Joe Ducharme has been with the Clivus companies for over 26 years. Throughout this time he has designed and installed composting and greywater systems that have efficiently and economically provided waste treatment on environmentally sensitive sites and for US Green Building Council projects. He also was a member of the 1994/1995 Title-5 review committee for Composting and Greywater systems regulations that are now in use.

Systems range in size from residential applications to public and commercial facilities which receive thousands of visitors daily, and are demographically diverse throughout North America. His wide-ranging experience and “outside the box” approach have allowed him to provide solutions for difficult projects.

Composting waste treatment systems used with the Nepon 3-oz. Foam-Flush Toilet rely on natural decomposition, conserve both clean water and energy, and reduce dependency on centralized water treatment facilities.

**LEED projects** with Clivus systems accredited to date by Joe include

- University of Vermont - University Heights Residential Learning Center
- Vermont Law School - South Royalton, VT
- Massachusetts Audubon Society Wellfleet Wildlife Sanctuary - Cape Cod
- NH Audubon Society McLane Center at Silk Farm - Concord, NH
- Society for the Protection of New Hampshire Forests - Concord, NH
- Trustees of Reservations Doyle Conservation Center - Leominster, MA
- Green Woodlands - Dorchester, NH
- US Forest Service Administrative Complex - Campton, NH
Composting Waste Treatment Systems
Then & Now
Creative Approach

- Take the blinders off
- Think outside the box

- Designs
- Engineering
- Consulting
- Permitting
- Installation
- Project Management
- 24-Hour Service
- Performance Monitoring
Splitting the waste stream

Blackwater & Greywater
What is Blackwater?

- Toilets
- Urinals
Perception is not always reality
Alternative Technology Toilet Systems
Natural Process
Humus/Composting Toilets

- Aerobic process
- Bacteria & Mold
- Low maintenance
- Self-contained
3-oz Foam Flush
Integrated Building Design
Splitting the waste stream

Blackwater & Greywater
What is Greywater

A Form of Wastewater

- Lavatories
- Showers
- Kitchen Sinks
- Dishwashers
- Janitorial Sinks
- Drinking fountains
- Clothes Washers
- Bathtubs
\[ G = RF + HQE \]

Greywater = reduced flow + higher quality effluent for reuse
Greywater Filtering System

Diagram showing a greywater system with labeled parts:
- Distribution Chamber
- Subsurface Treatment
- Greywater Filter
Typical System Plan
Greywater Filtering System
Recycling Greywater System Model 2000 (P3-0309-370)
Massachusetts Audubon
Wellfleet, MA
Massachusetts Audubon
Wellfleet, MA

U.S. Green Building Council Awarded LEED Platinum

Subsurface Greywater Reuse
AMC Noble View

April 24, 2012
Hermit Island

April 24, 2012
Wastewater Treatment

Hermit Island, Bath, ME
Residential Solution
Nantucket, MA
Greywater Only Discharge
Public Library
Little Compton, RI

Greywater Only Discharge Saves Land
Roadside Rest Area/Visitor Center

Traditional Title 5 Flows

- 5-Gallons Person
- Total traffic = 1250
- 1250 people X 5-Gallons each

Design Flow

- 6,250-GPD
- 150-GPD

- Traditional Waste Treatment System
- Clivus Composting Waste Treatment & Greywater Systems
Roadside Rest Area/Visitor Center

Site Specific Design Flow

Greywater-Producing Fixtures
- 2 ADA lavatories with flow-restricted faucets
- 2 lavatories with flow-restricted faucets
- 1 Janitorial basin
- 1 Drinking fountain

All Lavatories Will Use:
- Flow-restricted faucets rated at .5 GPM, set at a standard 10 seconds per push (wash)
- 6 washes per minute
- 12 washes per gallon (WPG)

Greywater Peak Day Use
- 4 Lavatories:
  - 5 Staff X 3 handwashing +
  - 1235 Visitors X 1 handwashing = 12 WPG
  = 105 gallons
- 1 Janitorial basin = 25 gallons
- 1 Drinking fountain = 20 gallons

Total Greywater Peak Day Use = 150 gallons
Massachusetts Highways
Lancaster Visitor Center (Route 2)

Save Land

Reduced Cost
Misquamicut State Beach
Westerly, RI

- 10,000 peak day
- 2,700-car parking
- Greywater only discharge
- No more water bans
Dramatic water conservation

Misquamicut Beach
Misquamicut Beach

High traffic use area
Sustainable Island Solution
Reduced flows and increased quality of discharge extends S.A.S lifespan
Commercial
Island Terrace Nursing Home
Lakeville, MA

Discharging Greywater Only
U S Forest Service
Campton, NH
White Mountain Administration Complex
Visitor Information Center

White Mountain Administration Complex
Greywater Reuse
Indoor Planters

White Mountain Administration Complex
Nepon 3-ounce Foam Flush

White Mountain Administration Complex
What’s in the basement

White Mountain Administration Complex

Greywater Equipment

Composting Equipment
Doyle Conservation Center
Leominster, MA
U.S. Green Building Council Awarded LEED Silver
Spectacle Island
Boston Harbor

Department of Conservation & Recreation
Interpretive Visitor Center
What’s in the basement
Spectacle Island
Boston Harbor

Greywater Only Discharge
Maine Huts & Trails

Poplar Stream Falls Lodge, Kingfield, ME
Clivus New England, Inc.
Providing Economic Solutions Through Recycling

Joseph A. Ducharme

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E-Mail: JDucharme@clivusne.com
East Matunuck Beach
Opening Spring of 2012
EAST MATUNUCK BEACH PAVILION
BURGIN LAMBERT ARCHITECTS
150 BELLEVUE AVENUE NEWPORT RI 02840
BURGINLAMBERT.COM 401-847-3339

- Re-used building materials will make up a minimum of 5% of the overall materials budget.
- Recycled building materials will make up a minimum of 30% of the overall materials budget.
- Regional building materials will make up a minimum of 30% of the overall materials budget.

- 50% of wood based building products will meet FSC certification.
- The use of low emitting materials will be used throughout.

EAVE OVERHANGS PREVENT HEAT GAIN
NATURAL VENTILATION SYSTEM

MAINTENANCE REQUIREMENTS ARE LIMITED BY THE ABSENCE OF PAINTED OR STAINED SURFACE AREAS. MATERIALS ARE LOCALLY SOURCED WHEN AVAILABLE.

WIND TURBINE
RECYCLED ALUMINUM GUARD RAIL SYSTEM
SOLAR HOT WATER SYSTEM
ALUMINUM ROOFING SYSTEM PREVENTS SOLAR HEAT GAIN
COMPOSTING TOILET SYSTEM
Coastal velocity zone
Compost liquid storage tanks
What’s in the basement

7-P’s

Composting Equipment
Horseneck State Beach

Westport, MA

Over a million gallons of sewage eliminated annually
Located in a coastal velocity zone
Greywater only discharge

Outdoor Rinse Stations
Outdoor rinse stations add no increase to greywater flows
Dedicated access for servicing composting systems
External collection ports for collecting the compost liquid
Compost liquid storage tanks
Camp Wonderland
Sharon, MA

Camp renovations required waste treatment system expansion
Camper cabins

Renovation incorporated strategic planning for composter location
Staff cabins
Staff cabins

Direct access to composting systems
Camper cabins

Utility vault access
Wastewater Treatment

Secure outside access to composting systems
Transportable Trailhead
C-11 Prefabricated Building
Charlestown Breachway
Charlestown, RI
Beavertail State Park
Jamestown, RI
Vermont Law School
U.S. Green Building Council Awarded LEED Silver
University of Vermont
University Heights North Complex
U.S. Green Building Council Awarded LEED Gold
Drinking water
Traditional Flushing Toilets
Traditional Wastewater Flows
Typical System Plan

Recycling Toilet System

General Information

Equipment:
- Composter: One Model M-12
  - MA Plumbing Board Approval P-068-12M
- Toilet Fixtures: Two Nepon Foam STW-30 Foam-Flush Toilet Fixtures, MA Plumbing Board Approval P-6388-778
- Storage Tank: One 50-gallon Storage Tank, Model 4FC 500-1A

Notes:
1. Installation to be done by a Plumber licensed in the Commonwealth of Massachusetts.
2. Clivus New England, Inc., is to oversee installation and certify upon completion.
3. Clivus New England, Inc., is to provide annual inspection and report to the Board of Health if necessary.
4. Clivus liquid end product is to be pumped by a licensed septic baker and disposed or used off-site agriculturally as provided by any regulatory code then in force.
5. All toilet fixtures are power vented through composters. There is to be no other power exhaust in the bathroom. Home design must have enough makeup air in the bathroom for proper operation.
6. Unless otherwise noted, all piping should be schedule 40 PVC pipe.

Thoreau Farm
341 Virginia Avenue
Concord, MA

Scale: As noted
Commercial
Drawn: LT
Checked: JD

Clivus New England, Inc.
P.O. Box 127 N. Andover, MA 01845

Drawing Number: M12-500-2FF