Virginia Department of Planning and Budget

Economic Impact Analysis

9 VAC 15-60 Small Solar Renewable Energy Projects Permit Regulation
Department of Environmental Quality
Town Hall Action/Stage: 6246 / 10341
July 29, 2024

The Department of Planning and Budget (DPB) has analyzed the economic impact of this proposed regulation in accordance with § 2.2-4007.04 of the Code of Virginia (Code) and Executive Order 19. The analysis presented below represents DPB's best estimate of the potential economic impacts as of the date of this analysis.[1]

Summary of the Proposed Amendments to Regulation

In response to Chapter 688 of the 2022 Acts of General Assembly,[2] the Department of Environmental Quality (DEQ) proposes to 1) require conservation easements and in-lieu fees as the two types of mitigation for those solar projects that are deemed by Chapter 688 to have a significant adverse impact to prime agricultural soils, contiguous forest lands, or lands enrolled in a program for forestry preservation. DEQ also proposes following discretionary changes to 2) consider threatened and endangered insects as wildlife for mitigation purposes; 3) require permit applicants to submit a pollinator smart/bird habitat scorecard; 4) establish several new timeframes to avoid delays in project construction; 5) and increase the exemption from notification or certification requirements from projects with 500 Kilowatt to one Megawatt (MW) electric generation capacity. In addition, the proposal includes several clarifying and structural changes to the regulatory language.

[1] Code § 2.2-4007.04 requires that such economic impact analyses determine the public benefits and costs of the proposed amendments. Further the analysis should include but not be limited to: (1) the projected number of businesses or other entities to whom the proposed regulatory action would apply, (2) the identity of any localities and types of businesses or other entities particularly affected, (3) the projected number of persons and employment positions to be affected, (4) the projected costs to affected businesses or entities to implement or comply with the regulation, and (5) the impact on the use and value of private property.

[2] https://lis.virginia.gov/cgi-bin/legp604.exe?221+ful+CHAP0688.

Background

This regulation became effective in 2012,[3] and it required the applicant to prepare a mitigation plan if DEQ determined that significant adverse impacts to wildlife or historic resources or both were likely. According to DEQ, the program has grown rapidly and in 2017 a legislative modification increased the size of projects eligible for a permit-by-rule[4] from 100 MW to 150 MW.[5] This increase in capacity has resulted in larger projects that seek permits, which correlates to an increase in the acreage per project.

This increased impact on the acreage of land affected has led to concerns about the loss of prime agricultural soils and forest land as part of this impact. Chapter 688 addressed these concerns for solar projects by declaring that

> *A project will be deemed to have a significant adverse impact if it would disturb more than 10 acres of prime agricultural soils or 50 acres of contiguous forest lands, or if it would disturb forest lands enrolled in a program for forestry preservation pursuant to subdivision 2 of § 58.1-3233.* [6]

The addition of this language in the statute effectively requires DEQ to require mitigation for impacts to prime agricultural soils and forest lands that are above the legislative thresholds. Notably, no such mitigation is automatically required for solar projects that are below these thresholds, although a mitigation plan for endangered insects or historic resources may be required for any project if the initial analysis indicates a need. However, the legislation makes the presumption that any project above these thresholds requires mitigation. These aspects of the regulatory approach thus result from the legislation itself, and not the regulation.

---

[3] The 2012 promulgation of this regulation was mandated by Chapters 808 and 854 of the 2009 Acts of Assembly that provided permitting authority to DEQ for solar-energy projects with rated capacity not exceeding 100 megawatts in addition to the State Corporation Commission (SCC). Currently, both DEQ and SCC have permitting authority for such projects.

[4] A permit-by-rule means that permit requirements are set forth "up front" in the regulation and if the applicant meets those requirements, a permit is automatically issued, rather than being issued on a case-by-case basis; thereby reducing uncertainty about the outcome and requirements of an application compared to a regular permit.

[5] According to DEQ and anecdotally, roughly one MW of electricity generation requires a solar farm size of about ten acres.

[6] Chapter 688 defines "prime agricultural soils" as soils recognized as prime farmland by the U.S. Department of Agriculture and "forest land" as having the same meaning as set forth in § 10.1-1178 which is the land on which forest trees are found.

In this regulatory action, DEQ proposes two types of mitigation for solar projects that exceed the statutorily-mandated thresholds for impacts to prime agricultural soils, contiguous forest lands that satisfy the legislative criteria, and C1 or C2 ecological cores, as follows:[7]

1. Conservation Easement(s): The use of conservation easements would require the direct protection of land via the acquisition of a conservation easement(s) by the applicant.[8] This would be accomplished by requiring a certain mitigation ratio of the area conserved to the area disturbed (e.g., a ratio of 1:2 would require one acre to be conserved for every two acres of disturbance). Although the proposal allows for reduced mitigation ratios under certain cases (e.g., for land containing riparian forest buffers within the easement, or for lands where partial mitigation options have been taken on-site to avoid grading, or removal of topsoil, etc.), the following primary mitigation ratios are proposed:

- 1:1 ratio for disturbance of more than 10 acres of prime agricultural soils,
- 1:1 ratio for disturbance of more than 50 acres of contiguous forest lands,
- 1:1 ratio for disturbance of forest lands enrolled in a program for forestry preservation,
- 7:1 ratio for disturbance of forest land categorized as Ecological Core C1,
- 2:1 ratio for disturbance of forest land categorized as Ecological Core C2,

2. In-Lieu Fees: In this alternative mitigation approach, “in-lieu” of acquiring conservation easements the applicant would pay a fee to a third party designated by DEQ. The in-lieu fee would be used to acquire conservation easement(s). The amount of the in-lieu fee is calculated to approximately equal the cost to the applicant of acquiring the required conservation easements.

Furthermore, regardless of whether the applicant obtains an easement or pays the in-lieu fee, the proposal would require that if a draft mitigation plan was not provided by the applicant as part of the initial application, the applicant must develop a mitigation plan and conduct a 45-day public comment period as per the legislation. Any application for a small renewable energy

[7] "C1 forest core" means forest land with at least 100 acres of continuous interior natural habitat that has been mapped in the Outstanding category (C1) by the Department of Conservation and Recreation in the Virginia Natural Landscape Assessment.
"C2 forest core" means forest land with at least 100 acres of continuous interior natural habitat that has been mapped in the Very High category (C2) by the Department of Conservation and Recreation in the Virginia Natural Landscape Assessment.

[8] "Conservation easement" means a perpetual easement complying with the proposed requirements of 9VAC15-60-60 G.

project received for which an interconnection request is applied for and received by December 31, 2024, would not be subject to these new provisions.

This regulation would also be amended to incorporate provisions that were previously included in a 2019 regulatory action that was not implemented.[9] These provisions include changes that would consider threatened and endangered insects as wildlife for mitigation purposes; require submission of a pollinator smart/bird habitat scorecard; establish several new timeframes to avoid delays in project construction; increase the exemption from notification or certification requirements from projects with 500 Kilowatt to one MW generation capacity.

The remaining changes would clarify definitions, the timeframe for submitting a notice of intent, the use of avoidance mitigation as it relates to cemeteries, the requirements for site plans, public participation requirements, recordkeeping and reporting requirements, and the procedures for modifying or transferring ownership of a permitted facility.

In summary, this regulatory action is necessary in order for DEQ to carry out the requirements of Chapter 688; it would also be utilized to address certain requirements from a 2019 regulatory action and to clarify some of the existing requirements.

Estimated Benefits and Costs

Implementation of Chapter 688 of the 2022 Acts of General Assembly

In the absence of Chapter 688, a solar project permittee would be mainly concerned with permit application costs, the cost of acquiring land for the project, ongoing operational costs, and the revenues expected from the solar project operation. It is worth noting that the legislation does not change these considerations for the applicant but adds other considerations in terms of additional costs for the permit application and the cost of either obtaining conservation easement(s) (either directly by the applicant or indirectly via the in-lieu fee) or the avoidance of sites containing the protected resources. Notably, because an easement(s) must be obtained either directly or indirectly, these costs would be incurred in addition to the cost of purchasing the protected land for the project itself. To the degree these costs increase the overall cost of a solar project on protected land, they act as a disincentive to the development of solar projects on protected land. All other things being equal, therefore, an applicant would face a financial

[9] https://townhall.virginia.gov/L/ViewAction.cfm?actionid=5216

incentive to use non-protected lands for solar projects up until the point where the cost of using non-protected land equals the cost of using protected land. These incentives only apply to solar projects, however, and not to other kinds of development, wherein disincentives for the use of protected land may not exist.

In light of this context, which results from the legislation, an analysis of the regulatory change must factor in benefits that may not necessarily accrue to the solar project owner but may accrue to the public in the form of effects on the general welfare. So, the ensuing discussion of the regulatory change addresses the additional economic costs and benefits beyond those that would have been expected if Chapter 688 had not been enacted. In other words, the economic analysis of a regulatory change compares the situation that existed before the regulation was amended to the situation that exists after the regulation is amended, and specifically assesses those changes that result from the regulation itself and not the legislation.

That said, the legislation and consequently the proposed regulation strive to strike a balance between two competing goals.[10] On one hand, solar development proponents are concerned with fair treatment of agricultural and forest lands impacted by solar projects in comparison to the treatment of those lands by other potential uses. This group aims to avoid constraints on land that is impacted by solar projects that are not imposed on other uses of the same land. Therefore, a key concern for solar development proponents is that the regulatory framework not become so onerous and complex that solar energy is no longer economically feasible in Virginia.

On the other hand, advocates for the protection of prime agricultural soils and forest lands are concerned that these resources cannot be replaced if converted to solar use. They argue that once prime agricultural soils and forest lands have been disturbed through subsoil compaction and loss of structure, they cannot be restored to their pre-disturbance levels of prime productivity. Because Virginia's largest industry in terms of land use is agriculture and forestry, the loss of prime soils and forest lands is viewed by this group as a direct threat to important economic and natural resources. Accordingly, such loss must be avoided, minimized when possible, and mitigated when an impact cannot be avoided. This is particularly true for C1 and

[10] A Study of Small Renewable Energy Projects: Impact on Natural Resources - HB 206 – December 1, 2022 (virginia.gov)

C2 ecological cores, which by definition form continuous wildlife corridors and constitute potentially irreplaceable habitat and reservoirs of native species.

In the context of these competing interests, the legislation's main impact was to deem certain solar projects as having a significant adverse impact and therefore subjecting such projects to mitigation and the associated costs. These projects are those that would disturb more than 10 acres of prime agricultural soils or 50 acres of contiguous forest lands, or that would disturb forest lands enrolled in a program for forestry preservation pursuant to subdivision 2 of § 58.1-3233.

One such cost is the increased cost of preparing an application for a solar project. Under the proposal, all applicants would incur additional costs to map and calculate the impact of their proposed development on prime agricultural soils, contiguous forest lands, and C1 and C2 ecological cores to determine if they fit the legislation's criteria. The regulation identifies geographic information system resources that may be used to identify these resources without physical surveys. DEQ reports that based on informal interviews of consultants, the additional time required to map and calculate the impacts on these resources may average approximately eight hours. Assuming a rate of $100/ hour for consultant time, this increased cost per application is estimated to be $800. Based on data from 2019-2023, there were 13.2 permits issued per year. Thus, the additional application costs would aggregate to approximately $10,560 for all project applicants in a typical year.

More significantly, other compliance costs would be related to the cost of acquiring conservation easements, whether the applicant plans to secure such easements directly by himself or indirectly via the payment of the in-lieu fee to a third party to obtain the required conservation easement. The components of the in-lieu fee would include the projected administrative costs and the predicted cost of a perpetual easement necessary to protect the required acreage of land (easement cost). The administrative costs are not currently known, but would include DEQ staff time, legal fees, due diligence costs, stewardship fees paid to the holder, etc. The regulation would be amended to stipulate that the per-acre easement cost is the higher of either $3,000/acre or the change in the value of land as a result of solar use. Because the administrative costs are applied to the entire project, they are not calculated on a per-acre basis. Thus, the total compliance costs associated with the in-lieu fee are the sum of the

administrative costs (fixed) and the easement cost (per acre). More precisely, the regulation would be amended to stipulate that the proposed in-lieu fee of a perpetual easement would be equal to

> *the greater of (i) $3,000 per acre adjusted annually by the percent change (2024 base year) in Virginia cropland value determined by the USDA National Agricultural Statistics Service, or (ii) the difference between the most recent assessed use value per acre of forest or agricultural land, as applicable, and the full assessed value per acre of the land affected by the solar project prior to re-assessment as a solar use. The applicant shall provide [DEQ] evidence of the assessed values from the local assessor. In the event the jurisdiction where the project is proposed does not participate in use value assessment, the applicant may provide a calculation of the use value provided by the Virginia State Land Evaluation Advisory Council (SLEAC).*

In other words, those solar permit applicants who chose to use protected land would have to incur additional costs either to obtain conservation easements themselves or to pay an in-lieu fee to a third party of at least $3,000/acre. DEQ reports that the $3,000 threshold is derived from data on appraisals for land preservation tax credits data provided by the Virginia Department of Taxation; according to DEQ, a single value was used because there is no statistical difference between the appraised values for forest land and for farmland preservation tax credits. Additionally, over the 2019-2023 period the annual number of solar permits issued averaged 13.2 permits per year; likewise, the permits involved 794 MW of electric production capacity and 9,483 acres of land on average each year.[11] However, this acreage is the entire real estate parcel for the project, some of which may not be disturbed due to slopes, wetlands, buffers, etc. Thus, the reported acreage involved in the permitted projects likely overstates the area of disturbance. However, there are no available data to estimate how much of the disturbed land is prime agricultural soils, forests, C1, or C2 ecological cores.

The cost of obtaining conservation easements directly, or indirectly via in-lieu fees, would effectively put a surcharge on the protected resources. This surcharge would incentivize solar developers to seek land that does not contain these protected resources up until the point where the cost of this alternative land equals the cost of mitigation. Thus, it is expected that the

[11] Source: DEQ

proposed mitigation requirements would lead solar developers to select those sites that minimize the disturbance of forests and prime agricultural soils. (Over time, if these incentives increase the demand for un-protected land then the cost of unprotected land would increase.)

However, if a project disturbs lands that would require a conservation easement or in-lieu fees, these costs would add to the overall project costs. To the degree that unprotected land is not available, or is more costly than protected land, the additional costs associated with using protected land may reduce the incentives to start a solar renewable energy project and, DEQ notes, could "slow the development of utility scale solar development in the Commonwealth."[12]

To the extent that the proposed implementation of the legislatively mandated regulation discourages solar projects, the benefits of solar energy may be curtailed. Generally, small solar projects are beneficial to the environment because they generate electricity that might otherwise be generated by facilities that rely on the combustion of fossil fuels. Public health and welfare are thus protected to some extent because, as noted by DEQ, solar generation of electricity helps to "reduce dependence on foreign oil and helps increase jobs and economic development related to construction and operation of these projects." DEQ adds that the mitigation requirements could potentially result in increased consumer costs for electricity. [13] Thus, the consequences of this proposal may be a reduction in the benefits expected from solar energy.

On the other hand, the additional solar project costs on applicants created by the in-lieu fees would generate new revenues that would be directed to conserve forests or prime agricultural lands in perpetuity, thereby offsetting the costs to the applicants and any negative societal or welfare impacts. In brief, DEQ estimates that the current value of conserving an acre of forest land in perpetuity is $273.73; the current value of conserving an acre of farmland in perpetuity is $1,558.99; and the values of conserving C1 and C2 ecological cores are indeterminate because there are no data on the monetary value of such lands. (The detailed data and methodology used for these estimated values are provided in the Appendix.)

As discussed in the appendix, no data exist with which to estimate the actual value of conserving these specific lands, and therefore certain statewide data were used by DEQ.

---

[12] See the Office of Regulatory Management Economic Review Form, page 3, at https://townhall.virginia.gov/l/GetFile.cfm?File=53\6246\10341\ORM_EconomicImpact_DEQ_10341_v1.pdf

[13] *Ibid*, pp. 3-4.

However, the inherent value of these cores is indicated by the proposed conservation ratios: instead of the standard 1:1 ratio used for forests or prime agricultural lands, the proposed conservation ratios for C1 and C2 ecological cores are 7:1 and 2:1 respectively. These ratios indicate a higher value relative to farmland or forests by a factor of seven and two respectively, indicating that such ecological cores are precious if not invaluable.

Given the two or seven-fold increase in the 1:1 standard-proposed mitigation ratio and the associated costs, a solar developer would be highly incentivized to avoid impacting such precious lands. In addition, research referenced in the legislatively mandated study[14] suggests that approximately 25 percent of solar facilities in Virginia have disturbed farmland and almost 58 percent have disturbed forested land. The remaining 17 percent of disturbed land are composed of pasture (7.0 percent), harvested/disturbed (3.4 percent), NWI/other (2.4 percent), shrub/scrub (1.7 percent), tree (1.4 percent), turf/grass (1.0 percent), impervious (0.2 percent), open water (0.0 percent), and barren (0.0 percent) land. Although this research illustrates the types of land that may be disturbed, it does not identify disturbance to prime agricultural lands or forests.

Additional offsetting benefits may be related to the reduction in uncertainty that this regulatory action will achieve by determining the appropriate mitigation techniques and criteria and other aspects of the regulatory approach that Chapter 688 required but did not stipulate. For example, the acreage of total land that would be conserved would be determined by the conservation ratios that would be established by this regulatory action. The proposed mitigation ratios would allow developers to determine the up-front costs associated with utility scale solar projects. This reduction in uncertainty is directly attributable to the proposed regulation and would be expected to benefit the solar developers given that DEQ is charged with establishing precise mitigation measures for the lands deemed to be adversely impacted by the legislation. However, by the same token, the proposed precise mitigation ratios that result from this regulation also directly impact how much farmland, or forests developers would be required to mitigate.

[14] See page 350 of https://rga.lis.virginia.gov/Published/2022/RD773/PDF, and page 23 of https://scholarscompass.vcu.edu/cgi/viewcontent.cgi?article=1043&context=murp_capstone

As noted above, the economic analysis of a regulatory change compares the situation that existed before the regulation was amended to the situation that exists after the regulation is amended. This comparison is summarized in the table below.

Additional Costs	Additional Benefits
-Mitigation costs or the payment of the in-lieu fee by the developers (i.e., $3,000/acre plus the administrative costs).	-Conservation value of protected lands (i.e., $273.73/acre forest land, $1,558.99/acre prime agricultural soils).
- Lower prices to owners of protected land if demand for protected land decreases compared to pre-regulation levels.	-Other unquantified environmental benefits of conserving protected lands (e.g., ecosystem services, food security, etc.).[15]
-Possibly higher land acquisition costs for developers to obtain un-protected land if the price is higher compared to the pre-regulation price.	-Benefits to owners of un-protected land from higher prices compared to pre-regulation levels.
-$800/permit increase in application costs.	- Greater certainty to developers about the up-front costs of solar projects.

Although most of the effects are unquantified and there are no data to estimate the total acreage of disturbed prime lands and forests, the fact that the $3,000 easement cost per acre exceeds the conservation values ($273.73 per acre of forest lands and $1,558.99 of prime agricultural soils) suggests that regardless of the protected acreage that solar projects may disturb, the quantified compliance cost of this proposal would likely exceed the quantified benefits. (Note that this statement only addresses quantified costs and benefits, and that some of these impacts may not be quantified.) This condition would be less likely to the degree that C1 and C2 cores are involved, if their quantified conservation values exceed those of forest and farmland.

Threatened & Endangered Insects Mitigation

The current and proposed regulations both state that DEQ shall find that significant adverse impacts to wildlife are likely whenever state-listed threatened and endangered (T&E) wildlife are found to occur within the disturbance zone. However, the current regulation excludes T&E insects from the T&E wildlife definition. DEQ proposes to expand this definition, by

[15] See page 7, https://www.cdfa.ca.gov/EnvironmentalStewardship/pdfs/Farmland-Conservation-in-California.pdf

specifying that T&E insect species would also be considered T&E wildlife. Thus, the presence of T&E insects in the disturbance zone would trigger the determination that adverse impacts to wildlife are likely.

Both the current and proposed regulations state that for state-listed T&E wildlife, the applicant shall take all reasonable measures to avoid significant adverse impacts or shall demonstrate in the mitigation plan what significant adverse impacts cannot practicably be avoided and why additional proposed actions are reasonable. These additional proposed actions may include best practices to avoid, minimize, or offset adverse impacts. An estimate of the cost of taking such actions for mitigation is not currently available.

Pollinator/Bird Habitat Scorecard

DEQ and the Department of Conservation and Recreation have developed a program to encourage pollinator-friendly solar energy developments throughout the Commonwealth. The program is referred to as the Virginia Pollinator-Smart Solar Industry (paraphrased hereafter as "Pollinator-Smart program"). A Pollinator-Smart solar facility is one that meets performance standards outlined in the most current release of the Virginia Pollinator Smart/Bird Habitat Scorecard (Scorecard).[16] Solar sites that meet the minimum requirement of 80 points on the Scorecard are considered "Certified Virginia Pollinator-Smart," and those that score 100 or more points are considered "Gold Certified Virginia Pollinator-Smart." The majority of points on the scorecard result from planting pollinator friendly native plants.

DEQ proposes to require that the applicant submit a completed scorecard with the application. The agency believes it would take approximately 45 minutes for the applicant to complete the two-page scorecard. Certification would not be required, and a low score would not prompt mitigation. DEQ believes that many applicants would seek to have a high score because it would be good for public relations.

Additionally, a paper[17] from Yale University Center for Business and the Environment finds that that pollinator-friendly solar may generate private benefits to solar developers. These benefits largely flow from higher energy output, from panel efficiency gains attributed to the cooler microclimate created by perennial plantings. A small added benefit accrues from the

[16] See https://www.dcr.virginia.gov/natural-heritage/pollinator-smart for details.
[17] See https://cbey.yale.edu/research/maximizing-land-use-benefits-from-utility-scale-solar

lower operations and maintenance costs over the project lifetime thanks to the reduced frequency of mowing for native pollinator-friendly plants as compared to turfgrass. By requiring that the scorecard be completed, with greater possibility that developers learn about the potential benefits to their business as well as the environment, applicants may be more likely to pursue a pollinator-friendly project.

The Yale study also points out that pollinator-friendly solar results in positive externalities such as more groundwater recharge and a greater reduction in soil erosion than conventional solar. Additionally, pollinator-friendly solar contributes other sizable social benefits in the form of increased crop yields when projects are sited near pollinator-dependent farmland, a reduction in the incidence of soil erosion, and an increase in the habitat needed by wildlife.

Timeframes

According to DEQ, the absence of certain timeframes within the regulation has been problematic. The agency proposes to establish several new timeframes, including adding that the authorization to construct and operate shall become invalid if (i) a program of continuous construction or modification is not begun within 60 months from the date the permit-by-rule or modification authorization is issued; or (ii) a program of construction or modification is discontinued for a period of 24 months or more, except for a DEQ-approved period between phases of a phased construction project. With large gaps in time between analyses and construction, conditions on the ground may have significantly changed and the analysis may no longer be accurate. If the authorization is deemed invalid, new fees and application documents would have to be submitted if the developer decides to pursue the project.

Under the current regulation, a report of any change of ownership must be done at least 30 days prior to the change. According to the agency, the industry has indicated that it is difficult to predict ownership transactions prior to the actual date and therefore requested that the notification occur after the transaction was complete. Since DEQ has no objection to receiving the information shortly afterwards, it proposes to change the requirement to within 30 days. This would reduce the reporting burden for the applicant.

Solar developers are currently required to submit post-construction site maps, but no deadline is indicated. The lack of a deadline has hindered DEQ's ability to enforce their

submission, which in turn hinders DEQ's ability to ensure the use of good practices. The agency proposes to require that the post-construction site maps be submitted within six months from the beginning of operation.

Projects with Reduced Requirements

DEQ proposes to increase the maximum rated capacity, under which the applicant is not required to submit any notification or certification to the department, from 500 KW to one MW. According to the agency, this proposed amendment was requested by the Department of Mines, Minerals and Energy to align with the nonresidential net metering requirements. This would moderately reduce costs for projects with capacity greater than 500 KW and less than or equal to one MW.

Businesses and Other Entities Affected

The proposed regulation applies to applicants for solar projects with generation capacity up to 150 MW. Contractors and consultants for permit preparation and required analyses may be affected as well.

The Code of Virginia requires DPB to assess whether an adverse impact may result from the proposed regulation.[18] An adverse impact is indicated if there is any increase in net cost or reduction in net benefit for any entity, even if the benefits exceed the costs for all entities combined.[19] As noted above, the most significant compliance costs are the cost of acquiring conservation easements, which Chapter 688 mandated that DEQ consider and implement. The economic impact that can be attributable to the regulation itself is mainly related to the proposals carried over from the unimplemented 2019 regulatory action that may introduce modest compliance costs in terms of mitigation actions for threatened and endangered insects, the cost of submitting the smart/bird habitat scorecard, and the cost of complying with proposed construction timeframes. With respect to those issues, an adverse impact on solar project

[18] Pursuant to Code § 2.2-4007.04(D): In the event this economic impact analysis reveals that the proposed regulation would have an adverse economic impact on businesses or would impose a significant adverse economic impact on a locality, business, or entity particularly affected, the Department of Planning and Budget shall advise the Joint Commission on Administrative Rules, the House Committee on Appropriations, and the Senate Committee on Finance.

[19] Statute does not define "adverse impact," state whether only Virginia entities should be considered, nor indicate whether an adverse impact results from regulatory requirements mandated by legislation. As a result, DPB has adopted a definition of adverse impact that assesses changes in net costs and benefits for each affected Virginia entity that directly results from discretionary changes to the regulation.

developers is thus indicated on account of the associated discretionary requirements in this regulatory action.

Small Businesses[20] Affected:[21]

According to DEQ, developers of utility scale solar projects could be classified as small businesses. For developers in this category, the increased cost of legislatively mandated mitigation could potentially limit solar development in Virginia. In addition, relatively modest costs on solar developers from the discretionary changes would add to those compliance costs.

Types and Estimated Number of Small Businesses Affected

Over the 2019-2023 period, on average 13.2 solar permits were issued per year. Exactly how many of these permittees would meet the definition of a small business is not known.

Costs and Other Effects

The costs and other effects discussed are the same on small businesses which include increased permitting costs, conservation easement costs, and relatively modest costs from the additional discretionary mitigation and streamlining proposals.

Alternative Method that Minimizes Adverse Impact

There are no clear alternative methods that both reduce adverse impact and meet the intended policy goals.

Localities[22] Affected[23]

The proposed amendments would apply to solar developers, which can essentially be located in any locality. The proposal does not introduce direct costs on localities unless a locality

[20] Pursuant to § 2.2-4007.04 of the Code of Virginia, small business is defined as "a business entity, including its affiliates, that (i) is independently owned and operated and (ii) employs fewer than 500 full-time employees or has gross annual sales of less than $6 million."

[21] If the proposed regulatory action may have an adverse effect on small businesses, Code § 2.2-4007.04 requires that such economic impact analyses include: (1) an identification and estimate of the number of small businesses subject to the proposed regulation, (2) the projected reporting, recordkeeping, and other administrative costs required for small businesses to comply with the proposed regulation, including the type of professional skills necessary for preparing required reports and other documents, (3) a statement of the probable effect of the proposed regulation on affected small businesses, and (4) a description of any less intrusive or less costly alternative methods of achieving the purpose of the proposed regulation. Additionally, pursuant to Code § 2.2-4007.1, if there is a finding that a proposed regulation may have an adverse impact on small business, the Joint Commission on Administrative Rules shall be notified.

[22] "Locality" can refer to either local governments or the locations in the Commonwealth where the activities relevant to the regulatory change are most likely to occur.

[23] § 2.2-4007.04 defines "particularly affected" as bearing disproportionate material impact.

itself chooses to develop a solar energy project, in which case the locality's costs would be similar to the costs of any other permit applicant.

Additionally, there might be potential costs to a locality if a project is developed within its jurisdiction. These indirect costs could occur because of the existence of the project (with potential access or road construction issues, for example) but not because of the proposed regulation. The locality, pursuant to its land-use authority, has the power to determine whether or not a project can be located within its jurisdiction. A locality's decisions in this regard are separate from the operation of the regulations. The regulation only requires that the local government certify that the applicant has met all local land-use ordinances.

Projected Impact on Employment

The costs of mandated conservation easements plus modest costs of additional discretionary requirements may reduce the number of solar farms and by extension may also reduce the demand for labor in the construction and operation of solar farms to the extent that the proposal slows down the development of such projects. In contrast, the required mitigation actions may add to the demand for consultants for permit preparation and associated analyses, as well as the demand for labor that would be needed to facilitate private easement transactions and transactions that would be conducted by the third party that would manage and obtain easements through in-lieu fees collected.

Effects on the Use and Value of Private Property

The proposal would increase the cost of developing real estate for the purpose of creating and operating solar energy projects with rated capacity up to 150 MW. These costs would vary, depending on whether the project meets the criteria noted above, but some additional costs would be incurred for all projects such as the $800 application cost. This would likely reduce profitability and asset values of affected businesses and discourage such development. The cost of conservation easements would incentivize developers to pay more for land outside protected resources up to the cost of mitigation. Furthermore, the prime agricultural lands and forests protected by conservation easements would essentially be protected in perpetuity from other potential uses, therefore limiting the availability of protected land for any other non-solar uses.

Appendix

DEQ notes that there are no readily available estimates for the conservation values specific to protected lands and as a result uses proxies to approximate the financial contributions of agricultural and forestry sectors. DEQ also employs a methodology to use these proxies in order to calculate the conservation values. Similarly, the proposed easement cost per acre is also derived from proxy data. More specifically, DEQ has used the following specific data and methodology to estimate the conservation values for the three types of land and the per acre easement cost.

Value of conserved forest lands:

The total annual financial contribution of forest products in Virginia has been estimated by the Weldon Cooper Center at $23,600,000,000.[24] In addition, the U.S. Forest Service estimates that there are 13,107,486 acres of privately owned forest land in Virginia.[25] Using these data, therefore, the annual per acre financial contribution of private forest land is approximately $1,800. The Forest Service also estimates that the total annual loss of forest land due to land use conversion is 59,782 acres. This means the probability of conversion of any acre of forest in any given year is 0.46 percent (59,782 / 13,107,486). The annual value of protecting an acre of forest land ($1,800 times 0.46 percent) equals $8.21. The present discounted value of protecting an acre of forest land in perpetuity (the annual value divided by a 3 percent discount rate) equals $273.73.

Value of conserved prime agricultural soils:

The total annual financial contribution of agricultural products in Virginia has been estimated by the Weldon Cooper Center at $82,329,000,000. The U.S. National Agricultural Statistics Service (NASS) estimates that there are 7,309,687 acres of farmland in Virginia.[26] Using these data, therefore, the annual per acre financial contribution of agricultural land is approximately $6,281. NASS also estimates that the total annual loss of farmland due to land use conversion is 97,600 acres. This means the probability of conversion of any acre of forest in any given year is 0.74 percent. The annual value of protecting an acre of farmland (per acre financial

[24] https://www.vdacs.virginia.gov/pdf/weldoncooper.pdf.
[25] https://dof.virginia.gov/wp-content/uploads/USDA-FS-FS-395-Forests-of-VA-2020.pdf.
[26] https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_1_State_Level/Virginia/.

contribution times probability of loss) equals $46.77. The present discounted value of protecting an acre of farmland in perpetuity (the annual value divided by a 3 percent discount rate) equals $1,558.99. However, the conservation value of prime agricultural lands is likely higher.

Value of conserved ecological cores:

Any effort to calculate the value of preserving C1 and C2 ecological cores requires determining the value of ecosystem services and non-use values (such as biodiversity preservation). A key aspect of C1 and C2 ecological cores is that they are connected by landscape corridors and nodes to create an interconnected, statewide network of natural lands.[27] Although these lands have value, there are no data with which to calculate their monetary value. However, the use of these lands would disrupt the network they create, thereby affecting the overall value of these lands as wildlife corridors. The Department of Conservation and Recreation estimates that there are approximately 2,926,000 acres of C1 ecological cores and 2,288,000 acres of C2 ecological cores. DEQ does not have direct data on the rate of loss of these cores, and used the U.S. Forest Service's estimates for forests (0.46 percent).

Easement cost:

DEQ has used 2018 - 2022 land preservation tax credit appraisals data from the Department of Taxation to determine the median appraised value of land preservation easements in ten river basins in the Commonwealth. The appraisal data was calculated by river basin because the conservation easements will be required to be located in the same river basin as the solar development requiring mitigation. These median appraised values varied between $1,593 per acre to $11,025 per acre. DEQ then calculated the median value of these medians from ten river basins to be $2,973 and rounded this number to $3,000 to establish the proposed easement cost. This minimum easement cost is the same for both the prime agricultural lands and the forests, because DEQ states that there was no statistically significant difference in the estimated values.

[27] https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla.