

**TABLE 2. SUMMARY OF PERTINENT ASPECTS OF FOREST CONSERVATION PROGRAMS IN SELECTED JURISDICTIONS**

County	What is the threshold that triggers forest planting obligation?	Is forest planting primarily the developer's responsibility or is fee-in-lieu funding or use of a forest bank accepted? Which approach has been most successful?_What is the ratio of new trees to removed trees?	How much is the fee-in-lieu?	How are forest planting sites selected and approved?	How many years of "maintenance" is required to complete the developer's forest planting obligation?	What maintenance tasks are required and who does the maintenance? How are invasives and deer browse addressed?	How often is a forest planting site inspected? What data are collected and who reviews the inspection report? Do you have standards defining tree health vs death, and what are the requirements for replacing trees that have died?	Are there other important factors in your program's success, such as selection of tree planting sites, species, size, or access to water?	Have the County Forest Conservation regulations been updated over the years in response to challenges to tree survival, and how successful has your forest planting program been?	Is there anything else that you think would be helpful?
<b>Anne Arundel</b>	Sites 40,000 SF or more in size which clear 20,000 SF or more of forest must comply with Forest Conservation regulations requiring forest planting.	AA doesn't do forest plantings. The developer has options to do required forest plantings, in order of preference: <ul style="list-style-type: none"> <li>• 1:1 on site</li> <li>• 1:1 off site</li> <li>• projects within the priority funding area (PFA) can acquire an off-site easement at a 2:1 ratio to protect existing forest within sensitive areas, such as greenways.</li> <li>• "Fees-in-lieu" which fund a Chesapeake Bay Trust grant program to establish forest easements and plantings across the County. The CBT grants attract churches, community organizations, land trusts, etc. The County and CBT make every effort to replant or preserve the requisite SF within the watershed in which the development occurred.</li> </ul>	\$1.25/SF of forest planting required inside the PFA, and \$1.50/SF outside the PFA	Developers and the CBT select sites, but AA County's <i>priority is planting within the watershed in which the development occurred.</i>	2 years of maintenance is required. Inspection at the end of this time period focuses on tree survival rates and can require additional planting.	The County follows State maintenance guidelines but is primarily focused on tree survival rates at the end of 2 years. It's not clear that they monitor survival after the 2-year maintenance period.	Monitoring is done by staff foresters and follows the State Technical Manual requirements.	County Code has specifications, but the main one is requirement for 1.5" caliper trees and native species. County also requires significant protections for priority forests. For example, NO trees may be removed from a development site within a 75-acre forest without a modification (variance in other counties) to the law. Any approved modifications require significant mitigation efforts. This single provision has been the most successful one to-date to protect forests across the County as it has essentially halted the large-scale clearings of 50 or 100 forested acres that were seen in the past.	County Forest Conservation regulations were amended in 2019 to: alter the amount of forest that can be cleared before triggering forest planting; increase mitigation requirements; and increasing the fee-in-lieu amount from \$0.40/SF to \$1.25 SF/inside the PFA and \$1.50/SF in rural areas. This legislation also included designation of "Priority Forest" areas, that can't be disturbed without a variance, and if the variance is approved, increases the reforestation obligations from to 2:1 to either 3:1 or 4:1	M. Johnston noted that <b>Frederick County's amendment to the Forest Conservation Regulations was the most ambitious, requiring 1:1 replacement of all forest cleared.</b> He also noted that the State Forest Conservation regulations are dense and difficult to understand. He emailed a document that simplifies calculation of forest replanting requirements. (Although this issue goes beyond review of forest planting and maintenance requirements).
<b>Balto City</b>	Disturbance of 5,000 SF or more land within a parcel triggers calculation of afforestation or reforestation planting obligations, using Maryland State's Forest Conservation Worksheet.	Since the City is quite urban, developer proposals to clear significant forest are unusual. Most of the forest clearing and planting obligations are due to City Dept of Public Works (DPW) projects for stream restoration, DOT bridge or culvert projects, or BGE utility projects. <b>Such projects trigger forest planting obligations on City-owned properties to meet State requirements.</b> Occasionally, redevelopment of industrial sites triggers a forest planting obligation; in these cases, a fee-in-lieu for forest planting is collected. When forest is impacted for development of residential or institutional properties, typically protection of existing priority forest in a forest conservation easement is achieved to meet the forest conservation worksheet requirements. The Depart of Planning which manages forest conservation funds, works with the Dept of Recreation & Parks (BCRP) or other City agencies to identify planting sites on City	\$60,000 per acre (one acre = 43,560 SF, so fee is equal to \$1.38/SF) based on \$600 per 2-2.5" caliper tree at 100 trees per acre.	Priority is given to forest planting on-site or as near as possible. Reforestation on park or Department of Public Works properties is coordinated with those agencies.	Only 2 years of maintenance are required. City agencies such as Dept of Recreation and Parks or Dept of Transportation have the ability to require longer or more stringent maintenance standards for projects on land under their aegis.	City capital projects require a contractor to handle reforestation and afforestation planting, as well as two years of maintenance. As most of the plantings are on Rec & Parks properties, that department provides some ongoing maintenance there as needed. BCRP has invasive vegetation management standards that are required for projects in natural areas in parks. Measures to protect from deer are also required.	The contractors responsible for the two-year maintenance and warranty are required to monitor the planting throughout the first 2 years and <b>replace trees in poor health as they are identified throughout the 2-year period.</b> In addition, for projects on park and, BCRP's forestry staff inspect forest plantings upon initial completion and at the end of the two-year maintenance period. Invasive plants and deer are the most frequent concerns. (Ms. Gilder-Busatti handles plan review for the Planning Dept. and isn't involved with the planting, maintenance, and replanting inspections and could not provide further details on this question. She also noted that DRP's lead for	Baltimore City follows the State Forest Conservation Manual requirements, except that it will only accept planting of 1- and 2-inch caliper trees, nothing smaller since those have not been successful.	Forest Conservation regulations (in the Natural Resources section of the Code, and the Forest Conservation Manual) have had some updating. Info is from <a href="https://www.baltimoresustainability.org/permits/forest-conservation/below">https://www.baltimoresustainability.org/permits/forest-conservation/below</a> : Updates to the City's forest conservation code (Article 7 - Natural Resources; Division IV - Forest and Tree Conservation - see page 140) and supplement to the state manual became <b>effective on December 28, 2020.</b> These updates were made to meet updated state requirements, add existing policies to the code, and align the code with other related codes and policies. <b>The most significant updates include:</b> <ul style="list-style-type: none"> <li>• Reducing the trigger for forest conservation review from 20,000 square feet of disturbance to 5,000 square feet of disturbance</li> <li>• Adding the existing specimen tree variance policy and mitigation requirements to the code and supplement</li> <li>• Establishing policies and criteria for requests to modify existing forest conservation easements</li> </ul>	Increased the fee-in-lieu. Note that planting on City-owned land absorbs to the City the costs of finding planting sites and incurs the costs of lost opportunities for other uses of that land.

		properties, based on Forest Management Plans for various properties. The City also has an environmental grants program that awards Critical Area and Forest Conservation funds to support community greening and tree planting projects, a few of which involve caring for and improving community forest patches.					forestry has just retired and not available to provide more specificity.)		<ul style="list-style-type: none"> <li>Adding the existing afforestation credit ratios to the supplement</li> <li>Clarifying inclusions and exclusions for calculating Net Tract Area</li> <li>Increasing the mitigation fee-in-lieu rates and fines for violations</li> </ul> <p>Making a Forest Stand Delineation (FSD) required as applicable for Site Plan Review, subdivision applications, grading plan reviews, and sediment and erosion control plan reviews</p>	
<b>Carroll</b>	Uses the 40,000 SF threshold but does <i>cumulative</i> tracking for all properties. If a property had 20,000 SF of forest cleared in the past, and later applies to clear additional land that reaches the 40,000 SF threshold, compliance will be required.	Retention of existing forest on-site has first priority. On-site planting is the second priority. Off-site planting is the third priority but developers rarely have access to off-site areas. Forest banking is the last priority but is used often. Reforestation is 1:1 unless development is in the Ag. district where the following formula is applied:  0-20,000 sq.ft. clearing = no mitigation  20,000 to 25,000 sq.ft. clearing = 1:1 mitigation  >25,000 sq.ft. clearing = 2:1 mitigation	Doesn't accept a fee-in-lieu and undertake mitigation plantings. Developers negotiate with the forest bank owner, with current pricing being around \$16,000/acre.	Priority is given to forest planting on-site in sensitive areas (stream buffers, steep slopes, contiguous to existing forest).Property owners that wish to establish a forest bank submit site information and planting plans for County approval. Owners use landscape contractors for site preparation, planting and maintenance.	Requires 3 years of maintenance However, J. Bowman said 5-7 years would be preferable, since invasives and deer browse are ongoing challenges.	Maintenance mowing, watering and invasive control are usually done by the landscape contractor but could be done by the owner. Deer protection tubes are generally used. Protective fencing has worked well on smaller sites but is expensive.	County staff inspect after planting, at 18 months, and 36 months. A tree survival rate of 75% must be met, or additional planting is required.	Since Carroll County relies on private owners proposing forest banks, it doesn't get to select priority sites. However, acceptable bank sites are typically at least an acre minimum.	Yes, the regulations have been updated over the years.Use of forest banks has been successful and developed landscape contractor expertise. This requires less County staff time than accepting a fee-in-lieu, which would make the County responsible for site selection, and contracting for design, planting and maintenance. Developers prefer forest banks since they just write a check to the forest bank owner, who then assumes responsibility. This releases the developer from posting surety and being responsible for 3 years. However, the County can still require forest planting on development sites in high priority locations.	It is important to note that even after meeting the 3-year maintenance requirement, long term survival is still impacted by invasive, and deer browse. <b>A longer, 5–7-year maintenance period would be helpful.</b> Carroll does contract for some forest planting to meet the County's NPDES and WHIP goals. For these sites, <b>longer term maintenance to control invasives</b> is a concern, so they've <b>contemplated getting an Americorps "staff" person to recruit and train members of environmental and community groups to assist</b> with maintenance.
<b>Howard</b>	"... any person or unit of local government developing land 40,000 square feet or greater in area shall file a forest conservation plan with the Department."	Forest cut or cleared below the required afforestation level shall be afforested at 2:1 ratio for afforestation sites within the same watershed and at 3:1 ratio for afforestation sites outside the same watershed. This afforestation shall be added to the amount of afforestation necessary to reach the minimum required afforested level, as determined by the amount of forest existing before cutting or clearing began.  Forest Mitigation Bank is found in Section 3.4.2.	\$1.25/SF in the public planned service area with public water and sewer. \$1.50/SF outside those areas, so in areas with private wells and septic.	Areas to be afforested shall be at least 10,000 square feet with a minimum width of 50 feet. Priority locations for afforestation and reforestation, in order of preference: On-site, mitigation bank, off-site. Department of Recreation and Parks is authorized to plant on County-owned properties. If off-site planting would have greater environmental benefit, the Department may approve off-site reforestation or afforestation in high-priority locations within Howard County, preferably within the same sub-basin or watershed: (1) Establish or enhance forest in the Howard County Green Infrastructure Network; (2) Establish or enhance forest in 100-year floodplains and buffers to intermittent and perennial streams as defined in the Subdivision Regulations; (3) Establish or enhance forest in wetlands and wetland buffers as defined in the Subdivision Regulations;	The County inspector visits 1 year after the execution date of the developer's agreement and may return repeatedly until the planting site is said by the developer to be "ready" for inspection. Passing the first actual "inspection" requires 90% survival of the trees, control of invasive plants and other encroachments, proper signage, and other factors. If an inspection at least 3 years later (after passing the first inspection) shows at least 75% survival, no encroachment issues, and other factors, then the surety deposit can	Monitoring by the applicant or the applicant's agent for continued compliance with the forest conservation requirements, including thinning, watering, fertilizing or other required measures to ensure survival and growth.  Removal and replacement of dead reforestation or afforestation plantings to meet growing season survival requirements." "4.4 MAINTENANCE AND MONITORING OF PLANTED AREAS Maintenance and monitoring for reforestation and afforestation sites are essential to ensure healthy new	The site is inspected at least annually by a single employee of Howard County Recreation & Parks until the developer is released from bond. "4.5.1 Inspection Routine monitoring of forest retention and planted areas should occur a minimum of three times throughout the year to pinpoint any problems, monitor survival rates and specify remedial actions."	Preferred species (those that are found in the local USGS ecoregion): Forest associations of Howard County are based on: The natural forests of Maryland: an explanation of the vegetation map of Maryland (with 1:250,000 map) by G. S. Brush, C. Lenk and J. Smith, 1980, Ecological Monographs 50:77-92. Figure D-2 shows the Howard County portion of that map, which identifies five forest associations in the County: Tulip Poplar Association, located in upland areas throughout the eastern three-quarters of the County. Chestnut Oak Association, located in upland areas of the western one-quarter of the County and along a small band in the vicinity of the County's Planned Service Area. Chestnut Oak—Post Oak—Blackjack Oak Association, located in the northeastern corner of the County. Sycamore—Green Ash—Box Elder—Silver Maple	...first passed in 1992 and became effective on January 1, 1993. The Act was repealed and replaced ... and the <b>new Act became effective on February 5, 2020.</b> " Further revision effective 2022.	Looking forward to seeing the outcomes of the newly updated Forest Conservation Manual and program improvements.

				<p>(4) Establish or enhance critical habitat buffers and forest corridors for wildlife movement, the corridors, where practical, being a minimum of 300 feet in width;</p> <p>(5) Establish plantings to stabilize slopes of 25 percent or greater and slopes of 15 percent or greater with a soil K value greater than 0.35;</p> <p>(6) Establish forest areas adjacent to existing forests to increase the overall area of contiguous forest cover;</p> <p>(7) Establish forest areas between small forest and tree stands to build a forest community; and</p> <p>(8) Establish buffers along property lines between differing land uses when appropriate, or adjacent to highways or utility rights-of-way, particularly adjacent to scenic roads.</p>	<p>be released to the developer; if not, then the process of inspections continues as many years as is needed to achieve that level of quality and the deposit is not refunded until then. Rarely would the maintenance period be only 3 years after the first inspection, which itself often occurs more than one year after the start of the project.</p>	<p>forests and to achieve the required survival rates. ... guidelines for assessing water, nutrients, invasive exotic plants, pests, and other needs...</p> <p>4.4.1 Watering 4.4.2 Fertilizing 4.4.3 Controlling Competing Vegetation 4.4.4 Protection from Pests, Diseases and Mechanical Injury”</p>		<p>Association, located along major stream valleys in the Piedmont province, primarily west of I-95. River Birch—Sycamore Association, located along major stream valleys in the Coastal Plain province, primarily east of I-95.</p> <p>The forest associations are distinguished by the presence of common or characteristic species. Example considering moisture and sunlight requirement.</p>		
<p><b>Montgomery</b></p>	<p>—40,000 SF triggers Forest Conservation Law. In 2021, change to the law requires that contiguous lots being developed simultaneously be considered as one rather than as separate, smaller properties (closing a loophole). —At Montgomeryplanning.org, Section 22A-4 “Applicability” is defined. —If the law applies, then either a Forest Conservation Plan is required (including mitigation requirement) or, a Forest Conservation Plan exemption can be confirmed but a plan must still be submitted and mitigation may be required (e.g., for removal of a single specimen tree). —Mitigation requirement is dictated by factors including tract area, zone of site, how much forest is being cleared, and others.</p>	<p>—Preferred sequence is on-site; off-site; enhancement of existing forest that is being protected; purchase of credits from an offsite forest mitigation bank; lastly fee-in-lieu and landscaping. —Mitigation requirement is derived from the formula based on the particulars of the project, and applies the relevant conservation threshold, reforestation ratio, and/or afforestation requirement. The worksheet for this is at montgomerplanning.org, under the Development section, Applications, Forest Conservation, Supportive documents.</p>	<p>Fee-in-lieu goes to Reforest Montgomery (see <a href="http://montgomeryplanning.org/reforest">montgomeryplanning.org/reforest</a>)  Currently \$1.30/SF, fee is adjusted every other year based on consumer price index, as required by County Council resolution.</p>	<p>—The developer’s Forest Conservation Plan is on-site. If off-site mitigation is also required, it must be shown on the FCP as well. If mitigation is available in the same watershed as the project, it must be done there. —Reforest Montgomery prioritizes certain watersheds. Decision depends on landowners’ available space and willingness. —Current efforts hope to formalize the “priority” watersheds for mitigation and incentivize mitigation in the same or a priority watershed by updating the reforestation ratios.</p>	<p><b>At least 5 years.</b> This was changed in 2021. —“Maintenance Agreement” specifies that length of agreement can increase if tree survival is below the requirement, or if additional work needs to be done on control of invasives, deer browse, or other work. —<b>Survival requirement at 5 years</b> depends on tree size when planted: at least 75% if planted trees were 0.75-1.0-inch caliper (planted at 200 trees/acre, this would be at least 150 surviving at 5 years); at least 100% if planted trees were 1.5-2.0-inch caliper (planted at 100 trees or more per acre, this would be at least 100 trees/acre surviving at 5 years).</p>	<p>—Maintenance and management agreements include mechanical or chemical control of invasive plant, maintenance of deer protection caging, replacement of trees if needed, and watering, fertilizing, protecting from other pests, etc. —In forest banks and reforestation projects, removing deer exclosures and other apparatus is done when trees are at least 3 inches diameter at breast height (a new rule of thumb we started implementing recently) —It is expected that at the end of the new 5-year maintenance period for all sites, the inspector can require removal of apparatus such as tree stakes, deer protection wraps or tubes, etc., to leave the forest free of plastic and other introduced materials.</p>	<p>Seven (7) inspections are required. Decision as to whether a tree is dead is left to the inspector. Current discussions are considering possible definitions to use in cases of borderline status.</p>	<p>Native trees only, from a planting list. Attention is given to the ecological location of the new trees, e.g. species suitable for upland areas are different from those for stream buffer valley or flood plain.</p>	<p>—Regulations were updated in 2021 when the law was passed. (See the law at <a href="http://montgomeryplanning.org">montgomeryplanning.org</a> under Planning, then Environment.) —No-net-loss law is beginning the process of consideration in May 2022, which if passed will lead to further changes in regulations. Worksheet will be useful to see if the no-net-loss goal is being achieved. (See the worksheet at <a href="http://montgomeryplanning.org">montgomeryplanning.org</a>, under the Development section, Applications, Forest Conservation, Supportive documents).</p>	<p>N/A</p>



<p><b>Balto County</b></p>	<p>For a development, the trigger for a Forest Conservation plan is a property of 40,000 SF or greater.</p> <ul style="list-style-type: none"> <li>- On a single lot 40,000 square feet or larger, if the lot owner is going to clear less than 20,000 square feet of forest, they can fill out a declaration of intent, which restricts further clearing for a period of five years.</li> <li>- Exceptions also include a linear project such as a road, regardless of the size of the land being cleared of trees.</li> <li>- County property is subject to the Forest Conservation law, but it depends on what development activity is taking place. For example, on County property such as a park, if trees are being removed to construct a building, the property would have to comply with Forest Conservation law.</li> <li>- Cumulative clearing of land in separate projects over the years does not seem to be considered as a whole (which Carroll County does).</li> </ul>	<ul style="list-style-type: none"> <li>- Baltimore County does not plant for the developer.</li> <li>- Preference is given to planting on the property that is being developed; if not, then a Forest Conservation planting bank can be used; if planting bank is not available, then fee-in-lieu.</li> <li>- <b>A planting “security” from the developer that is held by the County is \$0.25/SF of the planting site area that is required. 25% of the security is released after year 1 if the inspection shows a survival rate of at least 75%; an additional 25% of the security is released after year 2 if a survival rate of 75% is achieved; the remaining 50% of the security is released after year 3 if a survival rate of 75% is achieved. Thus the security can be refunded when at least 75% of the trees are found to be alive at the end of 3 years.</b></li> <li>- <b>No differential amount of planting is required relative to location</b> (e.g. inside or outside of the URDL), or watershed, or priority ecological setting (which Carroll and Howard Counties do, also Anne Arundel to some extent).</li> </ul>	<p>\$0.55/SF of the planting area that is required. No differential fee related to location relative to the URDL or other factors (which Anne Arundel County does do).</p>	<ul style="list-style-type: none"> <li>- First priority for the planting site is on the property currently under development.</li> <li>-Second priority is off-site at a property owned by the developer.</li> <li>-Third priority is a forest bank site on private property.</li> <li>-Fourth priority is fee-in-lieu.</li> <li>- Any forest conservation planting site on private land must have a minimum of 10,000 SF of planting area that is at least 35 feet wide; note that 35 feet wide does not provide protection for the critical root zone of a mature tree.</li> <li>-Any forest conservation planting site on private land goes through an application process and will have a Forest Conservation Plan that has been prepared by qualified professionals and approved by EIR.</li> <li>-There is no written priority list as to where such planting sites should be established, but often the reviewer may keep in mind wetlands, stream protection, presence of contiguous forest, etc. (unlike the priority list of Howard County).</li> <li>-Development and planting sites on County-owned land do not have clearly stated law about applicability of forest conservation law and requirements. (Unlike Howard County)</li> </ul>	<p>3 years but can be extended if there is less than 75% survival in any of the 3 years (somewhat like Howard County).</p>	<ul style="list-style-type: none"> <li>—Maintenance is spelled out in the site’s Forest Conservation Plan. Can include control of invasive plants (mowing and spot spraying of herbicide), watering in “drought” periods, maintaining deer shelters if present.</li> <li>— Tree shelters against deer now recommend 5-ft height (rather than shorter) to help resist deer browsing on new sprouts at the top of the young trees.</li> <li>— No requirement to remove any plastic tubes, wraps, cords, or other apparatus that were installed when the trees were planted.</li> </ul>	<p>Inspections should be every year , but the frequency is controlled and inspection is carried out by the developer or their contractor. Verification inspections are carried out by DEPS’ Environmental Impact Review.</p> <p>If tree survival is less than 75% then more trees must be planted, but not 1:1 ratio. Replacement requirement is site-specific.</p>	<p>Each Forest Conservation planting site is unique and the acceptable specifications for planting are site-specific, e.g., species, size, distance apart, etc. The county’s reviewers are involved from the beginning to the end of the process, and their response to observations can be agile.</p>	<p>The <b>Manual dates from 1993</b> and needs to be updated.</p>	<p>A comprehensive study of the success of all the tree planting sites after 3 years has not been done. Scientifically validated methods of measurement should be used. Such methods might include random selection of a location point within a planting site area and then examining all the trees within a certain radius of that point, the radius being large enough to get a reliable indication of the overall site within a statistically acceptable degree of confidence. Simple counting of trees that are alive or dead is objective and quick but other characteristics that indicate whether a developing forest is healthy or not could be incorporated as well.</p>
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Sources of information:

Anne Arundel County: Mathew Johnston, Environmental Policy Director [exjohn00@aacounty.org](mailto:exjohn00@aacounty.org) 410-222-1526. Interviewed by Marsha McLaughlin in March 2022.

Baltimore City: Amy Gilder-Busatti, Dept of Planning, Office of Sustainability [amy.gilder-busatti@baltimorecity.gov](mailto:amy.gilder-busatti@baltimorecity.gov). 410-396-4369 Interviewed by Marsha McLaughlin in March 2022.

Carroll County: Jonathan Bowman, Bureau of Resource Management [jbowman@carrollcountymd.gov](mailto:jbowman@carrollcountymd.gov) 410-386-2133. Interviewed by Marsha McLaughlin in March 2022.

Howard County: Brenda Lubber, Land Development Division, Dept of Planning and Zoning [blubber@howardcountymd.gov](mailto:blubber@howardcountymd.gov) 410-313-4343; and Scott Bowen, Howard County Rec & Parks [sbowen@howardcountymd.gov](mailto:sbowen@howardcountymd.gov) 410-313-3723. Interviewed by Don Callihan in March 2022, who also reviewed the Howard County Forest Conservation Manual and contents and documents on the [Planning & Zoning | Howard County \(howardcountymd.gov\)](#) and [Forests & Habitat - Live Green Howard County](#). Later interviewed by Carol Newill to clarify maintenance periods, fee-in-lieu and inclusion of County-owned properties.

Montgomery County: Kristin Taddei, Forest Conservation Programs Manager (Planner III), and Reforest Montgomery Program Manager, Department of Planning [kristin.taddei@montgomeryplanning.org](mailto:kristin.taddei@montgomeryplanning.org) 301-495-4597. Interviewed by Carol Newill in April 2022.

Baltimore County: Thomas Krispin, supervisor of enforcement section in the Environmental Impact Review Section of DEPS. [tkrispin@baltimorecountymd.gov](mailto:tkrispin@baltimorecountymd.gov) 410-887-3980 Interviewed by Carol Newill in March and April 2022.