

SCAP 2010 Biosolids Trends Survey

(Last Updated 11-12-10)

Executive Summary

I would like to thank all of our agencies that took the time and effort to assist with the production of this survey. The response has been exceptional, as can be seen by the number of agencies contributing. It is my sincere hope that the information provided will be useful to our SCAP members for future planning.

The intent of this survey was to quantify specific biosolids information from SCAP agencies in order to identify current industry trends for the following issues:

- biosolids production volumes
- dewatering technologies employed
- biosolids management technologies and destinations
- biosolids management and transportation rates
- agency challenges
- agencies 5-year biosolids management plans

Annual Biosolids Production

By comparing the total volume of wet tons produced in the 3-year period 2008-2010, it appears there is an obvious downward trend, as can be seen in Figure 1. In 2008, 1,471,436 wet tons were produced compared with 1,379,687 wet tons in 2009 for a decrease of 6.2%. A further reduction of 2.4% is noted when comparing the projected 2010 production with 2009 reported volumes. Overall, there is an estimated 8.4% reduction in volumes when comparing 2008 totals to the projected 2010 volumes. The reason for such a decline in biosolids production is most likely tied to the downturn in the economy and in particular the housing industry. To a lesser degree, on-going water conservation efforts may also be a contributing factor, as evidenced by reported reduction in wastewater flows for many agencies.

Technology and Cost

Results of the survey are summarized in Summary Table 1 and indicate that the types of technologies used for biosolids management include: bio-fuel production, composting, daily landfill cover, deep well injection, incineration, land application and landfilling. The most prevalent technology employed by most agencies is composting (44%), with land application (23%) and landfilling (16%) being the next most widely used methods.

By volume, the same 3 management methods are ranked in similar order but in slightly different proportions; composting (38%), land application (28%), and landfilling (15%). A breakdown of biosolids management costs is much more difficult to report as the so called “rate at the gate” can include many different factors for each agency. Similarly, the transportation costs reported vary widely due to the inclusion/exclusion of fuel charges and tipping fees, as well as travel distance. Breakdown of costs are shown where provided by the agency, otherwise a total cost is shown that reflects both the gate fee and the transportation cost. The average of the total rates reported was calculated to be \$54.97, however, many agencies were unable to report their rate due to confidentiality requirements. The average transportation cost was calculated to be \$16.76.

Dewatering Statistics

The on-site methods employed by agencies to dewater their biosolids prior to final use included: drying beds, centrifuges, belt presses and dryers. The percent solids for each technology were reported to be in the following ranges:

Drying beds	60 – 95%
Centrifuge	20 – 28%
Belt Press	15 – 20%
Dryer	90+%

Averaging of the submitted data results in an overall statistical average of 34.69% (percent) solids and a 26.6% solids weighted average for all reported biosolids produced. Furthermore, based on the total 2010 wet ton projections and the average solids reduction reported for each facility, the total estimated dry tons projection for 2010 is calculated to be 358,363 tons.

Agency Challenges

The question was asked as to what challenges did each agency face with regards to biosolids recycling. There were 17 different categories of challenges identified with a total of 37 responses from the agencies. As shown in Summary Table 2, the most reported challenge was related to rising costs. A full one third of the responding agencies indicated that they were struggling with increasing costs due to a variety of reasons, which include:

- Lack of local biosolids management options for land application of Class A and Class B biosolids
- Landfill closures
- Increasingly stringent air regulations
- Future dewatering equipment purchases

- Development of renewable energy projects
- Higher transportation costs
- Contracting restrictions

Future Plans

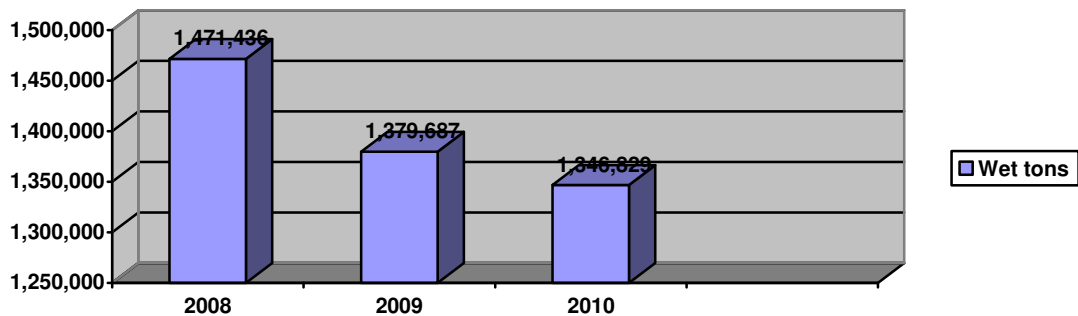
The final survey question dealt with what each agency was planning to do with their biosolids 5 years from now. Eleven different methods of disposal were reported which included: bio-fuel production, composting, heat drying/pelletizing, gasification/energy production, evaluation of Class A certification, development of new undetermined alternatives, daily landfill cover, deep well injection, incineration, land application and landfilling. As expected, the majority (24%) of the 33 responses indicated that most agencies would be composting their biosolids in 5 years, although many indicated that they intend to study other methods that could lead to renewable energy production.

Summary of Survey Responses

1. **How many tons of biosolids did your agency produce?** (All data is in wet tons unless noted otherwise)

Agency	2008 Wet Tons	2009 Wet Tons	2010 Projected WTs
Camarillo Sanitary District	1,269	1,467	1,400
Carpinteria Sanitary District	1,840	1,636	1,600
City of Barstow	1,122	1,053	1,100
City of Corona DWP	7,368	5,770	6,970
City of Escondido	4085	3461	3264
City of Los Angeles	256,555	240,636	229,075
City of San Diego	121,403	118,474	124,000
City of Santa Barbara	11,766	11,667	11,352
City of Santa Maria	5,012	7,406	7,500
City of Thousand Oaks	14,000	14,000	14,000
City of Ventura	14,437	12,955	13,500
Eastern MWD	63,477	57,343	60,000
Elsinore Valley MWD	14,612 – RWTP 1,102 – HTCWTP	13,773 – RWTP 910 – HTCWTP	12,517 – RWTP 745 – HTCWTP
Encina Wastewater Authority	38,778	8,833	6,763
Fairbanks Ranch CSD	133	118	170
Goleta Sanitary District	2,989	3,859	4,000
Inland Empire Utilities Agency	70,119	69,631	69,100
Lake Arrowhead CWSD	2,024	1,999	2,000
Las Virgenes MWD	7,000	6,200	6,500
Los Angeles CSD	551,154	526,864	496,000
Orange County San. District	255,092	246,504	250,450
Ojai Valley Sanitary District	6,438	6,050	6,050
Rancho Santa Fe CSD	460	465	456
San Elijo JPA	2,837	3,222	3,500
Santa Margarita Water Dist.	10,268	8,430	7,670
Valley Center MWD	180	180	180
Valley Sanitary District	232	947	1,100
Victor Valley WRA	5,331	5,493	5,500
Whispering Palms CSD	353	341	367
Total Volume (Wet Tons)	1,471,436	1,379,687	1,346,829

Figure 1



2. Where did you send your agency's biosolids this year?

Agency/ Destination/ Volume (wt)	Technology Employed	Rate at Gate \$/Ton	Miles (one way)	Transportation Cost \$/Ton	Total Cost \$/Ton
Camarillo Sanitary District—Liberty Recycling , Bakersfield, CA—1400 WT	Drying Beds/ Composting	Included in total		Included in total	\$47.65
Carpinteria Sanitary District—Engel & Gray Composting in Santa Maria, CA—1152 WT	Composting	Included in total	90	Included in total	≈\$65.00 Varies w/fuel surcharge
City of Barstow—Liberty Composting in Kern County	Composting	\$25.00	380	\$31.16	\$56.16
City of Corona DWP—All	Composting	Included in total	230	Included in total	\$65.00
City of Escondido	Landfill & Composting	Included in total		Included in total	\$37.72
City of Los Angeles—187,817 WT	Land Application	Included in total	112	Included in total	\$30.32
City of Los Angeles—20,938 WT	Composting	Included in total	120	Included in total	\$70.57
City of Los Angeles—20,280 WT	Deep Well Injection	Included in total	23	Included in total	\$7.24
City of San Diego—74,329 WT	Daily Cover	Proprietary Contractor	Proprietary Contractor	Proprietary Contractor	Proprietary Contractor
City of San Diego—18,974 WT	Land Application	Proprietary Contractor	Proprietary Contractor	Proprietary Contractor	Proprietary Contractor
City of Santa Barbara—7,177 WT	Composting	Included in total		Included in total	\$43.69
City of Santa Barbara—1,499 WT	Composting	Included in total		Included in total	\$37.20 Plus variable fuel surcharge
City of Santa Maria—2,500 WT	Composting	Included in total	NA	Included in total	\$29.41
City of Santa Maria—4,790 WT	Daily Cover	Included in total	6.5	Included in total	\$5.40
City of Thousand Oaks—Ventura RWA Dryer @Toland Landfill—14,000 WT	Belt Press/ Drying Beds/ Daily Cover	Included in total	25	Included in total	\$53.00
City of Ventura—Ventura RWA Dryer @ Toland Landfill—9,050 WT	Plate & Frame Press/ Daily Cover	Include in total	24	Included in total	\$52.79
Eastern Municipal Water District—12,170 WT	Land Application	Included in total	614	Included in total	\$55.00
Eastern Municipal Water District—20,025 WT	Landfill	Included in total	462	Included in total	\$55.00
Elsinore Valley Municipal Water District—SYNAGRO—	Composting	\$67.45	200	\$4.58	\$72.03

11,799 WT					
Encina Wastewater Authority—461 WT	Centrifuge/Land Application	Included in total	205	Included in total	\$48.50
Encina Wastewater Authority—240 WT	Heat Dryer/Land Application	Included in total	205	Included in total	\$48.50
Encina Wastewater Authority—3536 WT	Heat Dryer/BioFuel	\$5.80	135	\$26.50	\$32.30
Fairbanks Ranch CSD—Otay Landfill-All	Landfill	Included in total	30	Included in total	\$45.81 (trans. & tipping fee)
Goleta Sanitary District—Honey Bucket Farms, Kern County – 3,773 WT	Land Application w/ Lime Stabil.	Included in total	180	Included in total	\$39.85
Inland Empire Utilities Agency—All	Composting	\$44.00	12	\$6.00	\$50.00
Lake Arrowhead CSD—1200 WT	Composting	\$38.00	106	\$50 - \$60	\$88-\$98
Lake Arrowhead CSD—800 WT	Composting	\$55.00	40	\$25 - \$30	\$80-\$85
Las Virgenes Municipal Water District—Rancho Las Virgenes Composting Facility—All	Onsite Composting Disposal via community give-away program & commercial vendor contract	NA	NA	NA	\$260.00 (cost)
Los Angeles County Sanitation Districts—(JWPCP)-Mitsubishi-5,052 WT	Nox Reduction /Incineration	Included in total	106	Included in total	\$36.00
Los Angeles County Sanitation Districts —(JWPCP & Valencia)-Honey Bucket Farms-84,137 WT	Land Application w/ Lime Stabilization	Included in total	160	Included in total	\$37.50
Los Angeles County Sanitation Districts—(JWPCP)-Energetech-74,470 WT	Renewable E-Fuel	Included in total	70	Included in total	\$76.51
Los Angeles County Sanitation Districts—(JWPCP)-South Kern Composting Facility-58,583 WT	Composting	Included in total	127	Included in total	\$63.40
Los Angeles County Sanitation Districts—(JWPCP, Palmdale & Lancaster)-Liberty Composting-89,638 WT	Composting	Included in total	152	Included in total	\$40.00
Los Angeles County Sanitation Districts—(JWPCP)-Inland Empire Regional Composting Facility-67,335 WT	Composting	\$44.00	61	\$12.00	\$56.00
Los Angeles County					

Sanitation Districts— (JWPCP)-Puente Hills Landfill-147,649 WT	Co-Disposal (Landfill)	\$33.86	27	\$6.80	\$40.66
Orange County Sanitation District— 66,441 WT	Land Application	\$46.80	290	\$2.90 (averaged)	\$49.70
Orange County Sanitation District— 75,449 WT	Composting	\$62.34	153/263 (2 sites)	\$3.00 (averaged)	\$65.34
Orange County Sanitation District— 13,477 WT	Slurry Carb/Dryer	\$70.74	57	\$8.91 (Transportation & fuel surcharge)	\$79.65
Ojai Valley Sanitary District—sent to Liberty Composting during WW months, onsite composting during DW months— 1,697 WT	Composting	Included in total	167	Included in total	\$44.54
Rancho Santa Fe CSD—Otay Landfill-All	Landfill	Included in total	30	Included in total	\$45.81
San Elijo Joint Powers Authority—Arizona— 2,440 WT	Land Application	Included in total		Included in total	\$42.50
Santa Margarita Water District— 20,981 WT	Composting	Included in total	200	Included in total	\$70.00
Santa Margarita Water District—2,578 WT	Landfill	Included in total	14	Included in total	\$32.00
Valley Center MWD— Otay Landfill-All	Landfill	NA	60	Include in total	\$48.00
Valley Sanitary District—1,100 WT	Dredged from Lagoon, then belt pressed/Land application in Az	Include in total		Included in total	\$44.49
Victor Valley Wastewater Reclamation Authority—CEMEX in Apple Valley, CA—0 tons hauled to-date	Incineration in burn kilns	\$0.00 per lease agreement	20	\$0.00 per lease agreement	\$0.00 per lease agreement
Whispering Palms CSD—Otay Landfill-All	Landfill	Include in total	30	Included in total	\$45.81
Averages		\$44.82	136.5	\$16.76	\$54.58
Ranges		\$5.80 - \$70.74	6.5 - 614	\$2.90 - \$60.00	\$7.24 - \$260.00

Summary Table 1

Management Technology	Facilities Reporting	2010 Volume (Wet Tons)	Total Cost/Ton Range	Avg.Total Cost/Ton
Bio-fuel	3	91,483	\$32.30 to \$79.65	\$62.82
Composting	19	445,818	\$29.40 to \$260.00	\$69.03
Daily Landfill Cover	4	102,169	\$5.40 to \$53.00	\$37.06
Deep Well Injection	1	20,280	\$7.24	\$7.24
Incineration	2	10,552	\$36.00	\$36.00
Land Application	11	324,589	\$30.32 To \$55.00	\$43.46
Landfill	8	172,345	\$32.00 To \$5.00	\$38.12

3. What percent solids are your agency's biosolids?

Agency	% Solids	Est. 2010 (DT)
Camarillo Sanitary District	90%	1260
Carpinteria Sanitary District	14-15%	240
City of Barstow	23%	253
City of Corona DWP	91.67%	6,389
City of Escondido	25-30%	893
City of Los Angeles	29.4%	67,348
City of San Diego	27-28%	34,100
City of Santa Barbara	15.1%	1,714
City of Santa Maria	25%	1,875
City of Thousand Oaks	15-90% (air dried)	12,600
City of Ventura	18%	2,599
Eastern Municipal Water District	Morena Valley RWRF – 22% Temecula Valley RWRF – 22% Perris Valley RWRF – 20% San Jacinto Valley RWRF – 23%	12,600
Elsinore Valley Municipal Water District	17% @ RWTP 8% @ HTCWTP	2,128 60
Encina Wastewater Authority	21%-Cake 90+%-Pellets	1,420
Fairbanks Ranch CSD	21%	36
Goleta Sanitary District	15%	600
Inland Empire Utilities Agency	18%	12,438
Las Virgenes Municipal Water District	20-22% (centrifuged)	1,365
Los Angeles County Sanitation Districts	JWPCP – 28% (centrifuge) Valencia – 19% (filter press) Lancaster – 60-90% (dry bed) Palmdale – 60-90% (dry bed)	JWPCP – 133,000 Valencia – 3,800 Lancaster – 375 Palmdale – 375
Orange County Sanitation District	18.75% Plant 1 22.53% Plant 2	51,693
Ojai Valley Sanitary District	15%	908
Rancho Santa Fe CSD	21% (centrif)	96
San Elijo Joint Powers Authority	18-20% (BP)	665
Santa Margarita Water District	17.5%	1342
Valley Center MWD	20%	36
Valley Sanitary District	90+%	990
Victor Valley Wastewater Reclamation Authority	90-95%	5,088
Whispering Palms	21%	77
Total Volume (Dry Tons)	Statistical Average 34.69%	358,363
Total Volume (Dry Tons)	Weighted Average 26.6%	358,3630

4. What are the main challenges your agency faces with biosolids recycling?

Camarillo Sanitary District – Rising costs.

Carpinteria Sanitary District – Concerns about long term viability and cost.

City of Barstow – Cost and loading space.

City of Corona DWP – One of the main challenges the City has faced is finding an outlet that is cost effective and environmentally friendly. Another challenge was having a contract with only one company, this didn't allow the City to explore alternative options. It's important to have additional outlets for the times when our dryer is not operating or one of our contracted companies is unable to accept the biosolids.

City of Escondido – Space, land area, evolving regulations in jurisdictions other than CA and lack of viable back up/fail safe plans.

City of Los Angeles – In recent years, there has been increasing public perception and regulatory changes that have adversely impacted biosolids management activities. There is increasing public concern over land application of biosolids for agricultural use in California. Due to local pressure, a number of counties have implemented or are considering implementation of regulations restricting/banning land application of biosolids. In Kern County where the City's Green Acres Farm is located, a ballot initiative was overwhelmingly passed in June 6, 2006. This biosolids initiative banned land application of all biosolids or biosolids products in the unincorporated areas of Kern County.

City of San Diego – Cost for recycling (upgrade to Class A), opposed to current 100% beneficial use.

City of Santa Barbara – Dewatering our biosolids is our biggest challenge at this point. Our belt press performance is not where it should be. We are in design for upgrades to our presses to improve the belt washing to improve performance.

City of Santa Maria – We do not have many challenges with recycling, except that we run short on space in our drying beds in the winter.

City of Thousand Oaks – We don't want to recycle biosolids except for landfill daily cover.

City of Ventura – Inevitable rising costs.

Elsinore Valley MWD – Because biosolids produced at the RWRF and the HCWRF are not being certified as Class B biosolids, they must receive further treatment by an outside contractor. For several years, SYNAGRO has produced Class A compost for the EVMWD at its Kern County industrial complex. In Southern California, public opposition and growing restrictions on land

application of Class B biosolids is making it extremely difficult to find areas where Class B biosolids can be land applied. Increasing hauling cost to Kern County is an issue.

Encina Wastewater Authority – Consistency with respect to pellet dryness.

Fairbanks Ranch CSD – We are concerned over the cost to provide additional treatment and hauling if the current landfill stops accepting our biosolids.

Goleta Sanitary District – CSD has the capacity to produce Class A biosolids for all its solids production. The main challenge is having a market that will use the entire Class A production. Currently, GSD produces Class A to meet market demand only and transports the rest to Honey Bucket Farms in Kern County.

Inland Empire Utilities Agency – Agency’s biosolids are all processed at our own composting facility (50-50 partnership with LACSD) which is running well at full capacity. The primary challenges to the facility are SCAQMD rules and increased budget pressures but the facility is in full compliance and is operating within its budget.

Las Virgenes MWD – The main challenges we face are increasing operational costs and aging infrastructure.

Los Angeles County Sanitation Districts – The following are LACSD’s main biosolids challenges:

- Securing long term and cost effective biosolids management options;
- Handling public concerns/ perception of emerging contaminants in biosolids that would effect the land application of biosolids (similar to the recent SFPUC issue);
- Developing current projects that include a large-scale advanced composting facility and a biosolids to renewable fuel facility;
- Cross media regulations that could prohibit biosolids composting (ie. Regulatory limits on VOC and ammonia emissions);
- Local county measures and ordinances that would ban the reuse of biosolids (ie. Kern County Measure E, Imperial County Measure X).

Orange County Sanitation District – Finding low-cost regional facilities and planning low-cost onsite solutions to reduce truck traffic and pollution. Lowest cost options are further away. Higher cost options are closer, but hard to justify in this economy.

Ojai Valley Sanitary District – Operationally it is completing compost cycle for windrows in-progress when wet weather hits. For long-term recycling the biggest concern is new regulations that would require capital investment for odor control or in-vessel technology. This could result in Board decision to haul our biosolids to the new Toland Landfill Biosolids Drying unit and halt on-site composting.

Rancho Santa Fe CSD – We are concerned over the cost to provide additional treatment and hauling if the current landfill stops accepting our biosolids.

San Elijo JPA – Cost.

Santa Margarita Water District – Increasing disposal costs.

Valley Center Municipal Water District – The District would like to find a long term sustainable option for reuse of biosolids locally.

Valley Sanitary District – None really, rain at times can become an issue because our sludge is stockpiled outside.

Victor Valley Wastewater Reclamation Authority – Very few problems, occasional public relations issues but relatively minor in the last 5 years.

Whispering Palms CSD – We are concerned over the cost to provide additional treatment and hauling if the current landfill stops accepting our biosolids.

Summary Table 2

Challenges	Number of Agency's Reported
Rising Costs	12
Public Perception/Relations	3
Finding Low Cost Local Disposal Options	3
Space for Drying Operations	3
Regulatory Restrictions	3
Securing Long Term Disposal Options	3
Wet Weather Impeding Drying Operations	2
Contractual Considerations	1
Dewatering Technologies	1
Finding Class B Disposal Options	1
Consistency of Pellet Dryness	1
Finding Markets for Class A Disposal	1
Meeting Air District Regulations	1
Aging Infrastructure	1
Developing New Composting/Biofuel Projects	1
Cross Media Regulations	1
Cost of Recycling Technology	1

5. What does your agency plan to do with their biosolids in 5 years?

Camarillo Sanitary District – No changes.

Carpinteria Sanitary District – We plan to continue with current management practice of off-site composting by a third party contractor. We are exploring opportunities to participate in a regional heat drying / pelletizing project.

City of Barstow – Effective 10/28/2010, Liberty Composting will be the first fully permitted gasification plant ever in the State of California. It is considered gasification/transfer-processing and we will be burning the biosolids to generate electricity – eventually up to 15 megawatts added to the grid

City of Corona DWP – The City plans to supply biosolids for use as an alternate fuel source. We would like to continue with composting but reduce the distance our biosolids are hauled. The City is also working towards a Class A certification for our biosolids.

City of Escondido – In third year of five year contract, with an option for two more years. The remaining years in question (3) most likely will be consistent practices.

City of Los Angeles – The City of Los Angeles may consider issuance of a Request for Proposal to solicit new alternatives for biosolids management.

City of San Diego – Re-evaluate the need for Class A upgrade.

City of Santa Barbara – Our agency will be doing an assessment project to plan and design future upgrades to our plant solids handling systems. We will continue to send our biosolids for off-site composting.

City of Santa Maria – We plan on continuing to send our biosolids to Engel and Gray for composting.

City of Thousand Oaks – Turn them to dust and drive them once a year to the landfill. Hopefully, better drying technology emerges and can be applied economically here.

City of Ventura – Continue same operation.

Elsinore Valley MWD – Continue contract with SYNAGRO, but consider implementing efforts to minimize moisture content by drying of the dewatered sludge cake.

Encina Wastewater Authority – We will market the Heat Dried biosolids pellets as a state registered fertilizer to various end users such as soil blenders, flower growers, golf courses, and also as a bio-fuel.

Fairbanks Ranch CSD – We are concerned over the cost to provide additional treatment and hauling if the current landfill stops accepting our biosolids.

Inland Empire Utilities Agency – Continue to send all material to its composting facility.

Las Virgenes MWD – Continue to compost or truck the dewatered biosolids to a local landfill for drying and use as ADC.

Los Angeles County Sanitation Districts – LACSD will continue to utilize its existing biosolids management options. LACSD is currently developing its large-scale advanced composting facility located in Kings County, CA, and anticipates managing biosolids at that facility in 2013. In addition, LACSD will continue to evaluate biosolids management opportunities as they become available.

Orange County Sanitation District – We would like to study in-plant technologies to reduce our environmental footprint. We have also found that land application in Arizona is remaining more sustainable than we thought a few years ago, so we plan to stay. Land application is diversifying our portfolio with a low-tech, proven option while helping to balance out the costs of our higher priced options.

Ojai Valley Sanitary District – Same as identified in items #2 & #4.

Rancho Santa Fe CSD – Continue with landfill disposal as long as possible.

San Elijo JPA – Probably land application in AZ, depends on cost and availability.

Santa Margarita Water District – Our agency is seriously pursuing future incineration and power generation options for our biosolids.

Valley Center Municipal Water District – The District continues to search for a site within San Diego County suitable for land application of its biosolids.

Valley Sanitary District – At this point we intend to continue having it hauled to Yuma Arizona.

Victor Valley Wastewater Reclamation Authority – We anticipate a new WDR permit which will require us to dewater our solids before they are placed in our drying beds. Probably looking at a capital project in the 10M range. We are also developing public-private partnerships to develop energy from biosolids.

Whispering Palms CSD – We are concerned over the cost to provide additional treatment and hauling if the current landfill stops accepting our biosolids.

Summary Table 3

Agencies 5-Year Biosolids Disposal Plans	Number of Agency's Reported
Composting	8
Heat Drying/Pelletizing	2
Gasification/Energy Production	3
Evaluation of Class A Certification	2
New Undetermined Alternatives	1
Daily Landfill Cover	3
Deep Well Injection	1
Incineration	3
Land Application	5
Bio-fuel Production	1
Landfill	4