

5	<p>The characteristics that make conventional plastics commercially useful—strength, durability, synthetically derived from petrochemicals—make them highly resistant to biological attack.</p>	<p>CCX-891, ¶ 33 CCX-880 at 2</p> <p>(McCarthy, Tr. 397-99) (defining “conventional plastic” and stating that commodity plastics, PE, polypropylene, are polystyrene are generally considered nonbiodegradable)).</p> <p>(Burnette, Tr. 2432-2433 (“[P]lastics are designed to be stable. Their product integrity is important. They have an intended use. Their product integrity is important. They have an intended use. They're intended to be stable. That means that at a molecular level these are stable compounds.”))</p>
6	<p>Biodegradation is described as the chemical process by which microorganisms such as bacteria and fungi use the carbon found in organic materials as a food source.</p>	<p>CCX-891, ¶ 22 CCX-893, ¶18 RX-854, ¶ 1 RX-855 at 12, 13 CCX-880 at 2</p> <p>(Tolaymat, Tr. 130). (McCarthy, Tr. 372-373). (Sahu, Tr. 1976 (confirming he defines biodegradation as breakdown of the plastic substrate through biological means)). (Burnette, Tr. 2374-75)</p>
7	<p>Given enough time, all things are “biodegradable.” However, conventional plastics are not considered susceptible to biological attack. This process could take hundreds, if not thousands, of years. Therefore, it is commonly understood in the scientific community that conventional plastics are not biodegradable.</p>	<p>CCX-891, ¶¶ 33-34 CCX-892, ¶¶ 2-5</p> <p>(McCarthy, Tr. 375) (polymers formed through addition polymerization are not considered biodegradable)). (McCarthy, Tr. 397-399 (defining “conventional plastic” and stating that commodity plastics, PE, polypropylene, are polystyrene are generally considered nonbiodegradable)). (Sahu, Tr. 1758-1759 (conventional plastics last for “a very long time” in the environment after customary disposal, perhaps 10,000 or more years)). (Barlaz, Tr. 2292 (traditional plastics in</p>

		general do not biodegrade at all)). (Michel, Tr. 2869 (“[d]oes polyethylene biodegrade over thousands of year. Well, yes, it does, but so do many other things, you know, which we would not consider biodegradable.”))
8	There are some plastics that are susceptible to biological attack, however these generally do not have the same durability and low cost of most commodity conventional plastics.	CCX-891, ¶¶ 34-35 <i>See generally</i> CCX-892 RX-855 at 9, n.6. (McCarthy, Tr. 399 -404 (explaining that some plastics are biodegradable and that conventional plastics dominate the market due to price)).
9	The high-molecular weight and chemical structure of most conventional plastics prevent naturally occurring microorganisms from accessing the carbon.	CCX-891, ¶¶ 30, 32 (McCarthy, Tr. 375 (polymers formed through addition polymerization are not considered biodegradable because of their “carbon backbone . . . that doesn’t have any of these linkages that can be broken by the enzymes”)).
10	Petroleum-based conventional plastics have only existed for a hundred years or so, not long enough for microorganisms to have evolved to degrade them.	CCX-891, ¶ 33 CCX-880 at 2 (referring to plastics as xenobiotic) (McCarthy, Tr. 375).
11	Americans generate about 32 million tons of plastic waste every year, more than half of which ends up in landfills.	CCX-893, ¶¶ 15-16 CCX-880 at 1. (Tolaymat, Tr. 129 (in 2012 “plastic constituted over 12 percent of the total municipal solid waste generated or about 31.7 million tons of plastic”)).
12	Landfills continue to be the dominant method for managing discarded waste (MSW) in the United States. Biodegradation in landfills is remarkably slow because typical U.S. landfills are primarily anaerobic environments with low-moisture. U.S. landfills are anaerobic, temperate, “dry tombs” by design; these conditions are engineered (and largely mandated by federal law) to facilitate the containment rather than stabilization of MSW. The life of organic biodegradable materials in landfills is anywhere from 12 to 70 years.	CCX-893, ¶ 16; CCX-819 at 9 (Sinclair Dep.) (Q. But you would agree that most plastics are disposed of in landfills? A. Most plastics are at this time intended to end up in a landfill, or in other words, would more likely than not end up in a landfill.”). (Tolaymat, Tr. 126 (“Landfilling is by and large the largest management option for municipal solid waste in the United

		States. About 54 percent of solid waste is managed in that capacity.”)). (Tolaymat, Tr. 133-134 (describing slow biodegradation process in landfill conditions)). (Tolaymat, Tr. 333-35 (the majority of landfills in the U.S. are “dry tomb” landfills)).
13	Due to their recalcitrant nature, plastics pose a growing disposal and environmental pollution problem.	CCX-895 at 11 (observing “[t]he massive islands of plastic pollution now collecting in the world’s oceans . . . , plastic particle pollution in natural bodies of water like the Great Lakes . . . , and the plastic that pollutes many of the world’s beaches and natural areas . . .”). RX-855 at 9 (“The parties can agree that conventional plastics are a large and growing portion of the solid waste disposal stream . . . persistence of plastic was products poses such an enormous environmental threat.”)
14	Many consumers are concerned about environmental harms caused by plastic pollution: in a relatively recent survey, 62% of consumers said that they would be willing to pay a higher price for a product that is less burdensome on the environment.	CCX-865, ¶ 29. CCX-809 (Flexible Dep. 72:10-12) (“There is a lot of backlash against plastic bags. A lot of people don’t like plastic bags.”); CCX-800 (BER Dep. 18:5-9) (“[Customers] were looking for a product they could mark as degradable to say that they were being, you know, environmentally sensitive. It’s very important in their packaging, that they could . . . print it right on the package, you know, biodegradable.”); CCX-822 (ANS Dep. 13:15-17) (“People . . . don’t want to pollute the environment and this [biodegradable plastics] is what they choose to buy.”).
15	In response to consumer demand, various materials have been introduced to improve the biodegradability of plastics. These include conventional plastics amended with additives meant to enhance biodegradability (<i>e.g.</i> ,	CCX-891, ¶¶ 26, 34, 36 CCX-880 at 3

	photodegradable, oxodegradable, and biodegradable additives), bio-based plastics, and natural fiber composites.	
17	ECM exploits consumers' environmental consciousness. "Green impact" is ECM's sales pitch. For example, its website lists statistics on the environmental impact of plastic waste.	CCX-19 at 2. CCX-20 at 3 ("Who's winning the war on plastics?") RX-138 CCX-7 (sustainability brochure) CCX-21 (presentation)
18	ECM claims to have a "revolutionary additive technology" that "renders. . . plastic products biodegradable . . ." and ECM advises its customers that mixing 1% ECM Additive to non-degradable plastic, <i>i.e.</i> , conventional plastic, "transforms" it into a biodegradable plastic ("ECM Plastic").	CCX-3 CCX-15 CCX-19 (ECM website screenshots) CCX-20 (ECM website screenshots) CCX-24 (ECM website screenshots) CCX-25 (ECM website screenshots) (Sinclair, Tr. 767 (Q: "What do you tell customers that the ECM additive will do?" A: "It makes their plastic product that they use it in biodegradable.")).
19	ECM sells its additive to plastic producers.	CCX-818 (Sinclair Dep. 62:10-14). CCX-818 (Sinclair Dep. 217:9-23) (discussing distribution chain). (Sinclair, Tr. 758, 759, 787).
20	A company called Microtech Research, Inc. owns the ECM additive technology, and ECM licenses the technology from Microtech.	CCX-818 (Sinclair Dep. 21:8-13) (explaining ECM-Microtec relationship). CCX-241 (ECM-Microtec licensing agreement). (Sinclair, Tr. 1000 (Microtech owns the rights to the ECM additive)).
21	Some of these manufacturers use the additive to make "biodegradable" products for purchase by retailers or end-use consumers. Other manufacturers simply make plastic (such as plastic "film") that they sell to product and package manufacturers, who in turn sell to packagers, retailers, or end-use consumers.	CCX-818 (Sinclair Dep. 217:9-23). <i>See also</i> CCX-800 (BER Dep. 10:17-11:13).
22	Customers buy the ECM additive because they want biodegradable plastic—and they want to	CCX-800 (BER Dep. 17:10-18:11).

	be able to advertise their plastic as biodegradable.	<p>CCX-801 (D&W Dep. 19:14-22:7).</p> <p>CCX-803 (DTE Dep. 39:1-40:5; 42:8-43:9; 45:19-46:9).</p> <p>CCX-804 (Eagle Dep. 15:9-16:12).</p> <p>CCX-809 (Flexible Dep. 13:25-18:13).</p> <p>CCX-810 (FP Int’l Dep. 15:9-16:19).</p> <p>CCX-811 (IPB Dep. 11:13-12:1; 12:14-16).</p> <p>CCX-812 (Kappus Dep. 14:15:19).</p> <p>CCX-817 (Quest Dep. 19:9-24; 26:11-18).</p> <p>CCX-822 (ANS Dep. 12:16-13:5).</p> <p>(Sinclair, Tr. 774-75 (ECM customers buy the additive because “they want biodegradable products.”)).</p>
23	ECM has sold its product to approximately 300 customers.	CCX-747 at 7-68
24	ECM’s “biodegradable plastic” has reached millions of end-use consumers.	<p>CCX-822 (ANS Dep. 26:2-9) (“millions” of shopping bags)</p> <p>CCX-803 (DTE Dep. 48:23-49:3) (3.5 million grocery bags);</p> <p>CCX-811 (IPB Dep. 74:14-75:1) (12-13 million shopping bags).</p>
25	ECM’s “biodegradable plastic” claims have also reached millions of consumers through advertising for a host of products and packages—ranging from grocery bags to shampoo bottles, Frisbees, golf tees, highlighters, storage cases, shoe soles, mailers, zippers, plastic cutlery, straws, and more.	<p>CCX-30 (ad for biodegradable plastic bags);</p> <p>CCX-32 (apple bag with biodegradable logo);</p> <p>CCX-36 (biodegradable logo for bags and marketing material);</p> <p>CCX-37 (website ad for biodegradable cards);</p> <p>CCX-39 (website ad for biodegradable golf tees);</p> <p>CCX-40 (ad for biodegradable packaging);</p>

		<p>CCX-41 (ad for biodegradable bags and film); CCX-44 (art for bags with biodegradable logo); CCX-46 (biodegradable conditioner bottle); CCX-47 (biodegradable label for shampoo); CCX-52 (labels for “certified” biodegradable bags and cases); CCX-56 (ad for biodegradable bags and cutlery); CCX-59 (ad for biodegradable supply bags); CCX-61 (ad for biodegradable bottle); CCX-63 (biodegradable cold packs); CCX-64 (ad for biodegradable mailers); CCX-65 (ad for biodegradable trash bin); CCX-69 – 75 (various types of biodegradable plastic bags); CCX-76 (biodegradable credit card); CCX-79 (biodegradable zipper ad); CCX-96 (biodegradable straws); CCX-97 (biodegradable cutlery); CCX-98 (biodegradable foam clamshells for food); CCX-103 (biodegradable Frisbee); CCX-112 – 122 (various types of biodegradable bags); CCX-126 (biodegradable highlighter); CCX-139 (biodegradable shoe soles); CCX-142 (ad for biodegradable air cushions).</p>
26	Every page of ECM’s website, ecmbiofilms.com, has displayed the repeating tagline, “Additives for Manufacturing Biodegradable Plastic Packaging and Products,” with a description of ECM’s allegedly groundbreaking technology for biodegradable plastic.	<p>CCX-22 CCX-19 CCX-24</p>
27	ECM has distributed brochures aimed at “green business” promising that its technology yields “biodegradable plastic products” that are “priced competitively with, and have the same mechanical characteristics as, traditional non-	<p>CCX-7 at 5. RX-138</p>

	degradable products.”	
28	ECM’s flyers have called ECM Plastics “Biodegradable” or “100% Biodegradable”	CCX-3. CCX-12. CCX-15 CCX-17
29	ECM’s letters have certified the biodegradability of plastics made with ECM Additive.	CCX-10. CCX-11.
30	ECM’s emails with customers have echoed and expanded on unqualified biodegradable claims made in marketing materials.	CCX-317; CCX-341; CCX-342; CCX-344
31	ECM is not the only company that offers a biodegradable additive.	CCX-6 (ECM marketing flyer explaining differences between ECM’s additive and competing technology); CCX-12 (same); CCX-17 (ECM webpage with same); CCX-21 (presentation comparing compostable technologies with ECM additive). (Sinclair, Tr. 775 (ECM sells its additive in a competitive market)).
32	ECM claimed that its additive causes plastic to completely biodegrade in nine months to five years. This claim has pervaded ECM’s marketing materials and customer communications.	CCX-3; CCX-5; CCX-6; CCX-7 at 6; CCX-10; CCX-19 at 5; CCX-242 at 15; CCX-245; CCX-269; CCX-275-CCX-280; CCX-283; CCX-296; CCX-299; CCX-303; CCX-326; CCX-384. CCX-809 (Flexible Dep.) 20:3-10; CCX-800 (BER Dep.) 19:5-9; CCX-822 (ANS Dep.) 13:6-9; CCX-812 (Kappus Dep.) 14:15-25. (Sinclair, Tr. 768 (“We certainly have, you know, used those words out there . . .”)). (Sinclair, Tr. 974-975 (discussing Sinclair email characterizing 9 month to 5 year time frame as “a window of biodegradation”)). (Sinclair, Tr. 983 (discussing CCX 1008, 2009 Sinclair email claiming that biodegradation time for most products will be nine months to five years)). (Sinclair, Tr. 1606 (discussing 2007

		<p>Sinclair affidavit)).</p> <p>(Sullivan, Tr. 716 (testifying that ECM told customers its additive would cause plastics to biodegrade in a landfill in nine months to five years)). RX-135 at 1, 5,</p>
33	ECM claims that plastics treated with its additive will biodegrade in a landfill.	CCX-3; CCX-6; CCX-7 at 6; CCX-11; CCX-12; CCX-15; CCX-19 at 5; CCX-242 at 15; CCX-276; CCX-372.
34	Competing technologies do not work in anaerobic environments like landfills.	CCX-818 (Sinclair Dep.) 77:21-78:9
35	ECM's claims that ECM Plastics completely biodegrade in 9 months to 5 years and in landfills are material to its customers.	<p>CCX-819 (Sinclair Dep.) 231:2-5; 231:17-22; 292:5-8.</p> <p>Sinclair Tr. 829 ("But the biodegradability is important to them [customers] in one fashion or another; otherwise, they wouldn't be coming to us.")</p> <p>Sinclair Tr. 922 ("Rate wasn't that big a deal for most people. And now we've progressed where we saw that you and others are all concerned with the rate, and so we had to make different analogies and talk to him and others in other ways.")</p> <p>(Frederick, Tr. 1157-1158 (stating, generally, that studies indicate that biodegradable claims matter to consumers)).</p> <p>(Sullivan, Tr. 721 (testifying that ECM customers often asked ECM how quickly its additive caused plastics to biodegrade)).</p> <p>RX-135 at 5-6 (customer asks "how long in typical landfills does your plastic break down?")</p>
36	ECM's customers pass on the same or similar claims to ECM's nine month to five year claim in their own advertising.	CCX-33 (9 months to 5 years claim in ad for AirPouch biodegradable air pillows); CCX-34 (9 months to 5 years and

		<p>landfill claims in AirPouch “Sales and Marketing Alert”); CCX-37 (website ad for biodegradable cards claims 9 months to 5 years); CCX-38 (biodegradable packing ad claims 9-5 in landfill); CCX-38 (Customer’s FAQs for “Good Earth packaging” claim biodegradation in landfill); CCX-41 (Customer ad for biodegradable film and bags claim biodegradation in landfill); CCX-43 (landfill claim in ad for “enviroware”); CCX-44 & 45 (9 months to 5 years and landfill claims on art for grocery bag); CCX-50 at 2 (landfill claim in ad for storage cases and boxes); CCX-57 (9 months to 5 years claim in fact sheet for biodegradable vinyl); CCX-61 (landfill claim in ad for biodegradable bottle); CCX-105 (9 months to 5 years claim on ad for film); CCX-134 (9 months to 5 years and landfill claims on bag); CCX-563 (9 months to 5 years and landfill claims on ad for air cushions); CCX-565 (9 months to 5 years and landfill claims on ad for loosefill); CCX-627 (9 months to 5 years and landfill claims on fact sheet for “Bio Ultra Blend Liners”); CCX-811 (IPB Dep.) 40:16-20 (customer acknowledging passing of 9 months to 5 years and landfill claims to downstream customer).</p>
37	<p>After the Green Guides were issued, ECM removed many of its nine-month-to-five-years claims, replacing them with a disclaimer stating that “Plastic products produced with our additives will biodegrade in biologically-active environments (including most landfills) in some period greater than a year.”</p>	<p>CCX-819 at 53 (discussing pulling the 9 month to 5 year claim off of website at the end of 2012); CCX-231 (voluntary access letter dated 8/30/2011). CCX-20 at 2 (ECM website in March 2013).</p> <p>(Sinclair, Tr. 770-771 (discontinued the</p>

		claim when the revised Green Guides were released because to make a biodegradable claim “it had to be a year or less. And we knew, you know, our stuff isn’t going to be in a year or less . . . so we just said we’re more than a year.”)).
38	ECM did not change its claim until at least October 2012, even though ECM’s claims had been the subject of an FTC investigation since August 2011, and it did not completely remove the 9 months to 5 years claim until the end of 2013.	CCX-819 at 54 (discussing pulling the 9 months to 5 year claim off of website at the end of 2013); CCX-231 (voluntary access letter dated 8/30/2011).
39	ECM continued to make the nine-month-to-five-year and landfill claims on its website even after it added its disclaimer.	CCX-25 at 104, 117, 203, 208.
40	ECM continued to make the nine-month-to-five-year and landfill claims in its marketing materials that ECM distributed to customers, even after ECM added its disclaimer.	RX-138 at 9.
41	ECM continued to make the nine-month-to-five-year and landfill claims in emails to customers even after it added its disclaimer.	CCX-259 (attaching flyer with 9 months to 5 years and landfill claims); CCX-281 (April 2013 email describing “time frame of nine months to five years” in a landfill); CCX-282 (October 2013 email describing biodegradation “in a period of 9 months to 5 years” in landfills); CCX-286 (May 2013 email stating, “we say nine months to five years for biodegradation to take place”); CCX-321 (July 2013 email explaining “time period of nine months to five years”); CCX-423 (October 2013 email describing 9 months to 5 years as the “typical” range); CCX-813 (Nealis Dep.) 244:15-241:1 (Nealis acknowledging that he continued to send customers marketing flyer with 9 months to 5 years claim).
42	62% of respondents to the Synovate study agree with the statement: “ <i>If products I currently purchase were made less burdensome on the environment, I would be willing to pay a higher price.</i> ”	See RX-856 at 24; CCX-865, ¶ 29.

43	ECM's disclaimer did not change its customers' understanding of the additive's function.	CCX-809 (Flexible Dep.) 38:22-29:2 ("Q. Is it your understanding that there was a change in how the product worked? A. No. My understanding was a change in the rules, in terms of what we could call biodegradable . . . There wasn't any change in the product."); <i>Id.</i> 29:10-19 ("Q. How quickly did you understand the product would cause your product to break down when you made the greater than one year qualifier? A. . . That was our belief, was that in that range of nine month to five year, that that would fully degrade."); CCX-800 (BER Dep.) 33:7-15 ("Q. During that time ["approximately 2009 to the beginning of 2014"], BER understood that plastic treated with the ECM additive should biodegrade in nine months to five years? A. Yes.")
44	ECM claimed that independent tests proved its additive caused ECM Plastic to biodegrade in 9 months to 5 years in a landfill in its marketing materials.	CCX-4; CCX-5; CCX-6; CCX-10; CCX-11; CCX-21 (presentation)
45	ECM claimed that independent tests proved its additive caused ECM Plastic to biodegrade in 9 months to 5 years in a landfill in its communications with customers.	CCX-266; CCX-270 at 2; CCX-277 at 4; CCX-281; CCX-296 at 2; CCX-298; CCX-300; CCX-302; CCX-303; CCX-332; CCX-333; CCX-334; CCX-335; CCX-336; CCX-337; CCX-338; CCX-339; CCX-340; CCX-404 at 2.
46	ECM issued a "Certificate of Biodegradability of Plastic Products" to its customers.	CCX-1; CCX-446; CCX-454; CCX-455; CCX-492; CCX-509; CCX-557; CCX-567; CCX-612; CCX-613; CCX-837; CCX-727; CCX-756; CCX-824 CCX-800 (BER Dep.) 29:11-21 CCX-802 (D&W Dep.) 20:15-23-16 CCX-803 (DTE Dep.) 25:17-26:11 CCX-804 (Eagle Dep.) 23:15-24:20 CCX-809 (Flexible Dep.) 40:16-41:5 CCX-810 (FP Int'l Dep.) 33:6-18 CCX-811 (IPB Dep.) 12:20-18:4 CCX-812 (Kappus Dep.) 24:15-25:7 CCX-817 (Quest Dep.) 29:2-10 CCX-821 (3M Dep.) 33:5-18; 11:35:4 CCX-822 (ANS Dep.) 17:19-18:13

		(Sinclair, Tr. 783).
47	ECM's "Certificate of Biodegradability" claims to "certify that numerous plastic samples, submitted by ECM Biofilms, Inc., have been tested by independent laboratories in accordance with standard test methods approved by ASTM, ISO and other such standardization bodies"	CCX-1 and CCX-14. (Sinclair, Tr. 890-891 (certificate issued to SL Plastic Company Limited states that the "biodegradation of submitted plastic samples were tested using ASTM D5209-91 . . . and then ASTM D5338.")).
48	ECM's Certificate of Biodegradability states that the tests "certifies [sic] that plastic products manufactured with ECM additives can be marketed as biodegradable" and the certificate itself can be "used by [customer] to validate its claims to the biodegradability" of ECM Plastic.	CCX-1 and CCX-14.
49	Microtech commissioned the McLaren/Hart report.	(Sinclair, Tr. 1702-1703).
50	ECM often provided the "McLaren/Hart" or "ChemRisk" assessment to its customers.	CCX-732 ("Ecological Assessment of ECM Plastic," Prepared by ChemRisk, A Service of McLaren/Hart Inc., Feb. 16, 1999). CCX-266; CCX-322; CCX-333; CCX-334; CCX-335; CCX-336; CCX-337; CCX-338; CCX-339; CCX-340; CCX-818 (Sinclair Dep.) 125:8-11 ("Q. And do you provide copies of this test to your customers? A. I think so. Yes, I believe we have many, many times.")). (Sinclair, Tr. 1010 (Sinclair "absolutely" sent the McLaren/Hart report to customers)). (Sinclair, Tr. 1702). (Sinclair, Tr. 1000-1001).
51	The testing claim was essential to ECM's business, giving ECM credibility with its target audience, plastic manufacturers and other businesses.	CCX-818 (Sinclair Dep.) 93:5-6 ("[Customers] want to see data from an outside lab."); CCX-813 (Nealis Dep. 20:3-11) (Q: What is the purpose of that certificate? A: To give to our customers to show that we have tested. It states in there that we have tested it to three different standards, ASTM standards. Q: And why is that important? A: To show that our product is biodegradable.)
52	And ECM's customers passed the testing ECM gave them (or ECM's testing claims) on to their	CCX-35 (Customer's FAQs for "EarthAware Biodegradable Film"

	customers.	claim “independently tested” and offer certificate as proof); CCX-38 (Customer’s FAQs for “Good Earth packaging” claim that “[i]ndependent labs...have substantiated all our claims”); CCX-41 (Customer ad for biodegradable film and bags claim “thoroughly tested by independent laboratories”); CCX-64 (Customer ad for “Cool Stuff Mailers” claims “certified biodegradable”); CCX-246 (customer passing testing claims to downstream customer); CCX-257 (same); CCX-258 (same); CCX-261 (same); CCX-491 (same).
53	ECM routinely provided the biodegradability certificate to its customers.	CCX-813 (Nealis Dep. 20:3-11) (explaining that ECM routinely provided the certificate) (Sinclair, Tr. 783). (Sinclair, Tr. 784).
54	ECM routinely told its customers that ECM had “proof” of its claims.	CCX-329 (“I would think your customers want proof the product is biodegradable and ECM Biofilms offers that proof.”); CCX-301 (“We have done testing to prove the biodegradation...”); CCX-298 (“[W]e already proved what we needed to prove...”).
55	ECM stood behind its claims.	CCX-323 (“We stand behind every product sold with our additives as ‘biodegradable’ and have successfully been doing this in the marketplace around the world for over 10 years”); CCX-331 (“We fully stand behind our products’ efficacy based on the [testing] that we have and so can your customer.”); CCX-380 (“[W]e have tested the mentioned ASTM test standards and we stand behind the biodegradation of our product with the ECM BioFilms additive.”)
56	The Certificate of Biodegradability was a means of assuring customers and ECM’s customers’ customers that ECM’s additive worked as advertised.	CCX-272 (ECM providing customer with certificate “assuring you and your customers that the products made with our additives are fully biodegradable”); CCX-200 (same); CCX-341 (same);

		<p>CCX-344 (same); CCX-346 (same); CCX-347 (same); CCX-348 (same). <i>See also</i> CCX-273; CCX-278; CCX-282; CCX-290; CCX-304; CCX-305; CCX-306; CCX-321 (ECM advising customer to “use” the certificate to prove claims); CCX-343 (ECM attaching certificate in response to request for “written validation” that additive will cause biodegradation in a landfill); CCX-419 at 3. CCX-681 (“Now in order to use in in [Palace’s] products, they need your help in receiving a certification that their product is biodegradable. They need an official certificate that they can show whenever it is necessary and that none can sue them for fraud.”) <i>See also</i> CCX-818 (Sinclair Dep.) 183:24-25 (“[I]t’s like having a guarantee on your box.”)</p> <p>(Sinclair, Tr. 783-784 (“we then fill out one of these biodegradable certificates that we send to them, saying that, okay, to you and to your customers, here is our statement that says, because you’re complying with us, that your plastic products with our additives are going to be fully biodegradable.”)).</p>
57	<p>ECM also used testing claims and the certificate to convince customers to purchase the additive without doing their own testing. ECM repeatedly told customers that testing was unnecessary due to ECM’s own testing and its assurances in the certificate; testing would only create unnecessary costs and delay.</p>	<p>CCX-298; CCX-300 (thanks to the ECM certificate, no “need to incur the expense of duplicating our test results”); CCX-301 (“Due to the high cost and time needed we don’t send samples out for testing. These tests can cost up to \$25,000 and take over a year. We have done testing to prove the biodegradation and I have attached those for your use and review.”); CCX-302 (“We do have concerns regarding how to test to confirm the biodegradability . . . To address your concerns about testing, because we have third party independent testing of our additive in plastic ECM BioFilms certifies that when used at a minimum [sic] of 1% the product is</p>

		<p>biodegradable.”); CCX-303; CCX-304 (“First remember that none of this [testing] needs to be done as we certify your products...”); CCX-305 (“Concerning testing, yes it is very expensive which is why most all customers rely on our certification from our hundreds of thousands of dollars of testing over the years rather than going through the expense themselves”); CCX-304 (Sinclair to Shields: “First remember that none of this [testing] needs to be done as we certify your products with our additives”); CCX-306; CCX-390 (“Testing is very expensive, which is why most customers rely on our certification”); CCX-394 (“Asked about testing – not necessary”). <i>See also</i> CCX-818 (Sinclair Dep.) 185:15-17 (“Q. Does ECM encourage its customers to rely on its certificate in lieu of testing? A. Again, we want as fast and quick a sale as we can possibly get.”).</p>
58	<p>ECM’s customers relied on ECM’s representations about its proof, i.e., the testing and the Certificate of Biodegradability.</p>	<p>CCX-822 (ANS Dep.) 16:18-20 (“Q. Did you rely on ECM’s testing as the evidence that the product worked as advertised? A. Yes.”); CCX-800 (BER Dep.) 24:10-12 (“Q. Did BER rely on ECM’s testing as proof that its additive worked? A. Yes.”); CCX-803 (DTE Dep.) 28:24-29:1 (“Q. Did that fact [that ECM claimed to have tested] give Down to Earth comfort that ECM’s product would perform as advertised? A. Yes.”); CCX-804 (Eagle Dep.) 32:13-16 (“Q. Did your company rely on ECM’s claims relating to the alleged biodegradability of plastics containing its additive? A. Yes.”); CCX-809 (Flexible Dep.) 34:21-25; 38:6-7; 51:9-14 (explaining that he understood the certificate’s purpose to be “so that we can certify that that...if somebody wants to see evidence that</p>

		our bags are biodegradable, this is what I would provide them.”); CCX-811 (IPB Dep.) 40:7-9 (“Q. Island Plastic bags was relying on ECM for its interpretation of the McLaren/Hart report. A. Yes.”); CCX-812 (Kappus Dep.) (“Q. Did Kappus rely on ECM’s testing as proof that its additive worked? A. Yes, 100 percent.”)
59	ECM customers posted the Certificate of Biodegradability on their websites.	CCX-39 (excerpt from customer website displaying certificate); CCX-265 (email regarding downstream customer interest in posting certificate on website).
60	ECM customers provided the Certificate of Biodegradability to their downstream customers.	CCX-822 (ANS Dep.) 18:1-11; 28:14-28; CCX-800 (BER Dep.) 30:5-16 (“Q. Why did you give [the certificate] to each customer that purchased the product? A. To certify that it was biodegradable”); CCX-800 (BER Dep.) 18:1-6 (“Originally one of my customers asks how can you prove that my bag is biodegradable, they get the certificate...”); CCX-804 (Eagle Dep.) 25:12-26:11 (“Q. And is this a certificate that you forward to your own customers who are interested in buying blown film containing the ECM additive? A. Yeah.”); CCX-811 (IPB Dep.) 18:11-17 (“Q. In fact, IPB regularly sent copies of the certificate to prospective customers of Island Plastic Bags. A. Yes. Q. IPB did that to provide prospective customers with assurance that ECM bags would in fact biodegrade. A. Yes.”); CCX-34 (“Airpouch Sales & Marketing Alert” stating that “[s]ending this [certificate] to your customer should be your first response for validation”); CCX-257 (ECM customer providing certificate to its customer); CCX-258 (same); CCX-261 (same); CCX-345 (customer asking ECM for certificate because it “[h]elps me with sales.”); CCX-351 (customer asking ECM for certificate “hot rush

		back to me as my customer in California is going to drop our products without some sort of proof that our products [are] biodegradable”).
61	ECM customers copy the language from the Certificate of Biodegradability verbatim in their own marketing materials.	CCX-812 (Kappus Dep.) 22:8-14 (“We basically took the information that ECM had on their paperwork and moved it to our letterhead, transposed it on our letterhead”); 26:24-27:2 (explaining that most of the language from CCX-837 and CCX-838 was taken from ECM’s marketing materials); CCX-62, CCX-458, CCX-459 (customer certifications with ECM certification language).
62	ECM sells the right to make a “biodegradable” advertising claim.	CCX-819 (Sinclair Dep.) 277:21-23 (stating that he advised customers to market biodegradability); CCX-21 at 30 (“Conclusion” of ECM marketing presentation is that “Products can be marketed as ‘biodegradable’”); CCX-330 (Email from ECM Sales Director to potential customer: “If you or your customers want an additive to make your bags totally biodegradable and they want to say so on the bags let me know.”).
63	ECM provides its customers with the ECM biodegradable logo to place on their products, packaging, and advertisements.	CCX-819 (Sinclair Dep.) 432:8-10 (Q. What claims did you intend to convey with the old logo to end-use consumers? A. That the product is biodegradable.); Flexible Dep. 24:22-25:10 (explaining that he provided logo that ECM sent him to his customers so that they could use it as a “sort of label on the box for, you know, for customers to see.”) CCX-308 (email in which ECM advises customer on use of its logo); CCX-309 (same); CCX-316 (same); CCX-317 (same); CCX-319 (same); CCX-320 (same); CCX-322 (same); CCX-358 (ECM providing logo); CCX-359 (same); CCX-361 (same); CCX-362 (same); CCX-364 (same); CCX-374 (same); CCX-403 at 1 (same); CCX-411 at

		ECM-002256 (same).
63	ECM biodegradable logo is a picture of a green tree with the words “ECM” and “Biodegradable.”	CCX-8 and CCX-13.
64	Many customers use the ECM logo, especially on plastic bags.	CCX-816 (Poje Dep.) 52:14-20; CCX-822 (ANS Dep.) 24:13-15; CCX-803 (DTE Dep.) 42:8-13; CCX-307 at 2 (customer explaining to ECM employee that he wanted to use the ECM logo on his bag); CCX-32 (portion of “biodegradable” apple bag with ECM logo); CCX-39 (excerpt from CHAMP website advertising biodegradable gold tees with ECM logo); CCX-44 (“biodegradable” grocery bag with ECM logo); CCX-47 (“biodegradable” shampoo container with ECM logo); CCX-73 – CCX-75 (“biodegradable” shopping bags with ECM logo); CCX-118 (“biodegradable” detergent bag with ECM logo); CCX-134 (bag with ECM logo); CCX-621 (kitchen bags with ECM logo); CCX-623 (restaurant bag with ECM logo). Less frequently, customers used the ECM leaf logo. <i>See, e.g.,</i> CCX-46; CCX-114; CCX-123.
65	ECM provides its customers with marketing materials for the customer to use when selling ECM “biodegradable” plastic.	CCX-816 (Poje Dep.) 37:14-20; CCX-822 (ANS Dep.) 20:17-21:2. CCX-350 (ECM providing flyers that “may be used for marketing”); CCX-364 (“You and your customers can use the attached logos...and their related promotional material.”); CCX-368 (giving customer’s “marketing department” permission to use ECM’s flyer “as they see fit”); CCX-369 (recommending making sales “using the tools that we have given you”); CCX-370 (attaching “sales tools you may find helpful for your sales team”); CCX-373 (attaching “a good tool for your sales team”); CCX-387 (attaching marketing materials “for your sales team”); CCX-390 at 2 (attaching “flyer that might be useful for your sales people”).

66	ECM's Director of Sales, Thomas Nealis, specifically advised customers to refer consumers to the ECM website.	CCX-308; CCX-320.
67	ECM's Director of Sales, Thomas Nealis, specifically advised customers to use ECM's flyer for marketing.	CCX-3; CCX-15; CCX-259; CCX-259A; CCX-266; CCX-266C; CCX-267; CCX-267E; CCX-271; CCX-271D; CCX-368; CCX-373; CCX-387; CCX-390 at 2; CCX-492 at 6.
68	ECM instructed customers to make unqualified biodegradable claims.	CCX-818 (Sinclair Dep.) 42:15-43:14 (testifying that biodegradable would be a very reasonable claim for putting on an item in response to the question whether ECM advised its customer to use the biodegradable claim); CCX-819 (Sinclair Dep.) 277:21-23 ("Q. So you advised your customers to use the term biodegradable in their marketing? A. Right."); CCX-260 (customer informing downstream customer of ECM's feedback on marketing claims: "This bag is Biodegradable" or "This bag is manufactured from 100% Biodegradable plastic"); CCX-315 (advising customer "you do not need to mince words with our additives"); CCX-316 (advising customer to use ECM logo and "state 'totally biodegradable'"); CCX-317 (advising customer on color and language for claim such as "Biodegradable" or "This Liner Is Totally Biodegradable"); CCX-319 (suggesting that bag be labeled "Biodegradable/Recyclable"); CCX-320 (recommending "'packaging and product biodegradable' or simply biodegradable"); CCX-321 (recommending using logo or printing "biodegradable" on bag).
69	ECM provided detailed guidance on a customer's specific ad copy.	CCX-283 (offering to customer to "work together on particular language that [downstream customer] would

		want”); CCX-307 at 1 (correcting advertising claim); CCX-308 (suggesting specific copy for biodegradable claim on bags); CCX-309 (same); CCX-397 (correcting customer’s claim); CCX-408 at ECM-002014 (sending ECM’s “rewriting” of customer’s website page); CCX-562 (suggesting specific advertising language to place on bag made of ECM plastic); CCX-1095 .
70	ECM was integrally involved in developing and approving the marketing claims for “biodegradable” grocery bags used by a Hawaiian grocery store chain called Down to Earth All Natural and Organic (“Down to Earth”). ECM offered its approval of Down to Earth’s biodegradable claims in its press releases and on its bags. ECM recommended that specific, technical language about biodegradability be included in Down to Earth’s claims.	CCX-497 (approving 2009 press release); CCX-498; CCX-803 (DTE Dep.) 54:15-25; 55:18-56:7.
71	Robert Sinclair is the President of ECM.	CCX-818 (Sinclair Dep.) 9:3-5; 62:10-14; 63:21-24; CCX-819 (Sinclair Dep.) 378:19-379:22. (Sinclair, Tr. 745).
72	Mr. Sinclair is ECM’s “main sales contact” and takes responsibility for ECM’s claims.	CCX-350 (email from A. Poje to customer describing Sinclair’s role). CCX-818 (Sinclair Dep.) 194:14-18 (testifying“ . . . but certainly everything in this company that has to do with claims or anything else about the product, you know, comes directly from me. I’m the final say on everything.”) (Sinclair, Tr. 915 (Sinclair agrees he is the “only person at ECM who is responsible for reviewing and approving claims”)).
73	Mr. Sinclair advises customers on both marketing and the “science” behind ECM’s technology.	CCX-813 (Nealis Dep.) 56:24-57:20; CCX-816 (Poje Dep.) 222:8-17; 223:14-22; CCX-819 (Sinclair Dep.) 343:2-9 (“Q. . . Is there anyone in your staff who has

		<p>in-house expertise on scientific testing? A. I am the person that handles all claims, everything to do with scientific testing and everything to do with anything of that sort.”).</p> <p>(Sinclair, Tr. 908 (Sinclair is the one who is “ultimately responsible at ECM BioFilms for addressing issues that come up with . . . the science”)).</p>
74	Mr. Sinclair is a lawyer by training.	<p>CCX-818 (Sinclair Dep.) 7:23-8:4; CCX-819 (Sinclair Dep.) 393:8-394:8.</p> <p>(Sinclair, Tr. 745-746). (Sinclair, Tr. 912).</p>
75	Mr. Sinclair does not have any formal science training beyond a smattering of high school and undergraduate science classes, some time teaching science in the Cleveland Public Schools, and reading <i>Scientific American</i> .	<p>CCX-818 (Sinclair Dep.) 149:16-150:16.</p> <p>(Sinclair, Tr. 746 (Q: “Are you a scientist?” A: “No, I’m not. I’m a layperson that has a good background in science and I’ve very much read a lot of science and think about it, and so forth, all the time, but no, I’m not a scientist.”)).</p>
76	ECM’s Director of Sales is Thomas Nealis	<p>CCX-819 (Sinclair Dep.) 14:17-19 (“Q. Again, who is Tom Nealis? A. Tom Nealis is the Director of Sales located in Indiana”). CCX-813 (Nealis Dep.) at 9:24-10:3 (“Q. Do you have a particular job title? A. My title is Director of Sales. You can call me anything you want, but bottom line, I’m a salesman.”)</p> <p>(Sinclair, Tr. 761).</p>
77	Mr. Nealis disavows knowledge about most aspects of ECM’s business and customer relationships.	<p>See CCX-813 at 10-12.</p>
78	Mr. Nealis claimed that he did not know how many customers ECM had.	<p>CCX-813 (Nealis Dep.) 10:23-25.</p>
79	Mr. Nealis claimed that he did not know why they wanted to buy the ECM additive.	<p>CCX-813 (Nealis Dep.) 12:11-13.</p>
80	Mr. Nealis claimed that he did not know the size of ECM customers.	<p>CCX-813 (Nealis Dep.) 13:1-3.</p>

81	Mr. Nealis does not have any college degree.	CCX-813 (Nealis Dep.) 53:1-3.
82	Until mid-2013, ECM's Regulatory Specialist was Alan Poje.	CCX-816 (Poje Dep.) 11:1-5; 31:4-8. (Sinclair, Tr. 843 (Poje worked as ECM's regulatory affairs specialist)).
83	Mr. Poje advised customers on plastics extrusion (the mechanics of adjusting the manufacturing process to incorporate the ECM additive).	CCX-816 (Poje Dep.) 22:23-24
84	Mr. Poje had business cards describing himself as ECM's "Vice President for Engineering Development" and he described himself this way to at least one customer	CCX-816 (Poje Dep.) 32:18 – 33:22 (discussing CCX-677, an email in which Mr. Poje described himself to a customer as Vice-President of Engineering Development).
85	Mr. Poje claimed that he never actually filled the role of "Vice President for Engineering Development."	CCX-816 (Poje Dep.) 31:9-11; 32:25-34:5.
86	Many of ECM's customers and downstream users are relatively small companies—"mom and pop"-type businesses.	CCX-819 (Sinclair Dep.) 304:18-23; CCX-813 (Poje Dep.) 14:20-15:3.
87	ECM's customers show that they did not have the resources or know-how to evaluate ECM's biodegradability claims (beyond seeking information from ECM itself) or conduct their own testing.	CCX-809 (Flexible Dep.) 34:21-38:10 (answering series of questions about resources and ability to evaluate ECM's additive with uniform answers: insufficient resources and ability to independently evaluate); CCX-800 (BER Dep.) 21:6-24:12 (same); CCX-822 (ANS Dep.) 14:5-15:15; 16:5-7; 16:15-20 (same); CCX-803 (DTE Dep.) 13:9-19:9 (same); CCX-811 (IPB Dep.) 34:7-38:14 (same); CCX-812 (Kappus Dep.) 18:19-21:18 (same); CCX-804 (Eagle Dep.) 31:4-32:19 (same); CCX-817 (Quest Dep.) 34:2-12 (same).
88	Island Plastic Bags is still a small company—only about 16 employees and, as such, does not employ anyone with any expertise related to biodegradability.	CCX-811 (IPB Dep.) 33:25-38:14.
89	Island Plastic Bags reviewed ECM's testing (the McLaren/Hart Report), but had no way to evaluate whether the testing had been properly conducted and could reliably support its conclusions.	CCX-811 (IPB Dep. 38:15-40:6).
90	Despite its sophistication in manufacturing, Island Plastic Bags needed to rely—and did, in	CCX-811 (IPB Dep. at 40). CCX-804 (Eagle Dep. at 25).

	fact, rely—on ECM when it came to understanding biodegradability. Island Plastic Bag’s story is not unique. For example, the deposition of Eagle film extruders shows that the company “couldn’t perform” any testing because it doesn’t “have any of that testing equipment internally....Way too big of a thing for us to manage, being a small company.”	
91	Other customers did have the resources to conduct or commission their own testing.	CCX-172 (email between employees of potential ECM customer, identifying inadequacies in each of ECM’s tests); CCX-173 (test on ECM plastic commissioned by potential ECM customer).
92	3M is a global manufacturer with approximately \$30 billion in sales (employing 75-80,000 people).	CCX-821 (3M Dep.) 12:8-21.
93	3M has its own environmental laboratory, with ready capacity to conduct its own testing of ECM’s additive.	CCX-821 (3M Dep.) 18:12-19:8.
94	3M conducted a biodegradation study that showed no biodegradation of plastic containing the ECM additive. 3M is not unique. Other companies had sufficient sophistication in evaluating biodegradation to test and reject ECM’s additive. For example, Covidien identified the potential issues related to the additive, and sent plastic with the ECM additive to an independent laboratory, Organic Waste Systems, for testing—which showed no biodegradation of ECM plastic.	CCX-153; CCX-154 and CCX-155 (project outline and data collection showing the rigor of 3M’s testing process); CCX-230; CCX-254-256; CCX-157 (test); CCX-158 (presentation summarizing test); CCX-821 (Joseph at 66, Ex. 17).
95	Some companies had the resources to commission testing—but did not have the expertise to meaningfully evaluate the results.	CCX-802 (D&W Dep.) 65:16-25; 94:10-95:4 CCX-801 (D&W Dep.) 16:23-17:17; 18:8-17; 25:8-16.
96	ECM customers turned to Mr. Sinclair, ECM’s president, for guidance in understanding negative results.	CCX-323-CCX-325 (Sinclair explains away bad test results); CCX-954.
97	Correspondence with these customers shows that Mr. Sinclair is adept at explaining away negative test results by assuming testing flaws and bias.	CCX-325 (explaining negative results because of testing has “fundamental problems”) CCX 575; CCX-422.
99	Mr. Sinclair also learned to steer potential customers away from testing labs that provided	CCX-422 at 53-61.

	negative results and towards labs whose dubious testing protocols could produce a semblance of positive results.	
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102	ECM's spurious claims have not gone unnoticed; repeatedly, customers, distributors, and others informed Mr. Sinclair and ECM that ECM's testing did not substantiate its claims.	CCX-250; CCX-253 ("We chose ECM because of your strong claims for biodegradability, and now it seems we are unable to defend them."); CCX-323; CCX-327; CCX-328; CCX-375; CCX-381; CCX-382; CCX-386; CCX-391; CCX-400; CCX-402; CCX-409; CCX-428 ("Every scientist we have spoken to tell us that your claims are false and impossible to prove. We cannot put our name on a product that we cannot stand behind.").
103	Mr. Sinclair knew that the National Advertising Division of the Better Business Bureau and at least two foreign tribunals had found that several ECM customers had made false and unsubstantiated biodegradability marketing claims (that used the very language that ECM assured its customers was backed by testing) concerning products containing the ECM additive.	CCX-26; CCX-27; CCX-28; CCX-177; CCX-178; CCX-179; CCX-180; CCX 181; CCX182; CCX-183; CCX-184; CCX-185; CCX-186; CCX-187; CCX-188; CCX-189; CCX-190; CCX-191; CCX-375; CCX-471. CCX-203-CCX207; CCX-214-215; CCX-219; CCX; 225; CCX-222; CCX-570; CCX-810 at 47-49; CCX-184; CCX-188-CCX-193; CCX-696 (Sinclair, Tr. 1625 (upon receipt of the Masternet NAD decision, Sinclair offered to prepare a point-by-point refutation)). (Sinclair, Tr. 1630-1634 (admitting receiving copy of NAD decision against FP International)). (Sinclair, Tr. 1636-1637 (Sinclair was aware of the Dispoz-o NAD decision)).
104	ECM continued making its claims and routinely dismissed criticisms as nothing more than bias against the company.	CCX-323; CCX-324.
105	Mr. Sinclair has referred to Professor Narayan as, among other things, "very biased," and a "paid proselytizer."	Sinclair Dep. 284:4-289:14; CCX-251; CCX-253; CCX-289; CCX-294.
106	Mr. Sinclair has also accused entities such as the Biodegradable Products Institute ("BPI") and Organic Waste Systems, Inc. ("OWS") of	Sinclair Dep. 260:7-10 (describing BPI as "rabid opponents of us"); 262:20-281:21; 362:18-22; CCX-21 (describing

	being biased opponents of ECM.	BPI as “prime mover in the obfuscation campaign” conflating biodegradable and compostable technologies); CCX-251; CCX-253; CCX-273; CCX-290; CCX-295; CCX-297. CCX-422 at 54-63 (Sinclair accusing OWS of bias and skewing test results due to politics); (Sinclair, Tr. 1692-1697 (discussing OWS’s perceived bias and involvement with the “corn lobby”)).
107	ECM advertises on its website, www.ecmbiofilms.com.	CCX-25; CCX-726.
108	The ECM website is publicly available and has been visited by at least some end-use consumers.	CCX-326; CCX-819 (Sinclair Dep.) 312:18-314:10.
109	Landfill conditions do not support short degradation times in a landfill.	CCX-893 at 10-12 (“Biodegradation in landfills is remarkably slow because typical U.S. landfills are primarily anaerobic environments that are relatively cool with low-moisture.”); RX-853 at 3 (“[T]he suggestion that all materials should biodegrade within one, or even five years of disposal is not consistent with even the highest rates of biodegradation expected for [landfills].”). (Tolaymat, Tr. 133-134). (Tolaymat, Tr. 145). (Tolaymat, Tr. 155-156 (“it’s going to take obviously more than five years for a – even the most biodegradable material to completely decompose in a landfill environment, even under the optimum conditions of wet landfills”)).
110	Since the Green Guides’ revision in October, ECM has developed a version of its logo with the “some period greater than a year” disclaimer. However, ECM never told customers to stop using the old logo and customers have continued to use the old logo.	CCX-819 (Sinclair Dep.) 277:11-278:16; 407:13-24; 412:9-413:5.
111	ECM’s marketing materials contrast the “hundreds or thousands of years” that it takes	CCX-19; CCX-21 (“[A]ll of the commodity

	for conventional plastics to biodegrade with ECM Plastics as biodegradable in a “hundredth” of that time or less.	plastics used in the world today will take hundreds of thousands of years or more to degrade naturally in the environment; Plastic productions with the ECM [Additive] will biodegrade . . . in a hundred thousandth of that time or less.”).
112	ECM’s marketing materials repeatedly reference landfills.	<i>See</i> CCX-3; CCX-6; CCX-7 at 7; CCX-10 at 2; CCX-12; CCX-15; CCX-21 at 22; CCX-25 at 1.
113	ECM’s marketing materials specifically contrast its technology as working in landfills with other degradable alternatives that do not.	CCX-17.
114	ECM’s marketing materials with the new claim, “biodegrades in sometime greater than one year,” still contrasted long biodegradation times for untreated plastic to the fraction of time for ECM Plastic.	<i>See</i> CCX-25 at 104 (“Petrochemical plastics would normally take hundreds or thousands of years or even longer to biodegrade; with our additives, these same plastic formulas biodegrade in a hundredth of that time or less.”)
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127	ECM’s experts have opined that it would be unreasonable to believe that plastic products will biodegrade in one year or even five years because these times are inconsistent with even the shortest expected degradation times.	<i>See, e.g.</i> , RX-853 at 3 (“[T]he suggestion that all materials should biodegrade within one or even five years of disposal is not consistent with even the highest rates of biodegradation expected for mixed MSW.”) RX-855 at 8 (“[T]he expectation that all

		plastics with the ECM additive added in the usual amount (i.e., at a level of 1 or at most a few percent) should completely . . . degrade in typical landfill conditions, in a time period of 1 year or even 5 years, is unrealistic.”).
128	Dr. McCarthy is a professor of Plastics Engineering at the University of Massachusetts Lowell with more than thirty years’ experience studying both the chemical and mechanical behavior of polymers, including their biodegradability.	CCX-891 at 3-5. (McCarthy, Tr. 359, 361).
129	ECM recommends that a small concentration, 1% to 5%, of its Additive be melt-batch blended with a non-biodegradable conventional plastic, such as polyethylene.	CCX-4; CCX-17; CCX-818 (Sinclair Dep.) 164:18-166:8. (Sinclair, Tr. 787-788 (1% ECM additive must be added during the manufacturing process to ensure that the additive remains viable in the finished product)). (Sinclair, Tr. 790 (if a manufacturer adds less than 1% by weight, the product will not biodegrade at all)). (Sinclair, Tr. 797-798). (Sahu, Tr. 1813 (ECM additive is added to plastics by “blending through melting and then recooling afterwards”)).
130	A physical blend of a biodegradable polymer with a conventional plastic does not alter the chemical structure of the conventional plastic, a view resoundingly supported by the literature cited by ECM’s own experts.	CCX-891, ¶ 64. CCX-895 at 13 (“Addition of additives into conventional plastics does not increase the carbonyl content of the plastic nor does it reduce the molecular weight of the high molecular weight polymers or add hydrolysable linkages or unsaturated carbon bonds.”) CCX-895 at 13-14 (“Consistent with this fact [that additives do not affect the chemical structure of the conventional plastic], studies in which even large percentages of starch have been incorporated into PE (50% to >80%) do not show any improvement in the biodegradation of the PE fraction (Nakashima et al., 2002). For example

		<p>blends of 50% and 83% starch added to polyethylene displayed a maximum of 49% and 78% weight loss upon 16 months incubation in soil (Nakashima et al., 2002).”).</p> <p>(McCarthy, Tr. 387).</p> <p>CCX-892 ¶¶ 10-16 (explaining why the articles cited by Dr. Sahu are irrelevant to ECM’s claims)</p> <p>(Michel, Tr. 2873-2875)</p>
131	<p>Because the additive does not alter the chemical characteristics that make conventional plastics resistant to biodegradation, the non-biodegradable plastic component is no more susceptible to biodegradation after blending than it was before.</p>	<p>CCX-891, ¶ 64.</p> <p>(McCarthy, Tr. 387).</p>
132	<p>Even assuming ECM Plastic degrades faster (<i>e.g.</i>, by breaking the plastic into smaller pieces), the amount of time it would take for the conventional plastic to completely biodegrade would not be reduced to five years or even decades in any environment.</p>	<p>CCX-891, ¶ 65.</p> <p>(McCarthy, Tr. 385).</p> <p>(Sahu, Tr. 1953-1954 (ECM plastic would take 30 years to completely biodegrade, possibly up to 100 years on the “very, very high side”)).</p>
133	<p>ECM Plastic could take as long as the conventional plastic to biodegrade (because it still consists of 99% conventional plastic), or even longer (if the fragmented pieces become recalcitrant to biodegradation).</p>	<p>CCX-891, ¶ 65.</p> <p>(McCarthy, Tr. 386 (“ECM plastics will not completely break down in an appreciably faster rate than conventional plastics without the ECM additive”)).</p> <p>(McCarthy, Tr. 681-82 (testifying that conventional nondegradable plastics treated with 1% ECM additive will not completely break down into elements found in nature within one year)).</p> <p>(McCarthy, Tr. 682 (testifying that conventional plastics treated with 1% ECM additive will not completely break down into elements found in nature within 5 years)).</p>
134	<p>The Competent and Reliable Scientific Evidence standard is consistent with the level of substantiation expected from experts in the</p>	<p>(CCX-891, ¶ 37; <i>see also</i> CCX-892).</p>

	field, who view claims of biodegradable conventional plastic with great skepticism	
135	To satisfy polymer scientists that 1% additive will make conventional plastics biodegradable in a stated timeframe and disposal condition, the claimant should provide the results of appropriately-analyzed independent, well-designed, well-conducted, well-controlled testing. The testing should use the appropriate plastic application, load rate, inoculum, test conditions, and sample weight, over an appropriate duration of time.	CCX-891, ¶ 38. (McCarthy, Tr. 412).
136	Dr. Tolaymat states that tests must simulate landfill conditions if the claim is disposal in such conditions. Our experts independently conclude that ECM’s evidence falls short of these requirements for several reasons.	CCX-891, ¶ 81; CCX-893, ¶¶ 50, 59-85. (Tolaymat, Tr. 176). (Tolaymat, Tr. 202 (faulting ASTM D5511 tests because they do “not simulate a landfill environment”)). (Tolaymat, Tr. 296-297).
137	The tests conducted by Dr. Barber rely on a weight loss methodology.	CCX-892, ¶ 24. (Barber, Tr. 2100 (Dolco tests primarily involved a weight loss methodology to determine biodegradation)). (Barber, Tr. 2106-2109 (Dispoz-o, EDS, FP International tests primarily involved a weight loss methodology to determine biodegradation)).
138	The scientific community does not consider weight loss tests alone sufficient for determining biodegradation.	CCX-892, ¶¶ 24-26. RX-855 at 41 (“It is conventional wisdom, now, with some justification, that the only true indicator of biodegradation is, in fact, gas evolution. . . .”); RX-855 at 42. (McCarthy, Tr. 414, 457).
139	Our experts criticize ASTM D5511 as a basis to support ECM’s claims.	CCX-891, ¶¶ 51-53; CCX-892, ¶ 21; CCX-893, ¶¶ 77-84. (Tolaymat, Tr. 202-212). (McCarthy, Tr. 452 (most problematic tests on ECM plastics were the 5511 tests)).
140	ECM’s experts and Tom Poth of Eden	RX-853, at 8 (Dr. Barlaz stating

	Laboratories criticized ASTM D5511.	<p>“[M]any of the tests used to measure biodegradability, e.g., ASTM D5511, are designed to measure intrinsic biodegradability.”); RX-854, ¶ 65 (Dr. Burnette stating “The ASTM D5511 test is not representative of all possible MSW landfill conditions.”).</p> <p>(Poth, Tr. 1522-1523 (confirming that the witness told Sinclair that the 5511 test was “on its way out” and “a cheap-and-dirty test”)).</p>
141	Timothy Barber’s tests are unreliable.	CCX-891; <i>see also</i> RX-854, ¶ 71 (referring to the tests as inconclusive)
142	Northeast Lab’s tests of ECM plastic are unreliable.	CCX-891, ¶ 88.
143	Eden Lab’s tests of ECM plastic are not competent and reliable.	CCX-891, ¶ 89. (McCarthy, Tr. 687-88 (testifying that the D5511 tests conducted by Eden Laboratories are not competent and reliable)). (McCarthy, Tr. 465-466 (testing he reviewed related to ECM additive yielded unreliable results)).
144	Stevens Ecology, O.W.S., North Carolina State University, and Ohio State University tests show very little (or in some cases no) biodegradation of ECM Plastics under a variety of conditions.	CCX-891, ¶¶ 75-86.
145	ECM claimed to render conventional plastics “totally,” “completely,” “fully,” and “100%” biodegradable.	CCX-3 (“fully”); CCX-7 at 7 (“fully”); CCX-10 (“completely”); CCX-12 (“100%”). CCX-316 (“totally”); CCX-317 (“totally”).
146	ECM conveyed that plastics completely biodegrade in most landfill environments.	CCX-15; CCX-25 at 1.
147	Tests must be conducted for a sufficient length of time to demonstrate that the entire treated plastic, not just the biodegradable additive, will be consumed.	CCX-891, ¶ 38f.
148	Biodegradation tests must show at least 60%	CCX-891 ¶ 38f.

	biodegradation to support a claim of complete biodegradation.	
149	ECM rests its claim of complete biodegradation on the assumption that once started, biodegradation will go to completion.	CCX-15 (“The process continues until the plastic products become part of the organic components of the soil just like biodegraded sticks or other pieces of wood become part of the soil.”).
150	The scientific community rejects extrapolation of biodegradation results.	CCX-891, ¶ 55; CCX-892, 892, ¶¶ 22, 23. CCX-83 (ASTM D5511 precludes extrapolation of results) (McCarthy, Tr. 477-478). (Sahu, Tr. 1795-1796 (testifying that it would be “unusual” for to extrapolate a time to complete biodegradation from a rate derived from a test). <i>See also</i> (Barber Tr. 2081-2082 (conceding that rates of biodegradation cannot be extrapolated beyond the precise environmental conditions or to other plastics)).
151	Mechanism of action to explain how ECM Plastics will biodegrade to completion	CCX-4.
153	ECM’s expert concedes that the presence of a biofilm does not indicate that the microorganisms are using the plastic as a food source.	RX-840 at 41-43.
154	To support claims of biodegradation in landfill conditions, the experts agree that tests should be run at appropriate temperatures with appropriate anaerobic bacteria.	CCX-893, ¶ 51. CCX-891, ¶ 38c. and d. RX-853 at 7-9. (Tolaymat, Tr. 203 (faulting ASTM D5511 for calling for a temperature that is “much higher than what you would expect to see in a municipal solid waste landfill”)). (McCarthy, Tr. 391-392). (McCarthy, Tr. 442-443 (5526 tests are preferable to 5511 tests for longer-time degradation results, in part, because they simulate “slower-degrading materials at a temperature that’s closer to landfill

		conditions’’)). (Barlaz, Tr. 2300 (testifying that for the purpose of determining whether a material is biodegradable in a landfill, only anaerobic testing conditions are relevant)).
155	Hot temperatures could cause abiotic degradation of plastic that would not occur at more typical landfill temperatures of 37°C.	RX-943 (Barlaz, Dep. Tr. 82); RX-843 at 142.
156	The types of anaerobic bacteria that survive at the hotter temperatures are not the same types of anaerobic bacteria that operate at the cooler landfill temperatures.	RX-943 (Barlaz, Dep. Tr. 82); CCX-893, ¶54. (Tolaymat, Tr. 141).
157	In tests conducted under the appropriate temperature range, virtually no biodegradation was observed.	CCX-946; CCX-951; CCX-954.
158	At least a significant minority of consumers extrapolate rate and extent information concerning biodegradation times.	CCX-860, ¶¶ 43-44.
159	Robert Sinclair knew the 9 month to five year claim was false.	CCX-818 (Sinclair Dep.) 75:11-12 (“Q. Are you the only person at ECM who is responsible for reviewing and approving [] claims? A: “At this point, yes.”); 81:5-12 (“Q. “[W]hen you came up with the nine-month-to-five-year claim, what did you base that on? A. Again, nine months to five years is not really the claim. It’s only when you guys brought it up that it really like comes down to, Oh, what do you base that on and so forth, what’s all this.”); 81:5-82:20 (testifying that the 9 months to 5 years claim “was simply a frame of reference to get things out of the 6400 realm, that we’re not talking about that, that we’re talking about true biodegradation of things like a piece of wood.”). (Sinclair, Tr. 986-988).
163	ECM knew that the ASTM 5511 protocol was not a pass/fail standard.	CCX-963.
164	ECM routinely conveyed to its customers that ECM Plastics were “certified to”; “passed”; or met the ASTM 5511 standard.	CCX-288.

165	ECM customers made unqualified claims.	CCX-308; CCX-50.
166	Even in landfills that are considered to be the most conducive to biodegradation (so-called “bioreactors”), Dr. Barlaz reports a range of degradation times for MSW anywhere from 24 (for rapidly biodegrading food waste) to over 200 years.	RX-853 at 3, 14. (Barlaz, Tr. 2297 (explaining that even under accelerated biodegradation conditions, readily degradable municipal solid waste will not completely biodegrade in less than five years)).
167	Dr. Barlaz conducted at least four biodegradation tests of ECM Plastics under the Biochemical Methane Potential Test (BMP).	CCX-946-CCX-948; CCX-952; CCX-933; CCX-946; CCX-951; CCX-953; CCX-954. (Barlaz, Tr. 2306-20).
168	The results of one of Dr. Barlaz’s BMP tests showed no methane production.	CCX-951.
169	The results of three other BMP tests by Dr. Barlaz showed negligible amounts of methane production.	CCX-952; CCX-946; CCX-954
170	Landfill conditions do not support rapid degradation times.	RX-853 at 3, 14; RX-855 at 8.
171	The ECM Additive is mostly a synthetic biodegradable polymer like polycaprolactone (PCL).	CCX-891 ¶61.
172	The amount of methane generated in Dr. Barlaz’s tests exceed the amount of methane attributable to the additive	<i>Compare CCX-951 and CX-954 with CCX-946 (determining the methane potential of the ECM Additive alone).</i>
173	Dr. Barlaz offers no opinion in his expert report regarding the biodegradability of ECM Plastics.	RX-853
174	There are several tests that also report no biodegradation was observed at the conclusion of the test.	CCX-164; CCX-174-CCX-176; CCX-156; CCX-157; CCX-163; CCX-169-CCX-171.
175	According to Dr. Barlaz, the “BMP is an appropriate screening tool for biodegradability in landfills although the actual volume of methane generated in a landfill may well be less than that measured by a BMP test.”	CCX-952 at 1.
176	ECM experts Drs. Burnette and Barlaz concede that they are not polymer scientists and do not have the expertise to opine specifically on the biodegradability of plastics.	<i>See RX-840 at 65-66, 68, 204-5 (Dr. Burnette: (1) admitting he does not understand the role crystallinity plays in polymer biodegradation; (2) identifying “oxobiodegradable” as a “slang term”; and (3) admitting not being offered as a polymer expert);</i>

		CCX-943 at 26-27, 142 (Dr. Barlaz discussing (1) that he is not a polymer chemist, so he cannot speak to whether a non-homogenous polymer could be considered biodegradable; and (2) how one would need to be a polymer chemist to understand whether a plastic could be abiotically transformed at the temperatures of the ASTM D5511).
177	Dr. Barber's test looks to measurements of free chloride as an indicator of biodegradation.	CCX-892 at 12.
178	Dr. Barlaz stated that he was skeptical of the ASTM D5511 test.	CCX-948
179	ECM expert Dr. Burnette concedes that the presence of a biofilm does not indicate that the microorganisms are using the plastic as a food source.	RX-840 at 41-43.
180	Dr. Stephen Joseph, a 3M chemist, consulted with colleagues who were immediately suspicious of ECM's claims.	CCX-821 (Joseph at 43, Ex. 7).
181	Based on their suspicions of ECM's claims, 3M conducted its own test to determine if ECM's additive would make a plastic blend biodegrade to any extent.	CCX-821 (Joseph at 60, Ex. 17).
182	ECM's expert concedes aerobic tests (with oxygen) are irrelevant to claims of biodegradation in landfills.	RX-853 (Barlaz Report at 7) ("To begin, for purposes of biodegradability under landfill conditions, only anaerobic biodegradability is of relevance.")
183	ECM expressly claims that its additive enables conventional, non-degradable plastic to fully biodegrade in nine months to five years in a landfill since at least 2005.	CCX-274A; CCX-701
184	ECM's technical data sheets contained the unqualified biodegradable claim.	RX-683; RX-327 at 3; RX-326 at 5.
185	ECM's pricing sheets contain the unqualified biodegradable claim.	RX-330; RX-331.
186	ECM's customers used unqualified biodegradable claims to market their products.	CCX-30-31 (APM marketing); CCX-33 (Earth Aware marketing materials); CCX-39 (CHAMP marketing materials); CCX-40 (Good Earth marketing materials); CCX-41 (Crayex marketing materials); CCX-43 (D&W marketing materials); CCX-46 (photo of Green Natura bottle with unqualified biodegradable claim); CCX-47 (photo);

		CCX-49 (Epsilon Plastics marketing materials); CCX-50 at 2 (Flambeau); CCX-51 (Flexible Plastic); CCX-52; CCX-56, RX-229, RX-15, RX-16 (IPB); CCX-59 (Medical Arts Press); RX-00 (AMPAC); RX-02 (Sentry Green); RX-26 (Eaton)
187	ASTM D5511 is a screening-level test designed to evaluate whether the test specimen is capable of biodegrading under optimal conditions.	CCX-891 ¶¶ 51-53 (ASTM D5511 is conducted under optimal conditions).
188	Dr. Sahu's report and testimony estimate biodegradation times anywhere from 30 years to as long as 100 years for the thinnest of plastic films that contain ECM Additive.	RX-855 at 44; Sahu Tr., 1953-1954.
189	ECM concedes that conventional plastics are not biodegradable.	CCX-818 (Sinclair Dep. Tr. at 56).
190	Scientists view claims of biodegradable plastic with great skepticism.	(CCX-891, ¶ 37; <i>see also</i> CCX-892).
191	<p>ECM's expert David Stewart testified as follows:</p> <p>QUESTION: Assume that plastics manufactured with the ECM additive will not in fact biodegrade in landfills in less than five years. . . . Given that assumption, you would agree with me, wouldn't you, that prohibiting that claim would serve consumer welfare?</p> <p>STEWART: If it's not true, yes, prohibiting that specific claim would serve consumer welfare.</p> <p>QUESTION: Assume that plastics manufactured with the ECM additive will not in fact biodegrade in landfills in less time than plastics made without the additive. . . . Given that assumption, you would agree with me, wouldn't you, that allowing that claim would not serve consumer welfare; correct?</p> <p>STEWART: I would agree with that, yes.</p> <p>QUESTION: In this regard, you views with respect to policy really turn on the science; correct?</p>	(Stewart, Tr. 2804-2805).

	STEWART: That is correct, yes.	
192	“Convergent validity” refers to the degree that studies employing different methodologies yield similar results.	(Frederick, Tr. 1057-1058). <i>See also</i> CX-865 at 13.
193	<p>Professor Shane Frederick gave the following example regarding convergent validity:</p> <p>There’s a genuine question [in fisheries about whether tuna fish] have a body temperature which is higher than the external water in which they swim. And so one could imagine trying to ascertain the [answer] to this by embedding thermometers . . . inside of a live tuna fish. And suppose that you had three different thermometers constructed by three different companies using three different designs, and you embedded all three in the tuna fish, and . . . suppose that you got back the results from these three different designs: 75 degrees, 73 degrees, 74 degrees. You can conclude with a considerable degree of certainty that that tuna fish’s temperature is around 74 degrees because . . . they are different[ly] designed thermometers. They’re all yielding essentially the same result. That’s convergent validity.</p>	(Frederick, Tr. 1058-1059).
194	In 2006, the American Plastics Council (“APCO”) conducted an approximately 1000-respondent telephone survey.	(Frederick, Tr. 1037). CCX-860 at 7.
195	The survey focused primarily on plastic products; and 60% said that packages labelled “biodegradable” should biodegrade within one year or less.	(Frederick, Tr. 1037). RX-597 at 2.
196	In 2010, a company (EcoLogic) manufacturing a plastic additive similar to ECM’s product engaged a survey firm (Synovate) to conduct a 2000-respondent internet panel survey.	(Frederick, Tr. 1046-1047).
197	In the Ecologic study, 25% stated that “less than one year” was a reasonable amount of time for a “biodegradable” package to decompose in a landfill.	RX-673 at 4. CCX-860 at 11.
198	In 2014, Complaint Counsel engaged Professor Frederick to conduct surveys through Google Consumer Surveys (“GCS”) to assess how much time consumers believe plastic products labelled “biodegradable” will take to biodegrade.	(Frederick, Tr. 1114).

199	Professor Frederick conducted twelve GCS surveys addressing this issue—each employing different wording an images—and the results ranged from 20%-52%.	CCX-860 at 30-32.
200	Professor Frederick estimated that, overall, 35% believe plastic products will biodegrade in one year or less. (“Q: Based on your research and expertise, in your professional opinion, what percentage of American consumers believe that a plastic product labelled ‘biodegradable’ will biodegrade completely within a year in a landfill?” A: I would say 35 percent.”).	(Frederick, Tr. at 1180-1081).
201	In 2014, ECM’s expert, Dr. Stewart, supervised a 400-participant landline survey.	(Stewart, Tr. 2687). RX-856 at 18, 23.
202	Dr. Stewart never asked respondents to estimate how long it would take plastic products labelled “biodegradable” to biodegrade.	(Stewart, Tr. 2629-2630).
203	Dr. Stewart’s landline callers asked (without specifying a material or that the product was labelled “biodegradable”): “If something is biodegradable, how long do you think it would take for it to decompose or decay?”	(Stewart, Tr. 2777).
204	Of the 400 respondents, 206 gave codeable estimates, and of those 206, 33% gave estimates of one year or less.	(Stewart, Tr. 2790).
205	Many respondents gave nonspecific responses such as “I don’t know,” “it depends,” or other responses not quantifiable as a specific biodegradation time estimate.	(Stewart, Tr. 2790).
206	Dr. Stewart’s landline callers read ECM’s “some period greater than a year” disclaimer to respondents, and asked: “In your own words, what does this claim mean to you?”	(Stewart, Tr. 2796).
207	Although Dr. Stewart did not ask respondents to estimate biodegradation times, 150 respondents still gave estimates. Of those respondents—and notwithstanding the disclaimer—50% (75 respondents) gave estimates of a year or less.	(Stewart, Tr. 2796). (Stewart, Tr. 2804).
208	Professor Frederick cited the convergent validity between these different studies to conclude that, overall, the conclusion that at least a substantial minority of consumers believe that plastic products labelled “biodegradable” will biodegrade within one year.	(Frederick, Tr. 1043-1044 (“[O]ften in cases like this where the construct of interest is not something readily determinable by some other method, you need to compare the results of one survey to the results of other surveys and see whether . . . those results are giving you the same result, the same fact. That’s sort of known as convergent validity. And as you do

		<p>different surveys—if different surveys using different designs conducted by different people at different times, independent surveys, are yielding the same results, then you can gain confidence that those results are valid, that they’re measuring what they intend to measure.”)).</p> <p>(Frederick, Tr. 1145 (“[T]his is a study that was done at a different time using a different methodology. We call it APCO. It was a telephone study. This is a Google Consumer Survey. I did this survey, not APCO. It was done eight years later, and so forth, and yet you’re getting responses that are not too different from the ACPO study.”)).</p> <p>(Frederick, Tr. 1155 (“Q: How [do the results of your GCS study] relate to . . . convergent validity? This can be an illustration [] that when you have different studies using different methodologies conducted by different investigators at different times using slightly different question wording, different images, and so forth, and yet in all these cases you’re getting estimates that are on the order of a third [of year-or-less responses]”)).</p> <p>(Frederick, Tr. 1173 (“We have an issue again where there’s three different studies conducted independently by different people using different designs—phone, Internet survey, Google Consumer Surveys—that are yielding results which are qualitatively comparable to one another and therefore I think providing evidence of convergent validity of the results obtained.”)).</p>
209	An already overwhelming argument becomes even stronger if one moves the benchmark to five years. In APCO, 65% of respondents believe that packages labelled “biodegradable”	RX-597 at 2.

	should biodegrade within four years.	
210	Of 206 respondents in Dr. Stewart’s survey who gave specific estimates about how long an unspecified material would take to biodegrade, 58% estimated within five years.	(Stewart, Tr. 2791).
211	According to Synovate, 45% of consumers believe that “less than five years” is a reasonable amount of time for a “biodegradable” package to decompose in a landfill.	RX-673 at 4. CCX-860 at 11.
212	In Professor Frederick’s GCS research, depending on the type of question and the wording, from 40% to 76% of respondents understood that a plastic product labelled “biodegradable” would biodegrade within five years.	CCX-860 at 30-33.
213	Of the twelve questions Professor Frederick asked directly addressing this subject, more than 50% of respondents understood that a plastic product labelled “biodegradable” would biodegrade within five years in nine of twelve cases.	CCX-860 at 30-33.
214	<p>Dr. Stewart’s attempt to rebut convergent validity reflects his confusion:</p> <p>QUESTION: Is it, in your view, possible to rehabilitate a survey that is flawed by reliance on another survey you regard as also flawed?</p> <p>STEWART: Two surveys that are both flawed don’t produce an unflawed and valid survey. Two flawed surveys are still both flawed, and the fact that they might reflect something similar may simply reflect the fact that they share the same flaw.</p> <p>QUESTION: What if I gave you three flawed surveys? Would that make a difference?</p> <p>STEWART: You could give me three, four, five. If they’re all flawed, they’re—you know, they’re not valid. They may all even produce the same outcome, but that outcome could be produced because they all share the same flaw.</p>	(Stewart, Tr. 2619-2620).

215	Dr. Stewart acknowledged that “[n]o study is perfect.”	(Stewart, Tr. 2766).
216	Professor Frederick is an academic who has not testified before, and who focuses primarily on research and teaching.	(Frederick, Tr. 1026).
217	When asked, on cross-examination, “[w]hat do you consider to be the generally accepted survey principles that define a valid survey?,” Professor Frederick responded: “A valid survey is one which produces accurate results.”	(Frederick, Tr. 1187).
218	Professor Frederick collected approximately 29,000 responses to approximately sixty different questions he designed and paid GCS to pose. As he explained at trial, Google pays approximately 340 mainstream internet content providers to present survey questions to internet users who would otherwise need to pay to receive the content. Put differently, GCS gives internet users the opportunity to obtain content from behind a paywall in exchange for answering the GCS survey question. To the extent possible, GCS then infers certain demographic information (gender, approximate age, geographic region, urban density (whether the respondent resides in an urban, suburban, or rural area), and income range based on the respondent’s IP address and browsing history. GCS then reports this demographic information, along with the exact results of the survey, back to the researcher (in this case, Professor Frederick).	(Frederick, Tr. 1062-1064). CCX-863 (results). CCX-867 (product overview). CCX-868 at 3 (product summary). CCX-976 (GCS illustration Professor Frederick prepared and testified about). CCX-1074 (Google promotional video explaining GCS). CCX-865 at 3 (discussing Professor Frederick’s teleconferences with Google).
219	Every piece of data collected in response to each of Professor Frederick’s questions is the record (in Excel format).	CCX-863.
220	Based on this data, and as noted above, Professor Frederick opined that 35% of consumers believe that a plastic product labelled ‘biodegradable’ will biodegrade completely within a year in a landfill.”	(Frederick, Tr. at 1180-1081).
221	“Psychographic representativeness” means that the sample reflects the psychological characteristics (such as beliefs, opinions, or attitudes) of the population at large.	(Frederick, Tr. 1395).
222	Although demographic representativeness is correlated with psychographic representativeness, the differences between the two measures are particularly important in survey because a survey sample may match the demographics of American consumers perfectly, yet come nowhere close to matching the beliefs and attitudes of American consumers.	(Frederick, Tr. at 1066). (Frederick, Tr. 1065-1066).
223	The differences between psychographic and	(Frederick, Tr. 1395-1396 (opining that

	demographic representativeness is pertinent because people who use the internet and are willing to respond to a single Google survey question are more likely to be psychographically representative than people with landlines who are willing, without compensation, to take an approximately twelve-minute survey.	GCS has greater psychographic representativeness than telephone surveys, in-person research, or internet panel studies)). (Stewart, Tr. 2698-2699) (testifying that, in his study, the average call length was twelve minutes, with an approximate range from five to twenty minutes)).
224	The population of American internet users is more demographically and psychographically representative of the population of American consumers than other potential survey media, such as internet panels, landline surveys, or “mall intercept”-style face-to-face interviews.	(Frederick, Tr. 1395-1396).
225	This is true partly because the survey mechanism is much less intrusive than other types of surveys, and partly because the percentage of the population that uses the internet is enormous (85% in 2013).	(Frederick, Tr. 1067). CCX-865 at 4.
226	40% of Americans do not have a landline.	CCX-865 at 4.
227	Shortly after Google introduced GCS in 2012, the independent Pew Research Center compared the results of its own telephone survey of internet users with GCS respondents.	CCX-874.
228	Pew concluded: “A comparison of several demographic questions asked by Pew Research indicates that the Google Consumer Surveys sample appears to conform closely to the demographic composition of the overall internet population.”	CCX-874 at 2.

229

Pew reported the following demographic data:

CCX-874 at 5.

	Pew	GCS
	(percentages)	
Gender		
Male	49	53
Female	51	47
Age		
18-24	16	20
25-34	24	20
35-44	43	53
45-54		
55+	26	28
Race-ethnicity		
White	69	68
Black or African American	11	10
Asian or Asian American	3	5
Hispanic or Latino	13	10
Other or mixed race	4	7
Marital Status		
Married	52	48
Widowed	4	5
Divorced/Separated	12	12

	Never married	25	27	
	Living with a partner	6	8	
	Don't know	1	--	
	Homeownership			
	Own	63	63	
	Rent	33	37	
	Other/Don't know	4	--	
	Church Attendance			
	Weekly or more	38	35	
	Less often	60	65	
	Don't know	2	--	
230	As a practical matter, the demographics of Pew's respondents and the demographics of GCS respondents are the same.			(Frederick, Tr. 1070).
231	PEW compared its telephone survey respondents with GCS respondents along dozens of different measures of opinions and attitudes.			(Frederick, Tr. 1069). CCX-874 at 2.
232	Although PEW noticed differences depending on the precise question, "the median difference between 43 results obtained from Pew Research surveys and using Google Consumer Surveys was 3 percentage points," and mean difference was six points.			CCX-874 at 2.

233	In general, the percentage who said they owned particular devices and engaged in various online activities were fairly similar in Pew Research surveys and the Google Consumer surveys.	CCX-874 at 6.
234	“Views about the size and role of government were similar in a Pew Research survey and the Google survey.”	CCX-874 at 7.
235	“Reported frequency of voting also was little different in the Google Consumer Surveys and the Pew Research survey.”	CCX-874 at 7.
236	With respect to opinion about the health care legislation passed by Obama and Congress in 2010, the results of the two surveys were similar.	CCX-874 at 8.
237	“[T]he percentage of people saying that [global] warming is occurring mostly because of human activity was similar in the two surveys.”	CCX-874 at 8.
238	“Across a variety of foreign policy issues, results from the Pew Research surveys and those obtained using the Google Consumer Surveys method were quite comparable.”	CCX-874 at 8.
239	ECM’s expert, Dr. Stewart, never questioned PEW’s findings.	<i>See</i> (Stewart, Tr. 2491-2820). RX-856. RX-843. (Stewart, Tr. 5-308).
240	With respect to the 2012 presidential election in particular, Pew noted: “In a series of tests after each presidential debate, the Pew Research surveys and Google Consumer surveys produced similar reactions.”	CCX-874 at 8.
241	Nate Silver studied GCS’s impressive performance in predicting the 2012 presidential election results.	(Frederick, Tr. 1071-1075).
242	In his well-known New York Times column, Silver compared the accuracy of twenty-three polling entities that had conducted at least five polls in advance of the 2012 election.	CCX-872 at 2.
243	GCS tied for second place overall, conducting twelve pre-election polls with an average error relative to the actual results of only 1.6%.	CCX-872 at 2.
244	GCS finished ahead of better-known entities including CNN, Reuters, and Gallup.	CCX-872 at 2.
245	Mr. Silver wrote: “The final poll conducted by Google Consumer Surveys had Mr. Obama ahead in the national popular vote by 2.3 percentage points—very close to his actual margin, which was 2.6 percentage points. . . . Perhaps it won’t be long before Google, not Gallup, is the most trusted name in polling.”	CCX-872 at 3, 6.

246	Professor Frederick explained the importance of Google’s performance in the 2012 election: “[T]he fact that Google Consumer Surveys is doing so well [compared] with all these other opinion polling firms in predicting the presidential election across twelve different tests [] suggests to me . . . that the population is both psychographically and demographically representative. Otherwise, I don’t think they’d be able to accurately predict who people are going to vote for.”	(Frederick, Tr. 1074-1075).
247	ECM’s expert, Dr. Stewart, offered no testimony regarding Mr. Silver’s conclusions, or Professor Frederick’s evaluation of them.	<i>See</i> (Stewart, Tr. 2491-2820) RX-856. RX-843. (Stewart, Tr. 5-308).
248	Google engaged two different survey research firms to administer identical questionnaires to internet panels intended to represent American adults. Google also administered the same survey thirteen times through GCS.	CCX-872 at 5.
249	The results of the three surveys were compared to established benchmarks related to media usage (established by a 200,000 respondent survey) and health data (established by Centers for Disease Control (“CDC”) surveys with response rates above 80%).	CCX-872 at 5.
250	Significantly, the GCS surveys performed as well or better than the internet panel surveys, and—perhaps most important—the GCS surveys deviated from the established benchmarks by only approximately 4%.	CCX-872 at 5.
251	Dr. Stewart’s report apparently references Google’s study, and dismisses it solely on the grounds that Google has an interest in promoting its product.	RX-856 at 17.
252	ECM’s expert, Dr. Stewart, did not testify regarding this study.	<i>See</i> (Stewart, Tr. 2491-2820). RX-843. (Stewart, Tr. 5-308).
253	Through direct communications with Google, Professor Frederick verified GCS’ <i>bona fides</i> himself. Specifically, Professor Frederick conferred telephonically with Google’s representatives twice to confirm the mechanics and methodology GCS employs.	(Frederick, Tr. 1261) CCX-865 at 3 (“Such interviews with data collectors are regularly conducted in my field to ascertain the reliability of data-gathering techniques.”).

254	Although relying on GCS is relatively new, relying on a third party to ask questions and gather data from a representative sample is not. As ECM's expert opined, "it's quite common to make an assumption that a research organization follows a particular protocol or procedure."	(Stewart, Tr. 2663). (Stewart, Tr. 2664) (agreeing that "[i]t is typical in survey research" to rely "on the belief that a survey research firm is operating as you would expect them to operate with respect to the gathering of data"))).
255	Through his conversations with Google, Professor Frederick concluded that, "[b]ased on Internet protocol (IP) addresses and browsing history, GCS uses dynamic imputation algorithms to help ensure [the] demographic representativeness of [its] sample data."	CCX-865 at 3.
256	Dr. Stewart never communicated with anyone associated with GCS.	RX-843 at 162.
257	Dr. Stewart never testified that, as an expert in the survey research field, it was somehow inappropriate for Professor Frederick to rely on his communications with Google regarding GCS' methodology.	<i>See</i> (Stewart, Tr. 2491-2820). RX-843. (Stewart, Tr. 5-308).
258	Because Google delivers advertising to users partly based on their demographic information, Google has high incentives to get that information reasonably correct.	(Frederick, Tr. 1398).
259	Professor Frederick opined that "[a]dvertisers value online advertising only to the extent that it works, which give Google strong incentives to accurately ascertain the demographic characteristics of respondents advertisers target."	CCX-865 at 3.
260	GCS is highly representative both demographically and psychographically.	(Frederick, Tr. 1410).
261	APCO, Synovate, and Dr. Stewart's studies each surveyed ostensibly representative samples in various ways. Accordingly, the conformance between those results and GCS further supports the conclusion that GCS respondents are representative.	(Frederick, Tr. 1369).
262	Dr. Stewart's report repeatedly uses scare quotes when discussing Professor Frederick's GCS research (referring to it as a "survey").	RX-856 at 8, 13-14.

263	Dr. Stewart testified about Professor Frederick's article, <i>The Limits of Attraction</i> .	(Stewart, Tr. 2681-2682).
264	Dr. Stewart initially denigrated the portion of the article reporting GCS as a "footnote" involving a "partial replication" on GCS of data obtained through other sources; he later conceded that the article contained a table of GCS data, and that the article itself (containing GCS data) was published in a well-regarded peer-reviewed journal, <i>THE JOURNAL OF MARKETING RESEARCH</i> .	(Stewart, Tr. 2682). (Stewart, Tr. 2818). (Stewart, Tr. 2681).
265	Dr. Stewart also emphasized criticisms of the article (Stewart, Tr. 2681), but later conceded that "[n]one of those criticisms of th[e] article had anything to do with its use of GCS."	(Stewart, Tr. 2816).
266	Dr. Stewart also pronounced that no "serious scholar" would conclude that GCS is "in the legitimate market research business."	(Stewart, Tr. 2683-84).
267	ECM also compiled blog posts criticizing GCS. Most of the blog posts are from other survey researchers (i.e., competitors), the overwhelming majority have nothing to do with whether or not GCS is reasonably representative, and nineteen were compiled by ECM's counsel approximately one week before trial).	RX-823 RX-877-95. <i>See also</i> RX-877 at 5 (evidence of collection by counsel and July 27, 2014 retrieval date).
268	Dr. Stewart's report referenced alleged instances in which GCS "has been far off the mark."	RX-856 at 17.
269	Dr. Stewart admitted at trial that his source for the claim that GCS "has been far of the mark" is a tweet (and, indeed, he acknowledged that his report failed to disclose that the source was a tweet).	(Stewart, Tr. 2687).
270	Dr. Stewart also admitted that he had never "done any type of systematic analysis" to determine GCS' accuracy.	(Stewart, Tr. 2685-2686).
271	Consistent with basic survey research principles, precise demographic information about each individual survey respondent is unnecessary if the sample is representative.	(Frederick, Tr. 1079-80; 1360-1363).
272	Professor Frederick testified:	(Frederick, Tr. 1079-80; 1360-1363).

	<p>QUESTION: Speaking in general, to what extent, if any, is it necessary to know the demographic characteristics of individual respondents in order to be able to draw valid conclusions [] about a population as a whole?</p> <p>FREDERICK: No, that’s—it’s not necessary. </p> <p>QUESTION: Does the absence of [demographic] information impair your ability to draw reasonably valid conclusions about the population as a whole?</p> <p>FREDERICK: No, it does not.</p> <p>QUESTION: [W]hy is that?</p> <p>FREDERICK: That’s the essence of random sampling, because we have no reason to believe that those characteristics differ between the sample and the population at large as long as the same has been randomly selected or something very close to that.</p> <p>QUESTION: [T]o what extent, if at all, does it matter if you do not know anything else about an individual Google Consumer Survey respondent as long as you know that he or she was drawn from a pool that is reasonably representative of the population you are attempting to sample?</p> <p>FREDERICK: It makes no difference whatsoever.</p>	
273	<p>When possible, GCS infers five important demographic features (gender, approximate age, geographic region, urban density (whether the respondent resides in an urban, suburban, or rural area). With respect to age and gender, Google infers demographic information based on the respondent’s browsing history as recorded in a DoubleClick advertising cookie.</p>	<p>CCX-874 at 3. CCX-868 at 3.</p>
274	<p>Google infers the respondent’s location based on the computer’s IP address, and then infers the respondent’s income and urban density “by mapping the location to census tracts and using</p>	<p>CCX-868 at 3. <i>See also</i> CCX-874 at 3.</p>

	the census data to infer income and urban density.”	
275	GCS then uses this information “to ensure each survey receives a representative sample.” .	CCX-868 at 3.
276	In Professor Frederick’s data, when GCS lacked sufficient information about a particular respondent to draw an inference regarding a given demographic characteristic, GCS (and Professor Frederick) reported that characteristic as “unknown.”	<i>See</i> CCX-863 (data set).
277	“For approximately 30-40% of [GCS] users, demographic information is not available—either because their cookies are turned off but more often because the [GCS] algorithm cannot determine a trend from the websites visited as recorded in their DoubleClick advertising cookie that would suggest what gender or age they are.”	CCX-874 at 3.
278	Geographic information is potentially significant because—as Dr. Stewart conceded—“beliefs regarding the importance of purchasing environmentally-friendly products might vary” between people “living in cities and people living in rural environments,” or between people living in different regions of the country.	(Stewart, Tr. 2742).
279	In contrast to Professor Frederick’s GCS survey, Dr. Stewart’s 400-respondent landline survey collected no data at all regarding income, geography, or urban density.	(Stewart, Tr. 2739, 2742-2743, 2745).
280	Put differently, each of those three demographic characteristics (income, geography, and urban density) is entirely unknown regarding 100% of Dr. Stewart’s respondents.	(Stewart, Tr. 2739, 2742-2743, 2745).
281	Dr. Stewart testified “that consumers’ views regarding biodegradation times don’t vary much based on gender[.]”	(Stewart, Tr. 2738).
282	Regarding gender, there was no evidence presented at trial that Dr. Stewart’s callers asked respondents to provide their gender when the callers were uncertain based on a particular respondent’s voice.	(Stewart, Tr. 2735).

283	Without an inquiry in such situations, the error rate is about 5%.	(Stewart, Tr. 2735).
284	Dr. Stewart also did nothing to verify that the gender “recorded by observation” over the phone was correct.	(Stewart, Tr. 2735).
285	Although Dr. Stewart conceded that “[s]ometimes people lie about their age,” he did nothing to verify that his landline respondents’ self-reported age was correct.	(Stewart, Tr. 2739).
286	Dr. Stewart testified: QUESTION: Overall then, for 100 percent of respondents in your survey, with respect to the five demographic characteristics we’ve been discussing, two of the demographic traits were assessed but without any secondary verification, and three are unknown, correct? STEWART: That’s correct. QUESTION: It’s still possible for such a survey to produce valid results, isn’t it? STEWART: Yes, it is.	(Stewart, Tr. 2745).
287	Respondents’ individual demographic traits are irrelevant as long as the overall pool is reasonably representative.	(Frederick, Tr. 1079-1080; 1357-1363).
288	ECM did not challenge the wording or structure of any specific question Professor Frederick asked.	<i>See</i> (Stewart, Tr. 2491-2820). RX-856. RX-843. (Stewart, Tr. 5-308).
289	Professor Frederick asked more than sixty different questions.	(Frederick, Tr. 1060).
290	Professor Frederick’s questions included twelve open-ended questions that asked respondents to estimate the time it would take for a plastic product labelled “biodegradable” to biodegrade.	CCX-860 at 30-33.
291	The number of different questions is significant because it enabled Professor Frederick to test what effect, if any, the wording of particular questions has.	(Frederick, Tr. 1061 (“[M]y research is on framing effects . . . and I was interested in whether those things mattered. Again, this is part of the concept of convergent validity. It’s also

		called robustness. If you ask the questions a bunch of different ways, which things matter, which things don't matter, those kinds of things can be tested by asking [] different questions.'')).
292	As Professor Frederick explained, "if it's the case that you get the same result despite asking questions in different ways, that . . . increases your sense of construct validity."	(Frederick, Tr. 1061-1062).
293	Professor Frederick found that substantial minorities (or, sometimes, majorities) of consumers estimated that plastic products labelled "biodegradable" would biodegrade in one year or less—no matter how the question was presented.	CCX-860 at 27-35.
294	Some of Professor Frederick's questions involved the "ECM Biodegradable logo," some questions involved other "biodegradable" logos, and some involved only words.	CCX-860 at 27-35.
295	Sometimes the questions referred to "plastic products," sometimes to "plastic packages," sometimes to a specific object referenced in words ("a plastic water bottle"), and sometimes to an image of a plastic object (a plastic bag, or a plastic container).	CCX-860 at 30-33.
296	Some questions asked "how long" the object would take to biodegrade, whereas some asked "how much time" it would take.	CCX-860 at 30-33.
297	Some questions asked "how much time" it would take, whereas some questions asked "how much time do you think" it would take.	CCX-860 at 30-33.
298	For nine of the twelve questions asking consumers to estimate biodegradation times for plastic materials labelled "biodegradable," at least 30% of consumers estimated the product would biodegrade in one year or less—and in no case did fewer than 20% of consumers give such an estimate.	CCX-860 at 30-33.
299	Depending on phrasing of the question, a majorities ranging from 53% to 68% of consumers would consider it misleading if a plastic product labelled biodegradable did not biodegrade within one year.	CCX-860 at 35.
300	When asked: "A company should be allowed to label its plastic packaging material as 'biodegradable' if it biodegrades within what	CCX-860 at 35.

	amount of time,” 68% responded with one year or less, and only 9% of consumers thought periods longer than five years gave numbers greater than five years.	
301	Hardly any consumers believe it is appropriate for a company to label a product “biodegradable” if it takes that long to biodegrade. Specifically, if the responses to Questions 4A-4E are aggregated, less than 5% of consumers believe companies should be allowed to label as “biodegradable” products that take longer than twenty-five years to biodegrade.	CCX-860 at 35.
302	Additionally, consistent with the Commission’s Green Guides, at least a substantial minority of consumers believe that generic “products” (as opposed to plastic products) will biodegrade in one year or less. Again, Professor Frederick asked the relevant question numerous different ways, and “one year or less” responses ranged from 42% to 74%.	CCX-860 at 27-28.
303	This range includes two questions (1I and 1J) that Professor Frederick intended to test the effect of the use of the word “years” in the question, which suggests a longer process. Notably, even when consumers were asked: “If a package is labelled ‘biodegradable,’ how many years will it take to biodegrade,” 25% of consumers still estimated one year or less.	(Frederick, Tr. 1143). CCX-860 at 28. CCX-860 at 28.
304	Professor Frederick also compared ECM’s prior qualifier (“nine months to five years”) with its new attempt to qualify its biodegradable claim (“some period greater than a year”). Significantly, “nearly half, 40%-50%, of consumers construe the qualifier ‘some period greater than a year’ as implying faster biodegradation than the qualifier ‘nine months to five years.’”	(Frederick, Tr. 1161). CCX-860 at 16-18.
305	There is a typo in Appendix A to Professor Frederick’s expert report. Specifically, the results to Question 14A, reproduced at CCX-860 at 45, should reflect 60% of consumers thought “nine months to five years” conveyed longer biodegradation times, and 40% of consumers thought it conveyed shorter biodegradation times.	(Frederick, Tr. 1159-1160).
306	Notably, Professor Frederick is an expert on the	(Frederick, Tr. 1029-1032).

	anchoring effect, which is the “assimilation of a judgment” toward “a concurrent numeric standard,” or toward “a prior numeric standard previously presented.”	CCX-860 at 3. (Frederick, Tr. 1030).
307	Significantly, Professor Frederick attributed the failure of ECM’s new qualifier to produce meaningfully longer estimated biodegradation times in part due to the anchoring effect, because the representation presents consumers with “one year” as the starting point, and consumers may “infer that [one year] has some significance[.]”	(Frederick, Tr. 1167).
308	Thus, although the new “some period greater than a year” qualifier increases the number of estimates above five years, it also “move[s] some respondents to give lower estimates.”	(Frederick, Tr. 1167). <i>See also</i> CCX-860 at 18 (“The specified minimum value (‘one year’) likely functioned as a numeric referent towards which some respondents’ subsequent estimates assimilate.”)).
309	Specifically, changing the language from “nine months to five years” to “some period greater than a year” “significantly increases the fraction [of consumers] who believe [the product] will biodegrade within two years (from 17% to 29%[.]”	CCX-860 at 18. <i>See also</i> (Frederick, Tr. 1167 (“If you compare . . . people who gave estimates less than or equal to two years, that number increases from . . . 17 percent to 29 percent, perhaps because the one year is functioning as an anchor of sorts.”)).
310	Dr. Stewart did not challenge (or even address) Professor Frederick’s conclusion that ECM’s “some period greater than a year” language did not materially increase consumers’ estimated biodegradation times.	<i>See</i> (Stewart, Tr. 2491-2820). RX-856. RX-843. (Stewart, Tr. 5-308)).
311	ECM did not dispute other facts that “biodegradable” implies. As Professor Frederick testified, his study, APCO, and Synovate establish that most consumers believe plastic products labelled “biodegradable” will biodegrade in landfills.	(Frederick, Tr. 1172). CCX-860 at 13 (citing APCO and Synovate, as well as GCS).
312	Additionally, across eight different GCS surveys with varied wording and question type, between 37% and 50% of consumers understood that a plastic product labelled “biodegradable” will biodegrade completely into elements found in nature.	(Frederick, Tr. 1172). CCX-860 at 16.

313	Professor Frederick employed a “bright line” coding rule designed to avoid any “value judgments about which responses are ‘too inaccurate’ to count.”	CCX-865 at 6.
314	Professor Frederick’s bright-line rule was that “any response containing both a numeric specification and an accompanying temporal unit” was coded, and other responses were not.	CCX-865 at 6. <i>See also</i> (Frederick, Tr. 1128).
315	As Professor Frederick explained, five types of responses were excluded: (1) numeric responses lacking a temporal unit (for instance, “1”); (2) responses lacking a specification of quality (for instance, “months”); (3) responses indicating unwillingness to answer without further clarification (“it depends”); (4) responses indicating an unwillingness to answer a response about which they are uncertain (“I don’t know”); and (5) “bypass” or “protest” responses intended to circumvent the survey wall (e.g., “go away”).	CCX-865 at 6. (Frederick, Tr. 1122-1128).
316	As Professor Frederick explained, he did not code these responses because there is no way to translate them into a specific estimate of biodegradation time.	CCX-865 at 6. (Frederick, Tr. 1122-1128).
317	The omission of these responses would only affect the results if respondents who gave such responses hold different views concerning biodegradation that the rest of the population, but “there is no reason to believe that any of the people whose responses [Professor Frederick] did not code hold a view of biodegradation that differs from the rest of the population[.]”	CCX-865 at 6. <i>See also</i> (Frederick, Tr. 1122-1128).
318	Survey respondents with views as to the correct answer sometimes state “I don’t know” because they lack sufficient confidence in their view, or because they fear embarrassment if they give an incorrect response.	(Stewart, Tr. 2666-2667).
319	Furthermore, Dr. Stewart conceded it was “generally true” that “there’s a literature on the	(Stewart, Tr. 2669-2670).

	‘I don’t know’ response [in survey research], and that literature generally finds that you don’t change the distribution of responses substantially by forcing responses by preventing people from saying ‘I don’t know.’”	
320	Similarly, Professor Frederick testified there was no reason to conclude “that as a group, people who give ‘I don’t know responses’ to questions asking for beliefs regarding biodegradation time have different beliefs than people who gave [specific estimates].” Accordingly, omitting “I don’t know” responses does not “affect the conclusions of the research.”	(Frederick, Tr. 1125).
321	To provide a second example, Professor Frederick compared the distribution of (uncodeable) numeric responses that did not have an accompanying unit (for instance, “1”) with the distribution of (coded) responses that had an accompanying unit (“for instance, “1 year”).	(Frederick, Tr. 1127). CCX-865 at 6.
322	As Professor Frederick testified, the distribution of responses was “very similar . . . [t]herefore, I have every reason to believe that these people [who gave uncodable responses] have the same distribution of beliefs as the people who provided a unit.”	(Frederick, Tr. 1127). CCX-865 at 6.
323	Because the people whose responses Professor Frederick excluded very likely have distribution of beliefs regarding biodegradation time than those who gave codeable responses, excluding them does not “affect[] the inferences drawn from the data.”	CCX-865 at 6.
324	Out of approximately 20,000 responses Professor Frederick collected to open-ended questions, a very small fraction (less than one percent) gave insincere “protest” responses intended solely to bypass the GCS survey wall. Professor Frederick testified that excluding such responses would have no material effect because there is “no reason to believe that the people who [give protest responses] actually have different views about biodegradation times than the people who g[a]ve responses which are codeable.”	(Frederick, Tr. 1136, 1138). CCX-865 at 5. (Frederick, Tr. 1123-1124).

325	Dr. Stewart did not challenge this conclusion.	<i>See</i> (Stewart, Tr. 2491-2820). RX-856. RX-843. (Stewart, Tr. 5-308).
326	Professor Frederick also testified that GCS takes steps to ensure that people who respond randomly do not receive future surveys by periodically asking questions with obvious answers (for instance, how many states are there in the United States?), and removing persons who respond incorrectly from the pool who may receive future surveys.	(Frederick, Tr. 1099-1100).
327	Indeed, there is no reason to think that the less than one percent of respondents who react to a GCS survey with a bypass response (random typing) or a protest response (a snide remark) are psychographically different from the population at large in any respect relevant here. If, for example, the GCS question asked for respondents' views about paywalls limiting access to line content, then excluding bypass/protest respondents from the data might be problematic. In this context, however, there is no reason to think that bypass/protest responders, as a group, would give different biodegradation time estimates than people who give sincere responses.	(Frederick, Tr. 1123-1124).
328	In his report, Professor Stewart briefly alleged that a "disinterest bias" exists, wherein GCS respondents will allegedly give random answers to bypass the survey wall.	RX-856 at 14.
329	Dr. Stewart's report references only a blog post from a GCS competitor regarding alleged "disinterest bias."	RX-856 at 14.
330	Indeed, Professor Frederick testified that alleged "disinterest bias" has not been studied in the academic survey research literature, and his search for the term produced no results.	(Frederick, Tr. 1092).
331	Additionally, the fact that less than one percent of respondents gave protest responses provides additional evidence that the overwhelming majority of GCS respondents gave thoughtful answers.	(Frederick, Tr. 1093) ("The vast majority of people gave answers which were very reasonable given the questions.")).

332	Furthermore, the fact that average response times for GCS respondents were generally above 20 seconds (meaning that the average respondent took 20 seconds before responding) provides additional “evidence that people are thinking about the question.”	(Frederick, Tr. 1152).
333	As Professor Frederick testified, “[i]t wouldn’t make any sense . . . for someone to see a question, to sit there and do nothing, and then key in a nonsense response [after] 22 seconds[.]”	(Frederick, Tr. 1152). <i>see also</i> CCX-865 at 5.
334	ECM attempts to account for the response time by suggesting that respondents might have become distracted between when GCS presented the question stem and when they responded.	(Frederick, Tr. 1331-1334).
335	As Professor Frederick testified, “obviously [this] does happen sometimes,” but “I don’t think it’s common that people would be interrupted between reading the question stem and answering[.]” In short, atypical distractions might account for a few response times of twenty seconds or more, but not hundreds or thousands.	(Frederick, Tr. 1342).
336	In fact, as Professor Frederick testified, and Dr. Stewart conceded, a question in which the consumer gives a response in twenty seconds much better replicates the actual consumer experience when confronted with a “biodegradable” claim on a store shelf than a telephone interview taking ten minutes or more.	(Frederick, Tr. 1091 (“[I]f a question is embedded at the end of a ten-minute survey, that’s not replicating . . . the decision experience of the consumer itself. A consumer in a store might just spend a few seconds deciding between products.”)). CCX-865 at 5. (Stewart, Tr. 2700 (admitting that his landline survey “doesn’t simulate the shopping experience”)).
337	ECM characterizes consumers’ short biodegradation time estimates (including days and weeks) as “absurd” and “ludicrous.”	(Stewart, Tr. 2749-2755). RX-856 at 15.
338	ECM emphasizes extremely small estimates, for instance, “a nanosecond.” In reality, out of	(Frederick, Tr. 1377).

	approximately 20,000 responses to open-ended questions, only two consumers responded with “a nanosecond.”	
339	During his cross-examination, ECM confirmed that Professor Frederick coded approximately 26 responses of seconds, minutes, or hours, but this represents only approximately .001% of the data collected.	(Frederick, Tr. 1302-1305).
340	These 26 responses might represent people who mistook “biodegradation” for dissolution, people who misunderstood the question as asking when the biodegradation process begins, or people who did not take the question seriously. Regardless, the number of these responses is too small to affect the data.	(Stewart, Tr. 2757-2758). RX-843 at 39.
341	ECM fails to explain why making value judgments about consumers’ beliefs is appropriate (it is not).	CCX-865 at 6.
342	ECM fails to acknowledge that, like Professor Frederick, Dr. Stewart coded very short biodegradation time estimates and included them in his data.	(Stewart, Tr. 2755-2756). CCX-865 at 6-7.
343	ECM fails to note that Professor Frederick coded both extremely long responses as well as extremely short ones—again, he implemented a “bright line” rule intended to avoid value judgments.	(Stewart, Tr. 2755-2756). CCX-865 at 6-7.
344	Neither GCS respondents (who provided data) nor GCS itself (who collected the data) knew who sponsored Professor Frederick’s study.	(Stewart, Tr. 2745-2746). (Frederick, Tr. 1132).
345	The coding of numeric responses generally does not have any significant subjective component.	(Frederick, Tr. 1132-1133).
346	Professor Frederick produced the entirety of his data (including both the original responses and how those responses were coded) to ECM.	(Frederick, Tr. 1133-1134). CCX-863.
347	Although ECM criticized Professor Frederick for not using so-called “screening questions” to	(Stewart, Tr. 2764-2770).

	<p>exclude people who reported not knowing what “biodegradation” was, the evidence at trial was clear that such questions are ineffective. Initially, the evidence established that, despite using screening questions in his survey, Dr. Stewart still included dozens of respondents who understood that “biodegradable” meant that the product was recyclable, that it would not degrade, that it would “self-destruct,” and even that it was digestible.</p>	
348	<p>In addition, Dr. Stewart admitted that screening questions can remove people who do understand what “biodegradation” means, but who are not confident in their understanding, or who have decided that they no longer want to participate in the survey.</p>	(Stewart, Tr. 2761-2763).
349	<p>Furthermore, as Professor Frederick testified, the population of American consumers who might be misled by a false biodegradable claim includes the many consumers whose understanding of “biodegradation” is mistaken or incomplete, or consumers who believe “biodegradability” is a positive attribute even if they do not know precisely why.</p>	(Frederick, Tr. 1422-1424).
350	<p>Indeed, ECM’s own expert reluctantly concurred that a consumer might purchase a product “because he or she thinks biodegradation is a positive attribute even if his or her understanding of the term is scientifically incorrect,” and such a consumer “can still be misled if the product doesn’t biodegrade has he or she understands the term[.]”</p>	(Stewart, Tr. 2760).
351	<p>ECM also criticized Professor Frederick for not screening out respondents who reported not purchasing anything made out of plastic within the past month, or who work in the plastics industry. Even assuming some minuscule number of the 29,000 GCS respondents fall within these categories, the presence of a tiny number of these outliers would not affect the data.</p>	(Frederick, Tr. 1411 (“Q: To what extent is it possible that consumers who never purchase plastic products might have responded to your survey questions? A: I testified yesterday that it was possible. Q: And how likely do you consider that to be? A: Approximately never.”)).
352	<p>In 2014, ECM’s expert, Dr. Stewart, supervised a 400-participant landline survey.</p>	(Stewart, Tr. 2687). RX-856 at 18, 23.

353	Although Dr. Stewart never asked respondents to estimate how long it would take plastic products labeled “biodegradable” to biodegrade, he did collect data bearing upon this issue.	(Stewart, Tr. 2629-2630).
354	Dr. Stewart’s landline callers asked (without specifying a material or that the product was labeled “biodegradable”): “If something is biodegradable, how long do you think it would take for it to decompose or decay?”	(Stewart, Tr. 2777). RX-602 at 16.
355	Of the 400 respondents, a majority (206) gave codeable estimates, and of those respondents, 33% gave estimates of one year or less.	(Stewart, Tr. 2790).
356	As with all four surveys at issue, many respondents gave nonspecific responses such as “I don’t know,” “it depends,” or other responses not quantifiable as a specific biodegradation time estimate.	(Stewart, Tr. 2790).
357	Additionally, Dr. Stewart’s landline callers read ECM’s biodegradable in “some period greater than a year” disclaimer to respondents, and asked: “In your own words, what does this claim mean to you?”	RX-602 at 20.
358	Although Dr. Stewart notably did not ask respondents to estimate biodegradation times, 150 respondents still gave estimates. Of those respondents—and notwithstanding ECM’s disclaimer—50% (75 respondents) gave estimates of a year or less.	(Stewart, Tr. 2804).
359	Notably, Dr. Stewart did not personally check the coding of the 400 responses his landline callers reported.	(Stewart, Tr. 2798).
360	Stewart’s landline callers coded 95 responses as falling within the category “gone/decomposed/biodegrade in one year.”	(Stewart, Tr. 2796). RX-846 at 27.
361	Complaint Counsel located 75 responses that, when properly coded, fell within that category, and Dr. Stewart confirmed that the 75 responses we identified fell within the category “gone/decomposed/biodegrade in one year.”	(Stewart, Tr. 2800).
362	Dr. Stewart was adamant that the 95	(Stewart, Tr. 2798).

	respondents was “an accurate count” of those who gave responses properly coded as “gone/decomposed/biodegrade in one year”, that any errors by his coders were “highly unlikely”, and that the Court can rely on the figure he reported (95 respondents).	(Stewart, Tr. 2798). (Stewart, Tr. 2797).
363	However, Complaint Counsel could not locate the additional twenty “year or less” responses that Dr. Stewart alleges exist.	<i>See</i> RX-844 (actual responses entered into evidence).
364	Accordingly, at trial, Complaint Counsel asked Dr. Stewart to assume that there were only 75 such responses.	(Stewart, Tr. 2803).
365	Before issuing the Green Guides, the Commission evaluated two existing studies concerning estimates of biodegradation time: APCO and Synovate.	RX-348 at 122.
366	The 2006 APCO study involved an approximately 1000-respondent telephone survey that focused primarily on plastic products.	(Frederick, Tr. 1037). CCX-860 at 7.
367	Sixty percent of respondents stated that packages labeled “biodegradable” should biodegrade within one year or less.	RX-597 at 2.
368	In 2010, a company (EcoLogic) manufacturing a plastic additive similar to ECM’s product engaged a survey firm (Synovate) to conduct a 2000-respondent internet panel survey.	(Frederick, Tr. 1046-1047).
369	In the Ecologic/Synovate study, 25% stated that “less than one year” was a reasonable amount of time for a “biodegradable” package to decompose in a landfill.	RX-673 at 4. CCX-860 at 11.
370	Professor Frederick opined that APCO and Synovate/Ecologic, taken together, provide reasonably reliable and valid evidence that at least a substantial minority of consumers believe plastic products labelled “biodegradable” will biodegrade in one year or less.	(Frederick, Tr. 1041, 1059, 1180).

371	In addition to referencing the concept of convergent validity generally, Professor Frederick testified that that APCO and Synovate have opposing biases.	(Frederick, Tr. 1050, 1059).
372	Specifically, APCO’s response options suggested shorter biodegradation times, whereas Synovate’s response options suggested longer ones. Indeed, with respect to the presence of opposing biases, Dr. Stewart gave essentially identical testimony.	<p>(Frederick, Tr. 1050 (noting that Synovate suffers from a “similar type of problem” as APCO, but “in the opposite direction)).</p> <p>(Frederick, Tr. 1419-1420 (same)).</p> <p>(Stewart, Tr. 2515 (“So the same problem in terms of the use of the closed-ended format [in Synovate], same problem with respect to the bias and the options offered, but the nature of the bias would be in opposite direction, in an opposite direction from the APCO survey.”)).</p> <p>(Stewart, Tr. 2520 (“[T]he same problem exists in the Synovate survey, except the nature of the bias is in the opposite direction[.]”)).</p> <p>(Stewart, Tr. 2637 (same)).</p>
373	As Professor Frederick testified, the presence of opposing biases helps confirm the existence of convergent validity with respect to the conclusion that at least a substantial minority of consumers believe plastic products labelled “biodegradable” will biodegrade in one year or less.	(Frederick, Tr. 1420 (explaining that “having different designs, especially with opposing biases, is actually a good thing for convergent validity”)).
374	Thus, based on convergent validity, and viewed together (but without the benefit of either Professor Frederick’s research or Professor Stewart’s research), APCO and Synovate are sufficiently reliable and probative to establish that at least a substantial minority of consumers believe plastic products labeled “biodegradable” will biodegrade in one year or less.	(Frederick, Tr. 1041, 1059, 1180).
375	When he was deposed, after he wrote his expert report in this matter, Dr. Stewart was unfamiliar was the product at issue in this case (ECM Masterbatch Pellets).	(Stewart, Tr. 2629).

376	Dr. Stewart also never asked the central consumer perception question in this case: how much time will it take for plastic labeled “biodegradable” to biodegrade?	(Stewart, Tr. 2629-2630).
377	At trial, Dr. Stewart stated that he “was not interested in that specific issue.”	(Stewart, Tr. 2630).
378	He also denied (at trial) that this question was probative of the consumer perception in this case, although when asked in his deposition whether this question was “probative of the consumer perception question at issue in this case,” Dr. Stewart responded: “It certainly is.”	(Stewart, Tr. 2630). RX-843 at 126. <i>See also</i> (Stewart, Tr. 2634)).
379	In Dr. Stewart’s survey, after respondents were on the phone for a considerable period answering questions about biodegradation generally, Dr. Stewart’s researchers asked a final series of questions.	(Stewart Tr. 2698-2699).
380	At the beginning of this series, respondents were asked: “Do you think that there are differences in the amount of time it takes for different products to biodegrade, decompose, or decay?”	(Stewart, Tr. 2688). RX-602 at 17.
381	Unsurprisingly, almost everyone (98%) answered affirmatively.	(Stewart, Tr. 2689). RX-614 at 22.
382	Next, those 98% who answered “yes” were asked to expound upon those differences: “What differences exist in the time for different types of products to biodegrade, decompose, or decay?”	(Stewart, Tr. 2689). RX-602 at 18.
383	Immediately thereafter, respondents were asked to give their impressions of claims similar to ECM’s.	(Stewart, Tr. 2689). RX-602 at 19-21.
384	They were not asked to estimate biodegradation times of products labelled “ECM biodegradable”; rather, they were merely asked: “In your own words, what does this claim mean to you?”	(Stewart, Tr. 2796). RX-602 at 19-21.
385	Thus, many respondents did not give specific estimates of biodegradation times, many gave	RX-844 (full data set).

	“it depends”-type answers, many expressed confusion, and many gave answers with no direct bearing on this case (for instance, that ECM seems like a great product, or that they would be interested in learning more about ECM).	
386	Although, at trial, Dr. Stewart denied that this question series “put in the mind of survey respondents that there are differences in the amount of time it takes for different types of products to biodegrade, decompose, or decay,” in his deposition, Dr. Stewart offered this more candid response: “Well, I hope we did put that in their minds because we’re asking them whether or not they think there are those differences, yes or no.”	(Stewart, Tr. 2689-2690). RX-843 at 74.
387	Dr. Stewart reported results showing that whether a package or product is biodegradable is important to 71% of respondents. Dr. Stewart interpreted this fact as establishing “that while consumers have a conceptual understanding of what biodegradability is, it is not material to a sizeable minority of consumers.” Of course, it is material to a sizeable majority.	RX-856 at 24. RX-856 at 24.
388	The correct number from Dr. Stewart’s data is 75%, not 71%.	<i>Compare</i> RX-856 at 24 <i>with</i> RX-614 at 10.
389	Dr. Stewart conducted an anachronistic landline survey, thereby excluding from the outset the 40% of the population that no longer has a landline.	(Stewart, Tr. 2687). (Frederick, Tr. 1086). CCX-865 at 4.
400	Dr. Stewart’s survey was neither psychographically nor demographically representative. From a psychographic perspective, relatively few consumers are willing to take a telephone survey lasting as long as twenty minutes without compensation; indeed, although Dr. Stewart’s callers eventually located 400 participants, more than 4,000 hung up the phone when the callers introduced themselves (before they could even ask them whether the potential respondent was willing to participate in a survey).	(Stewart, Tr. 2703-2704). (Stewart, Tr. 2698-2699). (Frederick, Tr. 1090-91). (Frederick, Tr. 1391).
401	Because people willing to participate in this sort of survey likely have different opinions and	(Frederick, Tr. 1391, 1395-1396).

	attitudes than the population at large, Professor Frederick testified that landline surveys are less psychographically representative than GCS and other methods.	
402	Regarding demographics, Dr. Stewart admitted that “landline surveys tend to overrepresent older Americans[.]”	(Stewart, Tr. 2725). <i>See also</i> (Frederick, Tr. 1086).
403	In fact, a 58% of Dr. Stewart’s respondents were age 50 and older.	(Stewart, Tr. 2728).
404	In reality, only 40% of the population consists of persons 15 and above (based on 2010 census data ECM offered into evidence). Specifically, according to ECM’s data, the total population is approximately 308,746,000. Of those persons, approximately 61,277,000 are under age 15, leaving a population age 15 and older of 247,519,000. Of that group, approximately 99,048,000 are age 50 and above. Accordingly, persons aged 50 and above represent only 40% of persons age 15 and above (99,048,000/247,048,000 = .40).	<i>See</i> RX-867.
405	Thus, Dr. Stewart oversampled older Americans, which—as he admitted—means undersampling Hispanics and other minorities, because older Americans are disproportionately white.	(Stewart, Tr. 2728-2729).
406	Dr. Stewart also excluded consumers below age 18, even though he conceded that someone as young junior high school-age “might walk into a convenience store and purchase a bottle of water,” and “that purchasing decision could be influenced by the word ‘biodegradable’ on some of the bottles, but not [] others.”	(Stewart, Tr. 2720).
407	He testified only that he was “interested” in researching the opinions of consumers who had reached majority status.	(Stewart, Tr. 2720).
408	Intentionally left blank	
409	Omitting consumers under 18 is significant because—as Dr. Stewart also conceded—	(Stewart, Tr. 2723).

	consumers may have different opinions about the importance of purchasing environmentally-friendly products than older Americans, different levels of cognitive development, and different understandings of what “biodegradable” means.	
410	Dr. Stewart also conducted a ten-respondent pilot survey of ECM’s customers, but ECM elected not to conduct a full-scale study, and (on direct examination) he emphasized that no one should “make any statistical inferences based on only ten respondents.”	(Stewart, Tr. 2587). (Stewart, Tr. 2588).
411	In the manufacturer’s pilot study, ECM defined the pool of companies and the particular persons at those companies whom Dr. Stewart’s researchers could contact.	(Stewart, Tr. 2637-2639).
412	Notwithstanding the fact that Dr. Stewart’s researchers spoke only with ten people ECM nominated, three of the ten respondents gave either responses that were less than a year or referenced tests (ASTM D5511 and D6400) that are run for less than a year.	(Stewart, Tr. 2644-2647). RX-849 at 5.
413	A fourth respondent said “1-3 years.”	RX-849 at 5.
414	Dr. Tolaymat did not represent the interest of the EPA in this matter.	(Tolaymat, Tr. 121).
415	Dr. Tolaymat testified that plastics made with the ECM additive will not biodegrade completely in five years or less under ordinary U.S. landfill conditions.	(Tolaymat, Tr. 121, 122).
416	Dr. Tolaymat testified that typical U.S. landfills are too dry, too cool, and have too little oxygen to enable ECM plastics to completely biodegrade within five years or less.	(Tolaymat, Tr. 122-24).
417	Dr. Tolaymat testified that aerobic biodegradation occurs at a faster rate than anaerobic biodegradation.	(Tolaymat, Tr. 130).
418	Dr. Tolaymat testified that anaerobic decomposition results in the production of methane and carbon dioxide.	(Tolaymat, Tr. 137).
419	Dr. Tolaymat testified that most U.S. landfills are required by federal regulations to operate with oxygen content below 5%.	(Tolaymat, Tr. 137-139) (describing affects of EPA regulations on landfill oxygen levels).
420	Dr. Tolaymat testified that typical U.S. landfills operate at mesophilic temperatures.	(Tolaymat, Tr. 139, 140).
421	Dr. Tolaymat testified that typical U.S.	(Tolaymat, Tr. 142, 143).

	municipal solid waste landfills are generally referred to as “dry tomb” or Subtitle D landfills.	
422	Dr. Tolaymat testified that “dry tomb” or Subtitle D landfills constitute approximately 98% of all landfills in the U.S.	(Tolaymat, Tr. 143).
423	Dr. Tolaymat testified that moisture content in typical U.S. landfills is between 15-30%.	(Tolaymat, Tr. 145).
424	Dr. Tolaymat testified that the vast majority of Subtitle D landfills have low moisture content.	(Tolaymat, Tr. 147).
425	Dr. Tolaymat testified that federal regulations prohibit bulk liquid introduction in landfills, which makes decomposition in landfills extremely slow.	(Tolaymat, Tr. 142-45).
426	Dr. Tolaymat testified that leachate recirculation does not significantly increase a landfill’s moisture content.	(Tolaymat, Tr. 147).
427	Dr. Tolaymat testified that the rate of biodegradation in Subtitle D landfills is slower than the rate of biodegradation in bioreactor landfills.	(Tolaymat, Tr. 148).
428	Dr. Tolaymat testified that decay constant is the rate at which organic matter is converted to methane and carbon dioxide.	(Tolaymat, Tr. 148).
429	Dr. Tolaymat testified that decay constants provide an estimate of how quickly materials decompose in an anaerobic environment.	(Tolaymat, Tr. 148, 149).
430	Dr. Tolaymat testified that half-lives provide an estimate of how quickly it takes for half of organic material to decompose.	(Tolaymat, Tr. 149, 150).
431	Dr. Tolaymat testified that plastic waste generally does not degrade.	(Tolaymat, Tr. 154, 155).
432	Dr. Tolaymat testified that the most biodegradable material would not completely biodegrade in a landfill within 5 years even under optimum conditions for biodegradability.	(Tolaymat, Tr. 153-56) (discussing half-lives and decay rates of various types of waste).
433	Dr. Tolaymat testified that the liner system, leachate collection system, gas collection system, covering layers, and closure and post-closure procedures for landfills collectively reduce the moisture content, oxygen content, and temperature of landfills.	(Tolaymat, Tr. 156-62).
434	Dr. Tolaymat testified that approximately 2% of all U.S. landfills have been permitted by the EPA to operate as bioreactors.	(Tolaymat, Tr. 164).
435	Dr. Tolaymat testified that the EPA defines bioreactors as Subtitle D landfills that have 40% moisture content or higher and that exclude leachate recirculation and gas condensate.	(Tolaymat, Tr. 165).
436	Dr. Tolaymat testified that municipal solid waste would not completely biodegrade in a bioreactor landfill within 5 years, regardless of how the term bioreactor is defined.	(Tolaymat, Tr. 168, 169).

437	Dr. Tolaymat testified that ECM testing data are not competent and reliable evidence that ECM plastics will fully biodegrade in five years or less in most landfills.	(Tolaymat, Tr. 169).
438	Dr. Tolaymat testified that the Biochemical Methane Potential (“BMP”) test can provide competent and reliable evidence of biodegradation in landfills.	(Tolaymat, Tr. 171).
439	Dr. Tolaymat testified that weight loss is not a good or accurate measurement of biodegradation.	(Tolaymat, Tr. 172, 173).
440	Dr. Tolaymat testified that the Environ study relied on by ECM contains at least five flaws that individually make the study not competent and reliable evidence in support of ECM’s claims.	(Tolaymat, Tr. 183-7) (explaining that the study has flawed methodology and does not replicate typical landfill conditions).
441	Dr. Tolaymat testified that the McClaren/Hart study relied on by ECM contains at least five flaws that individually make the study not competent and reliable evidence in support of ECM’s claims.	(Tolaymat, Tr. 187-96) (explaining that the study has flawed methodology and does not replicate typical landfill conditions).
442	Dr. Tolaymat testified that the OWS Composting study relied on by ECM contains at least two flaws that individually make the study not competent and reliable evidence in support of ECM’s claims.	(Tolaymat, Tr. 198-202) (explaining that the study has flawed methodology and does not replicate typical landfill conditions).
443	Dr. Tolaymat testified that the ASTM D5511 tests relied on by ECM contains are not competent and reliable evidence in support of ECM’s claims.	(Tolaymat, Tr. 202-9) (explaining that the tests have flawed methodology and do not replicate typical landfill conditions).
444	Dr. Tolaymat testified that the Ecologica report relied on by ECM contains is not competent and reliable evidence in support of ECM’s claims.	(Tolaymat, Tr. 209-11) (explaining that the study has implausible data and insufficient information on methodology).
445	Dr. Tolaymat testified that the tests relied on by ECM identified in Appendix A of his expert report are not competent and reliable evidence in support of ECM’s claims.	(Tolaymat, Tr. 211-12) (explaining that the tests have flawed methodology and generally do not replicate typical landfill conditions).
446	Dr. Tolaymat testified that lysimeter tests can provide competent and reliable evidence of biodegradation in landfills.	(Tolaymat, Tr. 221, 354, 355).
447	Dr. Tolaymat testified that it is inappropriate for a scientist to deviate from the D5511 protocol and then claim to have followed the protocol.	(Tolaymat, Tr. 250-54).
448	At least a substantial number of consumers extrapolate rate and extent information concerning biodegradation times.	(CCX-860 at 18-19).
449	The evidence shows that at least 52 biodegradation studies have been conducted a variety of plastics containing ECM Additive.	CCX-153, 154, 157, 160, 161, 162, 164, 169, 173, 582, 590, 595, 669, 672, 741, 742, 743, 929, 946, 947, 952, 954, 970,

		1071, 1097 RX-248, 261, 262, 264, 265, 269, 270, 271, 273, 274, 275, 276, 278, 352, 371, 394, 395, 398, 401, 402, 403, 406, 835, 836, 838, 861, 862
450	Of these 52 biodegradation studies of ECM Plastic, only 5 were conducted at 37°C.	CCX-164, 590, 946, 947, 952
451	Fourteen (14) tests were “qualitative tests” such as SEM, GPC, weathering, and toxicity tests.	CCX-153, 161, 162, 169, 173, 582, 954 RX-264, 269, 270, 271, 274, 275, 278, 406, 835, 861
452	The SEM studies were not conducted by ECM, and there is no information in the record regarding who prepared the samples, how, with what load rate, duration of the test prior to examination, or any other details that enable a scientist to evaluate the information.	RX-270, 271, 278
453	The studies showing no biodegradation were conducted by independent or reputable labs, were well-documented, and included other necessary information (e.g., statistical information) necessary to interpret the results.	(McCarthy, Tr. 465-470); CCX-164 (Ohio State University); CCX-174-CCX-176 (Stevens Ecology); CCX-173 (Advance Materials Center); CCX-156; CCX-157; CCX-163; CCX-169-CCX-171 (O.W.S.)
454	None of the biodegradation studies supports ECM’s claims, and in fact disprove them.	CCX-891 ¶¶ 68-72; CCX-891 ¶¶ 75-88; (McCarthy, Tr. 453-455)
455	Drs. McCarthy, Michel, Sahu, and Barlaz concur that ¹⁴ C radiolabeling would provide strong, and perhaps definitive, evidence that the plastic, and not just the additive, is biodegrading.	CCX-891 ¶¶ 59-60; CCX-895 at 12, 15; RX-855 at 47; RX-853 at 9.
456	ECM’s consumer perception expert, Dr. David Stewart, was unaware of any reason why a manufacturer would purchase the additive other than to make its products biodegradable, and his own consumer survey found that 71% of respondents believe that whether a product is biodegradable is important.	(Stewart, Tr. 2643). RX-856 at 27.
457	Yale Marketing Professor Shane Frederick concurred that biodegradable claims “affect consumer decisions.”	CCX-865 at 15.
458	Sinclair testified that ECM used the “nine months to five years” claim only to distinguish its product from faster-degrading compostable material. However, although Mr. Sinclair offered this dubious story when deposed,	CCX-818 at 77-79
459	Although there are a few instances in which a customer suggested that it did not consider biodegradation time, the overwhelming majority of the evidence supports the opposite. For example, in a candid moment, ECM CEO Robert Sinclair admitted to customer Westchem	CCX-423 at 9; CCX-282 at 2 (asking various questions about “degradable timing,” including whether “adding more [additive]” would accelerate the “degradable effect”);

	<p>Group: <u>“Lots of people get hung up on how long.”</u></p>	<p>CCX-281 at 2 (requesting test results demonstrating the “progress of decomposition during a certain time span (a couple years)”); CCX-279 at 3 (expressing concern about “the ability to claim without exception the speeded up breakdown”); CCX-280 at 3 (“We do have some nagging concerns that we need to resolve. The first question is ‘how long does it take to degrade.’”); CCX-300 at 1 (“Does ECM test, or recommend testing, the end-users’ products to ensure that they biodegrade in less than 5 years?”); CCX-269 at 1 (“What determines 9 months vs 5 years as it is such a variance?”); CCX-400 at 4 (asking ECM precisely how much additive it needed to use in its products use “to meet your stated degradation timeframe of 9 months to 5 years”).</p>
460	<p>Other ECM customers demonstrated the importance the timeframe had to them by reiterating it to <u>their</u> prospective customers.</p>	<p>CCX-811 at 22 (agreeing that “[b]ecause the prospective customers were interested in purchasing biodegradable plastic, IPB thought that the fact that . . . plastic products made with ECM additives would fully biodegrade in nine months to five years would be important to them”); CCX-33 (EarthAware Films; repeating “nine months to five years” in marketing literature); CCX-34 (EarthAware Films; repeating “nine months to five years” in memorandum to its distributors); CCX-37 (BioPVC, repeating “nine months to five years” on website); CCX-53 (Gilman Brothers; stating product would degrade in one to five years in marketing material); CCX-57 (Kappus Plastics; marketing materials stated in bold that its product “will break down in approximately 9 months to 5 years”) (emphasis in original); CCX-102 (BioMugs; “This BioMug is made of a unique plastic that renders it biodegradable in 1-5 years.”); CCX-105 (Plascon Films; repeating “nine months</p>

		to five years” in advertisement).
461	after informing potential customers that its ECM Plastic allegedly would degrade in “9 months to 5 years,” one customer’s marketing materials exclaimed: “We think you’ll agree that this is an environmental bargain. . . especially when compared to the unknown breakdown time of other modern plastic materials!”	CCX-38 at 1 (ellipses in original).
462	Down To Earth asked ECM about using language that included “nine months to five years” on its grocery bags. ECM responded with general approval – not befuddlement or confusion as to why anyone would want to put that claim on packaging for end-use consumers. (approving the use of “nine months to five years” on another customer’s marketing).	CCX-307; see also CCX-1095
463	Down To Earth’s supplier, Island Plastic Bags (“IPB”), manufactured ECM Plastic bags reflecting the “nine months to five years” claim for “50 to 100” different customers.	CCX-811 (Hong, Tr. 57)
464	In total, IPB alone manufactured “about 10 million ” such bags.	CCX-811 (Hong, Tr. 99).
465	The claim “nine months to five years” helps ensure that consumers believe the “biodegradable” claim. Indeed, as IPB explained, its bags contain the “nine months to five years” language because “we want people [consumers] to know” how the product biodegrades, “so that they feel like this is an actual technology . . . it’s for real. ” Put differently, IPB wanted consumers to have details regarding the biodegradation process, including the timeframe, “so that they would understand that the bags would . . . work as advertised [.]	CCX-811 (Hong, Tr. 54-55).
466	Packaging manufacturer FP International testified that it conveyed to its potential customers that its “CELL-O air cushions will decompose completely within 9 to 60 months in the presence of microorganisms whether they are sent to a landfill or end up as litter in the soil” because “[i]t was important to convey a message of biodegradability.”	CCX-810 (Blood, Tr. 24-25).
467	The fact that ECM Plastic biodegrades quickly was so important that ECM required its customers to sign a so-called “Certificate of Minimum Loading” in which the customer acknowledges that “ECM’s reputation can be materially and, perhaps, irreparably damaged when products claiming to use ECM MasterBatch Pellets fail to biodegrade within a reasonable time	(Sinclair, Tr. 765), (CCX-832)

468	ECM further required that its customers certify: “we are fully aware [of] the risk that a [] plastic product will not fully biodegrade within a reasonable period of time if it contains less than one percent” of ECM’s Additive.	(CCX-832) (emphasis added).
469	Although ECM generally did not communicate with end-use consumers, one consumer who received a “biodegradable shopping bag” tracked down ECM and asked: “[I]n a landfill situation, would the bag be 100% broken down in XX years, or 50% within XX months.” Mr. Sinclair responded: “The timeframe for biodegradation is generally-speaking 9 months to five years[.]”	CCX-326
470	This anaerobic sludge from wastewater (sewage) treatment plants is what many of the labs used to conduct this test.	CCX-805 at 69 (Eden Labs Dep., lines 21-23). <i>See also</i> CCX-669 at 1 (Northeast Labs report indicating test inoculum sourced from Mattabasset Waste Treatment Facility).
471	Dr. Barlaz concedes that only about 10% of all landfills are bioreactors.	RX-853 at 5.
472	Dr. Stewart admitted that “information conveyed to respondents earlier in a survey can affect their answers to later questions[.]”	(Stewart, Tr. 2689)
473	Dr. Stewart also increased consumer confusion by asking end-use consumers to interpret “biodegradable” claims that included technical language such as “one percent load” and “plastic resins.”	RX-602. (Stewart, Tr. 2775-76).
474	He agreed that most consumers would not know what these terms meant, and that such claims never reached end use consumers.	(Stewart, Tr. 2775-76).
475	Mr. Sinclair maintains that the Green Guides were revised as a result of influence from the “corn lobby.”	(Sinclair Tr. 1702).
476	None of the samples in Eden Lab’s tests of plastics containing 1% ECM additives fully degraded.	(Poth, Tr. 1490-1491 (stating that the witness had concerns about turning over Eden’s ECM testing, and that the samples in the tests located had not totally degraded)).
477	Dr. Stewart also did not ask consumers any relevant variant, such as how much time would it take for plastic labeled “ECM biodegradable” to biodegrade?	(<i>See</i> RX-847).

II. Proposed Conclusions of Law

A. Burden of Proof

1. The parties' burdens of proof are governed by Federal Trade Commission ("FTC") Rule 3.43(a), Section 556(d) of the Administrative Procedure Act ("APA"), and case law. FTC Rules of Practice, Interim rules with request for comments, 66 Fed. Reg. 17,622, 17,626 (Apr. 3, 2001). Pursuant to Commission Rule 3.43(a), "[c]ounsel representing the Commission ... shall have the burden of proof, but the proponent of any factual proposition shall be required to sustain the burden of proof with respect thereto." 16 C.F.R. § 3.43(a). Under the APA, "[e]xcept as otherwise provided by statute, the proponent of a rule or order has the burden of proof." 5 U.S.C. § 556(d).
2. "It is well established that the preponderance of the evidence standard governs FTC enforcement actions." *Daniel Chapter One*, Docket No. 9329, 2009 FTC LEXIS 157, at *134-35 (Aug. 5, 2009) (initial decision) (citing *Telebrands Corp.*, 140 F.T.C. 278, 426 (2004) (initial decision), *aff'd.*, 140 F.T.C. 278 (2005), *aff'd.*, 457 F.3d 354 (4th Cir. 2006); *Automotive Breakthrough Sciences, Inc.*, 126 F.T.C. 229, 306 n.45 (1998)) (other citations omitted), *aff'd.* (FTC Dec. 24, 2009), *aff'd.*, 405 F. App'x. 505 (D.C. Cir. Dec. 10, 2010), *cert. denied*, 131 S. Ct. 2917 (May 23, 2011).

B. Jurisdiction

3. The acts and practices charged in the Complaint in this matter took place in or affecting commerce within the meaning of the Federal Trade Commission Act, as amended. 15 U.S.C. § 41 *et seq.* Nationwide advertising, marketing, or sales activity of the sort that ECM engaged in constitutes "commerce" under the FTC Act. *See, e.g., P.F. Collier & Son Corp. v. FTC*, 427 F.2d 261, 272 (6th Cir. 1970); *Ford Motor Co. v. FTC*, 120 F.2d 175, 183 (6th Cir. 1941) (noting that commerce also includes the actions, communications, and other acts or practices that are incident to those activities).
4. The Commission has jurisdiction over persons, partnerships, and corporations. 15 U.S.C. § 45(a)(2). A "corporation" is defined in Section 4 of the FTC Act as "any company . . . which is organized to carry on business for its own profit or that of its members[.]" 15 U.S.C. § 44. Therefore, the Commission has jurisdiction over ECM.
5. The Complaint charges ECM with violating Section 5 of the FTC Act. Section 5(a) provides that "unfair or deceptive acts or practices in or affecting commerce are hereby declared unlawful." 15 U.S.C. § 45(a)(1).
6. ECM's challenged forms of marketing constitute alleged deceptive acts or practices within the scope of Section 5 of the FTC Act, 15 U.S.C. § 45.

C. ECM Made Deceptive Advertising Claims.

7. An advertisement is deceptive if it contains a representation or omission of fact that is likely to mislead a consumer acting reasonably under the circumstances, and that

representation or omission is material to a consumer's purchasing decision. *In re POM Wonderful LLC*, No. 9344, 2013 FTC LEXIS 6 at *17-18 (FTC Jan. 10, 2013) (citing *FTC Policy Statement on Deception*, 103 F.T.C. 174, 175 (1984) (appended to *Cliffdale Assocs., Inc.*, 103 F.T.C. 110 (1984)) (“*Deception Statement*”).

8. To evaluate whether an advertisement is deceptive, the Commission applies a three-part inquiry as to: “(1) what claims are conveyed in the advertisement; (2) are those claims false or misleading; and (3) are those claims material to prospective consumers.” *Kraft, Inc. v. FTC*, 970 F.2d 311, 314 (7th Cir. 1992).
9. ECM violated Section 5 of the FTC Act because a preponderance of evidence shows: (1) respondent disseminated advertisements conveying the claims alleged in the complaint; (2) the claims were false or misleading; and (3) the claims are material to consumers.

ECM Disseminated Advertisements Conveying The Claims Alleged In The Complaint.

10. ECM's customers received the claims through ECM's website and myriad promotion materials, e.g., brochure, flyers, technical data sheets, technology summaries, Certificate, testing, and presentations. FOF ¶¶ 46, 63, 65-66.
11. End-use consumers received these claims both directly through ECM's website and through the means and instrumentalities ECM provided to its customers. FOF ¶¶ 107-108, 24-25.
12. Advertising claims may be express or implied. “Express claims directly represent the fact at issue while implied claims do so in an oblique or indirect way.” *Kraft*, 970 F.2d at 318 (citing *Thompson Medical*, 104 F.T.C. 648,788 (1984)).
13. The ALJ has the authority to rule as to the conveyed meaning of advertisements and promotional materials based on a facial analysis of these advertisements or promotional materials. *Automotive Breakthrough Sciences, Inc.*, Docket Nos. 9275-77, 1996 FTC LEXIS 252, at *44, (partial summary decision May 22, 1996) (citing *Kroger Co.*, 98 F.T.C. 726, 729 n.11 (1981); *Ford Motor Co.*, 87 F.T.C. 756, 794-97 (1976)).
14. “The courts and the FTC have recognized consistently that implied claims fall along a continuum, from those which are so conspicuous as to be virtually synonymous with express claims, to those which are barely discernible.” *FTC v. Febre*, No. 94 C 3625, 1996 U.S. Dist. LEXIS 9487, at *14 (N.D. Ill. July 3, 1996) (citing *Kraft, Inc., v. FTC*, 970 F.2d at 319) (magistrate judge's recommendation), adopted by 1996 U.S. Dist. LEXIS 14297 (N.D. Ill. Sept. 25, 1996), *aff'd*, 128 F.3d 530 (7th Cir. 1997); see also *FTC v. Bronson Partners, LLC*, 564 F. Supp. 2d 119, 127-28 (D. Conn. 2008) (an advertisement's statements were “so clear, repetitive, and unambiguous that they constitute[d] the functional equivalent of express claims”), *aff'd*, 654 F.3d 359 (2d Cir. 2011).
15. “If the advertisement explicitly states or clearly and conspicuously implies a claim, the court need not look to extrinsic evidence to ascertain whether the advertisement made the

claim.” *FTC v Nat’l Urological Group, Inc.*, 645 F. Supp. 2d at 1189; *see also FTC v. Colgate-Palmolive Co.*, 380 U.S. at 391-92 (stating that the FTC is not required to conduct consumer surveys before determining that a commercial has a tendency to mislead); *Kraft, Inc. v. FTC*, 970 F.2d at 320 (“[W]hen confronted with claims that are implied, yet conspicuous, extrinsic evidence is unnecessary because common sense and administrative experience provide the Commission with adequate tools to make its findings. [citations omitted]. The implied claims Kraft made are reasonably clear from the face of the advertisements, and hence the Commission was not required to utilize consumer surveys in reaching its decision.”).

16. In considering the net impression of an advertisement, the Commission does “not require that all consumers reading or viewing it be sophisticated experts in interpreting the nuances of the English language.” *Thompson Med. Co.*, 104 F.T.C. at 792 (“We look at how such individuals actually interpret advertisements in a real-life situation, not at how they would if they had sufficient time and incentives attentively to review the ads so as to come up with the most semantically correct interpretation of them.”).
17. Commission law recognizes that advertisements may be susceptible to more than one reasonable interpretation. *Kraft, Inc.*, 114 F.T.C. at 120-21 n.8; *Thompson Med. Co.*, 104 F.T.C. at 789 n.7. “Statements susceptible of both a misleading and a truthful interpretation will be construed against the advertiser.” *FTC v. Bronson Partners, LLC*, 564 F. Supp. 2d at 127 n.6 (quoting *Country Tweeds, Inc. v. FTC*, 326 F.2d 144, 148 (2d Cir. 1964)).
18. ECM repeatedly made four express claims: (1) ECM Plastics will biodegrade completely; (2) in nine months to five years; (3) in a landfill; and (4) scientific testing proves these claims. (SOF ¶¶18, 26-29; 31; 32; 33; 44-48; 50).
19. When claims are express, one can “infer that reasonable consumers interpret them to mean what they say.” *FTC v. USA Beverages, Inc.*, No. 05-61682-CIV, 2005 U.S. Dist. LEXIS 39075, at *16-17 (S.D. Fla. Dec. 5, 2005); *accord FTC v. Pantron I Corp.*, 33 F.3d 1088, 1096 n. 21 (9th Cir. 1994). These express claims are clear on their face. Accordingly, no further analysis is necessary to determine that ECM made these claims and that its customers and consumers reasonably understood them to mean what they said. *Pantron I* at 1088.
20. While under investigation by the FTC, ECM changed its primary advertising claim to “biodegradable in some time greater than a year.” (SOF ¶38). ECM also continued to prominently claim that ECM Plastic was “biodegradable” both on its website and in its brochure. (SOF ¶¶ 39-43). This advertising made three implied claims: (1) ECM Plastics will completely biodegrade; (2) after customary disposal (*i.e.*, in a landfill); (3) in a period close to one year, or at least within 5 years.
21. “Extrinsic evidence is unnecessary to establish the impression that consumers would take away from an ad if the claims are reasonably clear from the face of the advertisement.” *In re POM Wonderful LLC*, 2013 FTC LEXIS 6 (F.T.C. Jan. 10, 2013).

22. When the possibility of deception is as self-evident as it is in this case, we need not require the State to 'conduct a survey of the . . . public before it [may] determine that the [advertisement] had a tendency to mislead.' *Zauderer v. Office of Disciplinary Counsel*, 471 U.S. 626, 652-53 (1985).
23. “[T]he Commission may rely on its own reasoned analysis to determine what claims, including implied ones, are conveyed in a challenged advertisement, so long as those claims are reasonably clear from the face of the advertisement.” *Kraft, Inc. v. FTC*, 970 F.2d 311, 319 (7th Cir. 1992); *see also POM Wonderful*, 2013 FTC LEXIS *44 (“In this case, extrinsic evidence is not required because the establishment claims are in fact apparent from the overall, common-sense, net impression of the words and images of the advertisements themselves.”).
24. If a substantial number of consumers interpret an advertisement as conveying an implied claim, then the requirement that the advertisement convey the claim is satisfied. *See, e.g., Benrus Watch Co., Inc. v. FTC*, 352 F.2d 313, 319-20 (8th Cir. 1965) (“substantial percentage”); *Raymond Lee Org., Inc.*, 92 F.T.C. 489, 649 (1978) (“substantial numbers”), *aff’d*, 679 F.2d 905 (D.C Cir. 1980); *In the Matter of The Kroger Co.*, 98 F.T.C. 639, 728 (1981) (“some reasonably significant number”), *modified on other grounds*, 100 F.T.C. 573 (1982); *Travel King, Inc.*, 86 F.T.C. 715, 759 (1975) (“substantial numbers”); *Bristol-Myers Co.*, 85 F.T.C. 988, 744 (1975) (“substantial numbers”); Statement of Basis and Purpose for the Funeral Industry Practices Rule, 47 Fed. Reg. 42,260, 42,274 (1982) (“substantial segment”); Statement of Basis and Purpose for the Cigarette Rule, 29 Fed. Reg. 8325, 8360 (1964) (“substantial segment”).
25. Although the Commission has never determined the minimum number of consumers necessary to constitute a “substantial number,” Courts and the Commission have found repeatedly that percentages ranging from 10% to 22% are sufficient. *See, e.g., In the Matter of Telebrands Corp.*, 140 F.T.C. 278, 325 (**10.5%** is substantial); *Firestone Tire & Rubber Co. v. FTC*, 481 F.2d 246, 249 (6th Cir. 1973) (“We find it hard to overturn the deception findings of the Commission if the ad thus misled **15%** (or **10%**) of the buying public.”) (emphasis added); *In the Matter of Am. Home Prods.*, 98 F.T.C. 136, 394 (1981) (finding, based in part on a study showing that **22%** of respondents identified “tension/nervous” tension” as a symptom relieved by Anacin, that Anacin’s advertising “convey[ed] a strong message that Anacin relieves anxiety, stress and other mood problems entirely apart from its function as a pain reliever”); *In the Matter of Benrus Watch Co.*, 64 F.T.C. 1018, 1045 (1964) (“Moreover, even if the study does show 86% nondeception as assumed by the examiner, which it does not, this still leaves **14 percent** of the prospective purchasers who may be deceived, and, of course, these are entitled to protection.”) (citation omitted) (emphasis added), *aff’d, Benrus Watch Co. v. FTC*, 352 F.2d 313, 319-20 (8th Cir. 1965) (“[W]e think that the Examiner and the Commission were justified in concluding that list prices still indicate actual regular retail prices to a substantial percentage of the watch buying public, a percentage that is entitled to

- protection from deceptive preticketing.”); *see also In the Matter of Bristol-Myers Co.*, 85 F.T.C. 688, 745 (1975) (finding 2-4% “patently insubstantial”).
26. Although not using the technical term “convergent validity,” both the Commission and its ALJs have recognized that the convergence of results from different consumer perception studies confirms that they are “reasonably reliable and probative.” *See In the Matter of Bristol-Myers Co.*, 85 F.T.C. 688, 744 n.2 (1975) (noting the fact that different “surveys are from independent sources and tend to confirm one another” is relevant to whether surveys are reasonably reliable and valid); *In the Matter of Thompson Med. Co.*, 104 F.T.C. 648, 836 n.82 (“The consistency of this finding across both studies should have been a warning signal to Thompson that potential consumers might be confused about the ingredients of Aspercreme.”); *In the Matter of Am. Home Prods.*, 98 F.T.C. 136, 252 (noting that “[t]he fact that these studies generated consistent results over a relatively short period of time (three to four years) enhances their reliability”) (ALJ op.).
 27. Courts have also recognized “convergent validity” in other contexts. *See, e.g., United States v. Montgomery*, No. 2:11-cr-20044-JPM-1, 2014 WL 1516147, 53 (W.D. Jan. 28, 2014) (“the Court is guided by the principle of ‘convergent validity’” when evaluating testing for intellectual disability); *K.S. ex rel. P.S. v. Fremont Unified Sch. Dist.*, 679 F.Supp.2d 1046, 1060 (N.D. Cal. 2009) (rejecting argument that ALJ erred by relying on testimony of an expert who employed a “convergent validity” approach); *cf. Grigsby v. Mabry*, 758 F.2d 226, 237 (8th Cir. 1985) (“The consistency over a wide range of survey methods and respondents is impressive.”).
 28. A factfinder can draw valid conclusions from several studies even when the individual “studies could not, standing alone, serve as a basis for any conclusion.” *Am. Home Prods.*, 98 F.T.C. at 253.
 29. “[N]o survey is perfect.” *Selchow & Righter Co. v. Decipher, Inc.*, 598 F. Supp. 1489, 1502 (E.D. Va. 1984).
 30. Survey evidence need not be perfect, as long as it is “reasonably reliable and probative.” *See, e.g., In re POM Wonderful LLC*, 2013 FTC LEXIS 6, 49 (Jan. 10, 2013) (“The Commission does not require methodological perfection before it will rely on a copy test or other type of consumer survey, but looks to whether such evidence is reasonably reliable and probative.”) (citations omitted); *In re Telebrands Corp.*, 140 F.T.C. 278, 324 (2005) (“[C]opy tests do not have to be flawless to be reasonably reliable and probative.”) (citation omitted); *In the Matter of Novartis Corp.*, 127 F.T.C. 580, 699 n.24 (“While a given study may be flawed in some respects, it still can be probative, and any deficiencies simply will affect the weight given to the evidence.”) (citation omitted); *In the Matter of Stouffer Foods Corp.*, 118 F.T.C. 746, 807 (1994) (“Perfection is not the prevailing standard for determining whether a copy test may be given any weight. The appropriate standard is whether the evidence is reliable and probative.”).
 31. Professor Frederick defined a valid survey as “one which produces accurate results,” which is consistent with the Commission’s standard, which looks to whether a survey is reasonably reliable and probative.

32. Although federal courts sometimes use *The Manual for Complex Litigation* to guide their analysis of survey evidence, that manual merely points to various indicia of a probative survey (for instance, whether the questions are clear, and whether the data gathered were accurately reported). The Commission has never employed *The Manual for Complex Litigation* to guide its analysis of survey research, although the various considerations this treatise references are entirely consistent with an inquiry into whether a survey is reasonably reliable and probative. Indeed, under the Commission's authority, any consideration relevant to whether a survey is reasonably reliable and probative is relevant.
33. Although a claim is not deceptive if it is "unreasonably misunderstood by an insignificant and unrepresentative segment" of consumers, *Deception Statement*, 103 F.T.C. at 178 (quoting *In re Kirchner*, 63 F.T.C. 1282, 1290 (1963), *aff'd*, 337 F.2d 751 (9th Cir. 1964)) (emphasis added), there is no evidence that consumers who believe a product could biodegrade within days or weeks are have an *unreasonable* misunderstanding—especially when the product at issue is one labelled "biodegradable." With respect to the survey research at issue in this case, there is no legally valid basis to conclude that one set of mistaken estimates (days, weeks) should be excluded as unreasonable or "absurd," whereas another set of mistaken beliefs (months, one year) is close enough to count.
34. The Commission evaluates claims "in light of the sophistication and understanding" of the audience. *See, e.g.*, *Deception Statement*, 103 F.T.C. at 178-79.
35. The fact that there is no universal "shared understanding" of a term is legally irrelevant to whether a substantial minority of consumers have been deceived.
36. The Green Guides state that "[i]t is deceptive to make an unqualified degradable claim for items entering the solid waste stream if the items do not completely decompose within one year after customary disposal." 16 C.F.R. § 260.8(c).
37. ECM's advertisements convey expressly or strongly imply the following claims:
 - a. ECM Plastics are biodegradable, *i.e.*, will completely break down and decompose into elements found in nature within a reasonably short period of time after customary disclosure;
 - b. ECM Plastics are biodegradable in a landfill;
 - c. ECM Plastics are biodegradable in a stated qualified timeframe; and
 - d. ECM Plastics have been shown to be biodegradable, biodegradable in a landfill, or biodegradable in a stated qualified timeframe under various scientific tests, including but not limited to, ASTM D5511.

ECM's Advertising Claims Are False And Unsubstantiated.

38. Claims are deceptive if they are false or lack a reasonable basis. *In re Daniel Chapter One*, No. 9329, Initial Decision, at *99 (F.T.C. Aug. 5, 2009). ECM's claims both are

false and lack a reasonable basis.

39. ECM's express and implied claims are false and unsubstantiated.
40. ECM's claims are false. ECM's expert, Dr. Sahu, estimates that *at minimum* it would take 30 years for ECM Plastic to completely biodegrade. Another of ECM's experts, Dr. Barlaz, concurs with Complaint Counsel's expert, Dr. Tolaymat, that landfill conditions do not support the biodegradation times claimed by ECM. In addition to these concessions, ECM's express and implied claims are false based on indisputable science. A physical blend of 1% ECM Additive and 99% conventional plastic cannot change the underlying recalcitrance of the remaining 99% plastic—and ECM offers no reliable expert opinion the contrary. A number of biodegradation studies also show ECM's claims are false.
41. To prevail under the "reasonable basis" theory, Complaint Counsel must prove that the advertiser did not have a reasonable basis substantiating its claims at the time it made the claims. *Daniel Chapter One*, No. 9329, Initial Decision, at *99 (citing *Thompson Med. Co.*, 104 F.T.C. at 813). ECM's express and implied claims of complete biodegradation in landfills in five years or less lack a reasonable basis for two reasons. First, the appropriate level of substantiation is competent and reliable scientific evidence. This standard requires well-controlled, well-conducted studies, and ECM's evidence falls far short of this standard.
42. Second, even assuming that some of the tests show *some* biodegradation, they fail to reach levels of biodegradation beyond that attributable to the additive, much less enough to support ECM's claims of complete biodegradation. Nor were they conducted under conditions that come close to approximating the conditions claimed in ECM's advertisement. Accordingly, ECM's claims are unsubstantiated.
43. "To determine what constitutes a reasonable basis, the Commission considers the 'Pfizer factors,' which are factors relevant to the benefits and costs of developing substantiation for the claim." See *POM Wonderful*, Docket No. 9344, at 17-18 (citing *In re Pfizer Inc.*, 81 F.T.C. 23 (1972)); *Substantiation Statement*, 104 F.T.C. at 840. Application of the *Pfizer* factors here demonstrates that ECM's substantiation is insufficient to support its claims.
44. Biodegradable marketing claims must be supported with a high-level of substantiation. Environmental claims are particularly difficult for consumers to evaluate: consumers are not in a position to access, let alone evaluate, scientific evidence of biodegradability nor see for themselves whether a product actually degrades as promised. 16 C.F.R. § 260.4(b); *POM Wonderful* at 35 (citations omitted) (citing *Removatron Int'l Corp.*, 111 F.T.C. 206, 306 n.20, 884 F.2d 1489, 1496-97 (1st Cir. 1989)) (competent and reliable scientific evidence required for "claims whose truth or falsity would be difficult or impossible for consumers to evaluate by themselves"). This standard is consistent with the level of substantiation expected from experts in the field, who view claims of biodegradable conventional plastic with great skepticism. FOF ¶ 134.

45. Competent and reliable scientific evidence is the quantum of substantiation for biodegradability claims in The Guides for Environmental Marketing, 16 C.F.R. § 260.8, and in numerous consent orders. *See, e.g., Down to Earth Designs, Inc.*, Docket No. C-4443 (2014); *Clear Choices Housewares, Inc.*, File No. 122 3288 (2013); *Kmart Corp.*, File No. 0823186 (2009); *Tender Corp.*, File No. 082-3188 (2009); *Dyna-E Int'l Inc.*, File No. 082-3187 (2009); *Archer Daniels Midland Co.*, 117 F.T.C. 403, 415, 410 (1994); *Mobil Oil Corp.*, 116 F.T.C. 113, 120-121 (1993); *American Enviro. Prods., Inc.*, 115 F.T.C. 399, 408-09 (1992).
46. “Competent and reliable scientific evidence” is “tests, analyses, research, studies, or other evidence based on the expertise of professionals in the relevant area, that has been conducted and evaluated in an objective manner by persons qualified to do so, using procedures generally accepted in the profession to yield accurate and reliable results.” *See, e.g., Brake Guard Prods., Inc.*, 125 F.T.C. 138 (1998); *see also, POM*, 2013 FTC LEXIS 6, at 11.
47. The Commission then has the burden of proving that the respondent’s purported substantiation is inadequate, but is not required to conduct or present studies showing that the products do not perform as claimed. *See FTC v. QT, Inc.*, 448 F. Supp. 2d at 959 (citing *FTC v. Sabal*, 32 F. Supp. 2d at 1008-09).
48. “[T]he advertiser has the burden of establishing the substantiation it relied on for its claim.” *Daniel Chapter One*, 2009 FTC LEXIS 157, at *137 (initial decision) (citing *FTC v. QT, Inc.*, 448 F. Supp. 2d at 959). In addition, “where advertising expressly or impliedly represents that it is based on scientific evidence, the advertiser must have that level of substantiation, and, in particular, must satisfy the relevant scientific community that the claim is true.” *Removatron*, 111 F.T.C. at 299. If advertisements “expressly or impliedly promise a scientific level of substantiation,” then a *Pfizer* analysis is not required and the ads’ claims must be supported by scientific proof. *Removatron Int’l Corp.*, 111 F.T.C. at 297-98, 306 (when evaluating ads “the net impression” of which was “that respondents’ claims were based on competent scientific proof we need not apply the *Pfizer* analysis in determining the reasonable basis for respondents’ claims.”); *aff’d*, 884 F.2d 1489, 1498 (“[A] ‘reasonable basis,’ when one makes establishment claims, means well-controlled scientific studies.”)
49. Dr. McCarthy and Dr. Tolaymat testified on the level of substantiation they would expect, as experts in their fields, to support biodegradability claims. ECM’s evidence falls far short of this standard.
50. Dr. McCarthy is a professor of Plastics Engineering at the University of Massachusetts Lowell with more than thirty years’ experience studying both the chemical and mechanical behavior of polymers, including their biodegradability. He testified that there is overwhelming scientific consensus that conventional plastics are not biodegradable, because the chemical structure of commercial-grade plastics are resistant to naturally-occurring microorganisms.
51. He also testified that, to satisfy polymer scientists that ECM’s additive will make

conventional plastics biodegradable in a stated timeframe and disposal condition, the claimant should provide the results of well-conducted scientific testing.

52. The following claims are false and ECM did not possess competent and reliable scientific evidence to substantiate them at the time ECM made the claims:
- a. ECM Plastics are biodegradable, *i.e.*, will completely break down and decompose into elements found in nature within a reasonably short period of time after customary disclosure;
 - b. ECM Plastics are biodegradable in a landfill;
 - c. ECM Plastics are biodegradable in a stated qualified timeframe; and
 - d. ECM Plastics have been shown to be biodegradable, biodegradable in a landfill, or biodegradable in a stated qualified timeframe under various scientific tests, including but not limited to, ASTM 5511.
53. Therefore, ECM violated Section 5 of the FTC Act, and Complaint Counsel is entitled to the proposed order against ECM.

ECM's Deceptive Claims Are Material.

54. A claim is material if it “involves information that is important to consumers and, hence, likely to affect their choice of, or conduct regarding a product.” *Kraft, Inc. v. FTC*, 970 F.2d 311, 322 (7th Cir. 1992) (quotation omitted). Significantly, three types of claims are presumed material: (1) express claims; (2) implied claims the seller intended to make; and (3) claims involving health, safety, or “other areas with which reasonable consumers would be concerned, including a claim that concerns the **purpose**, safety [or] **efficacy**” of the product. *Id.* at 322-23 (emphasis added). Thus, any claim related to the product’s central characteristics is presumptively material, *Telebrands*, 140 F.T.C. at 292, including any implied claim, *Thompson Med.*, 104 F.T.C. at 816-17.
55. Each of ECM’s claims regarding the alleged biodegradability of ECM Plastic is material. ECM’s express claim—that the ECM additive would make plastic biodegrade in nine months to five years in a landfill and that testing proved this fact—are presumptively material. *Kraft*, 970 F.2d at 322-23. ECM’s implied claims—that the ECM additive would make plastic biodegrade in a reasonably short period of time (*e.g.*, less than a year, or at least 5 years) after customary disposal (*i.e.*, in a landfill)—are likewise presumptively material under two independent legal theories. First, there is ample evidence that ECM intended to make these claims. Second, the claims relate to the “central characteristic” of the product (its ability to make plastic completely biodegrade, in a landfill, in 5 years or less). *Thompson Medical Co.*, 104 F.T.C. 648, 816-817 (1984), *aff’d*, 791 F.2d 189 (D.C. Cir. 1986), *cert. denied*, 479 U.S. 1086 (1987).
56. Express representations are presumed material because “the willingness of a business to promote its products reflects a belief that consumers are interested in the advertising.” *Deception Policy Statement* at 182 (quoting *Cent. Hudson Gas & Elec. Co. v. Pub. Serv.*

Comm'n, 447 U.S. 557, 567 (1980)); *see also* *FTC v. 1st Guar. Mortg. Corp.*, No. 09-cv-61840, 2011 U.S. Dist. LEXIS 38152, at *46 (S.D. Fla. Mar. 30, 2011); *FTC v. Nat'l Urological Group, Inc.*, 645 F. Supp. 2d at 1190; *Medical Billers Network, Inc.*, 543 F. Supp. 2d 283, 304 (S.D.N.Y. 2008). Also presumed as material are implied claims that are made “by such strong implication that they are the functional equivalent of an express claim.” *See* *FTC v. Bronson Partners, LLC*, 564 F. Supp. 2d at 135.

57. The Commission infers materiality where the record shows that a respondent intended to make an implied claim. *Novartis Corp.*, 127 F.T.C. at 686-89 (explaining that the ALJ correctly presumed implied superior efficacy claims were material because Novartis had intended to make such claims) (citing *Deception Policy Statement* at 182); *see also* *FTC v. 1st Guar. Mortg. Corp.*, 2011 U.S. Dist. LEXIS 38152, at *46 (“[D]eliberately-implied claims used to induce the purchase of a product or service are presumed to be material to consumers as a matter of law.”); *FTC v. Bronson Partners, LLC*, 564 F. Supp. 2d at 135 (“The underlying rationale for finding [an intended] claim to be presumptively material is the assumption that the willingness of a business to promote its product reflects a belief that the consumers are interested in the advertising.”) (quotation and alterations omitted); *FTC v. Nat'l Urological Group, Inc.*, 645 F. Supp. 2d at 1190 (“[D]eliberately made implied claims, used to induce the purchase of a particular product or service, are presumptively material.”).
58. The Commission also presumes that claims are material if . . . they pertain to the “central characteristics of a product . . . such as those relating to its purpose . . . [or] efficacy.” *Telebrands Corp.*, 140 F.T.C. at 292 (quoting *Thompson Med. Co.*, 104 F.T.C. at 816-17) (alteration in original); *see also* *Novartis Corp.*, 127 F.T.C. at 687 (agreeing with the ALJ that “the challenged superior efficacy claim relates to central characteristic of the product, that is, Doan's ability to relieve back pain.”); *Brake Guard Prods., Inc.*, 125 F.T.C. 138, 210-11 (1997) (initial decision) (“The Commission also presumes claims to be material if they pertain to the ‘central characteristics of a product . . . such as those relating to its purpose . . . [or] efficacy,’ or to safety. The majority of the challenged claims made for the product directly involved its purpose, efficacy and safety. The central theme of respondents’ ads was that the Brake Guard device was an antilock brake system that provided certain braking and stopping distance improvements, and that installing an antilock brake system like Brake Guard would make the vehicle safer.”) (alteration in original) (citation omitted), *aff'd.*, 125 F.T.C. 138 (1998).
59. Notably, as a manufacturer of end-use products, Island Plastic Bag’s (“IPB’s”) intent in conveying the “nine months to five years” claim is “a predicate fact giving rise to the presumption of materiality.” *Deception Statement*, 103 F.T.C. at 182; *See also* *Kraft*, 970 F.2d at 311 (presumption of materiality applies “where there is evidence that the seller intended to make the claim”) (citation omitted); *FTC v. QT, Inc.*, 448 F. Supp.2d 908, 960 (N.D. Ill. 2006).
60. There are many different ways an advertiser can convey the material message that its product’s central feature functions as advertised. *See, e.g.,* *Thompson Med.*, 104 F.T.C. at 818 (“Evidence from the ads themselves confirms our conclusion that Thompson was making implied efficacy representations when it represented Aspercreme to be a new

product.”); *see also Sterling Drug, Inc. v. FTC*, 741 F.2d 1146, 1151-52 (9th Cir. 1984) (upholding Commission finding that broad references to drug’s “quality” would be interpreted by consumers as encompassing “efficacy,” because, with respect to the product at issue, “effective pain relief” was “consumers’ primary concern”).

ECM Provided Its Customers With The Means And Instrumentalities To Deceive End-Use Consumers.

61. “[I]t is well established that one who puts into the hands of others the means by which such others may deceive the public is equally as responsible for the resulting deception.” *FTC v. Magui Publishers, Inc.*, No. 91-55474, 1993 U.S. App. LEXIS 28684, at *10 (9th Cir. Oct. 6, 1993)) (quoting *In re Litton Indus., Inc.*, 97 F.T.C. 1, 48 (1981)). Specifically, under the doctrine of means and instrumentalities (“M&I”), a respondent is primarily liable for deceptive claims even when it does not convey the misrepresentations directly to end-use consumers. *FTC v. Winstead Hosiery Co.*, 258 U.S. 483 (1922). The purpose of the M&I doctrine is simple: “it is in the public interest to stop any deception at its incipiency.” *Regina Corp. v. FTC*, 322 F.2d 765, 768 (3d Cir. 1963).
62. The doctrine applies in at least two circumstances: the passing on of deceptive tangible items and the passing on of specific deceptive claims from the tangible item. *In re Shell Oil Co.*, 128 F.T.C. 749, 766 (1999) (Swindle, C., dissenting). M&I liability has been imposed to address a wide variety of deceptive claims. *See, e.g., FTC v. Winstead Hosiery Co.*, 258 U.S. 483, 494 (1922) (deceptive labels on knit goods sold to retailers); *Magui Publishers, Inc.*, No. 91-55474, 1993 U.S. App. LEXIS 28684, at *10-11 (certificates, brochures, and signed prints); *FTC v. Cyberspy Software, LLC*, No. 6:08-cv-1872-ORL-31GJK, 2010 U.S. Dist. LEXIS 145969 (M.D. Fla. April 22, 2010) (computer spyware); *FTC v. Cruz*, No. 08-1877 (JP), 2008 U.S. Dist. LEXIS 103103, at *4-5 (D.P.R. Dec. 18, 2008) (pamphlet containing instructions on how to perpetuate an envelope stuffing scheme, as well as sample advertisements and a script to carry out the scheme); *FTC v. Norvergence, Inc.*, No. 04-5414 (DRD), U.S. Dist. LEXIS 40699, at *7-8 (D.N.J. July 18, 2005) (consumer rental agreements); *FTC v. Five-Star Auto Club*, 97 F. Supp. 2d 502, 539 (S.D.N.Y. 2000) (marketing materials to recruit other participants to “free dream vehicle” pyramid scheme); *In re N.E.W. Plastics Corp.*, No. C-4449, 2014 FTC LEXIS 71, at *8 (Apr. 3, 2014) (plastic lumber marketing brochures); *In re Nonprofit Mgmt. LLC*, 151 F.T.C. 144, 154 (2011) (“Tested Green” logo and “green” certification).
63. ECM provided its customers with the means and instrumentalities to deceive consumers. Its product has no economic value unless it allows purchasers to make biodegradability claims about their products; without such a claim, a customer’s product would be indistinguishable from the products of its competitors who did not raise their costs by buying ECM’s additive. The fact that some ECM customers sell to others in the production or distribution chain does not change this fact. Each purchaser in such a chain only makes money from purchasing the ECM Additive if the claims can eventually be passed to a retailer who can use those claims to sell to end-use consumers. Given this fact, ECM provides its customers with a multitude of marketing tools to help sell their products to end-use consumers, all of which feature ECM’s false and unsubstantiated claims: the ECM logo, the ECM Certificate of Biodegradability, and other marketing

material such as the ECM flyer and ECM leaf. (SOF ¶¶39-41; 65-67). ECM's customers, in turn, use the deceptive claims provided in these material to sell their products. (SOF ¶36; ¶52; ¶¶59-60).

64. First, ECM routinely provided its customers with its “biodegradable” logo—a green tree with the wording “ECM” and “Biodegradable,” and instructed customers to use the logo on consumer products to promote the products’ alleged biodegradability. (SOF ¶¶62-64). Many customers followed ECM’s instructions, placing the ECM logo on products as varied as grocery bags, online golf tee ads, and shampoo containers. (SOF ¶25). By providing its customers with the ECM logo (and encouraging them to use it on their products and advertising), ECM gave them the means to deceive customers and end-use consumers.
65. Second, ECM routinely provided its customers with a “Certificate of Biodegradability,” and instructed them to use the certificate to prove the veracity of biodegradable claims to downstream customers and end-use consumers. (SOF ¶¶46-48; ¶53; ¶56). In fact, ECM expressly told its customers to “present” the certificate to downstream customers as a way of “assuring” them that ECM Plastic had been tested and proven to biodegrade. (SOF ¶56). Many customers followed ECM’s instructions, passing the certificate to their distributors and customers, posting the certificate on their website, and creating their own certificates with precisely the same (or very similar) wording as the ECM certificate. (SOF ¶¶59-61). ECM thus provided its customers with the means to fool downstream customers—and ultimately end-use consumers—into believing that they were purchasing tested and proven biodegradable plastic.
66. Finally, ECM provided its customers with dozens of “sales tools” and emails to help them market their products based on the ECM’s additives supposed efficacy. (SOF ¶¶65-67; ¶69-70). ECM also actively helped customers to develop “biodegradable” claims tailored to their product. Numerous emails show ECM employees reviewing, tweaking, and approving advertising copy (SOF ¶70), and testimony from ECM employees and customers reveals ECM’s eagerness to funnel biodegradable claims into the market. (SOF ¶¶65-67; ¶69-70). By providing customers with “sales tools” and personalized help in developing biodegradable claims, ECM gave its customers the means to deceive downstream customers and end-use consumers.

ECM’s Contention That It Never Made the Express and Implied Claims Set Forth Above Is Baseless.

67. There is no merit in ECM’s argument that its customers are “highly sophisticated” plastic manufacturers who do not perceive biodegradable claims the same way as end-use consumers. This defense fails for two reasons.
68. First, sophistication, or lack thereof, is irrelevant to interpretation of ECM’s express claims. As the Ninth Circuit explained in *Pantron I*, when a “case involves *express* objective product claims,” there is no need to consider whether they are “so far-fetched that reasonable consumer would not believe them” 33 F.3d at 1096 n.21 (emphasis in original, quoting *Thompson Medical*, 104 FTC at 788-89 n.6).

69. Second, ECM's customers are *not* biodegradation experts. Many ECM customers and downstream users were small businesses that had neither the resources nor the sophistication to meaningfully understand or evaluate the results of biodegradation tests. (SOF ¶95; SOF ¶87). Therefore, they relied solely upon ECM's express claims and purported substantiation. (SOF ¶58).
70. When ECM attempted to sell its additive to 3M Corporation, the results illustrate both the lack of sophistication of their actual customers and the difficulty ECM encountered when selling its product to a truly sophisticated customer. Unlike many customers who simply accepted ECM's claims, 3M conducted its own test showing no measurable biodegradation of the plastic samples. FOF ¶¶92-94; FOF ¶¶ 180-81. Thus, 3M, an actual sophisticated "customer," did not use ECM's additive in its products, and never passed any of ECM's false claims to consumers. This incident demonstrates why ECM's entire business was dependent on unsophisticated buyers.
71. A "pilot study" conducted by ECM's own expert, Dr. Stewart, provides additional evidence of lack of "sophistication." In that study, 37.5% of the customers questioned believed that biodegradation would happen within one year, making them essentially indistinguishable from end-use consumers. The study's sample size is too small to support meaningful conclusions. FOF ¶ 410. Nonetheless, these results tend to corroborate the already overwhelming evidence that at least some, if not most, of ECM's customers were unsophisticated regarding biodegradability.
72. There is no merit in ECM's argument that, even if some of its direct and indirect consumers were not sophisticated, ECM effectively qualified its biodegradable claims by delivering them as a package with verbal and written qualifiers. ECM's "qualification defense" fails for four reasons. First, to the extent that ECM's argument rests upon oral and written "disclaimers" purportedly disseminated separately from the false claims, the argument fails as a matter of law. An advertiser cannot "cure the deception" in one advertisement with different statements in another. *In re Chrysler Corp.*, 87 F.T.C. 719, 1976 FTC LEXIS 397, *59 (Apr. 13, 1976); *Removatron Int'l Corp. v. FTC*, 884 F.2d 1489, 1496-97 (1st Cir. 1989).
73. "The public has a right to expect each of respondent's advertisements to be equally free of deception." *Id.* See *In re Raymond Lee Organization, Inc.*, 92 F.T.C. 489, 618-19 (1978) ("If an initial contact with a purchaser is deceptive, the fact that the truth may be subsequently revealed will not necessarily eliminate the initial wrong."); *Removatron*, 884 F.2d at 1496-97 ("Each advertisement must stand on its own merits; even if other advertisements contain accurate, non-deceptive claims, a violation may occur with respect to the deceptive ads.").
74. Third, "disclaimers or qualifications in any particular ad are not adequate to avoid liability unless they are sufficiently prominent and unambiguous to change the apparent meaning of the claims and to leave an accurate impression. Anything less is only likely to cause confusion." *FTC v. Direct Mktg. Concepts*, 624 F.3d 1, 24 (1st Cir. 2010) (quotation omitted). ECM claims, without support, that it disclaimed the express nine-month-to-five-year claim by stating that biodegradation times are "approximate." Even if

true, however, such a “disclaimer” poses just the type of confusion the cases warn about. One logical and facially reasonable interpretation of the claim given the “disclaimer” is that the nine month to five years claim is an approximation of the time it typically takes ECM Plastic to completely biodegrade in a landfill. However, this range is off by decades, if not centuries. Thus, even with ECM’s disclaimer, the claim is not even close to being an accurate approximation.

75. Fourth, even if ECM qualified its claims to its purportedly “sophisticated customers,” ECM’s is still responsible for the claims as conveyed to end-use consumers because it intended (and insisted) that its customers use the “sales tools” it provided to pass claims down the distribution chain and ultimately to consumers. Thus the effectiveness of the qualifications must be viewed from the intended “relevant audience”—the end-use consumer, and not its customers. *Removatron*, 884 F.2d at 1497 (“We reject the contention that the relevant audience is only the beauty industry. While it is true that petitioners placed their ads in trade magazines, it is also true that their sales personnel provided brochures and other information to purchasers who were then instructed to provide these materials to potential clients. Furthermore, petitioners provided advertising to purchasers who would then place it in local print media. *The relevant audience thus includes potential purchasers and customers of purchasers. The two qualifications made by petitioners are, as the Commission found, ineffective to dispel the overall message that the machine will remove hair permanently.*”) (emphasis added). As discussed in prior sections, end-use consumers understand ECM’s biodegradable claims to mean rapid biodegradation times of around one year in a landfill.
76. Finally, ECM’s own customers’ understanding of the claims further demonstrate the ineffectiveness of ECM’s supposed “qualifiers.” Many of these customers testified that they self-evidently understood ECM to be claiming complete biodegradability in nine months to five years in a landfill. Thus, any “qualifiers” were demonstrably ineffective. In addition to being ineffective, ECM’s qualifications were rare. Dozens of ECM emails and marketing documents uniformly reiterate ECM’s deceptive claims without any qualifier. Thus, even if the qualifiers could have been effective, which they clearly were not, such sparse qualifications do no rise to the prominent and unambiguous level required by the law.

D. Remedy

Corporate liability

77. A corporation is liable for violations of the FTC Act if the corporation “engaged in misrepresentations or omissions of a kind usually relied on by reasonably prudent persons and [] consumer injury resulted.” *FTC v. Pantron I Corp.*, 33 F.3d at 1102 (citing *FTC v. Amy Travel Serv.*, 875 F.2d at 573).
78. ECM is liable under Section 5 of the FTC Act both for making biodegradability claims to its customers, and for providing its customers with the means and instrumentalities to deceive their customers and end-use consumers.

Entry of the Notice Order is Appropriate and Necessary

79. Entering a cease and desist order to stop ECM's ongoing deceptive advertising is appropriate because the findings of fact are "supported by substantial evidence upon the record as a whole." *Niresk Indus. Inc. v. FTC*, 278 F.2d 337, 340 (7th Cir. 1960). Once a violation is found, the FTC has wide latitude in crafting the appropriate relief. The Notice Order sets forth relief appropriate for this case:

In carrying out this function the Commission is not limited to prohibiting the illegal practice in the precise form in which it is found to have existed in the past. If the Commission is to attain the objectives Congress envisioned, it cannot be required to confine its "road block" to the narrow lane the transgressor traveled; it must be allowed effectively to close all roads to the prohibited goal, so that its order may not be "by-passed" with impunity. Moreover, the Commission has wide discretion in its choice of a remedy deemed adequate to cope with the unlawful practices disclosed.

FTC v. Ruberoid Co., 343 U.S. 470, 473 (1952); *Removatron Int'l Corp. v. FTC*, 884 F.2d at 1498 ("Our role in reviewing a Commission order has been defined by the Supreme Court: It has been repeatedly held that the Commission has wide discretion in determining the type of order that is necessary to cope with unfair practices found, and that Congress has placed the primary responsibility for fashioning orders upon the Commission.").

80. This "wide discretion" allows the Commission to issue orders with fencing-in provisions that are broader than the respondent's unlawful conduct. *Telebrands Corp. v. FTC*, 457 F.3d 354, 357 n.5 (4th Cir. 2006).
81. Pursuant to this discretion, courts have affirmed Commission orders requiring remedies as diverse as prohibitions on individual use of zone pricing (*FTC v. National Lead Co.*, 352 U.S. 419 (1957)); cancellation of existing contracts (*North Texas Specialty Physicians v. FTC*, 528 F.3d 346 (5th Cir. 2008)); mandated divestiture of assets to create a competitor (*Chicago Bridge & Iron Co N.V. v. FTC*, 534 F.3d 410 (5th Cir. 2008)); requirements for varying levels of substantiation for future claims (*See, e.g., Sears, Roebuck & Co. v. FTC*, 676 F.2d 385 (9th Cir. 1982) (requiring competent and reliable evidence for future performance claims for major household appliances); *Thompson Medical Co. v. FTC*, 791 F.2d 189 (1986) (requiring at least two adequate and well-controlled, double-blinded clinical studies for future efficacy claims for a topical analgesic)); disclosure requirements (*Porter & Dietsch, Inc. v. FTC*, 605 F.2d 294, 307 (1979)) and trade name excision (*Continental Wax Co. v. FTC*, 330 F.2d 475 (1964)), just to name a few. The underlying inquiry in all these orders is the same: what is the necessary remedy to ensure that respondents do not again violate the FTC Act? *See FTC v. Colgate-Palmolive Co.*, 380 U.S. 374 (1964).
82. The Commission's "wide discretion" to craft that remedy is subject to only two

constraints: (1) the order must bear a “reasonable relation” to the unlawful practices, *Jacob Siegel Co. v. FTC*, 327 U.S. 608, 612 (1946); and (2) it must be sufficiently clear and precise that its requirements can be understood, *Colgate-Palmolive*, 380 U.S. at 392.

83. The Commission may order “provisions that are broader than the conduct that is declared unlawful.” *Telebrands Corp.*, 457 F.3d at 357 n.5; *see also, e.g., Colgate-Palmolive Co.*, 380 U.S. at 394-95; *FTC v. Ruberoid Co.*, 343 U.S. 470, 473 (1952); *POM Wonderful*, 2013 FTC LEXIS 6, at *50. To the extent the proposed notice order goes beyond ECM’s specific practices, such fencing-in relief is appropriate in light of ECM’s willful and repeated misrepresentations about the core attributes of its sole product and its persistent, knowing misrepresentation of scientific evidence. The Notice Order is narrowly crafted to prevent ECM from continuing to deceive its customers, others in the manufacturing and distribution chain, and end-use consumers while still allowing ECM to make truthful and substantiated claims.
84. The Notice Order would allow ECM to make truthful, substantiated claims. First, if its substantiation only applies to limited disposal environments, they can make claims based on such substantiation so long as they conspicuously disclose that limitation. Second, ECM can disclose the substantiated time to complete biodegradation. Finally, because ECM’s own experts admit that ECM Plastics may take decades or centuries to completely biodegrade in landfills, ECM could disclose, with appropriate qualifications, the rate and extent of biodegradation shown in valid, properly controlled and conducted, scientific tests. Because partial biodegradability does not demonstrate that a product will completely biodegrade, let alone at the same rate as demonstrated in a short term test, additional disclosures are needed to prevent deceptive impressions about the meaning of test results. (SOF ¶158 (showing that at least a significant minority of consumers extrapolate rate and extent information concerning biodegradation times)). In short, the Notice Order is crafted carefully to permit ECM to make truthful claims, while preventing it from using incomplete test data to deceive consumers.
85. ECM has been misusing incomplete test data to deceive consumers for years. In fact, ECM’s repeated and willful misrepresentations to its customers and end-users about the efficacy of its product, and about its purported scientific “proof” of that efficacy, justify strong injunctive relief. As the Commissioner recently noted in *POM*:

when determining whether an order is reasonably related to the unlawful practices, the Commission should consider “(1) the seriousness and deliberateness of the violation; (2) the ease with which the violative claim may be transferred to other products; and (3) whether the respondent has a history of prior violations.” *Stouffer Foods Corp.*, 118 F.T.C. at 811; *see also Telebrands Corp.*, 457 F.3d 354, 358 (4th Cir. 2006); *Kraft, Inc.*, 970 F.2d at 326. “The reasonable relationship analysis operates on a sliding scale — any one factor’s importance varies depending on the extent to which the others are found. . . . All three factors need not be present for a reasonable relationship to exist.” *Telebrands Corp.*, 457 F.3d at 358-59.

(Emphasis added.)

POM Wonderful, 2013 FTC LEXIS 6, at *49.

86. ECM's violations were serious, repeated, and blatant. Indeed, Robert Sinclair, ECM's President and CEO, "acted in blatant and utter disregard of the law." *Standard Oil Co. v. FTC*, 577 F.2d 653, 662 (9th Cir. 1978). Sinclair had complete control over every aspect of ECM's marketing and testing. (SOF ¶72). He was responsible for ECM's prominent and express "9 months to 5 years" claim, even though he knew that the claim was false. (SOF ¶72). He was instrumental in the dissemination of the bogus and misleading McLaren-Hart study. He also knew about **five** different adverse adjudications regarding the efficacy of ECM Plastics, and multiple bad test results, but concealed this information from his customers and continued to promulgate the same debunked claims about his product's efficacy and the strength of testing. In fact, he aggressively discouraged his customers from doing their own testing, insisting that existing tests were sufficient to prove ECM's biodegradability claim. Finally, even after promulgation of the Green Guides, and during an FTC investigation, he directed ECM to switch its marketing to the facially misleading "some period greater than a year claim." As in *POM*, ECM has a "demonstrated propensity to misrepresent to [its] advantage the strength and outcomes of scientific research." *POM* at 51.
87. A violation is transferrable where other products could be sold utilizing similar techniques. *FTC v. Colgate-Palmolive Co.*, 380 U.S. at 395; *Sears, Roebuck & Co. v. FTC*, 676 F.2d at 392.
88. The Commission has issued orders covering many of a company's products on the basis of violations as to a single product. *Litton Indus., Inc.*, 97 F.T.C. 1, 78-80 (1981), *aff'd as modified*, 676 F.2d 364 (9th Cir. 1982); *Sears Roebuck & Co.*, 95 F.T.C. 406, 515-22 (1980), *aff'd*, 676 F.2d 385 (9th Cir. 1982).
89. The size and duration of the deceptive advertising campaign also is considered in evaluating the seriousness of the violations. *Stouffer Foods Corp.*, 118 F.T.C. at 812-13; *Kraft, Inc.*, 114 F.T.C. at 140.
90. Violations have been found to be "serious" where "claims were consciously made despite flaws in the studies relied upon by [the respondent], and because consumers who were not able to assess the validity of those claims relied on the misrepresentation." See *Schering Corp.*, 118 F.T.C. at 1121 (initial decision).
91. "The more egregious the facts with respect to a particular element, the less important it is that another negative factor be present." *Sears, Roebuck & Co. v. FTC*, 676 F.2d at 392; see also *Thompson Med. Co.*, 104 F.T.C. at 833.
92. Part I.A of the Order prohibits degradability claims for any product, package, or service unless they are true, not misleading, and substantiated, and specifies qualifications needed to prevent deception in some contexts. It is consistent with the provisions in the Commission's Green Guides that address biodegradability claims. Part I.B prohibits environmental benefit claims for any product, package, or service unless the claim is true,

not misleading and substantiated. Part I is consistent with the relief approved in recent Commission settlements. *E.g.*, *Down to Earth Designs, Inc. d/b/a gDiapers*, Docket No. C-4443 (Mar. 18, 2014); and *FTC v. AJM Packaging Corp.*, No. 1:13-cv-1510 (D.D.C. Oct. 1, 2013).

93. Part I requires competent and reliable scientific evidence to substantiate claims where appropriate. Commission orders requiring respondents to have, where appropriate, competent and reliable scientific evidence have been consistently upheld. *Daniel Chapter One*, 2009 FTC LEXIS 157, at *278-79 (initial decision) (citing *Telebrands Corp.*, 140 F.T.C. at 347; *Kraft, Inc.*, 114 F.T.C. at 149; *Thompson Med. Co.*, 104 F.T.C. at 844; *Removatron Int'l Corp.*, 111 F.T.C. at 318.).
94. The Notice Order's definition of "competent and reliable scientific evidence" requires that any scientific protocols used to substantiate biodegradability claims assure complete decomposition within the stated timeframe (or a reasonably short period of time) and simulate the physical conditions of the stated disposal environment. This provision is meant to ensure that ECM no longer makes unqualified biodegradable claims without adequate support, and, in particular, that ECM no longer (1) extrapolates from minimal biodegradation to complete decomposition or (2) makes landfill claims based on tests like ASTM D5511 that do not simulate landfills.
95. Part II of the Order prohibits ECM from providing, in connection with the marketing of any product, package, or service, the means and instrumentalities to make any false, unsubstantiated, or misleading statement of material fact regarding any environmental benefit. Part II is consistent with the relief approved in recent Commission settlements. *E.g.*, *Serious Energy, Inc.*, No. C-4359 (May 16, 2012); and *THV Holdings, LLC*, No. C-4361 (May 16, 2012)
96. Parts III through VII of the Order are standard provisions requiring recordkeeping, order distribution, notice to the Commission of corporate status changes, the filing of compliance reports, and termination of the order, respectively. They are necessary to ensure the Order's effectiveness and to facilitate the Commission's monitoring and enforcement of the Order. These provisions are consistent with the relief in virtually all Commission settlements.
97. ECM made deceptive biodegradability claims deliberately over an extended period of time. ECM can easily make similar claims for other products, packaging, and services, including other plastic products and non-plastic products. Consumers cannot assess the accuracy of these claims for themselves.
98. The seriousness and deliberateness of ECM's violations, the duration of the deceptive advertising campaign, the difficulty that consumers have in judging the truth or falsity of the biodegradability claims, and the transferability of the claims to other products, packaging, and services justifies the appropriateness of the Order's fencing-in relief, including the scope of the Order, which covers claims for any product, package or service.

99. The Notice Order does not violate ECM's First Amendment right to communicate truthful commercial speech about important environmental benefits. Specifically, ECM's argument that that the government must use less restrictive alternatives under *Pearson v. Shalala*, 165 F.3d 650, 658 (D.C. Cir. 1999); and that the proposed conduct relief would prevent it from providing truthful information to its customers about important environmental benefits of its products in conflict with federal environmental policy lacks merit..
100. ECM's arguments fail for three reasons. First, ECM's assertion that the Notice Order would require "complete elimination of plastic within one year as a condition precedent to use of the term 'biodegradable,'" ignores the two permissible qualified claims. As discussed in detail above, ECM can make truthful claims about biodegradation, and about its test results, as long as it has competent and reliable scientific evidence to support those claims.
101. Second, ECM's commercial speech argument is legally flawed. Although the First Amendment protects commercial speech, it is well-established that government can regulate deceptive commercial speech through adjudication. The Supreme Court has long held that "the Constitution accords less protection to commercial speech than to other constitutionally safeguarded forms of expression." *Bolger v. Youngs Drug Prods. Corp.*, 463 U.S. 60, 64 (1983). Commercial speech receives less protection than other forms of expression under the First Amendment because "commercial speech may be more durable than other kinds. Since advertising is the *sine qua non* of commercial profits, there is little likelihood of its being chilled by proper regulation and foregone entirely." *Virginia State Bd. of Pharmacy v. Virginia Citizens Consumer Council*, 425 U.S. 748, 772 (1976).
102. Importantly, for commercial speech to receive the protections of the First Amendment, the commercial speech "at least must concern lawful activity and not be misleading." *Central Hudson Gas & Elec. Corp. v. Pub. Serv. Comm'n*, 447 U.S. 557, 566 (1980).
103. Moreover, the government may prohibit false or misleading commercial speech entirely. *See In re R. M. J.*, 455 U.S. 191, 203 (1982) ("Misleading speech may be prohibited entirely"). In this case, ECM's ongoing marketing is deceptive and misleading, and will continue to mislead consumers without appropriate conduct relief. Furthermore, unlike its customers and end-use consumers of ECM Plastics, who lack the ability to independently verify the veracity of ECM's claims, ECM has "extensive knowledge of both the market and their products. Thus, [ECM is] well suited to evaluate the accuracy of [its] messages and the lawfulness of the underlying activity." *Central Hudson* at 564 (citing *Bates v. State Bar of Arizona*, 433 U.S. 350, 381 (1977)).
104. Furthermore, ECM's reliance on *Pearson* is misplaced. *Pearson* held that an FDA rule effectively banning specific health claims was an unduly restrictive means to regulate *potential* deceptive speech, and that the FDA needed to consider possible curative disclosures. *Pearson v. Shalala*, 165 F.3d at 659-660. In contrast, this case involves adjudication of actual deceptive claims in commerce. The Commission recently rejected this argument in *POM*, reasoning that:

In addition, the Commission's approach to address misleading advertising, which is a case-by-case adjudication *after* ads have been disseminated, differs from regulatory efforts that prohibit categories of speech or rely on *prior* approval of the language to be used. The latter serve as illustrations of "bars" on commercial speech and are inapplicable to the detailed *ex post* analysis we engage in here, based on a full record about the ads in question. [Internal citations omitted].

POM Wonderful, 2013 FTC LEXIS 6, at *44.

105. Third, ECM's federal environmental policy argument is legally incorrect. The FTC need not permit deceptive commercial speech in furtherance of environmental policy. Indeed, the FTC's role is to protect consumers in the marketplace from such unfair or deceptive acts or practices. In this case, the instant action and proposed relief further that role. Furthermore, even if environmental policy were the FTC's charge, ECM has not, and cannot, establish that lying to consumers about the efficacy of its product furthers any such policy.
106. ECM's practices, as alleged in the Complaint, constitute unfair or deceptive acts or practices, in or affecting commerce, in violation of Section 5(a) of the FTC Act, and they warrant the relief proposed in the Commission's Notice Order.

CERTIFICATE OF SERVICE

I hereby certify that on September 25, 2014, I caused a true and correct copy of the foregoing to be served as follows:

One electronic copy to the **Office of the Secretary**, one hard copy, and one copy through the FTC's e-filing system:

Donald S. Clark, Secretary
Federal Trade Commission
600 Pennsylvania Ave., NW, Room H-159
Washington, DC 20580
Email: secretary@ftc.gov

One electronic copy and three hard copies to the **Office of the Administrative Law Judge**:

The Honorable D. Michael Chappell
Administrative Law Judge
600 Pennsylvania Ave., NW, Room H-110
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One electronic copy to **Counsel for the Respondent**:

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Date: September 25, 2014

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