LEWISTON AUBURN
WATER POLLUTION CONTROL AUTHORITY

Facility Location:
535 Lincoln Street
Lewiston, Maine 04240

Serving
Lewiston,
Auburn and
surrounding
communities
since 1974

MISSION STATEMENT

To protect water quality
by providing wastewater
treatment services to
homes, schools, businesses, and
industry in the Twin Cities,
and to provide
septic and holding tank
waste treatment services for
area communities

LAWPCA Snapshot

- Operating since 1974 as a Wastewater Treatment Plant
- Receives flow from Lewiston and Auburn
- Wastewater treatment

  32 million gallons per day (mgd) facility peak capacity

  - 11-12 million gallons per day (mgd) average daily flow
  - 35,000+ domestic users
  - 23 significant Industrial users
  - 26 septic & holding tank waste communities

- Compost Facility in operation since 1993
- Anaerobic Digestion in operation since 2013

LAWPCA Operation

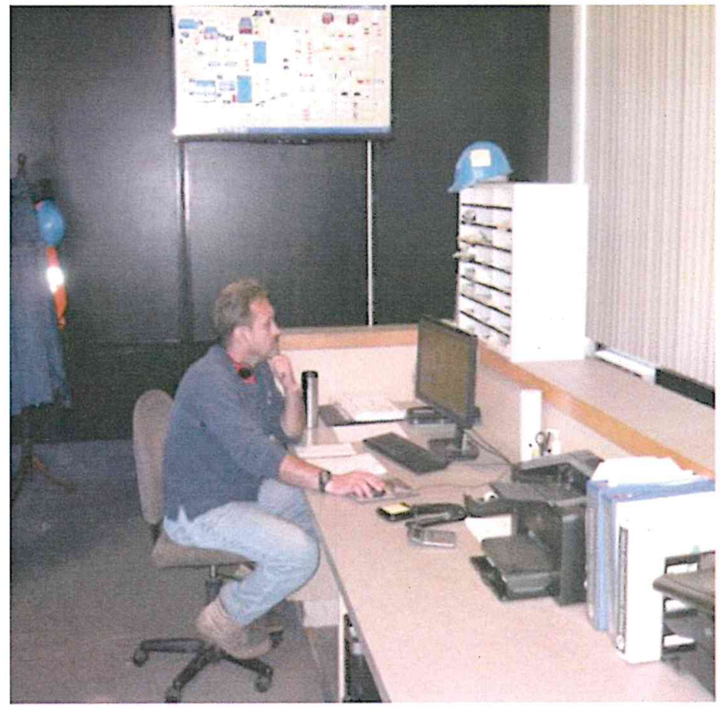
Hours of Operation

Plant is staffed 6 AM to 4 PM
7 days/week
365 days/year
On-call operators from
4 PM to 6 AM

Staffing Levels

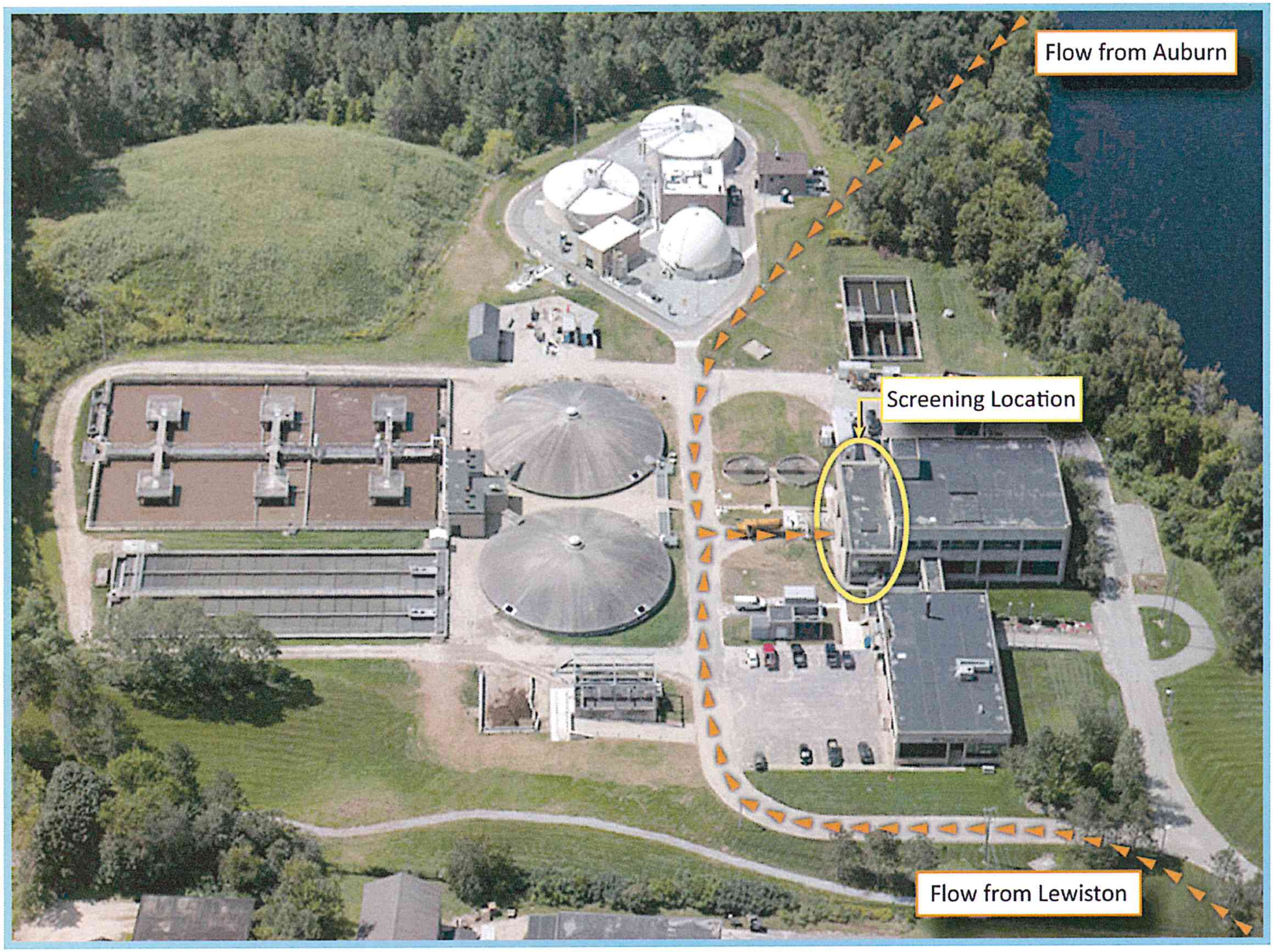
18 Treatment plant staff
3 Compost facility staff

Main WWTP SCADA (Supervisory Control and Data Acquisition) Control Room



How Do We Treat Wastewater?

Step I – Screening



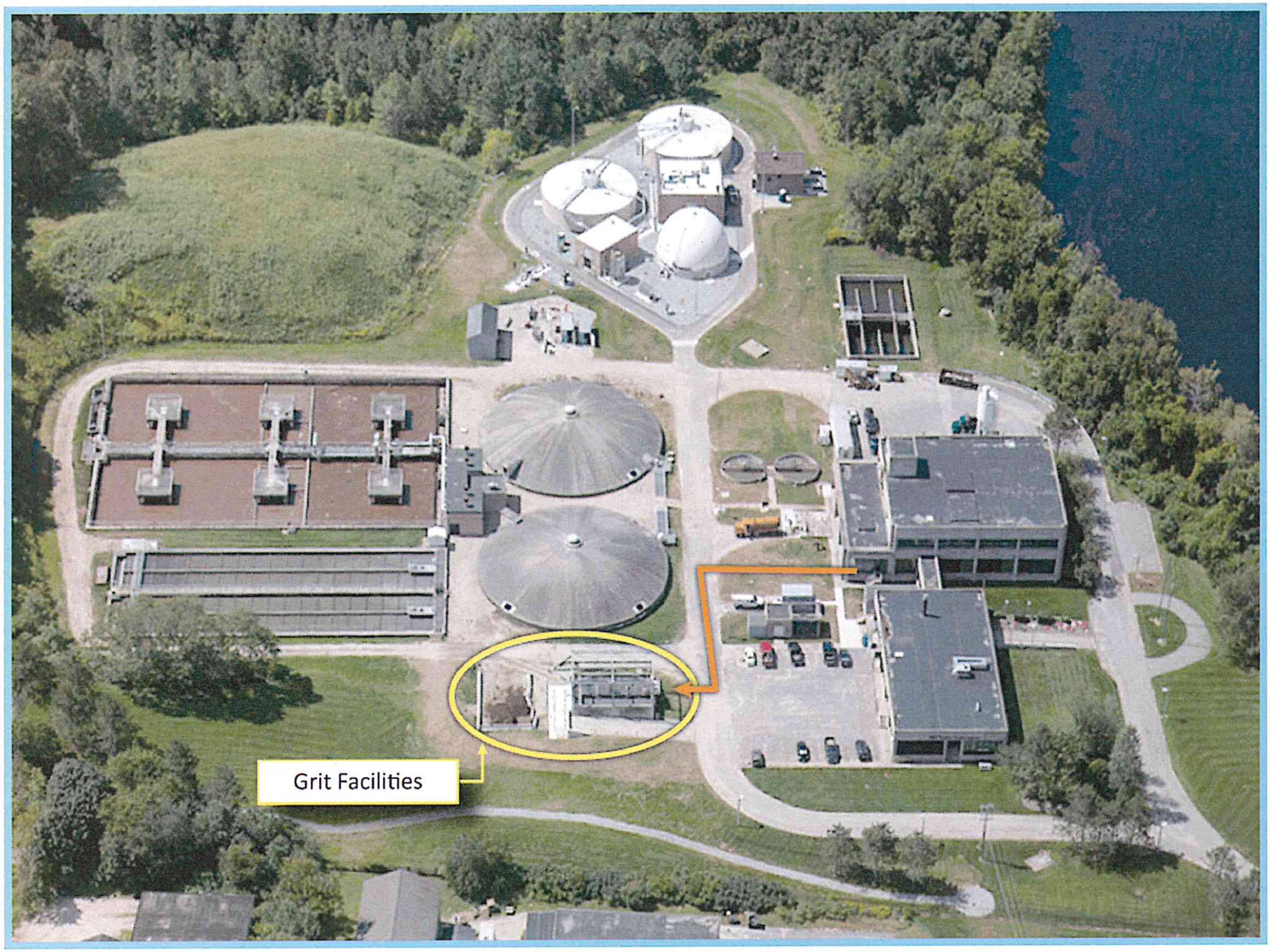
Wastewater enters the plant from Auburn and Lewiston

Screening removes materials ¾-inch or larger including rags, leaves, etc.

Screening material is landfilled

How Do We Treat Wastewater?

Step II – Grit Removal



The grit facility uses air to separate heavy inorganic particles from the waste-water, leaving lighter organic particles

Grit and debris are removed from the wastewater and landfilled

How Do We Treat Wastewater?

Step III – Primary Sedimentation

Wastewater flows to primary sedimentation tanks where more than one-half of the solids are removed

Grease, oils, and other floatable materials are also removed

How Do We Treat Wastewater?

Step IV – Aeration

Wastewater flows to secondary treatment tanks where air is bubbled into it, allowing naturally occurring bacteria to use the waste as their food

Oxygen, mixing, and nutrients provided

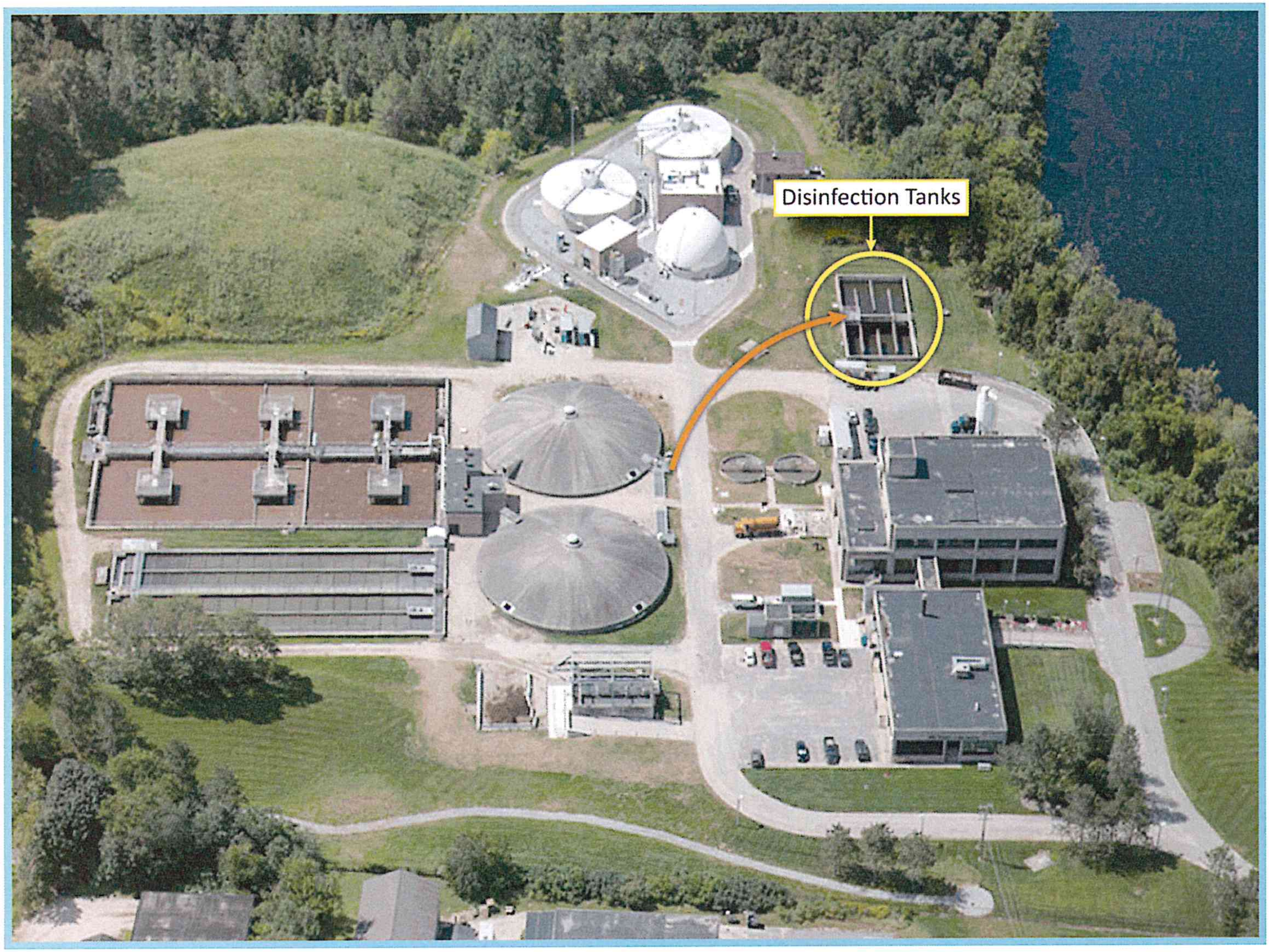
How Do We Treat Wastewater?

Step V – Secondary Clarifiers

Wastewater flows to secondary clarifier tanks where the bacteria from the aeration basins are settled out of the wastewater

How Do We Treat Wastewater?

Step VI – Disinfection

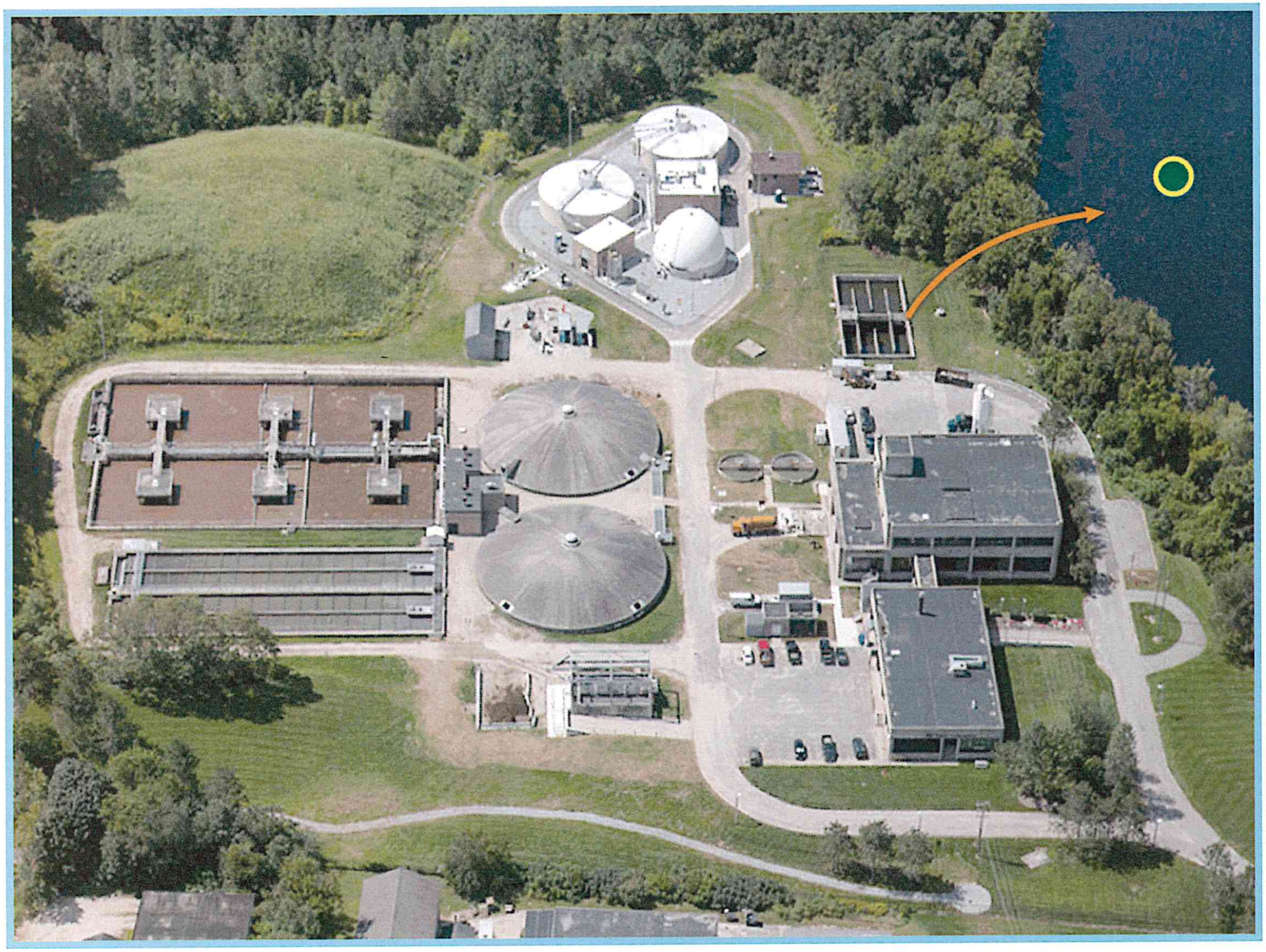


Treated wastewater is then chlorinated for disinfection with Sodium Hypochlorite

Prior to discharge, the water is dechlorinated with Sodium Bisulfite

How Do We Treat Wastewater?

Step VII – River Discharge



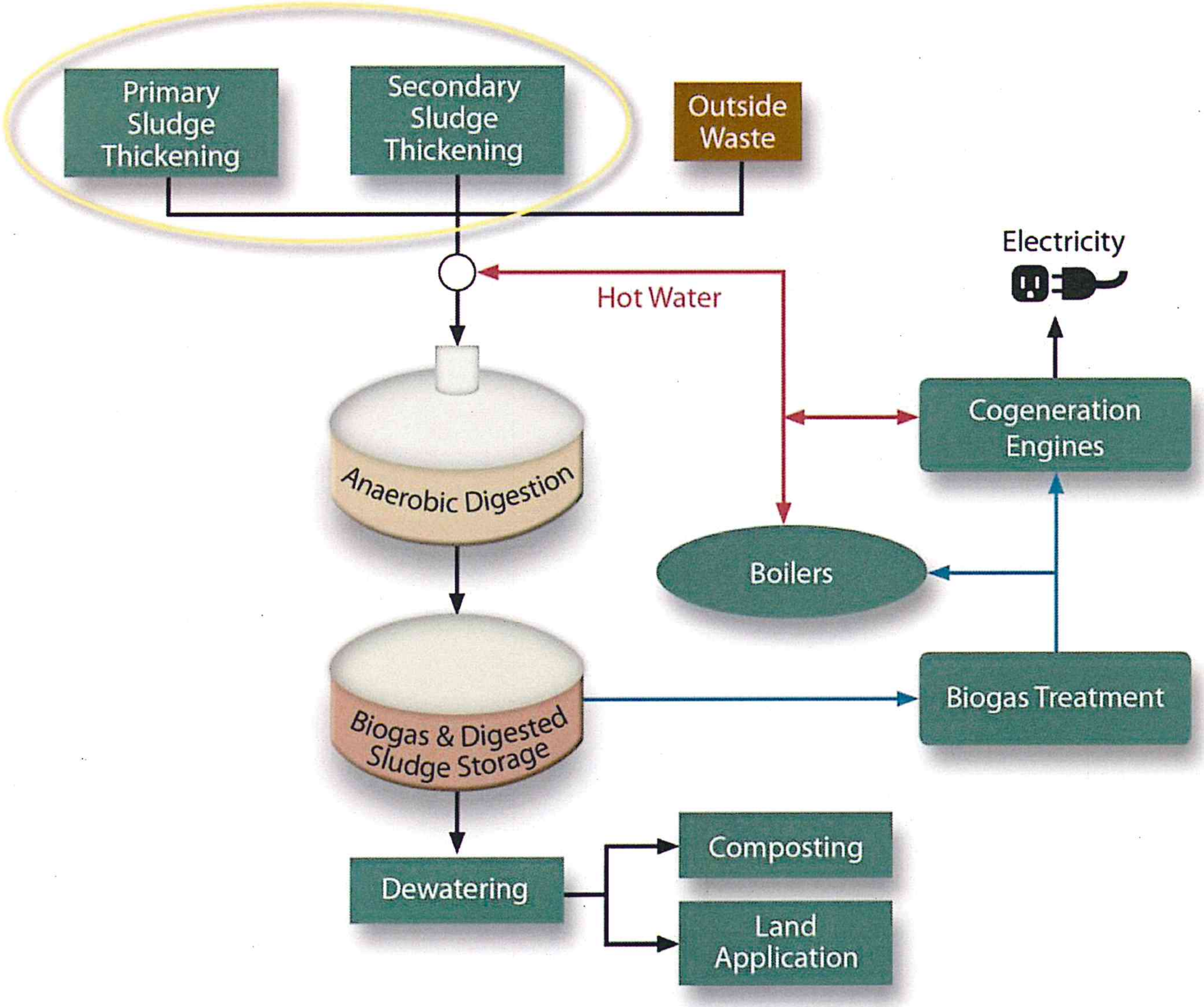
Treated water is returned to the Androscoggin River

>95% of pollutants are removed before discharge

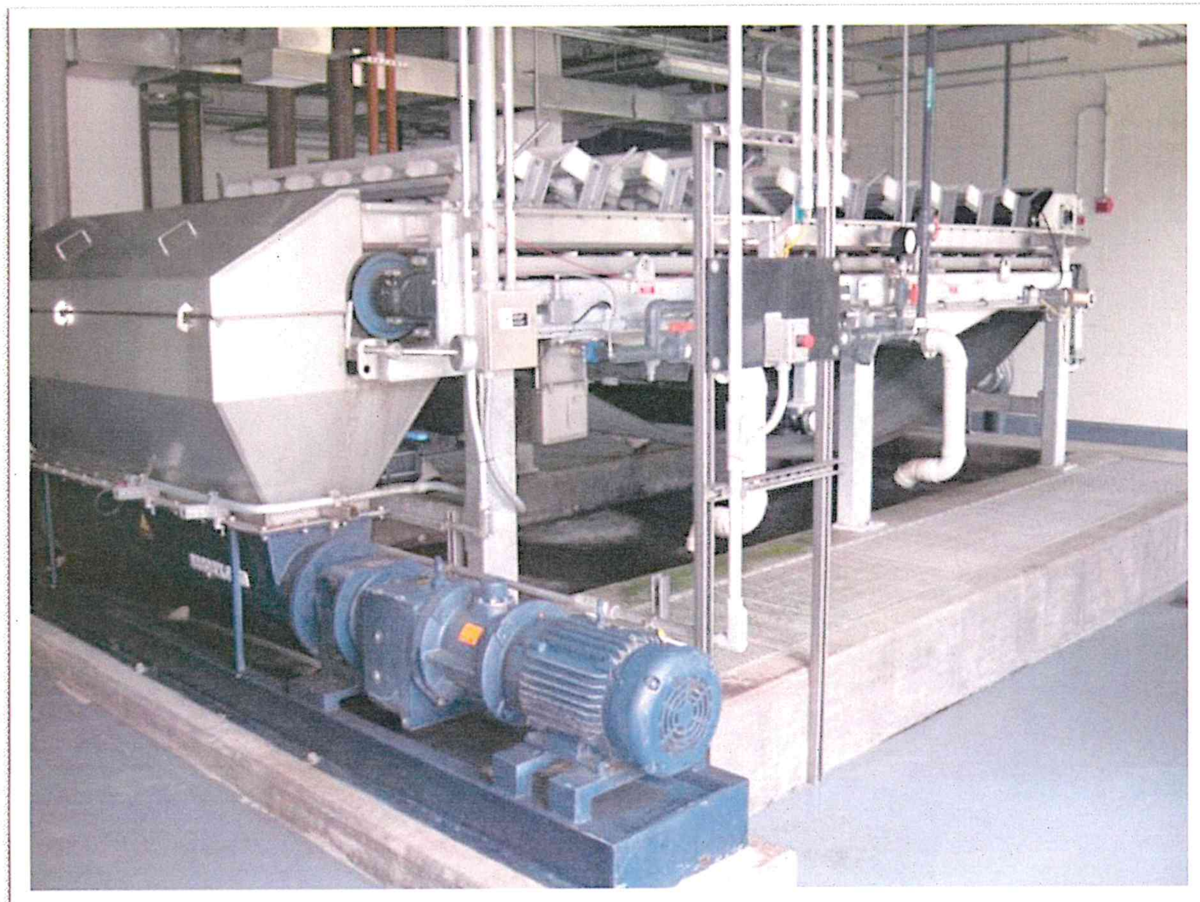
SOLIDS TREATMENT

How Do We Treat Solids?

Step I – Sludge Thickening

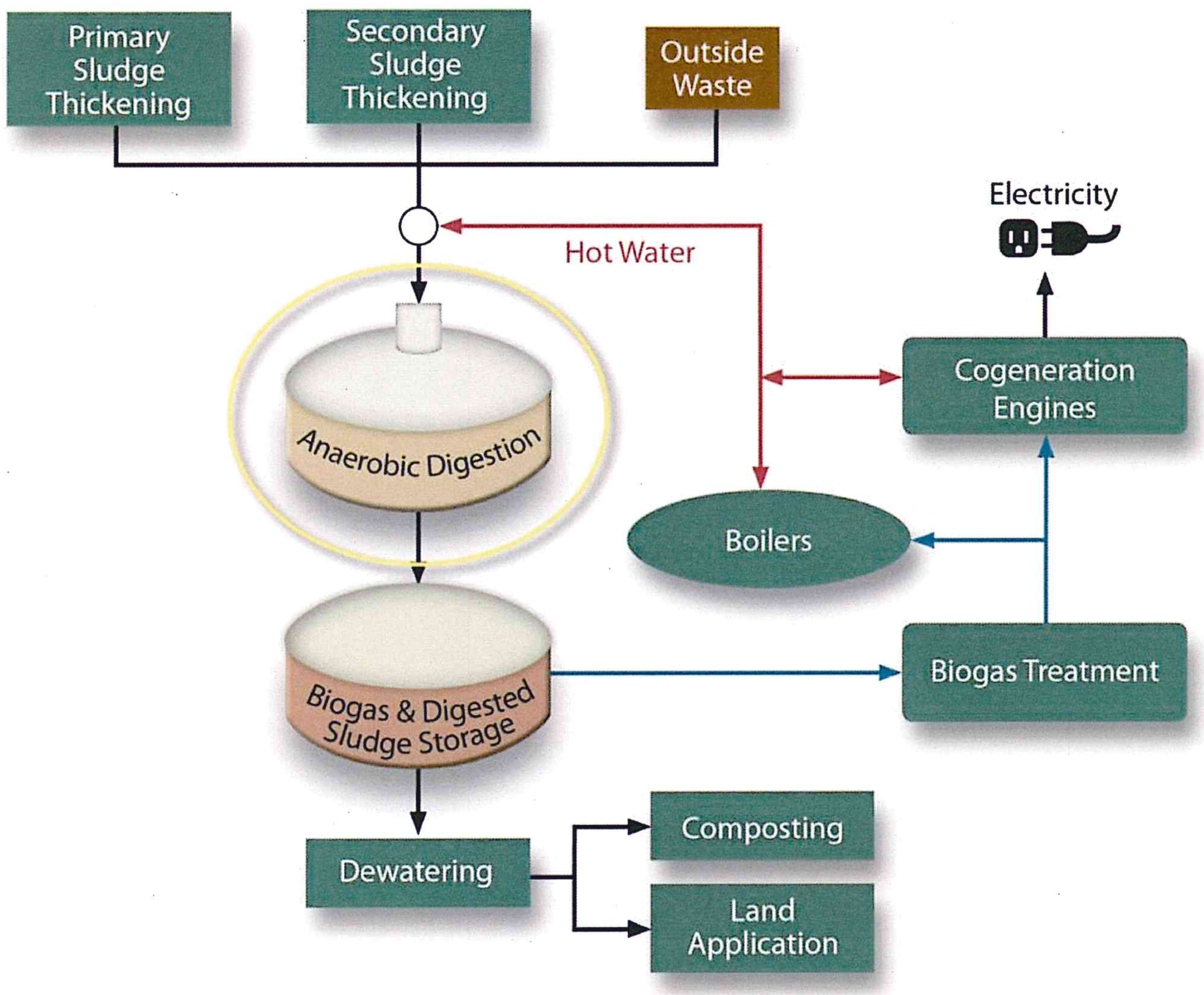


Step I – Sludge Thickening



Primary and secondary sludges are treated to remove excess moisture prior to anaerobic digestion

How Do We Treat Solids?
Step II – Anaerobic Digestion



Step II – Anaerobic Digestion

A different class of naturally present microorganisms consume organics at 95-100°F and convert a portion of the wastes to biogas

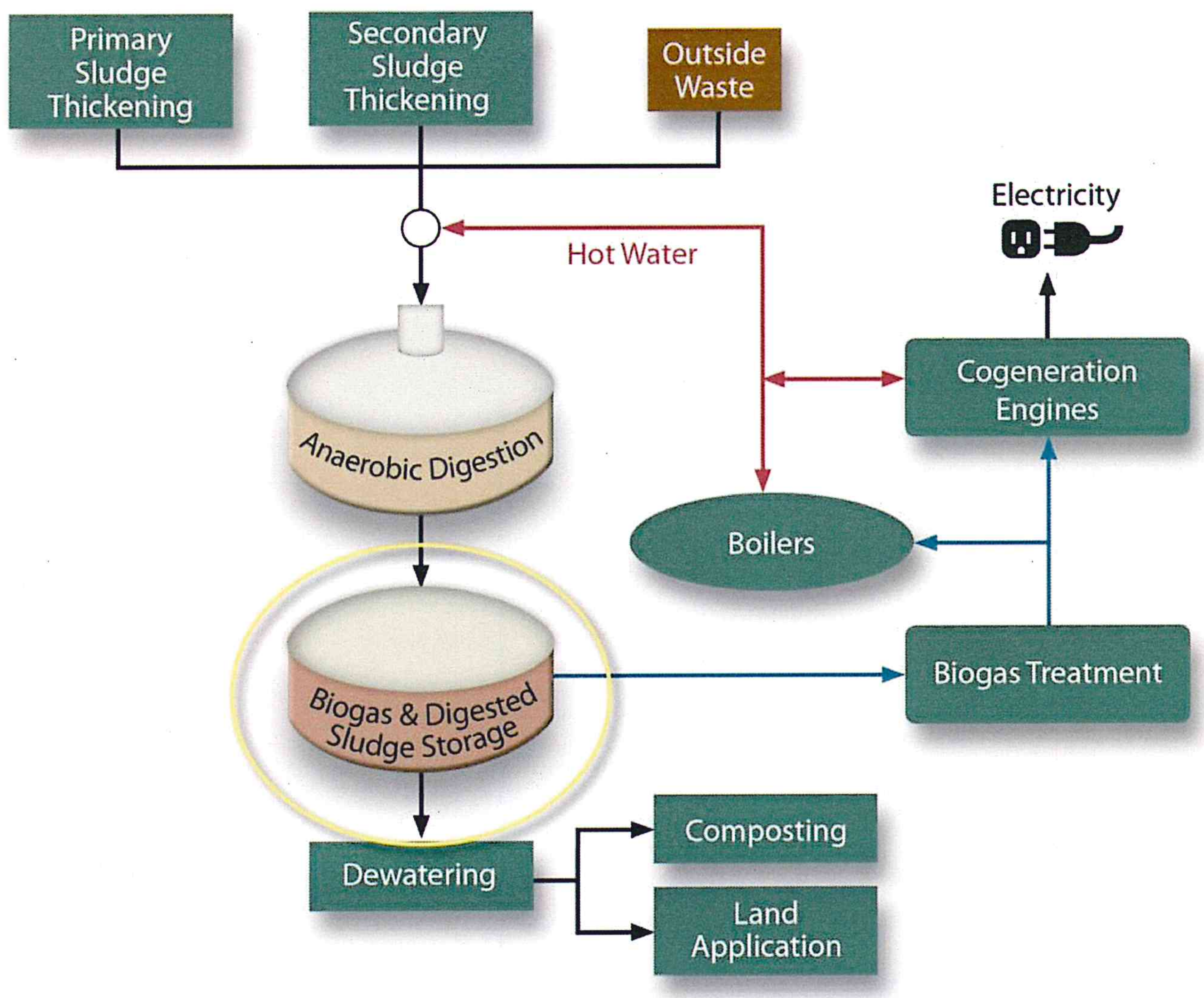
Digesters: 2

Total capacity:

1.38 million gallons

How Do We Treat Solids?

Step III – Biogas and Digested Sludge Storage



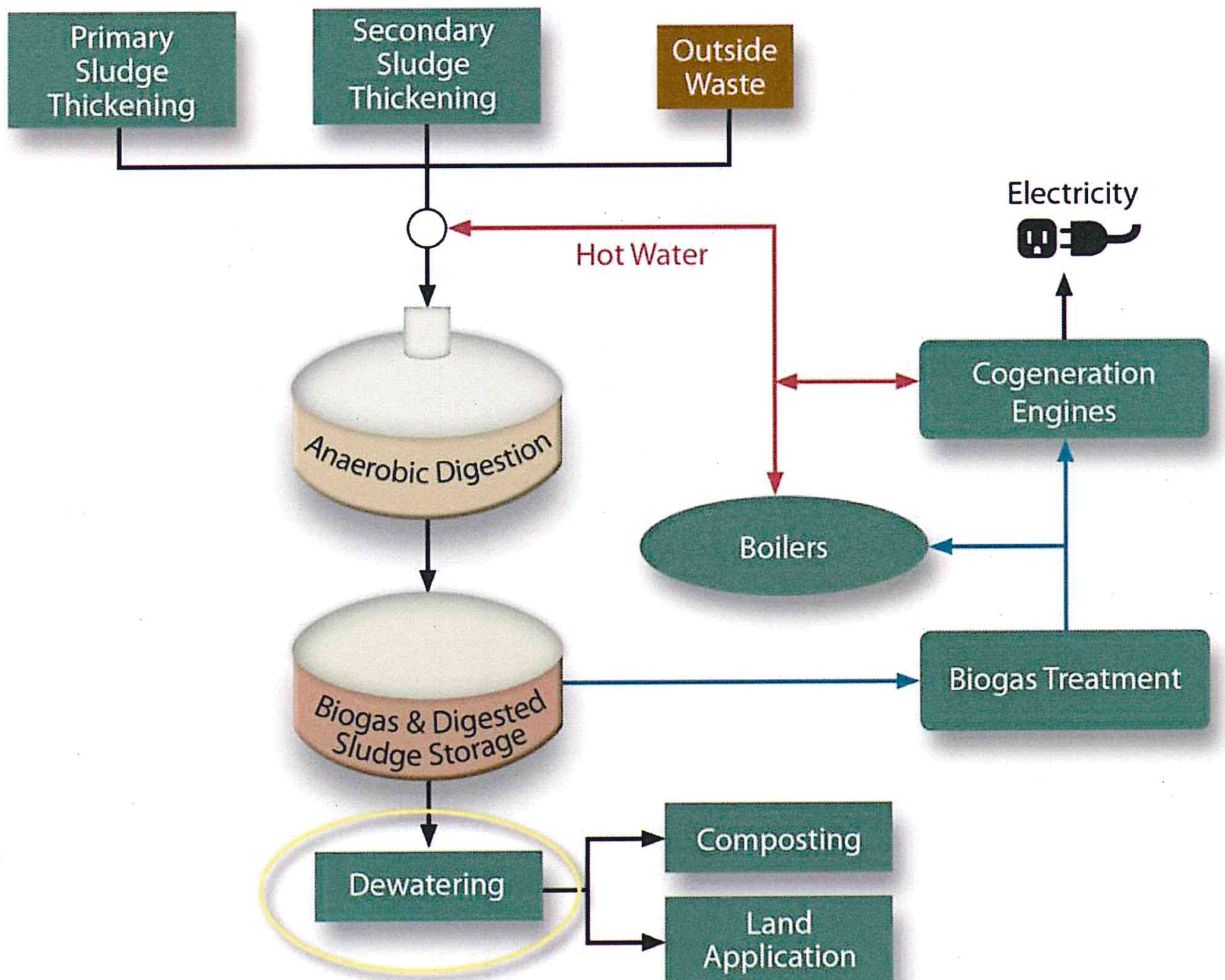
Step III – Biogas and Digested Sludge Storage

Biogas and digested sludge are stored prior to subsequent processing

Gas storage:
33,000 cubic feet

Digested sludge storage:
168,000 gallons

How Do We Treat Solids?
Step IV – Sludge Dewatering



Step IV – Sludge Dewatering

Digested sludge (aka biosolids) are dewatered using belt filter presses

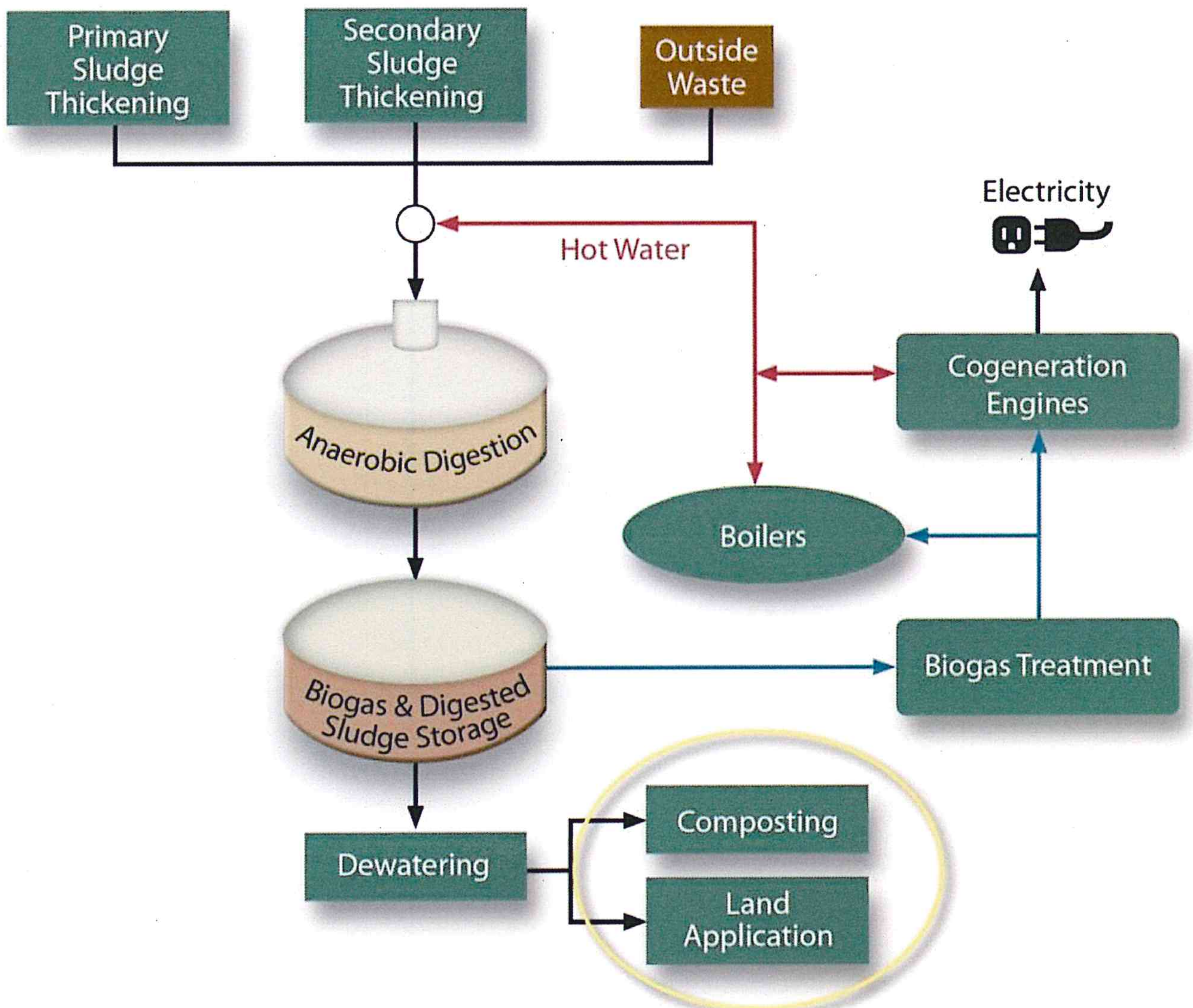
Biosolids (2012):
24,100 cubic yards

Expecting >35% reduction due to anaerobic digestion process

Biosolids (2013):
20,186 cubic yards

How Do We Treat Solids?

Step V – Biosolids Utilization



Step V – Biosolids Utilization

60% of the biosolids are converted to a compost product

MaineGro compost is sold to contractors, landscapers, and the general public

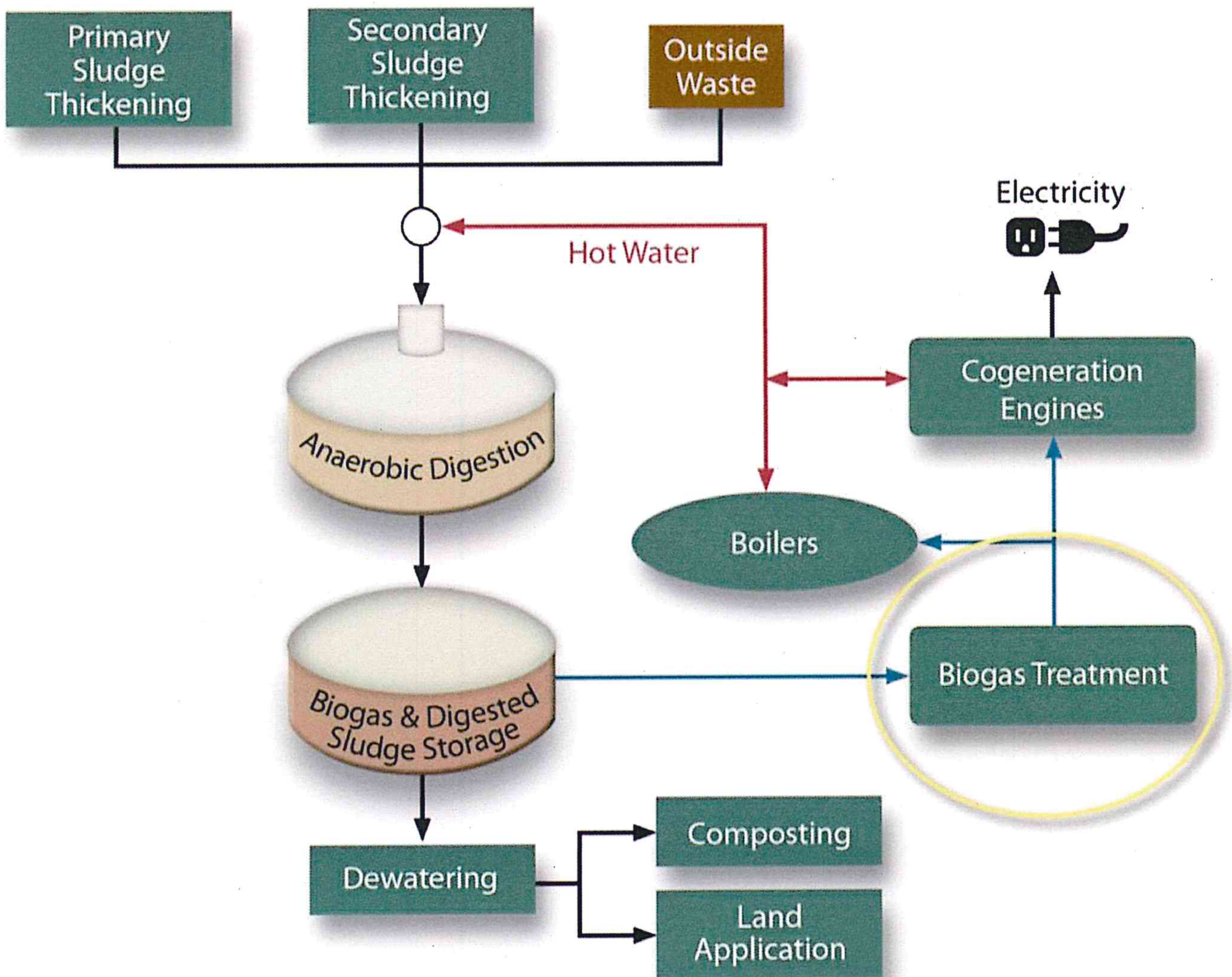
Step V – Biosolids Utilization

40% of the biosolids are used on area farms for fertilization

LAWPCA biosolids have helped sustain area farms ***for over 30 years!***

Gas Utilization/Energy Generation

Step VI – Biogas Treatment



Gas Utilization and Energy Generation

Step VI – Biogas Treatment

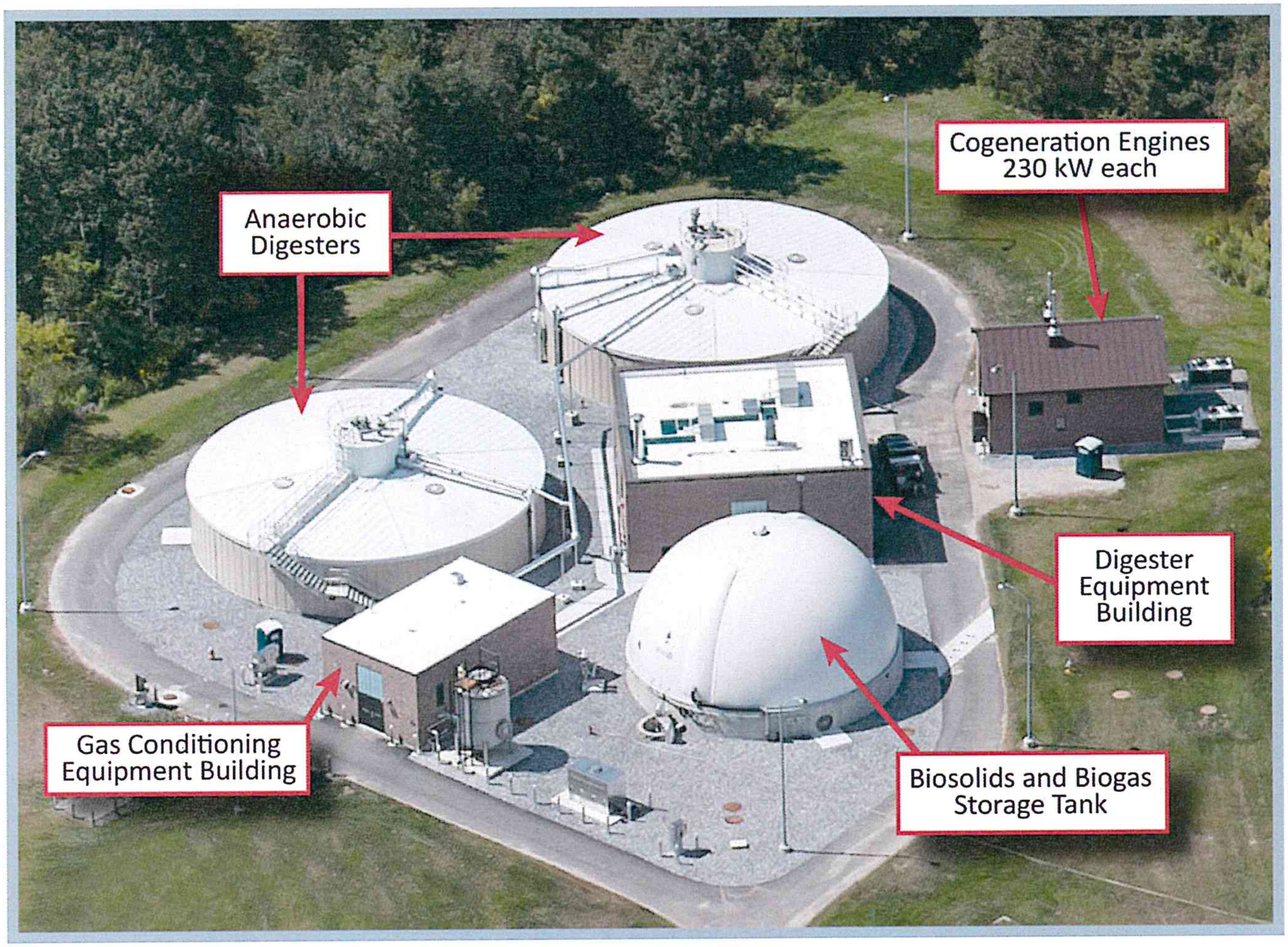
The methane-rich biogas is treated to remove impurities such as moisture and hydrogen sulfide

Step VII – Biogas Utilization

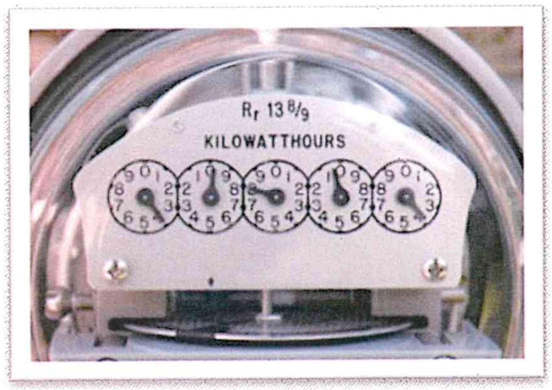
Biogas is used as a fuel in engines to produce electricity or is used in boilers to produce hot water

The hot water produced by the boilers and from engine cooling systems is used to keep the digesters at the correct temperature

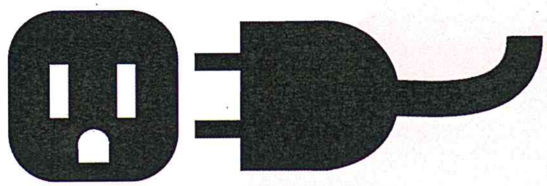
Anaerobic digestion and energy recovery facilities



Benefits of Anaerobic Digestion and Energy Recovery



Plant-wide purchased power



55%

CO_2 Emissions

80%

Biosolid Management Costs

35%

PROJECT COST AND DEBT SERVICE

Item	Amount
Source of Funds	
State Revolving Fund (SRF)	$13,800,000
Principal Forgiveness	880,000
Efficiency Maine Grant	330,000
Total Cost	**$15,010,000**
Anaerobic Digestion Debt Service	$920,000
Compost Facility Debt Service Retired 2013	(520,000)
Net Debt Service	$400,000
Annual Operating Cost Savings Goal	>$400,000

Anaerobic Digestion Performance Comparison

Feed	Design Conditions	August, 2014
Feed		
lb/d % TS Gal/d % VS VS, lb/d	27,400 5.7 58,000 75 20,550	19,400 5.1 44,700 75 14,550
HRT, days	24	31
VSR, %	55	56

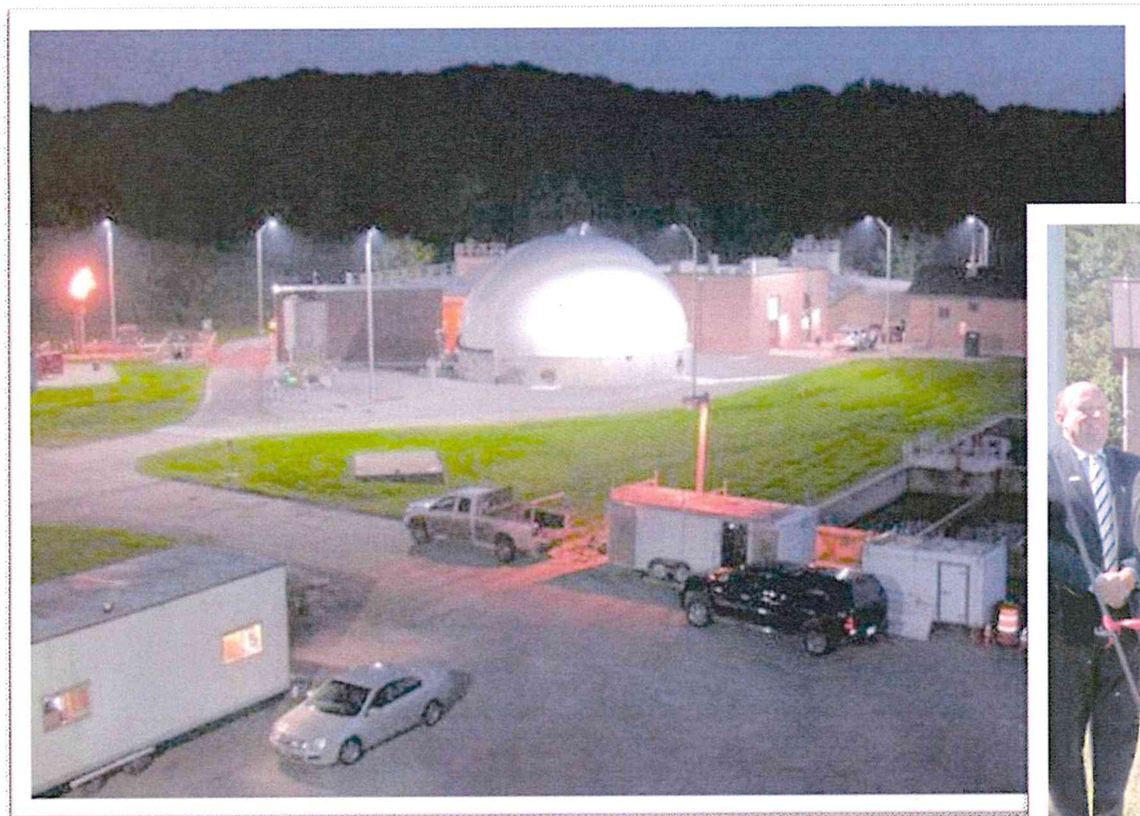
ENERGY RECOVERY PERFORMANCE COMPARISON

Item	Design Conditions	August, 2014
Biogas Volume		
cu ft/d	170,000	148,000
Yield		
cu ft/lb VSR	15	18
Biogas Methane Content, %	55	65
Biogas Utilization		
Engines, %	-----	94
Boilers, %	-----	2
Flare, %	-----	4
Energy Production		
KWH/Month	-----	177,000
Approximate Value/Month	-----	$19,500

OBSERVATIONS AND LESSONS LEARNED

- Class B Cake Odor Reduction
- Cake Solids Impact on Composting
- Winter Weather Operations
- Optimization of Feeding and Mixing Cycles
- Electric Power to the Grid
- Staff Training for New Facilities

Anaerobic Digestion/Energy Recovery Facilities
Completed Summer 2013



Maine Municipal Bond Bank

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QUESTIONS