PURCHASING RECOMMENDATIONS FOR SUSTAINABLE FOOD SERVICE WARE

Developed by the Sustainable Purchasing Leadership Council (SPLC) Action Team on Sustainable Food Service Ware, a partnership with the Center for Environmental Health (CEH) and the Charting a Path to Solutions to PFAS Group[1].

This document is the first formal output of an SPLC Action Team (see Appendix B for information on Action Teams), a dedicated team that has discussed, debated, and produced a document that identifies the issues around single-use food service ware and proposes strategies for addressing those issues to reduce environmental and human health risks. We invite you to read and put their work to use in your own procurement processes, and to offer additional insights and experiences to sharpen and improve the guidance over time.

Sarah O'Brien, SPLC, Director of Programs

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[1] Charting a Path to Solutions to PFAS in Food Packaging is an informal, multi-stakeholder group. The purpose of "Charting a Path" is to provide a platform for multi-stakeholder discussions and information sharing across businesses, governments, and NGOs on solutions to PFAS in food service ware and packaging applications. Interested in joining the group? Please reach out to Sue Chiang (*sue@ceh.org*).

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1. GETTING STARTED

Ready to take action on eliminating toxic chemicals from single-use food service ware (FSW)? This procurement toolkit is designed to help select safer FSW in institutional settings. While this toolkit focuses specifically on avoiding a class of chemicals known as per- and poly- fluoroalkyl substances (PFAS), it also touches on other life cycle impacts associated with single-use FSW.

PFAS is often added to disposable FSW (such as molded fiber products, paper food liners, and popcorn bags) to enhance the grease and water resistance of the products. However, over the past two decades, PFAS has come under increasing scrutiny from toxicologists, ecologists, and regulators given their extraordinary persistence and connection to serious potential health effects including affecting growth, learning, and behavior of infants and older children, lowering a woman's chance of getting pregnant, interfering with the body's natural hormones, increasing cholesterol levels, affecting the immune system, and increasing the risk of cancer.[2]

PFAS are often referred to as "forever chemicals" because they are extraordinarily persistent in the environment and cannot be broken down by natural systems.

IMPORTANT POINTS

REUSABLES ARE BEST

When selecting FSW, consider reusable products first. Choosing reusables eliminates many of the concerns associated with single-use FSW, such as exposure to certain chemicals of concern (including PFAS and styrene), increased waste production, and questions regarding recyclability or compostability. While reusables are not currently an option for all settings, it's important to prioritize reusables and look for ways to eliminate single-use products wherever possible.

Not all reusables are created equal and each material type will have different life cycle impacts. However, life cycle studies indicate that reusable products are typically the best choice from an environmental perspective.

COMMERCIAL VS. BACKYARD COMPOSTING

This toolkit includes many references to products being "certified compostable in commercial compost facilities." The toolkit does not cover recommendations for products suitable for backyard compost settings. In addition, not all commercial compost facilities accept FSW. Consult with your local composting facility, refuse hauler, or city's Department of Public Works to determine their compostable FSW acceptance requirements, and use that information to guide your purchasing strategy.

MARKET TRANSFORMATION

Users of this toolkit may find that options for sustainable single-use FSW are limited. It's important to note that the sustainable single-use FSW market is anticipated to undergo significant change over

[2] Agency for Toxic Substances and Disease Registry, August 2017, *https://www.atsdr.cdc.gov/pfas/docs/pfas_fact_sheet.pdf*

time, most notably since the *Biodegradable Products Institute* (BPI) began implementing low-fluorine requirements for certified compostable products on January 1, 2020; and also with similar restrictions expected to be implemented by the *Compost Manufacturing Alliance* (CMA) for their "composter approved" list of products by January 1, 2021. In addition, regularly communicating your preferences to your suppliers can also accelerate market transformation.

TESTING FOR PFAS

Due to the large number of compounds within the PFAS class and the testing and cost limitations associated with screening for individual compounds, researchers have been testing for total fluorine content as a proxy for potential PFAS in FSW. Based on test results from hundreds of FSW products, those identified as likely treated with PFAS had significantly higher (on average 10-fold higher) levels of fluorine in paper and other fiber-based FSW than those identified as low fluorine.

2. TAKE ACTION

SPECIAL SETTINGS (E.G. CORRECTIONS, SCHOOLS, HOSPITALS) AND CONSIDERATIONS

Certain settings, such as correctional facilities, schools, or hospitals may have unique needs and requirements for FSW. Examples of these unique needs and possible ways to address them are discussed below.

LARGE POPULATIONS

Facilities that serve crowds of people need access to large quantities of FSW, so cost per item is typically an important consideration. If a dishwasher is available, reusables are the most cost-effective option available. Although the facility will need to purchase a large volume of reusable FSW, this purchase will need to be made less frequently than single-use FSW.

QUICK TURNOVER

Settings that require quick turnover face similar challenges to settings serving large populations - they need access to large quantities of FSW. As with large populations, reusables are the most cost-effective option if the facility has dishwasher access.

LACK OF DISHWASHERS

Without access to dishwashing, reusables are not as likely to be a feasible option but should still be investigated. Also, new business services and innovative models for providing reusables are being piloted and launched at an increasing rate. If no other options surface, then the facility should consider the most sustainable and cost-effective disposable options.

REDUCE FIRST

Reusables may not be possible, but you can still find ways to reduce the number of disposables you purchase. Prioritize bulk items and avoid single-use disposable condiments. Consider if you really need that portion cup or the container lid. Only offer single-use food service accessories such as beverage stirrers and straws upon request. By critically evaluating your purchases, you may identify several waste prevention opportunities, which could also save money. If your state and local laws allow customers to bring in their own mugs and/or food containers, consider providing incentives such as a discounted price.

UNDERSTAND YOUR DISPOSAL OPTIONS

It is important to assess the waste management options available in your community, such as landfilling, incineration, composting or recycling. It may not make sense to purchase all compostable FSW if your community does not have access to commercial composting. Not only is compostable FSW typically more expensive, it can generate methane, a potent greenhouse gas, when sent to landfills rather than to a commercial composting facility.

EVALUATE PERFORMANCE NEEDS

Prices for FSW can vary greatly depending on the material type, durability, grease-resistance, etc. To make the most cost-effective purchase, you should buy the right product for the intended use. For instance, a plate used for continental breakfast service that does not include any wet items may not need to be grease-proof. If unsure about performance, the buyer should request samples of the items to conduct a performance test before making a large purchase.

SAFETY

In certain settings, safety of FSW is a primary concern. Food service ware must not splinter or have the ability to be turned into a sharp tool (especially if intended for use in a correctional facility).

PROMOTING SUSTAINABLE FSW

When implementing a significant change to the requirements for FSW, it will be important to clearly communicate the rationale and new approach. Use the statements below when developing emails, newsletter articles, and presentations regarding the changes. Feel free to tailor the language to meet your organization's needs.

WHAT'S THE PROBLEM WITH PFAS?

Per- and poly-fluoroalkyl substances (PFAS) are often added to disposable FSW to enhance the grease and water resistance of the products. However, over the past two decades, PFAS has come under increasing scrutiny from toxicologists, ecologists, and regulators given their extraordinary persistence and connection to serious potential health effects including affecting growth, learning, and behavior of infants and older children, lowering a woman's chance of getting pregnant, interfering with the body's natural hormones, increasing cholesterol levels, affecting the immune system, and increasing the risk of cancer (Reference: Agency for Toxic Substances and Disease Registry, August 2017, *https://www.atsdr.cdc.gov/pfas/docs/pfas_fact_sheet.pdf*).

CHOOSE REUSABLES WHENEVER POSSIBLE

If you have access to dishwashing or can incorporate adding dishwashing capacity into your long-term planning, choose reusables.

Reusable FSW is the best option from an environmental and human health perspective. Opting for reusables over single-use products reduces waste, greenhouse gas emissions, and cost. In addition, reusables are rarely treated with PFAS or other grease resistant chemicals. Looking for a real-life example of how making the switch from single-use to reusable FSW can benefit your organization? Read about how a *Minnesota middle school transitioned to the use of reusable utensils* and a *California school district that transitioned to reusable FSW in all 12 of their elementary schools*, saving money and reducing their environmental impacts.

APPROACH MOLDED-FIBER AND OTHER FIBER-BASED PRODUCTS WITH CAUTION

Recent testing by the Center for Environmental Health, Responsible Purchasing Network (RPN), and other organizations demonstrated that products made of the following materials consistently tested as highly fluorinated: all molded fiber products such as wheat fiber (wheat straw or wheat stalk), "blend of plant fibers", silver grass (Miscanthus), and sugarcane waste (bagasse) including molded recycled paper and PLA-lined molded sugarcane (bagasse). To impart grease resistance to molded fiber products, PFAS is mixed in with the fibers and is not a coating or lining.

Based on the results of the CEH study, purchasers should avoid molded fiber products at this time unless they are certified by BPI or listed in CEH's database as PFAS-free (Reference: *"Avoiding Hidden Hazards: A Purchaser's Guide to Safer Foodware"*). As of January 1, 2020, all PFAS-containing molded fiber products have been delisted by BPI because the new standard prohibits products containing more than 100 ppm fluorine. The new standard also requires a statement from the manufacturer confirming that PFAS was not intentionally added to the product. Some new PFAS-

free molded fiber products have already been added to the BPI list. Before purchasing, check *BPI's list* to ensure that the product is certified to the current standard.

AVOID POLYSTYRENE

Although polystyrene (rigid #6 containers and expanded polystyrene foam (EPS)) FSW products are often the lowest-priced option, they are not a recommended alternative due to the many environmental and *human health concerns* associated with the life cycle of polystyrene products. Styrene (used to manufacture polystyrene FSW) is reasonably anticipated to be a human carcinogen and can be transferred to food via FSW. Polystyrene is not typically accepted in community recycling programs and, since it is extremely slow to degrade, it can enter aquatic environments, remain for many years, and be mistaken for food. (Reference: *"Avoiding Hidden Hazards: A Purchaser's Guide to Safer Foodware."*)

ALTERNATIVE STRATEGIES

When proposing a new requirement for FSW that may significantly impact the eligible product selection, it may help to align with existing priorities or initiatives. Consider your organization's efforts related to the following and incorporate requirements for fluorine-free FSW into the existing effort.

- Promotion of reusable FSW
- Reduction of disposable FSW
- Waste reduction
- Prevention of litter
- Toxics reduction

REAL-WORLD EXAMPLES

THE CITY OF BERKELEY

The City of Berkeley incorporated a prohibition on intentionally-added fluorinated chemicals (defined as PFAS) in disposable FSW in their recent *Disposable-Free Dining ordinance*. By including the fluorine prohibition into a more comprehensive effort to reduce the use of disposable FSW, the City demonstrated its commitment to FSW that is safer for people and the environment.

THE CITY OF SAN FRANCISCO

The City of San Francisco took a similar approach to address the issues of single-use FSW, toxics, and litter reduction. Through an *ordinance* developed to address the multiple issues related to disposable FSW, the City was able to prohibit FSW that contains fluorinated chemicals.

3. SPECIFICATIONS

Organizational and regional differences in solid waste infrastructure may impact how an organization writes their specifications. While the toolkit offers examples from New York State and San Francisco as guidance for developing specifications as a template, be aware that the hierarchy of these products within your organization may have differences based on regional markets.

Reuse should always be the first choice and polystyrene should be avoided.

When reusable products are not practicable or available, "PFAS-free" products should be specified, with recyclable or compostable FSW also being options, in conjunction with implementing steps to reduce the number of single-use products overall and move towards reusables in the long-term.

The specific product hierarchy should be created based on conversations with local compost or recycling facilities, refuse haulers, and/or public-works departments to determine whether and/or which FSW products they will accept and process for recycling or composting.

If considering PFAS-free products, avoid regrettable substitutions by inquiring about what other chemicals the product may contain, especially if the product claims to have a grease-resistant barrier. Chemicals that have received a score of Benchmark 4 by *GreenScreen for Safer Chemicals®* provide a safer alternative and those with a score of Benchmark 1 should be avoided.

PFAS-free products may perform differently than PFAS-containing products; therefore, consider requiring vendors to provide samples for product testing to ensure performance needs are met.

STATE OF NEW YORK

The State of New York's *Food Service Containers and Wrappers Specifications* were developed to assist state agencies in developing their own specifications for environmentally preferable FSW. The specification can be used as a model for authoring your organization's specifications.

In New York's specification, the term PFC (perfluorinated chemical) is used. This term was previously used to reference this class of chemicals; however PFAS is recognized as the all-encompassing term for the larger class of chemicals (see *US EPA explanation* for more detail) and should be used in future specifications.

THE CITY OF SAN FRANCISCO

San Francisco's Criteria for FSW are more narrowly scoped, providing information that could be used in a bid solicitation.

STATE OF CONNECTICUT

As of the date of this publication, the State of Connecticut was in the process of negotiating a new contract for FSW. They issued a *Request for Proposals for Food Service Supplies* that restricts PFAS from all products on the contract. The State contract also aims to offer a "green products list" of certified compostable, recyclable, and recycled-content FSW items and restricts products containing polystyrene and polyvinyl chloride (PVC) as well as PFAS. See the Description of Goods and

Services on pages 8-9 of the Request for Proposals for sample language you can modify for use in your own contract development process. Exhibit B includes a list of compliant products.

4. SELECTING SUSTAINABLE FSW

COST IMPACTS

Grease-resistant products treated with PFAS are sometimes cheaper than other grease-resistant products such as polylactic acid (PLA)-lined paper products, palm leaf, bamboo, and 100% PLA products. To avoid additional, unnecessary cost, consider whether grease resistance is essential for the intended product use when purchasing. For example, untreated and uncoated (non-molded) paper products do not provide grease resistance but may be competitively priced and appropriate for serving foods that are not wet or greasy. Table 1 shows the average price/unit for compostable FSW by material type, reflecting June and July 2019 product retail prices.

TABLE 1: AVERAGE PRICING FOR COMPOSTABLE FSW

Material Type	8-9" Plate	12oz Bowl (Hot/ Cold)	12oz Bowl (Cold)	8-9" Clamshell (Hot/Cold)	8-9" Clamshell (Cold)	10-11" Food Tray	6-8" Food Boat	Straws
Bamboo	$0.84	$1.25	N/A	N/A	N/A	$1.52	$0.42	N/A
Palm Leaf	$0.53	$0.91	N/A	N/A	N/A	$0.81	$0.58	N/A
PLA (Ingeo™)	N/A	N/A	$0.19	N/A	$0.39	N/A	N/A	$0.04
Paper/paperboard (PLA-lined)	N/A	$0.17	N/A	$0.24	N/A	N/A	$0.04	N/A
Paper/paperboard (clay-coated)	$0.07	$0.11	N/A	N/A	N/A	N/A	$0.14	N/A
Paper (unknown coatings)	$0.07	$0.08	N/A	N/A	N/A	N/A	N/A	N/A
Paper (untreated/uncoated)	$0.03	$0.06	N/A	N/A	N/A	N/A	$0.03	$0.02
Polypropylene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0.01
CAUTION† All Molded Fibers*	$0.15	$0.11	N/A	$0.42	N/A	$0.25	N/A	N/A
AVOID× Polystyrene foam (Styrofoam)	$0.04	$0.03	N/A	$0.10	N/A	$0.17	N/A	N/A

† Molded fiber FSW is often treated with PFAS. However, with alternative products starting to come on the market, purchasers are advised to proceed with caution when purchasing molded fiber FSW. Check that products are certified by BPI or listed in CEH's database, which confirms that they are "PFAS-free".

* Molded fibers include wheat straw/wheat stalk, silver grass (Miscanthus), sugarcane waste (bagasse), recycled paper, blend of plant fibers.

× Polystyrene products are associated with negative environmental and human health impacts and should be avoided.

There is currently a wide variety of certified compostable products available in the marketplace. We recommend finding BPI-certified FSW now or CMA-certified compostable products starting in 2021 (refer to the Tools & Resources section for more information on relevant certifications). If a product your organization is interested in is not yet certified, be aware that certification may add time and cost. For example, the Biodegradable Products Institute (BPI) offers third-party analysis of products using independent labs and an accredited technical reviewer to measure fluorine content and determine whether materials and products meet the ASTM standards for compostability. BPI certification costs about $4,500, not including lab testing. Nevertheless, purchasing BPI- and other third party-certified FSW products can save your organization time, ensure that FSW products do not contain PFAS or other chemicals of concern, and are more likely to be accepted by local composting facilities.

GENERAL FSW PERFORMANCE CHARACTERISTICS

The intent of Table 2 (below) is to encourage purchasers to consider the level of performance needed for the expected use/situation of FSW and to choose the least "heavy duty" options first. For example, in a break room serving mostly light/dry snacks, an uncoated paper plate may be adequate instead of a water-/grease-proof plate. This table contains examples of only a few alternate materials to consider for each product type and food service application; it is not meant to serve as a comprehensive list of alternative FSW without PFAS.

SAMPLING OF PRODUCTS

This table does not represent all possible options on the market. It is meant to provide a framework for considering the performance needs of your products and examples of materials that might be available from your suppliers. Through testing that has been done on a limited sampling of products for total fluorine content (as an indicator for the likely use of PFAS), the following options have generally been shown not to contain PFAS.

PERFORMANCE CRITERIA

The following are broad categorizations for the performance criteria of whether a product can handle hot/cold, or dry/wet or greasy foods when serving food to an average user. These terms do not imply compliance with specific industry standards for products that can handle extreme temperatures (such as oven- or microwave-safe, freezer-safe) or several hours holding hot, greasy food. Example products were selected for each container and material type (e.g., a PLA bowl or an uncoated paper plate) to demonstrate the various uses and performance characteristics that are generally being marketed/claimed by manufacturers.

END OF LIFE (EOL) CONSIDERATIONS

- Different material types are generally categorized in the table below as "compostable" if at least two representative products of that material type were certified as compostable.
- Plastic types are listed as "recyclable" if the plastic is generally considered "recyclable". However, this doesn't guarantee that a recycling facility that accepts this type of plastic will also accept FSW - particularly because of food contamination concerns. At this time, most FSW is unlikely to be recycled as there are limited markets for these products once they have been used.
- Purchasers should contact their local Public Works Department, refuse hauler and/or composting or recycling facilities to confirm whether the specific products will not just be accepted but actually processed for recycling or composting. Material types listed as “other” are typically not recyclable or compostable and would be sent to less desirable disposal options (e.g. landfill or incineration).

AVOID POLYSTYRENE

Polystyrene, (rigid #6 containers and expanded polystyrene foam (EPS)), as mentioned in Section 1, is not a recommended alternative due to many negative environmental and *human health concerns*. Styrene (used to manufacture polystyrene FSW) is reasonably anticipated to be a human carcinogen. Styrene can be transferred to food via FSW. Polystyrene is not typically accepted in community recycling programs and, since it is slow to degrade, it can enter aquatic environments and be mistaken for food.

TABLE 2: EXAMPLE FSW MATERIALS BY CONTAINER TYPE (PFAS- AND POLYSTYRENE-FREE)

Container Type	Compostable	Recyclable	Other
Bowl for cold, dry food	BPI-certified molded fiber, Polylactic acid (PLA), PLA-lined paperboard, PLA foam, bamboo, palm leaf	Polypropylene (PP), Polyethylene terephthalate (PET)	Plastic-coated paperboard
Bowl for cold, wet/greasy food	BPI-certified molded fiber, PLA, PLA-lined paperboard, PLA foam, bamboo, palm leaf	PP, PET	Plastic-coated paperboard
Bowl for hot, dry food	BPI-certified molded fiber, PLA-lined paperboard, palm leaf, bamboo	PP	Plastic-coated paperboard
Bowl for hot, wet/greasy food	BPI-certified molded fiber, PLA-lined paperboard, palm leaf, bamboo	PP	Plastic-coated paperboard
Plate for cold, dry food	Uncoated paper, BPI-certified molded fiber, PLA foam, bamboo, palm leaf	PP	Plastic-coated paper
Plate for cold, wet/greasy food	BPI-certified molded fiber, PLA foam, bamboo, palm leaf	PP	Plastic-coated paper
Plate for hot, dry food	BPI-certified molded fiber, bamboo, palm leaf,	PP	Plastic-coated paper
Plate for hot, wet/greasy food	BPI-certified molded fiber, bamboo, palm leaf	PP	Plastic-coated paper
Multi-compartment food tray for cold, dry food	BPI-certified molded fiber, PLA foam, palm leaf,		
Multi-compartment food tray for cold, wet/greasy food	BPI-certified molded fiber, PLA foam, palm leaf,		
Multi-compartment food tray for hot, dry food	BPI-certified molded fiber, PLA foam, palm leaf,		
Multi-compartment food tray for hot, wet/greasy food	BPI-certified molded fiber, PLA foam, palm leaf,		
Beverage cups for cold, wet/greasy drinks	PLA, PLA-lined paperboard, waxed paper	PP, PET	Plastic-coated paperboard
Beverage cups for hot, wet/greasy drinks	PLA-lined paperboard	PP	Plastic-coated paperboard
Portion cups for cold, dry foods	BPI-Certified molded fiber, PLA, uncoated paper, waxed paper, bamboo	PP, PET	Plastic-coated paper
Portion cups for cold, wet/greasy foods	BPI-certified molded fiber, PLA, waxed paper	PP, PET	Plastic-coated paper

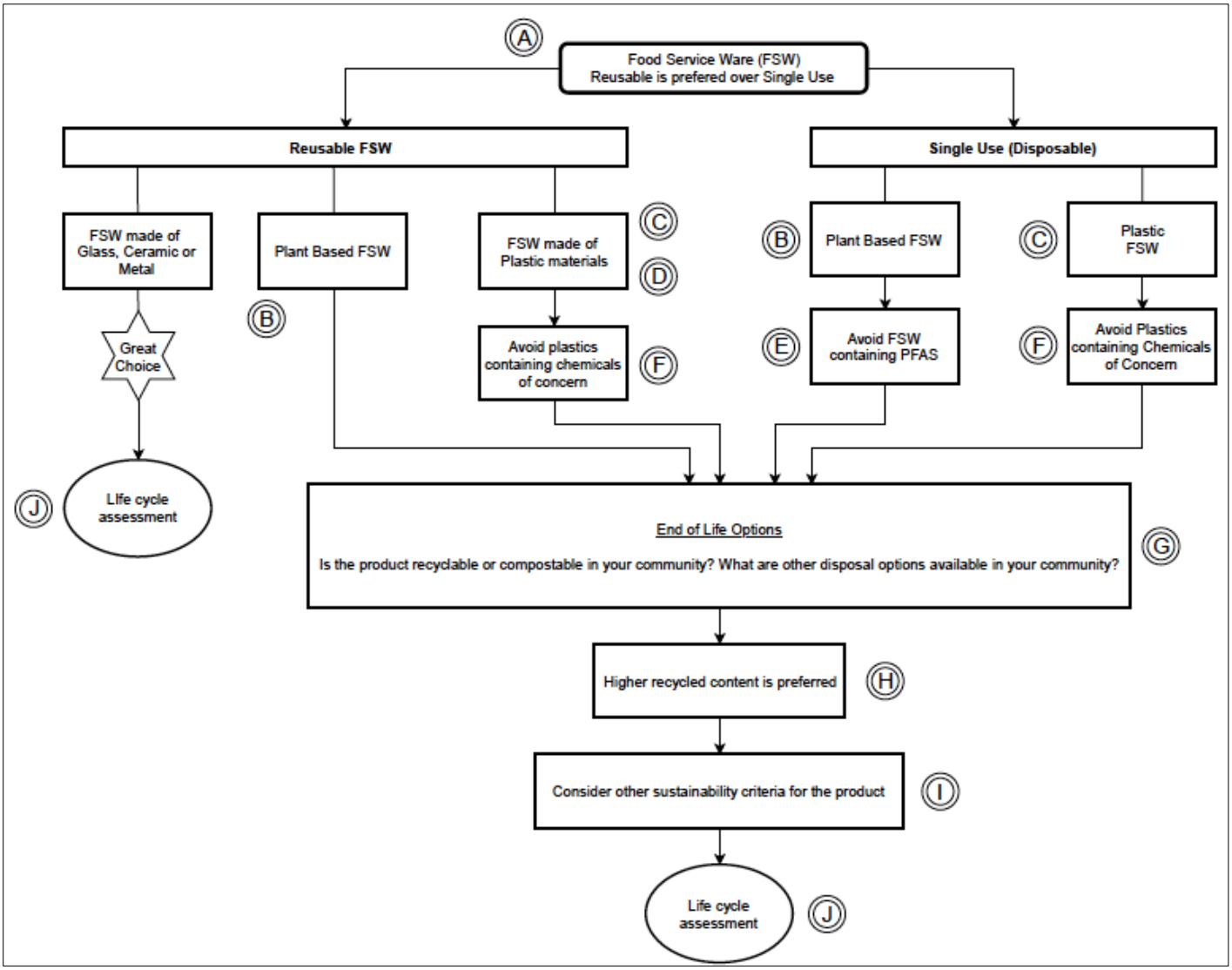
Container Type	Compostable	Recyclable	Other
Portion cups for hot, dry foods	BPI-certified molded fiber, palm leaf, waxed paper	PP, PET	Plastic-coated paper
Portion cups for hot, wet/greasy foods	BPI-certified molded fiber, palm leaf	PP, PET	Plastic-coated paper
Lids for cold, dry foods	PLA	PP, PET	
Lids for cold, wet/greasy foods	PLA	PP, PET	
Lids for hot, dry foods	PLA, PLA-lined paperboard	PP	
Lids for hot, wet/greasy foods	CPLA, PLA-lined paperboard	PP	
Clamshells for cold, dry foods	BPI-certified molded fiber, PLA, PLA foam	PP, PET	
Clamshells for cold, wet/greasy foods	BPI-certified molded fiber, PLA, PLA foam	PP, PET	
Clamshells for hot, dry foods	BPI-certified molded fiber	PP	
Clamshells for hot, wet/greasy foods	BPI-certified molded fiber	PP	
Folded boxes & take out containers for cold, dry foods	PLA, PLA-lined paperboard, waxed paperboard	Aluminum, PP, PET	Plastic-coated paperboard
Folded boxes & take out containers for cold, wet/greasy foods	PLA, PLA-lined paperboard, waxed paperboard	Aluminum, PP, PET	Plastic-coated paperboard
Folded boxes & take out containers for hot, dry foods	PLA-lined paperboard, waxed paperboard	Aluminum, PP	Plastic-coated paperboard
Folded boxes & take out containers for hot, wet/greasy foods	PLA-lined paperboard, waxed paperboard	Aluminum, PP	Plastic-coated paperboard
Soup containers for cold, dry foods	PLA-lined paperboard	PP	Plastic-coated paperboard
Soup containers for cold, wet/greasy foods	PLA-lined paperboard	PP	Plastic-coated paperboard
Soup containers for hot, dry foods	PLA-lined paperboard	PP	Plastic-coated paperboard
Soup containers for hot, wet/greasy foods	PLA-lined paperboard	PP	Plastic-coated paperboard

FOOD SERVICE WARE SELECTION GUIDE

The Food Service Ware Selection Guide (Figure 1) supports purchasers in making decisions that minimize the adverse impacts of FSW. This “decision tree” focuses on avoiding chemicals of concern, but also includes additional sustainability criteria related to the various life cycle stages of the products. Purchasers are encouraged to apply a life cycle approach when making purchasing decisions, since products may have adverse environmental, social, and economic impacts throughout their life cycles.

Image 1 shows the steps toward making more informed decisions for FSW procurement. Many of the decision points are further explained in the accompanying legend. These explanations are noted by letters in the tree. The final decision step in any of the paths recommends a life cycle assessment (LCA). Realistically, this is a conceptual goal, since few products have been evaluated in such a manner. However, purchasers should consider asking vendors about life cycle impact evaluation, as procurement has the power to transform markets.

FIGURE 1: FOOD SERVICE WARE SELECTION GUIDE



FOOD SERVICE WARE SELECTION LEGEND

A. Research has shown that reusable products usually have smaller environmental footprints than single-use products.

B. Waste plant material is preferred over virgin plant material.

C. Plastic may be either petroleum- or plant-based.

D. Plant-based material (e.g. bamboo) and plastic may be combined to make reusable FSW.

E. Due to the large number of compounds (~4,700) within the PFAS class, laboratory testing for total fluorine (F) content is used as a proxy to evaluate the likely use of PFAS for water and grease resistance in FSW. The Center for Environmental Health (CEH) has a *public database of FSW* that has been tested and categorized by level of fluorine content: Green ("No F" or no detectable fluorine or "Low F"), and Red ("High F"). "Low F" means either unlikely to contain PFAS, low levels of fluorine from other material sources (e.g. inorganic fluorine), or contamination in the product manufacturing process, but not intentionally added for grease/water resistance; "High F" means fluorinated compounds (e.g. PFAS) were likely added for grease and/or water resistance.

Some compostable product certifiers are incorporating fluorine limits for certified compostable products:

1. **The Biodegradable Products Institute (BPI)**, an independent third-party certifier for product compostability, *no longer allows PFAS-containing products* to be listed as BPI-Certified as of January 1, 2020. Before purchasing, check BPI's list to ensure that the product is certified under the new standard, **effective January 1, 2020**.
2. **The Compost Manufacturing Alliance (CMA)**, which includes Cedar Grove Composting, Inc., *will no longer allow PFAS-containing products* to be listed as CMA-accepted for compostability, **effective January 1, 2021**. During 2020, the transition year, both PFAS-containing and PFAS-free (< 100 ppm fluorine) containing products will be listed. Contact CMA with any questions regarding the fluorine content of a CMA-accepted product.

F. Plastic products may contain constituents that are hazardous (Reference: *Overview of Known Plastic Packaging-Associated Chemicals and their Hazards*). *The Plastics Scorecard*, developed by Clean Production Action, ranks many commonly used plastics (but not including, for example, melamine and acrylic), on the toxicity of hazardous chemicals that are used in the production of the plastic polymers and are present in the base polymer material. However, as this assessment only covers the base polymeric material, other chemical additives, such as plasticizers and dyes, that are used to manufacture the final plastic products (e.g. plates, bowls, take-out containers) are not evaluated by the Plastics Scorecard.

The Plastics Scorecard rankings are as follows: the more preferable plastics are in green; the least preferable in red (the numbers refer to common recycling classifications):

BEST [PLA > PP(#5),PE (#2,4)] > FAIR [PET (#1)] > WORST [PS (#6),PC (#7),PVC (#3), ABS (#7)]

Bisphenol is an example of a chemical class of concern that may be used in common plastics. It is a monomer used in making plastics (e.g., polycarbonates). Some bisphenols, such as Bisphenol A (BPA), are endocrine (hormone) disruptors, and should be avoided. Although products may be labeled "BPA-free," these products may include another bisphenol, such as BPF or BPS, as a substitute. These alternatives to BPA may not be safer and complete health data is lacking.

G. Procuring products based on end of life treatment marketing claims, such as recyclability or compostability, may not result in the selection of products with smaller environmental footprints. Oregon DEQ conducted *an* analysis of life cycle environmental impacts of FSW and concluded that product claims of "compostable" and "recyclable" do not necessarily indicate a smaller environmental footprint; in fact, sometimes they are poor predictors. Oregon's analysis concluded the following:

1. **Compostables**
   The technology, environmental factors, and residence time of compost facilities can vary vastly; therefore, compostable FSW may not fully degrade during the composting process, leading to contamination of the final compost product. It is important to check with your local composting facility to see what FSW is accepted. Contamination is also caused by improper material sorting – since differentiating between compostable and non-compostable FSW based on appearance can be challenging. For example, many compostable clear plastic cups look similar to recyclable PET plastic cups. Consequently, non-compostable products often contaminate the finished compost. Any compostable FSW should be certified compostable by either the Biodegradable Product Institute (under its January 1, 2020 standard) or the Compost Manufacturing Alliance (starting in 2021). (See section E for more information on these and other third-party compostability certifications and the benefits of choosing them.)
2. **Recyclables**
   Procuring recyclable FSW does not guarantee that the FSW will be recycled at the end of its life. Recycling FSW is challenging because 1) FSW is often contaminated with food; 2) differentiating between recyclable FSW and non-recyclable FSW based on appearance can be challenging (e.g. many recyclable plastic cups look similar to compostable plastic cups), leading to contamination of the recycling stream; and 3) recycling markets are currently more limited and many programs are cutting back the types of materials they accept. Consequently, FSW is generally recycled only under well-controlled conditions (e.g. a cafeteria purchases only recyclable FSW and implements a system to remove all food residue from the FSW prior to placement in the recycling bin).

When selecting products with environmental impacts in mind, understanding the local end of life treatment options is important. Before procuring recyclable or compostable FSW products, ensure that your local recycling and/or composting collector and facility accept the materials you intend to purchase.

1. **Compostables**
   Confirm with your Public Works Department, local refuse hauler or composting facility that it will accept and compost your specific FSW product(s). Determine if the FSW must meet certain requirements (e.g. be certified by BPI or CMA). To minimize contamination, clear signage should be displayed to provide disposal instructions to users of the products.
2. **Recyclables**
   Determine the types of materials (including which specific types of recyclable materials [e.g. paper, plastics] and product types [e.g. PET clear cups]) are accepted at your local recycling facility and confirm that it will be recycled. Confirm that the facility will accept FSW and if so, what level of food contamination is considered acceptable. To minimize contamination, clear signage should be displayed to provide disposal instructions to users of the products.

H. When selecting material options for FSW, higher recycled content means a lower environmental footprint, but only if the same material is being compared. For example, a polypropylene plastic plate with 20% recycled content has a lower environmental footprint than a polypropylene plastic plate with 10% recycled content. When comparing *different* materials, higher recycled content does not necessarily indicate lower environmental impacts. For example, a plastic plate with 20% recycled content does not necessarily have a lower environmental footprint than a paper plate with 10% recycled content. Recycled content should be post-consumer waste. Product labels need to indicate post-consumer, otherwise sources of recycled materials are unknown and the reduction in environmental impact is less certain. Purchasers should also note that the source of the recycled content in black plastic may also present human health concerns, since toxic ingredients from the recycled content source may end up in the end product (e.g. *flame retardants found in some recycled plastics*). Therefore, purchasers are encouraged to choose products with higher recycled content, while encouraging suppliers to incorporate clean recycled feedstocks into the recycled-content products.

I. Examples of other sustainability criteria to consider:

1. **Material Certification**
   For plant-based products, the chlorine-based bleaching process produces adverse impacts on human health and the environment and should be minimized, with the hierarchy (in decreasing order of preference):

   - Unbleached > PCF (processed chlorine free) > TCF (total chlorine free) > ECF (elemental chlorine free)
   - Oxygen, ozone, hydrogen peroxide, and periacetic acid are bleaching alternatives to chlorine-based bleaching

   For plant-based products, sustainable forestry management practices can be certified by:

   - FSC (*Forest Stewardship Council*) (FSC is the preferred certification.)
   - PEFC (*Programme for the Endorsement of Forest Certification*)
   - SFI (*Sustainable Forestry Initiative*)

2. **Company Sustainability Practices** (examples of practices a company can implement)

   - Companies may be a certified “B Corporation”, may purchase carbon credits to offset their carbon footprint, etc.
   - Companies may be ISO 14001 (Environmental Management System) or EMAS (Eco-Management and Audit Scheme) certified.

J. A Life Cycle Assessment (LCA) of the final product will provide an evaluation of impacts over the product’s life cycle. However, few products have been evaluated using this technique. Therefore, although LCAs may not be available, requesting such information from suppliers and manufacturers will help move them towards considering the necessity for them. Oregon DEQ conducted a meta-analysis of life cycle impacts of FSW, which contributed to developing this FSW Selection Tree. This analysis was neither brand nor category (e.g. plate) specific. The meta-analysis information can be accessed at *tinyurl.com/DEQresearch.*

5. TOOLS & RESOURCES

For purchasers seeking compostable products, below are some additional resources.

CERTIFICATIONS

Look for products with third-party, multi-attribute, environmental certifications such as:

BIODEGRADABLE PRODUCTS INSTITUTE (BPI)

BPI is a membership association that has developed a certification program to both certify and promote the use of compostable products including, but not limited to FSW. BPI certifies materials or products that meet ASTM compostability standards appropriate for composting in municipal or commercial aerobic composting facilities.

BPI established its *Position on Fluorinated Chemicals* in November 2017. The BPI membership and Board of Directors voted to approve a 100 parts per million (ppm) total fluorine limit in its certification to address the entire class of fluorinated chemicals. Manufacturers must attest that no fluorinated chemicals are intentionally added to their products. As of January 1, 2020, products that are BPI-certified meet both these criteria. Before purchasing, check BPI's list to ensure that the product is certified under the new standard effective January 1, 2020.

DIN CERTCO

DIN CERTCO is BPI's partner to contact for all aspects of conformity assessment. They assess and register a broad range of products and services and certify qualified enterprises and personnel.

COMPOST MANUFACTURING ALLIANCE

Compost Manufacturing Alliance (CMA) offers a program of technical review and field testing of compostable food service ware to determine their feasibility as a feedstock when shipped to fully permitted industrial composting facilities. CMA conducts compostability tests for product manufacturers, suppliers, and others (e.g. CMA has been testing Cedar Grove's line of compostable products since 2017) and CMA's certified compostable product list includes many different product lines, including Cedar Grove's products.

CMA established its *Position on Fluorinated Chemicals* in 2020. CMA will begin testing only PFAS-free (<100 ppm fluorine) products and effective January 1, 2021, CMA's list of compostable products will be PFAS-free. During 2020, the transition period, both types of products will be listed. Contact CMA with any questions regarding the fluorine content of a CMA-accepted product.

PRODUCT LISTS

Databases for identifying PFAS-free FSW and manufacturers:

- *The Center for Environmental Health's Database of Disposable Food Service Ware Products Tested for Fluorinated Additives*
- *BPI's Product Catalog is "PFAS-free" as of January 1, 2020*
- *CMA's Product Listing will be "PFAS-free" as of January 1, 2021*

PRODUCT TESTING

The Center for Environmental Health offers low-cost product testing for any single-use FSW product that meets the following criteria:

- Not currently listed in their database (or if the current test results are prior to mid-2018, or if a manufacturer claims that their product has been reformulated)
- Not made of polystyrene or other plastic material

Contact *foodware@ceh.org* for more information.

APPENDIX A: DEFINITIONS & ACRONYMS

DEFINITIONS

ASTM (American Society for Testing and Materials): An organization that develops international voluntary consensus standards for materials, products, systems and services that are recognized worldwide, referenced here for their standards related to compostability.

Bagasse: is a fibrous, pulpy material that remains after sugar is extracted from sugarcane. It is often molded into food service products such as compostable plates, bowls and takeout containers. Because it can insulate food, it can replace expanded polystyrene foam. Unfortunately, many bagasse food service products have been found to contain PFAS.

Bioplastic: is any plastic derived from plant-based materials that can replace traditional plastics derived from petroleum. A product made with bioplastic is not however inherently compostable. It may either be compostable, recyclable or neither, depending on the plastic manufactured from the plant-based materials.

Chlorine: used to whiten paper. Chlorine dioxide has mostly replaced elemental chlorine as a bleaching agent as it is less hazardous.

Compostable: means all the materials in a product or package are capable of undergoing biological decomposition in an appropriate (i.e. commercial or municipal) compost facility as part of an available program in a safe and timely manner (no more than 180 days), such that the material is not visually distinguishable and breaks down into carbon dioxide, water, inorganic compounds, and biomass suitable for use as a soil amendment (e.g., compost, soil-conditioning material, mulch), leaving no toxic residue. To be considered a compostable product under this specification, a product must be certified by the Biodegradable Products Institute (BPI) or an equivalent certifier, or be on the Cedar Grove list of Commercially Accepted Items (or the Compost Manufacturing Alliance's Composter Approved list), and must not contain PFAS.

Elemental Chlorine Free (ECF): produced from pulp that has been bleached with a chlorine derivative such as chlorine dioxide, but without elemental chlorine (e.g., chlorine gas).

Molded Fiber: means bagasse, wheat straw, recycled paper and other types of fibrous materials that are pressure formed into various types of food service products such as plates, bowls and takeout containers. Some molded fiber products are certified as compostable by the Biodegradable Products Institute or appear on other lists of approved compostable food service products. Unfortunately, many molded fiber FSW products have been found to contain PFAS, but new alternatives are starting to come out on the market and BPI's list now contains only PFAS-free products.

Per- and poly-fluoroalkyl substances (PFAS): means any perfluorinated or polyfluorinated chemical, including but not limited to long- and short-chain per- or polyfluorinated alkyl compounds (PFASs), fluorinated sulfonate compounds, fluorinated polyethers, and fluorinated polymers. This class of chemicals was previously referred to as PFCs (perfluorinated chemicals), but PFAS is recognized as the all-encompassing term for this larger class of chemicals (see *US EPA explanation* for more detail).

Polylactic Acid (PLA): is a clear bioplastic that resembles common petrochemical-based plastics such as polyethylene, PET and, when foamed, expanded polystyrene. PLA food service products are sometimes labeled with the #7 plastic resin recycling symbol.

Polystyrene: means all forms of the plastic resin polystyrene (#6), including expanded polystyrene or "foam," sometimes referred to as "Styrofoam."

Post-Consumer Recycled Content: means only those products, packages or materials generated by a business or consumer which have served their intended end use as consumer items, and which have been separated or diverted from the waste stream for the purposes of collection and recycling as a secondary material feedstock, but shall not include waste material generated by the manufacturer or converter during or after the completion of a manufacturing or converting process.

Processed Chlorine Free (PCF): means that no chlorine or chlorine derivatives were used in the in the paper making process, but that post-consumer recycled paper used as feedstock, may have originally been bleached with chlorine or chlorine derivatives

Recyclable Material: used material that can be reused as an ingredient in a manufacturing process to create another product

Third-Party Certified: Sustainability specifications for products that have been verified by an independent body that has no relationship with the product or product manufacturer

Totally Chlorine Free (TCF): produced with pulp that has been bleached without chlorine or chlorinated compounds, and no post-consumer recycled content was feedstock

ACRONYMS

ABS: Acrylonitrile Butadiene Styrene plastic
BPI: Biodegradable Products Institute
CEH: Center for Environmental Health
CMA: Compost Manufacturing Alliance
ECF: Elemental Chlorine Free
EPS: Expanded Polystyrene foam
FSC: Forest Stewardship Certification
FSW: Food Service Ware
PC: Polycarbonate plastic
PCF: Processed Chlorine Free
PE: Polyethylene plastic
PET: Polyethylene Terephthalate plastic
PFAS: Per-and poly-fluoroalkyl substances
PFC: Perfluorinated Chemical or polyfluorinated chemical
PP: Polypropylene plastic
PLA: Polylactic Acid
PS: Polystyrene plastic
PVC: Polyvinyl Chloride plastic
SPLC: Sustainable Purchasing Leadership Council
TCF: Total Chlorine Free

APPENDIX B: SPLC ACTION TEAMS

Over the years, the Sustainable Purchasing Leadership Council (SPLC) has developed its *Guidance for Leadership in Sustainable Purchasing* covering strategy development for individual products and service categories. The guidance was developed through multi-stakeholder processes. These processes brought stakeholders together for months or years to deliberate, identify, and agree on relevant category issues and strategies before finalizing recommendations for purchasers.

Today, the worlds of sustainability and sustainable procurement are moving faster than ever. The importance of aligning our actions and requirements to drive consistent and meaningful market transformation has never been more urgent. Recognizing this, our procurement professional members have asked SPLC to generate guidance to address complex emerging issues on a shorter timeline, to enable them to take meaningful action quickly.

To meet this need for timely guidance development, we have developed a model for member-led topical Action Teams – small member groups, expert on the issues involved and highly motivated to address specific procurement challenges. These groups convene for a limited time to develop interim guidance on a given topic, solicit expert support for review and revision, and share it with SPLC members as a starting point for addressing a specific topic or category.

This agile approach allows SPLC to leverage our members' collective expertise and experience to provide guidance in short order on pressing issues, while clearly acknowledging that the guidance produced by these teams is a starting point that will require iteration and improvement over time.

To ensure that members understand the nature of these resources, we will identify them in our Community Resources as Action Team outputs and provide a timeline and method for members and other experts to provide additional material, comments or suggested revisions to improve upon the guidance as presented. We are excited about developing and housing these living documents in a way that allows us to provide guidance in short order and increasingly sophisticated and specific recommendations over time.

CONVENING OR JOINING AN ACTION TEAM YOURSELF

All SPLC members are invited to convene or participate in Action Teams according to their needs and interests. An Action Team guidance document is under development, to provide direction on how to stand up and manage such a group, and we provide a template to structure the resulting guidance.

Please contact Johanna Anderson *johanna@sustainablepurchasing.org* to learn more about the Action Teams opportunity.