



# THE RAWHAY VALLEY SEWERAGE AUTHORITY BIOSOLIDS PROCESSING AND BENEFICIAL REUSE PROJECT

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# PRESENTATION OVERVIEW

1. Biosolids Processing
2. RVSA RFP for Biosolids Hauling and Beneficial Reuse Contract
3. Contract Implementation & Land Application For RVSA

# RVSA Biosolids Processing

1. RVSA Biosolids Process Train consisting of:
  - I. Three anaerobic digesters (1 Million gallons each)
    - I. Co-Digesting Biosolids and Food-Waste
  - II. Dewatering centrifuges
  - III. Indirect Biosolids dryer
2. Annual Biosolids production of approximately 2,500 dry tons

# RVSA Biosolids Processing (continued)

## RVSA Sludge Dewatering Facility

- Two Centrisys CS21-4 Centrifuges
  - 180 gpm max throughput each
  - Produces a Class B dewatered cake of approximately 23% solids



# RVSA Biosolids Processing (continued)

## RVSA Sludge Drying Facility

- One Komline-Sanderson Biosolids Dryer
  - 9,700 lbs per hour throughput
  - Produces an average dry product of 95% Class A Biosolids
  - Utilizes waste heat from Cogeneration Engines





# RVSA Biosolids Processing (continued)

Final product is screened into three categories:

- The Overs →  
(greater than 15 mm) are discharged to a dumpster for disposal
- The Fines  
(less than 1 mm) are returned to the front of the dryer and reprocessed
- The Final Product →  
Transported to trailers for removal



# Biosolids Processing (continued)

## Benefits to the Sludge Drying Facility

- Reduced Shipping Cost
  - Annual production of 2,500 dry tons of Biosolids equates to:  
10,870 wet tons of 23% dewatered cake, OR  
2,632 wet tons of 95% dried solids  
(This takes 360 trucks off the road each year)
  - Potential savings in excess of \$800,000 per year (Conservative estimate of \$100/ton)
- Potential market for Class A Biosolids
  - Land application
  - Cement Kiln
  - Landfill daily cover

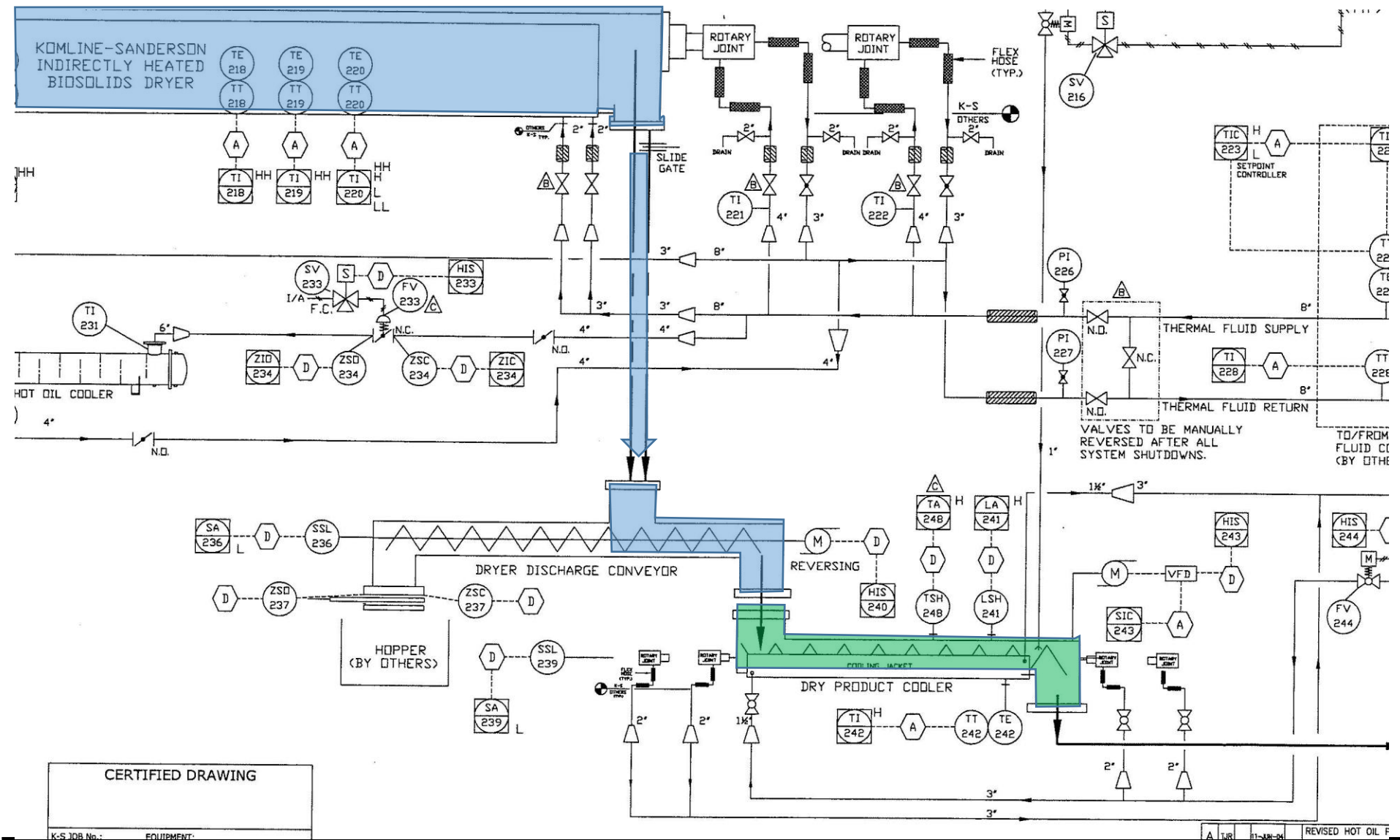
# Design Considerations for Biosolids Processing

## Challenges to Sludge Drying and Design Considerations

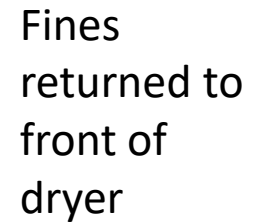
- Material Handling
  - “Chutes and Ladders”
  - A breakdown of any one step shuts the whole system down
- Non-Uniform Product Size
  - Pelletizer
- Dust
- Redundancy
- Overage handling and protection from foreign material



# Chutes and Ladders

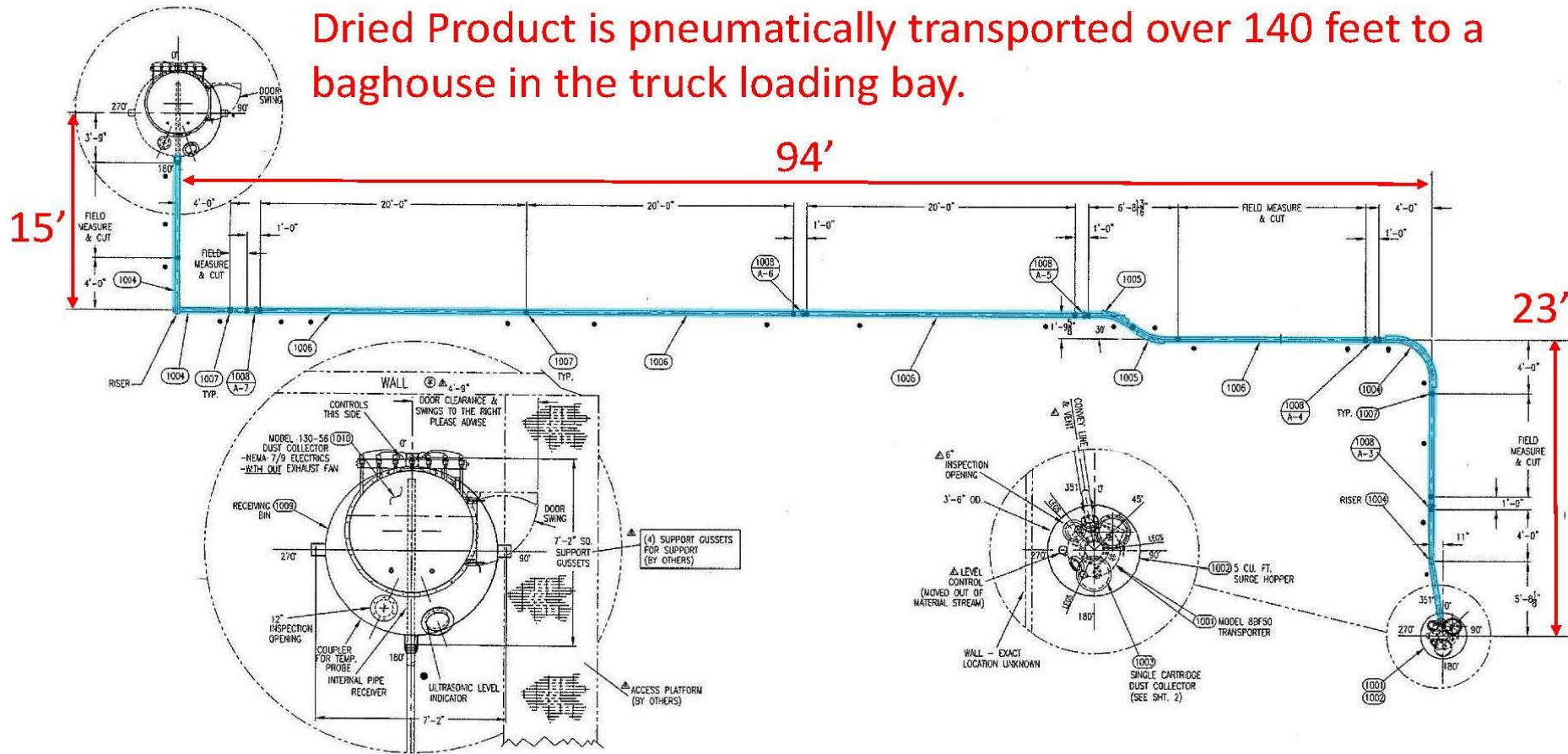


(continued)



# Chutes and Ladders (continued)

Dried Product is pneumatically transported over 140 feet to a baghouse in the truck loading bay.



FINAL APPROVED DWGS

# Chutes and Ladders (continued)

Once the dried material is at the truck loading bay the chutes and ladders continues with:

- Ribbon mixer which applies a de-dusting oil
- Inclined conveyor to a reversing screw feeding each truck bay
- Truck loading screw with shoots to evenly distribute product across the trailer



# Overages

- During the original operation of the dryer, both the overages and the fines were returned to the front of the dryer.
- Foreign material was therefore not discovered and caused damage to the paddle coatings.

Inside sludge dryer looking towards Dried Product End of dryer where product will be discharged



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# Biosolids Hauling and Beneficial Reuse

RVSA issued an RFP in November of 2019 under the Marketing of Recyclable Materials exemption to the NJ Local Public Contracts Law.

This exemption allowed us to:

1. Extend beyond a standard 3 year hauling contract
2. Allow discussions and negotiations with proposers
3. Select based on factors beyond price
4. Benefit from potential future market of dried product



# Biosolids Hauling and Beneficial Reuse

RVSA Received 3 proposals which were evaluated using the following categories:

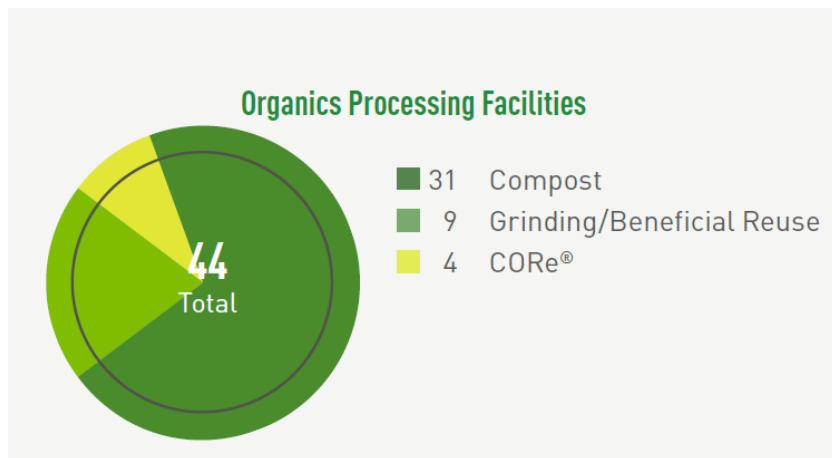
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|--|-----|
| i. Qualifications and Experience                                       | 20% |
| ii. Technical Approach   | 20% |
| iii. Business Proposal   | 10% |
| iv. Economic Proposal  | 50% |
| a. Cost of disposal (both A and B)                                     |     |
| b. Economic Benefit resulting from beneficial use of Class A Biosolids |     |

Based on the results of the evaluation criteria, RVSA selected Waste Management as the preferred vendor and entered into a 5-year contract on March 10, 2020.

# CONTRACT IMPLEMENTATION & LAND APPLICATION FOR RVSA

# Waste Management Organics At-A-Glance

**3.5 Million Tons per year of Organic Material Recycled**



- Manage 3 million+ tons per year of biosolids across US and Canada
- Administer biosolids land application and processing programs in several areas across the US & Canada
- WM Organics and Market Area Team includes the following specialists:
  - Agronomist
  - Wastewater Engineers
  - Environmental Protection Managers
  - Transportation/Logistic Managers
  - Project Managers

# RVSA Biosolids Management Plan

## Developing a Management Plan

- Mutual goal to beneficially reuse RVSA biosolids in an environmental responsible manner
- WM contracted with Jesse Baro Trucking to provide hauling and land application services. Jesse Baro has decades of experience with land application, and maintains ample acreage in PA.
- WM and RVSA recognized that the dried biosolids had limited history with direct land application. Proper characterization required. Management Plan was designed in two phases:

### Phase 1

- Anticipated to last approx. 12 months
- Direct portion of biosolids to land application sites that are closely monitored.
- Spread biosolids using conventional ag spreaders, log observations.
- Stockpile biosolids in controlled setting – determine ability to store biosolids.
- Utilize WM's landfill locations as backup disposal during Phase 1
- Work with RVSA to make reasonable changes to their process as needed.

### Phase 2

- Commencement based on outcome of Phase 1 (COVID-19 delays).
- Direct majority of RVSA biosolids to land application – direct application, topsoil blending, topsoil manufacturing or other Class A processing.
- Utilize WM developed compost facilities as additional beneficial use outlets.
- Develop Class B outlets for periods when drier is down.

# Beneficial Use Findings and Action Plan for 2021

## Findings:

- **COVID-19.....** Contract commenced in April 2020. WM & RVSA staff prohibited from in person observations of land application events.
- **Material has high level of dust. Dust issues were observed at WM landfill locations and land application sites. To properly manage dust, the following was initiated:**
  - RVSA attempted to adjust level of drying (typically ~95%), down to 90-92%. Operational challenges prevented this from becoming routine operation
  - Land application only to occur at sites with ample property, adequate buffer and in no wind conditions.
  - Trailer dumping at landfill only to take place at period with limited to no wind.
  - Evaluation of alternative dust suppression additives. WM contacted other biosolids drying operations and RVSA drier manufacturer for input. The Andersons was selected for trial.
- **Long-term storage evaluation resulted in consistent reheating (smoldering) in stockpiles of biosolids when field stored for 2-3 weeks or more**
  - Due to reheating, winter applications of biosolids limited due to inability to safely store dried biosolids
- **Nutrient value and crop results (primarily hay ground) performed as expected**

## Action Plan:

- **Full trial of dust suppressant with field studies and landfill activities**
- **Direct material to other approved applications – topsoil, mine land reclamation, composting operations. Outlets that are less vulnerable to dust and reheating**

# Considerations for Biosolids Drying Operations

## Biosolids Beneficial Use Program

### – Current Challenges

- Material quality – odor, dust, storage, contaminants of emerging concern, etc.
- Public acceptance – “not in my backyard” is major challenge. Biosolids often receive negative press, very little acknowledgement of benefits of biosolids.
- Nutrient management / regulations – particularly phosphorus limitations on land application
- PFAS....PFAS.....PFAS – uncertainty with future Federal and State regulations



Biosludged Documentary – Factually Challenged

## Considerations

- Multiple drier trains for redundant operation
- Multi day storage – minimize need to ship product in inopportune times (i.e. weather)
- Further processing – pyrolysis?
  - Improve product quality – minimal odor, increase product value
  - Eliminate contaminants of emerging concern - EPA findings support
- PFAS management – Federal and State regulations are likely (already in some States). Regulations impact on traditional biosolids management outlets?



### POTENTIAL PFAS DESTRUCTION TECHNOLOGY: PYROLYSIS AND GASIFICATION

In Spring 2020, the EPA established the PFAS Innovative Treatment Team (PITT). The PITT was a multi-disciplinary research team that worked full-time for 6-months on applying their scientific efforts and expertise to a single problem: disposal and/or destruction of PFAS-contaminated media and waste. While the PITT formally concluded in Fall 2020, the research efforts initiated under the PITT continue.

As part of the PITT's efforts, EPA researchers considered whether existing destruction technologies could be applied to PFAS-contaminated media and waste. This series of Research Briefs provides an overview of four technologies that were identified by the PITT as promising technologies



Figure 1. Biosolids beneficial use.

[EPA Research Brief – February 2021](#)  
[EPA PFAS Innovative Treatment Team \(PITT\) PowerPoint](#)



## Video of Spreader Loading





# Questions?

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