



BIOSOLIDS MANAGEMENT PROGRAM GUIDANCE MANUAL

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Foreword

The *NBP Biosolids Management Program (BMP) Guidance Manual* is designed to help organizations develop and implement a management program that meets the requirements set forth in the *Elements of an NBP Biosolids Management Program (BMP Elements)*. Following the step-by-step process described in this guidance manual will help you systematically develop a BMP that conforms with the *BMP Elements*.

The *NBP BMP Guidance Manual* is written in a “how-to” format that will allow you to plan and implement your organization’s BMP effectively. The manual is a “must read” for the full cross-section of individuals involved in biosolids management activities, including the utility director or general manager, the plant operations director or superintendent, the biosolids manager, wastewater treatment plant operators, the maintenance manager, maintenance technicians, the pretreatment program manager and his or her staff, and the biosolids contractor management and staff.

The first five chapters are introductory and provide background on the NBP, BMP fundamentals, BMP benefits, the requirements in the *BMP Elements*, and a step-by-step BMP implementation process. The term “Elements” is capitalized when it refers to a numbered Element of the BMP. Following is a summary of what you will find:

- Chapter 1 – Introduction to the National Biosolids Partnership (NBP) Biosolids Management Program (BMP)** – Introduces the NBP and how the *BMP Elements* fit into the NBP’s overall mission of developing sound and sustainable biosolids programs that gain public acceptance at both the local and national level.
- Chapter 2 – Biosolids Management Program Fundamentals** – Introduces the management system principles that the *BMP Elements* are based upon and how they help organizations improve the quality, effectiveness, and efficiency of their biosolids management activities.
- Chapter 3 – Benefits of a Biosolids Management Program** – Describes the benefits of implementing a BMP conforming to the *BMP Elements*. It describes how a BMP will help you systematically meet your legal, quality, and public acceptance requirements for biosolids and how the framework improves resource productivity and competitiveness.
- Chapter 4 – Elements of a Biosolids Management Program** – Contains the 17 *BMP Elements*.
- Chapter 5 – Step-by-Step To Your BMP** – Describes a step-by-step process for developing and implementing the BMP from start to finish, including the sequence for interdependent steps.

Chapters 6-10 of this manual contain detailed descriptions on how to implement each Element, and contain the following:

1. The Element requirements;
2. An interpretation of the Element's requirements;
3. Guidance on how to implement the Element;
4. A summary of what objective evidence that an auditor will look for to verify that the requirements of that Element have been met;
5. A completeness checklist; and
6. Examples of nonconformances.

These chapters are organized as follows.

Chapter 6 – The Policy Elements – The BMP Manual and biosolids management policy.

Chapter 7 – The Planning Elements – Critical control points, legal and other requirements, goals and objectives, and public participation in planning.

Chapter 8 – The Implementation Elements – Roles and responsibilities, training, communication, operational control of critical control points, emergency preparedness and response, and documentation, document control and recordkeeping.

Chapter 9 – The Measurement and Corrective Action Elements – Monitoring and measurement, nonconformances: preventive and corrective action, biosolids management program report, and internal management program audit.

Chapter 10 – The Management Review Element – Management review.

Chapter 11 finishes this manual off with a close look at how the third-party verification program works and how to become NBP certified:

Chapter 11 – Third-Party Verification Audits

The manual also contains appendices, which include a glossary, the *BMP Elements*, additional sources of information, and example forms and templates.

How you go about using the *NBP BMP Guidance Manual* depends somewhat on your role as well as the stage of your BMP development. Agency managers and their governance body members (directors, city councils, etc.) should at least review the introductory chapters to understand the compelling reasons for implementing a BMP, what's involved, and the benefits. These individuals need to understand the policy implications and why a sound and sustainable biosolids program with broad public acceptance is important to their communities.

Members of the BMP implementation team should read the initial chapters but focus especially on Chapters 4-10 plus the Appendices to support their BMP implementation efforts. Once your BMP is implemented, the *NBP BMP Guidance Manual* will continue to be a reference for new employees, new contractors, training and continual improvement.

Document Control Log

Name / Title	Approved By	Approval Date
Biosolids Environmental Management System Guidance Manual	NBP Management Committee	2000
Biosolids Management Program Guidance Manual	(name change approved by NBP/WEF staff)	2011

Revision Log

Revision Number	Description of Revision	Date
00	Original Issue	2000
01	Incorporated information from the Third Party Verification Recommendations into Chapter 11, which had been a placeholder for information on the NBP third party verification approach.	March 2001
02	Incorporated information from the NBP Auditor Guidance into Chapter 11 on third party verification, and key areas of interpretation for the EMS Elements into Chapters 7, 8, 9, and 10.	June 2002
03	<p>Made revisions consistent with 2 sets of issue papers approved by the NBP Management Committee, covering the following topics:</p> <ul style="list-style-type: none"> • <u>Post Audit Activities and Minor Nonconformances</u> (clarified requirements for resolving minor nonconformances. Chapter 11) • <u>Audit Follow-up to Major Nonconformances</u> (added language indicating that the lead auditor may determine if an on-site visit is necessary to determine if major nonconformances have been addressed. Chapter 11) • <u>Public Participation Outcomes</u> (renamed the “Public Participation” outcome area to “Relations with Interested Parties”. Chapter 11) • <u>Outcomes</u> (added text in Chapter 11 and to the Key Areas for Interpretation of Element 5 indicating that organizations should establish 	January 2005

	<p>measurable goals and objectives that document improvement in each of the four outcome areas)</p> <ul style="list-style-type: none"> • <u>Biosolids Management Policy Statement</u> (added to Element 2 key interpretive text indicating that the policy must include an explicit statement of commitment to the 10 principles of the <i>Code of Good Practice</i> and providing additional guidance on how public agencies can demonstrate conformance to Element 2) • <u>Annual Performance Report</u> (added to Element 15 key interpretive text indicating that the demonstration agencies are not required to prepare a Biosolids Management Program Performance Report prior to receiving <i>initial</i>, third party EMS verification) • <u>Legal and Other Requirements</u> (added to Element 4 key interpretive text on procedures for identifying and tracking “other requirements”) • <u>Internal, Interim, and Re-verification Audits</u> (added to Chapter 11 the schedule and scope for internal, interim and re-verification audits) • <u>Critical Control Points</u> (added to Element 3 key interpretive text referencing Appendix F of the <i>National Manual of Good Practice</i>. Also removed references to the term “critical control point category” and updated examples of critical control points for consistency with Append F) • <u>EMS Manual</u> (updated examples of what the auditor will look for in Element 1 to be consistent with requirements of the element and to clarify that documents and procedures may be cross-referenced in the Manual) • <u>Terminology: Verification and Certification</u> (updated Chapter 11 to reflect requirements for EMS Program certification) • <u>Interested Party Notifications</u> (added text to Chapter 11 clarifying requirements for notifying interested parties about the third party verification and appeals processes) • <u>Operational Control and Standard Operating Procedures</u> (added key interpretive text to Element 10 about types of operational control and documentation of standard operating procedures) <p>Updated description of Desk Audits (Chapter 11) to clarify the purpose and include an optional on-site visit by the third party auditor as part of the desk</p>	
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	audit.	
04	<p>Made revisions consistent with NBP Steering Committee decisions on interim audit issues, and to reflect current processes for establishing audit contracts between NBP and the audit firms and NBP and the biosolids organizations.</p> <p>Chapter 9</p> <ul style="list-style-type: none"> • <u>Internal Audit Scope</u> (Element 16, added text to clarify required scope for internal audits) <p>Chapter 11:</p> <ul style="list-style-type: none"> • <u>Audit Application Process</u> (updated text to clarify third party audit application and desk audit processes) • <u>4-Year Interim Audit Plan</u> (added text indicating that auditors and certified agencies should develop a 4-year interim audit plan that includes agency intent to substitute internal audits in eligible years) • <u>Closing Minor Nonconformances</u> (added text clarifying that only NBP third party auditors may verify correction of minor nonconformances found during a third party audit and that this does not necessarily need to be part of an on-site, third party interim audit) • <u>Contact with Regulators</u> (added a sentence indicating that NBP encourages third party auditors to contact regulators as part of information gathering on regulatory compliance outcomes) • <u>Notification of Change</u> (added text citing examples of changes that an organization should communicate to NBP and third party auditor, as well as text encouraging auditors to examine changes during the next, planned on-site third party audit) • <u>Interim Audits</u> (added text to indicate that interim audits may cost roughly 1/3 of the verification audit and clarified process for submitting an interim audit request form) • <u>Internal Audit Substitution</u> (updated text to reflect change in years that agencies have option to substitute internal audit for third party interim audits) 	March 2006
05	<ul style="list-style-type: none"> • Updated all sections of the document, from the cover page through the appendices and including the Code of Good Practice and the Elements, to reflect the name change from “EMS for Biosolids” to “Biosolids Management Program” or “BMP”. • Updated text in Chapter 2 to more accurately reflect the BMP by introducing concepts of biosolids value chain, critical control points, and outcomes. Dropped some of the background and history on Deming total quality management. 	June 2011

	<ul style="list-style-type: none">• Updated text in Chapter 3 to reflect current options for NBP recognition and certification.• Updated text of the BMP Elements in Chapter 4 and Appendix B to reflect the program name change (multiple elements), and make explicit the requirement to develop goals & objectives for all 4 outcomes areas.• Updated text in various chapters to reflect current program offerings for recognition and certification and the related requirements for attaining recognition (e.g., annual internal BMP audits required for Gold-level Recognition)/• Updated text in Chapter 11 to reflect the current audit relationships between NBP, third party auditors, and participating organizations.• Updated Glossary in Appendix A to reflect program name and current offerings, to align definitions for biosolids and preparers to those currently used by EPA and the industry, and to be more consistent with the key definitions provided in the BMP Elements.• Updated web links, organizational names, and contact information on other sources of information in Appendix C.	
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Acknowledgements

This Biosolids Management Program Guidance Manual (*BMP Guidance Manual*) was developed through a highly interactive process of working with various groups that are affiliated in one way or another with the National Biosolids Partnership (NBP) as well as key staff from the partnership organizations – the National Association of Clean Water Agencies (NACWA), the US Environmental Protection Agency (EPA), and the Water Environment Federation (WEF).

Project Steering Committee

The primary points of interaction and feedback in first creating the *BMP Guidance Manual* came from the individual members of the NBP Project Steering Committee. The Project Steering Committee (PSC) was headed by two co-champions from the NBP Steering Committee – Mark Lang of Sear-Brown and Ray Kearney, formerly the regulatory manager for the city of Los Angeles, CA, Bureau of Sanitation. We acknowledge the extensive role of PSC members in creating the *BMP Elements* and the *BMP Guidance Manual*. PSC members included the following:

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NBP Steering Committee and Management Committee

We acknowledge the important advisory and oversight role played by the NBP Steering and Management Committees in developing this *BMP Guidance Manual*. Their members included the following:

NBP Steering Committee

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Ken Kirk	Association of Metropolitan Sewerage Agencies
Richard Kuchenrither	Black & Veatch
Alfred Lindsey	US EPA
John Walker	US EPA

This manual, and the *Elements of a Biosolids Management Program* on which it is based (formerly called the *Elements of an Environmental Management System for Biosolids*), were initially developed for the NBP by the PA Consulting Group. Glenn Nestel led the PA Consulting team that included Elise Bacon, Joe Pringle, and Elisa Speranza.

Robert Wilson, James Scott, and Robert Danhauser of IQuES (International Quality and Services, Inc.), an Earth Tech Company, contributed to Chapters 5-10 of this guidance manual.

Special Collaboration Committee

The NBP Management Committee, at its October 16, 2000 meeting in Anaheim, California, directed the NBP staff collaboration team to harmonize the *Elements* and *Guidance Manual* with the recommendations developed by the Third-Party Verification Options Development and Advisory Groups. The 2001 version of the interim draft *Guidance Manual* was based on the November 11, 2000 version of the *Elements*, which incorporates the third-party verification recommendations. The Collaboration Committee members who oversaw the inputs to the interim draft *Guidance Manual* following the Anaheim meeting were the following:

Committee Member	Affiliation
Eugene DeMichele	National Biosolids Partnership
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Sam Hadeed	National Biosolids Partnership
Mark Hoeke	Association of Metropolitan Sewerage Agencies
James Horne	US EPA
Peter Machno	National Biosolids Partnership
Timothy Williams	Water Environment Federation

In November of 2001, the NBP Management Committee approved updates to this *Guidance Manual* in June of 2002 to incorporate key portions of the *Third-Party Verification Auditor Guidance* and to streamline it. These updates were overseen by Peter Machno of the NBP and prepared by a consultant team involving CH2M Hill, Ross & Associates Environmental Consulting, Ltd., and PA Consulting. We wish to acknowledge the following people for this effort:

Participant	Affiliation
Glenn Nestel	PA Consulting
Lori Ahouse	Ross & Associates Environmental Consulting, Ltd.
Caroline Hemenway	CH2M Hill
Peter Machno	National Biosolids Partnership
Lori Stone	CH2M Hill

Additional revisions to this document have been made as NBP has gained experience with and made adjustments to the Biosolids Management Program. Revisions made since the June 2002 version are described in the document control log at the end of this guidance manual.

Chapter 1

Introduction to the National Biosolids Partnership (NBP) Biosolids Management Program (BMP)

In 1997, The National Association of Clean Water Agencies (NACWA) (formerly Association of Metropolitan Sewerage Agencies or AMSA), the U.S. Environmental Protection Agency (EPA), and the Water Environment Federation (WEF) agreed to form the National Biosolids Partnership (NBP). The NBP is a not-for-profit alliance whose purpose is to assist wastewater organizations to manage their biosolids in a manner that is protective of public health and the environment. Producers, regulators, service contractors, universities, and environmental organizations participate in NBP activities and help shape the NBP's priorities.

The NBP has developed the Biosolids Management Program to help facilities manage their biosolids programs more effectively. The NBP hopes that this Biosolids Management Program (BMP) will be adopted throughout the biosolids profession, by wastewater treatment utilities and private companies that treat and prepare solids for use or disposal.

The BMP is a set of standard procedures and steps that biosolids managers can use voluntarily to: improve the effectiveness of their operations; meet regulatory requirements; and address other issues that are not regulated, but are a concern to local citizens, such as odor and noise. The BMP framework is based on a proven continual improvement management system approach that originated in private industry and is now embraced by all types of organizations worldwide, including public-sector organizations. The next chapter of this manual further describes the continual improvement management system approach.

The benefits of using this approach are numerous, including, but not limited to, better compliance and overall environmental performance, increased efficiency and cost savings, high-quality biosolids

NBP

The National Biosolids Partnership (NBP) is a not-for-profit alliance formed in 1997 with the National Association of Clean Water Agencies (NACWA), Water Environment Federation (WEF), and U.S. Environmental Protection Agency (EPA) to advance environmentally sound and accepted biosolids management practices.

www.wef.org/biosolids

NACWA

The National Association of Clean Water Agencies (NACWA) represents the nation's publicly owned wastewater treatment agencies. Its members serve the majority of the sewered population in the United States and collectively treat and reclaim more than 18 billion gallons of wastewater each day.

www.nacwa.org

EPA

The mission of the U.S. Environmental Protection Agency (EPA) is to protect human health the environment.

www.epa.gov

WEF

The Water Environment Federation (WEF) is an international not-for-profit educational and technical organization. WEF members include environmental, civil and chemical engineers, biologists, chemists, government officials, treatment plant managers and operators, laboratory technicians, college professors, researchers, students, and equipment manufactures and distributors.

www.wef.org

consistent with intended use or disposal markets, and improved relations with local citizens.

The NBP acknowledges that most organizations interested in participating in the NBP already have an existing biosolids management program that includes a variety of biosolids management activities and operations. The NBP BMP is designed to help organizations to improve upon what they already have and to attain recognition for “doing the right thing” and developing a formal BMP.

NBP Biosolids Management Program Documents

The NBP Biosolids Management Program includes five major components:

1. The *Code of Good Practice*
2. The *National Manual of Good Practice*
3. *Elements of the NBP Biosolids Management Program*
4. The *NBP Biosolids Management Program Guidance Manual*
5. *Auditor Guidance for Third-Party Verification of a Biosolids Management Program*

The NBP has developed the *Code of Good Practice*, which sets forth a number of broad goals that govern the operation of sustainable biosolids management programs. The code is provided below in this chapter, and is discussed throughout this guidance manual.

The *National Manual of Good Practice* describes the range of practices available to any organization wishing to implement an NBP Biosolids Management Program. The manual is available from the NBP and is intended for use as a reference and companion to this guide on developing and implementing your BMP.

The NBP has developed the *Elements for an NBP Biosolids Management Program* for use by organizations implementing a BMP. These Elements are the standards or requirements by which your BMP must be developed and against which your program will be evaluated for NBP recognition. All the Elements

are presented in Chapter 4. They are discussed in more detail in Chapters 6 through 10.

This *NBP Biosolids Management Program Guidance Manual* has been prepared to guide you in developing and implementing an NBP Biosolids Management Program. It provides information on the NBP's program, its benefits, and a suggested approach, along with specific instructions about what you will need to do to achieve success.

The NBP has developed the *Auditor Guidance for Third-Party Verification* to ensure that BMPs of participating organizations who choose independent verification are evaluated in a fair and consistent manner that corresponds with the expectations of the NBP. **Chapter 11** of this guidance manual provides all of the information you need to know about third-party audits.

Additionally, the Partnership's **Internet website**, <http://www.wef.org/biosolids>, serves as a central clearinghouse and technical resource for biosolids professionals and interested parties, and provides critical information to organizations that have or wish to develop a BMP.

The first step for any organization that wishes to participate in the NBP and develop a BMP is to make a commitment to the NBP *Code of Good Practice* on the following page.

CODE of GOOD PRACTICE

The Code of Good Practice (the Code) is a broad framework of goals and commitments to guide the production, management, transportation, storage, and use or disposal of biosolids. Those who embrace the Code and participate in the National Biosolids Partnership (NBP) commit to “do the right thing.” Specifically, code subscribers and NBP participants pledge to uphold the following principles of conduct:

COMPLIANCE: To commit to compliance with all applicable federal, state, and local requirements regarding production at the wastewater treatment facility, and management, transportation, storage, and use or disposal of biosolids away from the facility.

PRODUCT: To provide biosolids that meet the applicable standards for their intended use or disposal.

NBP BIOSOLIDS MANAGEMENT PROGRAM: To develop a Biosolids Management Program that includes a method of independent third-party verification to ensure effective ongoing biosolids management.

QUALITY MONITORING: To enhance the monitoring of biosolids production and management practices.

QUALITY PRACTICES: To require good housekeeping practices for biosolids production, processing, transport, and storage, and during final use or disposal operations.

CONTINGENCY AND EMERGENCY RESPONSE PLANS: To develop response plans for unanticipated events such as inclement weather, spills, and equipment malfunctions.

SUSTAINABLE MANAGEMENT PRACTICES AND OPERATIONS: To enhance the environment by committing to sustainable, environmentally acceptable biosolids management practices and operations through a Biosolids Management Program.

PREVENTIVE MAINTENANCE: To prepare and implement a plan for preventive maintenance for equipment used to manage biosolids and wastewater solids.

CONTINUAL IMPROVEMENT: To seek continual improvement in all aspects of biosolids management.

COMMUNICATIONS: To provide methods of effective communication with gatekeepers, stakeholders, and interested citizens regarding the key elements of each Biosolids Management Program, including information relative to program performance.



COFFEE BREAK

You learned how to use this manual in the Foreword and this chapter has introduced you to the National Biosolids Partnership's Biosolids Management Program.

Chapter 2 will provide you with a primer, outlining the framework and concepts on which the NBP's program is based.

Chapter 3 will describe the benefits of the NBP Biosolids Management Program.

If you are not already part of the NBP program and want to participate in the NBP's program, you can contact the NBP at:

National Biosolids Partnership
601 Wythe Street
Alexandria, VA 22314
Phone: 703-684-2400
Fax: 703-684-2492
E-mail: nbp@wef.org
<http://www.wef.org/biosolids>

Chapter 2

Biosolids Management Program Fundamentals

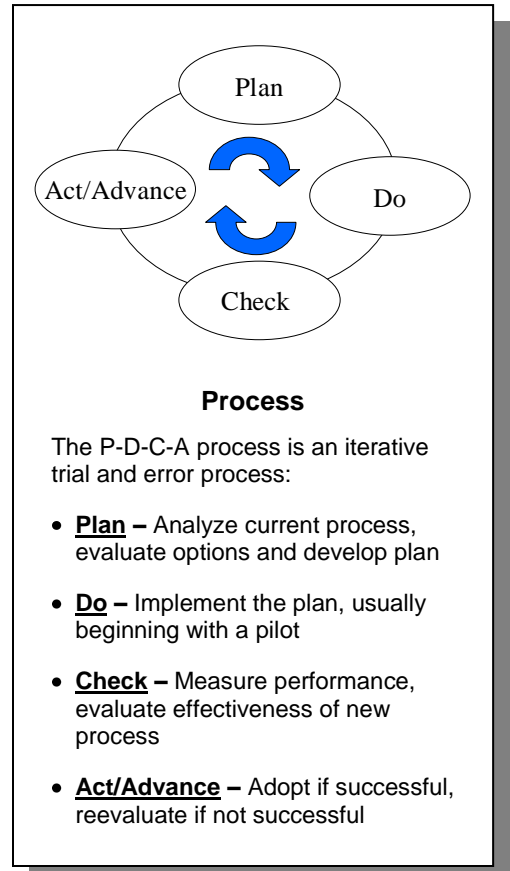
Plan-Do-Check-Act!

Quality management and continual improvement are the foundation of the BMP. The *Elements of the NBP Biosolids Management Program (or BMP Elements)* are designed around a continual improvement process is known as Plan-Do-Check-Act or the P-D-C-A process. The P-D-C-A process is based on the quality management principles first developed by Dr. W. Edwards Deming, which established a proven, systematic method for managing quality and improving performance. He developed many of his theories during World War II when he taught industries in the United States how to improve the quality of military equipment produced for the war effort.

In rebuilding their manufacturing capabilities after the war, Japanese companies began following Deming principles. Prior to these initiatives, the label “made in Japan” was equated with poor quality and workmanship. Under Deming’s approach, Japanese companies began to capture major market share from their U.S. and European competitors. By the 1970s, the benefits of Deming’s methods were apparent in Japanese companies’ dominance in automobiles, computers, and consumer electronics.

In the 1970s and 1980s, American companies rediscovered quality-based management systems. Faced with the increasing threat of global competition, poor productivity, and quality problems, U.S. companies turned to Deming’s methods to help them regain their competitive edge. Today, Deming-based quality management approaches are an industry standard in virtually all major manufacturing and service-market sectors.

Deming’s continual improvement management system approach also provides an effective framework for managing environmental outcomes – both regulatory and non-regulatory environmental impacts (such as solid waste recycling rates or energy use). A continual



improvement management system focused on environmental outcomes is called an environmental management system.

Hundreds of domestic and multinational corporations are implementing ISO 14000, a series of international environmental management system standards designed to enhance internal management system efficiency, reduce waste, prevent pollution, improve environmental performance, and help organizations adopt proactive environmental policies.

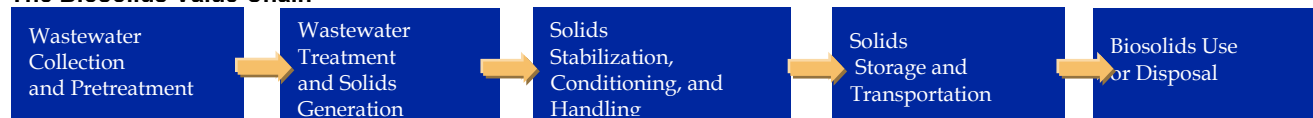
P-D-C-A for Biosolids Management

The *BMP Elements* are based on Deming's P-D-C-A process. The *BMP Elements* are a P-D-C-A process specifically for biosolids management. The *BMP Elements* incorporate aspects of both quality management and environmental management systems, as both quality and environmental outcomes are important for biosolids management. Most regulatory requirements for biosolids are environmental in nature (e.g., NPDES permits), so a management system focused on environmental outcomes is a natural fit for biosolids organizations. As well, controlling biosolids quality outcomes is critical for organizations to produce a product that is consistent with actual and/or intended biosolids end use(s).

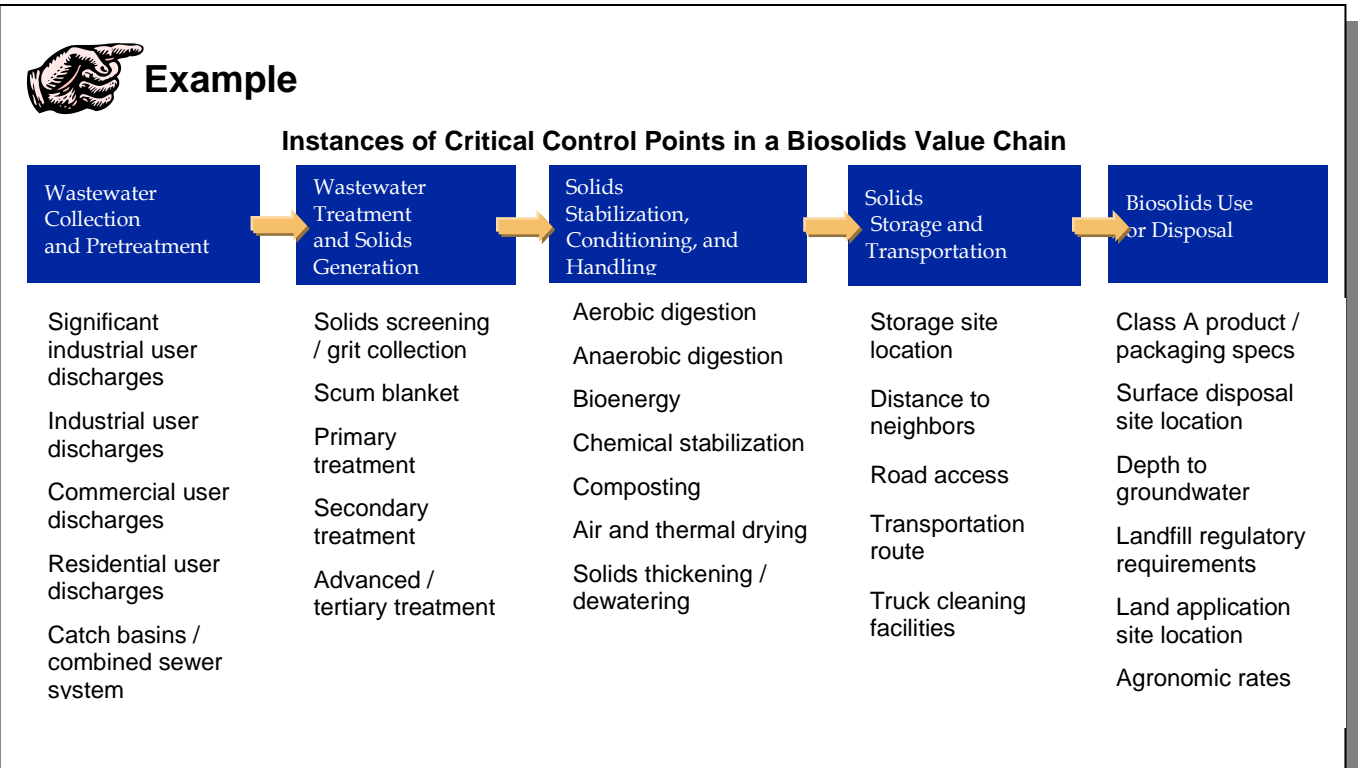
The *BMP Elements* are also specifically designed for biosolids organizations in that they require you to identify *critical control points* throughout your *biosolids value chain*, as applicable to your organization's specific biosolids management activities.

The *biosolids value chain* is the sequence of activities under your organization's control from wastewater pretreatment, discharge, and collection through wastewater treatment, solids treatment, and handling, storage, transportation, and disposal or use of biosolids that impact the quality and stability of biosolids and their suitability for the selected management method.

The Biosolids Value Chain



Critical control points are locations, unit processes, events, and activities throughout the biosolids value chain that require effective management – through policies, procedures, programs, practices, monitoring and measurement – to assure that biosolids activities meet legal, quality, and public acceptance requirements and do not have undesirable environmental impacts.



The BMP concepts of the biosolids value chain and critical control points are what narrow the management program scope to just biosolids management activities and operations, as opposed to all of your organization’s operations. While some operations might control both biosolids quality and effluent water quality, such as secondary treatment, the biosolids value chain and critical control points define a distinct boundary around biosolids management activities for the BMP. This limits the BMP focus of regulatory requirements and environmental impacts to the biosolids value chain and critical control points. For example, energy use for biosolids transportation could be a non-regulatory environmental impact that would be considered in scope for the BMP as biosolids transport is part of the biosolids value chain. Whereas,

energy use for pumping treated effluent would be considered out of scope for the BMP.

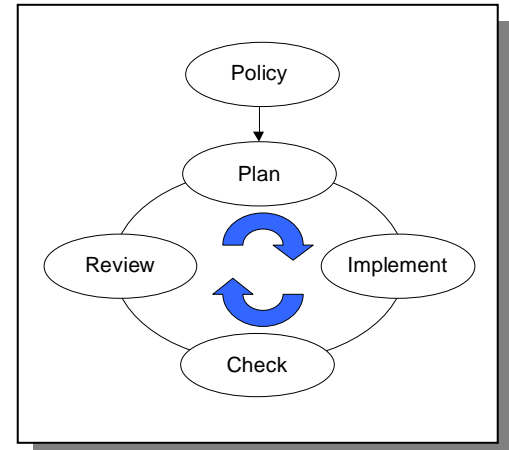
As part of the BMP planning and implementation processes, your organization will need to examine your biosolids operations and activities to identify the parts of the biosolids value chain and the critical control points that are relevant to your organization.

The Elements of the Biosolids Management Program

The *BMP Elements* are organized around the five key areas of the Deming-based management cycle depicted to the right. Each area contains between one and six Elements, for a total of 17 *BMP Elements*.

P-D-C-A, as applied to the NBP Biosolids Management Program, is outlined below:

- **Policy** – Develop documentation of the BMP; make commitment to the *NBP Code of Good Practice*.
- **Planning** – Identify existing and potential critical control points, determine legal and other requirements, and establish desired outcomes/public expectations.
- **Implementation** – Assign roles and responsibilities, provide training for necessary skills and knowledge, and establish communications activities, standard operating procedures, and practices for normal and abnormal situations.
- **Measurement and Corrective Action** – Assess success in meeting legal and other requirements, goals, objectives, and performance standards, and institute corrective action to correct problems.
- **Management Review** – Periodically review the progress and performance to ensure effectiveness of the BMP.



The following table shows how the 17 *BMP Elements* can be organized into the five areas of P-D-C-A.

Elements of the NBP Biosolids Management Program				
Policy	Plan	Implementation	Check	Review
1. BMP Manual 2. Biosolids Management Policy	3. Critical Control Points 4. Legal and Other Requirements 5. Goals and Objectives 6. Public Participation in Planning	7. Roles and Responsibilities 8. Training 9. Communication 10. Operational Control of Critical Control Points 11. Emergency Preparedness and Response 12. Documentation, Document Control, and Recordkeeping	13. Monitoring and Measurement 14. Nonconformances: Preventive and Corrective Action 15. Biosolids Management Program Report 16. Internal Management System Audit	17. Management Review

Producing Desired Outcomes

The NBP believes that “outcomes matter” for an effective BMP – the BMP should not be just a paper exercise for management. The NBP also believes that improved public understanding and acceptance of biosolids management ultimately depends on the ability of the NBP and program participants to demonstrate that the BMP produces better compliance, better environmental performance, good management practices, and improved relations with interested parties.

Therefore, the NBP has identified four areas where it has defined specific BMP expectations for producing improved outcomes. These four areas include:

- environmental performance;
- regulatory compliance;
- quality biosolids management practices; and
- relations with interested parties.

NBP participants demonstrate a commitment to achieving improved outcomes by identifying potential areas for improvement and establishing performance goals and objectives in each of the four outcome areas.

The *BMP Elements* require that goals and objectives reflect identified priorities for improving environmental performance of biosolids management activities.

Regulatory compliance outcomes are important to assure that organizations are attentive to and successful in their efforts to meet compliance obligations.

An organization must demonstrate a strong commitment to the utilization of quality biosolids management practices as dictated by the *Code of Good Practice* and captured in the *National Manual of Good Practice*.

To achieve the outcome of improved relations with interested parties, and ultimately public acceptance of biosolids management practices, organizations must be seeking and creating meaningful opportunities for public participation in BMP planning, implementation, and auditing.

Using the BMP to improve biosolids management is an effective means to ensure the integrity of a program for using or disposing of biosolids. It encourages local community involvement where the facilities and projects operate. Building community understanding and involvement into programs helps maintain recognition that biosolids operations meet strict safety and health requirements. At the same time, the BMP provides an opportunity for the public to better understand the value of biosolids as a resource.

Different elements or components of the BMP have a greater or lesser focus on each outcome area (more information on the BMP Elements is presented in Chapter 4). Some elements are specifically designed to focus on regulatory and environmental outcomes, while some are more focused on involving and communicating with interested parties, and other elements (like goals and objectives) address all four outcomes areas.



COFFEE BREAK

In this chapter, you have learned about the origins of modern management systems and the fundamental concepts on which they are based. The NBP Biosolids Management Program is based on a management system approach. You also learned about the desired outcome areas for continual improvement that a BMP will help your organization achieve.

In Chapter 3, you will learn more about the benefits of implementing the Biosolids Management Program.

Chapter 3

Benefits of the Biosolids Management Program

Benefits of Adopting the NBP Biosolids Management Program

A NBP Biosolids Management Program will help an organization improve their overall environmental performance and stewardship, which is important to their communities and regulators. Even organizations that already have a well-run biosolids management program can find ways to improve by using the systematic plan-do-check-act approach of the BMP. The BMP can also help increase understanding at all levels of the organization about how the pieces of what you do fit together in a system to drive desired outcomes.

The following are some benefits of adopting and implementing a BMP:

- When mapping current biosolids processes to document standard operating procedures as part of BMP implementation, organizations have the option of looking at ways to streamline them and make them more efficient. This can help managers identify money-saving opportunities.
- The BMP provides operators, managers, and administrators with tools to track and monitor critical data to achieve optimized management performance and ensure regulatory compliance.
- The BMP can also improve environmental performance outcomes and decrease negative environmental impacts.
- Improved communications protocols with the BMP will help organizations maintain credibility with communities and stakeholders and enhance relationships with interested parties. The BMP can improve public awareness and increase opportunities for interaction.

Biosolids Management Program Benefits

The *BMP Elements* will help organizations accomplish the following:

1. Identify the overall objectives of their biosolids management program
2. Describe a series of management practices to meet these objectives
3. Manage their biosolids and monitor and measure the effectiveness of their management practices at a series of critical control points
4. Take corrective and preventive measures if the management practices are not operating effectively
5. Conduct internal audits of the program
6. Establish a management “feedback loop” to evaluate and make changes to the program periodically

- The BMP incorporates elements of change management by regularly checking and acting upon the need for improvement. For example, the BMP establishes processes and procedures for keeping abreast of regulatory changes and integrating those changes into your biosolids management activities.

Other benefits include capture of institutional knowledge to address aging workforce issues and improved employee morale through clarity of the organization's mission, goals and objectives.

Benefits of Independent Audits

Independent third-party auditing of the BMP gives you an outside perspective on your management program and can help you identify how to improve your BMP. Independent audits can help improve interactions with stakeholders, such as regulatory bodies, and build or maintain the confidence of local communities. In addition, a successful audit results in recognition by the NBP as described further below.

Third-party audits have been highly valuable to organizations in improving internal operations, identifying cost saving measures, and building public confidence. Subsequent audits service to verify the continual improvement aspect of the BMP.

NBP Training and Support

The NBP provides biosolids management training and support that helps biosolids management organizations improve their programs. For more information on NBP training and support services, visit the NBP website at www.wef.org/biosolids or contact the NBP staff.

NBP Recognition

The NBP has created a tiered program of recognition for organizations that choose to participate in the Biosolids Management Program. The tiers reflect an organization's efforts to commit to the BMP, develop and implement the BMP, and have the BMP audited by internal and external audit teams. Audits of the BMP

Building a Centralized Biosolids Communications Network

The NBP web site infrastructure includes the following:

- Links with a variety of technical resources as well as with the NBP and other regional biosolids associations, member associations, wastewater agencies, state regulators, academia, trade press, and other stakeholder groups to ensure efficient and timely distribution of information.
- A mechanism that will allow timely information on biosolids issues to be posted and disseminated automatically via email to registered users to ensure effective communications over a broad network of individuals.
- Tools such as fact sheets, biosolids information kits, databases of biosolids information by state, and electronic newsletters.

<http://www.wef.org/biosolids>

help ensure that it meets the requirements of the BMP, produces desired outcomes, and is continually improved and maintained over time.

The requirements for each tier of NBP recognition are as follows.

Tier 1: Bronze-Level Recognition

Organization has made a commitment to the NBP *Code of Good Practice*, with the acknowledged goal of implementing the 17 NBP *Biosolids Management Program Elements* and obtaining independent verification of the organization's BMP.

Tier 2: Silver-Level Recognition

Organization has implemented the 17 *Biosolids Management Program Elements* and has completed an NBP approved audit, recognizing the BMP as ready for a third party verification audit. To maintain silver-level recognition, organizations must annually conduct internal audits and submit the internal audit reports to NBP.

Tier 3: Gold-Level Recognition

Organization has completed an independent, third party BMP verification audit and has committed to conducting annual internal audits. To maintain gold-level recognition, the organization must submit annual internal audit reports to NBP and complete another third party BMP verification audit after five years. Organizations that have obtained gold-level recognition have the option of committing to regular, third party interim audits and achieving platinum-level certification.

Tier 4: Platinum-Level Certification

Organization has completed third party BMP verification audit and at least one third-party interim audit with a commitment to a regular schedule of third party interim audits and internal audits. To maintain platinum-level certification, the organization must complete interim audits (at least two third party interim audits between verification audits), must

submit interim or internal audit reports to NBP annually, and complete another third party verification audit (or re-verification) after five years.

Organizations may choose to participate in the NBP program at any of these tiers. All biosolids organizations are encouraged to: start with a commitment to the NBP *Code of Good Practice*, learn about a BMP, and implement and seek audits as fits your organization.

The NBP has revised the program recognition offerings over time to increase flexibility for program participants. While organizations may ultimately choose to not pursue NBP Gold-level Recognition or Platinum-level Certification, both of which require at least 1 independent third-party audit, the NBP program materials are designed to prepare an organization's BMP for audit-readiness.



COFFEE BREAK

In this chapter you reviewed the benefits of a BMP for your organization and the benefits of BMP audits.

- The BMP leads to improved outcomes and operational efficiencies
- Audits provide an independent look at your BMP and opportunities for improvement.
- The BMP and audits can improve your credibility with interested parties.

As well, this chapter presented information on how the NBP can help you receive training and support for implementing your BMP.

Chapter 4 presents the details for the 17 BMP Elements.

Chapter 4

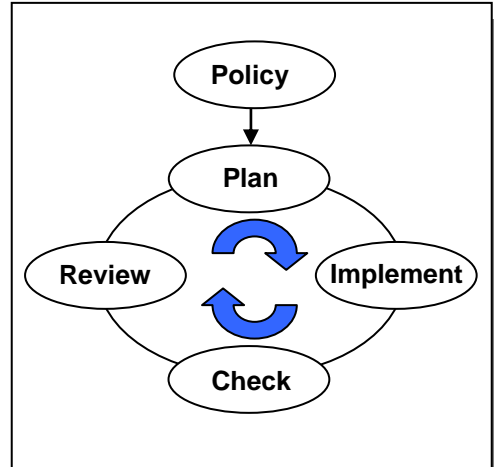
Elements of the NBP Biosolids Management Program

As discussed in Chapter 2, the *BMP Elements* establish the series of requirements and benchmarks around which you will design your BMP and against which you and outside parties will audit your program for conformance with these Elements.

In the NBP's Biosolids Management Program, five Element categories correspond to the Deming-based quality management cycle depicted to the right. Each category contains between one and six Elements, for a total of 17 BMP Elements.

This chapter provides the requirements for each Element to prepare you for learning more about the steps you will go through to develop and implement your own BMP. The process will be described in Chapter 5. Chapters 6 through 10 provide guidance about interpreting and implementing the Element requirements. The official requirements for reference are contained in the *Elements of a NBP Biosolids Management Program*, in Appendix B of this guide and on the NBP website.

The *BMP Elements* should be considered and implemented as a coordinated system, rather than independent, disconnected components. For example, Elements with a communication component should be implemented in coordination, and Elements that require action by contractors should be reviewed in tandem.



Policy

1. BMP Manual
2. Biosolids Management Policy

Plan

3. Critical Control Points
4. Legal and Other Requirements
5. Goals and Objectives
6. Public Participation in Planning

Implement

7. Roles and Responsibilities
8. Training
9. Communication and Public Outreach
10. Operational Control of Critical Control Points
11. Emergency Preparedness and Response
12. BMP Documentation and Document Control

Check

13. Monitoring and Measurement
14. Nonconformances; Preventive and Corrective Action
15. Periodic Biosolids Program Performance Report
16. Internal BMP Audit

Review

17. Periodic Management Review of Performance

Element 1 — BMP Manual

The *BMP Elements* describe an organization's requirements for establishing and maintaining a comprehensive Biosolids Management Program (BMP) that covers its biosolids management activities at all critical control points throughout the biosolids value chain.

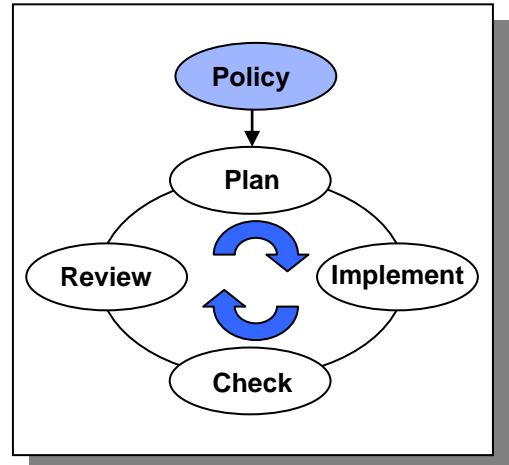
The BMP (including the other 16 BMP Elements) shall be documented in a BMP Manual or in an equivalent set of program documents that describe, at least at a general level, the applicable policies, programs, plans, procedures, and management practices in the BMP.

The BMP Manual shall:

1. Be approved by a level of the organization's management with the authority to commit people and resources to biosolids management activities;
2. Contain the organization's biosolids management policy and procedures required by the *BMP Elements*;
3. Contain or cross-reference public participation in planning, communication, and emergency preparedness and response programs and plans required by the *BMP Elements*;
4. Cover all critical control points for its biosolids management activities throughout the biosolids value chain;
5. Include or cross-reference all operational controls, procedures, processes, and other management methods used to achieve and maintain compliance with legal and other requirements; and
6. Describe those biosolids management activities assigned to and performed by contractors.

Element 2 — Biosolids Management Policy

The organization shall establish a biosolids management policy that commits the organization to following the principles of conduct set forth in the *NBP Code of Good Practice* and may include other biosolids commitments the organization voluntarily chooses to



Practical Handbook

Your BMP Manual is a cookbook of sorts — it describes how the Biosolids Management Program set up and where you can find everything you need to manage your biosolids and implement your BMP. If you are the BMP coordinator, it might be the kind of notebook you'd share with other staff, management, an internal auditor, and outside parties to introduce them to your BMP.

adopt.

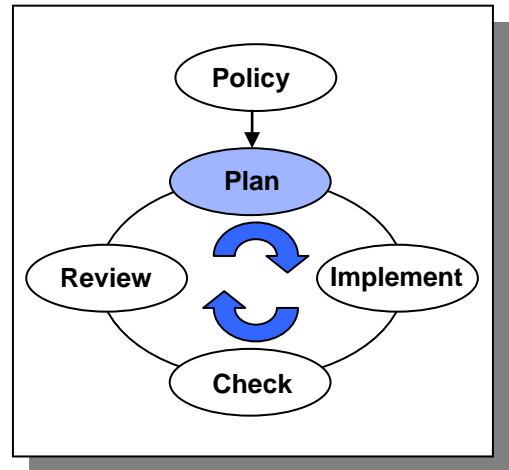
The organization’s biosolids management policy shall be communicated to employees, contractors, and all interested parties and be incorporated into the organization’s biosolids programs, procedures, and practices.

Element 3 — Critical Control Points

The organization shall identify and document the critical control points of its biosolids management activities throughout the biosolids value chain. The organization shall also identify potential or actual environmental impacts at each critical control point.

The organization’s critical control points shall be consistent with those identified in the NBP’s *National Manual of Good Practice* and other authoritative sources on biosolids management. The information on the organization’s critical control points shall be kept up to date and the records shall link each critical control point and its potential environmental impacts with the corresponding operational control(s).

Organizations that have successfully completed a third-party verification audit and are pursuing NBP Platinum-level Certification shall provide notification to the third-party verification auditor after any operational change that requires a change to the identified critical control points or to environmental impacts associated with the critical control points.



Element 4 — Legal and Other Requirements

The organization shall establish a procedure for identifying and tracking legal (federal, state, and local) and other requirements applicable to its biosolids management activities. The procedure shall include a management process for incorporating changes and new requirements into the elements of its BMP. The organization shall establish and maintain records of applicable legal and other requirements.

Legal Obligations

Legal and other requirements are the minimum performance objectives, monitoring, reporting, administrative, and other requirements for your biosolids management program and program activities.

Element 5 — Goals and Objectives

To continually improve the performance of its BMP, the organization shall establish and periodically review measurable biosolids program goals and objectives for its biosolids management activities. The organization shall set measurable goals and objectives for each of the four NBP outcome areas: environmental performance, regulatory compliance, relations with interested parties, and quality biosolids management practices.

The organization's goals and objectives shall reflect identified priorities for improving the environmental performance of its biosolids management activities based on its critical control points, identified or potential environmental impacts, legal and other requirements, and applicable best management practices as defined in the NBP's *National Manual of Good Practice* and various authoritative information sources on biosolids management (e.g., Water Environment Federation manuals of practice).

The biosolids program goals and objectives also shall consider input from interested parties developed through proactive public participation.

The biosolids program goals and objectives shall be integrated with other BMP Elements and its biosolids management activities, developed and documented using SMART criteria (i.e., be Specific, Measurable, Achievable, Relevant, and Time-bounded), and shall be updated on a regular basis.

The organization shall establish an action plan that describes those improvement activities it is pursuing to achieve its biosolids program goals and objectives. The action plan shall designate schedules, milestones, resources, and responsibilities for achieving its biosolids program goals and objectives.

Element 6 — Public Participation in Planning

The organization shall select and implement a proactive public participation approach to involve interested parties in its biosolids management program and BMP planning process. The approach selected for

SMART Goals

The goals you set should be:

Specific
Measurable
Achievable
Relevant
Time-bound

Mechanisms for Public Participation

Following are some ways you can include the public in your Biosolids Management Program activities:

- Formally chartered advisory committees
- Representation on workgroups
- Surveys
- Focus groups
- Press releases
- Public meetings
- Trade shows
- Annual performance reports
- Speakers' bureaus
- Periodic open house events
- Site tours of biosolids management facilities

Participants should reflect external stakeholders, including those groups potentially affected by the organization's biosolids management activities, and those groups that initially may oppose certain activities.

public participation shall reflect the organization's commitments to ten (10) principles in the NBP *Code of Good Practice*, including its plan for independent third-party verification of conformance with the *BMP Elements*. The public participation approach shall be consistent with the degree of current public interest, the history of public involvement, the method of biosolids management, and related local circumstances.

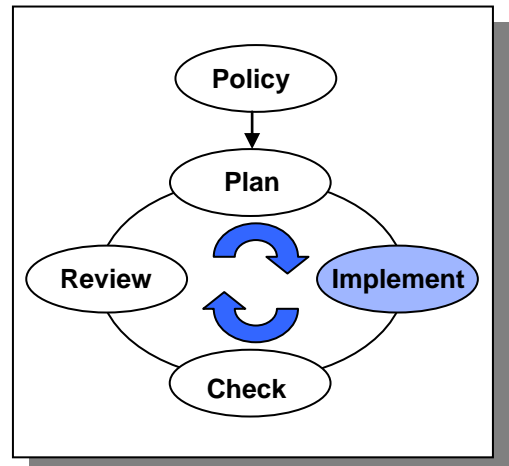
The approach selected for public participation also shall provide interested parties with meaningful opportunities to express their views and perspectives relative to the organization's biosolids management activities, including concerns about environmental impacts, biosolids program performance, and potential areas for improvement.

The organization shall consider input from interested parties in initially developing its biosolids program goals and objectives during its BMP implementation and in updating them as part of its periodic review of BMP performance.

Element 7 — Roles and Responsibilities

The organization shall establish and maintain records of the assigned roles and responsibilities for its BMP and biosolids management activities. To ensure these assigned roles and responsibilities are effectively performed, the organization shall:

1. Appoint an individual with overall responsibility for ensuring that its BMP is implemented and maintained;
2. Define and document roles and responsibilities of its employees for performing its biosolids management activities and BMP functions;
3. Provide the human, technical, and financial resources necessary to execute these responsibilities effectively; and
4. Define and document the roles and responsibilities of contractor(s) retained to perform various biosolids management activities and BMP functions through service agreements.



Element 8 — Training

The organization shall establish and maintain a training program to ensure that its employees responsible for specific biosolids management activities and for implementing various BMP functions are competent in performing their assigned tasks and duties.

The training program shall provide general awareness of the BMP and how each employee’s assigned roles and responsibilities relate to the entire biosolids value chain. The training program shall address new or reassigned employees. The organization shall maintain records of individual employee training delivered and completed.

The organization shall require that its contractors establish their own training programs consistent with their roles and responsibilities in biosolids management activities as defined through service agreements.

Training Options

- Structured on-the-job training, including apprenticeships and mentoring
- Classroom instruction
- Outside workshops, seminars, and courses
- Computer-based interactive training courses
- Formal certification programs (e.g., WWTP operator)

Element 9 — Communication

The organization shall establish and maintain a proactive communications program that provides on-going information about its biosolids management activities and BMP to interested parties and the public, consistent with local circumstances, the method of biosolids management, its public communications history, and degree of current interest in its biosolids management activities. The organization’s communication program shall make available a summary of its independent, third-party BMP verification audit results to the public. The organization shall define the roles and responsibilities of outside contractors in its communication program.

The communication program shall include a procedure for receiving inquires and requests for information from interested parties about its biosolids management activities and BMP. The procedure shall define a process for ensuring a timely and complete response to inquiries by interested parties. At a minimum, the organization’s communications program shall make the following information about the organization’s biosolids management activities and BMP available to

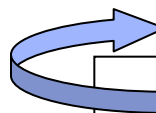
Internal Communication Opportunities

- Bulletin boards
- Memos
- Newsletters
- Performance reports
- Monitoring results
- Databases
- Internal e-mail
- Intranets
- Brown-bag lunches
- Workgroup meetings

interested parties:

1. Biosolids management policy;
2. Applicable legal and other requirements;
3. Biosolids program goals and objectives for continual improvement;
4. Periodic BMP performance report; and
5. Detailed report of its independent, third-party verification audit results of its BMP.

The organization's communications program also shall communicate relevant information about its biosolids management activities and its biosolids management policy and all 17 BMP Elements to its employees and outside contractors, consistent with their assigned biosolids management roles and responsibilities.



External Communication Venues / Methods

- Annual reports
- Periodic BMP reports
- Newsletters
- Web-site
- Speaking engagements
- Facility tours
- Community meetings
- Surveys
- Focus groups
- Bill flyers

Element 10 — Operational Control of Critical Control Points

The organization shall develop and implement standard operating procedures, work management practices, or other appropriate methods at all critical control points throughout the biosolids value chain to manage potential environmental impacts effectively. Operational controls at critical control points shall incorporate all legal and other adopted requirements and shall consider applicable best-management practices as defined in various authoritative information sources on biosolids management (e.g. NBP *National Manual of Good Practice*, Water Environment Federation manuals of practice).

Operational controls shall include appropriate preventive maintenance procedures and work management systems for maintaining equipment, instrumentation, vehicles, and other treatment technology and process control systems associated with its biosolids management activities.

The organization shall require that its contractors establish their own operational controls consistent with their roles and responsibilities in biosolids management activities.

Operational Controls

- Ordinances and regulations
- Standard operating procedures and work instructions
- Training
- Management practices
- Inspections and investigations
- Logs and checklists
- Transportation manifests, application and disposal records
- Technology, instrumentation, and process controls
- Information management systems and SCADA
- Monitoring and laboratory testing

Element 11 — Emergency Preparedness and Response

The organization shall establish and maintain emergency preparedness and response plans and procedures to ensure effective response to accidents and emergency situations associated with its biosolids management activities.

The organization shall review and evaluate the effectiveness of its emergency preparedness and response procedures, including communications systems, and revise them as necessary. All emergency response equipment shall be on site or readily available within a minimum response time.

The organization shall require its contractors to establish and maintain emergency preparedness and response plans and procedures to ensure effective response to accidents and emergency situations associated with its biosolids management activities.

Element 12 — Documentation, Document Control, and Recordkeeping

The organization shall establish and maintain documentation, documents, and records for its BMP including the 17 BMP Elements.

The organization shall establish and maintain document control procedures and practices to ensure that its BMP documentation and documents are:

1. Available and can be located easily;
2. Created following established document creation protocols;
3. Kept up to date through periodic reviews and revisions (if applicable);
4. Properly marked with version number, effective date(s), and references to replaced or superseded versions; and
5. Approved by authorized personnel.

The organization shall establish and maintain records of its biosolids management activities and ensure that they are:

Prepare, Respond Situations

- Industrial or commercial user loadings
- Liquid or solids process upset
- Rain, snow, ice, flooding
- Power interruptions or outages
- Extreme outside temperatures
- Air or soil conditions
- Off-site spills and transportation accidents
- Unauthorized access

Document Requirements

Your BMP documents should be:

- Available and easily located
- Orderly and legible
- Created following protocols
- Kept up to date
- Properly marked
- Approved
- Retained
- Publicly available where stipulated

1. Available and can be located easily; and
2. Retained for the specified period of time.

The organization shall establish BMP documentation, document control, and records requirements for biosolids management activities conducted by its contractors in service agreements, and incorporate these requirements into its BMP.

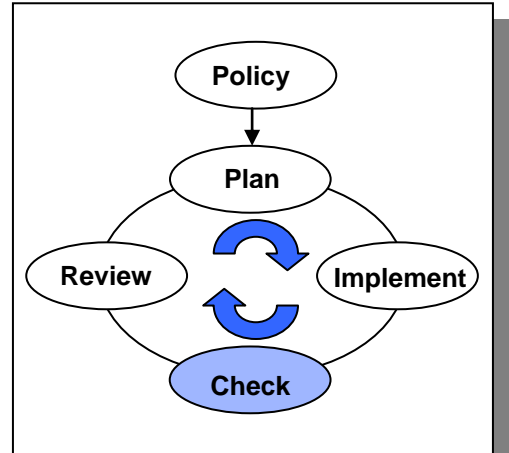
Element 13 — Monitoring and Measurement

The organization shall establish and maintain regular monitoring and measurement procedures and practices for all of its biosolids management activities to:

1. Ensure compliance with applicable legal and other requirements;
2. Measure biosolids program performance at critical control points; and
3. Track progress toward achieving biosolids program goals and objectives as required under Element 5.

Monitoring and measurement results shall be recorded and the records maintained as established in the recordkeeping procedures under Element 12.

The organization shall require its contractors to establish and maintain regular monitoring and measurement procedures and practices for all their assigned biosolids management activities, as defined in their service agreements.



Performance Report Has Results

Monitoring and measurement results are summarized and interpreted in your periodic biosolids program performance report.

Element 14 — Nonconformances: Preventive and Corrective Action

Procedures for Investigation and Taking Corrective Action for Nonconformances

The organization shall develop and implement a procedure to:

1. Investigate any noncompliance with applicable regulatory requirements and/or nonconformance with internal BMP procedures identified during

routine monitoring and measurement or periodic internal BMP audits;

2. Identify the cause and take actions to correct the nonconformance; and
3. Document the necessary corrective actions taken to prevent a recurrence.

Corrective Action Plans for Nonconformances

Corrective action plans shall be developed to address nonconformances identified during routine monitoring and measurement. Such plans may be as brief as is appropriate to the situation, but at a minimum, shall identify the nonconformance, the root cause(s), and the corrective action being taken. The corrective action plan shall identify changes to policies, programs, plans, operational controls, or monitoring/measurement procedures to prevent future nonconformances.

Corrective Action Plans for BMP Audits

Formal corrective action plans shall be established to address the findings of internal BMP audits under Element 16, and BMP verification audits conducted by third parties. The corrective action plan shall be documented and shall describe what actions will be taken to address the audit findings, the individual(s) responsible, the estimated completion date, and required resources to develop and implement corrective and preventive action.

Progress in completing the corrective actions shall be tracked and periodically updated to reflect completion. The corrective action plan shall include recommended changes to policies, programs, plans, operational controls, or monitoring/measurement procedures to prevent future nonconformances. These changes shall be documented in the corrective action plan, and in the BMP Manual and other relevant BMP documentation.

Element 15 — Biosolids Management Program Report

The organization shall complete a periodic, written BMP performance report (at least annually) summarizing the performance of its BMP. The report shall contain appropriate summaries of monitoring, measurement, and other results that demonstrate the

Nonconformances are incidents or situations where legal, voluntary, or BMP requirements are not met. Such requirements also include policies, plans, procedures, operational control targets, and other guidelines that form the basis for the BMP.

When these situations occur, ask yourself such questions as:

- Why did it happen?
- How could we have prevented it?
- Was there a way we could have flagged the problem earlier?
- What do we need to do next time?

Your corrective action plans should include any recommended changes to policies, requirements, operational controls, SOPs, work instructions, training, or other components of your BMP needed to prevent future nonconformances.

performance of the biosolids program relative to its goals, objectives, and legal requirements, including those biosolids management activities conducted by contractors.

The report also shall provide summaries of performance relative to other voluntarily adopted requirements, the organization's progress toward achieving its biosolids program goals and objectives, and a summary of its independent third-party verification audit results and internal BMP audit results.

The periodic BMP report shall be available to the public. The organization shall have the flexibility of using other methods, including electronic methods such as a biosolids web page in addition to or in lieu of a written periodic performance report.

Element 16 — Internal BMP Audit

The organization shall establish and maintain an internal audit program to periodically analyze its BMP and to determine whether it is effectively meeting its biosolids management policy, program requirements, and program goals and objectives.

The internal BMP audit program shall define the scope, frequency, and methodology of the audits, assign responsibility for conducting the audits and communicating their findings, and designate individuals to whom these findings are to be conveyed. The internal BMP audit also shall evaluate the organization's performance relative to established biosolids program goals, objectives, and performance measures. The internal BMP audit program shall cover all of the organization's biosolids activities including those performed by contractors.

Internal BMP audit results shall be reported to the organization's management in such a way that it can take action to make necessary modifications to the BMP. The person responsible for the BMP shall develop, or delegate the development of, a comprehensive corrective action plan addressing each nonconformance identified by the internal audit.

At a minimum, the organization shall maintain the following documents and records, as applicable,

Why Explain?

Why is it important to clarify where you are, how well you're doing, and where you're going?

Along with providing public participation in planning and with your communication and outreach strategy, sharing your program's performance can help you build trust, confidence, and understanding among public, stakeholders, partner agencies, and citizen groups.

relating to its audit program:

1. Description of audit methodology, protocol, scope, and schedule;
2. Identification of lead auditor(s), qualifications, and description of roles and responsibilities of auditor(s), management representatives, and others who may participate in, review, or be expected to act upon the audit; and
3. Corrective and/or preventive action plans prepared resulting from an audit, and any related changes made to policies, plans, procedures, or work practices that occur as a result of an audit's findings, evaluation, or follow-up actions.

[For organizations that are pursuing NBP Gold-level Recognition, internal audits are required annually, with reports sent to NBP as part of the periodic BMP report. Organizations that are pursuing the NBP Platinum-Level Certification should set a schedule and scope of internal audits. This schedule will be reviewed and approved by the third-party verification auditor.]

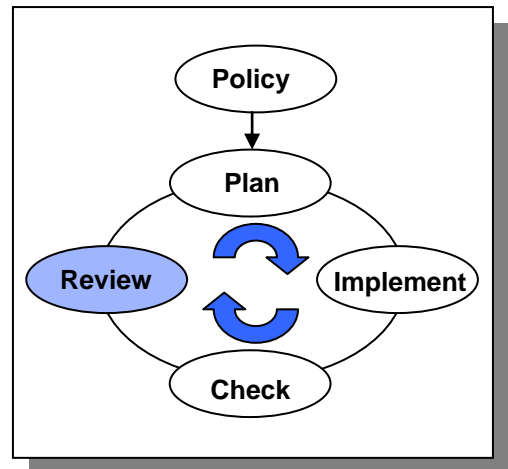
Element 17 — Management Review

The organization's management shall, at intervals that it determines appropriate, review the BMP and its performance relative to policy commitments, goals, objectives, and established performance measures to ensure its continuing suitability, adequacy, and effectiveness. A lead person or persons shall be responsible for organizing and conducting the review.

The management review shall address the possible need for changes to policy, the goals and objectives, biosolids activities, or other BMP Elements based on internal audit results, external verification audits by third parties, changing circumstances, and the commitment to continual improvement. The management review shall be documented. Any changes to policies, plans, procedures, and work practices that are made as a result of the review also shall be documented.

At a minimum, the organization shall maintain the following related to its management reviews:

1. Schedule and scope for review(s);



2. Documentation of findings, evaluation, and follow-up actions; and
3. Documentation of changes made to policies, plans, procedures, practices, or other BMP Elements that occur as a result of the management review findings, evaluation, or follow-up actions.



COFFEE BREAK

Element 17 — Management Review — is the last phase of the plan-implement-check-review cycle of your Biosolids Management Program.

But the process does not end there.

Your management review kicks off the next phase — planning — in a new cycle that repeats for as long you are committed to best practices and continual improvement.

In Chapter 5, you will learn the steps to develop and implement your Biosolids Management Program.

Chapter 5

Step-By-Step to Your Biosolids Management Program



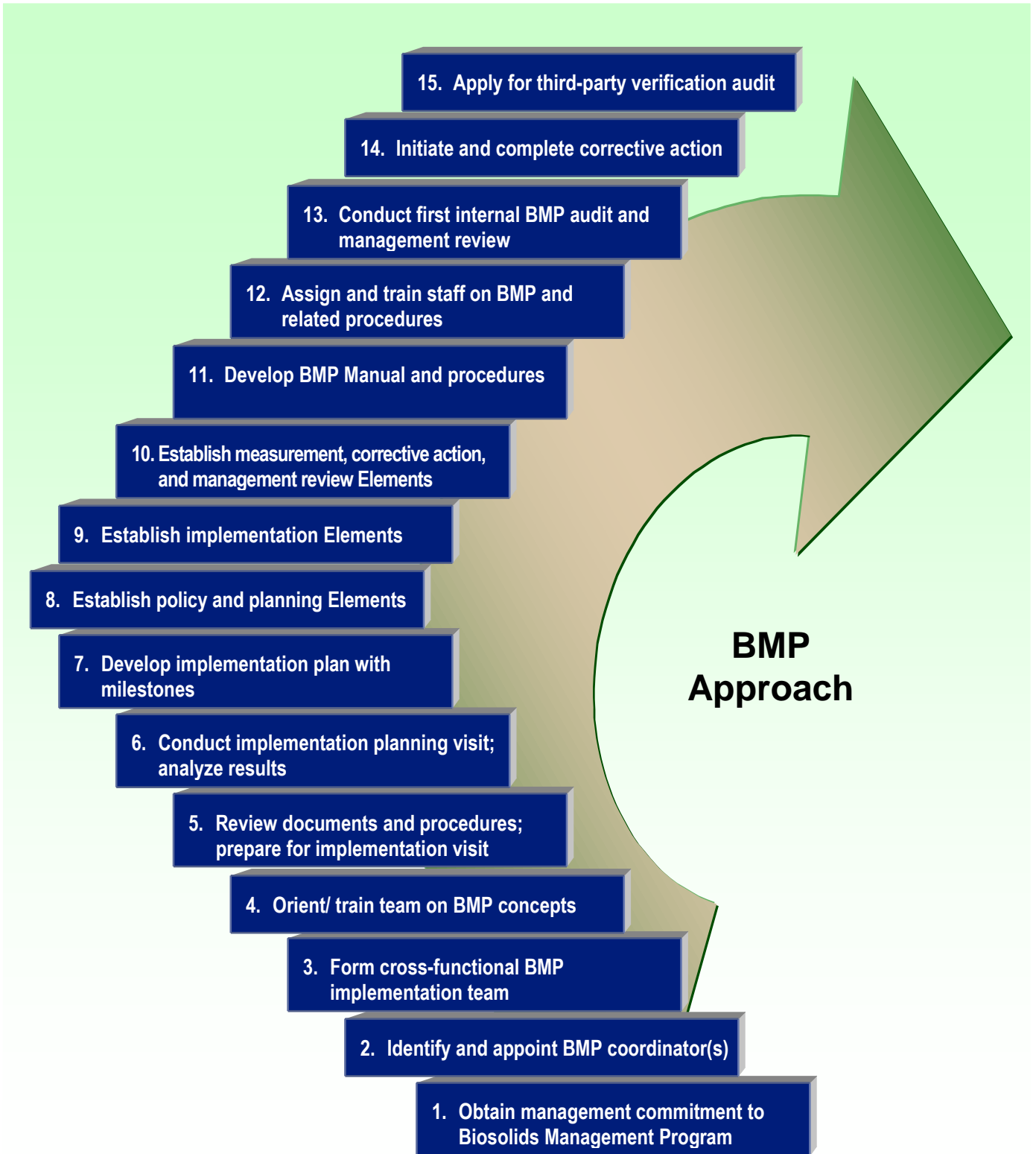
Milestone Approach

Implementing a Biosolids Management Program involves a series of steps that will take you from orientation, through a BMP implementation planning visit, into developing and implementing the BMP, and up to your first audit. Some action items necessarily overlap and the specific sequence of events may vary somewhat across organizations depending upon your familiarity with the BMP process, your internal organizational structure, and your use of outside expertise.

Following are key milestones along your journey:

<p style="text-align: center;">Covered in This Chapter</p> <ol style="list-style-type: none"> 1. Committing to a BMP— senior management and staff 2. Preparing for the BMP implementation planning visit 3. Selecting BMP leader(s) or coordinator(s) 4. Forming a cross-functional work team 5. Orienting to BMP concepts 6. Reviewing existing documents and procedures 7. Conducting the BMP implementation planning visit 	<p style="text-align: center;">Covered in Chapters 6 through 10</p> <ol style="list-style-type: none"> 8. Developing and implementing your BMP 9. Conducting your first internal audit 10. Preparing your first periodic BMP performance report and management review
	<p style="text-align: center;">Covered in Chapter 11</p> <ol style="list-style-type: none"> 10. Preparing for independent BMP verification

This chapter will guide you from your decision to develop a BMP through your BMP implementation planning visit. Chapters 6 through 10 provide guidance, helpful hints, and examples to walk you through developing and documenting the 17 *BMP Elements*. The figure on the following page illustrates the entire process through your first BMP cycle.



1. Obtain management commitment to Biosolids Management Program

First and foremost, your organization's top management must commit to the NBP's *Code of Good Practice* and embrace the BMP as a way to organize and implement a continual improvement program for biosolids operations. Understanding, buy-in, and ownership are critical for those who will develop and implement the BMP.

Maybe the idea to pursue a BMP originated at the top. In this case, management should reach out to key staff and educate them on the benefits of a BMP, before "springing" it on them or handing down a "thou shalt" directive.

Maybe the idea came from mid-level management or operations staff. In this situation, staff can build support among senior management by explaining how a BMP can help link up and strengthen existing practices and procedures and how it can help them be more efficient.

Senior management:

- Define your biosolids management policy
- Clarify roles and responsibilities
- Provide education, training, and resources
- Instill recognition and motivation among employees and stakeholders

Staff:

- Implement the policy on a day-to-day basis
- Understand how their jobs support the BMP
- Identify best practices and opportunities for continuous improvement
- Act as ambassadors throughout the organization and in the community

Helpful Hint

Engaging Senior Management

- ✓ Bring up the BMP at meetings
- ✓ Share NBP brochures
- ✓ Provide contacts at other organizations pursuing a BMP
- ✓ Highlight relevant agenda items at regional meetings and national conferences

Helpful Hint

Involving Staff

- ✓ Discuss BMP concepts at meetings
- ✓ Disseminate information through newsletters and bulletin boards
- ✓ Hold a "brown-bag" lunch
- ✓ Send staff to regional meetings and national conferences where BMP concepts are presented

3. Form cross-functional BMP implementation team

2. Identify and appoint BMP coordinator(s)

It may not matter in what order you take these steps – it really depends on your organizational structure and current roles and responsibilities. Senior management may elect to appoint a BMP coordinator (or BMP leader) and task this person with pulling together a work team from across relevant departments and operations – your cross-functional team for BMP implementation. Alternatively, management could assign staff to the BMP team and let team members select a coordinator or leader.

Whatever order you prefer, at least one person should have the responsibility and authority to organize and lead the team that will develop and play a key role in implementing the BMP. In larger organizations, you might consider having two people serve in co-leader or co-coordinator roles if this will help activities.

The number of people you need for your BMP team will depend on the size of your organization, the treatment and handling processes used, and staffing patterns. The cross-functional team should represent all major operational and decisionmaking areas related to biosolids, including public relations and regulatory areas. Where selected activities are contracted out, contractors should be invited to participate, or the organization will need to find another mechanism to involve them. For example, an organization with 50 people total may end up with five or six staff and one contractor on its BMP team. An organization with 200 people may end up with 12 staff and three contractors in its BMP team.

The lead(s) should ask senior management for and receive a commitment ensuring that their work schedules will be adjusted if necessary to accommodate their new responsibilities. Likewise, staff involved on the team will need to be made available for meetings and other important BMP activities. Where an organization has already been working on management systems improvements, or related initiatives, this commitment should not represent a

Helpful Hint

Key Traits of a BMP Leader


- ✓ Respected by peers and management
- ✓ Knows and has experience in multiple biosolids activities
- ✓ Understands or can master BMP concepts
- ✓ Has good project management and organizational skills
- ✓ Has authority and management experience to direct activities
- ✓ Is (or reports directly to) top management

Helpful Hint

BMP Team Representation

- ✓ Collection and pretreatment system
- ✓ Wastewater treatment
- ✓ Solids generation
- ✓ Solids treatment
- ✓ Solids conditioning and handling
- ✓ Biosolids transportation
- ✓ Biosolids storage
- ✓ Biosolids use or disposal, land application, incineration, land disposal
- ✓ Regulatory, public relations, administrative, safety, and other staff as needed
- ✓ One person can cover more than one area!

significant amount of additional effort. For organizations that are new to BMP and management systems, this may represent a significant commitment of resources.

 **Examples**

BMP Team Representation

Lawrence, KS 9.5 mgd, 15 staff	Appleton, WI 15.5 mgd, 21 staff	Denver Metro 160 mgd, 335 staff
BMP team ~ 5 Facility director Biosolids coordinator Operations supervisor Pretreatment coordinator Application contractor	BMP team ~ 11 Deputy director Biosolids management specialist Building maintenance Finance/budget Technical services WI Department of Natural Resources representative Process specialist Liquid operator Solids operator Safety-training-PR coordinator Application contractor	BMP team ~ 10 Engineering Human resources Laboratory services Operation & maintenance, safety Office of the manager Records management Regulatory and connector relations Resource recovery and reuse

4. Orient and train team on BMP concepts

Depending on the level of familiarity and experience among your personnel with continual improvement management systems in general and the NBP Biosolids Management Program in particular, you may need to spend some time teaching key staff BMP concepts and specifics.

One approach would be to send your BMP team leader(s) to a formal training session, perhaps sponsored by the NBP or an organization accredited to provide services related to the NBP BMP. The leader(s) then would provide training to the team members. This approach typically is referred to as “train the trainer.” Some organizations may decide to consolidate the BMP training and send the entire team to the same orientation session.

You might instead decide to bring in some outside experts with experience in developing and implementing BMP at other organizations.



COFFEE BREAK

You have now read about:

- ✓ The importance of getting your management and staff's commitment to the BMP.
- ✓ How to select a leader or coordinator for the BMP effort and who to pick.
- ✓ How to select a BMP cross-functional team and who should be on it.
- ✓ The importance of investing in BMP orientation and training, whether on a limited basis or in a more involved manner.

Think about what this guidance implies for your organization:

- Is management committed?
- Will the staff buy in?
- Who should lead the team, and who should be on it?
- Do you have the internal resources to develop and implement your BMP with limited assistance?
- Or, have you effectively relied on outside assistance in the past to design new programs?

6. Conduct implementation planning visit; analyze results

5. Review documents and procedures; prepare for implementation visit

At your first or second BMP team meeting, you'll probably be getting ready for your BMP implementation planning visit. As discussed in Chapters 1 and 2, a BMP implementation planning visit generally is one of the first steps in the process to implement a BMP. The BMP implementation planning visit results define an organization's starting point on the path to identifying, consistently implementing, and continually improving best management practices. The BMP visit is the initial step you will use to determine your organization's existing biosolids management activities level of conformance with the *BMP Elements*.

Organizations that choose to develop a BMP without NBP assistance can conduct their own implementation planning assessment using materials available by contacting NBP staff or visiting the NBP website at www.wef.org/biosolids.

Steps to Your BMP Implementation Planning Visit

1 Orient your BMP team

Orientation: Review with your BMP team the *Elements of the NBP Biosolids Management Program* and explain the purpose, benefits, and process. **Assigned reading:** this *NBP Biosolids Management Program Guidance Manual*. Everyone involved in the BMP implementation planning visit should have read through this completely. Browsing the NBP reports on results of other BMP planning visits also may be helpful. **Discussion:** Does everyone understand BMP concepts and the *BMP Elements* and why and how you plan to proceed? Are there any questions?

Helpful Hint

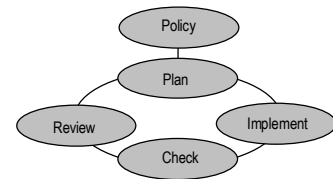
The Deming Quality Management Cycle

The NBP's Biosolids Management Program is based on Deming's quality management cycle:

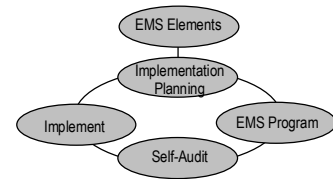
Plan—Do—Check—Act

This cycle is a continual improvement process used successfully by all kinds of organizations to improve environmental management and performance, as well as the quality and customer acceptance of their activities, products, and services. The road to developing and implementing the BMP follows this cycle, as does the BMP itself.

The process:



Your BMP:



2 **Distribute copies of the BMP Implementation Planning Visit Instructions and Questionnaire**

Cross-functional team members should review the questions in this BMP implementation planning visit instructions and questionnaire and be prepared to discuss them prior to the BMP implementation planning visit. These materials will be provided by NBP staff. Organizations choosing to conduct their own implementation planning assessment can use these same materials by contacting NBP staff or visiting the NBP website at www.wef.org/biosolids.

3 **Identify, gather, and review biosolids management and related program documents**

Based on the BMP implementation planning visit checklist, identify and pull together those documents you will need to conduct the BMP visit. Someone on the BMP team should have responsibility for each document or program area and be familiar with the document's purpose, use, contents, and related information sources. Examples include policies, procedures, organization charts, job descriptions for biosolids personnel, checklists, operating logs, annual reports, monitoring records, and other BMP documents/records you have that are related to biosolids management activities. In addition, a written summary of your overall biosolids operations and management activities, and available biosolids-related informational brochures, fact sheets, etc., should be gathered for review.

4 **Prepare for the BMP implementation planning visit interview**

Each staff member should come prepared with a summary of (or be prepared to talk about) his or her specific biosolids management activities and role in your organization's BMP. Also, provide examples of various BMP-related documents and records at the meeting. Participants should be prepared to provide a good summary of roles and responsibilities for the individuals in your organization or in your contractor organizations who are responsible for specific biosolids management activities (e.g., industrial pretreatment, wastewater treatment, biosolids stabilization and



Helpful Hint

Planning Visit Reactions

Participating organizations viewed the BMP planning visit as a very valuable exercise. These assessments accomplished the following:

- ✓ Identified areas where an organization's existing biosolids management practices, programs, and procedures could be improved.
- ✓ Provided a positive forum for identifying organizational, communications, and other BMP Elements that could be implemented more effectively.
- ✓ Raised awareness about biosolids management, especially among the pretreatment and wastewater treatment plant and operations and maintenance staff.

conditioning, biosolids monitoring/measurement, biosolids storage, biosolids transportation, biosolids use/disposal). One way to do this is to annotate an organizational chart template and add in each organizational unit's roles and responsibilities.

5

Finalize the BMP implementation planning visit agenda/itinerary

You will need to arrange for a plant tour, if applicable, assemble your team, and line-up meeting space for the two-day visit. Circulate the proposed agenda to relevant staff ahead of time and confirm availability of implementation team members and top management to attend the meetings indicated in the draft schedule.

6

Participate in the planning visit and review summary documents

Here, your organization actively participates in the planning visit and in finalizing the results.

What To Do with the Results

Activities that follow this BMP implementation planning visit involve the planning and implementation steps in the BMP process. You will proceed through the following steps:

1. Evaluating the BMP implementation planning visit results – *Where are we now?*
2. Developing a strategy and implementation plan to close any gaps and achieve conformance – *Where do we want to go?*
3. Implementing the plan (documentation, training, BMP manual, procedures, etc.) – *How do we get there?*
4. Assessing performance and conformance – *How well are we doing?*

Chapters 6 through 10 provide guidance on how to evaluate your BMP implementation planning visit results and develop your BMP by linking existing areas of your management program and closing any gaps.



Helpful Hint

Importance of Results

The results of the BMP implementation planning visit have the following important purposes:

- Use the BMP implementation planning visit results to develop your BMP implementation plan
- Help you track your BMP development and implementation progress

For many, this will involve consolidating various references and descriptions into a BMP Manual that will help implement and coordinate BMP activities. These chapters offer instruction and examples on how to assemble this document. It is important to note that this manual is not an end-product, but a living, dynamic part of the BMP process that evolves as the BMP progresses.



COFFEE BREAK

After you've completed your BMP implementation planning visit and have evaluated the results, you will embark on the second phase of BMP development, which will involve several important activities:

- Putting together a BMP implementation plan
- Establishing your BMP Elements
- Building your BMP Manual
- Assigning roles and responsibilities
- Providing BMP training where needed

Think for a minute about other initiatives you've participated in that have involved cross-functional teams working to develop new programs or enhance existing ones.

- Were the right people participating?
- Was there good leadership?
- What challenges did you face and what obstacles did you overcome?
- What were some keys to success?
- How would you have done things differently to improve the process and end results?

This next series of steps on the road to your BMP is summarized below. More specific details are provided in Chapters 6 through 10. Keep in mind while you are reading about these steps how you can apply lessons from your other experiences to your BMP.

7. Develop implementation plan with milestones

After you and your BMP team sit down together to review the results of the BMP implementation planning visit, the next step will be to identify action items necessary to close any gaps, strengthen weaker procedures, reinforce good practices, and develop new procedures where necessary – all to establish the BMP Elements.

Working through the five major sets of Elements – policy, planning, implementation, measurement and corrective action, and management review – you will identify what needs to be done, by whom, and by when. Many of the Elements are interdependent, so you will need to coordinate actions across various Elements. For example, goals and objectives will flow from your policy, legal requirements, and other commitments, while performance measurement depends on having goals and objectives in place.





Helpful Hint

Implementation Plan Particulars

Your implementation plan may be prepared best as a spreadsheet to include the following items:

- ✓ A description of your biosolids and market characteristics
- ✓ BMP activities broken down into specific tasks
- ✓ The status of each activity/task by percent completed
- ✓ Notation about the baseline from which you started
- ✓ The required action to be taken to complete the task
- ✓ Who is responsible for getting the task done
- ✓ The target date for completion

 Example Draft BMP Implementation Action Plan (Selected Elements)			
Element 2 — Biosolids Management Policy	Who	Action Plan Deadline	Action/Task Completed
Workgroup will create a biosolids management policy for adoption by top management	BMP Team		
Develop a board resolution for a biosolids management policy	OOM		
Board adoption of NBP <i>Code of Good Practice</i>	OOM		
Maintain documents listed above in accordance with planning cycle	All depts		
Element 3 — Critical Control Points (Planning)	Who	Action Plan Deadline	Action/Task Completed
Complete data management system upgrade	O&M		
Develop evaluation techniques	RR&R	Ongoing	
Maintain documents listed above in accordance with planning cycle	All depts.		

 Example Draft BMP Implementation Action Plan (Selected Elements)			
Element 4 — Legal and Other Requirements (Planning)	Who	Action Plan Deadline	Action/Task Completed
Document procedures used to meet legal & regulatory requirements	RR&R, HR, R&CR		
Identify other requirements to which we subscribe	RR&R, R&CR		
Create tracking sheet	RR&R, R&CR		
Maintain documents listed above in accordance with planning cycle			
Element 5 — Goals and Objectives (Planning)	Who	Action Plan Deadline	Action/Task Completed
Develop goals and objectives	R&CR, RR&R	Ongoing	
Maintain documents listed above in accordance with planning cycle	All depts.		
Element 6 — Public Participation in Planning (Planning)			
Develop community feedback mechanism	R&CR, RR&R	Ongoing	
Maintain documents listed above in accordance with planning cycle	All depts.		
Element 7 — Roles and Responsibilities (Implementation)	Who	Action Plan Deadline	Action/Task Completed
Develop SSO response policy	R&CR		
Annual BMP report (periodic performance report)	RR&R	In progress	
Verify contractor compliance	RR&R, O&M	Annual	
Maintain documents listed above in accordance with planning cycle	All depts.		
Element 8 — Training (Implementation)	Who	Action Plan Deadline	Action/Task Completed
Verify and centralize training documents	HR		
Document Human Resource's annual training plan for operations, emergency response, safety, drug & alcohol, etc.	HR		
Document departmental (R&CR, RR&R, Op) training plans, DOT, regulatory, etc.	HR		
Develop dept.-specific training for spill-response (R&CR, RRR, lab), RR&R biosolids operator training, RR&R safety training	RR&R, R&CR, HR		
Maintain documents listed above in accordance with planning cycle			

8. Establish policy and planning Elements

You can begin the process by creating the framework for a BMP Manual. This document provides the roadmap for your BMP and documents the applicable policies, programs, plans, procedures, and management practices in the BMP. If you build a framework at the beginning for this document, you can revise it and add to it throughout the process.

If you already have a policy committing your organization to quality management or environmental excellence, then you'll probably start there and incorporate the NBP *Code of Good Practices*. Then you can move on to the planning Elements. On the other hand, if you have a general policy or no policy at all, you may want to take a preliminary pass through the planning Elements as a way of getting a better feel for the activities and level of performance your policy will need to push for and support.

Guidance on how to develop the BMP Manual and recommendations for developing your policy are provided in Chapter 6.

To establish planning Elements, you need to do the following:

- Identify your critical control points — places where you can measure or influence biosolids quality, environmental impacts, or other important biosolids attributes and develop a BMP procedure for keeping them up-to-date.
- Document minimum legal and other requirements governing your activities, and establish a procedure for staying up-to-date.
- Develop short and long-term goals and objectives for your program — these may involve both quantitative and qualitative targets and developing a goal-setting procedure.
- Decide how you will involve the public in your BMP planning efforts and develop a public participation plan; this often is coordinated with Element 9, Communication, which includes proactive public education and outreach activities.

Helpful Hint

Develop Elements Sequentially or in Parallel?

You can develop your Elements in sequence or in parallel tracks or by hierarchy. This will depend in part on how much of your BMP already is in place, and the style and preferences of your BMP team.

- Proceed in order:
 - Policy
 - Planning
 - Implementation
 - Measurement and corrective action
 - Management review
- Set up five parallel tracks:
 - A task leader for each one
 - A separate team for each made up of BMP team members
- Select by hierarchy:
 - First, higher level activities from each major BMP Element group
 - Then, more specific and detail-oriented Elements
 - Goals and Objectives might be in the first group
 - Operational Controls might be in the second or third group

Keep in mind that developing your BMP is an iterative process and you probably will end up making several passes through each Element as you develop it and review overall consistency among the Elements.

9. Establish implementation Elements

The implementation Elements are really geared to providing the basis for day-to-day management of your biosolids value chain under your BMP.

To establish your implementation Elements, you need to do the following:

- Lay out roles and responsibilities at the departmental, group, and individual level; include service-level or contract agreements for other city organizations and contractors supporting biosolids management.
- Detail how you will provide training on BMP-specific activities, as well as on core competencies on which a successful BMP depends.
- Define plans, procedures, and protocols for communicating internally and with various external stakeholders about the BMP activities.
- Identify operational controls you will use to manage and track biosolids management activities at critical control points and develop an up-to-date list of related operational controls.
- Plan your responses to abnormal and emergency situations that may affect biosolids quality or general biosolids operations.
- Formulate document control procedures for your BMP documents, defining the format, number system, and document control process and the recordkeeping system.
- Establish an up-to-date list of all control documents.

More specific guidance on each of these Elements, including requirements for conformance with the NBP *BMP Elements*, explanations of their intent and purpose, and recommendations for developing your program Elements is provided in Chapter 8.



Helpful Hint

The Guts of the Matter

In some respects your implementation Elements are the clockworks of your BMP, describing the following:

- ✓ Who is doing what
- ✓ How they are supposed to do it
- ✓ How they will keep track of what they're doing
- ✓ How you and they will communicate with each other and the public about your biosolids program activities

10. Establish measurement, corrective action, and management review Elements

These Elements will provide you with the tools you will need to track your progress toward goals and objectives, gauge your performance against legal and self-imposed requirements, identify needed course corrections, and plan future activities. They represent the “Check” milestone in the “Plan-Do-Check-Act” cycle.

Some “checking” will occur daily – even hourly for some key measures. Broader reviews will occur monthly, quarterly, or annually. You will establish a frequency for checking that matches up with the nature of the activity.

To establish your measurement and corrective action Elements, you need to do the following:

- Detail existing monitoring and measurement procedures and refine them or add new ones as needed for the BMP (an option is to make monitoring and measurement part of the operational control SOPs).
- Outline and amend as necessary existing procedures for investigating nonconformances – with regulations, self-imposed targets, and BMP Elements.
- Establish and implement preventive and corrective action plans when needed.
- Commit to a process and format to produce a periodic biosolids program performance report that will cover your BMP – for public distribution.
- Develop an internal audit program that periodically evaluates your conformance with various Elements of your BMP.

Chapter 9 provides guidance on establishing these Elements.

To establish your management review Element, you need to do the following:

- Develop and implement a process to conduct a management review of your BMP, including a review of



Helpful Hint

Check the Timing

- ✓ If you check something too often, you will not see important changes that play out more slowly
- ✓ If you check too infrequently, you will miss opportunities to correct problems at early stages

your performance relative to your policy commitments, goals and objectives, and performance measures

One of the most important characteristics of your management review is its integration and links with other BMP Elements. The management review Element is described in more detail in Chapter 10.

11. Develop BMP Manual and procedures

In conjunction with the BMP Manual, Element 1, you should assemble key documents and references to documents and procedures. The BMP Manual serves several purposes:

- It will keep major pieces of your BMP in one place for easy reference by your BMP coordinator and other staff with roles and responsibilities in the BMP.
- It will define your documentation and document control system.
- It can help orient new staff to your BMP.
- It can provide a roadmap for internal and external auditors to familiarize them with your program and direct them to key documents and procedures.

This does not need to be a huge manual. In fact, many of the most detailed components of your BMP, such as monitoring procedures and protocols, operational controls, standard operating procedures, and technical specifications generally already will be documented and available in existing manuals and documents. The purpose of the BMP Manual is to provide an organizing structure and cross-references to those key documents that support your BMP Elements.

Recommendations and suggestions about how to create your BMP Manual are provided in Chapter 8.



Helpful Hint

It's Alive!

As scientists know, to grow or improve is to change. The same is true of a biosolids program. A BMP Manual reflects this cycle of growth and improvement. It should be:

- ✓ Dynamic – changing as your program changes
- ✓ Flexible – easy to update
- ✓ Useful – your staff, stakeholders, and auditors will refer to it as a practical tool
- ✓ Inclusive – but not cumbersome
- ✓ Pertinent – to *your* biosolids program

Remember: you are engaged in a continual improvement process.

12. Assign and train staff on BMP roles & procedures

Once you've got your BMP pretty much in place, you should evaluate how well your BMP team and other staff with BMP-related responsibilities understand their roles, new procedures, and how the overall program fits together.

Certainly, those involved in developing the BMP should know most of this to begin implementing the program and making any adjustments to current practices. Others who were less active or not involved may need a training session or two, some assigned reading, or some mentor-assisted instruction on various aspects of their responsibilities and important procedures.

This training should be integrated with your overall training program, and with any specialized training implemented under Element 8, Training. As with other training, you can select the venue and delivery mechanism (workshop, workbook, web-based, etc.) that makes the most sense for the material and the "student."

More guidance on training is provided in Chapter 8.

**▶▶ FAST-FORWARD THROUGH
YOUR 3 TO 6 MONTHS OF BMP
IMPLEMENTATION ▶▶**

13. Conduct first internal BMP audit and management review

After you've been implementing your BMP for several months you are probably ready to audit your program following the internal audit protocol you established under Element 16. Guidance regarding these approaches is provided in Chapter 9.

Some time after your internal audit – or maybe in conjunction with it, you will proceed through your first management review of the BMP. Again, you will follow the procedures established for your internal BMP audit (Element 16) and for management review of performance (Element 17). The purpose of the management review is to assess your progress toward goals and objectives, performance on quality and other measures, and overall conformance with your BMP. Additionally, the management review will be an opportunity to establish new goals and objectives and performance targets in keeping with your commitment to continual improvement and excellence.

14. Initiate and complete corrective action

Based on the results of your internal BMP audit and management review, you may have to develop a corrective action plan following the procedures you established for your monitoring and measurement (Element 13) and for nonconformances: preventive and corrective action (Element 14), and for related Elements. This will be an opportunity to identify any remaining shortcomings and enhance your practices and procedures to close those gaps and bring your program into full conformance with the BMP Elements.

15. Apply for third-party verification audit

Once you've implemented any corrective actions necessary to achieve conformance and your BMP has been operating for several months, you are ready to apply for a third-party verification audit, should your organization choose to pursue NBP Gold-level Recognition or Platinum-level Certification. The benefit of having a third-party audit your BMP is to provide



Helpful Hint

Credibility Quotient

Audits and the reviews that go with them provide assurance that the BMP is a vigorous system consistent with NBP requirements. The benefits of BMP verification are many:

- ✓ Customers and stakeholders know the BMP will be under independent scrutiny
- ✓ The BMP is viewed as credible
- ✓ The BMP represents meaningful commitment to and improvement of biosolids management
- ✓ The audit process itself helps an organization identify BMP weaknesses and strengths
- ✓ It assures the organization that others in the program are held to the same expectations
- ✓ Public trust and confidence in biosolids management can go up, which leads to acceptance of the product itself

an independent assessment of your conformance with the *BMP Elements*. The independent auditors approved by the NBP will have the necessary experience with implementing or auditing BMP and familiarity with wastewater treatment and biosolids management operations.



PIZZA BREAK!



You have just been through a whirlwind preview of the BMP journey on which you have just embarked. This chapter has presented the steps you will go through to develop and begin implementing your BMP. Chapters 1, 2, 3, and 4 introduced you to the National Biosolids Partnership's BMP, plan-do-check-act concepts, the benefits of a BMP, and the BMP Elements.

Take a moment to reflect you what you've learned.

- How does the BMP presented here fit with your current programs?
- How close are you to conforming already?
- Do you have a lot of work to do, or do you think it's merely a matter of linking and integrating various activities?

Chapters 6 through 10 will guide you through your post-BMP implementation planning phase. For each of the five major Element groups — policy, planning, implementation, measurement and corrective action, and management review — these chapters will:

- Provide more specific information about requirements for conformance
- Explain what each Element is really about
- Help you establish your BMP Elements through guidance, suggestions, and examples

Chapter 6

BMP Manual and Biosolids Management Policy

Element



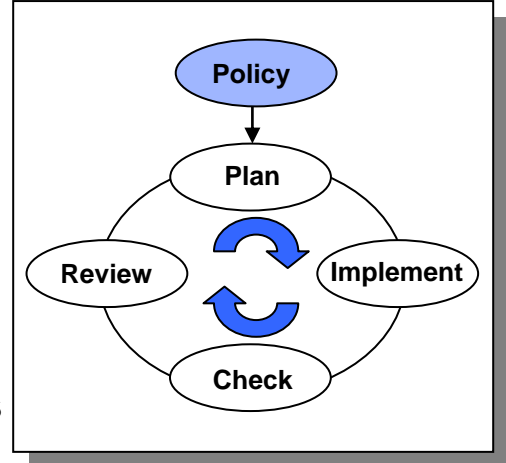
Biosolids Management Program Manual

The *BMP Elements* describe an organization’s requirements for establishing and maintaining a comprehensive Biosolids Management Program (BMP) that covers its biosolids management activities at all critical control points throughout the biosolids value chain.



Minimum Conformance Requirements

- 1.1 Document the Biosolids Management Program in a BMP Manual or equivalent set of program documents that describe, at least at a general level, the applicable policies, programs, plans, procedures, and management practices in the BMP.
- 1.2 Approve the BMP Manual by a level of the organization’s management with the authority to commit people and resources to biosolids management activities.
- 1.3 Contain, in the BMP Manual, the organization’s biosolids management policy and procedures required by the *BMP Elements*.
- 1.4 Contain or cross-reference, in the BMP Manual, public participation, communication, and emergency preparedness and response programs and plans required by the *BMP Elements*.
- 1.5 Cover, in the BMP Manual, all applicable, relevant, and selected critical control points for biosolids management activities throughout the biosolids value chain.
- 1.6 In the BMP Manual, include or cross-reference all operational controls, procedures, processes, and other management methods used to achieve and maintain compliance with legal and other requirements.
- 1.7 In the BMP Manual, describe those biosolids management activities assigned to and performed by contractors.



Practical Handbook

Your BMP Manual is a cookbook of sorts — it describes how the BMP is set up and where you can find everything you need to manage your biosolids and implement your BMP.

If you are the BMP Manager or Coordinator, it might be the kind of notebook you’d share with other staff, management, and outside parties to introduce them to your BMP.



Interpretation

The BMP Manual should be a short summary of your BMP, roughly 25 pages long. The manual should cross-reference other support documents with the intent that the BMP Manual does not have to be updated anytime there is a change in support documents (e.g., new dates). While the *BMP Elements* state that various documents should be “contained or cross-referenced” in the BMP Manual, practical experience has shown that cross-referencing keeps the Manual shorter and easier to keep up to date.

Contact NBP staff for examples of BMP Manuals prepared by other participating organizations.

The BMP Manual provides a framework describing how the various elements of your BMP (e.g., policies, plans, goals and objectives) are organized and how they fit together. Doing this will help you implement the BMP Elements as an integrated system, manage short-term and longer-term activities, and track performance. It also provides a platform for continual improvement.

This Element is especially important if you or some of your colleagues have not traditionally viewed the various activities in the biosolids value chain as being interrelated – as the NBP BMP views them. By definition, a good BMP cuts across and integrates your pretreatment, wastewater treatment, and biosolids activities. The exercise you will go through to develop your BMP Manual educates your staff and reinforces these links among different operations. Having the BMP Manual as an implementation guide and reference helps key people and supporting staff manage your program effectively.

The BMP Manual provides a general overview of your BMP and outlines your organization’s broad policies, governing BMP procedures for biosolids management. It also should serve as a useful organizational index, cross-referencing procedures and other relevant documents. Your BMP Manual may be a single notebook referencing a collection of documents that are readily accessible, are easy to reference, and are kept up to date.



Helpful Hint

- ✓ Keep the program(s) simple and focus on continual improvement of the program over time
- ✓ Clearly communicate the expectations and responsibilities laid out in the program to those who need to know
- ✓ Integrate your biosolids programs into the existing business planning and approval process
- ✓ Ensure grassroots employee involvement from the outset
- ✓ Establish clear lines of communication among the different functional areas of your organization

The BMP Manual also should define your document control procedures and system as required by Element 12, Documentation, Document Control, and Recordkeeping. It should include or reference a complete, up-to-date list of all current BMP documents under document control. It also should summarize the recordkeeping system for all records required under the BMP.



Guidance

Getting Started

Build on the plans and programs you have now for environmental compliance, health and safety, and/or quality management purposes.

Involve your employees early in establishing and carrying out the program.

Your BMP Manual *need not be a compilation of all the BMP documents*. The BMP Manual is a “road map” linking the biosolids management policy with key BMP procedures, plans, and other key documents defining the BMP. The BMP Manual defines how all 17 BMP Elements link together. The BMP Manual will cross-reference important policies and procedures that support the BMP Elements.

The BMP Manual describes the structure of the BMP and cross-references more dynamic BMP documents describing monitoring requirements and operating procedures. While it will not change as often as other documents, such as SOPs or records, it should be flexible enough to accommodate changes to your BMP, and should be easy to update as needed.

The following example summarizes an organizational approach for the BMP Manual. It provides an annotated table of contents.



Example

Annotated BMP Manual Table of Contents

Cover Page and Table of Contents

Chapter 1.... BMP Manual

- Overview/summary BMP, including long-term vision, mission, and goals (suggested)

Chapter 2.... Biosolids Management Policy

- Biosolids management policy and Code of Good Practice commitment

Chapter 3.... BMP – Planning

- Procedure for identifying and updating critical control points. Cross-reference to matrix with identified critical control points (CCPs) with linkages to environmental impacts and operational controls
- Procedure for tracking legal and other requirements with cross-references to legal, permit, regulatory records
- Procedure for establishing goals and objectives, including input from interested parties, and cross-references to current goals and objectives
- Public participation plan and procedures summary providing for meaningful input by interested parties into biosolids long-term planning

Chapter 4.... BMP – Implementation

- Summary description of BMP implementation Elements with cross-references to plans and SOPs
- Roles and responsibilities for biosolids management with organizational matrix, job descriptions (biosolids duties)
- Training program summary and cross-references to training records
- Communication/public education program summary with cross-references to program records
- Cross references to operational controls, individual SOPs and other management controls for all CCPs; cross-references to monitoring and measurement, testing, and inspection procedures in SOPs/operational controls
- BMP documentation summary and document control and recordkeeping system description and procedure
- Cross-reference to emergency preparedness and response plans and procedures

Chapter 5.... BMP – Measurement and Corrective Action

- Cross references to monitoring and measurement procedures and testing / monitoring records
- Corrective and preventive action procedures and cross-references to corrective and preventive action plans
- Process for development of periodic BMP performance report (Note: Element 15 does not specifically require a procedure for preparing the written program performance report, merely that the report be prepared, contains certain information, and is made available to the public.) Cross-reference to location of BMP performance report.
- Procedure for internal BMP audit and cross-references to records

Chapter 6.... BMP Program – Management Review

- Periodic management review records of performance

Appendix A BMP Elements

Appendix B Matrix of Critical Control Points, Operational Controls, Roles, and Monitoring

Appendix C National Code of Good Practice References

Appendix D BMP Controlled Documents List

Appendix X..... Other required BMP Documents if not incorporated in main chapters of BMP Manual



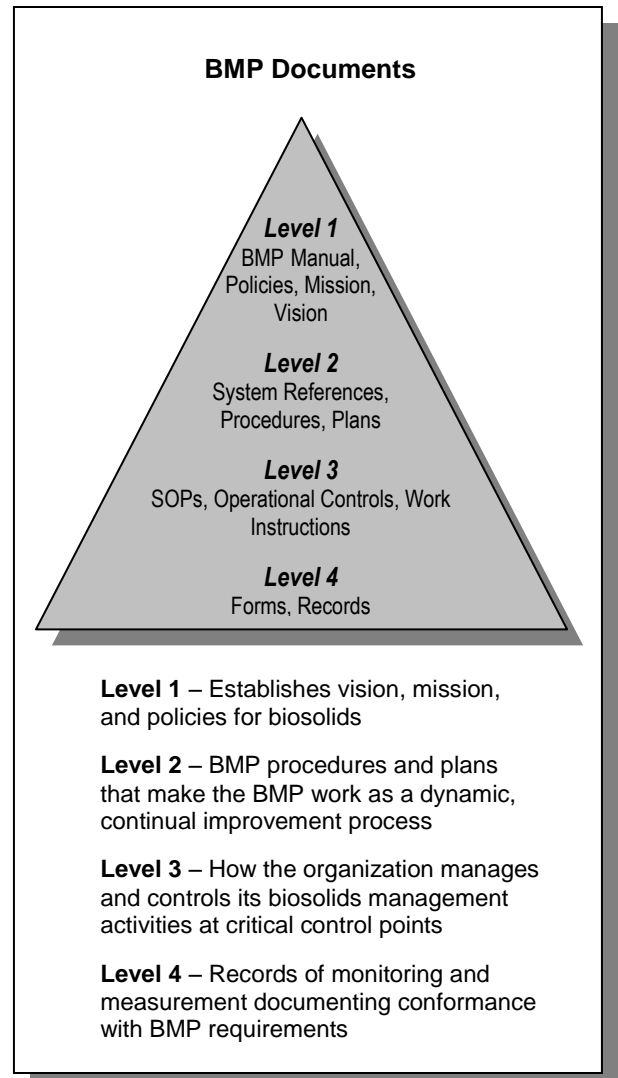
NBP Auditor Considerations

To verify that your BMP meets the requirements of all 17 *BMP Elements*, the auditor will use three different modes for collecting objective evidence. These three modes are described further in Chapter 11 of this guidance manual.

1. Document review - This could include examining your BMP Manual, procedures, documents and records.
2. Interviews - These could be conducted with staff, management, and contractors responsible for biosolids management activities.
3. Direct observation - This could involve looking at physical locations at the wastewater treatment plant(s) or biosolids disposal or land application site(s) and at other activities related to biosolids management.

The auditor will examine your BMP Manual to verify that it includes a copy of or reference to (with location) the following:

- ✓ BMP summary
- ✓ Biosolids policy with commitment to the principles of the NBP *Code of Good Practice*
- ✓ Identified critical control points and records linking actual or potential environmental impacts and operational controls for each critical control point
- ✓ BMP procedures, plans, approaches and programs (Level 2)
 - Procedures for tracking legal and other requirements
 - Public participation approach
 - Training program
 - External communication procedures
 - Emergency preparedness and response plans and procedures
 - Document control procedures



- Monitoring and measurement procedures with cross-references to testing and monitoring records
- Corrective and preventive action procedures
- BMP internal auditing procedures and summaries/records
- ✓ Controlled document list - Level 3 SOPS and operational controls, and Level 4 records
- ✓ Description of biosolids management activities assigned to and performed by contractors

The auditor also will look for signed approval of the BMP Manual contained in a letter or other form of documentation, such as management meeting minutes that would indicate that those with authority to commit people and resources to biosolids management activities have approved the BMP Manual.



Nonconformance Example

The auditor may consider the following to be an example of a nonconformance with this BMP Element. For more information on nonconformances and how they are evaluated by third party auditors, see Chapter 11 of this guidance manual.

- An organization's BMP Manual does not contain or cross-reference all operational controls, procedures, processes, or other management methods used to achieve and maintain compliance with legal and other requirements (Requirement 1.6 states that "all" should be included or cross-referenced).

The severity of this nonconformance will vary depending on the number and importance of those operational controls, procedures, processes, and other management methods that are not included or cross-referenced in the BMP Manual.

The absence of or lack of cross reference to certain SOPs (such as procedures for tracking digester temperature and retention time) may be more important than the absence others (such as procedures for hand-washing), depending on how fundamental they are to achieving and maintaining regulatory compliance or other outcomes. Therefore, the auditor

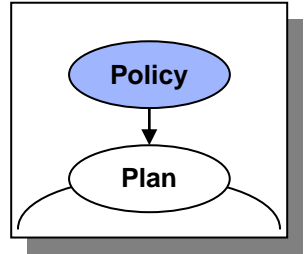
will examine the details of the situation to determine if the nonconformance rises to the level of major or minor. (See Chapter 11 for more information on major and minor nonconformances and how they must be addressed.)

Element



Biosolids Management Policy

An organization’s biosolids management policy establishes the guiding principles for the organization’s biosolids management and operations. The goals and objectives, procedures and work practices, monitoring and measurement, internal auditing, and performance reporting all should align to support the organization’s efforts to meet the commitments and apply the principles established in its policy.



Minimum Conformance Requirements

- 2.1 Establish a biosolids management policy that commits the organization to following the principles of conduct set forth in the NBP *Code of Good Practice* and may include other biosolids commitments the organization voluntarily chooses to adopt.
- 2.2 Communicate the policy to employees, contractors, and all interested parties.
- 2.3 Incorporate the policy into the organization’s biosolids programs, procedures, and practices.



Interpretation

Your organization’s biosolids management policy establishes the guiding principles of your BMP. It sets your BMP in motion and provides the benchmark against which all goals and objectives are defined and measured. To conform to this Element, you must explicitly or by reference incorporate the 10 principles of the NBP *Code of Good Practice* into the policy that governs your BMP (see Chapter 1 for the full text of the NBP *Code of Good Practice*, summarized below).

The policy is very important. Conformance with many other Elements will depend on having a strong policy in place and meaningfully implemented. Key Elements that depend on your policy include:

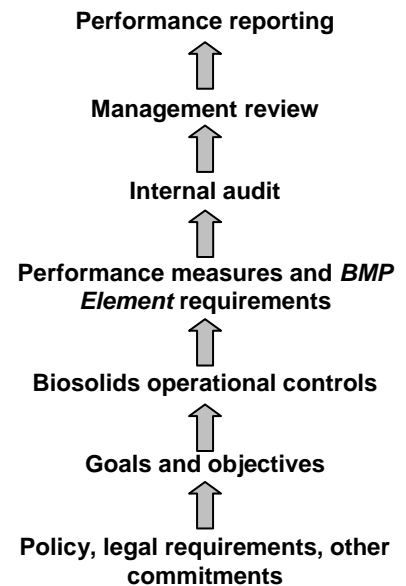
- Element 3, Critical Control Points
- Element 5, Goals and Objectives



Helpful Hint

Drivers

How the policy supports and drives other BMP Elements:



- Element 10, Operational Control of Critical Control Points
- Element 13, Monitoring and Measurement
- Element 16, Internal BMP Audit
- Element 17, Management Review

You may simply adopt the Code as your policy. Or, you can integrate the Code into an existing policy with authority over biosolids management activity. This may be accomplished by inclusion, or by reference. The strongest, clearest policy statement will include the Code. Inclusion by reference only, where the language of the Code is less visible, generally will be considered a weaker policy statement without supplementary statements regarding environmental quality and management commitments.

Chapter 1 of this guide contains the full text of the NBP *Code of Good Practice*. Here is a recap of its 10 principles of good conduct:

1. Commit to complying with all applicable federal, state, and local requirements
2. Provide biosolids that meet applicable standards
3. Develop a BMP that includes third-party verification
4. Monitor the quality of biosolids production and management
5. Practice good housekeeping
6. Develop contingency and emergency response plans
7. Commit to sustainable, environmentally acceptable biosolids management practices and operations
8. Prepare and implement a plan for preventive maintenance
9. Seek continual improvement in all aspects of biosolids management
10. Provide methods of effective communication with stakeholders



Example

A Preliminary Biosolids Management Policy

Our organization has adopted the NBP's *Code of Good Practice* as its biosolids policy statement.

We are committed to continual improvement of our biosolids program. As biosolids management practices and the industry evolve, we strive to incorporate technology advancements and best management practices into our operations and to developing a diverse, flexible program capable of meeting the dynamic needs of the communities we serve.



Guidance

Beginning with any policies already covering your organization's operations, and with the Code in hand, review your existing policies to determine the extent to which they already embody the principles of good practice. Are there any gaps in coverage, either substantively or with respect to the strength with which the policy commits your organization to general or specific actions, goals, or performance?

If you believe the current policy(ies) governing your biosolids operations are not strong or specific enough, you will need to amend applicable policies. A policy may have already been adopted in a previous decision, such as the adoption of a long range plan or facilities plan. This may involve changing the language in current policy documents. Or you may choose to establish a new policy that incorporates the Code to provide the basis for your BMP.

You should follow your existing procedures for developing, vetting, and adopting policies. Because the biosolids policy will cover a wide range of activities that may not have been thought of as all part of one program, you might need to involve a broader range of people in developing and adopting it. Think about who has responsibility for establishing policy for your organization. In local government, often the City Council or County Board sets policy.

The most important thing is to adopt and promulgate the policy in a way that means something to the organization's governing body, management, and staff. As you will see when you begin to read about other Elements and develop them for your BMP, it will not be enough to adopt a policy and pin it up on the wall. You will need to establish the policy firmly as the underpinning for your BMP and follow its prescriptions in your day-to-day activities.

Checklist for Element 2

- Do you have a policy covering biosolids activities?
- Does your policy commit you to the Code?
- Does your policy cover all departments, operations, etc. that it should?
- Who is or will be involved in implementing the policy?
- Who was or will be involved in developing the policy?
- Who needs to sign off on the policy?
- What is the process for formal adoption?
- At what level of the organization should or will the policy be adopted?
- How will the policy be communicated and implemented?



NBP Auditor Considerations

The biosolids policy establishes the principles by which your organization is committing to operate its BMP. The auditor will look for objective evidence that these principles and the requirements set forth in this Element are incorporated fully into the BMP and are adhered to fully in all day-to-day biosolids management activities.

Because the biosolids management policy statement establishes a commitment by your organization to the principles of conduct set forth in the *Code of Good Practice* – the core commitments for participating in the NBP Biosolids Management Program – auditors must be able to clearly identify objective evidence that the policy statement belongs to your organization and has been adopted by a level of the organization able to make such a commitment. You can demonstrate objective evidence that the policy statement commits the organization through a variety of methods including: a signature on the policy of the appropriate level, such as the chairman of the board, commission or council with the board, commission or council's name; printing the policy on organizational letterhead; and/or a reference to the name of the organization in the text of the policy statement.

The auditor will look for the following types of objective evidence regarding the biosolids policy:

- ✓ That the biosolids management policy was approved and adopted as an official policy of the organization by the appropriate governing body for your organization.
- ✓ That the policy explicitly references or contains a commitment to the 10 principles in the NBP *Code of Good Practice*.
- ✓ That the policy has been communicated to all employees, contractors, and interested parties; this communication could be demonstrated in any number of ways, such as the following:
 - The policy is attached to new contracts signed with contractors and service providers;

- The policy is posted for or distributed to employees (e.g., on bulletin boards or in employees updates);
 - Announcement or article are in the organization’s newsletter that includes or mentions the biosolids management policy;
 - Brochures contain the policy in locations where interested parties are likely to find them (e.g., local government information centers, the organization’s main offices, the local chamber of commerce); and/or
 - The policy is on the organization’s website.
- ✓ That there is documentation of employee training, staff meetings, or alternative forums in which the policy is presented to and discussed with employees.
 - ✓ That the BMP Manual and other documentation verifies that the policy is incorporated in all the BMP Elements and documents and is periodically evaluated and revised, based on revisions to the Code, changing circumstances, the evolution of technology, and best management practices.
 - ✓ Through interviews, that employees and contractors involved in biosolids-related operations can verify the policy has been communicated and is understood, and followed by, all employees and contractors in their day-to-day biosolids management activities (note that the policy need not be memorized word-for-word; it is just important that the main message gets across).



Nonconformance Example

The auditor may consider the following to be an example of a nonconformance with this BMP Element.

- Some employees or contractors associated with the organization’s biosolids-related operations, processes, and activities are not aware of the organization’s biosolids management policy or the principles or commitments identified in the policy, despite the organization’s efforts to communicate

the policy. This might indicate that the organization's policy communication efforts are not effective.



COFFEE BREAK

You have just reviewed the requirements for your BMP Manual, and you should have developed a biosolids management policy.

Regarding your manual, while this is the first Element, it is not the first thing you “write.” In fact, you will be developing the actual manual as you move through all the BMP implementation steps. And the manual will continue to be revised as you fine-tune your BMP.

As for the policy, this should be your guiding principle for all you do with your BMP. Think about where your policy fits in with your vision and mission:

- Vision — What do we want to be able to say about ourselves in, say, five or ten years?
- Mission — What is our modus operandi? What motivates us to reach our vision?
- Policy — What are the principles, our guidelines, that will govern our behavior in accomplishing our mission and reaching our vision?

Next you will delve into the planning process for this BMP. Elements 3 through 6 will set your BMP up for success.

Chapter 7

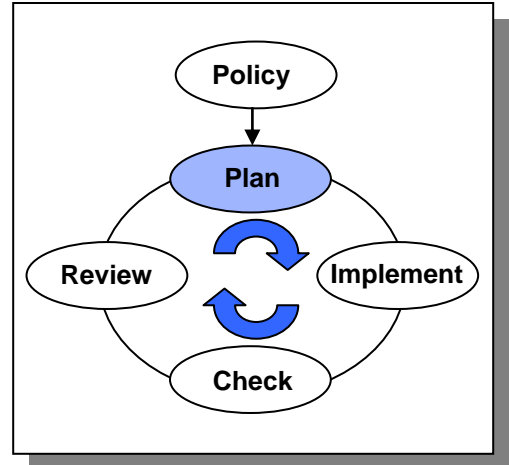
Planning

Element



Critical Control Points

Identifying critical control points along an organization's biosolids value chain is fundamental to effectively operating a BMP. By identifying critical control points and associated environmental, quality, and other impacts, an organization can plan and implement proactive steps – operational controls – to ensure that biosolids material characteristics are consistent with intended or actual final use or disposal and to manage or change the impacts associated with these locations or activities.



Minimum Conformance Requirements

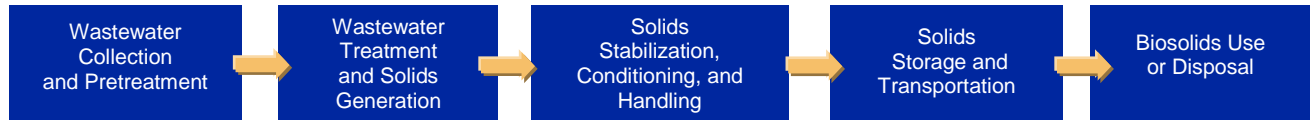
- 3.1 Identify and document the critical control points of the organization's biosolids management activities throughout the biosolids value chain, consistent with those identified in the *National Manual of Good Practice* and other authoritative sources on biosolids management.
- 3.2 Identify potential or actual environmental impacts at each critical control point.
- 3.3 Keep information on the organization's critical control points up to date.
- 3.4 Maintain records that link each critical control point and its potential environmental impacts with the corresponding operational control(s).
- 3.5 For organizations that have successfully completed a third-party verification audit and are pursuing NBP Platinum-level Certification, provide notification to the third-party verification auditor after any operational change that requires a change to the identified critical control points or to environmental impacts associated with the critical control points.



Interpretation

This BMP Element requires that you identify *critical control points* throughout your biosolids value chain, as applicable to your organization’s specific biosolids management activities. Element 3 also requires that you identify potential or actual environmental impacts at each critical control point. The list of critical control points also must be kept up to date. The easiest way to do this is with a procedure for identifying and updating critical control points.

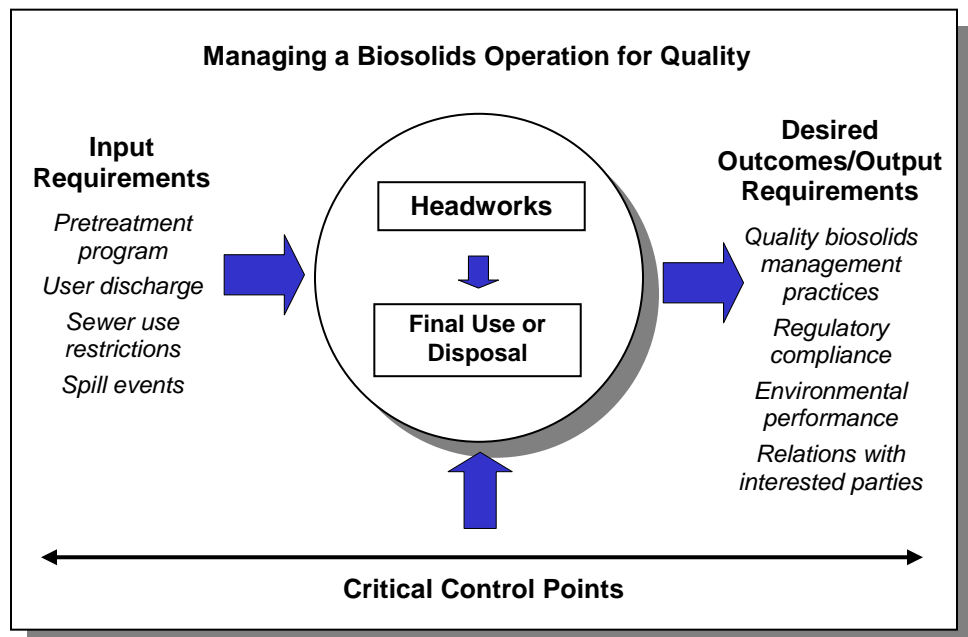
The Biosolids Value Chain



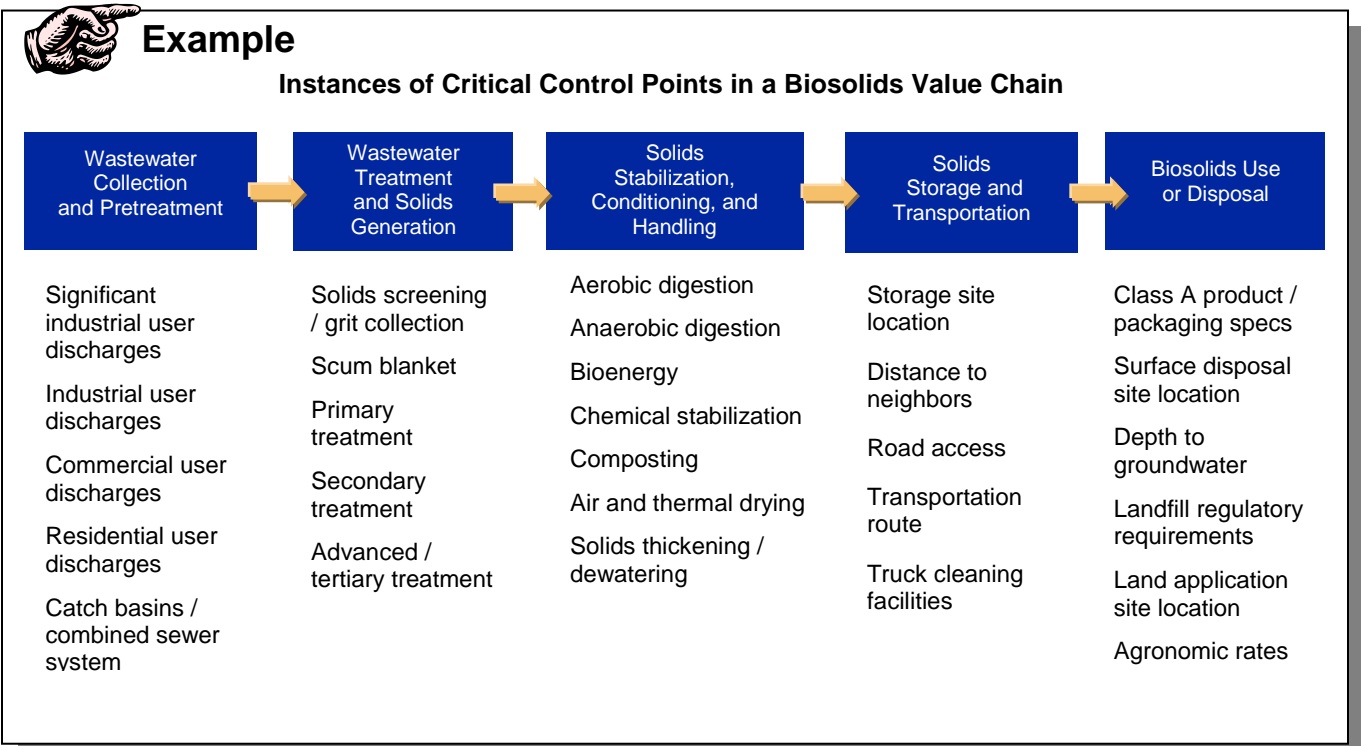
The foundation of a successful biosolids management program is accurate assessment and identification of your critical control points.

Critical control points are locations, unit processes, events, and activities throughout the biosolids value chain, from pretreatment through final use or disposal of biosolids. Effective management of critical control points – through policies, procedures, programs, practices, monitoring and measurement - assures that biosolids activities meet legal, quality, and public acceptance requirements and do not have undesirable environmental impacts.

The key is to define the quality of the biosolids product that must be produced consistently within the treatment process to assure the product meets the quality requirements for end use or disposal.



The following figure illustrates examples (not a comprehensive list) of critical control points across the biosolids value chain. Further information on critical control points and associated operational controls can be found in the *National Manual of Good Practice for biosolids*.



Quality management at each critical control point is necessary to ensure consistent, high-quality, uniform biosolids material. This is accomplished with *operational controls*. For example, odor associated with biosolids is directly related to the time of anaerobic digestion. The EPA regulatory minimum to protect public health and the environment is 15 days of retention. Many organizations manage digestion time to the maximum. There is typically less odor with the product at 20 days versus the minimum of 15 days. If the biosolids is trucked to a compost or drying facility through sensitive neighborhoods, there is a higher risk of odor from the trucks. If the compost facility is located in a sensitive area, odor could be a problem during the operations. The same odor issue could be near land application sites. Consequently, the key way to manage odor in the treatment plant process would be detention time in anaerobic digesters. Anaerobic

Helpful Hint

**What’s a critical control point?
What are operational controls?**

Critical control points are locations, events, activities, and other requirements (e.g., regulatory) from wastewater collection and pretreatment to final biosolids beneficial use or disposal that require systematic management to ensure biosolids consistently meet legal, quality, and public acceptance requirements and do not have undesirable environmental impacts.

Operational controls are the systematic procedures, work practices, monitoring and inspections, and other management methods to ensure that biosolids meet those requirements 100 percent of the time.

digesters would become a critical control point that is essential for the organization to manage.

All critical control points need operational controls and related management methods to ensure the processes or activities at each are consistently meeting applicable legal, quality, environmental, and public acceptance requirements for biosolids and do not create undesirable environmental impacts. Each critical control point has one or more associated operational controls.

Operational controls include standard operating procedures, work practices, process controls, and monitoring and other management methods such as ordinances, permits, periodic reports, and inspections.

Operational controls are developed, implemented, and maintained by an organization at all critical control points to ensure the following:

- Effective quality management of biosolids activities;
- Conforming with biosolids management policy, legal, and other requirements;
- Achieving biosolids program goals and objectives and public acceptance criteria; and
- Preventing undesirable environmental impacts.

This also applies to contractors retained to conduct various biosolids management activities.



COFFEE BREAK!

At this point, you should understand the basic concept of a *critical control point*. Critical control points are locations, unit processes, events, and activities under your organization's control that need to be managed to meet legal, quality, environmental, and public acceptance requirements for biosolids. All critical control points need to be managed systematically and effectively to ensure these requirements are consistently met.

The biosolids value chain concept also is important. Critical control points begin with the wastewater collection and pretreatment system. The critical control points and BMP must cover the entire biosolids value chain, not just the back-end biosolids management activities

The frontend activities can have significant impacts on the quality of the biosolids.

Think about what this guidance implies for your organization.

- Have you defined the quality of the biosolids product that must be consistently produced to meet intended markets?
- Do you believe you have a good idea of the critical control points throughout the biosolids value chain that relate to producing this desired quality?
- Does your current biosolids management program include all these critical control points?
- What individuals in the BMP team and elsewhere in the organization will need to be involved in developing a complete list of critical control points?
- What parts of your biosolids program are managed by contractors?
- Do you need to involve the contractors in identifying critical control points?

Take a break, and then get ready to read about the steps for developing your list of critical control points.



Guidance

Identifying critical control points is one of the initial steps in implementing a BMP. It occurs as part of Step 8 in the BMP implementation process (see Chapter 5) and should be one of the early tasks as part of the planning activity.

Identifying critical control points will require the involvement of all departments and functions involved in biosolids management. Think broadly so you are sure to involve all the organizational groups, including contractors.

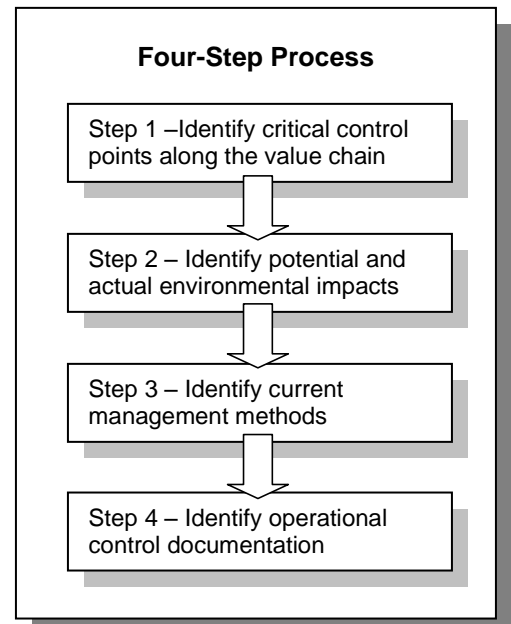
You are encouraged to follow the four-step process illustrated to the right and described below, or a similar approach that you may devise.

Step 1 — Identify Your Critical Control Points Along the Biosolids Value Chain

For each step in the biosolids value chain, you will need to identify a list of all the locations, unit processes, events, and activities – the critical control points – that require systematic management to ensure that biosolids material characteristics (quality) are consistent with intended or actual final use or disposal and to manage or change the environmental impacts associated with these locations or activities.

One approach to identifying critical control points is to conduct a structured brainstorming session with a team that is representative of all business departments, functions, and contractors involved in the biosolids management program. Start by identifying the intended or actual final use or disposal methods and the quality of the biosolids that must be consistently produced and then work back up the biosolids value chain to identify all locations, unit processes, regulatory requirements, events, and activities that require effective management to meet those end uses.

Table 7-1 at the end of this Element is a planning template that can be used to aid this brainstorming process. As you think about the critical control points, also begin to think about who is involved, i.e. the person(s) or group(s) primarily responsible for biosolids management activities for this critical control



Helpful Hint

How do you identify critical control points?


- ✓ Identifying critical control points is an important early step in developing a BMP. Many other BMP Elements will be linked directly with critical control points.
- ✓ Assemble a work group from all the departments, business functions, and contractors involved in your biosolids management program.
- ✓ Start by developing a preliminary list of the critical control points using Table 7-1, the template at the end of this Element.

point. Remember that the list of critical control points should be limited to those that your organization can directly control or influence.

Plant schematics and process flow maps can also be used to help identify critical control points. In a process flow map, an organization uses simple diagrams or icons to show the sequence of processes and operations along the biosolids value chain. These process flow maps or diagrams provide an illustration of your operations that can help you identify all applicable locations, events, activities, and unit processes along the biosolids value chain.

Before proceeding with the next step, you will want to consider whether you have missed any key critical control points. For example, if you land-apply biosolids outside your organization’s local governmental jurisdiction, are there public acceptance drivers for critical control points, such as a commitment to a community to provide greater setbacks from property lines than what you would plan for in your city or county?

The following are examples of critical control points and operational controls for land application. A more comprehensive list of critical control points is provided in Appendix F of the *National Manual of Good Practice*.



Helpful Hint

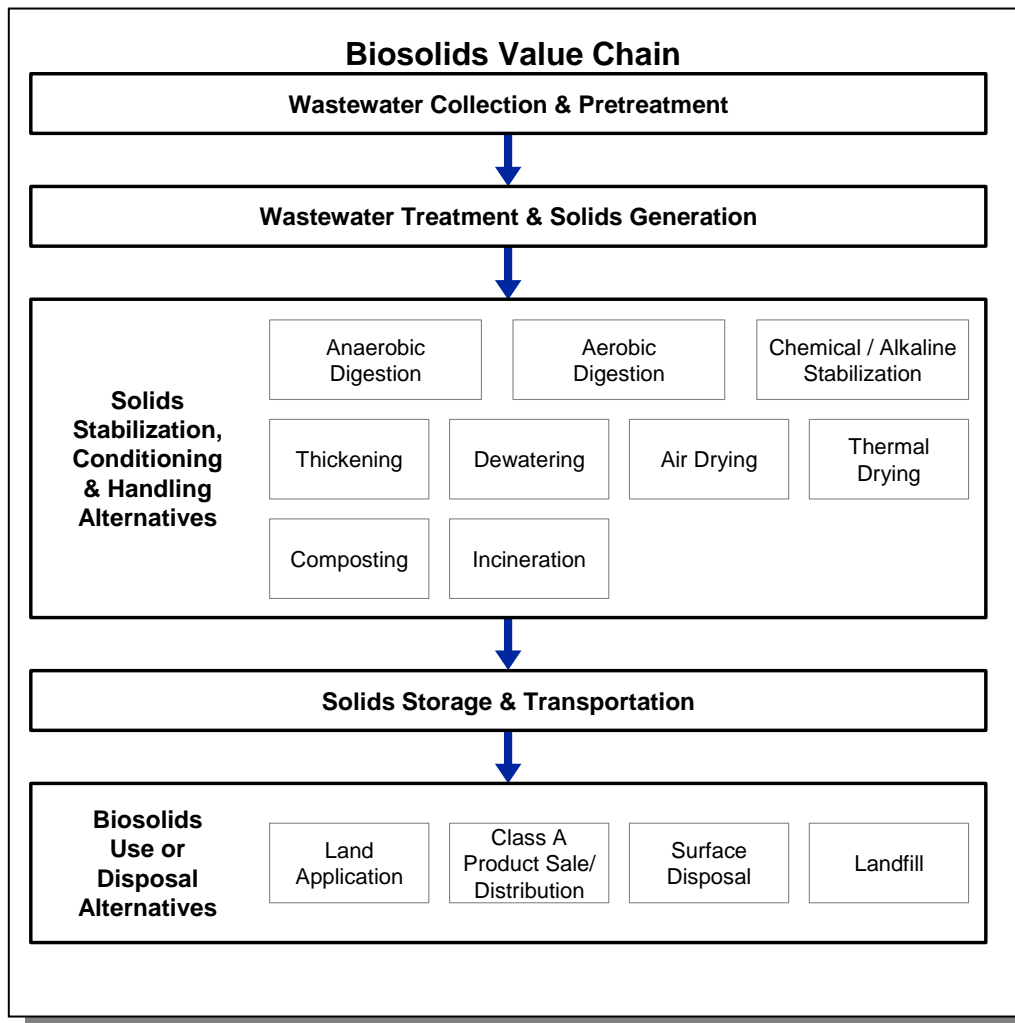
Use the *National Manual of Good Practice* to help identify any potential gaps in your identified CCPs. It can also help you see if the CCPs you have identified are appropriate for your operations, and it provide examples of operational control and management methods.



Example Critical Control Points and Operational Controls for Land Application

Biosolids Value Chain	Examples of Critical Control Points	Examples of Operational Controls
Biosolids Use or Disposal	<p><u>Land Application:</u> Application site location Location for off loading trucks Temporary on site storage Perimeter of application site-setback from surface water, well, neighbors and other receptors Depth to groundwater Agronomic rate Truck cleaning site Any regulatory requirements that identify specific locations / activities needing to be managed.</p>	<p>Operating specifications, procedures, practices monitoring (e.g., SOPs) Applicable federal, state, local regulatory requirements (monitoring, reporting, pathogen reduction, vector attrition, metals concentrations, site restrictions) Biosolids chemical, physical, and biological characteristics Soil nutrient characteristics Type of crop Land area/site application history Amount of storage Climatic conditions, time of year Biosolids application method and equipment Surface and groundwater characteristics Farm management program Odor control based on biosolids stability, location/size of site, buffer to neighbors</p>

Remember that Element 3 requires that you identify and document critical control points that are “consistent with those identified in the *National Manual of Good Practice* and other authoritative sources.” This means that you should identify critical control points that are similar in scope and scale to those identified in the *National Manual of Good Practice*. For example, if you were to identify “Wastewater Treatment” as a critical control point, this would be too broad in scale and scope to allow for effective mapping and management of environmental impacts and operational controls. Wastewater Treatment refers to an entire link in the biosolids value chain or a broad category of CCPs. To be consistent with the *National Manual of Good Practice*, you would need to dig deeper within Wastewater Treatment to identify specific locations or activities, such as anaerobic digestion, air drying systems, or solids dewatering.



Identifying CCPs “consistent with those identified in the *National Manual of Good Practice* and other authoritative sources” also means that you should identify all applicable critical control points in the organization’s biosolids management activities and value chain. Appendix F of the *National Manual of Good Practice* provides examples of critical control points that one would expect to typically find for that portion of the biosolids value chain. Failure to identify a complete range of CCPs may result in a failure to institute appropriate operational controls that are important for meeting your product quality requirements, managing for potential environmental impacts, as well as meeting legal and public acceptance requirements of your biosolids.

Biosolids management activities and wastewater treatment operations vary from one organization to another, and you will need to tailor the list of CCPs throughout the biosolids value chain to include those that are relevant to your specific operations. Further, not all CCPs identified in the *National Manual of Good Practice* will necessarily be applicable to your organization. For example, organizations throughout the country employ a variety of methods for stabilizing biosolids, such as aerobic digestion, anaerobic digestion, or chemical stabilization. Likely, only one of these CCPs applies to a single facility (although you may have more than one facility and the possibility of different types).

To assess completeness of CCPs, you should consider:

- the intended / actual final use or disposal of biosolids and the associated desired biosolids material characteristics;
- legal, quality, and public acceptance requirements, as well as potential or actual environmental impacts associated with your biosolids operations;
- your organization’s span of control; and
- the processes / operations used to produce biosolids materials.

 **Helpful Hint**

Additional examples and templates for identifying critical control points and operational controls are provided in Appendix D of this guidance document.

All points are not necessarily “critical.” For example, if anaerobic digestion is the key determinate in defining the quality of the end product, perhaps other processes “upstream” are important, but not critical and are thus not critical control points. For example, from the above list of potential critical control points, scum blanket or primary treatment may be a point that must be managed, but may not be a “critical” control point that might significantly affect the biosolids product quality or environmental impacts. Your BMP does not need to include all control points, but rather just the critical control points.

Regardless of what method you use for identifying your critical control points, you will need to document the critical control points you have identified and the process you used to identify them. You will also need to clearly provide reasons why you did not select critical control points from Appendix F of the *National Manual of Good Practice*. It will be important to document the rationale behind your selection of CCPs. This will help you explain the scope of your BMP, to your interested parties and to the third party auditors. It will also help the third-party auditors understand why your critical control points might vary from those in the *National Manual of Good Practice*.

Step 2 — Identify Potential and Actual Environmental Impacts at Each Critical Control Point

Step 2 requires that you identify potential and actual environmental impacts associated with each critical control point. *Environmental impacts* are any positive or negative effect that biosolids management activities may have on the environment. Examples include odor, surface and groundwater pollution, air pollution, and human and animal contact with pathogens.

This is a two-part determination: first, under normal conditions; and second, under abnormal or emergency situations. The latter can be a weather-related incident or other natural disaster or the result of a controllable accident or incident (e.g., a fuel spill).

You should also look at the entire biosolids value chain and determine if any potential critical control points were missed by focusing on biosolids end use and product quality. Remember that effective management

of CCPs is needed to prevent undesirable environmental impacts.

Step 3 — Identify Your Current Management Methods

In Step 3 you establish whether there is a current management system or method in place to control for potential or actual environmental impacts or to produce desired biosolids quality characteristics that are consistent with final use or disposal methods, regulatory compliance, and public acceptance requirements.

Consider whether an established system, practice, or procedure is in place, regardless of whether it is currently written up. Even where there is no documentation, a completely developed system is easy to address. A partially developed system with documentation will usually require more work.

Step 4 — Identify Your Operational Control Documentation

In this step, you establish the specific level of BMP documentation development needed. This includes documenting your current management methods or operational controls - standard operating procedures, work instructions, checklists, inspection procedures, reports, recordkeeping, and so on. This also includes developing records that link each critical control point with its potential environmental impacts and corresponding operational controls.

Documenting what is currently in place will help you plan and assign the documentation work, usually the most resource-intensive part of BMP implementation. This information will be used in a later implementation step to organize and assign the completion of documentation for the procedures and practices under Element 10, Operational Control of Critical Control Points, as well as other BMP Elements, as applicable.



Helpful Hint

Linking CCPs with Operational Controls

People tend to think about the critical control points in terms of the operational controls, such as the specific management procedures, practices, and methods that are being used.

This is OK since you ultimately will be linking each critical control point with the necessary operational controls.

For example, anaerobic digestion is a critical control point for solids stabilization if your organization uses one or more anaerobic digesters. The various operating specifications, SOPs, monitoring, process controls, SCADA, and maintenance procedures are the operational controls for the anaerobic digester.



NBP Auditor Considerations

Identifying critical control points is key for successful BMP implementation. Critical control points establish the foundation for most of the remaining sections of the BMP. They link directly with many of the remaining Elements for planning, implementation, and measurement and corrective action.

The auditor will look for the following objective evidence of your organization's conformance with Element 3, Critical Control Points.

The auditor will expect that you will have referenced the following in your BMP Manual.

- ✓ A comprehensive list of critical control points covering the complete biosolids value chain, as applicable, including those activities performed by contractors.
- ✓ Records that link each critical control point and its potential environmental impacts with the corresponding operational controls.

As described, the auditor will examine your selected critical control points to ensure the following:

- They are consistent with those identified in the *National Manual of Good Practice* and other authoritative sources, as applicable.
- They are consistent with the selected method of biosolids management and final use or disposal.
- They are kept current.

The auditor will expect that you can provide a rationale if your identified critical control points are not consistent with the *National Manual of Good Practice*. You may have good reason due to local circumstances for identifying CCPs that are either not addressed in the *National Manual of Good Practice* or not wholly consistent with the Manual's specification of critical control points. For example, an organization that sends its biosolids (or ash from incinerating biosolids) to a landfill for final disposal could explain that the landfill operations are not under the organization's

direct control or influence. However, the organization could also choose to identify the landfill as a CCP and define the operational controls as the agreement with the landfill operation, (bi-)annual calls to the regulator to check that landfill operations are in compliance, and direct observation of landfill operations.

The auditor will examine that rationale and determine whether the CCPs identified are adequate to ensure that the biosolids management activities meet legal, quality, and public acceptance requirements and do not have undesirable environmental impacts. Documenting your process for identifying critical control points will help you provide this type of explanation to the auditor.

The auditor may observe directly the scope of operations to confirm that on-the-ground operations and practices are consistent with the critical control points and operational controls described in the BMP manual and other documentation.

The auditor may conduct interviews with employees for signs that individuals responsible for overall BMP implementation are aware of the actual or potential environmental impacts associated with the identified critical control points.

This Element also requires those organizations that have successfully completed a third-party verification audit and are pursuing NBP Platinum-level Certification provide notification to the third-party verification auditor following any operational change that requires a change to the identified critical control points or environmental impacts associated with the critical control points. Indications that such a notification is warranted include changes to an NPDES permit or changes to operations that require notification of a regulatory agency.



Nonconformance Examples

The auditor may consider the following to be examples of nonconformance with this BMP Element.

- The organization has identified most, but not all of the relevant critical control points within the biosolids value chain. The auditor will reference

the *National Manual of Good Practice* and use his or her understanding of the organization's biosolids management activities to discern if the missing critical control point(s) (and thus their associated environmental impacts and operational controls) are significant enough to warrant a major nonconformance under this Element.

- While some actual or potential environmental impacts have been identified for each critical control point, not all environmental impacts have been sufficiently identified and documented.
- In the BMP documentation, some operational controls are not linked to critical control points.
- No rationale has been provided, verbally or in writing, to the auditor explaining why critical control points have been selected that are not consistent with the *National Manual of Good Practice* and other authoritative sources.

Table 7-1 — Critical Control Point Planning Template

Biosolids Value Chain	Locations / Unit Processes		Regulatory Requirements		Events		Activities	
	Potential Critical Control Points	Responsible Party	Potential Critical Control Points	Responsible Party	Potential Critical Control Points	Responsible Party	Potential Critical Control Points	Responsible Party
Wastewater Collection & Pretreatment								
Wastewater Treatment & Solids Generation								
Solids Stabilization, Conditioning & Handling								
Solids Storage and Transportation								
Biosolids End Use or Disposal								
Example: Critical Control Points for Wastewater Collection and Pretreatment								
Wastewater Collection & Pretreatment	Industrial discharges Commercial discharges Residential discharges Sewer system zones	Compliance affairs dept. Compliance affairs dept. Compliance affairs dept Laboratory field svcs	Significant industrial users: permits	Compliance affairs dept	Spill incident: combined sewers catch basins HM release	Hazmat contractor; fire dept Hazmat contractor; fire dept	Collection system flushing Septage collection	Maintenance dept Independent contractors

Element



Legal and Other Requirements



Minimum Conformance Requirements

- 4.1 Establish a procedure for identifying and tracking legal (federal, state, and local) and other requirements applicable to the organization’s biosolids management activities.
- 4.2 Establish and maintain records of applicable legal and other requirements.
- 4.3 Include a management process for incorporating changes and new requirements into the BMP Elements.

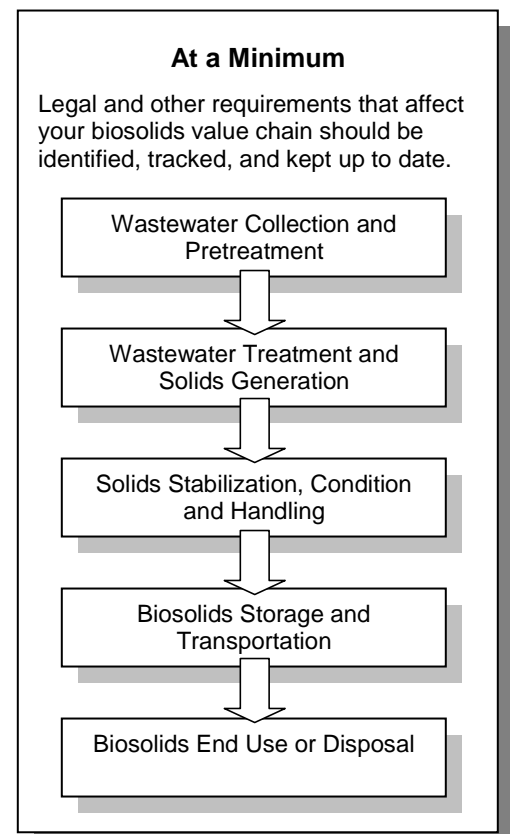
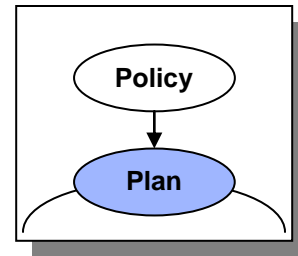


Interpretation

Under this Element, you will establish a formal procedure to identify and track legal and other requirements that apply to your biosolids operations. This may involve identifying procedures you already have in place that satisfy this requirement, augmenting or amending existing procedures to conform with this Element, or developing a new set of procedures.

Legal and other requirements establish the minimum performance objectives, monitoring, reporting, administrative, and other requirements for your BMP.

You also may establish other requirements. You can set these by yourself or with your stakeholders. Or other requirements may be set for you by a parent agency or governmental entity. Other requirements can take the form of voluntary policies, informal or formal agreements, or politically mandated goals. These other requirements may clarify or amplify standing legal requirements, or may be a mechanism to encourage, create incentives for, or commit the organization to go beyond compliance with respect to its biosolids management activities. For example, some of these other requirements may be key to public acceptance of the organization’s biosolids management activities.



You may find that the procedures and the roles/responsibilities for committing to other agreements are not the same as those involved with legal requirements. For example, the person(s) responsible for tracking and incorporating changes to federal requirements for an NPDES permit may not be the same person(s) who establish commitments with local jurisdictions regarding biosolids transportation routes. You should establish and document procedures for both legal and other requirements and for incorporating these requirements into the BMP.

You will need to take your legal and other requirements into account when setting environmental goals and objectives. Changing legal and other requirements might require that you modify your goals and objectives or other BMP Elements. By anticipating new requirements and making changes to your operations ahead of time, you will be prepared for future requirements, and you will not be forced to react to a new or changed requirement at the last minute.



Guidance

You will need to identify all legal requirements, and any other requirements you may have established or that were established for you, that directly or indirectly govern your BMP. These include the obvious, such as your NPDES permit, 40 CFR Part 503 regulation, air emission limits, and state and local regulations. They also include other federal, state, and local laws and requirements you need to be aware of or need to comply with. Examples here might be local ordinances governing transportation of biosolids, or health and safety regulations. Other requirements might include commitments from participation in voluntary programs or initiatives.

As defined by this Element, legal requirements refer to “federal, state, and local environmental laws and regulations” that are applicable to an organization’s biosolids operations and management activities. Wastewater treatment operations are subject to a wide array of regulatory requirements, many of which do not apply to biosolids material production. Although



Helpful Hint

What to Consider

Your legal and other requirements may include the following:

- Federal clean water and clean air acts
- National Environmental Policy Act (NEPA)
- Resource Conservation and Recovery Act (RCRA)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Superfund Amendments and Reauthorization Act (SARA)
- Emergency Planning and Community Right-to-Know Act
- Federal, state, local regulations
- Ordinances
- Municipal by-laws
- Permits
- Licenses
- Authorizations
- Industry codes of practice
- Agreements (e.g., with public authorities, environmental activists)
- Guidelines
- Voluntary programs



Helpful Hint

Keep a List

Maintain a list of all the laws and regulations that are applicable to your organization. This will help you track new and revised regulations.

participants may choose to incorporate or reference such requirements in their BMP, the NBP does not require or expect this to take place.

You must consider not only how to ensure that you *track* current and pending legal requirements, but that you *analyze* them and correctly *interpret* the consequences and implications for your operations. The procedure for tracking and evaluating legal requirements coupled with the procedure for internal and external communications should reflect this need.

Identifying applicable regulations, interpreting them, and determining their impacts on your operations can be a time-consuming task. Fortunately, there are many ways that you can obtain information about applicable laws or regulations in a time-efficient manner, as well as cost-effectively.

Options include the following:

- ✓ State, regional, and national trade groups/associations such as WEF, NACWA, and the Coalition for Clean Water
- ✓ Your engineering, management, and legal contractors and consultants
- ✓ Commercial services (offered on-line and on paper)
- ✓ Communication with federal and state regulatory agencies
- ✓ Code of Federal Regulations (CFR) and similar registers in the states
- ✓ Environmental seminars and courses
- ✓ Jurisdictional, organizational, and departmental environmental meetings
- ✓ Newsletters/magazines
- ✓ Internet-based services and information sources
- ✓ Customers, vendors, and other companies

Once identified, document the laws and regulations applicable to your operations. Consider maintaining a documented register or listing of applicable legislative and regulatory requirements, including new legislation. This listing also should include other requirements that have been identified.

Once you have developed this system, use it! Make sure that you communicate relevant information to employees *and* contractors. Consider conducting periodic training programs and workshops to convey updated information on environmental requirements to key personnel. Also, communicate requirements to contractors via their contracts (always a good way to make sure they pay attention), as well as in periodic meetings with them.

Don't forget to keep senior management involved. Even if the biosolids manager/coordinator is primarily responsible for tracking and interpreting compliance requirements, senior management must have sufficient awareness of current and pending regulatory requirements (and their business implications) so that these can become part of the planning process. Capital expenditures for upgrading unit treatment processes to improve biosolids quality as well as process modifications that prevent pollution and eliminate the need for pollution control equipment also must be incorporated into business planning. As a practical matter, the more the facility's senior and operations management become involved with tracking legal and other requirements, the better.



NBP Auditor Considerations

The NBP auditor will look for several kinds of objective evidence of conformance, including (as relevant), but not limited to items listed below.

✓ **Documented Procedure**

The auditor will examine your BMP Manual to verify that it contains or cross-references a written procedure or procedures for identifying and tracking legal and other requirements as applicable to your biosolids management program. The auditor will expect the procedure(s) to include a system for tracking developments and changes in legal and other requirements, including passive and active techniques, that alerts the organization to potential issues in a timely manner, where responsibility for the operation and its effectiveness is vested in one or more person.

Checklist for Element 4

Have you:

- Established a procedure or procedures for the tracking, identifying, and interpreting legal and other requirements?
- Established necessary processes and secured expert support (as necessary) to evaluate the potential consequences of existing and pending legal and other requirements?
- Made your senior management aware of current and pending legal requirements and their potential consequences through a structured communications process?

✓ *Tracking Updates*

The auditor may interview staff and examine records that indicate you are tracking developments and changes in legal and other requirements. Such records could include logs of resources reviewed regularly and copies of memoranda or other correspondence that indicate an organization has identified, is tracking, and is making explicit assessments of potentially applicable requirements (e.g., daily logs or subscriptions to the Federal Register, internal memos advising employees of new or changed regulations, or notifications or alerts to management or staff about new requirements).

✓ *Accessibility*

The auditor verifies that records of legal and other requirements are readily accessible in hard copy or electronic format. This includes proper documentation of dates that the requirements became or will become effective, the period covered, and a formal reference citation. Records of legal and other requirements would be considered readily available if organized and labeled in some form of physical file management system (e.g., file cabinets, file room, or an automated database tracking compliance requirements and status).

✓ *Reference and Integration*

The auditor will expect that records and operational controls demonstrate that applicable requirements are followed and incorporated in the BMP. Objective evidence may include summaries, excerpts, or cross-references in key BMP documents, such as in SOPs, training program materials, manuals, or checklists. This information might also be contained in other documents associated with planning, implementing, and evaluating biosolids management activities.

✓ *Input or Basis for Goals and Objectives*

The auditor will look for clear evidence that legal and other requirements have been used as the basis for establishing programmatic and strategic goals, objectives, and performance measures, through explicit reference or documentable through cross-checks. (See Element 5.)

✓ **Evaluating Compliance and Performance**

Through a combination of *BMP Elements* requirements, the auditor will expect that you have a system(s) for periodically evaluating compliance with legal requirements and that you can show compliance with other established standards and commitments. He or she will look for evidence that the responsibility for this effort is vested in one or more persons, that the timing of the evaluation(s) matches the timeframe associated with the requirement (e.g., hourly, daily, weekly, monthly, quarterly, annually) with enough lead time to react to, remediate, or take advantage of changing conditions or abnormal circumstances (see Elements 5 and 17).

See Chapter 11 for guidance on how a third-party auditor will consider regulatory compliance and performance outcomes when examining your BMP.

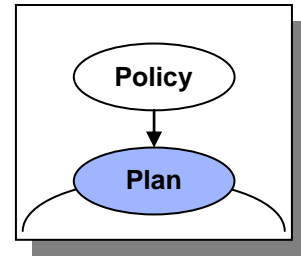


Nonconformance Examples

The auditor may consider the following to be examples of a nonconformance with this BMP Element.

- Documented procedures for identifying and tracking legal and other requirements have not been fully implemented; for example, the auditor may find evidence that not all responsible individuals understand their roles or properly follow procedures.
- Instances of potential noncompliance that are unaddressed by the BMP through lack of identification of a requirement or where there is no procedure to maintain compliance or to respond to a potential noncompliance.
- Tracking procedures do not cover other requirements, such as voluntary programs or other commitments relevant to biosolids management.
- Gaps in the documentation or recordkeeping associated with one or more applicable regulatory requirements (e.g., a requirement has not been identified, no documentation exists for a requirement, or legally required records cannot be located).

Element

**Goals and Objectives****Minimum Conformance Requirements**

- 5.1 Establish and periodically review measurable biosolids program goals and objectives for biosolids management activities, including measurable goals and objectives for each of the four NBP outcome areas: environmental performance, regulatory compliance, relations with interested parties, and quality biosolids management practices.
- 5.2 Reflect, in program goals and objectives, identified priorities for improving environmental performance of biosolids management activities based on critical control points, identified or potential environmental impacts, legal and other requirements, and applicable best management practices as defined in the *National Manual of Good Practice* and various authoritative sources on biosolids management (e.g., Water Environment Federation manuals of practice).
- 5.3 Consider, in developing program goals and objectives, input from interested parties developed through proactive public participation.
- 5.4 Integrate goals and objectives with other BMP Elements and biosolids management activities.
- 5.5 Develop program goals and objectives using SMART criteria (i.e., be Specific, Measurable, Achievable, Relevant, and Time-bounded).
- 5.6 Update program goals and objectives on a regular basis.
- 5.7 Establish an action plan that describes those improvement activities the organization is pursuing to achieve biosolids program goals and objectives. Designate, in the action plan, schedules, milestones, resources, and responsibilities for achieving biosolids program goals and objectives.



Interpretation

Setting biosolids program goals and objectives initiates and drives the continual improvement process. The terms “goals” and “objectives” are commonly used interchangeably, but in the BMP context they do not mean the same thing. Goals are long-term performance improvement targets that are strategic in nature. An example of a long-term strategic goal is to increase the percent of biosolids being beneficially used through a land application program. Objectives are short-term, interim steps that help achieve a specific goal. Both goals and objectives should be specific, measurable, and have designated timeframes.

Timeframes for goals are typically five to ten years, while objectives to achieve goals have twelve to 24 month timeframes.

Program Goals

Biosolids program goals are performance improvement targets that are consistent with an organization’s biosolids management policy to assure biosolids activities comply with applicable laws and regulations, meet quality and public acceptance requirements, and prevent other unregulated adverse environmental and public health impacts by effectively managing all critical control points. Biosolids program goals may include but are not limited to compliance with specific regulatory requirements, implementing quality biosolids management practices, expanding beneficial use, improving biosolids quality, improving environmental performance, improving relations with interested parties, improving public acceptance of the biosolids management activities, and reducing or eliminating negative environmental impacts.

Program Objectives

Biosolids program objectives are short-term, interim steps or detailed performance improvement requirements, quantified wherever possible, based on a specific biosolids program goal. One or more objectives usually must be met for the underlying goal to be achieved.



Helpful Hint

What are Goals?

Biosolids program goals are strategic, long-term targets (5-10 years) for achieving the biosolids management program legal, quality, public acceptance, and environmental performance requirements.

What are Objectives?

Biosolids program objectives are detailed, short-term steps for achieving goals (12-24 months).



Example

Goal 1 — Improve Compliance Performance

- Objective 1...
- Objective 2 ...
- Objective 3...

Goal 2 — Achieve Class A biosolids quality product for resale with new stabilization process

- Objective 1...
- Objective 2...
- Objective 3...

Goal 3 — Create a regional market for biosolids Class A and revenue stream for biosolids

- Objective 1...
- Objective 2...
- Objective 3...

Establishing and Reviewing

You will establish and periodically review and update biosolids program goals and objectives to implement your biosolids policy, including your commitment to meeting the 10 principles in the NBP *Code of Good Practice*. Setting measurable goals and objectives is critical to successful continual improvement of the biosolids management program. Goals and objectives provide a means for the organization to measure the effectiveness of your biosolids management efforts, including environmental compliance, and to set specific milestones for improving the performance of the both the biosolids operations and the BMP.

The easiest way for you to “reflect” priorities for improving environmental performance, as required by this element, is to establish specific, measurable goals and objectives for environmental impacts, legal and other requirements, and best management practices. Alternatively, you may also develop other goals and objectives that support these areas and can assure biosolids activities comply with applicable laws and regulations, meet quality and public acceptance requirements, and prevent other unregulated adverse environmental and public health impacts by effectively managing all critical control points. Demonstrated progress towards established goals and objectives in the areas of environmental performance and regulatory compliance would also demonstrate meeting the NBP expectations for those outcome areas. (See Chapter 11 for more on Outcomes.)

SMART

To be effective, goal and objectives must meet the SMART criteria (see box on next page).

First, the goals and objectives should be **specific**. Compliance with specific legal requirements may translate into a set of goals and objectives. For example, you might have some problems consistently complying with a particular element of the federal Part 503 regulation. You may have specific goals and objectives to improve public acceptance or to achieve biosolids of consistent and uniform quality.

Second, the goals and objectives should be **measurable**. For example, “this organization is committed to beneficial use of biosolids” is a statement of values but

is not a measurable goal. Land-applying 25 percent of the biosolids annually is a measurable goal.

Goals and objectives also should be **achievable**. It is permissible to consider technological feasibility as well as “financial, operational, and business” circumstances as additional requirements or constraints in developing goals and objectives.

In other words, you will need to ask yourselves the following kinds of questions:

- What is the technological feasibility of achieving the goal and objective?
- Can we afford the process improvements to generate Class A biosolids or will a rate increase be required?
- Is the technology for the new solids stabilization hydrolysis method commercially available and successfully applied in the United States?

The biosolids program goals should be **relevant** and strategically significant to the biosolids management program. For example, an objective to increase the number of land application sites by 25 percent could be a step toward achieving 100 percent beneficial use of biosolids.

Finally, the goals and objectives should be **time-bounded** to be effective. Goals have long performance periods, usually multiple years. Objectives have shorter performance periods, usually from several months one or two years.



Helpful Hint

Be SMART!

The primary purpose of goals and objectives is to drive continual improvement. To be effective, biosolids program goals and objectives should meet the SMART criteria:

Specific — linked to a specific Element or requirement of the biosolids management program

Measurable — quantifiable performance measure of the biosolids management program or activity linked to legal, quality, public acceptance requirements

Achievable — realistic, reasonable, and practical goals and objectives in terms of the organization’s ability to achieve them, including financial and technological feasibility

Relevant — element of the biosolids management program that is strategically important to meeting legal, quality, and public acceptance requirements

Time-bounded — of a specific and finite period of time so that progress and achievement can be measured



Example

Biosolids Program Goals and Objectives

Goals	Objectives
Goal A: Achieve 100% beneficial use of biosolids by 2016	Objective 1: By the end of 2011, land-apply at least 30% of the annual biosolids volume Objective 2: By the end of 2015, land-apply at least 50% of the annual biosolids volume Objective 3: By the end of 2013, land-apply at least 75% of the annual biosolids volume Objective 4: By the end of 2014, land-apply at least 90% of the annual biosolids volume
Goal B: Complete a successful pilot Class A	Objective 1: By the end of 2012, design and install pilot composting operation

<p>composting application and plan for commercialization by 2015</p>	<p>Objective 2: By the end of 2012, complete an 18-month pilot</p> <p>Objective 3: Complete market analysis of regional compost market by the end of 2013</p> <p>Objective 4: By the end of 2014, complete a plan for scale-up and full scale commercialization</p>
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Goals and objectives can apply to your entire organization, an individual department, or even a process or group of processes.

This is often the way it works:


1. An organization establishes a specific improvement goal for its biosolids management program.
2. Individual departments and contractors then develop their own specific objectives in support of achieving the goal.

Performance Measures

Goals and objectives must be assigned performance measures to track progress toward achieving them (see Element 13). Establishing SMART goals and objectives is a good starting point, but you will be ineffective without a systematic process to measure performance. It also is necessary to identify appropriate performance measures and set up a routine tracking process. Once a goal and objective is set, it is imperative for your organization to track progress that is made in achieving the goal and objective(s). (See Elements 13, 15, 16, and 17 for more information about tracking, evaluating, and updating your biosolids program goals and objectives.)

For this very purpose, organizations should consider establishing measurable environmental performance indicators. Performance indicators are specific, measurable indicators used to track the progress made in achieving a goal. Goals and objectives also should be reviewed and revised periodically, based on changing circumstances, including legal requirements, technology, operating costs, and the degree of public support.

Element 6, Public Participation in Planning, provides for involvement of interested parties in your organization’s biosolids management program, including setting improvement goals and objectives. The specific methods and mechanisms for engaging

 **Helpful Hint**

Performance Measures

Performance measures and indicators are specific, quantitative measurements used to track progress made in achieving a specific goal or objective.

Performance measures help you:

- Measure quality, effectiveness, efficiency, and cycle time, as applicable
- Pick the most suitable measure or group of measures
- Establish performance baseline for each goal and objective group
- Identify the root causes of performance gaps
- Systematically track progress toward goals and objectives

interested parties are defined in your public participation plan. (See Element 6 for more explanation of what is meant by “consider input from interested parties” in establishing biosolids program goals and objectives.)

Action Plan

This Element also requires an action plan that describes actions to take to meet the goals and objectives, when they will be implemented, who is responsible, what resources are required, and how success in carrying them out will be measured.

Once goals and objectives are set, the required actions or activities must be defined in an action plan. You can think of your action plan as a project management plan.

- You should identify an appropriate breakdown of tasks and sub-tasks needed to achieve specific goals and objectives. This work breakdown should consider task dependencies and linkages. In other words, you should consider which actions come first and which must be completed before the others can proceed.
- You also need to consider the resources and financial investments needed and plan to make requests or prepare budgets accordingly.
- Develop a schedule for each task and action item, complete with milestone dates, interim targets, and any hard internal or external deadlines as appropriate.
- Identify who is responsible for each task or action, including lead and supporting roles.

Guidance

The old style of setting goals was top down, established and dictated by senior management. This approach is often considered ineffective because goals need buy-in from the people who have to meet them.

Instead, consider developing your goals and objectives by applying the Deming principles. For smaller organizations, your BMP team can lead this process.

Helpful Hint

Your action plan details:

- What you're going to do
- Why you're doing it
- How you plan to do it
- Who is responsible for doing it
- When you plan to have it done

Helpful Hint

Prioritize!

Since goals and objectives are directly linked to critical control points for specific biosolids management activities, use information from the implementation planning visit to establish baseline performance.

Then use performance/importance analysis to identify the priority areas for improving the biosolids management program.

Build your initial improvement goals and objectives around the priority areas.

For larger organizations, consider forming a subcommittee or workgroup from the BMP team to facilitate this process. Begin by establishing the vision, mission, strategy, and broad goals for your overall biosolids management program. Performance objectives that contribute to these broad goals and strategies then should be developed and proposed to the senior management.

Grassroots involvement of many in the organization in setting goals and objectives is a critical success factor. The employees who do the work will be best positioned to establish, plan for, and achieve objectives.

The process for a wastewater utility or biosolids contractor is the same as that employed by large manufacturing facilities and other service organizations. Use your cross-functional team to integrate inputs from individual operations involved in the biosolids management activities.

Pull together information sources such as the initial list of the following:

1. Critical control points
2. Legal and other requirements
3. Baseline performance from the BMP implementation planning visit
4. Biosolids compliance programs and permits
5. Compliance audit reports
6. Communications from outside parties

Recommended Approach

The following steps or a similar process will help you in setting goals and objectives as part of the BMP implementation.

- List the biosolids quality characteristics that must be met constantly for end use or disposal markets.
- List the critical control points for all biosolids management activities throughout the biosolids value chain, including those performed by contractors.
- List all regulatory and permit requirements that affect the biosolids management activities. Also list



Helpful Hint

- ✓ When you develop your goals and objectives for specific functional areas, remember to draw on the expertise of your employees. After all, they are the ones most familiar with the processes and procedures that you are trying to influence!
- ✓ Be flexible in your goals and objectives. Define a desired result for the BMP and let the people responsible determine how to achieve the result.
- ✓ Keep your goals and objectives simple initially, gain some early successes, and then build on them.
- ✓ Make sure your goals and objectives are realistic. Determine how you will measure progress toward achieving them.
- ✓ Consider linking goals and objectives to measures of activity level: units of production if they are related to cost or resource productivity (e.g. tons of biosolids per day).

other voluntarily adopted requirements for which improvements may be needed.

- Review the implementation planning visit findings to identify target improvement areas, especially areas where there are significant problems relative to legal, quality, and public acceptance requirements and the four outcome areas (regulatory compliance, quality biosolids management practices, relations with interested parties, and improving environmental performance).
- Develop a preliminary list of possible goals and objectives related to improving compliance, meeting these other requirements.
- Obtain the views of interested parties, using the public participation approach developed in Element 6 from people in the community and other stakeholders. List the concerns identified. Identify additional objectives related to views of neighbors, community groups, or other parties potentially affected by biosolids activities.
- Look at the lists of possible goals and objectives developed in Steps 1-5.

Brainstorm whether your goals and objectives are

- Consistent with biosolids policy and long-term strategy
- Technologically feasible (commercially demonstrated technology is in widespread use and is available at an affordable cost)
- Consistent with biosolids volume, quality, and public acceptance requirements
- Consistent with other important business plan and competitive objectives
- List and prioritize goals and objectives based on importance, performance and ability to control or influence. There are likely to be far more candidates than there are technical, financial, and human resources to allocate to their achievement. Identify the most important goals and objectives that can be accomplished with the resources available.

10-Step Process for Goals and Objectives

1. List critical control points
2. List legal and other requirements
3. Review implementation planning visit results
4. Develop preliminary list of goals and objectives
5. Get public participation input
6. Screen for feasibility and consistency
7. Prioritize for performance and importance
8. Test whether they meet SMART criteria
9. Develop action plan and goals and objectives
10. Periodically revisit goals and objectives

Possible evaluation criteria include the following:

- Compliance requirement (yes, no)
- Quality requirement (yes, no)
- Public acceptance requirements (yes, no)
- Technological feasibility (high, medium, low)
- Cost efficiency (high, medium, low)
- Resulting productivity improvement (high, medium, low)
- Potential impact on competitiveness (high, medium, low)
- Goals and objectives for the biosolids management program should meet SMART criteria. Determine how you will measure each of the selected goals and objectives.

Following are examples of measurable performance indicators of quality, effectiveness and efficiency:

- Conformance with physical, chemical, and biological performance standards of compliance and other requirements
- Cost per dry ton of biosolids produced for solids stabilization, conditioning, handling, and storage
- Cost of transportation and final use or disposal of biosolids
- Revenue per ton or cubic yard of biosolids produced
- Public acceptance and satisfaction with biosolids management
- For each of the goals and objectives that you selected, develop an action plan that describes how you are going to meet them. For each goal and objective, list the action or activity, when it will be implemented or initiated, the names of those responsible, the expected resource requirements, and milestones for measuring progress.

Your action plan is a dynamic document that gets modified when one or more of the following occur:

 **Helpful Hint****Action Plans Tie It All Together**

Biosolids management program action plans are directly tied to goals and objectives. A biosolids management program action plan encompasses the planning, logistics, and resources that enable an organization to achieve the goals and objectives it has set for itself.

- Goals and objectives are revised or added.
- Progress in achieving your goals and objectives is made—or not made.
- Waste stream inputs, biosolids products, unit process operations, or technologies change; or other factors arise.

Your simplest approach may be to integrate the action plans for goals and objectives into a process you already are using. It can be very useful to integrate the biosolids management program with other planning efforts, such as strategic and operational planning, so that the activities will be given appropriate priority and assigned the necessary resources.

This integration also accomplishes the linkage of biosolids management with any overall continual improvement process and ensures that critical control points, goals, and objectives are considered as part of any process modification, biosolids disposal change, etc. The main principle here is that you need a plan, resources, and someone responsible for leading the work. And to make progress, you need a way of measuring the activity against the goals and objectives.

The plan should consist of action steps in order of their priority to the company. These actions may deal with individual processes, projects, products, services, plant facilities, or activities within a plant facility.

Resources include the human and financial resources, capital investments in technology, training investments, and so on that are required to achieve the goals and objectives.

Other activities that might be needed to implement the biosolids management program include developing and implementing management processes, procedures, and practices.

Employee training must provide the necessary awareness, skills, and knowledge to employees and contractors involved in the program.

Implementation also may require activities like emergency preparedness and response planning.

Checklist for Element 5

- ✓ Do you have a structured process for developing a prioritized list of biosolids management goals and objectives?
- ✓ Did you link goals and objectives with critical control points?
- ✓ Have you considered legal and other requirements when setting its goals and objectives?
- ✓ Have you addressed all four outcomes areas in the goals and objectives?
- ✓ Have you had grassroots employee participation in developing your goals and objectives?
- ✓ Did you consider inputs from other interested parties, including neighbors, interested community groups, and governmental officials when setting goals and objectives per Element 6, Public Participation in Planning?
- ✓ Did you develop a comprehensive list of documented biosolids program goals and objectives at each relevant function or activity within your organization?
- ✓ Are your goals and objectives consistent with the biosolids policy and commitment to NBP *Code of Good Practice*?
- ✓ Did you establish performance measures and indicators for key biosolids management activities covered by goals and objectives?
- ✓ Do you have a structured process for periodically measuring progress against objectives and targets and for reporting the results to senior management?

- Periodically revisit the goals, objectives, and targets as part of the BMP measurement and monitoring process and as a primary item considered in the periodic reviews by senior management. Remember to consider input from interested parties when updating your biosolids program goals and objectives.



NBP Auditor Considerations

Goals and objectives help establish the basis on which organizations manage biosolids program activities. Without goals and objectives, it is impossible to document and track where you've been, where you are, where you're going, and how you got or are going to get there — key capabilities in any successful biosolids management system.

Many BMP Elements depend on having goals and objectives in place, including critical control points, training, operational control of critical control points, monitoring and measurement, biosolids management program performance report, internal management system audit, and management review, among others (Elements 3, 8, 10, 13, 15, 16, and 17, respectively).

Without establishing goals and objectives, it will be difficult if not impossible to establish conformance with these and other Elements, and to demonstrate meeting NBP expectations for outcomes (regulatory compliance, environmental performance, quality biosolids management practices, and relations with interested parties.)

An auditor will examine records and interview employees to verify that your organization has established goals and objectives to improve the BMP. The auditor will be looking to verify the following.

- The goals and objectives are consistent with the biosolids policy as well as legal and other requirements;
- Goals and objectives consider public input;
- There are strategic goals that drive continual improvement, based on identified priorities for



Helpful Hint

An auditor will look for the following links:

- Linked groups of goals and objectives that are tied to the biosolids policy, important critical control points, legal and other requirements, and input from public participation.
- Strategic goals that drive continual improvement — Every organization should have several broad strategic goals, based on identified priorities for improvement. For example “increase beneficial use from 65% to 100% over three years,” or “increase the revenue from selling composted biosolids by 25% over the next 3 years.”
- Whether each goal is linked to a series of tactical, short-term objectives that are logical steps for achieving the goal — e.g. linking beneficial use goal to specific solids stabilization process improvements to improve quality, consistent with either Class A and Class B requirements under the Part 503 regulations

improvement, including the four outcomes areas (regulatory compliance, environmental performance, quality biosolids management practices, and relations with interested parties);

- Each strategic, long-term goal is tied to one or more tactical, short-term objective;
- Your goals and objectives meet the SMART goal criteria and have associated performance measures for tracking progress;
- Progress toward meeting goals and objectives is being measured and tracked systematically, as per Element 13; and
- Progress toward goals and objectives is reported in the BMP performance report, per Element 15, and is reviewed with management, per Element 17.

The auditor also will examine your action plan, which should include the following information.

- ✓ Assignment of responsibility for completing identified tasks
- ✓ Time schedules for completing various tasks
- ✓ Allocation of required resources
- ✓ Identification of measurable performance indicators to track performance in achieving the goals and objectives



Nonconformance Examples

The auditor may consider the following to be examples of a nonconformance with this BMP Element.

- The goals or objectives do not fully support the organization's biosolids management policy, the NBP Code of Good Practice, or another authoritative biosolids document.
- Goals or objectives have not been established to support continual improvement in each of the four outcomes areas.
- Goals or objectives fail to meet the SMART criteria.
- Your action plan has not been updated recently, or it does not contain all required information (e.g., milestones, resources, responsibilities).

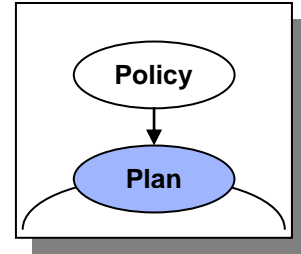
Element



Public Participation in Planning



Minimum Conformance Requirements



- 6.1 Select and implement a proactive public participation approach to involve interested parties in the organization's BMP planning process.
- 6.2 Reflect, in the selected approach, the organization's commitments to the ten principles in the NBP *Code of Good Practice*, including plans for independent third-party verification of conformance with the *BMP Elements*.
- 6.3 Select an approach that is consistent with the degree of current public interest, history of public involvement, method of biosolids management, and related local circumstances.
- 6.4 Provide interested parties with meaningful opportunities to express views and perspectives relative to biosolids management activities, including concerns about environmental impacts, biosolids program performance, and potential areas for improvement.
- 6.5 Consider input from interested parties in initially developing program goals and objectives during BMP implementation and in updating them as part of periodic review of BMP performance.



Interpretation

Securing and maintaining public acceptance of biosolids management practices, particularly with respect to beneficial use, should be part of your policy. Information from public participation also should be considered in setting your BMP goals and objectives. (See Element 5.)

While the requirements in this Element are intended to be flexible, consistent with the degree of current public interest, historic public involvement, the method of biosolids management, and other local circumstances,

there is a specific requirement for implementing a proactive approach.

The NBP considers a “proactive public participation approach” one that creates avenues for interested parties, as identified by your organization, to communicate their perceptions and concerns regarding biosolids management activities near the beginning of your BMP planning process and during the periodic review of BMP program goals and objectives. Specifically, this process applies to identifying environmental impacts and setting performance goals and objectives for the biosolids program.

A “proactive” participation approach also enables you to understand the needs, concerns, and perspectives of interested parties *before* problems arise or incidents occur. Public participation requires that the input from interested parties be considered but clearly leaves decisionmaking authority with the organization’s management.

Meaningful Opportunities

This Element requires you to provide interested parties with meaningful opportunities to express their views and opinions as well as raise concerns about biosolids management activities.

“Meaningful opportunities” means that you have established mechanisms (more than one) that allow interested parties to communicate their perspectives, views, and concerns regarding biosolids management activities to the organization. To be considered a “meaningful opportunity,” the method must meet the following criteria:

- Identified interested parties have been provided a method for input consistent with their location and capacity to comment; e.g., if interested parties are located in a rural area with limited or no Internet access, opportunities to express views and perspectives should not be limited to email or web site access.
- Efforts have been made to alert potential interested parties about the opportunity to provide comment.



Helpful Hint

Why do it?

Involve the public in your BMP planning process to:

- Foster a meaningful, two-way dialogue that improves the program from everyone’s vantage point.
- Give you an opportunity to hear public concerns and better understand the public’s perspectives
- Identify important and serious issues early
- Provide a venue to address these issues together
- Create a setting where you can tell the public about your processes and programs and explain how you meet your various requirements
- Provide people with information and an opportunity for input into your planning processes

All this can go a long way to building mutual respect and program support.

- Time has been provided to enable interested parties to participate, and formulate and deliver substantive input.
- Background information, such as information on your general BMP implementation plans, commitment to the *Code of Good Practice*, and third-party verification process, has been provided to interested parties to enable them to understand the BMP planning process and formulate substantive input.

Interested Parties

The definition of interested parties includes “all individuals, groups or other organizations interested, involved with, or otherwise affected by the organization’s biosolids management activities.”

Under the definition, interested parties include but are not limited to the following:

- Wastewater customers
- Farmers and agricultural groups
- Academia
- Water quality professionals
- Regulators and other state or local governmental officials, such as the mayor, city council, county board of supervisors or commissions, or public health officials
- The news media
- Environmental and public interest groups
- Community leaders
- Residents and the general public

In biosolids land application and other beneficial use methods, interested parties go beyond the government jurisdiction or region being served with sewage collection and treatment.

Engaging the Community

Some biosolids producers have been able to implement effective management programs in communities where public opinion is silent, or possibly indifferent.

However, you should not construe apparent indifference as an acceptable minimum objective — anything short of acceptance can leave your program vulnerable to opposition from the uniformed and uneducated. Clearly, your program will have difficulty succeeding in an atmosphere of widespread or “narrow but loud” public opposition. Lack of public acceptance on any scale is a potential barrier to a stable, sustainable biosolids management program.

Engaging the community in your BMP planning process serves several purposes:

- It provides you with an opportunity to describe and explain your program in venues where statements and dialogue go well beyond sound bites; and
- It provides you with feedback on the public’s understanding and perception of the program and biosolids use or disposal choices.

Without such proactive involvement, most biosolids producers’ contact with the public may be limited to formal regulatory settings, such as permit hearings, abnormal or emergency situations where public relations are likely strained or damaged, or public tours taken by people who already are supportive of program activities. This level of involvement in these types of settings may not be sufficient to build the public acceptance your biosolids program needs. The public participation under Element 6 goes hand-in-hand with Element 9, Communication, where public education and outreach efforts are used to gain public acceptance.

Involving the public in planning processes builds trust and support that can help propel you toward your goals and objectives and increase the chance that isolated negative events in an otherwise good program are viewed in the proper context.

When an organization develops and implements a BMP, it will do so with the understanding and intention that it will share information about its BMP and evidence of conformance and performance, including certification if pursued, with the public as part of its communication strategy (see Element 9) and reporting practices (see Element 15).



Helpful Hint

Assorted Alternatives

- You are not expected to develop public participation efforts solely dedicated to BMP planning and implementation (although you may choose to do this).
- It is fully acceptable to use existing methods such as existing community advisory groups, or leverage already-planned events, such as a meeting relating to planned treatment plant upgrades, to discuss BMP planning efforts and collect information on interested party perspectives.
- Already-existing public participation initiatives can provide you with an awareness of interested party perspectives sufficient to develop a responsive and effective BMP.

Thus, you have multiple options for demonstrating how public participation efforts have provided you with the understanding to prepare your BMP.

In most circumstances, some level of public participation in developing, implementing, or reviewing conformance with and performance under the BMP is desirable. The involvement of interested parties in the BMP can establish a constructive, two-way learning opportunity for the organization's staff, other stakeholders, and the public.

You will need to document your approach for involving interested parties in the BMP planning process. You also must develop and maintain records of public participation activities such as attendee lists, at a minimum, at least since the BMP was put in place. Not all organizations have had a formal public participation program and records of its implementation before implementing its BMP.



Guidance

Your challenge under this Element will be to develop a strategy for involving the interested parties in your planning process in a way that makes the most sense to you – and to them – given your operations, beneficial use or disposal method(s), and your community's political, logistical, and environmental characteristics. There usually is no one "right way" for any organization to design a public participation program. Multiple, equally effective alternatives may exist for you, or you may face certain constraints, such as historical precedents for public participation, that point you in one direction over others.

To ensure that your public participation approach is "consistent with the degree of current public interest, history of public involvement, method of biosolids management, and related local circumstances," you should do the following:

- Consider the history of local support for or opposition to your biosolids management practices;
- Examine previous public participation methods and their effectiveness;
- Consider any current interests, issues, or concerns;
- Consider who is affected or potentially affected by the organization's biosolids management practices;



Helpful Hint

Candidate Planning Participants

- Facility neighbors
- Application site owners and neighbors
- Neighborhood organizations
- Existing community groups
- Local chapter of national environmental organizations
- Farmers and farm organizations
- Local watershed planning organizations
- Professional landscape architects and their associations
- Local gardening clubs and Master Gardener programs
- Other local agencies and departments (e.g., health, transportation, parks and recreation, police, fire)
- City, county, regional government departments
- Local and state technical resources (e.g., university professors, graduate students)
- State and federal regulatory agencies
- Federal partners (e.g., USGS, NRCS)
- Key employees from the facility and the organization
- Other regional municipalities with biosolids management programs

- Identify who is concerned or whose opinions might be important for successful operations of the organization's biosolids management practices; and
- Select and implement an approach consistent with the above.

If you choose a less active public participation approach after considering all this (e.g., one where you are proactively prepared, but engage only as needed), you must provide evidence that other approaches were considered and that all interested parties and potential concerns or perspectives have been identified.

Selecting a less active public participation approach will not necessarily mean that you have failed to meet the requirements for this Element. However, you should be prepared to explain why a less active approach was selected.

What is the public's role in planning?

Think about your biosolids-related activities, including any biosolids activities being managed by contractors:

- Where do you handle and manage biosolids — only at your facility, at your contractor's location, on public or private property?
- If you transport biosolids from one location to another — how do you transport it, what areas do your routes pass through, how frequent are your trips, and how large are your loads?
- Do you store your biosolids for any length of time? Can people see or possibly smell the biosolids, how close are they, and are there permanent neighbors or passersby?
- What is your disposal or reuse method(s)? Who might be negatively affected, who might need information about your activities, who might have valuable input, who deserves the opportunity to voice their opinions, and who benefits from your biosolids product(s)?

Now, ask yourself these questions:

- How can involving the public in our planning activities improve our operations, build public support, and help our program be more successful?



Helpful Hint

Do you need a new group?

You might not even need to form a whole new group to deal with biosolids issues.

- Who is already participating in your planning processes?
- Are they formally organized?
- Do they represent everyone you think needs to be involved?

Perhaps with a few additional members, an existing group will serve your purpose. Make sure, however, that the existing group is interested and that additional involvement in biosolids matters will not detract from the work they already are helping you with.

- How can *not involving* interested and affected parties cause them to miss important information, diminish support or even foster opposition, and hinder our program's success?

Answering these questions should give you a pretty good idea of your need for public participation in planning. Past experience also can tell you a lot.

- Did you hold well-advertised planning meetings that no one attended?
- Did you have an overfilled space for what you considered to be a minor meeting?

Sometimes finding the right balance takes a little time, but your efforts will pay off.

Who should you invite to participate?

Assess your need for public participation again. This time, think about specific groups and individuals that your program affects, in positive and potentially negative ways.

- Whose support do you absolutely need?
- Whose support would help your program?
- Do you face opposition to certain activities?

These are people that you may want to try to win over or at least mollify with an invitation to participate in planning.

There are several strategies regarding invitations for participation. You don't necessarily need to pick one approach — you might choose to pursue more than one to cover your bases. Again, think about your experiences and what you learned from them.

- Invite everyone and every group you can think of that might have any interest, or that your activities possibly affect, even indirectly — and see who expresses an interest.
- Invite people and groups you have worked with and dealt with in the past — ask them if they are interested in participating and ask them who else ought to be at the table.
- Get your colleagues together to develop a targeted list of potential participants — this could include



Helpful Hint

Involvement Channels

Mechanisms for public participation include, but are not limited to the following:

- Formal advisory committees
- Representation on workgroups
- Surveys
- Focus groups
- Public meetings
- Trade shows
- Speakers' bureaus
- Periodic open house events
- Web site

True participation means providing a forum for two-way communication, not just one-way information dissemination on your part or venting sessions for the public.

known supporters and advocates, and opponents you want to win over.

- Make a special effort to involve key groups or individuals that are leaders in a sector or in the community – these are the organizations and the people who, when others see their support (or at least willingness to not oppose), they will follow.
- Make sure your outreach and public participation approach engages the news media.

In almost every case, inviting the right person within an organization, in terms of knowledge, authority, and respect, can make a big difference in the quality of their participation and in the benefits to you and their organization's interests and constituents.

To some extent, who you invite may depend on the manner in which you elect to engage them (see below). If you invite everyone and everyone accepts, you can't very well accommodate them in the planning process with one small workgroup. Likewise, if you end up with a small number of very active participants, a multi-level committee structure probably won't be necessary or effective.

Some might want to identify the participants first, and then build a participation structure that fits the size and relationships of the group. Others might want to select the participation mechanism that they think best fits their biosolids program and organizational procedures for participation, and then set up an invitation process to fill the number and mix of positions.

For most it will be an iterative process of matching the group that needs to participate and that wants to participate with a participation mechanism that facilitates education, input, and response.

How can you engage the public?

Meaningful public participation can be accomplished in many ways. "Involvement" could range from access to planning activities to direct participation and representation on special advisory councils or workgroups. As indicated above, the challenge is to find the right participant-mechanism match for your



Helpful Hint

Feedback is Fundamental

Perhaps *the* key to successful public participation in planning is being clear about how you will use the public's input at the outset and providing feedback on their influence on your planning process and decisions along the way.

People who give their time to your process deserve your respect and it is up to you to show them their efforts have been meaningful.

needs, your community's issues and level of interest, and your existing organizational structure.

If you have had a lot of experience and success with community advisory groups, for example, then this may be the approach to use again. If you have never used such a formal or structured approach, then perhaps an informal working group may be right for you.

You can select multiple options, since most alternatives are not mutually exclusive. Consider the level of formality and institutionalization, number of participants, breadth of representation, and method(s) for input. Choose someone in your organization with experience working with the public to lead your participation initiative. If you don't have such experience in house, consider bringing someone with experience in to help you facilitate meetings and planning sessions.

What are your responsibilities?

With your group in place, you will need to establish groundrules for their involvement and for how you will consider and respond to their input. "Input" can include written comments such as letters or completed surveys from the public and interested parties, and verbal comments made during meetings and other methods organized by or on behalf of your biosolids organization.

You may choose to establish groundrules up front, before you convene a group. For some participants, the groundrules and your commitments may make a difference in whether they participate or not. One thing you definitely don't want to do is lead the group to expect that you will consider their input with a greater weight than you really will. Alternatively, you may convene the group and then take up establishing the specifics of their participation as your first order of business.

Part of fulfilling your responsibilities will involve taking minutes at meetings and otherwise documenting issues, opinions, suggestions, and concerns. Either on-the-spot, or at the next meeting, you should let them know as best you can your organization's opinion on the subject and your ability to continue, change, improve, enhance, or otherwise

alter operations based on their input. If you need more time to consider their input, let them know when you can get back to them. If you face constraints — political, financial, technological, operational, or logistical — on implementing a suggestion, explain your constraints.

With more information, they probably will understand and may even help you with solutions. For every major item, you'll need to let your group know how you considered their input, how you responded, and if you couldn't respond, why and what you can do instead.

How do you “consider input?”

To satisfy the requirements of this Element, you will need to demonstrate that you acknowledge and respond to the interested party input. At a minimum, “consider input” means that:

- Views and perspectives have been captured by a process that ensures management is fully aware of interests, needs, and concerns of interested parties as critical control points are identified and objectives and goals are set; and
- Responses to public comments have been formulated, documented, and communicated back to relevant interested parties.

There are three potential responses to comments.

1. You may decide to address public input directly by implementing measures designed to resolve issues related to an area of public comment. For example, you might modify practices or alter equipment or processes.
2. You may decide to establish goals and objectives that focus organizational attention on addressing identified issues over a defined time horizon.
3. You may decide not to directly address a certain issue raised by public input because of technical, financial, or other constraints.

In such cases, you are expected to document, and communicate to interested parties, your rationale for making this determination, and, where possible, to suggest alternative steps to address (or partially address) the interested party input.

Checklist for Element 6

- ✓ Did you assess potential benefits from public participation? Did you identify your public and determine the input and outreach you need?
- ✓ Is your public participation approach consistent with the current level of interest, historic participation, the method of biosolids management, and other local circumstances?
- ✓ Does your public participation plan provide a mechanism for input by interested parties into goals and objectives?
- ✓ Did you go through a deliberative process to evaluate alternative approaches to involve the public in biosolids planning activities? Did you consider the various possible mechanisms and participant representation mixes?
- ✓ Who will you invite to participate and how will you engage them? Did you select the public participation approach that best matches the results of your evaluation?
- ✓ Have you been clear about your responsibilities regarding consideration of public input and follow-up?
- ✓ Are you carefully following the approach you selected?
- ✓ Do you have a process to identify changing circumstances to recalibrate your public planning Element?

Although this third option for response to interested party comments is acceptable, your auditor could view a pattern of not addressing concerns or issues raised by interested parties as a potential failure to achieve NBP public acceptance objectives and your commitment to continual improvement. In this context, however, the third party auditors are directed to remain attentive to the possibility that your prior efforts have addressed interested party input, resulting in a pattern of ongoing, residual concerns. However, even when this is the case, you are expected to continue to have ongoing, two-way communications with interested parties about such residual concerns.

What can you expect from participants?

You have a right to expect certain things from your participants too. Everyone needs to participate in good faith, including being as honest and open as they can be. Representation should be clear, and any potential conflicts of interest identified at the outset. Regular attendance at scheduled meetings is important. If someone can't make it most of the time, you can ask them to send a substitute or redesignate their seat to an individual or group that can.

The more formal your participation mechanism, the greater the level of responsibility you should be able to expect from your participants. In any case, everyone has a responsibility to follow-up and respond as agreed to.



NBP Auditor Considerations

The auditor will look for the following types of objective evidence to verify that you are meeting the requirements of this Element:

- ✓ Internal meeting minutes or other similar records that describe the process for selecting the public participation approach to verify that you have done the following:
 - Considered the history of support or opposition to biosolids management practices;



Helpful Hint

Thinking Outside the Map

Getting local sponsorship and endorsement when you leave your jurisdiction is critical to success.

To win public acceptance of biosolids management activities, especially for beneficial use in land application and similar nutrient supplement uses, is usually more difficult when the biosolids are transported outside the POTW's governmental jurisdiction.

It draws out the NIMBY cry, "not in my back yard!"

Therefore, public outreach is essential to achieve sponsorship, active support, and endorsement by highly placed public officials in the land application jurisdiction.

- Examined previous public participation methods and their successes or shortcomings;
- Considered any current interests or concerns; and
- Considered who is impacted or potentially impacted by the organization’s biosolids management practices.
- ✓ Identification of who is concerned and whose opinions matter for successfully operating your biosolids management practices.
- ✓ Historic public participation documents to verify that your public participation approach is consistent with the history of public involvement.
- ✓ Documentation providing justification and rationale for a decision not to include public participation or for a passive approach, if applicable.
- ✓ Documents describing your public participation approach contained or cross-referenced in your BMP Manual.
- ✓ Records of public participation activities, such as lists of meeting attendees, meeting materials, presentations and agendas that confirm your public participation approach is being implemented.
- ✓ Records, such as meeting materials, agendas, or presentations, verifying that interested parties were informed of the organization’s commitment to the *Code of Good Practice* and the independent third-party verification process.
- ✓ Public participation records, such as meeting materials, agendas, summaries, and attendance lists, to verify that interested parties were provided with opportunities to express views and perspectives relative to biosolids management activities, including concerns about environmental impacts, biosolids program performance, and potential areas for improvement.
- ✓ Invitations or public notices to verify that you have provided invitations or other mechanisms for

letting interested parties know about opportunities to express their views and perspectives.

- ✓ Records of public comments received during the BMP planning and goals-and-objectives-setting periods (e.g., files of written public comments, minutes from public meetings).
- ✓ Records indicating you have considered and responded to input from interested parties (e.g., letters of response to interested parties or public meeting minutes where input was addressed or responded to).

In addition, the auditor may conduct interviews with employees or contractors responsible for implementing public participation activities.

Meeting the requirements of Elements 6 and Element 9 (Communications) for establishing two-way flows of information with interested parties will also demonstrate to the auditor that you are meeting the expectations for the outcome area “Relations with Interested Parties.” See Chapter 11 for more information on how a third-party auditor will consider outcomes when examining your BMP.



Nonconformance Examples

The auditor may consider the following to be examples of a nonconformance with this BMP Element.

- Some parts of the public participation plan, or specific activities conducted, have not been fully documented.
- The public participation approach has not been fully implemented as documented.
- Opportunities for public participation were not meaningful, as defined in Chapter 7, or were not appropriate for all interested parties.
- Public participation activities did not provide an opportunity to provide views and perspectives on certain required areas (e.g., program performance, environmental impacts, potential areas for improvement).

- The public participation approach is not fully consistent with the degree of current public interest, history of public involvement, method of biosolids management, or related local circumstances.



COFFEE BREAK!

You have now read about the planning phase of developing and implementing a BMP. The key steps in this phase are as follows:

1. Identify and document all critical control points.
2. Establish a formal procedure to identify and track legal and other requirements that apply to the critical control points of your activities, products, or services.
3. Establish goals and objectives that are consistent with your biosolids management policy.
4. Involve interested parties in BMP planning.

Now you're ready to move into the implementation phase. Make sure to capitalize on all the time and energy spent planning! It will pay off.

Chapter 8

Implementation

Element



Roles and Responsibilities



Minimum Conformance Requirements

- 7.1 Establish and maintain records of the assigned roles and responsibilities for the BMP and biosolids management activities. These records shall define and document roles and responsibilities of employees for performing biosolids management activities and BMP functions.
- 7.2 Appoint an individual with overall responsibility for ensuring the BMP is implemented and maintained.
- 7.3 Provide the human, technical, and financial resources necessary to execute these responsibilities effectively.
- 7.4 Define and document the roles and responsibilities of contractor(s) retained to perform various biosolids management activities and BMP functions through contracts or service agreements.

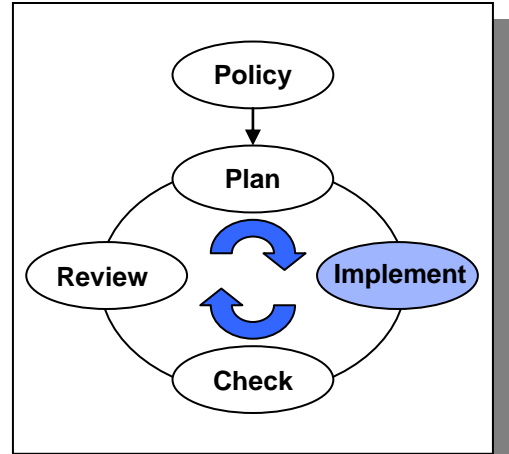


Interpretation

Identifying, defining, and assigning roles and responsibilities is one of the first steps in implementing your BMP:

- Everyone needs to know what they are supposed to do.
- Everyone needs to know how their roles do support the BMP.
- Everyone needs to have the authority and resources to fulfill their roles and carry out their responsibilities.

Roles and responsibilities for biosolids management activities should be consistent with and



Helpful Hint

Element 7 requires that the organization provide the necessary human, technical, and financial resources for employees to effectively carry out their roles and responsibilities for biosolids management.

These resources include:

- Adequate levels of staffing and contractor staff
- Sufficient capital investments for the necessary technology, equipment, and process controls
- Adequate funding in the capital and operating budget to pay for these resources
- Sufficient funding to cover training costs so that all staff have the necessary skills and knowledge to perform their assigned biosolids responsibilities effectively.

complementary to the general structure of your organization. A well-informed, motivated, and actively involved staff is your most powerful mechanism for generating new ideas, innovations, and continual improvement of your BMP. This does not happen by itself; you need to make sure it does by matching the right person to the right job.

You will need a biosolids program manager/ coordinator responsible for the BMP – who should it be?

Because the biosolids value chain links many technologies and processes that sometimes are thought of as separate rather than related activities, it is often advisable to vest responsibility for the BMP in a manager that can work and collaborate with departments that have responsibilities for critical control point management.

In larger organizations, many staff will be involved – sometimes representing many different groups or departments. Biosolids quality depends on many activities “upstream” of biosolids management activities and across your biosolids value chain.

In response, *everyone* should understand how their jobs relate to biosolids quality and to the whole biosolids management program, as well as how they relate to the specific areas or scopes they are involved in. This includes staff with key contributing roles, as well as staff with smaller roles.

In smaller organizations, where staff routinely wear “multiple hats,” there may be no dedicated biosolids staff. The plant operators, utility general manager, and several staff may compose the entire biosolids team.

Whatever your size, assigning roles and responsibilities is only the starting point. Management needs to support its commitment to the *Code of Good Practice* by providing the necessary human resources for implementing an effective BMP, as well as adequate other resources to support your staff in carrying out their roles and responsibilities.

This means you need to have enough people, in addition to the right people, for each set of activities. You also need to ensure that they receive proper training and possess the appropriate specialized skills

Helpful Hint

To identify appropriate roles and responsibilities:

- Conduct mapping exercises of your roles and responsibilities against:
 - Biosolids value chain
 - Critical control points and operational controls
 - *BMP Elements*
- Assess your roles and responsibilities maps
- Finalize new roles and responsibilities
- Document!

to satisfactorily perform their assigned duties in an environmentally responsible way.

Roles and responsibilities are inextricably linked with most, if not all, of the other BMP Elements. In creating those Elements, and in developing this Element, you are asking yourself who will do this and who is responsible?



Guidance

This section will walk you through a stepwise process to evaluate your current assignment and allocation of roles and responsibilities in your biosolids management program – across your entire biosolids value chain – to identify any changes or improvements you need to make to support your BMP.

Begin With Your Implementation Planning Visit Results

(If you prepared a NBP Biosolids Management Program with your own resources, use the results of your own assessment.)

- What did your BMP implementation planning visit tell you about your current assignment of roles and responsibilities for biosolids?
- Are your job descriptions specific and clear?
- Have you vested your staff with the proper authority to fulfill their responsibilities?
- Have you accounted for biosolids activities performed by staff who wear “multiple hats?”
- Have you defined contractor roles and formalized their responsibilities in contract documents?

Review your results and have them ready for a more detailed evaluation of your current practices.



Helpful Hint

Remember the Contractors

Don't forget to include any contractors and subcontractors in your mapping exercises. You need to review their roles and responsibilities too. You could involve them in the exercises. At minimum, run your evaluations and decisions by them for input and concurrence.

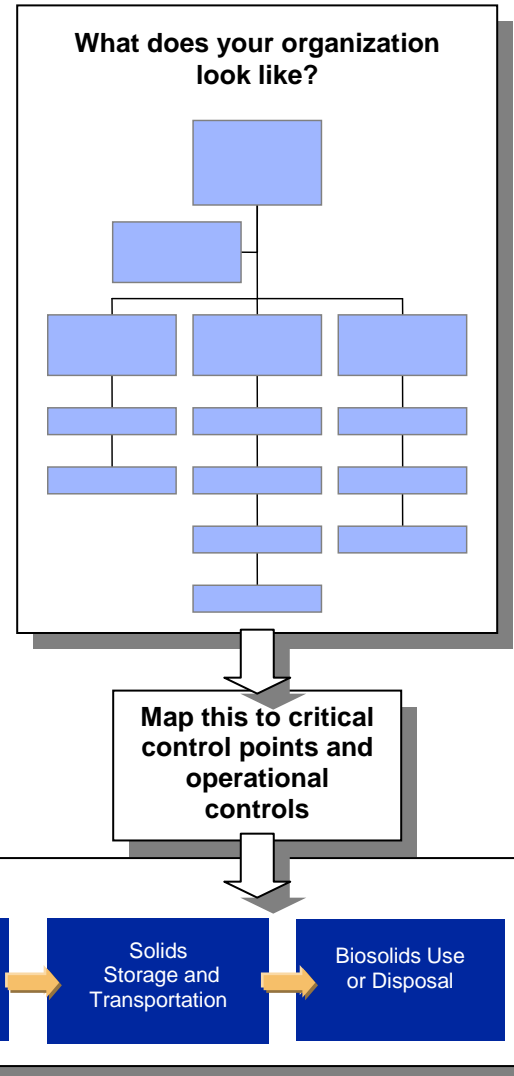
Conduct Mapping Exercises

Here are a couple of organizational and job mapping exercises that can help you evaluate your current arrangements compared with the needs of your BMP. You don't have to go through all of them. But each does give you a slightly different view of what you are doing now. **Remember, this BMP Element doesn't require any changes to your current organizational structure.** It is about making sure your staffs' roles and responsibilities are clearly defined, understood, and aligned with your BMP.

What does your organizational structure look like now? Take out an organizational chart that identifies divisions, departments, and groups – go down to the individual level.

- Are all your biosolids activities depicted?
- Does the chart identify specific biosolids activities, areas, or unit processes?
- Just by looking at it, can you get a good idea of the roles and responsibilities in your biosolids program?

If not, maybe you need to draw another chart or add more detail to the existing one.



How do current roles and responsibilities fall out along the biosolids value chain?

- How closely does your current structure correspond to the groups of activities and processes represented in your biosolids value chain?
- Do they map in a relatively straightforward way, or does it take some time to figure out how your roles and responsibilities fall out?

Try this exercise: Take your existing organization chart and reconfigure it under the blocks representing the biosolids value chain links (see Table 8-1).

Drill down and map your current roles and responsibilities to your critical control points and operational controls identified under Elements 3 and 10.

- What organizational groups and which individuals are responsible for each of your control points?
- What are their specific roles?
- Is this the same mapping as for operational controls?
- Do any responsibilities differ or overlap in important ways?

You can do this from several vantage points (or all).

1. You can list your critical control points and operational controls under the organizational box, group, or individual primarily responsible in an annotated org chart.
2. You can start with your critical control point and operational control lists, and write down roles and responsibilities there.
3. You can use a matrix format.

Do whatever seems most useful to you. Each tool will provide the same information (see Table 8-2).

Now map your current roles and responsibilities to the goals and objectives developed under Element 4. Use the same organizational diagrams or critical control point/operational control charts, or develop a new chart. Again, you can list goals and objectives under corresponding groups or individuals who are responsible for them, or you can write down lead and other responsibilities on your list of goals and objectives. (See Table 8-3).

- Who is the lead?
- Who else plays key roles?
- Who provides support?
- Is someone accountable for each goal and objective?



Helpful Hint

Peel Away the Layers

You will want to think about roles and responsibilities at several organizational levels, corresponding to your structure:

- Organization
- Facility/plant
- Division
- Department
- Section
- Group
- Work team
- Individual

There also are different levels of responsibility:

- Ultimate authority
- Primary/lead
- Major
- Secondary/co-lead
- Key support
- Contributor
- Minor
- Ancillary

- Is there anyone not assigned to support at least one goal and associated objective(s)?

Finally, and at a minimum, you should map your roles and responsibilities to your BMP Elements. For each BMP Element, to differing degrees, you will need to identify who or what department, group, or other organizational entity is involved in each activity, their respective roles, and specific responsibilities.

As described in Element 5, you will need to document this information in your BMP Manual and in your action plan. You can do this by reviewing your manual and action plan to make sure you've identified roles and responsibilities where needed. Or, as a crosscheck, you can consolidate your assignments and list roles and responsibilities by BMP Element (see Table 8-4).

Assess Your Role and Responsibility Maps

Now, look at how your roles and responsibilities are arrayed for each of the comparisons you made.

- What stands out as you look at them?
- Is each link in the biosolids value chain adequately covered with the breadth of responsibilities and the depth of skills necessary?
- Do you know who is specifically responsible for the BMP?
- Do you know what group or who specifically is responsible for *each* critical control point?
- Do you know what group or who specifically is responsible for *each* operational control?
- Are these the right groups and the right people for the job? Do they have the knowledge, skills, training, and authority to fulfill their roles?
- Have you assigned responsibilities for your goals and objectives? Are these consistent with group and individual roles?
- In conjunction with other BMP Elements, are you properly identifying current roles and responsibilities and are you making new ones consistently and systematically?
- Does everyone know their roles and their current responsibilities?



Helpful Hint

Don't forget to bring roles and responsibilities down to the individual level!

For everyone's benefit — managers, supervisors, and regular staff — try to include at least a summary of an employee's biosolids-related responsibilities in his or her job description. Clearly, if someone works in the belt press area this will be automatic.

But make sure descriptions of other positions across the biosolids value chain make reference to their relationships to biosolids activities and any specific roles and responsibilities.

If your human resources program includes personal performance plans, make sure individual goals and objectives are aligned with and support individual roles and responsibilities, as well as those of larger organizational units.

- Have you made plans to communicate new roles and responsibilities to your staff under Element 9?
- Have you planned for any additional instruction and training for changed or new roles under Element 8?

Finalize Your New Roles and Responsibilities

Based on your assessment and mapping exercises, establish roles and responsibilities for your BMP. This likely will mean keeping some arrangements exactly as they were when you began this process. If certain activities are running smoothly and people are performing well, don't reorganize or reassign if you don't need to.

However, after going through this process, most organizations will find they want to make at least some adjustments. This may mean that you shift some roles or responsibilities between two departments, or among several individuals working on the same unit process. In some cases, you may find you need to make bigger changes that involve a more complex reallocation to achieve the effectiveness you desire.

One of the most important criteria for assigning roles and responsibilities is consistency. Are roles and responsibilities consistent across organizational units, across process units, and across work group units? Strive for the right balance — don't make redundant assignments where you don't need to and don't leave any gaps, hoping someone will just jump in.

How you choose to finalize your assignments is up to you. You can complete them as part of this Element. Or you can finalize them under other BMP Elements as long as you provide the proper cross-references for your staff, internal auditors, and external auditors.

Document Everything!

In conjunction with other BMP Elements and this Element, you will need to thoroughly document roles and responsibilities of your staff and any contractors as they relate to biosolids operations and the BMP. According to the requirements and guidance for other Elements, develop a written record of roles and responsibilities, including departmental assignments all the way down to individual job descriptions.

Helpful Hint

In whom do organizations vest lead responsibility for their biosolids programs?

- Department director
- Operations manager
- Division manager
- Biosolids program manager/coordinator
- Biosolids management specialist

What do contractors do?

- Pick up biosolids
- Transport
- Land Apply
- Treat to Class A
- Compost
- Identify application sites
- Permit application sites
- Monitor application sites
- Identify new markets
- Develop new products
- Conduct public education



NBP Auditor Considerations

The auditor will look for objective evidence in a number of ways:

- ✓ Biosolids roles and responsibilities are clearly defined in job descriptions.
- ✓ Identification of Biosolids Manager/Coordinator with overall responsibility for the BMP.
- ✓ You have a biosolids management activities organization chart to help define respective roles and responsibilities.
- ✓ You have other documentation, such as matrices or charts that identify roles and responsibilities for critical control points, operational controls, biosolids goals and objectives, and BMP Elements.
- ✓ Your employees can describe their assigned roles and responsibilities and discuss their involvement in the BMP — this is a way of testing whether biosolids management has truly been incorporated into day-to-day job activities.
- ✓ Roles and responsibilities for biosolids management activities outsourced to contractors are documented in the actual contract or service agreement, and your contractors have their own records detailing their roles and responsibilities

Financial, Human, and Technical Resources

To verify that you have provided the “financial resources necessary,” the auditor will look to see that funds are allocated, consistent with the outcome of an evaluative process to ascertain the resources necessary to support effective BMP implementation. The auditor will *not* verify whether allocated funds are deemed sufficient, but will verify that you used an evaluative process to determine the resources necessary and then provided a level of financial resources consistent with that evaluation. The auditor will keep in mind that Biosolids Management Program and plant managers do not always have complete control over the level of capital expenditures provided.

Checklist for Element 7

You might consider an Element-by-Element approach to making sure you’ve covered your role and responsibility bases. However, keep in mind the BMP is a system in which all the components and elements are working together.

- BMP Manual — We made assignments for pulling our program manual together and writing our action plan; we involved a broad cross-section of people.
- Policy — Someone has the authority to approve our policy, someone is responsible for periodically reviewing it.
- Critical Control Points — Our team identified our critical control points, we know what group is responsible for which points, and someone is responsible for making sure other BMP Elements are consistent with them.
- Legal and Other Requirements — We know who has the lead for tracking our requirements; certain people have assignments to periodically review our program against any developing or new regulations.
- Goals and Objectives — each goal and objective has a name or names written next to it for who is responsible for seeing that we achieve it; certain people review our goals and objectives on a regular basis and are responsible for updating and revising them.
- Public Participation in Planning — We assigned a workgroup to develop our public participation strategy and it is implementing it; the person with lead responsibility knows who he or she is and our stakeholders know who he or she is.
- Roles and Responsibilities — Together, we reviewed our current structure and made adjustments as necessary to develop an effective and conforming BMP.
- Training — Someone is responsible for planning and executing our training program; someone keeps track of who gets what training.
- Communication — We have identified a point of contact for outside communication; several people are responsible for different parts of our outreach program, and internally we made assignments by area of expertise.

In determining if your organization has been provided the human, technical and financial resources necessary to “effectively execute” responsibilities, the auditor will look to see that biosolids management activities are producing biosolids materials that are in compliance with all legal and other requirements and meet other identified, desirable characteristics (e.g., you might identify “no visible plastics” as a desirable characteristic based on customer requirements or selected final use). It also means that your BMP has been implemented and updated as necessary.



Nonconformance Examples

The auditor may consider the following to be nonconformances with this BMP Element.

- Defined roles and responsibilities, for both employees and contractors, do not fully cover the scope of BMP functions reflected in the BMP Manual.
- The organization has provided some, but not all, of the human, technical, and financial resources necessary to effectively execute these defined responsibilities.
- Documentation of roles and responsibilities of employees or contractors is incomplete.
- Some employees or contractors are not fully aware of or do not understand their BMP roles and responsibilities, indicating that roles and responsibilities have not been clearly defined or assigned.

Checklist for Element 7 (continued)

- Operational Control of Critical Control Points — Someone is responsible for each and every operational control corresponding to significant critical control points.
- Emergency Preparedness and Response — A team of us reviewed our existing program and identified additional biosolids-specific scenarios we might have to deal with; we have an incident coordinator and a biosolids specialist who will manage any emergency.
- Documentation, Document Control, and Recordkeeping — Several people were responsible for compiling our manual, developing procedures, and template forms; these or other people share responsibility for reviewing and approving all biosolids-specific documents.
- Monitoring and Measurement — Everyone involved in sampling and lab analysis knows what he or she is supposed to do and how it fits into the biosolids value chain.
- Nonconformances: Preventive and Corrective Action — If someone finds a problem, he or she knows who to call, what they should do immediately, and where to get SOPs for identifying the source and initiating corrective action.
- Biosolids Management Program Report — A person or people are responsible for tracking our progress toward goals and objectives, for compiling important information along the way, and for summarizing results in a report.
- Internal BMP Audit — We have assigned responsibility for conducting internal audits to a specific group of people; we have identified the lead; and they understand the protocol.
- Management Review — Selected management-level staff are responsible for scheduling and conducting an annual review of our BMP; people who contribute information and analysis to this review know who they are and what they need to do.



Example

Table 8-1 — Biosolids Value Chain Roles and Responsibilities Matrix

Position Description	Wastewater Collection and Pretreatment	Wastewater Treatment and Solids Generation	Solids Stabilization	Solids Conditioning and Handling	Biosolids Storage	Biosolids Transportation	Biosolids Use or Disposal
Utility General Manager	X						
Director, Operations	X	X	X	X	X	X	X
Operator 1				X	X	X	
Operator 2				X	X	X	
Operator 3		X	X				
Operator 4		X					
Maintenance Superintendent		X	X	X	X		
Maintenance Tech1		X	X	X			
Maintenance Tech 2		X	X	X			
Regulatory Affairs	X						X
Laboratory	X						X
Engineering	X	X	X	X	X		
Procurement	X						X
Human Resources							
Contractor	X					X	X



Example

**Table 8-2 — Critical Control Points and Operational Controls Roles and Responsibilities Matrix
Biosolids Value Chain Category — Collection and Pretreatment**

Personnel	Industrial SIU Permits	Industrial SIU Monitoring	Industrial Permits	Industrial Monitoring	Commercial Permits	Inspection	Collection Zone Monitoring	Emergency Response
Utility GM	X		X		X			
Regulatory Affairs Manager	X		X		X			
Industrial Permit Administrator	X		X					
Commercial Permit Administrator					X			
Field Tech 1		X		X			X	X
Field Tech 2		X		X			X	X
Field Inspector 1					X	X		X
Field Inspector 2					X	X		X
Lab Chemist							X	X
Lab Technician							X	X
Engineer	X		X		X			X
Contractor								X



Example

Table 8-3 — Goals and Objectives Roles and Responsibilities Matrix

Goals & Objectives	Regulatory Affairs	Operations Front-End	Operations Back-End	Engineering	Outside Engineer	Laboratory	Contractor
Goal 1 – Increase Land Application							
Objective 1A		X	X	X	X	X	
Objective 1B	X		X	X	X	X	X
Objective 1C	X		X			X	X
Goal 2 – Reduce Odor							
Objective 2A		X	X	X	X		
Objective 2B		X	X	X	X	X	X
Objective 2C			X	X	X	X	x
Goal 3 – Reduce Lead and Copper							
Objective 3A	X			X		X	
Objective 3B	X			X		X	
Objective 3C	X			X		X	



Example

Table 8-4 — BMP Elements Roles and Responsibilities Matrix (by Department)

BMP Elements	Senior Management	Regulatory Affairs	Front-End Operations	Back-End Operations	Engineering	Procurement	Human Resources	Contractor
1. BMP Manual	X	X	X	X	X	X	X	X
2. Biosolids Management Policy	X			X				
3. Critical Control Points		X	X	X	X			X
4. Legal & Other Requirements	X	X	X	X				X
5. Goals & Objectives	X	X	X	X	X	X	X	X
6. Public Participation in Planning	X	X						X
7. Roles & Responsibilities	X	X	X	X	X	X	X	
8. Training							X	
9. Communication	X	X		X				X
10. Operational Control of Critical Control Points		X	X	X				X
11. Emergency Preparedness & Response		X	X	X	X			X
12. Documentation, Document Control, & Recordkeeping		X	X	X			X	X
13. Monitoring & Measurement		X	X	X				X
14. Nonconformances: Preventive and Corrective Action		X	X	X	X	X	X	X
15. Biosolids Management Program Report		X	X	X	X			X
16. Internal Management System Audit		X						
17. Management. Review	X	X	X	X	X			

Element



Training



Minimum Conformance Requirements

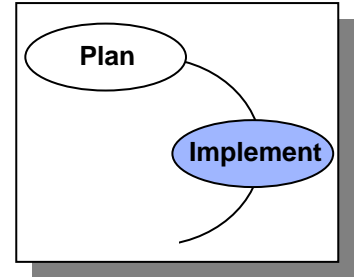
- 8.1 Establish and maintain a training program to ensure that employees responsible for specific biosolids management activities and for implementing various BMP functions are competent in performing their assigned tasks and duties. The training program shall provide general awareness of the BMP and how each employee's assigned roles and responsibilities relate to the entire biosolids value chain.
- 8.2 Include in the training program new or reassigned employees.
- 8.3 Maintain records of individual employee training delivered and completed.
- 8.4 Require that contractors establish their own training programs consistent with their roles and responsibilities in biosolids management activities as defined through service agreements.



Interpretation

No matter how many operations manuals, reference notebooks, or quick-reference cards are provided, some degree of training will be necessary for both the organization's employees and contractor employees to have the necessary awareness, skill, and knowledge to conduct their assigned biosolids responsibilities. Proper training will ensure that your employees can carry out their responsibilities efficiently and effectively *and* have a sufficient understanding of how their activities affect biosolids management. Your employees are your most valuable resources, and providing proper training is one of the best investments you can make!

Training needs to cover standard day-to-day activities and procedures, as well as appropriate responses to abnormal situations. Training also should reinforce best practices at an operational and process unit level,


 **Helpful Hint**

Training is a critical success factor in operating an effective BMP. It is inextricably linked with assigned roles and responsibilities and operational controls. All employees and contractors should, at a minimum, have training that addresses the following awareness, skills, and knowledge areas:

- The biosolids value chain and overall BMP;
- Biosolids-related legal and regulatory requirements that apply directly or indirectly to their jobs;
- Standard operating procedures and work instructions that are necessary to meet biosolids legal, quality and public acceptance requirements;
- Communication and public outreach;
- Monitoring and measurement; and
- Documentation, document control, and recordkeeping.

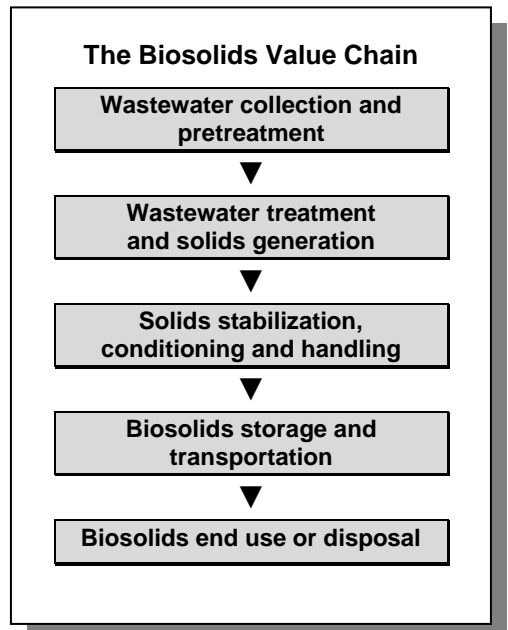
as well as at a programmatic level. The training methods you select should match your organization's size, structure, and style. The method also should match the issues and material being covered. Options include structured on-the-job training, including apprenticeships and mentoring; classroom instruction; outside workshops, seminars, and courses; computer-based interactive training courses; and formal certification programs.

Training is particularly important in a BMP, especially for managing the full value chain of biosolids management activities. This is true for several reasons.

1. Because the biosolids management activities encompass such a broad range of operational areas, many employees may not know all they should about their involvement in the BMP without supplemental training. Your staff historically may have viewed biosolids management as a waste disposal activity rather than an integral part of the overall biosolids value chain.
2. Many of your educational and training activities that could support your biosolids management activities may still be missing one or more of the following key components:
 - Coverage of biosolids information and operations at an adequate level of detail;
 - Full consideration of the interrelationships between links in the biosolids value chain (see also critical control point categories); or
 - Appropriate emphasis on and understanding of beneficial use objectives and beneficial use issues.

For these reasons, you will want to tailor your training program to provide the necessary level of awareness, skill, and knowledge to your staff and, as appropriate, to contractor employees. Contractor employees often are the points of contact with the public and other stakeholders and must be trained effectively to perform their assigned duties satisfactorily.

You will need to make sure mechanisms are in place to verify 1) that training is provided and occurs as planned, and 2) that training activities are successful



Helpful Hint

Key Steps for Training Requirement

- Define required skills and qualifications and identify training needs.
- Evaluate your current training program.
- Re-design or augment your training program, as required.
- Provide training.
- Document training received by employees.
- Evaluate training efficacy – demonstrated mastery of skills, competency.

and effective. Competency or mastery of the skills and knowledge covered in the training is a critical success factor. This guidance section suggests some ways to make your training more effective.

The method you select for assessing the efficacy of training will depend on the type of training and the skill set or knowledge being covered. For example, for SOPs and work instructions involving equipment and process controls, it's doing the job properly in the right sequence and keeping the necessary logs and records.

In keeping with continual improvement, you will need to review your training program periodically to make sure it is consistent with any changes to your operations or BMP Elements. Refresher training often is necessary, especially for infrequently performed operations.



Guidance

You should begin developing this Element by evaluating your current training activities. You then will be in a good position to identify any additional training needs. You may find that you can modify or add to existing training activities to address some needs, while in other cases you may need to develop new training programs.

Consider designing this training Element in parallel with establishing roles and responsibilities, as described under Element 7. At a minimum, your training program and identified roles and responsibilities need to be consistent. The training your people will need obviously depends on the job you are asking them to do. Also, the job(s) people are able to do (and how well they can do them) depends on their training providing and reinforcing important knowledge and skills.

As with roles and responsibilities, you will be examining training on several levels:

1. The BMP requirement covers your *general* training program as it relates to preparing and enabling your staff to carry out their biosolids-related responsibilities.

Helpful Hint

Ask yourself: What are the current sources or methods of biosolids training in our organization?

- On-the-job training for assigned duties
- Training on SOPs, work instructions
- State wastewater treatment plant operator certification programs – solids/biosolids modules
- State land application certification programs (site selection, 503 regulations, agronomic rates, application methods, testing and records)
- Trade association biosolids regional meetings and workshops
- Annual WEFTEC conference – papers and workshop sessions
- Formal academic training in community college, college, or university

2. The requirement also pertains to *NBP BMP-specific* training targeted to teaching your staff about the BMP Elements, their roles, and additional skills or knowledge they need to help implement your BMP.

Further, you will need to evaluate current training and additional training needs along several axes just as you did for roles and responsibilities:

- Processes and activities in each link of your biosolids value chain;
- Skills and knowledge needed to manage critical control points and operational controls; and
- Special understanding of your BMP Elements and how they fit together to create an effective BMP.

This means that you probably will want to coordinate development of your training Element with Element 7. You can establish the training and roles-responsibility Element in parallel, or use an iterative process to develop and refine the two. However you do it, you likely will want to draw on the role and responsibility mappings you did for Element 3, Critical Control Points, to provide a basis for evaluating and augmenting your training programs.

First, Evaluate Your Current Program

Begin with your BMP implementation planning visit results (or internal assessment if you used your own resources to prepare the NBP BMP):

- What were your strengths with respect to training?
- Did you have any weaknesses?
- Do you face any special barriers to offering or accessing specific kinds of training?
- Are there any special opportunities available to you—local community college, for example?
- Do you have special state or local requirements to meet?

For current training programs, ask yourself the following questions.

Helpful Hint

Ask yourself: What kind of training do we currently provide, pay for, or otherwise support?

- Operator licensing and certification
- “Odor” school
- Land applicator certification
- Soil tester certification
- Solids and biosolids management courses
- Continuing education
- Career advancement
- New staff orientation
- Corporate programs

- How well do our existing training programs cover overall biosolids operations? Does training adequately explain the links between different operations or unit processes and our BMP?
- What training methods do we rely on? Are the methods appropriate to the content and application?
- How effective are our programs? Do we measure and evaluate our results?
- Do we proactively plan training for individuals (e.g., develop a personal training plan or program)? Or do we provide training “ad hoc” or “by request” only?
- Overall, does our staff generally know how to do their jobs? Is this just by experience, tenure, or luck? Or are we doing our jobs well in part because we are well-trained?

Second, Identify Your Needs

This is a multi-step effort:

1. You will need to identify gaps you found in your BMP assessment and determine how to close them.
2. You will need to make sure your “new and improved” training program is aligned with the roles and responsibilities you establish under Element 7.
3. You will have to make sure you are not only covering biosolids operations training needs (e.g., how digester time and temperature impact a BMP objective), but that you also are covering BMP functional training needs (e.g., how to conduct an internal BMP audit).

You probably already have a training program, and have probably gone through a training program planning, review, and revision process at least once or twice. This is no different. This time, you will just be looking for a couple more specific things on which you make sure people get some training.

The most important thing for many organizations will be establishing the necessary *links* among different

Helpful Hint

- Establishing competency for various tasks can be a challenge. One informal method for assessing competency is to question employees on how they perform various aspects of their jobs (e.g., “Show me how you...”).
- Establish the current situation: What training needs are already being met with current training?
- Since some employees may require training on how to run a particular process, on-the-job training will certainly play a role.
- Consider developing a BMP training package for new employee orientation.
- Be creative about making “more time” available for training: Use lunch breaks or venues like safety meetings, staff meetings, and tool box meetings to provide “training” and reinforce key messages.
- Don’t forget to consider qualifications of your trainers. Professional certification may be appropriate for certain training functions.
- Consider “job aids” to supplement training or help establish competence. Examples include pictorial work instructions, decision tables, and flow charts.

types of knowledge skills and training. This is what will be new for many.

Your pretreatment staff probably are very skilled in influent load analysis. But do they know how various pollutant and constituent levels can affect biosolids quality, consistency, color, and odor? Your belt-press operators probably are very competent at their core jobs. However, do they understand the potential impact of upstream processes (e.g. solids storage, anaerobic digestion) on the physical, chemical, and biological characteristics of the biosolids? When abnormal conditions occur in the belt press area (e.g., smells or improper dewatering, specifications, etc.), do they know the potential causes?

Develop a series of tables or matrices to identify skills and knowledge needed for different job classifications, or roles and responsibilities to define your training needs (see Table 8-5). Check off needs you already are meeting. Work the ones that are left into existing training or develop new training programs for them. Use worksheets you already have to plan training, the tools developed to firm up your roles and responsibilities, or the examples provided, or develop new ones.



Helpful Hint

Know the Basics

Everyone — management and line staff — needs to have a *basic* understanding of the organization’s BMP, including policy, goals and objectives, onsite processes, disposal methods, and any beneficial use. People with specific responsibilities need to have the additional skills and knowledge to do their jobs.



Example

Table 8-5 — Training Requirements Matrix by Job Title

Job Title	BMP Overview	Biosolids Legal & Quality Req'ts	SOPs, Work Instructions	Emergency Response	Monitor, Measure Records	Storage & Transport	Certification
General Manager	X						
Operations Manager	X	X					
WWTP Operators	X	X	X	X	X		Operator certification
Regulatory Affairs Manager	X	X					
Field Technicians Inspectors	X	X	X	X	X		
Biosolids Manager							
Solids Operators	X	X	X		X	X	Biosolids certification
Truck Drivers				X	X	X	
Biosolids Contractor		X	X		X	X	X
Emergency Contractor				X	X		

Next, Refine Your Program

Based on your assessment of current programs and training needs:

- What are you going to keep doing?
- What are you going to change or improve?
- What new training do you need to offer or access?

Some organizations already have an organization- or department-wide training plan. If you do, then you can work to amend that document. If you don't have such a plan, then you might consider using the establishment of your BMP as an opportunity to develop one.

In your plan identify:

- **Who** needs **what** training – by job classification, role or responsibility, or individual.
- **Options** to meet training targets and requirements – formal course, web-based curricula, apprenticeship, mentoring, on-the-job.
- **Where** training is offered – in-house, community college, professional associations, special courses.
- **When** training is available, and should or can be scheduled – annually, biannually, semiannually, quarterly.
- **How** funds will be made available or earmarked to support designated training activities.
- **Why** training targets are met – how competency will be tested and how decisions will be made regarding refresher or follow-up training (see also below).
- **What** training incentives exist – tuition reimbursement, skill-based pay adjustments upon completion.

Provide Training!

After you develop your plan, stick to it. Training is generally most effective when it is provided on a regular basis, with a logical arrangement of topics and skills. Your employees probably will do their jobs

**Helpful Hint****Go Formal**

Prepare a formal training schedule for employees, planning in advance when training is to be provided to specific employees or groups. The schedule may simply list the type of training that is to be provided, who is to receive the training, and the date(s) the training is to be provided, or it may include more details.

If you rely primarily on on-the-job training for biosolids activities such as SOPs, work instructions, monitoring, testing, inspections, logs, and records, develop a description of the program, including the method(s) for demonstrating competency. Also, establish and maintain records.

Identify enhancements to your on-the-job training, required resources, funding sources, and incentives.

better and be willing to work harder if management takes a proactive approach to encouraging and providing training, than if staff has to ask repeatedly for training. Incorporating training into individual performance plans is one way to ensure broader organizational and divisional training needs are reflected in staff-level planning and actions.

Following are some ways biosolids organizations and their contractors currently provide biosolids-related and biosolids specific training opportunities to their staff.

- At one organization, employees take a state-level land application certification course.
- Many utilities have an established mentoring program — this is especially useful for cross-training and where unique equipment or unit process configurations are involved.
- At one organization, each employee in the biosolids group received 40 hours of training per year.
- Pretreatment and wastewater treatment operators at one organization attend various external workshops, symposia, and training courses on biosolids topics as part of its job progression training program.
- Some staff attend a variety of training sponsored by state and regional associations — wastewater generally, and biosolids specifically.
- One district sends its field operations supervisors to “odor school” and has eight “certified noses.”
- Another district that land applies has sent two staff for agronomist certification training.
- A large national contractor has extensive in-house training programs.
- A small local contractor sends its staff to state and local nutrient management courses.
- One organization supported three staff getting soil-testing certification.

Helpful Hint

Put Method in the Madness

Remember to pick the most appropriate training method for each particular need.

Training should be as interactive as possible, and include lectures *and* roundtable discussions, case studies, group activities and exercises, role playing, and on-the-job training.

Pick the method based on the people involved and the material that needs to be covered. For example, classroom training may be most appropriate for BMP awareness training for supervisors, while best-practices training for wastewater solids management personnel might include on-the-job training and apprenticeships.

For environmental awareness training, classroom training might include:

- An overview of both the organization’s biosolids management policy and Biosolids Management Program
- A step-by-step review of critical control points and operational controls
- A panel discussion with managers describing biosolids program goals and objectives for their areas
- A review of emergency preparedness and response, including simulation drills
- Written exercises and discussions about the individual employee’s role in the facility’s environmental management

For system operators training, classroom training might include:

- A video about biosolids quality problems caused by operational errors
- A review of relevant critical control points and operational controls
- A review of troubleshooting techniques and corrective actions for nonconformance situations

Field training might include:

- Hands-on demonstration of activities or processes that impact biosolids quality
- Field review of alarms, shutdown devices, bypasses, other emergency equipment, and monitoring equipment calibration procedures
- Mock drills for handling equipment malfunctions and other emergency situations
- Calculating agronomic rates

- A contractor using a patented biosolids treatment method sends staff to training certified by the patent holder.
- Many biosolids organizations send their staff to courses at local community colleges or state colleges (if nearby) — some colleges will help tailor courses for biosolids organizations based on regional demand.

Document Training Given and Received

You should keep track of *all* training your employees receive, whether it was given in-house, or received off-site. The easiest way to do this is to keep a record of planned and completed training in individual personnel files. In your training records include the date, location, course number (if applicable), and a short description of the curriculum or topics covered. Also note if any written exams or other tests of competency were taken, and if so the grade, assessment, certification, or license received. (See Table 8-6.)

The time when you record this information is a good time to make a note of any follow-on training required, recommended by management, or desired by the employee, and when the training is offered or should be taken.

These records provide evidence that employees have received required training, are capable of performing their assigned duties, and have the general knowledge and understanding they need to help support your biosolids program. Including the signature of the employee's manager, supervisor, or training provider in training records provides for authenticity.

Periodically Review Your Effectiveness

Remember to set up a process to evaluate the effectiveness of your training program periodically. This could be integrated with your annual management review (see Element 17), review and revisions to goals and objectives (under Element 5), or in conjunction with an assessment of roles and responsibilities (Element 7). Your internal audit program (under Element 15) also should incorporate a



Example

Sample Course List

Biosolids and Biosolids Management Program (BMP) Overview — Provides a general overview of the biosolids management policy, the overall BMP Elements, including a summary of legal requirements, goals and objectives, and performance

Biosolids Legal, Quality, and Public Acceptance — Provides more in-depth information on specific legal, quality, and public acceptance requirements for the organization's biosolids management program

SOPs and Work Instructions — Specific to each value chain category, job classification

Emergency Response — Training and simulation drills on biosolids emergency, abnormal situation response

Monitoring, Inspections, Measurements, etc. — Required testing, inspections, monitoring, sampling, calibration, and the associated recordkeeping requirements

Storage and Transportation — Requirements for storage, loading, truck cleaning, manifesting, routing

Certification program(s) relevant to biosolids — WWTP operator certification programs (levels 1-4), biosolids land application certification program, professional training, from community college or college courses and curricula.

review of your training program, either on an annual or rolling basis.



Example

Table 8-6 — Example BMP Training Log

Training Topic	Attendees	Frequency	Course Length	Course Method	Date Completed	Comments
BMP Awareness	Senior managers (5)	Annual	2 hrs.	Lecture	5-18-xx	
Supervisor EHS Training						
Biosolids Quality Overview						
Transportation						
Use or disposal, e.g., land application						
Emergency Response						
Accident Investigation						
Job-Specific Training (list)						
Other						

As part of this review, you can run through the process you used to refine your training program for this Element. At a minimum, you will need to ask yourself these questions:

- Do people have the knowledge and skills they need to perform their technical responsibilities and act as ambassadors for our biosolids program?
- Are we providing the right training?
- Do our staff have access to the type of training – classroom, seminar, on-the-job – that best suits their learning style and the topics?
- Are people learning? How do we know?
- Is the training we provide making a difference? Is our performance improving?
- How will we know when individuals or groups need refreshers or additional training?
- Do biosolids contractors have effective training programs for their employees that meet all legal and contractual requirements?

As with most Elements, documentation of training is key. Maintaining adequate documentation of the training courses or topics by job category and records of the training, including who was trained, the training content, and the date of training, will be necessary elements of objective evidence for BMP auditing. A sample training log is presented above.



NBP Auditor Considerations

The auditor will look for the following types of objective evidence for the biosolids training Element:

- ✓ Each job classification associated with biosolids management activities has the designated training requirements identified.
- ✓ A formalized training program and schedule for providing this training.
- ✓ Records of specific in-house training sessions, courses, who attended, the date completed, and mastery test results.
- ✓ Copies of training materials used to verify that required topics have been covered.
- ✓ Records of completed on-the-job training, courses, workshops, certifications, and so on in each employee's personnel file that has assigned biosolids management responsibilities, including off-site courses, workshops and training curricula provided through community colleges, colleges and universities.
- ✓ Training records to verify that training, consistent with the relevant job description, has occurred for new and re-assigned staff.
- ✓ Interviews with employees, including new and reassigned staff, with assigned biosolids management duties to verify training program activities are happening as described in the program and topics are consistent with identified roles and responsibilities.

Checklist for Element 8

You might consider an Element-by-Element approach, as you may have for Element 7, Roles and Responsibilities, to making sure you've covered bases. Here is a sampling of things you should run through.

- BMP Manual** — All employees who work in biosolids value chain areas have received an orientation to our BMP, including coverage of our program manual and action plan.
- Policy** — We have presented our policy to all employees, they know it well, they know how it drives our program, and know where to get a copy.
- Critical Control Points** — Everyone involved in biosolids management knows what our critical control points are, why they are critical, what happens at each point, and what they are supposed to do to manage them.
- Legal and Other Requirements** — Everyone has a general understanding of the legal requirements we face and are aware of other requirements we have voluntarily imposed on ourselves; people who need to have more detailed knowledge about requirements receive the training and continuing education opportunities they need to stay on top of things.
- Goals and Objectives** — Everyone knows what the goals and objectives are; people who are responsible for achieving goals and objectives have the training they need and make sure that anyone helping them or involved also has the proper training.
- Public Participation in Planning** — Staff with responsibility for dealing with the public and other stakeholders have on-the-job experience or specific training in the areas of meeting organization, planning strategies, facilitation, and public speaking; everyone in our biosolids program has been made aware of our public participation strategy and its implications for our program.
- Roles and Responsibilities** — Everyone knows what they are supposed to do and how to do it.
- Training** — Our in-house trainers have themselves been trained in teaching and mentoring techniques; we make sure outside trainers are properly qualified and credentialed.

- ✓ Observation of activities to verify employees have demonstrated competency in the necessary biosolids skills and knowledge for their assigned job duties.
- ✓ BMP documentation for a description of the training program to verify that it provides employees with a general awareness of the BMP and ensures that employees will be competent to perform their assigned biosolids management duties.
- ✓ Contract documents for inclusion of training program requirements for contractors.
- ✓ Contractor training materials to verify that the contractor training program is consistent with roles and responsibilities and has occurred.
- ✓ Interviews with contractors to verify that training has occurred.



Nonconformance Examples

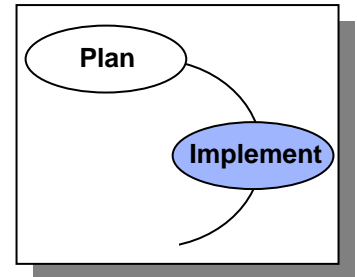
The auditor may consider the following to be examples of a nonconformance with this BMP Element.

- Training program content does not match the skills, knowledge, and awareness required to support employees' roles and responsibilities; for example, some employees may not be receiving appropriate training given their assigned roles and responsibilities, indicating that the process for tracking employee training may be deficient or that the training program is not entirely consistent with employees' assigned roles and responsibilities.
- Records of individual training are incomplete or inaccurate.
- An employee or contractor is not fully aware of assigned roles and responsibilities or of biosolids management practices or operational procedures, indicating that training has been inadequate to assure employees are competent in performing their assigned tasks and duties.

Checklist for Element 8 (continued)

- Communication — Our primary points of contact have received special training in public relations and public education (planning and delivery); everyone knows who the points of contact are and what our procedures are for responding to inquiries and complaints.
- Operational Control of Critical Control Points — Everyone has the technical skills, expertise, and knowledge they need to properly use and manage our operational controls, and people receive refresher training or advanced training as planned and needed.
- Emergency Preparedness and Response — Everyone in the organization has received general safety and emergency response training and knows our procedures; our response team and response coordinators have received special training that has included simulated drills.
- Documentation, Document Control, and Recordkeeping — Everyone who creates, handles, or otherwise manages documents has received training in and follows our document creation and control procedures.
- Monitoring and Measurement — Appropriate to their duties, our staff has received training in sampling techniques, QA/QC, analysis, and interpretation; everyone also knows how to read the instrumentation in their work areas and knows what the readings indicate.
- Nonconformances: Preventive and Corrective Action — People have been trained to prevent, identify, and correct nonconformances with our BMP and noncompliance with other requirements.
- Biosolids Management Program Report — We all know what we are supposed to do on a regular basis so that we can develop our performance report, and we understand why we develop such a report.
- Internal BMP Audit — Staff or contractors conducting internal audits have the proper qualifications and experience in audit techniques and in BMP requirements; participants understand our protocol and how they are supposed to facilitate and contribute to the audit.
- Management Review — Management-level staff involved in the review received special training on our BMP and understand how our operations, planning, and strategic and capital planning all fit together with our BMP.

Element

**Communication****Minimum Conformance Requirements**

- 9.1 Establish and maintain a proactive communications program that provides ongoing information about biosolids management activities and the BMP to interested parties and the public, consistent with local circumstances, the method of biosolids management, public communications history, and degree of current interest in the organization's biosolids management activities.
- 9.2 Include a procedure for receiving inquiries and requests for information from interested parties about the organization's biosolids management activities and BMP. The procedure shall define a process for ensuring a timely and complete response to inquiries by interested parties.
- 9.3 At a minimum, make the following information about the organization's biosolids management program and activities available to interested parties:
 - a) The biosolids management policy;
 - b) The applicable legal and other requirements;
 - c) The biosolids program goals and objectives for continual improvement;
 - d) The periodic BMP performance report; and
 - e) A detailed report of the independent, third-party verification audit results of the BMP.
- 9.4 Define roles and responsibilities of outside contractors in the communication program.
- 9.5 Communicate relevant information about biosolids management activities and all 17 BMP Elements to employees and outside contractors, consistent with assigned roles and responsibilities.



Interpretation

An effective communication strategy is essential for improving the public acceptance of your biosolids program and sustaining a stable biosolids management situation. Your organization's communications strategy must accomplish several things to support your BMP effectively.

Element 9 requires that your communication program have two components – one for external communication with partner agencies, other stakeholders, and the public; and one for internal communication with management, employees, and contractors. The two components may overlap some, but the communication approaches, venues, materials, level of detail, and message may differ across audiences.

Your communication program should convey information about your biosolids operations and your BMP. This Element provides lots of flexibility, as long as the communication program is consistent with local circumstances, the method of biosolids management and the current and historic interest in biosolids activities. The intent, however, is not to be passive with communications. (See Element 6 for considerations about what would make your communication program consistent with local circumstances, the method of biosolids management and the current and historic interest in biosolids activities.)

Commitment Needed

The purpose of the communication program is to provide information on your organization's biosolids management activities proactively, including the commitment to the *NBP Code of Good Practice* and the BMP in a manner that builds public awareness and understanding. A "proactive communication program" is one that accomplishes the following:

- Creates avenues for the public and interested parties to receive or access information about the organization's BMP, its biosolids management activities, and its biosolids management-related performance;

- Establishes quality, two-way flows of information that allow interested parties to communicate their perceptions and concerns regarding biosolids management activities;
- Establishes a foundation for communication with interested parties before problems arise or incidents occur;
- Includes plans to share key BMP Elements, including the biosolids policy, goals and objectives, the periodic performance report, and the results of third-party verification audit;
- Includes a procedure for responding to inquiries and requests for information in a timely manner, including information about the BMP performance as prescribed in the requirements of the Element; and
- Defines the communication roles and responsibilities of contractors.

As part of this process, you should identify and contact the people or organizations that are likely to receive inquiries or complaints from interested parties. For example, interested parties might direct inquiries or complaints about your biosolids operations to contractors or other organizations or government agencies (e.g., local departments of health, transportation, police).

Your external communication program should be proactive, informational, educational, honest, responsive, and linked programmatically in a way that supports achieving goals and objectives.

A Two-Way Street

A proactive program also goes beyond the basics. It:

- Builds and maintains support on a constant basis, not just when there's a problem;
- Provides information in a variety of formats, on a regular basis;
- Creates and takes advantage of opportunities to go beyond informational communication to educate stakeholders and the public about biosolids processes, safety, beneficial reuse, and related issues; and



Helpful Hint

Two Audiences

External – interested parties, stakeholders, and the public involved with or affected by the biosolids activities

Internal – Employees and contractors; need both general awareness and specific knowledge, consistent with the assigned roles for biosolids management

- Provides an opportunity for the public and interested parties to provide input to you (see Element 6, Public Participation in Planning for more about opportunities for the public to provide input).

An organization that proactively works to inform, educate, and listen to its stakeholders on a regular basis is in the best position to manage incidents and situations that might negatively affect public perceptions about the biosolids operations. Meeting the requirements for communications and establishing two-way flows of information with interested parties also demonstrates meeting the NBP requirements for the outcome area of Relations with Interested Parties. (See Chapter 11 for more information on outcomes.)

Response Mechanism

Your external communications and outreach program must have a formal procedure for responding to inquiries by external stakeholders. When external parties initiate communication, responses should be timely, accurate, and on point. In these situations, an organization can make a good impression and possibly turn a skeptic into a supporter with a little extra effort – perhaps by responding to a letter with a phone call, or perhaps responding to a call with a visit, or an invitation to tour your facilities.

The definition of a “timely response” to inquiries will depend on whether the public inquiry or request is part of an emergency situation or an inquiry pertaining to routine biosolids management activities. For emergency situations, a timely response could mean immediately. For routine inquiries, a timely response should be interpreted to mean that you acknowledge the receipt of the request or inquiry to the originator within two business days of its receipt. You have flexibility to determine the most appropriate means of acknowledgment (e.g., mail, email, phone). In addition, a timely response should be interpreted to mean that a response to the inquiry or the requested information is sent to the originator within two weeks of initial request or inquiry.

If you are unable to meet the suggested time frames for response, then you should inform the request originator of this within the two-week period and

provide a new timeframe for conveying the information requested. A response is “complete” if all requested information is provided. If you are unable to provide all or part of the requested information, indicate so in your response to the request originator and provide an explanation of why the information cannot be made available.

Internal Communication Loop

Your internal communication program should ensure that everyone directly and indirectly involved in biosolids management is aware of programmatic goals and objectives and the plan for achieving those targets, including what is expected of them and their immediate group. They also should be aware of progress to date. Internal communication programs generally will include updates and discussions at various regular staff meetings such as weekly managers’ meetings and monthly “all-hands” briefings.

Effective organizations tend to employ multiple communication mechanisms, including bulletin boards, memos, newsletters, performance reports, monitoring results, databases, internal e-mail lists, and internal web postings. One hallmark of an excellent internal communication program is having many staff familiar enough with the biosolids management activities that they can answer general questions and essentially act as ambassadors for the program in their professional roles and private lives.

In addition to communicating internal operational and administrative issues, a good internal communication program will keep staff apprised of external issues, positive and negative, that define the context in which the organization’s activities and biosolids products are evaluated.

Your BMP can be doing everything right on paper. But, if you and your staff are not on the same page, good performance may not be sustainable. And, if outsiders don’t know about the good performance — or worse, don’t believe it - achieving your biosolids objectives may be hampered or threatened, especially for beneficial use.



Guidance

You probably already have a communication and public outreach program that guides your interaction with stakeholders and the community. You also certainly have a system for communicating among yourselves, within and across departments, and with contractors and other partners.

You may not, however, have developed special plans and programs that address biosolids-specific issues. Your external communication and outreach strategies may focus on traditional wastewater issues – activity around the plant, your NPDES discharges, pretreatment issues, household waste issues, and possibly stormwater management.

Your internal communications may be aligned with your organizational structure and may not promote cross-departmental or cross-process interaction and education as much as it needs to be for biosolids issues, since the biosolids value chain extends across traditional organizational divisions.

This chapter walks you through an evaluation of your existing programs with a special emphasis on the unique challenges and opportunities associated with communicating about biosolids, both with the outside world and within your organization. First you'll look at external communications and outreach and then review your internal practices.

External Communication and Outreach

Begin with the results of your BMP gap assessment. How do you match up with this Element's requirements? Most programs will usually rely on a combination of *proactive* communication and outreach programming, as well as formal procedures guiding *reactive* communication when you need to respond to inquiries.

The specific mix of proactive and reactive activities that is right for you will depend on the nature of your biosolids production, handling, and disposal or beneficial use choices. It also will depend largely on your relationship with your constituents and the community, including past experiences and their level



Helpful Hint

Your external communication and outreach program should promote **awareness, knowledge, and understanding** of your Biosolids Management Program.

of interest in your program. For example, the right communication program for a facility that incinerates all of its product on site will be different from that for a facility that trucks liquid biosolids out to farms in other counties for application.

In addition to reviewing the results of your BMP gap assessment to begin developing this Element, also consider the program you develop for Element 6, Public Participation in Planning. In fact, you might consider developing Elements 6 and 9 together, since you may have some overlap between the two. At a minimum, Element 6 and the external communication and outreach component of Element 9 should be consistent. You will probably want to build this Element on the planning participation activities and establish your external communication program as an extension of those planning activities.

What do you need to communicate?

According to the requirements, you need to provide information about the following:

- Your biosolids management policy;
- Your legal and other requirements;
- Your BMP goals and objective; and
- Your performance in meeting requirements and objectives.

In satisfying Element 15, Biosolids Management Program Report, you will be sharing this information at least annually. Think about what else you might want to share with outsiders that might not be in your report, or might not be discussed in as much detail as people might want. In many cases, the information you disseminate in your ongoing communication program may be the same as you report annually, but the frequency will be different.

Who is your audience?

What you communicate, and how you communicate it, sometimes depends on *whom* you are trying to reach. Citizens living near your facility may be interested in different aspects of your operations than local officials. Again, this also will depend on your disposal or reuse methods. Who did you identify under Element 6 that you need to be talking to about planning? These are



Helpful Hint

Frequent and Varied Communication

To be effective, most programs will need to communicate with stakeholders, partners, and the public much more frequently than once a year.

Communication and outreach will need to be ongoing — using both formal and informal approaches. This will build trust in your program.

probably the same groups and individuals with whom you want to establish an ongoing dialogue.

Your audience may include the following:

- People living and working near your wastewater treatment plant;
- People living and working near disposal or reuse sites and along transportation routes;
- Local government officials in your jurisdiction, and any jurisdictions to where you may take your product;
- Partner agencies with health, environmental, public safety, and related responsibilities;
- Recipients and consumers of beneficial use biosolids products — farmers, silviculture businesses, owners and facilitators of reclaimed mining land, or gardening and landscape groups; and/or
- Local and regional community organizations including environmental groups, and general-issue groups, such as the League of Women Voters or the Chamber of Commerce.

Make a list of all the groups and people you have been communicating with already. Who should be added to this list? Write down why you need to reach out to each group and what you think the best way is to do that.

Pay particular attention to groups that exert an exceptional influence on public opinion. Give particular emphasis to “gatekeepers,” or key individuals who have disproportionate influence on public opinion about particular issues. For biosolids, this includes the following:

- Academics, agricultural sciences (perhaps from a nearby academic institution)
- Water quality professionals
- Public health officials
- Agricultural groups, farming representatives
- Environmental groups
- Regulatory officials



Helpful Hint

- ✓ Be sure to establish responsibility for external communication and outreach as part of this Element, in conjunction with Element 7, Roles and Responsibilities.
- ✓ Don't forget to identify roles and responsibilities for any contractors, appropriate to the work they do for you and with their communication skills.
- ✓ Consider having the same people responsible for both Element 6, Public Participation in Planning, and this Element.
- ✓ Involve your organization's or local jurisdiction's PR and public outreach specialists if you have such positions.

- News media (television, radio, print)

These groups exert a large influence on public opinion about biosolids recycling, and a successful communication strategy should seek to target them effectively. Educating gatekeepers about the safety and benefits of biosolids recycling may be the most efficient way to influence public opinion as a whole. Don't shy away from initiating a dialogue with groups that may be adversarial. Engaging these groups, even if difficult, is preferable to avoiding them.

How will you communicate with and reach out to each group?

Establish a *proactive* strategy and an inquiry-driven (reactive) strategy that matches communication techniques and outreach approaches to the information being shared and who you are sharing it with.

Your proactive strategy may need to do one or more of the following:

- Provide information
- Offer public education
- Promote public relations
- Conduct marketing

What will you do when they call you?

There also will be times when you will need to respond to inquiries from stakeholders, partners, the media, and the public. A proactive communication and public outreach program will make your job much easier when you do have questions than if you have an ineffective proactive strategy. In some cases, your reactions to inquiries and the inquirer's response are a very good test indeed of your proactive program.

Consider doing the following to establish your *reactive* biosolids communication strategy, in conjunction with existing procedures that cover all your operations, or as a stand-alone procedure.

- ✓ Establish a single **point of contact** — all phone calls, letters, media inquiries, and other questions should be directed to this individual.
- ✓ In the event the point of contact is unavailable, identify a **back-up** point of contact.

Helpful Hint

Make sure your responses are:

- Accurate
- Coordinated
- Quick
- Respectful — not emotional, not about personalities

Helpful Hint

- ✓ Establish points-of-contact for all inquiries
- ✓ Train your POCs in biosolids management activities, PR, and communication techniques
- ✓ Make a list of frequently asked questions — answer them — these are your FAQs & As.
- ✓ Train all staff in FAQs & As.
- ✓ Develop a written procedure with identified authorities to develop, review, and approve all responses.
- ✓ Keep a record of all inquiries and your responses.
- ✓ Establish links between this Element and Elements 3, Critical Control Points and Element 14, Nonconformances: Preventive and Corrective Action.

- ✓ These individuals not only should be knowledgeable about *all* of your biosolids management activities, but should receive **special training** in public relations, risk communication, facilitation, and perhaps even mediation techniques — you need to prepare them to deal with any situation.
- ✓ Make a list of all the questions that have come up to date. Get your BMP team together and brainstorm about what other questions people could conceivably have. From these develop a list of frequently asked questions — **FAQs** — and develop accurate, clear, and concise answers. Make these publicly available as appropriate — you might want to keep some of the more controversial questions and answers aside for when a question actually comes up.
- ✓ In addition to the main points of contact, all staff involved in biosolids management, especially contractors and organization staff that have an opportunity to come in contact with the public need to be **well-versed** in the FAQs and answers. They also need to know who to refer tough questions to. Incorporate this into your training program under Element 8.
- ✓ Develop a written procedure that details **protocols** for tracking, handling, and responding to inquiries. You might categorize inquiries into different categories and require different levels of approval for responses. For example, a field operator may have the authority to respond to a query covered under the FAQs, but you may require management-level sign-off for written response on a more sensitive or controversial issue. You might want to set up one or more form to track complaints, general questions, etc. Log in all questions and keep copies or records of all responses.
- ✓ **Establish links** between your inquiry-driven communication and Element 14, Nonconformances: Preventive and Corrective Action, especially for complaints. Also, incorporate an annual review of inquiries and responses into your annual goal and objective evaluation and setting process. Do you need to adjust your objectives or establish specific ones to improve your selected aspects of your overall program, or your response protocol?

**Helpful Hint****Listen Between the Lines**

Listen to what people are telling you you're doing wrong! These are things you need to correct and improve on.

Also listen to what they are telling you you're doing right. They may tell you directly, or you may have to read between the lines. Keep doing these things well and continually improve on them if you can.



COFFEE BREAK!

You have just read about how you should think about your external communication and outreach program with respect to biosolids and what you need to do to set up a conforming program. Remember, you will need to document and keep records of much of your external communications — proactive and reactive. You will read more about this under “Auditor Considerations” and “Checklist for Element 9,” as well as in the guidance for Element 12, BMP Documentation, Document Control, and Recordkeeping.

Think about what you have decided regarding external communication and outreach. Your internal communication program should not be substantively different. You will just be using different venues and techniques.

Internal Communication

One of the special challenges in establishing an internal communications program addressing biosolids activities is that the biosolids value chain involves staff across almost all your operations. To have an effective biosolids program and successfully take advantage of the benefits of a BMP, you might need to get people talking and sharing information that they do not share now. Additionally, it will be important for people to have an understanding of others’ roles and responsibilities, in addition to their own. You can achieve this with a strong internal communication program.

Employees at all levels should probably know as much about your BMP as you share with outside parties — and then some!

Everyone needs general information about the following:

- Your biosolids management policy
- Your legal and other requirements
- Your goals and objectives
- Your performance in meeting requirements and objectives
- Their roles and responsibilities and how they fit into the overall BMP



Helpful Hint

Establish Links

Look especially at the following Elements establish links with your internal communications program:

- Element 2 — Biosolids Management Policy
- Element 4 — Legal and Other Requirements
- Element 5 — Goals and Objectives
- Element 7 — Roles and Responsibilities
- Element 8 — Training
- Element 10 — Operational Control of Critical Control Points
- Element 14 — Nonconformances: Preventive and Corrective Action

- Other departments’ role and responsibilities, including contractors
- Up-to-date status of goals and objectives, monitoring results, preventive and corrective action, internal audit results, and management review results — as appropriate to their responsibilities

As with external communications, you should establish a *proactive* program to provide information about important program elements. This should occur regularly and should involve different types of communication mechanisms. You also should establish an *inquiry-driven* program to take and respond to employees’ and contractors’ questions about biosolids activities.

Just as you will for external communications, you will want to establish links between your internal communications program and other Elements, including those involving goals and objectives, nonconformances, and corrective and preventive action. Staff often are the best sources of information about problems and solutions. You should encourage them to speak out and get involved. Feedback loops between internal communications and other Elements can foster this type of environment.

What are you doing now? What more do you need to do?

Review your BMP gap assessment:

- What did it tell you about your internal communication with respect to biosolids?
- Do you have open channels of communication across the biosolids value chain?
- Are you using these effectively?
- Do you have any gaps or disconnects?

Take a look also at other BMP Elements you have developed or will develop:

- Given different employees’ responsibilities for different critical control points and operational controls, do they have a good understanding of what happens upstream and downstream of their area(s)?

Checklist for Element 9

External Communication, Public Outreach

- We have identified groups and individuals we need to be in contact with.
- We have decided what we need to be sharing with identified parties, based on their issues, concerns, and interests, and our needs.
- We have developed new materials or modified existing materials appropriate to each issue and group, in addition to regular reports.
- We have developed a process to collect and evaluate feedback periodically, from informal meeting debriefings to formal surveys.
- Select mechanisms and venues to implement proactive communication strategy.
- We have a process in place for inquiry and complaint intake, response, and follow-up.
- We have linked this Element with other Elements as appropriate.

Internal Communication

- We have established communication links across our biosolids value chain consistent with our operational and organizational structure.
- We have created a good mix of formal and informal communication and education opportunities.
- We have shared all publicly available information and materials with internal staff.
- We have developed biosolids-specific materials to share internally with staff involved in biosolids activities, as well as with other staff
- We have found opportunities to include biosolids-specific information in general-issue internal publications and message boards.
- We have made sure management and systems encourage and facilitate bringing new ideas forward, including complaints and solutions.
- We have given staff the knowledge and ability to be our ambassadors internally and within the community.

- Do they have the information they need to identify any problems and contribute to continual improvement?

Based on your assessment, develop a plan to enhance existing communication mechanisms and create new channels and opportunities for “cross-fertilizing” information and ideas. Use both formal and informal approaches. Frequent proactive communication and information also helps establish a favorable climate for asking potentially difficult questions and for communicating about problems when they arise. Such openness, directness, and honesty can help make your program the best it can be.

You will need to develop an internal communication program that is consistent with your organization’s size and structure. Smaller staffs usually can rely on informal means, with some formal venues. The larger your staff is, the more you probably will need formal, regularly scheduled meetings.



NBP Auditor Considerations

Following are some items an auditor will look for regarding external and internal communication.

External Communication and Public Outreach

- ✓ Written external communication program; can be summarized in your BMP Manual (see Element 1).
- ✓ Copies of materials provided to outside parties.
- ✓ List of recipients identifying what was sent or given – broken down by proactive communication and “by-request”.
- ✓ Information on your website (if you have one).
- ✓ List of speaking engagements and staff attending.
- ✓ List of meetings with groups, constituents, etc. (identify who asked for the meeting or if it is regularly scheduled).
- ✓ Surveys, focus group results, and other tools used to gather information.
- ✓ Facility or plant tour schedule; sign in sheet if feasible.

- ✓ FAQs and answers.
- ✓ Procedure for receiving and responding to inquiries and requests for information.
- ✓ Inquiry and complaint log, written responses, response action, and follow-up.
- ✓ Interviews with employees responsible for implementing the communications program and procedure for receiving and responding to inquiries and requests for information.
- ✓ Contract documents, service agreements, and contractor procedures for defined roles and responsibilities of contractors in the communication program (as applicable).
- ✓ Contractor logs or records.
- ✓ Interviews with contractors.

Internal Communication

- ✓ Written internal communication program; can be summarized in your BMP manual (see Element 1).
- ✓ Copies of materials distributed and made available.
- ✓ List of who gets or has access to different information sources.
- ✓ Information on your Intranet (if you have one).
- ✓ List of internal meetings and attending staff where biosolids activities are a main topic.
- ✓ List of other meetings and attendees where biosolids can and has come up.
- ✓ Suggestion box contributions, internal survey results, other tools used to gather information.
- ✓ Internal question and complaint logs, any written responses, response action, follow-up.



Nonconformance Examples

The auditor may consider the following to be examples of nonconformances with this BMP Element.

- The communication program is not fully consistent with local circumstances, the method of biosolids management, the organization's public

communications history, or the degree of current interest in its biosolids management activities.

- The organization's communication program is not being fully implemented as documented or intended.
- Records for receiving, tracking, or responding to inquiries and requests for information from interested parties are incomplete or do not include sufficient information to ensure that the responses are timely and complete (e.g., tracking logs do not include dates that inquiries were received or responded to).
- Records, or the lack thereof, indicate that the organization's communication program fails to respond, or to respond in a timely manner, to inquiries and requests for information.

Element



Operational Control of Critical Control Points



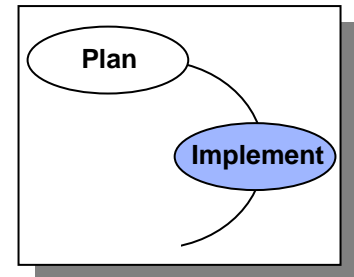
Minimum Conformance Requirements

- 10.1 Develop and implement standard operating procedures, work management practices, or other appropriate methods at all critical control points throughout the biosolids value chain to manage potential environmental impacts effectively.
- 10.2 Incorporate all legal and other adopted requirements in the operational controls of critical control points.
- 10.3 Consider applicable best management practices as defined in various authoritative sources on biosolids management (e.g., the *National Manual of Good Practice*, Water Environment Federation manuals of practice).
- 10.4 Include appropriate preventive maintenance procedures and work management systems for maintaining equipment, instrumentation, vehicles, and other treatment technology and process control systems associated with the organization's biosolids management activities.
- 10.5 Require that contractors establish their own operational controls consistent with their roles and responsibilities in biosolids management activities.



Interpretation

Operational controls are where “the rubber meets the road.” Each identified critical control point must have one or more operational control in place. The primary purpose of operational controls is to ensure that your day-to-day biosolids management activities consistently meet your organization's policy obligations, including legal and voluntarily adopted performance requirements, and other commitments made to the public. Operational controls help you minimize and eliminate negative environmental impacts from biosolids activities and maximize the benefits your program delivers to the community.



What's an Operational Control?

Operational controls are used to identify, evaluate, manage, monitor, and influence conditions at and between all critical control points.

Operational controls include:

- Ordinances
- Regulations
- Standard operating procedures
- Practices
- Technology
- Instrumentation
- Process controls
- Other criteria

— Developed, implemented, and maintained by an organization to ensure effective management of all critical control points associated with its biosolids management activities throughout the biosolids value chain.

Operational controls perhaps are your most powerful tools for achieving your goals and objectives.

Effective operational controls are one key to continual improvement. Think about why you may have fallen short of your goals and objectives in the past. These instances may have involved compliance requirements or a desire to improve public acceptance and biosolids quality for your use or disposal options. Often, the root cause of failure to meet your requirements consistently and reliably is the lack of standardized procedures and practices.

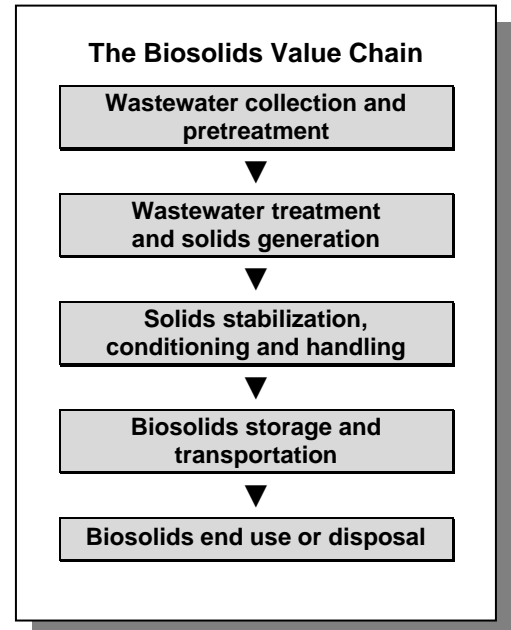
For example, installing advanced process treatment technology doesn't automatically ensure improved performance. Even installing automated unit treatment process controls and SCADA doesn't guarantee target performance. In these and all cases, equipment must be operated and maintained properly.

Effective operational controls go hand in hand with standard operating procedures and practices, ensuring you systematically operate your processes and conduct your activities consistent with your policies, requirements, and goals and objectives.

Under Element 3, you identified critical control points throughout your biosolids value chain. In combination with Element 3, under Element 10 you will identify existing operational controls, as well as develop and implement any new operational controls needed, and maintain standard operating procedures and practices for biosolids management activities under your direct control and influence — again, throughout your biosolids value chain — to ensure you consistently meet legal, quality, and public acceptance requirements, as well as your goals and objectives.

To achieve operational control, you will need to do the following:

- ✓ Develop effective pretreatment programs that prevent introduction of undesirable pollutants into the wastewater collection system; pretreatment operational controls include ordinances, permit programs for significant user classes, inspections, discharge monitoring, enforcement procedures, and emergency preparedness and response procedures for spills and accidental discharges



- ✓ Develop, implement, and maintain documented procedures for your biosolids management activities to ensure you consistently meet operational specifications; operational control means that the unit process parameters or conditions, whether manual or automated, are operated consistently within control points, personnel are effectively trained in SOPs, the prescribed laboratory testing is being done, and preventive maintenance schedules are being followed
- ✓ Establish and consistently operate within prescribed operating specifications and control limits (e.g., pH, feed rates, temperatures, pressures, detention time, batch times, drying times)
- ✓ Establish the necessary contractual requirements with contractors to ensure that they consistently and reliably meet their assigned biosolids management duties and overall responsibilities

Effective preventive maintenance programs and procedures are important operational controls too. If unit treatment processes and equipment are unreliable and are breaking down continually, they likely will be taken out of service for unscheduled repairs, and the effectiveness of your biosolids management activities may be compromised. Standard operating procedures and practices apply to preventive maintenance activities for critical unit treatment processes and biosolids equipment (e.g., front-end loaders, trucks, land application equipment, pump stations).

Effective operation and maintenance of pollution abatement equipment and treatment systems also is an important class of operational controls for biosolids. Your treatment systems are your first line of defense. If they are not operated properly or break down frequently because of equipment failures, undesired pollutants will get into your solids and biosolids.

Certain biosolids management methods also require critical operational controls for pollution abatement equipment. For example, biosolids incinerators have sophisticated air pollution control systems that must be operated and maintained properly. Improper operation or breakdown failures of this equipment impact biosolids management activities. While incinerator air

Examples of Operational Controls at Different Points in the Biosolids Value Chain

- Collection and Pretreatment - Ordinances, permits, regulations, inspections, monitoring, public education programs
- Wastewater Treatment - Operator training, standard operating procedures, work instructions, checklists, process controls, SCADA, operating logs, monitoring and laboratory testing and preventive maintenance
- Solids Stabilization - Operator training, standard operating procedures, work instructions, checklists, process controls, SCADA, operating logs, monitoring and laboratory testing and preventive maintenance
- Solids Handling and Conditioning - operator training, standard operating procedures, work instructions, checklists, process controls, SCADA, operating logs, monitoring and laboratory testing and preventive maintenance.
- Biosolids Storage and Transportation - operator training, standard operating procedures, work instructions, checklists, transport papers and manifests, emergency/accident procedures.
- Biosolids Land Application - site selection, landowner agreements, operator training, standard operating procedures, work instructions, checklists, equipment maintenance.
- Biosolids Product, Class A - operator training, standard operating procedures, work instructions, checklists, process controls, operating logs, preventive maintenance, monitoring and laboratory testing, product packaging and use instructions.

emissions are regulated under separate operating permits, they still affect compliance and public perception of the biosolids management activities.

For this Element, organizations are required to “consider” applicable best management practices as defined in various authoritative sources, such the NBP’s *National Manual of Good Practice*.

In this context, “consider” means that more than merely thought about adopting applicable management practices. Similar to the requirements for critical control points in Element 3, it is expected that you have *actually adopted*, as applicable, management practices outlined in the *National Manual of Good Practice*, the Water Environment Federation manuals of practice, or other authoritative sources. Meeting the requirements of this element to consider biosolids management practices consistent with the *National Manual of Good Practice* also demonstrates meeting the NBP requirements for the outcome area of Quality Biosolids Management Practices. (See Chapter 11 for more information on outcomes.)

If you have not adopted applicable management practices, then you must be able to provide a rationale for why you have selected an alternative approach for managing the relevant critical control point. As discussed under Element 3, you may have good reasons because of local conditions or circumstances that make a certain operational control inappropriate or impractical, or that make another approach more effective. The important part is that you are able to explain why a different approach was taken.



Guidance

Organizations are likely to have many of the operational control requirements for Element 10 already in place. The general approach should be to search out and identify existing operational controls, fill any gaps, make sure they are being implemented effectively, and establish the necessary document control and records links.

Element 10, Operational Control of Critical Control Points, is closely linked with Element 3, Critical



Helpful Hint

“Dependable” Elements

Operational controls depend on a number of other BMP Elements:

- Element 8 — training in assigned biosolids management activities is critical. Both your staff and your contractor’s personnel must have the necessary skills and knowledge to perform their assigned duties. The best-written SOPs in the world will be ineffective without proper training.
- Element 13 — monitoring and measurement standard procedures and practices are critical for maintaining each biosolids management activity within operational specifications and control limits.
- Element 11 — emergency preparedness and response preparedness for abnormal situations is an important component of operational control. Operational controls should cover those situations where the absence of effective response procedures could lead to nonconformance with your biosolids policy, legal requirements, other adopted requirements, goals and objectives, and public participation commitments.

For example, it should cover the accidental spill or release of a prohibited hazardous material or waste from an industrial or commercial user that could cause upsets the wastewater treatment plant or quality problems with the biosolids.

Control Points. Ideally, your BMP team already will have systematically identified all critical control points. Chapter 7, Element 3, including Table 7-2, provides guidance on the steps to take to identify these CCPs.

Begin with your list of critical control points

Start with the list of critical control points throughout the biosolids value chain that you identified earlier in Element 3.

Review your current management methods identified under Element 3

Identify the specific biosolids management activities and unit processes associated with each critical control point. Complete this step for all your internal biosolids operational controls. Ask your biosolids contractors to do the same for the critical control points covered under their contracts.

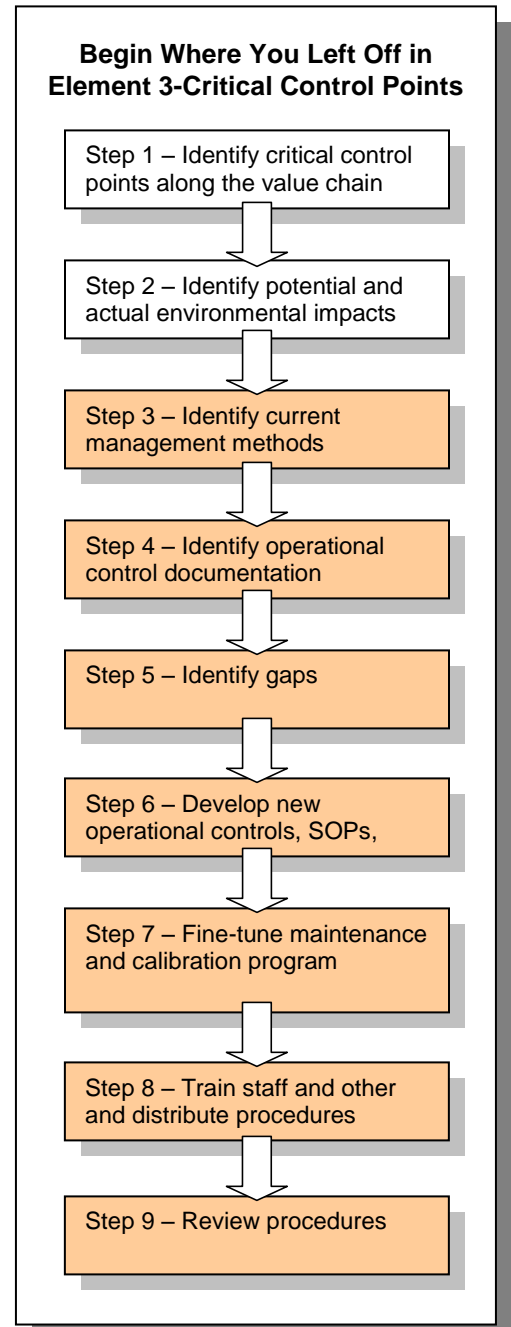
Review your current operational controls and documentation identified under Element 3

Compile a more detailed list if necessary. Review the existing procedures, work instructions, and other management control documents for the following:

- Completeness
- Ease of understanding
- Effectiveness of training - staff competency, skills and knowledge
- Effectiveness of current implementation
- Effectiveness monitoring and measurement
- Effectiveness of recordkeeping
- Document control (see Element 12)

Identify the current operational control gaps

These are those critical control points without existing or adequate operational controls. You could begin by flowcharting these processes to identify the work sequence of tasks in each process, noting those places you need to monitor, collect samples from, periodically inspect, and maintain operating logs on, etc., for effective operational control.



Develop new procedures and refine existing ones as needed

In developing standard operation procedures and work instructions, apply the following rule-of-thumb:

- The more highly skilled and trained your employees are, the less detailed the procedures and work instructions will need to be.

More complex work sequences by definition will need more steps in the procedures and operational controls. However, keep in mind that operational control procedures and work instructions are not the same thing as an operator’s manual, nor are they a substitute for training. You don’t have your operator’s manual open when you drive your car. The same is true for biosolids operational controls. An operator already has received detailed and periodic refresher training and should already have demonstrated competency in his or her assigned procedures or work process. Use the following table as a guideline for determining what needs to be done for having effective operating controls in place.

Guidelines for Developing Standard Operating Procedures and Work Instructions

Procedure needed (none exists)	Procedure exists and is not documented but requires modification	Procedure exists and is documented, and requires no modification	Required for all operational controls procedures and work instructions
Identify the individuals involved in the work activity Flowchart the steps, including monitoring and measurements needed for effective operation Reference the preventive maintenance and periodic calibration schedules that are needed for reliable operation Decide on the documentation method and summarize the standard operating procedure or work instruction	Identify existing procedures that require modification Identify the individuals involved in the work activity Identify what is driving the need for modification (new unit process or equipment, upgraded process control, change in process, etc.) Flowchart the steps, including monitoring and measurement needed for effective operation Proceed as with a new procedure	Confirm that the procedure exists, that it is up-to-date Evaluate operating competency and conformance with documentation requirements	Personnel are fully trained so they have the required skills and knowledge Steps for emergencies, accidents, and other abnormal conditions identified, as applicable Operational control procedures and work instructions follow documentation and document control requirements (approval, effective date, retention requirements) Identify and cross-reference to inspection, monitoring, measurement, and periodic reporting requirements

Under this Element, you also must require contractors to establish operational controls for those biosolids management activities they perform. How you work with contractors to ensure they have established operational controls is up to you. However, under the NBP program, it is ultimately your responsibility, not the contractors', to make sure this is done.

Fine-tune your maintenance and equipment calibration program

Once you have identified operations that require operational control procedures, consider what kinds of maintenance and calibration may be appropriate. Programmed maintenance and calibration schedules on critical unit processes and equipment for biosolids management should be consistent with manufacturer's recommendations and recognized industry best practices as set forth in *NBP National Manual of Good Practice*.

A computerized maintenance management system may be needed to plan and conduct such maintenance effectively. This does not mean, however, that an elaborate preventive or predictive maintenance program is needed in all cases. Assess your existing maintenance strategy and the program's effectiveness before making significant changes.

Provide training to support biosolids operational controls and distribute procedures as needed

Provide tools, training, guidance, examples, and facilitated work sessions to support the development of operational control procedures and procedure modifications. Make sure that the work group for each activity has a list of relevant critical control points and any existing procedures. Decide beforehand how the operational control procedures will be distributed for use.

Do not forget to communicate your expectations (including any relevant procedures) to those contractors whom you identified as being critical to biosolids management activities.

Helpful Hint

- When you are considering operational control procedures for each category of biosolids management activities, begin with existing SOPs and work instructions already in place for quality management and process control and incorporate biosolids Elements wherever possible.
- Use stand-alone operational control procedures only if relevant quality management and process control procedures do not exist or if the operational control procedure strictly responds to a compliance requirement.
- Keep procedures and work instructions simple. This makes them easy to understand and use. Excessive detail does not provide more control and is not needed. Competency in detail is achieved through training.
- Consider using pocket reference guides, laminated flowcharts, or checklists in lieu of or in addition to procedure books. These quick-reference guides ensure consistent quality.
- Make sure all SOPs and other operational controls follow the Element 12 document control procedure, which can use an identifying stamp or watermark and issuance date and version number to ensure that the current, up-to-date procedure is being followed.

Institute a process to review and update your operational controls and associated procedures, work instructions, etc.

Create a systematic way for reviewing the procedures to keep them current and relevant to the users. You can do this a variety of ways, including building links with other BMP Elements. For example:

- ✓ Link the review process with your internal audit and/or management review (Elements 16 and 17)
- ✓ Connect it with your monitoring and measuring activities (Element 13)
- ✓ Establish a feedback loop with your nonconformance-corrective and preventive action program (Element 14)
- ✓ Include it in your action plan (Element 5)
- ✓ Make sure you communicate it internally (Element 9)
- ✓ Periodically check that contractors have implemented and updated appropriate operational controls

Ultimately, it is your organization, not the contractor, who is responsible for ensuring that operational controls with respect to contractor activities have been identified, documented, implemented, and updated as necessary.



NBP Auditor Considerations

An auditor will look for objective evidence that:

1. All critical control points have operational controls in place; and
2. They are effective.

An auditor's assessment of operational controls is directly linked to Element 3, Critical Control Points. See Table 8-7 for a sampling of onsite documents and records and onsite direct observations related to the biosolids value chain that an auditor might consider.

The auditor will look at whether you have the following:



Helpful Hint

“Do What I Say, and What I Do”

To the extent possible, have the individuals that do the work draft work instructions and make sure they are reviewed by all the employees that will need to implement them. This will help ensure that the instructions are accurate and well-understood.

- ✓ Objective evidence that you have systematically identified and documented operational controls for all critical control points, including those managed by contractors
- ✓ Objective evidence of effective operational controls at each critical control point; this includes documentation contained or referenced in your BMP manual (see Element 3), documented ordinances, policies, operating procedures, work instructions, manuals, inspection checklists, operating logs, process flowcharts, SCADA/process controls, and/or other supporting documents and records relating to monitoring, inspection, enforcement, training, etc. that objectively document conformance with BMP Element requirements.
- ✓ Demonstration of documentation links with operator skills, knowledge and competency, usually determined through interviews and direction observation of activities
- ✓ Effectiveness, evaluated by whether the intended results are being achieved; for example, while the verification assessment of the BMP is not a compliance audit, evidence that biosolids management activities are not in compliance with all applicable laws, regulations, and permits is a direct indication that proper training and operational controls are either not in place or are in place but not effective.

Keep in mind that this Element requires that you “develop and implement standard operating procedures, work management practices, or other appropriate methods at all critical control points throughout the biosolids value chain to manage potential environmental impacts effectively.” The Element does not specifically require that standard operating procedures (SOPs) be written down. However, one easy way to demonstrate to an auditor that SOPs have been “developed and implemented” is to have them written down and clearly available to those who need them (e.g., at work stations). You may also write down SOPs in a remote manual, or not write them down at all. However, to ensure consistent implementation of operational control, the auditor should find that in the absence of written SOPs at work

Checklist for Element 10

- Operational controls are established and implemented at all significant critical control points throughout the biosolids value chain.
- Documented procedures and work instructions have been created to manage biosolids management activities at all significant critical control points, either as stand-alone documents or by incorporating them into standard operating procedures.
- Documented schedules have been established for inspections, monitoring, calibration, and laboratory testing, and corresponding records confirm they are being followed.
- Personnel skills, knowledge, and overall competency in systematically following the prescribed operating procedures and instructions are confirmed through records, interviews, direct field observation, and documented program effectiveness measures (biosolids compliance, quality, and public acceptance).
- Procedures have been established to ensure that these operational controls requirements are being followed by contractors for the biosolids management activities covered by the contract.

stations, staff are able to cite and implement procedures the same way all of the time. Also, remember that SOPs are not the only form of operational control. Operational controls can also include permits, ordinances, process controls, monitoring activities, and checklists, among others.

Written operational controls such as pretreatment ordinances, procedures, and work instructions are not sufficient objective evidence of conformance unless supported by the associated records (e.g., operating, calibration, and monitoring logs) and evidence that the results are being achieved (i.e., biosolids compliance, biosolids quality for selected use or disposal method, public acceptance and satisfaction with biosolids program).

Operational controls also are integrally linked with Element 7, Roles and Responsibilities and Element 8, Training. Proper and effective execution of all operational controls is a direct indicator of effective training and job performance for all biosolids management activities.

In summary, objective evidence of effective operational controls at critical control points means you have:

- ✓ Operational controls in place for all critical control points throughout the value chain, including those managed by contractors.
- ✓ Written documentation in the form of ordinances, permits, operating procedures, and work instructions as well as documented inspection, monitoring, calibration and maintenance schedules.
- ✓ Records or reports for the required operating logs, inspections, monitoring, calibration, laboratory testing, and maintenance activities.
- ✓ Evidence of demonstrated operator skills, knowledge, and competency as demonstrated through site observation and personnel interviews.
- ✓ Evidence of effectiveness in achieving compliance with applicable legal requirements, biosolids quality requirements, and biosolids public acceptance requirements.



Example

Table 8-7 — Onsite Documents and Records and On-site Direct Observations Related to Biosolids Value Chain

Major Step in the Biosolids Value Chain	Documents and Records
Wastewater Collection and Pretreatment	Annual pretreatment report Pretreatment procedures manuals Industrial user (IU) inspection reports IU permit and correspondence records/files Laboratory analysis reports and monitoring data Regulatory agency audit reports and correspondence
Wastewater Treatment and Solids Generation	Operations manuals Maintenance manuals Safety manuals Daily/weekly operations reports or logs Daily/weekly maintenance report or logs Monitoring reports or logs SCADA system reports Regulatory agency audit reports and correspondence
Solids Stabilization, Conditioning, and Handling	Annual biosolids report Operations manuals Maintenance manuals Daily/weekly operations reports or logs Daily/weekly maintenance report or logs Monitoring reports or logs Laboratory analysis reports
Solids Storage and Transportation	Hauling manifests/orders or bills of lading Truck operator logs Dispatcher logs Emergency response plans Safety manuals and contingency plans
Biosolids Use or Disposal Alternatives	Land application site plans and distribution schedules Land application site annual reports Operations manuals Daily/weekly operations reports or logs Application logs Regulatory agency audit reports and correspondence Composting time and temperature logs
Major Step in the Biosolids Value Chain	Direct Observations
Wastewater Collection and Pretreatment	Pretreatment procedure manuals are visible or easily located Sampling equipment for laboratory testing
Wastewater Treatment and Solids Generation	Operations and maintenance manuals are visible or easily located

Solids Stabilization, Conditioning, and Handling	There are no visible plastics (or other aesthetic quality goals have been met) % solids levels appear to be attained (e.g., biosolids do not look too wet)
Solids Storage & Transportation	Trucks are clean and do not leak Storage locations and truck routes on local or private roads are clearly marked (or referenced in plans)
Biosolids Use or Disposal Alternatives	Buffer zones are being observed Public signs are in place Different batches of material appear to be separated (mixing would throw off application rates)



Nonconformance Examples

The auditor may consider the following to be examples of a nonconformance with this BMP Element.

- ✓ It appears that operational controls may not be sufficient to manage the actual or potential environmental or health impacts associated with *all* critical control point (Requirement 10.1 states that operational controls must be developed for “all” critical control points).
- ✓ The auditor finds evidence that procedures have not routinely been followed as documented.
- ✓ Operational controls are outdated and need revision.
- ✓ An employee or contractor is occasionally not fully aware of the requirements outlined in an operational control, indicating that operational controls are not been fully implemented.



Example

Table 8-8 — Operational Control Procedure

BMP-SOP-00X	Revision 01	Approval signature	Date of approval	Page X of X pages
<p>Purpose:</p> <p>Scope:</p> <p>Definitions:</p> <p>References:</p> <p>Responsibility:</p> <p><u>Procedure</u></p>	<p>The purpose of this procedure is to ensure that the organization systematically establishes, implements and maintains the necessary operational control procedures, work instructions, and other management controls to ensure it is meeting the overall requirements of its biosolids management policy, including compliance with legal requirements, other voluntarily adopted requirement for biosolids quality, and public acceptance, and that progress toward improvement goals and objectives are being achieved.</p> <p>This procedure applies to all the organization’s biosolids management activities at all critical control points throughout the biosolids value chain that are under the organization’s direct control or influence.</p> <p><i>Operational control procedure</i> – A set of standard work instructions and practices for employees describing the “how-to” steps in managing the critical control points of a specific biosolids management activity.</p> <p><i>Other Management Controls</i> – Other management methods such as contract agreements, contractor oversight procedures and pretreatment ordinances, permit programs, and inspection and monitoring programs used to ensure that biosolids activities meet other requirements as necessary.</p> <p><i>Elements of NBP Biosolids Management Program</i></p> <p><i>Functional managers</i> are responsible for ensuring that the necessary operational control procedures for controlling all significant critical control points of their biosolids management activities have been developed, communicated (to employees and contractors), implemented, and maintained.</p> <p><i>The biosolids management representative</i> is responsible for providing training, guidance, and assistance to functional managers in identifying, developing, documenting, and implementing needed operational control procedures.</p> <p>Based on the identified list of critical control points, the biosolids management representative shall work with the facility’s functional managers and contractors to determine those activities, products, and services for which operational control procedures, work instructions, and other management control methods are needed.</p> <p>In collaboration with relevant functional managers, the biosolids management representative shall provide the necessary training and guidance to support development, implementation, and maintenance of the needed operational control procedures. The operational control procedures shall contain operating criteria, e.g., process specifications and parameters, product characteristics, and service instructions.</p> <p>The biosolids management representative shall ensure that each functional manager has developed, documented, and implemented the operational control procedures, and communicated them to relevant employees and contractors.</p> <p>The functional managers shall oversee the implementation of operational control procedures in their respective activity areas. This includes insuring that employees in each activity area receive the necessary resources, training, and support services to implement the operational controls properly.</p> <p>The biosolids management representative shall review the operational control procedures periodically and work with functional managers to revise them according to the changes in the facility’s critical control points.</p>			
<p>Notes:</p>				

Element



Emergency Preparedness and Response



Minimum Conformance Requirements

- 11.1 Establish and maintain emergency preparedness and response plans and procedures to ensure effective response to accidents and emergency situations associated with biosolids management activities.
- 11.2 Review and evaluate the effectiveness of emergency preparedness and response procedures, including communication systems, and revise them as necessary.
- 11.3 Have all emergency response equipment on site or readily available within a minimum response time.
- 11.4 Require contractors to establish and maintain emergency preparedness and response plans and procedures to ensure effective response to accidents and emergency situations associated with biosolids management activities.

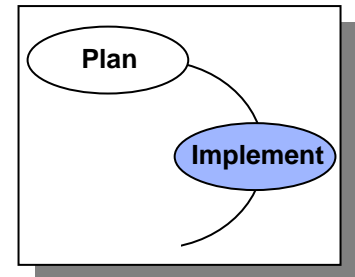


Interpretation

Your organization will need to manage two kinds of risks associated with its biosolids management activities under abnormal and emergency situations: real risks and perceived risks.

Real risks are those that pose a threat to safety, public health, and the environment or otherwise represent legal and regulatory violations.

Perceived risks are those that pose no significant safety or health threat, but a limited or good number of people believe they do pose such threats. Perceived risks include “public relations” emergencies—for example, a Class B biosolids spill on the roadway that



What situations could affect your biosolids program?

- Industrial or commercial user loadings?
- Liquid or solids process upsets?
- Biosolids pipeline leaks and breaks?
- Rain, snow, ice, flooding?
- Earthquakes, hurricanes, tornadoes?
- Fire or chemical spills?
- Power interruptions or outages?
- Extreme outside temperatures?
- Air or soil conditions?
- Off-site spills and transportation accidents?
- Unauthorized access?

the media or citizens react to as if raw sewage were spilled.

Across these two risk categories, you will need to work to prevent, prepare for, and, if necessary, respond to a range of situations from abnormal conditions, unusual circumstances, and rare events, to more serious incidents that represent real or perceived emergencies.

Most publicly owned treatment works and their contractors will have emergency preparedness and response plans for their pretreatment and wastewater operations. Different types of plans covering a range of activities already are required under federal, state, or local environmental regulations. Some of these come under worker health and safety regulations, public health requirements, or transportation-related incident plans.

However, your existing plans may not specifically address abnormal or emergency situations related to biosolids production, handling, and use or disposal in these plans. Under this BMP Element, you will need to address such specificities. You can develop plans covering biosolids management activities as stand-alone documents, or you can integrate them with existing plans addressing emergency and abnormal conditions for all of your operations and facilities.

Likewise, you will need to provide training specific to biosolids-related situations. Again, this can be established as an independent program or can be integrated with your broader emergency preparedness and response training. Such training needs to include periodic drills or simulations for teaching and readiness. Additionally, you will need to subject any contractors involved in your biosolids program to appropriate requirements for their own planning and training, tailored to their specific roles and responsibilities.

Your and your contractors' procedures should cover the full range of potential events, as relevant to your operations and use or disposal method(s). This includes weather-related situations that can affect your onsite and off-site activities.



Guidance

A six-step approach will help you develop your emergency preparedness and response plans and training programs specifically for your biosolids management program:

1. Identify the possibilities — Potential emergency situations involving health risks, public relations risks, and inconveniences must be identified.
2. Play through the scenarios — Evaluate factors that could cause or prevent situations from occurring, as well as the effect alternative responses could have on the situation.
3. Pre-plan your responses — Define the mandatory, appropriate, and preferred response actions for various situations.
4. Provide adequate documentation, training, equipment, and reinforcement — Support emergency prevention, preparedness, and response, including emergency response checklists with step-by-step instructions, drills, and simulations, as applicable.
5. Learn from real incidents and your responses — When events occur, document the incident facts, causal and contributing factors, response, and response effectiveness, and debrief with all involved to reinforce successful actions and learn from mistakes.
6. Implement your lessons — Revise plans and procedures as appropriate based on lessons learned from simulated and actual experiences.

Step 1 — Identify Biosolids Emergencies

Begin your planning process by identifying all the possible circumstances, no matter how remote or unlikely, that could impact your biosolids operations. This includes events at your wastewater treatment plant, solids and biosolids treatment and handling areas, onsite storage areas, trucking and loading areas, transportation routes, and any off-site storage or application sites you may have. In addition to normal operations, consider process equipment start-up and

Resources to Identify Possible Events

- Critical control points
- Operational controls
- Existing emergency response plans
- Other special plans
- Inventories of materials
- SOPs and work instructions for biosolids operations and activities
- Facility and site drawings
- Process flow diagrams
- Piping and instrumentation diagrams
- Weather data
- Transportation route maps
- Application site maps, including soil, slope, and demarcation of surrounding resources
- Specification for safety systems (alarms, sprinklers, etc.)

shutdown, and other infrequent or abnormal operating conditions.

Also consider the impact of off-site events, such as severe storms, upstream release of toxic or hazardous materials, and vandalism or other criminal acts.

Use your BMP team and involve anyone else with specific knowledge or experience you think will be helpful.

Start with your list of critical control points prepared for Element 3.

- Are you thinking broadly about circumstances that could occur at each of these points?
- Look at your operational controls (Element 10) – what would happen if those controls were ineffective or failed for some reason?
- Review existing emergency preparedness and response plans covering your operations. What events do those plans address that would impact your biosolids operations if those events occurred?
- What other situations could occur?

This will provide you with your first-cut list of possible “biosolids” emergencies.

Next, you probably will want to organize them in some way to make it easier to develop a response plan. You could do this by type of event, critical control point, or by physical location.

At a minimum, you should classify possible events according to *probability* and *risk*. For example, a given emergency or abnormal condition may have a high, medium, or low probability of occurring. And once it occurred, it may result in a high, medium, or low consequence.

You can use qualitative rankings, or attach quantitative definitions to probability and consequence. For example, you might estimate a truck spill occurs once in every 1,000 trips, or once every two years, as a medium probability. For consequence, you might define spills of a 20-ton load of dry biosolids (> 25% solids) as low. You will need to determine what kind of classification system works best for you, based on your operations and any existing emergency planning



Example

Priority Rankings for Biosolids-Related Events

		Probability		
		L	M	H
Risk	L	5	4	3
	M	4	3	2
	H	3	2	1

- Traffic accident/spill of 20 tons of dry biosolids on roadway
 Probability – one accident per 1,000 trips (medium)
 Risk – medium to high; depends on the biosolids characteristics; public safety risk can be high for biosolids with significant polymer content spilled on a major roadway
- Spill of 10,000 gallons of concentrated hydrochloric acid into sewer
 Probability – low, based on SPCC plans, containment
 Risk – high, serious upset to POTW biological treatment processes

protocols you have regarding probability analysis and risk management.

Remember, you should consider both *real* and *perceived* risks in your risk analysis and ranking. Hold on to your rankings, you will use them again in Steps 2 and 3.

Step 2 — Brainstorm How Scenarios Could Play Out

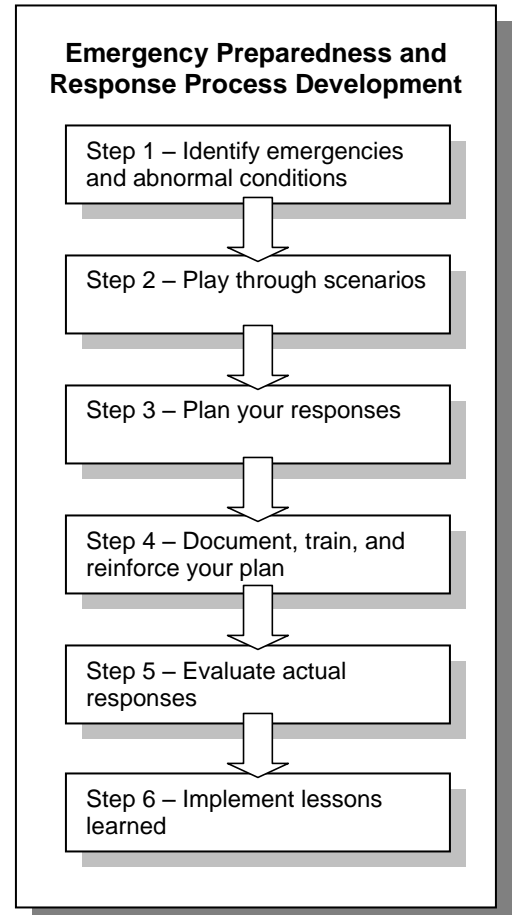
With your team, run through the various situations you identified and ask yourself these questions:

- How would the situation likely begin?
- Will our monitoring and measurement program (Element 13) alert us to problems in a timely manner?
- Under current plans, what would our initial response be?
- What would happen next — best case, expected case, and worst case?
- Do our employees *really* know what they are supposed to do?
- Do we have the proper equipment?
- Have we practiced our responses in drills?
- Have we already made joint plans with other potential response partners — our contractors, the police, local jurisdictions, other emergency response teams?
- How good is our relationship with the news media — are we proactive or do we think our coverage could be better?

Discussing the potential origins of emergency and abnormal events, how they could unfold, and how you can influence those events will put you in a good position to revise your existing plans and procedures and develop any new ones you may need to handle situations that can affect your biosolids operations, from safety, quality, and public relations perspectives.

Step 3 — Plan Your Responses

Based on the results of your situation identification and scenario brainstorming sessions, you should be ready to develop specific response plans to handle the



various biosolids-related events you could face. Use the priority ranking system to focus first on high-risk/high-probability events. These will need the strongest plans, the most training, and appropriate back-up systems and procedures. Your plans will need to include effective response to these scenarios with no or minimal impact on human health and the environment.

Move on through your ranking system and identify or develop response procedures consistent with the nature of the potential situation, its likelihood of occurring, risks – real and perceived – and any ancillary or collateral impacts on your operations, neighbors, or the public.

You have developed plenty of emergency response plans before, so this guidebook won't tell you exactly how to do that. Follow the procedures and processes you've used successfully in the past. Again, plans and procedures for biosolids management activities can be stand-alone, or you can integrate them with other existing emergency response plans – whichever you think will be most effective.

As part of this Element, you are required to have emergency response equipment on site or readily available with a minimum response time.

- A “minimum response time” means that equipment can be used in an emergency situation to avoid or minimize the effect on human health and the environment.
- You should consider public acceptance and public relations (such as biosolids spills on local roadways) in determining response times for emergency equipment.
- Personal safety equipment (such as fire prevention or eyewash capability) should be located on the job site.
- Equipment that might be maintained off-site could include larger equipment, such as tractors required to clean up a biosolids spill on the roadway.
- Have contracts or agreements in place for use of equipment in emergency situations that is not owned by your organization.

**Helpful Hint**

Ask yourself:

- Do we land-apply biosolids for beneficial use off-site?
- Do we use landfill, mono-fill, or surface disposal?

If so, one difference between existing emergency response plans and procedures will be the need to cover situations that may arise during transportation and application.

Here is a list of questions you should run through, however. They are drawn from the actual experiences of 13 POTWs and reflect things they do well, and things they should be doing, but weren't at one time.

- Do your plans detail appropriate actions and response for weather and natural disaster events — including severe conditions?
- Do your contingency plans address *specific* situations?
- Have you adequately planned for low probability but high-risk/high-consequence events?
- Do you address preventive measures?
- Do you address security issues?
- Is proper equipment for various circumstances available at your plant, from your contractor, or from another local or state agency?
- Do you have a formal process to mitigate abnormal loadings of undesirable substances in biosolids?
- What is the hierarchy of phone calls and other notifications you must or will make for different situations?
- Is the chain of command clear to everyone, including coordination responsibilities and response roles?
- Does your insurance cover major business risks associated with biosolids activities?
- If you land-apply, do you have an emergency response plan for each site or group of sites?
- If you land-apply, do you have the ability to “un-apply” if a serious problem is detected?
- Do your or your contractor's truck drivers know who to call and what to do in case of an accident, spill, or other emergency or abnormal situation?
- Do your or your contractor's truck drivers keep important information with them in the truck — do they carry cell phones?

Step 4 — Document, Train, and Reinforce Your Response Plan

As with your other emergency response plans, you will need to document situations, procedures, notification



Helpful Hint

What to Address

Your emergency preparedness and response plans for biosolids should address the following:

- Situation prevention
- Early detection and problem identification
- Comprehensive notification
- Quick response
- Effective correction, mitigation, and remediation
- Appropriate follow-up with affected and involved parties



Helpful Hint

What to Know

From your plan, documentation, training, and reinforcement, people need to know:

- Who is in charge
- Who needs to be called
- What they should do
- How they should do it
- Who they should involve



Helpful Hint

What to Understand

Procedures — These should be easy to understand and to use.

Support — local officials (fire department, hospital, etc.) should understand how they can support your response efforts, so they must be familiar with potential emergencies at your site.

Action — Mock drills can be an excellent way to reinforce training and get feedback on the effectiveness of your plans and procedures.

requirements, etc. in a notebook, manual, or other appropriate format.

Again, procedures for biosolids-related incidents can stand alone, or be integrated with facility- or site-wide plans. Consider using your Intranet or website, if you have one, to post the document(s). But remember to make sure that people have easy and quick access to the plan and procedures for reference and response purposes. This means that some part of your plan or quick-reference document will have a home on some employees' and contractors' shelves.

All staff and contractors will need training that teaches them about the situations they could face and how they are supposed to handle them. This probably includes some classroom-type training on the biosolids emergency preparedness and response plan, specifically, or in conjunction with training on broader emergency response protocols. Refer to Element 8 in this chapter for more information about the importance of training and suggested methods.

Perhaps more than other types of lessons, emergency *response* training generally needs to include a variety of drills and exercises, including authentic simulation drills for selected events. Aside from the real experience, the classroom is no substitute for hands-on, real-time, urgency-invoked drills to practice responses. Sometimes simulations are the only way to reveal potential flaws in plans or protocols and correct them before they really matter.

As with most training, one-time learning experiences will not be enough to ensure consistent readiness. After initial training, and periodically thereafter — for example, once year — you should test your employees' knowledge of emergency response procedures. Look for additional opportunities to reinforce lessons.

Perhaps you learn about an abnormal event in a neighboring jurisdiction — use this as a mini-case study.

- What would you have done?
- How would your staff have handled the situation?
- Are you prepared for that type of situation?



Helpful Hint

Prevention, the Best Cure

Have you identified the most effective release mitigation techniques for your operations?

For example, do you have pre-release controls, secondary containment and protection equipment, safety systems and procedures, and related management activities?

You should require any contractors to implement a comparable program as appropriate to their activities. Again, refer to Element 8 in this chapter for general guidance about training.

Step 5 — Review Actual Responses and Assess Your Performance

Ideally, you will never have to implement your emergency response procedures for a biosolids-related situation. Over the long term, however, odds are that you will have to deal with at least one, if not more than one abnormal or serious situation.

You should have a process in place to ensure that you evaluate and learn from these experiences. Such situations are the truest test of your plans and training and you should be prepared to evaluate your performance thoroughly, along with the performance of any partners.

- Had you foreseen this type of event — generally, specifically?
- Did the situation begin as you predicted it might?
- Did your systems or personnel sound the alarm in a timely manner?
- Did your staff, contractors, and other parties respond as they were supposed to?
- How were your response times — on target, slower, faster than established?
- Did you have the proper equipment? Could you access it fast enough, and did it work the way it was supposed to?
- Did the situation play out as you envisioned? If not, what happened that was different than you expected?
- Were the proper phone calls made in the proper order in a timely manner?
- Did the person(s) who was supposed to be in charge effectively take charge, direct the response, and coordinate participants per protocol and procedure?
- How effective were your dealings with the affected parties, the media, and the public?



Helpful Hint

Know Thyself

Your actual responsibilities and required level of emergency preparedness and response will depend on those involved knowing their own facility, including:

- The size of your facility
- The types and amounts of biosolids you handle
- The types of engineering controls in place
- The nature of development and sensitive receptors in the immediate vicinity of the plant site
- Transportation routes
- The nature of your storage or application sites

- How could you have prevented the situation?
- How could you have lessened its impact once it occurred?
- How will you respond if this event happens again – what will you do the same and what will you do differently?

Step 6 — Incorporate Lessons Learned Into Your Response Plan(s)

Use what you learn from actual experiences to improve your program and improve your readiness for the next event:

- Revise your plans, procedures, and protocols accordingly to improve your readiness and effectiveness.
- Conduct special training and additional drills, if you need to, to make sure everyone understands the revisions.
- Review your plans periodically to see if they still appear effective, even if you haven't employed them for real.
- Run through Steps 1, 2, and 3 above to confirm your plans and make any improvements you identify.
- Link this process with any reviews of critical control points, operational controls, and major changes in unit processes or use or disposal method.
- Link your emergency plan review process with public participation in planning and your communication and public outreach program.
- Link your periodic performance report, internal audits, and management review with this important Element.



NBP Auditor Considerations

Preparing for an emergency or abnormal situation is a critical part of the NBP Biosolids Management Program. If an emergency occurs, an organized, effective response will help minimize or prevent any



Helpful Hint

Feed the Loop

Feed lessons from actual events and periodic reviews back into your response plan, as well as into your goals and objectives process under Element 5.



Helpful Hint

Plan Ingredients

Your plan should include:

- Assigned authority and responsibility
- Procedures for providing emergency services
- Methods to react to different types of emergencies
- Information on biosolids materials
- Internal and external emergency communication
- Training for emergency preparedness and response

damage to the environment, worker and others' safety, and your organization's reputation as a good neighbor.

To conform to this Element, you must establish and maintain procedures to identify the potential for and the response to accidents and emergency situations. You also must be prepared to prevent and mitigate environmental impacts that result from spills, accidents, or other emergencies such as fires, explosions, severe weather (floods, hurricanes, or tornadoes), earthquakes, or major transportation incidents involving biosolids materials.

An auditor will look for documentation and other objective evidence of the following components of your emergency preparedness and response plan for biosolids activities.

- ✓ You have a plan, as a stand-alone document or incorporated into other appropriate documents.
- ✓ You developed it by reviewing existing emergency procedures and have ensured that they are adequate to respond to all potential accidents and emergencies that may lead to environmental impacts; you developed additional emergency procedures as necessary.
- ✓ You reference biosolids-specific plans in your general emergency plans and in your BMP Manual.
- ✓ Your plan identifies the potential for accidents and emergency situations in the facility and at off-site operations.
- ✓ For different situations, you have identified the probable affected area and population.
- ✓ You have effective methods for determining whether a situation has occurred.
- ✓ You have preventive measures and practices in place.
- ✓ You have identified a person or persons who are responsible for managing and coordinating any emergency response relating to biosolids.
- ✓ You have identified outside assistance, such as local hazardous materials emergency response

Checklist for Element 11

- We have identified emergencies and abnormal conditions that can cause negative environmental impacts, safety concerns, or negative public perceptions.
- We have established procedures for responding to and mitigating accidents and emergency situations and we have documented our plans and procedures.
- Our plans and procedures cover weather-related events and natural disasters affecting biosolids production, handling, transportation, storage, use, and disposal.
- Our plans and procedures define employee and contractor roles and responsibilities, and those of local or regional emergency response organizations.
- We, our contractors, and our partners provide training consistent with assigned roles, including periodic simulation drills.
- Our program includes a communication system and protocol so everyone knows who to call in what order.
- We periodically review emergency procedures and revise them as necessary — always after an accident or emergency situation.

teams, fire departments, police, and medical assistance.

- ✓ You have established emergency communication procedures (including contact information) to notify the authorities and local emergency support providers.
- ✓ You have identified all emergency equipment you own or have access to, the physical location, and the person(s) responsible for them; you have provisions for maintaining and testing your emergency equipment and have verified those of your contractors and partners; you have equipment, such as personal safety equipment, on site and other equipment readily available.
- ✓ You have communicated emergency procedures to necessary personnel and you display procedural summaries or references in appropriate areas, such as warning signs or postings of steps to take in an emergency situation.
- ✓ You have identified measures you can use to mitigate or correct emergency or abnormal conditions and impacts.
- ✓ You conduct actual emergency simulations, drills, and related “hands-on” training regularly, as appropriate and practical, based on the emergency response duties assigned to employees and contractors.
- ✓ You have assigned responsibility for reviewing emergency preparedness and response procedures on a regular basis and revising them as necessary; these responsibilities are carried out and revisions can be demonstrated, for example by having “last revised on date” for your emergency preparedness and response procedures.
- ✓ Revisions take into account responses to past emergency situations and the results of training and simulation drills; input from site emergency coordinators, other emergency response personnel, and other staff is actively sought for improving these procedures; revisions of emergency response procedures take into account any changes in the operations where these changes could result in an emergency situation.



Nonconformance Examples

The auditor may consider the following to be examples of a nonconformance with this BMP Element.

- Documented emergency preparedness response plans and procedures have not been fully implemented by the organization (e.g., lack of required equipment, inadequacy of training programs, absence of job site postings and procedures, lack of warning and hazard signs).
- Contractors' emergency preparedness and response plans and procedures have been established, but they have not been fully implemented.
- Some emergency response equipment is not on-site or readily available.

Element

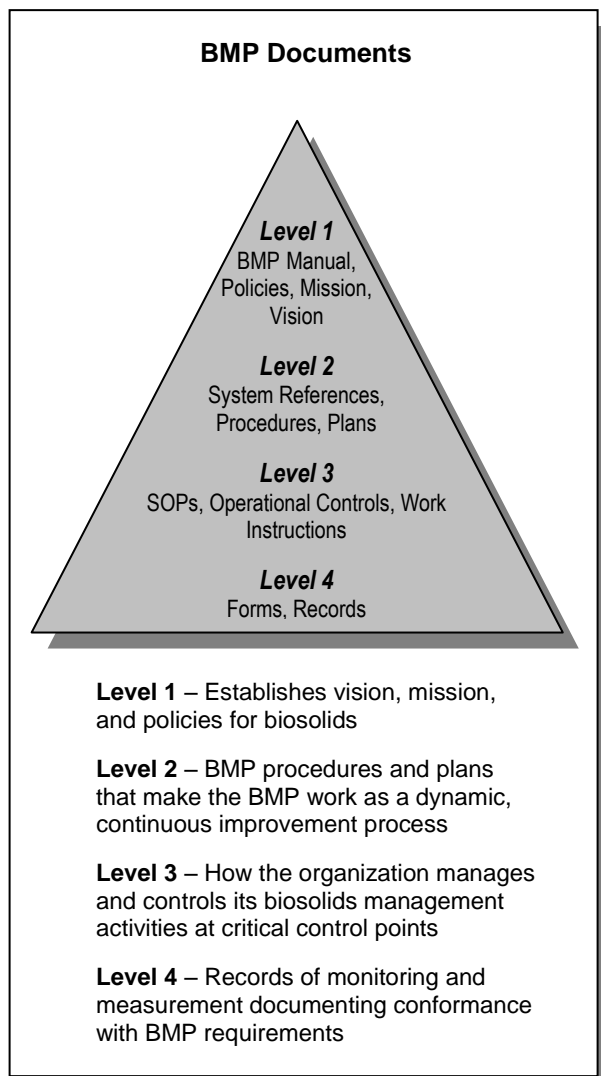
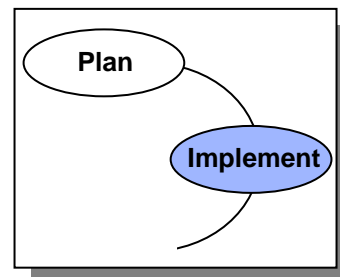


Documentation, Document Control, and Recordkeeping



Minimum Conformance Requirements

- 12.1 Establish and maintain documentation, documents, and records for the BMP including the 17 BMP Elements.
- 12.2 Establish and maintain document control procedures and practices to ensure that the organization’s BMP documentation and documents are:
 - a) Available and located easily;
 - b) Created following established document creation protocols;
 - c) Kept up to date through periodic reviews and revision (if applicable);
 - d) Properly marked with version number, effective date(s), and references to replaced or superseded versions; and
 - e) Approved by authorized personnel.
- 12.3 Establish and maintain records of biosolids management activities and ensure that they are:
 - a) Available and easily located; and
 - b) Retained for the specified period of time.
- 12.4 Establish BMP documentation, document control, and recordkeeping requirements for biosolids management activities conducted by the organization’s contractors in service agreements, and incorporate these requirements into its BMP.





Interpretation

This Element builds on Element 1 (BMP Manual), by creating (or adapting an existing) document control system that follows the framework of the BMP Manual. Think of documentation as the “blueprint” that establishes the overall framework and requirements of the BMP.

Documentation is essential for BMP implementation in that it provides a clear description of how the program is intended to function and what is required to achieve the commitments made in your organization’s biosolids management policy.

Collectively, the body of documents and records prescribed in the *BMP Elements* and associated BMP procedures and operational control procedures provide objective evidence of how the BMP is supposed to function.

The requirements for this Element are founded in Deming principles for quality management. Without some level of documentation and document control, there is no standardization. Without document control, it is common to have multiple versions of “standard operating procedures” and incomplete records of quality monitoring and measurement results.

Documenting the BMP involves creating a BMP Manual, which is based on a hierarchy of documents described below.

Level 1 Documents

This level starts with the biosolids management policy, which establishes overarching principles and commitments of the organization to the NBP *Code of Good Practice* and corresponds to BMP Element 1. Level 1 may include other applicable policies and the organization’s biosolids mission and vision.

Level 2 Documents

This level includes various procedures, processes, and related documents that describe the “what” part of BMP processes and activities. Level 2 documents are programmatic in nature and define who is responsible and what, where, and when the requirements apply. Level 2 includes contractual agreements and programmatic level procedures defining requirements for all BMP Elements.

Level 3 Documents

This level includes day-to-day operational documents and controls, defining “how-to” conduct various biosolids management activities. Level 3 documents are primarily operating procedures and instructions that describe how to conduct a specific biosolids management activity. Level 3 operational control documents should be in place for all significant critical control points. Level 3 documents include other programs such as industrial pretreatment, incorporated by reference into the BMP.

Level 4 Records/Recordkeeping

This level includes records and other retained documents that establish the “proof” that the activity is being conducted. Level 4 documents can be in paper or electronic format and include records of inspection, calibration, monitoring, laboratory testing, audit results, corrective action, and management reviews. Each type of record has specific retention requirements.

Framework

The BMP Manual establishes the framework for your BMP. The front-end sections include the biosolids management policy. The body of the BMP Manual includes all Level 2 procedures, documented processes, and activities. These documents, which need revision periodically, should be fairly static and should require only infrequent revisions.

Level 3 procedures and documents change more frequently. Because of this, it is generally more practical for the BMP Manual to include cross-references and summary lists of these. The BMP Manual also may contain appendices with various standard record forms and summaries of the latest Level 4 records and reports of various BMP-prescribed events, activities, and transactions.

Maintaining up-to-date, master lists of key Level 3 documents and Level 4 records/reports makes it easy for all staff and contractors to stay apprised of the current requirements and results.

The BMP Manual usually contains cross-references to applicable legal and regulatory requirements such as the CFR 503 regulations. It also cross-references

What’s in a BMP Manual?

- ✓ Biosolids policy
- ✓ BMP procedures and processes (Level 2)
- ✓ Critical control points updating procedure
- ✓ Legal tracking procedure
- ✓ Procedure for setting goals and objectives
- ✓ Public participation plan
- ✓ Organizational roles and responsibilities
- ✓ Training procedures and programs
- ✓ Communication plan
- ✓ Procedure for creating and maintaining operational controls
- ✓ Emergency response plans
- ✓ Document control and recordkeeping procedures
- ✓ Monitoring and measurement requirements or SOPs
- ✓ Corrective action procedure
- ✓ Periodic performance report
- ✓ Internal auditing plan and procedure
- ✓ Management review procedure
- ✓ Documented summary of critical control points and operational controls
- ✓ Documentation list and cross-references – all Level 1, Level 2, and Levels 3 documents (SOPs, operational controls), and Level 4 records

existing programs adopted by reference such as the pretreatment program mandated under an organization's NPDES permit. These may be included as appendices.

It is useful to include cross-referenced summaries of Level 3 operational control procedures, operating instructions, and Level 4 records in terms of types, retention, and location of the primary file. The BMP also may contain sample forms, checklists, and other relevant recordkeeping documents as appendices.

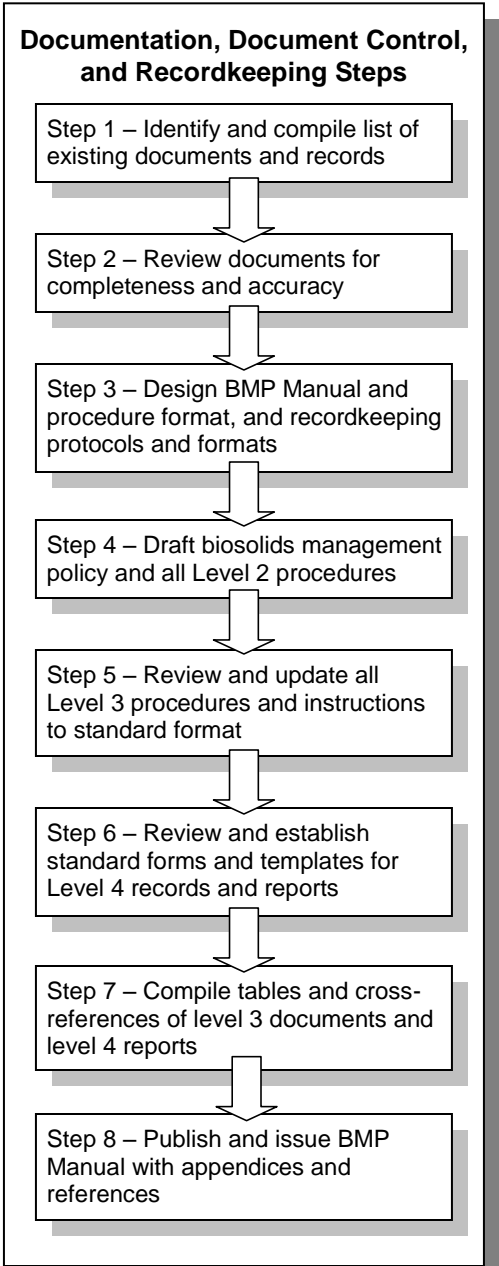
Using this approach, the BMP Manual then becomes a single point of reference that an outside party, such as a third-party verification auditor, should be able to use to become familiarized with all aspects and Elements of the BMP. A good practical test of your BMP documentation scheme as defined by the BMP Manual is whether an outside party can review and identify all the key documents that define how your BMP is supposed to work.



Guidance

Begin constructing your BMP Manual by including all Level 1 and Level 2 documents. Consider including sample copies of various recordkeeping forms used to document BMP activities. Here are some suggestions:

- Cross-reference major programs being incorporated into the BMP by reference such as the pretreatment program or the air permits for a biosolids incinerator.
- Include summary tables cross-referencing various Level 3 procedures that summarize document control information for each procedure or work instruction set, such as primary responsible person and title, location of primary document, original creation dates, latest revision number and date, and other cross-referenced requirements. See Table 8-9 for an example.
- Include summaries of recordkeeping requirements such as retention requirements, the person responsible for "primary" file(s), its location, and related information. The primary file is the original master copy and you must track these no matter how many additional copies are floating around the organization. The primary file is always the most recent version!



There is no single prescribed style or format. For example, the BMP manual may be done:

- In prose
- As an outline
- In flowchart format
- In some combination of the above
- As a hard copy manual with numbered, assigned copies
- Electronically as “html” or “pdf” files transmitted over your Intranet network

For examples of BMP Manuals, ask the NBP staff or go to the NBP website at www.wef.org/biosolids/.

Some organizations prefer to keep up-to-date master lists of Level 3 and Level 4 documents and records in a single manual. This is fine but can be fairly labor-intensive to keep everything up-to-date. To minimize BMP manual maintenance requirements, it is better to keep datable materials separate and use a cross-reference method.

The following sequence of steps will help you design your BMP documentation, document control, and recordkeeping, including your BMP Manual.

Step 1 — Identify and list existing documents and records

This step is straightforward. It should actually be done in preparation for your BMP implementation planning visit or internal assessment. It’s simply creating a compilation of what documents and records currently exist relevant to your BMP.

Step 2 — Review these documents for consistency and completeness

Some of this assessment will come out of the implementation planning visit action plan, but you should go further. Review the styles and formats. Begin to think about what might be the best standardized approach. Appoint a workgroup to be responsible for the BMP documentation work.

Step 3 — Design the BMP Manual, procedures format, and recordkeeping protocols and formats

This is a critical step. You are designing the overall framework for your BMP as well as the process for



Helpful Hint

Document Contents

The need for document control and retention requirements goes hand-in-hand with the document creation process.

All **Level 2 and 3** documents require the following information to be included, as applicable:

- Purpose and scope of the document
- Key definitions of terms used
- Responsible person(s)
- Authorized person(s) approval
- Creation or effective date
- Version number
- Revision dates when version supercedes or replaces an earlier version
- Primary location of official reference document
- Retention of earlier versions (if required by law)

Level 4 documents consist of records and reports that contain detailed results or summaries of specific activities or event such as equipment calibration, inspections, daily operating logs, monitoring, measurements, laboratory testing, audit results, corrective action activities and results and so on.

Records must include:

- Type of activity or event in the record
- Scope or content of the record or report
- Date or date(s) of the activity or event included in the record/report
- Person responsible for primary file
- Record retention requirements
- Location and responsibility for archived files, when applicable

updating it and maintaining up-to-date records. It may be necessary to do some flowcharting to modify existing procedures or to develop and document a newly created one. Then test and refine the procedures in completing Steps 4-8.

Step 4 — Draft biosolids management policy and BMP Level 2 procedures

The important thing to note is that the BMP Manual core procedures are short and succinct, using cross-references to link various BMP Elements to other BMP Elements as well as to other reference documents. An example template for a BMP Level 2 procedure is at the end of this section.

Step 5 — Review and update all Level 3 procedures and instructions to standard format(s)

This step involves standardizing and completing all Level 3 procedures. Note that this step also is used to finalize the process for updating Level 3 procedures. You may decide on a decentralized or centralized process for maintaining the latest procedures. The procedures themselves can vary in format but the referencing format should be consistent. This section may also cross-reference the NBP *National Manual of Good Practice* for appropriate standard operating procedures and process conditions.



Example

Table 8-9 — Operating Control Procedures Log

Critical Control Point	Operational Controls	Responsible Person	Date Created	Latest Revision	Location	Other References
Anaerobic Digester	SOP #3.1, Rev 1, Operating Procedures	Back-end Supervisor	8/1/05	6/15/06 Rev 1	Control Room: WWTP Operating Manual	Manufacturers Specifications AD 37-52-99
Dewatering Centrifuge	SOP #4.0 Operating Procedure	Back-end Supervisor	8/15/05	8/15/05 Original	Control Room WWTP Operating Manual	Manufacturers Specification AL 53-667-95

Step 6 — Review and establish standard templates and forms for Level 4 records and reports

Appendix D has example templates and forms for master lists and various kinds of records. Also finalize the process you will use to update and retain records,

the retention period, the responsible person, the location of the “official file,” and the date and type of records. This section also may cross-reference the NBP *National Manual of Good Practice* for appropriate types of monitoring, inspection, testing, and calibration records.

Step 7 — Complete and establish cross-references for all Level 2 and Level 3 documents and Level 4 records

This is the blueprinting step. For example, you will want to create one of the following:

- ✓ A layout for keeping track of procedures and their corresponding revision numbers.
- ✓ A record form that locates the controlled BMP monitoring and measurement records.
- ✓ A layout for keeping track of manufacturers’ instructions and manuals, along with the most current version available.
- ✓ A form that can be used to track revisions of biosolids Level 2 BMP documents.

Step 8 — Publish and issue BMP Manual with appendices and cross-references

This step finalizes the BMP manual with all appendices and cross-referenced document and records.

BMP documentation, document control, and records are a primary form of objective evidence showing conformance with the *BMP Element*. The documents and records will be a primary source of information for periodic evaluations, including performance reports, internal audits, management reviews, and third-party verification.

The auditor will look for the following kinds of BMP documents and records and will expect that each contains the information required by your document management and control procedures (e.g., version number, effective date).

- ✓ BMP Manual with biosolids management policy and Level 2 procedures, including your document control procedures.



Example

Example Forms and Templates Available in Appendix D

Table D-1 — Critical Control Point Planning — BMP Procedures — Template
Table D-2 — Critical Control Point Planning — Level of Management System Development — Template
Table D-3 — Critical Control Point Planning — Level of Management System Development — Example
Table D-4 — Critical Control Point / Operational Control / Environmental Impact / Monitoring and Measurement / Roles and Responsibilities — Example
Table D-5 — Applicable Legal Requirements and Permits — Template
Table D-6 — Biosolids Value Chain Roles and Responsibilities — Example
Table D-7 — Roles and Responsibilities by Biosolids Value Chain Category — Example
Table D-8 — Roles and Responsibilities by Goals and Objectives — Example
Table D-9 — Roles and Responsibilities by Departments and BMP Elements — Example
Table D-10 — Training Requirements by Job Title — Example
Table D-11 — BMP Training Log — Example
Table D-12 — Level 3 Documents and Forms — Document Map/Master List — Example
Table D-13 — Record of External Communication — Template
Table D-14 — Audit Checklist — Example
Table D-15 — Corrective Action Notice — Template
Table D-16 — Regulatory Requirements Checklist — Template
Table D-17 — Record of Emergency Incident/Response — Template
Table D-18 — Crop Harvesting Site Restriction Form — Example
Table D-19 — Field Summary Report — Example
Table D-20 — Landowner Consent Form — Example
Table D-21 — Field Compliance Summary — Example
Table D-22 — Notice to Land-Applicator — Example
Table D-23 — Site Inspection Report — Example

- ✓ Critical control processes and proper identification of critical control points covering the biosolids value chain.
- ✓ List of applicable legal requirements, permits, and other requirements across the biosolids value chain.
- ✓ Collection and pretreatment system control program, procedures, and records of inspections, monitoring, reporting, and enforcement.
- ✓ Operational controls procedures and work instructions at all critical control points.
- ✓ Biosolids job responsibilities and training requirements.
- ✓ Records of training and skills mastery.
- ✓ Public participation process and records.
- ✓ Inspection, calibration, monitoring, and measurement procedures, schedules, and records.
- ✓ Preventive maintenance schedules and records for all critical unit processes and equipment.
- ✓ Emergency preparedness and response plan for biosolids, and records of training.
- ✓ Internal audit program, protocols, checklists, and records.
- ✓ Corrective action procedure and records.
- ✓ Management review procedure and records.
- ✓ Periodic performance report procedure and one or more reports.
- ✓ Any of the above that need to be maintained by biosolids contractors.

Checklist for Element 12

- We have completed a biosolids management policy and BMP manual with Level 2 procedures and documents.
- We have established and implemented Level 3 operational controls and instructions for all significant critical control points.
- We have established recordkeeping procedures and forms and records retention requirements for inspections, operating logs, monitoring, measurement, laboratory testing, equipment calibration and reports.
- We have established procedures, schedules and records for BMP internal audits, periodic performance reports, management reviews and corrective actions.
- We have trained and documented employee and contractor staff on their understanding of the BMP.



Nonconformance Examples

The auditor may consider the following to be examples of a nonconformance with this BMP Element.

- Standard operating procedures are not formatted consistently with version numbers, effective dates, or other required information, indicating the document control procedures have not been fully implemented.
- Some procedures have not been documented or some records have not been maintained.



Example

Table 8-10 — Level 2 BMP Procedures or Processes — Template

List Name and Number of BMP Procedure				
BMP-SP-00X	Revision 01	Approval signature	Date of approval	Page X of X pages
Purpose:	Summarize the purpose of the procedure or process (e.g., to track legal requirements, to update goals and objectives, to maintain up-to-date procedures and so on).			
Scope:	Summarize the scope of the procedure; specifically what activity(ies) it is supposed to cover.			
Definitions:	Summarize key definitions from the <i>BMP Element</i> as well as for other terms used in the procedure			
References:	Reference the <i>BMP Element</i> as well as relevant external references that are incorporated into the procedure			
Responsibility:	Reference the key positions inside the organization responsible for the procedure and their respective roles and responsibilities, as applicable. For example: Functional manager(s) are responsible for ensuring ... Biosolids management coordinator is responsible for ensuring ... Utility general manager is responsible for ensuring...			
<u>Procedure (list steps)</u>				
Step 1 ...				
Step 2 ...				
Step 3 ...				
Step 4 ...				
Step 5 ...				
List additional steps				
Location of Official Reference Procedure				
<i>Notes:</i>				



PIZZA BREAK!



You have just worked your way through the implementation — or “Do” — sector of the P-D-C-A loop. It’s time to step back and congratulate yourself on getting through the most challenging part of the BMP implementation process.

You probably found that you had most of the implementation “elements” around somewhere, but needed to hunt them down, round them up, and put them in their stables. If not, you probably had to spend some time getting them born.

Now you can move on to the “checking” part of the BMP process. You’ll begin by practicing what you’ve just been preaching, and making sure it all works the way you want it to.

Chapter 9

Measurement and Corrective Action

Element

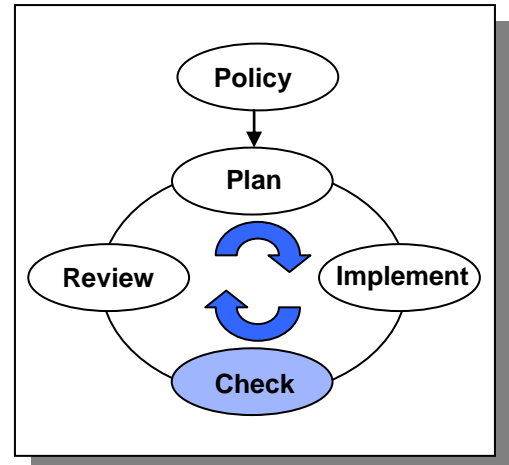


Monitoring and Measurement



Minimum Conformance Requirements

- 13.1 Establish and maintain regular monitoring and measurement procedures and practices for all biosolids management activities to accomplish the following:
- a) Ensure compliance with applicable legal and other requirements;
 - b) Measure biosolids program performance at critical control points; and
 - c) Track progress toward achieving biosolids program goals and objectives.
- 13.2 Record monitoring and measurement results and maintain records as established in the recordkeeping procedures under Element 12.
- 13.3 Require contractors to establish and maintain regular monitoring and measurement procedures and practices for all their assigned biosolids management activities, as defined in their service agreements.



Interpretation

The primary purpose of this Element is to ensure that you have developed a systematic approach for monitoring and measuring actual performance against your defined biosolids program goals and objectives and your regulatory requirements. The notion that “you can manage only what you can measure” is critical to performance evaluation and continual improvement.

Routine monitoring and measurement activities allow you to compare your results with regulatory



Helpful Hint

What Did I Do?

Routine monitoring and measurement activities typically include various inspection checklists and logs that are designed to verify that procedures are being followed:

- Did I record the amount of biosolids loaded into the truck?
- Did I put the seal on the intake valve?
- Did I send a sample to the laboratory for testing?
- Did I complete and file the transportation manifest?

requirements to verify compliance, with operational targets to assess performance, and with BMP targets to evaluate conformance. For example, monitoring for specific pollutants at a specified frequency and reporting the results to governmental agencies often is a permit requirement. Monitoring digester detention time and temperature is an important operational control and a specific target range may be one of your goals or objectives.

Monitoring and measurement enables you to gauge where you are and helps you avoid problems and pitfalls that may occur in the future. Your program also should be set up to identify activities that are not meeting performance requirements and to flag corrective and preventive actions needed to put you back on course toward achieving goals.



Guidance

If you want a BMP that works well and adds value to your organization, you need an effective system for monitoring and measurement. So take your time and do it right. Keep in mind that it makes your job a lot easier if you carefully consider this Element when you develop your goals and objectives. You should be asking yourself how you will monitor and measure your progress toward each goal and objective throughout the BMP planning process.

Definitely take advantage of the knowledge of your cross-functional BMP team — its members are the ones most familiar with the processes and procedures you want to monitor and measure.

In most cases, many of the key measurement processes probably are already in place. Your job is to incorporate them into an overall system to make sure you have all the information you need to manage and improve your BMP.

You will take a variety of quality, quantity, and other measurements along every link in the biosolids value chain, from pretreatment through final use or disposal of your biosolids. Many of these measurements will occur at critical control points or are an integral part of



Helpful Hint

Keep It Relevant

- Monitoring and measurement can be resource-intensive. Resist the urge to collect data “for data’s sake.”
- Use a combination of process measurements (e.g., unit of input/unit output) and outcome measurements (e.g., incidents/unit time).
- Consider key indicators as well as monitoring and measurement requirements at the same time you determine goals and objectives.
- List all required compliance-related monitoring and measurements.
- As an option, you can incorporate the monitoring, measurement, testing, and inspection instructions into SOPs for critical control points in lieu of standalone procedures.

operational controls that help manage critical control points.

Remember to include any measuring and monitoring activities that are conducted by contractors. These activities should be called out in service agreements.

Feed “ground-level,” hour-to-hour, and day-to-day data into higher-level monitoring and measurements of regulatory compliance and progress toward achieving short- and long-term objectives.

The monitoring and measurement requirements, however, are not just technically oriented. You also will want to collect management and administrative information, such as number of training hours, number of citizen complaints, number of new use or disposal sites certified, number of periodic performance reports distributed, or number of hits on your biosolids website.

Quantitative and qualitative measurements from all levels of the program, from technology-oriented to strategic- and policy-related, enable the organization to know where it is, where it’s heading, and how close (or far) it is from where it wants to go.

Getting Started:

1. Identify legal and other monitoring and measurement requirements — this is your minimum for the BMP.
2. Develop performance indicators for how you will measure progress towards your biosolids program goals and objectives — these may be quantitative or qualitative, as appropriate.
3. Make sure you have the ability to conduct the monitoring and take the measures you need to — collect the right information with the proper equipment and methods, and perform adequate QA/QC.

Compliance Monitoring and Measurement Requirements

For monitoring and measuring regulatory compliance, begin by compiling a list of routine monitoring and measurements required by applicable federal, state,



Helpful Hint

Keep It Measurable

Remember that BMP goals and objectives must meet the SMART criteria, which include M for “measurable”.

Some examples of measurable BMP performance indicators:

- Quantity of energy or materials used per unit (e.g., dry ton) of biosolids produced; efficiency of material used or energy consumed
- Quantity of biosolids produced per unit of wastewater effluent (e.g., MGD)
- Number of environmental incidents per unit of time
- Number of biosolids transportation kilometers per unit of biosolids produced per unit time
- Percentage of employees completing environmental training
- Average time for resolving nonconformances
- Number of notices of violation and trend over time, and associated fines and enforcement penalties

and local regulations for your facility(ies). The list should include:

- A summary of each monitoring and measurement requirement;
- The basis for the requirement;
- The required information;
- Frequency;
- Laboratory testing;
- Calibrations; and
- Records.

In addition to real-time monitoring instrumentation and laboratory analysis of samples, these requirements can include operating logs, inspection checklists, and similar tools for recording routinely performed observations, monitoring, and measurements used to verify compliance.

Performance Indicators for Goals and Objectives

This step involves reviewing the specific goals you have established to meet each stated objective — see Elements 4 and 5. The selected performance indicators for measuring progress towards goals and objectives should rely on available data. Ideally, these indicators are process control parameters already being monitored or that can be derived easily from operating records (for example, energy consumed or material used during a shift). If it is not possible to identify or develop reasonable performance indicators for each target, then the goals and possibly the objectives should be re-evaluated.

Identify process equipment and activities that truly affect your performance and the achievement of your goals and objectives. As a starting point, look at key process characteristics you identified for this Element and others. Again, use your cross-functional BMP team for this. This is a good way to approach determining key indicators for each objective.

This approach allows you to use the knowledge of people that manage specific operations and activities. It also creates a practical means of keeping the procedures up-to-date by spreading responsibility throughout the organization.

Element 13 Checklist

- We can identify key process characteristics and how to monitor and measure them.
- We have set up a process to evaluate compliance with applicable laws and regulations regularly.
- We have established a process to measure performance against goals and objectives.
- We have established procedures for monitoring and measurement.



NBP Auditor Considerations

An auditor will look for documentation of your procedures for monitoring and measuring progress toward goals and objectives and performance of your operational controls. Monitoring and measurement are critical success factors for continual improvement and an effective BMP. The rules for document and record retention set forth in Element 12, Documentation, Document Control, and Recordkeeping apply.

Examples of objective evidence include, but are not limited to the following:

- ✓ Lists of monitoring programs and measurements taken, organized by critical control point, BMP Element or other component in the biosolids program, including schedule, specifications, responsible party(ies), location where the results are transmitted or the person with whom they are shared.
- ✓ Necessary equipment and process control instrumentation, SCADA, and information systems for monitoring biosolids management activities that are in place, along with procedures for calibrating and maintaining equipment, instrumentation, and equipment systems.
- ✓ Standard operating procedures and protocols related to taking, analyzing, and evaluating monitoring and measurements.
- ✓ Hard and/or electronic copies of monitoring results, such as log books, laboratory testing records, manifests or databases, and any additional analysis or evaluation performed, including trend analysis.
- ✓ Data or information trails showing monitoring results feeding into BMP Elements, including especially goals and objectives, management review, nonconformances: preventive and corrective action, internal audits, and BMP report.
- ✓ Contract documents or service agreements and related records indicating that contractors have

been required to perform selected BMP-related activities, including appropriate monitoring and measurement practices.



Nonconformance Examples

The auditor may consider the following to be examples of a nonconformance with this BMP Element.

- Some monitoring and measurement procedures and practices have not been documented.
- Some monitoring and measurement procedures and practices have not been fully implemented; for example, inadequate monitoring or measurement practices exist for some critical control points, or monitoring and measurement practices have not been fully implemented to track progress towards all biosolids goals and objectives.

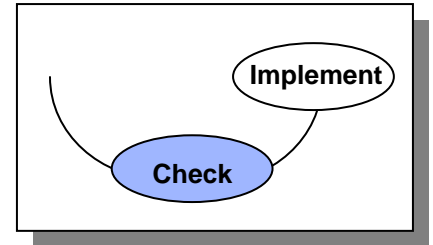
Element



Nonconformances: Preventive and Corrective Action



Minimum Conformance Requirements



- 14.1 Develop and implement a procedure to investigate any noncompliance with applicable regulatory requirements or nonconformance with internal BMP procedures identified during routine monitoring and measurement or periodic internal BMP audits.
- 14.2 Develop and implement a procedure to identify the cause and take actions to correct the nonconformance.
- 14.3 Develop and implement a procedure to document the necessary corrective actions taken to prevent a recurrence.
- 14.4 Develop corrective action plans to address nonconformances identified during routine monitoring and measurement and identify the nonconformance, the root cause(s), and the corrective action being taken. In the corrective action plans, identify changes to policies, programs, plans, operational controls, or monitoring and measurement procedures to prevent future nonconformances.
- 14.5 Establish formal corrective action plans to address findings of internal BMP audits and BMP verification audits conducted by third parties. Document corrective action plans and describe what actions will be taken to address the audit findings, the individual(s) responsible, the estimated completion date, and required resources to develop and implement corrective and preventive action. Include recommended changes to policies, programs, plans, operational controls, and monitoring and measurement procedures to prevent future nonconformances. Document these changes in the corrective action plan and in the BMP Manual and other relevant BMP documentation.
- 14.6 Track progress in completing the corrective actions and periodically update to reflect completion.



Interpretation

Nonconformances are incidents or situations where legal, voluntary, or BMP requirements are not met. This includes times when you fall short of requirements or guidelines in your policies, plans, procedures, operational control targets, or other guidelines that form the basis for your BMP.

Periods of nonconformance may occur over a matter of minutes, hours, days, weeks, or months, depending on the nature of a requirement, performance standards, and measurement schedule.

The term “nonconformance” refers to deviations from your BMP, which is an internal system. Nonconformance, as defined in this guidance, is different from “noncompliance,” which refers to a deviation from or violation of regulatory requirements, which are external to the organization.

Keep in mind however, noncompliance may very well be an indication of flaws in your BMP — spills, releases, other permit violations often are associated with some BMP nonconformance as the root cause. Similarly, nonconformances may lead to future noncompliance situations if you don’t take corrective and preventive action after you identify a nonconformance.

You implement this BMP Element because no person, technology, or system is perfect. Identifying nonconformance and initiating corrective and preventive action are a necessary part of continual improvement. Your objective, therefore, is to prevent and minimize nonconformances, and quickly and effectively correct them when problems do occur.

This Element also is about making time to learn from every incidence of nonconformance:

- Why did it happen?
- How could we have prevented it — and how do we prevent it from occurring again?
- Was there a way we could have flagged the problem earlier — and how do we flag it in the future?



Helpful Hint

It’s a Fixer-Upper

The nonconformance and corrective and preventive action Element is critical to continual improvement.

In simple terms, when you find parts of the BMP that deviate from requirements, do the following:

1. Determine the cause
2. Change operating procedures and instructions
3. Change goals and objectives
4. Change training requirements
5. Address any adverse impacts that may have occurred as a result of the problem



Helpful Hint

Keep It Simple

The amount of planning and documentation needed for corrective and preventive action can vary with the severity of the problem (and its potential consequences). Do not go overboard with bureaucracy; simple methods often work best. You may want to create a corrective action tracking log.

- What do we need to do next time? How can we be ready?

Such exercises are invaluable and your lessons can be used to revise and improve plans and procedures associated with corrective and preventive actions.

See Chapter 11 for information on how the third-party verification auditors will categorize nonconformances as major or minor. Chapter 11 provides information on how and in what timeframe major and minor nonconformances discovered during a third-party audit must be addressed.

Corrective action is a systematic process used to address nonconformance problems after they have occurred. Corrective action may be triggered by a variety of events, including a response to an emergency or a near miss, an internal audit, a third-party audit, an employee initiative, or a management review. Other items that might result in corrective action include neighbor complaints or results of nonconformances discovered during routine monitoring and measurement activities. Corrective action also includes the necessary and appropriate mitigation steps to eliminate or minimize environmental or other negative impacts.

Preventive action is generally a proactive process intended to prevent potential problems before they occur or before they become more severe. Preventive action should automatically be triggered by all significant (or major) nonconformances. Preventive action also should focus on identifying potential situations that could lead to nonconformances.



Guidance

You should begin with a list of the critical control points and the history of past incidents. Try to envision potential nonconformance scenarios — try to predict what might go wrong.

Then ask your BMP team some key questions:

- What is a logical nonconformance verification and communication process?
- Who should be notified?



Helpful Hint

Handling Nonconformances

A typical procedure for handling nonconformance would include the following key steps:

1. Identify the problem
2. Identify the cause (investigate)
3. Come up with solution
4. Implement solution
5. Document solution
6. Communicate solution

- Who should verify the nonconformance?
- Who needs to get involved with corrective action?
- Who will lead any required mitigation activities?
- Who will develop preventive action and solutions to prevent a recurrence?
- What internal and external notifications, reviews, and approvals will be needed?

Then construct a table or flowchart of activity and communication sequence that represents the probable scenarios you ran through. For each, you will need to answer the following questions:

- What departments and functions need to be involved (e.g., facility engineering, process engineering, human resources, environmental staff, public relations, facility general manager)?
- What communications are necessary and to what parties?
- What scenarios are probable and feasible for corrective and preventive action?
- What circumstances trigger regulatory agency notifications, as prescribed in environmental permits and applicable regulatory requirements?
- Who will be responsible for investigation, root cause analysis, planning, review, and approvals?
- When and where should these actions occur?

From these exercises, you will need to establish procedures and protocols to identify, correct, and prevent nonconformances with your BMP — including nonconformances with legal requirements that are integrated into your BMP. Obviously, start with your existing procedures and determine which ones need to be amended to support your BMP and if you need to write any new ones to ensure comprehensive coverage of BMP Elements.

As part of this process, identify and think about procedures that nonconformances may trigger under other Elements, including especially emergency response, communication, monitoring and measurement, and management review. List any existing or new procedures that have or should be



Helpful Hint

Avoid This Common Mistake!

A frequent point of failure in corrective and preventive action programs is failing to address the recurrence of identified problems adequately. Problems are identified, plans are created to fix problems, and corrections are carried out.

But, when it comes to preventive action, most organizations fall short.

- While people address immediate problems, they do not consider the *entire* system and root causes of the nonconformance so the corrective action will prevent problems from resurfacing.
- You should consider all available information: audit findings, records, processes, systems, etc. Performing a root-cause analysis is an effective way to study all pertinent aspects of the BMP, including upstream and downstream activities, in getting to the foundation of the problem.
- All corrective and preventive action derived from the initial implementation and internal audit should be implemented and verified for effectiveness before an organization applies for third-party verification.

cross-referenced with your nonconformance procedures and cross-reference them as necessary and appropriate.

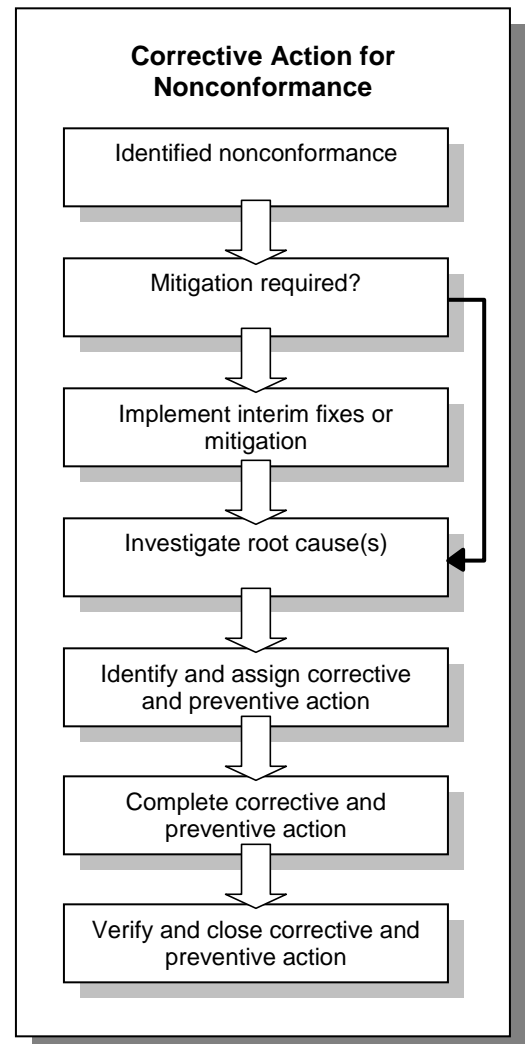
When developing your procedures, make sure to designate who is responsible for handling, investigating, and initiating corrective and preventive actions. Some organizations vest responsibility for initiating these actions with the manager or supervisor of the unit or area where the nonconformance occurred. Many organizations assign responsibility for verifying corrective or preventive action to their internal audit team. This is known as a follow-up activity, and should be part of your procedures for closing out nonconformances.

When you first begin implementing your BMP, most of your nonconformances may be identified by your internal audit team. This is normal during your ramping-up period as everyone becomes familiar with your system and new procedures. Additional experience will come with implementation (and training!). So, after a while, you should expect that most of the problems will be identified by the people doing the work — on the front line, so to speak. *This should be encouraged!* Find ways to get employees involved in your BMP and continual improvement process. For example, you could use suggestion boxes, contests, or incentive programs.

Once you document a problem, your organization must be committed to resolving it. Corrective action should be implemented as quickly as possible. You could initiate corrective action using a corrective action notice, for example, as the primary vehicle for communication (see example below).

Be sure of the following:

- That your corrective and preventive action process specifies responsibilities and schedules; review your progress regularly and follow up on any deficiencies.
- That you conduct any required communication and training so that employees, supervisors, managers, and support functions are aware of the procedure and their specific roles and responsibilities.



- That you conduct any required skills training in root-cause analysis, problem-solving, and corrective and preventive action implementation.
- That all employees understand the concept of nonconformance and the steps that need to be initiated when nonconformances are discovered.

Element 14, Nonconformance: Preventive and Corrective Action, is one of the most important BMP Elements. It drives continual improvement. It ensures that nonconformances will be corrected systematically, including steps to prevent a recurrence.



NBP Auditor Considerations

For this Element, an auditor will look at your documented procedures for identifying nonconformances and initiating preventative and corrective actions. The auditor will make sure that you have a documented procedure for verifying that corrective and preventive actions are appropriate to the magnitude of the problem, that they are implemented correctly, and once implemented, that they are effective in correcting the problem.

The auditor also will look for the following types of objective evidence that the Element 14 procedures are working effectively.

- ✓ Corrective and preventive action plans associated with potential and actual noncompliance and nonconformance situations that may be identified during routine monitoring and measurement, internal BMP audits, compliance audits, or third-party verification audits.
- ✓ Documented incident investigation reports or other documentation that you may have demonstrating that the procedure for investigating potential and actual noncompliance and nonconformance situations has been implemented.



Example Corrective Action Notice (CAN)

This form could be completed by the employee who first identified the nonconformance, a unit process or area supervisor, your BMP coordinator, or someone else in management.

Whoever it is, make sure you identify who should and who can do it in your procedures for Element 14, or in another Element (e.g., roles and responsibilities or documentation and document control).



Corrective Action Notice Title		
CAN Number:		
Issue Date:	Solution Due Date:	Name: Location: Phone:
Requested by:		
Issued to:		
Problem Statement:		
Most Likely Cause:		
Implemented Solutions:		
Results (confirming effectiveness):		
Closed by:	Closing date:	

- ✓ Interviews with employees about their involvement in the investigation process to assess the degree to which the procedures have been implemented.
- ✓ Audit reports to verify that all findings have been addressed effectively through the corrective action plans.

Because it is so important, Element 14 is reviewed extensively during the initial verification audit as well as during periodic surveillance audits.

The initial internal BMP audit may be the first actual use of Element 14, Nonconformances: Preventive and Corrective Action. The third-party auditor will specifically evaluate the initial internal BMP audit and follow through any discovered nonconformances to the corrective and preventive actions taken and documented.



Nonconformance Examples

The auditor may consider the following to be examples of a nonconformance with this BMP Element.

- Some corrective action plans do not include sufficient or appropriate information to prevent future nonconformances (e.g., identify changes to policies, programs, plans, operational controls, and monitoring and measurement procedures to prevent future nonconformances).
- Some corrective action plans have not been updated or closed out.
- Some nonconformance investigations have not been conducted as required by the organization's procedure.
- The corrective action plans developed to address audit findings do not follow the requirements established in requirement 14.5 (see above).

Element 14 Checklist

- We have a procedure for investigating and correcting nonconformances.
- We have a procedure that is consistent with our critical control points, operational controls, risk profile, and environmental history.
- We have a procedure that addresses corrective and preventive action, including steps to mitigate any actual or potential significant environmental impacts.
- We have a procedure that addresses communication required for nonconformance scenarios.
- We have a process for identifying and analyzing the root causes of nonconformances and for developing solutions to prevent their recurrence.
- We have a procedure for recording any corrective or preventive action and for incorporating any changes into applicable procedures associated with this and other Elements.
- We have a procedure for tracking the effectiveness of all corrective and preventive action.

Element



Biosolids Management Program Report



Minimum Conformance Requirements

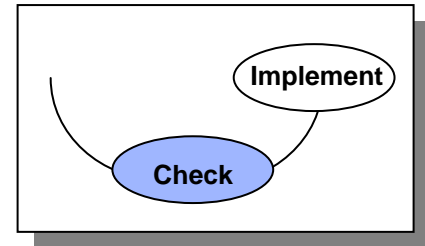
- 15.1 Complete a periodic written Biosolids Management Program performance report (at least annually), summarizing the performance of the BMP. The report shall contain appropriate summaries of monitoring, measurements, and other results that demonstrate the performance of the biosolids program relative to the organization's goals, objectives, and legal requirements, including those biosolids management activities conducted by contractors. The report also shall provide summaries of performance relative to other voluntary adopted requirements, the organization's progress toward achieving its biosolids program goals and objectives, and a summary of its independent, third-party verification audit results and internal BMP audit results.
- 15.2 Make the periodic BMP report available to the public. The organization shall have the flexibility of using other methods, including electronic methods such as a biosolids program web page, in addition to or in lieu of a written periodic performance report.



Interpretation

In conjunction with providing public participation in planning and the organization's communication and outreach strategy, periodically issuing a report on your BMP's performance can help build trust, confidence, and understanding among the public and other stakeholders, including partner agencies and citizen groups.

Such reports or report cards should be issued at least annually. This frequency is required because the schedule corresponds to annual reporting requirements under the Section 503 biosolids regulations and the annual business planning cycle. You may elect to compile and issue a performance



Helpful Hint

Evaluate and Celebrate

Summarizing and releasing an evaluation of your performance:

- Gives you a powerful, convenient tool to foster communication with your public;
- Provides evidence of your commitment to adhere to the *Code of Good Practice* and strive for the goals and objectives you have set for your program;
- Shows that you are paying attention to what you are doing and reaching out to explain and document your program; and
- Is an important exercise in self-assessment and discipline.

If you do a good job, it shouldn't be that much more work because so much of the material will come from activities under other Elements — including your annual management review.

report more frequently, or you may be required to do so under local regulatory requirements.

You could develop your report along the lines of an annual financial report, with text and pictures. Or you could choose a format more along the lines of an annual “report card” brochure that summarizes performance using easy-to-understand grades.

Regardless of the format or level of detail selected, the following should be clear to readers:

- What the performance or grading criteria are (laws, regulations, self-established goals and objectives);
- How well you did against these criteria;
- What your plans are for achieving unmet goals and for correcting any nonconformances; and
- Any new performance measures or targets you established for the future.

Most simply, the report should explain

- Where your organization is;
- Where you intend to be in the future; and
- Based on monitoring and measurement, your progress toward achieving goals and objectives.

Finally, you should be *proactive* in disseminating your report, consistent with your public participation and communication and outreach strategies.



Guidance

If you have a good system for monitoring and measurement, creating a periodic performance report for your BMP is easy. Basically, all you need to do is summarize key measures that you already track for internal purposes anyway. These include the following:

- Legally required monitoring, measurement, and laboratory testing;
- Progress toward goals and objectives;
- Results of internal BMP audits and identified nonconformances;



Helpful Hint

Financial Report Analogy

Annual financial reports are a good analogy to the BMP performance report.

- The front section provides strategic context and highlights performance accomplishments.
- The back section summarizes actual performance information.
- Together, they provide investors and other stakeholders with a picture of where the organization has been and where it is headed, reinforcing their confidence for continued investment.

As with the financial report, the process of creating the BMP performance report is a constructive exercise. It forces the organization and its contractors to do a structured analysis and appraisal of how well they are doing with biosolids management. It provides information that will help increase public confidence and acceptance of the biosolids management activities.

- A summary of the most recent independent third-party verification or interim audit results (if applicable); and
- Abnormal or emergency incidents.

In addition, you could spend some time discussing higher-level strategic objectives. For example, explaining how your short-term biosolids objectives fit with your longer-term plan and associated goals to meet population growth and demand for treatment might be important contextual information for your readers.

Your interested parties and members of the public also might want to know how you plan to take advantage of new technologies or biosolids management practices, including any new products you are considering or piloting. You could discuss the larger local or regional circumstances that define and frame your program. This might address how the community has helped you improve your program, how different groups may have participated in your meeting goals and objectives, and any political or perception constraints you are still working to overcome.

Remember, make sure that the target audience can easily understand what you're trying to tell it. Also, be honest, and don't shy away from discussing areas that need improvement. This will help build trust with the public that you'll do what you say and say what you do.

This is a key step toward building and maintaining public confidence in your program. Make your report available to the public or proactively distribute it, based on established public participation and communication programs. A fancy-looking report that says how great you're doing is useless if it gathers dust on the shelf.

Consider using your web page or other electronic media in addition to or in lieu of publishing hard copies. As with your communication plan, keep in mind how your interested parties and local public are likely to access information.

Last, use your performance report as a key document for the periodic management review. You might conduct your management review first, and then use the results to develop the performance report.

Element 15 Checklist

- We have selected a format for the report.
- We have established a process to gather information to prepare the report.
- We have identified any additional analysis or synthesis necessary to prepare summaries of other BMP Elements, including progress toward goals and objectives.
- We have assigned leads responsible for information collection, any additional analysis, and drafting.
- We have established a review team and review order, including various interim approvals and final approval.
- We have laid out a schedule for preparing, reviewing, finalizing, and releasing the report — and we have synchronized it with our internal audit cycle and our management review cycle.
- We have made sure to set up feedback loops with other Elements in case we find something during report preparation that needs to be reinforced or changed.

Alternatively, staff could prepare the performance report in preparation for the management review. Perhaps a draft is used for the review, and then finalized following your internal review on goals and objectives. Regardless of how you synchronize these activities, it might be useful to select a sequence and stick to it if it works, to avoid duplicating your efforts.

The auditor will want to see a copy of your most recent report. In addition, keep a record as to who was involved in writing the report in case the auditor wants to interview the authors about the report and its contents.



NBP Auditor Considerations

Per the exact language in the requirements of this Element, an auditor may request to review:

- ✓ Copies of previously published reports;
- ✓ Raw records of performance measures and current status, and any summaries, roll-ups, or syntheses developed for the report, or reference to program or location where such records are kept;
- ✓ List of organizations, stakeholders, and other individuals who automatically receive the report;
- ✓ List of parties requesting copies; and/or
- ✓ Copies of comments, letters, or other communication received regarding the report(s) and any responses provided.

The auditor will check your previously published reports to verify that they have included the following required information:

- ✓ Summaries of BMP performance;
- ✓ Summaries of monitoring, measurements, and other results that demonstrate the performance of the BMP relative to goals, objectives, and legal requirements, including those biosolids management activities conducted by contractors;
- ✓ Summaries of performance relative to other voluntary adopted requirements, the organization's

progress toward achieving its biosolids program goals and objectives; and

- ✓ A summary of the most recent internal BMP audit or independent third-party verification or interim audit results (if applicable).

If your organization has not yet received an initial, third-party verification audit but is planning to do so, you are not required to complete the BMP performance report and make it publicly available until after the third party audit has been completed so that a summary of the audit may be included, as required in Element 15. You may choose to prepare and make publicly available a report without the third-party audit summary. Failure to prepare the report and make it available to the public would not constitute a finding of nonconformance during the initial third-party verification audit only – reports must be prepared annually for all other interim and re-verification audits and for organizations that chose not to use third-party verification audits.



Nonconformance Examples

The auditor may consider the following to be examples of nonconformance with this BMP Element:

- The BMP performance report does not include all required information describing progress toward goals, objectives, and legal and other requirements, as well as how that progress is measured and a summary of the most recent third-party verification or interim audit (if applicable).
- Summaries of monitoring, measurements, and other results are not sufficient to demonstrate performance of the biosolids program.
- The periodic BMP performance report has not been made available to interested parties.

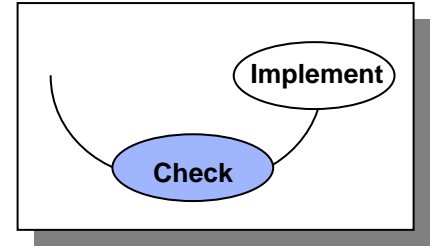
Element



Internal BMP Audit



Minimum Conformance Requirements



- 16.1 Establish and maintain an internal audit program to analyze the BMP periodically and to determine whether it is effectively meeting its biosolids management policy, program requirements, and biosolids program goals and objectives.

The internal BMP audit program shall define the scope, frequency, and methodology of the audits, assign responsibility for conducting the audits and communicating their findings, and designate individuals to whom these findings are to be conveyed. The internal BMP audit also shall evaluate the organization's performance relative to established biosolids program goals, objectives, and performance measures. The internal BMP audit program shall cover all the organization's biosolids management activities, including those performed by contractors.

- 16.2 Report internal BMP audit results to the organization's management in a manner that allows them to take action to make necessary modifications to the BMP. The person responsible for the BMP shall develop, or delegate the development of, a comprehensive corrective action plan addressing each nonconformance identified by the internal audit.
- 16.3 Maintain, at a minimum, the following documents and records, as applicable, relating to the organization's audit program:
- Description of audit methodology, protocol, scope, and schedule;
 - Identification of lead auditor(s), qualifications, and description of roles and responsibilities of auditors, management representatives, and others that may participate in, review, or be expected to act upon the audit; and
 - Corrective and/or preventive action plans prepared resulting from an audit, and any related changes made to policies, plans, procedures, and work practices that occur as a result of an audit's findings, evaluation, or follow-up actions.

Helpful Hint

Separate but Complementary

It is important to note that Element 16 is separate and different from a formal third-party verification program.

The internal BMP audit is the third major element of a continual improvement program. It compliments a third-party independent review, and is intended to function as a formal self-assessment of the BMP's effectiveness. Its frequency, however, can be adjusted to compliment a third-party independent review.



Interpretation

Internal BMP audits are intended to verify that your BMP conforms to requirements, is being implemented as intended, and is producing the results desired. Your internal auditors must gather objective evidence to substantiate whether you have properly implemented, and are maintaining, the BMP. The internal audit also should evaluate the organization's performance relative to established biosolids program goals, objectives, and performance measures.

Audits of the BMP are not compliance audits. However, during the course of an internal audit, your audit team may review information about your legal requirements and achievement of goals and objectives based on those requirements as part of auditing Elements 4 and 5 specifically, and other Elements indirectly.

A good internal audit program can provide incentives and impetus for better organizational, group, and individual performance under the BMP. Ideally, your audit should be designed to provide an *independent*, internal evaluation of conformance with BMP common procedures, legal and other requirements, and programmatic goals and objectives.

You can establish your internal auditor's independence in a number of ways. For example, you could have different operational units audit each other, have an internal party that is viewed as independent (e.g., legal counsel, a comptroller, an ombudsman) conduct the audits, or secure the services of an outside party (perhaps a consultant or peer organization).

You may elect to conduct the audit across all programmatic elements at once, or you may choose to audit programmatic elements separately, or in groups. Depending on how the program is set up, audits may occur on a regular basis, a randomly rotating basis, or an ad hoc basis, or may be triggered by a nonconforming or emergency event. The selected approach and schedule should be sufficient to identify minor problems as they occur and provide opportunities to address them in a timely manner, before they become major problems.



Helpful Hint

Internal Audit Program Queries

As you develop your internal audit program, look for answers to these questions:

- ✓ Who should conduct our audits?
- ✓ What is our process for qualifying and selecting auditors; for example do we have an independent evaluation panel?
- ✓ What are the roles and responsibilities of internal auditors and audit team leaders?
- ✓ Have we established internal auditor requirements for skills, knowledge, and competence?
- ✓ Do we (or a contractor) provide training to ensure that auditors are competent and do we continually assess training needs for auditors?
- ✓ What is our process for continually evaluating the performance and competence of auditors?

Upon completing the initial internal BMP audit, your senior management should review the audit findings, status reports, and any other relevant information to verify the suitability and effectiveness of the BMP, according to your plans for this Element and Element 17.



Guidance

To develop your internal BMP audit program you will need to determine the following:

- *Who* will conduct our audits?
- *When* will we audit our BMP?
- *How* will we conduct our audits?
- *What* will we do with the results?

Identify Your Lead Auditor and Participants

You can conduct your internal audits with your own personnel or an outside party. A combination of internal and external auditors also is a viable option.

Candidates from inside include staff involved in biosolids operations or staff with limited or no involvement in biosolids management. Internal auditors are likely to have an understanding of your organization's legal obligations and operating processes that cannot be matched by external consultants. The risk of conflicts-of-interest can be minimized by ensuring that internal auditors are independent of the operations they are auditing.

Candidate outside auditors include your contractors (as long as they aren't auditing their own performance), peers from other agencies, engineering or management consultants, and consultants who specialize in management system or compliance audits.

Some believe that external auditors often are better able to view organizational activities objectively — this is very desirable for your internal audit. Their experience in auditing other organizations may also provide a more realistic interpretation of BMP requirements than internal auditors would have. If you use an audit consultant or other external auditor, the internal audit report must have your organization's

name and not refer to a consultant's document or recommendation.

Whichever approach you choose, ensure that your internal auditors are trained in auditing techniques and management system concepts to conduct an audit properly.

If you use your own staff to conduct the audits, then you'll want to make sure they have (or provide them with) the proper training.

There are a number of firms specializing in management system services, including auditor training that support ISO 14000- and ISO 9000-based programs. If you use outside personnel, you also will want to make sure they are qualified to conduct your audit. In addition to experience with management systems in general, they should have knowledge of wastewater treatment and biosolids handling and production operations.

As for your own staff, the NBP may offer or sponsor training programs to qualify auditors. As you begin developing this Element, you should visit the National Biosolids Partnership's website (www.wef.org/biosolids) or contact NBP staff to get the most up-to-date information about auditor training and qualification programs.

Finally, you will need to determine the roles and responsibilities of the people involved in the audit.

- Who will be your "lead"?
- Does it make sense to have co-leads?
- Will you split up the Elements among your auditors?
- Or will each auditor focus on one or more operational areas (e.g., communications, operations), covering each BMP Element as applicable?
- How will the documentation, evaluation, and audit report-writing tasks be divided up?

Establish Your Audit Schedule

As part of your audit program, you need to create a schedule detailing the frequency for auditing various



Helpful Hint

Assigning Responsibilities

If you use an outside party to conduct your audits, it probably already will have established roles and responsibilities for its audit team. You should review them to make sure they make sense to you and you're comfortable with their procedures.

If you assign audit responsibilities to your legal department, ombudsman, or inspector general, they may prefer to decide how to allocate responsibilities among their team based on established practices for the group.



Helpful Hint

Schedule Time, Double It

Don't forget to factor audit planning time and the need for possible follow-up audits and unscheduled audits, needed by discovery of a nonconformance, into your audit schedule.

areas, departments or activities. You can audit the entire BMP at one time or break it down into discrete sectors for more frequent audits. (There may be advantages to more frequent audits, but the decision is up to you.) NBP encourages organizations to conduct internal audits at least annually. In many cases, organizations may already be conducting internal audits of various aspects of the BMP and just haven't called them "audits." For example, many organizations review biosolids quality data monthly and then make process management adjustments as a way of good business. Consider what activities you already conduct and how to incorporate them into your internal BMP audit program.

The periodic internal audit requirement allows organizations to define "periodic." For example, larger organizations typically have many changes within a year and might need or desire more frequent audits than smaller organizations, where change may be less frequent. Changes in the management of the BMP are an opportunity to determine through an internal audit if your BMP is responding appropriately.

You could let your BMP manager/coordinator establish your schedule, have your BMP team develop one as a group, or assign the scheduling responsibility to your internal leader of the audit team.

If you plan to pursue NBP platinum-level certification, and also plan to substitute internal BMP audits for some of the third-party interim audits (see Chapter 11 for more information on substitution for interim audits), your third-party auditor will review this schedule and determine with you whether the schedule is appropriate for the size of your organization and your BMP.

It is helpful to create the schedule at the same time every year, for example at the beginning of the year or in conjunction with your fiscal year. The timing for internal BMP audits should be coordinated with the management review (Element 17) and periodic Biosolids Management Program Report (Element 15), such that the results of the internal BMP audit might inform the management review (especially information about performance relative to established biosolids program goals and objectives) and the creation of the periodic BMP performance report.



Helpful Hint

What to Include

Minimally, your audit schedule should include:

- The department or function to be audited
- The frequency at which each department/function is to be audited
- The scheduled timeframe for upcoming audit activities



Helpful Hint

Coordinate Schedules

See Chapter 11 for more detail about the requirements of frequency of third-party verification and interim audits. You should design your schedule to be consistent with these requirements when you are pursuing third-party verification audits.

You also probably will want to coordinate your internal audit schedule with your biosolids management report preparation, management review, budgeting, and goals and objective development cycles.

Those leading the effort should distribute the schedule as soon as possible to allow internal auditors and department managers and supervisors to adjust their schedules and prepare for the audits.

Some organizations' audit teams do not publish their schedules ahead of time, and give audit subjects very little notice, under the philosophy that "we should be ready any time."

In determining the frequency at which you conduct internal BMP audits, you should base your decision on the following:

- The importance of the activity concerned;
- The results of previous audits;
- Changes or modifications to processes;
- Any requirements stipulated by applicable environmental laws or regulations (local, state, and national); and
- Your desire to substitute an internal audit for a third-party interim audit in eligible years for Platinum-level NBP Certification (see Chapter 11 for more details).

One of the easiest ways to determine how frequently various sections of the BMP should be audited is to create an audit frequency matrix. Separate matrices should be prepared for various categories, as determined by the organization (e.g., significant environmental aspects, legal requirements, and important biosolids management activities). Internal BMP audits may need to be rescheduled from time to time, but they should not be waived all together.

Develop Audit Protocols and Procedures

Your internal BMP audits should collect *objective evidence* of conformance: procedures, records, and observation of activities. You will need to decide how you will conduct your audits to ensure that audits are planned and carried out under the specified conditions.

To establish your program, you or your external auditor need to do the following:



Helpful Hint

Procedure

Your audit procedure should describe:

- Audit scope
- Audit frequency
- Audit methods
- Key responsibilities
- Reporting mechanism

Methods of collecting evidence include:

- Interviews with personnel
- Examination of documents
- Observation of activities
- Test and monitoring data
- Other records

- Lay out internal auditing procedures that establish guidelines and requirements for the conduct of internal audits;
- Determine the method for planning, performing, and reporting internal audits;
- Identify the activities, areas, and departments to be considered when conducting internal BMP audits;
- Develop standard forms or working documents (e.g., checklists, corrective action request forms, audit tracking reports) that will be used during the auditing process;
- Decide how privileged information will be safeguarded and treated with discretion;
- Determine how corrective and preventive action will be verified for suitability and effectiveness;
- Design a review process aimed at continually improving the audit program; and
- Secure the commitment of resources to fulfill the audit program's objective.

Before you start an audit, be sure to communicate the audit scope, schedule, and other pertinent information with the people in the affected area(s). This will help avoid confusion and will facilitate the audit process. It also is a good idea to reference the audit procedures that are required to perform the audits, as well as the necessary resources.

During the course of the internal audit, auditors should discuss identified deficiencies with the people who work in the area. This will help the auditors verify that their understanding is correct. It also can serve as refresher training on BMP requirements for organization staff.

If your internal auditor cannot tell whether a particular procedure or practice has been followed, then you should consider revising the procedure. During the actual audit, auditors should resist the temptation to evaluate why a procedure was not followed; that step comes later.

Internal Audit Scope

The NBP does not require that you cover all 17 Elements in any particular order or cycle for internal

audits. You determine the appropriate scope and schedule for reviewing the BMP Elements in internal audits. Keep in mind that the scope of your internal audits may shift over time. For example, internal audits conducted prior to receiving third-party verification of your BMP are likely to be very comprehensive, as you will want to assure for yourself the readiness of the BMP for third-party verification. However, subsequent internal audits may just look at a portion of the BMP at a time. There are minimum requirements regarding internal audit scope when you are substituting those for third-party interim audits as part of Platinum-level NBP Certification— see Chapter 11 for those requirements.

As required by the *BMP Elements*, internal audits should evaluate the organization’s performance relative to established biosolids program goals and objectives. Internal audits must also check that the organization is effectively meeting its biosolids management policy. As part of this check, the internal audit program should include an examination of the organization’s commitment and implementation of the *Code of Good Practice*, as part of analyzing the BMP and determining whether it is “effectively meeting its biosolids management policy”. Per the requirements of Element 2, the biosolids management policy must "commit the organization to following the principles of conduct set forth in the *Code of Good Practice*. Therefore, in examining whether or not you are meeting the biosolids management policy, the internal audit program should review the commitment and implementation of the *Code of Good Practice*.

Evaluate Your Results and Follow Up

Audit procedures should assign responsibility for communicating audit findings and designate those individuals to whom these findings are to be conveyed. At a minimum, results of your internal BMP audit should be reported to senior management in a detailed and comprehensive way so that management can take immediate action to implement any modifications to the BMP.

In conjunction with BMP Elements covering public participation in planning, communication and outreach, and performance reporting, you will need to

Element 16 Checklist

- We have established a program and procedures to conduct periodic internal BMP audits.
- Internal BMP audits are conducted to determine whether the BMP conforms to specific internal requirements and the *BMP Elements*.
- Internal BMP audits are conducted to determine whether the BMP has been implemented and maintained properly.
- Results of BMP audits are provided to management for review.
- The internal audit program and audit schedule are based on the importance of the activity audited and the results of previous audits.
- Audit procedures cover audit scope, frequency, methodologies, responsibilities, and the reporting of audit results.

decide how you will share audit results with employees, partner agencies, and the public.



NBP Auditor Considerations

Findings of nonconformance as a result of the internal BMP audit link back to Element 14 (Nonconformances: Preventive and Corrective Action) and indicate weaknesses in the BMP that, if uncorrected, could affect the performance of the BMP. Each finding requires an action plan with assigned responsibilities and a schedule for correcting the nonconformance and preventing a recurrence.

You must document the results of your audit, preferably in a stand-alone memorandum or report. This will facilitate review of this Element during an internal audit (yes, you must audit your internal audit program!), and in third-party verification audits. This approach will also help you during your management reviews and in developing corrective and preventive action plans to address nonconformances.

Here are some examples of items your auditor will look for through interviews and document review:

Organization and personnel:

- ✓ Facility name (auditee)
- ✓ Facility structure
- ✓ Names of personnel and managers participating in the audit as auditees
- ✓ Organization name of external auditor (if applicable)
- ✓ Names of audit team members

Audit protocol:

- ✓ Scope, objectives, and plan of audit
- ✓ Agreed criteria of audit (include a list of reference documents against which the audit is to be conducted)
- ✓ Audit period
- ✓ Distribution list for the audit report

Audit findings:

- ✓ Identification of the confidentiality associated with the audit contents
- ✓ Summary of audit process
- ✓ Audit findings and conclusions as to conformance to the BMP audit criteria
- ✓ Audit findings and conclusions as to whether the system is properly implemented and maintained
- ✓ Audit findings and conclusions as to whether the internal review process is able to ensure the continuing suitability and effectiveness of the BMP

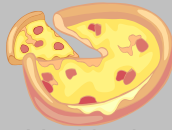
The auditor may consider the following to be examples of a nonconformance with this BMP Element.

- Required documents and records of your internal

**Nonconformance Examples**

audit program are missing; for example, there is no description of the audit methodology, protocol, scope and schedule, or the lead auditors and their qualifications have not been identified.

- Corrective action plans have not been developed for all nonconformances identified during an internal BMP audit.
- Corrective or preventative action plans are incomplete.



PIZZA BREAK!



Whew! In this chapter you learned about the importance of monitoring and measuring the performance of your BMP. Remember, you can only manage what you measure. In addition, you learned about how to use monitoring and measurement results to take action to correct problems and continually improve your BMP. You read about the importance of sharing relevant information with the public in periodic performance reports. Finally, you reviewed guidelines for establishing an internal audit program to self-assess your conformance with your BMP.

In Chapter 10, you will learn about the management review Element. This is the last phase of the Plan-Implement-Check-Review cycle of your BMP. This is where you review all the information and knowledge gained during the measurement phase, and apply it to make your BMP and your organization work even better. The process does not end there, however. Management review kicks off a new cycle, beginning with the next phase — planning. These cycles repeat for as long as you are committed to best practices and continual improvement.

Chapter 10

Management Review

Element

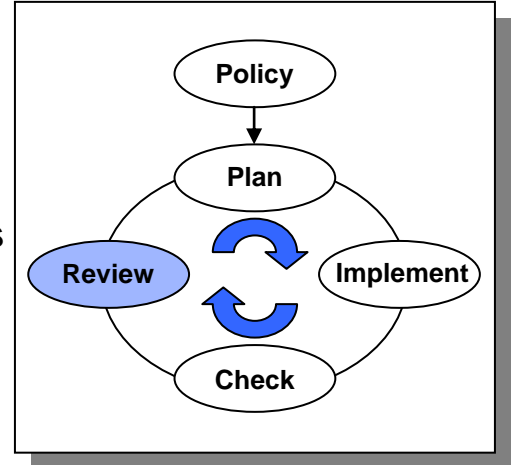


Management Review



Minimum Conformance Requirements

- 17.1 At intervals the management determines appropriate, review the BMP and its performance relative to policy commitments, goals, objectives, and established performance measures to ensure its continuing stability, adequacy, and effectiveness. The management review shall address the possible need for changes to policy, the goals and objectives, biosolids management activities, and other BMP Elements based on internal BMP audit results, external verification audits by third parties, changing circumstances, and the commitment to continual improvement. The management review shall be documented. Any changes to policies, plans, procedures, and work practices that are made as a result of the review also shall be documented.
- 17.2 Maintain, at a minimum, the following related to the organization's management reviews:
- Schedule and scope for review;
 - Documentation of findings, evaluation, and follow-up action; and
 - Documentation of changes to policies, plans, procedures, practices and other BMP Elements that occur as a result of the management review findings, evaluation, or follow-up actions.
- 17.3 Assign a lead person or persons to be responsible for organizing and conducting the review.





Interpretation

Management review is the last phase of the Plan-Implement-Check-Review cycle of BMP development and implementation. The process does not end there, however. Management review kicks off the next phase – Planning – in a new cycle that repeats for as long as an organization is committed to best practices and continual improvement.

The term “management review” in fact may encompass numerous reviews that cover different activities, time periods, programmatic scope, costs, and operational scale. At a minimum, organizations implementing BMPs should conduct at least an annual review that covers the BMP, including all BMP Elements, critical control points, etc. While all BMP Elements don’t have to be reviewed at once, senior management should ensure that every Element is evaluated over a set period of time. The more management review that takes place, the better your BMP will become. The concept of management review needs to include how well the system is working, as well as biosolids program performance. Management reviews should be focused on continual improvement, not just a discussion of results. One way for management to review BMP effectiveness is to have summary data collected along with recommendations for improvement. The data can be reviewed ahead of time by management individuals and then they meet periodically to discuss ONLY the recommendations for improvement.

The review schedule should match the time period established for goals and objectives and provide sufficient time for reinforcement or course changes if needed. For example, progress toward short-term, three- to six-month goals, might be reviewed monthly or bimonthly. Many organizations develop BMP review schedules that parallel their budgeting, capital planning process, or strategic planning processes.

One key to success is having regular review sessions. These can be scheduled by the BMP team leader or other designated individual. Some organizations incorporate the periodic management review into their



Helpful Hint

Management Review Objectives

- Examining BMP audit results
- Considering changing circumstances
- Assessing the organization's commitment to continual improvement
- Identifying possible changes in policy, practices, objectives, and other BMP Elements

formal business planning and budget cycle. This has the advantage of matching short-term objectives with requests for resources (capital investments, training expenditures, new positions, or operating expense). A management review does not necessarily have to be a meeting. It is more effective to consider management review as a process that may include different parts conducted at different times. Reviews can include short term (e.g. monthly) performance reviews and long term (semi-annual) high level reviews.

You must document your management reviews to satisfy internal audit requirements, as well as third-party verification audits, including all decisions and recommendations made.

Management reviews should reflect the organization's culture and style, as well as the preferences of the individuals involved. There are two kinds of people who should be involved in the management review process:

- People who have the right *information or knowledge*.
- People who can make *decisions*.

There are many approaches that management can use to structure its reviews. In general, these will involve a combination of formal and informal methods.

Formal methods include the following:

- Regular update and review of a given set of program and process measurements.
- In-depth review of program and process elements, such as requirements, procedures, measurements, and control points.
- Review of nonconformances.
- Review of biosolids management policy, BMP, and strategy for continual improvement.

Senior management also may use informal methods to stay in touch with the BMP operation. For instance, by interacting with employees in their work areas, executives can observe biosolids management practices in the organization firsthand, and can seek employee suggestions about how to improve the BMP. Another useful means of getting informal input is to engage in



Helpful Hint

Management Involvement

Managers can't review what they don't understand. For a successful and useful management review process, it is essential that managers have a substantive connection to the BMP.

discussions with peer executives managing similar operations or issues.

Management should plan corrective and preventive action to improve the BMP and should ensure that actions were taken and were effective. The results of the management review may drive changes in policy, which can cause changes in the BMP. Information obtained through communication strategies, monitoring and measurement, corrective action, and results of BMP audits may be of particular value in determining where improvements can be realized.

The management review and the audit of the BMP are different. The BMP audit can include conclusions about improving the BMP if requested by management. However, it is not the auditors' job to recommend specific changes to the BMP. Top management is responsible for making decisions on BMP improvement.

Determine the frequency for management reviews that will work best for your organization. Some organizations combine these reviews with other meetings (such as director meetings) while other organizations hold "stand-alone" reviews. Many organizations typically conduct management reviews once or twice a year.

If the management review is held in a management meeting format, make sure that someone takes notes on the following:

- What issues were discussed
- What decisions were made
- What action items were selected

Management reviews should be documented.

Once you have documented the action items arising from your management review, be sure that someone follows up. Progress on these items should be tracked.

Depending on your organization's public participation program, there may be outside parties involved in the management review. Or you may elect to share a summary of the periodic management review or make a summary available upon request.

Element 17 Management Review Checklist

- Our senior management reviews the effectiveness of our BMP at defined intervals to determine its suitability, adequacy, and effectiveness.
- Participants' roles and responsibilities are clear.
- Necessary information is collected to allow management to carry out management reviews.
- Our review process solidifies and confirms integration among various elements of our program and examines communication and procedural links among important activities.
- Records of management reviews are maintained.
- Management assesses the need for changes in environmental policy, objectives, and other BMP Elements, based on audit results, changing circumstances, and our commitment to continual improvement.



NBP Auditor Considerations

The auditor will look for objective evidence that an organization conducts regular management reviews of its BMP and acts upon the results. This includes a record of the management review process as well as evidence that action items resulting from the management review are acted upon. In general, this includes documentation such as the following:

- ✓ A record of the schedule and scope for management review activities.
- ✓ A record of the management review process noting who was present, what issues were discussed, what actions were suggested, who was assigned responsibility for what follow-up action, etc.
- ✓ Records indicating that a lead person or persons have been assigned responsibility for organizing and conducting the review (these could be part of job descriptions or management review procedures).
- ✓ Documentation of changes made to policies, plans, procedures, etc. that occur as a result of the management review findings, evaluation, or follow-up actions.
- ✓ Record of progress on follow-up actions.

The auditor also may conduct interviews with select management review participants.



Nonconformance Examples

The auditor may consider the following to be examples of nonconformance with this BMP Element.

- Periodic management reviews of the BMP and its performance have deviated from the planned procedure, schedule, or scope.
- The necessary changes to policies, plans, procedures, or work practices identified by the management review have not been made or documented.

- The assigned leader of the management review is not aware of the assigned responsibilities or the procedure for implementing the management reviews.



COFFEE BREAK

While you have just finished the first cycle of your BMP, you have just *begun* your BMP journey! The next step is ... Planning again, beginning with a check of your policy to make sure you are still on track with it. This time around will be much easier.

But you also have another next step: third-party auditing. Now you will have a chance to test your Biosolids Management Program objectively, catch any flaws, and congratulate yourself on its successes. When your BMP passes muster this way, it will gain credibility within your own organization, and with your external stakeholders. And you will begin to realize the true benefits of your BMP.

Chapter 11 shows you what you can expect with a third-party audit.

Chapter 11

NBP Third-Party Verification

Overview

The core of the third-party verification approach is an independent third-party audit of the Biosolids Management Program. An organization wanting to achieve NBP Gold-level Recognition or NBP Platinum-level Certification must have their BMP verified by an independent third-party audit.

The third-party audit will have a three-part focus:

- ✓ *Requirement Testing*: Is the BMP meeting all of the requirements in the *BMP Elements*?
- ✓ *Transaction Testing*: What is the overall system health? Is the BMP working as intended with different elements interacting with one another?
- ✓ *Outcome Testing*: Is the organization seeking continual improvement in the four NBP outcome areas: environmental performance, regulatory compliance, relations with interested parties, and quality biosolids management practices?

A summary of the basic steps to verify a BMP with an independent third-party audit is as follows:

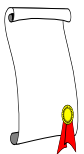
1. The organization formally commits to the *NBP Code of Good Practice*.
2. The organization proceeds with implementing a BMP meeting the requirements set for in the *NBP BMP Elements*.
3. The organization operates the BMP for three to six months, conducts an internal BMP audit, and determines that it is ready for its initial third-party verification audit.
4. The organization contracts with an NBP-approved, third-party audit company.
5. The audit includes a detailed review of documents, staff interviews, and wastewater treatment plant and biosolids site observations. The third-party auditor prepares an audit report with a summary

of its findings on whether the organization's BMP meets the requirements in the *BMP Elements*.

Two general scenarios are possible for the initial verification audit:

- The organization meets all the *BMP Elements* requirements with only minor nonconformances that it agrees to correct; or
- The organization has major nonconformance(s) that it needs to work out with the auditor before receiving BMP verification; an organization can file an appeal with the NBP Appeals Board if it disagrees with the auditor's findings.

The remaining sections of this chapter provide more detail about the third-party verification audit process, including pre-audit activities, onsite audit activities, and post-audit activities such as reporting and appeals.



Introduction to NBP Third-Party Verification

NBP Program and BMP Verification Eligibility

To be eligible for an NBP BMP verification audit, your organization must meet the following criteria:

- ✓ Be an organization that generates solids or biosolids during the treatment of domestic sewage in a treatment works or an organization that derives a material from wastewater solids or biosolids (technically defined as a "preparer" pursuant to federal regulation definitions);
- ✓ Have committed in writing to follow the NBP *Code of Good Practice* through a letter of understanding with the NBP, signed by your organization;
- ✓ Have an NBP BMP in place and operating for at least three to six months; and
- ✓ Have conducted at least one internal BMP audit.

Audit Relationships

For the third-party BMP verification process, the NBP has established the following relationships between the



Helpful Hint

Setting Up Verification Audits

Contact NBP staff or visit the NBP website at www.wef.org/biosolids for information on how to set up a third-party verification audit of your BMP.

NBP, auditing organizations, the NBP Appeals Board, and participating biosolids organizations.

- The NBP approves the third-party auditors and audit organizations who conduct the BMP verification and interim audits. Auditors are required to meet specific NBP training and auditor certification requirements. Auditors (or their organizations) will pay for their own training and certifications.
- The NBP provides information on these approved third-party auditors for organizations to contact when they are ready for a verification audit.
- The biosolids organization initiates contract negotiations with its third-party auditor of choice from the NBP approved list. Contract details should include the scope and proposed schedule for the third-party audit. (NBP staff can assist with this negotiation for a administrative fee of 15% of audit costs.)
- The third-party audit company issues a statement of BMP verification to biosolids organizations that successfully complete a third-party BMP verification audit.
- Biosolids organizations that wish to appeal their third-party verification audit results can present an appeal to the NBP Appeals Board.
- The NBP Appeals Board makes decisions on appeals. (See below for more information on the verification appeals process and on the makeup and role of the Board.)

Verification Audit Scope & Approach

Consistent with the NBP *BMP Elements*, the BMP verification audit scope encompasses all parts of the biosolids value chain (from pretreatment and collection through final use or disposal) that are under the organization's direct or indirect control. Auditors will focus attention on those practices and management activities that directly support your biosolids-related operations, processes, and activities, as opposed to all wastewater treatment utility activities.

The NBP third-party verification audit process is comprised of two major components. First, the

designated auditor conducts a desk audit of your application and supporting BMP documentation. During this review, the NBP anticipates that the auditor will be able to determine if your organization has satisfied the basic BMP documentation requirements. This review must take place before any on-site activity. The auditor must make a determination, based upon his/her documentation review, if the organization's BMP has any major issues that could result in not being verified during an on-site visit. You will be informed with a written report of the findings of the document review process.

Second, the auditor will conduct an on-site BMP verification audit. The on-site portion of the audit should emphasize examination of the effectiveness of your BMP as implemented at delivering intended outcomes - which should be documented in the BMP Manual, biosolids management policy, and/or goals and objectives - on a consistent basis.

To make the verification determination, auditors will evaluate the adequacy of your BMP with respect to requirements established through the *BMP Elements*. At the same time, however, the auditors are expected to defer substantially to the expertise and knowledge of local conditions that program participants have and the decisions they then make regarding practice selection, environmental performance improvements, and public participation methods. The NBP Biosolids Management Program has been specifically designed to provide substantial latitude for individual biosolids organizations to determine how to address the NBP expectations and requirements.



Pre-Audit Activities

Pre-audit activities address the various activities of the NBP third-party BMP verification that will occur before your onsite verification audit, including the application process and BMP paperwork review or desk audit. These activities are designed to ensure your BMP is ready for third-party verification in the form of an onsite audit.

Notification of Interested Parties

Prior to applying for a third-party verification audit, you must notify interested parties of your intent to receive an independent third-party audit and have built into your BMP planning a discussion with interested parties about approaches for observing the third-party audit. The NBP believes this provides you the best opportunity to manage expectations about audit results, articulate any constraints needed on audit observation, and understand how best to conduct the audit to gain maximum public acceptance of biosolids management activities.

During the BMP audit, the auditor will verify that you have made such notification. You must make this same notification to interested parties for any third-party interim audits, as well as full verification audits.

You are not required by NBP to have interested parties observe or otherwise participate directly in the independent, third party audit.

NBP Verification Application Process

Once your organization has implemented a BMP - and it has had at least three to six months of experience operating under the BMP - you may contact an NBP-approved third-party audit company to have your BMP verified by a third-party auditor for conformance with the NBP BMP requirements.

The NBP encourages you to contact the third-party audit company two or three months in advance of your desired audit date to allow lead time for contract negotiations and scheduling. Applicants can complete the requirement of having the BMP operate for three to six months prior to receiving the third-party audit while the audit scheduling process is taking place.

You and the NBP-approved audit company will work together to develop a mutually agreed upon audit plan (with scope, schedule and budget). Sufficient budget detail shall be provided by the audit company to address biosolids organization questions about cost (e.g., number of required audit days, desk audit costs, and final report detail).

In order to prepare an audit scope and schedule, the third-party audit company will likely request that you submit information describing your organization's BMP, biosolids facilities (location, size, operations), biosolids management activities including those performed by contractors, and biosolids end use or disposal methods.

BMP Documentation Review or Desk Audit

Once your organization and the audit firm have worked out the details of the contract, audit scope, budget, and schedule, a Lead Auditor shall be assigned to conduct the desk audit. The Lead Auditor will complete your BMP desk audit within 30 to 60 days of receiving your materials. The desk audit includes a review of BMP documentation (required), and may also include a brief, on-site visit by the auditor (optional) to confirm that your BMP is ready for an on-site verification audit.

The desk audit serves the following purposes.

- ✓ Determines if your BMP addresses the basic NBP requirements, as defined in the *BMP Elements*, sufficiently to warrant a full, on-site verification audit.
- ✓ Confirms that your BMP and stated goals and objectives are aligned with the *Code of Good Practice*.
- ✓ Confirms whether or not the critical control points, operational controls, and management practices identified in your BMP documents are consistent with those in the *National Manual of Good Practice*.
- ✓ Allows the Lead Auditor to assess the amount of time that is likely to be needed for the on-site audit, based on the size and complexity of the facility (or facilities) and number and location of final use and disposal operations.
- ✓ Enables the Lead Auditor to determine where and when the technical biosolids auditor expertise may be necessary to effectively evaluate your BMP, based on the types of processes and practices at your organization.

To conduct the desk audit, the Lead Auditor will likely request the following materials:

- ✓ A description of your intended use or disposal of biosolids material, the desired biosolids material characteristics, the wastewater facility operations associated with biosolids production, a characterization of contractor use and final use and disposal operations, and documentation of notification of interested parties about the intent to receive an audit and a discussion with interested parties about approaches to observe the audit.
- ✓ A signed letter from your organization that includes a clear statement of the date at which your organization believes it has achieved full implementation of its BMP (defined as the date when management officially approved the BMP Manual). This date starts the clock for the three to six months of BMP operating experience necessary to receive the initial verification audit.
- ✓ A copy of your organization's Biosolids Management Policy that includes a commitment to following the principles of conduct set forth in the *Code of Good Practice*.
- ✓ A copy of your most recent internal BMP audit report.
- ✓ Supporting documentation - in the form of a BMP Manual or collection of relevant documents - that demonstrates the BMP addresses all of the 17 *BMP Elements*.

The information provided shall include a list or description of actual operational controls, standard operating procedures, and operating records, sufficient to allow the auditor to gain an understanding of your facilities and operations prior to coming on-site. The supporting documentation should demonstrate that your organization has established policies, programs, procedures, and/or systems for each of 17 NBP *BMP Elements* and their associated requirements. The NBP anticipates that most organizations will submit a BMP Manual that describes the organization's BMP and that references additional specific documents (e.g., Emergency Response Plan, operating procedures) but does not include them. Documentation of your critical control points in the BMP Manual will help the auditor understand the type of utility operations, including final use or disposal, and determine whether your identified critical control points are consistent with the

NBP reference manuals, and what the scope of the audit should be.

If there is insufficient BMP documentation to make a determination about whether the BMP addresses the requirements of the *BMP Elements* (e.g., if required documents are missing or documents do not address all the specified topics) the Lead Auditor shall contact your BMP Coordinator to ascertain whether other paperwork exists that has not been supplied. If so, you will have the opportunity to supply additional documentation to the Lead Auditor for review.

You also have the option to ask for a short, on-site visit as part of the desk audit. The on-site visit would include an examination by the Lead Auditor of four-to-six key BMP Elements to further aid in determining BMP readiness for a full verification audit (which would cover the remaining BMP Elements and all operations). The on-site visit as part of the desk audit can also help the Lead Auditor to better plan for the remaining on-site audit in terms of determining which operations and sites to observe directly and which portions of the audit require the biosolids technical auditor. This additional planning, as well as BMP readiness, can help control overall audit costs.

Desk Audit Findings

A brief report will be issued to you on the findings of the desk audit. If the report indicates that the desk audit found issues that could result in a verification failure (i.e., indications that your BMP does not address, or does not fully address, any of the requirements of the *BMP Elements*) the audit company must contact you for guidance on a decision to continue with the next phase of the audit. At that point, discussions between you and the audit company can take place to clarify any issues that might not have been clear during the desk audit. In some cases, you may be able to provide additional documentation to the auditor that demonstrates that the requirement(s) has (have) been addressed.

Based on the auditor's observations from the desk audit, additional contact with you, and an on-site visit (if conducted) the Lead Auditor shall make a recommendation as to whether the full, on-site audit should proceed. This recommendation is based on the

Lead Auditor's assessment of the readiness of your BMP with respect to the requirements of the NBP *BMP Elements*. The Lead Auditor will provide you written notice of this recommendation.

If the Lead Auditor has determined that additional work is required before the on-site portion of the verification audit is warranted, then the paperwork shall be returned to you with the written notification. If the BMP paperwork is complete and indicates that your BMP generally addresses the requirements of the *BMP Elements* and the Lead Auditor has recommended that the on-site audit should proceed, you and the Lead Auditor may move forward with the on-site audit.

Planning for the On-site Verification Audit

The Lead Auditor shall determine, based on the size and complexity of the facility and location of sites, when and where to involve additional auditors to complete the site visit. The Lead Auditor shall determine how many additional auditors are necessary and contact appropriately qualified people to ascertain their availability. The amount of time needed to conduct the on-site audit can vary depending on the type and complexity of biosolids operations, the geographic location of the organization's facilities, and the number of auditors on the verification audit team.

The Lead Auditor shall contact the representative of the organization (usually the BMP Coordinator) to set the dates of the site visit and discuss the scope, agenda, and any audit requirements. These requirements include: availability of a private room and/or working area; use of a telephone; provision of lunch on site; any issues related to "rights of entry;" use of local auditors; availability of relevant personnel, including top management, for interviews; any health and safety requirements or precautions that may be relevant to the team during the audit; and any other logistical or administrative activities that need to be coordinated or planned prior to the on-site visit.

Following this contact, the Lead Auditor shall provide an audit plan and agenda to the representative of the organization. The audit plan shall identify the biosolids value chain critical control points for possible observation during the audit. In addition to the tentative audit agenda and plan, the Lead Auditor

shall also provide the organization with the following information.

- ✓ Composition of the audit team.
- ✓ List of individuals (by generic position titles) whom the auditor would like to interview, to ensure that they have time available during the on-site visit.
- ✓ Letter from the Lead Auditor to the applicant to confirm dates and establish the process, protocol, and auditor expectations for the organization (e.g., availability of personnel and documents during the audit, provision of a private room and/or working area, use of a telephone, provision of lunch).
- ✓ List of additional materials that should be available for on-site review during the audit.



On-site Verification Audit

This section addresses the various activities of the NBP third-party BMP verification audit that occur during the on-site part of the audit, including the audit scope and approach, format, types of testing, and general evaluation criteria.

On-site Audit Scope and Approach

The on-site portion of the audit will emphasize examination of the effectiveness of your BMP, as implemented, at delivering intended outcomes on a consistent basis. These outcomes should be documented in the BMP Manual, biosolids Management Policy, and/or goals and objectives.

Auditors include as an audit activity emphasis on those areas of your organization's management system that are necessary, as defined by your organization, to achieve the NBP's goal of promoting environmentally sound and publicly accepted biosolids management.

On-site Audit Scope

During the on-site portion of the audit, auditors will examine your operations and facilities and review BMP



Helpful Hint

Scope it Out

The on-site BMP audit scope encompasses the all parts of the biosolids value chain — collection and pretreatment through final use or disposal — that your organization controls either directly or indirectly.

However, with some exceptions, you select the auditable critical control points that govern your BMP and ensure that the characteristics of your biosolids material satisfy regulatory, quality, and public acceptance requirements.

records and documents that were not included in your BMP Manual and desk audit materials.

Consistent with the NBP *BMP Elements*, the onsite audit scope encompasses all portions of the biosolids value chain (wastewater collection and pretreatment through biosolids final use or disposal) that are under your organization's direct or indirect control. The auditor will emphasize those activities that relate to the biosolids value chain, as opposed to all wastewater utility activities.

The critical control points you select will determine the scope of your BMP. Therefore, the auditor will only examine activities throughout the biosolids value chain insofar as there are critical control points that you rely on to ensure that the characteristics of your biosolids material (e.g., solids content, metals, pathogens, odor, plastics, vector attraction) satisfy the regulatory, quality, and public acceptance requirements associated with handling, managing, and final use or disposal of the biosolids material.

All audits - third-party verification, third-party interim, and internal BMP audits - should include a sampling of activities for direct observation during the on-site portion of the audit. The auditor will select a sampling of activities for direct observation, based on your identified critical control points. However, there are some observations the auditor is required to make.

To maintain BMP program credibility and to achieve the NBP's goal of increased public acceptance of biosolids management activities, during verification audits the auditor must directly observe all facilities that produce biosolids and are covered by your BMP. Facilities that "produce biosolids" are considered those that include processes in the value chain from solids stabilization forward.

The NBP does not require direct observation of all final use or disposal sites during the verification audit. However, some specific criteria for auditors to use in selecting final use or disposal sites for direct observation are provided in the section on the on-site audit format below.

You should note that the audit does not entail an analysis of biosolids material characteristics by the

auditor, only that you have effective systems for ensuring that biosolids material characteristics meet all requirements associated with its intended final use or disposal method.

On-site Audit Approach

During the onsite audit, the auditor will look for objective evidence at each step in the value chain that is relevant to your organization that your actual practice conforms to that documented in the BMP. If the auditor has any indication that actual practices diverge from practices documented as part of the BMP, the auditor shall assess the degree to which the finding suggests a weakness in your BMP. In particular, a divergence in actual practice can have important implications for the completeness and appropriateness of the critical control points, legal and other requirements, and operational controls that are included in your BMP.

During the on-site audit, the auditor shall also look for objective evidence that your BMP is functioning as intended. This is largely done through the use of transaction testing, described in greater detail in the section on audit testing and transaction testing and on examining outcomes produced by the BMP, described below.

Collecting Objective Evidence

The primary focus of the on-site audit is to collect objective evidence that verifies that your BMP is functioning as intended, that practices and procedures are conducted as documented, and that the BMP, as implemented, is aligned with the *Code of Good Practice*, the *BMP Elements*, and NBP program objectives.

To collect objective evidence, the audit team will conduct interviews, review on-site documentation, and directly observe selected activities and locations that are relevant to critical control points and associated operational controls identified by your organization as being important to managing biosolids-related operations and material. These various “modes of audit inquiry” (interviews, document review, and direct observation) enable the audit team to collect “objective evidence” that verifies whether your BMP adequately addresses the NBP expectations and requirements as stated in the *BMP Elements*.

Helpful Hint

Objective Evidence:

- ✓ Policies
 - ✓ Ordinances
 - ✓ Procedures
 - ✓ Manuals
 - ✓ Inspection checklists
 - ✓ Operating logs
 - ✓ Annual reports
 - ✓ Other documents and records
 - ✓ Observations of practices, equipment, and facilities
 - ✓ Interviews with key personnel, management, or contractors
- ... that objectively demonstrate conformance with the *BMP Elements* requirements.

Interviews help the auditors determine whether employees are familiar with the biosolids management policy and its requirements, and their specific BMP-related responsibilities. Review of on-site documentation and records allows the auditors to determine whether required documents exist, procedures are being implemented as written, and appropriate records are being kept.

When specific questions arise that your BMP representative cannot answer, or that require a review of specific areas, an auditor may need to observe activities or locations directly, accompanied by an organizational representative. Such evidence might include monitoring logs, training records, posted notices, or meeting minutes. If written evidence is not available, the auditor may need to question a sample of relevant employees to determine that their answers are consistent with and support the BMP.

Auditors will use these three methods of collecting objective evidence during each phase of the onsite audit discussed below.

On-site Audit Format

This section summarizes the typical format of an on-site BMP verification audit.

Based on the desk review of your application and BMP Manual, the lead auditor should have sufficient information to work with you to prepare a preliminary plan and agenda for the site visit. While the lead auditor has discretion in arranging the schedule and plan for the onsite audit, the general agenda and structure of the audit should follow the format discussed below.

1. Entrance Meeting and Document Review

The site visit will start with an entrance meeting, which will be led by the Lead Auditor. It is recommended that the initial meeting and document review be conducted at your primary location or facility, where important BMP documents discussed below are accessible. This location is likely to vary depending on the size and structure of your organization. For example, large organizations may have a central office that is separate from its treatment facilities and other facilities, whereas smaller utilities may have their



Helpful Hint

First Meeting and Document Review

You should expect that the entrance meeting and review of documents and records will require a half-day of on-site time.

administrative offices and BMP records located at their primary wastewater treatment facility.

The purpose of this meeting is to accomplish the following objectives:

- Introduce members of the audit team to your organization's representatives;
- Brief your BMP representative, managers, and key staff on the scope of the audit, audit team activities, and requirements; and
- Confirm the plan and agenda for the audit.

After the entrance meeting, the audit team likely will need to review documents and continue discussions with key representatives of your organization to confirm the specific critical control points, facilities, and locations that should be observed or visited during the subsequent on-site audit phases discussed below. The audit team also might review copies of previous internal or third-party audit reports at this time to identify potential areas for exploration or follow-up.

Based on this initial document review, the audit team will work with key representatives of your organization to finalize the site audit plan and agenda. You should expect that the entrance meeting and review of documents and records will require a half-day of on-site time.

2. Direct Observation of Facilities and Equipment

During the on-site portion of verification audits, the auditor (or at least one member of the audit team) will directly observe *all* treatment works that produce biosolids and are covered by your BMP. As described in the section on on-site audit scope, facilities that produce biosolids are considered those that include processes in the biosolids value chain from solids stabilization forward. For interim audits, the lead auditor will determine if direct observation of all treatment works that produce biosolids is necessary.

The auditor will directly observe a sampling of all other facilities and equipment covered by your organization's BMP through selecting critical control points. The length of the on-site portion of the audit will vary according to the scale and complexity of your biosolids management operations.

 **Helpful Hint**

The Agenda

The specific structure and agenda for the on-site audit will depend on multiple factors, including the following:

- The nature of your operations.
- The final use or disposal of biosolids material.
- The number of wastewater treatment facilities.
- The location of final use or disposal facilities.
- Relevant processes and steps in the biosolids value chain.
- The presence of contractor operations.

3. Final Use and Disposal Operations

Direct observation of final use and disposal operations, whether operated by a contractor or not, is necessary for program credibility. Because many final use or disposal operations are not located on or adjacent to the treatment facilities, auditors are not required to observe directly all final use or disposal operations, since the costs of such a requirement could be prohibitive. Program credibility should be balanced with audit costs by not requiring that all final use or disposal operations receive direct observation.

The requirements that apply are given below.

- ✓ The auditor will choose a sampling of final use and disposal operations to observe directly.
- ✓ If final use and disposal operations are performed by a contractor or contractors, then the auditor will observe directly, at a minimum, one site for each contractor.
- ✓ If the organization uses multiple types of final use or disposal operations, then the auditor will observe directly, at a minimum, one site for each type of final use or disposal method (for example, agricultural land application is different from forest land application or land reclamation).

Some final use or disposal operations may take place on private property not owned by you or your contractor (e.g., land application on a private farm). In this case, you or your contractor may need to include a contract clause to provide right of entry. Flexibility in the audit plan is necessary to address the intermittent and changing nature of some final use or disposal operations (e.g., land application at certain sites might be halted during winter months).

For cases where a biosolids management organization has multiple use or disposal operations, the auditor will consider the following, in addition to the minimum criteria identified above:

- ✓ Which operations are scheduled for activity during the time of the audit;
- ✓ Which might require intensive management activity; and

- ✓ Which have a history of or are at higher risk of having public issues or concerns (e.g., sites in close proximity to residential or commercial areas).

However, final use or disposal sites included for direct observation do not have to have current activity at the time of the audit, since there can be some benefit to examining inactive sites, such as sites where biosolids had been applied or stored.

Auditors are cautioned not to focus solely on land application sites that have received the most public attention or are the largest, but to consider some of the smaller and more out-of-the way sites; it is important that publicly accepted and environmentally sound biosolids management practices be used consistently at all sites, including those that otherwise might receive less intensive management.

As a result of the seasonal nature of some biosolids management activities, you may request that the on-site portion of the audit be conducted during a specific time of year. Auditors may determine that they need to revisit, for direct observation, sites that had been inactive during the time of the audit to complete the audit and make a BMP verification determination.

If a use or disposal operation is a considerable distance from your wastewater treatment facility(ies) or focus of operations, local or regionally based auditors may conduct the site visits to keep your audit costs lower (the lead auditor will audit all operations close to your wastewater treatment facilities). Local auditors will send audit findings on use and disposal operations to the Lead Auditor.

If the third-party audit team finds that documentation and interviews are inadequate to verify that there is an effective BMP throughout all use and disposal operations, then the auditor may find it necessary to visit additional sites or take further action to verify those parts of the BMP.

4. Contractors

During the desk and on-site audits, auditors will examine contract documents and conduct interviews with contractors to determine if contractor roles and responsibilities are defined, as consistent with the *BMP Elements*.

In cases where contractors are used to manage key critical control points and associated operational controls, the audit team will audit these operations in a manner identical to how they would monitor them if they were managed by you (see the sections on on-site audit approach and on-site audit format). During the audit, your contractors must make available full BMP documentation and a contractor representative is expected to attend portions of the onsite audit, where appropriate.

5. Follow-Up

In some cases, the audit team may need to spend additional time before the site audit is completed to return to your facilities or administrative offices to follow up on unresolved areas of audit inquiry or questions that arose during the course of audit activities.

For example, auditors may find it appropriate to examine your communication processes (see Element 6 and 9) or other BMP processes (see Elements 14 through 17) after reviewing the treatment works and biosolids use or disposal operations, since the auditors may be aware of potential BMP weaknesses that need to be more thoroughly explored and tested.

6. Exit Meeting

The audit team will hold an exit meeting with your BMP representatives to present the findings of the audit. This meeting can provide the opportunity for you to present additional information that may not have been available during previous audit activities. The tentative outcome of the audit will be discussed at the exit meeting.

During the exit meeting, the organization and Lead Auditor shall discuss the need for ongoing interim and internal audits, depending on the organization's intent to pursue NBP Gold-level Recognition or Platinum-level Certification.

If your organization intends to pursue Gold-level Recognition, you will be required to conduct internal BMP audits annually.

If your organization intends to pursue NBP Platinum-level Certification, you and the Lead Auditor shall develop an agreed-upon interim audit plan, including

the BMP elements that will be reviewed in the interim audits during the ensuing four years of the five-year audit cycle, as well as your organization's intent to substitute internal audits in eligible years. Thus, you should always know in advance if a third-party interim audit shall need to be conducted during the coming year.

During these discussions, you and the third-party auditor should also cover any changes to operations anticipated in the coming year that could affect the BMP. Changes to operations that should be discussed include those that would require changes to the identified critical control points or environmental impacts associated with the critical control points. Any significant changes to the BMP may require a revision in the third-party audit schedule.

7. Recording Nonconformances

During the audit, the audit team will work closely with your BMP representative and will keep the representative informed of any findings and potential findings as they are discovered. This allows you to provide additional information to help the auditors assess the BMP appropriately.

Audit team members will meet independently of representatives of your organization to discuss any questions and findings resulting from the interviews and document review and determine exactly where nonconformances exist.

Before the exit meeting, BMP strengths, weaknesses, and all nonconformances identified during the audit will be recorded on an audit findings sheet. The auditor then will present and discuss these findings with your BMP representatives at the exit meeting.

8. Peer Involvement

Participation of peer organizations can have a variety of benefits, such as technical assistance, feedback, and advice. As a result, you may choose to have peers participate in developing and implementing your BMP. Peers also may observe the third-party audit and serve as a resource for your organization (e.g., by providing technical assistance, conducting audit readiness assessments, providing advice on corrective actions).

However, peers *may not* be part of the third-party verification audit team (e.g., they do not have a role in collecting objective evidence or making the verification recommendation). It is critical that peers not interfere with the third-party audit. Any technical assistance or advice provided by peers shall come after the third-party audit or before the third-party audit as part of assessing readiness.

Evaluation Criteria — Nonconformances

For each of the BMP testing approaches described above and all of the BMP requirements, the auditor must understand the applicable criteria for evaluating whether or not the organization's BMP satisfactorily addresses the requirement. In other words, the auditor must understand what the "hurdle", or "bar", is for each requirement and test. Performance above this threshold indicates that the organization's BMP sufficiently addresses the particular BMP requirement. Performance below the bar indicates that the organization's BMP does not sufficiently address the particular BMP requirement. This latter case results in a "nonconformance." In this case, the auditor must then distinguish whether the nonconformance constitutes a minor nonconformance or a major nonconformance. Definitions of major and minor nonconformances are the following.

- **A minor nonconformance** is one that, when taken by itself, does not indicate a systemic problem with the BMP. It is typically a random or isolated incident. Minor nonconformances involve discrepancies within a BMP element that do not significantly affect the implementation of the BMP and commitment to conform with the *Code of Good Practice* – a systemic problem is not indicated.
- **A major nonconformance** occurs when one of the the *BMP Elements* has not been addressed or has not been addressed adequately. Major nonconformances can occur when an organization has documented a process or procedure, but has not implemented it or cannot demonstrate effective implementation. A major nonconformance can also occur if a number of minor nonconformances in a given activity or against a given element point to a systemic failure. Major nonconformances also exist

if an element is being disregarded sufficiently during organization operations that it is having a noticeable effect on the organization's environmental compliance, environmental impacts, or the quality of the material being produced – there is a gap or problem that could lead to a systemic failure.

The NBP recognizes that not all BMPs will be perfect, if any. The NBP also understands that your BMP does not need to be perfect to be effective. Minor nonconformances are expected as program participants adapt to address diverse changes and challenges. It is essential, however, that your organization's BMP actively engages a process of continual improvement to identify, learn from, and respond to nonconformances so that they are addressed in ways that prevent recurrence.

When the auditor has identified a minor nonconformance during the on-site audit, you must resolve the nonconformance and provide documentation to the auditor within 30 days of the audit, unless the auditor and you have made mutually agreeable alternative arrangements in the context of an action plan.

The NBP acknowledges that biosolids organizations may not be able to fully correct some minor nonconformances within 30 days. The NBP requires that you develop an action plan, with time frames approved by the Lead Auditor, for correcting minor nonconformances. The action plan shall be developed and shared with the Lead Auditor within 30 days of the audit completion.

The Lead Auditor will review the effectiveness of action taken to correct minor nonconformances, and will expect that nonconformances have been corrected, no later than at the next interim third-party audit or internal audit. Only the third-party auditor may close out – or verify the correction of – nonconformances identified during a third-party verification or third-party interim audit. Individual findings of minor nonconformances shall not prevent an organization from successfully completing a verification or interim audit.

When the third party auditor has identified a major nonconformance during the on-site audit, the

Addressing Minor Nonconformances

When the auditor has identified a minor nonconformance during the on-site audit, you must resolve the nonconformance and provide documentation to the auditor within 30 days of the audit, unless the auditor and you have made mutually agreeable alternative arrangements in the context of an action plan.

Individual findings of minor nonconformances shall not prevent an organization from successfully completing a third-party verification or interim audit.

organization must resolve the nonconformance and have the auditor verify that the nonconformance has been corrected. Failure to correct a major nonconformance identified during an on-site audit shall prevent an organization from successfully completing a verification or interim audit.

The NBP recommends that organizations correct any major nonconformances within 90 days, but the required time frame is subject to agreement with the Lead Auditor. If a major nonconformance is corrected within the 90-day time period or other mutually agreed-upon time frame, the auditor is only required to verify that the specific nonconformance has been addressed. Failure to correct a major nonconformance within the 90-day period or other mutually agreed-upon time frame shall result in the organization not achieving, or having revoked, NBP Platinum-level Certification status until another full verification audit has been completed successfully. The Lead Auditor shall determine if an on-site visit is required to verify that the major nonconformance has been corrected, or if the verification can be made off site via document review.

Methods of Collecting Objective Evidence

There are three primary methods of collecting objective evidence available to auditors during the on-site verification audit to determine your conformance with the *BMP Elements* and requirements. These are document review, interviews, and direct observation of operations. Whenever possible, the audit team will use more than one of these methods to ensure that findings are consistent and cross-checked. Each of these methods of collecting objective evidence is discussed below.

1. Document and Record Review

In some cases, the *BMP Elements* identify specific requirements regarding documents or records that you must have (e.g., emergency preparedness and response plan). In this case, document and record review enables the auditor to determine both that the document or record exists and that it addresses any required topics or information.

In other cases, document and record review may provide evidence that you have a particular system in place or are following a required procedure. Typical documents or records reviewed during a verification audit include written policies, procedures, manuals, reports, brochures, action plans, forms, operating records, and logs.

2. Interviews

By asking questions of employees and contractors who work with a biosolids organization, auditors can gain a better understanding of how management systems and practices actually work. Interviews also provide information about the degree to which aspects of the BMP are understood and implemented.

3. Direct Observation

During the on-site audit, an auditor might observe if an employee is following a procedure or operating a piece of equipment in light of expectations from the BMP or the *National Manual of Good Practice*. Direct observation provides a useful means for verifying that you are actually implementing procedures and controls prescribed in the BMP and other relevant documentation.

Audit Testing

There are three complementary approaches to testing that auditors will use to evaluate whether your BMP meets the expectations and requirements identified by the NBP. These testing approaches are requirement verification, transaction testing, and examining outcomes. Requirement verification ensures that your BMP meets the basic requirements of the *BMP Elements*. Transaction testing and outcomes examination ensure that your BMP is functioning as intended and is producing desired outcomes.

1. Requirement Verification

Requirement verification looks at specific NBP BMP Elements to determine if your BMP satisfies the associated requirements, as defined in the *BMP Elements*. There are specific requirements associated with each BMP Element that can be evaluated or tested individually. If you fail to address the minimum requirements associated with each BMP Element



Requirement Verification

In this step, the auditor looks at specific NBP *BMP Elements* to determine if your BMP satisfies the associated requirements, as defined in the NBP's *BMP Elements*.

For example, to assess if your BMP meets the requirements of Element 1, the auditor would seek affirmative answers to the following questions by collecting objective evidence:

- Do you have a BMP manual?
- Was the BMP manual approved by a level of your management with the authority to commit people and resources to biosolids management activities?
- Does the BMP manual contain your biosolids management policy and BMP procedures required by the *BMP Elements*?
- Does the BMP manual contain or cross-reference public participation, communication, and emergency preparedness and response programs and plans required by the *BMP Elements*?
- Does the BMP manual cover all critical control points for your biosolids management activities throughout the biosolids value chain?
- Does the BMP manual include or cross-reference all operational controls, procedures, processes and other management methods used to achieve and maintain compliance with legal and other requirements?
- Does the BMP manual describe those biosolids management activities assigned to and performed by contractors?

completely or adequately, it likely will constitute a finding of major nonconformance.

The auditor can test many of the requirements of the *BMP Elements* by determining if there is a particular process or system in place or if a document or procedure exists. Many of the required, documented procedures and plans can be examined during the desk audit review. Additional collection of objective evidence during the on-site audit can demonstrate or document that the required process, procedure, or document does exist or that it operates consistently with NBP BMP expectations.

2. Transaction Testing

It also is important to verify that required processes and procedures actually work as documented and intended. Transaction testing provides a useful approach for investigating overall system health (e.g., if the BMP is actually working as documented and intended).

Transaction testing enables auditors to assess how well various components of your BMP function in practice — and how well they work together — from a broader systems perspective. Far too often, organizations' efforts to develop continual improvement management systems become paper-pushing exercises that result in a set of binders on the shelf, rather than in changes in the ways a facility operates. Documenting policies, procedures, and BMP activities is important for supporting BMP implementation, creating institutional memory, and demonstrating the existence of the BMP. However, documentation does not ensure that the policies and procedures are followed or that the BMP works as intended.

Transaction testing provides a means for ensuring that you are working actively to implement and continually improve the BMP. The concept is that, just as your organization's activities are linked throughout the entire biosolids value chain, the BMP Elements are linked and coordinated. For example, if internal audits are being conducted (as required in Element 16), the associated identified corrective actions should have been implemented (as required in Element 14).

Another way of looking at this is to examine certain changes or events that should trigger a response from



Transaction Testing

Transaction tests enables auditors to assess how well various components of your BMP function in practice — and how well they work together — from a broader systems perspective.

Transaction testing ensures that various BMP Elements are functioning in coordination.

the BMP. By tracing how your organization's BMP responds to a transaction or triggering event, the auditor can better identify and assess gaps or weaknesses. Examples of such events include a new regulation or requirement, new equipment, a change in personnel, a biosolids spill, a past compliance violation, or an odor complaint by a local resident.

Auditors have substantial latitude in selecting when and how they use transaction testing. In most cases, the auditor would use a transaction test to confirm that your documented system or procedure is operating as intended and documented in the BMP. The auditor might track a particular transaction or triggering event through the organization to see how the various components of the BMP responded.

In particular, the auditor will be interested in answers to the following questions.

- Did the transaction or triggering event cause all relevant management activities to occur as intended in your BMP?
- If the triggering event was associated with an undesirable outcome, was the incident responded to as intended by the BMP, and, did the BMP prompt appropriate actions to prevent recurrence of the undesirable outcome?

More examples of transactions and triggering events and associated transaction tests are provided in Table 11-1 following.



Example

Table 11-1 — BMP Transaction and Event Tests

Transaction Test	Potential BMP Interactions
<p><u>Existing regulatory requirement</u> – The auditor may identify an applicable regulatory requirement and determine if it has been incorporated into various BMP elements. Auditors may wish to give particular emphasis to requirements that result in frequent violations. If the facility had a past compliance violation, it may be appropriate to target that requirement.</p> <p>[The auditor also should try to understand what factors caused any past violations, so he or she can test areas where the BMP failed in the past.]</p>	<p>Has the applicability of the requirement been identified and documented? (Element 4)</p> <p>Have roles and responsibilities for addressing the requirement been assigned and communicated? (Element 7)</p> <p>Have procedures and practices for addressing the requirement been developed and implemented? (Elements 10 and 13)</p> <p>Are records related to the requirement complete and organized? (Element 12)</p>
<p><u>New or modified regulation</u> – The auditor may identify a recent or modified regulation or requirement that may be applicable to the facility and track that requirement through the system.</p>	<p>Has the organization identified a potentially applicable requirement? (Element 4)</p> <p>Has the organization evaluated and documented the applicability or non-applicability of the regulation or requirement? (Element 4)</p> <p>Have procedures been developed, documented, and implemented to address the newly applicable requirement? (Element 10)</p> <p>Have the BMP Manual and related documents been updated to address the new requirement? (Element 1)</p> <p>Have roles and responsibilities for implementing the procedure or addressing the requirement been assigned and communicated? (Element 7)</p> <p>Have appropriate monitoring and measurement activities been instituted to address the requirement, if appropriate? (Element 13)</p> <p>Have recordkeeping requirements been followed? (Element 12)</p> <p>Has the facility satisfied its compliance obligations related to the requirement?</p> <p>Has the organization made information on the applicability of this requirement available to the public? (Element 9)</p>

Transaction Test	Potential BMP Interactions
<p><u>Equipment or process change</u> – The auditor may investigate how a new piece of equipment or process line was integrated into facility operations and the BMP.</p>	<p>Has the BMP manual, including documentation of critical control points and operational controls, been updated to address the equipment or process change? (Elements 1, 3, and 10)</p> <p>Has the organization identified potential and actual environmental impacts associated with the equipment or process change? (Element 3)</p> <p>Have SOPs been prepared or revised to address the equipment or process change? (Element 10)</p> <p>Have appropriate personnel been trained on the equipment or process and associated environmental management responsibilities? (Element 8)</p> <p>Have emergency response plans and procedures been modified (if necessary) to address the equipment or process change? (Element 11)</p>
<p><u>Contractor operations</u> - The auditor may identify existing or new contractor operations and track them through the system (include interview with contractor)</p>	<p>Are environmental roles and responsibilities assigned and communicated to contractors? (Element 7)</p> <p>Are contractors appropriately trained to perform its environmental responsibilities? (Element 8)</p> <p>Is this training documented and tracked? (Element 8)</p> <p>Does the contractor sufficiently understand its responsibilities to perform its tasks consistently with the BMP and <i>Code of Good Practice</i>? (Element 8)</p>
<p><u>Accidental spill or release</u> – The auditor may investigate how an accidental spill or release was handled by the BMP</p>	<p>Did the organization respond to the spill or release according to its procedures? Were emergency response plans followed? Were response actions appropriate to the type and scale of the incident? (Element 11)</p> <p>Were personnel appropriately trained for response? (Element 8)</p> <p>Was the appropriate response equipment available? (Element 11)</p> <p>Were regulatory notification, reporting and recordkeeping requirements followed? (Element 12)</p> <p>Did the organization engage a root-cause analysis or continuous improvement process to learn from the incident and prevent future occurrences?</p> <p>Have any associated process upset or equipment failure conditions been documented in appropriate logs and addressed through corrective action to prevent recurrence? (Element 14)</p>

Transaction Test	Potential BMP Interactions
<p><u>Public inquiry or complaint</u> – The auditor may track a public complaint or inquiry through the system</p>	<p>Did the organization process the inquiry or complaint in accordance with its documented procedures? (Element 9)</p> <p>Did the organization acknowledge receipt of the inquiry or complaint and respond in a timely manner? (Element 9)</p> <p>Were appropriate personnel sufficiently trained to respond to the inquiry or complaint? (Element 8)</p> <p>Was the inquiry or complaint documented or recorded appropriately?</p> <p>Is management sufficiently aware of potential public concerns raised by the inquiry or complaint?</p> <p>Has the inquiry or complaint been considered (along with others) in the organization’s periodic review of BMP goals and objectives? (Element 5)</p>

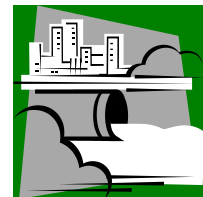
Auditors have substantial latitude in what types of transactions they test, since appropriate choices will depend on the specific attributes (e.g., processes, procedures, equipment, and/or history) of the organization being audited. For example, if your facility had a past compliance violation, it may be important to investigate what systemic factors caused the violation.

3. Examining Outcomes

The third method of testing available to auditors is examining outcomes, which allows the auditor to verify that your BMP is functioning as intended and is producing desired outcomes.

The NBP *Code of Good Practice* is a broad framework of goals and commitments to guide biosolids management activities. Those who embrace the Code commit to “do the right thing.” Code subscribers pledge to uphold the 10 principles in the Code, which are focused on a commitment to quality practices and operations, as well as to quality outcomes.

Although the BMP is a systems-based program, public acceptance ultimately will depend on the ability of the NBP and individual program participants to demonstrate that the BMP produces better compliance, better environmental performance, good management practices, and improved relations with interested parties.



Outcomes Matter

While it’s not expected that you would never have performance problems, auditors will base verification determinations on the evidence that your BMP responds actively to such problems and seeks to prevent it from recurring.

For example, past compliance violations or public complaints would prompt the audit team to explore how you and your BMP responded to the performance outcome.

Therefore, four specific, auditable expectations for examining outcomes have been identified as important indicators of BMP health:

1. Environmental performance;
2. Regulatory compliance;
3. Relations with interested parties; and
4. Quality biosolids management practices.

Performance outcomes relate to the commitment to continual improvement in all aspects of biosolids management. The *BMP Elements* (Element 5) require that goals and objectives for environmental performance reflect identified priorities for improving environmental performance of biosolids management activities based on critical control points, identified or potential environmental impacts, legal and other requirement, and applicable best management practices as defined in the *National Manual of Good Practice* and various authoritative sources on biosolids management.

To demonstrate continual improvement in each of the four outcome areas and meet the requirements for Element 5, organizations must establish measurable goals and objectives that document the improvement in each of the four outcome areas over time.

For example, in the area of relations with interested parties, an organization might agree to expand the range of interested parties that it involves in its BMP, over and above those parties that were involved as the BMP was initially developed.

In the area of regulatory compliance, an organization that had regulatory violations in the past would commit to reduce and ultimately eliminate these violations. Another way to demonstrate a commitment to regulatory compliance could involve reducing the amount of regulated pollutants in its biosolids, over and above those amounts currently used to demonstrate compliance with applicable Federal or State regulatory requirements.

In the area of best practices for biosolids management, an organization might set a goal to adopt a new practice for detecting and reducing odors.

An example of an environmental performance goal could be to reduce energy consumption.

These four outcomes are critical indicators of how well your BMP is functioning as intended and conforms to the NBP's program expectations and goals. However, you should note that failure to achieve desired outcomes does not necessarily constitute a finding of system nonconformance.

Rather, past and current outcomes related to environmental performance, regulatory compliance, public participation, and quality biosolids management practices should be used by third-party auditors to identify potential areas of weakness in an organization's BMP.

Audit reports will explicitly identify the outcomes examined and the relationship they have to system health or deficiencies.

Your progress in meeting these goals and objectives should then be evaluated in follow-up, interim audits to ensure that your BMP continues to meet all the elements of the NBP program.

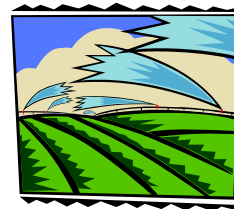
For programs pursuing NBP Gold-level Recognition, review of these goals and objectives will take place through internal audits and reported to NBP as part of Biosolids Management Program reports. When the organization is verified again five years later, the third-party auditor will also review the organization's progress on goals and objectives and in meeting the continual improvement requirement for the four outcome areas.



Auditor Considerations

Environmental Performance

BMP auditors will examine your progress toward identified priorities for improving environmental performance, as reflected in your established goals and objectives, as one potential indicator of BMP health. Meaningful environmental performance improvement is critically linked to the NBP's public acceptance



Performance Matters

An auditable commitment to performance is critical to fostering credibility with interested parties and to achieving publicly accepted biosolids management practices.

objectives — and to the Code’s commitment to continual improvement.

The *BMP Elements* require you to identify biosolids program goals and objectives. These goals include “environmental performance improvement goals” that are consistent with your biosolids management policy to ensure that, by effectively managing all critical control points, biosolids management activities comply with applicable laws and regulations, meet quality and public acceptance requirements, and prevent unregulated adverse environmental and public health impacts.

Biosolids program objectives include “detailed environmental performance improvement requirements, based on a biosolids program goal.”

Examining Environmental Performance Outcomes

As one indicator of BMP health, auditors will examine your progress toward identified priorities for improving environmental performance, as reflected in established goals and objectives. If an auditor detects a pattern of lack of improvement with respect to those goals and objectives, the auditor will interpret this as an indicator that your BMP potentially is failing to meet the NBP program expectations. The auditor will examine your BMP to determine if the cause for lack of continual improvement constitutes a system nonconformance.

For example, the cause may be that certain operational controls tied to those environmental improvements have not been implemented or that management reviews are not addressing the possible need for changes to the policy, the goals and objectives, the biosolids management system, or other BMP Elements.

Auditors will recognize that some environmental performance goals and objectives may require long-term planning and investment. Auditors will recognize that you may focus goals and objectives only on addressing certain environmental impacts, while other goals and objectives may be to maintain current performance levels (assuming that regulatory and public acceptance requirements for biosolids are being met).

In examining environmental performance outcomes, an auditor will expect that you have done the following:

- ✓ Identified potential environmental impacts associated with your identified critical control points, with respect to the entire biosolids value chain (Element 3.2 in minimum conformance requirement section of Chapter 3).
- ✓ Established environmental performance goals and objectives that reflect your identified environmental impacts and related critical control points (Element 5.2).
- ✓ Provided interested parties with meaningful opportunities to express views and perspectives relative to biosolids management activities, including concerns about environmental impacts, BMP performance, and potential areas for improvement (Element 6.4).
- ✓ Considered input from interested parties in initially developing biosolids program goals and objectives during BMP implementation and in updating them as part of your periodic review of BMP performance (Element 6.5).
- ✓ Developed and implemented standard operating procedures, work management practices, or other appropriate methods at all critical control points throughout the biosolids value chain to manage potential environmental impacts effectively (Element 10.1).
- ✓ Established and maintained regular monitoring and measurement procedures and practices for all biosolids management activities to measure biosolids program performance at critical control points and track progress toward achieving program goals and objectives (Element 13.1).
- ✓ Completed a periodic written Biosolids Management Program performance report (at least annually), summarizing your progress toward achieving biosolids program goals and objectives (Element 15.1).
- ✓ Established and maintained an internal audit program to analyze your BMP periodically and determine whether it is effectively meeting your

biosolids management policy, program requirements, and biosolids program goals and objective (Element 16.1).

- ✓ Reviewed the BMP and its performance relative to policy commitments, goals, and objectives; established performance measures to ensure its continuing stability, adequacy, and effectiveness; and addressed the possible need for changes to policy, the goals and objectives, and other BMP Elements based on internal BMP audit results, third-party BMP audits, changing circumstances, and the commitment to continual improvement (Element 17.1).

Regulatory Compliance

Auditors will examine your performance in meeting legal requirements (regulatory compliance) as one potential indicator of BMP health.

The third-party verification audits are *not* intended to be regulatory compliance audits that verify whether you are complying with all applicable regulatory and legal requirements. However, the compliance status of your organization can provide an indication of how well your BMP manages operations within established parameters.

Through the *Code of Good Practice*, you are required to pledge “to commit to compliance with all applicable federal, state, and local requirements.” You are expected to establish a comprehensive set of regulatory compliance-based goals and objectives to provide the basis for you, the NBP, and auditors to assure interested parties that your BMP is effectively translating the commitment to regulatory compliance into consistent performance with respect to compliance outcomes.

At the same time, this approach would not require a full regulatory compliance audit. A systems audit, which verifies the existence of a robust BMP, provides an equal, and potentially better, indication of your commitment to meeting and going beyond regulatory compliance obligations on an ongoing basis than a regulatory compliance audit, which looks only at a given point in time.



Compliance Matters

Public confidence goes up when regulatory compliance is assured.

Consistent with a systems audit approach, auditors will determine that you have a robust BMP in place that accomplishes the following:

- ✓ Effectively identifies and tracks regulatory compliance obligations;
- ✓ Proactively identifies potential regulatory compliance issues;
- ✓ Ensures effective implementation of applicable compliance activities;
- ✓ Quickly detects regulatory compliance problems; and
- ✓ Addresses regulatory compliance problems in a timely fashion.

Examining Regulatory Compliance Outcomes

NBP auditors will examine your performance in meeting legal requirements and regulatory compliance-based goals and objectives as potential indicators of BMP health.

Auditors will review documentation containing regulatory compliance information, such as recent regulatory inspection reports and annual biosolids reports, and gather other objective evidence about selected regulatory compliance endpoints. Auditors are encouraged to contact biosolids regulators as part of the process of gathering compliance information, keeping in mind that the audit will not contain a statement of compliance status. They will review BMP documentation to verify that you have established a comprehensive set of regulatory compliance-based goals and objectives.

Auditors will record in the audit report your performance with respect to your regulatory compliance-based goals and objectives. They also will provide in their audit report a statement, based on the review of documentation and direct observation of selected regulatory compliance endpoints, about the adequacy of the BMP in meeting your commitment to regulatory compliance.

If an auditor detects a pattern of failing to meet compliance obligations, or failing to make continual improvement toward compliance-based goals and objectives, the auditor will examine your BMP to

determine if the cause is a system nonconformance. For example, the cause may be that certain measuring and monitoring activities have not been implemented or that roles and responsibilities for key activities related to meeting compliance have not been clearly assigned.

Areas of past noncompliance can point to places that an auditor may examine during a verification audit. Through transaction testing, auditors can explore how well your BMP, through its continual improvement mechanisms, has responded to the noncompliance situations. In the presence of a well-functioning BMP, the auditor should detect the implementation of controls and practices to prevent recurrence of noncompliance situations.

Auditors will recognize that even the best-run organization occasionally may experience conditions that result in a non-compliant situation. What is important is that you respond in a timely and appropriate manner to instances of potential regulatory noncompliance.

In examining regulatory compliance outcomes, the auditor will expect that you have done the following:

- ✓ Established a procedure for identifying and tracking legal (federal, state, and local) and other requirements applicable to your biosolids management activities (Element requirement 4.1).
- ✓ Reflected, in program goals and objectives, legal and other requirements (Element requirement 5.2).
- ✓ Incorporated all legal and other adopted requirements in the operational controls of critical control points (Element requirement 10.2).
- ✓ Established and maintained regular monitoring and measurement procedures and practices for all biosolids management activities to ensure compliance with applicable legal and other requirements (Element requirement 13.1).
- ✓ Developed and implemented a procedure to investigate any noncompliance with applicable regulatory requirements identified during routine monitoring and measurement or periodic internal BMP audits (Element requirement 14.1).

- ✓ Developed and implemented a procedure to document the necessary corrective actions taken to prevent a recurrence (Element requirement 14.3).
- ✓ Established formal corrective action plans to address findings of internal and third-party BMP audits, and documented corrective action plans describing what actions will be taken to address the audit findings, the individuals responsible, the estimated completion date, and required resources to develop and implement corrective and preventive action (Element requirement 14.5).
- ✓ Established and maintained an internal audit program to analyze the BMP periodically and determine whether it is effectively meeting its biosolids management policy, program requirements, and biosolids program goals and objectives (Element requirement 16.1).

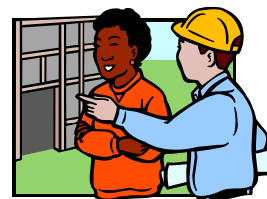
Relations with Interested Parties

Auditors will examine the state of your relationships with interested parties as one potential indicator of BMP health.

Your relationships with interested parties are not expected to be positive all of the time, and you are not required, as a basis for program participation, to resolve the concerns of all interested parties. There can always be parties who are not satisfied that their concerns have been addressed or parties who are fundamentally opposed to certain biosolids management practices, regardless of your environmental performance or how active and meaningful the public participation effort has been.

Rather, setting up a quality, two-way flow of information between interested parties and participating organizations is critical to the program's goal of publicly accepted biosolids management practices. "Two-way flow of information" means that information flows from interested parties in to you such that you have the capacity to understand the concerns and perspectives of interested parties.

Requirements for how you must establish information flows into the organization from interested parties are covered primarily under Element 6, Public



Relations with Interested Parties Matter

Two-way flow of information — between you and the public — is critical for biosolids program and product acceptance.

Most biosolids management organizations use a variety of successful public participation mechanisms, and many of those mechanisms are sufficient to meet program requirements.

Participation in Planning, and Element 9, Communication.

Two-way flow of information also means that information on your BMP flows to interested parties. Requirements for how you must establish information flows out to interested parties are covered primarily under Element 9, Communication. Also, the *Code of Good Practice* commits you to “provide methods of effective communications with gatekeepers, stakeholders, and interested citizens regarding the key elements of each Biosolids Management Program, including information relative to program performance.”

There likely will be substantial local tailoring of public participation plans and you are expected to remain fully in control of the decisions you make once interested party perspectives are understood. You have the flexibility to choose a set of public participation activities that best meet your local needs.

Examining Public Participation Outcomes

Auditors will examine the state of your relationships with interested parties as one indicator of BMP health.

For example, if, during BMP document review, an auditor encounters a pattern of repeated written public complaints, the auditor will interpret this pattern as an indicator that your BMP is failing to meet the NBP program expectations to promote publicly accepted biosolids management practices. The auditor will examine your BMP to determine if the cause of the pattern of consistent complaints constitutes a system nonconformance. It could be that the failure to resolve complaints about, say, truck traffic, resulted from your corrective action system functioning inadequately. In this context, however, auditors will not judge the validity of interested party perspectives, nor will they expect you to have accommodated all perspectives.

Auditors will recognize that some organizations are implementing public participation programs for the first time, as part of participation in the NBP's Program. Where this is the case, it is possible that the state of relationships with interested parties may actually appear to worsen as the public participation program is implemented.

For example, this can be reflected by the number of negative comments actually rising because opportunities for comments may not have been provided in the past. It also is possible that the lack of past negative comments was the result of interested parties not knowing about the organization's biosolids management practices (e.g., lack of negative comment does not necessarily equal public acceptance), and thus negative comments appear to rise as the program is implemented.

Auditors also will take into consideration the maturity of your biosolids management program. For example, a well-established and accepted program may, at its outset, have conducted substantial public education and involvement efforts, but now is maintaining ongoing, targeted relationships with individual community members or groups.

In examining the state of relationships with interested parties, the auditor will expect that you have:

- ✓ Selected and implemented a proactive public participation approach to involve interested parties in your BMP Planning process (Element requirement 6.1).
- ✓ Reflected, in the selected approach, your commitment to the ten principles of the *Code of Good Practice*, including a plan for independent third-party verification of conformance with the BMP Elements (Element requirement 6.2).
- ✓ Selected an approach that is consistent with the degree of current public interest, history of public involvement, method of biosolids management, and related local circumstances (Element requirement 6.3).
- ✓ Provided interested parties with meaningful opportunities to express views and perspectives relative to your biosolids management activities, including concerns about environmental impacts, biosolids program performance, and potential areas for improvement (Element requirement 6.4).
- ✓ Considered input from interested parties in initially developing program goals and objectives during BMP implementation and in updating them as part

of periodic review of BMP performance (Element requirement 6.5).

- ✓ Established and maintained a proactive communications program that provides ongoing information about the BMP to your interested parties and the public (Element requirement 9.1).
- ✓ Developed and followed a procedure for receiving and responding to inquiries and requests for information from interested parties (Element requirement 9.2); and
- ✓ Made information about your BMP activities available to interested parties (Element requirement 9.3).

In conducting the audit, the auditor primarily will rely on BMP documentation to verify your public participation actions. However, after consulting with you, he or she can interview interested parties as necessary to verify the adequacy of your actions.

Quality Biosolids Management Practices

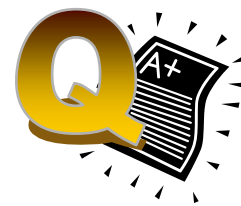
An auditable commitment to best practices is a key link to credibility with interested parties and to achieving the NBP's goal of publicly accepted and environmentally sound biosolids management practices.

The *Code of Good Practice* commits organizations to implement “good housekeeping practices for biosolids production, processing, transport, and storage, and during final use or disposal operations” and to “sustainable, environmentally acceptable biosolids management practices and operations.”

Therefore, in selecting biosolids management practices, you must have considered and, to the extent applicable and practical, used the best practices identified in the *National Manual of Good Practice* and other recognized sources you have identified (Element 10.3).

Examining Quality Biosolids Management Practices

The auditor will examine identified critical control points and associated operation controls in light of the *National Manual of Good Practice*, operating under the presumption that you know best which practices to select for your operation.



Quality Practices Matter

You are expected to follow best-management practices as much as possible because they lead to best outcomes.

If you adopt practices that appear inconsistent with the *National Manual of Good Practice*, the auditor will ask you to explain why.

The *National Manual of Good Practice* intends to be “practice-neutral” by providing management practices for all wastewater solids and biosolids management alternatives. Thus, auditors will look only at those critical control points and associated operational controls that are relevant to your organization and your biosolids final use or disposal.

The auditor will presume that choices on practice selection are not made in a vacuum and can be influenced by local political and economic situations. Thus, local tailoring of practice selection is necessary and appropriate.

If you adopt practices that appear inconsistent with the *National Manual of Good Practice*, the auditor will ask you to explain if the practices are inconsistent and why. Inconsistencies with the *National Manual of Good Practice* would not necessarily prevent verification if a suitable explanation is provided.

However, an auditor could identify this as a system nonconformance if he or she believed your choices did not adequately reflect the NBP’s expectations for promoting environmental sound and publicly accepted biosolids management practices and that your explanation for inconsistencies with the *National Manual of Good Practice* was not suitable.



Post-Audit Activities and Reporting

This section describes those activities that occur after the on-site verification audit has been completed.

Within two weeks of completing the on-site audit, the Lead Auditor will make a verification recommendation and prepare a working draft audit summary and detailed findings reports. The audit summaries will reflect the complete results of the audit, including areas of strength and weakness, any nonconformances identified, and the auditor’s final verification recommendation. The format and contents of the audit report are shown below.

The auditor will provide these working draft documents to you for review before you make them available to the public. This review allows you to ensure the technical accuracy of audit findings and develop observations for

inclusion in the final summary and detailed audit reports. After you have reviewed the draft reports and prepared any observations, the auditor will prepare final audit summary and detailed audit reports, attach your observations, and submit all of the documents simultaneously to you and the NBP.

Developing an Interim Audit Plan

The need for ongoing interim and internal audits shall be discussed by the organization and the Lead Auditor during the audit exit meeting at the end of the verification audit, as well as at the conclusion of each third-party interim audit. After the verification audit is complete, the organization and the Lead Auditor shall develop an agreed-upon interim audit plan, including the BMP elements that will be reviewed in the interim audits during the ensuing four years of the five-year audit cycle.

If you are pursuing NBP Gold-level Recognition, your plan will be to have internal audits in the intervening years between a verification audit (Year 0) and a second verification audit (Year 5).

If you are pursuing NBP Platinum-level Certification, your plan should indicate your intent to substitute internal audits in eligible years (e.g., years 2 and 4). Thus, you should always know in advance if a third-party interim audit shall need to be conducted during the coming year.

During these discussions, you and the third-party auditor should also cover any changes to operations anticipated in the coming year that could affect the BMP. Changes to operations that should be discussed include those that would require changes to the identified critical control points or environmental impacts associated with the critical control points. Any significant changes in the BMP may require a change in the interim audit plan developed with the third-party auditor.

Correcting Minor Nonconformances

As described earlier, the NBP expects that you will make a commitment to correcting minor nonconformances in a timely fashion, defined by NBP as 30 days. However, the NBP acknowledges that you may not be able to fully correct some minor

nonconformances within 30 days. For example, if a minor nonconformance was cited for failure to include the BMP policy in the training program, you could make changes to the training program materials right away. However, actually conducting all of the required trainings in the program with the new information could take several months. As such, the NBP requires that within 30 days of completing the audit, you develop an action plan and agreed-upon time frame with the Lead Auditor for correcting minor nonconformances.

The Lead Auditor will review the effectiveness of action taken to correct minor nonconformances, and will expect that nonconformances have been corrected, no later than at the next interim third-party audit or internal audit. Only the third-party auditor may close out – or verify the correction of – nonconformances identified during a third-party verification or third-party interim audit.

The third party auditor does not necessarily need to come on-site to close out all minor nonconformances. Auditors are encouraged to close out minor nonconformances via a desk review whenever possible. When an on-site examination is required to verify that a minor nonconformance has been corrected, auditors are encouraged to verify the corrective action during the next, planned on-site visit and avoid an additional on-site trip at additional cost to you. When on-site examination is required sooner than the next planned visit, the auditor may conduct a short, on-site visit. This visit does not need to be part of an interim audit. An auditor can close out minor nonconformances via a short visit in a year when an organization chooses to substitute an internal audit for the third party interim audit. Thus, the auditor visit does not prevent you from substituting with the internal audit.

Audit Report Format

The audit report shall contain the following information.

Section	Content
Title Page	<ul style="list-style-type: none"> • Heading — <i>National Biosolids Partnership BMP Audit Report</i> • Organization’s name and address • Audit team member’s names and roles • References: <ul style="list-style-type: none"> – NBP <i>BMP Elements</i> – Organization’s environmental policy and environmental management system manual • Date issued • Date revised • Signatures of organizations representative and lead auditor with date • Other
Body of Document	<ul style="list-style-type: none"> • Attendance sheets for entrance and exit meetings • List of any final use or disposal operation included in the audit • Pre-audit document review summary • List of documents reviewed citing any strengths and weaknesses • List of requirements for documentation taken from <i>BMP Elements</i> along with references to relevant organization documents that meet each of the requirements • Findings sheets indicating the following: <ul style="list-style-type: none"> – Areas of strengths and weaknesses – Outcomes examined – Any nonconformances with the requirements as identified in the <i>BMP Elements</i>, – A description of the nonconformance and if major or minor • Auditor’s determination regarding BMP verification

Notification of Change

When you make a change to your BMP after having undergone the third-party verification audit and are pursuing or maintaining NBP Platinum-level Certification, the auditor will expect to receive written notification from you about the change(s). (See Element 3 on minimum conformance requirements.) The auditor then will need to make a determination if the nature of the change(s) warrants additional audit activity before the next scheduled third-party interim or re-verification audit.

The following are examples of changes that the organization should communicate to your third-party auditor.

- ✓ Change in scope of the BMP;
- ✓ Organizational change involving top management and/or BMP responsibilities;
- ✓ Changes to or addition of new facilities or operations that cause changes in critical control points;

- ✓ Changes to or addition of new facilities or operations that cause changes in potential environmental impacts;
- ✓ Addition of a new contractor or expanded role of an existing contractor;
- ✓ Change in relations with interested parties that cause the communications program to change; or
- ✓ Other changes to biosolids management practices that the biosolids organization feels need to be included in an audit.

Not all the changes listed above would necessarily warrant additional on-site audit activity by the third-party auditor. For example, a change in BMP Coordinator on its own should not trigger additional on-site auditing. However, an auditor might determine that the combination of a change in BMP Coordinator along with changes in operations or contractors warrants additional auditing. Thus, the NBP has provided for auditor judgment in determining what kind of change warrants additional auditing under the NBP Platinum-level Certification, as well as examples to illustrate changes to be communicated between you and your auditor.

Maintaining NBP Program Recognition and Certification

To retain NBP recognition, you must meet the following criteria after the initial third-party verification audit.

Gold-Level Recognition

To maintain gold-level recognition, the organization must submit annual internal audit reports to NBP and complete another third-party BMP verification audit after five years. Organizations that have obtained gold-level recognition have the option of committing to regular, third party interim audits and achieving platinum-level certification.

Platinum-Level Certification

To maintain platinum-level certification, the organization must complete interim audits (at least two third party interim audits between verification audits), must submit interim or internal audit reports to NBP annually, and complete another third-party verification audit (or re-verification) after five years.

Reporting

Consistent with BMP Elements 9 and 15, you must make available to the public (including interested parties) your annual BMP performance report and a detailed report of any independent, third-party verification audit results. The BMP performance reports must contain the following:

- ✓ Summaries of monitoring;
- ✓ Measurements;
- ✓ Other results that demonstrate the performance of the biosolids program relative to its goals, objectives, and legal requirements;
- ✓ Summaries of performance relative to other voluntary adopted requirements;
- ✓ Summaries of your progress toward achieving your biosolids program goals and objectives; and
- ✓ A summary of the most recent independent third-party verification or interim audit results (as applicable).

BMP Conformance

NBP program participants must maintain conformance of their BMP with the *BMP Elements*, as demonstrated through the audit process.

Rather than identify an exhaustive list of criteria or situations that could lead to revocation of NBP certification or recognition, the NBP Steering Committee has the discretion to revoke program participation status to address unforeseen or extraordinary circumstances.

Some environmental verification initiatives have established criteria requiring that organizations found guilty of committing an environmental crime be immediately removed from the associated program. However, rather than attempting to define specific criteria such as these or others, the NBP Steering Committee will make determinations on an as-needed basis about whether conditions at or action undertaken by a biosolids organization risk undermining the credibility of the NBP program and therefore justify

revoking the recognition provided through the program.



Interim Audits

To receive and maintain NBP Platinum-level Certification, regular interim audits conducted on-site by the independent third-party auditor must occur between verification audits. Interim audits focus on ensuring “system health” (i.e., that the BMP is doing what it is supposed to) in between verification audits.

For organizations pursuing the NBP Gold-level Recognition, the organization does not have third-party interim audit requirements. Instead, the organization maintains an annual internal audit schedule.

The schedule of third-party audits for NBP Platinum-level Certification is based on a five-year cycle, with a verification audit in year 0, third-party interim audits in years 1 and 3, and the option of internal audits rather than third-party audits in years 2 and 4 (see below for the full audit schedule, including years 5 and on). Because of the potential changes in an organization’s staff, policies and procedures over time, regular audits are common practice. Because interim or internal audits only look at a part of the BMP, they are typically less resource intensive than full verification audits. Data points suggest that interim audits may cost roughly one third of the Year 0 verification audit.

Organizations should arrange for an interim audit by contacting the third-party auditor at the previously agreed-upon schedule. To prepare for the interim audit, the third-party auditor will need the following information: the organization’s NBP BMP verification anniversary date; documentation describing major changes made to the BMP since the last third-party audit; preventive and corrective action requests and responses since the last third-party audit; documentation describing how nonconformances have been corrected since the last third-party audit; and documentation of notification to interested parties about the intent to receive an audit and discussion about approaches to observe the audit. Interim audits

should be completed by the organization's anniversary date, to avoid any lapse in program participation.

Interim Audit Scope

Individual interim audits cover only a portion of the BMP. However, over the course of the four interim audits conducted between verification audits, the entire BMP (i.e., all 17 elements) must be covered. Each interim audit must include a review of: the organization's progress toward goals and objectives; BMP outcomes (environmental performance, regulatory compliance, interested party relations, quality biosolids management practices); actions taken to correct minor nonconformances; the management review process; corrective action requests and responses; and preventive action requests. The Lead Auditor shall determine if direct observation of all treatment works that produce biosolids is necessary during the third-party interim audits.

Substituting Third-Party Interim Audits with Internal Audits

For organizations pursuing NBP Platinum-level Certification, you may choose to substitute internal audits for third party interim audits in two years of the five-year verification cycle, provided the results of the internal audits are fully publicly disclosed and the independent, third party audit is not needed to ensure proper system functioning and health.

During years in which you choose to substitute internal audits for third-party interim audits, you must report on system conformance with the *BMP Elements* by providing the NBP with a copy of the internal BMP audit report. This option to substitute internal audits is designed to reduce the burden on staff resources and lower overall audit costs. You may choose to have the internal audits conducted by your own personnel or by an independent party (for example, paid audit consultants or a peer organization). If an audit consultant is utilized, the report must have your name and not refer to a consultant's document or recommendation.

For the NBP Platinum-level Certification, the schedule for verification and interim audits is as follows.

Year 0 - Verification audit	Year 5 - Re-verification audit (same as yr. 0)
Year 1 - Interim audit (third party required)	Year 6 - Interim audit (third party <i>optional</i>)
Year 2 - Interim audit (third party <i>optional</i>)	Year 7 - Interim audit (third party required)
Year 3 - Interim audit (third party required)	Year 8 - Interim audit (third party <i>optional</i>)
Year 4 - Interim audit (third party <i>optional</i>)	Year 9 - Interim audit (third party required)

Note that the timing of optional years for substituting an internal audit for a third-party interim audit shifts after year 5. Internal audits may be substituted in the year immediately following the year 5 re-verification audit. For years 10 and on, the verification and interim audit cycle matches that from years five through nine.

Substituting the third-party interim audits in years 2, 4, 6, 8, etc. with internal, interim audits shall be based on system performance from the previous audit. Thus, the Lead Auditor may require a third-party interim audit if system performance in the previous audit indicated a need for a re-visit the following year. For example, the Lead Auditor may require a third-party interim audit if one or more major nonconformances were found during the previous third-party audit, or if you did not develop action plans to correct one or more minor nonconformances found during the previous third-party audit.

You and your Lead auditor will discuss the need for ongoing interim and internal audits during the audit exit meeting at the end of the verification audit, as well as at each third-party interim audit. You and the Lead Auditor shall develop an agreed-upon interim audit plan that includes your intent to substitute internal audits for third-party interim audits.

When substituting for a third-party interim audit, the internal audit must include a review of: your progress toward goals and objectives; BMP outcomes (environmental performance, regulatory compliance, interested party relations, quality biosolids management practices); actions taken to correct minor nonconformances; the management review process; corrective action requests and responses; and preventive action requests.



Re-Verification Audits

To maintain NBP Platinum-level Certification, re-verification audits must occur every five years and are similar in scope to the initial verification audit. Re-verification audits must be completed before your organization's fifth NBP anniversary to avoid any lapse in NBP Platinum-level Certification.



BMP Appeals Process

The NBP program provides an independent appeals process for those organizations that would like to question third-party verification audit results. Organizations that appeal a third-party interim or re-verification audit and have obtained NBP Platinum-level Certification shall retain their status until the appeal has been resolved.

The appeals process involves the NBP Appeals Board, representing a balance of biosolids management interested parties and wastewater industry professionals. This appeals process is designed to make organizations that wish to participate in the program more comfortable with the auditor's role in interpreting the auditable requirements that allow for tailoring to local circumstances.

You must notify interested parties that a process exists to appeal third-party BMP verification and third-party interim audit results. With the notification, you must include information on how to use the process, such as by when appeals must be submitted, based on what grounds, and to who appeals are submitted. You may choose to inform interested parties via a number of methods and times including: during regular public participation activities, as part of the (pre-audit) notification to interested parties about the third-party audit; as part of the publicly available (post-audit) audit report; and as part of the annual BMP performance report.

The following is a list of functions for the Appeals Board.

Appeals Decisions

The board evaluates and makes final determinations on appeals actions. This function supports the ability of audited biosolids organizations, or other interested parties, to question and derive a board determination on, the verification decisions made by the independent third-party audit organization. Final appeals determinations must be made by a majority of the board.

To warrant an appeals action before the board, the party bringing an appeal of an individual verification decision must set forth the specific BMP element(s) that it contends have not been evaluated or implemented consistent with NBP expectations and requirements as reflected in the *BMP Elements*, along with the objective evidence to support that claim.

When presented with a request for an appeals action, the board may take any or all of the following action:

- Request further information from the biosolids organization, interested parties, or the auditor(s);
- Request appearances by the relevant parties, in person or by phone;
- Conduct further investigations; or
- Deny the appeal without any of the above actions if the application for appeal 1) concerns claims other than the verification or evaluation of a participating biosolids organization's BMP or 2) on its face, lacks sufficient objective evidence to support the claim.

A board "determination" will take the form of a conclusive statement that the identified BMP deficiency does or does not represent a major nonconformance as defined in the auditor guidance and in the context of the NBP expectations and requirements as contained in the *BMP Elements*. The board will direct its determination to the audit company for follow-up action.

In the case of an appeal of a finding of major nonconformance that led to verification denial, a Board determination that the BMP deficiency does not represent a major nonconformance will result in the biosolids organization receiving BMP verification. As would have been the case in the absence of such an

appeal, a finding that the deficiency does represent a major nonconformance will require the biosolids organization to correct the deficiency prior to receiving BMP verification.

In the case of an appeal questioning the lack of a finding of major nonconformance that resulted in the issuance and/or maintenance of BMP verification, a Board determination that a major nonconformance does exist will require the audit company and the biosolids organization to address the BMP deficiency in conformance with the procedures and time frames contained in the *Auditor Guidance*. As would have been the case in the absence of an appeal, a Board determination that the BMP deficiency does not represent a major nonconformance will result in the biosolids organization's maintenance of its BMP verification.

With the exception of appeals actions, the independent, third-party audit organization will make final verification determinations. The Board does not verify BMPs or recognize/certify a biosolids organization to the NBP Program, but rather concludes whether or not a BMP deficiency under consideration constitutes a major nonconformance thereby either postponing BMP verification until corrected or requiring improvement consistent with *Auditor Guidance* procedures and time frames to maintain an existing BMP verification.

Composition of the Board

The board provides perspective to and enhances the credibility of the NBP program with a diverse range of interested parties. The board represents a balance of biosolids management interested parties and wastewater industry professionals. The board is composed of the following representatives.

- Four (4) representatives from within the biosolids industry, at least one of whom has experience with implementing or operating a continual improvement management system; and at least one of whom should have been involved with developing the NBP's BMP and blueprint documents (e.g., *National Manual of Good Practice*, *NBP Biosolids Management Program Guidance Manual*, *BMP Elements*, and *Auditor Guidance*).

- Five individuals from interested groups, such as the following, but not necessarily one from each type, and they can come from elsewhere:
 - Environmental and community organizations
 - Public health organizations
 - State and federal regulatory agencies
 - Academia
 - Food, agriculture, and timber industries

Appointment of the Board

Terms

Representatives serve for three (3) years. To prevent complete board turnover, the initial nominations consist of two- and three-year terms (50 percent each).

Nominations

The board presents nominations for new board members to the NBP management committee.

Appointments

After careful review of the recommendations from the existing Appeals Board, the NBP Steering Committee appoints all new members of the board. The Steering Committee retains control over board membership and could, if it believed necessary, ask for board member resignations.

Board Meetings

The board meets on an as-needed basis to handle appeals actions. To ensure board cohesion, at least one (1) board meeting per year should be face-to-face. The other meetings are likely to be conference calls. However, the board determines, on a case-by-case basis, if any of the other meetings necessitate face-to-face interaction.

Board Staffing

The board uses NBP staff to provide the required level of administrative and technical support, including the following functions:

- Travel and logistics coordination for board meetings;

- Administrative and communications for board operations; and
- Background review for appeals actions.



DESSERT BREAK!



You are now an expert on BMP requirements, implementation, hints, justification, advantages, obstacles, approaches, and dozens of other BMP facets. If you read through this entire document before beginning the policy-planning-implementing-checking-reviewing process, you are in terrific shape for beginning a journey to success. If you implemented as you went along, you should just about be ready to put a certificate on a wall of fame in your organization.

In any case, your participation in the National Biosolids Partnership Biosolids Management Program demonstrates that your organization is committed to environmental stewardship, biosolids quality, and public outreach and enlightenment.

KUDOS!

Appendix A

Glossary

Audit Criteria - Policies, practices, procedures, or requirements against which the auditor compares collected audit evidence about the subject matter.

Audit Findings - Results of the evaluation of the collected audit evidence compared with the agreed audit criteria.

Biosolids -The nutrient-rich organic materials resulting from the treatment of domestic sewage at a wastewater treatment facility. Through biosolids management, solid residue from wastewater treatment is processed to reduce or eliminate pathogens and minimize odors, forming a safe, beneficial agricultural product.

Biosolids Management Activities - A wide range of activities that impact the quality of wastewater solids and biosolids, including pretreatment activities, wastewater treatment processes, solids stabilization processes, conditioning and dewatering processes, transportation, storage, and beneficial use or disposal.

Biosolids Management Policy - Statement by an organization committing it to the principles set forth in the NBP *Code of Good Practice* with respect to biosolids management and any other overall environmental goals voluntarily adopted by the organization.

Biosolids Management Program (BMP) - A comprehensive program covering all aspects of the organization's biosolids activities throughout the biosolids value chain, including management processes for all critical control points in order to mitigate environmental impacts, meet quality and public acceptance requirements, meet legal and other requirements, and execute action plans to achieve biosolids program goals and objectives. A BMP meets requirements of the *BMP Elements* for developing a biosolids management policy and for developing, implementing, reviewing, and maintaining effective biosolids programs, procedures, and practices.

Biosolids Management Program Audit - A systematic and documented verification process of objectively obtaining and evaluating evidence to determine whether an organization's BMP conforms to the requirements of the NBP *Code of Good Practice*, the organization's biosolids management policy, and the 17 *BMP Elements*. BMP audits may be conducted by internal audit teams and/or qualified independent third-party auditors.

Biosolids Management Program Coordinator - The person with overall responsibility and authority to organize and lead the group that will develop and play a key role in implementing the BMP.

Biosolids Management Program Documents - Various documents that collectively compose the BMP documentation, including the biosolids management policy, BMP manual, procedures, practices, operating instructions, and other supporting documents required by the BMP and applicable biosolids laws and regulations.

Biosolids Management Program Guidance Manual - A detailed manual with useful step-by-step guidance on how to implement the *BMP Elements*.

Biosolids Management Program Implementation Plan - Plan that outlines action items necessary to close any gaps, strengthen weaker procedures, reinforce good practices, and develop new procedures where necessary — all to establish the Elements of the organization's BMP.

Biosolids Management Program Records - Various records or reports of biosolids management activities required by the BMP and applicable biosolids laws and regulations, including but not limited to records or reports of monitoring, measurement, laboratory testing, inspections, operating logs, emergency response incidents, outside party inquiries, public participation meetings, audits, corrective actions, management reviews, and periodic performance reports. Records describe the results of specific biosolids management activities for a prescribed event, activity, or period of time.

Biosolids Management Program Team - Group representing all major operational and decision-making areas related to biosolids, tasked with developing, implementing, and maintaining the BMP.

Biosolids Program Action Plans - Action plans designating schedules, milestones, resources, and responsibilities for achieving biosolids program goals and objectives.

Biosolids Program Goal(s) - Performance improvement goals that are consistent with an organization's biosolids management policy to ensure biosolids activities comply with applicable laws and regulations, meet quality and public acceptance requirements, and prevent other unregulated adverse environmental and public health impacts by effectively managing all critical control points. Biosolids program goals include but are not limited to compliance with specific regulatory requirements, improving biosolids quality, improving public acceptance, and reducing or eliminating direct/indirect negative environmental impacts.

Biosolids Program Objective(s) - A detailed performance improvement requirement, quantified wherever possible, based on a biosolids program goal. One or more objectives usually must be met for the underlying goal to be achieved.

Biosolids Public Acceptance Requirements - Biosolids physical, chemical, biological, and aesthetic characteristics and management methods that must be met consistently and reliably to achieve public acceptance of the organization's selected biosolids management method(s).

Biosolids Quality Requirements - Biosolids physical, chemical, biological, and aesthetic characteristics that must be met consistently and reliably to apply the organization's selected biosolids management method(s).

Biosolids Value Chain - Sequence of activities from wastewater pretreatment, discharge, and collection through wastewater treatment, solids treatment, and handling, storage, transportation, and disposal or use of biosolids that impact the quality and stability of biosolids and their suitability for the selected management method.

Changing Circumstances - Internal and external changes that affect the organization's BMP, including changes in legislation, varying expectations of interested parties, changes in the organization's products or activities, technological advances, consumer interests, and feedback from environmental incidents.

Continual Improvement – Process for systematically improving the overall management of biosolids to achieve the organization’s biosolids program goals and objectives set forth in the organization’s biosolids management policy and the NBP *Code of Good Practice*.

Corrective Action – Specific actions and steps taken to correct an organization’s nonconformance(s) to policies, procedures, and other legal, quality, and public-acceptance requirements, and to mitigate any resulting negative impacts on the environment.

Critical Control Points – Those locations, unit processes, events, and activities throughout the biosolids value chain under the organization’s direct control or influence that require effective policies, programs, procedures, practices, monitoring, and measurements to ensure the biosolids activities meet legal, quality, and public acceptance requirements and do not have undesirable environmental impacts. Critical control points include all biosolids management activities that are covered under applicable legal and other requirements.

Document Control – Procedures and practices to ensure that BMP documentation and documents are available and can be located easily, created following established document creation protocols, kept up to date through periodic reviews and revisions, properly marked with version number, effective date(s), and references to replaced or superseded versions; and approved by authorized personnel.

Elements of a Biosolids Management Program (BMP Elements) – These Elements are the standards or benchmarks by which your BMP should be developed and by which your program will be judged.

Emergency Preparedness – A structured emergency planning process to ensure that plausible emergency situations that can affect appropriate biosolids management have been identified, response plans and procedures have been developed, and trained emergency response personnel and equipment are available and in a state of readiness.

Emergency Response – Specific emergency plans and activities that are initiated to contain an emergency situation and bring it under control to minimize environmental impacts.

Environmental Impacts – Any change to the environment (positive or negative), including public health, public nuisances, and odor problems, that wholly or partially result directly or indirectly from the organization’s activities, products, or services, including those activities associated with biosolids management, and those activities that alter (positively or negatively) the acceptable disposal or use method or create public nuisance and public health risks.

Interested Parties – Individuals, groups, or other public or private organizations interested in, involved with, or otherwise affected by the organization’s biosolids management activities, including customers, farmers, regulators, and other local or state governmental officials, community residents, the media, environmental and public interest groups, university professors, and the general public.

Legal Requirements – The federal, state, and local laws and regulations that are applicable to an organization’s BMP activities.

Measurement – A systematic method for estimating, testing, or otherwise evaluating key parameters and characteristics of an organization’s biosolids management activities to determine compliance with a specific standard, regulatory, or other performance requirement, or to measure progress toward its biosolids program goals and objectives.

Monitoring – A systematic process of watching, checking, observing, inspecting, keeping track of, regulating, or otherwise controlling key parameters and characteristics of an organization’s biosolids management activities to determine compliance with a specific standard, regulatory, or other performance requirement, or to measure progress toward its biosolids program goals and objectives.

National Manual of Good Practice – Provides detailed guidance on identifying critical control points and selecting appropriate management practices.

Noncompliance – A deviation from federal, state, or local laws, regulations or other compliance requirements applicable to the organization’s biosolids management activities.

Nonconformance – A deviation in an organization’s established biosolids management policy or BMP from the NBP *Code of Good Practice* principles or the requirements of the *BMP Elements*. Nonconformances include circumstances that have the potential to create a noncompliance situation or significant environmental impacts.

Objective Evidence – Policies, ordinances, procedures, manuals, inspection checklists, operating logs, annual reports, various other documents, and various records, such as monitoring, inspection, enforcement, and training records, that objectively document conformance with the *BMP Elements* requirements.

Operational Controls – Ordinances, regulations, standard operating procedures, practices, technology, instrumentation, and process controls, monitoring and other criteria developed, implemented, and maintained by an organization to ensure effective management of all critical control points associated with its biosolids management activities, including conformance with biosolids management policy requirements, and achievement of biosolids program goals and objectives.

Organization – Enterprise, authority, or institution, or part thereof, responsible for individual or a combination of, biosolids management activities.

Other Requirements – Other binding biosolids management practices and requirements to which an organization voluntarily subscribes as part of its BMP. Examples include binding agreements with customers, suppliers, and public organizations and commitments to “beyond-compliance” performance.

Outcomes Areas – For specific outcomes areas where the NBP has defined specific expectations for the BMP to support performance improvement: 1) environmental performance; 2) regulatory compliance; 3) relations with interested parties; and 4) quality biosolids management practices.

Preparer – Organization who generates solids or biosolids during the treatment of domestic sewage in a treatment works or the organization that derives a material from wastewater solids or biosolids. Examples of preparers would be a public wastewater treatment plant or a private company that manages a compost facility or drying facility that changes the quality of the solids or biosolids to produce a product that meets federal regulations (CFR part 503) for use or disposal.

Preventive Action – Specific actions and steps taken to identify, analyze, and eliminate the root causes of noncompliance(s) and nonconformance(s) and to put in place permanent solutions that will prevent a recurrence.

Procedure – Documented protocol for meeting the requirements of a BMP Element that defines the purpose, terms, detailed actions, responsible persons, and supporting documentation relevant to that Element.

Public (Interested Parties) – Same as the definition of interested parties.

Public Education – Systematic public communication program for educating interested parties and other stakeholders on an organization’s biosolids management activities.

Public Participation – Specific approach(es) and action(s) taken by an organization to involve interested parties and the general public in its BMP, including establishing improvement goals and objectives.

Responsibility(ies) – The specific task(s) a group or individual carries out in a lead or supporting role that accomplishes or supports operational or strategic goals and objectives.

Role(s) – The purpose(s) of the activity(ies) a group or individual performs with respect to the biosolids value chain, biosolids operations, and the BMP.

Service Agreement(s) – Contractual or other legally binding agreements that define the roles and responsibilities of contractors and other groups in supporting the organization’s BMP.

Training – Teaching to make fit, qualified, or proficient; preparation for a test of skill or knowledge; instruction in disciplines and techniques.

Third-Party Verification – The process of having a BMP verified by an independent, qualified auditor.

Appendix B

Elements of an NBP Biosolids Management Program

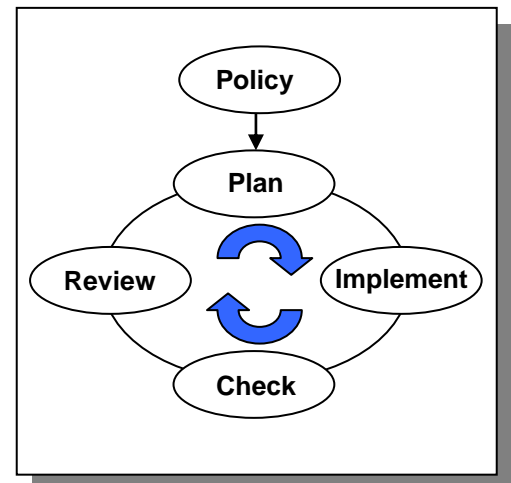
Preamble

The National Biosolids Partnership (NBP) has developed the *National Biosolids Code of Good Practice*, which emphasizes best practices, communication, and implementation of environmentally sound management programs. The NBP Biosolids Management Program (or BMP) is a framework for a biosolids management system, providing a standardized and comprehensive management framework to ensure that biosolids activities are managed effectively.

This document, *Elements of a NBP Biosolids Management Program (BMP Elements)* is an integral part of the overall management framework that makes up the NBP Biosolids Management Program. The *BMP Elements* establish management system requirements for managing biosolids activities effectively at all critical control points in the treatment of wastewater solids, transportation, and end use or disposal of the biosolids. These Elements cover management commitments, planning processes, organizational development, operating procedures, documentation requirements, monitoring, and review processes.

Overall, the *BMP Elements* described in this document provide an effective process for optimizing management of wastewater treatment solids and biosolids. Adopting the *BMP Elements* will help organizations that manage biosolids activities ensure compliance with applicable federal, state, and local regulatory requirements and address other environmental issues such as odor that could cause community concerns. Implementing the *BMP Elements* also will help organizations apply best practices and will foster continual improvement in biosolids management practices.

The NBP Biosolids Management Program provides a rigorous management framework that will produce a consistently stable, high-quality, biosolids product. To achieve that end, the *BMP Elements* should be considered and implemented as a coordinated system, rather than independent, disconnected components. Ultimately, the NBP hopes that implementation of the NBP Biosolids Management Program on a broad scale will help develop and promote the use and disposal of biosolids.



The *BMP Elements* use an environmental management system framework similar to the ISO 14001 Environmental Management System standard. The *BMP Elements* have been adapted to meet the needs of organizations managing solids and biosolids. As with the ISO 14001 standard, the *BMP Elements* are based on the Deming quality management cycle for

continual improvement (Plan-Do-Check-Act), a management process used successfully by manufacturing and service organizations to improve the quality of their activities, products, and services, and to manage environmental compliance. The *BMP Elements* include five sequential steps for developing and implementing a BMP:

1. Biosolids management policy
2. Biosolids management planning
3. Biosolids program implementation
4. Measurement and corrective action
5. Management review

The *BMP Elements* are applicable to all biosolids management activities that the organization can control or influence directly. The *BMP Elements* are applicable to any organization involved in biosolids management activities that wishes to accomplish the following:

- Implement, maintain, and improve its biosolids management program;
- Use best-management practices, as defined in the National Biosolids Partnership's *National Manual of Good Practice for Biosolids*;
- Ensure its conformance to the National Biosolids Partnership's *Code of Good Practice*; and/or
- Demonstrate conformance with the *Code of Good Practice* to customers, regulators, local residents, and other local stakeholders through a third-party verification process.

The NBP *Code of Good Practice* commits an organization to conducting an independent, third-party verification audit to document BMP conformance with the *BMP Elements*. Successfully completing a third-party verification audit is a requirement for achieving NBP Gold-level Recognition or Platinum-level Certification. The *BMP Elements* presented in this document contain objective requirements that are suitable for third-party verification, regardless of which level of NBP recognition or certification your organization chooses to pursue. The third-party verification process and procedures have been developed in a separate set of documents, which include auditor qualifications and requirements to receive recognition from the NBP for implementation of the NBP Biosolids Management Program.

The *BMP Elements* define the requirements but do not prescribe specific approaches, methods or activities. The *BMP Elements* are flexible and allow an organization to determine how its implementation of the NBP Biosolids Management Program will meet the requirements set forth in each of the 17 Elements. A third-party auditor will look for objective evidence that the organization is doing what said it would do to meet the requirements of all 17 *BMP Elements* and that the organization is implementing the Biosolids Management Program as a cohesive management system.

In addition, there are two guidance documents that should be considered in developing and implementing the *BMP Elements*:

1. *Biosolids Management Program Guidance Manual* – A detailed manual with useful step-by-step guidance on how to implement the *BMP Elements*.

2. *National Manual of Good Practice for Biosolids* – A detailed set of documents that provide guidance on identifying critical control points and selecting appropriate management practices.

NBP Statement of Purpose or Intent

The National Biosolids Partnership (NBP) is a not-for-profit alliance formed in 1997 with the National Association of Clean Water Agencies (NACWA), the Water Environment Federation (WEF), and the US Environmental Protection Agency (EPA). Its purpose is to advance environmentally sound and publicly accepted biosolids management practices.

The NBP has sponsored several initiatives designed to promote responsible biosolids management within the industry, with the goal of enhancing public perception of biosolids programs. The cornerstone of these initiatives is a framework for preparing and implementing an NBP Biosolids Management Program, which includes an independent, third-party verification step. Development of a management system based on the NBP Biosolids Management Program and its associated requirements is voluntary. It is the goal of the NBP that all publicly owned treatment works and commercial biosolids preparers, as defined by EPA, voluntarily adopt and implement a formal Biosolids Management Program.

It is not the intent of the NBP that the NBP Biosolids Management Program be a substitute for regulatory oversight or that the BMP requirements be included as a regulatory requirement in National Pollutant Discharge Elimination System (NPDES) permits. However, the NBP Biosolids Management Program can be used by facilities as a mechanism to ensure compliance with permit requirements.

Organization of the BMP Elements

As illustrated in the table below, the *BMP Elements* include 17 individual management elements that must be addressed in developing a NBP Biosolids Management Program. Each management element contains a set of requirements that can be measured objectively. The requirements have been designed to allow the organization a significant level of flexibility in how it chooses to implement the requirements.

While the content and structure of the *BMP Elements* is similar to the international ISO 14001 standard, they contain specific biosolids management requirements based on best practices that were observed in successful biosolids programs. For example, proactive public participation, communication, education, and outreach are important factors in achieving public acceptance.

Table 1 — Biosolids Management Program Elements

Category	Element Number	Element
Policy	1	Biosolids Management Program Manual
	2	Biosolids Management Policy
Planning	3	Critical Control Points
	4	Legal and Other Requirements
	5	Goals and Objectives
	6	Public Participation in Planning

Implementation	7	Roles and Responsibilities
	8	Training
	9	Communication
	10	Operational Control of Critical Control Points
	11	Emergency Preparedness and Response
	12	Documentation, Document Control, and Recordkeeping
Measurement and Corrective Action	13	Monitoring and Measurement
	14	Nonconformances: Preventive and Corrective Action
	15	Biosolids Management Program Report
	16	Internal BMP Audit
Management Review	17	Management Review

Key Definitions

Audit Criteria - Policies, practices, procedures, or requirements against which the auditor compares collected audit evidence about the subject matter.

Audit Findings - Results of the evaluation of the collected audit evidence compared with the agreed audit criteria.

Biosolids - The nutrient-rich organic materials resulting from the treatment of domestic sewage at a wastewater treatment facility. Through biosolids management, solid residue from wastewater treatment is processed to reduce or eliminate pathogens and minimize odors, forming a safe, beneficial agricultural product.

Biosolids Management Activities - A wide range of activities that impact the quality of wastewater solids and biosolids, including pretreatment activities, wastewater treatment processes, solids stabilization processes, conditioning and dewatering processes, transportation, storage, and beneficial use or disposal.

Biosolids Management Policy - Statement by an organization committing it to the principles set forth in the NBP *Code of Good Practice* with respect to biosolids management and any other overall environmental goals voluntarily adopted by the organization.

Biosolids Management Program (BMP) - A comprehensive program covering all aspects of the organization's biosolids activities throughout the biosolids value chain, including management processes for all critical control points in order to mitigate environmental impacts, meet quality and public acceptance requirements, meet legal and other requirements, and execute action plans to achieve biosolids program goals and objectives. A BMP meets requirements of the *BMP Elements* for developing a biosolids management policy and for developing, implementing, reviewing, and maintaining effective biosolids programs, procedures, and practices.

Biosolids Management Program Audit - A systematic and documented verification process of objectively obtaining and evaluating evidence to determine whether an organization's BMP conforms to the requirements of the NBP *Code of Good Practice*, the organization's biosolids management policy, and the 17 *BMP Elements*. BMP audits may be conducted by internal audit teams and/or qualified independent third-party auditors.

Biosolids Management Program Documents - Various documents that collectively compose the BMP documentation, including the biosolids management policy, BMP manual, procedures, practices, operating instructions, and other supporting documents required by the BMP and applicable biosolids laws and regulations.

Biosolids Management Program Guidance Manual - A detailed manual with useful step-by-step guidance on how to implement the *BMP Elements*.

Biosolids Management Program Records - Various records or reports of biosolids management activities required by the BMP and applicable biosolids laws and regulations, including but not limited to records or reports of monitoring, measurement, laboratory testing, inspections, operating logs, emergency response incidents, outside party inquiries, public participation meetings, audits, corrective actions, management reviews, and periodic

performance reports. Records describe the results of specific biosolids management activities for a prescribed event, activity, or period of time.

Biosolids Program Action Plans – Action plans designating schedules, milestones, resources, and responsibilities for achieving biosolids program goals and objectives.

Biosolids Program Goal(s) – Performance improvement goals that are consistent with an organization’s biosolids management policy to ensure biosolids activities comply with applicable laws and regulations, meet quality and public acceptance requirements, and prevent other unregulated adverse environmental and public health impacts by effectively managing all critical control points. Biosolids program goals include but are not limited to compliance with specific regulatory requirements, improving biosolids quality, improving public acceptance, and reducing or eliminating direct/indirect negative environmental impacts.

Biosolids Program Objective(s) – A detailed performance improvement requirement, quantified wherever possible, based on a biosolids program goal. One or more objectives usually must be met for the underlying goal to be achieved.

Biosolids Public Acceptance Requirements – Biosolids physical, chemical, biological, and aesthetic characteristics and management methods that must be met consistently and reliably to achieve public acceptance of the organization’s selected biosolids management method(s).

Biosolids Quality Requirements – Biosolids physical, chemical, biological, and aesthetic characteristics that must be met consistently and reliably to apply the organization’s selected biosolids management method(s).

Biosolids Value Chain – Sequence of activities from wastewater pretreatment, discharge, and collection through wastewater treatment, solids treatment, and handling, storage, transportation, and disposal or use of biosolids that impact the quality and stability of biosolids and their suitability for the selected management method.

Changing Circumstances – Internal and external changes that affect the organization’s BMP, including changes in legislation, varying expectations of interested parties, changes in the organization’s products or activities, technological advances, consumer interests, and feedback from environmental incidents.

Continual Improvement – Process for systematically improving the overall management of biosolids to achieve the organization’s biosolids program goals and objectives set forth in the organization’s biosolids management policy and the NBP *Code of Good Practice*.

Corrective Action – Specific actions and steps taken to correct an organization’s nonconformance(s) to policies, procedures, and other legal, quality, and public-acceptance requirements, and to mitigate any resulting negative impacts on the environment.

Critical Control Points – Those locations, unit processes, events, and activities throughout the biosolids value chain under the organization’s direct control or influence that require effective policies, programs, procedures, practices, monitoring, and measurements to ensure the biosolids activities meet legal, quality, and public acceptance requirements and do not have undesirable environmental impacts. Critical control points include all biosolids management activities that are covered under applicable legal and other requirements.

Document Control – Procedures and practices to ensure that BMP documentation and documents are available and can be located easily, created following established document creation protocols, kept up to date through periodic reviews and revisions, properly marked with version number, effective date(s), and references to replaced or superseded versions; and approved by authorized personnel.

Emergency Preparedness – A structured emergency planning process to ensure that plausible emergency situations that can affect appropriate biosolids management have been identified, response plans and procedures have been developed, and trained emergency response personnel and equipment are available and in a state of readiness.

Emergency Response – Specific emergency plans and activities that are initiated to contain an emergency situation and bring it under control to minimize environmental impacts.

Environmental Impacts – Any change to the environment (positive or negative), including public health, public nuisances, and odor problems, that wholly or partially result directly or indirectly from the organization’s activities, products, or services, including those activities associated with biosolids management, and those activities that alter (positively or negatively) the acceptable disposal or use method or create public nuisance and public health risks.

Interested Parties – Individuals, groups, or other public or private organizations interested in, involved with, or otherwise affected by the organization’s biosolids management activities, including customers, farmers, regulators, and other local or state governmental officials, community residents, the media, environmental and public interest groups, university professors, and the general public.

Legal Requirements – The federal, state, and local laws and regulations that are applicable to an organization’s BMP activities.

Measurement – A systematic method for estimating, testing, or otherwise evaluating key parameters and characteristics of an organization’s biosolids management activities to determine compliance with a specific standard, regulatory, or other performance requirement, or to measure progress toward its biosolids program goals and objectives.

Monitoring – A systematic process of watching, checking, observing, inspecting, keeping track of, regulating, or otherwise controlling key parameters and characteristics of an organization’s biosolids management activities to determine compliance with a specific standard, regulatory, or other performance requirement, or to measure progress toward its biosolids program goals and objectives.

National Manual of Good Practice – Provides detailed guidance on identifying critical control points and selecting appropriate management practices.

Noncompliance – A deviation from federal, state, or local laws, regulations or other compliance requirements applicable to the organization’s biosolids management activities.

Nonconformance – A deviation in an organization’s established biosolids management policy or BMP from the NBP *Code of Good Practice* principles or the requirements of the *BMP Elements*. Nonconformances include circumstances that have the potential to create a noncompliance situation or significant environmental impacts.

Objective Evidence – Policies, ordinances, procedures, manuals, inspection checklists, operating logs, annual reports, various other documents, and various records, such as monitoring, inspection, enforcement, and training records, that objectively document conformance with the *BMP Elements* requirements

Operational Controls – Ordinances, regulations, standard operating procedures, practices, technology, instrumentation, and process controls, monitoring and other criteria developed, implemented, and maintained by an organization to ensure effective management of all critical control points associated with its biosolids management activities, including conformance with biosolids management policy requirements, and achievement of biosolids program goals and objectives.

Organization – Enterprise, authority, or institution, or part thereof, responsible for individual or a combination of, biosolids management activities.

Other Requirements – Other binding biosolids management practices and requirements to which an organization voluntarily subscribes as part of its BMP. Examples include binding agreements with customers, suppliers, and public organizations and commitments to “beyond-compliance” performance.

Outcomes Areas – For specific outcomes areas where the NBP has defined specific expectations for the BMP to support performance improvement: 1) environmental performance; 2) regulatory compliance; 3) relations with interested parties; and 4) quality biosolids management practices.

Preparer - Organization who generates solids or biosolids during the treatment of domestic sewage in a treatment works or the organization that derives a material from wastewater solids or biosolids. Examples of preparers would be a public wastewater treatment plant or a private company that manages a compost facility or drying facility that changes the quality of the solids or biosolids to produce a product that meets federal regulations (CFR part 503) for use or disposal.

Preventive Action – Specific actions and steps taken to identify, analyze, and eliminate the root causes of noncompliance(s) and nonconformance(s) and to put in place permanent solutions that will prevent a recurrence.

Procedure – Documented protocol for meeting the requirements of a BMP Element that defines the purpose, terms, detailed actions, responsible persons, and supporting documentation relevant to that Element.

Public (Interested Parties) – Same as the definition of interested parties.

Public Education – Systematic public communication program for educating interested parties and other stakeholders on an organization’s biosolids management activities.

Public Participation – Specific approach(es) and action(s) taken by an organization to involve interested parties and the general public in its BMP, including establishing improvement goals and objectives.

Responsibility(ies) – The specific task(s) a group or individual carries out in a lead or supporting role that accomplishes or supports operational or strategic goals and objectives.

Role(s) – The purpose(s) of the activity(ies) a group or individual performs with respect to the biosolids value chain, biosolids operations, and the BMP.

Service Agreement(s) – Contractual or other legally binding agreements that define the roles and responsibilities of contractors and other groups in supporting the organization’s BMP.

Training – Teaching to make fit, qualified, or proficient; preparation for a test of skill or knowledge; instruction in disciplines and techniques.

Third-Party Verification – The process of having a BMP verified by an independent, qualified auditor.

Elements of an NBP Biosolids Management Program — Element-by-Element Requirements

Policy

Element 1 — Biosolids Management Program Manual

The *BMP Elements* describe an organization's requirements for establishing and maintaining a comprehensive Biosolids Management Program (BMP) that covers its biosolids management activities at all critical control points throughout the biosolids value chain.

The BMP (including the other 16 BMP Elements) shall be documented in a BMP Manual or equivalent set of program documents that describe, at least at a general level, the applicable policies, programs, plans, procedures and management practices in the BMP. The BMP Manual shall:

1. Be approved by a level of the organization's management with the authority to commit people and resources to biosolids management activities;
2. Contain the organization's biosolids management policy and procedures required by the *BMP Elements*;
3. Contain or cross-reference public participation in planning, communication, and emergency preparedness and response programs and plans required by the *BMP Elements*;
4. Cover all critical control points for its biosolids management activities throughout the biosolids value chain;
5. Include or cross-reference all operational controls, procedures, processes, and other management methods used to achieve and maintain compliance with legal and other requirements; and
6. Describe those biosolids management activities assigned to and performed by contractors.

Element 2 — Biosolids Management Policy

The organization shall establish a biosolids management policy that commits the organization to following the principles of conduct set forth in the NBP *Code of Good Practice* and may include other biosolids commitments the organization voluntarily chooses to adopt.

The organization's biosolids management policy shall be communicated to employees, contractors, and all interested parties and be incorporated into the organization's biosolids programs, procedures, and practices.

Planning

Element 3 — Critical Control Points

The organization shall identify and document the critical control points of its biosolids management activities throughout the biosolids value chain. The organization shall also identify potential or actual environmental impacts at each critical control point.

The organization's critical control points shall be consistent with those identified in the NBP's *National Manual of Good Practice* and other authoritative sources on biosolids management. The information on the organization's critical control points shall be kept up to date and the records shall link each critical control point and its potential environmental impacts with the corresponding operational control(s).

Organizations that have successfully completed a third-party verification audit and are pursuing NBP Platinum-level Certification shall provide notification to the third-party verification auditor after any operational change that requires a change to the identified critical control points or to environmental impacts associated with the critical control points.

Element 4 — Legal and Other Requirements

The organization shall establish a procedure for identifying and tracking legal (federal, state, and local) and other requirements applicable to its biosolids management activities. The procedure shall include a management process for incorporating changes and new requirements into the elements of its BMP. The organization shall establish and maintain records of applicable legal and other requirements.

Element 5 — Goals and Objectives

To continually improve the performance of its BMP, the organization shall establish and periodically review measurable biosolids program goals and objectives for its biosolids management activities. The organization shall set measurable goals and objectives for each of the four NBP outcome areas: environmental performance, regulatory compliance, relations with interested parties, and quality biosolids management practices.

The organization's goals and objectives shall reflect identified priorities for improving the environmental performance of its biosolids management activities based on its critical control points, identified or potential environmental impacts, legal and other requirements, and applicable best management practices as defined in the NBP's *National Manual of Good Practice* and various authoritative information sources on biosolids management (e.g., Water Environment Federation manuals of practice).

The biosolids program goals and objectives also shall consider input from interested parties developed through proactive public participation.

The biosolids program goals and objectives shall be integrated with other BMP Elements and its biosolids management activities, developed and documented using SMART criteria (i.e., be Specific, Measurable, Achievable, Relevant, and Time-bounded), and shall be updated on a regular basis.

The organization shall establish an action plan that describes those improvement activities it is pursuing to achieve its biosolids program goals and objectives. The action plan shall

designate schedules, milestones, resources, and responsibilities for achieving its biosolids program goals and objectives.

Element 6 — Public Participation in Planning

The organization shall select and implement a proactive public participation approach to involve interested parties in its biosolids management program and BMP planning process. The approach selected for public participation shall reflect the organization's commitments to ten (10) principles in the NBP *Code of Good Practice*, including its plan for independent third-party verification of conformance with the *BMP Elements*. The public participation approach shall be consistent with the degree of current public interest, the history of public involvement, the method of biosolids management, and related local circumstances.

The approach selected for public participation also shall provide interested parties with meaningful opportunities to express their views and perspectives relative to the organization's biosolids management activities, including concerns about environmental impacts, biosolids program performance, and potential areas for improvement.

The organization shall consider input from interested parties in initially developing its biosolids program goals and objectives during its BMP implementation and in updating them as part of its periodic review of BMP performance.

Implementation

Element 7 — Roles and Responsibilities

The organization shall establish and maintain records of the assigned roles and responsibilities for its BMP and biosolids management activities. To ensure these assigned roles and responsibilities are effectively performed, the organization shall:

1. Appoint an individual with overall responsibility for ensuring that its BMP is implemented and maintained;
2. Define and document roles and responsibilities of its employees for performing its biosolids management activities and BMP functions;
3. Provide the human, technical, and financial resources necessary to execute these responsibilities effectively; and
4. Define and document the roles and responsibilities of contractor(s) retained to perform various biosolids management activities and BMP functions through service agreements.

Element 8 — Training

The organization shall establish and maintain a training program to ensure that its employees responsible for specific biosolids management activities and for implementing various BMP functions are competent in performing their assigned tasks and duties.

The training program shall provide general awareness of the BMP and how each employee's assigned roles and responsibilities relate to the entire biosolids value chain. The training program shall address new or reassigned employees. The organization shall maintain records of individual employee training delivered and completed.

The organization shall require that its contractors establish their own training programs consistent with their roles and responsibilities in biosolids management activities as defined through service agreements.

Element 9 — Communication

The organization shall establish and maintain a proactive communications program that provides on-going information about its biosolids management activities and BMP to interested parties and the public, consistent with local circumstances, the method of biosolids management, its public communications history, and degree of current interest in its biosolids management activities. The organization's communication program shall make available a summary of its independent, third-party BMP verification audit results to the public. The organization shall define the roles and responsibilities of outside contractors in its communication program.

The communication program shall include a procedure for receiving inquiries and requests for information from interested parties about its biosolids management activities and BMP. The procedure shall define a process for ensuring a timely and complete response to inquiries by interested parties. At a minimum, the organization's communications program shall make the following information about the organization's biosolids management activities and BMP available to interested parties:

1. Biosolids management policy;
2. Applicable legal and other requirements;
3. Biosolids program goals and objectives for continual improvement;
4. Periodic BMP performance report; and
5. Detailed report of its independent, third-party verification audit results of its BMP.

The organization's communications program also shall communicate relevant information about its biosolids management activities and its biosolids management policy and all 17 BMP Elements to its employees and outside contractors, consistent with their assigned biosolids management roles and responsibilities.

Element 10 — Operational Control of Critical Control Points

The organization shall develop and implement standard operating procedures, work management practices, or other appropriate methods at all critical control points throughout the biosolids value chain to manage potential environmental impacts effectively.

Operational controls at critical control points shall incorporate all legal and other adopted requirements and shall consider applicable best-management practices as defined in various authoritative information sources on biosolids management (e.g. NBP *National Manual of Good Practice*, Water Environment Federation manuals of practice).

Operational controls shall include appropriate preventive maintenance procedures and work management systems for maintaining equipment, instrumentation, vehicles, and other treatment technology and process control systems associated with its biosolids management activities.

The organization shall require that its contractors establish their own operational controls consistent with their roles and responsibilities in biosolids management activities.

Element 11 — Emergency Preparedness and Response

The organization shall establish and maintain emergency preparedness and response plans and procedures to ensure effective response to accidents and emergency situations associated with its biosolids management activities.

The organization shall review and evaluate the effectiveness of its emergency preparedness and response procedures, including communications systems, and revise them as necessary. All emergency response equipment shall be on site or readily available within a minimum response time.

The organization shall require its contractors to establish and maintain emergency preparedness and response plans and procedures to ensure effective response to accidents and emergency situations associated with its biosolids management activities.

Element 12 — Documentation, Document Control and Recordkeeping

The organization shall establish and maintain documentation, documents, and records for its BMP including the 17 BMP Elements.

The organization shall establish and maintain document control procedures and practices to ensure that its BMP documentation and documents are:

1. Available and can be located easily;
2. Created following established document creation protocols;
3. Kept up to date through periodic reviews and revisions (if applicable);
4. Properly marked with version number, effective date(s), and references to replaced or superseded versions; and
5. Approved by authorized personnel.

The organization shall establish and maintain records of its biosolids management activities and ensure that they are:

1. Available and can be located easily; and
2. Retained for the specified period of time.

The organization shall establish BMP documentation, document control, and records requirements for biosolids management activities conducted by its contractors in service agreements, and incorporate these requirements into its BMP.

Measurement and Corrective Action

Element 13 — Monitoring and Measurement

The organization shall establish and maintain regular monitoring and measurement procedures and practices for all of its biosolids management activities to:

1. Ensure compliance with applicable legal and other requirements;

2. Measure biosolids program performance at critical control points; and
3. Track progress toward achieving its biosolids program goals and objectives as required under Element 5.

Monitoring and measurement results shall be recorded and the records maintained as established in the recordkeeping procedures under Element 12.

The organization shall require its contractors to establish and maintain regular monitoring and measurement procedures and practices for all their assigned biosolids management activities, as defined in their service agreements.

Element 14 — Nonconformances: Preventive and Corrective Action

Procedures for Investigating and Taking Corrective Action for Nonconformances

The organization shall develop and implement a procedure to:

1. Investigate any noncompliance with applicable regulatory requirements and/or nonconformance with internal BMP procedures identified during routine monitoring and measurement or periodic internal BMP audits;
2. Identify the cause and take actions to correct the nonconformance; and
3. Document the necessary corrective actions taken to prevent a recurrence.

Corrective Action Plans for Nonconformances

Corrective action plans shall be developed to address nonconformances identified during routine monitoring and measurement. Such plans may be as brief as is appropriate to the situation, but at a minimum, shall identify the nonconformance, the root cause(s), and the corrective action being taken. The corrective action plan shall identify changes to policies, programs, plans, operational controls, or monitoring/measurement procedures to prevent future nonconformances.

Corrective Action Plans for BMP Audits

Formal corrective action plans shall be established to address the findings of internal BMP audits under Element 16, and BMP verification audits conducted by third parties. The corrective action plan shall be documented, and shall describe what actions will be taken to address the audit findings, the individual(s) responsible, the estimated completion date, and required resources to develop and implement corrective and preventive action.

Progress in completing the corrective actions shall be tracked and periodically updated to reflect completion. The corrective action plan shall include recommended changes to policies, programs, plans, operational controls, or monitoring/measurement procedures to prevent future nonconformances. These changes shall be documented in the corrective action plan, and in the BMP Manual and other relevant BMP documentation.

Element 15 — Biosolids Management Program Report

The organization shall complete a periodic, written BMP performance report (at least annually) summarizing the performance of its BMP. The report shall contain appropriate summaries of monitoring, measurement, and other results that demonstrate the

performance of the biosolids program relative to its goals, objectives, and legal requirements, including those biosolids management activities conducted by contractors.

The report also shall provide summaries of performance relative to other voluntarily adopted requirements, the organization's progress toward achieving its biosolids program goals and objectives, and a summary of its independent third-party BMP verification audit results and internal BMP audit results.

The periodic BMP report shall be available to the public. The organization shall have the flexibility of using other methods, including electronic methods such as a biosolids program web page in addition to or in lieu of a written periodic performance report.

Element 16 — Internal BMP Audit

The organization shall establish and maintain an internal audit program to periodically analyze its BMP and to determine whether it is effectively meeting its biosolids management policy, program requirements, and program goals and objectives.

The internal BMP audit program shall define the scope, frequency, and methodology of the audits, assign responsibility for conducting the audits and communicating their findings, and designate individuals to whom these findings are to be conveyed. The internal BMP audit also shall evaluate the organization's performance relative to established biosolids program goals, objectives, and performance measures. The internal audit program shall cover all the organization's biosolids management activities including those performed by contractors.

Internal audit results shall be reported to the organization's management in such a way that it can take action to make necessary modifications to the BMP. The person responsible for the BMP shall develop, or delegate the development of, a comprehensive corrective action plan addressing each nonconformance identified by the internal audit.

At a minimum, the organization shall maintain the following documents and records, as applicable, relating to its audit program:

1. Description of audit methodology, protocol, scope, and schedule;
2. Identification of lead auditor(s), qualifications, and description of roles and responsibilities of auditor(s), management representatives, and others who may participate in, review, or be expected to act upon the audit; and
3. Corrective and/or preventive action plans prepared resulting from an audit, and any related changes made to policies, plans, procedures, or work practices that occur as a result of an audit's findings, evaluation, or follow-up actions.

[For organizations that are pursuing NBP Gold-level Recognition, internal audits are required annually, with reports sent to NBP as part of the periodic BMP report. Organizations that are pursuing the NBP Platinum-Level Certification should set a schedule and scope of internal audits. This schedule will be reviewed and approved by the third-party auditor.]

Management Review

Element 17 — Management Review

The organization's management shall, at intervals that it determines appropriate, review the BMP and its performance relative to policy commitments, goals, objectives, and established performance measures to ensure its continuing suitability, adequacy, and effectiveness. A lead person or persons shall be responsible for organizing and conducting the review.

The management review shall address the possible need for changes to policy, the goals and objectives, biosolids management activities, or other BMP Elements based on internal audit results, external verification audits by third parties, changing circumstances, and the commitment to continual improvement. The management review shall be documented. Any changes to policies, plans, procedures, and work practices that are made as a result of the review also shall be documented.

At a minimum, the organization shall maintain the following related to its management reviews:

1. Schedule and scope for review(s);
2. Documentation of findings, evaluation, and follow-up actions; and
3. Documentation of changes made to policies, plans, procedures, practices, or other BMP Elements that occur as a result of the management review findings, evaluation, or follow-up actions.

Appendix C

Sources of Information

Air and Waste Management Association

One Gateway Center, 3rd Floor
420 Fort Duquesne Blvd.
Pittsburgh, PA 15222-1435
Phone: 412-232-3444; 800-270-3444
Fax: 412-232-3450
E-mail: info@awma.org
<http://www.awma.org>

National Association of Clean Water Agencies, NACWA

1816 Jefferson Place, NW
Washington D.C. 20036-2505
Tel: 202-833-2672
Fax: 888-267-9505
e-mail: info@nacwa.org
<http://www.nacwa.org>

American Water Resource Association, AWRA

4 West Federal Street
PO Box 1626
Middleburg, VA
20118-1626
Tel: 540-687-8390
Fax: 540-687-8395
e-mail: info@awra.org
<http://www.awra.org>

American Water Works Association AWWA

6666 West Quincy Ave.
Denver, CO 80235
Tel: 303-794-7711 or
888-926-7337
Fax: 303-347-0804
<http://www.awwa.org>

Association of Metropolitan Water Agencies, AMWA

1620 I Street, NW, Suite 500
Washington, DC 20006
Tel: (202) 331-2820
Fax: (202) 785-1845
<http://www.amwa.net>

Association of State Drinking Water Administrators, ASDWA

1401 Wilson Blvd. Suite 1225
Arlington, VA 22209
Tel: 703-812-9505
Fax: 202-293-7656
e-mail: info@asdwa.org
<http://asdwa.org>

Environmental Protection Agency

Office of Enforcement and Compliance Assurance
<http://www.epa.gov/aboutepa/oeca.html>

Environmental Protection Agency Regional and State Pretreatment Coordinators

http://cfpub.epa.gov/npdes/contacts.cfm?program_id=3&type=STATE

European Union of National Associations of Water Suppliers and Wastewater Services (EUREAU)

47-51. Rue du Luxembourgstraat
B-1050 Brussels, Belgium
Tel: + 32-2-706 40 80
Fax: + 32-2-706 40 81
<http://eureau.org>

Federal Emergency Management Agency

500 C Street SW
Washington, DC 20472
<http://www.fema.gov>

International Water Association

Alliance House, 12 Caxton Street
London SW1H 0QS, UK
Tel: +44 -20-7654 -5500
Fax: +44 -20 -7654 -5555
e-mail: water@iwahq.org
<http://www.iwahq.org>

International Water Resources Association

e-mail: office@iwra.org
<http://www.iwra.org>

National Association of Water Companies

2001 L Street NW, Suite 850
Washington, DC 20036
Tel: 202-833-8383
Fax: 202-331-7442
email: info@nawc.com
<http://www.nawc.org>

National Biosolids Partnership

601 Wythe Street
Alexandria, VA 22314-1994
Tel: 703-684-2452
Fax: 703-684-2492
<http://www.wef.org/biosolids>

National Institute for Occupational Safety and Health

Tel: 1-800-356-4674
Fax: (513) 533-8573
e-mail: pubstaft@cdc.gov
<http://www.cdc.gov/niosh/>

National Rural Water Association

2915 South 13th Street
Duncan, OK 73533-9086
Tel: 580-252-0629
Fax: 580-252-4896
<http://www.nrwa.org>

National Water Resources Association

3800 North Fairfax Drive
Suite 4
Arlington, VA 22203
Tel: 703-524-1544
Fax: 703-524-1548
<http://www.nwra.org>

Water Environment Federation WEF

601 Wythe Street
Alexandria, VA 22314-1994
Tel: 703-684-2452
Fax: 703-684-2492
<http://www.wef.org>

Water Environment Research Foundation (WERF)

635 Slaters Lane, Suite G-110
Alexandria, VA 22314
Tel: 571-384-2100
e-mail: werf@werf.org
<http://www.werf.org>

Water for People

6666 West Quincy Avenue
Denver, Colorado 80235
Tel: 720.488.4590
e-mail: info@waterforpeople.org
<http://www.waterforpeople.org>

Water and Wastewater Equipment Manufacturers Association, Inc.

P.O. Box 17402
Washington, D.C. 20041
Tel: 703-444-1777
Fax: 703-444-1779
e-mail: info@wwema.org
<http://www.wwema.org>

WaterWiser

6666 West Quincy Avenue
Denver, CO 80335
Tel: 303-794-7711 or 800-926-7337
Fax: 303-347-0804
<http://www.waterwiser.org>

Appendix D

Example Forms and Templates

- Table D-1 — Critical Control Point Planning — BMP Procedures — Template
- Table D-2 — Critical Control Point Planning — Level of Management System Development — Template
- Table D-3 — Critical Control Point Planning — Level of Management System Development — Example
- Table D-4 — Critical Control Point / Operational Control / Environmental Impact / Monitoring and Measurement / Roles and Responsibilities — Example
- Table D-5 — Applicable Legal Requirements and Permits — Template
- Table D-6 — Biosolids Value Chain Roles and Responsibilities — Example
- Table D-7 — Roles and Responsibilities by Biosolids Value Chain Category — Example
- Table D-8 — Roles and Responsibilities by Goals and Objectives — Example
- Table D-9 — Roles and Responsibilities by Departments and BMP Elements — Example
- Table D-10 — Training Requirements by Job Title — Example
- Table D-11 — BMP Training Log — Example
- Table D-12 — Level 3 Documents and Forms — Document Map/Master List — Example
- Table D-13 — Record of External Communication — Template
- Table D-14 — Audit Checklist — Example
- Table D-15 — Corrective Action Notice — Template
- Table D-16 — Regulatory Requirements Checklist — Template
- Table D-17 — Record of Emergency Incident/Response — Template
- Table D-18 — Crop Harvesting Site Restriction Form — Example
- Table D-19 — Field Summary Report — Example
- Table D-20 — Landowner Consent Form — Example
- Table D-21 — Field Compliance Summary — Example
- Table D-22 — Notice to Land-Appplier — Example
- Table D-23 — Site Inspection Report — Example

The below templates are not required for use in an organization’s BMP Manual or other documentation. However, they can be tools that organizations use to help organize their BMPs.

Table D-1 — Critical Control Point Planning — BMP Procedures — Template

Biosolids Value Chain	Locations / Unit Processes		Regulatory Requirements		Events		Activities	
	Potential Critical Control Points	Responsible Party	Potential Critical Control Points	Responsible Party	Potential Critical Control Points	Responsible Party	Potential Critical Control Points	Responsible Party
Wastewater Collection & Pretreatment								
Wastewater Treatment & Solids Generation								
Solids Stabilization, Conditioning & Handling								
Solids Storage and Transportation								
Biosolids End Use or Disposal								

Table D-2 — Critical Control Point Planning — Level of Management System Development — Template

Critical Control Point Category:						
Critical Control Point Completeness of Documentation = X	No Systems = 0 None	Limited Systems = 2 Limited	Some Systems = 4 Some	Basic Systems = 6 Basic	Good Systems = 8 Good	Full System =10 Full

Table D-3 — Critical Control Point Planning — Level of Management System Development — Example

Biosolids Value Chain: Wastewater Collection and Pretreatment						
Critical Control Point Completeness of Documentation = X	No Systems = 0 None	Limited Systems = 2 Limited	Some Systems = 4 Some	Basic Systems = 6 Basic	Good Systems = 8 Good	Full System =10 Full
SIU Industrial - Permits						
Industrial User						
Commercial User						
SIU Inspections						
SIU Monitoring						
Zone Monitoring						
SIU/Industrial Inspections						
Enforcement						
Technical Assistance						
Spill Plan/Response						
Other						

Table D-4 — Critical Control Point / Operational Control / Environmental Impact / Monitoring and Measurement / Roles and Responsibilities — Example

Biosolids Value Chain	Critical Control Points	Operational Controls	Environmental Impacts	Monitoring/ Measurement/ Recordkeeping Requirements	Roles and Responsibilities
Wastewater Collection and Pretreatment					
Wastewater Treatment and Solids Generation					
Solids Stabilization, Conditioning and Handling					
Biosolids Storage and Transportation					
Biosolids End Use or Disposal					

Table D-5 — Applicable Legal Requirements and Permits — Template

Biosolids Value Chain	Applicable Legal Requirements	Permit	Location	Owner
Wastewater Collection and Pretreatment				
Wastewater Treatment and Solids Generation				
Solids Stabilization, Conditioning and Handling				
Biosolids Storage and Transportation				
Biosolids End Use or Disposal				

Table D-6 — Biosolids Value Chain Roles and Responsibilities — Example

Position Description	Wastewater Collection and Pretreatment	Wastewater Treatment and Solids Generation	Solids Stabilization, Conditioning and Handling	Biosolids Storage and Transportation	Biosolids Use or Disposal
Utility General Manager					
Director, Operations					
Front-End Superintendent					
Back-End Superintendent					
Operator 1					
Operator 2					
Operator 3					
Maintenance Superintendent					
Maintenance Tech1					
Maintenance Tech 2					
Regulatory Affairs					
Laboratory					
Engineering					
Procurement					
Human Resources					
Contractor					

Table D-7 — Roles and Responsibilities by Biosolids Value Chain Category — Example

Biosolids Value Chain: Wastewater Collection and Pretreatment								
Personnel	Industrial SIU Permits	Industrial SIU Monitoring	Industrial Permits	Industrial Monitoring	Commercial Permits	Inspection	Collection Zone Monitoring	Emergency Response
Utility GM								
Manager Regulatory Affairs								
Industrial Permit Administrator								
Commercial Permit Admin								
Field Tech 1								
Field Tech 2								
Field Inspector 1								
Field Inspector 2								
Lab Chemist								
Lab Technician								
Engineering								
Contractor								

Table D-8 — Roles and Responsibilities by Goals and Objectives — Example

Goals and Objectives	Regulatory Affairs	Operations Front-End	Operations Back-End	Engineering	Outside Engineer	Laboratory	Contractor
Goal 1– Increase Land Application							
Objective 1A							
Objective 1B							
Objective 1C							
Goal 2 – Reduce Odor							
Objective 2A							
Objective 2B							
Objective 2C							
Goal 3 – Reduce Lead and Copper							
Objective 3A							
Objective 3B							
Objective 3C							

Table D-9 — Roles and Responsibilities by Departments and BMP Elements — Example

EMS Elements	Senior Management	Regulatory Affairs	Front-End Operations	Back-End Operations	Engineering	Procurement	Human Resources	Contractor
1 – BMP Manual								
2 – Biosolids Management Policy								
3 – Critical Control Points								
4 – Legal and Other Requirements								
5 – Goals and Objectives								
6 – Public Participation in Planning								
7 – Roles and Responsibilities								
8 – Training								
9 – Communication								
10 – Operational Control of Critical Control Points								
11 – Emergency Preparedness and Response								
12 – Documentation, Document Control, and Recordkeeping								
13 – Monitoring and Measurement								
14 – Nonconformances: Corrective and Preventive Action								
15 – Biosolids Management Program Report								
16 – Internal BMP Audit								
17 – Management Review								

Table D-10 — Training Requirements by Job Title — Example

Job Title	Biosolids Program Overview	Biosolids Legal and Quality Requirements	SOPs, Work Instructions	Emergency Response	Monitoring, Measurement Records	Storage and Transportation	Certification
General Manager							
Operations Manager							
WWTP Operators							
Regulatory Affairs Manager							
Field Techs and Inspectors							
Biosolids Manager							
Solids Operators							
Truck Drivers							
Biosolids Contractor							
Emergency Contractor							

Table D-11 — BMP Training Log — Example

Training Topic	Attendees	Frequency	Course Length	Course Method	Date Completed	Comments
BMP Awareness						
Supervisor BMP Training						
Biosolids Quality Overview						
Transportation						
Land Application						
Emergency Response						
Accident Investigation						
Job-Specific Training (list)						
Other						

Table D-12 — Level 3 Documents and Forms — Document Map/Master List — Example

Biosolids Value Chain	Existing Form	Stand Alone?	Location	Owner
Wastewater Collection and Pretreatment				
Wastewater Treatment and Solids Generation				
Solids Stabilization, Conditioning and Handling				
Biosolids Storage and Transportation				
Biosolids End Use or Disposal				

Table D-13 — Record of External Communication — Template

Description of Inquiry	Date Received	Date Responded	Type of Response	Name of Respondent

Table D-14 — Audit Checklist — Example

Auditee:		Audit Number:	Audit Standard:
Document Reference	Requirement	Objective Evidence	Finding
Prepared By:		Date:	
Prepared By:		Date:	

Table D-15 — Corrective Action Notice — Template

Corrective Action Notice (CAN)		
CAN Number:		
Issue	Solution	Name:
Date:	Due Date:	Location:
Phone:		
Requested by:		
Issued to:		
Problem Statement:		
Most Likely Cause:		
Implemented Solutions:		
Results (confirming effectiveness):		
Closed by:	Closing date:	

Table D-16 — Regulatory Requirements Checklist — Template

Regulatory Requirement (Citation)	Description	✓

Table D-17 — Record of Emergency Incident/Response — Template

Record of Emergency Incident / Response	
Date: _____	Time: _____
Location: _____	
Summary of Incident: _____	

Response Actions:	

Responsible Person (s): _____	
Company Phone No.: _____	

Table D-18 — Crop Harvesting Site Restriction Form — Example

(Applier Name Here)

**CROP HARVESTING SITE RESTRICTIONS
QUARTERLY GROWER CERTIFICATION**

Farm Name: _____ Total Acres: _____
 Farm Location (include County): _____
 Crossroads: _____
 T / R / S, Latitude/ Longitude: _____

Owner: _____
 Leaseholder (if different from above): _____
 Dates of Application: _____

I understand the following regulatory requirements and consented to comply with these regulations prior to receiving any biosolids:

- (a) Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application of biosolids.
- (b) Food crops with harvested parts below the surface of the land shall not be harvested for 20 months after application of biosolids when the biosolids remain on the land surface for four months or longer prior to incorporation into the soil.
- (c) Food crops with harvested parts below the surface of the land shall not be harvested for 38 months after application of biosolids when the biosolids remain on the land surface for less than four months prior to incorporation into the soil.
- (d) Food crops, feed crops, and fiber crops shall not be harvested for 30 days after application of biosolids.
- (e) Turf grown on land where biosolids are applied shall not be harvested for one year after application of the biosolids when the harvested turf is placed on either land with a high potential for public exposure or a lawn, unless otherwise specified by the permitting authority.

I certify that I am responsible for the agricultural operations on the above described property and that the above requirements were met for the Quarter _____ to _____, 199 _____

GROWER SIGNATURE

DATE

Receipt of Completed Form Acknowledged by Applier

Date

Modified Form - Wheelabrator, Bio Gro Systems

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Table D-19 — Field Summary Report — Example

FIELD _____ SUMMARY REPORT¹

FIELD INFORMATION

Location: T _____ R _____ S _____
 County / Crossroads: _____
 Size: Acres _____ Hectares _____
 Area Applied: Acres _____ Hectares _____ (attach map if different from above)
 Applier: _____

APPLICATIONS HISTORY

Dates of Application	Applier	Total dry tons	Total dry metric tons
/ / - Present	_____	_____	_____
/ / - / /	_____	_____	_____
Lifetime Applications ²	_____	_____	_____

CURRENT APPLICATIONS SUMMARY

Biosolids Source	Dates	%TS	Wet tons	Dry Tons	Dry Metric Tons
Generator X	/ / - / /	_____	_____	_____	_____
Generator Y	/ / - / /	_____	_____	_____	_____
Generator Z	/ / - / /	_____	_____	_____	_____
Total			_____	_____	_____

CROP INFORMATION

Scheduled: Crop _____ Plant Date _____ Harvest Date _____
 Crop Nitrogen Requirement (lbs N/acre): _____ (kg N/ha) _____
 Carry-over/Additional Nitrogen³ (lbs N/acre): _____ (kg N/ha) _____
 Biosolids Target Rate⁴ (lbs N/acre): _____ (kg N/ha) _____
 Actual Biosolids N loading (lbs N/acre): _____ (kg N/ha) _____
 Calculations are attached.
 Actual crop planted, plant date, harvest date, and market will be submitted in the Annual Report.

CUMULATIVE POLLUTANT LOADINGS (KG/HA)

Pollutant - CPLR - Limit	Pollutant - CPLR - Limit	Pollutant - CPLR - Limit
As _____ 41	Pb _____ 300	Se _____ 100
Cd _____ 39	Hg _____ 17	Zn _____ 2,800
Cu _____ 1,500	Ni _____ 420	

Do any metals exceed 90% of Limits? If so, list. _____

SITE RESTRICTIONS

Type of Access Restriction: _____
 Will Grazing be practiced? If so, list dates. _____

COMMENTS ARE ATTACHED [if applicable]

CERTIFICATION [modify as appropriate]
 "I certify under penalty of law that the requirements to obtain information in 503.12(e)(2), the management practices in 503.14, the site restrictions in 503.32 (b)(5) and the vector attraction reduction requirements in [503.33(b)(9) or (b)(10), if one of those requirements is met] have been met. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the management practice and the site restrictions [and the vector attraction reduction requirements if applicable] have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

Signature _____ Date _____

¹ Form to be completed by the Applier for each application.
² Since 7/20/93 or earlier if it is known that CPLR biosolids were applied prior to 7/20/93.
³ Nitrogen from previous biosolids applications and from other nitrogen sources.
⁴ Net allowable nitrogen from biosolids (crop requirement - carry-over/additional).

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Table D-20 — Landowner Consent Form — Example

(*Applier Name Here*)

LANDOWNER CONSENT FOR BIOSOLIDS APPLICATION

The undersigned hereby agrees to the application of biosolids by (*Applier Name here*) at agronomic rates, for agricultural purposes, in accordance with all applicable laws and regulations.

Landowner Name: _____
 Address: _____
 City/State/Zip Code: _____
 Telephone Number: _____

Farm Name: _____ Total Acres: _____
 Farm Location (include County): _____
 Crossroads: _____
 T / R / S, Latitude/ Longitude: _____

Leaseholder: _____

I understand and agree to the following regulatory requirements:

- (a) Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application of biosolids.
- (b) Food crops with harvested parts below the surface of the land shall not be harvested for 20 months after application of biosolids when the biosolids remain on the land surface for four months or longer prior to incorporation into the soil.
- (c) Food crops with harvested parts below the surface of the land shall not be harvested for 38 months after application of biosolids when the biosolids remain on the land surface for less than four months prior to incorporation into the soil.
- (d) Food crops, feed crops, and fiber crops shall not be harvested for 30 days after application of biosolids.
- (e) Animals shall not be allowed to graze on the land for 30 days after application of biosolids.
- (f) Turf grown on land where biosolids are applied shall not be harvested for one year after application of the biosolids when the harvested turf is placed on either land with a high potential for public exposure or a lawn, unless otherwise specified by the permitting authority.
- (g) Public access to land with a high potential for public exposure shall be restricted for one year after application of biosolids.
- (h) Public access to land with a low potential for public exposure shall be restricted for 30 days after application of biosolids.

I agree to allow Generators of the biosolids being applied and all federal, state, regional, and local regulatory staff access to this land for inspection and sample collection purposes.

I certify that I am the holder of legal title to the above described property or am authorized by the holder to give consent for the land application of biosolids.

I agree to notify (*Applier name here*) immediately in the event of the sale of this property and provide them with the name, address and telephone number of the future owner.

I agree to notify (*Applier name here*) immediately in the event of a change in Leaseholder and provide them with the name, address and telephone number of the new leaseholder.

LAND OWNER SIGNATURE (Include title if signing as a representative)	DATE
Receipt of Completed Form Acknowledged by Applier	Date

Modified Form - Wheelabrator, Bio Gro Systems

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Table D-21 — Field Compliance Summary — Example

FIELD _____ COMPLIANCE SUMMARY¹
 APPLICATION PERIOD _____

FIELD INFORMATION

Location: T _____ R _____ S _____
 County/Crossroads: _____
 Size: _____ Acres _____ Hectares
 Area Applied: _____ Acres _____ Hectares (attach map if different from above)
 Applier: _____

APPLICATIONS SUMMARY

	Wet Tons	Dry Tons	Dry Metric Tons
Total for application period	_____	_____	_____
Per acre/per hectare	_____	_____	_____
Lifetime ²	_____	_____	_____

CROP INFORMATION

Crop _____ Plant Date _____ Harvest Date _____ Market _____
 Crop Nitrogen Requirement (lbs N/acre) _____
 Biosolids Target Rate³ (lbs N/acre) _____
 Actual Biosolids N loading (lbs N/acre) _____
 Year 2 Crop _____ Harvest Date _____ Market _____
 Year 3 Crop _____ Harvest Date _____ Market _____
 Year 4 Crop _____ Harvest Date _____ Market _____

CUMULATIVE POLLUTANT LOADINGS

Do any CPLRs exceed 90% of Limits? Yes No
 If yes, list pollutants and CPLR. _____
 If yes, was permitting agency notified? Yes No Date of notification _____

SITE RESTRICTIONS

Type of Access Restriction _____
 Was the field grazed? Yes No If yes, list dates. _____

CERTIFICATION

Is certification on file? If no, explain. _____

COMMENTS

¹ Form to be completed by Generator for each field application; Supporting information is available in Operations Status Reports.
² Since 7/20/93 or earlier if it is known that CPLR biosolids were applied prior to 7/20/93.
³ Net allowable nitrogen from biosolids.

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Table D-22 — Notice to Land-Appplier — Example

SAMPLE FORMAT
FOR PROVIDING NOTICE AND NECESSARY INFORMATION TO APPLIER
 [This form is intended to assist the Generator with bulk biosolids notification requirements in 503.12(f).]

A. POLLUTANT CONCENTRATIONS (Highlight results that exceed associated limit)

Pollutant	Concentration (mg/kg dry weight) <input type="checkbox"/> monthly average <input type="checkbox"/> instantaneous value	Part 503 Table 3 Pollutant Concentration (mg/kg dry weight) monthly average	Part 503 Table 1* Ceiling Concentration (mg/kg dry weight) instantaneous maximum
Arsenic		41	75
Cadmium		39	85
Copper		1,500	4,300
Lead		300	840
Mercury		17	57
Molybdenum		NA	75
Nickel		420	420
Selenium		100	100
Zinc		2,800	7,500
Organic-N		NA	NA
Ammonia-N		NA	NA
Nitrate-N		NA	NA
Nitrite-N		NA	NA

* Biosolids cannot be land applied if any pollutant concentrations in any sample exceed these values.

B. PATHOGEN REDUCTION (Indicate level achieved and alternative used to achieve that level; attach applicable supporting data.)
 Class A Alternative _____ Class B Alternative _____

C. VECTOR ATTRACTION REDUCTION (Indicate option performed; attach applicable supporting data.)
 Option 1 Option 2 Option 3 Option 4
 Option 5 Option 6 Option 7 Option 8
 No Vector Attraction Reduction Options were performed

D. CERTIFICATION
 "I certify under penalty of law that the pathogen reduction requirements and the vector attraction reduction requirements have been met as shown in B and C above. This determination has been made under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information used to determine that the pathogen reduction requirements and the vector attraction reduction requirements have been met. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

 Name and Official Title (type or print) Area Code and Telephone Number

 Signature Date Signed

Modified Form - U.S. EPA, 1993

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Table D-23 — Site Inspection Report — Example

 (Generator Name Here)

**BIOSOLIDS MANAGEMENT PROGRAM
 SITE INSPECTION REPORT**

Land Applier: _____ On-Site Rep.: _____ Title: _____

Address: _____ City: _____ State: _____ Zip Code: _____

Telephone Number: _____ Fax Number: _____

Date of this Inspection: _____ Time In: _____ Time Out: _____

Inspecting Agency: _____ Agency Rep. Name: _____

Was this inspection an ... Announced Inspection? Unannounced Inspection?

Date of Last Inspection: _____

Current Weather Conditions: _____

Temperature: _____ Wind Speed: _____ Wind Direction: _____

INSPECTION SUMMARY			
General Site Conditions		Review of Truck Documents	
Facilities & Equipment Housekeeping		Biosolids Delivery Travel Inspection	
Quantity of On-Site Inventory		Operational Changes Noted	

- Legend:
 A Acceptable
 B Needs Improvement
 C Corrective Action Required Immediately
 NR Not Reviewed
 NA Not Applicable