BAY AREA BIOSOLIDS COALITION

Biosolids Product Profile – Class B Cake

Biosolids are produced from the stabilization of solids collected during the wastewater treatment process. Biosolids can be beneficially used in agriculture to provide multiple benefits, including improved soil fertility and water retention, carbon sequestration, and replacement of synthetic fertilizers. Some biosolids can also be used as a biomass energy source or for other specialty uses. This profile describes Class B Cake - how it is produced, its typical characteristics, and the markets in which it can be used.

What is Class B Cake? How is it Produced?

Class B biosolids are the most common biosolids product in the San Francisco Bay (SF) Region, constituting approximately half of the biosolids produced, and produced by 24 out of 31 of the agencies that participated in the *Bay Area Clean Water Agencies (BACWA) 2021 Biosolids Trends Survey*.

Class B biosolids can be produced through several stabilization processes including anaerobic digestion, aerobic digestion, and lime stabilization. After stabilization, the biosolids are commonly dewatered to produce a Class B cake product. Of the 24 agencies in the BACWA 2021 Biosolids Trends Survey that produce a Class B product, 21 dewater to produce Class B cake.

To meet Class B criteria, the Environmental Protection Agency (EPA) specifies in *40 CFR Part 503* that biosolids must:

- meet pathogen reduction requirements,
- meet vector attraction reduction requirements, and
- be below the ceiling concentration limits for 10 heavy metals.

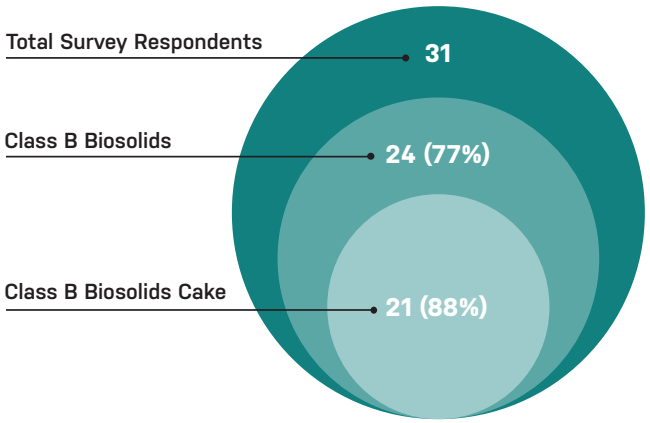
To meet the pathogen reduction requirement, the EPA requires solids to be tested for fecal coliforms, treated using one of five processes to significantly reduce pathogens (PSRP), or treated using an equivalent process to a PSRP.

There are five PSRPs, three of which can be used to produce Class B cake:

1. Aerobic digestion with a solids retention time (SRT) between 40 days at 20°C (68°F) and 60 days at 15°C (59°F).
2. Anaerobic digestion with an SRT of 15 days at 35 to 55°C. (95 to 131°F)
3. Lime stabilization using sufficient lime to raise the pH to 12 for two hours.

There are 12 options for vector attraction reduction. The most commonly used methods for Class B cake are:

- For anaerobically digested biosolids, achieving 38 percent volatile solids reduction.
- For aerobically digested biosolids, either maintaining a temperature of 40°C (104°F) for 14 days, or longer or by performing a test that measures the biodegradability of the solids.
- In addition, the vector attraction reduction requirements can be met through management methods at the land application site.



BACWA 2021 Biosolids Trends Survey

Typical Solids and Nutrient Content

The solids and nutrient content of Class B cake varies depending on the specific stabilization and dewatering process used, as well as the specific influent wastewater characteristics. The table below provides a range of typical characteristics in the SF Bay Region.

Typical Class B Cake Characteristics in the SF Bay Region

Parameter	Concentration
	Average (Range)
Total Solids Content[1]	22% (14-32%)
Total Nitrogen (%-dry weight)[1]	5.5% (1.3-7.6%)
Volatile Solids (%-dry weight)[1]	64% (57-76%)

Source:

1. 2010 data from 15 Bay Area Biosolids Coalition member facilities.

Markets for Class B Cake

There are two major biosolids markets for Class B cake:

- **Agriculture:** The majority of Class B cake is used in bulk agriculture for feed and fiber crops, food crops, and rangelands. Use restrictions are specified in 40 CFR Part 503. Due to these use restrictions, Class B cake is most commonly used for animal feed and fiber crops or for food crops that do not touch the soil.
- **Land Reclamation:** Class B cake can also be used for land reclamation of contaminated sites, mines, and fire-ravaged land. This practice has been common in other parts of the US and Canada but not in California. However, there is growing interest in California in using biosolids for reclamation of fire-ravaged land, given the increased incidence of wildfires.

Class B Cake Bay Area References

Some examples of Bay Area utilities that produce Class B cake and their uses are:

- *Ironhouse Sanitary District* produces Class B cake through aerobic digestion of secondary solids from wastewater treatment known as waste activated sludge (WAS). They meet the pathogen reduction requirement through measurement of fecal coliforms and the vector attraction requirement by incorporating the cake into the soil within six hours of application. Most of the year, they apply biosolids in land that they own (Jersey Island). During the rainy season, they contract out biosolids management to a third party who hauls the Class B cake to one of their large land application sites.
- *East Bay Municipal Utility District (EBMUD)* produces Class B cake through anaerobic digestion of primary sludge and WAS. In addition, EBMUD co-digests high strength waste and food waste. Like most facilities with anaerobic digestion, they meet the pathogen reduction requirement by maintaining at least 15 days SRT and the vector attraction reduction requirement by achieving at least 38% volatile solids reduction in their anaerobic digesters. EBMUD contracts out their biosolids management to a third party which hauls the Class B cake to one of three uses: land application on farms, feedstock for compost, or conversion to liquid fertilizer via thermal hydrolysis.

Carbon Sequestration Benefits

Beneficial use of Class B cake for agriculture results in carbon sequestration and offsets the use of synthetic fertilizers, both of which constitute carbon sinks or negative greenhouse gas emissions. Each dry metric ton of Class B cake is estimated to result in 0.15 and 0.24 metric tons of CO_2 equivalents for carbon sequestration and fertilizer offsets, respectively.

*Emission factors from BEAM*2022 Biosolids Greenhouse Gas Accounting Model.

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