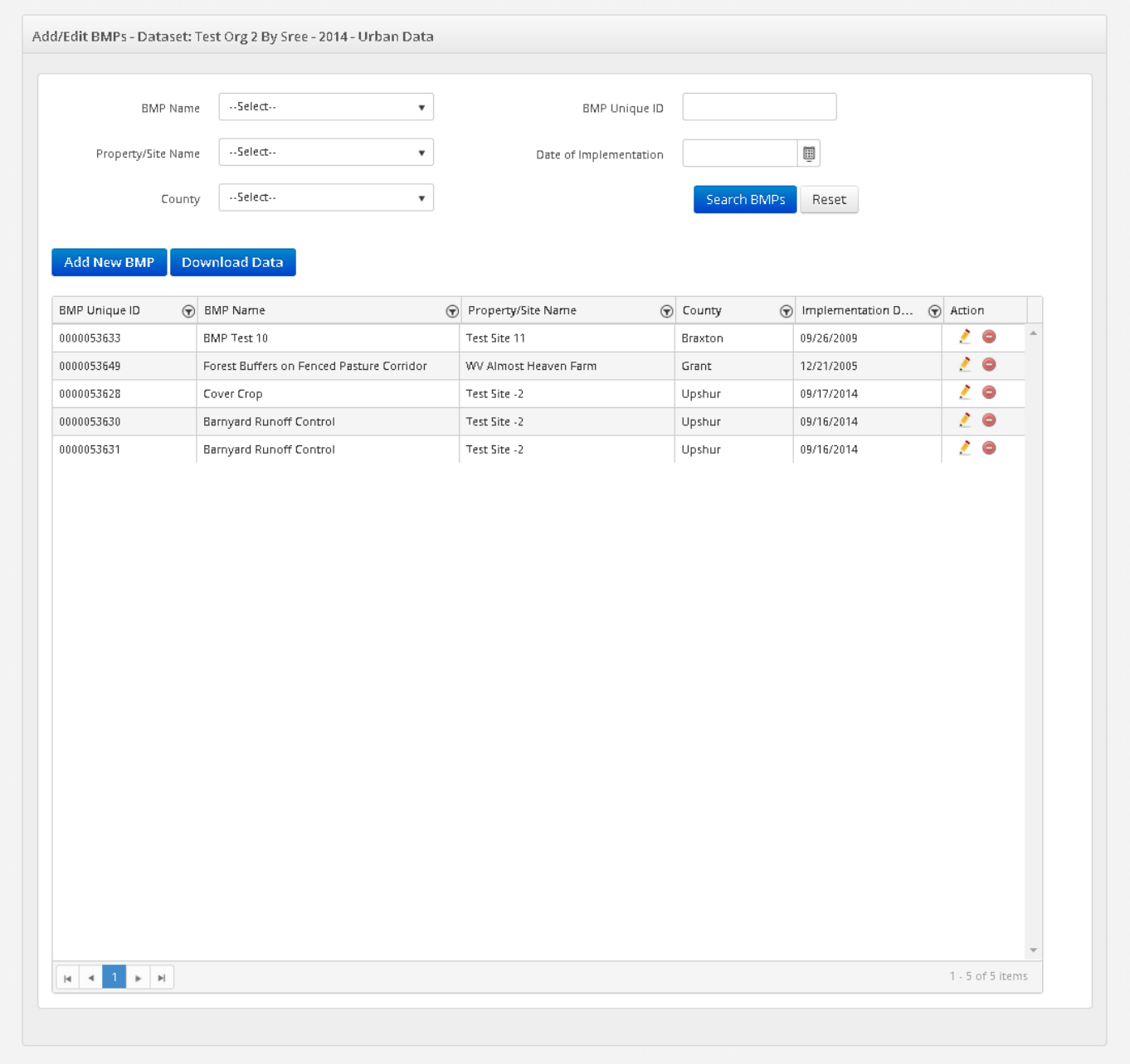


Figure 2.2.2 BMPs Listing Screen

The user can export the records of uploaded BMPs into an excel file by clicking the 'Download Data' button. Users can also add a new BMP record to the selected submissions by clicking 'Add New BMP' button.

The BMP forms allow users to edit and enter new information for a BMP, as seen in figure below. There are several required fields in the main section that need to be populated before the user can save the data.

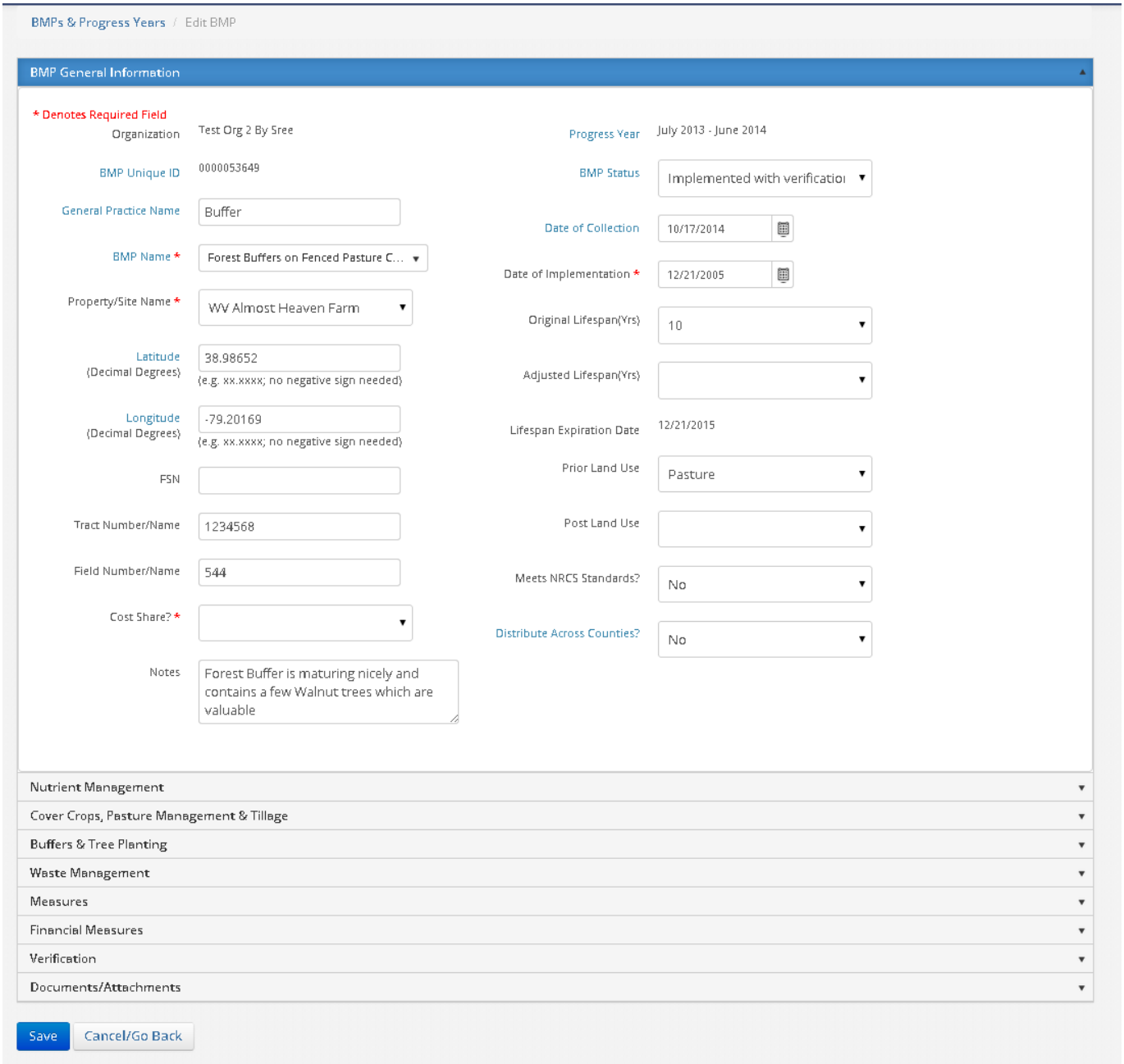


Figure 2.2.3 BMPs Detail Screen – BMP General Information

This is the General section to enter general information of the BMP. User should select a 'BMP Name' and the Site on which the BMP is/will be implemented. If the BMP is going to be implement on multiple counties then select

'Yes' for Distribute Across Counties? And do not select the location (Latitude and Longitude values) and the measures for the BMP will be split across counties.

Enter additional information for the BMP in the following sections – Nutrient Management, Cover Crops, Pasture Management & Tillage, Buffers & Tree Planting, Waste Management, Measures, Financial Measures, Verification and Documents and Attachments

Below are the screens for all the subsections of BMP information.

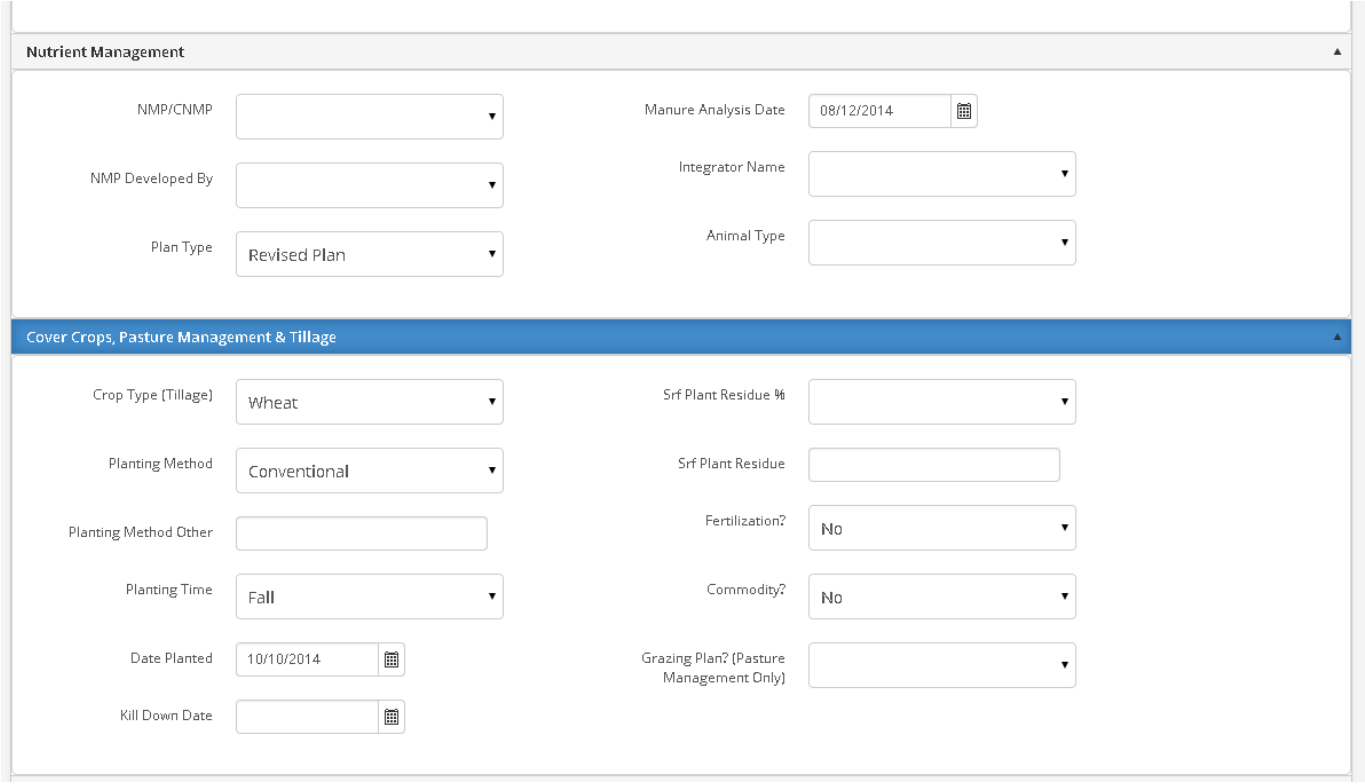


Figure 2.2.4 BMPs Detail Screen – Nutrient Management and Cover Crops, Pasture Management & Tillage

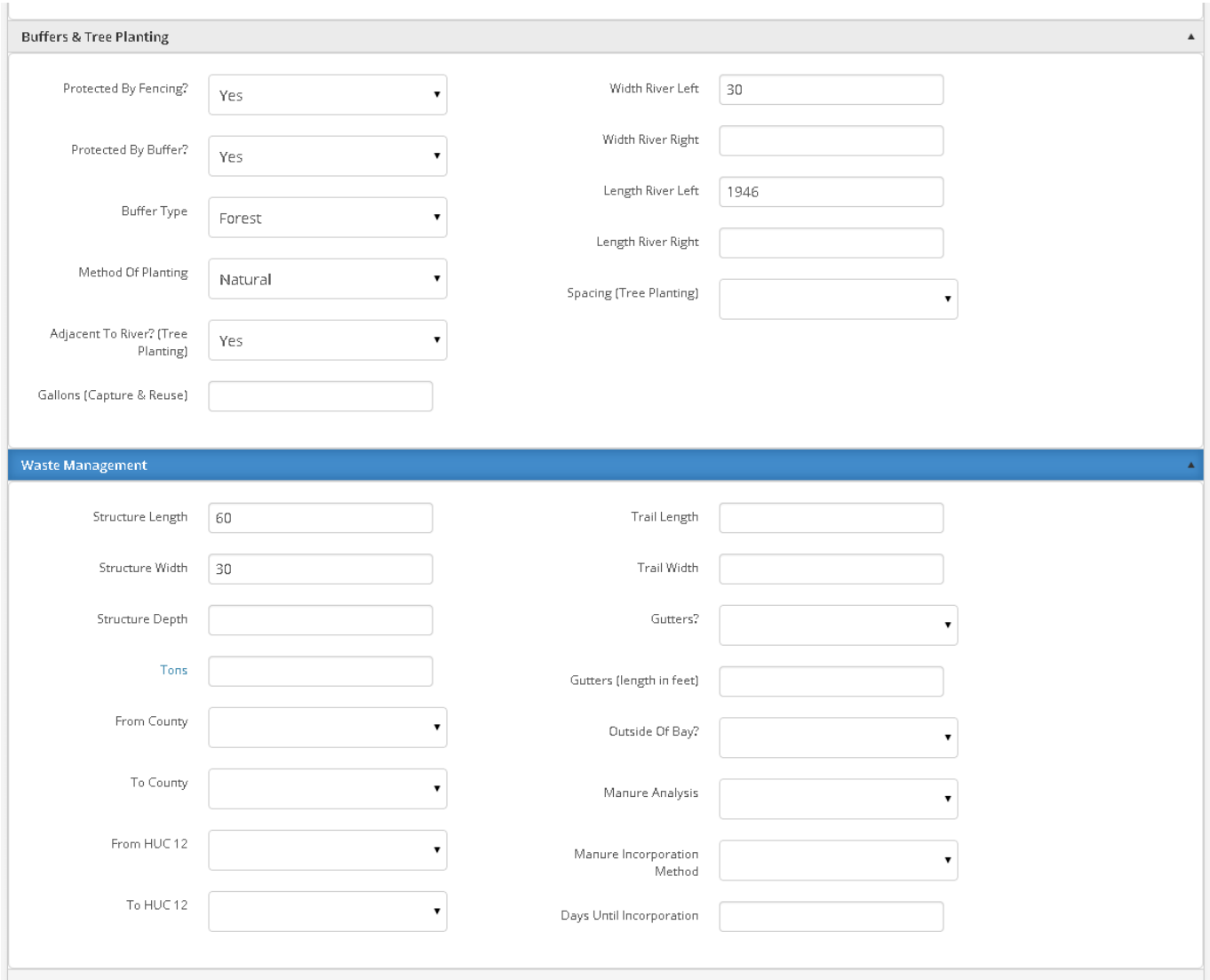


Figure 2.2.5 BMPs Detail Screen – Buffers & Tree Planting and Waste Management

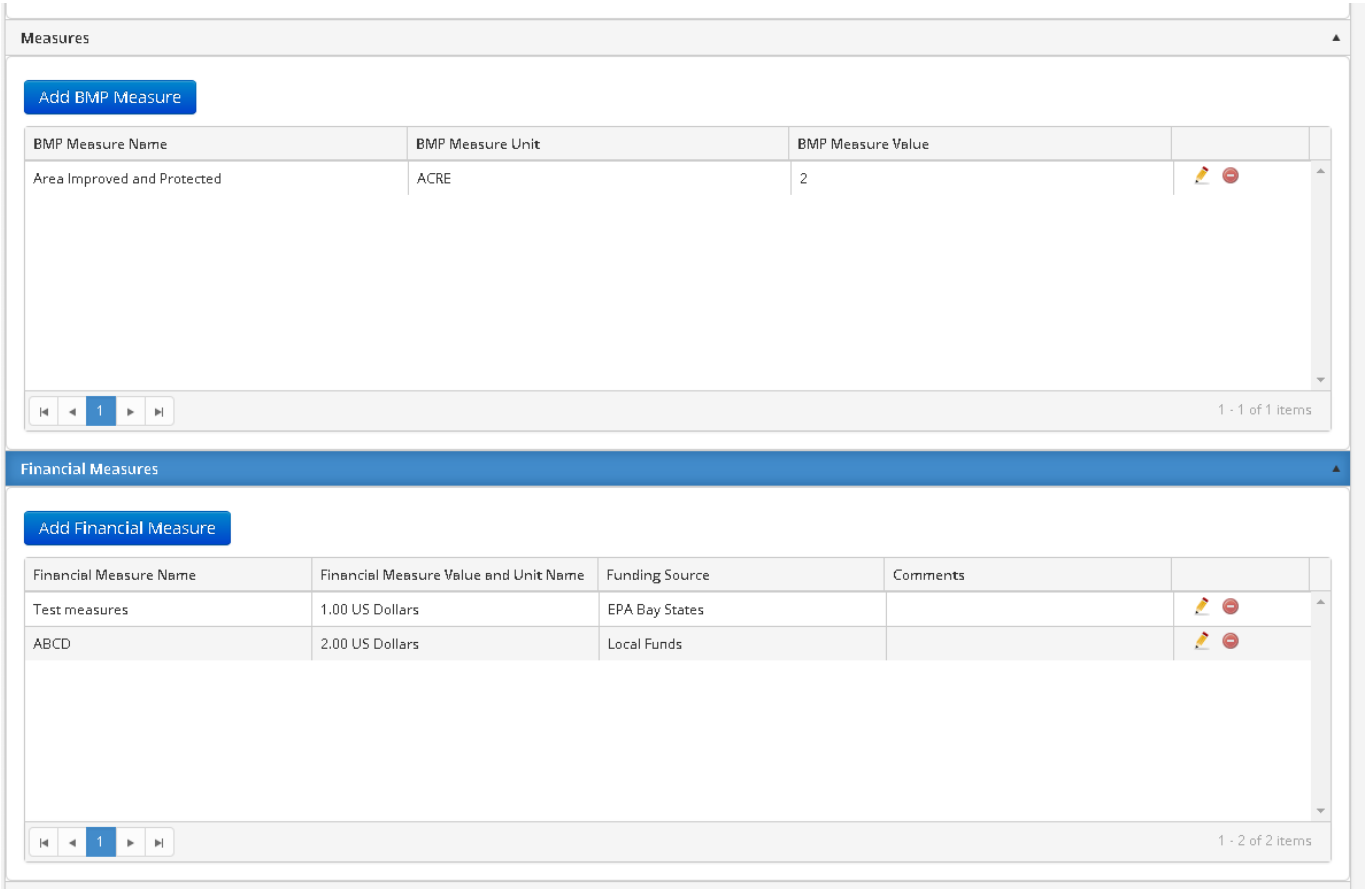


Figure 2.2.6 BMPs Detail Screen – Measures and Financial Measures

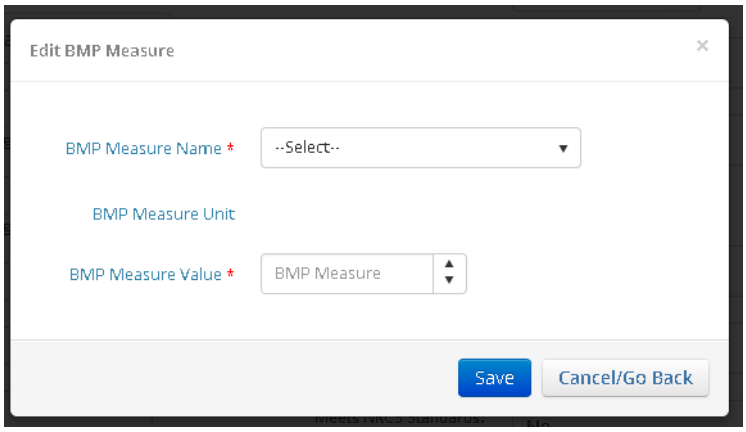


Figure 2.2.7 BMPs Detail Screen – Measures Detail popup

In this section a user can add a BMP measure and view the list of BMP measures associated with the selected BMP. The user can also edit or delete an existing BMP measure from the data grid

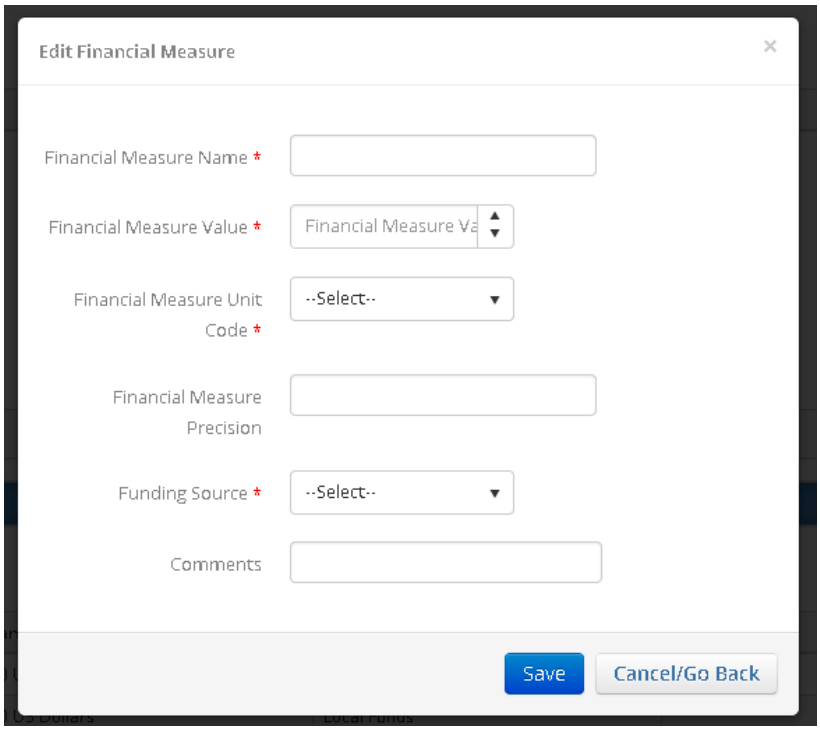


Figure 2.2.8 BMPs Detail Screen – Financial Measures Detail popup

In the Financial Measures section users can add a BMP financial measure and view the list of existing measures associated with the selected BMP

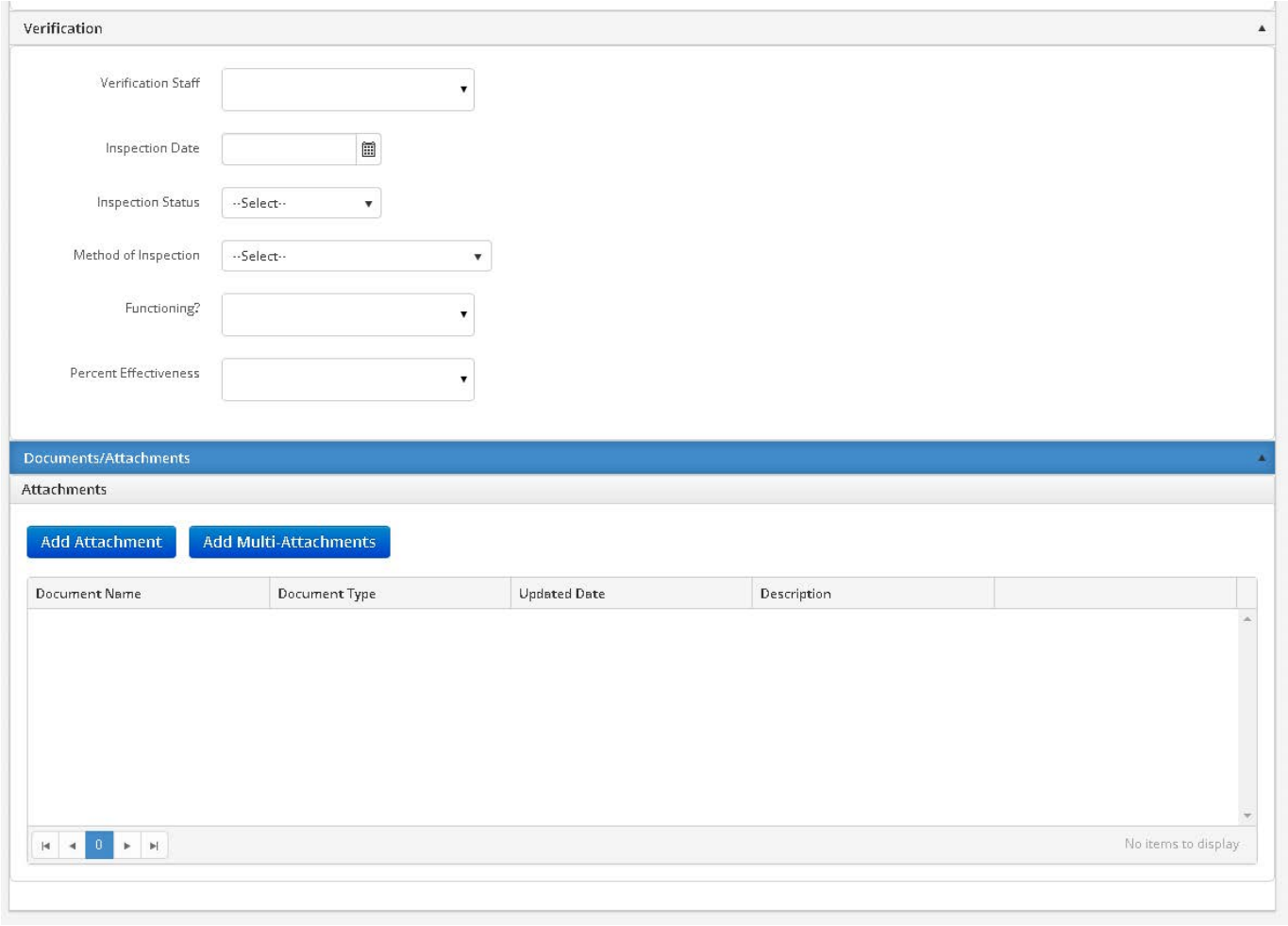


Figure 2.2.9 BMPs Detail Screen – Verifications and Document Attachments

2.3. Upload Data

This page allows users to import their BMP data as a complete set per year using the upload templates. For the import to work successfully the user must use one of the provided templates for WV Ag BMP Data or WV Aggregated BMP Data. Users can download these templates by selecting the appropriate type and clicking the Download Blank Template button, seen below in figure. The user may then enter all their data in the format specified in the template.

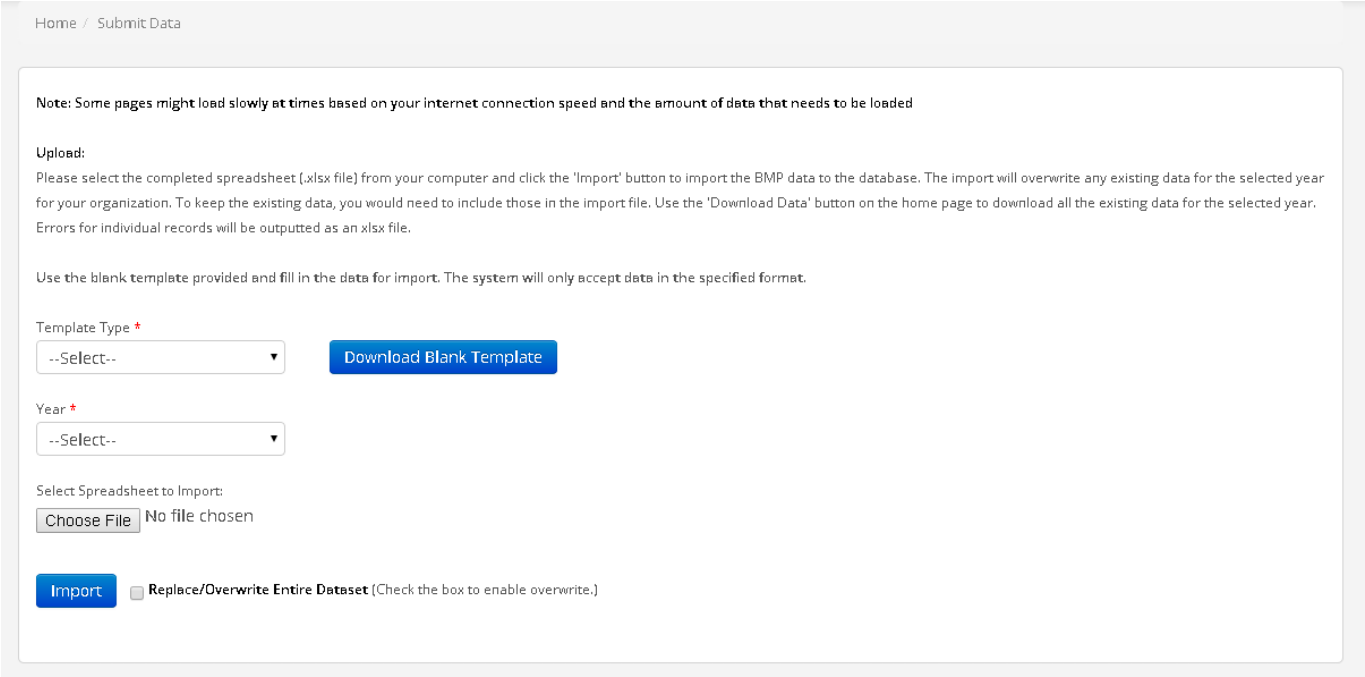


Figure 2.3.1 Upload Data Screen

Once the user has entered their data into the correct template, the next step is to upload the template into the database. To do this the user must select the correct template type, either WV Ag BMP Data or WV Aggregated BMP Data, and then select the year that the data applies to. Finally the user needs to browse for their template and click the Import button. Please note, that each template must contain data for only one Chesapeake Bay Program submission year, e.g., July 1st, 2012 – June 30th, 2013. The data will be “added to” any existing data. Only the Admin has the ability to overwrite existing data.

2.4. Contacts & Organizations

Manage Contacts

There will be a contacts section which serves as an address book. The contacts would usually be the list of farm/site owners, operators etc .

All user roles will have access to all the contacts in the system and all the contact information. Once a contact has data tied with it, the contact cannot be deleted.

Contacts can be accessed through the Contact & organization menu, and ‘Manage Contacts’ option displays the screen below.

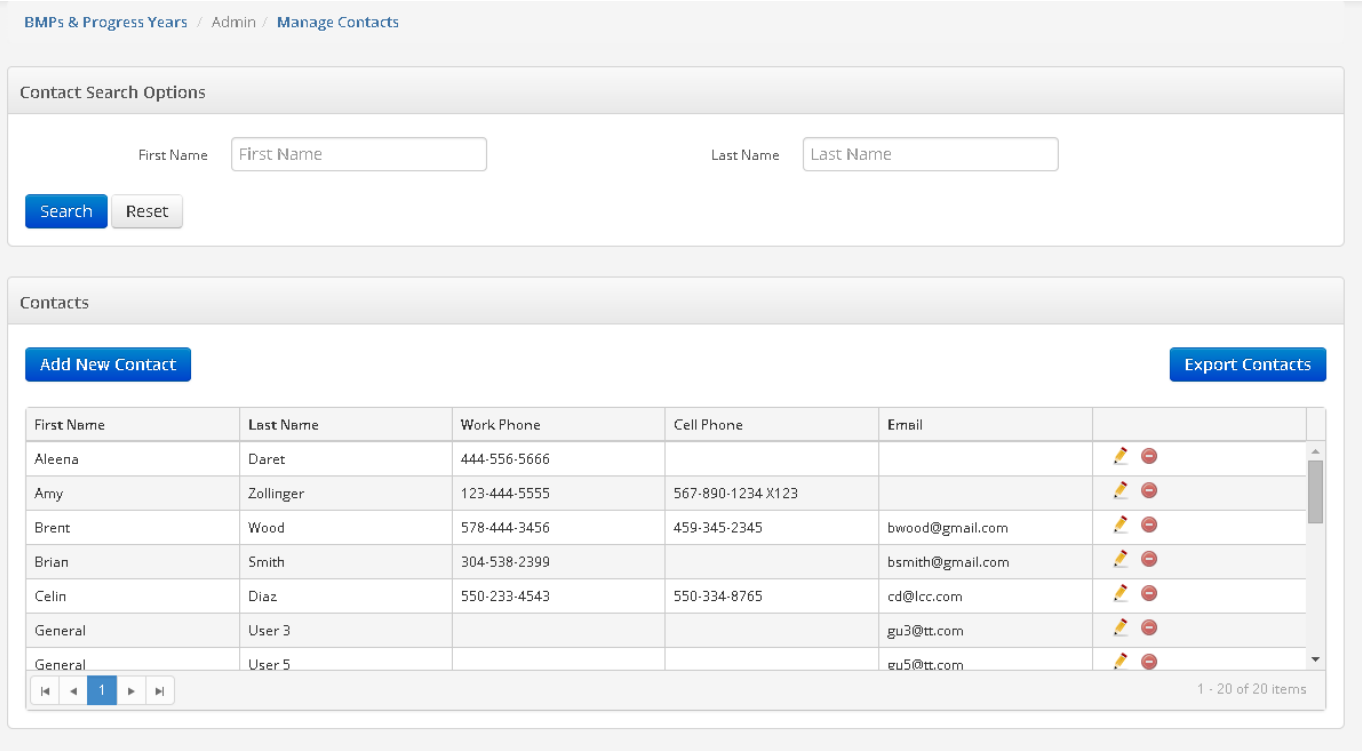


Figure 2.4.1 Contact Search Screen

The page is divided into sections – Contact Search Options and Contacts
Search the contacts by 'First Name' and 'Last Name. The results of this search will be displayed in the Contacts Section of the page. Contacts section displays all the Contacts by default. All user can edit or delete a Contact from the grid, upon deletion user will be provided a confirmation message.

Add a new contact by 'Add New Contact' button, which will display the screen shown below. The Edit icon of an existing contact will also show the same screen with the information.

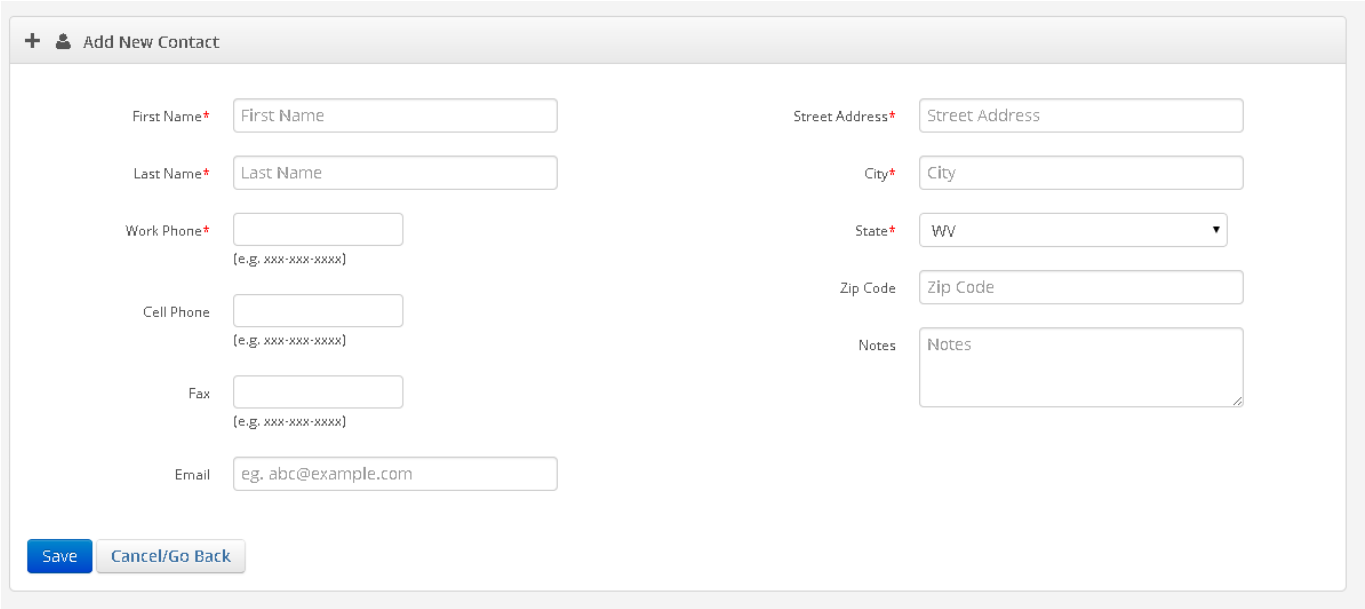


Figure 2.4.2 Contact Detail Screen

All the required fields needs to be entered before saving the contact. System will display a confirmation message on saving the entered information. Cancel/Go Back button will take back to the search page without saving any unsaved information.

Organization

Organization can be accessed through the Contact & organization menu, and ‘Manage Organization’ option displays the screen below.

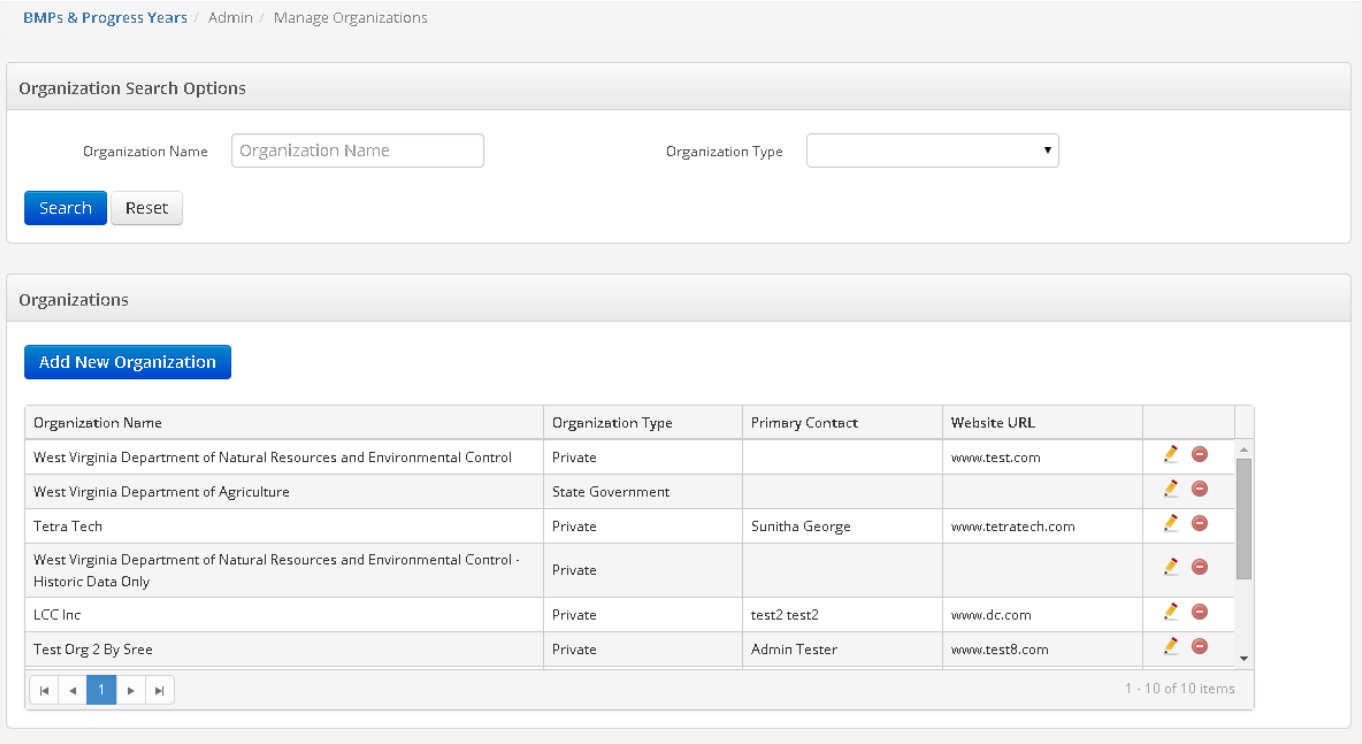


Figure 2.4.1 Organization Search Screen

The page is divided into sections – Organization Search Options and Organizations
Search the organizations by 'Organization Name' and 'Organization Type'. The results of this search will be displayed in the Organizations Section of the page. Organizations section displays all the Organization by default. All users can edit or delete an Organization from the grid, upon deletion user will be provided a confirmation message.

Add a new organization by 'Add New Organization' button, which will display the screen shown below. The Edit icon of an existing organization will also show the same screen with the information.

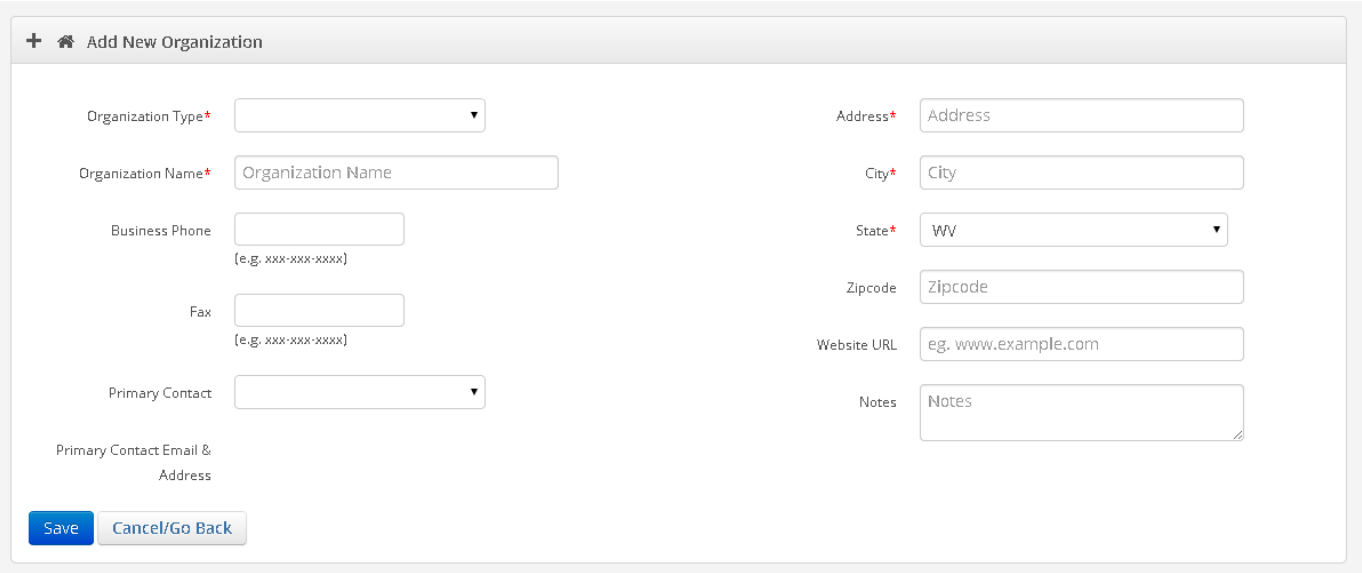


Figure 2.4.2 Organization Detail Screen

All the required fields needs to be entered before saving the contact. System will display a confirmation message on saving the entered information. Cancel/Go Back button will take back to the search page without saving any unsaved information.

The Primary Contact cannot be added when an organization is first created. The organization must be created and user's/contacts assigned to the organization before a Primary Contact can be selected.

2.5. Sites

Sites can be accessed through the Sites menu, and 'Manage Sites' option displays the screen below.

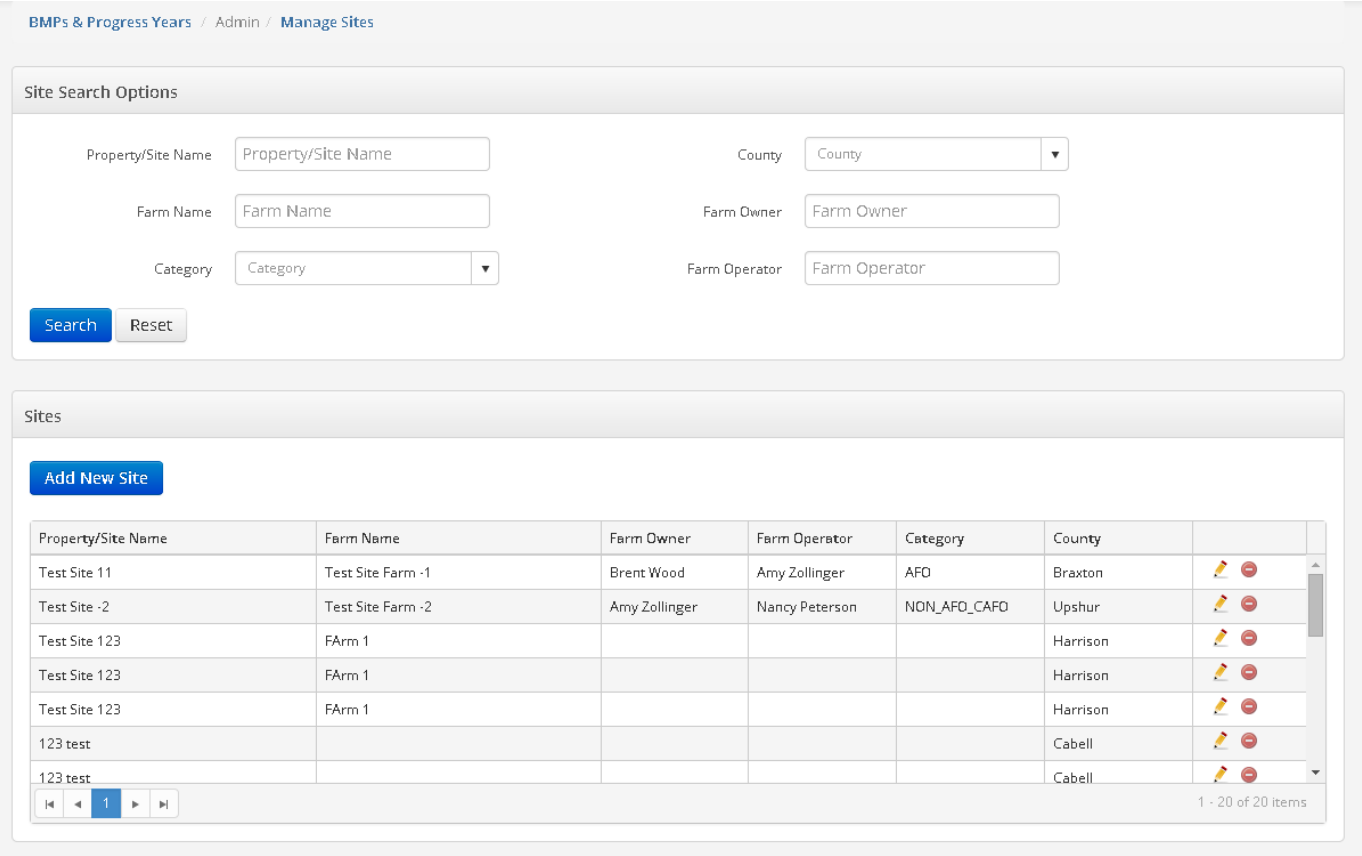


Figure 2.5.1 Sites Search Screen

The page is divided into sections – Sites Search Options and Sites

Search the sites by 'Property/Sites Name', 'County', 'Farm Name', 'Farm Owner', 'Category' and 'Farm Operator'. The results of this search will be displayed in the Sites Section of the page. Sites section displays all the sites by default. All users can edit or delete a Sites from the grid, upon deletion user will be provided a confirmation message.

Add a new sites by 'Add New Sites button, which will display the screen shown below. The Edit icon of an existing sites will also show the same screen with the information.

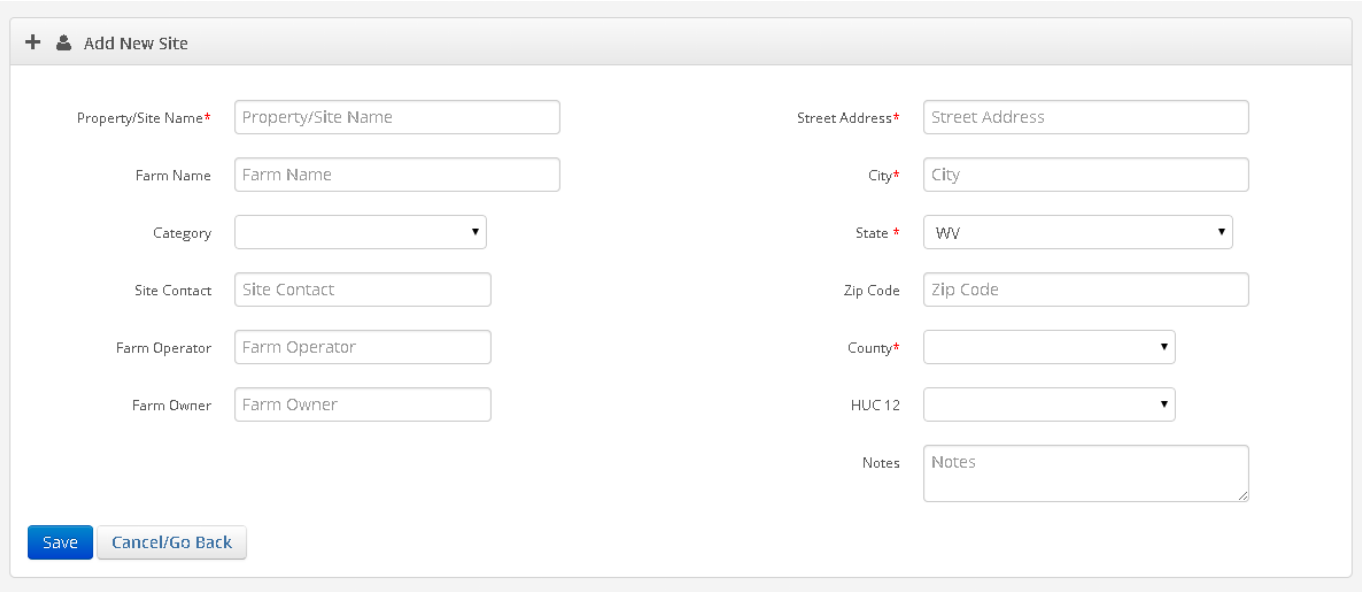


Figure 2.5.2 Sites Detail Screen

All the required fields needs to be entered before saving the contact. System will display a confirmation message on saving the entered information. Cancel/Go Back button will take back to the search page without saving any unsaved information. It will generate error log if the data is not in the correct format.

On upload

2.6. Adhoc Search

This section of the application allows user to query the database based on various fields. All the user can search the database using Adhoc Search. User can access the Adhoc Search from the top menu, which will display the following page.

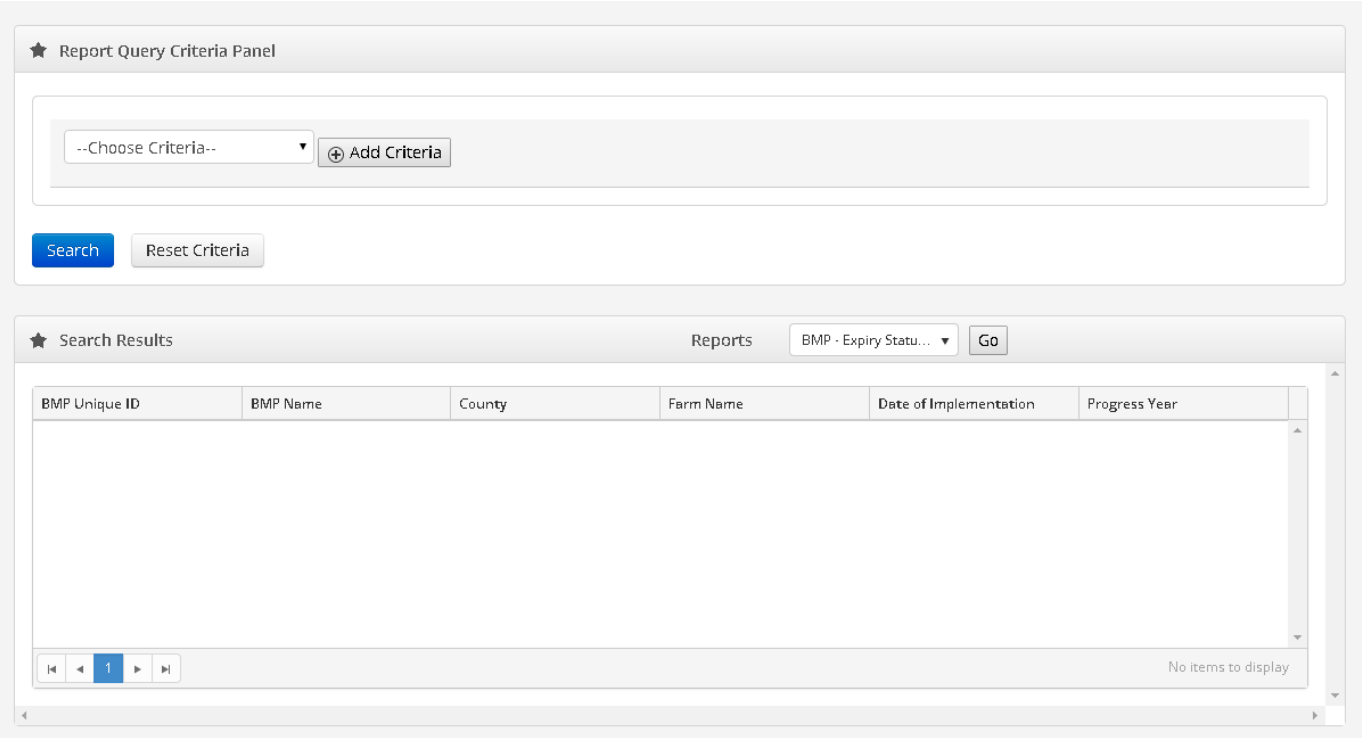


Figure 2.6.1 Adhoc Search Screen.

This page is divided into two sections- Report Query Criteria Panel where user can define search criteria and the search results are displayed in the bottom section. User can query the database by various database fields. Select the name of the field on which you want to query, then click the Add Criteria button, then then select the operator and select the value for that field. User can add as many criteria to search for the desired record.
The criteria can use “And” or “Or” logic. “And”, the default, stipulates that the results must conform to all of the criteria specified. “Or” stipulates that the results must conform to at least one of the criteria specified.

Please note that if the user clicks search without defining any search criteria then all the records will be displayed in the search results section of the page.

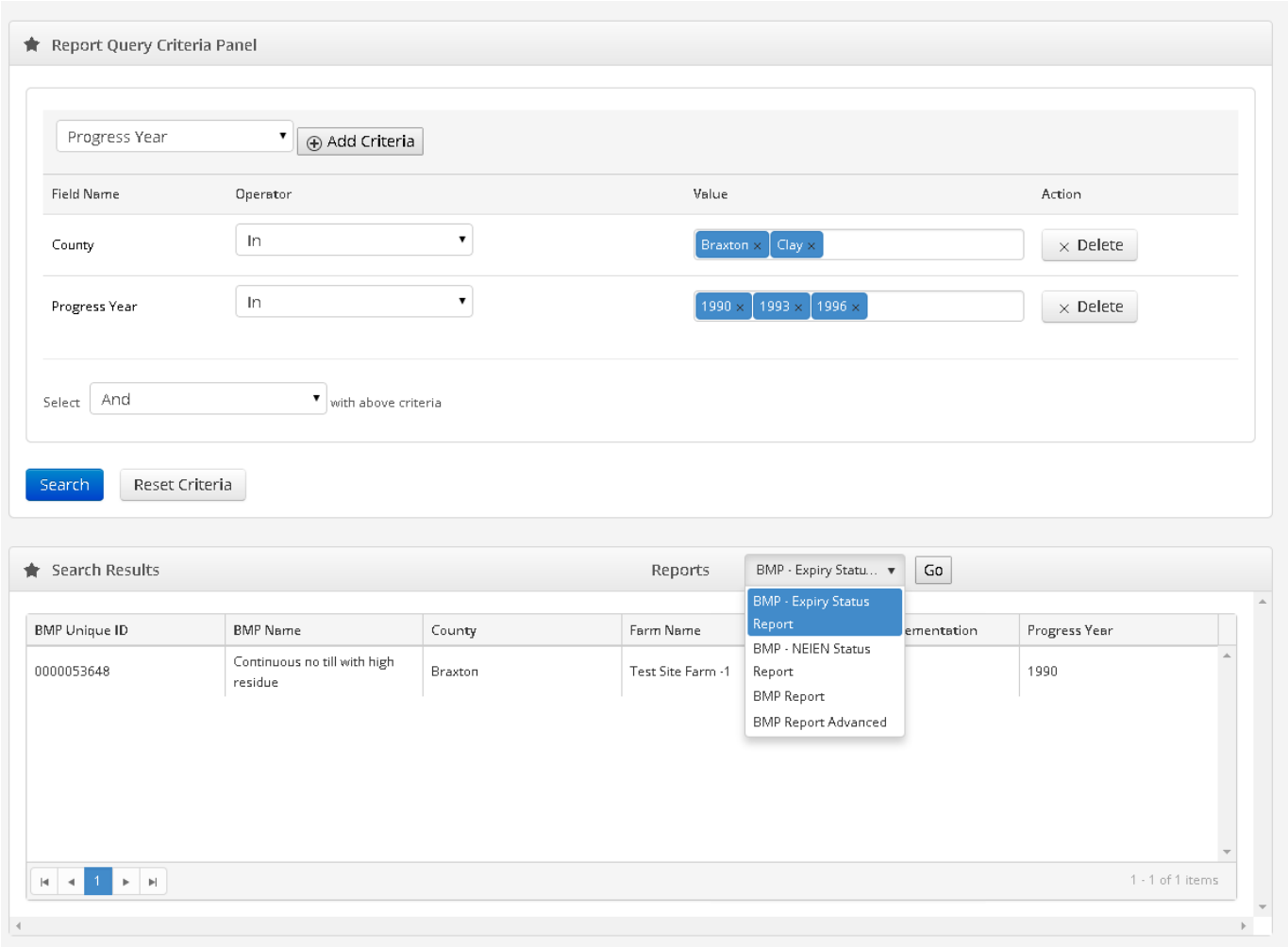


Figure 2.6.2 Adhoc Search Screen (with query).

User can generate the following reports either for all the records in the database or for specific set of records.

- BMP – Expiry Status Report
- BMP – NEIN Status Report
- BMP Report
- BMP Advance Report

2.7. Generate NEIN XML

Only Admin User can generate the Xml file for each year to submit the data to NEIN Node. The XML would be generated for a specified year and would export all the data across agencies. The data being exported would be aggregated data. All the data will be aggregated at county level before reporting to NEIEN.

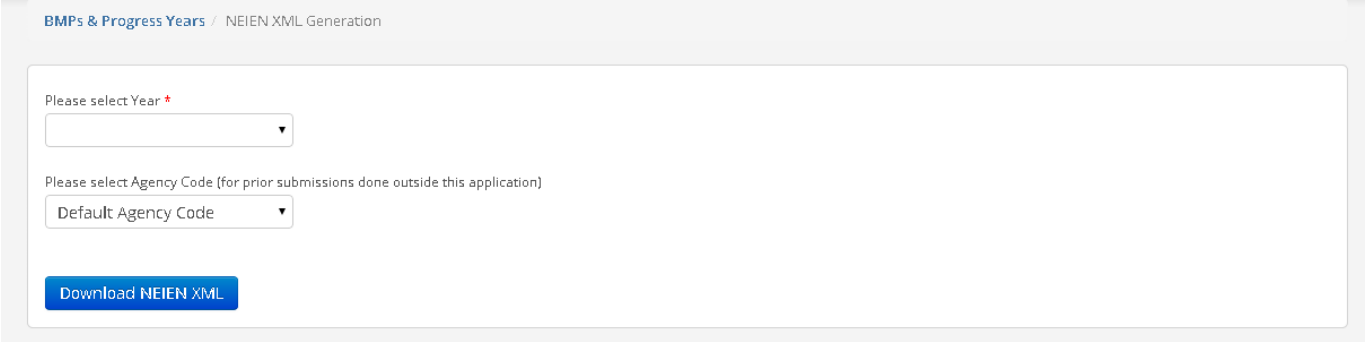


Figure 2.7.1 XML Generation Screen

The Generate NEIEN XML section of the application allows admin users to create a NEIEN compliant XML file that can then be submitted through a NEIEN node.. The user must first select the year that they would like to send, and then the appropriate Agency Code. The Agency Code is used only to re-submit historic data that was previously sent to the Program via a different application or submission method. For all data entered directly into this application via the user interface or upload templates, the Default Agency Code value can be used.

2.3. *User Guide*

This is a link form where you can download the User Guide of Ag BMP Database System.

3. Administration

The Admin section in the system allows the simple creation, editing and deletion of various supporting records. These functions are limited to a very small number of administrative users only. The following items may currently be administered in these screens.

- Manage Users
- Manage BMP Names
- Manage Lookups
- Manage Settings

Mange Users

From the Admin menu, user can select 'Manage Users' to view the page below.

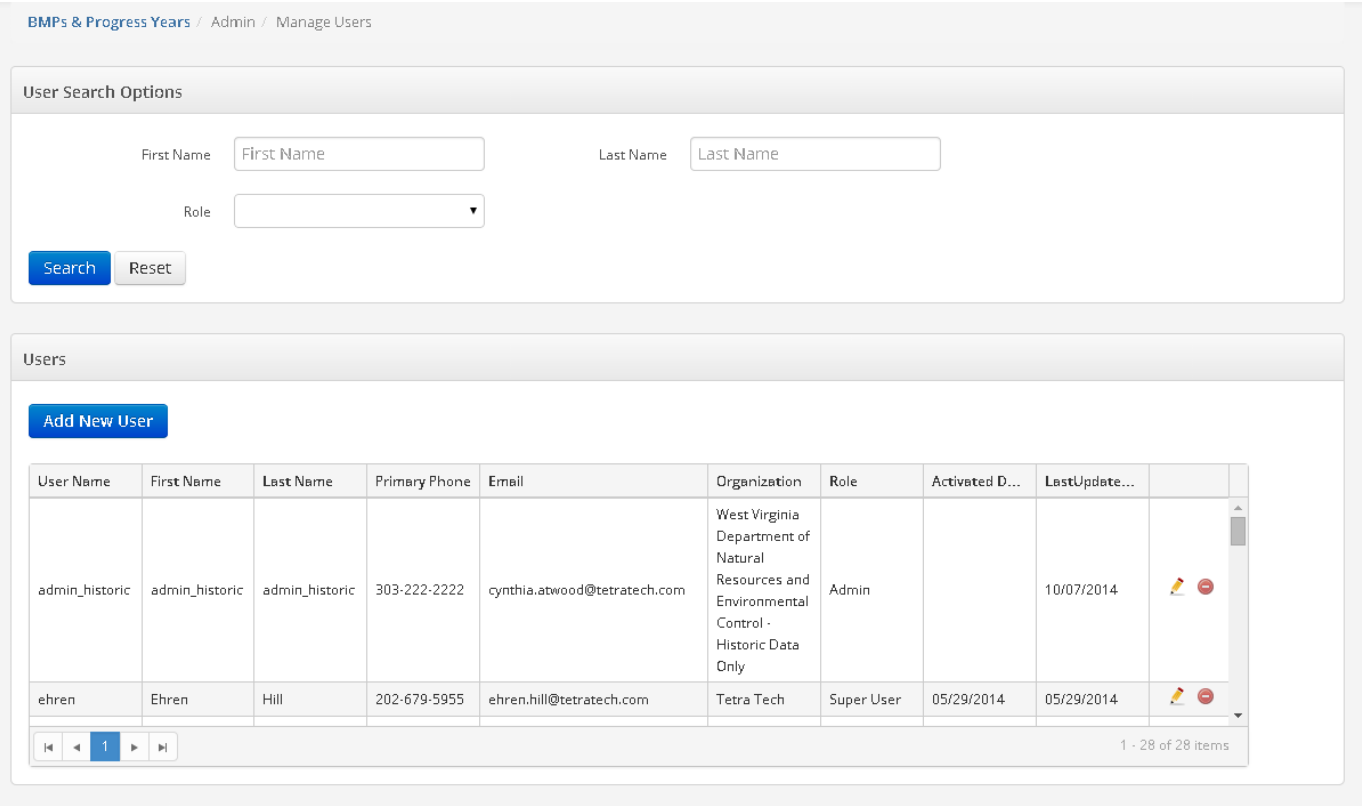


Figure 3.1 User administrator screen

The page is divided into sections – User Search Options and Users

Search the users by 'First Name', 'Last Name' and 'Role'. The results of this search will be displayed in the Users Section of the page. Users section displays all the users by default. Only Admin user can edit or delete a User from the grid, upon deletion user will be provided a confirmation message.

Add a new user by clicking the ‘Add New User’ button, which will display the following screen. The Edit icon of an existing user will also show the same screen with the information.

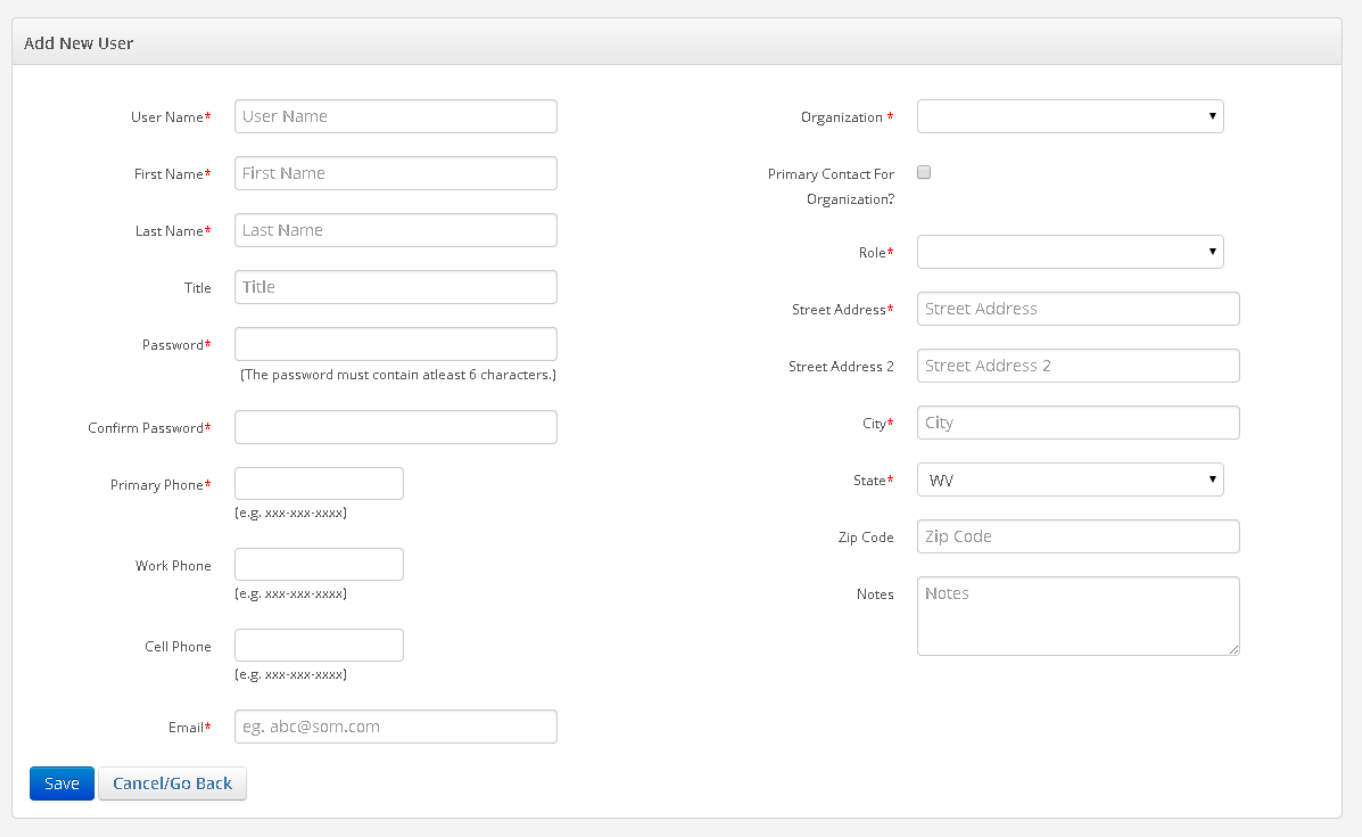


Figure 3.2 Add New User screen

All the required fields needs to be entered before saving the contact. System will display a confirmation message on saving the entered information. Cancel/Go Back button will take back to the search page without saving any unsaved information.

Manage BMP Names

Only certain measures are applicable to each BMP Name. An admin or super user can add/edit BMP Names within the system & the edit the measures associated to it.

To add an FE BMP user has to append ‘_FE’ at the trailing end of a BMP name and leave the NEIN BMP Name field blank. Multiple BMP measures can be associated to a BMP.

From the Admin menu, user can select ‘Manage BMP Names’ to view the page below.

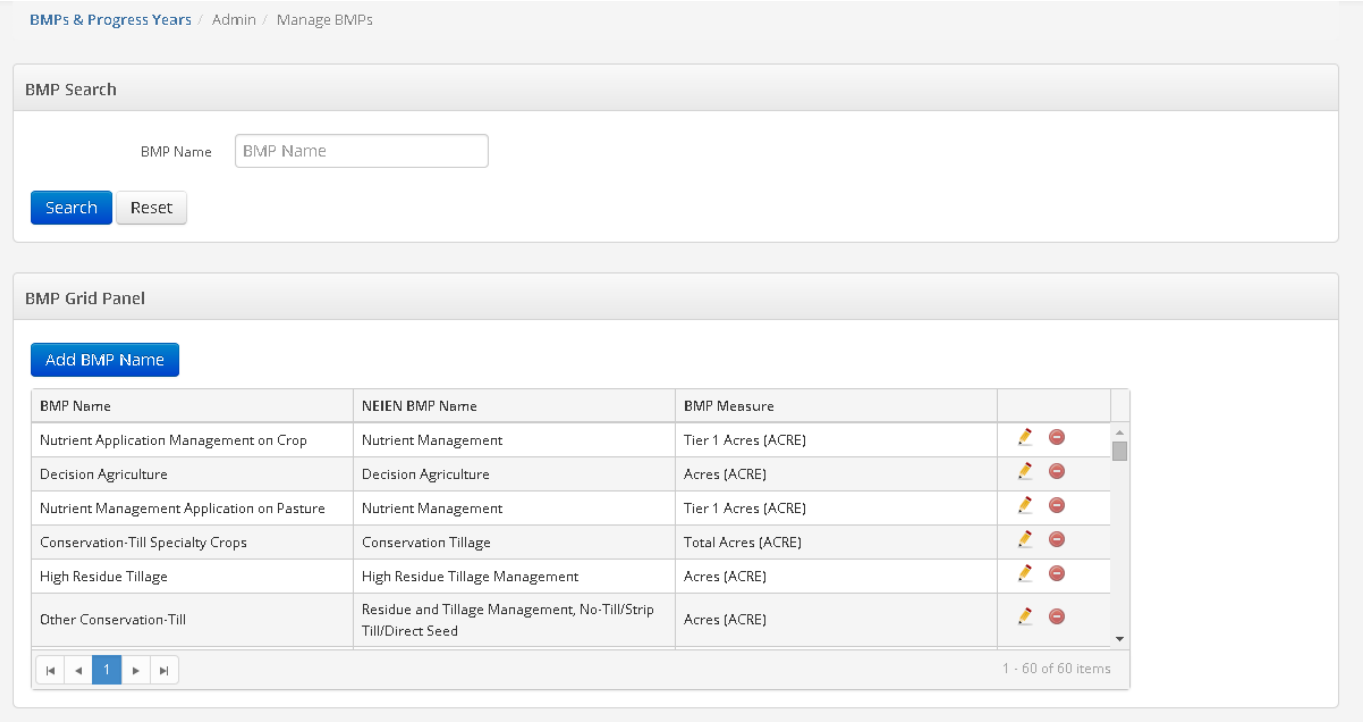


Figure 3.3 Manage BMP Names administrator screen

The page is divided into sections – BMP Search Options and BMP Grid Panel
Search the BMPs by 'BMP Name'. The results of this search will be displayed in the BMP Grid Panel section of the page. BMP Grid Panel section displays all the BMPs by default. Only Admin user can edit or delete a BMPs from the grid, upon deletion user will be provided a confirmation message.

Add a new BMP by 'Add BMP Name' button, which will display the following screen. The Edit icon of an existing user will also show the same screen with the information.

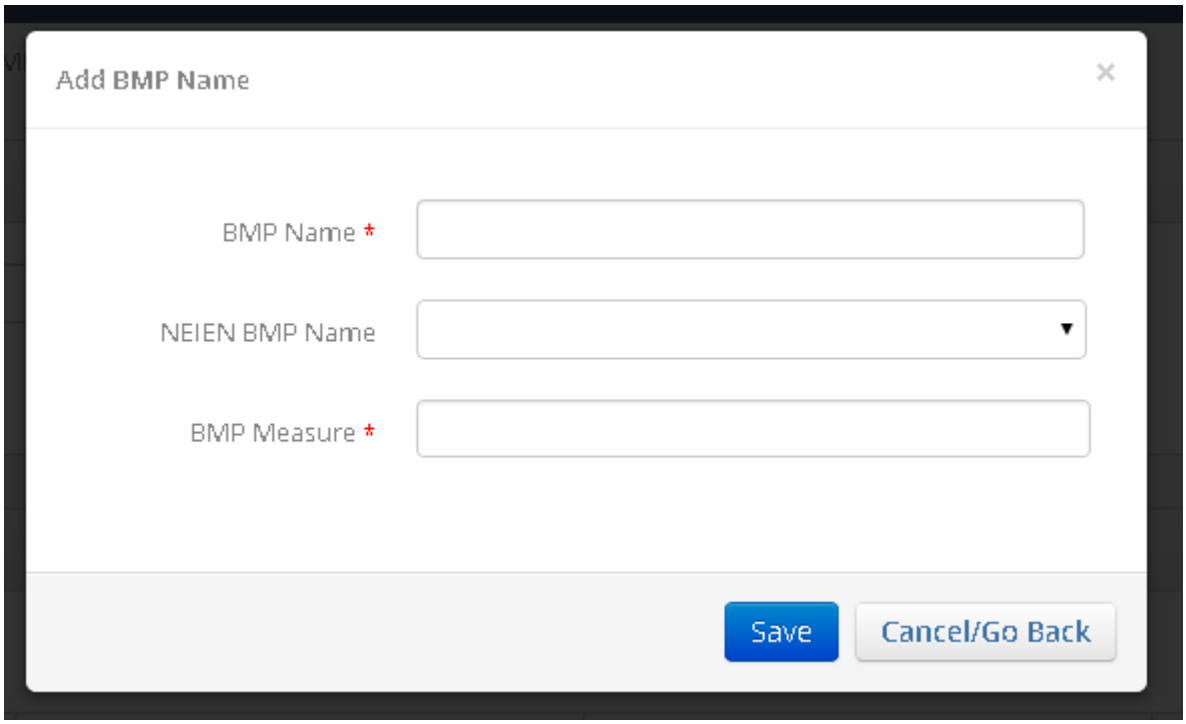


Figure 3.4 Add BMP Name Detail Popup

All the required fields needs to be entered before saving the contact. System will display a confirmation message on saving the entered information. Cancel/Go Back button will take back to the search page without saving any unsaved information.

Manage Lookups

An Admin can edit and manage the lookups lists from this section.

From the Admin menu, user can select ‘Manage Lookups’ to view the page below.

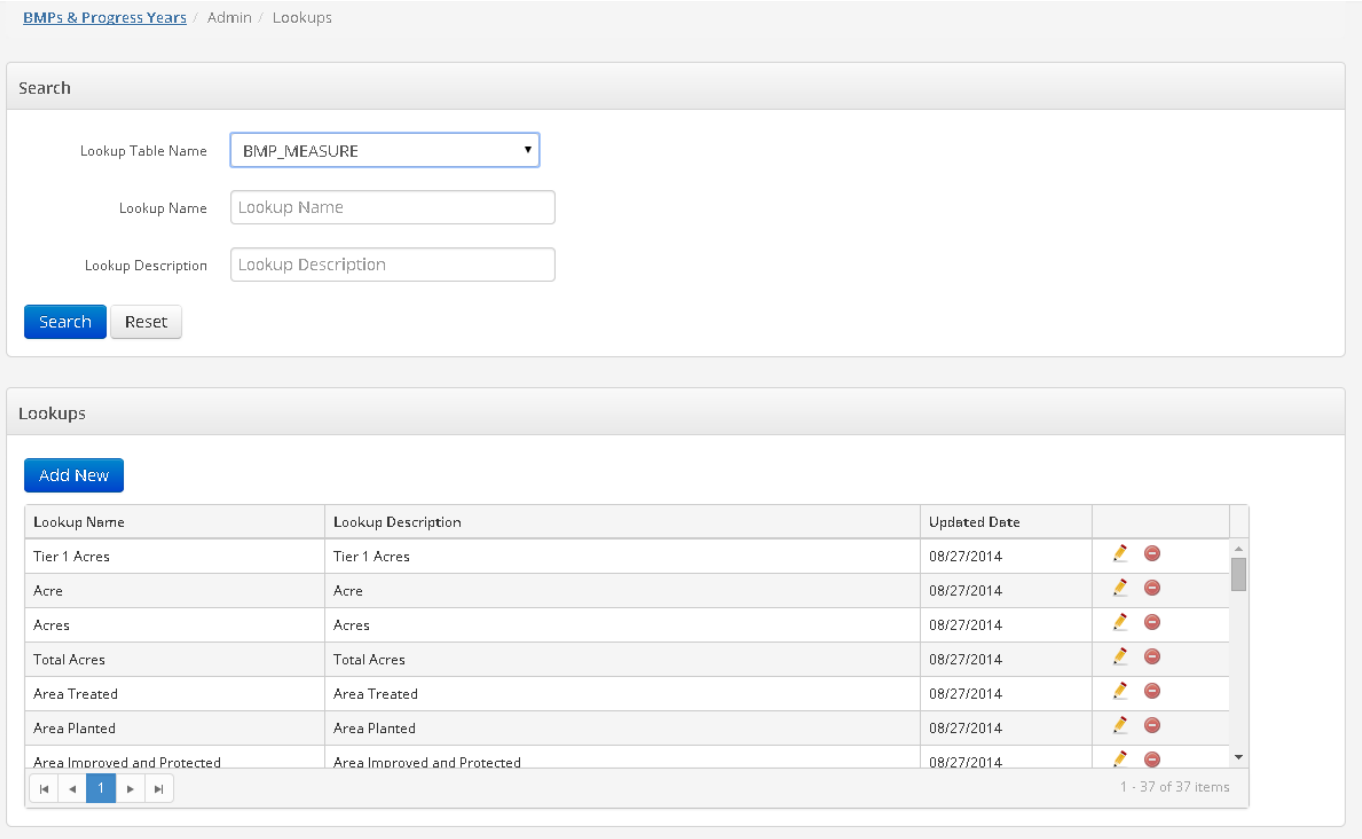


Figure 3.5 Look search screen

The page is divided into sections – Lookup Table Search Options and Lookups
Select the name of the Lookup Table form the dropdown to view the lookup values in the section below.

Search the lookup tables by 'Lookup Name' and 'Lookup Description'. The results of this search will be updated in the Lookups Section of the page. Lookups section displays all the Lookups by default of the lookup table selected. Only admin has the permission to view, add or delete the tables. Any new values can be added to lookup tables.

Clicking the 'Add New' button of the lookup tables will display the screen shown below.

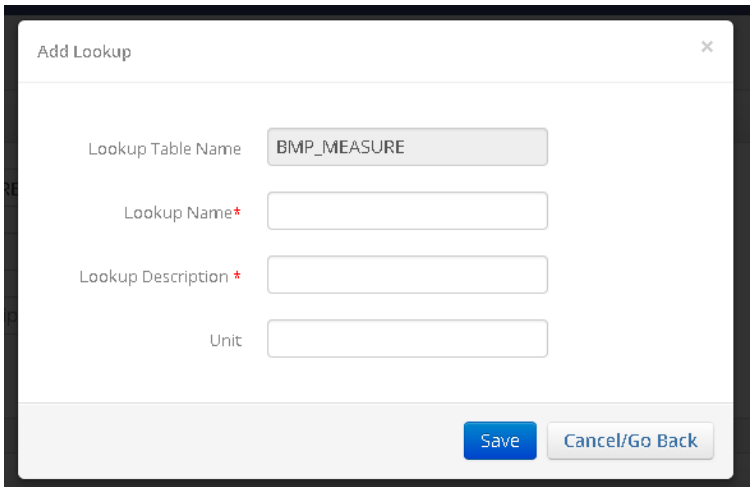


Figure 3.6 Look detail popup

Manage Settings

From the Admin menu, user can select 'Manage Settings' to view the page below.

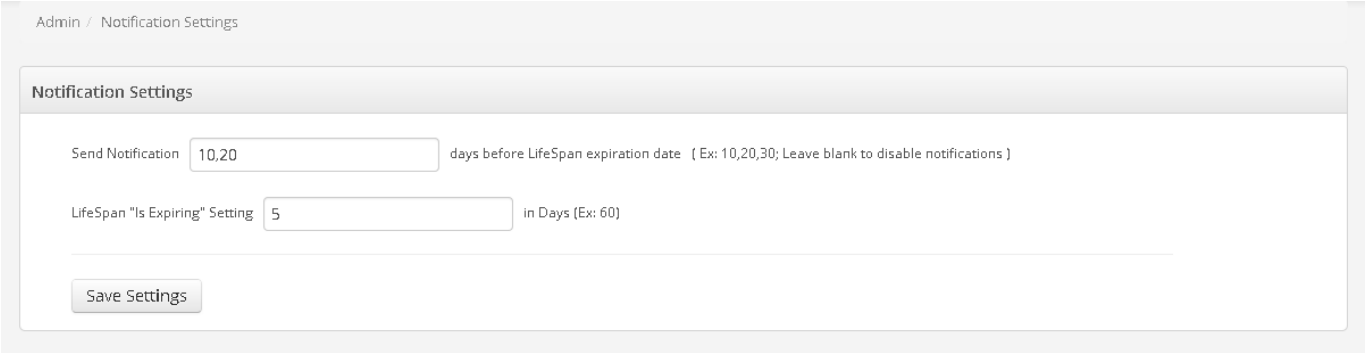


Figure 3.7 Notification Setting screen

Here you can set when an admin and site contact receives a notification that a lifespan of a BMP practice is coming to an end. It will send the notification on days set before the BMP is expired. How many days prior to expire date is considered can be set on 'Lifespan IS Expiring Setting field.

If Send Notification field is set to blank then not notification will be send.

ATTACHMENT H: APPENDIX G OF SOP: RI GUIDANCE DOCUMENT

CHESAPEAKE BAY PROGRAM

RESOURCE IMPROVEMENT PRACTICE

DEFINITIONS AND VERIFICATION VISUAL INDICATORS

GUIDANCE DOCUMENT

Presented by the Agriculture Workgroup's Resource Improvement Technical Review Panel:

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July 2014

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Introduction

As Chesapeake Bay states implement local Watershed Implementation Plans to meet the new Total Maximum Daily Load requirements for the Chesapeake Bay Watershed, a more accurate accounting of all conservation measures on agricultural lands is critical to ensure that appropriate nutrient load reductions are being credited in the Bay Watershed Model. Traditionally, states have relied upon both State and Federal Cost-Share Programs as the source of conservation implementation data for progress to report in their Watershed Implementation Plans.

Recognizing that many conservation measures have been, and are being, implemented without Federal or State financial assistance, the Chesapeake Bay Program has agreed to credit Best Management Practices that meet CBP or NRCS definitions and standards and Resource Improvement Practices that have been implemented without public cost-share funds provided they are providing a reduction of sediment and nutrients to the Chesapeake Bay. This document will provide the process for identification and verification of these two types of practices.

Objective

The objective of this guidance document is to provide what is required for the collection and verification of non-cost-shared agricultural best management practices that meet CBP definitions and establish definitions and verifications methods for Resource Improvement Practices**.** The goal is to account for all verified farmer implemented conservation practices that result in nutrient and sediment reductions. In order for practices to be counted in the Bay Model, data will have to be tracked, verified and reported and then transmitted to the Chesapeake Bay Program via the National Environmental Information Exchange Network (NEIEN).

The process of identifying Non-cost shared practices will normally happen when local Conservation District or other trained technical staffs are on farms working with cooperators and landowners assisting them with the planning process to correct any potential environmental concerns that the landowner may have. It is extremely important for technical staff to establish a dialogue with landowners to encourage the proper use and maintenance of all BMPs. It is the intent of this document is to provide guidance for jurisdictions to develop verification protocols for the reporting all non cost-shared conservation practices for crediting toward progress in their state Watershed Implementation Plans.

Why Is It Important To Report Non Cost shared BMP's?

- **Farmers and Agricultural Landowners** voluntarily install many BMP's outside of state or federal cost share programs or cannot accept a government subsidy:
  - ✓ Plain Sect Farmers (Amish, Mennonite Farmers as examples)
  - ✓ Farms owned by corporations that cannot accept federal funding due to the payment limitations.
- **Some state nutrient regulations** require farmers to install practices that provide water quality protection and need to be verified for compliance with state laws. These state requirements may result in practices that are not required to meet NRCS Standards and Specifications:
  - ✓ Stream Exclusion (fencing type or distance from stream)
  - ✓ 10' and 35' buffers for fertilizer and manure application setbacks
- **Watershed Organizations, Environmental Organizations, Conservation Organizations, and NGOs** are all helping Farmers and Agricultural Landowners to meet WIP goals to protect water quality by installing BMPs:
  - ✓ Shenandoah RC&D Council - Stream exclusion fencing with narrow width tree plantings
  - ✓ Nanticoke Watershed Alliance – 10' Buffers on Drainage Ditches
  - ✓ Chester River Association - Switch grass plantings for field buffers
  - ✓ Mid-Shore Riverkeeper Conservancy - Water Control Structures on Field Ditches

Non Cost-Shared Practices that Provide Resource Improvement

Resource Improvement Best Management Practices (RI) are non-cost shared BMPs that are typically financed by the operator or other non-public entity or source and may or may not meet the practice standards associated with federal and state cost-share programs. RI practices may lack the contractual provisions of cost-shared BMPs as well as the corresponding implementation and maintenance oversight. ***"Resource Improvement BMP's are practices which provide similar annual environmental benefits for water quality but may not fully meet all the design criteria of existing governmental design standards. RI BMP's are usually identified during a visit with the farmer. RI BMP's are implemented by a farmer and are not cost shared through a federal or state program. RI BMP's can be the result of a farmer choosing not to completely follow all the details of the design standard from the District or NRCS, but will contain all the critical elements for water quality resource improvement. Approved CBP RI BMP's definitions contain descriptions of the practice with Visual Indicators. A Visual Indicator is a means of assessing the presence of key elements that must be present to achieve the water quality benefits of the RI practice and to be reported in Jurisdictional WIPs. The re-verification interval of an agricultural Resource Improvement BMP may be more frequent than practices meeting state or federal programs to insure proper functioning."***

Resource Improvement Practices are Multi-Year Visual Assessment Practices

The Resource Improvement Practices (RI) discussed in this guidance documents fall under Visual Assessment BMPs - Multi-Year Practices in the Chesapeake Bay Program Partnership Agricultural Workgroup's "Agricultural BMP Verification Guidance". These are practices can be visually assessed and have a protracted physical presence on the landscape, i.e., of more than one year when properly maintained and operated.

Verification and Quality Assurance of Non Cost-Shared Practices

Currently the Chesapeake Bay Program (CBP) can accept non-cost shared practices that fully meet NRCS practice standards and address CBP BMP definitions for credit. This guidance document further develops definitions and suggested methods to verify and document the existence of Resource Improvement Practices (RI), non-cost shared practices, which do not fully address all NRCS practice standards but do comply with appropriate CBP BMP definitions. Each state will develop a method to verify and document these two types of non-cost shared practices and include it in their State Jurisdictional Protocols. Jurisdictions will utilize approved AgWG recommended quality assurance methods and frequency for spot-checking all non-cost shared and RI practices per The Chesapeake Bay Program Partnership Agricultural Workgroup's Agricultural BMP Verification Guidance.

How Were Resource Improvement Practices and Visual Indicators Developed?

The development of Resource Improvement Practices started in July of 2013 with the Maryland Department of Agriculture requesting that their "Non Cost-Shared Management Practice Verification Procedures Manual" be approved by the AgWG. The November 2013 version of their verification document was the original document the Technical Panel reviewed and used for the development of this Guidance Document. The process for the development of this Guidance Document included the following actions by MDA and the Technical Panel:

1) Starting in 2011, through the review of practices that farmers have installed without cost sharing, the Maryland Department of Agriculture determined there were fourteen practices that they considered to be what was first called Functional Equivalent Practices (FE). MDA's first verification procedures manual (Version 1) created documentation worksheets that consisted of open ended and fill-in the blank questions. Upon review by MDA, it was determined at this method of documentation resulted in wide variations in interpretation and what was reported as a FE Practice. Note: Virginia also conducted a trial of collecting Non-Cost shared practices in 6 Districts, but did not provide any information to the Panel for this process.

2) MDA worked with representative Conservation Districts to develop Versions 2 and 3 of the MDA Non-Cost Shared Verification Manual. It included a new FE worksheet that contained NRCS practice design criteria and FE design criteria. It was tested and updated from input by the representative Conservation Districts in Maryland.
3) MDA presented this document to the AgWG in July 2013 and the Partnership endorsed the concept and requested approval from Water Quality Goal Implementation Team (WQGIT). The WQGIT requested that the AgWG work through a technical review process for final approval. The AgWG then requested a Partnership Technical Review Panel be created to review the MDA document and provide recommendations back to the AgWG for final approval.
4) AgWG sent out a notice to the jurisdictions for Technical Review Panel member nominations. In this notice, the AgWG requested technically qualified members from State Agencies, Conservation Districts, NRCS technical personal and the NGO Community. States submitted nominees and NRCS agreed to participate as technical members in an advisory role (See letter from Rich Sims in Appendix A). December 12, 2013, the AgWG selected Technical Review Panel members.
5) The Technical Review Panel held a teleconference January 29, 2014 to receive an introduction to the issue and their panel charge.
6) The Technical Review Panel met in person on March 2, May 8, 2014 and then held a May 29, 2014 teleconference for working sessions to develop the definitions and documentation checklists for the practices. During these sessions, the following overall document changes were made:

a) Change in name from Functional Equivalents (FE) to Resource Improvement Practices (RI)
b) Change FE Criteria test to Visual Indicators (VI), following the WQGIT approved process developed by the Storm Water Sector for verification of homeowner BMPs.
c) The NRCS design criteria were removed from the documentation checklists. The NRCS Practice standards will only be used as a reference practices along with CBP BMPs for assistance in identifying if a practice should be reported and a Non-Cost Shared Practice that meets a NRCS standard or a RI.
d) Final definitions and VI's for each practice were developed.
e) Two practices were deleted: Concentrated Area Protection and Wetland Development. It is recommended by the Technical Review Panel that these two be provided back to the appropriate CBP program Expert Panel or Sector for assistance on the development of an appropriate RI practice.
f) It was decided to make a jurisdictional neutral document and recommendations were made on the appropriate Agricultural Verification BMP Methods, documentation requirements and re-verification for RI practices using the Agricultural Workgroup's Agricultural BMP Verification Guidance (DATE, 2014).

7) The document was presented by the Technical Panel to the AWG for review on June 19, 2014.
8) Comments were provided by the AWG members and the Technical Panel reviewed and incorporated or made changes to the RI documents as appropriate July 10, 2014.
9) The document was approved by the AgWG on DATE, 2014.
10) The document was approved the WTWG and the WQGIT on *DATE*, 2014.
11) The final approved document provided for jurisdictions on *DATE*, 2014.
12) Jurisdictions that choose to report RI's will develop the specified guidance and will get approval the appropriate CBP approval process. If states propose additional RIs they will need the appropriate AgWG and CBP approval.
13) CBP approved RI practices will be collected by approved jurisdictional verification processes and reported through NEIEN for credit in the Jurisdictional TMDL Watershed Improvement Plan progress runs.

Resource Improvement Practices and Visual Indicator Requirements

RI Practices and Visual Indicators (VI) meet the follow requirements:

a) RI and their associated VI's are usually found as part of a state or NGO entity working with farmers. They typically would not be designed by Agencies or NGOs, but by the farmer who has an interest in resolving a conservation water quality problem on their farm and they implemented a RI to meet that need. To receive credit for the practice, the VI's for each RI are required to be present and are verified by

an approved CBP Verification Method with the appropriate documentation provided to the certifying agency for approval before credit is provided in Jurisdictional WIPs (see Matrix in Appendix B)
b) VI's will meet the appropriate federal, state and local regulations.
c) VI's provide for the safe functioning of the practice for humans or animals.
d) VI's will provide water quality or resource improvement as implemented.
e) Some RI standards will have more than one reportable code to record the appropriate buffer widths, vegetation or type of animal, or animal units, etc. (See Appendix C- Animal Units)
f) Nutrient Exclusion Areas that are less than CBP Buffer widths (i.e. <35') are will receive "land use change" credit only as previously approved by the AgWG.
g) RI practice names, units and CBP credit will be finalized through the appropriate NEIEN Appendix process and timelines to be credited to the Jurisdiction WIP.
h) All RI practices have reduced re-verification intervals and must be recertified to ensure they are being properly maintained and functioning.

How are Visual Indicators Evaluated and Recorded?

In the process of working with a farmer, RI practices may be mentioned by the farmer or discovered by the technical specialist during a farm visit. Jurisdictions may use any approved AgWG verification method (See Appendix B) to determine if the practice will meet the RI definitions and VI's. In order for a RI practice to be considered reportable the technical specialist will look at the RI practice Visual Indicators and see if they are present. All Visual Indicators must either have a Y or NA marked. If a N is marked on the checklist, the technical specialist may not report the RI practice, but they may use the opportunity to discuss the deficiency with the farmer.

Jurisdictional Checklist Requirements

Jurisdictions may use any format or design (i.e. paper, electronic, etc.) for their state checklist to document if the practice meets an approved RI definition and all elements of a RI are present with appropriate VI's. The Checklists that are included in this Guidance Document are one example of recording all the elements required for RI verification documentation.

Jurisdictional RI checklist will contain the following information for each RI:

1) Date of verification and name of certifying official;
2) Landowner information: such as address, county, etc.;
3) Location of RI on the landscape such as: marking on an aerial map or conservation plan map, GPS location or Latitude/Longitude coordinates, etc.;
4) Presence of the required VIs (as appropriate);
5) Date the practice was installed by the farmer;
6) Appropriate reported units for state database and NEIEN;
7) Visual documentation such as a photo of the practice, drawing or other description;
8) Other notes as needed for additional documentation or re-verification.

The RI checklist and associated information will be placed the farmer's conservation plan or other jurisdictional approved location.

Modifications to Approved VI's: Upon CBP partnership approval, jurisdictions are allowed to make individual VI's stricter than the approved guidance per state program requirements, regulations, etc. Where "state or local regulations or requirements" are mentioned, jurisdictions may insert specific state regulation or requirement references in the VI. A jurisdiction may not make a VI less restrictive or weaker than the approved CBP VI guidance. If jurisdictions wish to propose less restrictive VI's or additional RI's, they must be first reviewed and approved following the CBP partnership's "BMP Protocol" process.

Who can report RI practices?

RI BMPs may be reported by using any approved AgWG Verification method (See Appendix B). Any trained and/or certified technical field staff person that has the required knowledge and skills to determine if the practice meets the applicable RI definition and VIs may conduct the RI practice review. Jurisdictions will have final oversight and will be the certifying entity of all information that is provided and approved for entry into the CBP NEIEN reporting system. The appropriate spot-checking will be completed during annual Quality Assurance Reviews and the appropriate actions will be taken if information submitted is incorrect such as: removal of RI practice from reporting system; potential re-training of technical staff; removal of certification of the individual, NGO or other entities that may report RI's, etc.

RI BMP Re-verification

RI practices shall be re-verified at a more frequent interval since their design may not be as extensive as similar state funded or NRCS practices Therefore a technical person must visit the RI BMP on a more frequent basis to review the efficacy of the RI BMP and the farmer's operation and maintenance of the BMP. RI re-verification intervals are found in the below table. When a jurisdiction re-verifies the practice it must determine if required VIs are still present and functioning for the appropriate water quality credit or it will be removed from the jurisdictional and NEIEN database.

RI BMP Re-verification Intervals:

RI BMP Name	RI Re-Verification Intervals (Years)
Dry Waste Storage Structure	5
Animal Compost Structure	5
Alternative Crop/Switchgrass	5
Watercourse Access Control (Narrow, Grass, Trees)	5
Grass Nutrient Exclusion Area on Watercourse and Grass Buffer on Watercourse	5
Forest Nutrient Exclusion Area on Watercourse and Forest Buffer on Watercourse	10
Vegetative Environmental Buffer for Poultry, Grass	3
Vegetative Environmental Buffer for Poultry, Trees	5
Conversion to Pasture or Hayland	3
Rotational Grazing	3
Barnyard Clean Water Diversion	5
Water Control Structure	5
Watering Trough	5

Resource Improvement Practices

There are 19 Resource Improvement Practices. Some practices have multiple options for different widths or vegetation:

	Resource Improvement Practice Name	Additional Practice Information
RI-1	Dry Waste Storage Structure	
RI-2	Animal Compost Structure	
RI-3	Alternative Crop/Switchgrass	
RI-4a	Watercourse Access Control-Narrow Grass	10'-34' Width Exclusion Area, Natural Grass or planted
RI-4b	Watercourse Access Control-Narrow Trees	10'-34' Width Exclusion Area, Native Trees or planted
RI-5	Watercourse Access Control-Grass	35'+ Width Exclusion Area, Natural or planted Grass
RI-6	Watercourse Access Control-Trees	35'+ Width Exclusion Area, Natural or planted Trees
RI-7	Grass Nutrient Exclusion Area on Watercourse	10'-34' Width Nutrient Exclusion Area
RI-8	Grass Buffer on Watercourse	35'+ Width Buffer
RI-9	Forest Nutrient Exclusion Area on Watercourse	10'-34' Width Nutrient Exclusion Area
RI-10	Forest Buffer on Watercourse	35'+ Width Buffer
RI-11	Vegetative Environmental Buffer for Poultry-Grass	Warm Season Grass
RI-12	Vegetative Environmental Buffer for Poultry-Trees	Trees
RI-13	Conversion to Pasture	
RI-14	Conversion to Hayland	
RI-15	Rotational Grazing	
RI-16	Barnyard Clean Water Diversion	
RI-17	Water Control Structure	
RI-18	Watering Trough	

RI-1: DRY WASTE STORAGE STUCTURE Resource Improvement Practice Definition

Reported Units: Number of Systems; Animal Type; Animal Units

DEFINITION

A waste storage structure for dry stackable manure constructed by fabricating a structure, or by fabricating a field-stacking pad. This does not include the temporary stacking of poultry manure in a field that would be moved to different locations each year.

PURPOSES

To temporarily store dry stackable manure.

CONDITIONS WHERE PRACTICE APPLIES

To temporarily store dry stackable manure.

CRITERIA

Size of the facility should be large enough to store all accumulated dry animal manure, for the maximum period during which such wastes cannot be applied to the land for reasons such as operational restrictions, weather, or crops.

Storage of stackable manure must meet all state and local regulations. All runoff is controlled and non-polluting.

Exclude clean runoff to the fullest extent practical.

Waste handling equipment shall be available to remove waste materials from agricultural waste storage facility and apply it to the land at the locations, times, and rates per local, county or state regulations.

OPERATION AND MAINTENANCE

Re-verification of animal waste structures is required at least every 5 years for practices meeting RI specifications.

SUPPORTING DATA AND DOCUMENTATION

Complete accompanying checklist; Visual Documentation of the practice (picture or drawing); and document on conservation plan map or aerial photo of farm.

Reference Practices: CBP- Animal Waste Management Systems (AWMS); NRCS -313 Waste Storage Facility

RI-1: Dry Waste Storage Structure Example Checklist Verification Date:

Cooperator Name, Address, and Phone #	FSA Farm / Tract Field Number:	SCD	Inspection Type ☐ Initial Inspection ☐ QA Spot Check ☐ Re-verify ☐ Other _____

	RI-1 Practice: Dry Waste Storage Structure				Supporting Data & Documentation:
	Life span: 5 years	Y	N	N/A	
	RI-1 Visual Indicators				
1	Does facility operate without polluting waters?				Visual observation
2	Facility is located ≥ 100' from wells, unless there is a Health Dept. waiver or per State, County or Local Regulation				Estimate by paces
3	Facility is 100 feet from top of bank of any stream or per state, county or local regulation.				Estimate by paces
4	Volume per sizing sheet for NRCS Spec or describe management methodology used by farmer				Owner interview
5	Offsite runoff is excluded or accounted for in storage				Visual observation
6	Storage of stackable manure must meet all state and local regulations. All runoff is controlled and non-polluting.				Visual observation and Owner interview
7	No safety concerns present.				Visual observation
8	Slab on grade, or may be other stabilized impervious surface.				Visual observation
9	Retaining wall if used is straight, not in imminent danger of failure				Visual observation
	Meets RI-1 Visual Indicators				
	RI-1 Installation Date:				
	RI-1 Reportable Units:				
	Number of Systems:				
	Animal Type: AU:				
	CERTIFICATION DATE/INITIALS:				
	RECERTIFICATION DATE/INITIALS:				

All Visual Indicators must either have a Y or NA marked. If an N is marked on the checklist, the RI may not be reported until the deficiency is addressed.

Additional Notes/Documentation about RI:

RI-2: ANIMAL COMPOST STRUCTURE Resource Improvement Practice Definition

Reported Units: Number of Systems; Animal Type; Animal Units

DEFINITION

An on-farm facility for the treatment or disposal of livestock and poultry carcasses for a small numbers of animals. (Typically less than 80 Animal Units total on the farm)

PURPOSES

Provide proper disposal of carcasses to decrease non-point source pollution of surface and groundwater resources.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where animal carcass treatment or disposal must be considered as a component of a waste management system for livestock or poultry operations. This practice includes disposal of normal, not catastrophic, animal mortality.

CRITERIA

The facility shall be designed to handle normal mortality.

Contaminated runoff from any mortality facility without a roof must be controlled.

The appropriate carbon source to animal carcass volume is utilized resulting in appropriate biological decomposition.

Leachate should not occur from any composting facility.

Operators should receive proper training on the use of the facility.

OPERATION AND MAINTENANCE

Re-verification of animal mortality facilities is required at least every 5 years for practices meeting RI specifications.

SUPPORTING DATA AND DOCUMENTATION

Complete accompanying checklist; Visual Documentation of the practice (picture or drawing); and document on conservation plan map or aerial photo of farm.

Reference Practices: CBP- Mortality Composters (MortalityComp); NRCS- 316 Animal Mortality Facility

RI-2: Animal Compost Structure Example Checklist Verification Date:

Cooperator Name, Address, and Phone #	FSA Farm / Tract Field Number:	SCD	Inspection Type ☐ Initial Inspection ☐ QA Spot Check ☐ Re-verify ☐ Other _____

	RI-2 Practice: Animal Compost Structure				Supporting Data & Documentation:
	Life span: 5 years	Y	N	N/A	
	RI-2 Visual Indicators				
1	Does facility operate without polluting waters?				Visual observation
2	Facility is located ≥ 100' from wells, unless there is a Health Dept. waiver or per State, County or Local Regulation				Estimate by paces
3	Facility is 100 feet from top of bank of any stream or per state, county or local regulation.				Estimate by paces
4	Facility meets pollution control requirements of state & local agencies and regulations				Visual observation
5	The appropriate carbon source to animal carcass volume was utilized resulting in appropriate biological decomposition.				Visual observation
6	The resulting product is utilized according to state and local regulations				Owner Interview
	Meets RI-2 Visual Indicators				
	RI-2 Installation Date:				
	RI-2 Reportable Units:				
	Number of Systems:				
	Animal Type: AU:				
	CERTIFICATION DATE/INITIALS:				
	RECERTIFICATION DATE/INITIALS:				

All Visual Indicators must either have a Y or NA marked. If an N is marked on the checklist, the RI may not be reported until the deficiency is addressed.

Additional Notes/Documentation about RI:

RI-3: ALTERNATIVE CROP/SWITCHGRASS Resource Improvement Practice Definition

Reported Unit: Acres

DEFINITION

Conversion of cropland to a herbaceous alternative crop of switchgrass.

PURPOSES

Improve water quality and sequester atmospheric carbon dioxide; Promote desired plant growth; improve or provide wildlife habitat.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to alternative crops plantings of switchgrass on land that was previously used for crop production.

This practice does not apply to plantings that are intended to function primarily as field borders, hedgerows, or riparian buffers, for which other standards are applicable.

OPERATION AND MAINTENANCE

Re-Verification of the alternative crop are required at least every 5 years for practices meeting RI specifications.

SUPPORTING DATA AND DOCUMENTATION

Complete accompanying checklist; Visual Documentation of the practice (picture or drawing); and document on conservation plan map or aerial photo of farm.

Reference Practices: CBP- AlternativeCrop (CarSeqAltCrops); NRCS-327 Conservation Cover

RI-3: Alternative Crop/Switchgrass Example Checklist Verification Date:

Cooperator Name, Address, and Phone #	FSA Farm / Tract Field Number:	SCD	Inspection Type ☐ Initial Inspection ☐ QA Spot Check ☐ Re-verify ☐ Other _____

	RI-3 Practice: Alternative Crop/Switchgrass				Supporting Data & Documentation:
	Life span: 5 years	Y	N	N/A	
	RI-3 Visual Indicators				
1	Pure switchgrass planting				Visual Observation
2	Appropriate lime & fertilizer applied per state regulations				Owner Interview
3	Livestock are excluded				Visual Observation
4	75% switchgrass cover is present				Visual Observation
	Meets RI-3 Visual Indicators				
	RI-3 Installation Date:				
	RI-3 Reportable Units:				
	Acres:				
	CERTIFICATION DATE/INITIALS:				
	RECERTIFICATION DATE/INITIALS:				

All Visual Indicators must either have a Y or NA marked. If an N is marked on the checklist, the RI may not be reported until the deficiency is addressed.

Additional Notes/Documentation about RI:

RI-4a,4b,5,6: WATERCOURSE ACCESS CONTROL Resource Improvement Practice Definition

Reported Units: Feet Length, Feet Width

RI Code	RI BMP Name	Additional Practice Information
RI-4a	Watercourse Access Control-Narrow Grass	10'-34' Width Exclusion Area, Natural Grass or planted
RI-4b	Watercourse Access Control-Narrow Trees	10'-34' Width Exclusion Area, Native Trees or planted
RI-5	Watercourse Access Control-Grass	35'+ Width Exclusion Area, Natural or planted Grass
RI-6	Watercourse Access Control-Trees	35'+ Width Exclusion Area, Natural or planted Trees

DEFINITION

A constructed barrier to livestock. A field border will be present of either herbaceous materials or trees between the watercourse and the barrier or fence. The RI grass or tree exclusion area width behind the barrier will be either 10 to 34 feet, or 35 feet or greater.

PURPOSES

This practice is to prevent, restrict, or control access of livestock into surface water or environmentally sensitive areas.

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied on any area adjacent to surface water or environmentally sensitive areas where the control of livestock is needed. Fences are not required where natural barriers or other methodologies will meet this purpose.

CRITERIA

The barrier shall be appropriately installed and maintained sufficient to control or restrict the access of livestock.

The minimum buffered width between barrier and surface water and or environmentally sensitive area shall be no less than 10 feet measured horizontally on a line perpendicular to the water body, beginning at the top of bank. In order to adequately address water quality, the buffer width may need to be expanded to include important resource features such as wetlands, steep slopes, areas that are occasionally or seasonally flooded, or critical habitats. Vegetation in the buffer between the barrier and surface water should be of a density to help reduce sediment, organic material, nutrients, pesticides and other pollutants in surface runoff.

OPERATION AND MAINTENANCE

Fencing materials, if used, shall be of high quality and durability, and constructed to meet the intended purpose of the practice.

Re-verification of the barrier is required at least every 5 years for practices meeting RI specifications.

SUPPORTING DATA AND DOCUMENTATION

Complete accompanying checklist; Visual Documentation of the practice (picture or drawing); and document on conservation plan map or aerial photo of farm.
Reference Practices: CBP Stream Access Control with Fencing (PastFence), Tree Planting (TreePlant), Streamside Grass Buffers (GrassBuffersTrp), Streamside Forest Buffers (ForestBuffersTrp)' NRCS-382 Fence, 472 Access Control

RI-4a, 4b,5,6: Watercourse Access Control Example Checklist Verification Date:

Cooperator Name, Address, and Phone #	FSA Farm / Tract Field Number:	SCD	Inspection Type ☐ Initial Inspection ☐ QA Spot Check ☐ Re-verify ☐ Other _____

	RI-4,5,6 Practice: Watercourse Access Control				Supporting Data & Documentation:
	Life span: 5 years	Y	N	N/A	
	RI-4,5,6 Visual Indicators				
1	Exclusion method controls the intended animals				Owner interview Visual Observation
2	Livestock concentration and grazing are minimized in riparian (wetland, stream) areas				Visual Observation
3	If fencing is used then there is a 10' minimum setback from the top of bank of watercourse				Estimate by paces
4	Areas around fence are stabilized				Visual Observation
5	Vegetation in buffer between the barrier and surface water should be of a density to help reduce sediment, organic material, nutrients, pesticides and other pollutants in surface runoff.				Visual Observation
6	Exclusion method is determined to be critical to confinement/exclusion from environmental area				Visual Observation
	Meets RI-4,5,6 Visual Indicators				
	RI Installation Date:				
	RI-4a,4b,5,6 Reportable Units: Feet				
	Check RI Reporting and Record Length in Feet:				
	RI-4a: 10'-34' – Narrow-Width Access Control, Natural Grass or planted Length Feet: Width Feet:				
	RI-4b: 10'-34' – Narrow-Width Access Control, Native Trees or planted Length Feet: Width Feet:				
	RI-5: 35'+ Width Access Control, Natural or planted Grass Length Feet: Width Feet				
	RI-6: 35'+ Width Access Control, Natural or planted Trees Length Feet: Width Feet				
	CERTIFICATION DATE/INITIALS:				
	RECERTIFICATION DATE/INITIALS:				

All Visual Indicators must either have a Y or NA marked. If an N is marked on the checklist, the RI may not be reported until the deficiency is addressed.

Additional Notes/Documentation about RI:

RI-7,8: GRASS NUTRIENT EXCLUSION AREA or BUFFER on Watercourse Resource Improvement Practice Definition

Reported Units: Feet Length, Feet Width

RI Code	RI BMP Name	Additional Practice Information
RI-7	**Grass Nutrient Exclusion Area on Watercourse**	10'-34' Width Nutrient Exclusion Area
RI-8	**Grass Buffer on Watercourse**	35'+ Width Buffer

DEFINITION

Grasses, grass-like plants, and forbs that are established **on converted cropland** that receive no nutrients and are managed to provide a herbaceous buffer located **adjacent to and up-gradient** from water bodies or a strip or area of herbaceous vegetation that inhibits nutrients and sediment from overland flow located adjacent to cropland. This includes areas that function as nutrient exclusion area or riparian herbaceous buffers.

PURPOSES

This practice is to create a nutrient exclusion area or buffer, reduce excess amounts of sediment, organic material, nutrients, pesticides and other pollutants in surface runoff and reduce excess nutrients and other chemicals in shallow ground water flow and to increase carbon storage in plant biomass and soils.

CONDITIONS WHERE PRACTICE APPLIES

This practice qualifies if applied on cropland on stable areas adjacent to permanent or intermittent streams, ditches and tidal waters**. It may only be reported on cropland without a fence (otherwise see RI-4 or RI-5 Watercourse Exclusion)**. Exclusion areas will be 10 to 34 feet, or buffers of 35 feet or greater.

CRITERIA

To create a grass nutrient exclusion area or buffer, reduce excess amounts of sediment, organic material, nutrients, pesticides and other pollutants in surface runoff and reduce excess nutrients and other chemicals in shallow ground water flow.

For areas adjacent to surface water, the minimum width shall be at least 10 feet measured horizontally on a line perpendicular to the water body, beginning at the top of bank or wetland edge. There should be at least 75% perennial grass cover. In order to adequately address water quality, the buffer width may need to be expanded to include important resource features such as wetlands, steep slopes, areas that are occasionally or seasonally flooded, or critical habitats. Plant and animal pest species shall be controlled to the extent feasible to achieve and maintain the intended purpose of the vegetative cover. Noxious weeds shall be controlled as required by state law.

OPERATION AND MAINTENANCE

Re-verification of the grass exclusion areas or buffers is required at least every 5 years for practices meeting RI specifications. Control concentrated flow or mass soil movement up gradient of the exclusion area or buffer to maintain function. Species shall have stiff stems and high stem density near the ground surface.

SUPPORTING DATA AND DOCUMENTATION

Complete accompanying checklist; Visual Documentation of the practice (picture or drawing); and document on conservation plan map or aerial photo of farm.

Reference Practices: CBP- Land Retirement to Hay Without Nutrients (LandRetireHYO), Grass Buffers; Vegetated Open Channels for Agriculture (GrassBuffers); NRCS-390 Riparian Herbaceous Cover

RI-7,8: Grass Nutrient Exclusion Area or Buffer on Watercourse Example Checklist

Verification Date:

Cooperator Name, Address, and Phone #	**FSA Farm / Tract** **Field Number:**	**SCD**	**Inspection Type** ☐ Initial Inspection ☐ QA Spot Check ☐ Re-verify ☐ Other _____

	RI-7,8 Practice: Grass Nutrient Exclusion Area or Buffer on Watercourse				**Supporting Data & Documentation:**
	Life span: 5 years	Y	N	N/A	
	RI-7,8 Visual Indicators				
1	Horizontal buffer width ≥ 10', measured perpendicular to top-of-bank intermittent stream, ditch or tidal area				Estimate by paces
2	Width is ≥ 35' if receiving dissolved contaminants (e.g. nutrients, pesticides)				Estimate by paces Visual Observation
3	Overland flow through buffer is maintained as sheet flow				Visual Observation
4	All excessive sheet-rill and concentrated flow are controlled in areas immediately adjacent & up gradient of buffer, before entering				Visual Observation
5	No livestock are present nor have access				Visual Observation Owner Interview
6	Plant species are native (preferred), or introduced and non-invasive, with stiff stems and high stem density				Visual Observation
7	Plants are compatible in growth rate, tolerant of flooding/saturation and shade				Visual Observation
8	Minimum of 75% perennial grass cover is present				Visual Observation
	Meets RI-7,8 RI Visual Indicators				
	RI Installation Date:				
	RI-7,8 Reportable Units: Feet				
	Check RI Reporting and Record Length in Feet:				
	RI-7: 10'-34' Width Nutrient Exclusion Area Length Feet: Width Feet:				
	RI-8: 35'+ Width Buffer Length Feet: Width Feet:				
	CERTIFICATION DATE/INITIALS:				
	RECERTIFICATION DATE/INITIALS:				

All Visual Indicators must either have a Y or NA marked. If an N is marked on the checklist, the RI may not be reported until the deficiency is addressed.

Additional Notes/Documentation about RI:

RI-9,10: FOREST NUTRIENT EXCLUSION AREA or BUFFER on Watercourse Resource Improvement Practice Definition

Reportable Units: Feet Length, Feet Width

RI Code	RI BMP Name	Additional Practice Information
RI-9	Forest Nutrient Exclusion Area on Watercourse	10'-34' Width Nutrient Exclusion Area
RI-10	Forest Buffer on Watercourse	35'+ Width Buffer

DEFINITION

An area predominately trees and/or shrubs established **on converted cropland** located adjacent to and up-gradient from streams, ditches or tidal waters.

PURPOSES

This practice is to create a nutrient exclusion area, reduce excess amounts of sediment, organic material, nutrients, pesticides and other pollutants in surface runoff adjacent to streams.

CONDITIONS WHERE PRACTICE APPLIES

This practice qualifies if applied on stable areas adjacent to permanent or intermittent streams, ditches or tidal water. **It may only be reported on converted cropland without a fence (otherwise see RI-4 or RI-6 Watercourse Access Control).** Exclusion areas will be 10 to 34 feet, buffers will be 35 feet or greater.

CRITERIA

To create a forested nutrient exclusion area or buffer, reduce excess amounts of sediment, organic material, nutrients, pesticides and other pollutants in surface runoff.

The minimum width shall be at least 10 feet measured horizontally on a line perpendicular to the water body, beginning at the top of bank or wetland edge. In order to adequately address water quality, the buffer width may need to be expanded to include important resource features such as wetlands, steep slopes, areas that are occasionally or seasonally flooded, or critical habitats. Dominant vegetation (>50% canopy cover) consists of existing, naturally regenerated, or planted trees and/or shrubs.

OPERATION AND MAINTENANCE

Re-verification of the forested nutrient exclusion area/buffers is required at least every 10 years for practices meeting RI specifications.

Control concentrated flow or mass soil movement up gradient of the forested nutrient exclusion areas or buffers to maintain function.

Manage the dominant canopy to maintain maximum vigor of over story and understory species.

SUPPORTING DATA AND DOCUMENTATION

Complete accompanying checklist; Visual Documentation of the practice (picture or drawing); and document on conservation plan map or aerial photo of farm.

Reference Practices: CBP- Tree Planting (TreePlant), Forest Buffers (ForestBuffers); NRCS-391 Riparian Forest Buffer

RI-9,10: Forest Exclusion Area or Buffer on Watercourse Example Checklist Verification Date:

Cooperator Name, Address, and Phone #	FSA Farm / Tract Field Number:	SCD	Inspection Type ☐ Initial Inspection ☐ QA Spot Check ☐ Re-verify ☐ Other _____

	RI-9,10 Practice: Forest Nutrient Exclusion Area or Buffer on Watercourse				Supporting Data & Documentation:
	Life span: 10 years	Y	N	N/A	
	RI-9,10 Visual Indicators				
1	Dominant vegetation (>50% canopy cover) consists of existing, naturally regenerated, or planted trees and/or shrubs				Visual Observation
2	Perpendicular distance from top-of-bank of steam, ditch or tidal area ≥ 10' minimum average for width of buffer				Estimate by paces
3	Overland/sheet flow through buffer is maximized (no concentrated flow)				Visual Observation
4	Structural measures are present where vegetation practice is insufficient to control erosion				Visual Observation
	Meets RI-9,10 Visual Indicators				
	RI Installation Date:				
	RI-9,10 Reportable Units: Feet				
	Check RI Reporting and Record Length in Feet:				
	RI-9: 10'-34' Width Nutrient Exclusion Area Length Feet: Width Feet:				
	RI-10: 35'+ Width Buffer Length Feet: Width Feet:				
	CERTIFICATION DATE/INITIALS:				
	RECERTIFICATION DATE/INITIALS:				

All Visual Indicators must either have a Y or NA marked. If an N is marked on the checklist, the RI may not be reported until the deficiency is addressed.

Additional Notes/Documentation about RI:

RI-11,12: VEGETATIVE ENVIRONMENTAL BUFFER FOR POULTRY (Grass or Trees) Resource Improvement Practice Definition

Reportable Units: Feet Length, Feet Width

RI Code	RI BMP Name	Additional Practice Information
RI-11	Vegetative Environmental Buffer for Poultry-Grass	Warm Season Grass
RI-12	Vegetative Environmental Buffer for Poultry-Trees	Trees

DEFINITION

Vegetative Environmental Buffers are a minimum of two staggered rows of trees/ shrubs or warm season grasses in linear configurations adjacent to poultry house fans.

PURPOSES

This practice applies to buffers around poultry operations that are designed to improve air and water quality by reducing and intercepting airborne particulate matter.

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied on any area where linear plantings of woody plants or warm season grasses are desired and are suitable for the intended purpose.

Vegetative Environmental Buffers are generally not used solely for purposes of enhancing aesthetics or providing wildlife habitat. These are usually secondary purposes that may complement a primary purpose.

Consider that water and air quality benefits may arise from using vegetative environmental buffers to intercept airborne particulates and to trap sediment-attached substances. Vegetative environmental buffers may also benefit air and water quality by assimilating plant nutrients in leaves and roots.

This practice does not apply to plantings that are intended to function primarily as field borders, or riparian forest buffers, for which other standards are applicable.

CRITERIA

Plant species shall be selected based on the planned purpose(s) of the vegetative environmental buffer, preferences of the client, and conditions of the site.

Use staggered spacing in multiple row plantings. Vegetative environmental buffers may be established using trees, shrubs, and/or perennial bunch grasses producing erect stems attaining avg. heights of at least 3 feet and persisting over winter.

OPERATION AND MAINTENANCE

Re-verification of the vegetative environmental buffers is required at least every 3 for grass buffers and 5 years for tree buffers for practices meeting RI specifications.

SUPPORTING DATA AND DOCUMENTATION

Complete accompanying checklist; Visual Documentation of the practice (picture or drawing); and document on conservation plan map or aerial photo of farm.

Reference Practices: CBP- Grass (None), Tree Planting: Vegetative Environmental Buffers Poultry (TreePlant); NRCS-422 Hedgerow Planting

RI-11,12: Vegetative Environmental Buffer for Poultry Example Checklist Verification Date:

Cooperator Name, Address, and Phone #	FSA Farm / Tract Field Number:	SCD	Inspection Type ☐ Initial Inspection ☐ QA Spot Check ☐ Re-verify ☐ Other _____

	RI-11,12 Practice: Vegetative Environmental Buffer for Poultry (grass or trees)				Supporting Data & Documentation:
	Life span: 3 years for grass or 5 years for trees	Y	N	N/A	
	RI-11,12Visual Indicators				
1	Plant species are trees, shrubs, and/or perennial bunch grasses ≥ 3' tall				Visual Observation
2	Used for poultry house ventilation-outlet filtering and must be living and within 100' of fans.				Visual Observation
3	Hedgerow is ≥ 2 rows wide. Row vegetation heights should be: 1'-2' (bunch grass), 2'-4' (shrubs), 6'-12' (deciduous trees), 6'-10' (evergreen trees) as appropriate.				Visual Observation
4	If using trees, one row should contain deciduous trees and the other evergreen trees.				Visual Observation
5	Livestock are controlled or excluded				Visual Observation Owner interview
6	Hedgerow is located between poultry house and sensitive areas if appropriate. Use N/A if no sensitive area.				Visual Observation
7	Hedgerows plants will be staggered with no gaps greater than 1' when fully mature.				Visual Observation
	Meets RI-11,12 Visual Indicators				
	RI Installation Date:				
	RI-11,12 Reportable Units: Acres				
	RI-11=Warm Season Grass Length Feet: Width Feet:				
	RI-12=Trees/Shrubs Length Feet: Width Feet:				
	CERTIFICATION DATE/INITIALS:				
	RECERTIFICATION DATE/INITIALS:				

All Visual Indicators must either have a Y or NA marked. If an N is marked on the checklist, the RI may not be reported until the deficiency is addressed.

Additional Notes/Documentation about RI:

RI-13,14: CONVERSION TO PASTURE OR HAYLAND Resource Improvement Practice Definition

Reportable Units: Acres

DEFINITION

Conversion of cropland to pasture or hayland for the purpose of forage production through the establishment of native or introduced forage species.

PURPOSES

This practice may be applied to establish forage species for the purposes of forage production, primarily intended for grazing or harvesting, which may balance forage supply, reduce soil erosion and improve water quality.

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied on cropland or other agricultural lands where forage production is feasible or desired. This only applies where grazing or harvesting is the primary consideration.

CRITERIA

Select forage species for planting based on the intended use, realistic yield goals, maturity stages, compatibility with other species, and level of management that the client is willing and able to provide. This is intended for multi-year hay crops with a minimum life span of at least 3 years.

Select plants that will provide adequate perennial ground cover of at least 75% cover, root mass, and resistance to water flow when site conditions require erosion protection.

Removal of herbage should be consistent with site production limitations, rate of plant growth, and the physiological needs of specific forage plants to maintain plant reserves for regrowth, winter survival, and drought survival.

OPERATION AND MAINTENANCE

Re-verification of the plantings is required at least every 3 years for practices meeting RI specifications.

SUPPORTING DATA AND DOCUMENTATION

Complete accompanying checklist; Visual Documentation of the practice (picture or drawing); and document on conservation plan map or aerial photo of farm.

Reference Practices: CBP- Land Retirement to Pasture (LandRetirePast), Land Retirement to Hay Without Nutrients (LandRetireHYO); NRCS- 512 Forage and Biomass Planting

RI-13,14: Conversion to Pasture or Hayland Example Checklist Verification Date:

Cooperator Name, Address, and Phone #	FSA Farm / Tract Field Number:	SCD	Inspection Type ☐ Initial Inspection ☐ QA Spot Check ☐ Re-verify ☐ Other _____

	RI-13,14 Practice: Conversion to Pasture or Hayland				Supporting Data & Documentation:
	Life span: 3 years	Y	N	N/A	
	RI-13,14 Visual Indicators				
1	Lime & fertilizer rates are applied according to state regulations				Owner Interview
2	75% perennial grass cover is established and maintained as “pasture or hayland in good condition"				Visual Observation
3	Plants are either native or non-invasive introduced				Visual Observation
	Meets RI-13,14 Visual Indicators				
	RI Installation Date:				
	RI-13,14 Reportable Units: Acres				
	RI-13=Conversion to Pasture Acres:				
	RI-14=Conversion to Hayland Acres:				
	CERTIFICATION DATE/INITIALS:				
	RECERTIFICATION DATE/INITIALS:				

All Visual Indicators must either have a Y or NA marked. If an N is marked on the checklist, the RI may not be reported until the deficiency is addressed.

Additional Notes/Documentation about RI:

RI-15: Rotational Grazing Resource Improvement Practice Definition

Reported Units: Acres

DEFINITION

Managing the controlled harvest of vegetation with grazing animals.

PURPOSES

This practice utilizes a range of pasture management and grazing techniques to improve the quality and quantity of the forages grown on pastures and reduces the impact of animal travel lanes, animal concentration areas or other degraded areas.

CONDITIONS WHERE PRACTICE APPLIES

This practice may be applied as a part of conservation management system to achieve one or more of the following:

- Improve or maintain desired species composition and vigor of plant communities.
- Improve or maintain quantity and quality of forage for grazing animals' health and productivity.
- Improve or maintain surface and/or subsurface water quality and quantity.
- Improve or maintain riparian and watershed function.
- Reduce accelerated soil erosion, and maintain or improve soil condition.

CRITERIA

Frequency and intensity of grazing shall be managed to promote ecologically and economically stable plant communities (of at least 75% perennial grass cover) that meet the producer's objectives. Use stubble height target levels in conjunction with monitoring to help ensure that resource conservation and producer objectives are met.

Minimize concentrated livestock areas, trailing, and trampling to reduce soil compaction, excess runoff and erosion. Pasture fencing layouts shall provide laneways that are least prone to livestock trail erosion and provide protection to sensitive areas, such as wetlands.

Provide all livestock on pasture with free access to clean water.

OPERATION AND MAINTENANCE

Apply prescribed grazing on a continuing basis throughout the occupation period of all grazing units. Adjust intensity, frequency, timing and duration of grazing and/or browsing to meet the desired objectives for the plant communities and the associated resources, including the grazing and/or browsing animal.

Manage kind of animal, animal number, grazing distribution, fencing, length of grazing and/or browsing periods and timing of use to provide grazed plants sufficient recovery time to meet planned objectives. The recovery period of non-grazing can be provided for the entire year or during the growing season of key plants.

Re-verification of the grazing system is required at least every 3 years for practices meeting RI specifications.

SUPPORTING DATA AND DOCUMENTATION

Complete accompanying checklist; Visual Documentation of the practice (picture or drawing); and document on conservation plan map or aerial photo of farm.

Reference Practices: CBP- Prescribed Grazing (PrecRotGrazing); NRCS-528 Prescribed Grazing

RI-15: Rotational Grazing Example Checklist Verification Date:

Cooperator Name, Address, and Phone #	FSA Farm / Tract Field Number:	SCD	Inspection Type ☐ Initial Inspection ☐ QA Spot Check ☐ Re-verify ☐ Other _____

	RI-15 Practice: Rotational Grazing				Supporting Data & Documentation:
	Life span: 3 years	Y	N	N/A	
	RI-15 Visual Indicators				
1	75% perennial grass cover is maintained in all grazing areas through the appropriate use of fencing as needed				Visual Observation
2	Livestock have limited (restricted) access to streams, seeps, ponds, and other surface waters in compliance with state regulations				Visual Observation
3	Livestock have close access to clean water, which meets their average daily water requirements				Visual Observation
4	Grazing system (watering, feeding and HUA's) minimizes erosion and protects sensitive areas				Visual Observation
5	Nutrient Management is applied in accordance with state regulations				Owner Interview
6	Owner has a grazing objective for all grazing units and manages the grass height				Visual Observation of grass height and Owner Interview
7	Landowner has a plan for movement of animals to maintain appropriate forage cover				Owner Interview
	Meets RI-15 Visual Indicators				
	RI-15 Installation Date:				
	RI-15 Reportable Units:				
	Acres:				
	CERTIFICATION DATE/INITIALS:				
	RECERTIFICATION DATE/INITIALS:				

All Visual Indicators must either have a Y or NA marked. If an N is marked on the checklist, the RI may not be reported until the deficiency is addressed.

Additional Notes/Documentation about RI:

RI-16: BARNYARD CLEAN WATER DIVERSION Resource Improvement Practice Definition

Reported Unit: Number of Systems

DEFINITION

This practice includes the installation of practices to control clean water runoff from barnyard areas, such as roof runoff control, diversion of clean water from entering the barnyard and control of runoff from barnyard or poultry barn areas. This is not associated with dirty water that requires treatment before release.

PURPOSES

To prevent roof runoff water from mixing with barnyard wastes and/or to divert clean water away from the barnyard or areas of heavy animal concentration to prevent erosion or pollutants (nutrients, sediment, and animal wastes) from reaching the waters of the State.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to situations where roof runoff or clean water needs to be diverted away from structures, poultry houses or contaminated areas, such as barnyards or other concentrated animal areas. Such structures include, but are not limited to, erosion-resistant channels or subsurface drains with rock-filled trenches along building foundations below eaves, roof gutters, downspouts, and appurtenances.

CRITERIA

Roof gutters should have a minimum top width of 5 inches and supports no greater than 24 inch spacing.

All downspouts, gutters and outlets should be protected from damage by livestock and equipment.

The water from roof runoff structures may empty into surface drains or underground outlets, or onto the ground surface and should be directed away from foundations, structures or contaminated areas.

Stone filled trenches with an underground outlet, under the roof drip line, may be used in lieu of roof gutter. Locate the trench so the trench centerline follows the roof drip line.

OPERATION AND MAINTENANCE

Inspect collection and storage devices, valves, outlets and pipelines at least biannually. Make repairs as needed.

Re-verification of the barnyard or poultry barn runoff control structures is required at least every 5 years for practices meeting RI specifications.

SUPPORTING DATA AND DOCUMENTATION

Complete accompanying checklist; Visual Documentation of the practice (picture or drawing); and document on conservation plan map or aerial photo of farm.

Reference Practices: CBP- Barnyard Runoff Control (BarnRunoffCont); NRCS-558 Roof Runoff Structure

RI-16: Barnyard Clean Water Diversion Example Checklist Verification Date:

Cooperator Name, Address, and Phone #	FSA Farm / Tract Field Number:	SCD	Inspection Type ☐ Initial Inspection ☐ QA Spot Check ☐ Re-verify ☐ Other _____

	RI-16 Practice: Barnyard Clean Water Diversion				Supporting Data & Documentation:
	Life span: 5 years	Y	N	N/A	
	RI-16 Visual Indicators				
1	Surface outlet is stable; downspouts have elbow and dissipation device directed away from buildings, as appropriate.				Visual Observation
2	Gutter-less system has stone-filled, collection trench under entire roof drip line: width ≥ 24", depth ≥ 24"				Visual Observation Owner interview
3	Drip line stone extends along sides of and over pipe				Visual Observation
4	Gutter is K-style, half-round or box-type on good-condition vertical fascia board, free floating on supports, and ≥ 5" top width. Roof rafter ends are sound				Visual Observation
5	Downspout avoids mix with waste				Visual Observation
6	The system is sound and functioning				Visual Observation
7	Downspouts are securely fastened @ top & bottom, with intermediate supports ≤ 10', installed appropriately				Visual Observation
8	Gutter & downspout are protected from livestock. Otherwise made of steel pipe, Sch40, or similar				Visual Observation
9	Clean surface runoff is directed away from barnyard area				Visual Observation
	Meets RI-16 Visual Indicators				
	RI-16 Installation Date:				
	RI-16 Reportable Units:				
	Number of Systems:				
	CERTIFICATION DATE/INITIALS:				
	RECERTIFICATION DATE/INITIALS:				

All Visual Indicators must either have a Y or NA marked. If an N is marked on the checklist, the RI may not be reported until the deficiency is addressed.

Additional Notes/Documentation about RI:

RI-17: WATER CONTROL STRUCTURE Resource Improvement Practice Definition

Reported Unit: Number of Systems

DEFINITION
A structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation in **drainage ditches for water de-nitrification purposes.**

PURPOSES
The purpose of this practice is to reduce nutrient loading from agricultural drainage systems into downstream receiving waters.

CONDITIONS WHERE PRACTICE APPLIES
This practice applies wherever a permanent structure is needed as an integral part of a water control system to serve one or more of the following functions:

1. To control the elevation of water in drainage or irrigation ditches. Typical structures: checks, flashboard risers, check dams.

2. To control the water table level, remove surface or subsurface water from adjoining land, flood land for frost protection or manage water levels for wildlife or recreation. Typical structures: water level control structures flashboard risers, pipe drop inlets, and box inlets

3. To provide silt management in ditches or canals. Typical structure: sluice.

CRITERIA
Structures should be designed and installed consistent with all federal and state rules and regulations.

The structure capacity shall be appropriate for the intended practice or purpose.

The structure shall be fenced, if necessary, to protect the vegetation from grazing livestock.

Protect outlets to the extent that design flows will not result in erosion downstream of the structure.

OPERATION AND MAINTENANCE
Structures will be checked and necessary maintenance, including removal of debris, shall be performed after major storms and at least semiannually. Water level management and timing shall be adequately described wherever applicable.

Re-verification of the water control structure is required at least every 5 years for practices meeting RI specifications.

SUPPORTING DATA AND DOCUMENTATION
Complete accompanying checklist; Visual Documentation of the practice (picture or drawing); and document on conservation plan map or aerial photo of farm.

Reference Practices: CBP- Water Control Structures (WaterContStruc); NRCS-587 Structures for Water Control

RI-17: Water Control Structure Example Checklist Verification Date:

Cooperator Name, Address, and Phone #	FSA Farm / Tract Field Number:	SCD	Inspection Type ☐ Initial Inspection ☐ QA Spot Check ☐ Re-verify ☐ Other _____

	RI-17 Practice: Water Control Structure				Supporting Data & Documentation:
	Life span: 5 years	Y	N	N/A	
	RI-17 Visual Indicators				
1	No active erosion on ditch banks or at the structure				Visual Observation
2	Structure has no effect on septic filter fields				Visual Observation
3	No un-approved backwater on neighbors				Visual Observation
4	Structure complies with applicable federal, state and local regulations				Visual Observation
5	Outlet is protected if necessary				Visual Observation
6	Inlets have non-clog trash rack if needed				Visual Observation
7	Structure is function correctly and managed for intended use				Visual Observation
	Meets RI-17 Visual Indicators				
	RI-17 Installation Date:				
	RI-17 Reportable Units:				
	Number of Systems:				
	CERTIFICATION DATE/INITIALS:				
	RECERTIFICATION DATE/INITIALS:				

All Visual Indicators must either have a Y or NA marked. If an N is marked on the checklist, the RI may not be reported until the deficiency is addressed.

Additional Notes/Documentation about RI:

RI-18: WATERING TROUGH Resource Improvement Practice Definition

Reported Unit: Number of Systems

DEFINITION

A permanent or portable device to provide an adequate amount and quality of drinking water for livestock.

PURPOSES

To provide watering facilities which will bring about the desired protection of vegetative cover to prevent erosion and pollutants (nutrients, sediment, and animal wastes) from reaching the waters of the State. The primary purpose is not to provide livestock water, but to improve animal distribution to protect water quality.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all land uses where there is a need for alternative watering facilities for livestock. The source of water supplied to the facilities can be from any source including pipelines, spring developments, water wells, and ponds.

CRITERIA

Locate facilities to promote even grazing distribution and reduce grazing pressure on sensitive areas.

Provide fencing as necessary to exclude livestock from sensitive areas and encourage use of facility.

Locate as far away from streams and drainage ways as practical.

Design the watering facility to provide adequate access for the animals planned to use the facility.

Install troughs on sites that are well drained, or provide drainage.

OPERATION AND MAINTENANCE

Inspect collection and storage devices, valves, outlets and pipelines at least biannually. Make repairs as needed.

Check valves, automatic water level devices, and overflow pipes for proper operation as appropriate.

Re-verification of the watering facilities is required at least every 5 years for practices meeting RI specifications.

SUPPORTING DATA AND DOCUMENTATION

Complete accompanying checklist; Visual Documentation of the practice (picture or drawing); and document on conservation plan map or aerial photo of farm.

Reference Practices: CBP- Off Stream Watering Without Fencing (OSWnoFence); NRCS-614 Watering Facility

RI-18: Watering Trough Example Checklist Verification Date:

Cooperator Name, Address, and Phone #	FSA Farm / Tract Field Number:	SCD	Inspection Type ☐ Initial Inspection ☐ QA Spot Check ☐ Re-verify ☐ Other _____

	RI-18 Practice: Watering Trough				Supporting Data & Documentation:
	Life span: 5 years	Y	N	N/A	
	RI-18 Visual Indicators				
1	There is an adequate water supply				Owner interview
2	Area around trough does not create a resource concern				Visual Observation
3	Automatic water level control is functioning without overtopping				Visual Observation
4	Overflow is piped to acceptable outlet				Visual Observation
5	Backflow prevention is installed and working, where connected to wells, domestic or municipal water systems and meets state and local regulations				Visual Observation
	Meets RI-18 Visual Indicators				
	RI-18 Installation Date:				
	RI-18 Reportable Units:				
	Number of Systems:				
	CERTIFICATION DATE/INITIALS:				
	RECERTIFICATION DATE/INITIALS:				

All Visual Indicators must either have a Y or NA marked. If an N is marked on the checklist, the RI may not be reported until the deficiency is addressed.

Additional Notes/Documentation about RI:

Appendix A: USDA, NRCS Letter of Support

USDA
United States Department of Agriculture

MAR 2 0 2014

SUBJECT: Chesapeake Bay Functional Equivalent Technical Review Panel

TO: Jack Bricker, Virginia State Conservationist
Denise Coleman, Pennsylvania State Conservationist
Jon Hall, Maryland State Conservationist
Don Pettit, New York State Conservationist
Kasey Taylor, Delaware State Conservationist
Kevin Wickey, West Virginia State Conservationist

File Code: 120

The issues surrounding counting and assigning value to conservation treatments and practices in the Chesapeake Bay Model are important. Clearly all efforts towards conservation on the land have some value. The outcome of this effort, as we understand it, is to further define and credit voluntary non-cost shared treatment on the land by accurately assessing and accounting for this treatment. Establishing a measure of credit in the Bay Model for voluntary non-cost shared treatment would be the next step.

The NRCS members of the review panel are being tasked with:

A) Reporting of non-cost shared practices that meet NRCS standards:
   1) How do you develop a distinct definition for a non-cost shared practice that meets NRCS standards that is more descriptive than what the Bay program currently has?

   2) How do you document that it has been verified?

B) Defining "functionally equivalent" practices. Once you settle on the "definition", each state will also have to develop a method to verify these and document procedure.

Guidance: NRCS Standards are described in the "Field Office Technical Guide." Conservation practices identified as implemented in Toolkit meet NRCS standards. At a minimum this requires NRCS employees or partners with specific Job Approval Authority (JAA). NRCS fully support the jurisdictions effort to identify freestanding non-cost shared conservation practices that meet NRCS standards and allowing them to receive "credit" in the Bay model in the same manner as cost-shared practices.

Specific conservation practices require significant engineering or management with technical assistance. After the fact installation (without technical assistance) of conservation practices, would seriously hamper any effort to verify if a conservation treatment meets standards and specs. This does not disallow some form of credit and it is within the full purview of the jurisdiction to determine the credit. These conservation treatments should not be associated as meeting NRCS standard and specs.

Natural Resources Conservation Services
1400 Independence Ave., SW Room 5204
Washington, DC 20250
Voice: 202-690-2196
An Equal Opportunity Provider and Employer

Summary:

- We believe that this proposal is in alignment with Executive Order 12508 on the Chesapeake Bay in which USDA agreed to assist states to get a full accounting of conservation practices both cost and non-cost shared practices (sometimes called voluntary practices) that have been implemented in the Bay Region.

- NRCS is not funded or staffed appropriately to have an authentication or validation role for freestanding conservation treatments.

- We are willing to discuss this effort in an advisory capacity to achieve comprehensive Bay model credit for applied conservation treatment of identified resource concerns. This includes the consideration of human concerns toward achieving sustainable agriculture; consideration for the effects of planned actions on interrelated geographical areas within Bay watershed; and identifying areas where knowledge, science, and technology need to be advanced.

- As stated above, the issues surrounding counting and assigning value to conservation treatments and practices in the Chesapeake Bay Model are important. All efforts achieving conservation on the land have some value and should be identified by the jurisdictions.

Richard Sims
Regional Conservationist, Northeast

James E. Tillman, Sr.
Regional Conservationist, Southeast

cc:
Leonard Jordan, Associate Chief for Conservation, Washington, DC
Martin Lowenfish, Team Leader, Initiatives, Washington, DC

APPENDIX B: Verification Methods/RI Practices and Documentation

Agricultural BMP Verification Methods	Assessment Method	Verification Expectation	Resource Improvement (Non-Spec)	Eligible RI Practices	Documentation Necessary
1.) Permit Issuing Programs	Verified compliance with federal NPDES (CAFO) or state agricultural operational permit program requirements.	Non-annual frequency of permit compliance inspections for all or sufficient statistical percentage of permitted operations during permit life span. Review of office/farm records.	Not Eligible	N/A	
2.) Regulatory Programs	Verified compliance with federal or state agricultural regulatory requirements (non-operational permit).	Non- annual frequency of regulatory compliance inspections for all or sufficient statistical percentage of regulated operations. Review of office/farm records.	Not Eligible	N/A	
3.) Financial Incentive Programs	Verified compliance with federal program contractual requirements.	Non- annual frequency of contractual compliance inspections for all or sufficient statistical percentage of contracted operations during contractual life span. Review of office/farm records.	Not Eligible	N/A	
4.) Financial Incentive Programs	Verified compliance with state or county program contractual requirements.	Non-annual frequency of contractual compliance inspections for all or sufficient statistical percentage of contracted operations during contractual life span. Review of office/farm records.	Potentially Eligible	All RI Practices are eligible if done in accordance with state or county funding requirements and meet RI Visual Indicators.	Visual Indicator Checklist; photo/description; Location documentation

5.) Financial Incentive Programs	Verified compliance with NGO program contractual requirements.	Non-annual frequency of contractual compliance inspections for all or sufficient statistical percentage of contracted operations during contractual life span. Review of office/farm records.	Potentially Eligible	All RI Practices are eligible if done in accordance with NGO funding requirements and meet RI Visual Indicators.	Visual Indicator Checklist; photo/description; Location documentation provided to certifying entity.
6.) Farm Inventory	Farm inventory by trained and certified federal, state, and/or county agency personnel.	Non-annual frequency of inventories for all or sufficient statistical percentage of operations during BMP life span. Review of office/farm records.	Eligible	All RI Practices are eligible if they meet RI Visual Indicators.	Visual Indicator Checklist; photo/description; Location documentation
7.) Farm Inventory	Farm inventory by trained and certified NGO personnel.	Non-annual frequency of inventories for all or sufficient statistical percentage of operations during BMP life span. Review of office/farm records.	Eligible	All RI Practices are eligible if they meet RI Visual Indicators.	Visual Indicator Checklist; photo/description; Location documentation provided to certifying entity.
8.) Farm Inventory	Farmer completes self-certified inventory survey and trained and certified federal, state and/or county personnel verify on-site.	Non-annual frequency of inventories for all or sufficient statistical percentage of operations during BMP life span. Review of office/farm records.	Eligible	All RI Practices are eligible if they meet RI Visual Indicators.	Visual Indicator Checklist; photo/description; Location documentation provided to certifying entity.
9.) Farm Inventory	Farmer completes self-certified inventory survey and trained and certified NGO personnel verify on-site.	Non-annual frequency of inventories for all or sufficient statistical percentage of operations during BMP life span. Review of office/farm records.	Eligible	All RI Practices are eligible if they meet RI Visual Indicators.	Visual Indicator Checklist; photo/description; Location documentation provided to certifying entity

10.) Farm Inventory	Farmer completes in-office self-certified inventory with assistance of trained and certified federal, state and/or county agency personnel. No on-site verification.	Non-annual frequency of inventories for all or sufficient statistical percentage of operations during BMP life span. Review of office/farm records.	Not Eligible	N/A	
11.) Farm Inventory	Farmer completes in-office self-certified inventory with assistance of trained and certified NGO personnel. No on-site verification.	Non-annual frequency of inventories for all or sufficient statistical percentage of operations during BMP life span. Review of office/farm records.	Not Eligible	N/A	
12.) Farm Inventory	Farmer with training and certification completes self-certified inventory survey.	Non-annual frequency of inventories for all or sufficient statistical percentage of operations during BMP life span.	Not Eligible	N/A	
13.) Farm Inventory	Farmer without training and certification completes self-certified inventory survey.	Non-annual frequency of inventories for all or sufficient statistical percentage of operations during BMP life span.	Not Eligible	N/A	
14.) Office Records	Review of existing office records by trained and certified federal, state and/or county agency personnel. No on-site verification.	Non-annual frequency of office records review and verification for all or sufficient statistical percentage of operations during BMP life span.	Not Eligible	N/A	
15.) Farm Records	Review of existing on-farm records by trained and certified federal, state and/or county agency personnel. No on-site verification.	Non-annual frequency of on-farm records review and verification for all or sufficient statistical percentage of operations during BMP life span.	Not Eligible	N/A	

16.) Farm Records	Review of existing on-farm records by trained and certified NGO personnel. No on-site verification.	Non-annual frequency of on-farm records review and verification for all or sufficient statistical percentage of operations during BMP life span.	Not Eligible	N/A	
17.) Transect Survey	Statistically designed and recognized transect survey completed by trained and certified federal, state and/or county personnel.	Non-annual frequency of statistical transect surveys for a sufficient statistical percentage of operations during BMP life span.	Not Eligible	N/A	
18.) Transect Survey	Statistically designed and recognized transect survey completed by trained and certified NGO personnel.	Non-annual frequency of statistical transect surveys for a sufficient statistical percentage of operations during BMP life span.	Not Eligible	N/A	
19.) CEAP Survey	CEAP statistical survey conducted in-person at field-level scale following NASS verification protocols.	Non-annual frequency of statistical CEAP surveys for a sufficient statistical percentage of operations during BMP life span may limit verification.	Potentially Eligible	All RI Practices are eligible if they meet RI Visual Indicators.	NRCS/NASS provide Visual Indicator Checklist; photo/description; Location documentation certifying entity.
20.) NASS Survey	NASS statistical survey conducted at farm-level scale following NASS verification protocols.	Non-annual frequency of statistical NASS surveys for all or sufficient statistical percentage of operations during BMP life span.	Potentially Eligible	All RI Practices are eligible if they meet RI Visual Indicators.	NASS provides Visual Indicator Checklist; photo/description; Location documentation to certifying entity.
21.) NRI Point (NRCS) or some other statistically selected sites	Statistical survey conducted in-person at field-level with NASS trained and certified personnel.	Non-annual frequency of statistical NRI surveys for a sufficient statistical percentage of operations during BMP life span may limit verification.	Potentially Eligible	All RI Practices are eligible if they meet RI Visual Indicators.	NRCS provides Visual Indicator Checklist; photo/description; Location documentation to certifying entity.

22.) Remote Sensing	Statistically designed and recognized remote sensing surveys with supporting field-level scale ground-truthing verification.	Non-annual frequency of statistical remote sensing surveys implemented by trained and certified agency personnel, for all or sufficient statistical percentage of operations during BMP life span.	Potentially Eligible	All RI Practices are eligible if RI Visual Indicators and can be identified by approved methodology and remote sensing signatures.	Inventory Entity provides Visual Indicator Checklist; photo/description; Location documentation to certifying entity
23.) Remote Sensing	Statistically designed and recognized remote sensing surveys with supporting field-level scale ground-truthing verification.	Non-annual frequency of statistical remote sensing surveys implemented by trained and certified NGO personnel, for all or sufficient statistical percentage of operations during BMP life span.	Potentially Eligible	All RI Practices are eligible if RI Visual Indicators and can be identified by approved methodology and remote sensing signatures.	Inventory Entity provides Visual Indicator Checklist; photo/description; Location documentation to certifying entity

APPENDIX C:

ANIMAL UNIT EQUIVALENCIES

One animal unit is generally defined as 1,000 pounds of live animal weight. The numbers given below represent averages for different types of livestock. It may serve as a guideline for the number of animals of a certain type that would constitutes eight animal units for purposes of nutrient management regulations. If actual weights are available from a certified scale, use them. For animals not listed here, contact MDA for guidance on weight calculations.

Animal type	Animal weight (average in pounds)	Number of animals that would equal 8 animal units (AU)
Horses (any animal 3 months or older)	1,000	8
Feed Cattle	1,000	8
Dairy Cattle	1,000	8
Sheep	200	40
Goat	89	90
Alpaca	107	75
Llama	320	25
Emu	133	60
Ostrich	267	30
Broilers/fryers	4	2,000
Ducks	7	1,200
Geese	12	650
Turkeys	19	425

Source: Maryland Dept. of Agriculture 2000

ATTACHMENT I: WVDA FIELD REFERENCE MANUAL

Instruction Manual for Tracking, Reporting and Verification of Agricultural Best Management Practices in West Virginia

May 2015

Alternative Watering Facility

Alternative watering facilities typically involves the use of permanent or portable live- stock water troughs placed **away from the stream corridor**. The source of water supplied to the facilities can be from any source including pipelines, spring developments, water wells, and ponds. In-stream watering facilities such as stream crossings or access points are not considered in this definition.

Units: AUs/# of livestock, systems, or acres

Effectiveness: TN: 5%, TP: 8%, TSS: 10%

NRCS practice(s) counted : 614 (Watering Facility),

NRCS 614 Watering Facility

Please record the number of animals serviced by facility and any design specs. ie concrete, trough, etc.

Definition- a permanent or portable device to provide an adequate amount and quality of drinking water for **livestock** and/or wildlife.

Purpose- to provide access to drinking water for livestock in order to: meet daily water requirements and/or ***improve animal distribution.*** *(The latter is the focus of tracking because the practice has to have an effect on reducing nutrients and sediments to the Bay).*

Design Highlights-

Locate facilities to promote even grazing distribution and reduce grazing pressure on sensitive areas. If possible, located in fence lines to provide water to more than one field.

Allow for adequate access to the animals planned to use the facility.

Minimum trough/tank capacity will be 100 gallons or three days

storage volume accumulation.

Automatic watering devices can be used if freeze protection, electrical requirements, necessary water pressure and a backup water source can be met.

Suitable foundation of bedrock, compacted gravel, or well compacted soils.

Designed and installed to prevent overturning by wind and animals.

Automatic water level control and overflow facilities shall be

provided.

Heavy equipment tires are allowed.

Pipes of minimum diameter of 1 ¼ inches for gravity flow systems and ¾ inches for pumped pressure systems.

Concrete troughs or tanks should have a minimum wall and bottom thickness of 4".

Portable troughs or tanks will only be used as part of an intensive grazing system.

O &M to include monitoring, checking for leaks, ensure protected against erosion, and periodic cleaning.

Barnyard Runoff Control

Installation of practices to control runoff from barnyard areas. Roof runoff control, diversion of clean water from entering the barnyard and control of runoff from barnyard areas.

Units: Systems AUs/Feet

Effectiveness: TN: 20%,

TP: 20%, TSS: 40%

NRCS practice(s) counted : 558 (Roof runoff management), 575 (Animal trails and walkways) applicable to keep livestock away from the system.

NRCS 558 Roof Runoff Structure

Please record feet of gutter. If landowner is unable to recall or estimate feet of gutter, please record length and width of building and estimate feet of gutter.

Definition-structures that collect, control and transport precipitation from roofs to keep “clean water” “clean.”

Purpose- to improve water quality, reduce soil erosion, increase infiltration, protect structures, and increase water quantity. Applies to areas where roof runoff from precipitation needs to be diverted away from structures or contaminated areas, collect, controlled, and transported to a stable outlet, or collected and used for other purposes such as irrigation or animal watering facility.

Design Highlights:

Roof gutters and downspouts may be made of aluminum, galvanized steel, wood or plastic. Wood may be redwood, cedar, or cypress.

The discharge area for runoff must slope away from the protected structure.

Avoid discharging outlets near wells and sinkholes.

O&M to keep gutters clean and free of obstructions and perform regular inspections.

Conservation Tillage

Any tillage and planting system in which at least thirty percent of the soil surface is covered by plant residue to reduce soil erosion and improve the quality of surface water. This also includes using a non-inversion tillage method.

Units: Acres

Effectiveness: Landuse change

NRCS practice(s) counted: 329 (Residue and Tillage Management, No-Till/Strip Till/Direct Seed); 344 (Residue Management, Seasonal); 345 (Residue and Tillage Management, Mulch Till)

NRCS 329 Residue and Tillage Management

No-Till/Strip Till/Direct Seed

This standard is used as a baseline for the Chesapeake Bay BMP of Continuous No-Till. However, in order to record this practice under Continuous No-Till, the field will have to be under no till for *5 consecutive years.* Please note the number of years in no till for each field.

Definition- managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting soil disturbing activities to only those necessary to place nutrients, condition residue and plant crops.

Purpose- reduce sheet and rill erosion, reduce wind erosion, and reduce CO2 losses from the soil.

Design Highlights:

May be referred to as no till, strip till, direct seed, zero till, slot till or zone till

Approved implements are no-till and strip-till planters, certain drills and air seeders, strip type fertilizer and manure injectors and applicators, in row chisels.

All residues shall be uniformly distributed over the entire field.

No full width tillage shall be performed regardless of the depth of the tillage operation.

Must maintain a 50% residue cover.

Weeds and pests are managed through chemical methods or field borders.

Cover Crops

(Non-harvested) cover crops specifically designed for nutrient removal. Seeded into crop residue with little or no disturbance of soil. Burned or plowed down in the spring. Acres of cover crops that receive manure are not eligible. The crops capable of nutrient removal include: **rye, wheat, barley, radishes, triticale and oats.** There is no BMP reduction credit for legume cover crops such as clover and vetch that fix their own nitrogen from the atmosphere.

Units: Acres

Effectiveness: Varies greatly

NRCS practice(s) counted: 340 (Cover crops)

NRCS 340 Cover Crop

Please list the type of cover crop used, planting date, killing date, fields, manure or fertilizer application and how many years cover crops have been used in that field, and how it is used, i.e. commodity, green manure etc.

Definition- Crops including grasses, legumes and forbs for seasonal cover and other conservation purposes.

Purpose- reduce erosion from wind and water, increase organic matter, capture and recycle or redistribute nutrients in the soil profile, promote biological nitrogen fixation, increase biodiversity, weed suppression, provide supplemental forage, soil moisture management, minimize and reduce soil compaction.

Design Highlights:

Terminated by harvest, frost, mowing, tillage, crimping, or herbicides in preparation for following crop.

Maintained proper vegetative density.

Timed so that soil will be adequately protected during the critical erosion periods.

Forage provided by the cover crop may be hayed or grazed as long as sufficient biomass is left for resource protection.

Uses grasses to utilize more soil nitrogen and legumes utilize both nitrogen and phosphorus.

Commodity Cover Crops

Commodity cover crops differ from cereal cover crops in that they may be harvested for grain, hay or silage and they may receive nutrient applications, but only after March 1 of the spring following their establishment. The intent of the practice is to modify normal small grain production practices by eliminating fall and winter fertilization so that crops function similarly to cover crops by scavenging available soil nitrogen for part of their production cycle.

Units: Acres

Effectiveness: Varies

No corresponding NRCS code. Use 340 as a guide.

Grass Buffer

Grass plantings between fields and rivers and streams. Linear strips of vegetation along rivers and streams, helping to filter nutrients, sediment, and other pollutants carried in runoff. Min width = 35', recommended 100'. Record length and width!

Units: Acres

Effectiveness: TN: 13-46% (4x acres), TP: 30-45% (2x acres), TSS: 40-60% (2x acres)

NRCS practice(s) counted: 390 (Riparian Her- baceous Cover), 393 (Filter Strip), 412 (Grassed Waterway)

Photo courtesy of USDA NRCS

NRCS 390 Riparian Herbaceous Cover

Please record length and width of buffer, type of vegetation and include a picture.

Definition- grasses, grass like plants and forbs that are tolerant of intermittent flooding or saturated soils and that are established or managed in the transitional zone between terrestrial and aquatic habitats.

Purpose- to improve and protect water quality by reducing the amount of sediment and other pollutants in surface runoff as well as nutrients and chemicals in shallow ground water flow. Help stabilize stream bank and shorelines.

Design Highlights:

35 foot width

Applies only to land adjacent to water sources, water bodies and wetlands.

> Does NOT apply to: woody establishments-Riparian
>
> Forest Buffer applicable and plantings intended to remove large amounts of sediments and other pollutants-Filter Strip applicable.

Reduce or exclude grazing or haying on vegetation until it is established. Both practices are allowed so long as to exclude them when the site is saturated and vulnerable to livestock or mechanical damage.

O&M to reduce weeds, manage vegetation, remove storm debris, grazing, haying, control of concentrated flow erosion and fertilizer/pesticides.

See NRCS Practice 393, Filter Strip, and 412, Grassed Waterway, for guide on vegetation. However if a BMP meets these standards, it is not automatically a grass buffer by Chesapeake Bay standards.

NRCS 561 Heavy Use Area Protection

Please record type of material used, area and animal type.

Definition- stabilization of areas frequently and intensively used by people, animals or vehicles by establishing vegetative cover, by surfacing with suitable materials, an/or by installing needed structures.

Purpose- reduce soil erosion, improve water quantity and quality

Design Highlights:

Can include protection for portable hay rings, water troughs, feeding troughs, mineral blocks and other livestock concentration areas

Base foundation of gravel, stone or geotextile material.

Surface Treatment- concrete- minimum 4" thick

Aggregate- fine or coarse aggregate minimum of 2" thick.

Other materials such as cinders, mulch, shredded rubber or sawdust may be used with a minimum 2" thickness.

Vegetative measures may be taken but only for the purpose to provide permanent vegetation and not for grazing of livestock.

Equine exercise lots serving 10 units or less-can't be used as an arena or riding area.

Also see NRCS Practice 528 Prescribed Grazing, 512 Forage and Biomass Planting, and 575 Animal Trails Walkways.

Mortality Composters

A physical structure and process for disposing of dead poultry. Composted material is combined with poultry litter and land applied using nutrient management plan recommendations.

Units: AUs

Effectiveness: TN: 40%,

TP: 10%

NRCS practice(s) counted : 316 (Animal Mortality Facility)

NRCS 316 Animal Mortality Facility

Please record the type of animal, length, width, capacity

Definition- An on farm facility for the treatment of disposal of livestock and poultry carcasses.

Purpose: Part of a conservation management system to support one or more of the following purposes: decrease non-point source pollution of surface and groundwater resources, reduce the impact of odors that result from improperly handled animal mortality, decrease the likelihood of the spread of disease on other pathogens that result from the interaction of animal mortality and predators, to provide contingencies for normal and catastrophic mortality events.

Design Highlights:

Down gradient from a spring or well, out of the floodplain and located to minimize the impact of the facility on odor and other air quality issues. Located on slopes 5% or less. Located as close to the source of mortality as practicable.

Direct surface runoff from the facility and direct contaminated runoff away from the facility.

Minimum 300’ setback from adjacent residences with prevailing wind direction considered.

Compost mix should be 40-65% wet.

Compost mix should reach 130 F for at least 5 days to reduce pathogens.

Incinerators should be located a minimum of 20’ from any structure.

Burial pits are allowed for catastrophic mortality resulting from natural conditions such as temperature and should be sized accordingly. Burial sites should not be located on highly permeable soils and should be covered with a minimum of 2 feet of top soil.

Operators should maintain a list of phone numbers for state and local officials to aid in notification if disease related catastrophic mortality occurs.

Non-urban Stream Restoration

Restoring the natural ecosystem by restoring the stream hydrology and natural landscape. Site specific engineering techniques used to stabilize an eroding stream bank and channel. These are areas not associated with animal entry.

Units: Linear feet

Effectiveness: 0.02 lbs N/ft; 0.003 lbs P/ft; 2lbs Sed/ft

NRCS practice(s) counted : 395 (stream habi- tat improvement and management) 580 (stream bank and shoreline protection)

NRCS 395 Stream Habitat Improvement and Management

Definition- maintain, improve or restore physical, chemical and biological functions of a stream, and its associated riparian zone, necessary for meeting the life history requirements of desired aquatic species.

Purpose- provide suitable habitat for desired aquatic species. Provide stream channel and associated riparian conditions that maintain ecological processes and connections of diverse stream habitat types important to aquatic species.

Design Highlights:

Nutrient Management Plan

Implementation

Application of nutrients to croplands. Details type, rate, timing, and placement of nutrients for each crop. Soil, plant tissue, manure and/or sludge tests used to assure optimal application. Revised every 3 years.

Units: Acres

Effectiveness: N/A

NRCS p ractice(s) counted : 633 (Waste utilization), 590 (Nutrient management)

NRCS 590 Nutrient Management

Record the number of acres under plan and the agency who wrote the plan.

Definition- managing the amount, source, placement, form and timing of the application of nutrients and soil amendments.

Purpose- to minimize ag non-point source pollution of surface and ground water resources. To budget and supply nutrients for plant production. To properly utilize manure or organic byproducts as a plant nutrient source. To protect air quality by reducing nitrogen or particulate emissions to the atmosphere. To maintain or improve the physical, chemical and biological condition of the soil.

Design Highlights:

Plan should specify the form, source, amount, timing and method of application of nutrients on each field to achieve realistic yield goals while minimizing nitrogen and phosphorus movement to surface or ground water.

Current soil test. (Not older than 3 years)

Nutrients shall not be applied to frozen, snow covered, or saturated soil or areas without vegetation.

A manure analysis is required within 1 yr. of the initial plan where book values were used.

Phosphorus movement risk should be assessed based on soil tests and the P-Index when necessary.

Considers site characteristics in relation to applying nutrients, ie sinkholes and streams.

Manure or litter spreader rate calibrations and application rate.

Cropping sequence, realistic yields, and guidance for

implementation and recordkeeping.

Prescribed Grazing

This practice utilizes a range of pasture management and grazing techniques to improve the quality and quantity of the forages grown on pastures and reduce the impact of animal travel lanes, animal concentration areas or other degraded areas. Pastures that meet this BMP must have a vegetative cover of 60% or greater.

Units: Acres

Effectiveness: Varies by geography; TN:9-11%, TP: 24%, TSS: 30%

<u>NRCS practice (s) counted:</u>

528 (Prescribed Grazing)

NRCS 528 Prescribed Grazing

Definition- Managing the controlled harvest of vegetation with grazing animals. Improves or maintains animal distribution.

Purpose- improve or maintain water quality and quantity. Reduce accelerated soil erosion and maintain or improve soil condition. Improve or maintain the health and vigor of plant communities.

Design Highlights:

- Rotational Grazing, continuous grazing, stockpiled/extended grazing or riparian grazing
- A plan should include the following:
    - Contingency plan detailing adjustments to grazing plan in time of drought
    - Grazing height requirement
    - Length of grazing and rest period
    - Number of grazing management units
    - Maximum number of livestock that can be grazing a management unit
- Current soil tests.
- Provide proper facilities for livestock-fencing, watering and pest management of the forages.
- Producer must keep records on all above.

Riparian Forest Buffer

Agricultural riparian forest buffers are linear wooded areas along rivers, streams, and shorelines. Forest buffers help filter nutrients, sediments and other pollutants from runoff as well as remove nutrients from groundwater. Min width 35', recommended 100'. Please record length and width.

Units: Acres implemented

Effectiveness: TN: 19-65% (4x acres), TP: 30-45% (2x acres), TSS: 40-60% (2x acres)

NRCS practice(s) counted : 391 (Riparian Forest Buffer)

NRCS 391 Riparian Forest Buffer

Please record length and width of buffer including those with widths less/more than 35’

Definition- an area of predominantly trees/shrubs located adjacent to and up gradient from watercourses or water bodies.

Purpose- reduce excess amounts of sediment, organic material, nutrients and pesticides in surface runoff and reduce excess nutrients and other chemicals in shallow ground water flow. Reduce pesticide drift entering the water body.

Design Highlights:

Applied to areas adjacent to permanent or intermittent streams, lakes, ponds, and wetlands.

Vegetation can be naturally regenerated or seeded/planted.

Livestock shall be controlled or excluded as necessary to achieve the intended purpose.

Harvesting operations are allowed in the riparian buffer adhering to state law.

Minimum width of 35 feet

O & M to inspect buffer, replace dead trees or vegetation, inspect plant vigor and density, and control invasive weeds.

Stream Protection W/ Fencing

Excluding a strip of land with fencing along the stream corridor to provide protection from livestock. The fenced areas may be planted with trees or grass, or left to natural plant succession, and can be of various widths. Record linear feet and width between fence and stream.

Units: acres

Effectiveness: Varies geographically; TN: 13-46% (4x acres), TP: 30-45% (2x acres), TSS: 40-60% (2x acres)

NRCS practice(s) counted: 472 (Access Control), 580 (Streambank and shoreline protection), 382 (Fence)

NRCS 580 Streambank and Shoreline Protection (ft.)

Record the average width between the streambank and fence and the length of protected streambank.

Definition: Treatment(s) used to stabilize and protect banks of streams or constructed channels, and shorelines of lakes, reservoirs, or estuaries.

Purpose: To maintain the flow capacity, reduce offsite or downstream effects of sediment resulting from bank erosion, improve stream corridor for fish and wildlife, prevent loss of land or damage to land uses.

See 472, Access Control and 382, Fence, for reference in evaluating for stream protection with fencing.

Tree Planting

Any tree plantings on any site except those along rivers and streams. Tree plantings do not include reforestation. Targets land that is highly erodible or identified as critical resource area. Density should be sufficient to produce forest-like cover over time. CRP planting given as an example.

Units: Acres

Effectiveness: Landuse Conversion

NRCS practi ce(s) counted: 612 (Tree/Shrub Es- tablishment)/666 (Forestland Re-established or Improved)

NRCS 612 Tree/Shrub Establishment

Record the number of trees and type of species.

Definition- establishing woody plants by planting seedlings or cutting, direct seeding, or natural regeneration.

Purpose- long-term erosion control and improvement of water quality, treating waste.

Design Highlights:

(Use 391 Forest Riparian Buffer if planting is along a stream.)

Use plantings adapted for site conditions and plant at proper time and space to allow for optimum growth and to achieve the designated purpose.

New plantings should have shelterguards or be staked properly.

Selected species should have extensive root systems.

O&M to maintain the site including control of weeds and replanting.

WASTE STORAGE FACILITY – Livestock

Storage/handling of manure during times when manure is susceptible to runoff. Includes controlling the runoff from roofs, feedlots, and loafing areas. Practices designed for proper handling, storage, and utilization of wastes generated from confined animal operations.

Units: Systems

Effectiveness: TN: 80%,

TP: 80%

NRCS practice(s) counted : 313 (Waste storage facility)

NRCS 313 Waste Storage Facility

Please record number of animals, type of structure, manure stored, size and capacity.

Definition: a waste storage impoundment made by constructing an embankment and/or excavating a pit or dugout, or by fabricating a structure (tanks, stacking facilities and ponds)

Purpose: to temporarily store wastes such as manure, wastewater, and contaminated runoff as a storage function component of an agricultural waste management system.

Design Highlights: Located outside the floodplain and as close to the source of waste and polluted runoff as practicable.

Waste storage ponds should be a minimum of 1,000 feet from a neighboring residence.

The waste material may be manure, wastewater, bedding, feed additives, silage, silage waste, wasted feed, sand etc.

Ramps used to empty liquids shall have a slope of 4 horizontal to 1 vertical or flatter.

Slabs on Grade- Where applied point loads are minimal and liquid-tightness is not required, such as a barnyard and feedlot slabs subject only to precipitation, and the subgrade is uniform and dense, the minimum slab thickness shall be 4 inches with a maximum joint spacing of 10 feet.

Safety measures should be in place to prevent spillage, or accidental release and warning signs should be utilized.

A CNMP should be onsite for the storage facility detailing design storage volume, storage period, inlet structures, emptying facilities, fabricated structure criteria and emergency plans for spills and secondary containment.

Waste Storage Facility Poultry

Storage/handling of manure during times when manure is susceptible to runoff.. Practices designed for proper handling, storage, and utilization of wastes generated from confined animal operations.

Units: Animal Units

Effectiveness: TN: 80%,

TP: 80%

NRCS practic e(s) counted: 313 (Waste storage facility)

Photo courtesy of USDA NRCS

NRCS 313 Waste Storage Facility

Please record number of animals, type of structure, manure stored, size and capacity.

Definition: a waste storage impoundment made by constructing an embankment and/or excavating a pit or dugout, or by fabricating a structure (tanks, stacking facilities and ponds)

Purpose: to temporarily store wastes such as manure, wastewater, and contaminated runoff as a storage function component of an agricultural waste management system.

Design Highlights: Located outside the floodplain and as close to the source of waste and polluted runoff as practicable.

Waste storage ponds should be a minimum of 1,000 feet from a neighboring residence.

The waste material may be manure, wastewater, bedding, feed additives, silage, silage waste, wasted feed, sand etc.

Ramps used to empty liquids shall have a slope of 4 horizontal to 1 vertical or flatter.

Slabs on Grade- Where applied point loads are minimal and liquid-tightness is not required, such as a barnyard and feedlot slabs subject only to precipitation, and the subgrade is uniform and dense, the minimum slab thickness shall be 4 inches with a maxi- mum joint spacing of 10 feet.

Safety measures should be in place to prevent spillage, or accidental release and warning signs should be utilized.

A CNMP should be onsite for the storage facility detailing design storage volume, storage period, inlet structures, emptying facilities, fabricated structure criteria and emergency plans for spills and secondary containment.

Wetland Restoration

Agricultural wetland restoration activities re-establish the natural hydraulic condition in a field that existed prior to the installation of subsurface or surface drainage. Projects may include restoration, creation or enhancement acreage. Any wetland classification including forested, scrub-shrub, or emergent marsh.

Units: Acres

Effectiveness: TN:14%, TP: 26%, TSS: 8%

NRCS practice(s) counted : 646 (Shallow Water Development & Management), 657 (Wetland Restoration)

NRCS 657 Wetland Restoration

Please record size, and take pictures if allowed.

Definition- *the return* of a wetland and its functions to a close approximation of its original condition *as it existed prior to disturbance* on a former or degraded wetland site.

Purpose- to restore wetland function, value, habitat, diversity and capacity to a close approximation of the pre-disturbance conditions by restoring: conditions conducive to hydric soil maintenance, wetland hydrology, native hydrophytic vegetation, and original fish and wildlife habitats.

Design Highlights: ASK: "Was there a wetland on this site historically?"

Only applies to sites with existing hydric soils or sites that were hydric soils but are covered by fill, sediments or other deposits.

This practice does not apply to treat point and non-point sources of water pollution, to modify an existing wetland or return a degraded wetland back to a wetland but to a different type than what previously existed on the site, or to creating a wetland on a site location which historically was not a wetland.

Site should be on hydric soils and appropriate maps and surveys should accompany the plan as well as available water. Steps should be taken to minimize water effects of neighboring residences.

Vegetation should be restored as close to the original plant community as the restored site conditions will allow.

Natural succession should be utilized to the extent possible.

See NRCS Code 657 for further details.

NRCS 472 Access Control (ac)

Definition: The temporary or permanent exclusion of animals, people, vehicles, and/or equipment from and area.

Purpose: Achieve and maintain desired resource conditions by monitoring and managing the intensity of use by animals, people, vehicles or equipment in coordination with the application schedule of practices, measures and activities specified in the conservation plan.

1. Are barriers adequate to prevent, restrict or control use by targeted animals, vehicles or people? Yes____ No____

2. Adequate warnings or markings displayed where there is potential danger with the use of a barrier? Yes___ No___

3. Does the barrier consist of either natural/artificial structures such as logs, vegetation, earth fill, boulders, fences, gates, electronic and sonic devices, signs or removal of the targeted animal? Yes____ No___

4. Are livestock excluded by one of the following: fence (refer to Fence 382), living fence or hedge, other impassable barriers to livestock or animals such as stone/rock barriers and mining high walls, or permanent removal of the targeted animal? Yes____ No____

5. Does the barrier type and design minimize impacts to non-targeted wildlife, animal movement and human health? Yes___ No___

5. Is there an operation and maintenance plan? Yes_____ No___

NRCS 575 Animal Trails and Walkways

Record length and width of trail and surfacing material.

Definition-Established lanes or travel ways that facilitate animal movement.

Purpose- provide or improve access to forage, water, handling facilities or shelter. Improve grazing efficiency and distribution. Protect ecologically sensitive, erosive or potentially erosive sites.

Design Highlights:

Wide enough for animal movement and any machinery if necessary for O&M.

If a vegetative cover is established, should be done according to 342 (Critical Area Planting).

If vegetative cover is not practical, surface protection should be done according to 561 (Heavy Use Area Protection).

Animals should not be allowed on the walkway until appropriate vegetative cover is established.

O&M of re-shaping trails, addition of surfacing materials, reseeding, removal of manure and mending fences.

NRCS 393 Filter Strip

Record length, width and plantings. Describe management of species and condition.

Definition: a strip or area of herbaceous vegetation that removes contaminants from overland flow.

Purpose: reduce suspended solids and associated contaminants in runoff. Reduce dissolved contaminant loadings in runoff. Reduce suspended solids and associated contaminants in irrigation tail water.

Practice Information:

This practice does not apply to components of a waste management system, the treatment of runoff from such areas as feedlots, barnyards, and other livestock holding areas.

Design Highlights:

Overland flow entering the filter strip shall be primarily sheet flow. Concentrated flow shall be dispersed.

Minimum flow length through the filter strip shall be 20 ft.

The drainage area above the filter strip shall have a slope of 1% or greater.

Vigorous vegetative cover and density shall be established and maintained as well as maintenance of noxious weeds. Frequent vehicular and livestock traffic shall be excluded.

NRCS 512 Forage and Biomass Planting

Record planting species type

Definition- Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay or biomass production.

Purpose- reduce soil erosion, improve soil and water quality.

Design Highlights:

Do not plant noxious weeds.

Variety of legumes where appropriate.

Apply proper lime and fertilizer

Control weeds, insects and disease.

NRCS 344 Residue Management, Seasonal

Record the number of acres

Definition- Managing the amount, orientation and distribution of crop and other plant residues on the soil surface during part of the year, while growing crops in a clean tilled seedbed.

Purpose- Reduce sheet and rill erosion.

Design Highlights-

Applies to all cropland

Tillage must leave a minimum 30% cover on soil surface.

Residues may be removed through tillage (burying), grazing, or mechanically removed.

Plans should include % residue cover, acceptable tillage operations and timing and acceptable grazing period (if applicable).

NRCS 345 Residue and Tillage Management Mulch Till

Record the field, acres, and crop

Definition- managing the amount, orientation and distribution of crop and other plant residue on the soil surface *year round* while limiting the soil-disturbing activities used to grow crops in systems where the entire field surface is tilled prior to planting.

Purpose- reduce sheet and rill erosion and maintain or improve soil condition.

Design Highlights:

Partially incorporates the residue through non inversion methods such as chiseling and disk harrowing thereby increasing organic matter in the soil.

All residues shall be uniformly distributed over the entire field.

Crop residue levels following planting will be a minimum of 30%.

Partial removal of residue by means such as baling or grazing shall be limited to retain the percent residue needed.

NRCS Code: 580 Streambank and Shoreline Protection

Record the practice treatment and a picture if approved.

Definition: Treatment(s) used to stabilize and protect banks of streams or constructed channels, and shorelines of lakes, reservoirs, or estuaries.

Purpose: To maintain the flow capacity, reduce offsite or downstream effects of sediment resulting from bank erosion, improve stream corridor for fish and wildlife, prevent loss of land or damage to land uses.

Design Highlights:

Vegetation shall be selected that is best suited for the site conditions, soil moisture regime and achieves the intended purpose as it relates to reducing sediment and nutrients to waters.

Vegetation should be of appropriate plantings and density.

NRCS 633 Waste Utilization

Record type of waste utilized, design details such as length and width and materials used.

Definition: Using agricultural wastes such as manure and wastewater or other organic residues.

Purpose: protect water quality, protect air quality, provide fertility for crop, forage, fiber production and forest products, improve or maintain soil structure, or provide a source of energy.

Design Highlights: Includes waste from animal manure and contaminated water from livestock and poultry operations; solids and wastewater from municipal treatment plants; and agricultural pro- cessing residues are generated.

Samples of the waste should be analyzed annually and municipal wastes should be analyzed for concentration of metals.

Priority areas of waste application are those with slopes less than 15% and located a minimum of 50 feet from waterways, sinkholes and other water bodies.

When wastes are to be spread on land not owned or controlled by the producer, the waste utilization shall document the amount of waste to be transferred, date of transfer, analysis of the material, and who will be responsible for the environmentally acceptable use of the waste. Records should be maintained a minimum of 5 years.

Wastes should not be applied on frozen or snow covered ground.

Waste utilization should be done in accordance with the farmer's Nutrient Management Plan.

NRCS 658 Wetland Creation

Please take a picture.

Definition- the creation of a wetland on a site that was historically non-wetland.

Purpose- to create wetland functions and values. Does NOT apply to constructed wetlands to treat point and non-point sources of water pollution, wetland enhancement intended to rehabilitate a degraded wetland, or wetland restoration intended to rehabilitate a degrade wetland where it is returned to approximate original wetland conditions.

Design Highlights:

Located in areas capable of supporting the wetland functions and values.

Designed to create hydrologic conditions to meet wetland functions.

Hydrophytic vegetation should be established.

Fertilizer or pesticide use should not compromise the intended purpose.

Control of undesirable plant species and pests using biological means first.

Timing and level setting of water control structures is required for the establishment of desired hydrologic conditions.

Inspection schedule.

Maintain vegetation and control unwanted vegetation.

Haying and grazing will be used as appropriate to manage vegetation.

Control water depth and duration.

NRCS 659 Wetland Enhancement

Please record site characteristics and picture.

Definition- The rehabilitation or re-establishment of a degraded wetland, and/or the modification of an existing wetland, which augments specific site conditions for specific species or purposes; possibly at the expense of other functions and other species.

Purpose- To provide specific wetland conditions to favor specific wetland functions and targeted species by: hydrologic enhancement or vegetative enhancement.

Design Highlights: any degraded or non-degraded existing wetland where the objective is specifically to enhance selected wetland functions.

This DOES NOT apply to rehabilitate a degraded wetland where the soils, hydrology, vegetative community, and biological habitat are returned to original conditions or to create a wetland on a site that historically was not a wetland.

Tolerant vegetative species should be selected for the site. Natural regeneration is allowed. Invasive/noxious species should be controlled.

Inspection schedule should be in place as well as management to maintain vegetation.

Haying or grazing shall be used as appropriate to manage vegetation such that it minimizes disturbance to ground nesting species.

ATTACHMENT J: STATISTICAL SAMPLING APPROACH FOR INITIAL AND FOLLOW-UP BMP VERIFICATION

Statistical Sampling Approach for Initial and Follow-Up BMP Verification

Purpose

This document provides a statistics-based approach for selecting sites to inspect for verification that BMPs are on the ground (or otherwise continue to be implemented) and performing as expected based on engineering specifications or other applicable criteria. Verification on a BMP-by-BMP basis is emphasized here to both simplify the approach and reflect the need for practical methods to address this large undertaking.

While the agricultural BMP verification guidance (*Chesapeake Bay Program Partnership Agriculture Workgroup's Agricultural BMP Verification Guidance*) developed by the Chesapeake Bay Program Agriculture Workgroup (2014) calls for 100% verification of the initial identification of annual or multi-year structural BMPs and plan implementation by trained and certified technical field staff or engineers for most practices, it does allow for statistical sub-sampling to verify single-year BMPs such as tillage practices. The guidance also states that for follow-up BMP verification, states may propose using a sub-sampling approach with documentation as an alternative strategy for review and approval. The statistical sampling approach described here can be used for both single-year BMP verification and in an alternative follow-up BMP verification approach for multiple-year BMPs.

Selection of appropriate verification methods at sites selected using this approach is addressed in the agricultural BMP verification guidance. Regardless of the sampling approach used initially for agricultural BMP verification, states should do a post-evaluation of the results and process, updating as necessary.

Background

The need for verification that BMPs are implemented properly and remain functional is documented in the agricultural BMP verification guidance. That guidance also provides information on defining and categorizing agricultural BMPs, defining implementation mechanisms for agricultural BMPs, agricultural BMP verification methods and priorities, and how to develop an agricultural practice verification protocol. In addition, it provides streamlined guidance and an overview of the default verification levels for agricultural BMP verification.

This document supplements the agricultural BMP verification guidance by providing specific information on a statistically-based sampling approach that can be used as part of state efforts to meet verification requirements. The measure of choice for this approach is the proportion (percentage) of implemented BMPs (1) still in place or (2) still performing in accordance with expectations. The approach described here addresses how to compute the sample size necessary to estimate these proportions (i.e., "p" or proportion of "Yes" responses and "q" or proportion of "No" responses) with the desired degree of confidence and a specified acceptable error (±d%) using simple random sampling. No hypothesis testing, comparison of proportions, or trend analysis is considered.

Probabilistic Sampling

Overview

Probabilistic approaches are appropriate for ground verification of agricultural BMPs because they can yield accurate information without having to visit each site. In a probabilistic approach, individuals are randomly selected from the entire group. The selected individuals are evaluated, and the results from the individuals provide an unbiased assessment about the entire group. Applying the results from randomly selected individuals to the entire group is *statistical inference*. Statistical inference enables one to determine, in terms of probability, for example, the percentage of implemented multi-year BMPs that are still in place without visiting every site.

The group about which inferences are made is the population or *target population*, which consists of *population units*. The *sample population* is the set of population units that are directly available for measurement. Statistical inferences can be made only about the target population available for sampling. For example, if only a certain class of BMPs can be ground verified (e.g., cost-shared BMPs), then inferences cannot be made about other classes of BMPs that could not be ground verified (e.g., voluntarily implemented BMPs with no cost-share). States will need to consider carefully how they define their population units for each BMP. See "Defining Population Units" for addition information regarding this very important task.

The most common types of sampling that should be used are either simple random sampling or stratified random sampling. *Simple random sampling* is the most elementary type of sampling. Each unit of the target population has an equal chance of being selected. This type of sampling is appropriate when there are no major trends, cycles, or patterns in the target population. If the pattern of BMP presence or performance is expected to be uniform across the geographic area of interest (e.g., state), simple random sampling is appropriate to estimate the proportion of BMP presence or performance. If, however, implementation is homogeneous only within certain categories (e.g., region of state, cost-shared vs. non-cost-shared), stratified random sampling should be used. See "Sample Size Calculation with Simple Random Sampling" for additional details.

In *stratified random sampling*, the target population is divided into groups called strata for the purpose of obtaining a better estimate of the mean or total for the entire population. Simple random sampling is then used within each stratum. Stratification involves the use of categorical variables to group observations into more units (e.g., cost-shared vs. non-cost-shared), thereby reducing the variability of observations within each unit. In general, a larger number of samples should be taken in a stratum if the stratum is more variable, larger, or less costly to sample than other strata. See "Stratified Sampling" for additional information.

If the state believes that there will be a difference between two or more subsets of the sites, the sites can first be stratified into these subsets and a random sample taken within each subset. The goal of stratification is to increase the accuracy of the estimated mean values over what could have been obtained using simple random sampling of the entire population. The method makes use of prior information to divide the target population into subgroups that are internally homogeneous. There are a number of ways to "select" sites to be certain that important information will not be lost, or that results will not be misrepresented. One current approach is Generalized Random Tessellation Stratified (GRTS) survey design (Stevens and Olsen 2004).

Sample Size Calculation with Simple Random Sampling

The following are data requirements for the sample size (n) calculations described in this document:

- An initial estimate of both the percent of BMPs still in place and the percent of BMPs still performing as expected. This can be based on previous studies or assumed to be 50% (p=0.5) for a conservative (high) estimate of sample size.
- An allowable error (e.g. ±5% or 0.05). This error (d) can be different for different BMPs based on considerations of BMP importance, risk of BMP abandonment, failure, cost, or other factors.
- A confidence level (e.g., 90% or α=0.10). This is used to determine the 2-sided Z score from the standard normal distribution ($Z_{1-\alpha/2}$), e.g., $Z_{1-\alpha/2}$ is equal to 1.645 for α = 0.10. For example, an α=0.10 indicates that the actual proportion of BMPs still in place has a 10 percent chance of being outside the allowable error or calculated confidence interval.
- An estimate of the total population (N) from which the sample is taken (e.g., how many BMPs were installed). This can be based on records of BMP implementation.

In simple random sampling, we presume that the sample population is relatively homogeneous and we would not expect a difference in sampling costs or variability. If the cost or variability of any group within the sample population were different, it might be more appropriate to consider a stratified random sampling approach.

To estimate the proportion of BMPs still in place or still performing as expected (p), such that the allowable error, *d*, meets the study precision requirements (i.e., the true proportion lies between *p-d* and *p+d* with a *1-α* confidence level), a preliminary estimate of sample size (n_0) can be computed with the following equation assuming a large population from which to sample (Snedecor and Cochran, 1980):

$$n_o = \frac{(Z_{1-\alpha/2})^2 pq}{d^2} \quad (1)$$

In many applications, the number of population units in the sample population (*N*) is large in comparison to the population units sampled (*n*) and the *finite population correction term* (*1-φ*) can be ignored. However, depending on the number of units (e.g., expensive or unique BMPs) in a particular population, *N* can become quite small. *N* is determined by the definition of the sample population and the corresponding population units. If φ is greater than 0.1, the finite population correction factor should not be ignored (Cochran, 1977). Thus, the final sample size (n) can be estimated as (Snedecor and Cochran, 1980)

$$n = \begin{cases} \frac{n_0}{1+\varphi} & for\ \varphi > 0.1 \\ n_o & otherwise \end{cases} \quad (2)$$

where φ is equal to n_o/N.

Terms:

N = total number of population units in sample population

n = number of samples

p = proportion of "yes" responses

q = proportion of “no” responses (i.e., 1-p)

n_0 = preliminary estimate of sample size

$\varphi = n_0/N$ unless otherwise stated

$Z_{1-\alpha/2}$ = value corresponding to cumulative area of $1-\alpha/2$ using the normal distribution

d = allowable error

Practical Sampling Considerations

The best sampling approach will be one that meets statistical objectives and can be performed with maximum ease at minimum cost. Success requires that the information to be used in the equation described above is unambiguous and obtainable within logistical, programmatic, and budgetary constraints.

Defining Population Units

Population units should be defined in a manner that makes enumeration simple. The most promising options for population units are structures (e.g., lagoons), contracts, and plans (e.g., nutrient management plans). States should have access to counts of these population units through federal or state permit programs (e.g., CAFO), federal/state/local cost-share programs, or other sources. In some cases, counts or a portion of counts may need to be obtained from private-sector sources (e.g., nutrient management plans). The use of acreage as a population unit for the purposes of this sampling approach is not considered although acreage might be a useful variable to stratify BMPs (see “Stratified Sampling”). Acreage of practices (e.g., cover crops) inspected through a sampling effort based on contracts can be recorded, however, to provide an additional measure of the extent to which existing practices were inspected. For example, A% of contracts that include cover crops were sampled, covering a total B acres, or C% of existing cover crop acreage in the state.

States will need to choose population units that make the most sense for those BMPs they verify. Structural BMPs, for example, could be enumerated on the basis of actual structural units or contracts with the structure. If contracts are used as the population unit it is recommended that the total number of structural BMP units inspected on the sampled farms is recorded as well (e.g., if contracts can include more than one structure).

Stratified Sampling

Because some BMPs provide a greater pollutant load reduction than others, states may want to place priority on verification of those BMPs. If, for example, nutrient management plans (NMPs) have yielded the greatest nitrogen and phosphorus load reductions, it might be appropriate to emphasize these practices in the BMP verification program to provide results with better precision. For example, a smaller confidence interval (e.g., ±5%) and greater confidence level (e.g., 95%) might be appropriate for these BMPs. Less important BMPs, with respect to nutrient reduction, could be verified with a larger confidence interval (e.g., ±15%) and/or lower confidence level (e.g., 80%).

Alternatively, if state reports have indicated that livestock operations, for example, yield a greater load reduction than cropland farms (or vice versa) for a particular BMP, the state may want to use a stratified random sampling approach. A separate population for livestock operations and cropland farms would be developed for the BMP, with perhaps even a different confidence interval or confidence level applied to the two strata. The intent of this approach would be to provide the best verification data on a targeted basis within the resource constraints of the state. The same logic would apply to stratification by

geographic region, BMP delivery program (e.g., permits, cost-share, voluntary), farm size (e.g., large vs. small), or risk (e.g., BMPs most likely to be abandoned or implemented poorly vs. BMPs that are more reliably implemented and maintained).

Grouping

If the count for a specific BMP is so low that it would be difficult to achieve a reasonably precise estimate of verification via sampling, a state may consider combining similar BMPs to increase the number of population units and increase the precision of the verification estimate. Similarity of BMPs could be judged on the basis of nutrient reduction credits provided by the Bay model. For example, if BMP A is credited with a 10% reduction in nitrogen load and BMP B is credited with a 12% reduction in nitrogen load (per unit applied), it may be reasonable to combine the two BMPs for the purpose of verification. This approach would be most appropriate for BMPs that account for a smaller share of the state's load reductions attributed to agricultural BMPs. Additional guidance on BMP grouping can be found in Part 6 of the agricultural BMP verification guidance.

Field Verification Methods

States will need to establish field protocols that address the type of information to be collected and consistency between different field technicians or groups collecting the data. Specific verification methods and the need for quality assurance procedures are discussed in the agricultural BMP verification guidance. Essential to the statistical approach described in this document is determination and documentation of how "yes" and "no" responses will be assigned for the two basic questions:

- Is the BMP there?
- Is the BMP functioning properly?

States may have existing verification programs that go beyond simple yes/no determinations. For example, a state may have a third, gray area response between yes and no indicating that the BMP is partially functional or could be functional after tweaking by the landowner. This may be very important information for purposes other than verification using this statistical approach, but the data will need to be reduced down to yes/no to apply the method described here. A simple approach to reducing data down to yes/no responses is that anything not "yes" is "no." Using this approach, BMPs checked off as "gray area" BMPs would be added to the "no" tally.

States should consider performing initial field testing as part of their overall plan for agricultural BMP verification. This will help identify issues that can be resolved before the program is launched.

Timeframe for Sampling

Field inspections should be scheduled to provide the best opportunity to observe the features of a BMP that best indicate its presence and whether it is functioning properly. Cover crops, for example, may need to be observed both at planting and later to determine if seeds have germinated and cover has been established. The number of sites to be examined would remain the same, but the number of site visits would double in this case. States will need to consider when each BMP should be examined to establish a cost-efficient inspection schedule that can be achieved with existing resources.

Level of Effort

Resources committed to verification will most likely come from resources that could be used for other purposes such as technical and financial assistance for BMP implementation. Scheduling of staff activities will be an essential element to ensure that verification and other program functions are carried out successfully. The efficiency with which staff are deployed may be increased if states can find opportunities to piggyback verification work with other tasks while visiting individual farms. The

establishment of standard operating procedures for verification site visits, creative use of modern technology, and other innovative approaches may help reduce the time required for inspections and the recording and management of verification data.

Application to Chesapeake Bay Program

There are currently 47 agricultural BMPs and interim BMPs subject to verification under the Chesapeake Bay Program, and this number will increase over time. States may track even more BMPs before having them translated into BMPs recognized by the Bay model. While there may be interest in designing a single, comprehensive sampling approach that addresses all BMPs that must be verified at specified levels of precision and confidence, such an approach is not recommended because it might become logistically impractical. Keep it simple.

A simple approach to sampling is to:

1. Estimate sample sizes for the priority BMPs,
2. Choose the largest "n" value from the set of priority BMPs,
3. Randomly select the farms to inspect for the priority BMPs,
4. Check records for the non-priority BMPs at the selected farms to determine the respective "n" values for non-priority BMPs,
5. Estimate confidence intervals for the non-priority BMPs based on the "n" values
6. Do either:
    - Increase random sample size for priority BMPs as needed to reach suitable confidence intervals for the non-priority BMPs and repeat steps 3-5 until a suitable confidence interval is reached for all BMPs of interest, or
    - Develop a separate sampling approach for non-priority BMPs by carrying out steps 1-3 for the non-priority BMPs. This creates two sampling approaches, but there may be overlap on sites visited.

This approach is illustrated with an example featuring five priority BMPs (Table 1) and five non-priority BMPs (Table 2) that must be verified by the state. Equations 1 and 2 are applied to the data in Table 1 to estimate sample sizes required for each priority BMP.

Table 1. Example: Priority agricultural BMPs for verification.

BMP	Population Unit	N	d	α	P (a priori)	n	% Sampled
Nutrient Management Plans	plan	350	.05	.10	.70	139	40
Cover Crops	contract	750	.05	.10	.65	186	25
Conservation Tillage	contract	2,000	.05	.10	.90	98	5
Prescribed Grazing	contract	155	.05	.10	.85	74	48
Grass Buffers	contract	900	.05	.10	.90	89	10

In this case, the state would need to inspect 186 farms to satisfy the precision and confidence level requirements for cover crops (Table 1). The state would then randomly select 186 farms from the set of farms with contracts including cover crops. Next, the state would check the contracts for those 186 farms to see if they also included nutrient management plans, conservation tillage, prescribed grazing,

or grass buffers. For illustrative purposes, assume that the state found that the 186 farms selected based on cover crop contracts had the following counts for the other four priority BMPs:

- Nutrient Management Plans: 145 plans
- Conservation Tillage: 132 contracts
- Prescribed Grazing: 55 contracts
- Grass Buffers: 93 contracts

With the exception of prescribed grazing, sample sizes are also adequate for the other four priority BMPs. A sample size of 55 for prescribed grazing would yield a confidence interval of ±7% at α=.10.

The state can now choose to:

- Accept the slightly larger confidence interval for prescribed grazing, or
- Increase the sample size for cover crops and see if the prescribed grazing "n" value reaches the target of 74 (this would likely require an increase of at least another 60 farms based on the ratio of prescribed grazing to cover crop contracts), or
- Randomly select an additional 19 sites with prescribed grazing contracts from the 100 (155-55) prescribed grazing contract sites not captured in the cover crops sample. The total sample size would now be 205, a slight over-sampling for cover crops.

Assuming the state decides to add 19 sites for prescribed grazing contracts, the state now estimates the required sample sizes for non-priority BMPs, assuming a larger confidence interval (d=.10) and same confidence level (α=.10).

Equations 1 and 2 are also applied to the data in Table 2 to estimate sample sizes needed for each non-priority BMP. Note that the value of d is greater than used for Table 1 while the value for α is kept at 0.10. These choices and those made for Table 1 are judgment calls that the state must make.

Table 2. Example: Non-priority agricultural BMPs for verification.

BMP	Population Unit	N	d	α	P (a priori)	n	% Sampled
Land Retirement	contract	65	.10	.10	.90	19	29
Barnyard Runoff Control	contract	125	.10	.10	.95	12	10
Poultry Phytase	contract	475	.10	.10	.95	13	3
Crop Irrigation Management	contract	33	.10	.10	.85	17	52

Reviewing the contracts for the 205 farms selected based on cover crop and prescribed grazing contracts yielded the following counts for the non-priority BMPs:

- Land Retirement: 47 plans
- Barnyard Runoff Control: 15 contracts
- Poultry Phytase: 2 contracts
- Crop Irrigation Management: 27 contracts

Comparing these numbers with the results in Table 2 it can be seen that in this case all but poultry phytase would be adequately sampled. The simplest approach at this point would be to randomly select 11 additional contracts (13-2) from the 473 (475-2) poultry phytase contracts not captured in the cover

crops/prescribed grazing sample, yielding 216 farms to inspect to meet statistical requirements for all tracked BMPs included in this example.

Currently, we do not have any information to suggest that selecting BMPs in this way (i.e., based on largest n value for priority BMPs) would result in a biased sampling of other BMPs. However, it should be an issue that is discussed within states based on knowledge of BMP implementation patterns.

Generalized Example

By executing Equations 1 and 2 over a wide range of scenarios we are able to construct generalized tables that indicate appropriate sample sizes within the established constraints. This begins with forming a precision statement that includes an allowable error term, ±d, and a confidence level. For example, a state may want to estimate the percentage of manure sheds passing the verification process to within ±10% at the 95% confidence level. Here is where the state might think about identifying different goals for different types of programs or BMPs. For example, some practices might be of a higher or lower importance to the Bay model in terms of loading while other practices might be of higher or lower risk of meeting the implementation requirements.

The state would also want to use a priori knowledge about the likely proportion of "yes" responses. One way to factor in this knowledge might be to establish a few categories or levels of expected implementation. For example, states may choose to set an "excellent" level of expected maintenance at 85%. Similarly, a 70% level could be set for "good," and 50% could be used if no information is available. These would essentially be the starting point assumptions of p to be used in equation 1. We can then combine these levels of BMP maintenance with a few choices of allowable error and confidence levels. In this example, we chose allowable error values of ±5, 10, 15, 20 and 25 percent and confidence levels of 90 and 95 percent.

Table 3 shows the results of those calculations. The top panel is for a 95% confidence level and the bottom panel is for 90% confidence level. The left-most columns show the expected level of BMP maintenance and allowable error, respectively. The Large N column represents the sample size without correction for finite populations; and the remaining six columns represent the adjusted sample sizes for a variety of population sizes. For example, to estimate the proportion of 200 BMPs successfully passing through the validation process assuming a 90% confidence level, assuming a likely percentage of BMPs equal to 85%, and an allowable error of ±10%, results in a sampling requirement of 30 as shown by the orange star. The blue bars represent a histogram of sample size.

Table 3. Generalized example: calculation of n.

95% Confidence Level

p		±d	Large N	100	200	600	1000	1,500	2,000
No Information	50%	5%	385	80	132	235	278	307	323
	50%	10%	97	50	66	84	89	92	93
	50%	15%	43	31	36	41	42	42	43
	50%	20%	25	20	23	24	25	25	25
	50%	25%	16	14	15	16	16	16	16
Good Maintenance	70%	5%	323	77	124	210	245	266	279
	70%	10%	81	45	58	72	75	77	78
	70%	15%	36	27	31	34	35	36	36
	70%	20%	21	18	20	21	21	21	21
	70%	25%	13	12	13	13	13	13	13
Excellent	85%	5%	196	67	99	148	164	174	179
	85%	10%	49	33	40	46	47	48	48
	85%	15%	22	19	20	22	22	22	22
	85%	20%	13	12	13	13	13	13	13
	85%	25%	8	8	8	8	8	8	8

90% Confidence Level

p		±d	Large N	100	200	600	1000	1,500	2,000
No Information	50%	5%	271	74	116	187	214	230	239
	50%	10%	68	41	51	62	64	66	66
	50%	15%	31	24	27	30	31	31	31
	50%	20%	17	15	16	17	17	17	17
	50%	25%	11	10	11	11	11	11	11
Good Maintenance	70%	5%	228	70	107	166	186	198	205
	70%	10%	57	37	45	53	54	55	56
	70%	15%	26	21	24	25	26	26	26
	70%	20%	15	14	14	15	15	15	15
	70%	25%	10	10	10	10	10	10	10
Excellent	85%	5%	138	58	82	113	122	127	130
	85%	10%	35	26	30	34	34	35	35
	85%	15%	16	14	15	16	16	16	16
	85%	20%	9	9	9	9	9	9	9
	85%	25%	6	6	6	6	6	6	6

Recognizing that sampling percentage can be the focal point for verification efforts, we can take Table 3 and divide through by the population size. Table 4 contains the same results as Table 3 but we display the results based on sampling percentage and use a 4-color stop light coding scheme. Sampling levels greater than 20% are coded black, 10 to 20% are coded red, 5-10% are coded yellow, and less than 5% are coded green. Table 4 therefore provides a quick visual assessment of sampling percentages needed to meet verification expectations. For example, where N is small (e.g., 100), nearly all sampling levels need to be greater than 20% for an allowable error of ±15% or smaller at the 90 and 95% confidence levels.

Table 4. Generalized example: calculation of sampling percentage.

95% Confidence Level

p		±d	Large N	100	200	600	1000	1,500	2,000
No Information	50%	5%	385	80%	66%	39%	28%	20%	16%
	50%	10%	97	50%	33%	14%	9%	6%	5%
	50%	15%	43	31%	18%	7%	4%	3%	2%
	50%	20%	25	20%	12%	4%	3%	2%	1%
	50%	25%	16	14%	8%	3%	2%	1%	1%
Good Maintenance	70%	5%	323	77%	62%	35%	25%	18%	14%
	70%	10%	81	45%	29%	12%	8%	5%	4%
	70%	15%	36	27%	16%	6%	4%	2%	2%
	70%	20%	21	18%	10%	4%	2%	1%	1%
	70%	25%	13	12%	7%	2%	1%	1%	1%
Excellent	85%	5%	196	67%	50%	25%	16%	12%	9%
	85%	10%	49	33%	20%	8%	5%	3%	2%
	85%	15%	22	19%	10%	4%	2%	1%	1%
	85%	20%	13	12%	7%	2%	1%	1%	1%
	85%	25%	8	8%	4%	1%	1%	1%	0.4%

90% Confidence Level

p		±d	Large N	100	200	600	1000	1,500	2,000
No Information	50%	5%	271	74%	58%	31%	21%	15%	12%
	50%	10%	68	41%	26%	10%	6%	4%	3%
	50%	15%	31	24%	14%	5%	3%	2%	2%
	50%	20%	17	15%	8%	3%	2%	1%	1%
	50%	25%	11	10%	6%	2%	1%	1%	1%
Good Maintenance	70%	5%	228	70%	54%	28%	19%	13%	10%
	70%	10%	57	37%	23%	9%	5%	4%	3%
	70%	15%	26	21%	12%	4%	3%	2%	1%
	70%	20%	15	14%	7%	3%	2%	1%	1%
	70%	25%	10	10%	5%	2%	1%	1%	1%
Excellent	85%	5%	138	58%	41%	19%	12%	8%	7%
	85%	10%	35	26%	15%	6%	3%	2%	2%
	85%	15%	16	14%	8%	3%	2%	1%	1%
	85%	20%	9	9%	5%	2%	1%	1%	0.5%
	85%	25%	6	6%	3%	1%	1%	0.4%	0.3%

Summary

A robust sampling effort begins with clear identification of the target population and enumeration of the population units (i.e., N). States will need to define the appropriate population unit for a large number of agricultural BMPs. Use of structural units, contracts, or plans is recommended.

Appropriate sample size for verification is driven by N, the desired margin of error (e.g., ±10%), the desired level of confidence (e.g., 95%), and the proportion of the sampled population that will have a positive result (p). States will need to apply their judgment in making decisions on the values for d and α. Improved precision (smaller d) or greater confidence (smaller α) will require increased sampling, while reduced sampling levels will result in lower confidence levels or increased allowable errors.

A priori knowledge is important in setting sample sizes; 50% is a conservative value with respect to sample size calculations. That is, absent knowledge of the likely proportion of positive responses, a p value of 0.5 is used in the calculation, resulting in a larger sample size than would result from using

values of p greater or smaller than 0.5. It will benefit states to check for records on BMP compliance to use in the calculation of sample sizes.

The error associated with setting sample sizes for small populations can be large. In these cases it might be appropriate to group BMPs into classes rather than accept margin of errors that are too large to be helpful.

Field assessments of BMPs will require "yes" or "no" determinations for this statistical approach to be applicable. This may involve performing an additional step for states with existing verification approaches, but should not interfere with achievement of other objectives the state may have. States will need to strive for consistency among field staff making these assessments.

Finally, with limited resources states will need to seek optimal scheduling for field visits by considering appropriate timing to inspect different types of BMPs, multiple site visits for some BMPs, other staff commitments, and the potential for achieving multiple objectives during each site visit. Development and application of standard protocols for field assessments may also save time.

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ATTACHMENT K: SAMPLE SIZE ESTIMATION FOR BMP VERIFICATION

Sample Size Estimation for BMP Verification

September 11, 2014

(Shortened from August 14, 2014)

TETRA TECH

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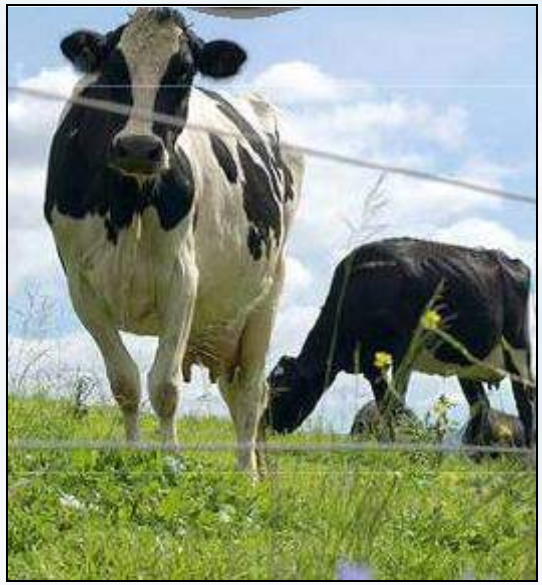
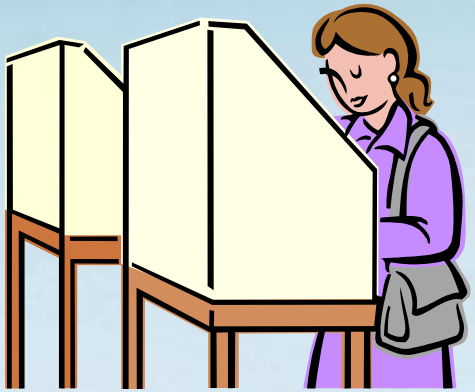
Sample Size Estimation

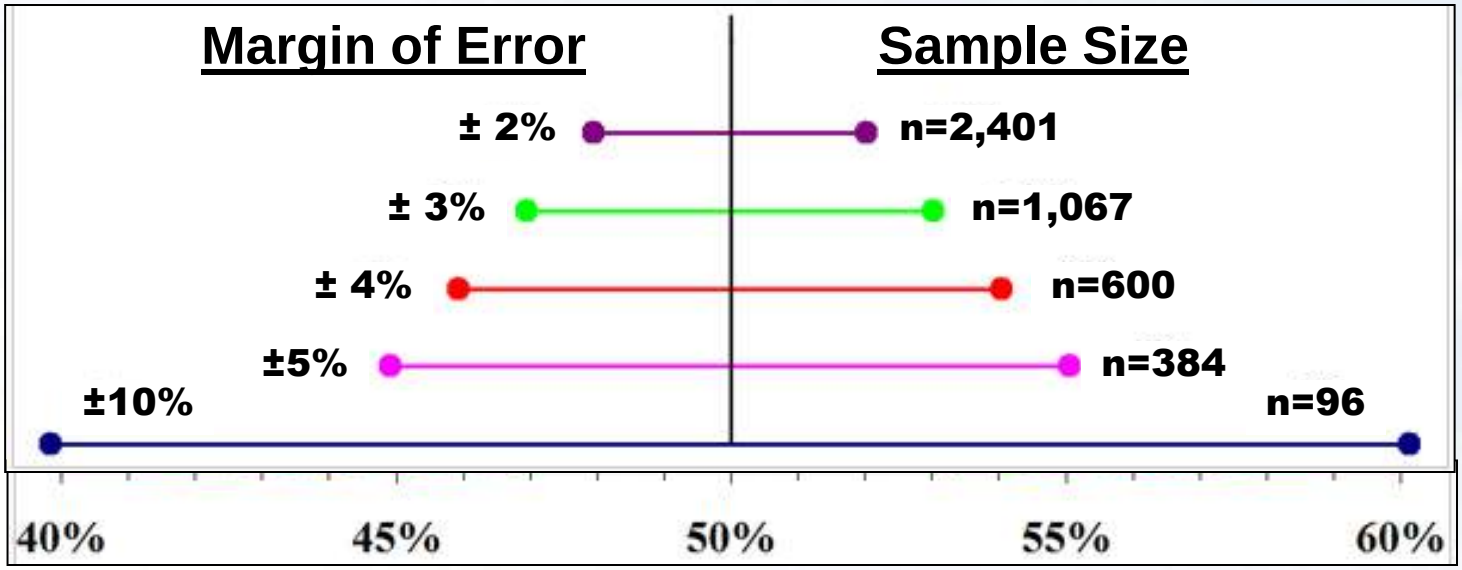
- Objective/Management Goal
  - Document the percentage of BMPs that are still in place and functioning properly
  - Inform Bay model simulation updates
- Target Populations
  - BMP implemented through state cost-share program
  - BMP implemented through CAFO permits
  - BMP implemented voluntarily without cost-share
  - Resource improvement practice



Binomial Distribution



- Binomial Distribution
  - Are the BMPs still there?
    - Yes/No
  - Are the BMPs still functioning properly?
    - Yes/No
- Sample Size—just like political polls



Source: http://en.wikipedia.org/wiki/Margin_of_error#Calculations_assuming_random_sampling

Binomial Distribution

Standard Sample Size Equation

$$n_o = \frac{\left(Z_{1-\alpha/2}\right)^2 pq}{d^2}$$

Political Poll Example

$$96 = \frac{(1.96)^2(0.5)(0.5)}{(0.10)^2}$$

Finite Population Correction

$$n = \frac{n_o}{(1+\varphi)}$$

N = total number of population units in sample population

n_o = preliminary estimate of sample size (sample size for large N)

$Z_{1-\alpha/2}$ = value corresponding to cumulative area of 1-α/2 using the normal distribution

p = proportion of "yes" responses

q = proportion of "no" responses (i.e., 1-p)

d = allowable error (margin of error)

φ = n_0/N unless otherwise stated

n = number of samples (adjusted for finite population)

Observations

- Improved precision
  - More sampling
- Reduce sampling costs
  - Lower confidence level (e.g., 95% CI → 90% CI)
  - Increased allowable error, d, (e.g., ±10% → ±15%)
- Less sampling is needed to maintain precision if the percentage of BMPs maintained is closer to 100%
  - A priori knowledge is important
  - 50% BMP maintenance is a conservative assumption
  - But don't overestimate
- Finite Populations
  - Sampling from small populations can result in large errors.

Potential Application

- Precision Statement
  - Estimate the percentage of BMPs maintained, **p**, to within **±d%** using a **X%** confidence level.
- Example:
  - The percentage of BMPs maintained is 85% ±10% with a 95% confidence level, or
  - The range of maintained BMPs is 75-95% with a 95% confidence interval.
- Worked Example
  - **p**: No information (50%), Good (70%), Excellent (85%)
  - **±d**: 5%, 10%, and 15%
  - **X%**: 90% and 95%

Work Example—Sample Size (n)

95% Confidence Level

p		±d	Large N	100	200	600	1000	1,500	2,000
No Information	50%	5%	385	80	132	235	278	307	323
	50%	10%	97	50	66	84	89	92	93
	50%	15%	43	31	36	41	42	42	43
Good Maintenance	70%	5%	323	77	124	210	245	266	279
	70%	10%	81	45	58	72	75	77	78
	70%	15%	36	27	31	34	35	36	36
Excellent	85%	5%	196	67	99	148	164	174	179
	85%	10%	49	33	40	46	47	48	48
	85%	15%	22	19	20	22	22	22	22

90% Confidence Level

p		±d	Large N	100	200	600	1000	1,500	2,000
No Information	50%	5%	271	74	116	187	214	230	239
	50%	10%	68	41	51	62	64	66	66
	50%	15%	31	24	27	30	31	31	31
Good Maintenance	70%	5%	228	70	107	166	186	198	205
	70%	10%	57	37	45	53	54	55	56
	70%	15%	26	21	24	25	26	26	26
Excellent	85%	5%	138	58	82	113	122	127	130
	85%	10%	35	26	30	34	34	35	35
	85%	15%	16	14	15	16	16	16	16

Work Example—Sample Level (n/N)

>20%	●
10-20%	●
5-10%	●
<5%	●

95% Confidence Level

p		±d	Large N	100	200	600	1000	1,500	2,000
No Information	50%	5%	385	80%	66%	39%	28%	20%	16%
	50%	10%	97	50%	33%	14%	9%	6%	5%
	50%	15%	43	31%	18%	7%	4%	3%	2%
Good Maintenance	70%	5%	323	77%	62%	35%	25%	18%	14%
	70%	10%	81	45%	29%	12%	8%	5%	4%
	70%	15%	36	27%	16%	6%	4%	2%	2%
Excellent	85%	5%	196	67%	50%	25%	16%	12%	9%
	85%	10%	49	33%	20%	8%	5%	3%	2%
	85%	15%	22	19%	10%	4%	2%	1%	1%

90% Confidence Level

p		±d	Large N	100	200	600	1000	1,500	2,000
No Information	50%	5%	271	74%	58%	31%	21%	15%	12%
	50%	10%	68	41%	26%	10%	6%	4%	3%
	50%	15%	31	24%	14%	5%	3%	2%	2%
Good Maintenance	70%	5%	228	70%	54%	28%	19%	13%	10%
	70%	10%	57	37%	23%	9%	5%	4%	3%
	70%	15%	26	21%	12%	4%	3%	2%	1%
Excellent	85%	5%	138	58%	41%	19%	12%	8%	7%
	85%	10%	35	26%	15%	6%	3%	2%	2%
	85%	15%	16	14%	8%	3%	2%	1%	1%

What is the basis for using the initial estimate of 50% as the standard for presence or functioning of BMPs?

A: 50% isn't a standard per se. Rather, the assumption of 50% is the most conservative estimate in terms of sample size calculation. If you have no better information, it's the safest approach to meeting your precision requirements.

What is the basis for recommending use of a percentage from previous studies?

A: If a jurisdiction has information from past assessments to indicate that the actual percentage of BMPs present or functioning is greater than or less than 50%, then a smaller sample size can be used to achieve the same precision requirements.

Because the formula does not establish a defined allowable error (d) or confidence level (α), then the Ag Work Group should do so. Does that not return us to the debate over the prior 80% confidence level that was rejected?

A: Assumptions of allowable error or confidence level will exist regardless of the approach taken, whether stated explicitly or implicit in the decision making. For example, assuming that either a 5% or 10% sampling is adequate presumes an allowable error and confidence level even if they have not been stated. Our approach starts with those decisions and then does the math based on those choices.

$$\% = 100 \times \frac{n}{N}$$

$$n = \frac{n_o}{(1+\varphi)}$$

$\varphi = n_0/N$

$$n_o = \frac{\left(Z_{1-\alpha/2}\right)\ pq}{d^2}$$

It is unclear why the total number of BMPs initially reported as being present and operating is not the baseline for deriving the sample numbers. Am I simply confused?

A: The total number of BMPs initially reported as being implemented and operational is N. The sampling approach calculates the number of those BMPs that would need to be sampled to confirm continued presence and operation given a specified allowable error and confidence level.

N = total number of population units in the sample population

= the total number of BMPs initially reported as being implemented and operational

The procedure incorporates an "estimate of the total population (N) from which the sample is taken" and argues that this estimate "can be based on records of BMP implementation." How? Isn't verification of implementation what the process is trying to determine?

A: The total number of BMPs that you wish to check via follow-up inspection = N and the jurisdiction would perform a follow-up inspection at n sites. The approach assumes knowledge of where and how many BMPs were originally implemented. If there is no advance knowledge of where or how many BMPs were implemented, it is unclear how a state would ensure that an unbiased sample of 5% or 10% could be implemented. If the state cannot determine N, then it would be conservative to assume a large N and not take advantage of the finite population correction term that can reduce sample size. The state would then need to develop an approach for randomly selecting sites that doesn't rely on an inventory of BMPs.

There needs to be a clear linkage between the formula and the verification standards we are establishing. For example, who does the sampling and how is it done when using the formula?

A: The August 14, 2014, draft of *Statistical Sampling Approach for Initial and Follow-Up BMP Verification* attempts to address this linkage by inclusion of a section on practical sampling considerations. It also includes a discussion on how to apply the approach to the Chesapeake Bay Program and provides a generalized example for direct use by the jurisdictions. Selection of appropriate verification methods at sites selected using this approach is addressed in the agricultural BMP verification guidance.

I am assuming that if a state is to determine how to use this formula, it would be reviewed by the BMP Review Panel and EPA. We would, as we discussed, need to insure this linkage, also, in any verification guidance?

A: This is not a question for Tetra Tech, but we can provide assistance in applying the formula. To that end, the examples provided here and in the August 14, 2014, draft of *Statistical Sampling Approach for Initial and Follow-Up BMP Verification* provide jurisdictions with "look-up" tables to determine sampling sizes.

95% Confidence Level

p		±d	Large N	100	200	600	1000	1,500	2,000
No Information	50%	5%	385	80	132	235	278	307	323
	50%	10%	97	50	66	84	89	92	93
	50%	15%	43	31	36	41	42	42	43
Good Maintenance	70%	5%	323	77	124	210	245	266	279
	70%	10%	81	45	58	72	75	77	78
	70%	15%	36	27	31	34	35	36	36
Excellent	85%	5%	196	67	99	148	164	174	179
	85%	10%	49	33	40	46	47	48	48
	85%	15%	22	19	20	22	22	22	22

90% Confidence Level

p		±d	Large N	100	200	600	1000	1,500	2,000
No Information	50%	5%	271	74	116	187	214	230	239
	50%	10%	68	41	51	62	64	66	66
	50%	15%	31	24	27	30	31	31	31
Good Maintenance	70%	5%	228	70	107	166	186	198	205
	70%	10%	57	37	45	53	54	55	56
	70%	15%	26	21	24	25	26	26	26
Excellent	85%	5%	138	58	82	113	122	127	130
	85%	10%	35	26	30	34	34	35	35
	85%	15%	16	14	15	16	16	16	16

ATTACHMENT L: WVDEP STANDARD POST CONSTRUCTION STORMWATER BMP EVALUATION FORM

Standard Post Construction Stormwater BMP Evaluation Form

west virginia department of environmental protection

Date:_____ Time:_____ Site Number: _____
Location/Municipality: _____ Lat/Long: _____
Evaluated by: _____ MS4 : Yes□ No □

I. *Project Information*

1. Year of installation: _____ 2.Name of project:_____
3. Project type: □ Residential □ Commercial □ Industrial □ Multi-use □ Road □ Other
4. Facility name: _____
5. Site address: _____
6. Party responsible for maintenance: _____
7. Contact name: _____ Phone:_____
8. Past/previous land use: _____

II. *BMP Type*

1. Biofiltration
a.□ Vegetated Swale _____
b.□ Vegetated Buffer Strip _____
c.□ Bioswale _____
d.□ Rain Garden _____

2. Structural
a.□ Drain Insert _____
b.□ Porous Pavement _____
c.□ Media Filter _____

3. Infiltration
a.□ Infiltration Basin _____
b. □ Infiltration Trench _____
c.□ Exfiltration Trench _____
Other (describe): _____
_____
_____

4. Detention
a.□ Dry & Extended Detention Basin _____
b.□ Wetlands & Wet Pond _____
c.□ Dry Detention Ponds/ Hydrodynamic Structures _____

9. Comments/Notes: _____

III. *Evaluation Results*

[if multiple BMP's specify # (eg. 1a.) in comments]

0 = Good condition. Well maintained, no action required
1= Moderate condition. Adequately maintained, routine maintenance needed.
2= Degraded condition. Poorly maintained, routine maintenance and repair needed.
3= Serious condition. Immediate need for repair or replacement.

		Comments
1. Excessive trash/ debris	0 1 2 3 N/A	
2. Bare/exposed soil	0 1 2 3 N/A	
3. Evidence of erosion	0 1 2 3 N/A	
4. Evidence of clogging	0 1 2 3 N/A	
5. Sediment accumulation	0 1 2 3 N/A	
6. Abnormally high or low water levels	0 1 2 3 N/A	
7. Evidence of pollution/sediment runoff	0 1 2 3 N/A	
8. Evidence of sinkholes/karst	0 1 2 3 N/A	
9. Dead/excessive vegetation	0 1 2 3 N/A	
10.Evidence of future integrity issues	0 1 2 3 N/A	

(Scores from 0-9 are given TMDL credit) **Total**: _____ *(Scores of 3 cannot exceed two occurrences to be counted in milestones)*

0-4 = Good condition 5-10 = Moderate condition 11-15 = Degraded condition >15= Serious/poor condition

10. Is maintenance needed at this time? Yes□ No □ 11. GPS Coordinates: _____

IV. *Summary/Notes*

(compliance recommendations) Efficiency range: (*Refer to reference sheet)*

V. *Photographs*

Photo ID	Description
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

VI. *Sketch of Site* (optional)

(note problem areas)

ATTACHMENT M: WVDEP EXTENDED POST CONSTRUCTION BMP EVALUATION FORM

BMP Evaluation Form

FACILITY ID: _____	REGION: _____ JURISDICTION: _____	DATE: ___/____/___	ASSESSED BY:

NAME: _____

ADDRESS: _____

PHOTO IDS: _____

HANDHELD/ GPS ID:

SECTION 1- BACKGROUND INFORMATION (GIS)

BMP TYPE :

- ☐ Water Quality Dry Pond
- ☐ Unspecified Dry Pond
- ☐ Wet Pond
- ☐ Wetland
- ☐ Filter (specify: _____)
- ☐ Infiltration (specify: _____)
- ☐ Dry Swale
- ☐ Wet Swale
- ☐ Grass Channel
- ☐ Dry Well
- ☐ Permeable Pavement
- ☐ Bioretention
- ☐ Level Spreader
- ☐ WQ Inlet
- ☐ Underground
- ☐ Proprietary Device
- ☐ Other _____

YEAR CONSTRUCTED: _____

OWNERSHIP

☐ Public ☐ Private ☐ Unknown

SITE CHARACTERIZATION

DRAINAGE AREA: _____(acres) IMPERVIOUS COVER: _____(%) Discerned from: ☐ Plan ☐ County Data ☐ GIS ☐ Field

CONTRIBUTING DRAINAGE AREA (% land use): *Note – All percentages should sum up to 100%.*

_____Industrial _____Commercial _____Urban/Residential _____Suburban/Res

_____Forested _____Institutional _____Golf course _____Park

_____Crop _____Pasture _____Other: _____

CALCULATED WATER QUALITY VOL: _____(ft^3)

SECTION 2- FIELD VISIT

Rain in last 48 hrs? ☐ Yes ☐ No

Evidence of high water table? ☐ Yes ☐ No

DESIGN ELEMENTS

FACILITY SIZE:
Length: _____(ft)
Width: _____(ft)
Surface Area: _____(ft^2)
Depth of WQ storage _____(ft)

OBSERVED WQ STORAGE VOL: _____(ft^3)

HYDRAULIC CONFIGURATION
☐ On-line Facility
☐ Off-line Facility

DESIGN STORM:
☐ Water Quality
☐ Flood Control
☐ Channel Protection
☐ Unknown

SIGNAGE (check all that apply)

☐ None ☐ Flood Warning ☐ Stormwater Education ☐ No Trespassing ☐ Wildlife Habitat
☐ Public Property ☐ Do Not Mow ☐ Other: _____

OUTLET CHARACTERISTICS

MEASUREMENTS:
Number of Outlets : _____
Outlet Diameter: _____(in)
(up to 4 outlets) _____(in)
_____(in)
_____(in)
Outlet includes restrictor? ☐ Yes ☐ No

TYPE OF OUTLET: ☐ N/A ☐ Pipe ☐ Riser ☐ Weir ☐ Large Storm Overflow ☐ Open channel ☐ Large Storm By-pass ☐ Other: _____

OUTLET FEATURES: ☐ N/A ☐ Trash Rack ☐ Pond Drain ☐ Inverted outlet pipe ☐ Other_____ ☐ Hooded outlet ☐ Multiple outlet levels ☐ Anti-vortex device ☐ Perforated pipe ☐ Gravel Diaphragm ☐ Micropool

☐ Impoundment BMP

BMP contains Emergency Spillway?: ☐ Yes ☐ No

If yes, type: ☐ Channel ☐ Riser Overflow ☐ Weir ☐ Other: _____

OUTLET CONDITIONS:

Outlet Erosion	☐None	☐Slight	☐Moderate	☐Severe
Outlet Clogging	☐None	☐Slight	☐Moderate	☐Severe
Structural Problems	☐None	☐Slight	☐Moderate	☐Severe

DOWNSTREAM CONDITIONS: ☐Unknown ☐ Stream ☐ Other

☐ Closed storm sewer ☐ Surface channel ☐ Road ditch

Active Erosion	☐None	☐Slight	☐Moderate	☐Severe
Trash	☐None	☐Slight	☐Moderate	☐Severe
Sedimentation	☐None	☐Slight	☐Moderate	☐Severe
Odor	☐None	☐Slight	☐Moderate	☐Severe
Algae	☐None	☐Slight	☐Moderate	☐Severe
Other WQ Problems	☐None	☐Slight	☐Moderate	☐Severe

SOIL OR FILTER MEDIA

TYPE OF FILTER MEDIA
☐ N/A ☐ Unknown ☐ Soil Media ☐ Sand ☐ Gravel ☐ Large Stone ☐ Organic material ☐ Other_____
Depth of filter media _____(in)
Avg. depth of sediment build-up?_____(in)

SOIL MEDIA SAMPLE: *Note – Complete during site investigation, if applicable*
Dominant Soil Type ☐ Clay ☐ Loam ☐ Sand
Is the soil homogenous ☐ Yes ☐ No

Comments:

VEGETATION

GENERAL OBSERVATIONS:
☐ Landscaped
☐ Aquatic Bench
☐ Invasive Species
☐ Plant Diversity

TYPE OF GOUND COVER (% of Surface Area in Plan View up to low Outlet):
Note – All percentages should sum up to 100 %.
_____Trees _____Grasses/Perennials _____ Ponded water
_____ Managed Turf _____ Bare Soil _____Shrubs
_____ Gravel/stone _____ Mulch _____ Other: _____

Type of mulch, if present: ☐ Hardwood ☐ Pine Straw ☐ Other_____
Rate degree of shading of BMP Surface Area: ☐ Well Shaded ☐ Some Shading ☐ No Shading

INLET CHARACTERISTICS

MEASUREMENTS:
Number of Inlets : _____
Inlet Diameter/Width _____(in)
(up to 4 inlets) _____(in)
_____(in)
_____(in)

TYPE OF INLET: (check all that apply)
☐ Open Channel ☐ Closed Pipe
☐ Sheet Flow ☐ Curb Cut
☐ Other: _____

INLET SUBMERSION:
☐ Complete
☐ Partial
☐ None

INLET CONDITIONS:
Inlet Erosion ☐None ☐Slight ☐Moderate ☐Severe
Inlet Clogging ☐None ☐Slight ☐Moderate ☐Severe
Structural Problems ☐None ☐Slight ☐Moderate ☐Severe

Does BMP receive additional overland flow?
☐ Yes ☐ No

PRETREATMENT

TYPE OF PRETREATMENT
☐ None
☐ Sediment Forebay (_____ ft^3)
☐ Grass Channel
☐ Riprap Channel or Apron
☐ Gravel Filter Strip
☐ Grass Filter Strip
☐ Plunge Pool?
☐ Stone Diaphragm
☐ Other: _____

PRETREATMENT FUNCTION
Is pretreatment functioning? ☐ Yes ☐ No
Is sediment removal necessary? ☐ Yes ☐ No
Signs of pretreatment bypass? ☐ Yes ☐ No
Signs of flow of sediment from pretreatment to BMP? ☐ Yes ☐ No
Severity: ☐ Slight ☐Moderate ☐Severe

GENERAL DESIGN

BMP FEATURES (check all that apply)
☐ Maintenance Access
☐ Fence
☐ Multi-cell
☐ Micropool
☐ Impermeable Liner
☐ Underdrain
☐ Clean Out
☐ Observation Well
Is water present in observation well?
☐ Yes ☐ No Depth: _____ ft
☐ Pond Drain
☐ Large Storm Overflow
☐ Large Storm Bypass
☐ Other:_____

CONVEYANCE SYSTEM THROUGH BMP
☐ Low Flow Channel
☐ Concrete ☐ Eroded ☐ Earthen ☐ Other _____
☐ No Defined Channel
Length of Shortest Flow Path: _____(ft)

Is BMP designed with a Permanent Pool? ☐ Yes ☐ No
Permanent Pool Max Depth: _____(ft)
Permanent Pool Avg. Depth: _____(ft)
Permanent Pool Volume: _____(ft^3)

PERFORMANCE

GENERAL PROBLEMS: (check all that apply)

- ☐ Maintenance Needed
- ☐ Water Bypass of Inlet
- ☐ Water Bypass of Outlet
- ☐ Incorrect Flow Paths
- ☐ Short-circuiting of treatment mechanism
- ☐ No or ineffective treatment
- ☐ No or ineffective pretreatment
- ☐ Others _____
- ☐ Erosion at Embankments
- ☐ Erosion within Facility
- ☐ Deposition within Facility
- ☐ Inappropriate Ponding of Water
- ☐ Clogged Pond Drain/Underdrain
- ☐ Clogged Media
- ☐ Inappropriate media material
- ☐ Inappropriate underlying soil (infiltration)
- ☐ Permanent Pools not stable
- ☐ Inadequate vegetation
- ☐ Dead or Diseased Vegetation
- ☐ Too much vegetation/invasives
- ☐ Trees on Embankment
- ☐ Failing structural components
- ☐ Safety issue (Note:_____)

WATER QUALITY IN FACILITY: ☐N/A

Algae	☐None	☐Slight	☐Moderate	☐Severe
Odor	☐None	☐Slight	☐Moderate	☐Severe
Color	☐None	☐Slight	☐Moderate	☐Severe
Turbidity	☐None	☐Slight	☐Moderate	☐Severe

EVIDENCE OF:

- ☐ Geese
- ☐ Animal Burrows
- ☐ Mosquitoes

PROBLEM		1=NONE	2 - FEW	3 – SEVERAL	4-SEVERE
TRASH		No evidence of trash	A few pieces of trash throughout BMP	Trash accumulation near inlet/outlet	Lots of trash in BMP or BMP used for storage
BMP BANK EROSION		No noticeable erosion	Slight erosion < 5% of bank affected	Moderate erosion ~15% of bank affected	Banks severely eroded, >25% of bank affected
SEDIMENT DEPOSITION		No sediment deposition	Areas of minor sediment deposition	Areas of some deposition, may be severe near inlet/outlets	Lots of deposition resulting in pond bottom clogging
SURFACE SLOPE		0-1% BMP surface slope	1-3% BMP surface slope or steeper slopes with check dams,	3-5% BMP surface slope with no check dams,	>5% surface slope;
SIDE SLOPES		BMP side slopes 3:1 or flatter	BMP side slopes 2:1	Steep BMP side slopes	Risk of side slope failure
STRUCTURAL		No evidence of structural damage	Minor problems – bank slump, eroded channels	Moderate structural problems –failure pending	Structural failures – bank failure, blowout
VISIBILITY		High visibility, near high-traffic areas	Some visibility, near traffic areas	Limited visibility, near low traffic areas	No visibility, behind buildings or fences
VEG COVER		No mowing in/around BMP	Mowing along BMP edges but areas of no mow in BMP bottom	Mowed turf vegetation	BMP bottom has large areas of bare soil
		Dense plant cover (>50%)	Plant cover 30-50%	Some plant cover 15-30%	Sparse vegetative cover (<15%),
VEG HEALTH	TREES	Healthy and established	New growth	Stressed	Dead
	GROUND COVER	Healthy and established	New growth	Stressed	Dead
	SHRUBS	Healthy and established	New growth	Stressed	Dead

OVERALL PERFORMANCE SCORE (circle one number)

Excellent design and function, no general problems with performance			BMP is well designed, but is undersized or has a few performance problems		BMP is adequately designed, several problems with performance are noted			Poor BMP design, severe performance problems or failure	
10	9	8	7	6	5	4	3	2	1

FIELD NOTES

GOOD OR INTERESTING DESIGN FEATURES:

PHOTO #'S:

POOR OR PROBLEMATIC DESIGN FEATURES:

PHOTO #'S:

SECTION 3 – DESIGN PLAN VERIFICATION

AS BUILT (OR DESIGN) PLAN AVAILABLE: ☐ Yes ☐ No

Do field observations match design plans/as-builts? Describe any differences.

Soil type in facility	☐ Yes	☐ No	If no, describe:
Pretreatment type and size	☐ Yes	☐ No	If no, describe:
Signage	☐ Yes	☐ No	If no, describe:
Low-flow channel	☐ Yes	☐ No	If no, describe:
Dimensions/volume	☐ Yes	☐ No	If no, describe:
Inlet type, #, and sizing	☐ Yes	☐ No	If no, describe:
Outlet type, #, and sizing	☐ Yes	☐ No	If no, describe:
Vegetation composition	☐ Yes	☐ No	If no, describe:
Other features	☐ Yes	☐ No	If no, describe:

ATTACHMENT N: WVDEP QUALITY ASSURANCE PROJECT PLAN FOR CHESAPEAKE BAY POINT-SOURCE DATA COLLECTION

WV DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER & WASTE MANAGEMENT
PROGRAM SUPPORT BRANCH

QUALITY ASSURANCE PROJECT PLAN FOR CHESAPEAKE BAY POINT-SOURCE DATA COLLECTION

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Approval Sheet

Suzanne Hersh, EPA Project Manager	Date
Jennifer Pauer, Watershed Basin Coordinator	Date
Terrie Sangid, Assistant Director – Division of Water and Waste Management	Date

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Section A1 – Distribution List

This document and all supporting materials will be submitted to the following individuals. Distribution format will be electronic and/or paper copies.

US Environmental Protection Agency (US EPA)
Chesapeake Bay Program Office
410 Severn Avenue – Suite 109
Annapolis, MD 21403

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West Virginia Department of Environmental Protection
601 57th St. Charleston, WV. 25304
Phone: (304) 926-0499

Jennifer Pauer, Watershed Basin Coordinator
Terrie Sangid, Assistant Director – DWWM

Section A2 – Project Task

This QAPP is intended to cover only point source data collection from Industrial and Municipal facilities along the Chesapeake Bay watershed in West Virginia. Data is collected by the facilities or authorized contracted laboratories which are certified pursuant to 47 CSR 32, Environmental Laboratories Certification and Standard of Performance. It is reported on Discharge Monitoring Reports to WVDEP, which are then analyzed and submitted to US EPA's Chesapeake Bay Program Office.

Section A3 – Project Description and Background

West Virginia's point-source data collection focuses on collecting data from permitted industrial and municipal facilities along the Chesapeake Bay watershed. The data is collected through each facility's submission of Discharge Monitoring Reports as required by their permit. Discharge Monitoring reports (DMRs) are reports that provide analytical results of chemicals and nutrients being discharged by NPDES permitted facilities (point source) into the waterways of West Virginia. The data undergoes rigorous quality assurance checks before being uploaded into WVDEP's Environmental Resource Information System (ERIS) and uploaded into US EPA's Integrated Compliance Information System (ICIS).

Annually, the point-source data is compiled into a report to be used by the US EPA's Chesapeake Bay Program Office in Chesapeake Bay modeling software to track the environmental impact upon bay waters. Since the nature of this project relies on data collected and reported from outside sources, there are unique challenges to ensuring complete and accurate data. A quality assurance project plan to address the procedure for obtaining thorough, correct data was needed to ensure consistency from year to year.

Section B – Data Acquisition and Management

Data is collected from all permitted industrial and municipal facilities on the Chesapeake Bay watershed on no less than a yearly basis. Depending on the permit requirements, the reporting frequency can be monthly, quarterly, semi-annual or annual. WVDEP employs two Microsystem Support Specialists (MSSSs) to administer the industrial and municipal DMRs on a daily basis. The permit holders enter their DMR data into an electronic reporting system

via the web. The MSSSs upload all municipal and industrial DMRs in West Virginia, including those used for the collection of Chesapeake Bay point-source data.

Data received is first verified to correspond with the facility's respective permit and to ensure there were no errors in translation between WVDEP's electronic DMR (eDMR) submittal system and ERIS. The eDMR system has numerous QA/QC procedures built directly into the interface that prevents facilities from submitting erroneous data, such as detecting missing information or improper units. Facilities cannot submit their eDMR until the errors have been addressed, thus all data received should have a very high standard of completeness and accuracy. The MSSSs still review all submitted data to look for any errors that may not have been detected by the eDMR system filters and work with the facility representative over the telephone or via email or written correspondence to rectify the reporting problem.

Once data is validated in eDMR and uploaded to DEPs Oracle database (ERIS), the data is translated (in batch, utilizing the Central Data Exchange) to US EPA's Integrated Compliance Information System (ICIS). Batch Transaction Summary Reports from ICIS are ran and checked, rectifying any errors that occurred during translation.

The individuals also complete the municipal and industrial Quarterly Non-Compliance Reports (QNCR) data verification within one month following each quarter. The QNCR will show missing DMR data and data that violates the permit limits and conditions, as well as show any facilities that failed to submit a scheduled eDMR during the quarter. The individuals will rectify any missing data and verify the validity of the violations by comparing the DMR data provided by the facility against the limits and conditions within the permit and contact facility representatives to obtain the necessary reporting data as needed.

Section C1 – Assessment and Collection of Chesapeake Bay Point-Source Data

The Program Support Branch conducts assessments of all point-source industrial and municipal DMR data on the Chesapeake Bay watershed on a yearly basis. An environmental resource specialist prepares and evaluates a year's data between July 1st and June 30th. The following are the QA procedures adhered to during data preparation and submittal:

- ensure all DMR data has been properly recorded in ERIS by July 30 of each year;
- extract Chesapeake Bay watershed data from ERIS and convert into an Excel spreadsheet to be uploaded into the US EPA's Chesapeake Bay Program Office modeling software;
- analyze and evaluate data for accuracy and completeness as outlined by the Chesapeake Bay Phase 5 Community Watershed Model (particularly Section 7: Point Sources, Water Withdraws, and On-Site Waste Disposal Systems), the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements and the WV NPDES Reporting Reference Manual;
- complete mathematical calculations for data fields that have no analytical data provided, utilizing the standards and specification provided by US EPA in the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements;
- participate in meetings and conferences

- adjust reporting requirements to reflect those outlined in WVDEPs Watershed Implementation Plan as needed.

Section C2 – Chesapeake Bay Point-Source Data Report

Once the Chesapeake Bay point-source data is compiled, quality checked and appropriately formatted, the data is sent to US EPA no later than December 31st of the same year. All data review and utilization is performed at the US EPA level. Any questions relating to the point-source data report can be directed to WVDEP's Environmental Resource Specialist responsible for compiling and submitting the report.

Section D – References and Additional Information

1. Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements
   http://www.epa.gov/region3/chesapeake/grants/2011Guidance/Attachment6_Point%20_NonPoint_Source_Data_Dec2010.pdf
2. Chesapeake Bay Phase 5 Community Watershed Model
   http://www.chesapeakebay.net/model_phase5.aspx
3. Quality Management Tools: QA Project Plans
   http://www.epa.gov/QUALITY/qapps.html
4. US EPA's Requirements for Quality Assurance Plans
   http://www.epa.gov/quality/qs-docs/r5-final.pdf
5. WV NPDES Reporting Reference Manual
   http://www.dep.wv.gov/WWE/ee/ww/Documents/npdes_nov2007.pdf

ATTACHMENT O: WVDEP CHESAPEAKE BAY PROGRAM WASTEWATER FACILITY AND NONPOINT SOURCE DATA SUBMISSION SPECIFICATIONS AND REQUIREMENTS

Updated December 2010
Chesapeake Bay Program
Wastewater Facility and Nonpoint Source
Data Submission Specifications and Requirements

The Watershed Technical and Wastewater Treatment Workgroups of the Water Quality Goal Implementation Team coordinate with the Chesapeake Bay Program's Technical Support and Services team and the Management Board to establish data submission requirements that meet the communications and management needs of the Chesapeake Bay Program. Implementation Grant or Work Plan deliverables must include schedules for submission of point source and nonpoint source nutrient reduction activities for use in Chesapeake Bay Watershed Model annual assessment scenarios. The following point source and nonpoint source data submission requirements were developed by the Water Quality Goal Implementation Team's Wastewater Treatment and Watershed Technical workgroups, respectively, to meet Chesapeake Bay Program watershed model requirements. With the exception of the EPA required dates for reporting stated on page 3 of this Attachment, the following information reflects both workgroups' latest agreements and minimum data requirements.

Jurisdictions are required to submit quality assured data by the established due date**s**. If necessary, base implementation grant funds should be used by the jurisdiction to ensure compliance with the due dates and data quality requirements. Recipients are to follow the output requirements stated in the General Guidance portion of this document.

WASTEWATER FACILITY DATA SUBMISSION

Facility Requirements:

Jurisdictions will submit wastewater facility data for all significant dischargers within their portions of the Chesapeake Bay watershed. A significant discharger is a facility that meets <u>one</u> of the following criteria:

- In West Virginia, Delaware and New York - Facility treating domestic wastewater and the design flow is greater than or equal to 0.4 million gallons per day (MGD).
- In Pennsylvania - Facility treating domestic wastewater and discharging greater than or equal to 0.4 MGD.
- In Maryland - Facility treating domestic wastewater and the design flow is greater than or equal to 0.5 MGD.
  In Virginia - Facility treating domestic wastewater and the existing design flow is greater than or equal to 0.5 MGD west of the fall line or 0.1 MGD east of the fall line **as well as** all new facilities greater than 40,000 gallons per day (GPD) or facilities expanding by greater than 40,000 GPD as significant.
- Industrial facilities with a nutrient load equivalent to 3,800 total phosphorus (TP) lbs/year or 27,000 total nitrogen (TN) lbs/year.
- Any other municipal and industrial wastewater facilities identified within a jurisdictional tributary strategy.

Jurisdictions are encouraged, but not required, to track "non-significant" facilities not meeting the above definition and provide their flow and concentration data on an annual basis to EPA Chesapeake Bay Program Office (CBPO). For the purpose of consistency, jurisdictions are strongly encouraged to include flow and concentrations for all facilities with a design flow greater than 0.40 MGD.

Data Requirements:

Jurisdictions are required to submit monthly concentration and flow data for all parameters listed below for each significant discharger facilities within their portion of the Chesapeake Bay watershed. The QAQC procedures listed in Figure 1 should be performed prior to data submission.

At Facility Level: Data must be provided for those municipal, industrial, and federal facilities as defined above as "significant dischargers" of total nitrogen and total phosphorus to the Bay watershed. The jurisdictions must annually update their list of significant dischargers with additional facilities that meet one of the criteria of the significant facility definition. The location (county, latitude/longitude) of each facility's discharge point must be reported.

At the Monthly Level: concentration and flow data for the 10 identified parameters must be provided for each outfall. Jurisdictions will submit all parameters in each month's data record for each facility. Data for the following parameters will be submitted: average monthly flows and average monthly concentrations of NH3, TKN, NO23 (or NO2+NO3), TN, PO4, TP, CBOD **(**preferable) or BOD, DO and TSS. All nitrogen species need to be reported as nitrogen; all phosphorus species need to be reported as phosphorus.

In the absence of monthly monitored concentration data for one or more of the above listed 10 parameters for a facility, the jurisdiction will submit the CBP **Water Quality Goal Implementation Team's** Wastewater Treatment Workgroup agreed to default concentration data or calculated data based on the species relationship listed in Table 1. All default or calculated data must be flagged with an appropriate description such as:

- Average of reported monthly data;
- Default value agreed by the workgroup;
- Default value based on state specific information;
- Default value based on SIS database;
- Calculated as 67% of TP by CBP species ratio;
- Calculated as NO23=TN-TKN; and
- Net Value (the influent concentration or load is subtracted).

Industrial facility data should be reported as average monthly flow and net concentrations for that respective month, as quantified.

Each jurisdiction **MUST** review all wastewater facility data for accuracy and outliers prior to submission to EPA CBPO. The required quality assurance and quality control procedures are listed in Figure 1.

NONPOINT SOURCE DATA SUBMISSION

Nonpoint source BMP information is used to create annual progress scenarios using the CBP Watershed Model (WSM) and measures of restoration efforts. Beginning October 2010, data **must** be submitted via the National Environmental Information Exchange Network (NEIEN) using the nonpoint source BMP schema. Starting in the 2011 Grant Guidance, EPA CBPO will not accept Microsoft Excel, Access, or ASCII for nonpoint source data submissions.

The NEIEN BMP data exchange is capable of accepting current and historical BMP data submissions. At a minimum, recipients must submit BMP data for the period of July 1, 2010- June 30, 2011. Data outside this temporal range will be accepted, processed through NEIEN and used by the Chesapeake Bay Program based on the guidance of Chesapeake Bay Program subject matter experts and the Watershed Technical Workgroup.

Nutrient **and sediment** reduction activities that are new to reporting or not currently modeled will not be credited in the model until the BMPs, their definitions and pollutant removal efficiencies have been approved using the **Water Quality Goal Implementation Team's "Protocol for the Development, Review and Approval of Loading and Effectiveness Estimates for Nutrient and Sediment Controls in the Chesapeake Bay Watershed Model."**[1]

WASTEWATER FACILITY AND NONPOINT SOURCE REPORTING FREQUENCY

Progress reports are an output of the grant. Each jurisdiction must check all data for accuracy and outliers prior to submission to the Chesapeake Bay Program Office. Grant recipients must provide progress data for significant point sources and nonpoint source BMPs according to the following schedule:

Submission or data call: December 31, 201**1**
Period data covers: July 1, 20**10** June 30, 20**11**

This schedule may not apply to the Commonwealth of Virginia which may submit its data in accordance with the Nutrient Allocation Compliance and Reporting requirements under Section 62.1-44.19:18 of the Virginia Code.

[1] **The Protocol is located on the web at: http://archive.chesapeakebay.net/pubs/Nutrient-Sediment_Control_Review_Protocol.pdf**

Figure 1: Wastewater Facility Nutrient Data Processing Flow Diagram

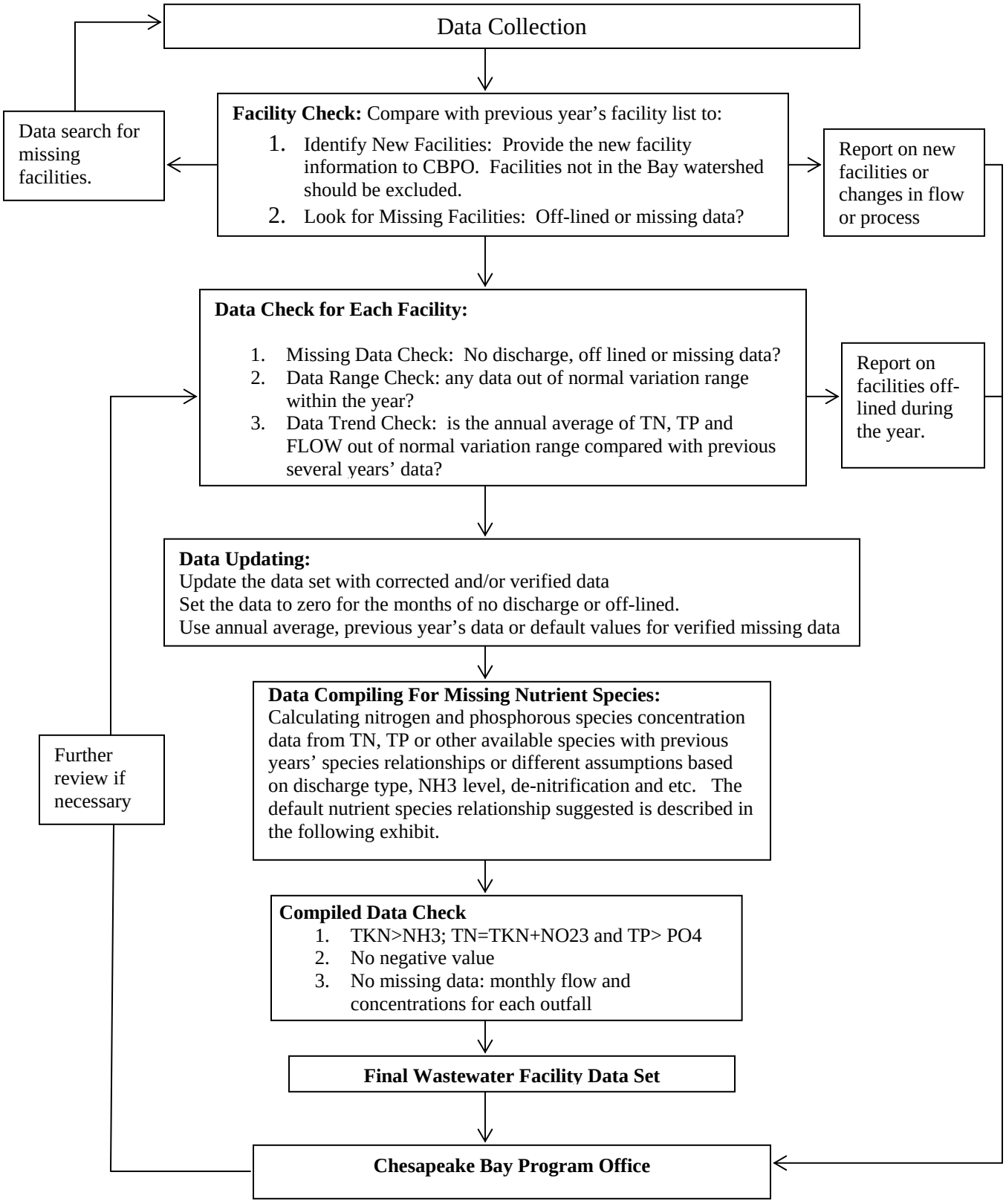

Table 1: Species Relationship

Type of Facility		**NH_3/NO_{23}/TON** (w/o Nitrification)	**NH_3/NO_{23}/TON** (w/ Nitrification)++	**NH_3/NO_{23}/TON** (w/Denitrification)
Municipalities (phase IV)		80/5/15(1)	7/85/8	12/73/15
Municipalities (phase V)		80/3/17**	7/80/13**	12/73/15(2)
Industries	Chemical	7/85/8+		
	Pulp & Paper	1/0/99**		
	Poultry Facilities w/BNR			8/75/17**
	Nonchemical (includes seafood, poultry, & food processors w/out BNR)	80/3/17**	7/85/8+	8/75/17**

(1) Stearns and Wheler recommended 80/0/20; however, the PSWG felt that there would often be minimal (5%) NOx present.

(2) Unchanged from the ratio recommended by Stearns and Wheler in Phase IV.

++Apply this relationship wherever NH3 limits apply

+Assumed by performing an analysis of MD chemical industry wastewater effluents which showed it is very close to the relationship for nitrifying sewage. This would apply to all chemical discharges and assumes that wastewaters are treated chemically and thus would not vary as for sewage relationships

** Updated, as based on an analysis of actual data from plants operating in Virginia.

Type of Facility	Facilities w/out TP Control PO_4/TOP ratio	Facilities With TP Control PO_4/TOP Ratio
All	71/29[a]	67/33[a]

[a] determined by averaging the actual data from MD and VA plants (including Blue Plains for "with TP Reduction".

Facility with TP Control is defined as a facility having a permit limit for total phosphorus.

Period	TSS Default (All jurisdictions)	TSS Default w/out NRT	TSS Default w/ NRT
1985-1990[b]	45		
1990-2000	25		
2000-2010		15	8

Type of Facility	DO concentration 1985-1990	DO Concentration 1990-2010
All	4.5 mg/l (b)	5.0 mg/l

(b) takes into account a number of NMP facilities operating across the watershed.

ATTACHMENT P: WVDEP WATER COMPLIANCE INSPECTION REPORT

EPA Water Compliance Inspection Report

Section A: National Data System Coding (ie PCS)

Transaction	Code	NPDES	Mo/Day/Yr	Inspection Type	Inspector	Facility Type
N	5				S	

Remarks:

Inspection Work Days	Facility Self-Monitoring Evaluation Rating	B1	QA	Reserved
			N	

Section B: Facility Data

Name and Location of Facility Inspected:	_____	**Entry Time**:	**Permit Effective Date**:
Name(s) of On-Site Representatives(s) Titles/Phone and Fax Numbers:	_____ _____ _____	**Exit Time/Date**:	**Permit Expiration Date**:
Name, Address of Responsible Official/Title/Phone/Fax:	_____	Contacted: Yes ☐ No ☒	**Other Facility Data**:

Section C: Areas Evaluated During Inspection
M - Marginal; N - No; N/A - Not Applicable; N/E - Not Evaluated; S - Satisfactory; U - Unsatisfactory; Y - Yes

	Permit		Flow Measurement		Sampling		Operations & Maintenance
	Records/Reports		Laboratory		Compliance Schedule		Sludge Disposal
	Fac Site Review		Eff / Rec. Waters		Self-Monitoring		Pollution Prevention
	Pretreatment		Stormwater		CSO/SSO		Multimedia
	Groundwater Data		Unpermitted Bypass				

Section D: Summary of Findings / Comments (attach additional sheets if necessary):

Compliance Assistance (check all that apply): Troubleshooting ☒ Records/Reports ☒ Sampling ☒

Name/Signature(s) of Inspectors(s)	**Agency/Office/Telephone/Fax** Dept. of Environmental Protection P. O. Box 662, Teays, WV 25569 (304) 757-1693	**Date**
Signature of Management QA Reviewer	**Agency/Office/Phone/Fax** Dept. of Environmental Protection P. O. Box 662, Teays, WV 25569 (304) 757-1693	**Date**

Revised: October 2003

Effluent Characteristics, A Table of Results

	Discharge Limitations, 001			
Parameter	*Avg. Monthly*	*Max. Daily*	*DEP*	*Permittee*
	Report Only	Report Only		

①
②

**M-Marginal; N-No; N/A-Not Applicable; N/E-Not Evaluated;
N/O-Not Observed; S-Satisfactory; U-Unsatisfactory; Y-Yes**

PERMIT VERIFICATION

Overall Rating Select one

	1.	Current copy of permit is onsite.
	2.	Name and mailing address of permittee are correct.
	3.	Facility is as described in permit.
	4.	Permit modification(s) issued.
	5.	Timely permit renewal application submitted (≤ 180 days remain to expiration)
	6.	Notification was given to EPA/State of new, different, or increased discharges.
	7.	Number and location of discharge points are as described in permit.
	8.	Permit accurately identifies name and location of receiving waters.
	9.	All discharges are permitted.
Comments:		

RECORDKEEPING AND REPORTING EVALUATION

Overall Rating Select one

	1.	Maintain records and reports as required by permit.
	2.	All required information is available, complete, and current.
	3.	Information is maintained for 3 years (or 5 years for sewage sludge).
	4.	If facility monitors more frequently than required by permit (Using approved methods), a. Are these results reported? b. Is the increased monitoring frequency indicated on the DMR(s)?
	5.	Analytical results are consistent with data reported on DMRs. a. The data moves accurately from the bench sheets to the DMRs. b. The calculations are performed properly (including loading, averages, etc.)
	6.	Sampling and analyses data are adequate and include: a. Dates, times, and location of sampling. b. Name of individual performing sampling c. Analytical methods and techniques d. Results of analyses and calibration e. Dates of analyses f. Times of analyses (where needed to determine if analyses met holding times) g. Name of person performing analyses h. Flow for samples obtained.
	7.	Monitoring records are adequate and include: a. Flow, pH, DO, etc., as required by permit b. Monitoring charts kept for 3 years (or 5 years for sewage sludge) c. Flow meter calibration records kept. d. Locational data (latitude and longitude of each outfall)

**M-Marginal; N-No; N/A-Not Applicable; N/E-Not Evaluated;
N/O-Not Observed; S-Satisfactory; U-Unsatisfactory; Y-Yes**

	8. Laboratory equipment calibration and maintenance records are adequate.
	9. Plant records are adequate and include: a. O & M Manual b. Daily plant operational records or log book c. Equipment maintenance records and schedules d. CSO/lift station check records or log books e. Schedules and dates of equipment maintenance repairs
	10. Pretreatment records are adequate and contain inventory of industrial waste contributors, including. a. Monitoring data b. Inspection reports c. Compliance status records d. Enforcement actions.
Comments:	

FACILITY SITE REVIEW

Overall Rating Select one

	1. Oil/chemical storage tanks have adequate secondary containment
	2. Secondary containment drains closed when not in use.
	3. Procedures for removing accumulated water from secondary containment.
	4. Facility schedules/performs routine and preventive maintenance on time.
	5. Plant has general safety structures such as rails around or covers over tanks, pits, or wells.
	6. Emergency phone numbers are listed, including EPA, State, and Spill Hotline.
	7. No cross connections exist between a potable water supply and nonpotable source.
	8. Chlorine safety precautions are followed: a. NIOSH-approved 30-minute air pack. b. All standing chlorine cylinders chained in place. c. All personnel trained in the use of chlorine d. Chlorine repair kit available. e. Chlorine leak detector tied into plant alarm system. f. Chlorine cylinders stored in adequately ventilated areas? g. Ventilation fan with an outside switch h. Posted safety precautions i. Existing emergency SOP and/or RMP or SPCC?
	9. Trash Disposal
	10. Oil Disposal
	11. Surface H2O Diversion
	12. Dike Condition
	13. Fencing
	14. All permitted outlets properly located and marked.

**M-Marginal; N-No; N/A-Not Applicable; N/E-Not Evaluated;
N/O-Not Observed; S-Satisfactory; U-Unsatisfactory; Y-Yes**

	15. Auxiliary Power
	16. Open dumps on property
	17. Spill Detection and Alert a. Adequate lighting provided. b. Adequate monitoring to detect spills. c. Adequate alarm or other systems to alert personnel in a timely manner.
Comments:	

PRETREATMENT

Overall Rating Select one

	THE FACILITY IS SUBJECT TO PRETREAMENT REQUIREMENTS
	1. All required industrial users are identified in the permit
	2. Required pretreatment ordinances, regulations, etc. established
	3. Required analyses being performed on industrial users waters.
	4. Adequate inspection and enforcement program for industrial users and, if applicable, their pretreatment facilities.
Comments:	

GROUNDWATER DATA

Overall Rating Select one

Comments:

FLOW MEASUREMENT

Overall Rating Select one

	1. Flow measurement frequency and type meets permit requirements.
	2. Type of primary flow measuring device.
	3. Type of secondary flow measuring device.
	4. Other type of flow measuring device.
	5. Flow measurement equipment adequate to handle expected ranges of flow rates.
	6. Actual discharged flow measured.
	7. Secondary instruments (totalizers, recorders, etc.) properly operated and maintained.
	8. Effluent flow measured after all return lines.
	9. Date of last flow meter calibration. Performed by:
	10. Frequency of flow meter calibration:
	11. Flow totalizer properly calibrated.
	12. Calibration frequency adequate.

**M-Marginal; N-No; N/A-Not Applicable; N/E-Not Evaluated;
N/O-Not Observed; S-Satisfactory; U-Unsatisfactory; Y-Yes**

	13. Spare parts stocked.
	14. Effluent loadings calculated using effluent flow.
	15. Flumes
	16. Weirs
Comments:	

FLUMES

	1.	Flow entering flume reasonably well-distributed across the channel and free of turbulence, boils, or other disturbances.
	2.	Cross-sectional velocities at entrance relatively uniform.
	3.	Flume clean and free of debris and deposits.
	4.	All dimensions of flume accurate and level.
	5.	Side walls of flume vertical and smooth.
	6.	Sides of flume throat vertical and parallel.
	7.	Flume head being measured at proper location.
	8.	Flume head properly measured
	9.	Flume properly sized to measure range of existing flow.
	10.	Flume operating under free-flow conditions over existing range of flows.
	11.	Flume submerged under certain flow conditions.
Comments:		

WEIRS

	1.	What type of and size weir does the facility use?
	2.	Weir exactly level.
	3.	Upstream face both smooth and perpendicular to axis of channel both horizontally and vertically.
	4.	Downstream edge of weir is chamfered at 45° if over ¼" thick.
	5.	Free access for air below the nappe of the weir.
	6.	Distance from sides of weir to side of channel at least 2H (for all except suppressed weir).
	7.	Head measurements properly made by facility personnel.
	8.	Leakage does not occur around weir.
	9.	Use of proper flow tables by facility personnel.
	10.	Height from bottom of channel to weir crest never less than 1' and at least 2H.
Comments:		

OTHER FLOW DEVICES

	1.	Type of flow meter used:

**M-Marginal; N-No; N/A-Not Applicable; N/E-Not Evaluated;
N/O-Not Observed; S-Satisfactory; U-Unsatisfactory; Y-Yes**

	2. What are the most common problems that the operator has had with the flow meter? a. Is there a straight length of pipe or channel before and after the flow meter of at least 5 to 20 diameters? b. If a magnetic flow meter is used, are there sources of electric noise in the near vicinity? c. Is the magnetic flow meter properly grounded? d. Is the full pipe requirement met?
	3. Measured wastewater flow: mgd; Recorded flow: ; Error %
Comments:	

LABORATORY

Overall Rating Select one

	1. Onsite Lab DEP certified. Certification #
	2. Onsite lab analyst is certified.
	3. Parameters analyzed onsite.
	4. Adequate equipment and procedures used for non-certified labs performing analyses onsite.
	5. EPA approved analytical procedures are used.
	6. Appropriate laboratory methods used as specified by permit.
	7. State certified contract laboratory being used. Lab name: Address: Contact: Phone #: Certification #:
	8. Holding times being met by laboratory.
	9. Satisfactory refrigeration in use.
	10. Transfer of samples fully documented.
Comments:	

EFFLUENT/RECEIVING WATERS

Overall Rating Select one

	1. Recent History (last months reviewed)
	a. Violation of discharge limits
	b. Spills/bypasses
	c. Fish Kills
	2. Latest bioassay results.
	3. Appearance of effluent during inspection.

**M-Marginal; N-No; N/A-Not Applicable; N/E-Not Evaluated;
N/O-Not Observed; S-Satisfactory; U-Unsatisfactory; Y-Yes**

	a. Color b. Clarity c. Foam, scum, or sheens present d. Excessive solids e. odor
	4. Appearance of receiving stream during inspection a. Distinctly visible foam or sheen on stream b. Sludge beds or deposits of solids below discharge point c. Distinctly visible plume from discharge to stream d. Discharge creates objectionable odor at or near the stream
Comments:	

STORMWATER

Overall Rating Select one

Comments:

UNPERMITTED BYPASS

Overall Rating Select one

Comments:

SAMPLING

Overall Rating Select one

	1. Samples are representative of the monitored activity.
	2. Take samples at sites specified in permit.
	3. Locations adequate for representative samples.
	4. Flow proportioned samples obtained when required by permit.
	5. Complete sampling and analysis on parameters specified by permit.
	6. Conduct sampling and analysis in frequency specified by permit.
	7. Permittee uses method of sample collection required by permit.
	8. Sample collection procedures adequate: a. Samples refrigerated during compositing. b. Proper preservation techniques used. c. Containers are appropriate for samples collected.

**M-Marginal; N-No; N/A-Not Applicable; N/E-Not Evaluated;
N/O-Not Observed; S-Satisfactory; U-Unsatisfactory; Y-Yes**

	d. Sample holding times conform to current 40CFR 136.3 e. Fecal coliform sample taken directly into sterilized container. f. BOD samples are reseeded after disinfection.
	9. Automatic samplers and other sampling equipment are properly cleaned.
	10. Chain of custody is maintained and documented
	11. Samples collected from industrial users in pretreatment program.
Comments:	

AUTOMATIC SAMPLER PROCEDURES AND OBSERVATIONS

	1. Sample intake tubing placed in a well-mixed, representative location (0.4 to 0.6 depth).
	2. Proper sample tubing (Teflon for organics, otherwise tygon).
	3. Proper composite sample container (glass for organics, otherwise plastic).
	4. Proper refrigeration with required documentation.
Comments:	

COMPLIANCE SCHEDULE

Overall Rating Select one

	1. Items in the compliance schedule, which are currently due, have been completed. (includes both the permit and orders)
	2. Permittee has a plan to comply with items in the compliance schedule coming due in the future. (includes both the permit and orders)
	3. Written notification to OWR of compliance with scheduled items as required by the permit.
Comments:	

SELF MONITORING

Overall Rating Select one

Comments:

CSO/SSO

Overall Rating Select one

Comments:

**M-Marginal; N-No; N/A-Not Applicable; N/E-Not Evaluated;
N/O-Not Observed; S-Satisfactory; U-Unsatisfactory; Y-Yes**

OPERATION AND MAINTENANCE EVALUATION

Overall Rating Select one

	1. Facility properly operates and maintains treatment units
	a. Collection system
	b. Pump Stations
	c. Trash Trap
	d. Grease Trap
	e. Bar Screen
	f. Comminutor
	g. EQ Basin
	h. Holding Tank (s)
	i. Primary Clarifier (s)
	j. Grit removal
	k. Pond-Stabilization
	l. Pond-Polishing
	m. Pond-Lagoon
	n. Aeration
	o. Secondary Clarifier (s)
	p. Scum Removal
	q. Chemical Feeders
	r. Filtration
	s. Chlorination
	t. Contact Chamber
	u. Post Aeration
	v. Dechlorination
	w. UV
	x. SBR (s)
	y. Trickling Filter
	z. Dosing device
	aa. Sludge Dewatering
	bb. Digester
	cc. Process Controls
	dd. MLSS
	2. All treatment units, other than backup units, are in service.
	3. Adequate alarm system for power or equipment failures is available.
	4. Facility follows procedures for facility operation and maintenance.
	5. Facility has standby power or other equivalent provision.

**M-Marginal; N-No; N/A-Not Applicable; N/E-Not Evaluated;
N/O-Not Observed; S-Satisfactory; U-Unsatisfactory; Y-Yes**

	6. a. Hydraulic overflows and/or organic overloads are experienced. b. Untreated bypass discharge occurs during power failure. c. Untreated overflows occurred since last inspection. Reason: d. Flows were observed in overflow or bypass channels. e. Checking for overflows is performed routinely. f. Overflows are reported to EPA or to the appropriate State agency as specified in the permit.
Comments:	

SLUDGE DISPOSAL

Overall Rating Select one

	1. Sludge disposal/reuse method. and location in accordance with permit
	2. Sludge use and disposal practice(s): a. Land Application b. Landfilled location at least 20% solids --- c. Pumped and Hauled certified hauler d. Other: (list)
	3. Notification is given to EPA/State of new or different sludge disposal method?
	4. Number and location of disposal sites/activities are as described in the permit or fact sheet or land application plan
	5. Sludge stored at facility: a. Adequately sized for periods of inclement weather. b. Controls leachate, runoff and public access.
Comments:	

POLLUTION PREVENTION

Overall Rating Select one

Comments:

MULTIMEDIA

Overall Rating Select one

**M-Marginal; N-No; N/A-Not Applicable; N/E-Not Evaluated;
N/O-Not Observed; S-Satisfactory; U-Unsatisfactory; Y-Yes**

SUMMARY

1. Samples

**M-Marginal; N-No; N/A-Not Applicable; N/E-Not Evaluated;
N/O-Not Observed; S-Satisfactory; U-Unsatisfactory; Y-Yes**

PHOTO LOG	
Photo #	**Comments**
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ATTACHMENT Q: WVDEP ELECTRONIC DISCHARGE MONITORING REPORTING USER'S GUIDE

Electronic Discharge Monitoring Reporting (eDMR)

User's Guide

Revised March 22, 2013

Contents

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Logging into the System

Website address for electronic discharge monitoring reporting (eDMR):
https://apps.dep.wv.gov/eplogin.cfm

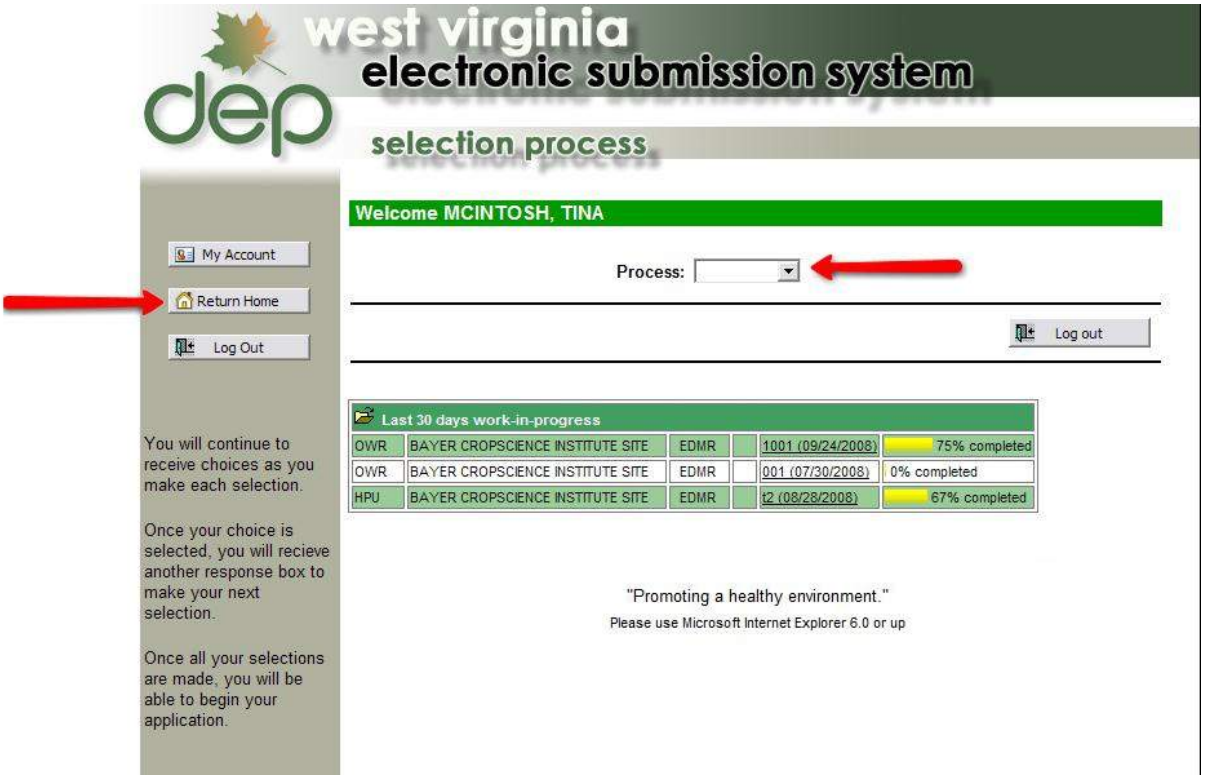
Before you can log into the system, you need to register for a username and password. If you do not have an account, please refer to the "How to Sign Up for an eDMR/ePermitting Login ID and Password" document. If you have a login for ePermitting, you do not need to request a separate production login for eDMR.

NOTE: Once you have successfully entered your login information, any period of inactivity for two hours will log you out of the system.

Creating a New eDMR

After logging in, you will be presented with the **Selection Process** screen. This screen is considered the eDMR **Home** screen and is where you will start to create, continue, or review eDMRs.

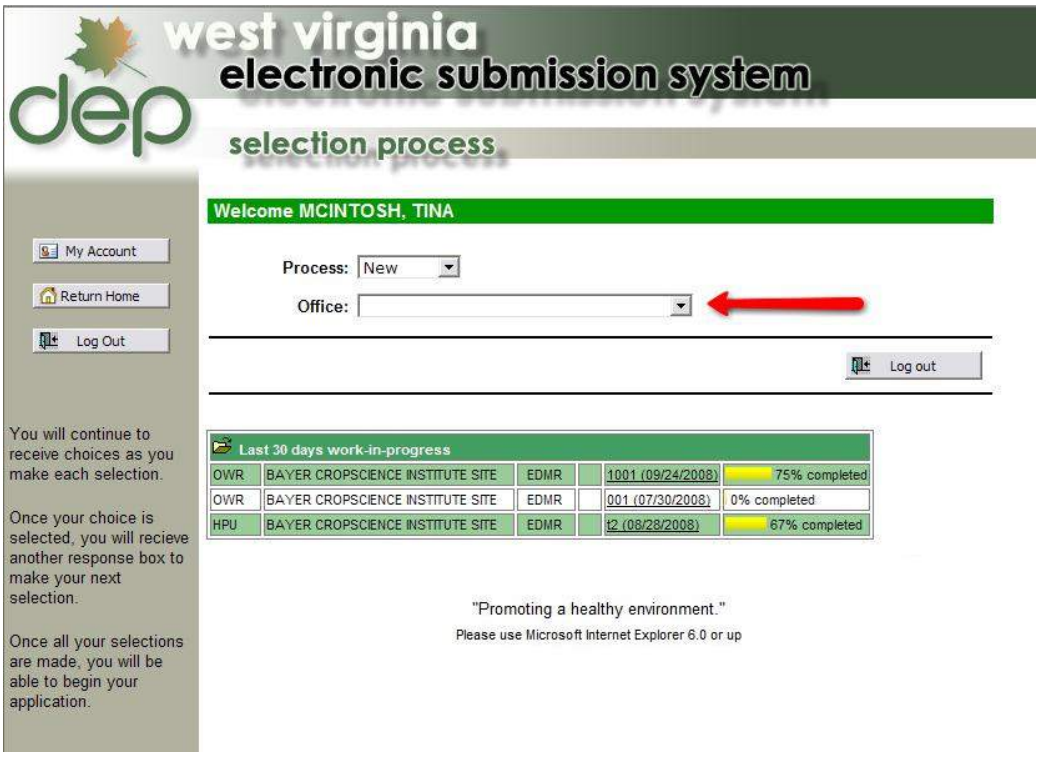
Anytime you need to switch to a different eDMR (e.g. a different month for the same facility or an entirely different facility), you can click the **"Return Home"** button at the left to get back to the **Selection Process Home** screen.



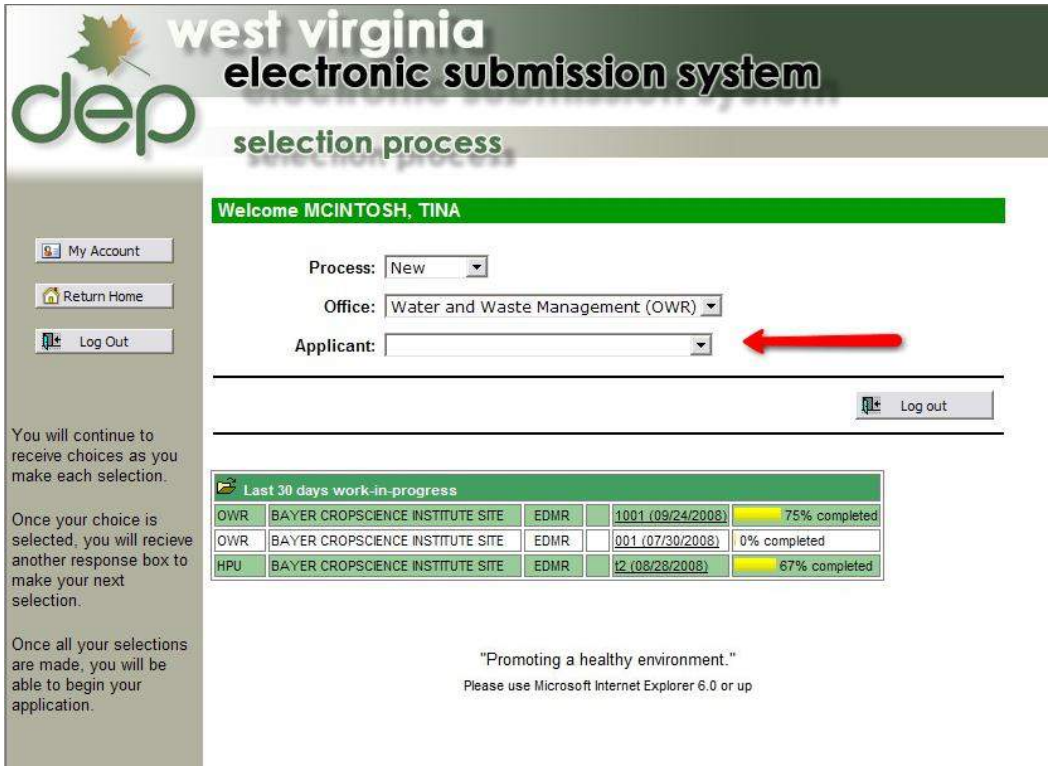
Several options are available under the **Process** field:

- **New**: create a new eDMR
- **Continue**: work on a previously created eDMR
- **Review**: bring up a read-only version of a previously submitted eDMR
- **Security**: change your account preferences

You will select the **Office** you intend to create the eDMR for. The common choices will be **Hydrologic Protection Unit (HPU)** or **Water and Waste Management (OWR).**

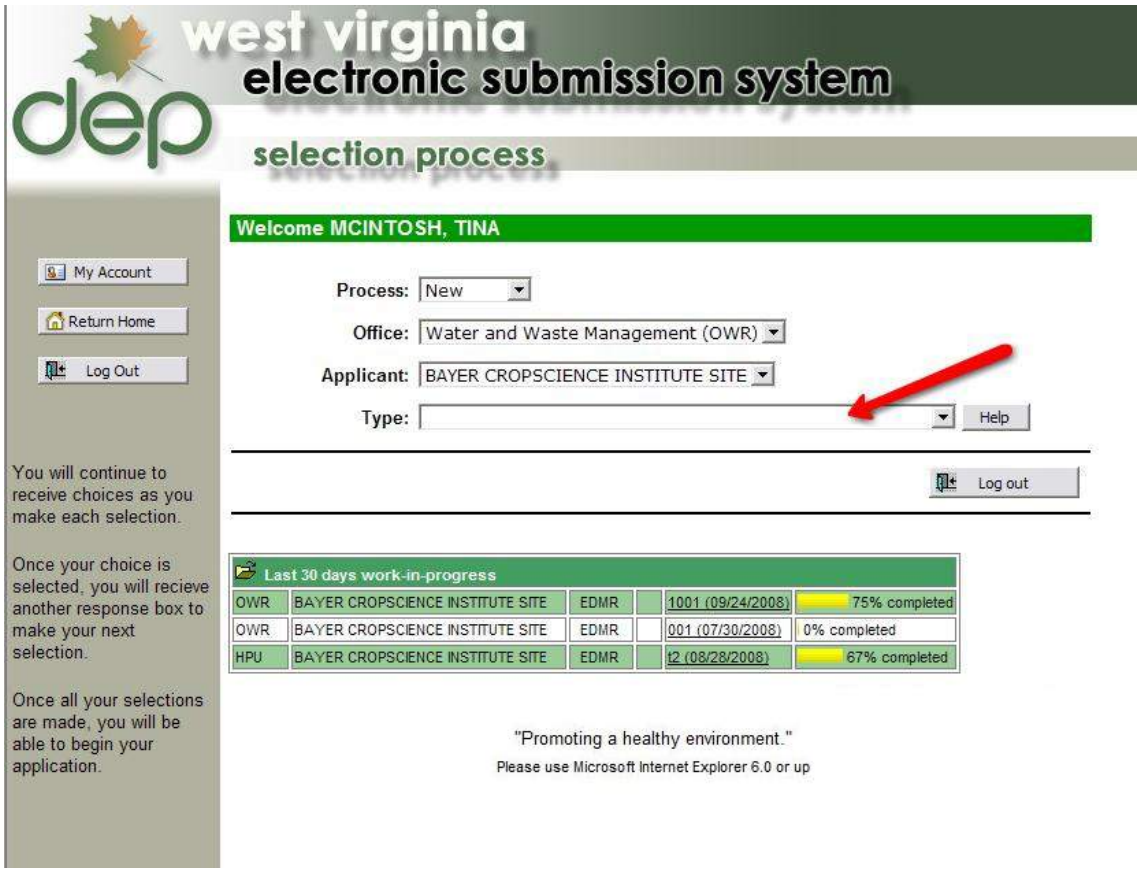


On the **Applicant** field, select the company or facility that you intend to create the eDMR for. You will only see companies or facilities you have access to.



On the **Type** field, select "**Electronic DMR – eDMR.**"

NOTE: You might see other options here if you have the security rights to create a permit (e.g. ePermitting).

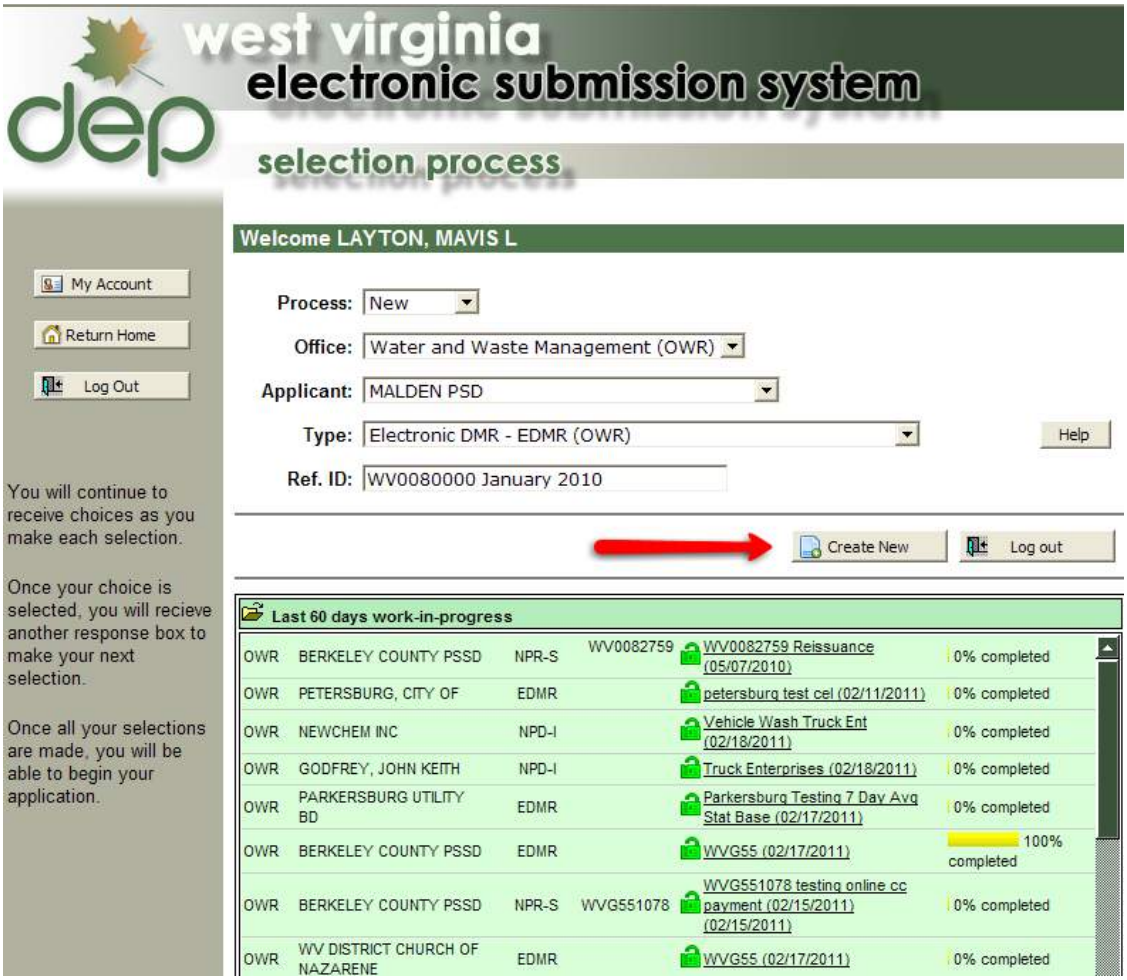


On the **Reference ID** field, please include your permit number and/or general permit registration number as applicable, sample period and year. Examples: WV0023205 August 2012, WVG550987 3rd Qtr 2012, WVG610897 Semi-Annual August 2012.

This will help you easily bring up and review previously submitted eDMRs when needed.

NOTE: If you have more than one NPDES permit ID number and/or general permit registration number, a separate Reference ID should be created for each.

Hit the "**Create New"** button to create the eDMR.

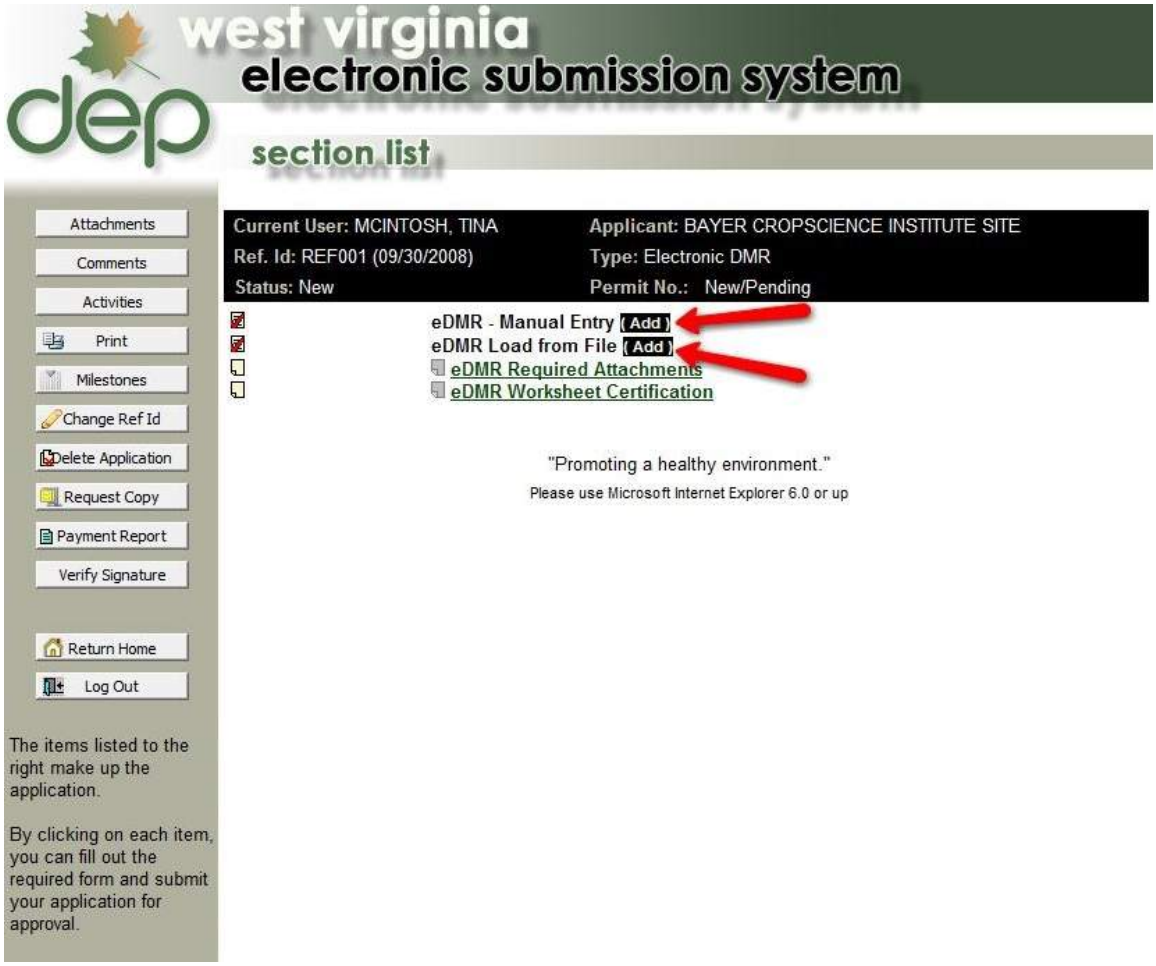


Entering DMR Information

Below are two options for submitting an eDMR.

- Manual Entry- to enter DMR information manually
- Load from File – to upload a file that conforms to the DEP DMR file structure, visit http://www.dep.wv.gov/WWE/permit/npdes/Documents/FileStructure2.pdf.

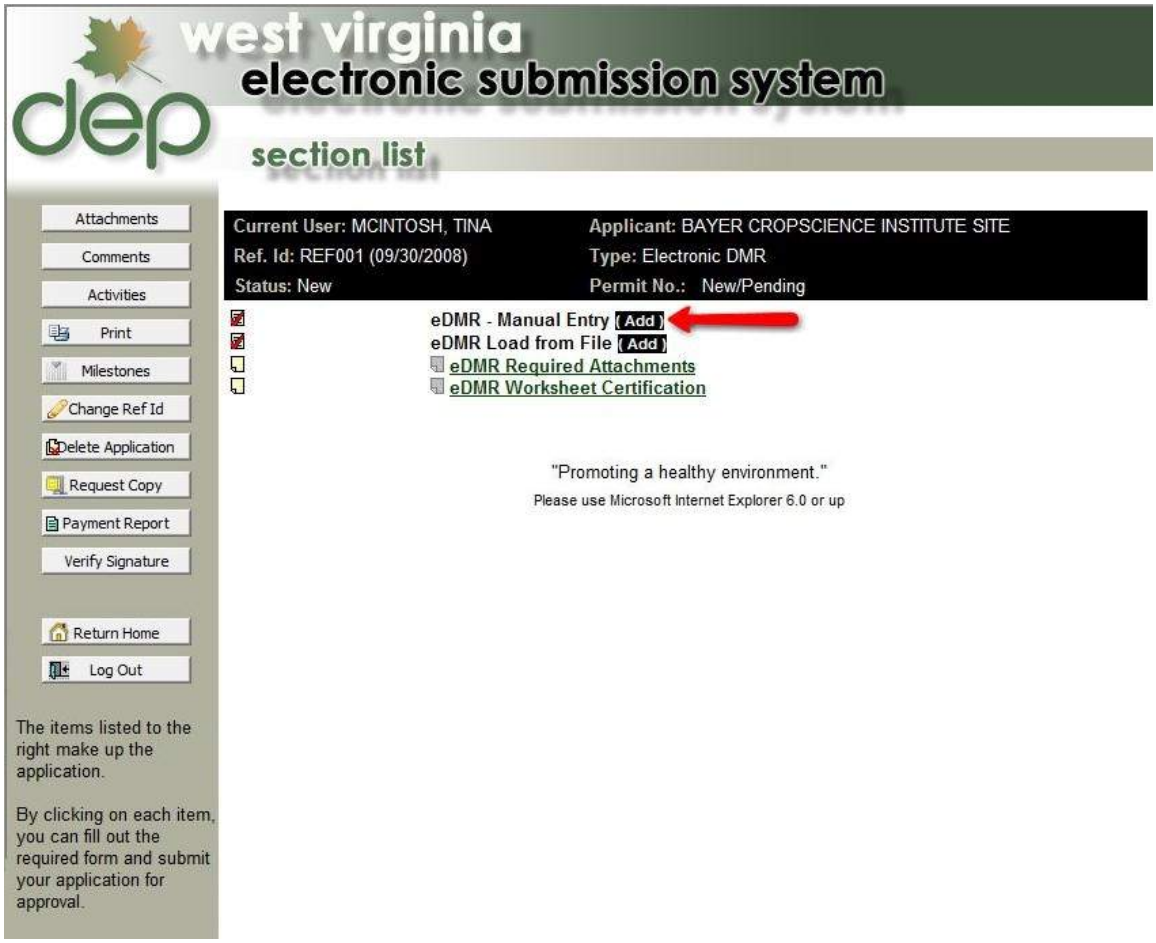
NOTE: Choose only ONE method for each eDMR.



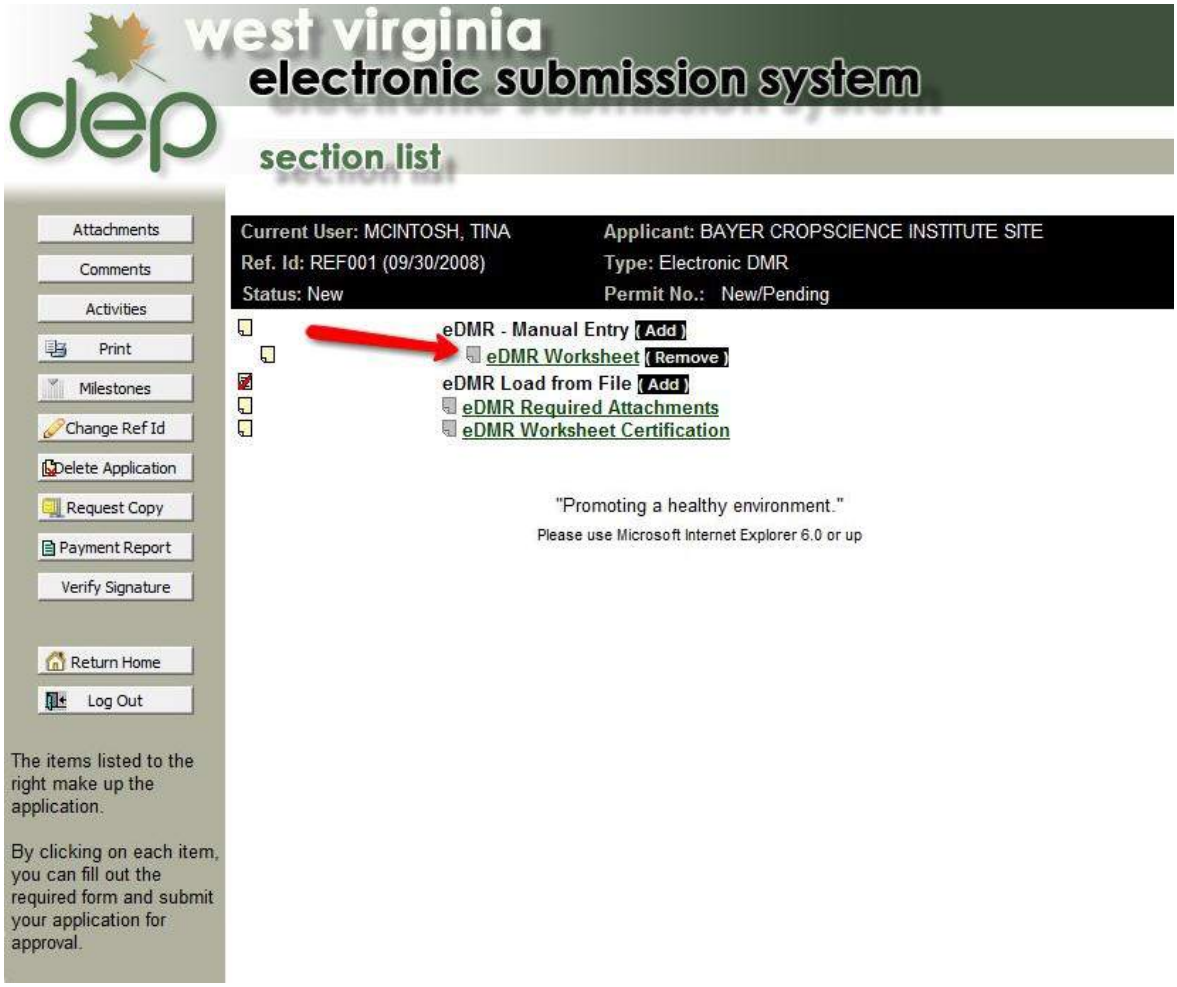
Manual Entry

Click on "**Add**" beside **"Manual Entry"** to create a new eDMR Worksheet in the **Section List** screen.

NOTE: You need to create a new eDMR Worksheet for each Permit / Outlet combination.



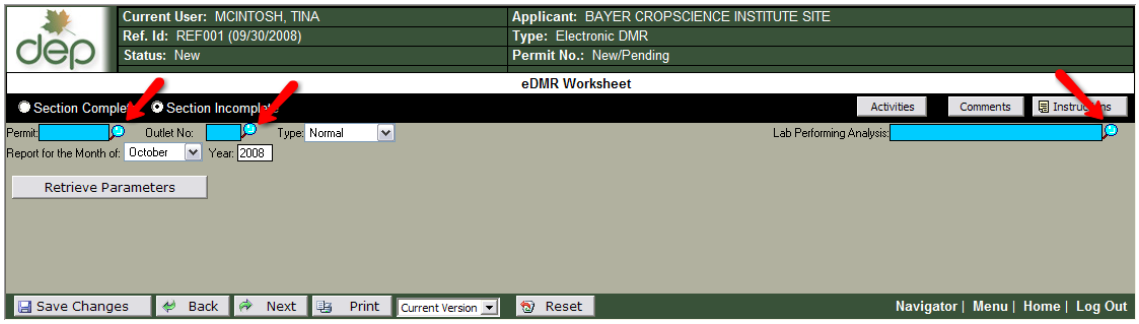
To start entering information, click on the green **"eDMR Worksheet"** link.



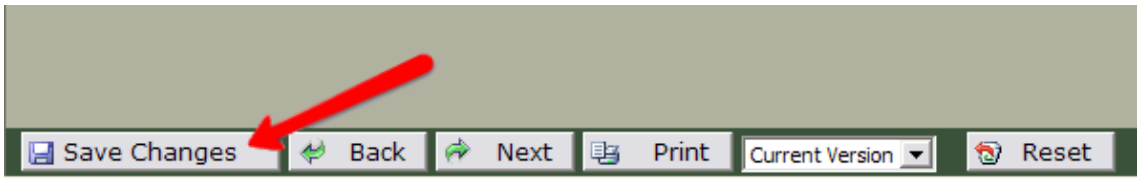
NOTE: You can delete unwanted worksheets by clicking on "**Remove**" beside the worksheet link.

You are required to provide information for blue highlighted fields. Any field with a magnifying glass 🔎 beside it, is a drop-down field, which means if you click on the field, you will be able to choose from a list of options.

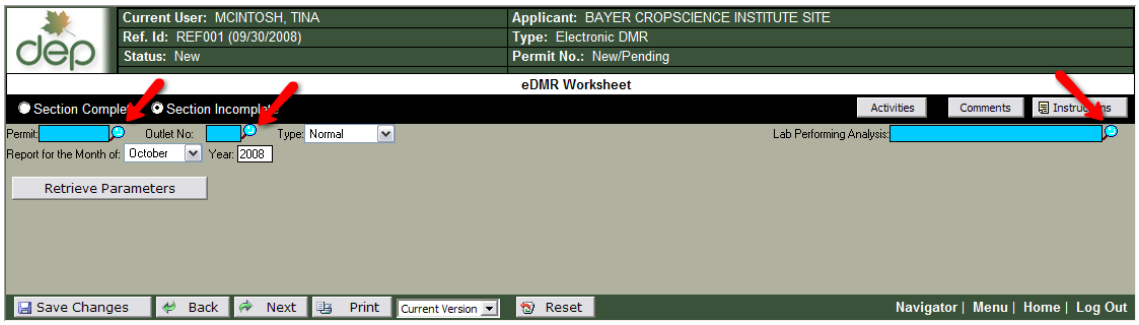
Specify the Permit Number, Outlet Number, Type, and the Lab that has performed the analysis for this eDMR. If the Permit Number and/or Outlet Number box doesn't show up, minimize your screen, it's probably setting behind the screen in another window. See page 13 for additional information about entering the laboratory identification.



In order to save data that has been entered, you must click the "**Save Changes**" button **at least every two hours**.



Below are examples of the choices available in the drop-down fields :



Permit – choose the permit you intend to enter information for.

Select a Permit:
WV0021792
WVR100098
WVR100384

Outlet - choose the outlet you intend to enter information for.
NOTE: These outlets are filtered based on the permit you have selected.

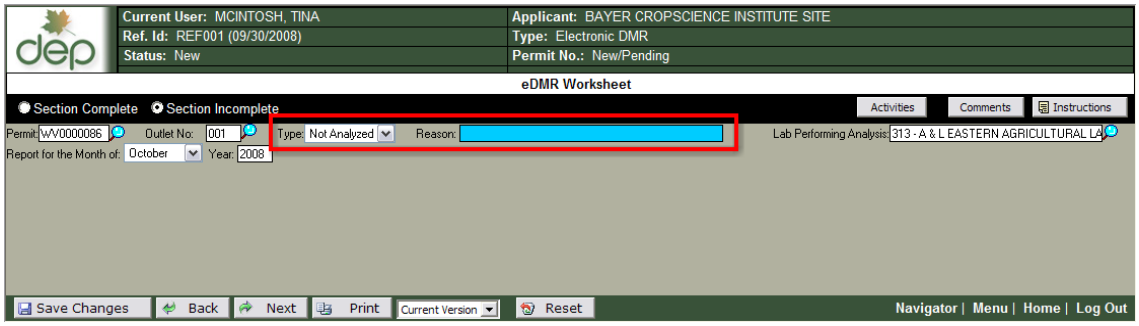
ID	Name	Pipe Status
002	EFFLUENT BOD5 SAMPLES SHALL BE COLLECTED AT A LOCA...	Reactivated - 12/27/2005
IU01	ALLEGHENY WOOD PRODUCTS, INC. - REFER TO SECTIONS F....	
IU02	PETERSBURG WTP - REFER TO SECTIONS F.2.A.2 AND F.2.B.2 ...	
IU03	GRANT COUNTY LANDFILL - REFER TO SECTIONS F.2.A.3 AN...	
IU04	REGION VIII SWA - REFER TO SECTIONS F.2.A.4 AND F.2.B.4 F...	
IU05	ADELL POLYMERS - REFER TO SECTIONS F.2.A.5 AND F.2.B.5 ...	Reactivated - 01/09/2006
IU06	HESS OIL COMPANY (FORT HILL EXXON) - REFER TO SECTION...	
IU07	REACTIVATE PIPE AND USE THIS OUTFALL FOR NEXT INDUST...	Inactive - 01/17/2006
S01	SLUDGE	

Lab Performing Analysis – Only certified labs will be available in the drop-down field. Choose the lab that has performed the majority of the analysis. If a different lab has performed analysis for a specific parameter, you will have the opportunity to change the lab information at the parameter level.

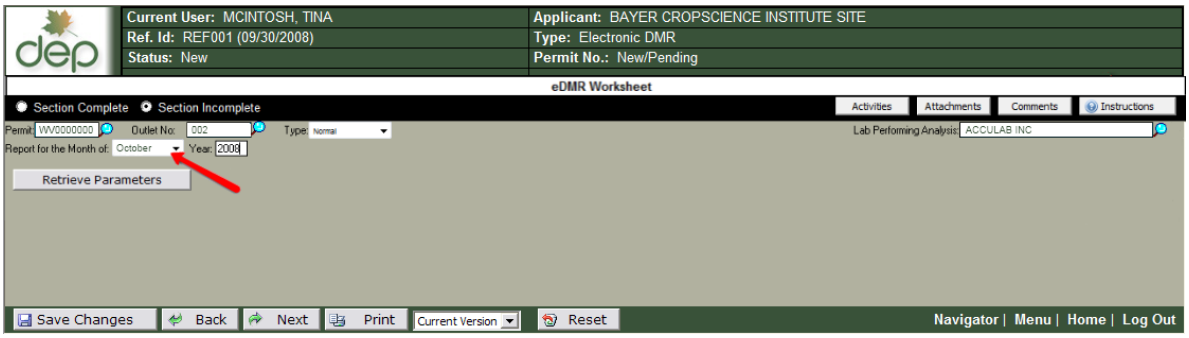
Lab ID	Lab Name
313	A & L EASTERN AGRICULTURAL LABORATORIES INC
010	AC & S LABORATORIES
279	ACCULAB II INC
062	ACCULAB INC
329	ACCUTEST LABORATORIES
304	ACCUTEST LABS, SE
280	ADVANCED ANALYTICS LABORATORIES INC
351	ADVENT-ENVIRON

Select **No Flow**, **Not Analyzed**, **Conditional Monitoring**–Not required this period, **Not Quantifiable** or **Other** on the **Type** field. **NOTE:** You also can do this for individual parameters.

- Use **Conditional Monitoring** when you are required to submit an annual certification form and/or at parameter level when monitoring has been waived.
- When choosing **No Flow, Not Analyzed, Conditional Monitoring**–Not required this period, or **Other** select 000 – under **Lab Performing Analysis.**
- You are required to enter a reason if you have selected **Not Analyzed** or **Other**. (Examples: Lab Accident, Flow meter out of service, etc.)
- For facilities registered under the Sewage General Permit less than 50,000 GPD (WVG55 prefix), use **Not Quantifiable** at the parameter level for Total Residual Chlorine in the test flag field *if you have ultraviolet disinfection (uv).*



Enter the appropriate month in the **Report for the Month of** field and the appropriate year.



The following information is provided to assist you in determining what month you are reporting.

For permitted facilities that are required to submit a discharge monitoring report on a quarterly, semi-annual, or annual basis, the eDMR system will only allow you to submit the data in the month that it is required. Examples:

- **If your permit was effective prior to July 1, 2011 the following will apply:**
  - A quarterly reporting requirement is based on the calendar quarters; therefore, the quarterly discharge monitoring data can only be entered and submitted in eDMR in March, June, September and December.
  - If a permit requires semi-annual or annual reporting of DMR data based on **the effective date of the permit** (Individual Industrial and Municipal permits) the reporting month is as follows:
    - **Effective date** of the permit is prior to the 15th day of a month, the reporting month is determined by counting from the first day of that month forward six months (e.g., if effective date is February 11th, the reporting month is July).
    - **Effective date** of the permit is the 15th day of a month or after, the reporting month is determined by counting from the first day of the following month forward six months (e.g. if effective date is February 17th, the reporting month is August).
  - If a permit requires semi-annual or annual reporting of DMR data based on **the issued (or reissued) date of the permit** (General Permits), the reporting month is as follows:
    - **Issued (or reissued) date** of the permit is prior to the 15th day of a month, the reporting month is determined by counting from the first day of that month forward six months (e.g., if issued or reissued date is February 11th, the reporting month is July).
    - **Issued (or reissued) date** of the permit is the 15th day of a month or after, the reporting month is determined by counting from the first day of the following month forward six months (e.g. if issued or reissued date is February 17th, the reporting month is August).

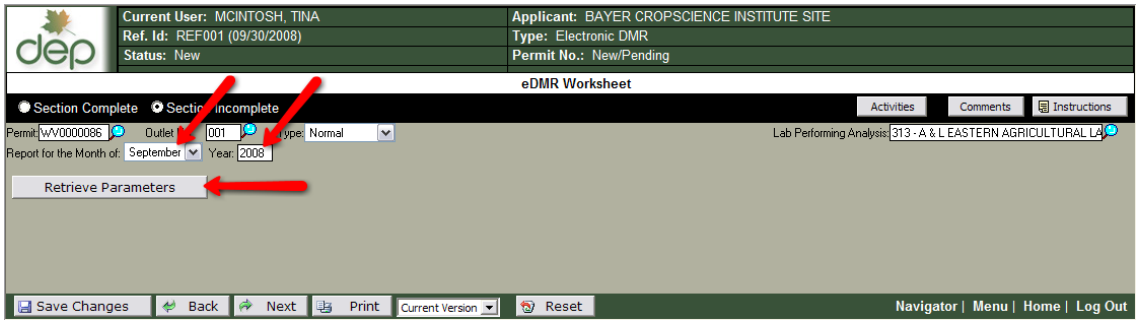
- **If your permit was effective after July 1, 2011 the following will apply:**
  - A quarterly reporting requirement is based on the calendar quarters; therefore, the quarterly discharge monitoring data can only be entered and submitted in eDMR in March, June, September and December.
  - **For Individual Permits** - If a permit requires semi-annual or annual reporting of DMR data the reporting month is six or twelve months forward from the effective date of the permit (e.g., if the effective date is February 1st, the reporting month is July).
  - **For General Permits** - If a permit registration approval requires semi-annual or annual reporting of DMR data the reporting month is determined by counting from the first day of the following month past the issuance date of the permit (e.g., if the issuance date is February 17th, start your limit report period on March 1st and count forward six months, making the reporting month August).

Please refer to your permit to determine your reporting frequency of sampling analysis data.

Permittees are required to submit their eDMR 20 days following the end of the reporting period. In other words, if your reporting month is August, you have until September 20th to submit your eDMR.

Specify the reporting month and year, and hit the "**Retrieve Parameters"** button.

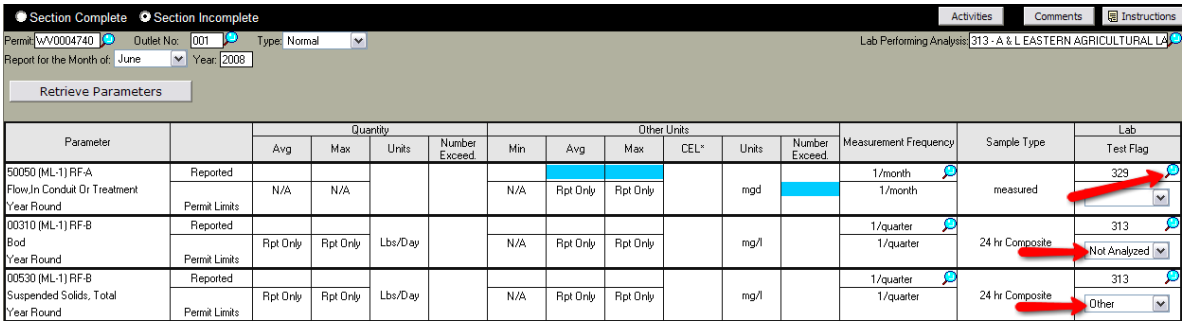
This will bring up all the parameters that need reporting for the month and year you have specified.



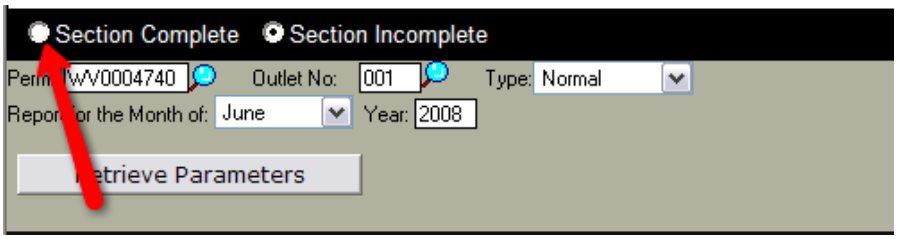
Blue fields indicate the data that MUST be entered for the period you have specified.

When entering your parameter data, if you have a lab that has completed analysis on a single parameter than what you entered at the outlet level, you can change the lab on that single parameter (see diagram below).

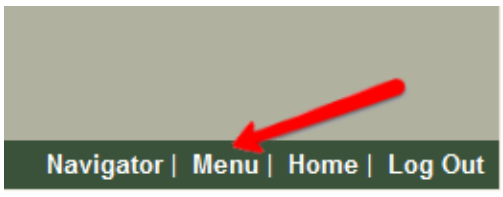
- You can mark a parameter as a **No Flow**, **Not Tested**, or **Other**.
- You are required to enter a reason if you have selected **Not Analyzed** or **Other**. (Examples: Lab Accident, Flow meter out of service, etc.)
- You are required to enter a reason if you change the **Measurement Frequency**.



When all the required fields (in blue) are completed, you must mark the **Section Complete.**
All sections of your eDMR need to be marked as **Section Complete** before it can be submitted to DEP.

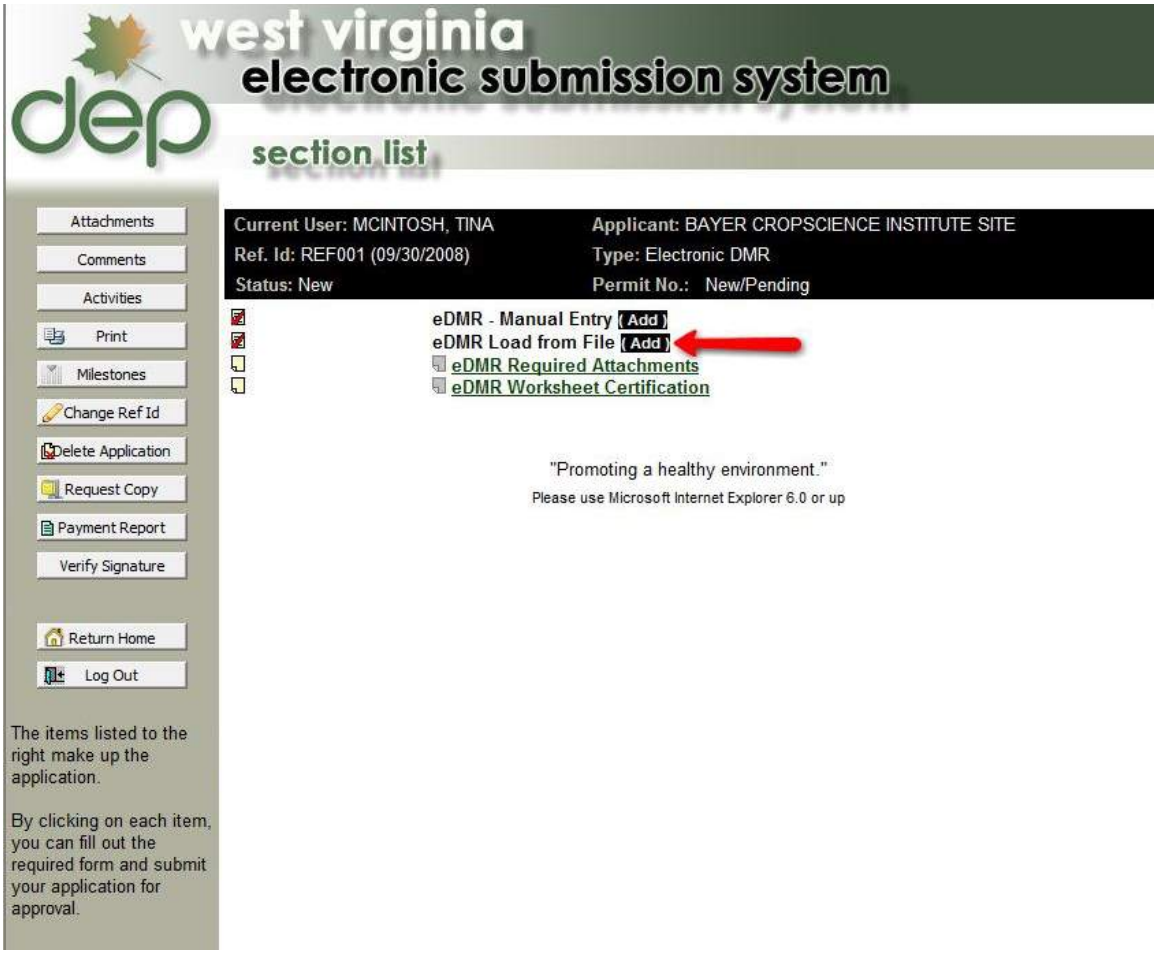


Click on **"Menu"** to return to the **Section List** screen.



Load from File

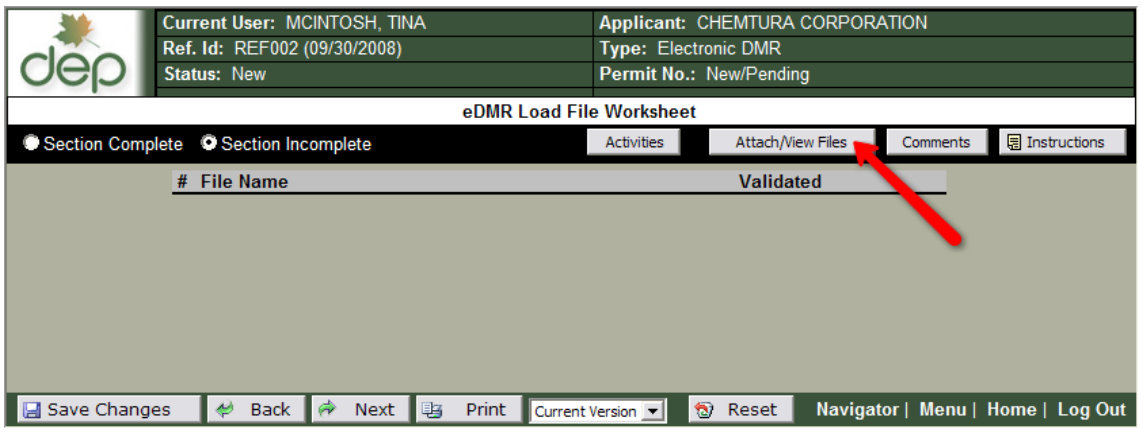
Click on "**Add**" to create a new eDMR Load File Worksheet in the **Section List** screen.



Then, click on the "**eDMR Load File Worksheet"** link**.**

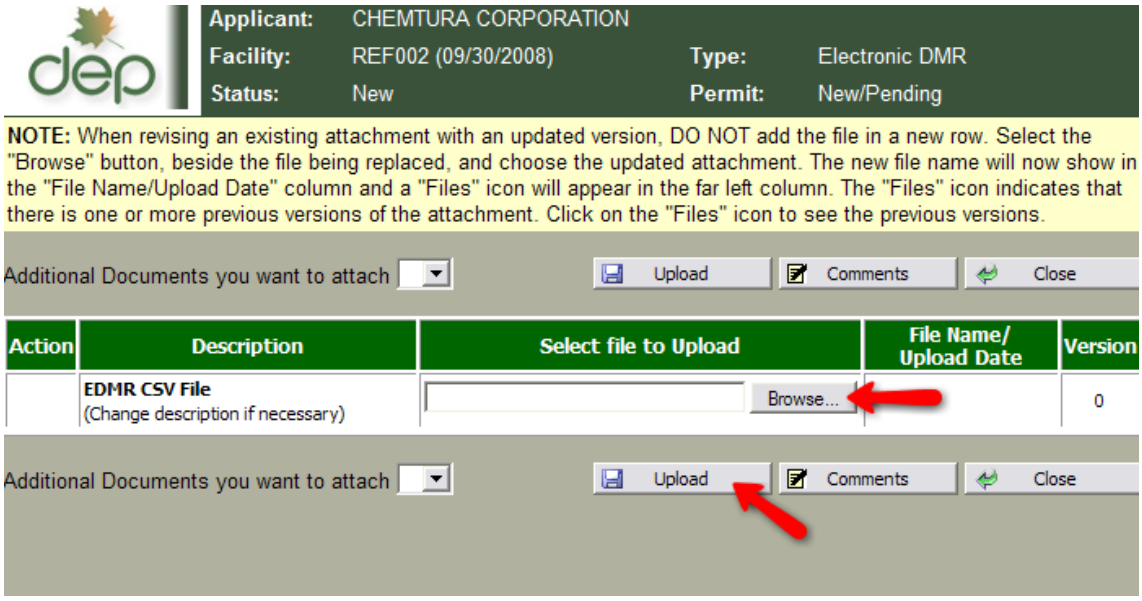
NOTE: The eDMR Load File Worksheet function can only accept data in a comma-separated values (CSV) format that conforms to DEP's DMR file structure. The specific requirements for the CSV file can be found at http://www.dep.wv.gov/WWE/permit/npdes/Documents/FileStructure2.pdf.

Click on the "**Attach/View Files**" button to upload a file.



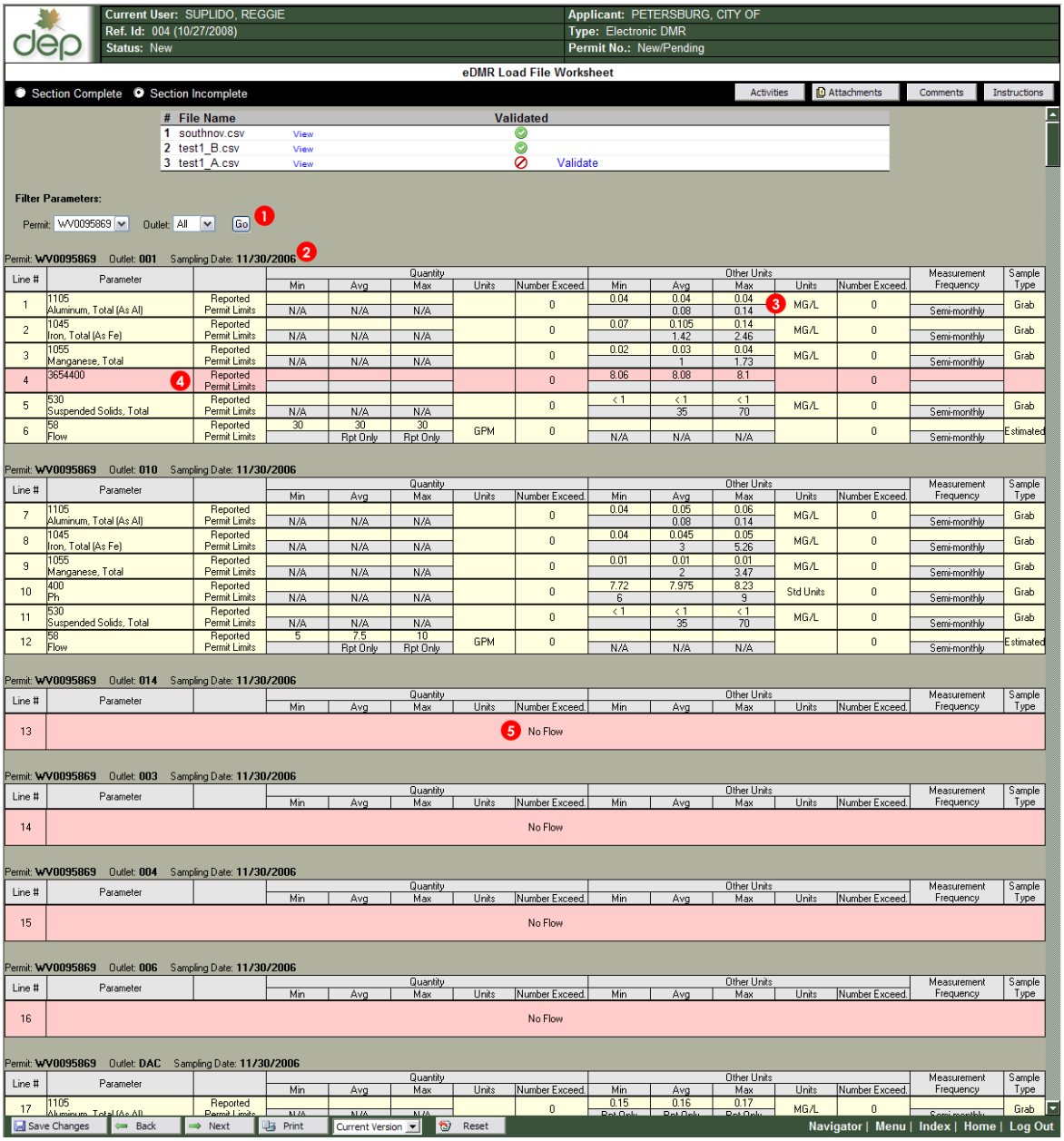
On the **Attach/View Files** pop-up window, "**Browse**" for the file you want to upload, select the file and hit the "**Upload**" button.

Hit the "**Close**" button to close the pop-up window.



The file you have uploaded should now be displayed on the section form.

Click "**View**" to look at and verify the contents of the file. While viewing, you can filter by permit, outlet and sampling date.

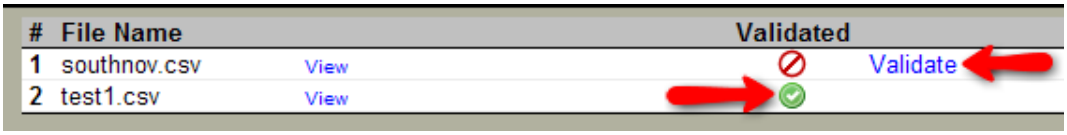


This is how the work-in-progress File Upload Viewer will look like.

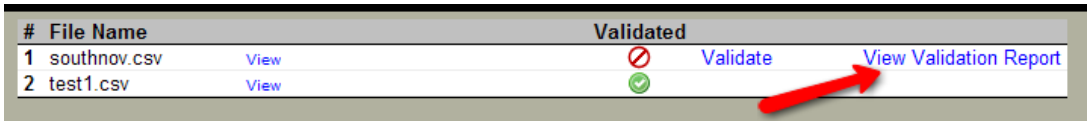
Legend:

1. Select All or specific Permit – Outlet – Sampling Date combination
2. Viewer will group report by Permit – Outlet – Sampling Date
3. The actual permit limits of each chemical will be shown, along with the limits being reported
4. Chemicals being reported that are not part of the permit will be highlighted in pink.
5. Outlets declared as a "No Flow" will be highlighted in pink.

Click on "**Validate**" to check the file for accuracy.
Depending on the size of the file, validation can take between a few seconds to a few minutes.



A properly validated file will show a green circle with a check on the **Validated** field. Files that did not pass validation will show a red icon. You can click on the "**View Validation Report**" to display the problems encountered in the file.



A sample **Validation Report** is shown below.
Rows that have passed will have a green **"Pass"** beside them.
Rows that were rejected will have details of the problem(s). You will need to correct these rows, then re-upload and re-verify your file.

Records Found: 19
Row: 1 Pass
Row: 2 Fail
'Quantity Average' must be a numeric value, and can not equal zero. If below detectable level, please use '<' (less than) sign for 'Quantity Average Flag' column.

Row #	Sampler ID	Outlet		Sampling Date	Qty Code	Qty Min Flag	Qty Avg Flag	Qty Max Flag	Conc Code	Conc Min Flag	Conc Avg Flag	Conc Max Flag	Sample Freq	Qty Exceed	Rainfall Inch	Frozen Cond	Discharge Flag
	NPDES No	Quality	Mon Loc			Qty Min	Qty Avg	Qty Max		Conc Min	Conc Avg	Conc Max	Sample Type	Conc Exceed	Rainfall Date	Report Freq	
2	060	001		06/30/2008	26		<	<	19		<	<	01/90				
	WV0004740	00310	1				0	4			2	2	24				

Row: 3 Fail
'Quantity Maximum' must be a numeric value, and can not equal zero. If below detectable level, please use '<' (less than) sign for 'Quantity Maximum Flag' column.

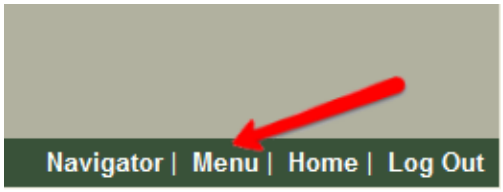
Row #	Sampler ID	Outlet		Sampling Date	Qty Code	Qty Min Flag	Qty Avg Flag	Qty Max Flag	Conc Code	Conc Min Flag	Conc Avg Flag	Conc Max Flag	Sample Freq	Qty Exceed	Rainfall Inch	Frozen Cond	Discharge Flag
	NPDES No	Quality	Mon Loc			Qty Min	Qty Avg	Qty Max		Conc Min	Conc Avg	Conc Max	Sample Type	Conc Exceed	Rainfall Date	Report Freq	
3	060	001		06/30/2008	26				19				01/90				
	WV0004740	00340	1				166	0			82	82	24				

Row: 4 Pass
Row: 5 Pass
Row: 6 Pass
Row: 7 Pass
Row: 8 Pass
Row: 9 Pass

Once all the files have passed validation, you must mark the "**Section Complete.**"

NOTE: All the sections need to be marked as complete before they can be submitted to DEP.

Click on **"Menu"** to return to the **Section List** screen.



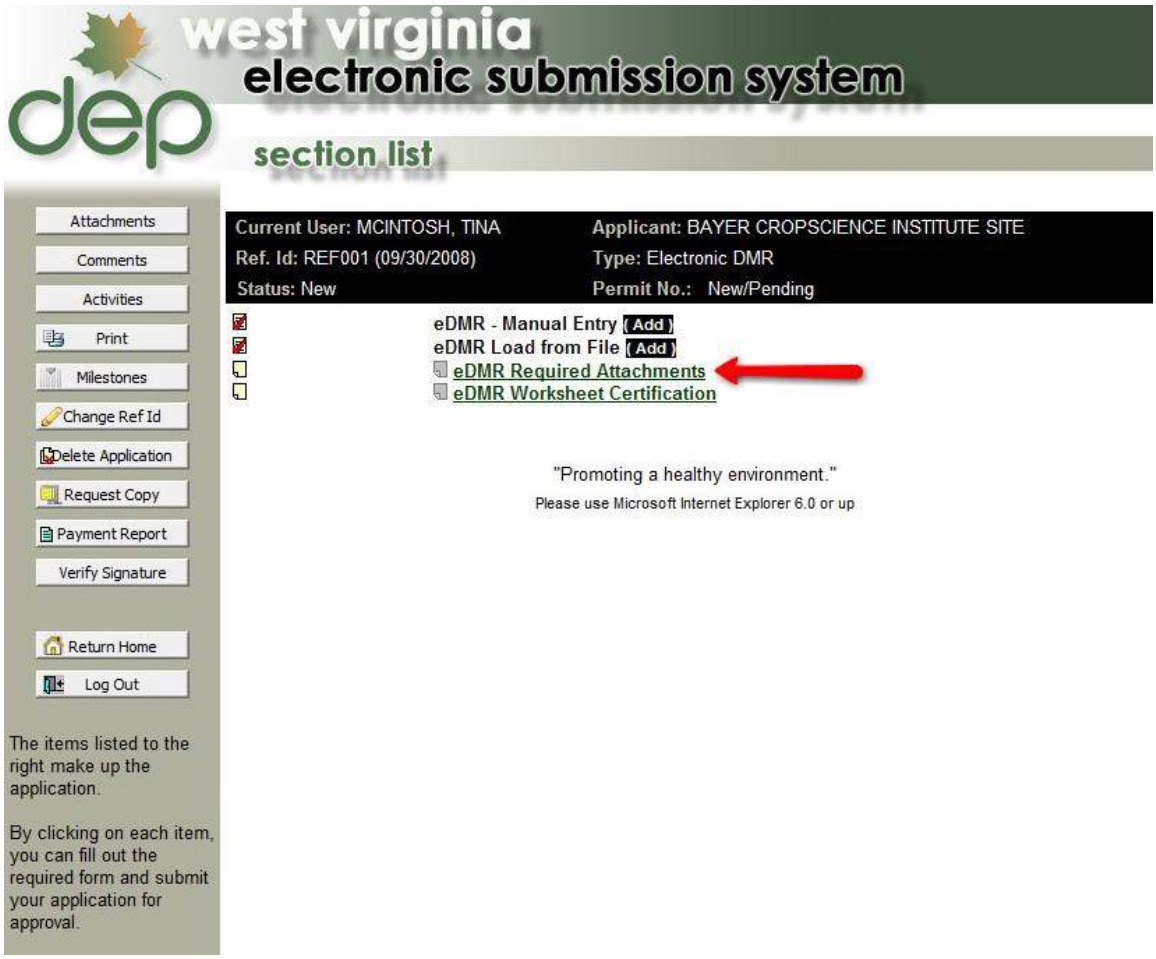
If you need to replace a file that you have uploaded, please see page 27 for instructions.

Required Attachments

The **eDMR Required Attachments** section is where you upload other documents that need to be submitted.

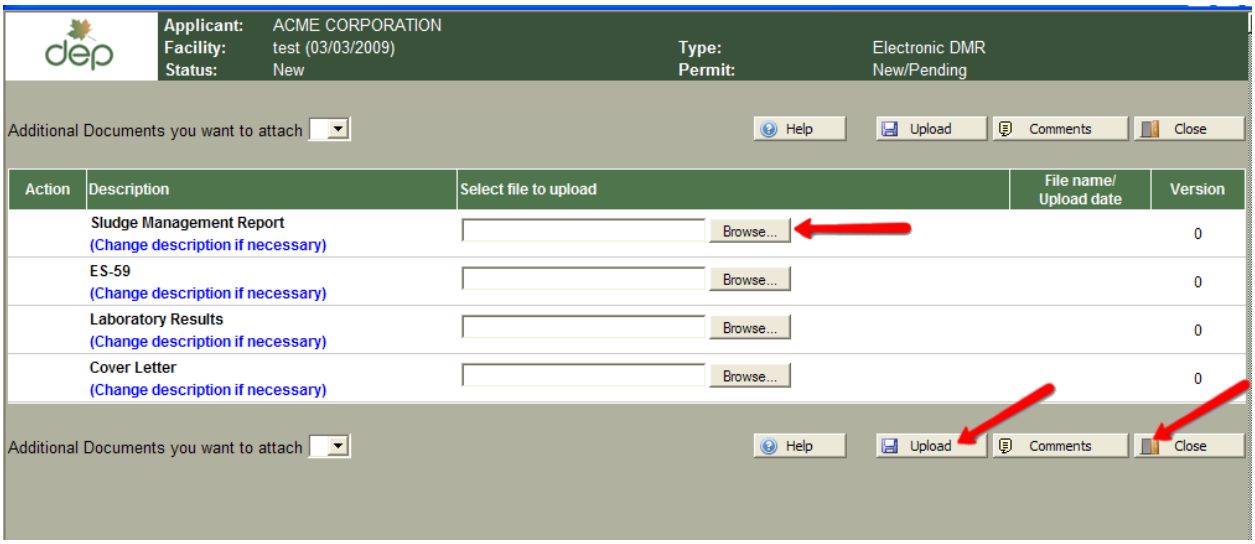
Municipal facilities may be required to submit a **Sludge Management Report and/or ES-59 Summary of Wastewater Treatment Plant Operations**. Please refer to your permit to determine what you are required to submit by attachment.

Annual certification form, laboratory results, etc. may also be attached.

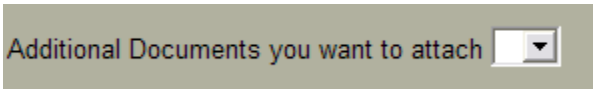


To upload files, click on the "**Attachments"** button.

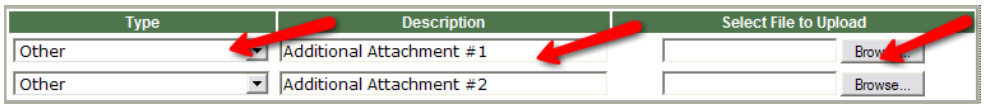
On the **Attachments** pop-up window, click "**Browse**" to find the files from your computer that you want to upload. Select the file and hit the "**Upload**" button. Hit the "**Close**" button to close the pop-up window.



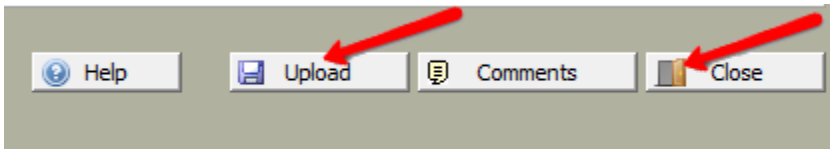
If you need to attach additional files, you may do so by selecting the number of additional files you want to attach to the eDMR.



An additional set of rows will then appear at the bottom of the window to let you attach the additional files. Select the **Type** of file you are uploading and enter a short description of the file. Hit **"Browse"** to locate the file you want to upload.

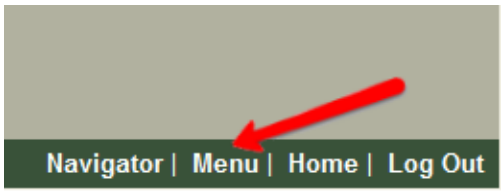


Once all the files have been added, select the "**Upload**" button and hit the "**Close**" button to close the pop-up window.



After closing the **Additional Attachments** screen, you must mark "**Section Complete**" on the **Required Attachments** screen. If you are not required to attach any documents, and have not uploaded any documents on the **eDMR Required Attachments** screen, you still must mark "**Section Complete**." All sections must be marked as complete, before they can be submitted to DEP.

Click on **"Menu"** to return to the **Section List** screen.



Replacing Attachments

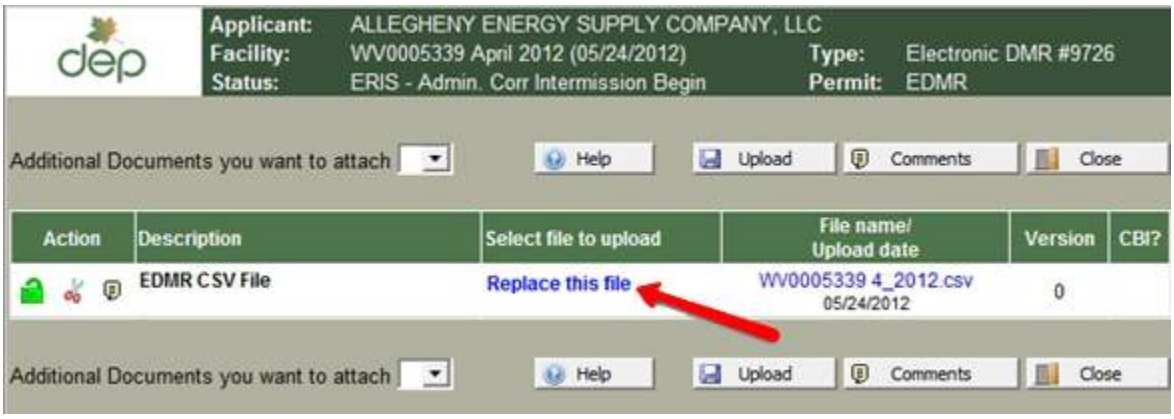
To replace a file attachment, go to the **Section List** screen and click on **"eDMR Load File Worksheet"** or **"eDMR Required Attachments."**

On the next screen, click on **"Attachments."**

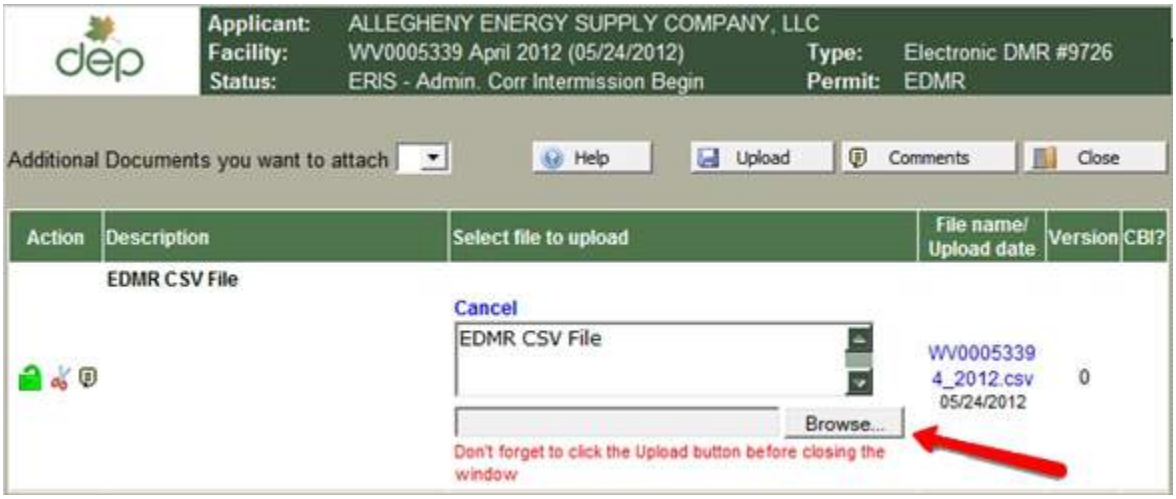
On the screen that appears, click on the **red lock** under **Action**.

A small blue box appears for you to type a reason. Then click on the **"Ok"** button.

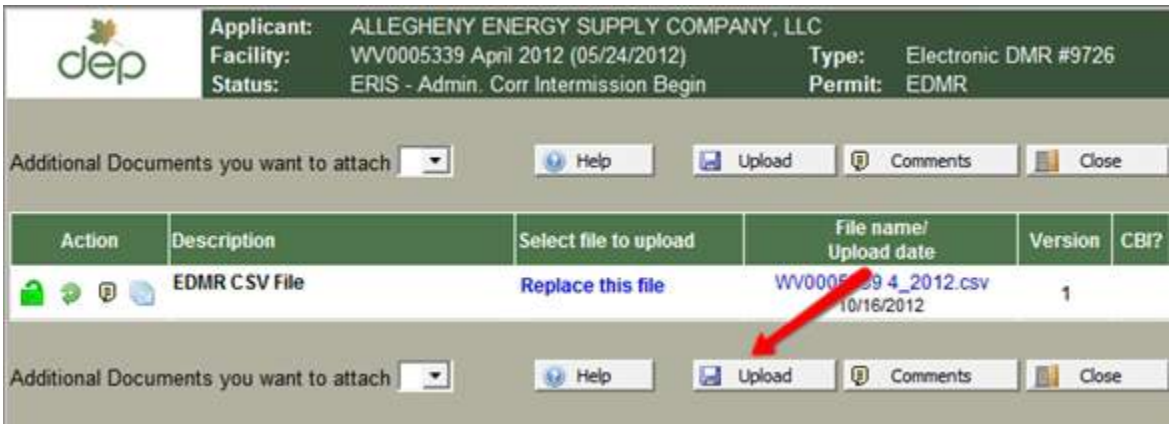
Click on **"Replace this file."**



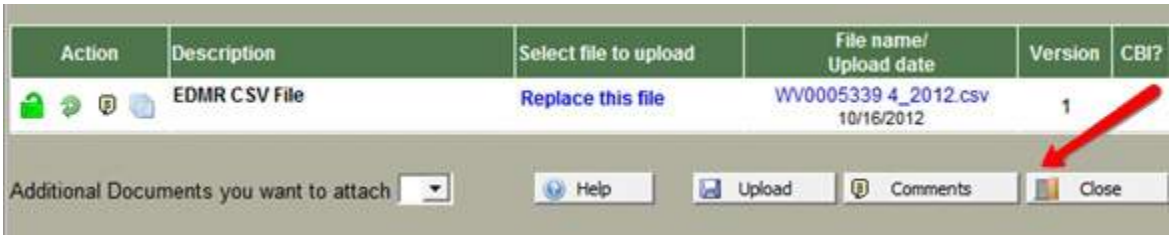
Click on the **"Browse"** button to find the replacement file.



After you select the file, you must click on the **"Upload"** button.

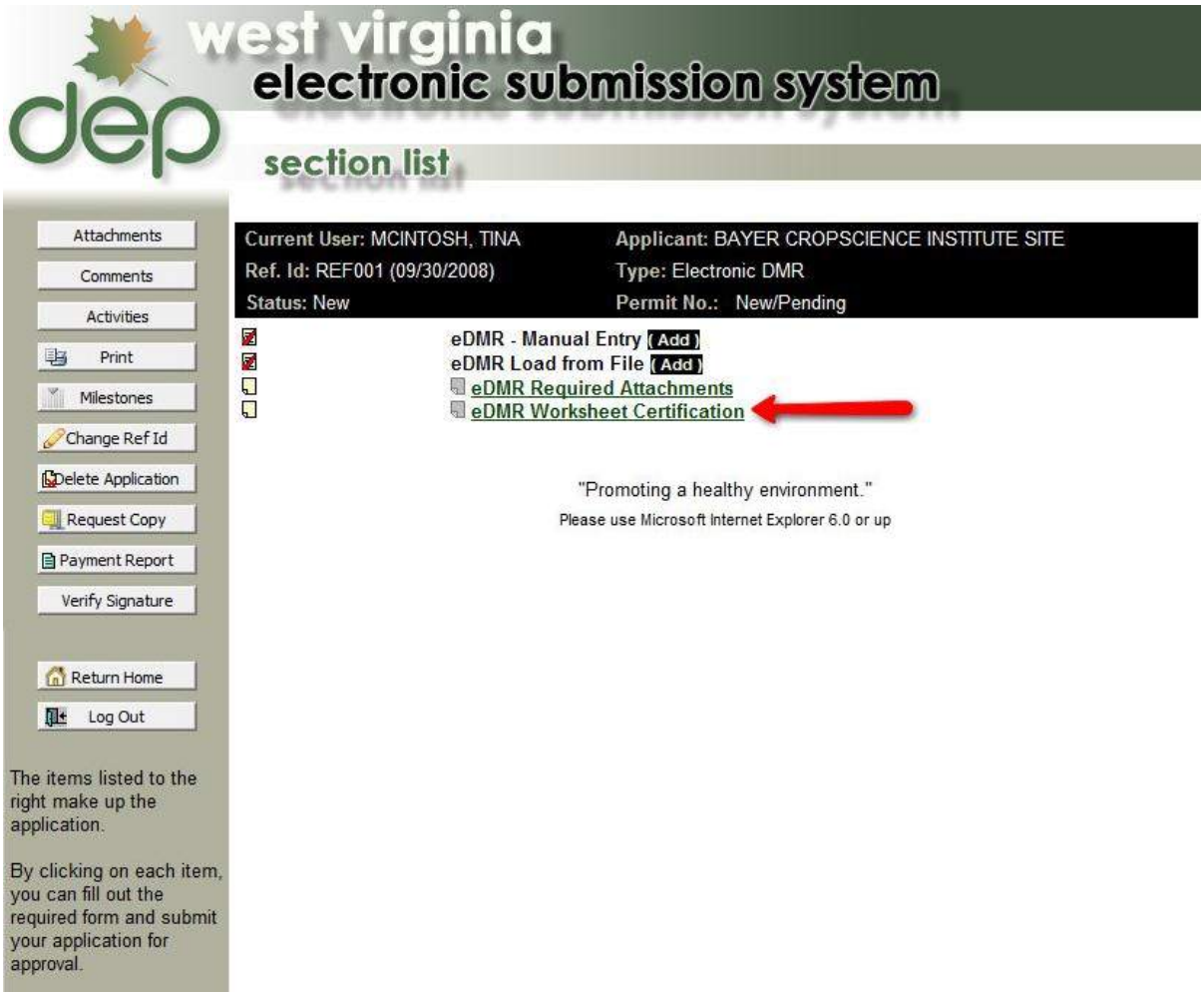


At this point click on the **"Close"** button.

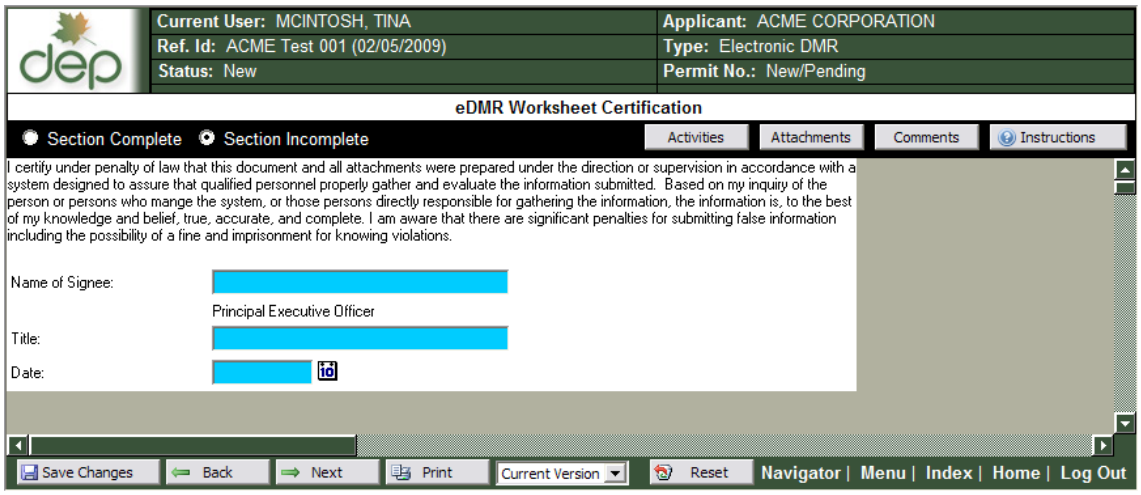


Worksheet Certification

The **eDMR Worksheet Certification** screen is also known as the **Signature** page.

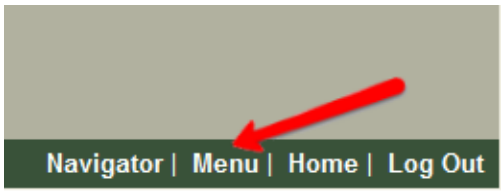


The **Principal Executive Officer** of the facility must complete this section.



Once all the information has been entered, you must mark the "**Section Complete.**"
NOTE: All sections must be marked as complete, before they can be submitted to DEP.

Click on **"Menu"** to return to the **Section List** screen.

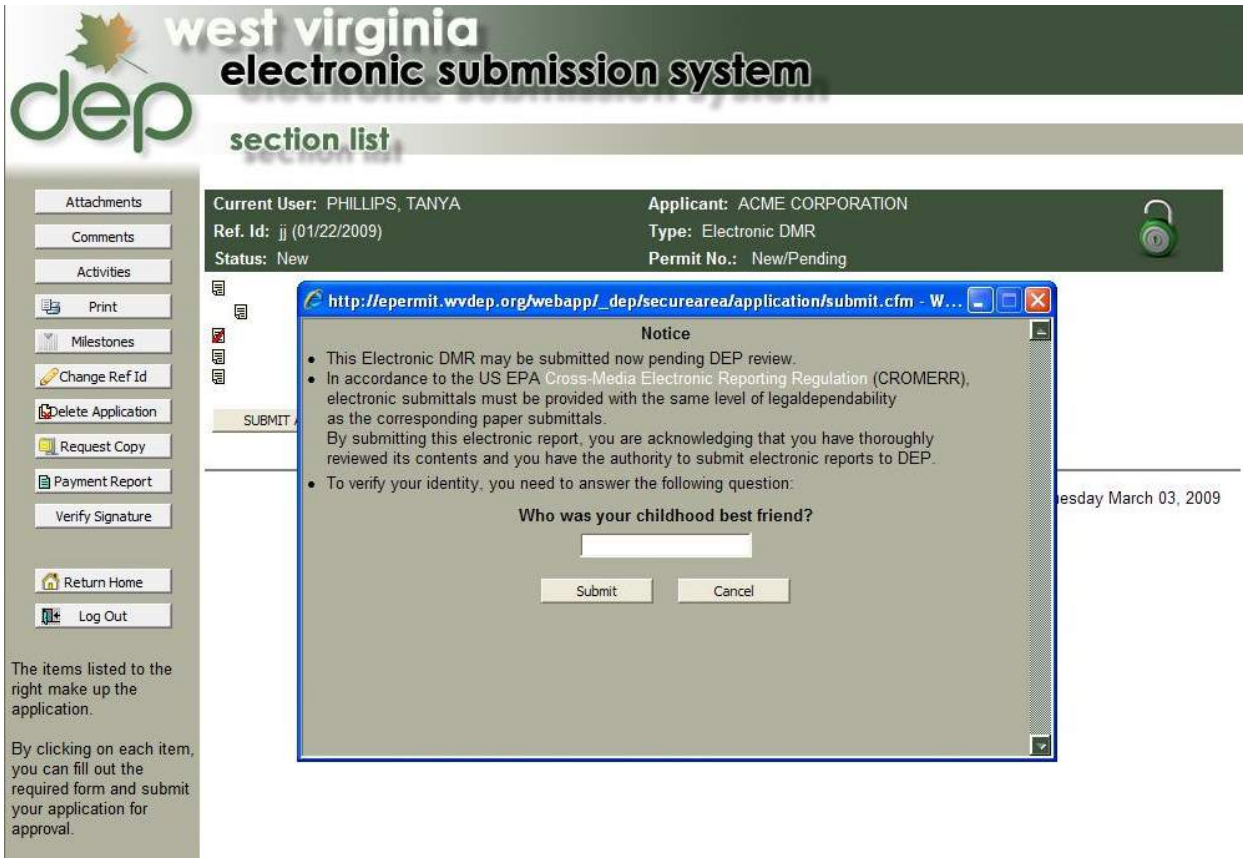


Submitting the eDMR to DEP

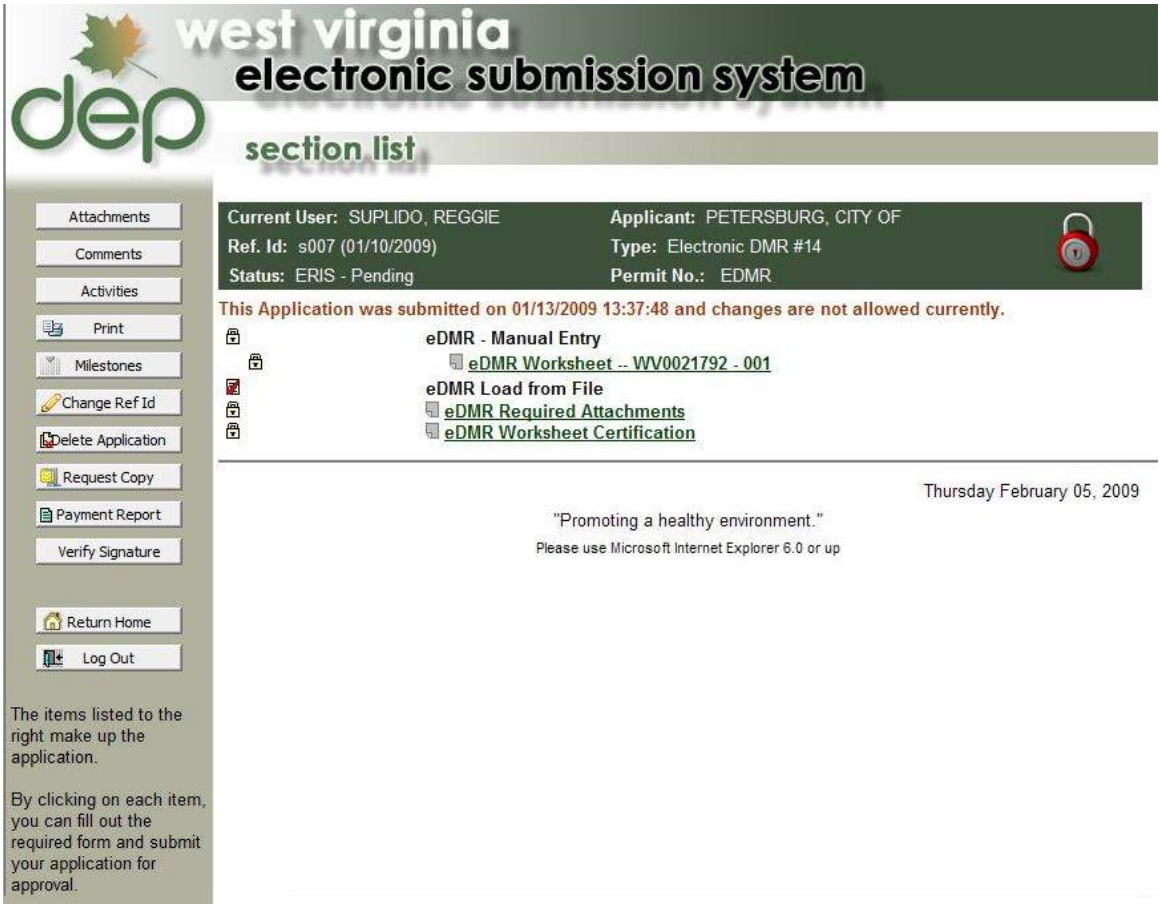
After marking all sections complete, a "**Submit Application**" button will appear on the **Section List** screen (see diagram below).

NOTE: Only the users who have security rights to submit applications to DEP will see this button.

Clicking the "**Submit Application"** button requires the user to answer a security question in order to submit the eDMR.

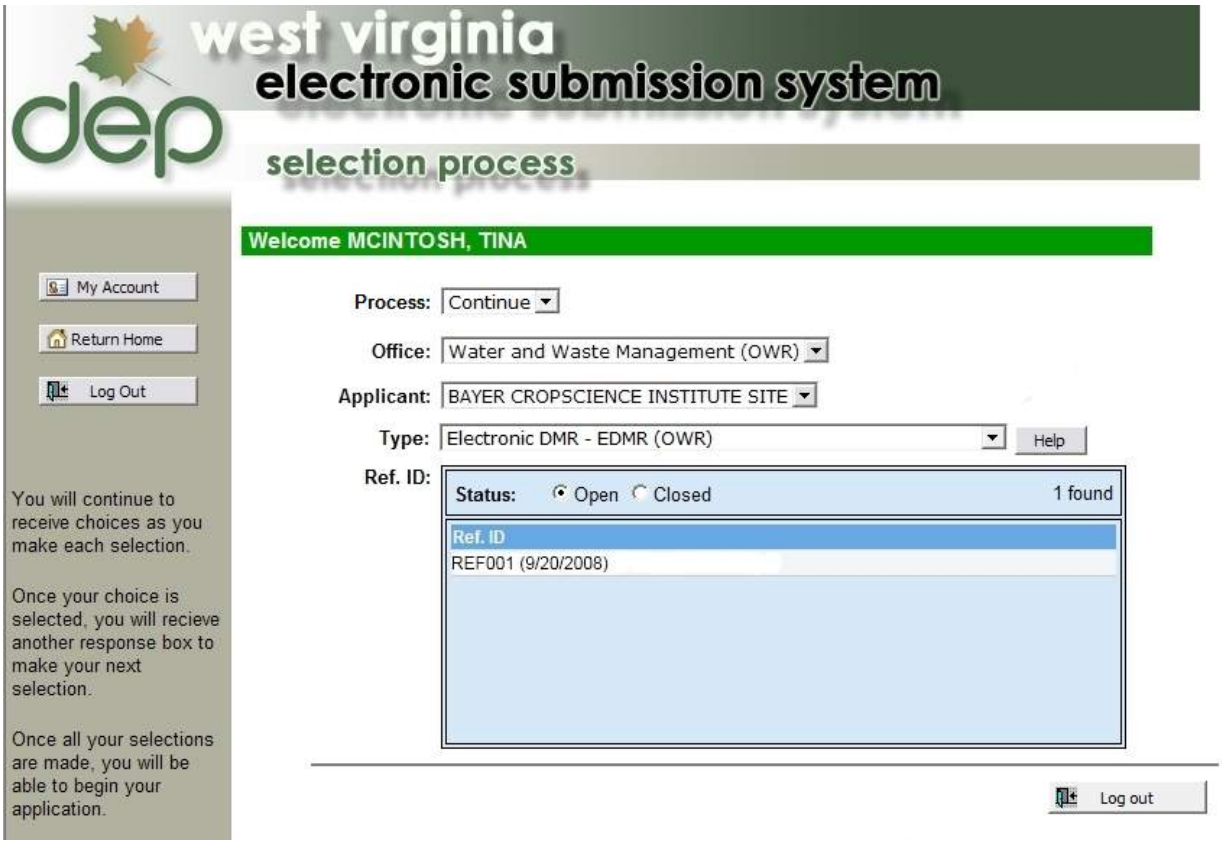


Submitting the eDMR will automatically lock the sections from being changed; however, viewing the sections will still be possible.



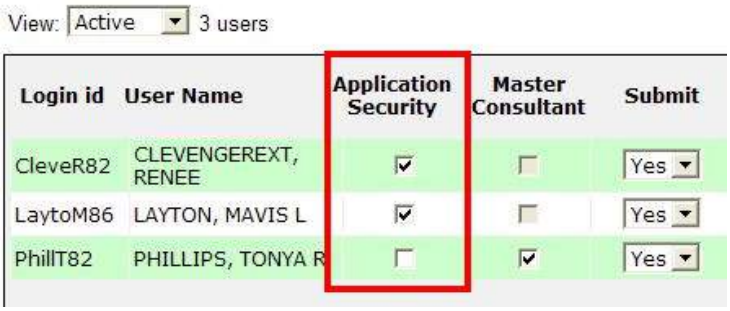
Once the eDMR is submitted, DEP and facility personnel involved with processing the eDMR will be notified via e-mail. Any status change on the submitted eDMR will also trigger an e-mail notification.

If you receive an e-mail requesting a correction or clarification of your submitted eDMR, you will have to log into eDMR. On **the Selection Process** screen, choose **Continue** in the drop-down menu, and then select the **Office**, **Applicant** and **Type**. A **Ref. ID** section will appear. Click on the eDMR that needs correction. This will bring you to the **Section List** screen where you will select a worksheet to modify.

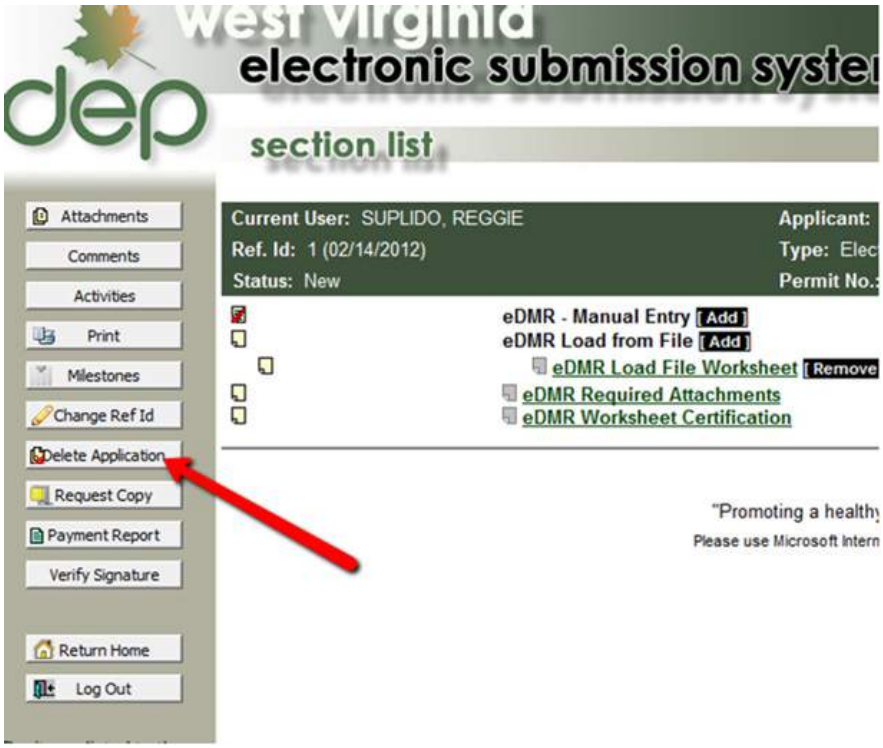


Deleting eDMRs Created in Error

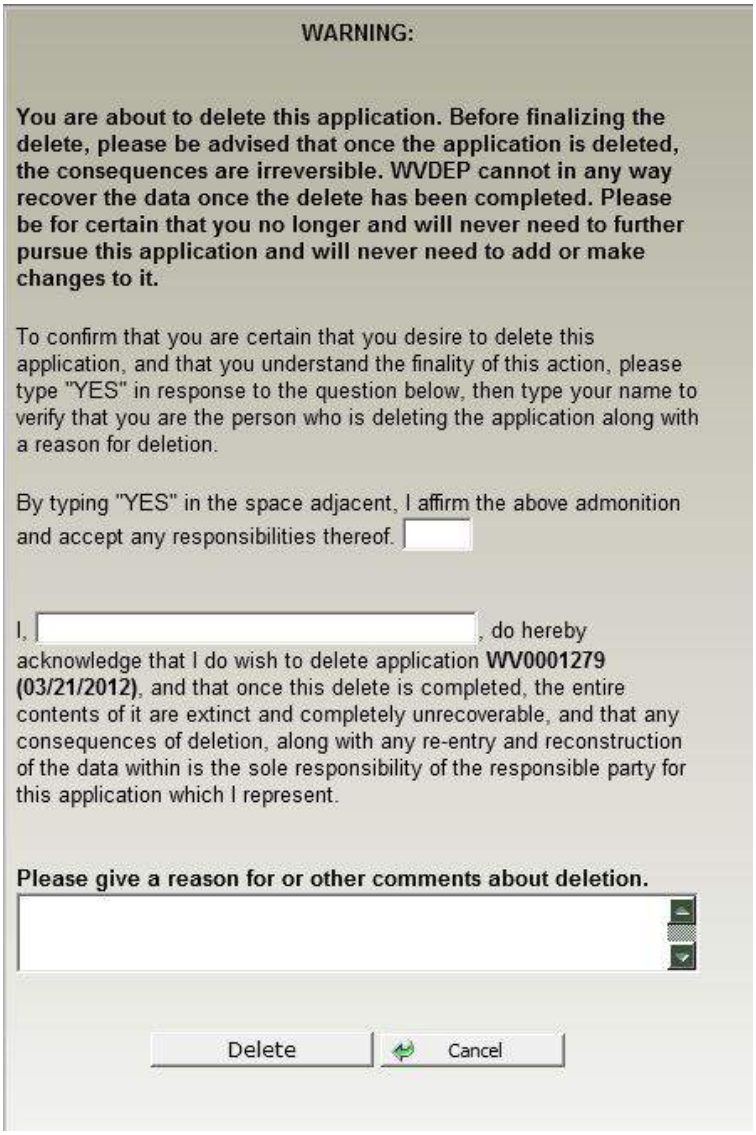
An eDMR application that has been created in error can only be deleted by the person who is listed as the Applicant Security for the electronic submission of the eDMR.



The person(s) with these rights can delete an eDMR by bringing up the eDMR on the **Section List** screen. From there, click on the **Delete Application** button on the left side of the screen (shown below).



A pop-up warning will appear. You must complete the information requested on the pop-up and click **Delete**.



A message will then confirm that you have successfully deleted your application.

Contact Information

For individual eDMRs:

Tonya Phillips (304) 926-0499 Ext. 1010 or by e-mail at Tonya.R.Phillips@wv.gov

Megan Smith (304) 926-0499 Ext. 1281 or by e-mail at Megan.D.Smith@wv.gov

For Stormwater eDMRs (WVG61s):

Patrick Burch (304) 926-0499 Ext. 1067 or by e-mail at Patrick.D.Burch@wv.gov

For UIC eDMRs:

Michelle Finney (304) 926-0499 Ext. 1047 or by e-mail at Michelle.L.Finney@wv.gov

For Mining and Reclamation eDMRs:

Angela Dorsey (304) 926-0499 Ext. 1513 or by e-mail Angela.H.Dorsey@wv.gov

Vicki Lucas (304) 926-0499 Ext. 1514 or by e-mail Vicki.E.Lucas@wv.gov

For all other General Permit eDMRs:

Thomas Sowers (304) 926-0499 Ext. 1012 or by e-mail at Thomas.J.Sowers@wv.gov

Backup for all of the above with the exception of mining related eDMRs and current contact for any type not listed above:

Mavis Layton (304) 926-0499 Ext. 1025 or by e-mail at Mavis.L.Layton@wv.gov