

# Sewage Sludge Incineration (SSI)

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Past, Present and Future of SSI  
for POTW Solids Management

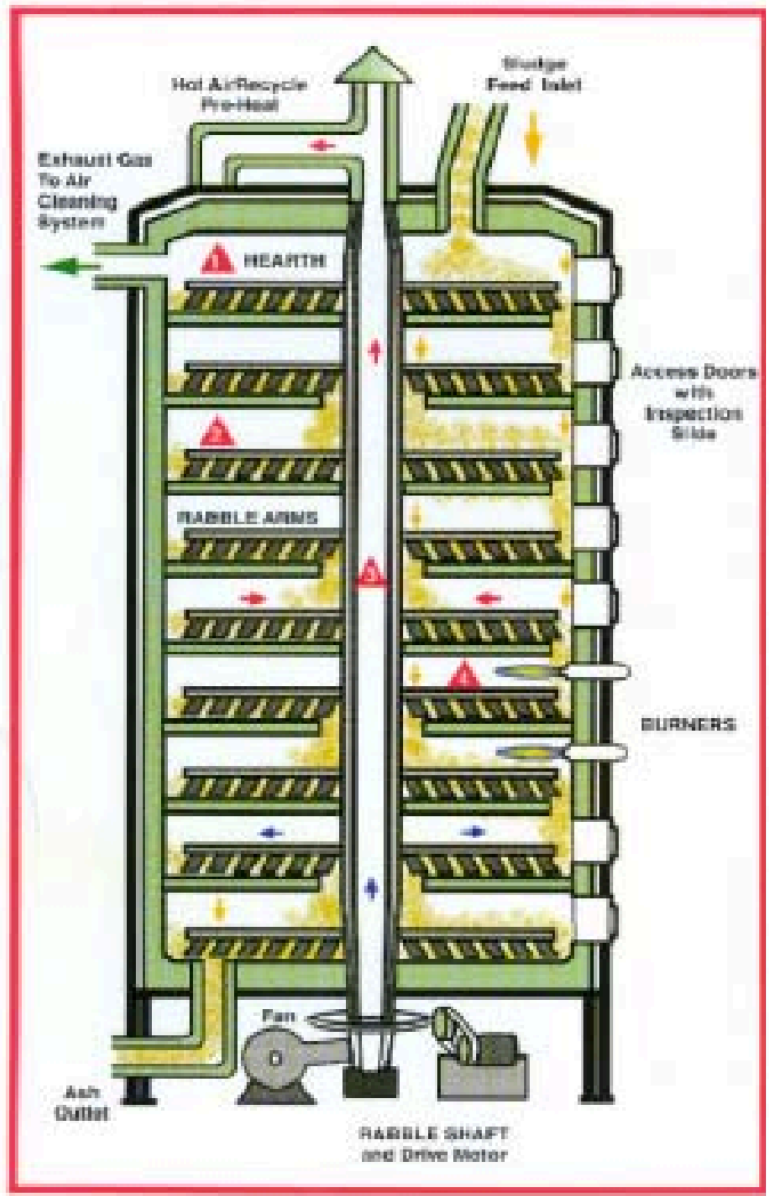
VAMWA-MWCOG-MAMWA  
Biosolids WEBEX Meeting  
March 23, 2020

Mark Feltner/HRSD

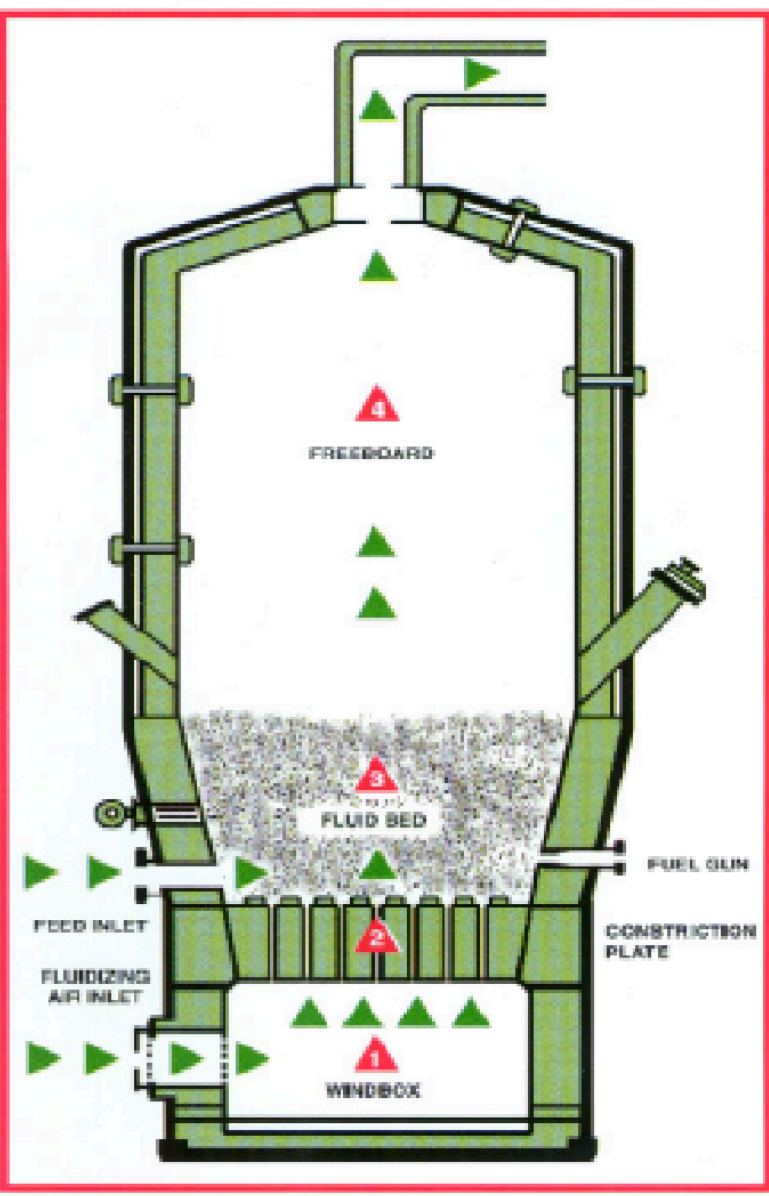


# SSIs, The Past to Present

- Combustion of wastewater solids since early 1900's
  - Multiple hearth incinerator (MHI), originally Herreshoff furnace for ore roasting
- 1950-1970 MHI expanded use for solids disposal as more primary treatment plants came online
- 1970s Federal funds/grant money
  - Funded construction of MHIs e.g., HRSD's 10 MHIs
- 1980-2000s Fluid Bed Incinerator (FBI) for wastewater solids disposal
  - The newer cleaner technology



(a) Multiple Hearth



(b) Fluid Bed

# SSI Regulations (and surviving them)

- 1972 EPA Office of Air's NSPS Subpart O (Hg, Be NESHAPs)
  - PM w/monitoring of operating parameters - venturi differential pressure
- 1990s EPA Office of Water's Part 503 Subpart E – Incineration
  - Metals and THC CEMs
- 2000 Title V Federal Operating Permits
  - Product of the CAAs of 1990 for major sources of emissions
  - Codify all requirements, compliance assurance monitoring (CAM) plans
- 2011 EPA OAQPS Section 129 SSI Rule
  - The MACT standards for existing and new/modified SSIs
  - Compliance required 2016 includes ~ annual stack testing
  - 129 requirements rolled into Title V permits, “continuous compliance”
- > 2020 and beyond - future regulations?
  - Revisit existing 129 SSI rule, residual risk and technology eval, or a new reg



# 2016 SSI Listing

- Pre-2011 Section 129 SSI Rule - 233 SSI units
- 2016 169 SSIs – 111 MHIs and 58 FBIs across 23 states, Puerto Rico
  - Some SSI units taken offline by 2011 regulation (e.g., MHI Blacksburg, VA)
  - DC Metro no SSIs
  - MD - Western Branch (2 MHIs)
  - VA SSIs – Fairfax Co. (6 MHIs), HRSD (10 MHIs), Hopewell (MHI), & Prince William Co. (FBI)
- HRSD “burning” for 40+ years, 76% invested in SSIs for solids mgt
  - 2021-2026, two POTWs offline, shuttering another’s MHIs
  - > 2026 4 MHIs at two POTWs, ~ 30% invested in SSIs for solids mgt
  - Increased investment in THP class A solids land app thru 2026

Prepared by Bob Dominak  
May 27, 2016

SSIs that were either reported to be in service in 2009 or still had an active permit to operate

New SSIs placed into service since 2010

SSIs anticipated to be in service after March 21, 2016

SSIs either removed or to be removed are highlighted in yellow

Multiple Hearth Incinerators

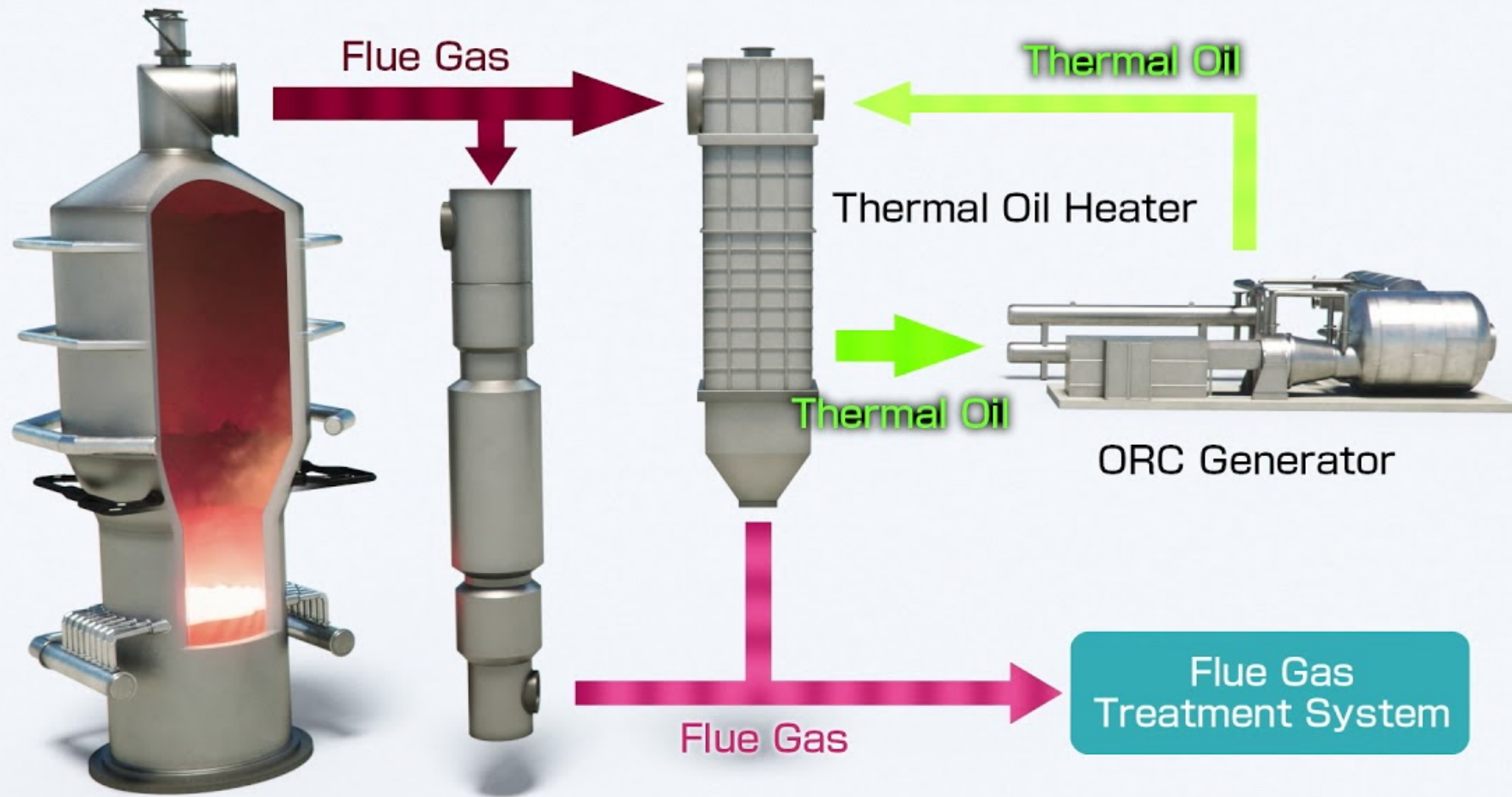
Count	State	Facility Name	Unit	Type	Source of information	Count	State	Facility Name	Unit	Type	Count	State	Facility Name	Unit	Type			
1	AK	City and Borough of Juneau WWTP	1	FB	EPA	1	CT	Mattabassett	1	FB	✓	1	AK	John M. Asplund Water Pollution Control Facility	1	MH	✓	
2	AK	City of Wrangell	1	EI	EPA	2	MO	Little Blue Valley Sewer District	1	FB	✓	2	CA	Central Contra Costa Sanitary District	1	MH	✓	
3	AK	John M. Asplund Water Pollution Control Facility	1	MH	✓	3	OH	Southerly Wastewater Treatment Plant	1	FB	✓	3	CA	Central Contra Costa Sanitary District	2	MH	✓	
4	CA	Central Contra Costa Sanitary District	1	MH	✓	4	OH	Southerly Wastewater Treatment Plant	2	FB	✓	4	CA	Palo Alto Regional Water Quality Control Plant	1	MH	✓	will eventually be phased out
5	CA	Central Contra Costa Sanitary District	2	MH	✓	5	OH	Southerly Wastewater Treatment Plant	3	FB	✓	5	CA	Palo Alto Regional Water Quality Control Plant	2	MH	✓	will eventually be phased out
6	CA	Palo Alto Regional Water Quality Control Plant	1	MH	anaerobic digestion - long term?	6	OH	Mill Creek Wastewater Treatment Plant	1	FB	✓	6	CT	Hartford Water Pollution Control Plant	1	MH	✓	
7	CA	Palo Alto Regional Water Quality Control Plant	2	MH	"	7	OH	Mill Creek Wastewater Treatment Plant	2	FB	✓	7	CT	Hartford Water Pollution Control Plant	2	MH	✓	
8	CT	Hartford Water Pollution Control Plant	1	MH	✓	8	OH	Mill Creek Wastewater Treatment Plant	3	FB	✓	8	CT	Hartford Water Pollution Control Plant	3	MH	✓	
9	CT	Hartford Water Pollution Control Plant	2	MH	✓							9	CT	Naugatuck Treatment Company	1	MH	✓	
10	CT	Hartford Water Pollution Control Plant	3	MH	✓							10	CT	Naugatuck Treatment Company	2	MH	✓	
11	CT	Mattabassett Regional Sewage Authority	1	FB	Mattabassett							11	CT	New England Treatment Co. New Haven Plant	1	MH	✓	
12	CT	Naugatuck Treatment Company	1	MH	✓							12	GA	President Street Water Pollution Control Plant	1	MH	✓	

New SSIs currently under Construction or design

# SSIs Future

- Future for SSIs is surprisingly good/some of us are even optimistic
  - Esp., given land app opposition, limited landfill space, PFAS and other issues
- Do not expect any new MHIs to be built
- Existing MHIs maintained with upgraded off gas systems/APCDs
  - Provide a minimum another 10-20+yrs of service to the industry (e.g., Central San, CA new wet scrubbers and low NOx burners; Fairfax's multi throat venturi scrubbers, HRSD VIP SO<sub>2</sub> scrubbers and ZHAs)
- 12 FBIs placed into service and/or being built since 2010
  - Juneau, AK, Cleveland, OH, Green Bay, WI, Hazelton, PA, Mattabassett, CT, St. Louis, MO, St. Paul, MN
- POTW SSIs are slowly moving from MHIs to FBIs
- Possible an FBI in HRSD's future (> 2040) too?





Sludge Incinerator Air Preheater

\*ORC = Organic Rankine Cycle

# SSIs Future - Comments, Discussion, Observations, and Questions?

- A “Guide to select air acronyms” and FBI videos
  - APCDs – air pollution control devices
  - CAAAs – clean air act amendments
  - CEMS – continuous emission monitoring systems (or monitors)
  - NSPS - new source performance standards
  - NESHAPS – national emission standards for hazardous air pollutants
  - MACT - maximum achievable control technology
  - OAQPS – office of air quality planning and standards
  - THC – total hydrocarbons
  - ZHA – zero hearth afterburner
- <https://www.youtube.com/watch?v=iuLCYCa-wbg> (Metro Council)
- <https://www.youtube.com/watch?v=wZ3p9da7Hls> (FBI sight glass)
- <https://www.youtube.com/watch?v=UcfTF6XsVic> (Tokyo FBI 3/20)