Spokane’s Waste to Energy Disposal System

May 2025

Overview

- Provides disposal for 250,000 tons of municipal solid waste annually and generates electricity as a byproduct.
- Part of a comprehensive solid waste system that:
  - Encourages recycling and composting.
  - Supports the state objectives to reduce, reuse, and recycle waste with lower lifecycle emissions than other disposal options.
- City is committed to:
  - Implementing programs to reduce waste.
  - Meeting Washington's 2050 vision of net emissions neutrality.
  - Supporting the state's goal of addressing environmental burdens placed on low-income communities.
  - Supporting innovative solutions.

History

Part of an overall solution to handle the community's solid waste

Replaced leaking landfills that had become Superfund sites

Choice protected our sole-source aquifer

Waste disposed of locally rather than placing the burden on another community

The State of Washington was a partner in the facility

Provided a $60 million grant

From the sale of $450M in bonds as part of voter-approved State Referendum 39 in 1980

25 Year Design/Build/Operate contract with Wheelabrator

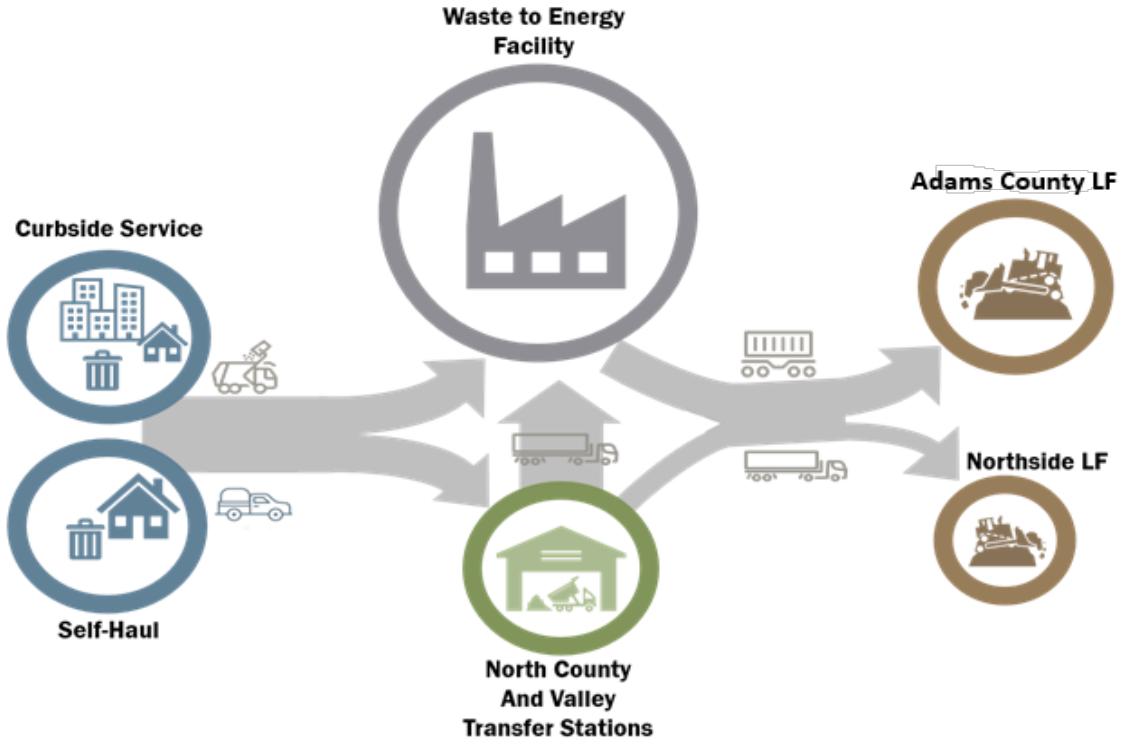
Construction started in 1989.

Plant operational in 1991

City took over operations in 2014

Regional Role

- Part of the Spokane County Solid Waste System
  - ➢Serves as the center of the regional strategy
  - ➢Partnerships throughout Spokane County to promote waste diversion and recycling.

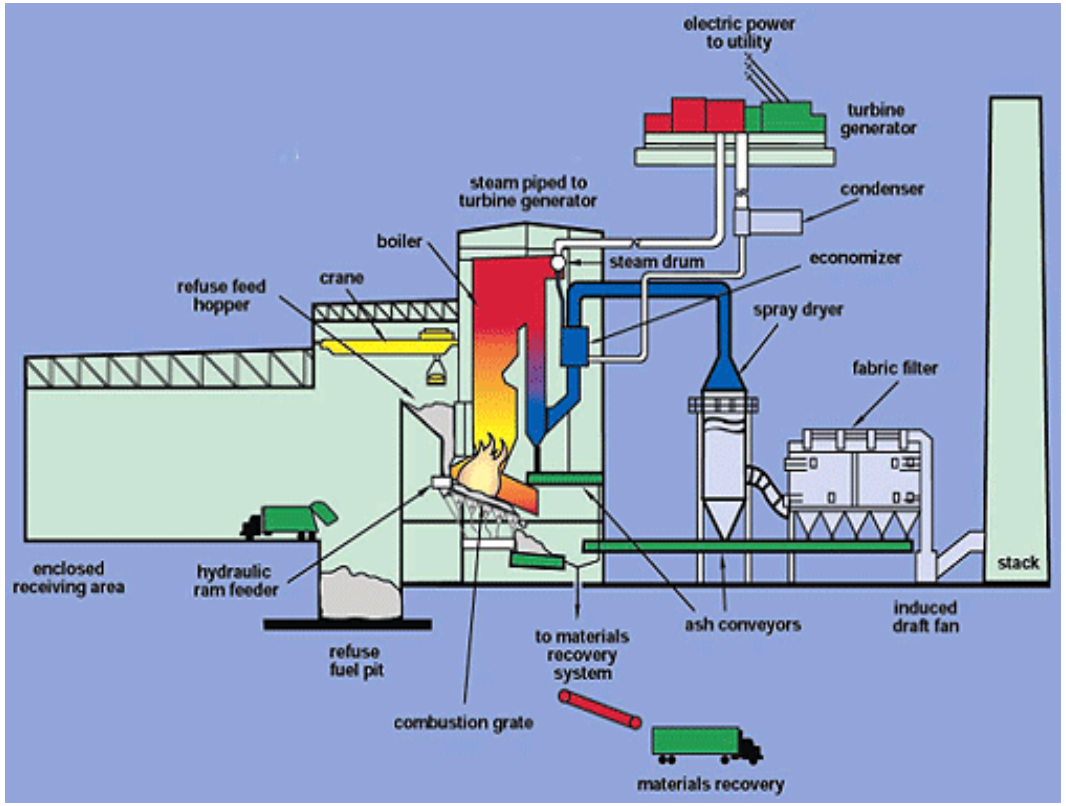


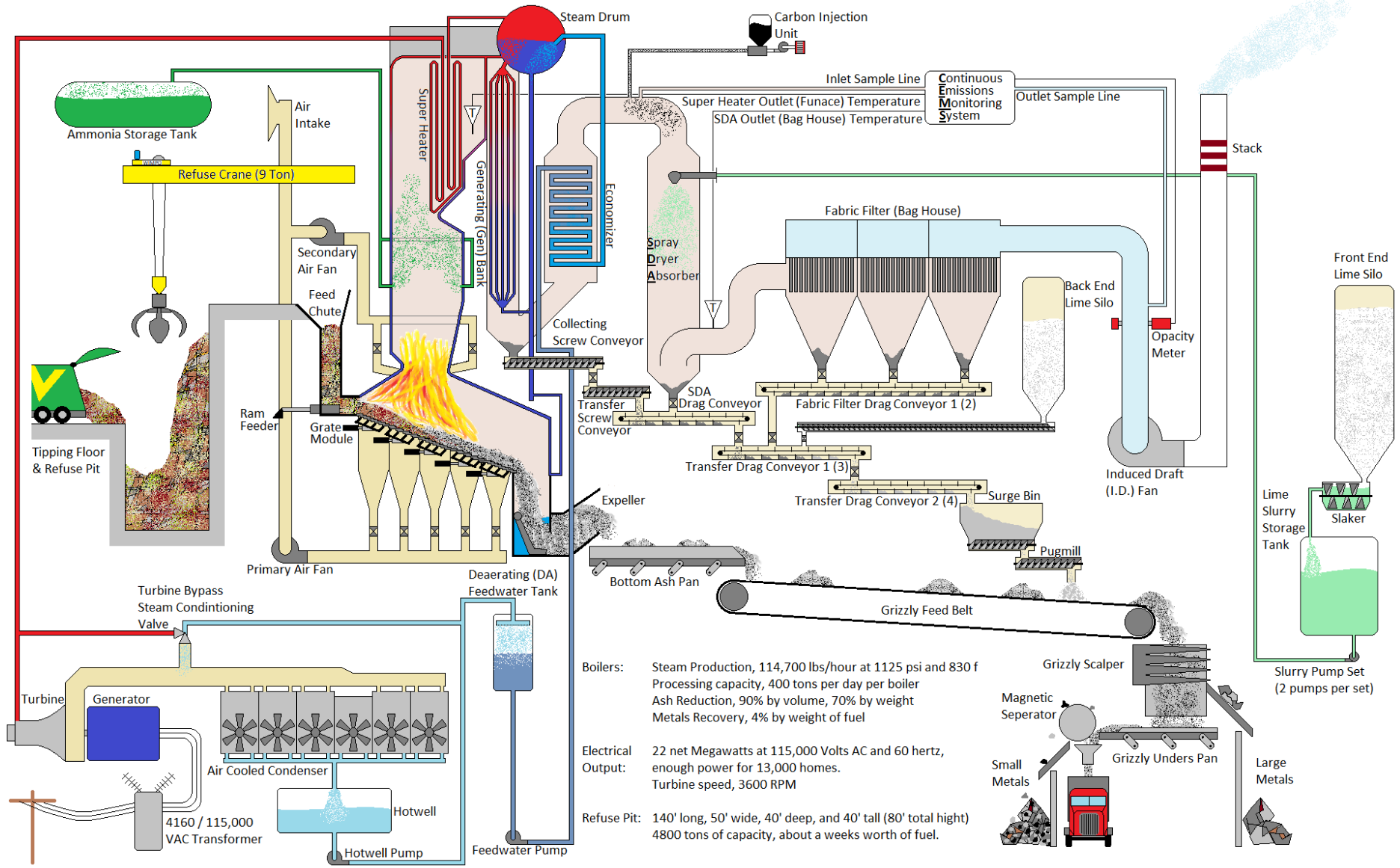
Current Customers

- Spokane County Transfer Stations (35% of System Tons)
- Curbside and Commercial Collection (48% of System Tons)
  - City of Spokane (37% of System Tons)
  - City of Cheney
  - City of Medical Lake
  - City of Airway Heights
  - Fairchild Airforce Base
- City and County Residents Self Haul (16% of System Tons)
- Special Handling and Assured Destruction Services (1% of System Tons)
  - Law Enforcement – Seized narcotics, evidence, weapons
  - Federal or International Regulated Waste – Airlines, Antarctica Research Stations, Pharmaceutical take backs, etc.
  - Corporate Landfill Free Accounts – Bigelow, Keurig

Operations

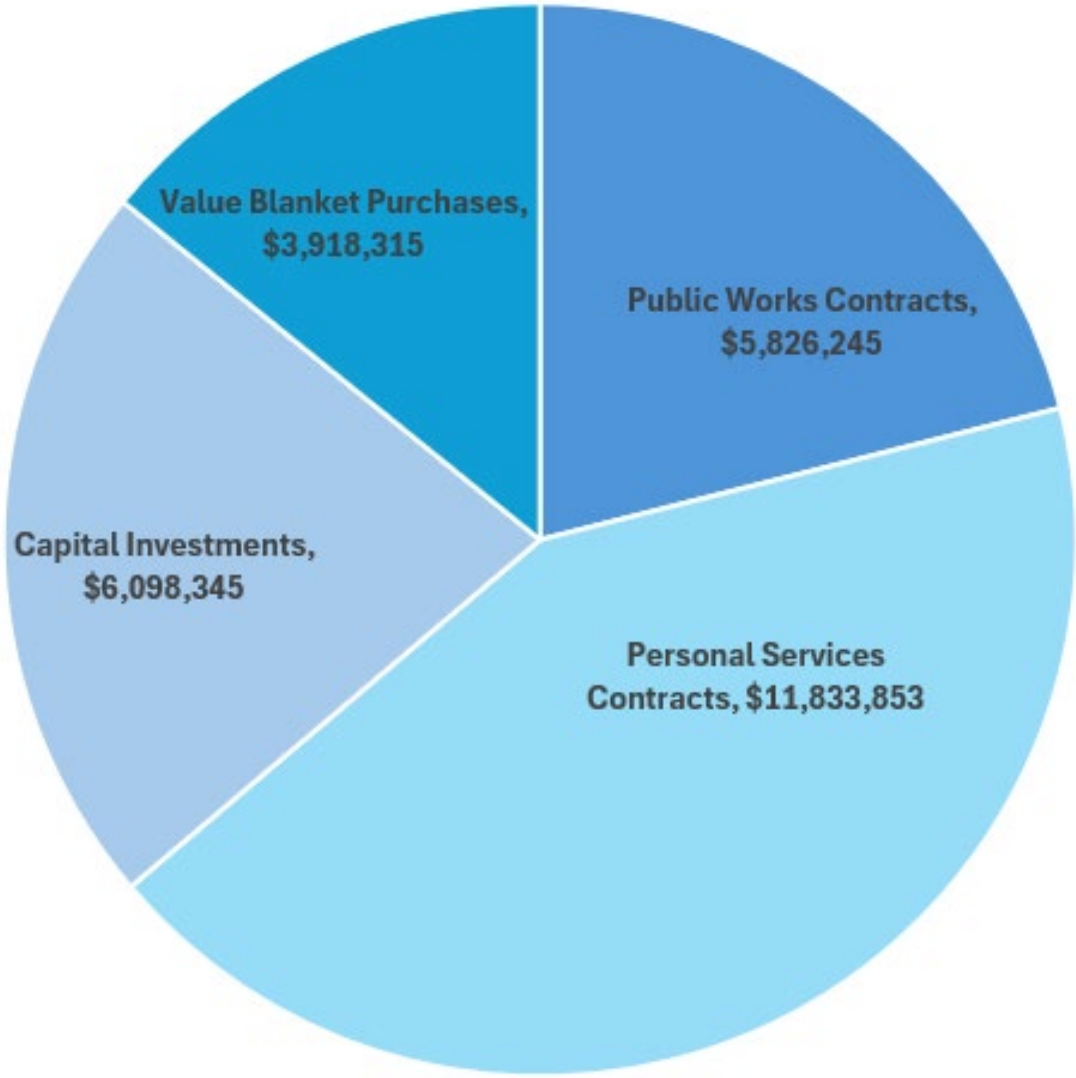
- Facility operates 24/7/365
- Employs 75 full time City employees
- Processes 800 tons/day of solid waste
- Excess power is sold to Avista, enough power for 11,000 homes
- Two scheduled outages per year in the spring and fall
    - Outage repair works includes boiler tubes, refractory, mechanical components, instrumentation, and a variety of others to ensure operation for the next 6 months




Steam Drum
Carbon Injection Unit
Inlet Sample Line
Continuous Emissions Monitoring System
Super Heater Outlet (Funace) Temperature
SDA Outlet (Bag House) Temperature
Outlet Sample Line
Stack
Ammonia Storage Tank
Air Intake
Super Heater
Generating (Gen) Bank
Economizer
Refuse Crane (9 Ton)
Secondary Air Fan
Feed Chute
Spray Dryer Absorber
Fabric Filter (Bag House)
Back End Lime Silo
Front End Lime Silo
Collecting Screw Conveyor
Opacity Meter
Tipping Floor & Refuse Pit
Ram Feeder
Grate Module
Transfer Screw Conveyor
SDA Drag Conveyor
Fabric Filter Drag Conveyor 1 (2)
Transfer Drag Conveyor 1 (3)
Induced Draft (I.D.) Fan
Expeller
Transfer Drag Conveyor 2 (4)
Surge Bin
Lime Slurry Storage Tank
Slaker
Pugmill
Primary Air Fan
Deaerating (DA) Feedwater Tank
Bottom Ash Pan
Grizzly Feed Belt
Turbine Bypass Steam Condintioning Valve
Grizzly Scalper
Slurry Pump Set (2 pumps per set)
Turbine
Generator
Magnetic Seperator
Air Cooled Condenser
Grizzly Unders Pan
Small Metals
Large Metals
4160 / 115,000 VAC Transformer
Hotwell
Hotwell Pump
Feedwater Pump
Boilers: Steam Production, 114,700 lbs/hour at 1125 psi and 830 f
Processing capacity, 400 tons per day per boiler
Ash Reduction, 90% by volume, 70% by weight
Metals Recovery, 4% by weight of fuel
Electrical Output: 22 net Megawatts at 115,000 Volts AC and 60 hertz, enough power for 13,000 homes.
Turbine speed, 3600 RPM
Refuse Pit: 140' long, 50' wide, 40' deep, and 40' tall (80' total hight)
4800 tons of capacity, about a weeks worth of fuel.

Economic Impacts

- Every $1 in revenue at a WTE Facility injects $1.77 into the economy
- Spokane's WTE total economic output estimated at $74.9 Million
- Facility utilizes 109 Contracts and 145 Value Blankets for a variety of goods and services
- 4,125 hours of Apprentice and Journeyman contracted union labor in 2023



Spokane's CCA Challenges

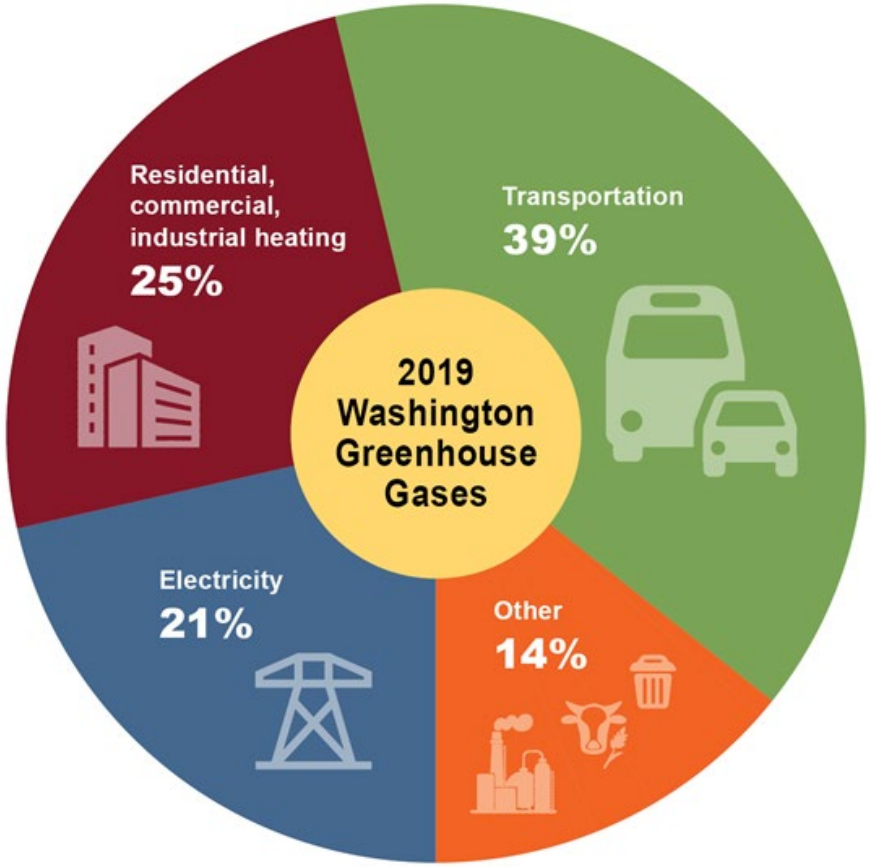
- Treats Disposal Technologies differently.
  - Spokane's SW Disposal method is the only disposal method that is part of the CCA
  - Results in higher costs for Spokane's residents & businesses
- Penalizes good technology.
  - Features lower lifecycle emissions than landfills
  - Avoids decades of methane generation and emissions
  - Avoids decades of leachate generation and potential groundwater impacts
  - Increased metals recovery
  - Generation of electricity as a byproduct
- Limits the ability to create additional environmental & other benefits.
  - WTE is the center of circular economy potential
  - Eliminates potential for emission reduction projects such as non-ferrous metals recovery
  - CCA only recognizes up to 6% in the form of emissions offsets, eliminating direct investment within the community.

CCA Costs

Annual cost to the Spokane WTE facility is estimated at $2.5 to $8.8 million

Increases the cost to Spokane SW Collections customers and other jurisdictions

Jeopardizes the structure of the Spokane Regional Solid Waste System



Lifecycle Assessment

- Department of Ecology was awarded funding in the 2023 legislative period for a Lifecycle Assessment (LCA) that examined total emissions from WTE versus disposal at one of three area landfills.
- LCA provided a total inventory of greenhouse gas emissions including transportation and avoidances due to recycling of materials.
- CDM Smith was contracted by the Department of Ecology to complete this study. LCA Conclusion:
  - Recommendation to use the 20 year Global Warming Potential due to Climate Change Urgency.
  - In the 20 year GWP analysis, Spokane WTE provides the greatest net reduction in life-cycle GHG emissions
- Legislative solution needed for fair and equitable treatment of Spokane's Solid Waste Disposal System.

Carbon Capture

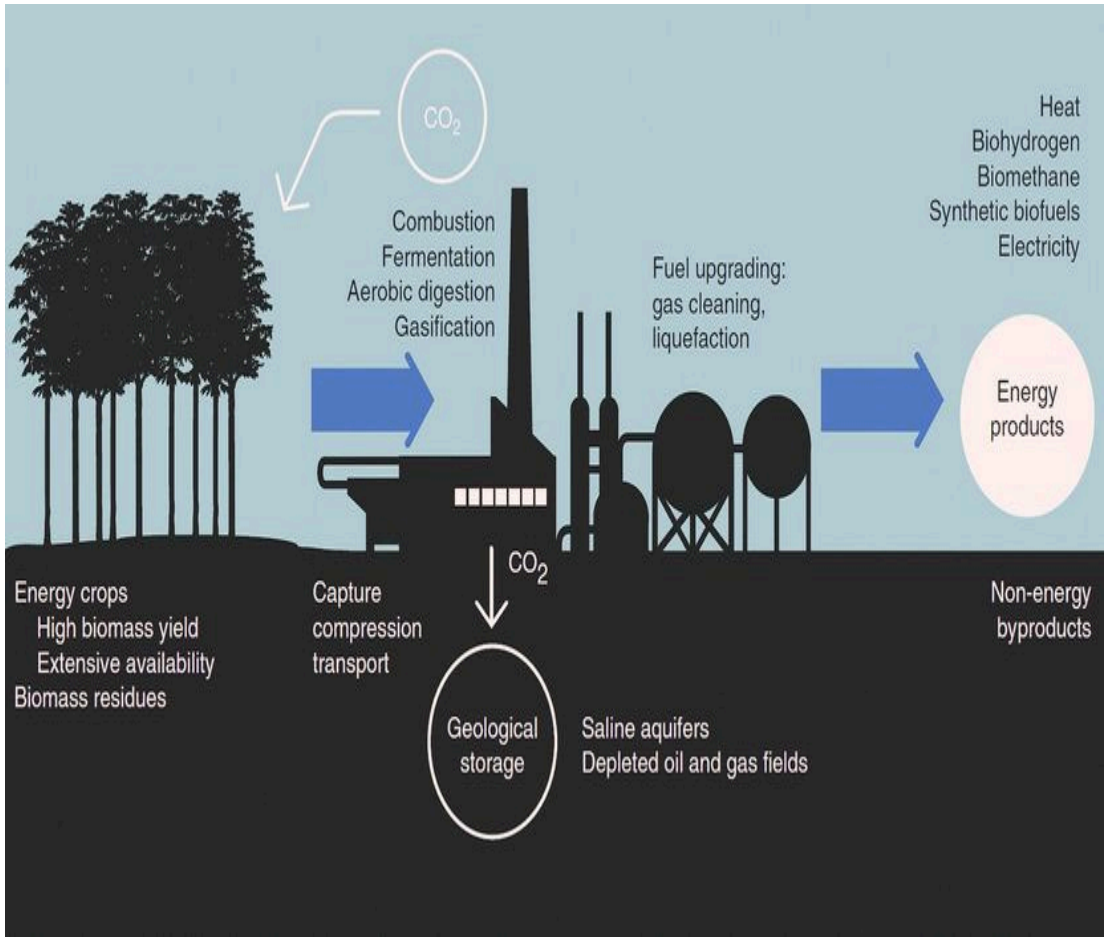
The City is actively examining technologies for CO2 capture and reuse.

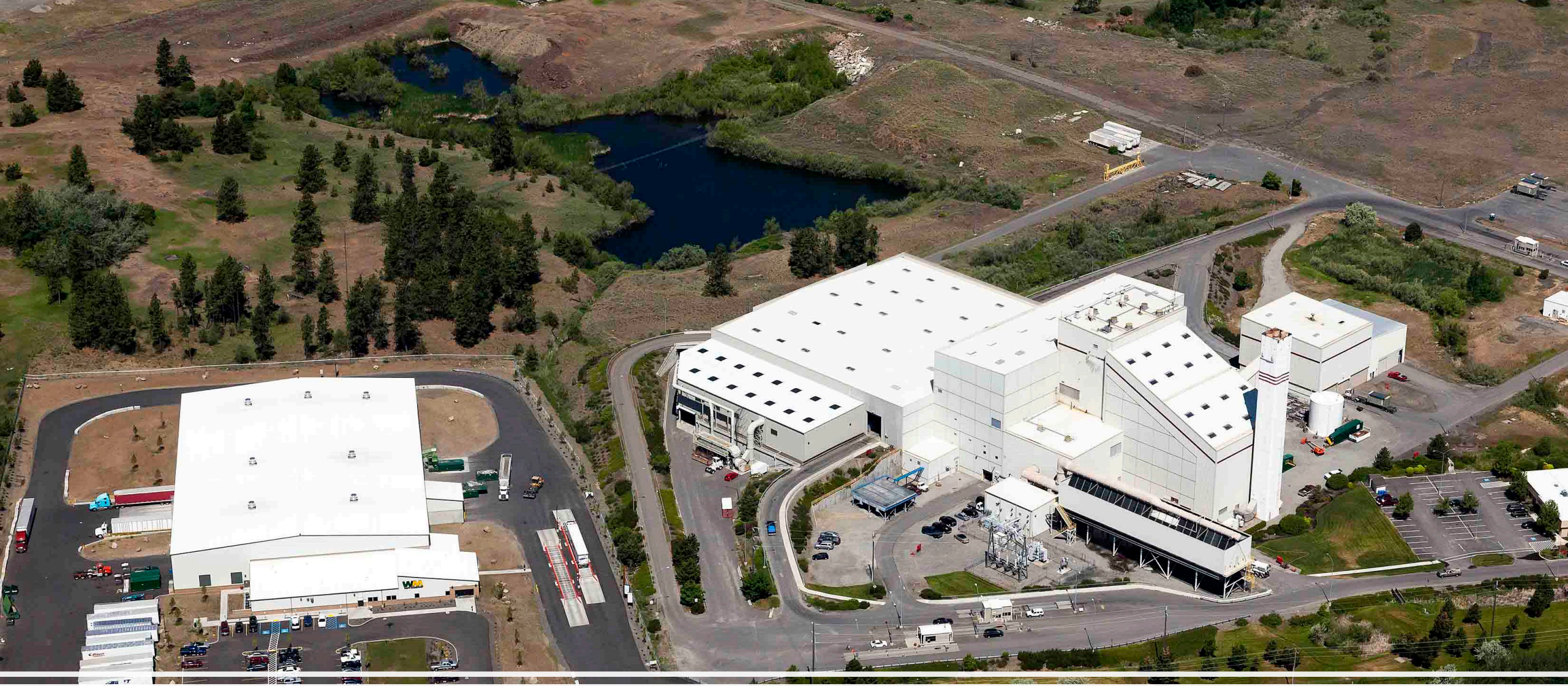
CarbonQuest, a Spokane based carbon capture company, was awarded $650,000 from the state for a feasibility study of their technology at the WTE.

Market analysis conducted with TerraForma to explore costs of installation and ROI for potential end uses.

Potential end uses include but are not limited to:

Mineral sequestration	Beverage grade CO2	Urea (fertilizer)	Methanol	Sustainable Aviation Fuel





Questions?