2015

COMPOSTABLE ORGANIC PROGRAM



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**Overview**

The Department has developed a strategy for handling compostable organic material for Kern County. Pending regulations will require some or all of that waste stream be recycled. The proposed strategy will affect many facilities operated by the Department and will require an investment in both staff and equipment in order to allow the Department to provide acceptable end uses for the material.

The following is a site by site analysis of what has been done and what additional resources would be needed at each site to allow the Department to remain in compliance with the proposed regulations. The implementation is staged over a number of years with the program being implemented by area. Costs associated with the expansions are included in the analysis with a summary of those costs included following the last facility evaluated.\*

Next a summary of the cost per ton of the program, by fiscal year, is included to assist in the overall analysis of the programs cost effectiveness.

Finally, a query was run to determine an estimated amount of material which may be charged if there is a modification of the current policies. The material listed in the tables is what is currently believed to be material which would fall into the commercial classification if regulatory changes are indeed enacted.

**\* A portion of this plan has been approved by the Board of Supervisors for implementation. Those items already approved and/or implemented are highlighted in a light gray. Additional proposed actions or plans are in plain text.**

**SHAFTER FACILITY**

The Department has committed to improving the capabilities of the compostable organics diversion program to allow staff to more effectively remove the contamination from the grass and other compostable material currently being accepted. This was determined to be necessary in order to allow continued use of the Synagro option which accepts the material at no cost. The plan for this improvement includes purchasing the following:

1. Star Screen ( Determined to be the Komptech L3 ) Approximate cost $750,000
2. Dedicated loader for Start Screen Approximate cost $200,000
3. 20,000ft2 of concrete for material processing area Approximate cost $300,000

While implementing the above improvements, legislative changes were being implemented that would drastically change the program and cause a large increase in throughput. In order to handle that increase the following acquisitions provided the Department with an acceptable processing capability to handle the organics:

1. Sorting station to process overs from Start Screen Approximate cost $150,000
2. Slow Speed Shredder to size reduce overs Approximate cost $700,000

The sorting station required the installation of a concrete pad to allow the equipment to be correctly installed. Once that final piece of equipment is obtained, the program would effectively have a system that could remove contaminates and size the material for use in any compost system. This system would also process out grass that appears to be very marketable at this time as cattle feed. The mechanization as outlined would allow the system to process and make ready for use as much as 100 tons per day.

At this point, we needed to evaluate continuing to ship the material to Synagro or constructing and operating a compost facility on site. Shipping that quantity of material to Synagro costs the Department (at today’s prices) approximately $77,200 per year.

A compost facility capable of handling the material could be added to the diversion area by utilizing a portion of the 20 acres being held unused and adjacent to the current diversion area. The system currently being considered the best for this purpose is a Gore Compost system which is an aerated static pile system utilizing Gore-Tex covers to control moisture and VOC emissions. Building a facility such as this would provide a turnkey operation at this facility that could take in the compostable organic material, clean and process that material, compost it on site, and produce a finish product suitable for sale. Resources needed for that expansion would be as listed below:

1. Gore Compost Facility Approximate cost $6,000,000
2. Additional loader for compost operation Approximate cost $ 250,000
3. Skid steer loader Approximate cost $ 30,000

The acceptance of food waste in the program is something that the Department knows will be needed and operational plans to handle that material have been reviewed. At first, that portion of the program would be handled by creating a bunker collection point for food waste and co-mingling that material with sufficient grass clippings to control the moisture. Once mixed that material would be shipped to the Mount Vernon Compost Facility until such time as the Department completed the construction of the Shafter Compost Facility (currently slated for 2017).

**Current Operations**

Current operations is using line Items 1-3 and 5. It is being staffed with existing employees hired to operate the program. A breakdown of costs at this point is as follows.

Capital cost $2,100,000 Annualized over a ten-year period for an annual cost of $210,000

Current annual labor costs to handle this tonnage level $270,000

Additional maintenance cost $ 21,000

Total Annual Cost $501,000

Total tonnage processed 30,000

Cost per ton process $501,000/30,000tons = $16.70/ton

Cost to ship 21,600 tons to Synagro (Current end market) $8/ton

Cost for shipping 21,600 tons x $8.00/ton = $172,800

Total Annual cost for current tonnage (Including freight) $673,800

Current Annual cost per ton $22.46

*\*These numbers include the sorting station even though it will not be acquired and installed until 2016*

**Proposed Expansion #1 Fiscal Year 2017/18**

**Construct & Operate Compost Facility**

This expansion begins a process of increasing both, the green waste and other feed stocks necessary to the creation of the compost. Specifically, the Department would start to work with local dairies and feed lots to accept their manure into the program (this material generally is being spread on land owned by those entities. However, they are beginning to look for additional options to reduce the amount of manure currently being land applied). The estimate to operate is that the Department will attract 20,000 tons of this new material and will charge the ½ price rate for recycling. That will produce a revenue offset of $450,000 and will be backed out of the cost as shown below.

This expansion level would require the Department to acquire line Items 6 – 8 as listed above. The cost factors at this level would be as follows:

Capital cost $ 6,280,000 Annualized over a 20-year period for an annual cost of $314,000

Additional labor costs to handle this tonnage level $ 90,300

Additional maintenance/Ops cost $ 75,000

Total Additional Annual Cost $479,300

Total tonnage processed 50,000

New Total Annual Cost $501,000 + $479,300 = $980,300

**Expected revenue offsets**

New waste stream accepted due to compost program $450,000

Sale of finished compost to various markets (25,000 tons x $10 ton) $250,000

Total annual revenue offsets $700,000

Net program cost: $980,300 - $700,000 = $280,300

Net cost per ton: $280,300/50,000 tons = $5.61/ton



**BENA FACILITY**

**Current Operations**

Currently it is required that the L3 Star Screen be transported to the facility weekly and all compostable organic material brought to the facility be sorted and cleaned. The clean organic material is then used as Alternative Daily Cover (ADC). The Department recognized the inefficiency of transporting the equipment weekly from the Shafter facility as well as the problem caused by not being able to process at both sites simultaneously. In order to correct the problem a second L3 Star Screen was approved for purchase as well as an additional staff member to operate the program. Cost to achieve the current operations are as shown below:

Capital Cost:

1. Dedicated loader for Star Screen Approximate cost $ 250,000
2. Skid steer loader Approximate cost $ 30,000
3. Star Screen (Determined to be the Komptech L3) Approximate cost $ 750,000

Total Capital Expense $1,030,000

Performing this sort on the grass would increase the labor cost for the program significantly. It is anticipated that it would take three staff members, two days per week to operate the equipment and produce the cleaned material. It is estimated that the green waste material would break down as follows: 72% usable grass, 18% overs being sent to the active face, 10% residual being taken to the face for disposal. Given this assumption the annual cost breakdown would be as follows:

Additional Capital cost $1,030,000 annualized for ten years $103,000

Additional labor cost for program $ 90,300

Additional maintenance/Ops cost $ 5,000

Additional Annual Cost $198,300

New total annual tonnage processed 20,000

Current cost per ton of program: $198,300/20,000 tons = $9.92/ton

It is anticipated that the Department will discontinue the ADC program in the near future and begin shipping the cleaned material to either the Mount Vernon facility or the Synagro facility. Shipping the material will add additional cost to the program. Those costs are estimated to be the following:

Shipping cost for new tonnage 14,400 tons x $8.00/ton = $115,200

Total Annual cost $198,300 + $115,200 = $313,500

Cost per ton of program: $15.68/ton

*Approximately 14,400 tons of material will be sent to either Synagro or to the Mt Vernon facility. This split will have to be determined in the operations phase but $50,000 per year has been added to the expected cost of the Mt Vernon Facility contract as a worst case scenario. In order to not double count that expense it is not being included here.*

**TAFT FACILITY**

The Compostable Organics Program requires that we implement an organics program at most sites. At the Taft SL the current waste stream of green waste is approximately 500 tons per year. This is a marginal volume and the material coming to the facility is clean enough to allow on-site staff to separate the material for shipment to Synagro.

The cost to handle this waste stream is as follows:

Loading Cost: $3. 00 X 500 tons = $1,500

Shipping Cost: $8.00 x 500 tons = $4,000

Total cost to divert green waste at Taft = $5,500

Cost per ton = $5,500/500 tons = $11.00/ton

**KERN VALLEY FACILITY**

The Kern Valley site is located in a rural area which allows for the exemption of the requirements for commercial entities to participate. Due to the low volume of material in this area, combined with the remoteness of processing facilities, this area is being exempted from the program.

The program can be re-evaluated for possible inclusion at a later date if the situation warrants.

**RIDGECREST FACILITY**

The Compostable Organics Program, as previously stated, will require that we implement an organics program at sites currently not participating in the program. However, the Ridgecrest SL waste stream of green waste is approximately 3,100 tons per year. This tonnage is significant and large enough that a method to handle it would need to be implemented.

**Current Operations**

Current operations is material, is comingled with waste, and disposed.

The cost to handle this waste stream is, therefore, as follows:

Per ton operations charge: $12.20 X 3,100 tons = $37,820

Per ton BOE payment: $1.40 x 3,100 tons = $4,340

Total cost to dispose green waste at Ridgecrest = $42,160

**Proposed Expansion #1 Fiscal Year 2016/17**

**Ship Green Waste to Bena from Ridgecrest**

This expansion level will require that the grass be kept separate from the waste and shipped separately to the Bena SL for diversion. This requires that some mechanism be put in place to load the material into transport vehicles and that the material be transported to Bena or Mojave for processing.

The Department has been anticipating taking on the diversion work at this facility and this would facilitate that implementation. To create this area, and start the diversion activities, the following would be needed:

1. Dedicated loader for operation Approximate cost $ 200,000
2. Skid steer loader Approximate cost $ 30,000
3. Fuel tanks, Office trailer other improvements Approximate cost $ 250,000

Total capital cost to create diversion area $ 480,000

The newly-created diversion area would require four staff members to operate.

Additional labor costs (four positions) $ 361,200

Annual Maintenance costs $ 9,600

Capital cost $480,000 annualized over a ten-year period $ 48,000

Labor costs $ 361,200

Maintenance cost $ 9,600

Total $ 418,800

Cost per ton for green waste portion = 20% of cost of diversion area $ 83,760

Cost per ton for shipping to Mojave $12/ton x 3,100 tons $ 37,200

Total cost for green waste portion $ 120,960

Cost per ton: $120,960/3,100 tons = $39.02/ton

**BORON FACILITY**

The Boron site is located in a rural area which allows for the exemption of the requirements for commercial entities to participate. Due to the low volume of material in this area, combined with the remoteness of processing facilities, this area is being exempted from the program.

The program can be re-evaluated for possible inclusion at a later date if the situation warrants.

**MOJAVE FACILITY**

At the Mojave SL the current waste stream of organics is approximately 600 tons per year with 150 tons of wood. This is a marginal volume to support a separate program and that material would have to be transferred to a larger facility with an existing program. However, as the program in eastern Kern County grows and expands this site would be a prime location to handle the material generated in the eastern area.

**Current Operations**

Current operations is material, is comingled with waste, and disposed.

The cost to handle this waste stream is, therefore, as follows:

Per ton operations charge: $12.20 X 750 tons = $9,150

Per ton BOE payment: $1.40 x 750 tons = $1,050

Total cost to dispose organics at Mojave = $10,200

**Proposed Expansion #1 Fiscal Year 2016/17**

**Ship Green Waste to Bena or Mount Vernon from Mojave**

This expansion level will require that the grass be kept separate and shipped to the Bena SL for diversion. This would require that some mechanism be put in place to load the material into transport vehicles and the material be transported to Bena or Mount Vernon facility for processing.

The acceptance of food waste in the program is something that the Department knows will be needed and operational plans to handle that material have been reviewed. At first, that portion of the program would be handled by creating a bunker collection point for food waste and co-mingling that material with sufficient grass clippings to control the moisture. Once mixed that material would be shipped to the Mount Vernon Compost Facility until such time as the Department completed the construction of the Mojave Compost Facility (currently slated for 2019).

The Department has been anticipating taking on the diversion work at this facility and this would facilitate that implementation. Opening this diversion area is expected to increase the tonnage diverted by the facility significantly. It is also anticipated that the compostable organic material diverted would increase to approximately 3,100 tons. To create this area, and start the diversion activities, the following would be needed:

1. Dedicated loader for operation Approximate cost $ 200,000
2. Skid steer loader Approximate cost $ 30,000
3. Fuel tanks, Office trailer other improvements Approximate cost $ 250,000

Total capital cost to create diversion area $ 480,000

The newly-created diversion area would require four staff members to operate.

Additional labor costs (four positions) $ 361,200

Annual Maintenance costs $ 9,600

Capital cost $480,000 annualized over a ten-year period $ 48,000

Labor costs $ 361,200

Maintenance cost $ 9,600

Total $ 418,800

Cost per ton for green waste portion = 20% of cost of diversion area $ 83,760

Cost per ton for shipping to Bena $12/ton x 3,100 tons $ 37,200

Total cost for green waste portion $ 120,960

Cost per ton: $120,960/3,100 tons = $39.02/ton

**Proposed Expansion #2 Fiscal Year 2017/18**

**Sort and Clean Green Waste at Mojave**

**Accept Curbside Green Waste/Purchase L3 Star Screen**

In order to handle the eastern region of Kern County a new diversion operation which includes compostable organics diversion would have to be constructed, staffed, and operated. In order to begin this operation, the following would be needed:

1. Star Screen (determined to be the Komptech L3 ) Approximate cost $ 750,000
2. Dedicated loader for Start Screen Approximate cost $ 200,000
3. Brush Grapple Bucket Approximate cost $ 20,000
4. 20,000ft2 of concrete for material processing area Approximate cost $ 300,000
5. Sorting station to process overs from Start Screen Approximate cost $ 50,000
6. Slow Speed Shredder to size reduce overs Approximate cost $ 700,000

Total Capital Costs $2,020,000

Capital cost $2,020,000 Annualized over a 10-year period for an annual cost of $ 202,000

Additional labor costs to handle this tonnage level (four positions) $ 361,200

Additional maintenance/Ops cost $ 120,000

Total Additional Annual Cost $ 683,200

Total tonnage processed 50,000

Cost per ton for shipping to Bena $12/ton x 35,000 tons = $420,000

New Total Annual Cost = $120,960 + $683,200 + $420,000 = $1,224,160

Cost Per ton $1,224,160/50,000 =$24.48/ton

**Proposed Expansion #3 Fiscal Year 2019/20**

**Construct & Operate Compost Facility**

1. Gore Compost Facility Approximate cost $6,000,000
2. Additional loader for this operation Approximate cost $ 200,000
3. Skid steer loader Approximate cost $ 30,000
4. Fuel tanks, Office trailer other improvements Approximate cost $ 250,000

Total Capital Improvements for Compost Facility $6,480,000

Capital cost $6,480,000 Annualized over a 10-year period $ 648,000

Additional labor costs to handle this facility (four positions) $ 361,200

Additional maintenance/Ops cost $ 20,000

Total Additional Annual Cost for Compost facility $1,029,200

Expected revenue offsets

New waste stream accepted due to compost program $450,000

Sale of finished compost to various markets (25,000 tons x $10 ton) $250,000

Total annual revenue offsets $800,000

Net program cost: $120,960 + $683,200 + $1,029,200 - $800,000 = $1,033,360

Net cost per ton: $1,013,360 /50,000 tons = $20.27/ton

**TEHACHAPI FACILITY**

The Tehachapi SL waste stream of green waste is approximately 600 tons per year. This is a marginal volume to support a separate program and that material would have to be transferred to a larger facility with an existing program.

**Current Operations**

Current operations is material, is comingled with waste, and disposed.

The cost to handle this waste stream is, therefore, as follows:

Per ton operations charge: $3.70 X 600 tons = $2,220

Per ton BOE payment: $1.40 x 600 tons = $840

Total cost to dispose green waste at Tehachapi = $3,060

**Proposed Expansion #1 Fiscal Year 2016/17**

**Ship Green Waste to Bena from Tehachapi**

This expansion level will require that the grass be kept separate from the waste and shipped separately to the Bena SL for diversion. This would require that some mechanism be put in place to load the material into transport vehicles and the material be transported to Bena for processing.

Loading cost $10 ton x 600 tons = $6,000

Shipping cost 600 tons x $9.25/ton = $5,550

Total Annual cost at expansion level 1 $6,000 + $5,500 = $11,500

Cost per ton for program: $11,500/600 tons = $19.17/ton

**Capital Expense Line Item By Fiscal Year**

 **Line Item Cost Year**

 **Shafter**

1. Star Screen (determined to be the Komptech L3 ) Approximate cost $ 750,000 14/15
2. Dedicated loader for Start Screen Approximate cost $ 200,000 14/15
3. 20,000 ft2 of concrete for material processing area Approximate cost $ 300,000 15/16
4. Sorting station to process overs from Start Screen Approximate cost $ 150,000 16/17
5. Slow Speed Shredder to size reduce overs Approximate cost $ 700,000 15/16
6. Gore Compost Facility Approximate cost $ 6,000,000 17/18
7. Additional loader for compost operation Approximate cost $ 250,000 17/18
8. Skid steer loader Approximate cost $ 30,000 17/18

**Bena**

1. Dedicated loader for Star Screen Approximate cost $ 250,000 14/15
2. Skid steer loader Approximate cost $ 30,000 14/15
3. Star Screen (Determined to be the Komptech L3 ) Approximate cost $ 750,000 15/16

**Ridgecrest**

1. Dedicated loader for operation Approximate cost $ 200,000 16/17
2. Skid steer loader Approximate cost $ 30,000 16/17
3. Fuel tanks, Office trailer other improvements Approximate cost $ 250,000 16/17

**Mojave**

1. Dedicated loader for operation Approximate cost $ 200,000 16/17
2. Skid steer loader Approximate cost $ 30,000 16/17
3. Fuel tanks, Office trailer other improvements Approximate cost $ 250,000 16/17
4. Star Screen (Determined to be the Komptech L3) Approximate cost $ 750,000 17/18
5. Dedicated loader for Start Screen Approximate cost $ 200,000 17/18
6. Brush Grapple Bucket Approximate cost $ 20,000 17/18
7. 20,000 ft2 of concrete for material processing area Approximate cost $ 300,000 17/18
8. Sorting station to process overs from Start Screen Approximate cost $ 50,000 17/18
9. Slow Speed Shredder to size reduce overs Approximate cost $ 700,000 17/18
10. Gore Compost Facility Approximate cost $ 6,000,000 19/20
11. Additional loader for this operation Approximate cost $ 200,000 19/20
12. Skid steer loader Approximate cost $ 30,000 19/20
13. Fuel tanks, Office trailer, other improvements Approximate cost $ 250,000 19/20

**Implementation Schedule & Annual Cost**

 14/15 15/16 16/17 17/18 18/19

**Shafter**

Capital Cost $ 950,000 $1,000,000 $ 150,000 $ 6,280,000 $ 0

Additional Labor Cost $ 180,600 $ 90,300 $ $ 90,300 $ 0

Maintenance/Ops Cost $ 21,000 $ 0 $ $ 75,000 $ 0

Possible Revenue $ 0 $ 0 $ $ 700,000 $ 0

**Bena**

Capital Cost $ 280,000 $ 750,000 $ 0 $ 0 $ 0

Additional Labor Cost $ 0 $ 90,300 $ 0 $ 0 $ 0

Maintenance/OPS Cost $ 5,000 $ 15,000 $ 0 $ 0 $ 0

Possible Revenue $ 0 $ 0 $ 0 $ 0 $ 0

**Taft**

Capital Costs $ 0 $ 0 $ 0 $ 0 $ 0

**Kern Valley**

Capital Costs $ 0 $ 0 $ 0 $ 0 $ 0

**Ridgecrest**

Capital Cost $ 0 $ 0 $ 480,000 $ 0 $ 0

Additional Labor Cost $ 0 $ 0 $ 361,200 $ 0 $ 0

Maintenance/Ops Cost $ 0 $ 0 $ 9,600 $ 0 $ 0

**Boron**

Capital Costs $ 0 $ 0 $ 0 $ 0 $ 0

**Mojave**

Capital Cost $ 0 $ 0 $ 480,000 $ 2,020,000 $ 6,480,000

Additional Labor Cost $ 0 $ 0 $ 361,200 $ 361,200 $ 361,200

Maintenance/OPS Cost $ 0 $ 0 $ 9,600 $ 120,000 $ 20,000

Possible Revenue $ 0 $ 0 $ 0 $ 0 $ 800,000

**Tehachapi**

Capital Costs $ 0 $ 0 $ 0 $ 0 $ 0

**City of Bakersfield**

Annual Cost $ 0 $1,050,000 $1,100,000 $1,150,000 $1,200,000

**Annual Cost Summary**

TOTALS 14/15 15/16 16/17 17/18 18/19

CAPITAL COST $1,230,000 $1,750,000 $1,110,000 $ 8,300,000 $ 6,480,000

LABOR COST (Add) $ 180,600 $ 180,600 $ 722,400 $ 451,500 $ 361,200

(# OF NEW POSITIONS) (2) (2) (8) (5) (4)

MAINTENANCE COSTS $ 26,000 $ 15,000 $ 19,200 $ 195,000 $ 20,000

 (Additional)

CONTRACT COSTS $ 0 $1,050,000 $1,100,000 $ 1,150,000 $1,200,000

 (Additional)

REVENUE $ 0 $ 0 $ 0 $ 700,000 $ 800,000 (Additional)



**Commercial vs. Residential Tonnage**

The Department currently receives significant amounts of green waste material from various sources. However, very little of the material is claimed as commercial. In order to try and estimate the amount that might be coded commercial, a query was performed by vehicle type bringing the material to the facilities. All cars and pickup trucks were listed as residential while all other larger vehicle types were listed as commercial. The results of that query are as follows:

