

Northern Exposure: North Conway Septage Receiving and Dewatering Upgrades

NEWEA Annual Conference

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Welcome to North Conway, NH



Population:
2,284



Tourist Destination:
Skiing, hiking, and
exploring Saco River



WRIGHT-PIERCE 
Engineering a Better Environment



North Conway Water Precinct



- Wastewater Treatment Facility (WWTF) constructed in 1995
- 0.6 MGD ADF, 2.3 MGD design
- Serves North Conway, CVFD, Bartlett
- 5-stage Bardenpho process
 - Nitrogen and phosphorus limits
 - Rapid infiltration basins
- 1. Septage Receiving Facility
- 2. Dewatering Operations
 - Sized for regional capacity
 - Four full-time staff plus administration



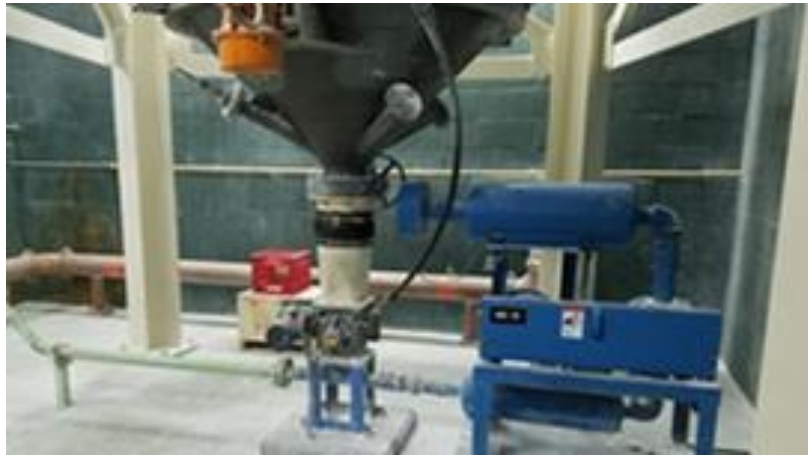
Project Need & Genesis



- **Summary of Challenges**
- **Financial**
 - Chemical Costs
 - Reduced Septage Revenue
 - Rising Personnel Costs
- **Operational**
 - Septage Overload
 - Operator Safety
 - Deferred Maintenance



Sludge Dewatering



Existing System

- Two plate and frame presses
- Waste activated sludge feed (0.7 - 0.9%)
- 2-4 batch per day cycle
- Lime addition
- Ferric chloride addition
- Periodic acid cleaning
- Daily operational babysitting

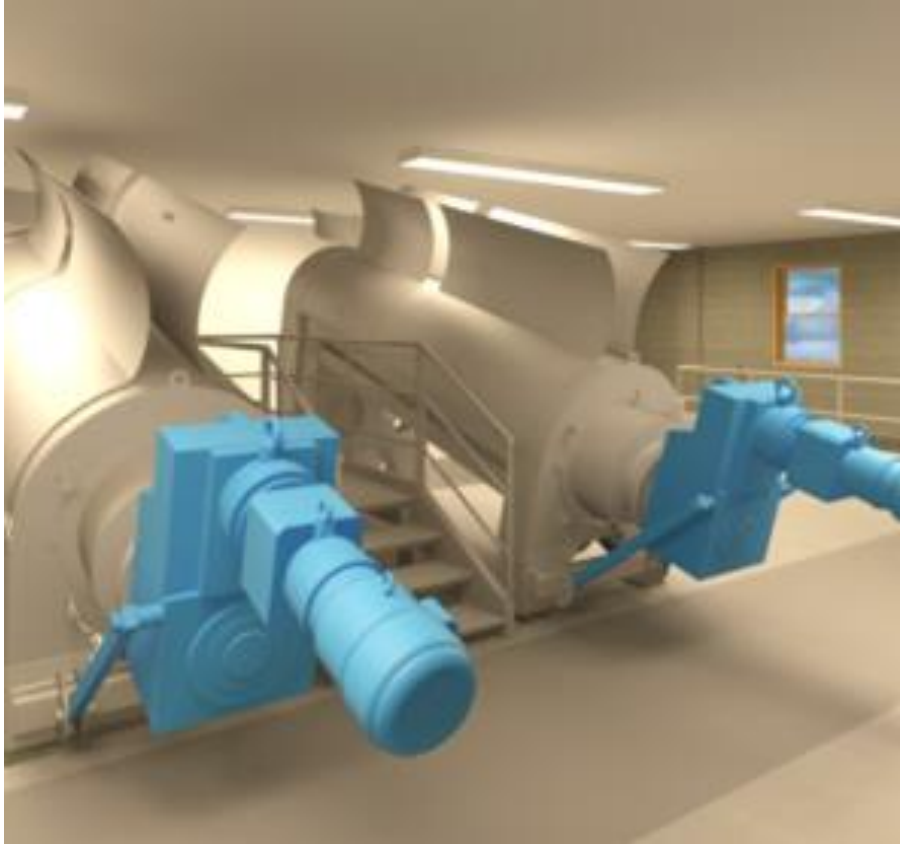
Dewatering Upgrade Need



1. Increased Solids Production
2. Expensive Chemical Costs
3. Aging Equipment
4. Labor Intensive



Sludge Dewatering

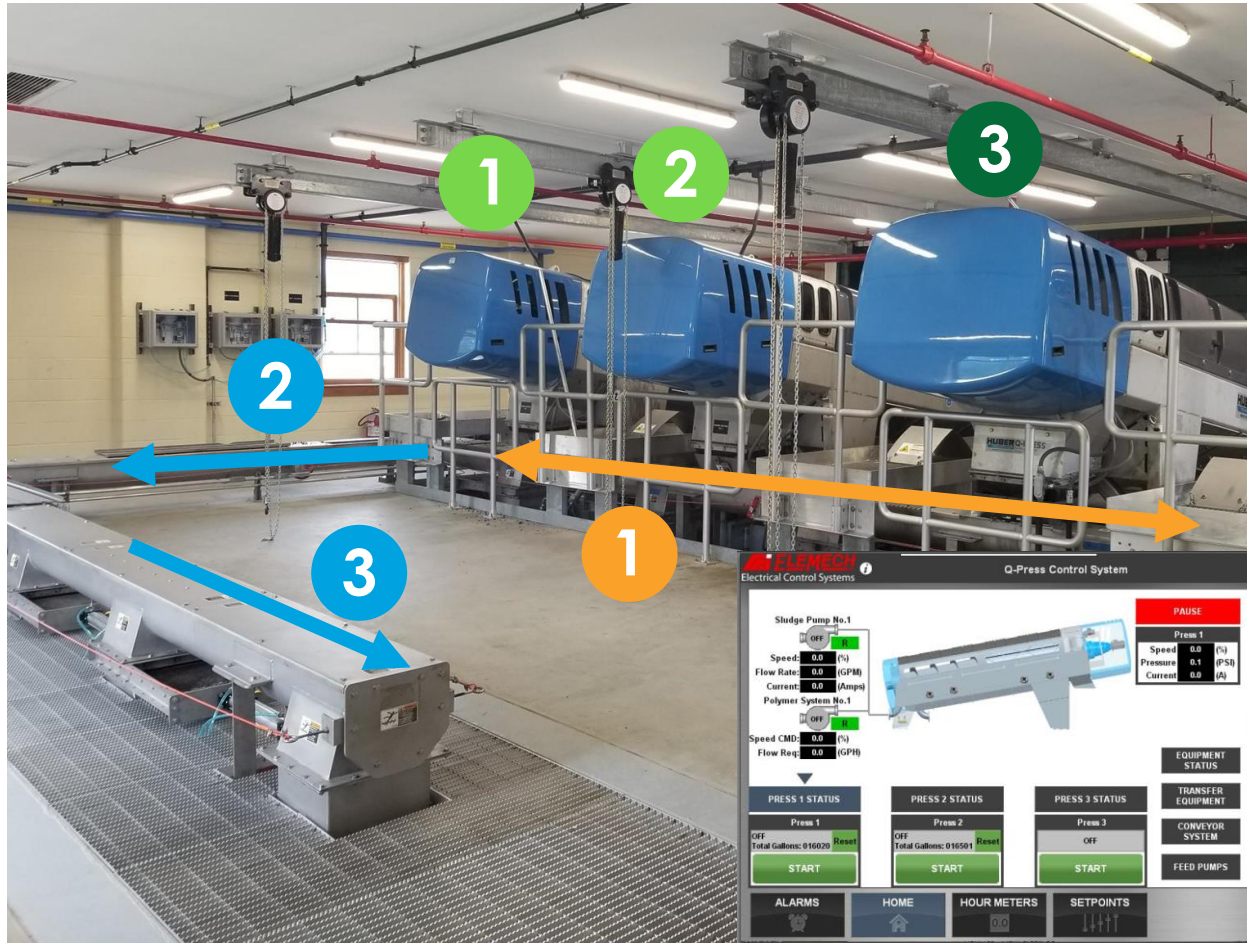


Alternatives Evaluation

- Dewatering performance
- Chemical requirements
- Automated operation capabilities
- System complexity
- Costs (Capital, O&M)



Sludge Dewatering



Design

- Inclined screw press pre-selected
- Low capital cost, O&M cost
- 18% - 20% typ. cake solids performance
- Minimal chemical requirements
- Unattended operation
- Third screw press and conveyors added via change order
- Fully Automated

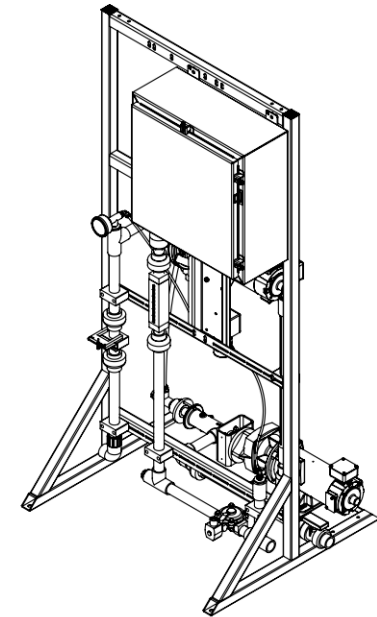


Sludge Dewatering



Design

- New press feed pumps
 - Rotary Lobe
 - Double Disc
- New emulsion polymer system

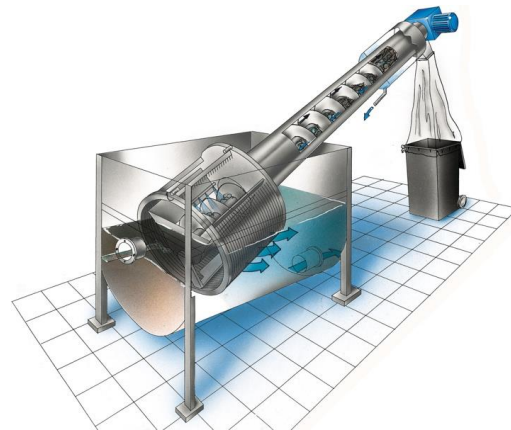


Septage Receiving



Existing System

- 1-2 million gallons of septage per year
- Tank mounted ROTOMAT fine screen
- **Single** septage discharge **connection**
- Manual septage accounting system
- Two 7,000-gallon septage storage tanks
- **Limited** septage receiving **capacity**
- **Limited** septage storage **volume**



Septage Upgrade Need



1. Lack of Storage → Plant Upset
2. High Cost of Solids Dewatering
3. Aging Equipment
4. Hauler Accessibility

Septage Goals



Innovation.
Implement robust state-of-the-art septage technology



Streamline operations.
Improve O&M requirements while valuing operator and hauler needs



Regionalization.
Nestled at the base of the White Mountains, become a septage hot spot



Increase revenue.
Streamline septage accounting to sustain a long-term revenue source



Septage Receiving



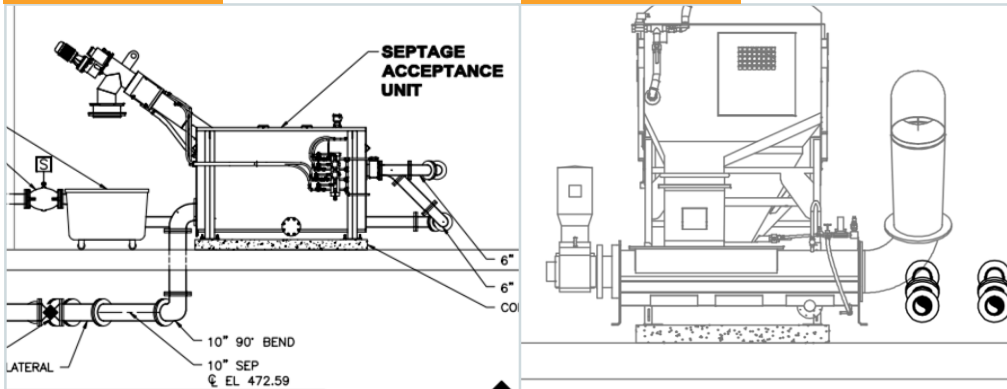
Alternatives

- Single vs. Dual inlet discharge units
- Screening Types
 - Rotamat style (tine and rake)
 - Perforated plate, rotating drum
- Screenings Dewatering
 - Integral to screen
 - Separate wash press
- Pilot Testing for perforated plate style

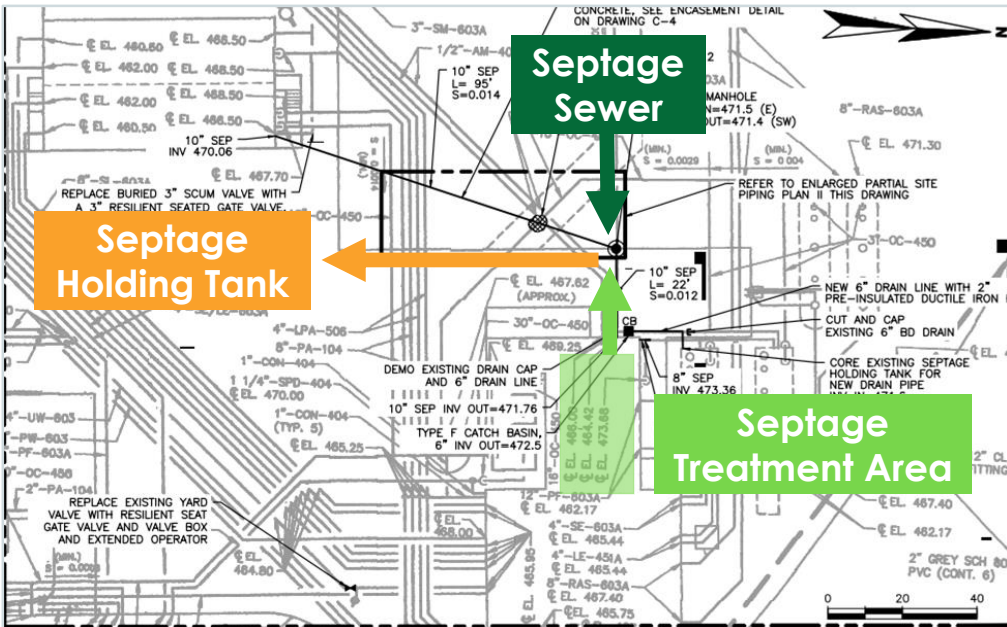
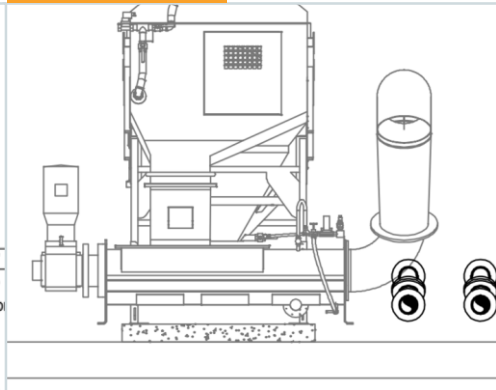


Septage Receiving

Base Bid



Bid Add.



Design

- Equipment bid adder approach
 - Rake and tine (base bid)
 - Perforated Plate (bid alternate)
- Dual discharge style
- Automated accounting system
- New septage sewer to repurpose sludge holding tank
- ~75,000 gallons of septage storage



Septage Receiving

New retro-fitted
septage storage



Septage Receiving

ROFAS Unit

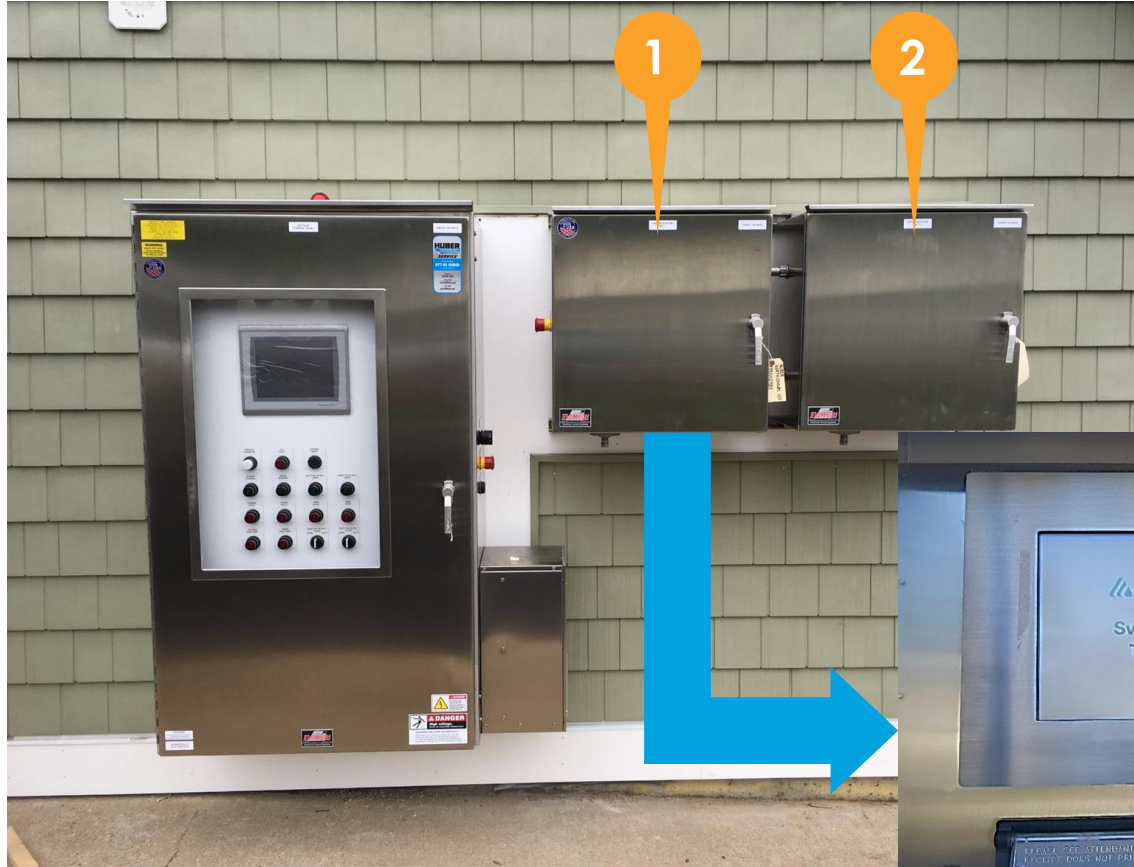


- Rotating perforated plate (ROFAS)
- Up to 1,500 gpm capacity
- Heavy duty wash press
- Continuous Bagger



Septage Receiving

Automated Tracking/Accounting



Dual Inlet



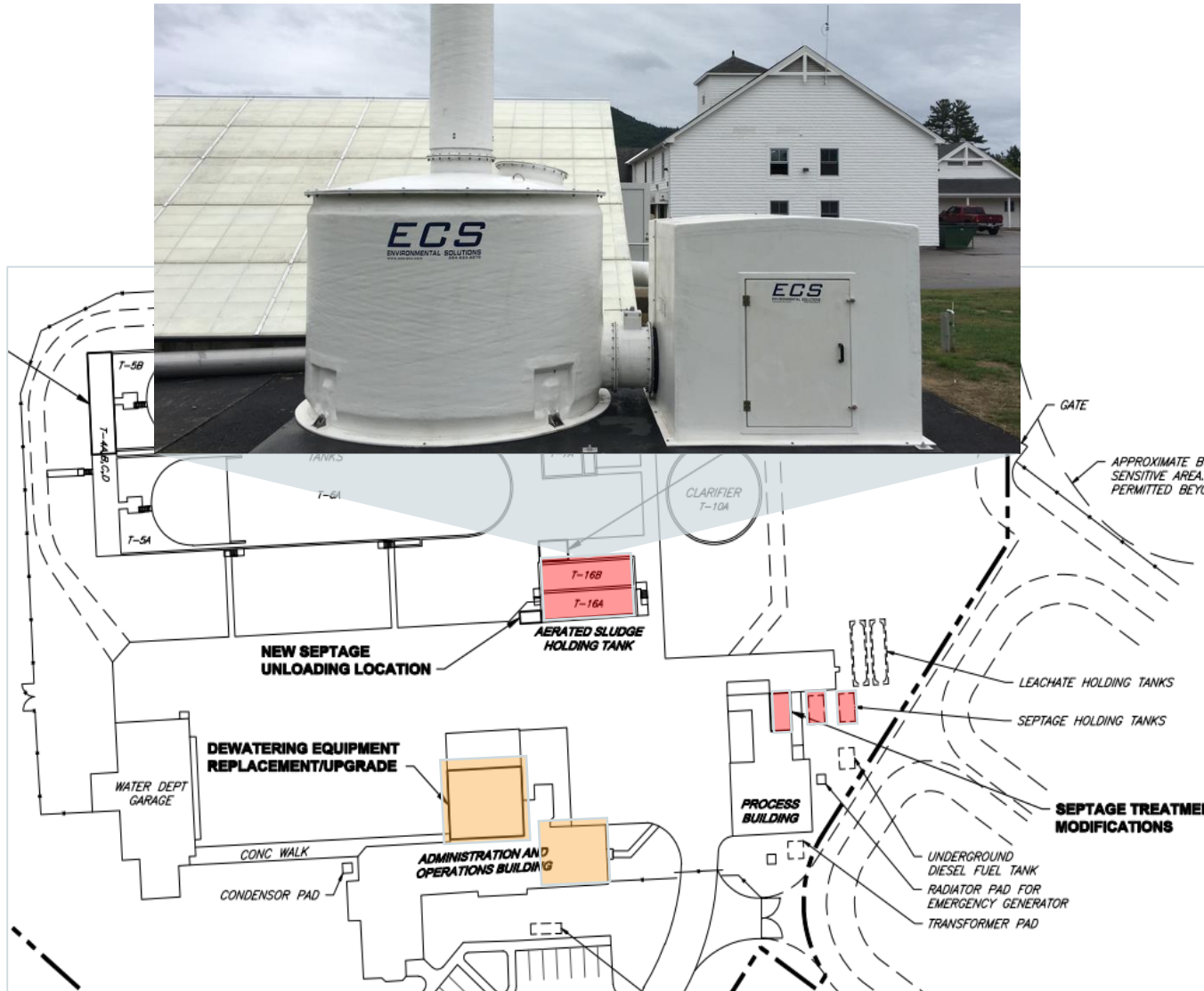
Odor Control



Existing System

- Centralized Pepcon tower odor control for entire site (3 different buildings)
- Wet chemical scrubber
- On-site sodium hypochlorite generation requirements
- Longtime inactive system
- Operationally intensive

Odor Control



Evaluation of Need

- Septage storage (**high**)
- Dewatering Area (**moderate**)
- Existing ferric chloride system
- Headworks (**moderate**)
- Alternative Options

Alternative Options

- Centralized vs. Decentralized
- Seasonal variability
- Wet Chemical scrubber
- Biological odor control
- **Dry Media (Granular Activated Carbon)**



Site Considerations



Project Financial Return

Septage Revenue

Year	Gallons	Revenue
2017	1.7 MG	\$ 151,000
2018	1.8 MG	\$ 175,000
2019	3.1 MG	\$ 282,000
2020	3.6 MG	\$ 321,758

Septage Upgrade Brought Online

*Septage rates dropped from \$0.12/gallon to \$0.09/gallon



Project Financial Return



2020 Cost Impacts

Dewatering:

Chemical Cost Reduction \$156 K

Labor Savings \$60 K

Net Dewatering Savings \$216 K

Septage Receiving:

Additional Revenue \$145K

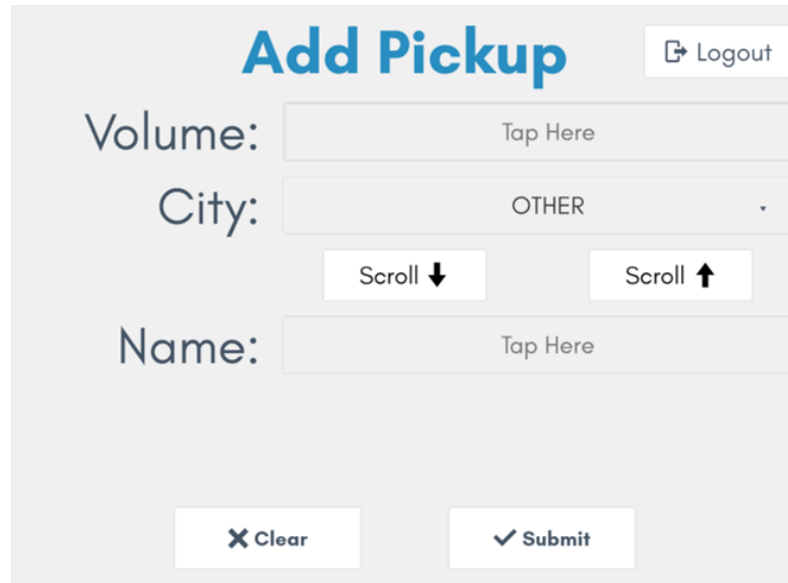
Loan Repayment:

2020 SRF Payment (\$220 K)

Net 2020 Return: \$141 K



Operations Feedback



The screenshot shows a mobile application interface titled "Add Pickup". At the top right is a "Logout" button. Below the title are three input fields: "Volume:" with a "Tap Here" prompt, "City:" with a dropdown menu currently showing "OTHER" and "Scroll ↓" / "Scroll ↑" buttons, and "Name:" with a "Tap Here" prompt. At the bottom are "Clear" and "Submit" buttons.

Septage Receiving

- Simple Interface = Quick Adoption
- Integration of high throughput septage equipment produces clean, dry screenings
- Increased Efficiency for Haulers
- Improved Operational Flexibility



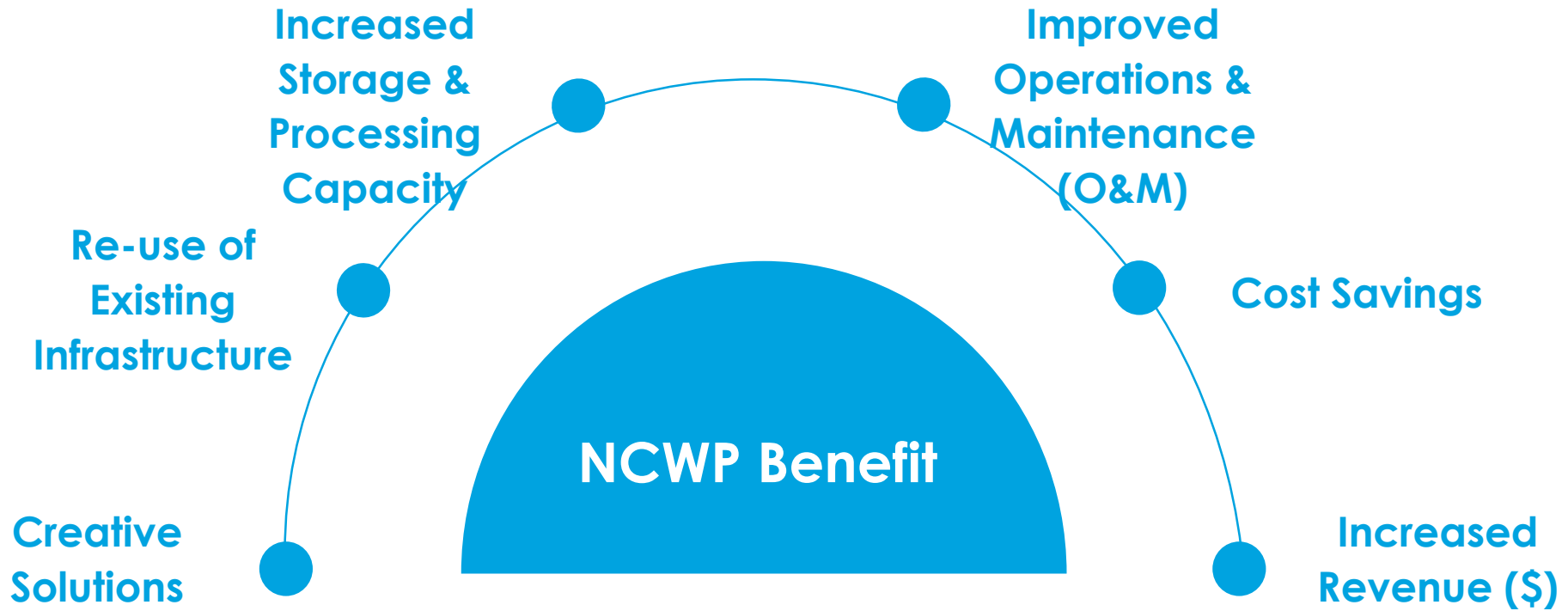
Dewatering System

- Fully automated system reduces operator labor requirements
- Significant chemical cost reduction (saving ~\$156K/year)
- Improved Operator Safety
- Improved Operational Flexibility



Project Outcome

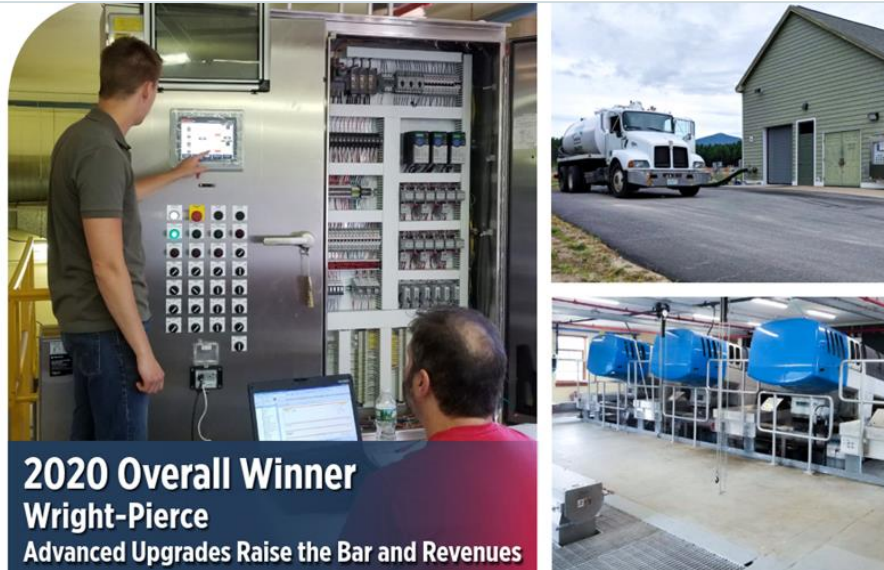
A holistic engineered approach delivered cost-effective and maintenance friendly improvements to the NCWP.



ACEC-NH Engineering Excellence Award



Congratulations



The North Conway Septage & Dewatering Upgrades received the **2020 Overall Winner** of the ACEC-NH Engineering Excellence Award!



Acknowledgements



- Mickey McDonald
- Aaron Bernier
- Tony Paraspolo
- Dennis Aikens
- Peter Labonte



- Bill Ouellette
- Carlin Berger
- Robert Helgesen



- David Bernier
- Michael Curry
- Timothy Vadney



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THANK YOU



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