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Comments on MP&M Plus NODA

Editor's note: T**he following comments on the Metal Products & Machinery (MP&M) NODA were prepared by Frank Altmayer, MSF.**

EPA has indicated a desire for comments on the concept of moving companies that are indirect dischargers, currently regulated under 40CFR Part 413, to 40 CFR Part 433. The following comments assume that EPA will **NOT** classify such as move as a "new source."

Table 1 compares the existing 413 and 433 discharge limits for existing source indirect job shop dischargers (common metals) discharging **more than 38,000 liters** of wastewater per day.

Table 2 compares the existing 413 and 433 discharge limits for existing source indirect dischargers (common metals) discharging **less than 38,000** liters of wastewater per day.

Compliance With 40CFR Part 433 Metals Limits

Companies Discharging More Than 38,000 Liters Per Day

Compliance with the metals limits of 40 CFR Part 433 will require these companies to reduce the concentration of some metals (notably cadmium and zinc) by about 50%. This appears achievable by the addition of polishing filtration plus cation exchange or modification of waste treatment chemicals (addition of DTC-type precipitants).

Companies Discharging Less Than 38,000 Liters Per Day

Our best estimate, based upon data from the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC), is that 25 percent of all companies regulated under 40CFr part 413 are currently regulated under the 38,000 LPD exemption standards. As such, they are regulated on a local basis, except for cyanide amenable to chlorination (end of pipe), lead and cadmium.

Jobshops that currently practice water conservation to an extreme level and those companies that are the smallest of the small will need to comply with new limits that are significantly lower than limits that are currently non-existent (on a federal level).

In many cases, such companies will need to install entire waste treatment systems. These companies are the least likely to be able to afford such a change or have the floor space to accomplish it. A small waste treatment system (assuming the floor space is available) will cost about $150,000, installed.

It would seem to be counter-productive to move the under 38,000 liters per day companies to 40CFR Part 433. In effect, this would penalize those companies that have practiced good water conservation.

Cyanide Compliance

Companies Discharging Less Than 38,000 Liters Per Day

These companies currently have cyanide amenable to chlorination limits at the end of pipe. End-of-pipe samples typically do not contain interferences at high concentrations as one might find at the point of treatment. Therefore, the limits are readily achievable under the current regulations.

By moving such companies to 40CFR Part 433, cyanide compliance must be at the point of treatment. Further, the regulated concentrations are lower by a factor of almost 5. Compliance with such a change would entail the installation of a new waste treatment system that incorporates 2-stage chlorination and a clarifier for removal of ferro-cyanides (as per our following discussion). Many of these small companies do not have the financial resources or floor space to install such treatment systems. Those that do would incur a significant expense from business interruption caused by the replacement of the older system with the new one.

Table 1—PSES 40CFR Part 413 vs. 40 CFR Part 433

Parameter	40CFR Part 413		40 CFR Part 433.13	
	1 DM	4DA	1DM	30DA
Cadmium	1.2	0.7	0.69	0.26
Chromium	7.0	4.0	2.77	1.71
Copper	4.5	2.7	3.38	2.07
Lead	0.6	0.4	0.69	0.43
Nickel	4.1	2.6	3.98	2.38
Silver	NR	NR	0.43	0.24
Zinc	4.2	2.6	2.61	1.48
Cyanide-T	1.9*	1.0*	1.2**	0.65**
Total Metals	10.5	6.8	NR	NR

* End Of Pipe
** Point Of Treatment
NR = Not Regulated under 40CFR; locally regulated in most cases

Table 2—PSES 40CFR Part 413 vs. 40 CFR Part 433

Parameter	40CFR Part 413		40 CFR Part 433.13	
	1 DM	4DA	1DM	30DA
Cadmium	1.2	0.7	0.69	0.26
Chromium	NR	NR	2.77	1.71
Copper	NR	NR	3.38	2.07
Lead	0.6	0.4	0.69	0.43
Nickel	NR	NR	3.98	2.38
Silver	NR	NR	0.43	0.24
Zinc	NR	NR	2.61	1.48
Cyanide-A	5.0*	2.7*	1.2**	0.65**

*End of Pipe
** Point of Treatment
NR = Not Regulated under 40CFR; locally regulated in most cases

The Cyanide "at the Point of Treatment" Issue

A major issue is that 433 requires cyanide compliance at the point of treatment, while 413 allows for compliance at the total discharge from the treatment system (end of pipe).

Numerous 413 regulated job shops utilize cyanide to plate over ferrous substrates and therefore generate cyanide-bearing rinsewater that contains high concentrations of ferro-cyanide, which is not amenable to chlorination. Therefore compliance with the total cyanide limit of 0.65 (30-day average) is an extremely difficult proposition if not an impossibility. Our experience is that a typical discharge from a cyanide destruct system at a job shop plating with cyanide over steel has a total cyanide concentration in the 20-30 mg/L range.

EPA allows for an alternate limit of CN-ATC of 0.32 (with the permission of the POTW). However, the CN-ATC procedure is so flawed that compliance with this limit is often a source of much exasperation on the part of the regulated and regulators.

EPA conducted a study of the CN-ATC procedure (EPA 600/4-83-054) in 1983. The contractor hired by EPA noted that the method "…exhibits a number of deficiencies..." and "…its deficiencies should be corrected…." To date, those deficiencies have NOT been corrected.

The same contractor stated: "The modified Roberts-Jackson (WAD) procedure is far superior to any other method investigated," yet EPA has yet to embrace this as an official alternate method. Quantum Chemical company was given permission to use ion chromatography, yet EPA has not embraced this as an official alternate.

Deficiency 1

The reproducibility of the method under the best conditions (lowest level of interferences), and with the most experienced analyst is +/- 10 percent. Because the total cyanide at the point of treatment may be 20 ppm, 10 percent of 20 is 2.0 and the limit is 0.65 mg/L on average. Violations can therefore be created in the laboratory of the control authority. Resolving these issues typically takes a considerable amount of time and expense on the part of the discharger and the control authority.

Deficiency 2

The method often produces negative results (which are an impossibility in real life). Some POTWs refuse to accept a negative value, and re-analyze with alternate sample sizes, alternate pretreatment schemes and reagents until they get a positive value (usually a violation). Dr. Andrew D. Eaton (Standard Methods representative) responded to a letter from us regarding this issue by stating that negative CN-ATC results are "normal" for certain electroplating wastewaters, because ferrous iron is oxidized to less stable ferri-cyanide compounds, which then decompose during distillation of the second (chlorinated) portion of the sample. Because EPA has not take a formal stance on the negative cyanide-ATC values, the move to 40CFR Part 433 will create additional expense, time, and false listings as SNC for companies and control authorities.

Deficiency 3

The method is not reproducible between laboratories.

Quantum Chemical Company (Cincinnati, OH), Masterlock (Milwaukee, WI), Olin Corp., (East Alton IL), and Three J's Plating (Elk Grove Village, IL), have all reported disagreements between laboratories on the same sample. Quantum Chemical (see *Industrial Wastewater*, Jan/Feb 1996, page 33) sent the same sample to four different laboratories. Results (duplicate analysis at each lab) obtained were:

Lab	Day 1	Day 2	Day 3
1	2.83	3.74	2.87
	3.89	3.24	2.54
2	0.10	0.01	0.08
	0.03	0.50	0.70
3	0.39	1.2	0.02
	16.0	3.10	3.8
4	0.05	0.05	1.36
	1.7	0.5	0.43

The above data obviously indicate that the procedure is deeply flawed and should not be used for compliance purposes.

The MWRDGC in its comments to EPA on the original 40CFR Parts 413/433 proposal stated: "The cyanide amenable to chlorination test, as detailed in Standard Methods, ASTM, EPA and conducted by various laboratories, yields results that are not reproducible or accurate. "The amenable to chlorination method gave erratic results....

"Based on our extensive experience with pollution control litigation, it is our opinion that the cyanide amenable to chlorination proposal is not enforceable."

All three "official" sources (Standard Methods, EPA, and ASTM) of CN-ATC procedures provide procedures that are vague and subject to analyst interpretation. Further, there are numerous interferences that can not readily be compensated.

The MWRDGC has a NELAP-certified laboratory. They tested a sample taken from the point of treatment from a job shop plating with cyanide over steel. The same sample was analyzed using a 500 mL portion and a 500 mL sample consisting of a second portion diluted 1/50. Theoretically, one would expect the same test results. The results were:

	500 mL as is	500m after 1/50 dilution
CN-ATC	50 mg/L	27 mg/L

Our own laboratory, which is also NELAP-certified has obtained equally puzzling results on numerous samples containing high concentrations of ferro-cyanide.

The analytical methods do not agree with how much reducing agent is used to eliminate free chlorine in the sample. They do not agree with or describe well how to detect the presence of free chlorine in the sample. The tests given are not specific to chlorine. Standard Methods suggest using sodium thiosulfate or sodium arsenite to neutralize excess chlorine in a sample, while ASTM and EPA suggest using ascorbic acid (but specify different amounts). Our investigations have shown that use of different reducing agents and different concentrations yield different results, even though all eliminated excess chlorine.

The procedures are vague about how much, if any, excess reducing agent should be added. Our investigation showed that this can produce a 62.5 vs. 0.05 mg/L test result!

Sampling after a conventional clarifier (after cyanide is precipitated along with metal-bearing rinsewater) is typically an unworkable option for cyanide compliance because the dilution from non-cyanide wastewater must be taken into account. Often such dilution results in a re-calculated new cyanide (total) limit that is below the limit of detection or is so low that analytical problems again arise.

The "bottom line" is that a jobshop electroplater with ferro-cyanide in its rinsewater, subject to cyanide compliance at the point of treatment, is literally between a rock and a very hard place.

Because a move from 40CFR Part 413 to 40CFR Part 433 would result in significant cost to many small- and medium-sized companies, making it difficult for such companies to stay in business, we would urge EPA to acknowledge that there is little, if any, benefit from such a move, and that the existing regulations currently protect the environment to a sufficient degree.

At a minimum, EPA needs to acknowledge that CN-ATC at the point of treatment is not workable when large amounts of iron cyanide complexes are present. Compliance should be monitored at the end of the pipe.

We urge EPA to withdraw the entire MP&M regulation proposal on the basis that it is economically not achievable and unnecessary in light of the fact the industry has been regulated and has an excellent record of compliance with existing regulations. ***P&SF***