Medical Waste Services, LLC Community Meeting

South Coast Air Quality Management District

August 9, 2017
Progress Park Community Center
Paramount

Who is SCAQMD?

The South Coast Air Quality Management District (SCAQMD) is the air pollution control agency of Orange County and the urban portions of Los Angeles, Riverside, and San Bernardino counties.

- 10,743 square miles
- Over 16.8 million people

Because this area's smog problem is so severe, SCAQMD is often at the forefront of efforts to control pollution.

- 27,000 permitted facilities
- No zoning authority

Purpose of Public Meeting

- When a permit unit is located within 1000 feet of a school, a public notice is required to be distributed to all addresses within 1000 feet of the facility boundary and to all students attending schools within ¼ mile from the facility boundary.
- Howard Tanner Elementary School is ~980 ft from Medical Waste Services.
- A Public Notice was distributed on March 22, 2017.
- Many comments and requests for a public meeting from the public were received.
- The purpose of this public meeting is to provide information on the proposed permit and respond to public comments.

Overview

- Who is and Where is Medical Waste Services, LLC?
- What is Medical Waste and How is it Processed?
- How Much Medical Waste is Processed?
- What is the Equipment?
- What is Pyrolysis?
- How Do We Know This Equipment Uses Pyrolysis?
- How Are Emissions Controlled?
- What Does Medical Waste Look Like (Before & After)?
- What Are The Emissions?
- What Are The Health Risks?
- Questions

Who is Medical Waste Services, LLC (MWS)?

MWS is a facility operated since 2010. MWS processes non-hazardous medical waste for sterilization and destruction from the surrounding Southern California area.

MWS applied for a permit for a boiler to generate steam for their autoclaving (sterilization) process in 2010.

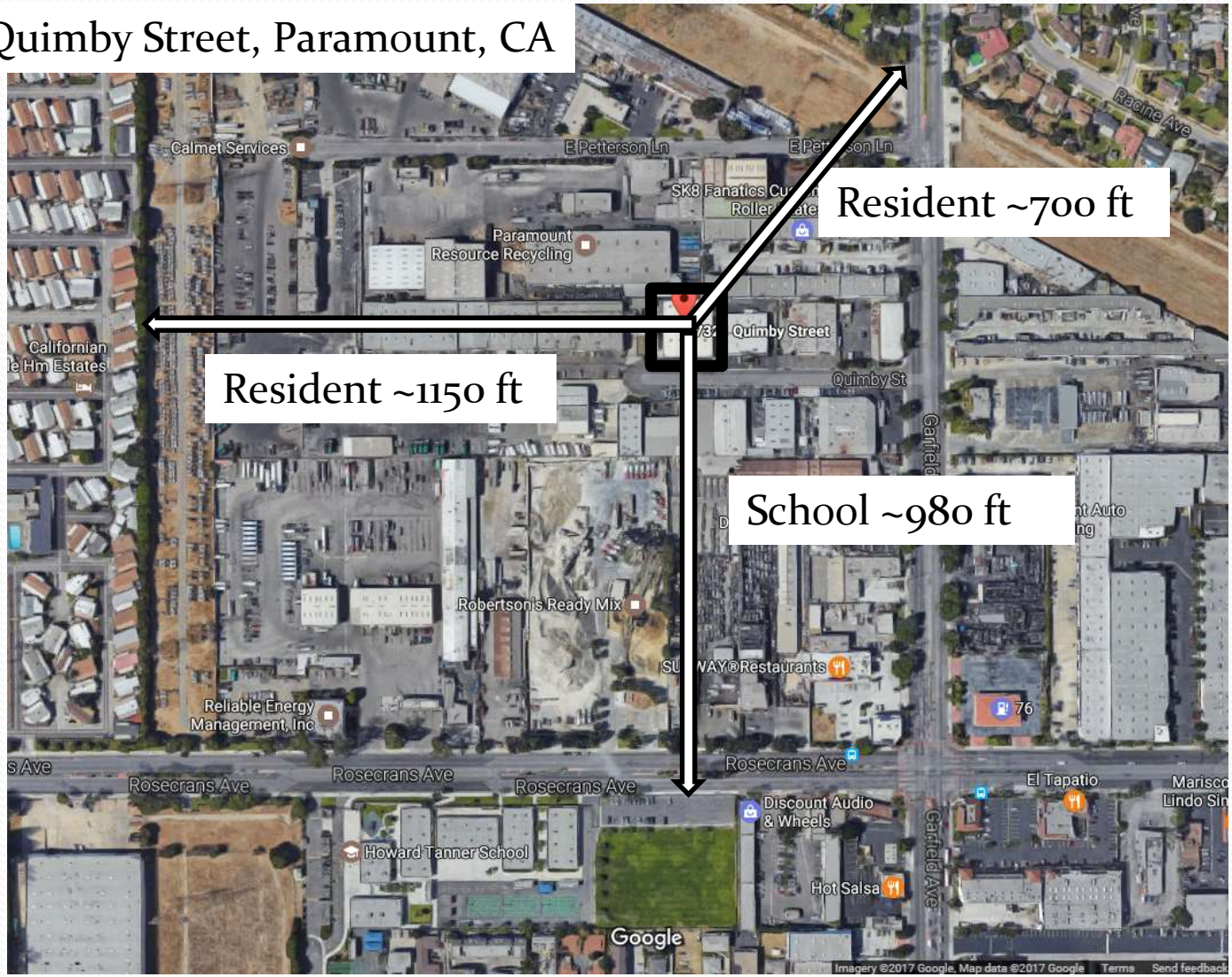
- Permit to Construct issued October 6, 2010.
- Permit to Operate issued February 8, 2012.

MWS applied for a permit for the Medical Waste Destruction and Air Pollution Control System (CoronaLux) in 2014.

- Research Permit issued April 24, 2015.
- Regular Permit applied for on March 29, 2016.

Where is Medical Waste Services, LLC?

7321 Quimby Street, Paramount, CA



What is Medical Waste and How is It Processed?

Medical Waste is a type of waste generated at health care facilities, such as hospitals, physician's office, dental practices, blood banks, and other medical facilities.

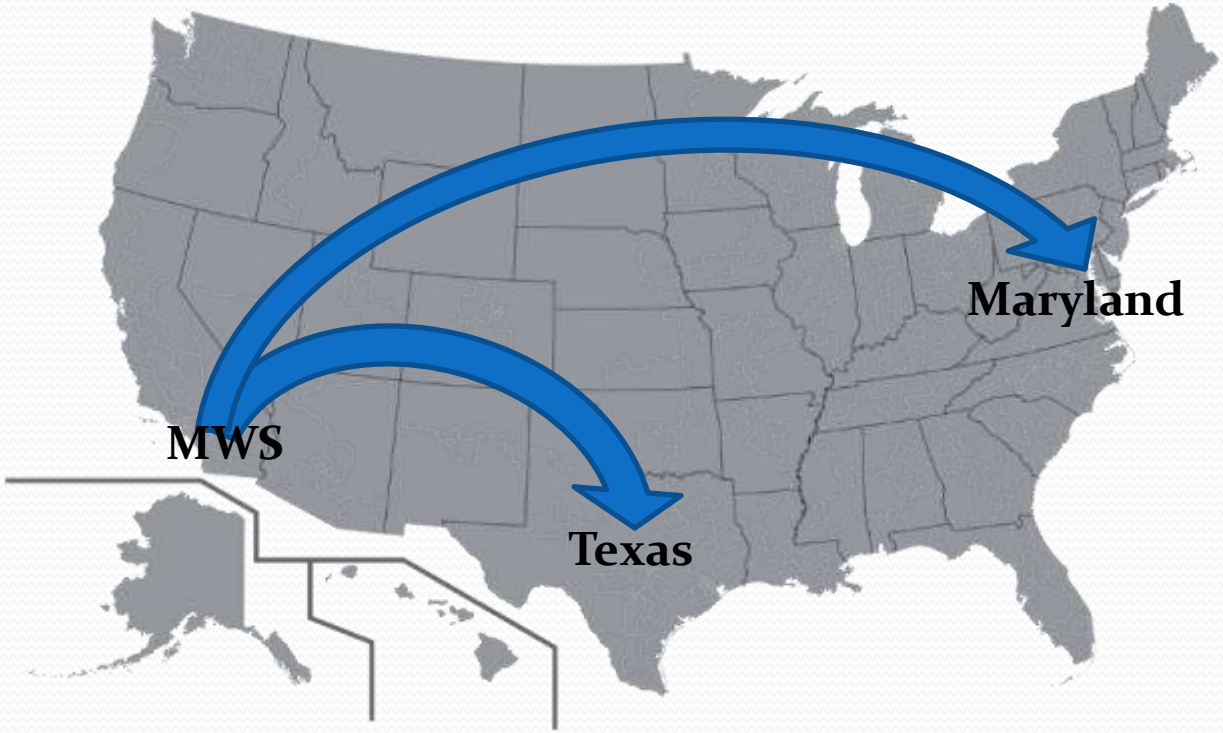
MWS has two process streams for medical waste:

- 75% of Medical Waste goes to an autoclave (sterilization)
  - Needles, blood soaked bandages, lab wastes, etc.

- 25% of Medical Waste goes to the CoronaLux (pyrolysis/ thermal destruction)
  - Biohazardous (red bag) waste
  - Sharps (needles) waste
  - Non-hazardous pharmaceutical waste
  - Trace chemotherapy waste
  - Pathology (tissues) waste

Local Medical Waste Processing

Prior to this system, all medical waste for thermal processing was transported out of state.



How Much Medical Waste is Processed?

- Previously Proposed Permit (at the time the notice was distributed)
  - 10,000 lbs/day of medical waste
  - Up to 24 hrs/day, 7 days/week

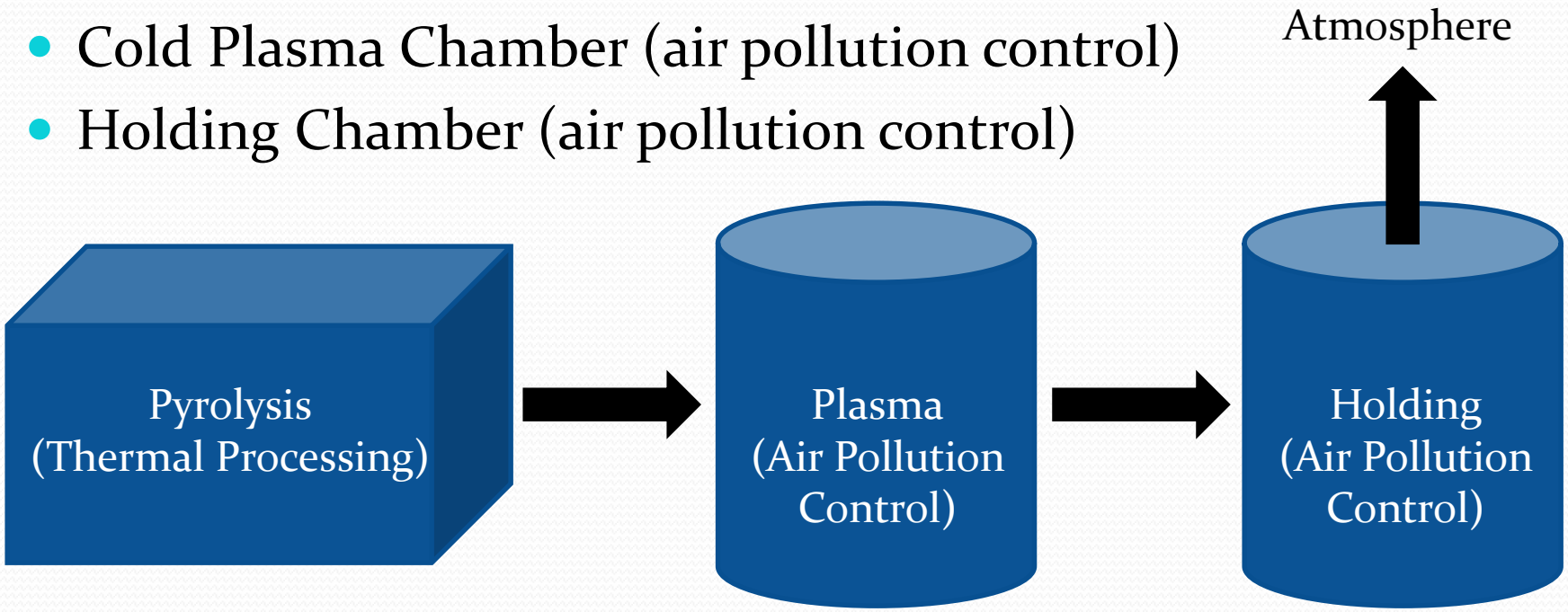
- Revised Proposed Permit
  - Less than 3,000 lbs/day of medical waste
  - 12 hrs/day, 7 days/week

- In response to the comments received, MWS in an abundance of caution has decided to revise the processing throughput limit to ensure that no further CEQA requirements could potentially be triggered.

What is the Equipment?

The CoronaLux System destroys medical waste utilizing pyrolysis (instead of incineration) with two stages of subsequent air pollution control. It utilizes three chambers:

- Pyrolysis Chamber (thermal destruction)
- Cold Plasma Chamber (air pollution control)
- Holding Chamber (air pollution control)




DANGER
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DANGER
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Waste
Solutions
A SEER Company

What is Pyrolysis?

Pyrolysis- an endothermic gasification process, using external heat, **with little to no oxygen**.

- Endothermic- absorbs energy/heat
- External heat- heat from a source external to material processed
- Gasification- a thermal process converting organic material into gaseous products (CO, CO_2, etc.)
- Little to no oxygen

How Do We Know the Equipment Uses Pyrolysis?

- It uses a heat source external to the medical waste being processed, by using natural gas burners that do not come into contact with the waste.
- The temperature in the chamber decreases when it is not being heated, as heat is absorbed. The temperature does not increase, as heat is not released (not incineration).
- The pyrolysis chamber is sealed.
- The pyrolysis chamber is evacuated for 2-3 minutes prior to heating, removing air from the chamber.
- Burner exhaust is introduced into the chamber to drive off any remaining air.
- The air to fuel ratio of burners are non-resettable to ensure sub-stoichiometric air to fuel ratio.

How Are the Emissions From Pyrolysis Controlled? Part I

First Stage of Emission Control: Plasma Chamber

- High voltage electrodes in the chamber produce an electric field necessary to create plasma (from the gases already inside the chamber).
- Plasma is an ionized gas whose molecules split into electrons and positive ions.
- Exhaust gases from the pyrolysis chamber are introduced to and interact with plasma, which break apart the exhaust gas molecules.
- The exhaust gases are converted to mostly carbon dioxide and water.

How Are the Emissions From Pyrolysis Controlled? Part II

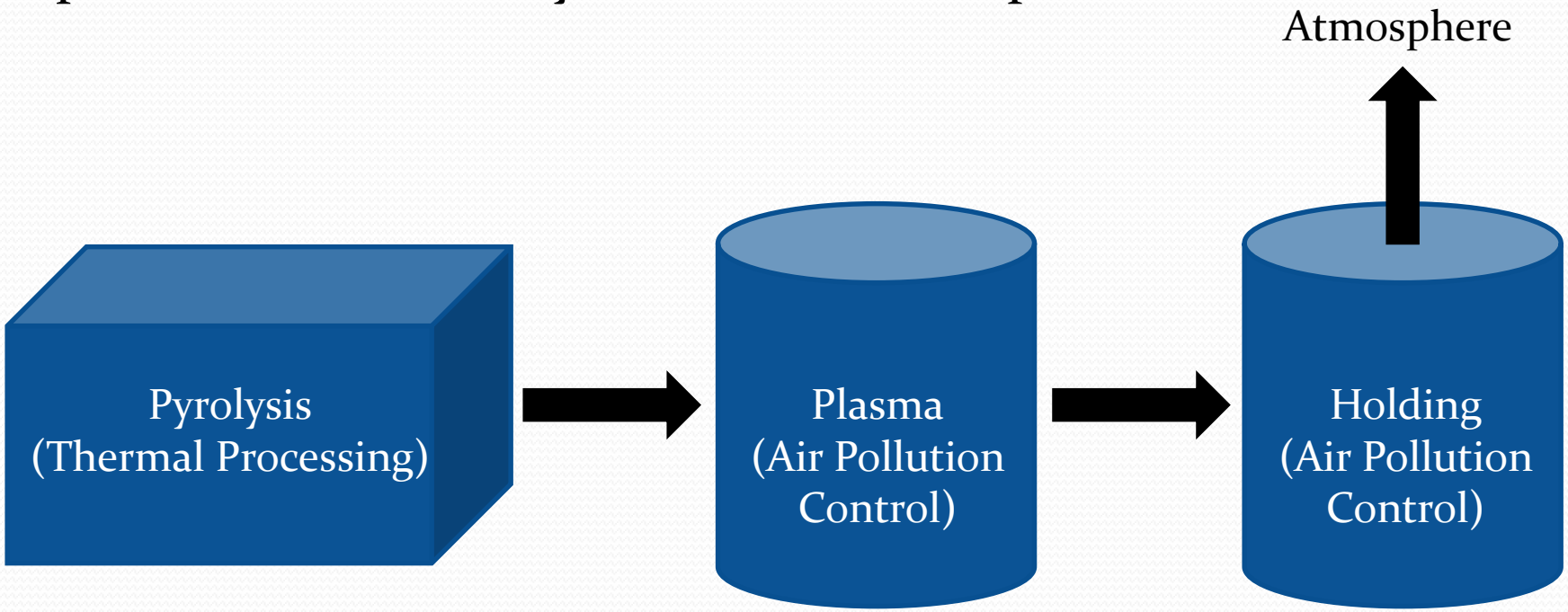
Second Stage of Emission Control: Holding Chamber

- The holding chamber is operated at high temperature (≥1400°F) and provides extended time (residence time) for the completion of reactions to ensure destruction of the air contaminants.

- The holding chamber has a long residence time, ~5 seconds
  - Other high temperature air pollution control systems have residence times ~ 0.6 seconds.
  - The holding chamber residence time more than 8x longer to ensure proper emissions control.

How Are the Emissions From Pyrolysis Controlled? Part III

The CoronaLux System order of operations ensures that the downstream air pollution control systems are fully operational before any medical waste is processed.



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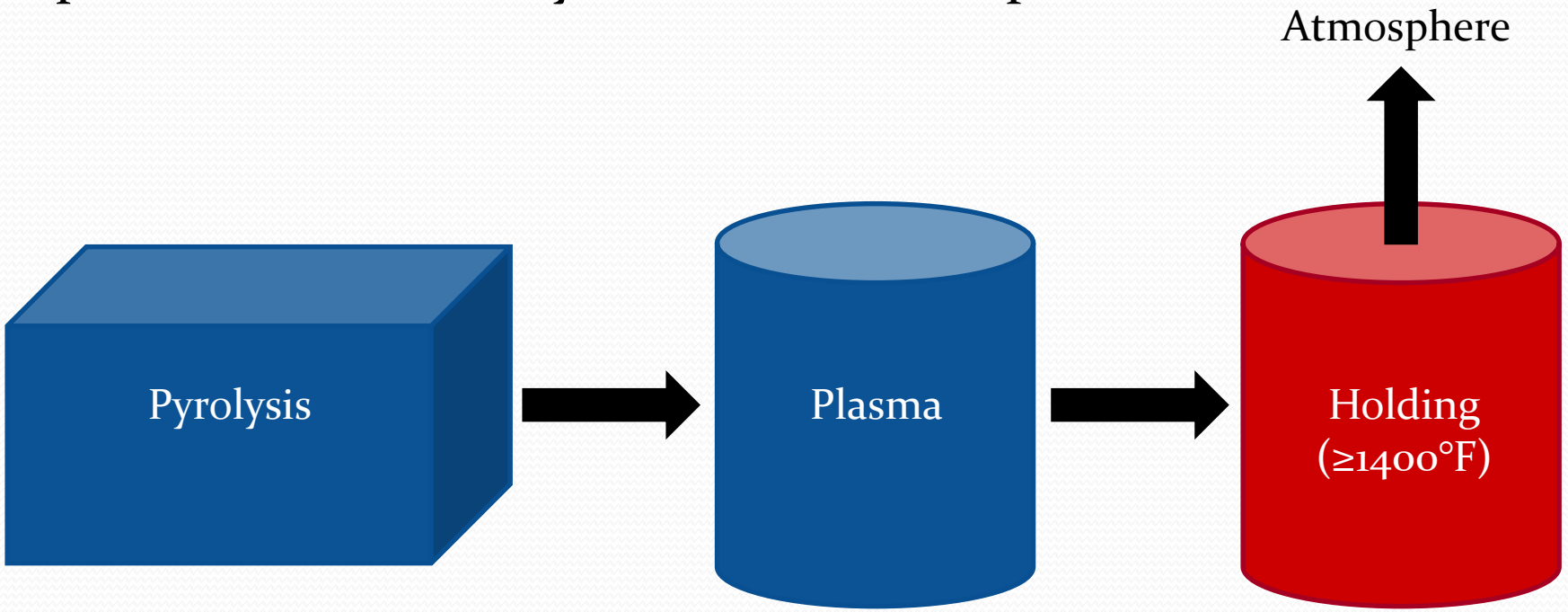

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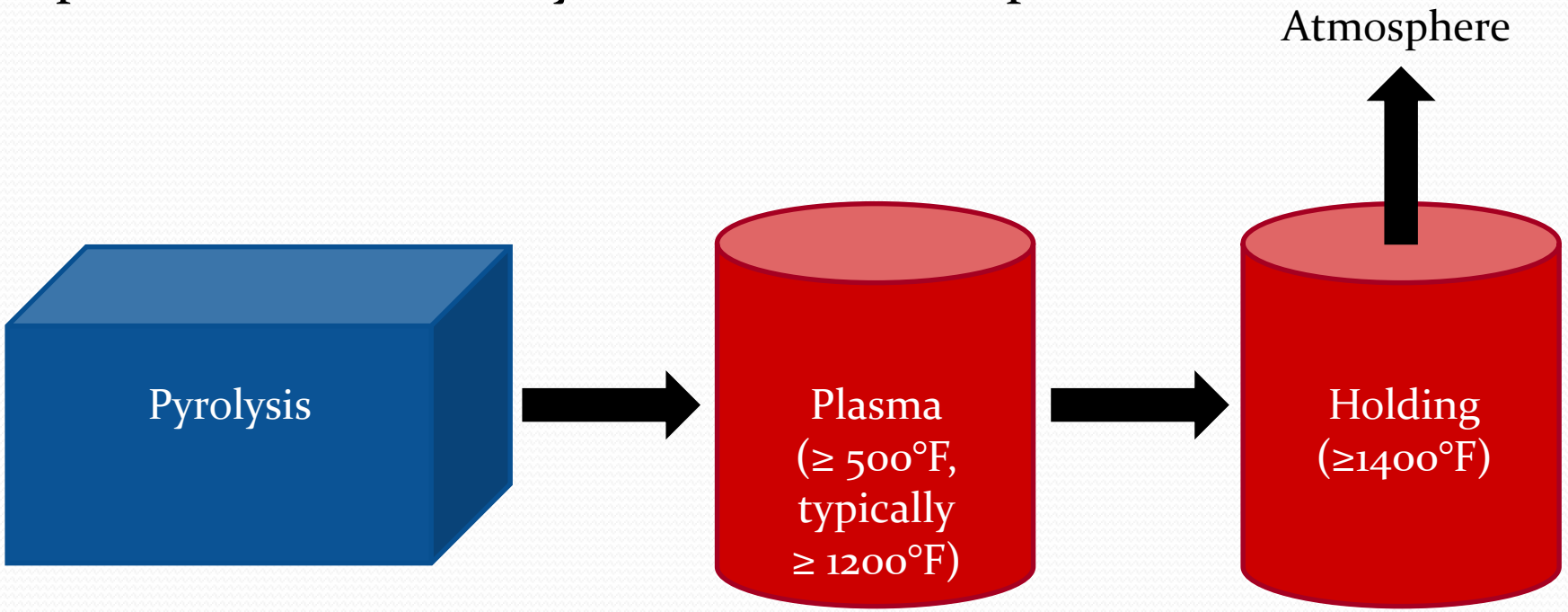

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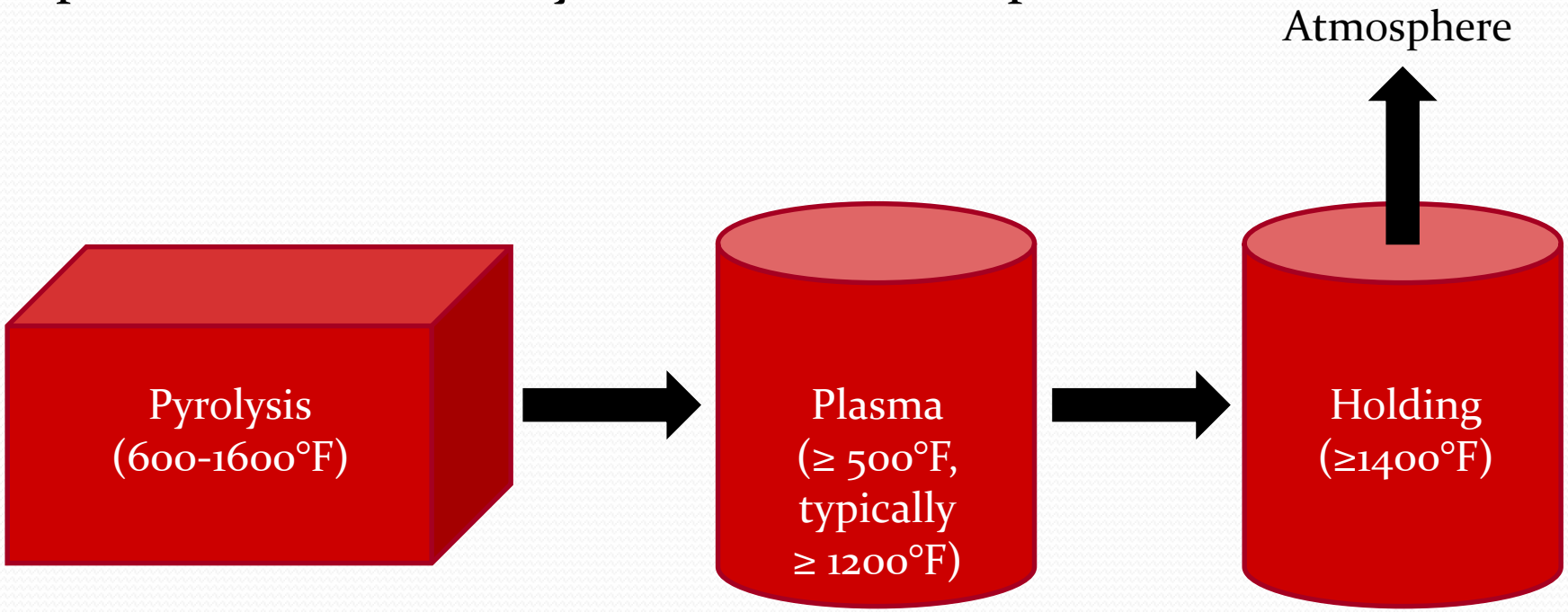


Medical Waste Prior to Processing

Medical waste is contained:

- At the source
- During loading for transport from the source
- During delivery to the facility
- During loading of waste into the processing system

Medical Waste After Processing

- The waste has been destroyed and the remaining material is mostly glass and metal.
- The remaining material is non-hazardous and is disposed of in a landfill.

What Are the Actual Criteria Pollutant Emissions From This Process?

December 2015 Source Test	Maximum	Average
PM10	0.108 lbs/hr	0.100 lbs/hr
Total Non-Methane OC	0.02 lbs/hr	<0.01 lbs/hr
NOx	0.08 lbs/hr	0.07 lbs/hr
CO	0.02 lbs/hr	0.01 lbs/hr

What Are the Criteria Pollutant Permit Limits (Potential Emissions)?

Potential Emissions (Permit Limits)	Previously Proposed	Revised Proposal
PM10	2.64 lbs/day	1.32 lbs/day
Total Non-Methane OC	0.96 lbs/day	0.48 lbs/day
NOx	6.96 lbs/day	3.48 lbs/day
CO	0.48 lbs/day	0.24 lbs/day

- The revised proposal has a 50% reduction of potential emissions from the previously proposed permit (at the time of the notice).
- Actual emissions are expected to be lower.

What Are the Toxic Air Contaminant (TAC) Dioxin/Furan Emissions From This Process?

December 2015 Source Test	Max lbs/hr
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.15E-11
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	4.82E-11
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	5.86E-11
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.24E-10
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.01E-10
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	6.76E-10
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-idioxin	8.45E-10
Total TAC Dioxins	1.86E-9
2,3,7,8-Tetrachlorodibenzofuran	9.20E-11
1,2,3,7,8-Pentachlorodibenzofuran	1.58E-10
2,3,4,7,8-Pentachlorodibenzofuran	3.55E-10
1,2,3,4,7,8-Hexachlorodibenzofuran	2.70E-10
1,2,3,6,7,8-Hexachlorodibenzofuran	2.55E-10
1,2,3,7,8,9-Hexachlorodibenzofuran	1.16E-10
2,3,4,6,7,8-Hexachlorodibenzofuran	3.61E-10
1,2,3,4,6,7,8-Heptachlorodibenzofuran	7.57E-10
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.49E-10
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	3.49E-13
Total TAC Furans	2.86E-9
Total TAC Dioxins/Furans	4.73E-9

What Are the Other TAC Emissions From This Process?

December 2015 Source Test	Max lbs/hr
Benzene	2.81E-05
Toluene	8.48E-04
Ethyl benzene	4.13E-05
Xylenes	1.01E-04
Chlorobenzene	3.16E-05
Styrene	1.09E-04
p-Dichlorobenzene	8.02E-06
Acrolein	3.96E-05
Acrylonitrile	1.09E-05
Allyl chloride	2.55E-05
Chloroethane	5.62E-05
Chloroform	1.40E-04
Carbon disulfide	1.03E-03
Hexane	1.43E-04
Isopropanol	7.54E-04
Methylene chloride	1.45E-03
Bromomethane	1.99E-05
1,1,1-Trichloroethane	8.31E-06
Tetrachloroethylene	1.84E-05
Propylene (propene)	9.17E-04

What Are the TAC Metal Emissions From This Process?

December 2015 Source Test	Maximum
Arsenic	2.96×10^{-6} lbs/hr
Beryllium	$<3.74 \times 10^{-7}$ lbs/hr
Cadmium	4.02×10^{-7} lbs/hr
Chromium (total)	3.18×10^{-5} lbs/hr
Copper	1.05×10^{-4} lbs/hr
Lead	1.04×10^{-5} lbs/hr
Manganese	3.37×10^{-5} lbs/hr
Mercury	$<3.43 \times 10^{-6}$ lbs/hr
Nickel	7.03×10^{-5} lbs/hr
Selenium	4.06×10^{-6} lbs/hr
Vanadium	$<3.74 \times 10^{-6}$ lbs/hr

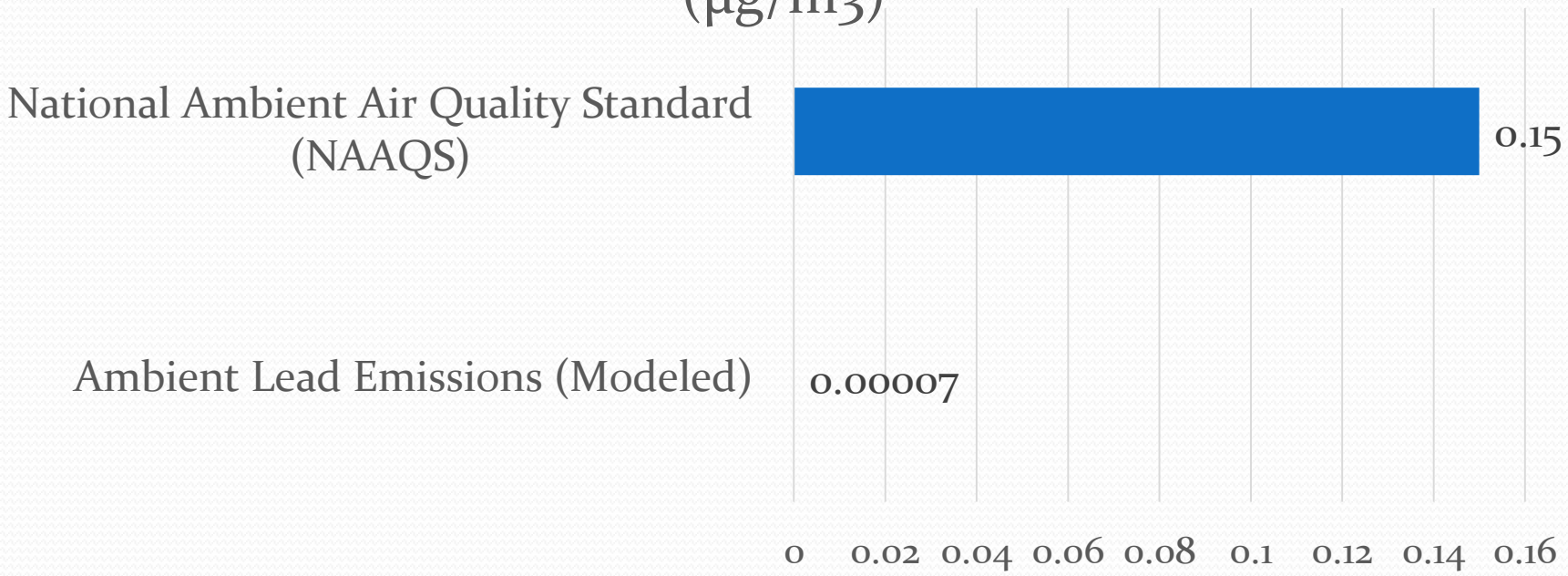
What is the Health Risk Comparing the Previously Proposed and Revised Permit?

Previously Proposed	Residential	Commercial	Howard Tanner	Threshold	Multiplier Below Threshold
Cancer Risk	1.77 in a million	0.11 in a million	0.11 in a million	10 in a million	> 5 x
Cancer Burden	0.011			0.5	> 45 x
Revised Proposal	**Residential**	**Commercial**	**Howard Tanner**	**Threshold**	**Multiplier Below Threshold**
Cancer Risk	0.58 in a million	0.07 in a million	0.06 in a million	10 in a million	> 17 x
Cancer Burden	N/A			0.5	N/A

What is the Health Risk Comparing the Previously Proposed and Revised Permit?

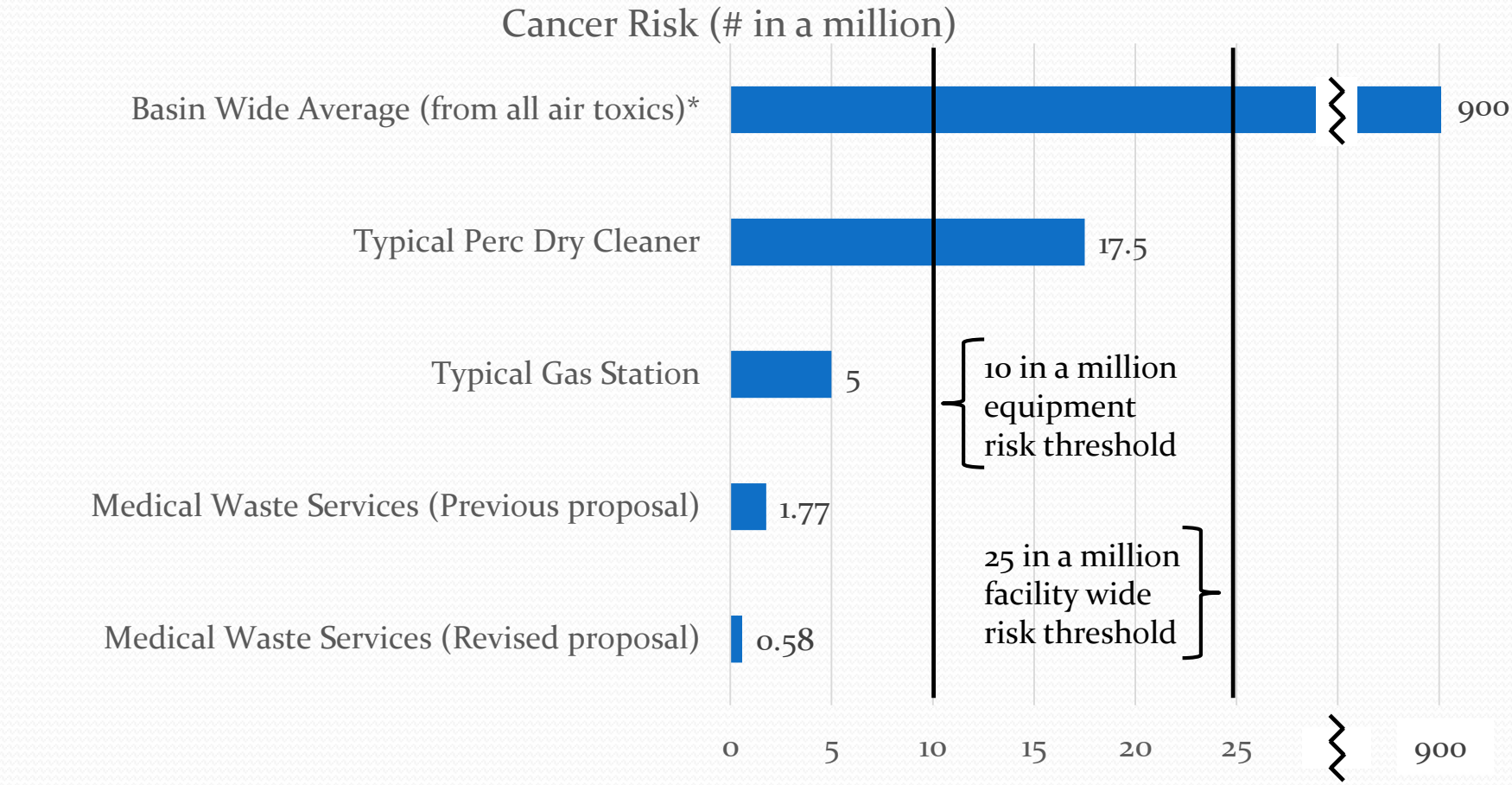
Previously Proposed	Residential	Commercial	Howard Tanner	Threshold	Multiplier Below Threshold
Acute Hazard Index	0.00948	0.0272	0.00414	1.0	>36 x
Chronic Hazard Index	0.0487	0.0352	0.00307	1.0	>20 x
Revised Proposal	**Residential**	**Commercial**	**Howard Tanner**	**Threshold**	**Multiplier Below Threshold**
Acute Hazard Index	0.00948	0.0272	0.00414	1.0	>36 x
Chronic Hazard Index	0.0159	0.0234	0.00179	1.0	>42 x

Ambient Lead Concentration



- National Ambient Air Quality Standard for Lead: 0.15 µg/m^3
- Ambient Lead Emissions at the Community: 0.00007 µg/m^3
  - Calculated from the max lead stack emission (Dec 2015) of 1.1 µg/m^3
- Over **2100x below** the National Ambient Air Quality Standard

Cancer Risk Comparison



*Based on Multiple Air Toxics Exposure Study (MATES) IV.

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Questions?