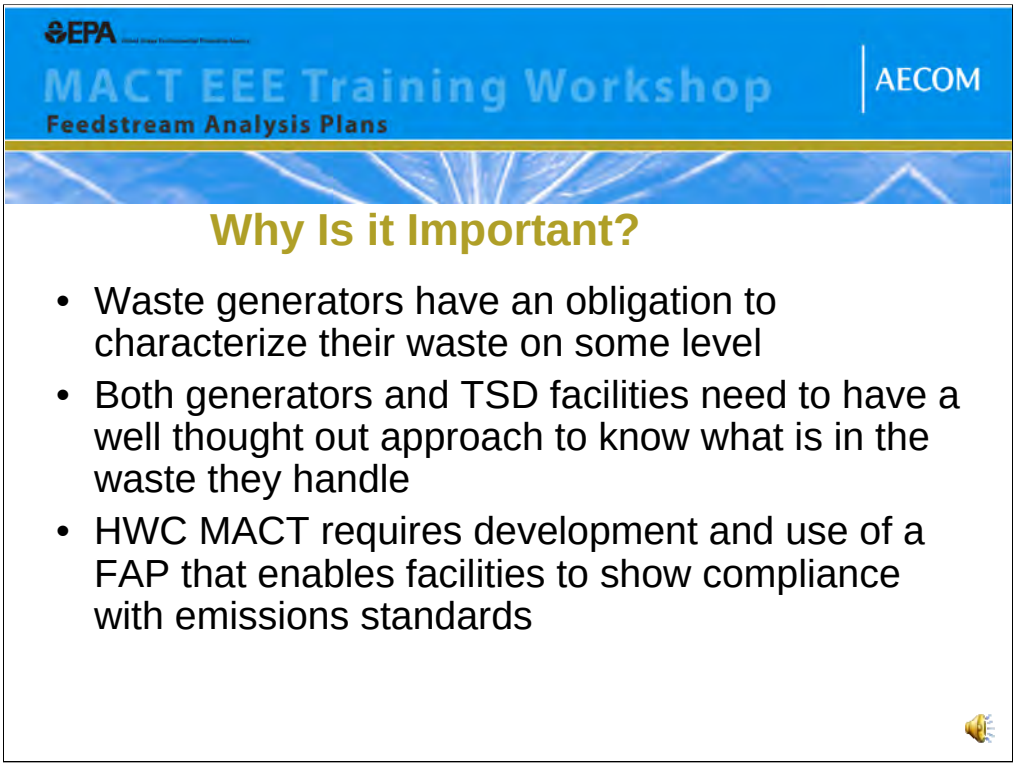
In this module, the requirements of the Subpart EEE Feedstream Analysis Plan will be reviewed.

Presentation Overview

- Why are these plans important?
- What do they do?
- Regulatory Requirements
- Similarities and Differences with the RCRA WAP
- Some issues
  - Frequency issues
  - Process Knowledge

The topics to be covered include their importance in assuring compliance, how they work, some similarities and differences between what is required under Subpart EEE versus RCRA and some additional related issues.

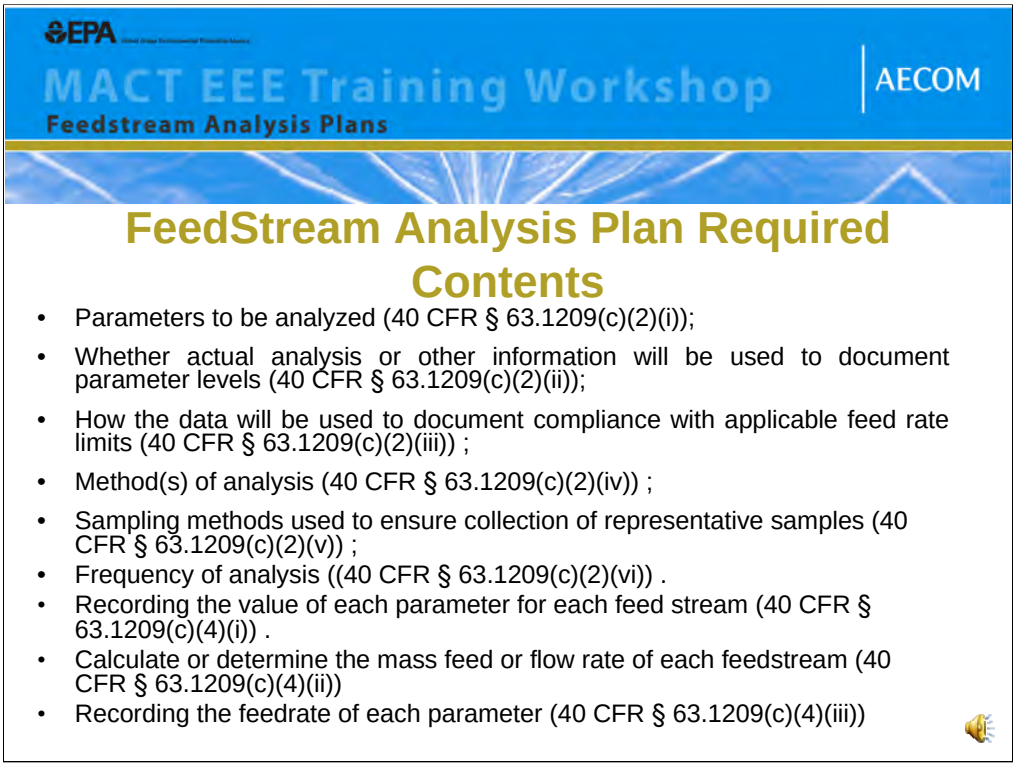


Feedstream Analysis Plans (FAP) are fundamentally an outgrowth of what has been historically required for generators of hazardous waste and HWCs as part of their regulation under RCRA. Subpart EEE requires HWCs to develop and follow a FAP so that the unit can show compliance with established feedrate limits and emissions standards under these regulations.

Feed Streams Covered by the FAP

- Solid wastes - bulk or containerized
- Liquid wastes
- Compressed gases
- Process vent streams
- Auxiliary fuels

Feedstreams that can be covered under the FAP can include the full range of materials that are processed in that specific HWC, including auxiliary fossil fuels.

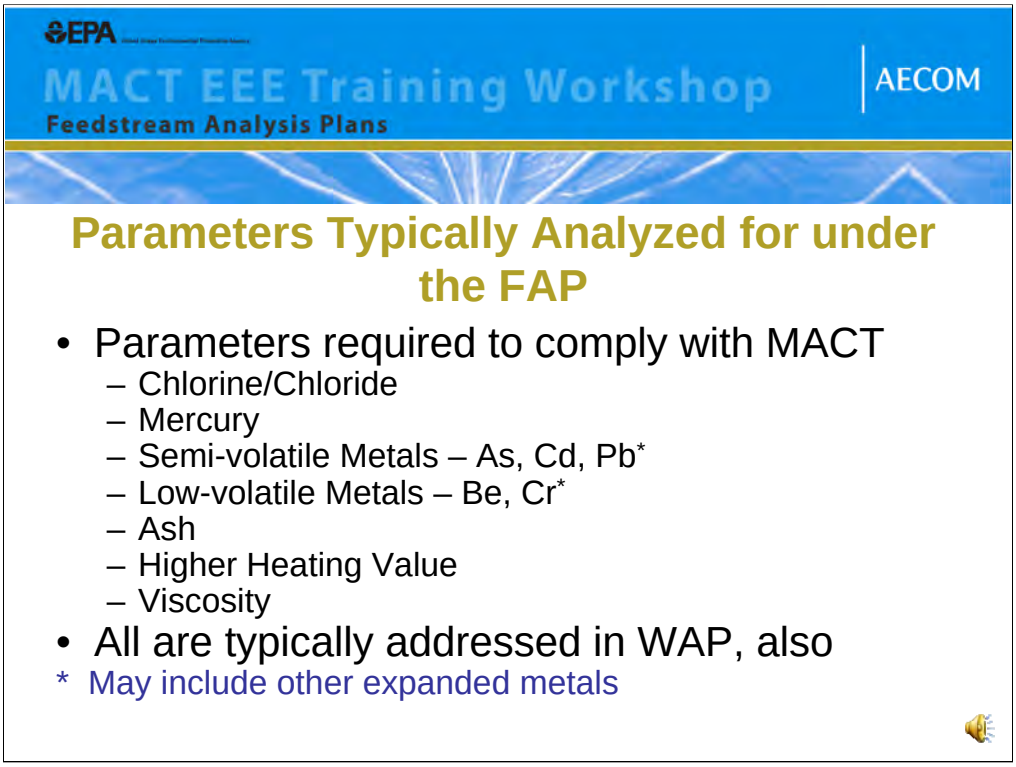


The regulations found at 40 CFR 63.1209(c) detail what is required to be included in the FAP. In addition to what sampling and analytical procedures will be used to analyze or characterize (i.e., using generator or process knowledge approaches) and at what frequencies this will be done, the FAP should discuss how this data or information will be used to document compliance.

Program Design Aspects

- How will data be used to establish compliance?
- Determination of prohibited constituents (e.g., > 50 ppm polychlorinated biphenyls or PCBs)
- Comparison of waste levels to allowable permit levels
- Calculation of feed rates
  - Updating inputs for new results based on frequency of analysis
  - If statistical approaches are to be used, explanation of how calculations will be used for compliance

This key aspects of detailing how the data generated as part of the FAP will be used to document include, determining or confirming whether prohibited constituents remain below allowable levels (e.g., the 50 ppm limit for PCBs). This won't be needed in all FAPs. In addition, documentation showing that waste levels of regulated constituents are below allowable permit limits or Subpart EEE OPLs. And finally, the FAP should summarize relevant feed rate calculations or statistical approaches that are being used to document compliance.

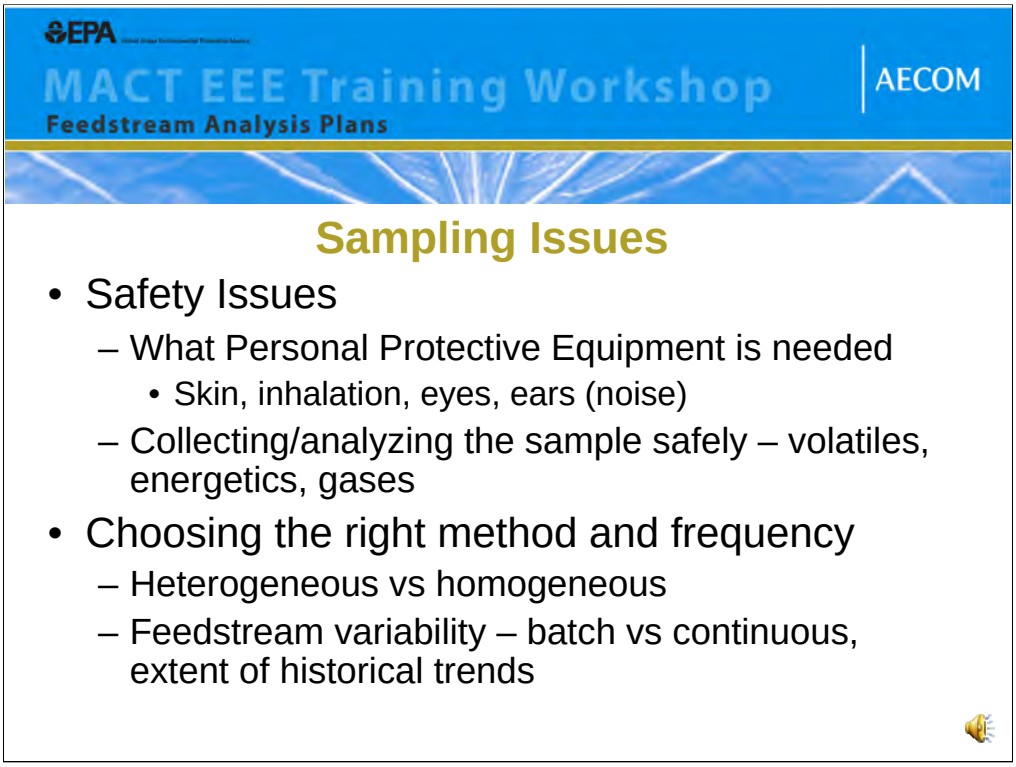


The parameters that should be analyzed for in the FAP include the relevant Subpart EEE constituents for that subcategory. It should be noted that for those HWCs using the alternative metals or PM standard approaches, this should include the expanded metals list for the "non-enumerated" metals - lead, cadmium and selenium, antimony, arsenic, beryllium, chromium, cobalt, manganese and nickel. In addition, for other liquid wastes, Btu content and viscosity can be important parameters although for some liquids with high melt points (i.e., some liquids are considered "molten" meaning they will remain a solids unless they are heated in some cases to near or above the boiling point of water. For these streams, conventional viscosity measurements cannot be done and depending on the actual melt point, it may not be feasible at all). For certain bulk solid wastes, moisture content may also be an important parameter.

Example of Sampling and Analysis Summary

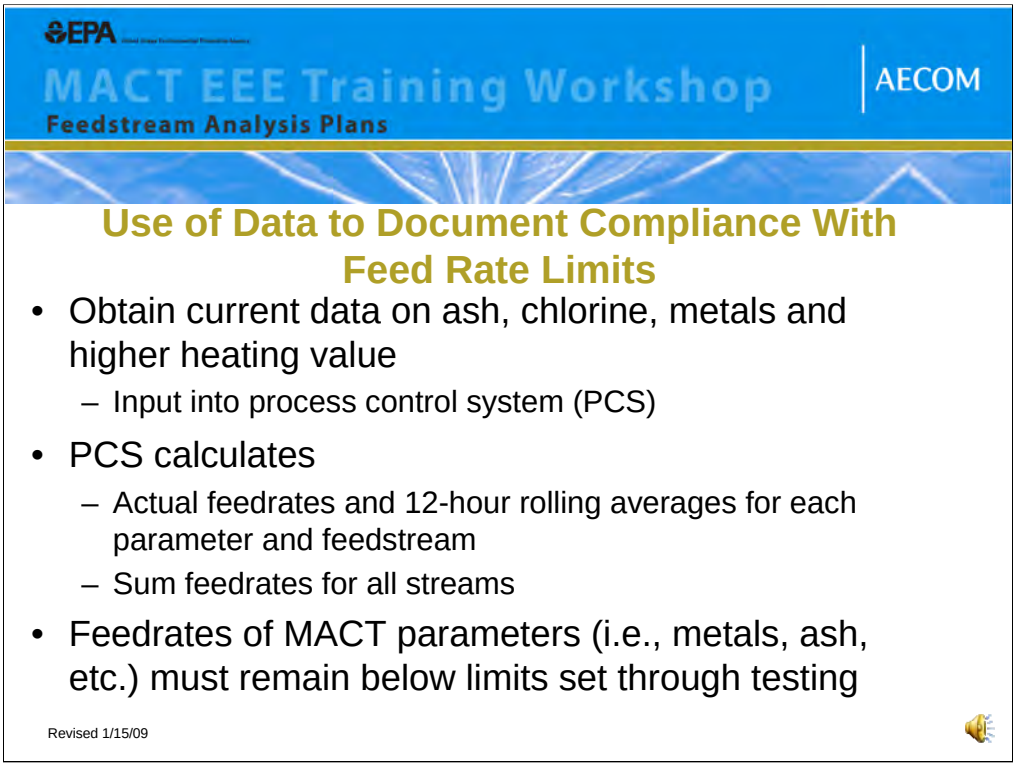
Feedstream	Parameters	Sampling Method	Analytical Method
Organic Liquids	Total Chlorine Ash Metals Higher Heating Value Specific Gravity Viscosity	Grab sample	EPA M 5050/9056 ASTM D482 EPA M 6010B/7470A ASTM D240 ASTM D1298 ASTM D445
Process Vent Streams	Site specific		
Natural Gas	Site specific		

This table provides one example of how the sampling and analysis information might be summarized in a FAP. Note that for process vents and auxiliary fuels, particularly natural gas, there may be both safety and logical rationale for allowing the use of process knowledge in lieu of actual analysis.



From an actual sampling approach, there are a couple of key issues to be aware of. First and foremost, before any waste sampling activity is performed, a thorough understanding of the safety issues surrounding that activity should be done. This begins with reviewing the MSDS of each material to gain an understanding of their physical, chemical and hazard properties. In some cases, this will reveal that standard sampling techniques can be used and only normal safety gear is needed. For higher hazard materials, such as high toxicity, corrosivity or reactivity, specialized sampling approaches and personal protective equipment may be needed. For very high hazard materials (e.g., energetics or pyrophoric materials), judgment should be used as to whether these should be sampled at all. In most cases, it is typically better to allow trained operations personnel collect the samples.

Once the safety issues have been thoroughly addressed, it is important to understand the variability of the material to be sampled as that might affect compliance with the Subpart EEE OPLs and emissions standards. Most HWC facilities in operation have extensive historical experience with the streams they manage, in some cases this dates back years. For batch type operations, it may be necessary to perform certain analyses on a per batch basis so that constituent levels can be manage within allowable limits. in other cases where the waste is generated from the same production process that does not change, sampling frequencies of quarterly or even longer may be sufficient to verify key parameters remain within expected and allowable limits.

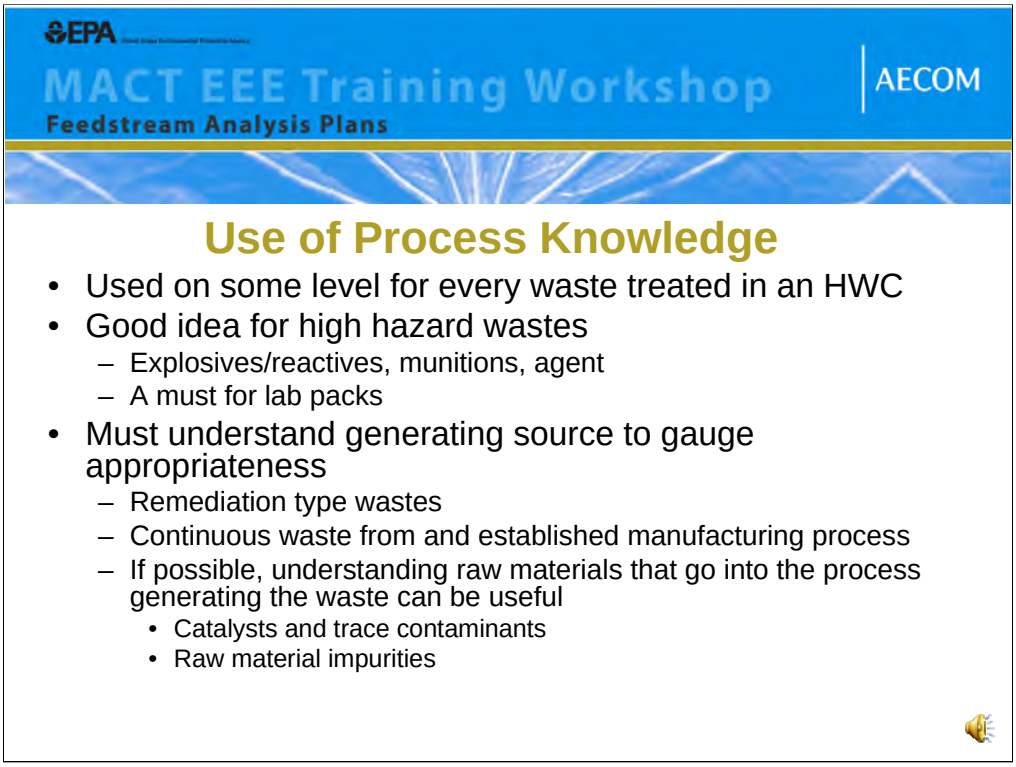


In order to perform the actual calculations of waste feed rates of regulated constituents, HWC units must have an established process and means by which to accomplish this. Typically, when new data is received from the laboratory and determined to be acceptable from a QA/QC perspective. Facility personnel input these new data into the process control systems (PCS) that is performing the feedrate calculations. The PCS will continue to calculate actual feedrates for each of these constituents and demonstrate ongoing compliance according to procedures spelled out in the FAP.

Frequency of Sampling and Analysis

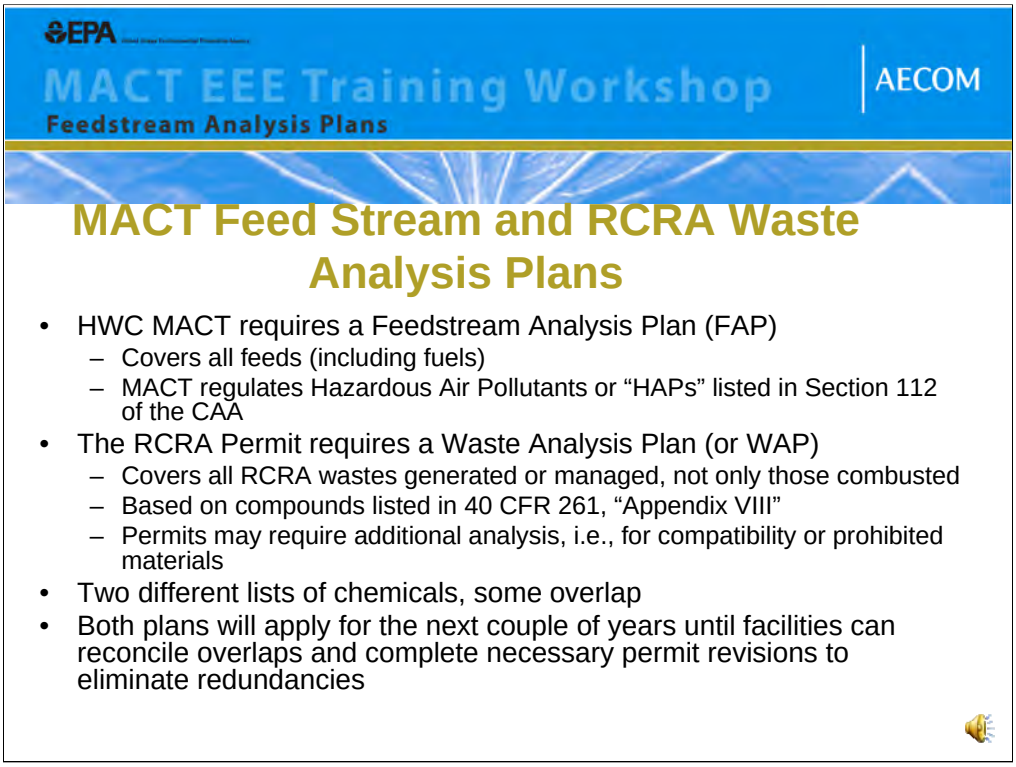
- Depends on
  - Waste variability
  - Historical data
  - Confidence in generating source
  - Batch or continuous process
- Commercial units often required to analyze each load and compare to profile before receipt
- Onsite HWC frequencies vary greatly from daily to annually

The question of frequency of analysis is very HWC specific. A general rule of thumb in determining what is appropriate is the greater the variability of a given waste, the more frequent analysis should be considered, at least initially until sufficient historical data exists to understand that variability. Combustors treating waste from batch product operations that can change (i.e., different reactions run in the equipment with different raw materials), it may be necessary to analyze the waste under the FAP on a per batch basis, particularly where HWC MACT parameters can vary sufficiently to necessitate managing feed rates closely. This can be the case at some onsite facilities where daily analysis may make sense. Where data defines variability of MACT constituents well, less frequent sampling such as quarterly, semi-annually or annually should be considered and to the extent possible consistent with what is required under the facility's RCRA permit or Waste Analysis Plan. Commercial facilities typically have a greater need for routine profiling and depending on the nature of the wastes they handle and number of clients they serve, will have some type of analytical program to verify and validate incoming loads prior to releasing them for processing.



An additional issue that is worthy of discussion in the context of feedstream analysis is the use of process knowledge. First, it is an important concept to understand that on some level, this is done with any waste treated in a HWC. This is because even the basic process of collecting a representative sample of that stream for analysis involves having some knowledge of stream, its characteristics and how it might vary and therefore, based on that knowledge, what is the best way to get sufficient information for proper management. The use of process knowledge by itself is an appropriate approach on a routine basis in certain circumstances. The most obvious examples are at facilities that handle waste that are simply to dangerous to sample without putting sampling personnel at risk. Explosives, reactives, nerve agent and highly hazardous or toxic process wastes are examples. Also, process knowledge is used in incinerating lab packs of waste. An inventory list of what's in the lab pack describes its contents, but it simply is not practical to analyze each individual lab bottle in a lab pack. In considering the appropriateness of using process knowledge, it is essential to understand the generating process or source. A remediation project with highly heterogeneous wastes will require a complex analysis plan. Where wastes are generated continuously in an established manufacturing process using the same raw materials, analytical frequencies can be reduced and for process vent streams that come from the same processes as liquid waste and go to the same HWC, the use of process knowledge can be appropriate and warranted. It can also be important for waste generators to understand their production processes from the standpoint of raw material impurities and trace contaminants that may be present in catalysts.

Another issue that is important to understand is the management of containerized wastes that are managed in rotary kilns and cement kilns. First, based on their packaging, it is not always possible to see what is in them. Plus, as mentioned, lab packs are comprised of many individual bottles that cannot all be analyzed. HWC facilities manage this in a could of different ways. First, there are specific limits that these HWCs impose on containers. Overall size and weight, size and content of bottles or containers in the container being fed (e.g., in a lab pack) and specific limits for restricted or regulated constituents like metals and chlorine. In addition, some HWCs utilize opaque drums so that contents can actually be send by facility staff. Another options used by some HWCs is a random check of a certain percentage of each lot of containerized waste. And finally, some facilities send their own or contract waste packaging personnel to package waste at the generator location, transfer facility or at the HWC itself to make sure that these containers will be able to fed safely and in compliance with limits.



Finally, this slide presents a brief summary of highlights of the FAP and the RCRA Waste Analysis Plan (or WAP), how they compare and what some differences are. First, both serve similar purposes. A FAP required under Subpart EEE covers everything fed to the HWC and is based on the list of Hazardous Air Pollutants listed in Section 112 of the Clean Air Act. RCRA permits require HWC facilities to operate under a Waste Analysis Plan or WAP that covers all hazardous waste generated and managed at that facility, not only those managed in an HWC. It has its basis in a list of compounds contained in Appendix VIII of 40 CFR 261. WAPs may require additional analysis besides waste characterization and constituent analysis, specifically when waste operations may included potential blending of streams or where wastes may contain materials prohibited from being managed in traditional RCRA facilities (like PCBs). Each plan is based on two different lists with some overlap. Both plans will apply to the operation of an HWC for the foreseeable future unless and until RCRA and Title V permit reconciliation can be completed for the redundant activities at the HWC.