Incinerator Air Pollution Right-to-Know bill

A response to Hawai'i Department of Health Clean Air Branch

by

Mike Ewall, Esq., Energy Justice Network

215-436-9511 | mike@energyjustice.net

BACKGROUND: In the 2024 legislative session, Senator Mike Gabbard has introduced the Incinerator Air Pollution Right-to-Know bill (SB 2101). The bill is based largely on Oregon's Senate Bill 488 of 2023, where Oregon became the first state requiring a trash incinerator to use modern technology to continuously monitor for toxic chemicals and other pollutants that are typically not monitored at all, or are tested just once a year under optimal operating conditions that understate actual emissions.

On 10/30/2023, the Hawai'i Department of Health Clean Air Branch (DOH-CAB) drafted a nine-page review of the bill. This review provides some good background information and context, but also contains some statements to which this response provides some clarification. The DOH review is printed verbatim below on pages 3 to 19, set side-by-side with our response for ease of reviewing both. A chart from our factsheet, comparing current vs. proposed monitoring requirements, is attached on page 20.

WHY CONTINUOUS MONITORING? At trash incinerators throughout the U.S., only three pollutants are required to be monitored on a continuous basis (NOx, SO_2, and CO). Carbon dioxide (CO_2), the global warming pollutant, is often monitored continuously at larger incinerators, as are various parameters like oxygen, temperature, and opacity (darkness of air emissions). In rare other cases, additional pollutants are monitored continuously (see examples on next page).

Other pollutants, if monitored at all, are typically tested once per year, and sometimes less frequently. If we regulated motorists the way we do most pollutants from smokestacks, it would be akin to enforcing a speed limit by allowing drivers to drive all year with no speedometer. Once a year, a speed trap would be set on the highway with signs warning "slow down... speed trap ahead," and the driver's brother would be running the speed trap (companies choose who they pay to conduct the test). Some incinerator operators have also been known to manipulate emission testing to present lower emissions levels to regulators.[1]

UNDERESTIMATING POLLUTION: Testing just once a year underestimates actual pollution levels. An analysis of seven years of data from the nation's largest trash incinerator, Covanta Delaware Valley in the City of Chester, Pennsylvania, where they monitor hydrochloric acid continuously as well as once per year in an annual stack test, the continuous monitors show actual emissions to be 62% higher than annual stack tests show.

Increased downtime at aging incinerators results in higher emissions from startup and shutdown occurrences. Dioxin emissions are a stark example. One study out of Europe found that using continuous sampling for dioxins at incinerators found the actual emissions to be 32-52 times higher than we think they are in the U.S. when requiring incinerators to test each unit just

[1] In Connecticut, Covanta was fined $20,000 in 1993 in a civil action filed by the state Attorney General in response to an employee adjusting a continuous emissions monitoring device to alter a reading in order to pass a continuous emissions monitoring audit. In Tulsa, Oklahoma in 2013, Covanta was the target of a criminal investigation by the U.S. Attorney's Office "related to alleged improprieties in the recording and reporting of emissions data" in which Covanta entered into a non-prosecution agreement to follow applicable laws and regulations and pay a $200,000 "community service payment" to the state environmental agency. For the Connecticut incident, see page 37 for this 1993 incident reported in this 93-page compilation of Covanta's U.S. violations through September 2006: www.energyjustice.net/files/incineration/covanta/violations2006.pdf. For Tulsa, see Covanta Holding Corporation's 2019 10-K Securities and Exchange Commission filing, p. 105. (see "Tulsa Matter" describing the consequences of this 2013 incident) d18rn0p25nwr6d.cloudfront.net/CIK-0000225648/992dfb7f-398d-4b17-8e33-75e956f6f235.pdf

once per year under ideal operating conditions.[2] A more recent study found that our failure to use continuous sampling technology is underestimating dioxin emissions by 460 to 1,290 times.[3] Considering that continuous sampling technology has been tested and verified by EPA since 2006[4] and that dioxin is the most toxic substance known to EPA – 140,000 times more toxic than mercury[5] – there is no excuse for not requiring continuous dioxin sampling at waste incinerators.

Similarly, the technology to continuously monitor mercury, particulate matter, hydrochloric acid, and other regulated air pollutants from trash incinerators has existed for far too long that it's time for enforcement of new EPA standards to be based on continuous monitoring to ensure that spikes in emissions, especially during startup, shutdown, and malfunction (SSM) times, are not missed for lack of looking.

While EPA's proposed new regulations for trash incinerators will be removing the loophole that exempts incinerators during startup and shutdown times, that exemption only applies to the three pollutants that are federally required to be tested on a continuous basis (CO, NOx, and SO_2) and will still permit higher emissions during malfunctions to be unregulated. For all other pollutants, the higher emissions during SSM times will still go unmonitored and unregulated.

Municipal solid waste (trash) is a very variable waste stream, and incinerators burning industrial wastes, medical waste, sewage sludge, recyclables, or construction and demolition wastes have even more variability that can alter emissions.

WHERE ARE CONTINUOUS MONITORS USED AT INCINERATORS?

Hydrochloric acid: all six trash incinerators in Pennsylvania, plus Covanta's Union and Camden County incinerators in New Jersey, Covanta Onondaga in New York, and Wheelabrator's Portsmouth, VA incinerator.

Ammonia: The Union County, NJ incinerator, and Covanta's Huntington and Onondaga incinerators in New York continuously monitor for ammonia.

Dioxins/furans, PCBs, and toxic metals: Covanta Marion in Oregon, since the passage of Senate Bill 488 in 2023, will have to continuously monitor for dioxins/furans, PCBs, and nine toxic metals.

Dioxins, mercury, and particulate matter: According to Covanta's website about their innovations, they claim that their Covanta Haverhill incinerator in Massachusetts, in 2010, pioneered the "installation and demonstration of a new continuous monitoring system for mercury, dioxin and particulate matter. Although the dioxin monitor still requires laboratory analysis, it allows long-term monitoring of emissions without a team of specialists."

Mercury: Covanta Bristol in Connecticut, if they get permission to start burning medical waste, says they'll continuously monitor for mercury. West Palm Beach #2 in Florida tested mercury CEMS from 2015-2018, as did Covanta's Hillsborough County, Florida incinerator (at Unit #4 from 2009-2015). Durham-York Energy Centre operated by Covanta in Ontario, Canada, and Covanta Onondaga in New York, may also have mercury CEMS.

Dioxins/furans: Durham-York Energy Centre in Ontario, Canada is another incinerator using long-term sampling for dioxins/furans.

[2] De Fré R, Wevers M. "Underestimation in dioxin emission inventories," Organohalogen Compounds, 36: 17–20. www.ejnet.org/toxics/cems/1998_DeFre_OrgComp98_Underest_Dioxin_Em_Inv_Amesa.pdf

[3] Arkenbout, A, Olie K, Esbensen, KH. "Emission regimes of POPs of a Dutch incinerator: regulated, measured and hidden issues." docs.wixstatic.com/ugd/8b2c54_8842250015574805aeb13a18479226fc.pdf

[4] Environmental Protection Agency, Environmental Technology Verification Program. archive.epa.gov/nrmrl/archive-etv/web/html/vt-ams.html

[5] Environmental Protection Agency, Risk-Screening Environmental Indicators (RSEI) Model. www.epa.gov/rsei

Hawai‘i Department of Health Clean Air Branch (DOH-CAB) review of the bill (10/30/2023) [reprinted verbatim]	**Response by Energy Justice Network on behalf of Hawai‘i Clean Power Task Force (1/16/2024)**
The Department of Health Clean Air Branch (DOH-CAB) was requested to provide feedback on a bill being considered for the forthcoming 2024 legislative session. The bill is similar to Senate Bill 488 that recently passed in Oregon to require increased continuous emissions monitoring for burning municipal solid waste (MSW) and caps the facility's medical waste incineration at 18,000 tons/year. The Oregon measure affects the Covanta Marion, Inc. MSW facility in Marion County which operates two 250 ton per day MSW combustor units. Medical waste from outside the State of Oregon is accepted at the Marion facility.	This is accurate. You can find a copy of the Oregon bill here: Oregon Senate Bill 488
The bill considered for Hawaii would affect the Honolulu Program of Waste Energy Recovery (HPOWER) plant on the southwest corner of Oahu owned and operated by Covanta Honolulu Resource Recovery Venture. The HPOWER plant operates one 900 ton per day mass-burn municipal waste combustor (MWC) boiler and two 854 ton per day refuse derived fuel (RDF) MWC boilers. The RDF is produced by processing MSW through shredding and size classification. Shredding and size classification for the 900 ton per day boiler is not required because the combustor is a mass-burn unit.	H-POWER has three burners (units): Unit / Went Online / Fuel / Capacity 1 / Nov 1989 / RDF / 854 tons/day 2 / Nov 1989 / RDF / 854 tons/day 3 / Feb 2013 / MSW / 900 tons/day Refuse-derived fuel (RDF) basically just means that the trash (municipal solid waste, or "MSW") is processed to remove much of the metal and glass (which don't burn) before burning the remaining trash. The term "mass burn" is used to describe units like Unit 3 that burn trash (MSW) without removing metals or glass first.
The Hawaii bill will require HPOWER to develop a plan to continuously monitor or continuously sample emissions at its MSW plant from a large list of pollutants including: • criteria air pollutants (carbon monoxide, lead, nitrogen dioxide, particulate matter, sulfur dioxide, and volatile organic compounds); *currently carbon monoxide, nitrogen dioxide, and sulfur dioxide are sampled continuously*	See the chart attached as page 20 (also in this factsheet) for a more visual breakdown of current vs. proposed testing requirements. Carbon monoxide (CO), nitrogen oxides (NOx), and sulfur dioxide (SO_2) are already required to be continuously monitored per federal regulation. The bill includes them just to be thorough. Note that DOH uses the term nitrogen dioxide, but should have written nitrogen oxides. Nitrogen oxides (NOx) is a collective term used to refer to nitrogen monoxide (nitric oxide or NO) and nitrogen dioxide (NO_2). H-POWER is already required to monitor both. Volatile organic compounds (VOCs) are tested just once per year. Total particulate matter is tested just once per year, but the smaller (more dangerous) sizes of particulate

	matter are only tested annually on Unit 3. The old Units 1 & 2 are not tested and only do engineering estimates.
• hazardous air pollutants (arsenic, cadmium, dioxins/furans, hexavalent chromium, hydrochloric acid - HCL, hydrofluoric acid - HF, manganese, mercury, nickel, polychlorinated biphenyls - PCB, polycyclic aromatic hydrocarbons - PAH, Per – and polyfluoroalkyl substances – PFAS, and selenium); *currently dioxin/furans, MWC acid gases, and MWC metals are sampled annually*	Yes, dioxins/furans, acid gases (hydrochloric and hydrofluoric acids) and four metals (beryllium, cadmium, lead and mercury) are tested once per year. Arsenic, hexavalent chromium, manganese, nickel, selenium and zinc are metals that are never tested.
• carbon dioxide; *currently carbon dioxide is sampled continuously* and	Yes, carbon dioxide (CO_2) is already continuously monitored, as required by federal regulations. The bill includes it just to be thorough.
• zinc.	
The bill will also requires DOH-CAB to host a website to make all continuous emissions monitoring system (CEMS) data from HPOWER publicly available in real-time through an internet feed and set annual fees to cover the cost to develop and maintain the website. Requirements for the website include line chart displays of each pollutant monitored, red colored text notifications of violations, summary charts listing all violations of any applicable emissions limit, emission trend charts showing totals for all reporting facilities, and immediate alerts by email to owners, the Department, and other parties who signed up to be notified of any violations of data availability requirements or exceedances of any applicable air pollution limitations. For implementing the continuous monitoring measures, the owner of the waste combustion facility must submit a plan 3 months after the effective date. Within 3 months of plan approval by the DOH-CAB, the owner would be required to implement the plan. The DOH-CAB would then be required to issue a determination on whether the data is reliable for enforcing permit limits within 12 months after first use of the continuous monitoring or sampling measure. Within 6 months of the determination, the DOH-CAB would then be required to issue rules for enforcement which would start no later than 12 months after its determination on whether the monitoring data is reliable. The DOH-CAB would make these determinations on an annual basis as required by the bill. The bill requires DOH-CAB to submit the following reports to the legislature:	This is an accurate description of the bill.

a) A report of progress made on implementing the continuous emissions monitoring requirements of the bill, no later than the regular session of 2025; and b) An annual report on the results of continuous monitoring or sampling that may include recommendations for legislation.	Note that the bill, as introduced, no longer has this requirement to provide the results to the legislature (which will be on a public website, anyway), or to provide recommendations for legislation.
DOH-CAB supports the intent of the bill to require a higher standard of monitoring for MSW combustors and making data publicly available. However, DOH-CAB has the following concerns and comments:	We appreciate DOH-CAB's support for the intent of the bill and have already addressed their main concerns with amendments made to the bill prior to introduction, in response to DOH-CAB's memo.
<u>Differences in Oregon's MSW facility and Hawaii's HPOWER facility to consider</u>:	
• Unlike the Oregon MSW facility for which SB488 placed a capped at burning 18,000 tons/year of medical waste, HPOWER typically burns significantly less medical waste, about 1,200 to 2,400 tons/year (100 to 200 tons/month). The Oregon facility accepts medical waste from outside of the state and burns untreated medical waste. HPOWER's medical waste is treated. Hawaii Bio-Waste Systems, Inc. and Tripler Hospital have equipment to treat medical waste. After medical waste is treated, the waste is classified as MSW. Unlike the Oregon bill, the HPOWER bill would not limit or decrease emissions with such a cap as the amount of medical waste burned by HPOWER is significantly less than the Oregon facility.	As DOH-CAB admits here, this discussion of the medical waste provisions in Oregon's SB 488 is irrelevant since the Incinerator Air Pollution Right-to-Know bill (Hawaii Senate Bill 2101) does not include any provisions about medical waste burning.
• Wind patterns and location of public areas in the vicinity of the Oregon facility are different than those at the HPOWER facility (please see Figures 1 through 6). While winds transport pollutants downwind to various public areas on all sides of the Oregon facility (please see Figures 1, 2 & 3), prevailing trade winds from the northeast transport pollutants from HPOWER away from residential areas a majority of the time (please see Figures 4, 5, and 6). Generally, in order for emissions to significantly impact residential areas in the vicinity of the HPOWER facility, sustained winds with a southerly component are needed. Wind data from the Kalaeloa Airport over a five year period (January 1, 2018, to December 31, 2022) indicates that winds from this direction (135^{O} -315^{O}) occur 12.79% of the time. For the 87.21% of time	DOH argues that H-POWER's emissions predominantly blow out toward the ocean, perhaps trying to imply that these emissions are not worth worrying about. However, DOH documents that 12.79% of the time, H-POWER's emissions blow toward residential areas, which is still significant. DOH compares to the Covanta Marion incinerator in Oregon to make its point. However, H-POWER is five times larger and actually burns about four times more waste than Covanta Marion. H-POWER also operates with fewer pollution control devices.

remaining, winds blow pollutants in a direction from HPOWER to the ocean. Please refer to Figure 6.

Even if you subtract all of H-POWER's emissions that blow toward the ocean from what they reported emitting in 2020 according to EPA's National Emissions Inventory, this is how much pollution H-POWER still released that blew toward O'ahu neighborhoods that year:

Pounds	Air Pollutant	Health impacts
230,220	Nitrogen oxides	Asthma attacks
30,031	Particulate matter	Heart attacks / strokes, cancer
3,274	Hydrochloric acid	Lung damage; eye & skin irritant
1.96	Lead	Learning & behavioral disabilities
1.52	Mercury	Neurotoxic, immune damage

These are amounts worthy of concern, especially considering that, except for nitrogen oxides, none of these are monitored on a continuous basis and are likely underestimated.

It's also worth noting that emissions that blow out to the ocean do not vanish, but enter the environment where people recreate, and use as a food source. Emissions like dioxins/furans, PCBs, and mercury will bioaccumulate in fish tissue and expose people at much higher doses than they would receive from breathing the air nearby.

HPOWER Controls, Source Testing, and Risk Assessment:

- The continuous emissions monitoring proposed by the bill is inconsistent with conditions specified in permits already held by HPOWER for operating its MWC boilers. The MWC boilers operate state-of-the-art air pollution control equipment for complying with emission limits including those established by federal New Source Performance Standards and best available control technology pursuant to federal Prevention Significant Deterioration regulations. The mass-burn boiler uses a spray dryer absorber with lime injection to control sulfur dioxide, MWC acid gases, sulfuric acid mist, and fluorides; a fabric filter baghouse for the control of particulate matter and MWC metals; carbon injection combined with spray dryer absorber and baghouse to control dioxin furans; good combustion practices for minimizing carbon monoxide; and Covanta Very Low NO_X system combined with selective non catalytic reduction (SNCR) to reduce nitrogen dioxide emissions. The RDF boilers use a spray dryer absorber with lime injection to

It is not "inconsistent" to require better monitoring by going from testing for a chemical once per year (or never) to modern continuous monitoring or sampling technology. Several trash incinerators already do both, such as monitoring for hydrochloric acid emissions continuously *and* via annual stack tests. Find examples of some of these on page two above.

In fact, the new regulations that the U.S. Environmental Protection Agency is in the process of adopting for large trash incinerators like H-POWER explicitly provides for the use of continuous emissions monitoring (CEMS). The draft rulemaking states that the 2006 final amendments to rules for large trash incinerators allow the optional use of CEMS for particulate matter and mercury in place of annual stack testing, and allows

control sulfur dioxide, MWC acid gases, sulfuric acid mist, and fluorides; baghouse to control particulate matter and MWC metals; and good combustion practices for minimizing carbon monoxide emissions.	the optional use of CEMS for multi-metal, hydrochloric acid, and dioxins/furans in place of stack tests after performance specifications for these CEMS are promulgated. EPA's Environmental Technology Verification Program (no longer active) tested and verified a variety of CEMS and continuous sampling technologies, including for multi-metals and dioxins/furans, around 2006. See their Verified Technologies page for details. EPA's Air Emissions Monitoring Center (EMC) also provides Promulgated Test Methods and Performance Specifications for continuous monitoring of most of the pollutants discussed here. DOH makes a blanket statement about *monitoring* being inconsistent with H-POWER's existing permit conditions. Of course, this is true because existing permits do not require continuous monitoring for more than four pollutants. However, DOH goes on to expound about what pollution *controls* H-POWER has, which is a different issue from monitoring. DOH's description of the controls, however, confirms that two of the three burners at H-POWER are missing two of the four common pollution control systems used at incinerators, while the new (third) burner has all four (though not as strict as modern requirements for new incinerators). Most trash incinerators in the U.S. have four different pollution control systems – each designed for different pollutants. DOH describes them fairly well. Three of the systems spray things into the exhaust to reduce certain emissions, often moving those chemicals into the ash. The spray dryer absorber (SDA) injects lime. The carbon injection (CI) system injects activated carbon (like Brita filter material). The selective non-catalytic reduction (SNCR) system injects ammonia or urea to reduce nitrogen oxides (NOx), and the unreacted excess amount becomes ammonia air pollution. The fourth system, the fabric filter (FF) or "baghouse," is like a large set of vacuum cleaner bags that collect particulate matter (PM) resulting from the exhaust plus the materials injected in the other control systems. This rather toxic "fly ash" is then mixed with the larger volume of

bottom ash left when trash is burned, and this combined ash is then landfilled at Waimanalo Gulch Landfill in Honokai Hale.

Pollution controls in place at H-POWER's three units (burners):

Control:	FF	SDA	CI	SNCR
Injects:	n/a	Lime	Activated Carbon	Ammonia
Reduces:	PM	Acid gases	Dioxins/mercury	NOx
Unit Fuel				
1 RDF	Y	Y	None	None
2 RDF	Y	Y	None	None
3 MSW	Y	Y	Y	Y*

The fact that two of the three burners at H-POWER are missing very common pollution controls that reduce air emissions of ultra-toxic dioxins and mercury, and asthma-triggering NOx, is rather unusual and shocking. They have the fewest pollution controls of any incinerator in the U.S. Once the new federal regulations kick in by 2028-2029, these will likely be required. The City and County of Honolulu has not yet evaluated what these systems will cost, or if they are affordable to install on such an old facility. Nevertheless, the Incinerator Air Pollution Right-to-Know bill would only require installation of monitors so that we know how extensive the pollution really is, not controls to actually reduce the pollutants, which is a more expensive proposition.

* Covanta's "Low-NOx" system (not "Very Low NO_X" as DOH writes) is basically an improved way to spray ammonia at the right places and times to do a better job at reducing NOx. This technology can reduce NOx enough to meet the new federal regulations that will come into effect in 2028-2029 requiring 110 parts per million (ppm). The current federal standard is 180-205 ppm. However, the modern limit for *new* trash incinerators is 45-50 ppm, which can only be met with selective catalytic reduction (SCR), which involves the same as SNCR (spraying ammonia into the exhaust), but also uses a catalyst to reduce these emissions much further. Existing facilities like H-POWER can install this equipment, but it can be rather expensive. A study for the incinerator in Baltimore, MD found that it would

	cost $60-90 million to install at that facility, which also has three burners. While the public health costs of asthma are also quite high (higher than the cost to install this equipment), EPA has chosen not to make the industry bear this cost to bring old incinerator up to modern standards for new facilities.
• A risk assessment, as part of the air modeling process for permitting, determined HPOWER's MWC mass-burn boiler to comply with air standards specified in Hawaii Administrative Rules (HAR) §11-60.1-179 for noncarcinogenic and carcinogenic hazardous air pollutants. The RDF boilers were grandfathered from requiring a risk assessment. However, calculations, based on impacts from the mass-burn boiler, predicted the total combined impact from HPOWER's three MWC boilers to be in compliance with HAR §11-60.1-179 for acid gases, MWC metals, and dioxin/furans.	"Risk assessment data can be like the captured spy. If you torture it long enough, it will tell you anything you want to know." — William Ruckelshaus, first U.S. EPA Administrator Time for a joke: What is the difference between a mathematician, a philosopher, and an environmental consultant? Well, if you ask each one what two plus two equals, a mathematician will tell you 2 + 2 = 4. The philosopher will tell you it depends on your definition of two, four, plus, and equals. The environmental consultant will take you in the back room and ask you what you want it to equal. Sadly, this is no joke in far too many situations. Risk assessment can be more art than science, depending on many assumptions that are often off-base, such as looking at toxic exposures to incinerators by examining only air inhalation when the most toxic pollutants (dioxins/furans, PCBs, mercury…) bioaccumulate and reach people via meat and dairy products they consume, which typically fall outside of the analysis. It is highly unusual for a risk assessment to come back with anything other than "this amount of pollution is fine," especially when conducted on behalf of a paying client that is operating a polluting facility. That said, a risk assessment showed that H-POWER's 3rd burner is in compliance with the amount of toxic pollution they're allowed to release, but that the two older burners are grandfathered and thus exempt from the requirement to even conduct a risk assessment. DOH's statement that they *calculated* that all of H-POWER complies with the standard for allowable cancer and non-cancer toxic impacts is just that – a modeling exercise that is not based on actual emissions because <u>none</u> of the toxic emissions are monitored on a continuous basis, and are likely underestimated because of this

	fact alone, not to mention issues like only examining inhalation as an exposure pathway, without considering food ingestion.
• The most recent source performance test results indicate the HPOWER facility is well within compliance with all of its air emissions limits. Please see attached source test results.	This only underscores the need to know the real emissions amounts, because these tests are based on once per year self-tests under optimal operating conditions.
<u>Enforcement</u>:	
• Enforcement would be an issue for many of the pollutants listed in the bill to be continually monitored since:	
a) There are no emission limits with associated averaging times specified in federal regulations or HPOWER's permits for arsenic, hexavalent chromium, manganese, nickel, PCB, PAH, PFAS, selenium, zinc, and carbon dioxide. However, limits are specified for particulate and opacity which are surrogates for MWC metals. If the facility is complying with particulate and opacity limits, it can be assumed that limits for MWC metals are being complied with. Also, please note that zinc on the list of pollutants to be monitored continually is not listed as a hazardous air pollutant.	It's true that the emissions limits for pollutants tested just once per year are not designed for continuous monitoring, but they can be set in a new standard that is comparable. If an annual stack test is an average of a six hour-period, for example, then a standard for continuous monitoring data could be based on rolling six-hour periods, or back-to-back six-hour periods. The point of using continuous monitoring is to catch the spikes in emissions that can occur if the facility is starting up, shutting down, experiencing malfunctions, or where waste composition or operating conditions (like temperature) changes. Allowing longer averaging times would hide those spikes and allow more air pollution to be legally released. Particulate matter is <u>not</u> continuously monitored, as the statement implies. Opacity (darkness of emissions) is continuously monitored, but this is not a pollutant, per se. Monitoring darkness of emissions is not an adequate proxy for particulate matter emissions of all sizes, and is absolutely not a surrogate for toxic metals, which are released in much smaller, but significant, amounts that will not sufficiently affect visibility. Even if metals were visible enough, knowing how dark the exhaust is does not specify anything about which metals are released, and in what amounts. Different toxic metals have different emissions limits, different levels of toxicity, and different health and environmental impacts. The point of doing continuous monitoring is to stop this guesswork with surrogates and assumptions about compliance.

b) CEMS are not available for measuring: dioxin/furans, PCB, PAH, and PFAS. Also, DOH-CAB could not find information on continuous automated sampling systems for these pollutants.	While EPA's Environmental Technology Verification Program tested and verified four dioxin/furan monitoring systems in 2006, some of which are described as real-time or semi-real-time in their factsheet, we are not aware of the real-time or semi-real-time kind being commercially available. This is why the Incinerator Air Pollution Right-to-Know Act provides for the use of continuing *sampling* technology where continuous emissions *monitoring* is not available, just as Oregon's law does. While continuous monitoring can provide readings on a regular basis, such as every so many minutes, continuous sampling involves gathering a long-term sample, for up to 4-6 weeks in a cartridge, and sending that sample off to a lab for testing. Through back-to-back uses of these sampling cartridges, the full story can be gathered over time, even though real-time readings are not available with this method. Continuous sampling systems have been in use for over 20 years. The most common is known as Adsorption Method for Sampling of Dioxins and Furans (AMESA). This 1998 study of dioxins tested with AMESA in Belgium found that the actual emissions are 32-52 times higher than annual stack tests indicate. EPA put together a Powerpoint presentation about this method in 2002 which might be helpful for DOH to review. Current vendors that make the technology commercially available include: • Illinois-based Envea's Amesa-D product. They claim "20 years of expertise, 40,000 dioxin analyses, and 400 AMESA® installed in waste incinerators, cement, power plants, etc." • France-based Tecora's Continuous Emissions Dioxin Sampler DECS. They have a U.S. distributor in New Hampshire. Their product can continuously sample for dioxins/furans (PCDD/Fs), polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). These samplers might also work on PFAS. Air sampling for PFAS is an emerging field, growing out of science showing that

	incineration does not destroy PFAS, but can spread it into the air. This is discussed in this 2020 presentation and we can put DOH in touch with scientists working in this field.
c) HPOWER's permits do not specify continuous monitoring for the aforementioned pollutants and would need to be revised.	Yes. Of course. The point of the bill is to get the permit revised to require continuous monitoring/sampling.
DOH does not have the necessary resources:	
• The Department does not have resources to revise the HAR to collect annual fees for developing and maintaining a real-time CEMS website, nor to develop and maintain the website.	The Incinerator Air Pollution Right-to-Know Act ensures that DOH will have the resources it needs by assessing fees on regulated waste combustion facilities. The bill was redrafted in response to DOH's comments to clearly state that DOH may set the fees "to cover the department's cost of enforcing this section." Any amendments needed to ensure that DOH is adequately resourced for implementation are welcome.
• Should a bill be proposed, the Website should be developed, maintained, and funded by HPOWER similar to that done for developing the following real-time website for Puna Geothermal Venture (PGV): Public Satellite View - Public - Dashboards - Grafana. The PGV website was developed for monitoring hydrogen sulfide, noise, wind, and rainfall.	We disagree that H-POWER should be in charge of development and maintenance of the emissions data disclosure website. Covanta (the operator of the H-POWER incinerator) and the City and County of Honolulu (the owner) have a conflict of interest and would not be invested in ensuring the most user-friendly disclosure. DOH's mandate for public health aligns better with the mission of public disclosure of data from facilities they regulate.
Additional DOH staff would still be needed to review and approve the facility plan, sampling plans, and testing and test reports. Oregon estimated $118,537 for this in the 2023 -25 biennium.	Mahalo to DOH staff for doing the research to locate cost estimates for this and other costs discussed below.
Associated Cost to consider:	
• MSI – Mechanical Systems, Inc. was contacted to obtain information on the types of CEMS available for measuring pollutant emissions. According to MSI, among pollutants listed in the Hawaii bill for continuous monitoring, CEMSs are available for CO_2, CO, NO_X, SO_2, HCL, HF, and PM. There are no CEMS for measuring dioxins/furans, PCB, PAH, and PFAS. HPOWER's permits only specify the use of a CEMS for measuring CO, NO_X, and SO_2. HPOWER's CEMS is also set up to measure carbon dioxide. Therefore, HPOWER would need to install a CEMS to measure HCL, HF, PM, and	While it's true that "[t]here are no CEMS for measuring dioxins/furans, PCB, PAH, and PFAS," this does not negate the fact that, where these are not yet commercially available, the bill allows for continuous *sampling* of these chemicals, as Oregon's Department of Environmental Quality found as they start to implement their new law adopted through passage of SB 488 of 2023. As we document above, there are products such as Envea's Amesa-D and Tecora's Continuous Emissions Dioxin

VOCs for three MWC boilers. According to MSI, CEMS would cost over a million dollars to continually measure the additional pollutant emissions for the three MWC boilers. • CEMS will require daily, monthly, quarterly, semi and annual maintenance along with purchase of calibration gases for which CEMS annual service contracts typically cost $1,000-$2,500 per month, not including travel costs. • Cooper Environmental manufactures a Multi-Metal CEMS (640i Monitoring System) that provides continuous near real-time analysis for a wide range of elements including arsenic, cadmium, chromium, manganese, mercury, nickel, selenium, and zinc listed in the bill to be continuously monitored. Please see https://sci-monitoring.com/product/xact-640-multi-metals-monitor/. • Sonoma Technology provided the following rough estimate on the cost to develop a public facing website for accessing real-time CEMS data: a) Implementation of real-time, public facing website displaying CEMS data with email notifications: $50,000 – $100,000. i. Depends on 1) data retrieval and processing; 2) website design/customization; and 3) QA/QC requirements; and ii. Text messaging/pushed notifications can be included and may incur additional cost. b) Website operations/maintenance fee after implementation: $1,800/month, includes: i. Data management system subscription; ii. Website hosting fee; iii. Web server operation and maintenance; and iv. Monitoring of systems, routine backups, and cybersecurity.	Sampler DECS that can provide continuous sampling of these chemicals. These and the other costs of compliance are small compared to the budget for a commercial trash incinerator like H-POWER, and are also quite small relative to the costs that will be required when compliance with new EPA regulations forces H-POWER to install the pollution control systems they've been lacking from their start. Oregon-based Cooper Environmental (now SailBri Cooper) have long been the only company with the multi-metal CEMS capable of monitoring many metals at once.

Figure 1 Close-up image of Covanta Marion, Inc. facility in Oregon State that is shown in the red shaded area.

Interesting, but not relevant in any way to the Incinerator Air Pollution Right-to-Know Act or H-POWER. If DOH's point is that some people live closer to Covanta Marion incinerator in Oregon than O'ahu residents do to H-POWER, it's worth pointing out that emissions travel far enough to impact residents throughout O'ahu and beyond. Dioxin travels as far as the Arctic. Mercury air emissions circumnavigate the globe. While some emissions, like PAHs are heavy and fall more locally, many will blow with kona winds toward population centers on O'ahu.

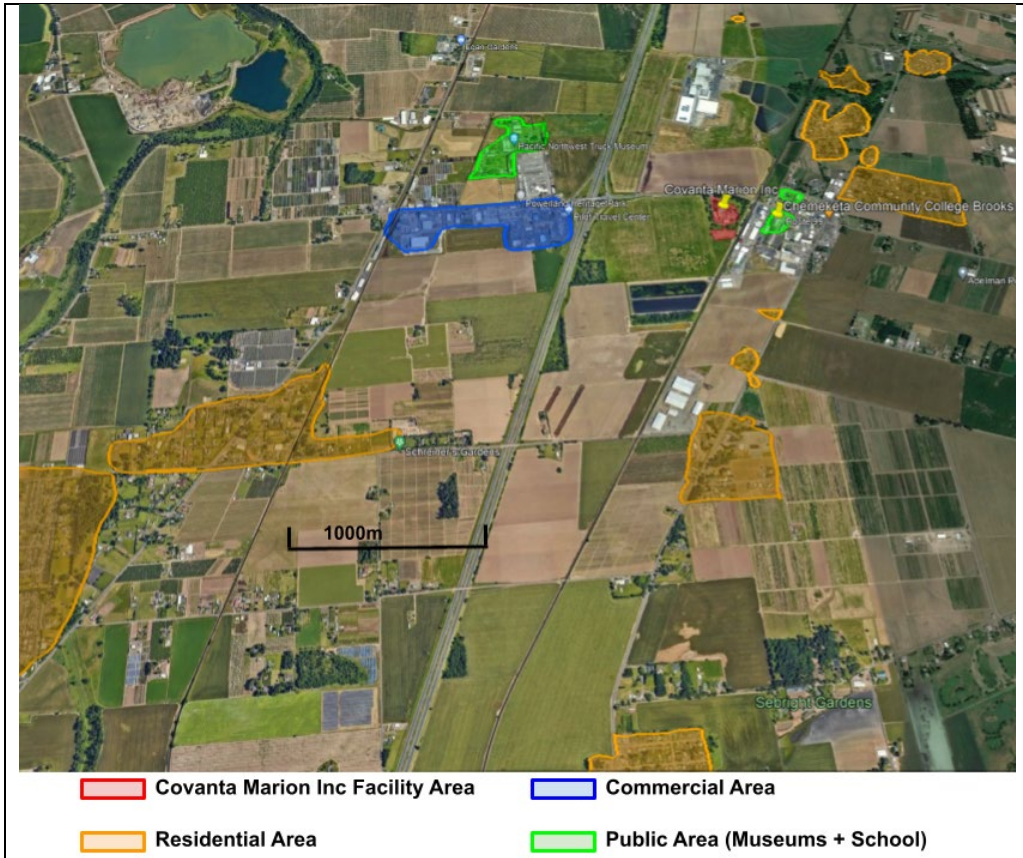


Figure 2 Image of residential areas (yellow), commercial areas (blue), public areas (green), and Covanta Marion, Inc. facility (red).
Windrose Graph with label in knots:

Yes, there are people in Oregon who live closer to that small trash incinerator than residents on O‘ahu do to the much larger H-POWER trash incinerator.

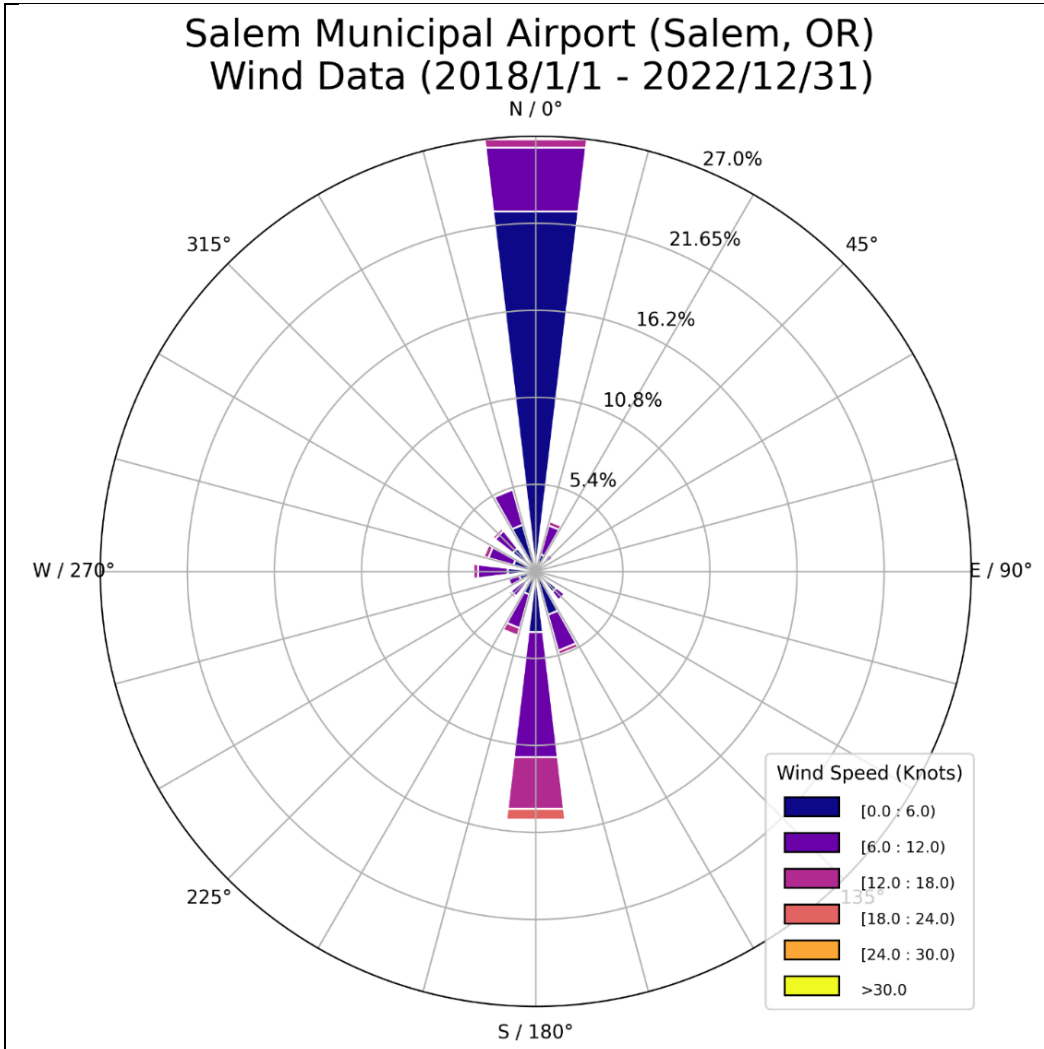


Figure 3 Windrose graph from the nearest airport (Salem Municipal Airport) to Covanta Marion, Inc. facility in Oregon State. The wind rose shows the general wind direction and speed for the sampling period. Each spoke around the circle shows how often the wind blew from that direction. For example, during the sampling period from January 1, 2018, to December 31, 2022, the wind blew from the north towards the south 27% of the time. The different colors of each spoke provide details on the wind speed in knots (1 knot = 1.15 mph), of the wind from each direction.

Not sure what the relevance is of pointing out Oregon's wind direction.

Figure 4 Close-up image of HPOWER facility on southwest corner of Oahu that is highlighted in red.

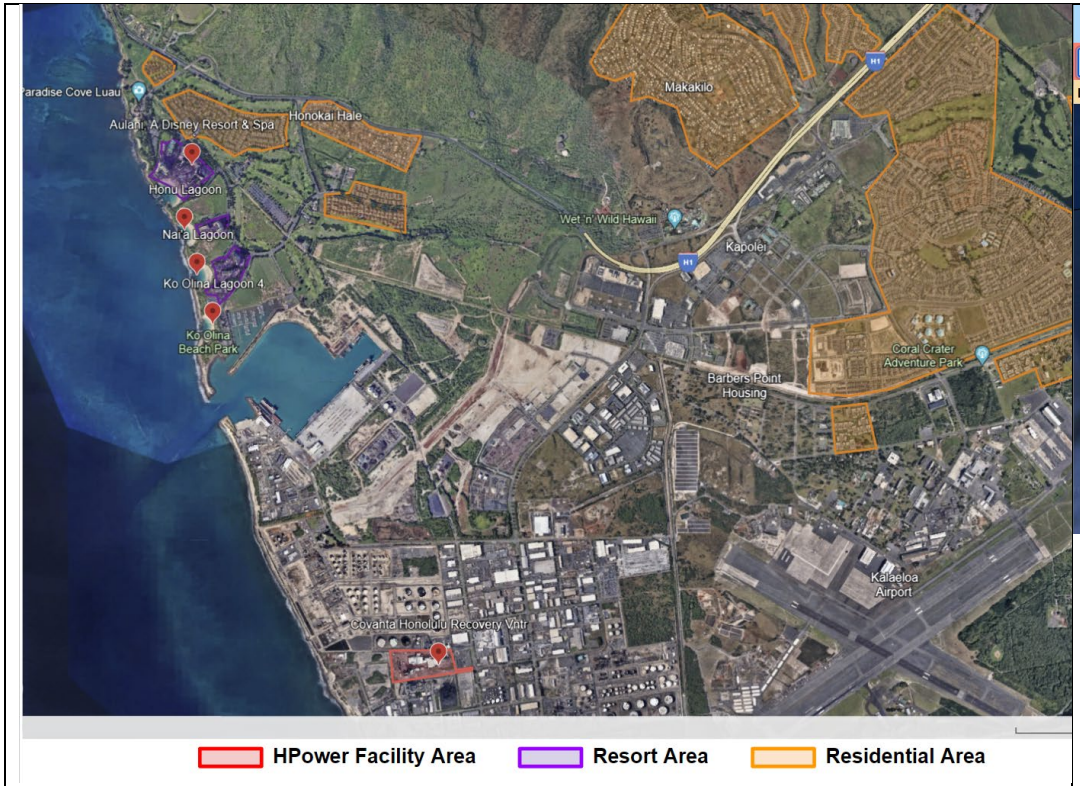
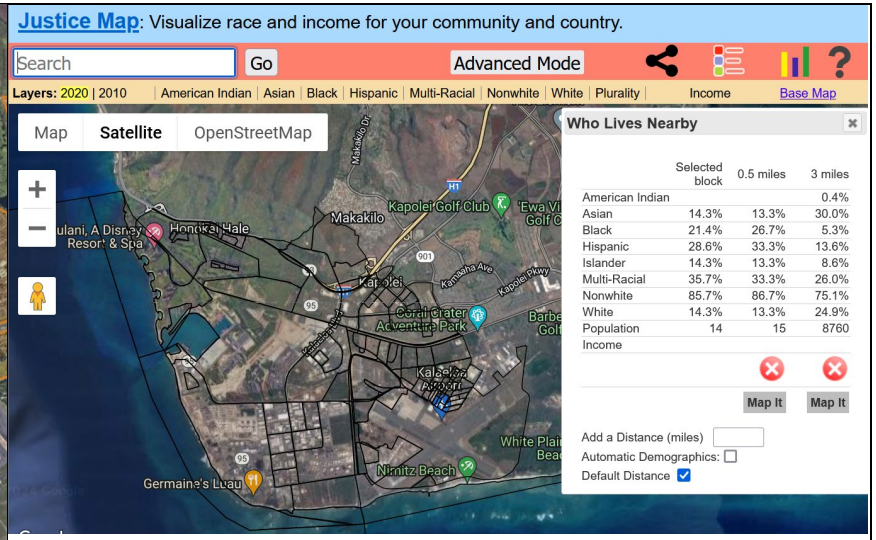


Figure 5 Image of residential areas (yellow), resort areas (purple), and HPOWER facility (red). Kalaeloa Airport is at the at the bottom right of the image.

Windrose Graph with label in knots:



Using the JusticeMap.org site to map race and class demographics, we see that, within three miles (a standard distance for environmental justice analyses used by EPA), nearly 9,000 residents are impacted, 75% of whom identify as Black, Indigenous, or other People of Color (BIPOC) based on the 2020 Census data. This is a start environmental justice issue, especially when combined with the cumulative impacts of the many other industrial polluters concentrated in and near Campbell Industrial Park, and Kapolei, Honokai Hale more generally.

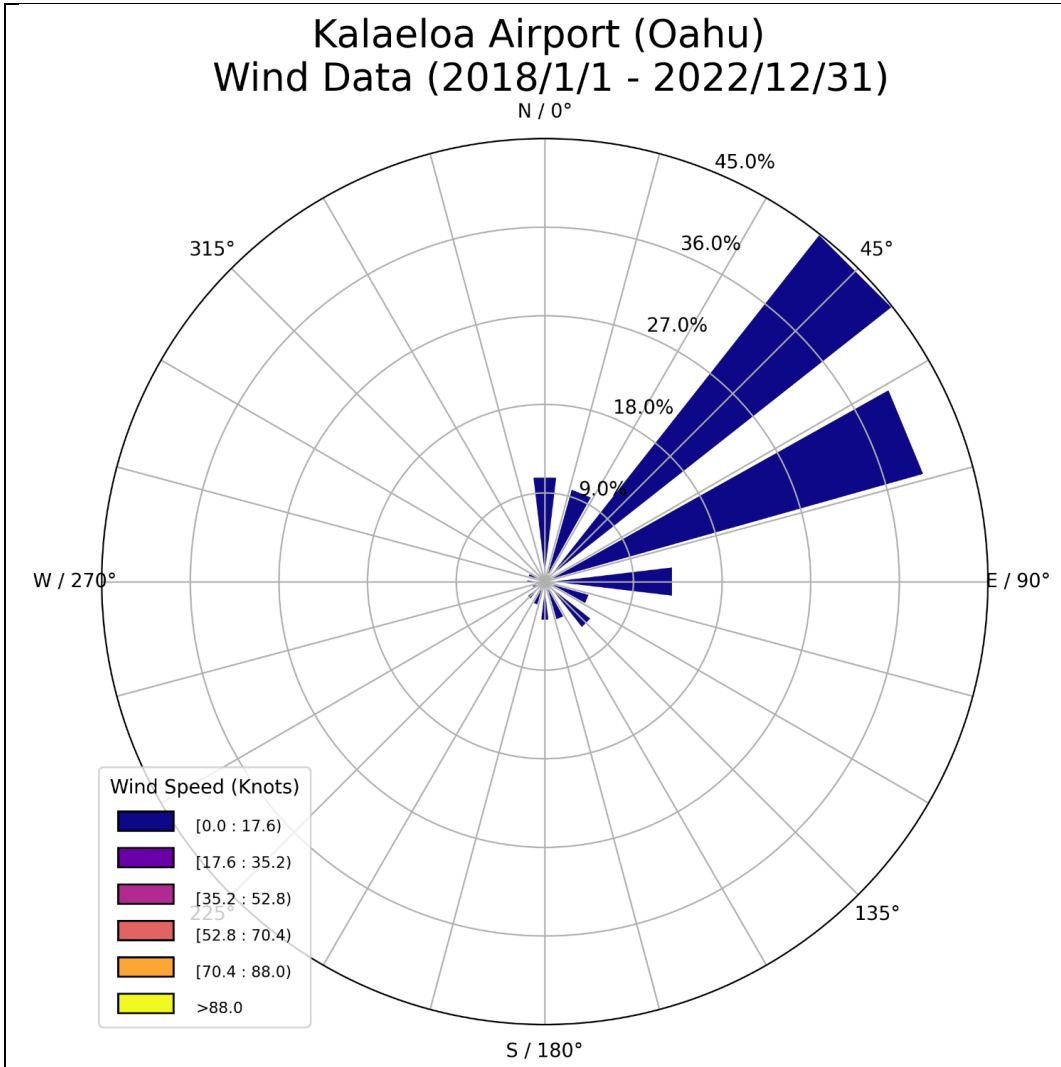


Figure 6 Windrose graph from nearest airport (Kalaeloa Airport) in vicinity of HPOWER facility. Information on the wind data set from the sampling period January 1, 2018, to December 31, 2022, is provided below. The largest spoke shows that winds blow from the northeast (at 45^{O}) 45% of the time.

<u>Kalaeloa Airport</u>

Wind blowing from the direction (135^{O}-315^{O}) towards public areas: 12.79 % of the time.

The wind blowing toward population centers 12.79% of the time means that for nearly one full day of every week (on average), residents are breathing air pollution from H-POWER, and that which deposits on their land and water, or which accumulates in plants and animals that people eat, is available on a more routine basis.

That much of the emissions blow into the ocean is not an effective argument for not being concerned about this pollution.

Frequency of air emissions testing at the H-POWER trash incinerator's three burners
Status quo vs. proposed Incinerator Air Pollution Right-to-Know Act (SB 2101)

Chemical	Abbreviation	Testing frequency (status quo)	Proposed bill	Category
Sulfur dioxide	SO_2	Continuous	Continuous	Criteria air pollutant
Nitrogen oxides	NO_x	Continuous	Continuous	Criteria air pollutant
Carbon monoxide	CO	Continuous	Continuous	Criteria air pollutant
Carbon dioxide	CO_2	Continuous	Continuous	Greenhouse gas
Ammonia	NH_4	Annual	Continuous	Released via NOx controls
Dioxins/Furans	2,3,7,8-TCDD TEQs	Annual	Continuous **	Highly toxic organohalogen
Polychlorinated biphenyls	PCBs	Never	Continuous **	Highly toxic organohalogen
Per- and polyfluoroalkyl substances	PFAS	Never	Continuous **	Highly toxic organohalogen
Polycyclic aromatic hydrocarbons	PAHs	Never	Continuous **	Toxic hydrocarbons
Volatile organic compounds	VOC	Annual	Continuous	Toxic hydrocarbons
Hydrogen chloride (Hydrochloric acid)	HCl	Annual	Continuous	Acid gas
Hydrogen fluoride (Hydrofluoric acid)	HF	Annual	Continuous	Acid gas
Arsenic	As	Never	Continuous	Toxic metal
Beryllium	Be	Annual	Continuous	Toxic metal
Cadmium	Cd	Annual	Continuous	Toxic metal
Chromium (VI)	Cr (VI)	Never	Continuous	Toxic metal
Lead	Pb	Annual	Continuous	Toxic metal
Manganese	Mn	Never	Continuous	Toxic metal
Mercury	Hg	Annual	Continuous	Toxic metal
Nickel	Ni	Never	Continuous	Toxic metal
Selenium	Se	Never	Continuous	Toxic metal
Zinc	Zn	Never	Continuous	Toxic metal
Opacity (darkness of emissions; an indirect measure of particulate matter)		Continuous	(unaddressed)	Particulate matter
Total particulate matter (filterable)	PM-FIL	Annual	Continuous	Particulate matter
Coarse particulate matter (filterable)	PM_{10}-FIL	None (Units 1-2); Annual (Unit 3)	Continuous	Particulate matter
Fine particulate matter (filterable)	$PM_{2.5}$-FIL	None (Units 1-2); Annual (Unit 3)	Continuous	Particulate matter
Total particulate matter (filterable and condensable)	PM-PRI (PM Primary)	None (Units 1-2); Annual (Unit 3)	(unaddressed)	Particulate matter
Coarse particulate matter (filterable and condensable)	PM_{10}-PRI (PM_{10} Primary)	Estimates * (Units 1-2); Annual (Unit 3)	(unaddressed)	Particulate matter
Fine particulate matter (filterable and condensable)	$PM_{2.5}$-PRI ($PM_{2.5}$ Primary)	Estimates * (Units 1-2); Annual (Unit 3)	(unaddressed)	Particulate matter
TOTALS OF ACTUAL POLLUTANTS MEASURED		**4 Continuous + 10 Annual *** **	**23 Continuous**	

Note: those listed as "(unaddressed)" in the bill would continue to be monitored as current permits require.

* Unit one estimates these two types of particulate matter using "Engineering judgment" and Unit two with "USEPA Speciation Profile."

** Would likely need to be tested with continuous sampling. Instead of having real-time data, a long-term sampling cartridge would be switched out every 14 days to be tested at a lab.

*** Opacity is not a true measure of particulate matter and is not counted as a pollutant, itself. The different sizes (grades) of particulate matter are counted only once here.