To: CalEPA, Air Resource Board
From: Dynea North America – Tom Holloway; Georgia-Pacific Chemicals, LLC – Pablo Dopico; Hexion Specialty Chemicals, Inc. – David M. Harmon
Subject: California Air Resources Board (CARB) proposed Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products

Comments representing the position of major resin suppliers in North America for the subject regulation follow. The focus of these comments is the section of the proposal that grants incentives (exemptions) only for no-added formaldehyde resin ["NAF"] systems. This provision places no requirement for actual raw panel emissions produced with a qualifying-exempt system to be lower than those defined in the appropriate tables of the Proposed Regulation Order and is therefore inconsistent with establishing an emission based regulation. Further, it discriminates against formaldehyde-based systems that may yield similar results as NAF systems.

For example, a review of the Best Available Control Technology (BACT) analysis tables [ISOR Chapter V, tables V-22, 24, and 26] reveals the following:

- Identification of a NAF binder system noted to yield ASTM E1333 emissions less than or equal to 0.05 ppm.
- Identification of a formaldehyde-based adhesive system characterized at less than or equal to 0.01ppm.

The Proposed Regulation Order would exempt the NAF binder, but would hold the manufacturer using the formaldehyde based technology accountable for compliance in accordance with the third party testing protocol outlined in the regulation.

More specifically, NAF binders are afforded the opportunity in 93120.3 (e) (1) to qualify for an exemption from compliance with third party certification based on "a demonstration of the emissions performance of the candidate no-added formaldehyde based resins. " However, the criteria required for such a demonstration of emissions performance which warrants consideration for the exemption are not clearly specified in the regulation. Section 93120.3 (e) (4) simply requires that "the evidence submitted by the applicant is sufficient to demonstrate that the applicant can meet the emissions standards specified in section 93120.3 (a)." This section does not specifically require compliance with phase 2 to obtain approval for exemption. Furthermore, the third party certification which constitutes the backbone of the assurance and enforcement protocols in the regulation are thus not required of NAF binders. In contrast, the same opportunity for an exemption from third-party certification and ongoing testing is not offered to formaldehyde-based binders.

We recommend that a level playing field be established for all adhesives (and panel products produced from those adhesives) that is performance-based and technology encouraging. A potential solution is to require all adhesive categories to comply with the testing protocol outlined in the regulation and grant a panel manufacturer exempt status only once the third-party certified data obtained in accordance with 93120.3 (b) indicates that the combination of

adhesive system and panel processing conditions yields the desired results (for example, achieving the applicable Proposed Phase 2 level defined in the regulation or a percentage thereof). The benefits of this approach are:

- establishes clearly defined emission characteristics for exempt-eligible panel products that may be lower than the current criteria,
- encourages both short and long term adhesive and panel manufacturing innovation commensurate with potential for acquiring exempt status based on documented emission performance,
- eliminates the uncertainties associated with formaldehyde emission component variability (substrate, adhesive, and other processing conditions), and
- enables a panel manufacturer to establish cost/benefits associated with establishing exempt status.

Detailed Background and Comments

Staff has repeatedly indicated during preceding workshops that they do not intend to deselect formaldehyde based resins, but when they grant an exemption to no-added formaldehyde ["NAF"] products that is not available to equivalently low-emitting formaldehyde bonded products, such as the PF-bonded particleboard that they describe in the BACT analysis, they are *de facto* deselecting the formaldehyde-based options. The additional costs for formaldehyde-based resin bonded products due to QA testing requirements, third party certification, and the liability of penalties for non-compliance that are not equally imposed on the no-added formaldehyde products may very well drive board manufacturers to select the no-added formaldehyde option even though the performance criteria could be met with a formaldehyde-based resin (which is thereby "deselected").

As was pointed out by Mr. Will Warburg (Plum Creek Timber Company) at a recent Public Workshop, switching from the current UF resins to PF resins would result in a manufacturing capacity decrease of about 20% in a MDF plant. Other companies' experiences in particleboard manufacturing plants have shown even more drastic reductions in productivity with the use of PF resins.

Currently, North America consumes approximately 3 billion pounds of UF-based resins annually. Given that California consumes about 10% of the products made with UF-based resins, this translates into about 300 million pounds to meet current market demands – not counting imports. There is not enough existing resin manufacturing capacity, especially among NAF sources, to replace this volume. Even converting existing UF manufacturing capacity to manufacture the performance-equivalent replacement amount of PF production would be highly unlikely in the timeframe allowed under the proposed regulation order. Further, we anticipate that the impact will be larger than that which has historically been observed due to the California market alone. No commercially viable binding technology exists for composite products except hardwood plywood that does not include the use of formaldehyde.

Therefore, we recommend a "level playing field" for all adhesives, and the products made from those adhesives. We would support a beneficial approach that is performance-based and technology encouraging. In fact, the Staff Report (ISOR) provided nearly all the elements necessary to define a performance-based criterion.

A review of the BACT analysis tables [ISOR Chapter V, tables V-22, -24 & -26] listing emission characteristics of products that will meet the proposed Phase 2 emissions requirements made with "no-added formaldehyde" shows three SierraPine MDF products with ASTM E1333 emissions $\leq$ 0.05 ppm. Under exemption application provisions in the Proposed Regulation order [ISOR Appendix A, section 93120.3(e)(1-6)], "[T]he Executive Officer shall issue an Executive Order approving the application if the evidence submitted by the applicant is sufficient to demonstrate that the applicant can meet the emission standards specified in section 93120.2(a) through the use of no-added formaldehyde based resins. The approval shall have a duration of two years, and the manufacturer may reapply for approval as provided in this section."

Additional review of the above-cited BACT analysis tables reveals that Roseburg's Skyblend ® Particleboard emissions are characterized at $\leq$ 0.01 ppm, which is substantially lower than the $\leq$ 0.05 ppm emissions listed for SierraPine's NAF MDF products. Also, other listed products that are manufactured using formaldehyde-based resin systems are shown with emissions equal to or less than those for the NAF, exemption-candidate SierraPine MDF products.

Therefore, the ability of select formaldehyde-based bonding systems to provide low formaldehyde emissions equivalent to NAF-based bonding systems has been established. The demonstration techniques (ASTM E1333 or correlated equivalent ARB-approved methodology) are also equivalent.

ARB Staff has provided the concept of "Near-zero emission" ["NZE"] (ISOR, Ch V, Tables V-24 & V-26) products that can be cohesively defined to bridge existing gaps and provide the basis for a performance-based, technology-encouraging, and mutually beneficial modification to the Proposed Regulation Order.

Specifically, it is proposed to establish a common, performance-based category for third-party certification exemption eligible "Near-zero" formaldehyde emission products ["NZE"] as those having an ASTM E1333 measured or extrapolated formaldehyde emission meeting the applicable Phase 2 emissions limit or some percentage thereof. This would replace the currently defined "no-added formaldehyde resins" in the body of the Proposed Regulation Order, and would be exemption eligible under application and performance terms as otherwise stated.

It should be specified in the regulation that screening testing and enforcement testing will be conducted on all products equally, including those granted exemption under applicable sections of the regulation order.

Benefits:

This would place a reasonable and clearly defined criterion for the emissions characteristics of **exemption-qualifying** products. This approach encourages both short and longer term resin and manufacturing process development with commensurate potential for certification exemption based on documented performance equivalency for all competing resin and manufacturing technologies.

While product volumes manufactured with technology-forcing "no-added formaldehyde" resins might be sufficient to meet the consumption needs of the State of California, they are not adequate to fulfill the needs of other States and/or countries that are likely to follow California's emissions limiting regulation lead. Incorporation of the "Near-zero" proposal would additionally encourage global development of comparably performing products.

Rational:

This proposal will formally and fairly recognize achievement of desired results under consistent and defined criterion. It does not diminish achievement based on labels or perception.

Wood products manufacturers will have clearly defined performance guidelines, by which they can evaluate their opportunities and options, along with more accurately determining the associated costs. This is key to their business decision process.

References:

ISOR Ch V, Pg 63: "In general, staff projects that BACT will be based on reformulated UF resins. However, the proposed regulation provides an incentive for panel manufacturers to convert to no added HCHO resins early by not having to comply with the requirement to perform quarterly emission tests of their products under a third party certification program."

ISOR Ch V, Section A.3., Table V-2 (Pg 68) indicates that under Japanese Building Stand Law Classifications that F**** board usage has no restrictions.

ISOR Ch V, § E (Pgs 101 – 106), presents the Technical basis for the Proposed Emission Standards and introduces the concept of "Near-zero HCHO Emissions.

ISOR Appendix A (Proposed Regulation Order), Section 93120.1(a)(25) [Pg A-4] defines "["N]o-added formaldehyde based resins" means resins formulated with no-added formaldehyde as part of the resin cross linking structure for making hardwood plywood, particleboard, or medium density fiberboard. "No-added formaldehyde based resins include, but are not limited to, resins made from soy, polyvinyl acetate, or methylene diisocyanate."

ISOR Appendix A (Proposed Regulation Order), Section 93120.3(e)(1) provides for exemption from third party certification for manufacturers who plan to use no-added formaldehyde based resins.

ISOR Appendix A (Proposed Regulation Order), Section 93120.3(e)(4) provides that "[T]he Executive Officer shall issue an Executive Order approving the application if the evidence submitted by the applicant is sufficient to demonstrate that the applicant can meet the emission standards specified in section 93120.2(a) through the use of no-added formaldehyde based resins. The approval shall have a duration of two years, and the manufacturer may reapply for approval as provided in this section."