



**B A C W A**  
**B A Y A R E A**  
**C L E A N W A T E R**  
**A G E N C I E S**

**ANNUAL REPORT to the  
SOLANO COUNTY BOARD OF SUPERVISORS**



**LAND APPLICATION OF BIOSOLIDS in SOLANO  
COUNTY**



**Prepared by the BACWA Biosolids Committee  
December 2018**

## **Introduction**

With the 2018 application season recently completed, the Bay Area Clean Water Agencies (BACWA) Biosolids Committee is pleased to present its annual summary report on land application of biosolids in Solano County. BACWA wishes to express its sincere appreciation to the staff of the Environmental Health Services Division of the Department of Resource Management for the continuing support of the biosolids land application program. This program allows for the effective use of biosolids as an agricultural soil amendment in the County. We believe this partnership provides a valuable resource to the Solano County agriculture and provides many Bay Area agencies with an opportunity to ensure their biosolids are put to their highest and best use and are making a positive impact on the environment.

This report provides information on trends in the use of biosolids resources in California and the Bay Area, an update on regional biosolids programs, and specific information on projects from individual agencies currently applying biosolids in the County. It highlights each agency's compliance with the requirement in Chapter 25, Article IV, Sec. 25-400 that "Class B biosolids may only be land applied provided that the generator of the Class B biosolids is individually or as part of a consortium having a portion of their biosolids produced as Class A Exceptional Quality biosolids, converting biosolids to energy, or otherwise diverting Class B biosolids away from land spreading or landfilling (as waste or as Alternative Daily Cover)."

This report is intended as supplemental information to the report submitted by the County Department of Resource Management staff and by Synagro, contract haulers and appliers of biosolids. It has been prepared for the Solano County Board of Supervisors in response to the Board's request for an annual update on agency activities and progress towards compliance with the goals set forth in County Code, Chapter 25. The affected agencies have coordinated the required reporting through BACWA to produce a single report for the Board.

We would like to acknowledge the assistance of your staff in working with BACWA member agencies throughout the year, particularly Jagjinder Sahota (Program Manager), Jeffrey Bell (Supervisor), Anthony Endow, Misty Kaltreider, Chelsea Lash and Long Lai.

## **Municipal Agencies Applying Biosolids in Solano County**

The use of biosolids as an amendment supplies valuable plant nutrients and carbon to soils which enhances the productivity and financial resilience of local farms. Each agency that applies biosolids is required to meet strict standards and provides a report annually to the United States Environmental Protection Agency (USEPA) to demonstrate compliance. The following Bay Area agencies currently transport biosolids to agricultural land in Solano County under contract with Synagro:

City of Calistoga	Ironhouse Sanitary District (serving Oakley and Bethel Island)
Central Marin Sanitation Agency (serving San Rafael, Ross Valley, Larkspur, and Corte Madera)	San Francisco Public Utilities Commission
Delta Diablo (serving Antioch, Pittsburg, Bay Point)	Southeast Water Pollution Control Plant
East Bay Municipal Utility District (serving El Cerrito, Albany, Berkeley, Emeryville and Alameda)	Oceanside Water Pollution Control Plant
City of Eureka	City of San Leandro
Fort Bragg Municipal District #1	Silicon Valley Clean Water (serving Redwood City, Belmont, San Carlos, Woodside, and Menlo Park)
	Union Sanitary District (serving Fremont, Newark and Union City)
	Town of Windsor

A total of 7,665 dry tons were land applied on agricultural sites in Solano County in 2018. The portion from each agency is shown on the follow page in Figure 1. Data provided by Synagro indicates that the total quantity of biosolids applied to agricultural land in Solano County in 2018 increased by 23 percent over the 2017 application season total of 6,243 dry tons and 5 percent over the 2016 application season total of 7,318 dry tons.

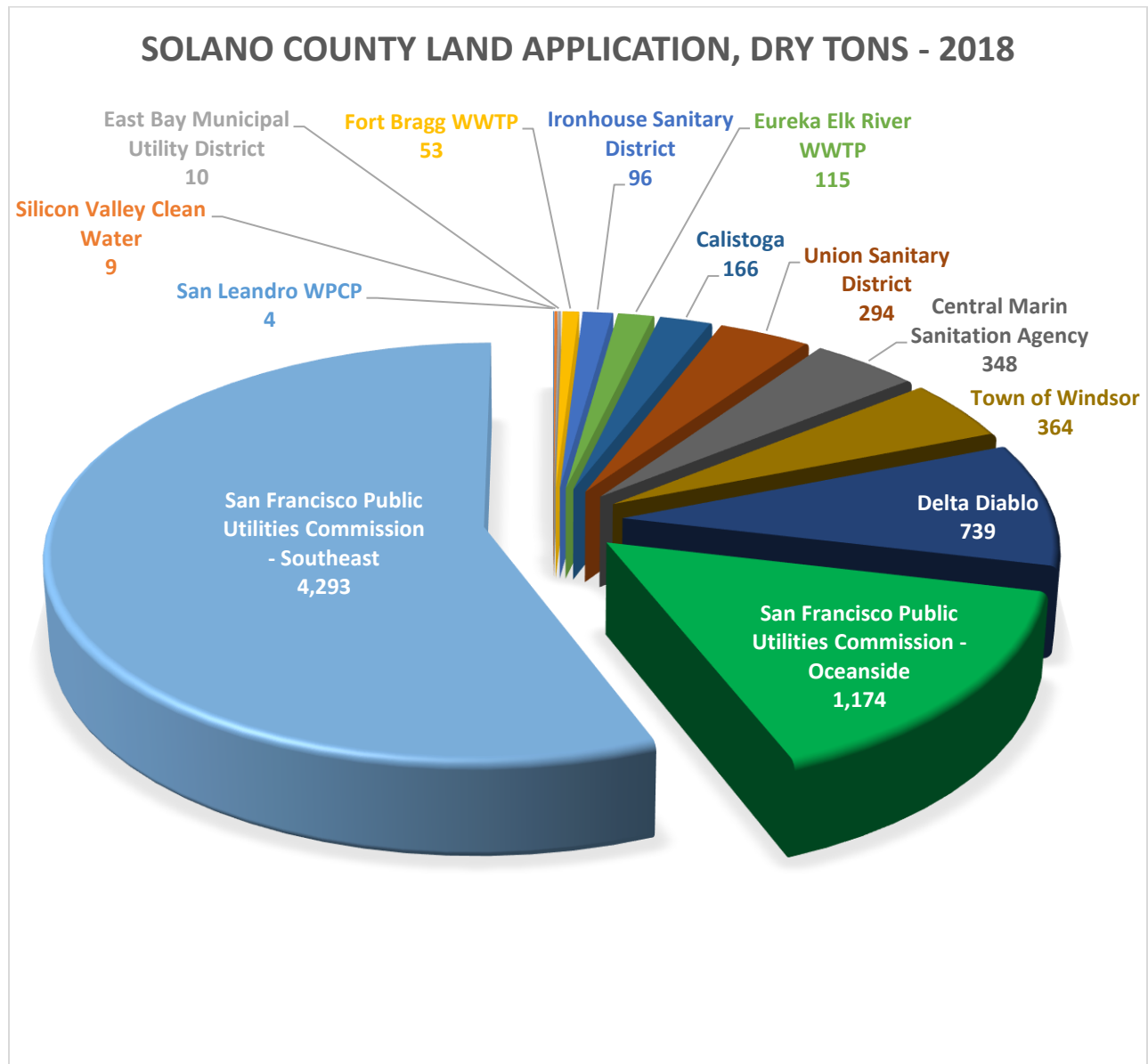
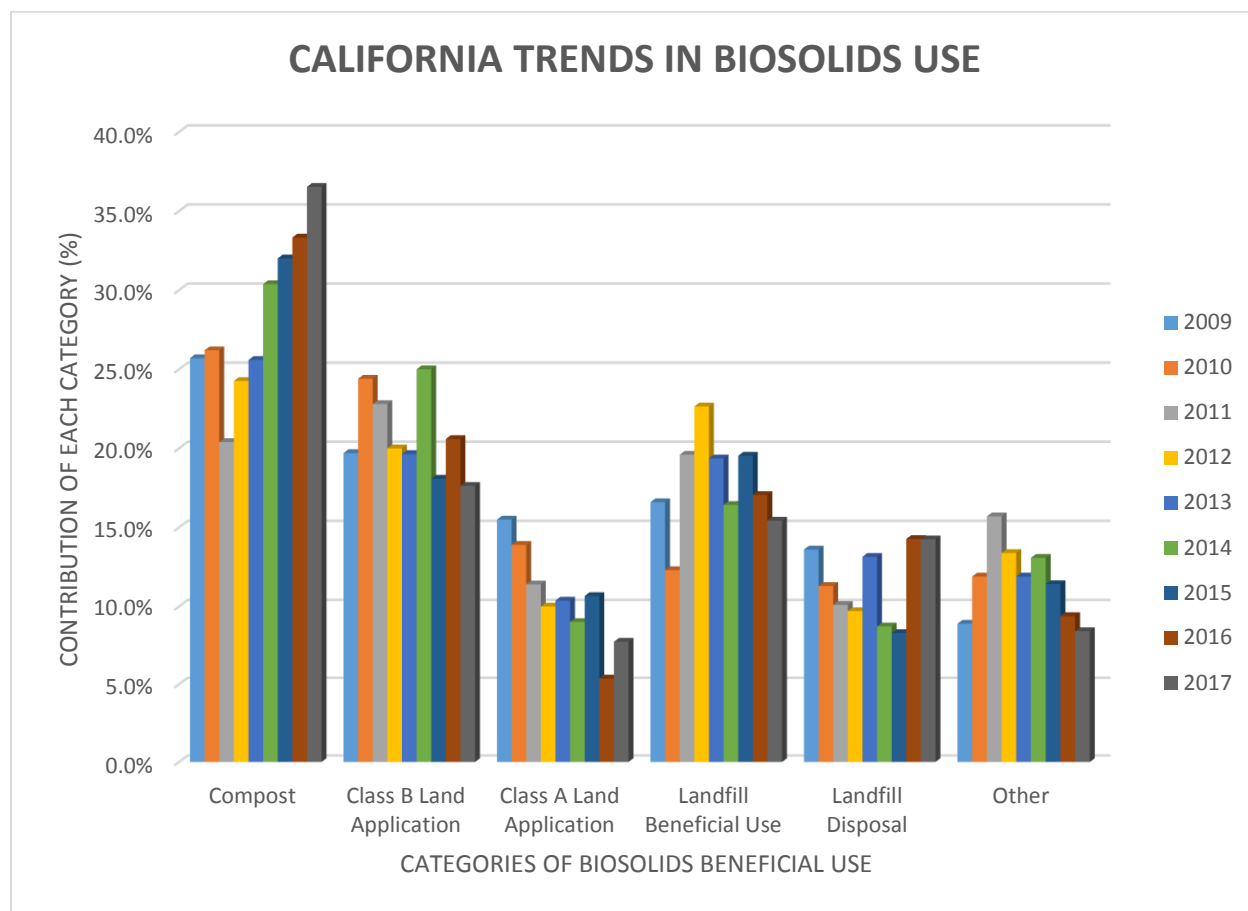


Figure 1. Amount of Biosolids Applied in Solano County by Each Agency in Dry Tons (2018). (Data provided by Synagro).

## Trends in Biosolids Usage in California

Wastewater agencies in California are continuing to identify and evaluate new options for biosolids reuse and recycling, including emerging technologies as well as established practices such as composting and heat drying.

**Overall Use Summary.** Figure 2 summarizes the use of biosolids in California for calendar years 2009 through 2017. Data for 2018 are not yet available and will be included in the 2019 report. The number one use statewide continues to be land application for agriculture in the form of compost, Class B biosolids and Class A biosolids. The use of biosolids compost has increased steadily, accounting for 20% of statewide biosolids use in 2011 to 33% in 2016 and 36% in 2017. Land application of Class B biosolids decreased slightly from 21% to 18%, and land application of Class A biosolids increased from 5% to 8%. Biosolids have proven to be a safe, reliable, and nutrient-rich soil amendment that offers a more cost-effective alternative to chemical fertilizers, which are increasingly expensive and energy intensive to produce. The beneficial use of biosolids as alternative daily cover in landfills and landfill disposal are also common management practices for biosolids in California, account for 15% and 14% respectively of statewide biosolids distribution.



**Figure 2. California Trends in Biosolids Use for the Years 2009 to 2017. (Data provided by USEPA Region 9).**

**Bay Area Trends.** Looking solely at the nine county Bay Area, Figure 3 illustrates end uses of biosolids. The primary uses continue to be landfill beneficial use, land application, and incineration, which together account for 87 percent of biosolids end uses in the Bay Area. Compost, landfill disposal, and surface disposal levels remained similar to 2015 percentages.

Tonnage for biosolids conveyed to the Lystek OMRC is categorized as Class A EQ liquid fertilizer and has increased from representing 0.7% of Bay Area biosolids end uses in 2016 to 3.8% in 2017. Several Bay Area agencies send their biosolids to the Lystek OMRC. The OMRC conducts further biosolids processing by utilizing LysteGro technology to create a Class A EQ product. Lystek's hydrolysis process uses high speed shearing, low pressure steam and alkali in an enclosed reactor to transform sludge or biosolids into a liquid fertilizer. Lystek's fertilizer program in Solano County began in spring 2017. The following agencies sent material to Lystek in 2018: Central Marin Sanitation Agency, City of Benicia, City of Petaluma, City of Santa Rosa and the San Francisco Public Utilities Commission.

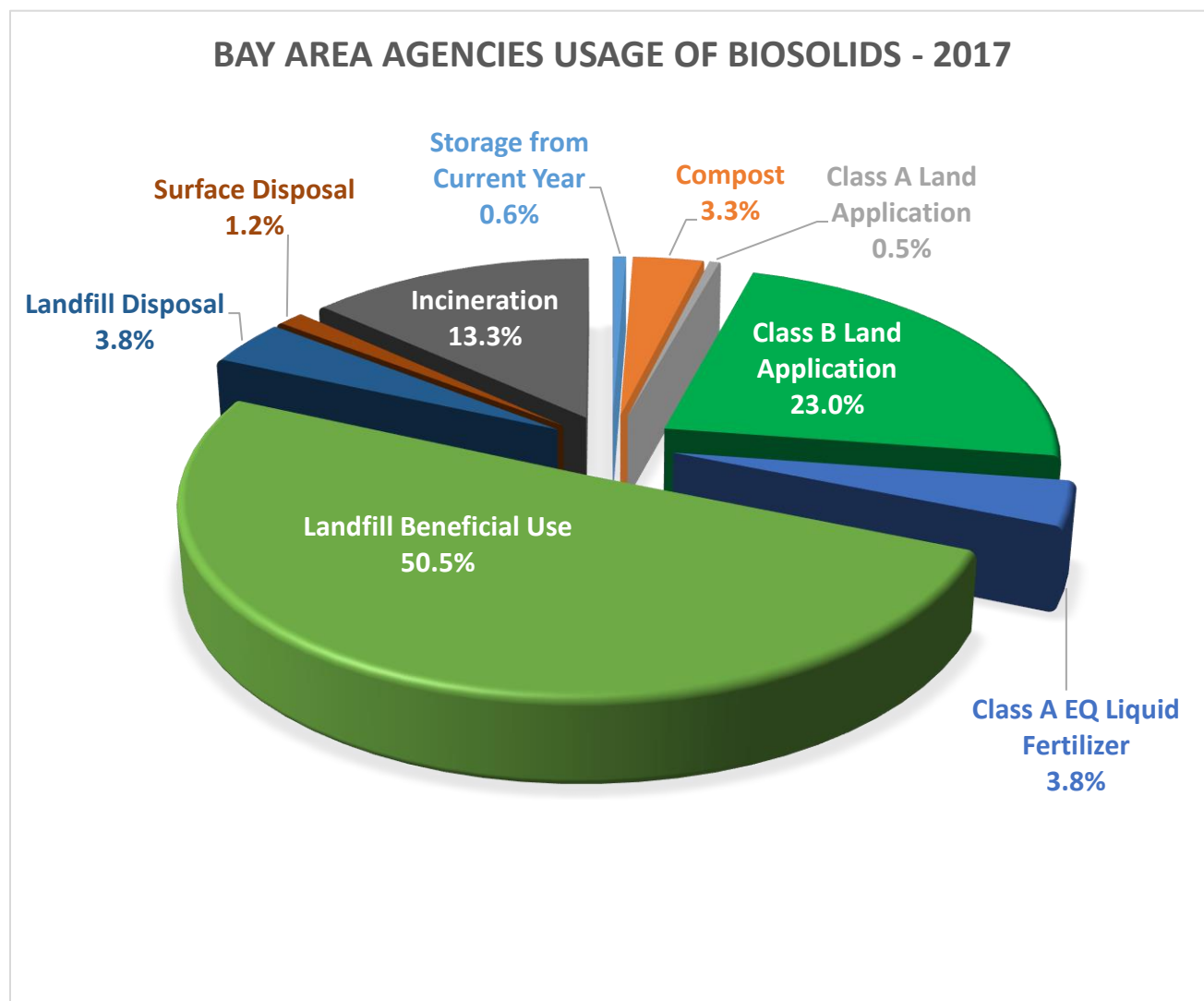
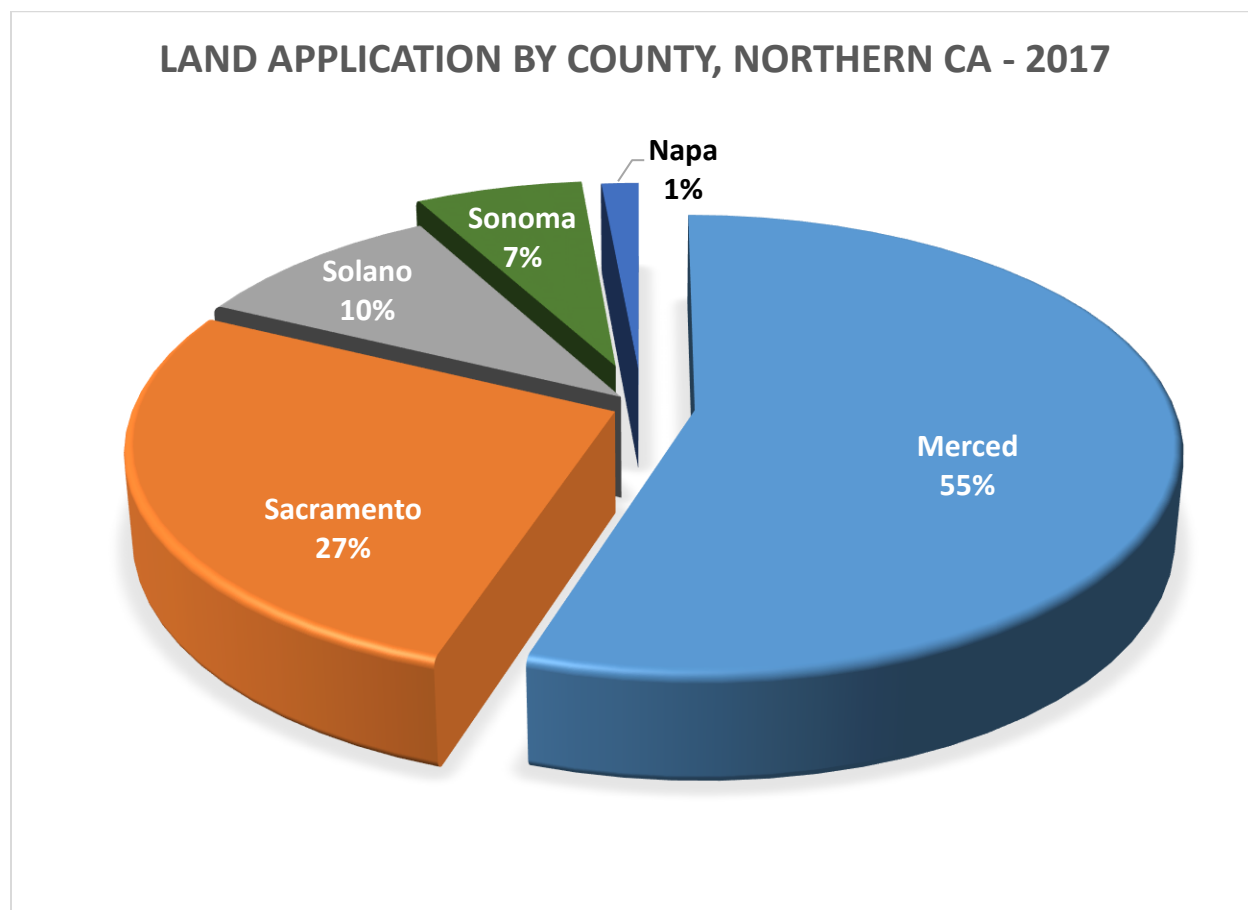


Figure 3. Bay Area Agencies Usage of Biosolids - 2017. (Data Provided by USEPA Region 9).

Biosolids were applied to agricultural land primarily in five different Northern California counties in 2017 with Solano County ranking third at 10 percent, similar to the 2016 proportion of 11 percent. Figure 4 illustrates the distribution of land applied biosolids among the counties.



**Figure 4. Distribution of Land Application of Biosolids among the Northern California counties - 2017. (Data Provided By USEPA Region 9 and Synagro).**

## Bay Area Regional Efforts

**BACWA Biosolids Committee.** The mission of the BACWA Biosolids Committee (The Committee) is to support the development and maintenance of cost-effective, sustainable biosolids management options for the more than 140,000 dry metric tons of biosolids produced in the Bay Area annually. The Committee continues to provide proactive support and information sharing to member agencies on regional biosolids issues, projects, and proposed regulations and legislation.

The Committee holds quarterly meetings with an emphasis on biosolids technology information sharing among the participating agencies by providing facility tours and establishing a forum for vendors to present their products and technologies. In 2018, the Committee met at the San Jose/Santa Clara Regional Wastewater Facility, and toured their current operations and



construction. They are adding new centrifuges, a new cogeneration facility, and plan to construct a new dewatering facility. The Committee also toured the Santa Rosa composting facility, one of the few sites in the Bay Area where biosolids are converted to a marketable product. The committee held one joint meeting with the CASA Regulatory Workgroup Land Committee in March, and plans a second joint meeting in December 2018. In 2016, the Committee conducted a survey of all BACWA members and compiled the results to show the production rates, current uses, costs, and future plans for biosolids management across member agencies. In 2017, the Committee completed the 2016 Biosolids Trends Survey Report, which is available at <https://bacwa.org/wp-content/uploads/2017/08/BACWA-2016-Biosolids-survey-report-1.pdf>. BACWA updated and repeated the survey in 2018 to help track changes in biosolids trends over time. The 2018 Biosolids Trends Survey Report is anticipated to be complete in early 2019.

**Bay Area Biosolids Coalition. Bay Area Biosolids Coalition.** The Bay Area Biosolids (BAB) Coalition originally formed in 2004 when a group of agencies came together to evaluate the feasibility of a regional biosolids management project to avoid the threat of a potential ban on land application of biosolids. By 2008, the membership expanded and the group decided to officially brand itself as the Bay Area Biosolids to Energy (BAB2E) Coalition to take advantage of opportunities anticipated to be developed under new state legislation (specifically, Assembly Bill 32 or AB 32). Assembly Bill 32 was adopted in 2006 requiring the state to reduce greenhouse gas (GHG) emissions to 1990 levels by 2020 (with further reductions through 2050). To achieve GHG reductions, the state created numerous programs incentivizing renewable energy and low carbon fuel production. This legislation served as a driver to prioritize the conversion of biosolids to energy for the BAB2E Coalition.

A decade later, Governor Brown announced five overarching "pillars" by which he plans to achieve the 2030 GHG reduction target under Senate Bill 32 (SB 32). These pillars recognize that several major areas of the California economy will need to reduce emissions.

1. Reducing petroleum use in cars and trucks by 50 percent
2. Increasing the procurement of electricity derived from renewable sources from 33 to 50 percent
3. Doubling the energy efficiency achieved at existing buildings
4. Reducing the release of short-lived climate pollutants (including methane)
5. Increasing land-based carbon sequestration

To enact these pillars, the Governor has signed legislation that either directly or indirectly impacts the disposal and use of WWTP biosolids at landfills, as well as the diversion of other organic waste streams to WWTPs. In an effort to holistically address biosolids end use options, the BAB2E Coalition re-branded themselves as the Bay Area Biosolids Coalition in 2017. While the Coalition continues to be vigilant in identifying biosolids to energy opportunities, the Coalition has expanded its focus to biosolids end use options that manage additional nutrient loading and produce other value-added products to address the Governor's goals and associated regulations in support of GHG reductions statewide. The updated focus of the BAB Coalition continues to satisfy the Solano County Code requirements for land application of biosolids.



The Coalition has been evaluating biosolids management options with the intent of identifying three to six options by the end of 2018 that can be implemented within the next two to three years and generate a product that can be beneficially used locally in all seasons of the year. The first step of the evaluation was an initial screening process completed in October 2017. The next phase is underway and includes further information gathering and discussions with specific technology providers that had passed the initial screening process. The Coalition continues to pursue a multi-pronged approach that includes:

- Investigating viable, year-long (weather resilient) alternatives to land application that look beyond "biosolids to energy" and seek to responsibly recycle back value-added products of biosolids to the environment.
- Educating the public on biosolids management issues in California through public outreach efforts, including the creation of a public website and securing media coverage.
- Serving as a technology incubator - particularly for pre-commercial technologies.
- Supporting land application in the Bay Area by seeking to create more capacity for biosolids in the Bay Area marketplace.
- Advancing the industry and legislative state of knowledge on biosolids as a valuable resource.

To achieve the Coalition objectives (listed above) and address critical challenges identified in the next two years, the Coalition will:

- **Build Relationships** - among members and local governments (e.g., Solano County), academia, legislature, state agencies, public, etc.
- **Achieve Project Maturity** - gaining experiences from the six existing sub regional projects
- **Promote Product Development** - continuing to identify/develop technologies and other biosolids end use products that can be replicated by others

Current Coalition members are:

City of Millbrae  
City of Petaluma  
City of San Jose  
City of Santa Rosa  
Central Marin Sanitation Agency  
Delta Diablo  
Dublin San Ramon Services District  
East Bay Municipal Utility District  
Fairfield-Suisun Sewer District

Ironhouse Sanitary District  
North San Mateo County Sanitation District  
San Francisco Public Utilities Commission  
Sausalito-Marin City Sanitary District  
Union Sanitary District  
Vallejo Flood & Wastewater District  
West County Wastewater District

## Individual Agency Programs

Individual BACWA agencies are responsible for their own biosolids management programs and each develops its own plan in addition to participating in regional programs. Below are program descriptions from all agencies which sent biosolids to Solano County for agricultural use via land application.

Several Bay Area agencies send their biosolids to the Lystek OMRC as an alternative end use. The OMRC conducts further biosolids processing by utilizing LysteGro technology to create a liquid bio-fertilizer Class A EQ product. Lystek's hydrolysis process simultaneously introduces high speed shearing, low pressure steam and alkali in an enclosed reactor to transform sludge or biosolids into a liquid fertilizer. Lystek's fertilizer program in Solano County began in spring 2017. The following agencies sent material to Lystek in 2018: CMSA, City of Benicia, City of Petaluma, City of Santa Rosa and the SFPUC.

Agencies that land applied Class B biosolids in Solano County either participated in the BAB Coalition and/or converted portion of their biosolids to Class A either through their own means or at a 3<sup>rd</sup> party conversion facility (e.g., compost facility or Lystek OMRC).

**Central Marin Sanitation Agency.** The Central Marin Sanitation Agency (CMSA) contracted with Synagro for land application of its biosolids during the dry weather season in Sonoma and Solano counties. CMSA also has contracts in place for sending the biosolids to Redwood Landfill for landfill beneficial use and to Lystek International for further processing to meet Class A biosolids requirements. CMSA is a member of the Bay Area Biosolids Coalition.

**City of Calistoga.** The City of Calistoga produces biosolids according to 40 CFR regulations. At this facility, solids are processed by the treatment methods of thickening and application to drying beds. The material is land applied to various fields in Solano County by Synagro, and a portion of this material is diverted to produce Class A Biosolids at Synagro's Central Valley Compost Site.

**Delta Diablo.** Delta Diablo produces Class B biosolids and contracts with Synagro for biosolids management. Over 90% of the biosolids are land applied in either Solano, Sacramento or Merced Counties with a portion of the material sent to Synagro's Central Valley Compost facility. Delta Diablo is an active participant in the Bay Area Biosolids Coalition and continues to explore additional and alternative biosolids management options.

**East Bay Municipal Utility District.** EBMUD produces Class B biosolids. In 2018 approximately, half of the biosolids was land applied, approximately ten percent was composted, and the remainder was used for landfill alternative daily cover. While most of the land application occurred in Merced County, a small portion was land applied in Solano County.

**City of Eureka.** The City of Eureka's Elk River Wastewater Treatment Plant contracts with Synagro to land apply biosolids to farmland in Solano, Sonoma, and Sacramento Counties. As

part of the Synagro contract, Synagro diverts a portion of Eureka's biosolids to the CVC composting facility in Dos Palos, CA where a Class A product is produced. The City of Eureka continues to investigate feasible and cost-effective Class B disposal options as well as Class A processes for the future.

**Fort Bragg Municipal District #1.** The Fort Bragg Municipal District #1 Wastewater Treatment facility produces Class B bio-solids according to 40 CFR regulations. During the construction of our new Aero-Mod Activated sludge plant we have contracted with Synagro to manage our bio-solids. Synagro transported a portion of our bio-solids to their Central Valley Compost (CVC) site to be further processed into Class A Bio-solids.

**Ironhouse Sanitary District.** The Ironhouse Sanitary District (ISD) produces biosolids according to 40 CFR regulations. ISD's Water Recycling Facility is designed to produce Class B biosolids. In 2018, about 93 dry tons of ISD's biosolids were land applied to various fields in Solano County by Synagro and about 22 wet tons were sent to Central Valley Composting to be composted for Class A transformation. ISD is currently a member agency of the Bay Area Biosolids Coalition.

**San Francisco Public Utilities Commission (Southeast and Oceanside WPCPs).** The San Francisco Public Utilities Commission (SFPUC) marked its eighteenth consecutive season of land application of biosolids for agricultural use in Solano County. Inspectors from the SFPUC perform land application inspections in Solano County to ensure that the contractors are following local regulations. The SFPUC also contracts with Synagro to land apply Class B biosolids in Sacramento County and with Lystek to produce a Class A EQ liquid fertilizer. A portion of biosolids are beneficially used for alternative daily cover at Vasco Road and Potrero Hills landfills. The SFPUC is an active participant in the Bay Area Biosolids Coalition.

The Oceanside WPCP currently runs its digesters in a TPAD (Temperature Phased Anaerobic Digestion) process which uses thermophilic digestion to produce Class A biosolids. In August of 2018, the SFPUC demonstrated to the EPA that the Oceanside WPCP met Class A standards via Alternative 1 of 40 CFR Part 503 regulations (thermal treatment), fecal coliform testing and salmonella testing. Time and temperature requirements for digestion, bi-weekly fecal coliform testing, and monthly salmonella testing continue to be employed to ensure Class A compliance. The SFPUC is also proceeding with a multi-billion dollar Sewer System Improvement Program <http://sfwater.org/index.aspx?page=116>, which includes a keystone project – complete reconstruction of the Southeast WPCP's biosolids processing facility. This facility will use thermal hydrolysis pretreatment prior to mesophilic digestion to produce Class A biosolids. Completion of the new facility is expected in the summer of 2024, followed by a transition period to conduct performance testing and facility commissioning, with full operation commencing in the summer of 2025.

**City of San Leandro.** The City of San Leandro contracted with Synagro to land apply Class A and Class B biosolids. Most of the land applied biosolids were utilized in Sacramento County with less than 1% applied in Solano County.

**Silicon Valley Clean Water.** SVCW produces class B biosolids and contracts with Synagro for hauling, and disposal. The majority of biosolids are used for land application in Sacramento and Merced Counties. For calendar year 2018 Synagro has land applied 8.96 DT in Solano County. Synagro also hauls Biosolids to the Central Valley Compost site in Merced County. During the winter months when land application and or composting are not available biosolids may be hauled to land fill.

SVCW is also in contract with BioForceTech Corporation (BFT). BFT has a two-step method that allows for economical and energy efficient in-house biosolids disposal. BFT developed a technology that removes most of the water from biosolids with minimal net energy input. To avoid truck transportation of waste, the BFT plant reduces the weight of biosolids (and other biomasses) by more than 90%. What is left is extra energy and BioChar, a nutrient rich soil amendment.

**Town of Windsor.** The Town of Windsor Water Reclamation Facility contracts with Synagro to land apply biosolids to farmland in Solano, Sonoma, and Sacramento Counties. As part of the Synagro contract, Synagro diverts a portion of its biosolids to its Merced County facility for composting. The Town of Windsor continues to investigate feasible and cost-effective Class B biosolids treatment and process options.

**Union Sanitary District.** Union Sanitary District (USD) beneficially used all of its biosolids in 2018 and met all USEPA regulations for the 25th consecutive year. USD continues to contract with Synagro for its biosolids management, with approximately 65 percent of USD's biosolids land-applied to farmland in Sacramento, Merced and Solano Counties. Nearly 35 percent of biosolids production was delivered to Merced County for producing Class A compost. USD is one of 16 Bay Area wastewater utilities actively participating in the Bay Area Biosolids Coalition.