Chapter 2

Land Application of Biosolids

What Is Land Application?

Land application is the application of biosolids to land to either condition the soil or to fertilize crops or other vegetation grown in the soil. Nearly half of the biosolids production in the United States is currently being used beneficially to improve soils. This guidance document categorizes the types of land that benefit from the application of biosolids (see Figure 2-1) as follows:

- agricultural land, forests, and reclamation sites—collectively called ***nonpublic contact sites*** (areas not frequently visited by the public); and
- public parks, plant nurseries, roadsides, golf courses, lawns, and home gardens—collectively called ***public contact sites*** (areas where people are likely to come into contact with biosolids applied to land). The Part 503 rule, however, does not regard lawns and home gardens as public contact sites, and fewer types of biosolids may be land applied to these sites (i.e., CPLR biosolids are not permitted on lawns and home gardens given the considerable difficulty of tracking cumulative levels of metals in biosolids applied to such sites).

Biosolids can be either applied to land in ***bulk*** or sold or given away in ***bags or other containers*** for land application (see Figure 2-2). The term ***biosolids in bulk*** refers to biosolids that are marketed or given to manufacturers of products that contain biosolids. The term ***biosolids in bags*** generally refers to biosolids in amounts that are bagged and generally marketed for use on smaller units of land such as lawns and home gardens.

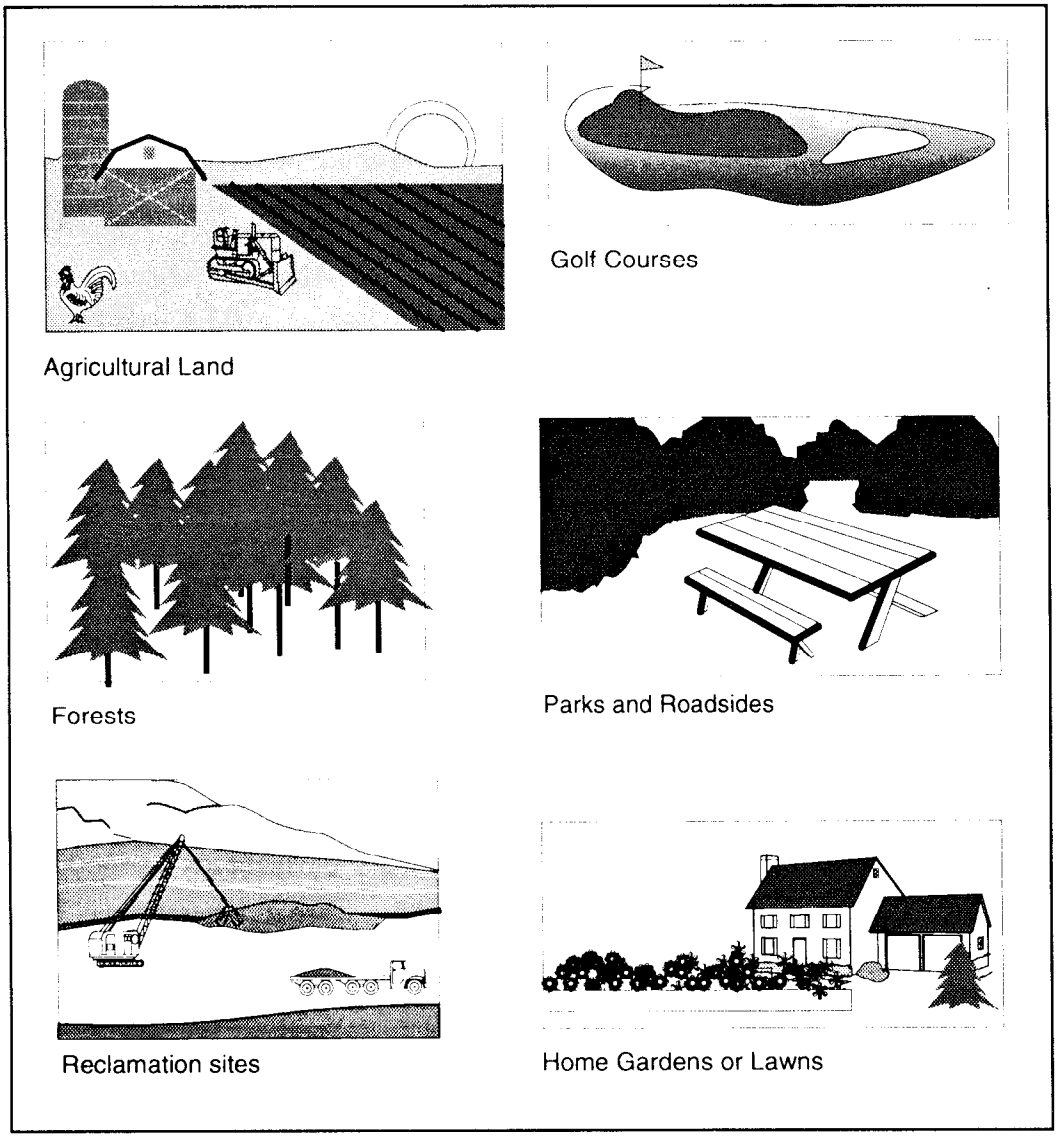


Figure 2-1. Biosolids can be beneficially land applied on agricultural land, forest land, reclamation sites, golf courses, public parks, roadsides, plant nurseries, and lawns and home gardens.

The term ***other containers*** is defined in the Part 503 rule as open or closed receptacles (e.g., buckets, boxes, or cartons) or vehicles with a load capacity of one metric ton or less. (Most pickup trucks as well as trailers pulled by an automobile would meet the regulatory definition of other containers.)

Biosolids are generally land applied using one of several techniques. The biosolids may be sprayed or spread on the soil surface and left on the surface (e.g., on pastures, range and forest land, or lawn). They also may be tilled (incorporated) into the soil after being surface applied or injected

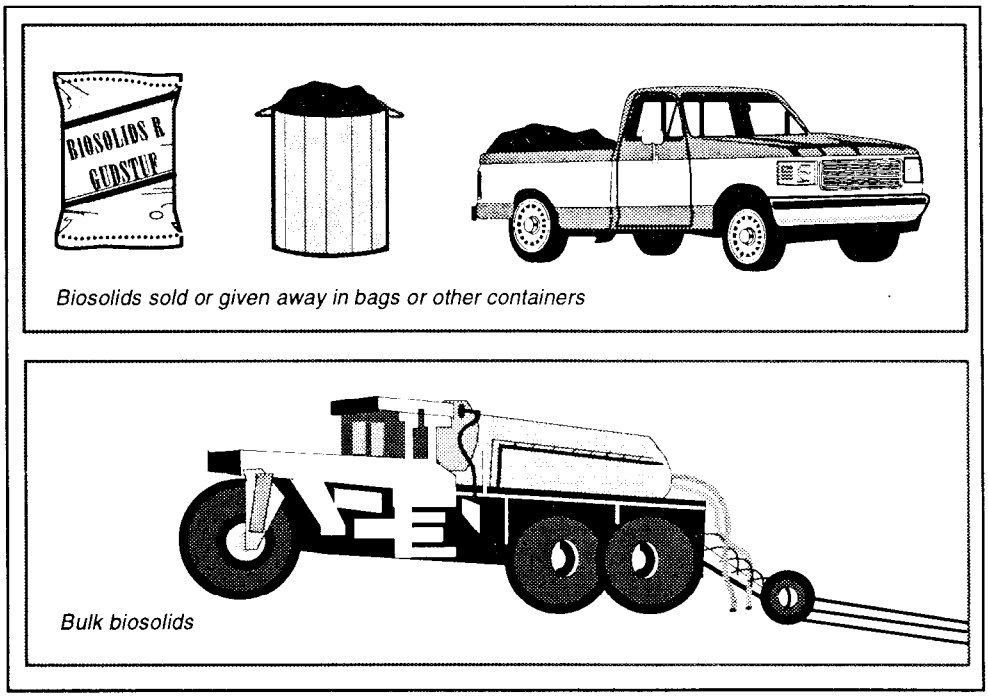


Figure 2-2. For application to the land, biosolids can be sold or given away in bags, in other containers, or they can be land applied in bulk form.

directly below the surface for producing row crops or other vegetation and for establishing lawns.

Biosolids in a liquid state can be applied using tractors, tank wagons, irrigation systems, or special application vehicles. Dewatered biosolids are typically applied to land using equipment similar to that used for applying limestone, animal manures, or commercial fertilizers. Both liquid and dewatered biosolids are applied to land with or without subsequent incorporation into the soil.

Because biosolids are typically treated before being land applied, their use poses a low degree of risk. This chapter discusses approaches for meeting the requirements of the Part 503 rule for the land application of biosolids.

The practice of growing crops or grazing animals on a biosolids surface disposal site, another form of beneficial use, is discussed in Chapter 3. This guidance document refers to this practice as ***dedicated beneficial use***. A permitting authority can allow crops to be grown on a surface disposal site and marketed or grazed if the owner/operator of the site shows that site-specific management practices are being used that will ensure protection of public health and the environment from any reasonably anticipated adverse effects of certain pollutants that can be present in biosolids.

Spreading finished biosolids product on Walt Disney World tree farm in Orlando, Florida.

To Whom the Land Application Requirements Apply

Different provisions of the Part 503 rule apply to the ***preparer*** and the ***applier*** of biosolids. The ***preparer*** of biosolids is defined as a person who either ***generates*** biosolids during the treatment of domestic sewage in a treatment works or who ***derives*** a material from biosolids (i.e., changes the quality of the biosolids prepared by a generator). Examples of materials derived from biosolids include biosolids treated by composting, pelletizing, or drying (to kill pathogens and reduce attractiveness to vectors), and mixtures of biosolids with other materials (e.g., biosolids blended with soil or fertilizer, which will usually lower pollutant concentrations). The ***applier*** is defined as the person who applies the biosolids to land. The responsibilities of preparers and appliers of biosolids under the Part 503 rule are summarized in Figure 2-8.

Landowners and leaseholders also have certain responsibilities. These are discussed at the end of this chapter.

Land Application Requirements

Biosolids applied to the land must meet risk-based pollutant limits specified in Part 503. Operational standards to control disease-causing organisms called pathogens and to reduce the attraction of vectors (e.g., flies, mosquitoes, and other potential disease-carrying organisms) to the

biosolids must also be met. In addition, there are general requirements, management practices, and frequency of monitoring, recordkeeping, and reporting requirements that must be met. Each of these land application requirements is discussed below.

Pollutant Limits, Pathogen and Vector Attraction Reduction Requirements

All biosolids applied to the land must meet ***the ceiling concentrations for pollutants,*** listed in the first column of Table 2-1. The ceiling concentrations are the maximum concentration limits for 10 heavy metal

TABLE 2-1
Pollutant Limits

Pollutant	Ceiling Concentration Limits for All Biosolids Applied to Land (milligrams per kilogram)[a]	Pollutant Concentration Limits for EQ and PC Biosolids (milligrams per kilogram)[a]	Cumulative Pollutant Loading Rate Limits for CPLR Biosolids (kilograms per hectare)	Annual Pollutant Loading Rate Limits for APLR Biosolids (kilograms per hectare per 365-day period)
Arsenic	75	41	41	2.0
Cadmium	85	39	39	1.9
Chromium	3,000	1,200	3,000	150
Copper	4,300	1,500	1,500	75
Lead	840	300	300	15
Mercury	57	17	17	0.85
Molybdenum[b]	75	—	—	—
Nickel	420	420	420	21
Selenium	100	36	100	5.0
Zinc	7,500	2,800	2,800	140
Applies to:	All biosolids that are land applied	Bulk biosolids and bagged biosolids[c]	Bulk biosolids	Bagged biosolids[c]
From Part 503	Table 1, Section 503.13	Table 3, Section 503.13	Table 2, Section 503.13	Table 4, Section 503.13

[a] Dry-weight basis

[b] As a result of the February 25, 1994, Amendment to the rule, the limits for molybdenum were deleted from the Part 503 rule pending EPA reconsideration.

[c] Bagged biosolids are sold or given away in a bag or other container.

pollutants in biosolids; specifically, arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc. If a limit for any one of the pollutants is exceeded, the biosolids cannot be applied to the land until such time that the ceiling concentration limits are no longer exceeded. The ceiling concentrations for pollutants are included in Part 503 to prevent the land application of biosolids with the highest levels of pollutants and to encourage pretreatment efforts that will result in lower levels of pollutants.

2 Biosolids applied to the land must also meet either pollutant concentration limits, cumulative pollutant loading rate limits, or annual pollutant loading rate limits for these same heavy metals.

3 Either ***Class A or Class B pathogen requirements*** (summarized in Table 2-5) ***and site restrictions*** (Figure 2-4) must be met before the biosolids can be land applied; the two classes differ depending on the level of pathogen reduction that has been obtained.

4 Finally, 1 of 10 options specified in Part 503 and summarized in Table 2-6 to achieve ***vector attraction reduction*** must be met when biosolids are applied to the land.

Options for Meeting Land Application Requirements

This guidance document groups the Part 503 requirements into four options for meeting pollutant limits and pathogen and vector attraction reduction operational standards when biosolids are applied to the land. The options include:

- the Exceptional Quality (EQ) Option
- the Pollutant Concentration (PC) Option
- the Cumulative Pollutant Loading Rate (CPLR) Option
- the Annual Pollutant Loading Rate (APLR) Option

It is very important to realize that each option is equally protective of public health and the environment; that is, EQ, PC, CPLR, and APLR biosolids used in accordance with the Part 503 rule are equally safe. This safety is ensured by the combination of pollutant limits and management practices imposed by each option.

Whichever option is chosen, at a minimum, the ceiling concentrations for pollutants (listed in Table 2-1) and the frequency of monitoring, reporting, and recordkeeping requirements (see Tables 2-7 and 2-8) must be met. The four options are summarized in Table 2-2, illustrated in Figure 2-3, and discussed in detail below.

Depending on the land application option under consideration, site restrictions (Figure 2-4), general requirements (Figure 2-8), and management practices (Figure 2-9) also apply. These additional restrictions,

TABLE 2-2
Options for Meeting Pollutant Limits and Pathogen and Vector Attraction Reduction Requirements for Land Application

Option*	Pollutant Limits	Pathogen Requirements	Vector Attraction Reduction Requirements
"Exceptional Quality" (EQ) Biosolids	Bulk or bagged biosolids meet pollutant concentration limits in Table 2-1	Any 1 of the Class A requirements in Table 2-5	Any 1 of the requirements in options 1 through 8 in Table 2-6
"Pollutant Concentration" (PC) Biosolids	Bulk biosolids meet pollutant concentration limits in Table 2-1	Any 1 of the Class B requirements in Table 2-5 and Figure 2-4	Any 1 of the 10 requirements in Table 2-6
		Any 1 of the Class A requirements in Table 2-5	Requirements 9 or 10 in Table 2-6
"Cumulative Pollutant Loading Rate" (CPLR) Biosolids	Bulk biosolids applied subject to cumulative pollutant loading rate (CPLR) limits in Table 2-1	Any 1 of the Class A or Class B requirements in Table 2-5 and Figure 2-4	Any 1 of the 10 requirements in Table 2-6
"Annual Pollutant Loading Rate" (APLR) Biosolids	Bagged biosolids applied subject to annual pollutant loading rate (APLR) limits in Table 2-1	Any 1 of the Class A requirements in Table 2-5	Any 1 of the first 8 requirements in Table 2-6

* Each of these options also requires that the biosolids meet the ceiling concentrations for pollutants listed in Table 2-1, and that the frequency of monitoring requirements in Table 2-7 and recordkeeping and reporting requirements in Table 2-8 be met. In addition, the general requirements in Figure 2-8 and the management practices in Figure 2-9 have to be met when biosolids are land applied (except for EQ biosolids).

requirements, and practices are summarized in Tables 2-3 and 2-4 and discussed in greater detail at the end of this chapter.

Rather than presenting the four options in the order described in the Part 503 rule, this document presents them in order of increasing regulatory requirements. Table 2-3 graphically displays the level of required regulatory control for each option. The types of land onto which these different biosolids may be applied are listed in Table 2-4.

Option 1: Exceptional Quality (EQ) Biosolids

For biosolids to qualify under the EQ option, the following requirements must be met:

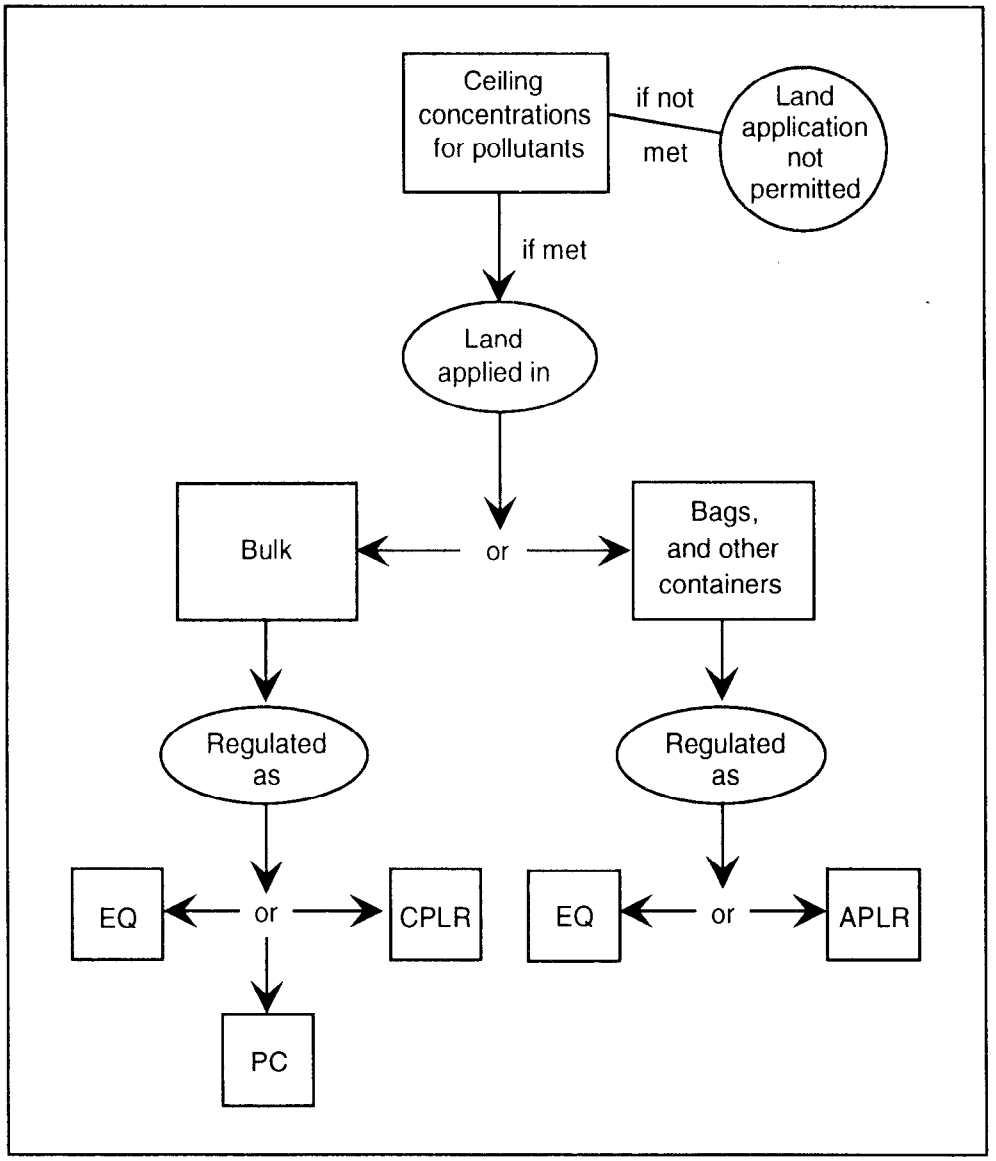
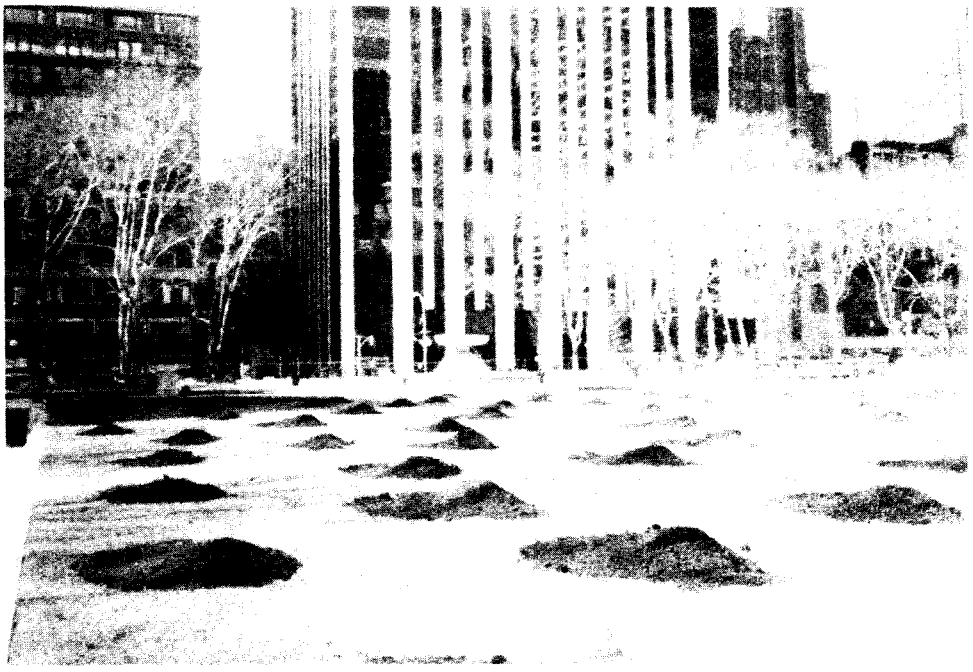


Figure 2-3. Options for meeting certain Part 503 land application requirements

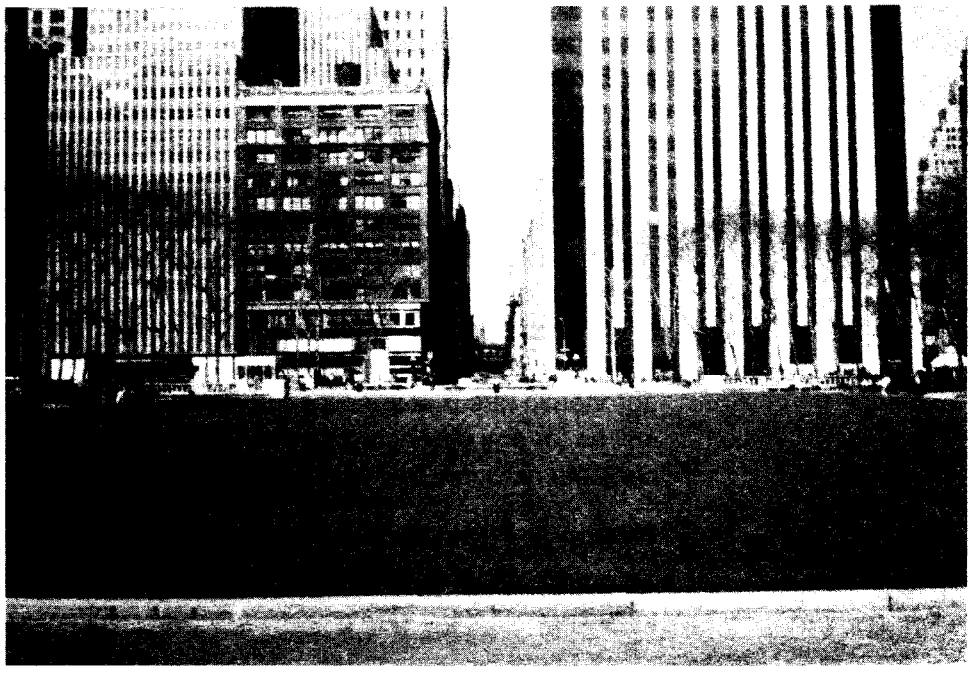
The ceiling concentrations for pollutants in Table 2-1 may not be exceeded.

- The pollutant concentration limits in Table 2-1 may not be exceeded.
- One of the Class A pathogen requirements in Table 2-5 must be met.
- One of the first eight vector attraction reduction options in Table 2-6 must be achieved.

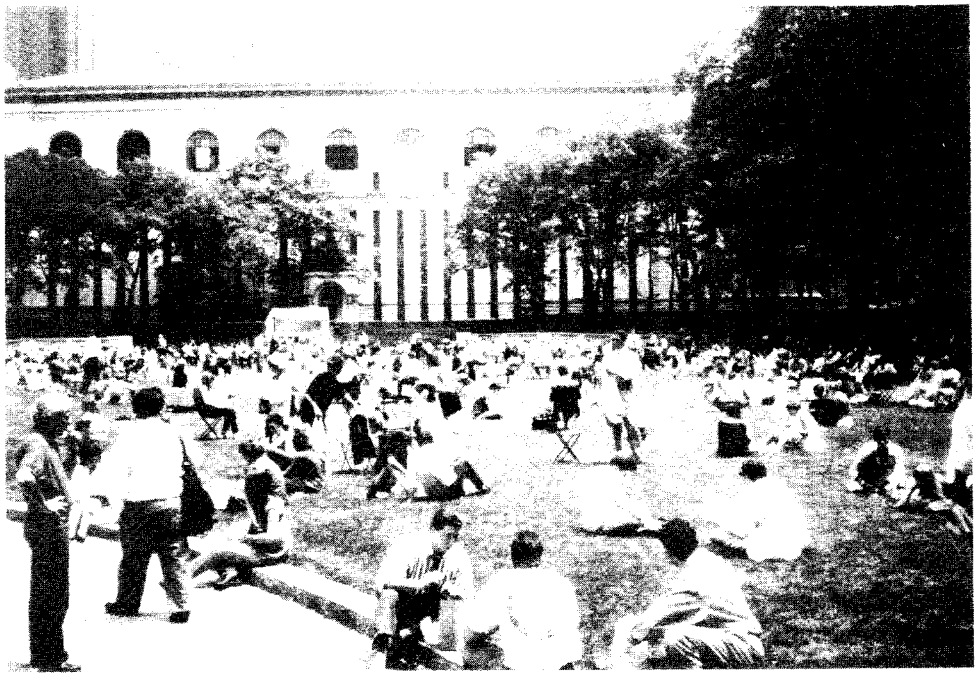
Methods that typically achieve the pathogen and vector attraction reduction requirements and allow biosolids to meet EQ requirements include alkaline stabilization, composting, and heat drying. The Part 503 frequency of



Use of biosolids on parkland in Manhattan, New York. *Biosolids compost is piled on barren site to be spread for soil conditioning.*



Use of biosolids on parkland in Manhattan, New York (continued). *One month after spreading of biosolids, the turf is vigorously established.*



Use of biosolids on parkland in Manhattan, New York (continued). *Different view showing public enjoying the park.*

monitoring, recordkeeping, and reporting requirements (see Tables 2-7 and 2-8) also must be met for EQ biosolids.

Once biosolids meet EQ requirements, they are not subject to the land application general requirements and management practices in Part 503, with one possible exception—if the Regional Administrator or the State Director determines, on a case-by-case basis, that such requirements are necessary to protect public health and the environment (this exception applies only to bulk biosolids). Once biosolids have been established as meeting EQ requirements, whether in bulk form or in bags or other containers, they can generally be applied as freely as any other fertilizer or soil amendment to any type of land. While not required by the Part 503 rule, EQ biosolids should be applied at a rate that does not exceed the agronomic rate that supplies the nitrogen needs of the plants being grown, just as for any other commercial fertilizer or soil amending material that contains nitrogen.

Option 2: Pollutant Concentration (PC) Biosolids

To qualify under the PC option, biosolids must meet several requirements, including:

- The ceiling concentration for pollutants in Table 2-1 may not be exceeded.

TABLE 2-3
Summary of Regulatory Requirements for Different Types of Biosolids

Type of Biosolids and Class of Pathogens	Meet Ceiling Concentration for Pollutants	Meet Pollutant Concentration Limits	Site Restrictions	General Requirements and Management Practices	Track Added Pollutants
EQ Bag or Bulk Class A	Yes	Yes	No		
PC Bulk Only Class A[a]	Yes	Yes	No	Yes	No
PC Bulk Only Class B	Yes	Yes	Yes		No
CPLR Bulk Only Class A	Yes	No	No	Yes	
CPLR Bulk Only Class B	Yes	No	Yes		
APLR Bag Only Class A	Yes	No	No	Yes[b]	Yes[c]

[a] Biosolids meeting Class A pathogen reduction requirements but following options 9 or 10 vector attraction reduction requirements are also considered PC biosolids.

[b] The only general and management practice requirement that must be met is a labeling requirement.

[c] The amount of biosolids that can be applied to a site during the year must be consistent with the annual whole sludge application rate (AWSAR) for the biosolids that does not cause any of the ALPRs to be exceeded.

Note: See Chapter Two text for explanation of biosolids types.

The pollutant concentration limits in Table 2-1 may not be exceeded (same requirement as for EQ biosolids, discussed above).

One of three Class B pathogen requirements must be met (see Table 2-5), as well as Class B site restrictions (see Figures 2-4 and 2-5).

One of 10 vector attraction reduction options must be achieved (see Table 2-6).

Frequency of monitoring (see Table 2-7), as well as recordkeeping and reporting requirements (see Table 2-8) must be met.

TABLE 2-4
Types of Land onto Which Different Types of Biosolids May Be Applied

Biosolids Option	Pathogen Class	VAR[a] Options	Type of Land	Other Restrictions
EQ	A	1-8	All[b]	None
PC	A	9 or 10	All except lawn and home gardens[c]	Management practices
	B	1-10	All except lawn and home gardens[c]	Management practices and site restrictions
CPLR	A	1-10	All except lawn and home garden[d]	Management practices
	B	1-10	All except lawn and home garden[c,d]	Management practices and site restrictions
APLR	A	1-8	All, but most likely lawns and home gardens	Labeling management practice

[a] VAR means vector attraction reduction.

[b] Agricultural land, forest, reclamation sites, and lawns and home gardens.

[c] It is not possible to impose site restrictions on lawns and home gardens.

[d] It is not possible to track cumulative additions of pollutants on lawns and home gardens.

Applicable site restrictions, general requirements, and management practices must be met (summarized in Tables 2-3 and 2-4 and listed in Figures 2-4, 2-8, and 2-9).

Class A biosolids meeting vector attraction reduction requirements 9 and 10 in Table 2-6 are another type of biosolids material that would fit in the PC category.

Thus, PC biosolids must meet more requirements than EQ biosolids, but are subject to fewer requirements than CPLR biosolids. Currently, the majority of biosolids in the United States could be characterized as PC biosolids, as defined in this guidance document.

Option 3: Cumulative Pollutant Loading Rate (CPLR) Biosolids

The third option for meeting land application requirements allows bulk biosolids that do not meet the pollutant concentration limits in Table 2-1 to

TABLE 2-5
Summary of Class A and Class B Pathogen Reduction Requirements

CLASS A

In addition to meeting the requirements in one of the six alternatives listed below, fecal coliform or *Salmonella* sp. bacteria levels must meet specific density requirements at the time of biosolids use or disposal or when prepared for sale or give-away (see Chapter Five of this guidance)

Alternative 1: Thermally Treated Biosolids

Use one of four time-temperature regimens

Alternative 2: Biosolids Treated in a High pH-High Temperature Process

Specifies pH, temperature, and air-drying requirements

Alternative 3: For Biosolids Treated in Other Processes

Demonstrate that the process can reduce enteric viruses and viable helminth ova. Maintain operating conditions used in the demonstration

Alternative 4: Biosolids Treated in Unknown Processes

Demonstration of the process is unnecessary. Instead, test for pathogens—*Salmonella* sp. or fecal coliform bacteria, enteric viruses, and viable helminth ova—at the time the biosolids are used or disposed of or are prepared for sale or give-away

Alternative 5: Use of PFRP

Biosolids are treated in one of the Processes to Further Reduce Pathogens (PFRP) (see Table 5-4)

Alternative 6: Use of a Process Equivalent to PFRP

Biosolids are treated in a process equivalent to one of the PFRPs, as determined by the permitting authority

CLASS B

The requirements in one of the three alternatives below must be met

Alternative 1: Monitoring of Indicator Organisms

Test for fecal coliform density as an indicator for all pathogens at the time of biosolids use or disposal

Alternative 2: Use of PSRP

Biosolids are treated in one of the Processes to Significantly Reduce Pathogens (PSRP) (see Table 5-7)

Alternative 3: Use of Processes Equivalent to PSRP

Biosolids are treated in a process equivalent to one of the PSRPs, as determined by the permitting authority

Note: Details of each alternative for meeting the requirements for Class A and Class B designations are provided in Chapter Five.

TABLE 2-6
Summary of Vector Attraction Reduction Options

Requirements in one of the following options must be met:

Option 1:	Reduce the mass of volatile solids by a minimum of 38 percent
Option 2:	Demonstrate vector attraction reduction with additional anaerobic digestion in a bench-scale unit
Option 3:	Demonstrate vector attraction reduction with additional aerobic digestion in a bench-scale unit
Option 4:	Meet a specific oxygen uptake rate for aerobically treated biosolids
Option 5:	Use aerobic processes at greater than 40°C (average temperatures 45°C) for 14 days or longer (e.g., during biosolids composting)
Option 6:	Add alkaline materials to raise the pH under specified conditions
Option 7:	Reduce moisture content of biosolids that do not contain unstabilized solids from other than primary treatment to at least 75 percent solids
Option 8:	Reduce moisture content of biosolids with unstabilized solids to at least 90 percent
Option 9:	Inject biosolids beneath the soil surface within a specified time, depending on the level of pathogen treatment
Option 10:	Incorporate biosolids applied to or placed on the land surface within specified time periods after application to or placement on the land surface.

Note: Details of each vector attraction reduction option are provided in Chapter Five.

FIGURE 2-4
Restrictions for the Harvesting of Crops and Turf, Grazing of Animals, and Public Access on Sites Where Class B Biosolids Are Applied

Restrictions for the harvesting of crops* and turf:

1. Food crops, feed crops, and fiber crops, whose edible parts do not touch the surface of the soil, shall not be harvested until *30 days* after biosolids application.
2. Food crops with harvested parts that touch the biosolids/soil mixture and are totally above ground shall not be harvested until *14 months* after application of biosolids.
3. Food crops with harvested parts below the land surface where biosolids remain on the land surface for 4 months or longer prior to incorporation into the soil shall not be harvested until *20 months* after biosolids application.
4. Food crops with harvested parts below the land surface where biosolids remain on the land surface for less than 4 months prior to incorporation shall not be harvested until *38 months* after biosolids application.
5. Turf grown on land where biosolids are applied shall not be harvested until *1 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.

Restriction for the grazing of animals:

1. Animals shall not be grazed on land until *30 days* after application of biosolids to the land.

Restrictions for public contact:

1. Access to land with a high potential for public exposure, such as a park or ballfield, is restricted for *1 year* after biosolids application. Examples of restricted access include posting with no trespassing signs, and fencing.
2. Access to land with a low potential for public exposure (e.g., private farmland) is restricted for *30 days* after biosolids application. An example of restricted access is remoteness.

* Examples of crops impacted by Class B pathogen requirements are listed in Figure 2-5.

be land applied as safely as EQ and PC biosolids. To qualify as CPLR biosolids, the following requirements must be met:

The ceiling concentrations for pollutants in Table 2-1 may not be exceeded.

Cumulative Pollutant Loading Rates (CPLRs) listed in Table 2-1 may be not be exceeded.

FIGURE 2-5
Examples of Crops Impacted by Site Restrictions for Class B Biosolids

Harvested Parts That:		
Usually Do Not Touch the Soil/Biosolids Mixture	**Usually Touch the Soil/Biosolids Mixture**	**Are Below the Soil/Biosolids Mixture**
Peaches	Melons	Potatoes
Apples	Strawberries	Yams
Oranges	Eggplant	Sweet Potatoes
Grapefruit	Squash	Rutabaga
Corn	Tomatoes	Peanuts
Wheat	Cucumbers	Onions
Oats	Celery	Leeks
Barley	Cabbage	Radishes
Cotton	Lettuce	Turnips
Soybeans		Beets

Either the Class A or Class B pathogen requirements in Table 2-5 must be met.

One of the 10 vector attraction reduction options in Table 2-6 must be met.

Frequency of monitoring (see Table 2-7), as well as recordkeeping and reporting requirements (see Table 2-8) must be met.

Applicable site restrictions, general requirements, and management practices must be met (summarized in Tables 2-3 and 2-4 and listed in Figures 2-4, 2-8, and 2-9).

The CPLR is the maximum amount of regulated pollutants in biosolids that can be applied to a site considering all biosolids applications made after July 20, 1993. When the CPLR for any one of the 10 heavy metals listed in Table 2-1 is reached at a site, no additional bulk biosolids, subject to the CPLR limits, may be applied to the site.

Option 4: Annual Pollutant Loading Rate (APLR) Biosolids

The fourth option only applies to biosolids that are sold or given away in a bag or other container for application to land. Under this option, the following requirements must be met:

The ceiling concentrations for pollutants in Table 2-1 may not be exceeded.

The Annual Pollutant Loading Rates (APLRs) listed in Table 2-1 may not be exceeded.

The Class A pathogen requirements in Table 2-5 must be met.

One of the first eight vector attraction reduction options in Table 2-6 must be met.

The frequency of monitoring as well as recordkeeping and reporting requirements in Tables 2-7 and 2-8 must be met.

Applicable site restrictions, general requirements, and management practices must be met (summarized in Tables 2-3 and 2-4 and listed in Figures 2-4, 2-8, and 2-9).

An APLR is the maximum amount of regulated pollutants in biosolids that can be applied to a site in any 1 year. APLRs rather than CPLRs are used for biosolids sold or given away in a bag or other container because tracking the amount of pollutants applied in biosolids is not feasible in this situation.

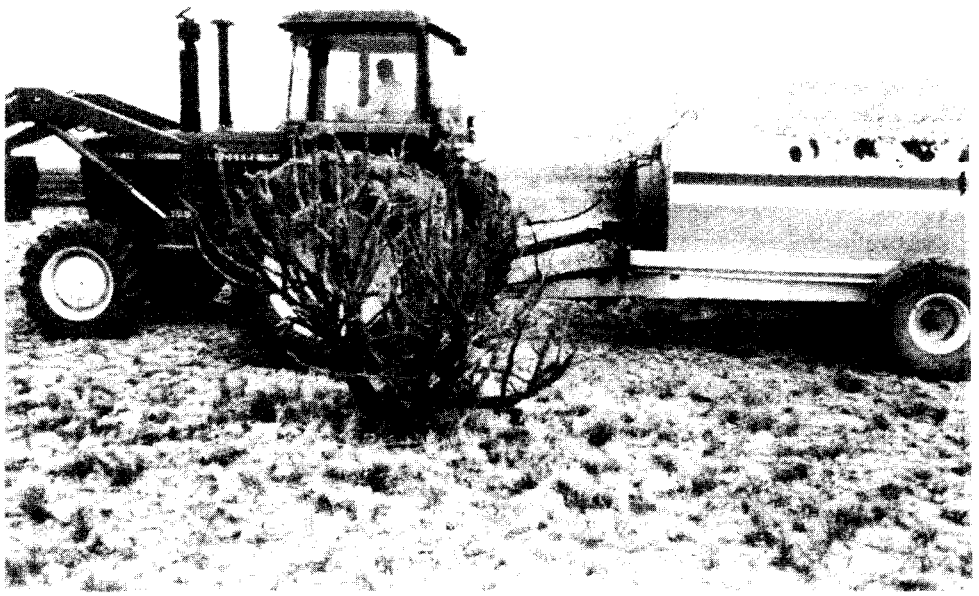
A labeling requirement for bagged or containerized APLR biosolids is discussed in Figure 2-9. To meet the labeling requirement, the preparer of biosolids must calculate the amount of biosolids that can be applied to a site during the year so that none of the APLRs are exceeded. This amount of biosolids is referred to as the annual whole sludge application rate (AWSAR). The AWSAR can be determined once the pollutant concentrations in the biosolids are known. The procedure for determining the AWSAR is explained in Figure 2-6. The AWSAR must be calculated for each of the 10 metals listed in Table 2-1, and the lowest AWSAR for the 10 metals is the allowable AWSAR for the biosolids. The AWSAR on the required label or information sheet has to be equal to or less than the AWSAR calculated using the procedure in Figure 2-6.

While not required by the Part 503 rule, it would also be good practice to provide information about the nitrogen content of the biosolids as well as the AWSAR on the label or information sheet that accompanies the biosolids. Figure 2-7 shows calculations that can be useful for determining how much nitrogen is being applied to land relative to the AWSAR and the nitrogen requirements of the plants being grown.

General Requirements and Management Practices

The Part 503 general requirements and management practices must be met for all but EQ biosolids. The specific general requirements and kinds of management practices that apply to each type of biosolids are given in Figures 2-8 and 2-9, respectively. Several of the management practices are singled out for a bit more discussion below.

Grain growing in sandy soil without (left) and with (right) anaerobically digested biosolids in Yuma, Arizona.



Biosolids are applied on a semi-arid rangeland demonstration study site in Rio Puerco, New Mexico.

FIGURE 2-6
Procedure To Determine the Annual Whole Sludge (Biosolids) Application Rate for Biosolids Sold or Given Away in a Bag or Other Container

1. Analyze a sample of the biosolids to determine the concentration of each of the 10 regulated metals in the biosolids.
2. Using the pollutant concentrations from Step 1 and the APLRs from Table 2-1, calculate an AWSAR for each pollutant using equation (1) below:

$$AWSAR = \frac{APLR}{C \cdot 0.001}$$ where:

$AWSAR$ = Annual whole sludge (biosolids) application rate (dry metric tons of biosolids/hectare/year)

$APLR$ = Annual pollutant loading rate (in Table 2-1) (kg of pollutant/ha/yr)

C = Pollutant concentration (mg of pollutant/kg of biosolids, dry weight)

0.001 = A conversion factor

3. The AWSAR for the biosolids is the lowest AWSAR calculated for each pollutant in Step 2.

Example:

1. Biosolids to be applied to land are analyzed for each of the 10 metals regulated in Part 503. Analysis of the biosolids indicates the pollutant concentration in the second column of the table below.
2. Using these test results and the APLR for each pollutant from Table 2-1, the AWSAR for all the pollutants are calculated as shown in the fourth column of the table below.
3. The AWSAR for the biosolids is the *lowest* AWSAR calculated for all 10 metals. In our example, the lowest AWSAR is for copper at 20 metric tons of biosolids/hectare/year. Therefore, the controlling AWSAR to be used for the biosolids is 20 metric tons per hectare/year. The 20 metric tons of biosolids/hectare is the same as 410 pounds of biosolids/1,000 square feet (20 metric tons × 2,205 lb per metric ton/107,600 square feet per hectare). The AWSAR on the label or information sheet would have to be equal to or less than 410 pounds per 1,000 square feet.

Metal	Biosolids Concentrations (milligrams/kilogram)	APLR* (kilograms/ hectare/year)	AWSAR = $\frac{\text{APLR}}{\text{Conc. in Biosolids (0.001)}}$ = metric tons/hectare
Arsenic	10	2.0	2 / (10 x 0.001) = 200
Cadmium	10	1.9	1.9 / (10 x 0.001) = 190
Chromium	1,000	150	150 / (1,000 x 0.001) = 150
Copper	3,750	75	75 / (3,750 x 0.001) = 20
Lead	150	15	15 / (150 x 0.001) = 100
Mercury	2	0.85	0.85 / (2 x 0.001) = 425
Nickel	100	21	21 / (100 x 0.001) = 210
Selenium	15	5.0	5 / (15 x 0.001) = 333
Zinc	2,000	140	140 / (2,000 x 0.001) = 70

* Annual Pollutant Loading Rate from Table 2-1 of this guide and Table 4 of the Part 503 rule.

FIGURE 2-7
Procedure for the Applier To Determine the Amount of Nitrogen Provided by the AWSAR Relative to the Agronomic Rate

In Figure 2-6, the AWSAR for the biosolids in the example calculation was determined to be 410 pounds of biosolids per 1,000 square feet of land. If biosolids were to be placed on a lawn that has a nitrogen requirement of about 200 pounds* of available nitrogen per acre per year, the following steps would determine the amount of nitrogen provided by the AWSAR relative to the agronomic rate if the AWSAR was used:

1. The nitrogen content of the biosolids indicated on the label is 1 percent total nitrogen and 0.4 percent available nitrogen the first year.
2. The AWSAR is 410 pounds of biosolids per 1,000 square feet, which is 17,860 pounds of biosolids per acre:

$$\frac{410 \text{ lb}}{1{,}000 \text{ sq ft}} \times \frac{43{,}560 \text{ sq ft}}{\text{acre}} \times 0.001 = \frac{17{,}860 \text{ lb}}{\text{acre}}$$

3. The available nitrogen from the biosolids is 71 pounds per acre:

$$\frac{17{,}860 \text{ lb biosolids}}{\text{acre}} \times .004 = \frac{71 \text{ lb}}{\text{acre}}$$

4. Since the biosolids application will only provide 71 pounds of the total 200 pounds of nitrogen required, in this case the AWSAR for the biosolids will not cause the agronomic rate for nitrogen to be exceeded and an additional 129 pounds per acre of nitrogen would be needed from some other source to supply the total nitrogen requirement of the lawn.

*Assumptions about crop nitrogen requirement, biosolids nitrogen content, and percent of that nitrogen that is available are for illustrative purposes only.

TABLE 2-7
Frequency of Monitoring for Pollutants, Pathogen Densities, and Vector Attraction Reduction

Amounts of Biosolids* (metric tons per 365-day period)	Amount of Biosolids (English tons)		Frequency
	Avg. per day	per 365 days	
Greater than zero but less than 290	>0 to <0.85	>0 to <320	Once per year
Equal to or greater than 290 but less than 1,500	0.85 to <4.5	320 to <1,650	Once per quarter (4 times per year)
Equal to or greater than 1,500 but less than 15,000	4.5 to <45	1,650 to <16,500	Once per 60 days (6 times per year)
Equal to or greater than 15,000	≥45	≥16,500	Once per month (12 times per year)

* Either the amount of bulk biosolids applied to the land or the amount of biosolids received by a person who prepares biosolids for sale or give-away in a bag or other container for application to the land (dry-weight basis).

FIGURE 2-8
Part 503 Land Application General Requirements

For EQ Biosolids

None (unless set by EPA or State permitting authority on a case-by-case basis for bulk biosolids to protect public health and the environment).

For PC and CPLR Biosolids

The ***preparer**** must notify and provide information necessary to comply with the Part 503 land application requirements to the person who applies bulk biosolids to the land.

The ***preparer*** who provides biosolids to another person who further prepares the biosolids for application to the land must provide this person with notification and information necessary to comply with the Part 503 land application requirements.

The ***preparer*** must provide written notification of the total nitrogen concentration (as N on a dry-weight basis) in bulk biosolids to the applier of the biosolids to agricultural land, forests, public contact sites, or reclamation sites.

The ***applier*** of biosolids must obtain information necessary to comply with the Part 503 land application requirements, apply biosolids to the land in accordance with the Part 503 land application requirements, and provide notice and necessary information to the owner or leaseholder of the land on which biosolids are applied.

Out of State Use

The ***preparer*** must provide written notification (prior to the initial application of the bulk biosolids by the applier) to the permitting authority in the State where biosolids are proposed to be land applied when bulk biosolids are generated in one State and transferred to another State for application to the land. The notification must include:

- the location (either street address or latitude and longitude) of each land application site;
- the approximate time period the bulk biosolids will be applied to the site;
- the name, address, telephone number, and National Pollutant Discharge Elimination System (NPDES) permit number for both the preparer and the applier of the bulk biosolids; and
- additional information or permits in both States, if required by the permitting authority.

Additional Requirements for CPLR Biosolids

The ***applier*** must notify the permitting authority in the State where bulk biosolids are to be applied prior to the initial application of the biosolids. This is a one-time notice requirement for each land application site each time there is a new applier. The notice must include:

- the location (either street address or latitude and longitude) of the land application site; and
- the name, address, telephone number, and NPDES permit number (if appropriate) of the person who will apply the bulk biosolids.

The ***applier*** must obtain records (if available) from the previous applier, landowner, or permitting authority that indicate the amount of each CPLR pollutant in biosolids that have been applied to the site since July 20, 1993. In addition:

- when these records are available, the ***applier*** must use this information to determine the additional amount of each pollutant that can be applied to the site in accordance with the CPLRs in Table 2-1;
- the ***applier*** must keep the previous records and also record the additional **amount of each pollutant he or she is applying to the site**; and
- when records of past known CPLR applications since July 20, 1993, are not available, biosolids meeting CPLRs cannot be applied to that site. However, EQ or PC biosolids could be applied.

If biosolids meeting CPLRs have not been applied to the site in excess of the limit since July 20, 1993, the CPLR limit for each pollutant in Table 2-1 will determine the maximum amount of each pollutant that can be applied in biosolids if:

- all applicable management practices are followed; and
- the applier keeps a record of the amount of each pollutant in biosolids applied to any given site.

The ***applier*** must not apply additional biosolids under the cumulative pollutant loading concept to a site where any of the CPLRs have been reached.

* The preparer is either the person who generates the biosolids or the person who derives a material from biosolids.

FIGURE 2-9
Part 503 Land Application Management Practice Requirements

For EQ Biosolids

None (unless established by EPA or the State permitting authority on a case-by-case basis for bulk biosolids to protect public health and the environment).

For PC and CPLR Biosolids

These types of biosolids cannot be applied to flooded, frozen, or snow-covered agricultural land, forests, public contact sites, or reclamation sites in such a way that the biosolids enter a wetland or other waters of the United States (as defined in 40 CFR Part 122.2, which generally includes tidal waters, interstate and intrastate waters, tributaries, the territorial sea, and wetlands adjacent to these waters), except as provided in a permit issued pursuant to Section 402 (NPDES permit) or Section 404 (Dredge and Fill Permit) of the Clean Water Act, as amended.

These types of biosolids cannot be applied to agricultural land, forests, or reclamation sites that are 10 meters or less from U.S. waters, unless otherwise specified by the permitting authority.

If applied to agricultural lands, forests, or public contact sites, these types of biosolids must be applied at a rate that is equal to or less than the agronomic rate for nitrogen for the crop to be grown. Biosolids applied to reclamation sites may exceed the agronomic rate for nitrogen as specified by the permitting authority.

These types of biosolids must not harm or contribute to the harm of a threatened or endangered species or result in the destruction or adverse modification of the species' critical habitat when applied to the land. Threatened or endangered species and their critical habitats are listed in Section 4 of the Endangered Species Act. Critical habitat is defined as any place where a threatened or endangered species lives and grows during any stage of its life cycle. Any direct or indirect action (or the result of any direct or indirect action) in a critical habitat that diminishes the likelihood of survival and recovery of a listed species is considered destruction or adverse modification of a critical habitat.

For APLR Biosolids

A label must be affixed to the bag or other container, or an information sheet must be provided to the person who receives APLR biosolids in other containers. At a minimum, the label or information sheet must contain the following information:

- the name and address of the person who prepared the biosolids for sale or giveaway in a bag or other container;
- a statement that prohibits application of the biosolids to the land except in accordance with the instructions on the label or information sheet;
- an AWSAR (see Figure 2-6) for the biosolids that do not cause the APLRs to be exceeded; and
- the nitrogen content.

There is no labeling requirement for EQ biosolids sold or given away in a bag or other container.

Endangered Species

The Part 503 rule prohibits the application of bulk biosolids to land if it is likely to adversely affect endangered or threatened species or their designated critical habitat. Any direct or indirect action that reduces the likelihood of survival and recovery of an endangered or threatened species is considered an "adverse effect." Critical habitat is any place where an endangered or threatened species lives and grows during its life cycle. The U.S. Department of Interior, Fish and Wildlife Service (FWS) publishes a list of endangered and threatened species at 50 CFR 17.11 and 17.12.

Practices that involve applying biosolids to lands (subjected to normal tillage, cropping, and grazing practices, or mining, forestry, and other activities that by their nature are associated with turning the soil and affecting vegetation) are not likely to result in any increase in negative impacts on endangered species and in fact may be beneficial given the nutritive and soil-building properties of biosolids. It is the responsibility of the land applier, however, to determine if the application of biosolids might cause an adverse effect on an endangered species or its critical habitat. Moreover, the Part 503 rule requires the land applier to certify (Figure 2-10) that the applicable management practices have been met, including the requirement concerning endangered species, and that records are kept indicating how the applicable management practices have been met.

One recommended step for making the threatened and endangered species determination is to contact the FWS Endangered Species Protection Program in Washington, DC (703-358-2171), or one of the FWS Field Offices, listed in Appendix C, for more information about the general area being considered for land application. State fish and game departments also can be contacted for specific state requirements.

Flooded, Frozen, or Snow-Covered Land

Application of biosolids to flooded, frozen, or snow-covered land is not prohibited by the Part 503 rule. Appliers must ensure, however, that biosolids applied to such land does not enter surface waters or wetlands unless specifically authorized by a permit issued under Sections 402 or 404 of the Clean Water Act (CWA). Some common runoff controls include slope restrictions, buffer zones/filter strips, tillage to create a roughened soil surface, crop residue or vegetation, berms, dikes, silt fences, diversions, siltation basins, and terraces.

Distance to U.S. Waters

Bulk biosolids may not be applied within 10 meters (33 feet) of any waters of the United States (e.g., intermittent following streams, creeks, rivers, wetlands, or lakes) unless otherwise specified by the permitting authority. Permitting authorities can allow exceptions to this requirement if the application of biosolids is expected to enhance the local environment. For

example, biosolids application may help revegetate a stream bank and otherwise minimize erosion. Approval of such biosolids application could be given via letters of authorization under Section 308 of the CWA, a settlement agreement, or a permit.

Agronomic Rate

The ***agronomic rate*** for biosolids application is a rate that is designed to provide the amount of nitrogen needed by a crop or vegetation to attain a desired yield while minimizing the amount of nitrogen that will pass below the root zone of the crop or vegetation to the ground water. Crop-available nitrogen in biosolids that is applied in excess of the agronomic rate could result in nitrate contamination of the ground water. The Part 503 rule requires that the rate of land application for bulk biosolids be equal to or less than the agronomic rate, except in the case of a reclamation site where a different rate of application is allowed by the permitting authority. Approval could be given via letters of authorization under Section 308 of the CWA, a settlement agreement, or a permit.

Although the preparer is required to supply the land applier with information on the nitrogen content of the biosolids, the land applier is responsible for determining that the biosolids are applied at a rate that does not exceed the agronomic rate for that site. Procedures for the design of the agronomic rate differ depending on such factors as the total and available nitrogen content of the biosolids, nitrogen losses, nitrogen from sources other than biosolids (including estimates or measurements of available nitrogen already present in the soil), and the requirements for the expected yield of crop or vegetation. Assistance in designing the agronomic rate should be obtained from a knowledgeable person, such as the local extension agent or the soil testing department at the Land Grant University in each state. (A sample calculation of the nitrogen supplied by biosolids based on the AWSAR is provided in Figure 2-7.)

Frequency of Monitoring Requirements

Pollutants, pathogen densities, and vector attraction reduction must be monitored when biosolids are applied to the land. This monitoring ensures that pollutant limits and pathogen and vector attraction reduction requirements are being met. Chapter Six describes the sampling and analytical procedures to be followed. The required frequency of monitoring is 1, 4, 6, or 12 times per year, depending on the number of metric tons (mt) (dry-weight basis) of biosolids used or disposed in that year. This frequency is presented in Table 2-7. Frequency of monitoring requirements must be met regardless of which option is chosen for meeting pollutant limits and pathogen and vector attraction reduction requirements, with the exception of Class B pathogen Alternative 2.

TABLE 2-8
Recordkeeping and Reporting Requirements

Type of Biosolids	Records That Must Be Kept	Person Responsible for Recordkeeping		Records That Must Be Reported[a]
		Preparer	Applier	
EQ Biosolids	Pollutant concentrations	✓		✓
	Pathogen reduction certification and description	✓		✓
	Vector attraction reduction certification and description	✓		✓
PC Biosolids	Pollutant concentrations	✓		✓
	Management practice certification and description		✓	
	Site restriction certification and description (where Class B pathogen requirements are met)		✓	
	Pathogen reduction certification and description	✓		✓
	Vector attraction reduction certification and description	✓	✓[b]	✓[c]
CPLR Biosolids	Pollutant concentrations	✓		✓
	Management practice certification and description		✓	
	Site restriction certification and description (if Class B pathogen requirements are met)		✓	
	Pathogen reduction certification and description	✓		✓
	Vector attraction reduction certification and description	✓	✓[b]	✓[c]
	Other information: — Certification and description of information gathered (information from the previous applier, landowner, or permitting authority regarding the existing cumulative pollutant load at the site from previous biosolids applications) — Site location — Number of hectares — Amount of biosolids applied — Cumulative amount of pollutant applied (including previous amounts) — Date of application		✓	✓[d]
APLR Biosolids	Pollutant concentrations	✓		✓
	Management practice certification and description	✓		✓
	Pathogen reduction certification and description	✓		✓
	Vector attraction reduction certification and description	✓		✓
	The AWSAR for the biosolids	✓		✓

[a] Reporting responsibilities are only for POTWs with a design flow rate equal to or greater than 1 mgd, POTWs that serve a population of 10,000 or greater, and Class I sludge management facilities.

[b] The preparer certifies and describes vector attraction reduction methods other than injection and incorporation of biosolids into the soil. The applier certifies and describes injection or incorporation of biosolids into the soil.

[c] Records that certify and describe injection or incorporation of biosolids into the soil do not have to be reported.

[d] Some of this information has to be reported only when 90 percent or more of any of the CPLRs is reached at a site.

Recordkeeping and Reporting Requirements

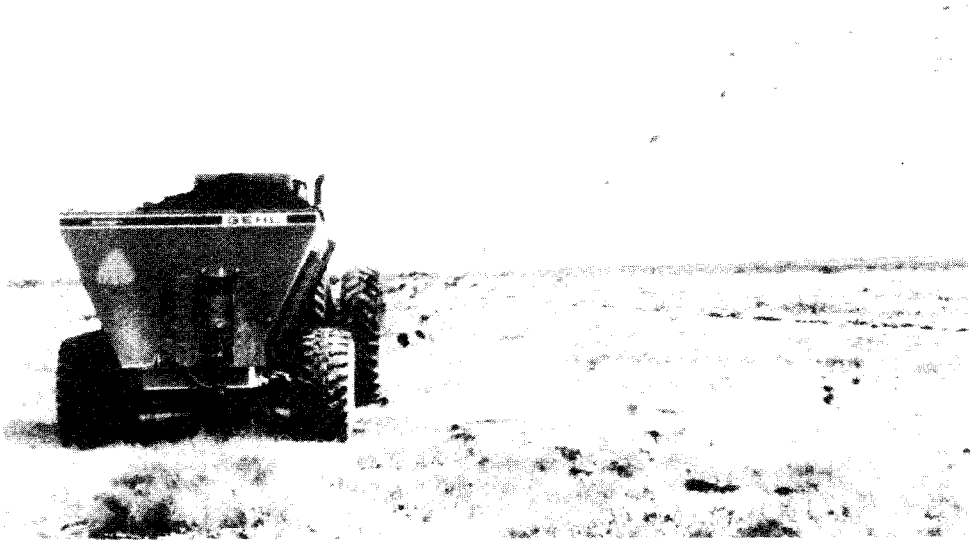
Part 503 requires that certain records be kept by the person who ***prepares*** biosolids for application to the land and the person who ***applies*** biosolids to the land. The recordkeeping and reporting requirements are summarized in Table 2-8. Some of the records that must be kept when biosolids are applied to the land include statements certifying whether certain land application requirements are met. The general certification statement that must be used is provided as Figure 2-10. This statement certifies that, among other things, the land applier and his or her employees are qualified to gather information and perform tasks as required by the Part 503 rule.

The certifier should periodically check the performance of his or her employees to verify that the Part 503 requirements are being met. Then, when a Federal or State inspector checks the employee's logs, office records, and performance in the field, the inspector should find that the required management practices are being followed and that any applicable pathogen and vector attraction reduction requirements, including associated crop harvesting, animal grazing, and site access restrictions, are being met. The inspector also should find that all other necessary records and requirements listed in Table 2-8 are in order. Even if the preparer/applier is not required to report this information, he or she must keep these records for 5 years, or indefinitely for cumulative amounts of pollutants added to any site by CPLR biosolids. These required records may be requested for review at any time by the permitting or enforcement authority.

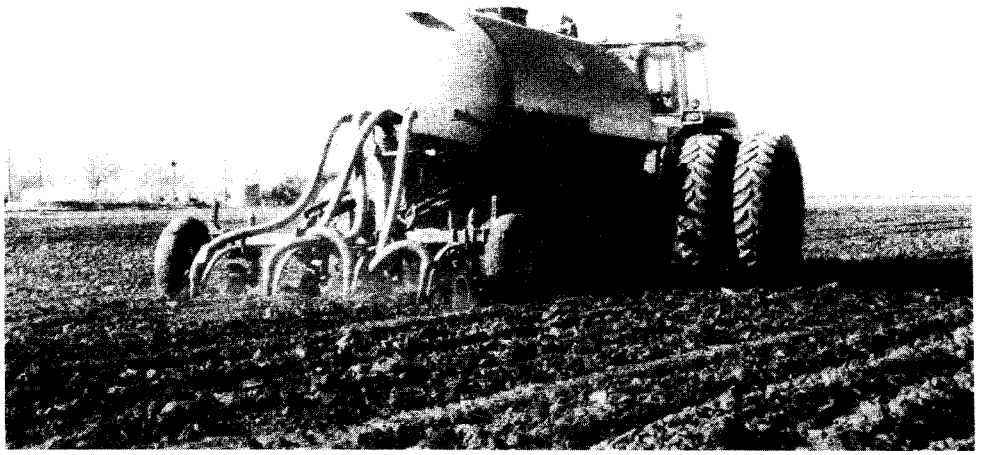
FIGURE 2-10
Certification Statement Required for Recordkeeping

"I certify under penalty of law, that the *[insert each of the following requirements that are met: Class A or Class B pathogen requirements, vector attraction reduction requirements, management practices, site restrictions, requirements to obtain information]* in *[insert the appropriate section number/s in Part 503 for each requirement met]* have/have not 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 requirements have been met. I am aware that there are significant penalties for false certification, including the possibility of fine and imprisonment."

Signature _____ Date _____



Top-flinging applicator spreads dewatered biosolids from a New York City wastewater treatment works onto a site in Texas.



Anaerobically digested biosolids from Los Angeles are injected into the soil in California.

Some facilities are not subject to any Part 503 reporting requirements. However, all Class I treatment works, treatment works serving a population of 10,000 or more, and treatment works with a 1 mgd or greater design flow (as described in the first chapter of this guidance) have reporting responsibilities. Each year, facilities with reporting requirements must submit some of the information contained in their records (according to Table 2-8). The information must be submitted every February 19th to the permitting authority (either EPA or a State with an EPA-approved biosolids management program).

Domestic Septage

Part 503 imposes separate requirements for domestic septage applied to agricultural land, forest, or a reclamation site (i.e., nonpublic-contact sites). The "simplified rule" for application of domestic septage to such sites is explained in ***Domestic Septage Regulatory Guidance: A Guide to the EPA 503 Rule.*** If domestic septage is applied to public contact sites or home lawns and gardens, the same requirements must be met as for bulk biosolids applied to the land (i.e., general requirements, pollutant limits, pathogen and vector attraction reduction requirements, management practices, frequency of monitoring requirements, and recordkeeping and reporting requirements).

Landowner and Leaseholder Responsibilities

If the landowner or leaseholder is also the land applier of the biosolids, that person must follow the applicable provisions of the Part 503 rule for land appliers as described in this chapter. If the land-applying operation is of sufficient size or concern to the permitting authority, the landowner or leaseholder applier might also be required to obtain a permit for the land application activities.

If the landowner or leaseholder is not the land applier (e.g., the applier is a contractor or biosolids generator/preparer), the landowner or leaseholder might wish to obtain certain information and maintain certain records even though not required by the Part 503 rule. For example, he or she might wish to keep records on information that Part 503 requires the land applier to give to the landowner or leaseholder for any site where cropping or grazing restrictions apply.

Additional information that the landowner or leaseholder should obtain from the biosolids preparer and/or land applier is the nutritive value (i.e., the amount of each available nutrient such as nitrogen, potassium, phosphorus, and lime being applied), so that he or she will not over-apply any supplemental fertilizers. Also, if biosolids are being applied to the land in accordance with the CPLR concept, it would be prudent for the landowner

or leaseholder to make sure that he or she is given and retains information on the cumulative totals of pollutants that have been added to each parcel of land so that more CPLR biosolids can be applied each year until the cumulative limits for CPLR biosolids have been reached.

The landowner or leaseholder might wish to obtain assurances via an agreement that any biosolids being land applied are of an appropriate quality and have been sufficiently prepared and that the application procedures used meet the requirements of the Part 503 rule. One possible agreement between the landowner or leaseholder and land applier might be:

> **Contractor agrees to indemnify, defend, and hold harmless [Landowner/Leaseholder] from and against any and all claims, suits, actions, demands, losses, costs, liabilities, and expenses (including remediation costs and reasonable attorney's fees) to the extent such losses result from: (1) Contractor's or Generator/Preparer's violation of applicable laws or regulations in effect at the time of biosolids application; or (2) the negligence or willful misconduct of Contractor in delivery and application of biosolids to the undersigned Landowner/ Leaseholders' property. In the event this indemnification is enforced against the Contractor for a violation of law by a Generator/Preparer, Landowner/Leaseholder agrees to assign and subrogate to Contractor its claim against Generator/ Preparer. This indemnification shall survive termination of this Agreement until the expiration of any applicable statutes of limitations. Landowner/Leaseholder shall promptly notify Contractor in the event of a third-party claim and Contractor shall have the right to provide and oversee the defense of such claim and enter into any settlement of such claim at its discretion (holding the Landowner/Leaseholder harmless). Landowner/Leaseholder agrees to fully cooperate with Contractor in the defense against any third-party claim.**

Liability Issues and Enforcement Oversight

Remember that the Part 503 rule is self-implementing and that its provisions must be followed whether or not a permit is issued. Remember also that State rules, which may be different from and more stringent than the Part 503 rule, may also apply.

EPA's Part 503 rule concerning the use or disposal of biosolids includes enforcement measures regarding the proper testing and application of biosolids. Landowners (including their lenders) and leaseholders who use biosolids beneficially as a fertilizer substitute or soil conditioner in

accordance with EPA's Part 503 rule are protected from liability under the Superfund legislation (Comprehensive Environmental Response, Compensation and Liability Act—CERCLA) (see 58 *Federal Register* 9262, February 19, 1993) as well as any enforcement action from EPA under the Part 503 rule. Where the Federal requirements are not followed, appliers of biosolids are vulnerable to EPA enforcement actions or citizen-initiated suits and can be required to remediate any problems for which they are found liable.

There is concern that if for some reason the application of biosolids to farmland might result in damage to crops, livestock, or the land itself, a farmer or the farmer's lender may be exposed to significant financial loss. There is also concern about possible future loss that might occur if unanticipated hazards from previous biosolids use are discovered. While there are no guarantees, past experience with agronomic use of biosolids is very reassuring. Where biosolids have been applied in accordance with Federal and State regulations, problems have been rare and virtually the same as those that have occurred from normal farming practices. Available research indicates that the agronomic use of high-quality biosolids is sustainable.

EPA oversight of land application practices includes a program for administering permits and for monitoring, reporting, and inspecting. As with wastewater discharge standards and requirements, preparers and land appliers are required to keep detailed records and Class I biosolids management facilities must self-report on their activities during the preceding calendar year by February 19th. As described in Table 2-8, the reports must include information on biosolids quality. In the case of CPLR biosolids, a field-by-field analysis of the site activity must also be reported, including information on management practices and on the cumulative application of metals. Hence, EPA will know the quality of the biosolids and where they are going, in accordance with EPA Part 503 requirements.

EPA will not rely solely on the word of the regulated community. The Agency will conduct routine sampling and inspections of these facilities. If discrepancies are identified, enforcement actions will be taken. Enforcement actions can include fines of up to $25,000 per day per violation, injunctive relief, or criminal imprisonment.

EPA shares the concern regarding the potential for harm from the misapplication of biosolids (i.e., not in accordance with general or management practices) or the failure to meet quality or treatment requirements. Notwithstanding, EPA believes that the Part 503 rule is protective and that most land application activities will be in compliance with its requirements.

Common Questions and Answers

Q: EPA has an enforcement strategy that focuses on EQ biosolids first and then addresses biosolids meeting more burdensome requirements. Why?

A: Biosolids that meet the EQ criteria are exempt from further consideration (i.e., management practices or tracking requirements) under the rule. This means that EQ biosolids may be used to supply plant nutrients and to condition soils, such as commercial fertilizers and other soil amending products, after meeting the EQ criteria. If biosolids that are claimed as EQ do not meet these requirements, then it is not possible to know if the untracked non-EQ biosolids are being used in accordance with other applicable provisions of the Part 503 rule and there could be a potential for adverse environmental and public health impacts. Therefore, it is crucial, from a public health and environment standpoint, to ensure that biosolids truly meet these EQ requirements. That is why EPA chose to focus first on EQ biosolids.

Q: The Part 503 rule states that its requirements apply to any person who prepares [biosolids], applies [biosolids] to land, fires [biosolids] in an incinerator, or owns or operates a surface disposal site. The Part 503 rule defines a person as an individual, association, partnership, corporation, municipality, or a State or Federal agency or an agent or employee thereof. EQ biosolids are not subject to general requirements or management practices. If the biosolids are distributed as EQ and later found not to be EQ, will all the individuals who apply the biosolids to land be considered to have violated the Part 503 rule? Who is ultimately responsible?

A: The generator and/or preparer, and possibly in some unique cases the land applier, would be liable. Whom EPA targets for enforcement action would depend on the specifics of the situation. It is highly unlikely that EPA would target any individual user or land applier of such alleged EQ biosolids material. In many cases, the user or land applier might not even know that he or she was using a biosolids product.

Q: What happens to sites that reach the CPLR? Can you ever reuse or repermit that site?

A: Once a site reaches the CPLR, that site can no longer have biosolids subject to the CPLR concept applied to it. You could, however, continue to apply biosolids that meet the EQ or PC requirements.

Q: If EQ or PC biosolids are land applied, do you need to keep records of cumulative application rates? If non-EQ or non-PC biosolids are subsequently applied to the same land, do you have to consider the pollutants land applied in the EQ or PC biosolids?

A: Part 503 does not require land appliers to keep track of the cumulative amounts of pollutants in EQ or PC biosolids that are applied to a particular parcel of land. The applier of any biosolids that are subject to CPLRs are not required by Part 503 to consider the pollutant loadings already applied to the same parcel of land from EQ or PC biosolids.

Q: When biosolids from a Class I facility are land applied, exactly what information must be reported regarding biosolids pollutant levels and pathogen and vector attraction reduction?

A: On February 19 of each year, the preparer and land applier, as applicable, would be required to submit on the previous year the following information to the permitting authority:

- the concentration in biosolids of each pollutant listed in Table 2-1 of this guidance;
- the appropriate certification statement indicating the Class A and B pathogen reduction and vector attraction reduction options used; and
- a description of how the preparer/applier is meeting the requirements of the pathogen and vector attraction reduction options chosen. In general, the preparer/applier would not need to report the actual data collected on pathogens or related to vector attraction reduction; however, the preparer/applier would need to describe how the required limiting numbers have been met or exceeded and how required operating parameters have been maintained. In addition, the preparer/applier must retain the actual data collected for a minimum of 5 years and have it available for inspection by authorized permitting or regulatory authorities when requested. Pollutant loading rate information must be kept indefinitely for CPLR biosolids on a site-by-site basis.

Q: If biosolids are applied to land in accordance with the requirements of the Part 503 rule, would the landowner, leaseholder, mortgage lender, land applier, or generator/preparer be liable under CERCLA for the cost of any cleanup of soil or water contamination or loss of crops?

A: No. Application of sewage sludge for a beneficial purpose in compliance with the Part 503 rule would not give rise to CERCLA liability.

Q: Does EPA believe there is an environmental or public health problem related to the beneficial use of biosolids in accordance with the Part 503 rule?

A: It is EPA's long-standing position that the beneficial application of biosolids to provide crop nutrients or to condition the soil is not only safe but good public policy, so long as preparers and land appliers comply with all applicable requirements of the Part 503 rule. Among other things, those requirements address the quality of biosolids allowed for land application, the rates of application of biosolids under various circumstances, and monitoring. Beneficial use of biosolids reclaims a wastewater residual, converting it into a resource that is recycled to land. EPA's position on biosolids use is based on extensive research involving hundreds of successful land application projects over the past 25 years.