EPA and Analytical Environmental Services (AES) Meeting Notes from 12/21/2023

In Attendance:

AES: Ady Padan (President & CEO), Mildred Santiago (Chemist & Auditor), Lisa Colon (Laboratory Manager)

EPA: Claire Brisse, Wyn Zenni, William Silagi

Laboratory Operations and Instrumentation:

AES no longer operates in Atlanta and is solely based in Puerto Rico. They utilize three Flame Atomic Absorption Spectrometers (flame AA) and one Inductively Coupled Plasma - Optical Emission Spectroscopy (ICP-OES). The ICP-OES is primarily reserved for analyzing multiple metals or air, not for dust-lead wipes and in their experience is twice as slow as flame AA. The flame AA instruments were acquired in 2012, 2014, and 2019, respectively. They are operated manually without autosamplers, so one individual must be present operating the equipment at all times. During high workload periods, two flame AA instruments may be used simultaneously while the third serves as a backup.

Once again, operating each flame AA instrument requires one person per machine and they have five staff members in total for flame AA operations, including sample preparation. Preparing 50 samples takes between 1 to 1.5 hours, with each batch of 50 samples taking approximately 40 minutes to analyze, making the processing time a little less than a minute per sample. Note that they warm up the instrument while doing the sample preparation and the laboratory currently uses a 45 mL dilution for the digestate from dust-lead wipes. The laboratory does not use an autosampler with the flame AA. The flame AA instrument is not stable, and an analyst needs to be keeping an eye on it all the time. They had a flame AA autosampler at one time but ensuring that everything had run correctly took more time than doing the work manually – using an autosampler might take twice as long as manual operation.

The maximum flame AA capacity is 120 samples per batch. A flame AA could run a maximum of 300 to 400 samples a day per machine, but 200 to 250 per day is more typical.

In comparison, their ICP-OES has a considerably lower throughput, processing 50 to 100 samples per day (25% to 50% of what flame AA can handle) due to its slower rate of 2.5 minutes per sample, and because it runs 3 iterations per sample. Their ICP is a Perkin Elmer that is 5 or 6 years old and has an autosampler. An ICP also has more costly consumables and maintenance than flame AA; and the ICP service contract is more expensive.

Laboratory Services and Pricing Structure:

AES's standard turnaround time for dust-lead results is 5 days, but they also offer 24 hour or same-day results depending on the urgency and number of samples. Pricing ranges from $10 to $25 per sample depending on turnaround time, with same-day service available up to $30 per sample, maybe more. For example, if samples come in at 7 a.m., they can complete the entire process in about 3 hours, excluding the time needed to prepare the report (which can take more time because of Puerto Rican requirements to have a chemist review the results). For ICP, wipes would cost $20-50 for standard turnaround.

Testing Volume and Clientele:

The flame AA instruments have a maximum batch capacity of 120 samples, with a maximum daily throughput of 300 to 400 samples per machine but running 200 to 250 samples per day is more typical (once again the ICP can run roughly 50 or so samples a day). Annually, they process 13,000 to 15,000

dust-lead wipe samples, averaging slightly over 1,000 per month. Currently, dust-lead wipes constitute about 60% of their chemical laboratory work, with the remaining 40% involving asbestos analysis through microscopy. They currently operate below full capacity and could handle more dust-lead samples if needed.

Their clients are abatement contractors, management companies, and public housing. There is seasonal variation in the volume of work (December, January, July slow because some clients are on vacation then).

Analytical Capabilities and Challenges with the "Any Reportable Level" Approach:

Because "any reportable level" will differs between ICP and flame AAs, AES thinks that EPA needs to come up with a specific numerical level that laboratories have to be able to report, and not have differences between laboratories. Ultimately, they are concerned about inconsistency across laboratories.

They are currently doing round-robin testing through AIHA for asbestos, so laboratories can see how they compare to other laboratories. Perhaps NLLAP should do something similar (testing samples at very low lead levels) to ensure consistency across laboratories.

Analytical Capabilities and Challenges with Lowering the Clearance Levels:

The laboratory's current Method Detection Limit (MDL) over the last 3 years has averaged between 1.3 and 1.4 µg/wipe, with a reporting limit set at 2.6 to 2.8 µg/wipe. Each instrument differs, but in terms of reporting less than the reporting limit to clients, they report 50% of the regulatory limit to clients (< 5 ug/ft^2, etc.). This year the individual MDLs varied from 1.1 ug/wipe to 1.8 ug/wipe. That is based on a sampling area of 1 ft^2; a 2 ft^2 sampling area would give a different result. They could get to a 5 ug/ft^2 action limit for floors with their flame AA, particularly with a 2 ft^2 wipe area. They do not know if they could comply with an action level of 3 ug/ft^2 – it would be more difficult – borderline, even with a 2 ft^2 wipe area.

A regulatory standard of 3 ug/ft^2 is concerning. Might have to use a wipe area of more than 2 ft^2 (for example, 3 ft^2) in order to use flame AA and it is not clear if one wipe can be used to sample such a large area. Such a large sampling area might require composite wipes, which create difficulties for laboratories – preparation is more difficult for composite samples. Also, proficiency testing for accreditation does not look at composite samples, so accreditation would need to change.

They would switch to ICP-OES to meet the new requirements, if they cannot do so with the flame AA. However, ICP-OES involves considerably higher costs, lower sample throughput, and requires additional training for staff. They would also presumably need at least one additional ICP to serve as a backup. They would really need to evaluate whether to use a larger sampling area with flame AA (and how clients responded to sampling a larger surface area and whether they would do composite samples to keep using flame AA) or switch over completely to ICP-OES, considering the associated costs and operational changes (ICPs consume more gas and require more sample preparation).

To keep analyzing the same number of samples they are now, they would need at least one more ICP. Doing their current volume of wipes on a single ICP would require running the laboratory 24 hours a day, and they cannot do shifts – it is not safe to have staff working overnight. But switching to ICP would mean they would not have a backup instrument. The result of switching to ICP would be longer turnaround times. It would increase wait times on clients, potentially making same day or next day high volume turnarounds more challenging.

Window Sill or Window Trough Sizes:

For window sills and troughs the wipe area is an issue in some cases, but they do not foresee a problem for them with a regulatory limit of 40 ug/ft^2. Most Puerto Rican windows do not have troughs – the windows open out instead of sliding up and down, or just do not have a trough (referred to as "Miami windows"). But those that do have troughs may be very small. Have seen trough areas less than 0.1 ft^2 – they had to reject those samples. Typical trough size is 12 inches by 1 inch or 12 inches by 2 inches.

Updating the LQSR:

They do not think the reporting limit should be close to regulatory limit, because clients will misinterpret the results. There has to be a clear difference between the laboratory test result and the regulatory limit. AES thinks that requiring the reporting limit to be 50% of the regulatory limit is adequate. If reporting limit is too close to the regulatory limit, contractors will think that any result below the reporting limit are sufficient. But there is uncertainty in testing value. If the regulatory limit is 5 ug and the reporting limit is 4 ug, there is uncertainty about whether a laboratory result of 4 ug is actually below the regulatory limit.

They provide results below the reporting limit to the client where the reporting limit is calculated, not the actual reporting level calculated for each instrument. They do not provide the client the MDL.

Implementation:

Six years ago, their ICP cost $80,000 to $90,000; they have not priced them recently, but their guess is that they currently cost at least $100,000 to $120,000. Also, uses ICP more gas and takes more sample preparation than flame AA, which increases costs.

Getting an ICP would take several months just to purchase it and funding alone could take a month. Accreditation would not take that long for them because they are already accredited for ICP – they would just be revising their accreditation to include another instrument. But they would also need time to validate the results from the new instrument. They would need to set up new space for another ICP. It took a long time for their current ICP to get to Puerto Rico after they purchased it, and then there was time to get it set up, and then more time to get validated. That took 6 months with their existing ICP. EPA's proposed compliance time of 1 year would work for them, but that is because they already have accreditation for an ICP. For laboratories without ICP accreditation, that step could take a long time – maybe up to another year, on top of the time for the other steps.

If they were using an ICP for all lead wipes, they are concerned about what would happen when the ICP needs maintenance or if it breaks down. The personnel doing the maintenance for Puerto Rico service the entire Caribbean area, and the parts come from Florida, so an ICP could go down for several days. They would need a backup ICP, but they are not sure they could afford that. If they had to use ICP to meet a change in the regulation, they would start by using their current ICP, which is not running at full capacity. They might be able to move 25% of their flame AA work to their existing ICP instrument.

To get lower MDLs and reporting levels they might be able to decrease the volume of the digestate from the current 45 mL. That might require different sample preparation, such as switching from hot block to microwave. Improving digestion might be able to lower MDLs, but they would need accreditation body approval to change their sample preparation methods.

They also highlighted that switching to ICP-OES for all dust-lead wipes could double the cost compared to continuing to use flame AA. AES aims to balance protecting children with maintaining affordable

prices, as significant cost increases could discourage compliance. They believe if prices increase significantly, people will not do the work, resulting in less work being done overall thus being less protective. Overall, AES prefers to continue using flame AA if possible and are prepared to switch to ICP-OES, if necessary, to meet regulatory changes.

Additional Information:

Asks about how portable XRFs used for dust testing would be able to comply with the rule. Those XRF readings are being taken without supervision, unlike laboratory testing (which is overseen by accreditation bodies).

Also mentioned cleaning verification after a renovation job.