Attachment 21 - Revised

Environmental Assessment

1. **Date:** August 28, 2017

2. **Name of Notifier:** Kaneka North America LLC

3. **Address:** 6161 Underwood Road
   Pasadena, TX 77507

4. **Description of Proposed Action:**

The proposed action is the approval of a Food Contact Notification authorizing the use of styrene-*iso*butylene-styrene (SIS) block copolymer in food packaging applications. The SIS polymers are intended to be used as components of blends with other polymers, *e.g.,* polyethylene or polypropylene, without limitation as to concentration, food types or condition of use. As detailed in the confidential attachment to this EA, production of the FCS for food contact applications will be limited.

The Notifier will not be producing the final food contact articles. Kaneka North America (Kaneka) will only produce the base SIS polymer that will be provided to other processors who will either produce the food contact articles or will incorporate SIS into polymer blends which will subsequently be used to produce food packaging materials.

Under the proposed action, food packaging materials containing the SIS copolymer will be used to produce both flexible, *e.g.*, film, and rigid food packaging. It is expected that the FCS will be widely distributed across the country upon use. According to the Environmental Protection Agency (EPA), 14.3 million tons (28.6×10^9 lbs) of plastics were used for in plastic packaging applications in 2014.[1] Thus, as discussed in the Appendix, the proposed use of the FCS will be less than 0.15% of the plastics used in container and packaging in the United States. The use of the FCS is not expected to effect current disposal patterns. Thus, disposal will be similar to disposal of "Other resins." EPA data for 2014 shows that the amount of other resins disposed of through recycling is "negligible." EPA also found that 16.7% of all plastics in containers and packaging are disposed of through combustion with energy recovery, and 68.5% landfilled in

[1] EPA, *Advancing Sustainable Materials Management: 2014 Tables and Figures, Assessing Trends in Material Generation, Recycling Composting, Combustion with Energy Recovery and Landfilling in the United States, Table 8,* U.S. Environmental Protection Agency, December, 2016 https://www.epa.gov/sites/production/files/2016-11/documents/2014_smm_tablesfigures_508.pdf.

municipal solid waste.[2] Based on the EPA data, we calculate that 19.6% of the FCS will be disposed of through incineration. [3]

5. Identification of Substance

A. Chemical Abstracts Name/Number:

2-methylprop-1-ene, styrene/9011-12-5

B. Other Chemical Name:

Styrene-*iso*butylene-styrene block copolymer

C. Trade Name

SIBSTAR™ 062T-FD

D. Molecular Weight:

Number Average Molecular Weight (Mn): 60,000

Low Molecular Weight Oligomers (< 1000 Daltons): <0.30%

E. Molecular Formula:

$(C_8H_5)_m - (C_4H_6)_n - (C_8H_5)_m$

F. Physical Description:

Clear to white solid

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[2] *Id.* Table 8, Plastics in Products in MSW, 2014.

[3] *Id.* EPA does not include specific percentages for "combusted with energy recovery" or "landfilled" for "other resins". However, the percent of "other resins" disposed of through incineration may be estimated as follows:

Quantity of all resin disposed of through incineration or landfill:

(Total Plastics in Containers & Packaging) - (Recycled) = (14,320) - (2,120) = 12,200 thousand tons

Fraction of plastics that are not recycled that are disposed of through incineration:

(2,390 thousand tons incinerated)/(12,200 thousand tons) = **19.6%**

6. Introduction of Substances into the Environment:

The Notifier intends to produce the food contact substance at its facility in Pasadena, Texas. That facility is operated in compliance with all federal and state environmental laws and regulations. The facility currently produces similar SIS copolymers for non-food applications thus the proposed action will not result in the use of any new technology or manufacturing processes that are not currently in use in the facility. Any waste material produced during the production of the polymer for use under the proposed action will be disposed of in the same manner currently used for similar polymers. Thus, the additional production of polymers that may result from the proposed action will not result in any extraordinary circumstances that would have any adverse environmental impact.

The Notifier will not produce the finished food-contact materials. Rather, these will be produced by the Notifier's customers at separate facilities. It is expected that these facilities are currently engaged in the production of other food-contact materials for similar applications and that these facilities are operated in compliance with the relevant federal, state and local environmental laws and regulations. The use of the FCS in the production of these products is not expected to have a significant effect on the facility's compliance with these laws and regulations.

As noted in Item 4, disposal of the final food-contact materials will be by the ultimate consumers by conventional municipal waste disposal, *i.e*., through recycling, sanitary landfill and incineration. The final food contact substance is a hydrocarbon composed exclusively of carbon and hydrogen, all elements of materials commonly found in municipal solid waste. The products of complete combustion are water and carbon dioxide. Based on the stated market limitation provided in the confidential attachment, to the EA, the market volume of the FCS will make up a very small portion (less than $1/100^{th}$ of a percent) of the total plastic container and packaging waste currently combusted (estimated to be 2.39 million metric tons or 16.7% of 14.3 million tons in 2013).[4]

In accordance with 40 CFR 1508.27 the analysis of the significance of environmental impacts must include the degree to which the action threatens a violation of federal, state, or local laws imposed for the protection of the environment. In this context, 40 CFR 98.2(a)(3), requires stationary fuel combustion sources which emit 25,000 metric tons (mT) CO2 equivalents (CO2-e) or more per year to report their GHG emissions to the U.S. Environmental Protection Agency (EPA). Municipal solid waste (MSW) combustion facilities are stationary fuel combustion sources pursuant to 40 CFR 98.30(a). The GHG emissions resulting from the use and disposal of the FCS relate to the incineration of articles containing the FCS in MSW combustion facilities. Such facilities are regulated by the U.S. Environmental Protection Agency (EPA) under 40 CFR 98, which "establishes mandatory GHG reporting requirements for owners and operators of certain facilities that directly emit GHG". Part 2 of this regulation (40 CFR 98.2) describes the facilities

[4] *Id*. At Table 26.

that must report GHG emissions and sets an annual 25,000 metric ton carbon dioxide equivalent (CO_2-e) emission threshold for required reporting.

To evaluate the significance of the environmental impact of these GHG emissions, we refer to CEQ regulations under 40 CFR 1508.27, which defines "significantly" as it relates to assessing the intensity of an environmental impact in NEPA documents. 40 CFR 1508.27(b)(10) states that when evaluating intensity of an impact, one should consider "whether the action threatens a violation of Federal, State or local law or requirements imposed for the protection of the environment." GHG emissions from MSW combustion facilities are regulated under 40 CFR 98.2 As the estimated GHG emissions, as discussed in the confidential attachment to the EA are less than 0.1% of the threshold for mandatory reporting, no significant environmental impacts are anticipated to result from the combustion of the FCS in MSW combustion facilities. Further, as the FCS will not significantly alter the emissions from properly operating MSW combustors, incineration of the FCS will not cause MSW combustors to threaten a violation of applicable emissions laws and regulations (*i.e.,* 40 CFR 60 and/or relevant state and local laws).

Disposal of the final food packaging materials will be by the ultimate consumers by conventional municipal waste disposal, *i.e.,* through sanitary landfill and incineration. The food contact substance is a hydrocarbon composed exclusively of carbon, oxygen and hydrogen, all elements of materials commonly incinerated in municipal facilities. The results of complete combustion are anticipated to be water and carbon dioxide. Production of the FCS for food contact applications will be limited.

The FCS is not expected to have a significant effect on the emissions from properly operated municipal incinerators and incineration of the FCS will not result in municipal solid waste combustors to deviate in their compliance with applicable federal, state or local laws and regulations. Further, since the FCS will be used in place of other hydrocarbon-based polymers in these applications, it is anticipated that the proposed use and possible incineration of the FCS will not result in any significant change in the emission of carbon dioxide or other greenhouse gases.

Similarly, the proposed action will not result in any significant change in the amount of material disposed of through municipal solid waste landfill units. As noted above, the maximum quantity of the FCS that will be produced as a result of this proposed action will be less than $1/1000^{th}$ of one percent of the total plastics used in packaging applications. Further, the use of the FCS is expected to replace other polymeric materials currently used in these applications. Thus the proposed action will not significantly change the quantity of plastic materials disposed of through landfill operations.

In addition, the proposed use of the FCS will not result in leaching of oligomeric components of the FCS into surface or groundwater. Under current EPA regulations, 40 C.F.R. Part 258, all municipal landfills constructed after October 9, 1993 are required to have composite liners and leachate collection systems to prevent the release of materials into surface and groundwater. Thus no materials are expected to leach from landfill operations constructed after October 9, 1993. While landfills constructed before this date are not required to retrofit with their operations, they

are required to monitor ground water and take action to prevent leaching if necessary. The high molecular weight of the FCS, the fact that it contains only low levels of low molecular weight oligomers, less than 0.125%, and the low concentration of the FCS in the municipal waste stream confirm that there is no anticipation that the components of the FCS will enter surface or ground water.

7. Fate of Emitted Substances

(a) Air

The proposed action is not expected to have any significant effect on the concentrations of any substances in the atmosphere. The food contact substance is a high molecular weight copolymer of styrene and isobutylene that does not volatilize under the intended conditions of use. It will comprise less than $1/1000^{th}$ of one percent of the plastics used in packaging applications and therefore will represent an insignificant amount of material processed through municipal waste incinerators. Further, since the substance will be used in place of other hydrocarbon-based polymers, any increase in carbon dioxide emitted by incineration will be offset by reductions in carbon dioxide that would have been emitted from incineration of the polymers that were replaced. Further we note that possible CO_2-equivalent emissions from incineration will be well below the threshold for mandatory reporting, as discussed in item 6.

(a) Water

The food contact substance that is the subject of the proposed action is a high molecular weight polymer that is not water soluble. Any residual production material present in the polymer will be bound by the polymer matrix and would not be released under normal environmental conditions. Thus the proposed use of the FCS will not have any significant effects on freshwater, estuary or marine ecosystems. As noted in item 6, above, there will be no significant introductions of substances into ground or surface waters and therefore no environmental fate to be addressed.

(b) Land

The proposed action is not expected to result in any significant effects on terrestrial ecosystems. When properly disposed of, the FCS will be treated as municipal solid waste and either disposed of in landfill or through incineration, with no material permanently disposed of on land. Further, the FCS is a high molecular weight polymer that is not expected to release any of its constituents under normal environmental conditions even if the final food packaging materials are improperly disposed of as litter. Thus, there is no exposure of the FCS to terrestrial organisms anticipated to result from the proposed action. Further, since there not be any significant material present on land for extended periods of time, the Notifier has concluded that there are no materials that will have any environmental fate on land.

8. Environmental Effects of Released Substances

As noted above, the only substances that may be expected to be released to the environment upon the use and disposal of food-contact materials manufactured with the FCS consist of extremely small quantities of combustion products and leachables. Thus, no adverse effect on organisms in the environment is expected as a result of the disposal of articles containing the FCS. In addition, the use and disposal of finished articles containing the FCS are not expected to threaten a violation of applicable laws and regulations, such as the EPA's regulations in 40 CFR Parts 60 and 98 that pertain to municipal solid waste combustors or Part 258 that pertains to landfills.

9. Uses of Resources and Energy

The FCS that is the subject of the proposed action is intended to be used in place of polyolefins, olefin/vinyl alcohol copolymers and other food-contact polymers that are regulated or authorized for use as articles or components of articles intended for use in contact with food including 21 CFR 177 Subpart B and FCN numbers 1399, 1357, and 1195. Thus, no significant increase in energy or other resources is expected to result from this action. Food contact materials produiced using the FCS are not expected to be recycled. Thus, there will be no impact on recycling programs.

10. Mitigation Measures

No potential adverse environmental impact has been identified to result from the proposed action. Therefore, no mitigation measures are necessary.

11. Alternatives to the proposed Action

The alternative to the proposed action is not approving the proposed use of the FCS. This would result in the continued use of similar polymers in the same applications. In that no potential adverse environmental effects have been identified to result from the proposed action, the alternative will not have any advantageous environmental impact.

12. List of Preparers

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13. Certification

The undersigned hereby certifies that the information provided herein is true, accurate and complete to the best of his knowledge.

Date: August 28, 2017

[redacted]

Mark L. Itzkoff