

**Programmatic Environmental Assessment for Marketing  
Orders for New Combusted, Filtered Cigarettes  
Manufactured by Philip Morris USA, Inc.**

**Prepared by Center for Tobacco Products,  
U.S. Food and Drug Administration**

April 15, 2020

**Table of Contents**

Table of Contents ..... 2

1. Applicant and Manufacturer Information ..... 3

2. Product Information ..... 3

3. The Need for the Proposed Actions ..... 3

4. Alternative to the Proposed Actions ..... 4

5. Potential Environmental Impacts of the Proposed Actions and Alternatives - Manufacturing the New Products ..... 4

    5.1 Affected Environment ..... 4

    5.2 Air Quality ..... 6

    5.3 Water Resources ..... 6

    5.4 Soil, Land Use, and Zoning ..... 6

    5.5 Biological Resources ..... 6

    5.6 Regulatory Compliance ..... 7

    5.7 Socioeconomics and Environmental Justice ..... 7

    5.8 Solid Waste and Hazardous Materials ..... 8

    5.9 Floodplains, Wetlands, and Coastal Zones ..... 8

    5.10 Cumulative Impacts ..... 8

    5.11 Impacts of the No-Action Alternative ..... 9

6. Potential Environmental Impacts of the Proposed Actions and Alternative – Use of the New Products ..... 9

    6.1 Affected Environment ..... 9

    6.2 Air Quality ..... 9

    6.3 Environmental Justice ..... 9

    6.4 Cumulative Impacts ..... 10

    6.5 Impacts of the No-Action Alternative ..... 11

7. Potential Environmental Impacts of the Proposed Actions and Alternative – Disposal of the New Products ..... 11

    7.1 Affected Environment ..... 12

    7.2 Air Quality ..... 12

    7.3 Water Resources ..... 12

    7.4 Biological Resources ..... 12

    7.5 Solid Waste ..... 13

    7.6 Socioeconomics and Environmental Justice ..... 13

    7.7 Cumulative Impacts ..... 13

    7.8 Impacts of the No-Action Alternative ..... 13

8. List of Preparers ..... 14

9. A Listing of Agencies and Persons Consulted ..... 14

10. References ..... 14

CONFIDENTIAL APPENDIX 1 ..... 16

Comparison of the New Products to the Corresponding Predicate Products ..... 16

CONFIDENTIAL APPENDIX 2 ..... 17

First- and Fifth-Year Market Volume Projections for the New Products and Percentage of Cigarette Use in the United States Projected to be Attributed to the New Products ..... 17

**1. Applicant and Manufacturer Information**

<b>Applicant Name:</b>	Altria Client Services LLC
<b>Applicant Address:</b>	2325 Bells Road Richmond, VA 23234
<b>Manufacturer Name:</b>	Philip Morris USA Inc.
<b>Product Manufacturing Address:</b>	3601 Commerce Road Richmond, VA 23234

**2. Product Information**

**New Product Submission Tracking Numbers (STNs), Names, and Predicate Product Names**

STN	New Product Name	Predicate Product Name
SE0015500	L&M Turkish Blend Box	L&M Turkish Blend Box (SE0014914)
SE0015501	Virginia Slims Box	Virginia Slims 100's Box (GF1200173)
SE0015502	Marlboro Menthol Slate Box	Marlboro Menthol Slate Box (SE0014859)
SE0015503	Benson & Hedges 100's Menthol Box	Benson & Hedges 100's Menthol Box (GF1200128)

**Product Identification**

<b>Product Category</b>	Cigarettes
<b>Product Sub-Category</b>	Combusted Filtered
<b>Number of Products per Retail Unit</b>	Twenty cigarettes per pack with ten packs per paperboard carton and 60 cartons per shipping case.
<b>Product Package</b>	The packaging materials consist of paperboard hard packs with inner frames. The hard packs have inner foils, polypropylene outer wraps, polypropylene tear tapes, paperboard cartons and corrugated paperboard shipping cases.

**3. The Need for the Proposed Actions**

The marketing actions, requested by the applicant, are for the Food and Drug Administration (FDA) to issue marketing orders under the provisions of sections 910 and 905(j) of the Federal Food, Drug, and Cosmetic Act. The applicant wishes to introduce four new tobacco products into interstate commerce for commercial distribution in the United States and submitted to the Agency four substantial equivalence (SE) reports to obtain marketing orders. The Agency shall issue the marketing orders if the new products are found substantially equivalent to the corresponding predicate products. Two of the predicate products (for SE0015500 and SE0015502) received marketing orders, on January 24, 2019 (SE0014914) and on February 13, 2019 (SE0014859), while the others (SE0015501 and SE0015503) are grandfathered products (GF1200173 and GF1200128) commercially marketed in the United States as of February 15, 2007.

The new products differ from the corresponding predicate products in changes in cigarette seam adhesive, filter seam adhesive, and tipping adhesive (Confidential Appendix 1).

#### **4. Alternative to the Proposed Actions**

The no-action alternative is FDA does not issue marketing orders for the new tobacco products in the United States.

#### **5. Potential Environmental Impacts of the Proposed Actions and Alternatives - Manufacturing the New Products**

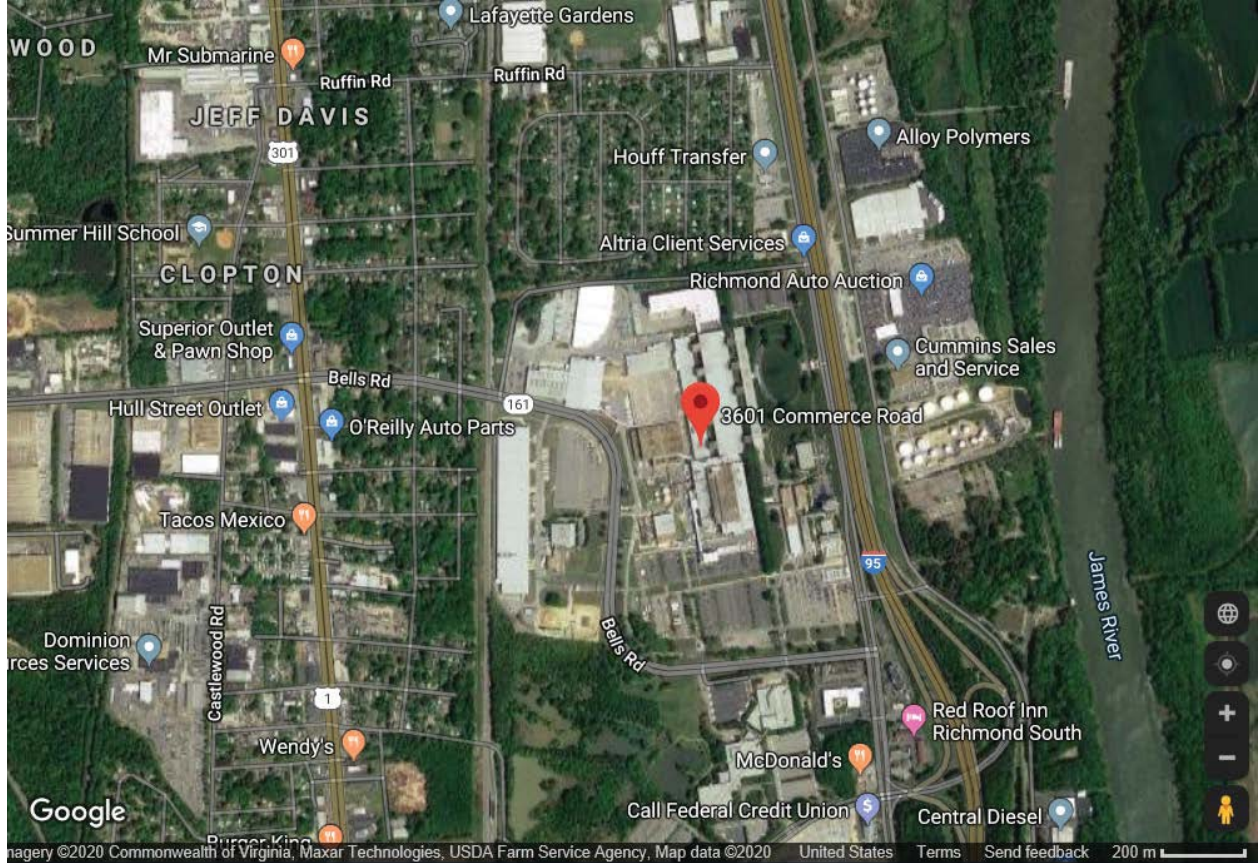
The Agency considered potential impacts to resources in the environment that may be affected by manufacturing the new products and found no significant impacts based on the Agency-gathered information and the following applicant-submitted information:

- The ingredients added to the new products are commonly used in other products currently manufactured at the facility.
- The production of the new products will replace production of other cigarettes currently being manufactured at the same facility.
- The applicant stated that the new and predicate products would not be simultaneously manufactured if the new products receive marketing orders.
- No facility expansion or new construction is expected due to manufacturing the new products.
- No net increase in the facility production is expected due to manufacturing the new products.

##### **5.1 Affected Environment**

The affected environment includes human and natural environments surrounding the manufacturing facility. The new and predicate products are manufactured at 3601 Commerce Road, Richmond, VA (Figure 1).

Figure 1. Location of the Manufacturing Facility



The manufacturing facility is surrounded by a residential development across a road to the north; a two-lane divided road and an interstate freeway (I-95) to the east; two hotels, a fast food restaurant, and a gas station at the southeast corner; undeveloped forested land and a petroleum product pumping station and delivery terminal to the south; and a railroad to the west with a spur into the manufacturing facility.<sup>1</sup>

<sup>1</sup> Google. 2020. Map of 3601 Commerce Road, Richmond, VA 23234. Retrieved from Google Maps: [www.google.com/maps](http://www.google.com/maps). March 19, 2020.

The facility is located in the James River watershed, which occupies the central portion of Virginia and covers 24% of total land area of the state of Virginia.<sup>2,3</sup> Land use within the watershed is 65% forest, 19% agriculture and farming, and 12% urbanized area.<sup>4</sup>

## **5.2 Air Quality**

The Agency does not anticipate that manufacturing the new products would cause the release of any new chemicals or new type of emissions into the environment. The applicant stated that manufacturing the new products is not expected to result in changes in air emissions or require any additional environmental controls for air emissions.

## **5.3 Water Resources**

The Agency does not anticipate that manufacturing the new products would cause the discharge of any new chemicals into water. The new products are intended to replace other tobacco products currently manufactured at the facility. The applicant stated that manufacturing the new products would not require any additional environmental controls for water discharges and, therefore, would not require a revised or new wastewater discharge permit.

## **5.4 Soil, Land Use, and Zoning**

The Agency does not anticipate that manufacturing the new products would lead to changes in soil, land use, or zoning. The applicant stated that there would be no expected facility expansion due to manufacturing the new products. Therefore, there would be no zone change or land conversion of prime farmland, unique farmland, or farmland of statewide importance to non-agricultural use.

## **5.5 Biological Resources**

The Agency does not anticipate that manufacturing the new products would jeopardize the continued existence of any listed species or result in the destruction or adverse modification of the habitat of any such species identified under the Endangered Species Act (ESA). The applicant reviewed the U.S. Fish and Wildlife Service's (U.S. FWS) critical habitat and endangered species maps. According to the maps, three threatened species (two plants, and one northern long-eared bat) and one endangered freshwater mussel species are listed in the city of Richmond and the bordering counties (Henrico and Chesterfield

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<sup>2</sup> A watershed is an area of land where all bodies of water drain to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel. Such bodies of water include the following: surface water from lakes, streams, reservoirs and wetlands; the underlying ground water; and rainfall, See <https://water.usgs.gov/edu/watershed.html> and <http://www.dcr.virginia.gov/soil-and-water/document/wshedguideb2b.pdf>.

<sup>3</sup> Virginia Department of Environmental Quality. Available at: <http://deq.state.va.us/Portals/0/DEQ/Water/SWRP/App%20B%20James%20River%20Basin%20Summary.pdf>. Accessed March 19, 2020.

<sup>4</sup> Ibid.

Counties).<sup>5,6</sup> However, the applicant stated that none of these species are found near the manufacturing facility. The Agency searched the U.S. FWS's maps and verified the accuracy of the listed species.

## 5.6 Regulatory Compliance

The applicant stated that the manufacturing facility complies with the Clean Air Act, the Clean Water Act and the Resource Conservation and Recovery Act. The manufacturing facility is registered for waste generation under EPA ID# VAD000819466. The applicant provided detailed information for the following air emission and wastewater permits:

- (1) Air permits: Title V Air Permit number PRO50076 and a Stationary Source Permit, issued in accordance with applicable U.S. Environmental Protection Agency (EPA) and Virginia Department of Environmental Quality (VA DEQ) regulations.
- (2) Wastewater permit: Industrial User Permit number 2149 from the local publicly owned treatment works (POTW) in the City of Richmond. The permit requires compliance with the relevant effluent limitations (40 CFR 400 – 699) to ensure the wastewater is of a certain quality for effective treatment at the POTW facility. The applicant stated that the facility submits regular discharge monitoring reports to VA DEQ.

The Agency's search of EPA's Enforcement and Compliance History Online (ECHO) database did not reveal any violations of the environmental laws and regulations for the manufacturing facility.<sup>7</sup>

The applicant stated that the facility complies with the ESA and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

## 5.7 Socioeconomics and Environmental Justice

No changes in socioeconomics are anticipated due to manufacturing the new products. The Agency does not anticipate any impacts on employment, revenue, or taxes because the new products are intended to replace similar tobacco products currently manufactured at the facility.

No changes in impacts on environmental justice are anticipated. The applicant stated that the future year projections of cigarette production at the facility, including the new products, are within the existing permitted manufacturing capacity and would not require facility expansion. Also, as discussed, the emissions and discharges from the facility are not expected to change due to manufacturing the new products. Thus, though 2010 U.S. Census and American Community Survey data show that 80% of the population within a three-mile radius of the manufacturing facility is minority,<sup>8</sup> no disproportionate

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<sup>5</sup> U.S. Fish and Wildlife Services (U.S. FWS), available at: <https://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=51087>. Accessed March 19, 2020.

<sup>6</sup> Critical habitat map available at: <https://databasin.org/maps/new#datasets=d579d87eb54f4374a77ea53e7ef66449>. Accessed, March 19, 2020.

<sup>7</sup> EPA ECHO Detailed Facility Report: Philip Morris USA Facility, Richmond, VA. Available at: <https://echo.epa.gov/detailed-facility-report?fid=110000869793>. Accessed March 19, 2020.

<sup>8</sup> See footnote # 7.

impacts to environmental justice populations would occur as a result of manufacturing the new products. In addition, the facility is not located within Native American lands.

### 5.8 Solid Waste and Hazardous Materials

The Agency does not foresee that the introduction of the new products would notably affect the current manufacturing waste generated from the facility production of all combusted, filtered cigarettes. The Agency anticipates the waste generated due to manufacturing the new products would be released to the environment and disposed of in landfills in the same manner as any other waste generated from any other products manufactured in the same facility. The applicant stated that manufacturing the new products would not require any additional environmental controls for solid waste disposal. Therefore, no new or revised waste permit or construction of new waste management facility is expected.

### 5.9 Floodplains, Wetlands, and Coastal Zones

There would be no facility expansion due to manufacturing the new products and the applicant did not propose any land disturbance; therefore, there would be no effects on floodplains, wetlands, or coastal zones.

### 5.10 Cumulative Impacts

The Agency does not anticipate the proposed actions would incrementally increase or change the chemicals released to the air from the facility due to the tobacco manufacturing. A search in the EPA's Toxic Release Inventory (TRI) database showed that in 2018, Philip Morris USA Inc. (PMUSA) manufacturing facility in Richmond, Virginia released 10,313 pounds of nicotine and nicotine salts to air (Table 1).<sup>9</sup> Nicotine and nicotine salts have known adverse developmental effects.<sup>10</sup> The TRI database search did not show that the Philip Morris USA manufacturing facility disposed of, treated, or released into the environment any other reportable toxicants associated with manufacturing tobacco products. In addition, EPA's ECHO database did not show that the facility released the following reportable criteria pollutants: ozone, lead, particulate matter, or sulfur dioxide, at or above the reportable threshold levels to air.

**Table 1 Management of Chemical Waste Associated with Manufacturing Tobacco Products at Philip Morris USA Facility in 2018**

<b>Production-Related Waste Managed or Released</b>	<b>Chemical Mass (Pounds)</b>
Recycled	122,530
Energy Recovery	0
Treated	94,266
<i>Subtotal Waste Managed</i>	<i>216,796</i>

<sup>9</sup> U.S. Environmental Protection Agency (EPA). TRI Data Form R & A Download. Available at: [https://www3.epa.gov/enviro/facts/tri/form\\_ra\\_download.html](https://www3.epa.gov/enviro/facts/tri/form_ra_download.html). Searched on March 19, 2020.

<sup>10</sup> EPA. myRight-to-Know, available at: <https://myrtk.epa.gov/info>. The site allows for searching the industrial facilities that manage toxic waste chemicals by entering the facility address and clicking on the facility location on the map. Accessed March 19, 2020.



Production-Related Waste Managed or Released			Chemical Mass (Pounds)
On-Site Release	Air	Nicotine and Nicotine Salts	10,313
Off-Site Disposal/Release			35,528
<i>Subtotal Waste Released</i>			<i>45,841</i>
<b>Total Production-Related Waste</b>			<b>262,637</b>

The applicant stated that manufacturing the new products would not require any additional environmental controls for air emission, water discharges, or solid waste disposal.

#### 5.11 Impacts of the No-Action Alternative

The environmental impacts of the no-action alternative would not change the existing condition of manufacturing cigarettes at the listed facility, as many similar tobacco products would continue to be manufactured.

### 6. Potential Environmental Impacts of the Proposed Actions and Alternative – Use of the New Products

The Agency evaluated potential impacts to resources in the environment that may be affected by use of the new products and found no significant impacts based on Agency-gathered information and the applicant's submitted information. Included in the information the Agency considered were the projected market volumes for the new products (Confidential Appendix 2) and the documented decline in cigarette use in the United States.

#### 6.1 Affected Environment

The affected environment includes human and natural environments in the United States because the marketing orders would allow for the new tobacco products to be sold to consumers in the United States.

#### 6.2 Air Quality

The Agency does not anticipate new chemicals would be released into the environment as a result of use of the new products, relative to chemicals released into the environment due to use of other cigarettes already on the market, because (1) the combustion products from the new products would be released in the same manner as the combustion products of other marketed cigarettes, (2) the new products are expected to compete with or replace other currently marketed cigarettes and (3) the ingredients in the new products are used in other currently marketed tobacco products.

#### 6.3 Environmental Justice

No new emissions are expected due to use of the new products. Therefore, there would be no new disproportionate impacts on minority or low-income populations.

## 6.4 Cumulative Impacts

The impacts from use of combusted tobacco products include exposure to secondhand smoke (SHS) produced from burned cigarettes. Particles emitted by smoking may remain on surfaces, be re-emitted back into the gas phase, or react with oxidants and other compounds in the environment to yield secondary pollutants, thirdhand smoke (THS). These pollutants coexist in a mixture in the environment alongside SHS (Burton, 2011; Matt et al., 2011).

There is no safe level of exposure to SHS (U.S. Department of Health and Human Services, 2006a and 2006b). Even low levels of SHS can harm children and adults in many ways, including the following:

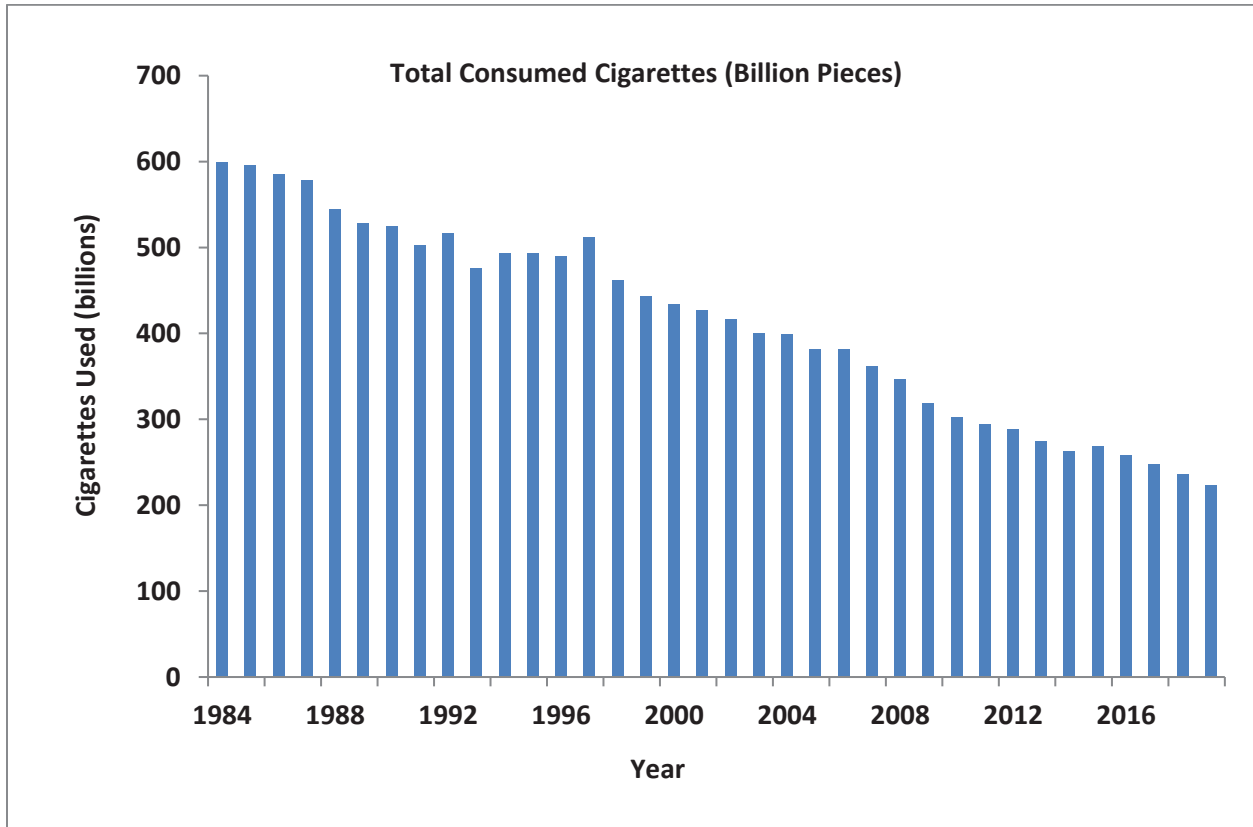
- The U.S. Surgeon General estimates that living with a smoker increases a nonsmoker's chances of developing lung cancer by 20 to 30% (U.S. Department of Health and Human Services, 2014).
- Exposure to SHS increases school children's risk for ear infections, lower respiratory illnesses, more frequent and more severe asthma attacks, and slowed lung growth. Such exposure can cause coughing, wheezing, phlegm, and breathlessness (U.S. Department of Health and Human Services, 2006a and 2006b).
- SHS causes more than 40,000 deaths a year (U.S. Department of Health and Human Services, 2014).

However, use of cigarettes in the United States is declining according to the U.S. Alcohol and Tobacco Tax and Trade Bureau (TTB) Statistical Release reports (Figure 2).<sup>11</sup> This likely is responsible for the decline in SHS exposure observed in several studies that evaluated the levels of SHS exposure in children and nonsmokers living in homes of smokers (Homa et al., 2015; Yao et al., 2016). Despite the considerable ethnic and racial disparities in SHS exposure in vulnerable populations, data from the National Health and Nutrition Examination Survey showed a decline in SHS exposure from 1999-2000 to 2011-2012 with the highest prevalence of exposure among non-Hispanic subpopulations (46.8%), compared to Mexican Americans (23.9%) and non-Hispanic whites (21.8%) in 2011-2012 (Homa et al., 2015). There were also significant declines in SHS exposure prevalence noted in the 2000 and 2010 National Health Interview Survey Cancer Control Supplements. Exposure to SHS declined in Hispanics from 16.3% in 2000 to 3.1% in 2010, non-Hispanic Asians from 13.4% in 2000 to 3% in 2010, and non-Hispanic blacks from 31.2% in 2000 to 11.5% in 2010 as compared to exposures in non-Hispanic whites, which declined from 25.8% in 2000 to 9.7% in 2010 (Yao et al., 2016).

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<sup>11</sup> U.S. Alcohol and Tobacco Tax and Trade Bureau (TTB) statistical data available at: <https://www.ttb.gov/tobacco/tobacco-stats.shtml>. Accessed March 19, 2020.

Figure 2. Use of Cigarettes in the United States, 1984 – 2019



As of March 2019, 28 states and the District of Columbia had implemented comprehensive smoke-free laws (American Lung Association, 2019). Such laws are also expected to reduce the levels of non-users' exposure to SHS and THS.

### 6.5 Impacts of the No-Action Alternative

The environmental impacts of the no-action alternative would not change the existing condition of use of cigarettes, as many similar tobacco products would continue to be used in the United States.

## 7. Potential Environmental Impacts of the Proposed Actions and Alternative – Disposal of the New Products

The Agency considered potential impacts to resources in the environment that may be affected by disposal of the new products. Based on publicly available information such as the documented continuous decline of cigarette use in the United States, and the applicant's submitted information, including market volume projections for the new products, the Agency found no significant impacts.

## **7.1 Affected Environment**

The affected environment includes human and natural environments in the United States because the marketing orders would allow for the new tobacco products to be sold to consumers and be disposed of in the United States.

## **7.2 Air Quality**

The Agency does not anticipate disposal of the new products or the packaging material would lead to the release of new or increased chemicals into the air.

No changes in air quality are anticipated from disposal of the cigarette butts of the new products. The chemicals in the new products' cigarette butts are commonly used in other currently marketed cigarettes. Because the new products are anticipated to compete with or replace other currently marketed cigarettes, the butt waste generated from the new products would replace the same type of waste. Therefore, the fate and effects of any materials emitted into the air from disposal of the new products are anticipated to be the same as any materials from other cigarettes disposed of in the United States.

No changes in air quality from disposal of the new products' package materials would be expected because (1) the paper and plastic components of the packages are more likely to be recycled, or at least a portion of the packaging waste is likely to be recycled, (2) the packaging materials are commonly used in the United States, and (3) the waste generated due to disposal of the new products' packaging is a minuscule portion of the municipal solid waste in the United States (U.S. EPA 2019) per FDA's experience in evaluating the packaging waste generated from cigarettes.

## **7.3 Water Resources**

No changes in impacts on water resources are expected due to disposal of the cigarette butts from the new products because the chemicals in the new products are the same or similar to chemicals in the currently marketed cigarettes. The new products would replace similar products currently on the market.

## **7.4 Biological Resources**

The proposed actions are not expected to change the continued existence of any endangered species, or result in the destruction or adverse modification of the habitat of any such species, as prohibited under the U.S. ESA. Although disposal of smoldering cigarettes has been implicated in many fire incidents,<sup>12, 13</sup> the disposal of the new products is not expected to change the fire frequency because (1) the disposal of the new products would be similar to the disposal of cigarettes that are currently marketed in the United States, and (2) there would be no anticipated increase in number of cigarettes being disposed of as the new products are anticipated to replace similar marketed cigarettes.

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<sup>12</sup> National Fire Protection Association. The smoking-material fire problem. Available at: <https://www.nfpa.org/News-and-Research/Fire-statistics-and-reports/Fire-statistics/Fire-causes/Smoking-Materials>. Accessed August 16, 2018.

<sup>13</sup> UC Davis Health News. Available at: <https://www.ucdmc.ucdavis.edu/publish/news/newsroom/2763>. Accessed August 16, 2018.

## **7.5 Solid Waste**

The Agency does not foresee the introduction of the new products would noticeably affect the current cigarette butt waste generated from all combusted, filtered cigarettes. The waste generated due to disposal of the new products would be handled in the same manner as any other waste generated from any other combusted, filtered cigarettes marketed in the United States. The number of cigarette butts generated would be equivalent to the market projections (Confidential Appendix 2) and a portion of those would be littered.

## **7.6 Socioeconomics and Environmental Justice**

The Agency does not anticipate changes in impacts on socioeconomic conditions or environmental justice from disposal of the new products. The waste generated due to disposal of the new products is expected to be handled in the same manner as the waste generated from other cigarettes in the United States. No new emissions are expected due to disposal of the new products; therefore, there would be no new disproportionate impacts on minority or low-income populations.

## **7.7 Cumulative Impacts**

A major existing environmental consequence of the use of the new products as well as other conventional cigarettes is littering of discarded cigarette filters or butts, which can persist in the environment (Novotny and Zhao, 1999). Cigarette butts are among the most common forms of litter found on beaches (Claereboudt, 2004; Smith et al., 1997), near streams, night clubs (Becherucci and Pon, 2014), bus stops (Wilson et al., 2014), roads, and streets (Healton et al., 2011; Patel et al., 2013). Cigarette butts have been found at densities averaging more than four cigarette butts per meter squared of urban environments (Seco Pon and Becherucci, 2012).

Compounds in cigarette butts can leach out into water, potentially threatening human health and the environment, especially marine ecosystems (Kadir and Sarani, 2015). The environmental toxicity of cigarette butts due to air emissions is not well studied. The chemicals in cigarette butts can be the original chemicals in the unsmoked cigarettes or the pyrolysis and distillation products deposited in the cigarette butts. Airborne emissions from cigarette butts after disposal depend on the environmental conditions and the chemicals in the butts. These emissions can be influenced by several factors, such as the cigarette brand, cigarette length, filter material, types of tobacco, ingredients in the cigarette and tobacco fillers, number of puffs, and the mass transfer behavior of combustion products along the cigarette.<sup>14</sup>

However, the cumulative impacts from cigarette butts are declining because the use of cigarettes in the United States is declining.

## **7.8 Impacts of the No-Action Alternative**

The environmental impacts of the no-action alternative would not change the existing condition of disposal of cigarettes and cigarette packaging, as many other similar tobacco products would continue to be disposed of in the United States.

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<sup>14</sup> NIST Technical Report 8147 available at: <http://dx.doi.org/10.6028/NIST.IR.8147>. Accessed March 19, 2020.

## 8. List of Preparers

The following individuals were primarily responsible for preparing and reviewing this programmatic environmental assessment (PEA):

### **Preparer:**

Shannon K. Hanna, Ph.D., Center for Tobacco Products  
Education: Ph.D. in Environmental Science and Management  
Experience: Four years in environmental science, three years in toxicology  
Expertise: Ecotoxicology of new substances and materials, bioaccumulation of chemicals including heavy metals, soil/sediment and water quality

### **Reviewer:**

Gregory G. Gagliano, M.S., Center for Tobacco Products  
Education: M.S. in Environmental Science  
Experience: Thirty-seven years in environmental compliance and analysis  
Expertise: Environmental toxicology, risk assessment, regulatory compliance, NEPA analysis

## 9. A Listing of Agencies and Persons Consulted

Not applicable.

## 10. References

American Lung Association. 2019. Smokefree Air Laws. [www.lung.org/our-initiatives/tobacco/smokefree-environments/smokefree-air-laws.html](http://www.lung.org/our-initiatives/tobacco/smokefree-environments/smokefree-air-laws.html) (updated March 8, 2019). Accessed March 19, 2020.

Burton B. Does the smoke ever really clear? Thirdhand smoke exposure raises new concerns. *Enviro Health Perspectives*. 2011;119(2):A70-A74.

Becherucci ME, Pon JPS. What is left behind when the lights go off? Comparing the abundance and composition of litter in urban areas with different intensity of nightlife use in Mar del Plata, Argentina. *Waste Management*. 2014;34(8):1351-1355.

Claereboudt MR. Shore litter along sandy beaches of the Gulf of Oman. *Marine Pollution Bulletin*. 2004;49(9-10):770-777.

Healton CG., Cummings KM, O'Connor RJ, Novotny TE. Butt really? The environmental impact of cigarettes. *Tobacco Control*. 2011;20(suppl. 1): i1.

Homa DM, Neff LJ, King BA, Caraballo RS, Bunnell RE, Babb SD, Garrett BE, Sosnoff CS, Wang L. Vital signs: Disparities in nonsmokers' exposure to secondhand smoke — United States, 1999–2012. *MMWR Morb Mortal Wkly Rep*. 2015;64(4), 103-108.

Kadir AA, Sarani NA. Cigarette butts pollution and environmental impact – A review. *Appl Mechanics and Materials*. 2015;773-774:1106-1110.

Matt GE, Quintana PJE, Destailats H, Gundel LA, Sleiman M, Singer BC, Jacob P, Benowitz N, Winickoff JP, Rehan V, Talbot P, Schick SF, Samet J, Wang Y, Hang B, Martins-Green M, Pankow JF, Hovell ME. Thirdhand tobacco smoke: emerging evidence and arguments for a multidisciplinary research agenda. *Enviro Health Perspectives*. 2011;119(9):1218-1226.

Novotny TE, Zhao, F. Consumption and production waste: Another externality of tobacco use. *Tobacco Control*. 1999;8(1):75-80.

Patel V, Thomson GW, Wilson, N. Cigarette butt littering in city streets: A new methodology for studying and results. *Tobacco Control*. 2013;22(1):59-62.

Seco Pon JP, Becherucci ME. Spatial and temporal variations of urban litter in Mar del Plata, the major coastal city of Argentina. *Waste Management*. 2102;32(2):343-348.

Smith CJ, Livingston SD, Doolittle DJ. An international literature survey of "IARC Group 1 carcinogens" reported in mainstream cigarette smoke. *Food and Chem Toxicol*. 1997;35(10-11):1107-1130.

U.S. Department of Health and Human Services. 2014. The Health Consequences of Smoking—50 Years of Progress. *A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 2014. Printed with corrections, January, 2014.

U.S. Department of Health and Human Services. 2006a. The Health Consequences of Involuntary Exposure to Tobacco Smoke. *A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 2006.

U.S. Department of Health and Human Services. 2006b. The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General: What it Means to You. *Consumer Booklet*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 2006.

U.S. Environmental Protection Agency. 2018. *Advancing Sustainable Materials Management: 2015 Fact Sheet*. Washington, DC: U.S. Environmental Protection Agency, Office of Land and Emergency Management. July 2018.

Wilson N, Oliver J, Thomson G. Smoking close to others and butt littering at stops: Pilot observational study. *PeerJ*. 2014;2:e272.

Yao T, Sun HY, Wang Y, Lightwood J, Max W. Sociodemographic differences among U.S. children and adults exposed to secondhand smoke at home: National Health Interview Surveys 2000 and 2010. *Public Health Reports*. 2016;131:357-366.

**CONFIDENTIAL APPENDIX 1**

**Comparison of the New Products to the Corresponding Predicate Products**

STN	Component	Change from Predicate Product
SE0015500	Cigarette seam adhesive	Same total amount of cigarette seam adhesive but different composition in the new product
SE0015501 SE0015502	Filter seam adhesive	Same total amount of filter seam adhesive but different composition in the new product
SE0015503	Tipping adhesive	Same total amount of tipping adhesive but the new product contains (b) (4) which was not in the predicate product



**CONFIDENTIAL APPENDIX 2**

**First- and Fifth-Year Market Volume Projections for the New Products and Percentage of Cigarette Use in the United States Projected to be Attributed to the New Products**

First- and fifth-year market volume projections for the new products were compared to the total forecasted use of cigarettes in the United States.<sup>15</sup> The projected use of the new products in the first and fifth years of marketing account for about (b) (4) of the forecasted cigarette use in the United States, respectively. In addition, the applicant stated that the new and predicate products would not be simultaneously manufactured if the new products receive marketing orders.

STN	Projected Market Volume			
	First-Year		Fifth-Year	
	New Product (# of Cigarettes)	New Product as a Percent of Total Cigarettes Used <sup>16</sup>	New Product (# of Cigarettes)	New Product as a Percent of Total Cigarettes Used <sup>17</sup>
SE0015500	(b) (4)			
SE0015501				
SE0015502				
SE0015503				
<b>Total</b>				

<sup>15</sup> The Agency used historical data regarding total use of cigarettes from 2002 to 2019 to mathematically estimate the total number of cigarettes used in the United States. Using the best-fit trend line with an R<sup>2</sup> value of 0.9743, the forecasted number of cigarettes that would be used in the United States is estimated at 203.85 billion cigarettes in the first year and 157.40 billion cigarettes in the fifth year of marketing the new products.

<sup>16</sup> Projected Market Occupation of the New Product in the United States (%) =  $\frac{\text{Projected Market Volume of the New Products (cigarette pieces)}}{\text{Projected Use of Cigarettes in United States (cigarette pieces)}} \times 100$

<sup>17</sup> Ibid.