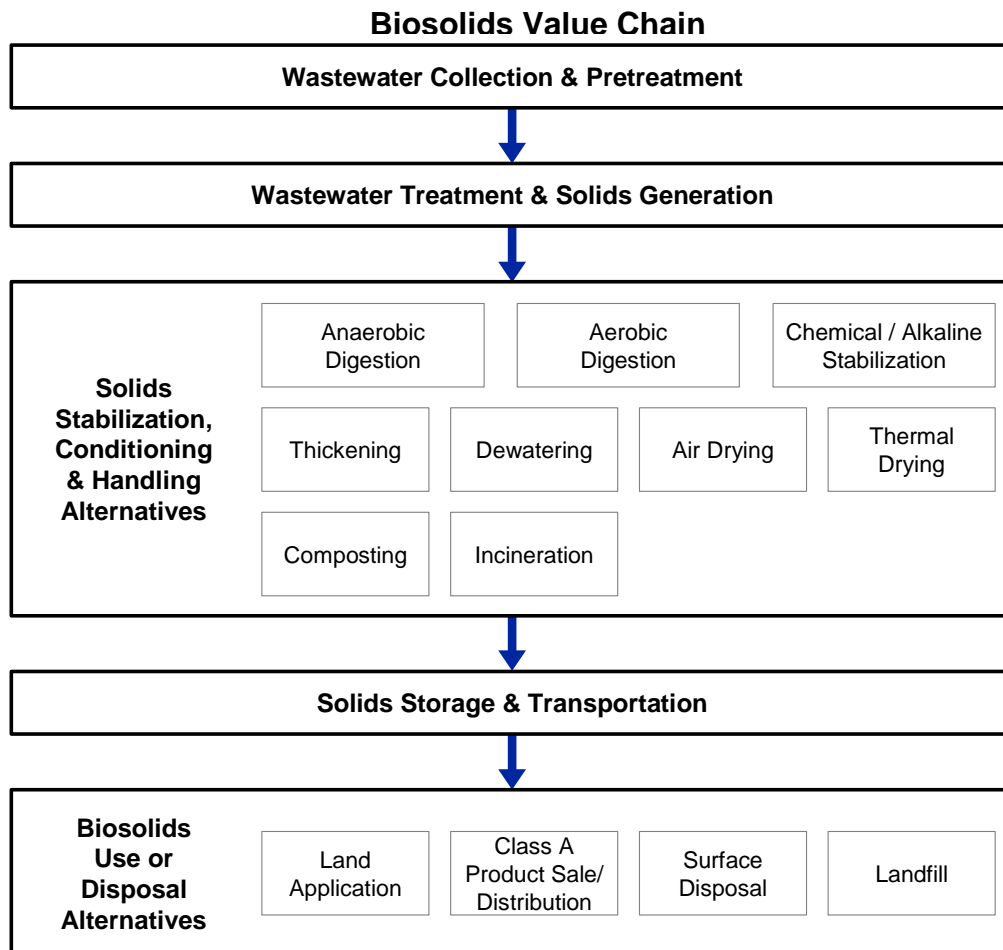


Appendix F – Critical Control Points throughout the Biosolids Value Chain

The purpose of this appendix is to clarify identification of critical control points throughout the biosolids value chain. 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 assures that biosolids management activities meet legal, quality, and public acceptance requirements and do not have undesirable environmental impacts. This effective management of critical control points is accomplished with operational controls. 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.

At each major step in the value chain (e.g., solids stabilization, conditioning and handling), wastewater treatment facilities have a variety of alternative processes to choose from. For example, solids stabilization methods might include aerobic digestion, anaerobic digestion, chemical stabilization, composting, thermal drying and/or air drying. In identifying critical control points, organizations participating in the NBP EMS Program must include all methods that apply to local operations. Some alternatives may not apply to some operations.



Organizations participating in the NBP EMS Program are required to identify critical control points that are consistent (e.g., similar in scope and scale) to those in the *National Manual of Good Practice*. The table below can help organizations confirm that their critical control points meet NBP requirements. For example, if an organization 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 critical control points. To be consistent with NBP expectations, an organization would need to dig deeper within Wastewater Treatment to identify specific locations or activities – such as anaerobic digestion, air drying systems, or solids dewatering.

The NBP encourages organizations to go even one level deeper when identifying critical control points, as indicated in the table below. For example, under anaerobic digestion, organizations could identify digester temperature and detention time as critical control points needing effective management to assure that biosolids activities meet legal, quality, and public acceptance requirements and do not have undesirable environmental impacts.

As discussed, earlier, the guidance contained in this manual is not intended to be interpreted as requirements that third party auditors will use. Auditors should ask if the manual was consulted during the identification of critical control points and operational controls. However, auditors should recognize that each facility and biosolids management program is unique. Consequently operating procedures will be unique as will the selection of critical control points and operational controls. Auditors should recognize and allow for the possibility that a critical control point for one organization may be listed as an operational control (or monitoring/measurement) by another organization.

Biosolids Value Chain	Examples of Critical Control Points
Wastewater Collection and Pretreatment	Industrial – Significant Industrial User discharges
	Commercial user discharges
Wastewater Treatment and Solids Generation	Solids screening / grit collection
	Scum blanket
	Primary treatment
	Secondary treatment
Solids Stabilization, Conditioning, and Handling	Anaerobic digestion <ul style="list-style-type: none"> - Temperature - Digester mixing - Detention time - “End product” meets regulatory requirements - Any regulatory/permit requirements that identify specific locations/activities that need to be managed
	Aerobic digestion <ul style="list-style-type: none"> - Temperature - Digester mixing - Aeration requirements - “End product” meets regulatory requirements - Any regulatory/permit requirements that identify specific locations/activities that need to be managed
	Chemical stabilization – Class B product <ul style="list-style-type: none"> - Quality of add mix of chemicals / lime - Mixture consistency - Mixture pH and temperature - Mixture detention time - Any regulatory/permit requirements that identify specific locations/activities that need to be managed
	Chemical stabilization – Class A product <ul style="list-style-type: none"> - Quality of add mix of chemicals / lime - Mixture consistency - Mixture pH and temperature - Mixture detention time - “End product” meets regulatory requirements - Location of facility – air emissions management - Any regulatory/permit requirements that identify specific locations/activities that need to be managed
	Composting <ul style="list-style-type: none"> - Quality of add mix of bulking agent - Mixture consistency - Mixture temperature - Mixture turning - Mixture detention time - “End product” meets regulatory requirements - Any regulatory/permit requirements that identify specific locations/activities that need to be managed

Biosolids Value Chain	Examples of Critical Control Points
Solids Stabilization, Conditioning and Handling (continued)	Air drying system <ul style="list-style-type: none"> - Location of facility - Mixture turning - Mixture temperature - Mixture detention time - “End product” meets regulatory requirements - Any regulatory/permit requirements that identify specific locations/activities that need to be managed
	Thermal drying systems <ul style="list-style-type: none"> - Location of facility – air emission management - Temperature - Detention time - Stack emissions - “End product” meets regulatory requirements - Storage bin / silo - Any regulatory/permit requirements that identify specific locations/activities that need to be managed
	Bioenergy / Incineration <ul style="list-style-type: none"> - Thickening - Dewatering - Scum conditioning - Thickened solids holding tank - Burn zone - Scrubber - Stack emissions - Any regulatory/permit requirements that identify specific locations/activities that need to be managed
	Dewatering <ul style="list-style-type: none"> - Location of facility - “End product” meets specifications / percent solids
	Thickening <ul style="list-style-type: none"> - Location of facility - “End product” meets specifications / percent solids
Solids Storage and Transportation	Solids storage <ul style="list-style-type: none"> - Site location - Distance to neighbors - Road access - Set back from surface water - Depth to groundwater - Any regulatory/ permit requirements that identify specific locations/activities that need to be managed
	Solids transportation <ul style="list-style-type: none"> - Truck (e.g., maintenance, appearance) - Truck cover - Transportation route - Truck cleaning facilities - Any regulatory/permit requirements that identify specific locations/activities that need to be managed

Biosolids Value Chain	Examples of Critical Control Points
<p>Biosolids End Use or Disposal</p>	<p>Land application</p> <ul style="list-style-type: none"> - Application site location - Location of off loading from trucks - Interim storage/staging area - Perimeter of biosolids application site-setback distances from surface water/neighbors/wells - Depth to groundwater - Agronomic rate - Truck cleaning on site - Any regulatory/permit requirements that identify specific locations/activities that need to be managed
	<p>Class A/EQ product sale and distribution</p> <ul style="list-style-type: none"> - Product and packaging specifications - Product application rates - Product transportation - Any regulatory/permit requirements that identify specific locations/activities that need to be managed
	<p>Landfill</p> <ul style="list-style-type: none"> - Landfill - Any regulatory/permit requirements that identify specific locations/activities that need to be managed
	<p>Surface disposal</p> <ul style="list-style-type: none"> - Site location - Perimeter of application site – setback from surface water/neighbors/wells - Depth to groundwater - Truck cleaning site - Access road - Any regulatory/permit requirements that identify specific locations/activities that need to be managed