Alta Plating & Chemical Corp.

1733 S Street
Sacramento, CA 95814
(916) 442-1063 Fax # (916) 442-4779

August 29, 2006

To: Carla Takemoto
From: Dominick Nole
Subject: Comments Regarding the Proposed ATCM changes.

1. **The Source Testing Program. -**As I had mentioned to you in my E-Mail dated June 24, 2006, I have a deep concern as to the proposed new ATCM requirements. Since the inception of the Clean Water Act and California's Tiered Permitting regulations, in the Sacramento Area alone 10 of 13 Platers have gone out of business. All of these Platers were small businesses with 2 to 10 employees. CARB's proposed changes in the ATCM will add to the regulatory burden already imposed on this Industry. If CARB's decisions were based on sound scientific evidence and technical data, we could understand the State's reasoning to tighten the ATCM regulations over and above what USEPA now requires. For whatever reason, CARB has decided that BACT should be the basis for the proposed ATCM regulations to minimize the cancer risk to the surrounding community. The Dispersion Model calculations used to determine how that Cancer goal can be achieved is based on many broad assumptions one of which is the assumption that the Emission Factors developed in the Source Testing program is a true measure of the chrome emissions from an open surface chrome plating tank. Having been closely associated with CARB in their testing program, I am finding it difficult to justify that assumption. Even though we had tried to set the testing protocol as close as possible to actual plating conditions, all of the shops tested in the North had too low an amp-hr usage, consequently in order to obtain enough of an air sample to adequately quantify the Hex-chrome concentration, the amp-hr usage was increased 3 to 6 fold over and above what these shops normally use in one day. In addition, from the Southern California Source tests run on tanks that had fume hoods, there was an indication that the high air flow over the surface of the tank swept additional chrome into the ductwork causing the emission factors to be biased on the high side. For the Source Testing Program, in an effort to minimize that effect, the fume hood flow rate (90m3/min) was reduced by a factor of 3 to about 28 m3/min. At that rate the smoke test indicated that the capture efficiency was adequate. **As far as I know no testing was done to determine whether or not the Emission Rate was still biased at the lower flow rate.** The sampling protocol used for the Source Testing Program and at SCAQMD is an excellent way to evaluate the effectiveness of commercial fume suppressants. However, without any additional supporting data, it is a quantum leap to assume this technique is an accurate measure of the Emission Rate from an open surface tank.

2. **Ambient Test Data.** -In an effort to better understand the source test data, I have closely reviewed the data for all testing done on facilities with open surface tanks. In my review I found the ambient test results to be very interesting. I realize CARB had no specific purpose in mind when it decided to take ambient samples. However, the data is reported and may be significant. Attached is a summary of the ambient test data reported by CARB for Alta Plating, Sherms' Plating, and Clovis Plating. I did not receive the ambient data for Walker Custom Chrome. If one examines the ambient data, it can be seen that Alta's plating room with no hood in place has an average of 59ng/m3. Sherm's plating room was 149ng/m3. These ambient test results are far below the OSHA PEL of 5000ng/m3. For Alta's and Sherm's ambient data, it can be seen that the ambient concentrations increased when the Hood was removed. The question that needs to be answered is a) **If according to the smoke test the capture efficiency of the hood is acceptable, why do we find significant quantities of chrome in the plating room during the testing?** b) **If the Emissions Factor is a true measure of the Chrome emissions, wouldn't the ambient concentration in the room with no hood be much higher than the concentrations found in the ambient air during testing?** The Clovis ambient data is curious. The average data with no hood was 248ng/m3; whereas the average data with the hood operating was higher at 465ng/m3. This anomaly cannot be explained by the presence of fugitive dust. With the hood pulling chrome off of the surface of the tank, one would expect the concentration in the plating room to be lower with the hood in operation. **Is it possible that the hood when operating spewed chrome back into the plating room?**

   During the Clovis testing, CARB placed an additional air sampler in the plating room. One sampler was placed near the rectifier (RA) and a second sampler (CA) was placed elsewhere in the plating room. It can be seen from the data, the results between RA and CA are comparable and in the same ballpark. Also a third sampler was employed using a 1 liter per minute flow rate instead of a 10 liter per minute flow rate. The data showed that the 1-lpm rate was as good as the 10-lpm rate. All in all it appears as though the ambient air sampling technique is fairly reliable. Unless there is data that shows the Ambient sampling method used is not an accurate measure of the Cr6 in the plating room, one can only conclude that the Ambient sampling data is a measure of the Cr6 concentration in the room air. **And if so, the Emissions Factor as measured by the Source Test Protocol may be over stating the true Emission Rate.**

3. **Requirements For Intermediate Facilities.-** Utilizing data reported in the Staff Report, 51% of all the Chrome Platers in California account for 98.9% of the total Cr6 Amp-hr usage in California. The other 49% of the Platers utilize only 1.1% of the total Amp-hrs used in the State. All of the 49% fall under the Intermediate or Small category Tier. Some of the 49% already have Add-on Controls. How does CARB justify imposing a significant compliance cost on small businesses that contribute very little to the overall emissions? **The new ATCM should define the BACT for all facilities under 200,000 Amp-hrs as the use of approved fume suppressants.**
4. **The Barrio Logan Study –** Data from the Barrio Logan Study has contributed greatly to CARB's decision to tighten the ATCM regulations. A close examination of the data indicates that out of 107 days of sampling the test results from two days in December of 2001 were inordinately high indicating something was different during those two days. The December 3 through 17 sampling event had an average outdoor concentration of 0.98ng/m3. The February 5 through 22 and February 23 through March 7 sampling event concentrations had dropped to 0.22ng/m3 and 0.21ng/m3 respectively. Later testing indicated that the December high concentrations in the outside air may have come from Fugitive dust contaminated with Cr6 rather than the daily emissions from the plating operation. This theory was substantiated on one day in April after Master Plating had stopped its chrome plating operations. An outside air sample on April 6th, 2002 had one of the highest concentrations (21ng/m3). The other high concentration (22ng/m3) occurred on December 13th, 2001. If one excludes the two days in December and the one day in April, the average outdoor concentration for 416 samples drop from 0.42 to 0.25ng/m3. One must keep in mind even this data is biased high as CARB assumes all samples that had a result below the detection limit (0.2ng/m3) have at least 0.1ng/m3. In the Staff report it was stated that ***the detection limit has been improved to 0.06ng/m3. And, as a result, mean concentrations calculated before 2003 <u>may</u> be biased high***. In the Barrio Logan study out of 431 samples 65+% were below the detection limit. All of the 65% non-detects were assigned a 0.1ng/m3 concentration. **USEPA for whatever reason has disregarded the Barrio Logan study and in its 2004 NESHAP approved the use of Fume Suppressants alone for some Hard Chrome Platers**.
5. **Dispersion Modeling-** In the Staff Report it is stated that the modeling analysis was based on the assumption that the chrome mist droplets were small enough such that the droplet would behave as a gas in the ambient air. This assumption is based on a report that Hex-Chrome droplets are 8 micrometers or smaller. It was stated that "**<u>Particles</u> of this size are <u>thought</u> to behave as a gas.**" In reality the Hex-Chrome droplets do **not** have the same characteristics as a particle. The droplet is comprised of either Hydrogen or Oxygen gas encapsulated in a solution of about 20% Hex-Chrome and 80% water. Certainly the behavior of the droplet will be different depending on whether or not it has entrapped Hydrogen or

Oxygen. In addition depending on the relative humidity of the air the water will begin to evaporate. At this time we do not know how long the gasses will remain entrapped. Certainly the escape of the gases and the evaporation rate of the water play an important part on how the droplet behaves in air. The chrome droplet's specific gravity is dynamic and will change dramatically depending on the rate of change of the gas and water content. The behavior of the droplet in air is also influenced by the fact that the bath temperature can range anywhere from 100 to 140 degrees F. The dynamics of the temperature affect will depend on the ambient air temperature in the plating room. All of the above scenarios are variables that may or may not affect how the Chrome droplet behaves when it leaves an open surface tank.

The modeling analysis assumes that all of the chrome emissions from the plating tank enter the atmosphere outside the building. We in the industry know that some of the droplets fallout back into the tank and some of the droplets deposit on the walls and other surfaces inside the building. The data reported from the Barrio Logan study showed that significant quantities of chrome had deposited on dust particles inside the plating shop. The Barrio Logan results are a strong indication that all of the chrome droplets are not emitted to the outside air. **Based on this data it is obvious that the Dispersion Modeling overstates the concentration of chrome in the surrounding community.** In addition the dispersion analysis does not account for the stability of Hex-Chrome in the air. Hex-Chrome is a very strong oxidizer especially at low pH. When Hex-Chrome comes in contact with organic matter or any reducing material, it will oxidize the material and itself will be reduced to Trivalent Chrome. The reaction rate will depend on many factors besides pH. If one takes a look at the Source Test data where Total Chrome is reported along side Hex-Chrome it can be seen that on average the Hex-chrome is about 79.6% of the Total Chrome. Since the sample is taken from a duct only a few feet away from the plating tank and the sample is trapped in a preserving solution, it can only be concluded that 20% of the Hex-chrome was reduced to Tri-Chrome between leaving the process tank and entering the preserved solution. **If in that short of a period of time 20% of the Hex-Chrome had been reduced, what percent would be reduced before the droplets reach the outside air? Would the chrome continue to be reduced as it travels outside the building?** If these factors are not taken into account, the Dispersion Models will grossly overstate the concentration of Hex-Chrome in the outside ambient air.

6. **Conclusions-**
    a. Based on the test data presented thus far, it has not been established whether or not the Emission Rate Factor as determined from the Source Testing Program is a true measure of the Hex-Chrome emissions from an open surface chrome plating tank. The ambient data without the Hood indicates that the Emission Rate Factor may be biased on the high side. The use of the Emission Rate Factor in the Dispersion Modeling Equations more than likely is overstating the down wind Hex-Chrome concentrations.

b. Even though the proposed ATCM has a provision whereby companies that fall into the Intermediate Tier can use other means of control if they can prove that the alternate means can meet the 0.0015mg/A-hr requirement, there is not presently an adequate sampling protocol that will yield a true measure of the emissions from an open surface tank. In light of the fact that Intermediate and Small Facilities utilize only 1.1% of the Amp-hrs used in the State, these facilities should not be required to install an expensive ventilation system. Approved Fume suppressants alone should be the BACT for this Tier.

c. The one positive conclusion that can be made from the Barrio Logan Study is that Hex-Chrome deposited on dust particles in Master Plating's building and those dust particles if disturbed by activity in the building and/or wind caused the outside air to have elevated concentrations of Hex-Chrome. Because of the interference of the dust particles during the sampling events, it is difficult to determine how much the actual plating contributed to the measured concentrations. In facilities where grinding and polishing are done in close proximity to the plating, housekeeping as addressed in the proposed ATCM is beneficial to the environment and the work place.

d. Because of the broad assumptions used in the modeling analysis, the predicted concentrations in the ambient air are biased high. Although it is prudent to err on the side of caution, there is a point where the cost for a very small improvement cannot be justified. The question must be asked; why does the California Air Resources Board believe it is necessary to promulgate regulations that go beyond and above those required by The United States Environmental Protection Agency?

Dominick Nole, Chemist, REA

CARB Ambient Test Data Summary

Alta	ng/m3 Hood	Sherms	ng/m3 Hood	Clovis	ng/m3 Hood	Clovis	ng/m3 Hood
40dyne				C1-A	Sample ?	*C20-RA	150
A-11-A	70	S1-A	67	C2-A	530	*C20-CA	150
A-12-A	28	S2-A	39	C3-A	400	C21-RA	1600
A-13-A	10	S3-A	65			C21-CA	560
avg	**36**	**avg**	**57**			C22-RA	330
30dyne				**avg**	**465**	C22-CA	510
A-21-A	18					C23-RA	1300
A-22-A	16					C23-CA	No Data
A-23-A	9.3					**RA avg**	**693**
avg	**14.4**					**CA avg**	**407**
30dyne	**No Hood**		**No Hood**		**No Hood**		**Hood**
A-33-A	79	S11-A	100	C4-A	120	C30-RA	2200
A-32-A	41	S12-A	210	C5-A	280	C30-CA	No Data
A-30-A	57	S13-A	120	C6-A	130	C31-RA	1600
avg	**59.0**	**avg**	**143.3**	C7-A	460	C31-CA	1100
A-31-A	3.9 Sunday			**avg**	**248**	C32-RA	510
						C32-CA	760
						C33-RA	860
						C33-CA	880
						RA avg	**990**
						CA avg	**913**
							Hood
						C41-RA	1113
						C41-CA	2350
						C41-CAC	2390
						C42-RA	448
						C42-CA	1190
						C42-CAC	No Data
						C43-RA	789
						C43-CA	1281
						C43-CAC	1481
						RA avg	**783**
						CA avg	**1607**
					2-day	**CAC avg**	**1936**
					2-day	**CA avg**	**1916**

Notes RA=Sampler near the Recti at 10 liters per minute.
CA=Sampler in the plating r room " "
CAC=1 liter per minute sampler volume Located near the CA sampler.

Samles C20-RA & -CA were taken while **no** plating was being done.