



Montpelier Water Resource Recovery Facility Biosolids Drying Project Final Design Review

May 24, 2023



Presented By:

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Discussion Topics

- Biosolids Drying / Thermal Conditioning Alternatives
- WRRF Project Benefits
- Additional Project Components
- Project Schedule
- Cost estimates / Finances

Biosolids Drying Equipment Alternatives

INDIRECT HOT WATER BELT DRYER

- Fuel source from biogas (methane) through hot water loop
- Low maintenance / unstaffed operational options
- Proven install history

GASIFICATION / DRUM DRYER

- Fuel source from bio solids with heat recovery
- Moderate maintenance / staffed operations required
- New technology
- PFAS / PFOA Reduction
- Reduced solids disposal with potential renewable biochar byproduct

PYROLYSIS / BIODRYER

- Fuel source from bio solids
- Low maintenance / unstaffed operations options
- New technology
- PFAS / PFOA Reduction
- Reduced solids disposal with established renewable biochar byproduct

Biosolids Dryer Project Layout



PROJECT BENEFITS

- Drying allows for stabilized, reduced solids disposal costs and lower trucking emissions.
- Beneficial use of solids byproduct through use of renewable energy.
- Potential PFAS/PFOA reduction in solids stream at WRRF.
- Resolution of NOAV for odor issues
- Rehabilitation of last major infrastructure component – Secondary Clarifiers



Additional Project Components

NEW PERMITTED AMMONIA LIMITS

- VT DEC has indicated new WRRF permit will have ammonia limits.
- Permit anticipated to be received within the next year. Meet new limit within 5 years.
- Added scope to transfer filtrate to refurbished aeration tank
- Added scope to transfer filtrate from aeration tank to headworks

PROJECT ENERGY COMPONENTS

- Reduce air exchanges in dewatering building
- Extend hot water heating loop to chemical building
- Evaluate combined heating loop with DPW garage – pellet boiler
- Determine capacity of Methane and heat recovery from selected thermal dryer

PROJECT SCHEDULE

- May 2023 – Project Kickoff Meeting
- September, 2023 – 30% Design Workshop
- October 2023 – Equipment pre-selection RFP Issued
- February 2023 – 60% Design Workshop
- July 2024 – 90% Design Workshop
- September 2024 – Project Bid Documents (100% Design)
- December 2024 – Contract Issued
- April 2026 – Project Completion

PROJECT COST ESTIMATES

WRRF Biosolids Upgrade Total Project Cost

Scope	Amount			Notes
	Low Range	Mid Range	High Range	
Capital Construction Cost	\$14,000,000	\$17,400,000	\$22,600,000	Class 4 AACE Cost Estimate (Spring 2022)
Final Design	\$1,458,300	\$1,458,300	\$1,458,300	Based on State funding Curve
Engineering Construction Services	\$760,000	\$760,000	\$760,000	Based on State funding Curve
Subtotal Dryer Project	\$16,218,300	\$19,618,300	\$24,818,300	

Notes

1. Bond Amount for project \$16.4M
2. Unused bond funding from AI/OE upgrade \$4M
3. USDA Grant Funding (with East St. St) \$3.5M
4. Potential for Pollution Control Grant Funding

Biosolids Dryer Economics (2021 – 2022)

Table 5-3. Estimated Alternative Annual Costs

Cost Component	Status Quo	Hot Water Belt Dryer Alternative	Drum Dryer and Gasifier Alternative
Dewatered solids disposal	\$936,000	\$36,000	\$36,000
Dried product management	\$0	\$54,000	\$34,000
Supplemental fuel oil at dryer	\$0	\$9,000 ¹	\$0 ¹
Electricity use at dryer system	\$0	\$38,000	\$38,000
Dryer maint./service costs	\$0	\$20,000	\$60,000
Total annual operating costs	\$936,000	\$152,000	\$166,000
Annualized amortized capital ¹	\$0	\$740,000	\$770,000
Midterm Project Budget	\$936,000	\$894,000	\$935,000

Biosolids Dryer Economics (Present)

Table 5-3. Estimated Alternative Annual Costs

Cost Component	Status Quo	Hot Water Belt Dryer Alternative	Drum Dryer and Gasifier Alternative
Dewatered solids disposal	\$1,350,000	\$48,000	\$48,000
Dried product management	\$0	\$62,000	\$38,000
Supplemental fuel oil at dryer	\$0	\$9,000 ¹	\$0 ¹
Electricity use at dryer system	\$0	\$38,000	\$38,000
Dryer maint./service costs	\$0	\$20,000	\$60,000
Total annual operating costs	\$1,350,000	\$152,000	\$166,000
Annualized amortized capital	\$0	\$1,021,000	\$1,055,000
Midterm Project Budget	\$1,650,000	\$1,140,000	\$1,050,000

PROJECT FUNDING

- USDA Grant / Loan
- VT CLSRLF Design Subsidies
- Pollution Control Grant
- Efficiency Vermont
- Short Term Financing through local bond authorization.



RECOMMENDED ACTION

Approve the draft engineering contract with Brown and Caldwell for final design of the WRRF Biosolids Drying, clarifier upgrade and odor control project with minor revisions as may be required by the funding agencies. Authorize the City Manager or designee to sign the contract and related documents.

QUESTIONS?

