CB 38-2019

Sayers, Margery

From: Fern Nerhood <fern@nerhood.net>
Sent: Tuesday, September 24, 2019 7:23 AM
To: CouncilMail
Subject: CB-38 Testimony in Support
Attachments: County Council Testimony CB38 9-16-2019c.docx

Dear Howard County Council,

This is the full text of my testimony in support of CB-38.

Thank you,
Fern Nerhood

Testimony to County Council in Support for County Bill 38, continued to 9-23-2019

by FERN NERHOOD, 5825 Judge Dobbin Court, Elkridge, MD 21075

Good evening. County Bill 38 is a common-sense plan to protect the people of Howard County. It will ensure that construction projects and developers along the Patapsco River Watershed for the Lower North Branch actually meet the requirements for adequate storm water management, floodplain and wetland buffers, forest management, and open space.

Rather than seeing this strictly as environmental conservation, I ask you to also see it in the same light as insisting that road construction is sound and buildings are safe. Through CB-38, you will actually be protecting many things.

First is the protection and safety of the people. The history of allowing waivers for adequate storm water management or construction near slopes, waterways, and the floodplain puts people in the line of danger. Taking down forests or eliminating open space, compounds that danger because the trees and permeable ground absorb high amounts of run off. Ignoring these factors in the vulnerable Patapsco watershed simply puts real lives in danger.

Second is the protection of our residents' financial wellbeing. When an individual's car is damaged or a family's home is flooded, someone pays for it. While insurance may cover some costs, it is rare that everyone will regain the full amount lost. Individuals are left covering the difference. There is also the great loss of time it takes to clean up, replace what was destroyed, and deal with insurance companies. The loss of time and transportation can also can hinder a person's ability to work.

Third is the protection of taxpayer dollars and the county budget. When a developer does not provide adequate storm water management, and rains like those that we saw in 2016 and 2018 occur, who pays to fix roads, sidewalks, and other infrastructure? When tributaries swell and grow strong, leading to drastic erosion of the riverbanks, who is left with the bill? When developments spring up next to waterways or steep slopes, who pays for the costly slope stabilization after a storm?

Unsafe Affordable Housing is Wrong

Developers may tell you that this bill will make development prohibitively expensive and affordable housing out of the question. That storm water management is too costly, open space is unnecessary, and forests are easily compensated for by a fee. These statements are false. Instead, providing affordable housing that endangers our most vulnerable residents is simply wrong. CB-38 will help protect them too.

"Go to Our House"

Since I live in Elkridge, you may be wondering how my family was affected by the floods in Ellicott City. On May 27, 2018, my family was actually even farther away in Pittsburgh, PA. We were shocked to hear about the return of flooding in Howard County and saw that it was national news. Then we got a call from Maryland. Friends who lived near the flooding were trying to reach their home. Authorities turned them away. It was not safe. "Go to our house," we told them. "We just put fresh sheets on the guest bed." Our friends were safe this time. But not everyone was. Just houses away from theirs, basements flooded and cars were destroyed. A road washed out. And I humbly remember that Staff Sgt. Eddison Hermond gave his life trying to save another.

Elkridge is downstream in the same watershed. If development continues in the same way where we live, in a few years we expect to be the ones calling for a safe place to stay.

The County Seal

One last thought. As you know, Howard County is precious and unique. One symbol of our county is the seal posted proudly in this room. But now, it makes me sad. It no longer represents what I actually see: farms disappearing with their agriculture and livestock; forests clear-cut and graded; wildlife scrambling to survive; subdivisions packed with homes and asphalt. Every square foot is a target. So what image would represent us now? What if the seal was actually a circle of road; what if instead of farm equipment and bundle of wheat in front of trees, there was a bulldozer taking down the last trees; what if instead of rolling hills, we had building after building after building with no open space except for one area where a river was tearing through it all. This is what I see; this is where we are headed if we don't proceed carefully.

Honored members, please pass County Bill 38 and require adequate protection of our tax dollars, financial wellbeing, and the safety of the people.

Sayers, Margery

From: John Rice <johnrice5874@gmail.com>
Sent: Monday, September 23, 2019 8:35 PM
To: CouncilMail
Subject: CB38 - John Rice written testimony
Attachments: HC Testimont.docx

[Note: This email originated from outside of the organization. Please only click on links or attachments if you know the sender.]

Council Members,

Attached is my written testimony against the approval of Council Bill 38.

Thanks,
John Rice
Cell 240-882-3049
jgr27.com

Talking Points
Draft

Good Evening Council Members my name is John Rice from Elkridge, md.
I've been a resident of Howard County for 57 years I am not the doomsday threat I am a tax paying resident, I represent the current property owners that have no clue you are about to rob them of their property value through this Council Bill. I was here before I-95 and BC -Before Columbia was built. I've seen Howard County transform from a Rural farming community to an urban city. County Bill 38 is an Anti Development bill with no actual factual data and is leveraging the Floods in 2016 and 2018 to push an AntiGrowth agenda. If this Bill is passed it will be a complete robbing of current property owners and will be the death of the Small Local builders. Every single one of the council members have purchased a home in Howard county and some might live in homes that were constructed before 1982 with no Storm water Management and now you want to take property from someone that held out to development. This bill just robbed three of my adjoining Neighbors of 1.2 million dollars and they don't even know it. Another person I know probably is getting robbed around 1.3 Million dollars and he doesn't even know it. I know another family that has property in Elkridge that you're probably robbing approximately $500,000. I cannot imagine the number of homeowners that this bill is affecting.

The contents of this bill will NOT stop flooding of homes and Roads that were constructed in Low Lying areas before SWM regs. The biggest offenders of the SWM problem are Columbia, the government owned properties and Roads and Structures that have No SWM. This bill is a political shot at developers because they are easy targets for politicians when it really takes aim at current residents. We know that Stormwater Management is not an exact science. I have seen hundreds of thousand of dollars spent on Stream restoration projects be wiped out by Mother Nature in one day. Using the Floods of 2016 and 2018 and pinning the blame on Developers when in reality those 2 floods major contributors to the damage of Ellicott City were the Government Buildings and Developments done before 1982. The $100 million tunnel the taxpayers are going to pick up the tab for, is picking up all the SWM water of Church Road and the Old Circuit Court Courthouse and Parking Lots. Almost every structure or device being construct is catching the storm water from pre 1982 develop activity. Also, the county installed asphalt curb along Church Rd to trap Storm Water on the lower side of Church Rd and is channeling the Storm water right down to main street instead of letting it flow off the low side of the road into the Patapsco. In reviewing the Safe and Sound plan almost all the improvements are to capture the Storm water that had no SWM.

The addition of -NO Residential infill development clause is the killer of all property owners that could do a small development in the Elkridge and the Ellicott City area. No infill in Elkridge and Ellicott City robs every Taxpaying property owner that decided they were not ready to develop their land. I believe this clause alone will end up in a Law suit against the County

Waivers and Variances
Do you realize that a pool with Cattails in it is considered a wetland, do you realize that sometimes steep slopes can be graded out to create a slower time of concentration which reduces the possibility of floods. stopping all variances or waivers for steep slopes floodplains Etc does not solve the Flooding problem. In many circumstances the variances improve the situation. There are a million situation of each parcel of land to just put a Blanket Clause stopping all Variances and Waivers.

Have you read the Bill and do you really understand the damage and ramifications that this bill does to the current property owners that held out to development that could do a small subdivision. Public Home Builders do not want small subdivisions under 20 lots, The small local Home Builder is the 2nd casualty if this Bill if approved. The 3rd casualty is the taxpaying citizen. The Current Regulations are extremely strict in regards to protecting the environment, much of the damage to our environment was done before 1982. This bill was cleverly crafted to capture the extreme antigrowth stance and then make room for negotiating down the bill. I believe the whole bill should be denied.

I believe in controlling development but this bill is an overreach to push a political agenda. You need to vote against this bill because the current regulations are stringent enough and if you really want to protect the environment and flooding go back to everything that was built before 1982 and install Stormwater Management facilities. This is a County wide problem not a current development problem. Thanks for allowing me to testify and I would be happy to answer any questions.

Sayers, Margery

From: Jones, Diane
Sent: Monday, September 23, 2019 8:30 PM
To: Sayers, Margery
Cc: Wimberly, Theo
Subject: FW: Howard County CB-38-2019-BGE
Attachments: GAM-Article - Public Utilities, Section 7-213.pdf; COMAR 20.50.12.09 Vegetation Management.pdf; fac-003-4.pdf

Hi Margery,

Please include this in the legislative record. This was requested of BG&E at the worksession.

Thank you,

Diane

From: Gelwicks, Colette
Sent: Monday, September 23, 2019 4:29 PM
To: Jones, Diane <dijones@howardcountymd.gov>
Subject: FW: Howard County CB-38-2019-BGE

Hi Diane,

Just sending this to you so that you have it as well – follow up from the work session on CB38.

Colette Gelwicks
Special Assistant

Councilwoman Christiana Mercer Rigby, District 3
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From: Eaves, Megan M:(BGE) <Megan.Eaves@bge.com>
Sent: Monday, September 23, 2019 1:35 PM
To: Walsh, Elizabeth <ewalsh@howardcountymd.gov>; Jung, Deb <djung@howardcountymd.gov>; Rigby, Christiana <crigby@howardcountymd.gov>; Jones, Opel <ojones@howardcountymd.gov>; Yungmann, David <dyungmann@howardcountymd.gov>
Subject: Howard County CB-38-2019-BGE

County Council Members:

Thank you for the opportunity to attend and participate in last Friday's Legislative Work Session. Per our discussion, attached you will find the following:

- Maryland Statute that prohibits a county or municipality from adopting or enforcing a local law, rule, or regulation or take any other action that interferes with, or materially increases the cost of the work of an electric company in connection with complying with the state vegetation management standards for public utilities. I highlighted a few relevant provisions.
- Regulations related to Vegetation Management
- FAC-003

Please let me know if you require any additional information.

Best regards,

Megan

BGE
An Exelon Company

Megan Eaves
External Affairs Manager

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- Vol II: Chapters 132--307
- Vol III: Chapters 308--451
- Vol IV: Chapters 452--568
- Vol V: Chapters 569--772
- Resolutions

LexisNexis - Unannotated Code of Maryland

Statute Text

Article - Public Utilities

[Previous][Next]

§7–213.

(a) (1) In this section the following words have the meanings indicated.

(2) (i) "Eligible reliability measure" means a replacement of or an improvement in existing infrastructure of an electric company that:

1. is made on or after June 1, 2014;

2. is designed to improve public safety or infrastructure reliability;

3. does not increase the revenue of an electric company by connecting an improvement directly to new customers; and

4. is not included in the current rate base of the electric company as determined in the electric company's most recent base rate proceeding.

(ii) "Eligible reliability measure" includes vegetation management measures that are necessary to meet applicable service quality and reliability standards under this section.

(3) "Fund" means the Electric Reliability Remediation Fund established under subsection (j) of this section.

(4) "System–average interruption duration index" or "SAIDI" means the sum of the customer interruption hours divided by the total number of customers served.

(5) "System–average interruption frequency index" or "SAIFI" means the sum of the number of customer interruptions divided by the total number of customers served.

(b) It is the goal of the State that each electric company provide its customers with high levels of service quality and reliability in a cost–effective manner, as measured by objective and verifiable standards, and that each electric company be held accountable if it fails to deliver reliable service according to those standards.

(c) This section does not apply to small rural electric cooperatives or municipal electric companies.

(d) On or before July 1, 2012, the Commission shall adopt regulations that implement service quality and reliability standards relating to the delivery of electricity to retail customers by electric companies through their distribution systems, using:

(1) SAIFI;

(2) SAIDI; and

(3) any other performance measurement that the Commission determines to be reasonable.

(e) (1) The regulations adopted under subsection (d) of this section shall:

(i) include service quality and reliability standards, including standards relating to:

1. service interruption;

2. downed wire response;

3. customer communications;

4. vegetation management;

5. periodic equipment inspections;

6. annual reliability reporting; and

7. any other standards established by the Commission;

(ii) account for major outages caused by events outside the control of an electric company; and

(iii) for an electric company that fails to meet the applicable service quality and reliability standards, require the electric company to file a corrective action plan that details specific actions the company will take to meet the standards.

(2) The regulations adopted under subsection (d) of this section may include a separate reliability standard for each electric company in order to account for system reliability differentiating factors, including:

(i) system design;

(ii) existing infrastructure;

(iii) customer density; and

(iv) geography.

(3) In adopting the regulations required under subsection (d) of this section, the Commission shall:

(i) consider applicable standards of the Institute of Electrical and Electronics Engineers;

(ii) ensure that the service quality and reliability standards are cost–effective; and

(iii) with respect to standards relating to vegetation management, consider:

1. limitations on an electric company's right to access private property; and

2. customer acceptance of vegetation management initiatives.

(4) A county or municipal corporation may not adopt or enforce a local law, rule, or regulation or take any other action that interferes with, or materially increases the cost of the work of an electric company toward, compliance with the vegetation management standards adopted under subsection (d) of this section.

(f) (1) On or before September 1 of each year, the Commission shall determine whether each electric company has met the service quality and reliability standards adopted by the Commission for that electric company under subsection (d) of this section and under § 7–213.1(e) of this subtitle.

(2) (i) This paragraph does not apply to electric cooperatives.

(ii) The Commission shall take appropriate corrective action against an electric company that fails to meet any or all of the applicable service quality and reliability standards, including the imposition of appropriate civil penalties for noncompliance as provided in § 13–201 of this article.

(iii) A civil penalty assessed under § 13–201 of this article for a violation of the service quality and reliability standards under this section shall be paid into the Fund.

(iv) An electric company may not recover the cost of any civil penalty paid under this section from ratepayers.

(g) (1) On or before April 1 of each year, each electric company shall submit to the Commission an annual performance report that summarizes the actual electric service reliability results for the preceding year.

(2) The annual performance report shall include:

(i) the electric company's average 3–year performance results;

(ii) actual year–end performance measure results;

(iii) an assessment of the results and effectiveness of the reliability objectives, planned actions and projects, programs, and load studies in achieving an acceptable reliability level; and

(iv) annual information that the Commission determines necessary to assess the electric company's efforts to maintain reliable electric service to all customers in the electric company's service territory, including:

1. current year expenditures, labor resource hours, and progress measures for each capital and maintenance program designed to support the maintenance of reliable electric service;

2. the number of outages by outage type;

3. the number of outages by outage cause;

4. the total number of customers that experienced an outage;

5. the total customer minutes of outage time; and

6. to the extent practicable, a breakdown, by the number of days each customer was without electric service, of the number of customers that experienced an outage.

(3) At the request of an electric company, the Commission shall hold a hearing to discuss the annual performance report of the electric company.

(h) This section may not be construed to limit the Commission's authority to adopt and enforce engineering and safety standards for electric companies.

(i) The Commission and each electric company assessed a penalty for a violation of service quality and reliability standards under this section shall establish priorities for targeting remediation efforts to improve electric service quality and reliability for the worst performing feeder lines and other distribution lines and equipment that shall be paid for, in whole or in part, using the Fund, as available and in accordance with subsection (j) of this section.

(j) (1) There is an Electric Reliability Remediation Fund in the Commission.

(2) The purpose of the Fund is to provide resources to target remediation efforts to improve electric service quality and reliability for the worst performing electric distribution lines in the State.

(3) The Commission shall administer the Fund.

(4) (i) The Fund is a special, nonlapsing fund that is not subject to reversion under § 7–302 of the State Finance and Procurement Article.

(ii) The State Treasurer shall hold the Fund separately, and the Comptroller shall account for the Fund.

(5) The Fund consists of:

(i) revenue distributed to the Fund under § 13–201(e)(2) of this article for a violation of this section;

(ii) money appropriated in the State budget to the Fund; and

(iii) any other money from any other source accepted for the benefit of the Fund.

(6) (i) The Fund may be used only for eligible reliability measures.

(ii) The civil penalties collected from an electric company:

1. may be used only for eligible reliability measures and projects in the service territory of that electric company; but

2. may not replace or substitute for money already budgeted for or spent on any project, including an otherwise eligible reliability measure, that the electric company is required to implement under this section or any other law.

(7) (i) The State Treasurer shall invest the money of the Fund in the same manner as other State money may be invested.

(ii) Any investment earnings of the Fund shall be credited to the General Fund of the State.

[Previous][Next]

.09 Vegetation Management Requirements.

A. Intent and Scope.

(1) It is the intent of the Commission that a utility engage in vegetation management programs that are necessary and appropriate to maintain safety and electric system reliability.

(2) The standards set forth in this regulation shall constitute minimum vegetation management requirements applicable to utilities in the State, and are not intended to supersede or prohibit a utility's implementation of more aggressive vegetation management standards and practices.

(3) The vegetation management requirements in this chapter apply to the extent not limited by contract rights, property rights, or any controlling law or regulation of any unit of State or local government.

(4) This regulation applies to any electric transmission plant not regulated by the Federal Energy Regulatory Commission.

B. Technical Standards for Vegetation Management.

(1) Each utility shall ensure that vegetation management conducted on its energized plant is performed in accordance with the standards applicable to Maryland Licensed Tree Experts, which are incorporated by reference under COMAR 08.07.07.02.

(2) Each utility's vegetation management program shall address, at a minimum, all of the following activities:

(a) Tree pruning and removal;

(b) Vegetation management around poles, substations, and energized overhead electric plant;

(c) Manual, mechanical, or chemical vegetation management along rights-of-way;

(d) Inspection of areas where vegetation management is performed after the vegetation management;

(e) Cultural control practices;

(f) Public education regarding vegetation management practices;

(g) Public and customer notice of planned vegetation management activities; and

(h) Debris management during routine vegetation management and during outage restoration efforts.

(3) Each utility shall develop its own vegetation management program, which shall be consistent with this regulation. In developing the program, a utility shall conduct its vegetation management and determine the extent and priority of vegetation management to be performed at a particular site based on these factors:

(a) The extent of the potential for vegetation to interfere with poles, substations, and energized overhead electric plant;

(b) The voltage of the affected energized conductor, with higher voltages requiring larger clearances;

(c) The relative importance of the affected energized conductor in maintaining safety and reliability;

(d) The type of conductors and type of overhead construction;

(e) The likely regrowth rate for each species of vegetation at the site;

(f) The potential movement of energized conductors and vegetation during various weather conditions;

(g) The utility's legal rights to access the area where vegetation management is to be performed;

(h) The maturity of the vegetation;

(i) The identification of the structural condition of the vegetation, including the characteristics of a species as one having a high probability of causing a service interruption during weather events;

(j) State and local statutes, regulations, or ordinances affecting utility performance of vegetation management;

(k) Customer acceptance of the proposed vegetation management where the utility does not have legal rights to perform vegetation management; and

(l) Any other appropriate factor approved by the Commission.

(4) Each utility shall file a copy of its vegetation management program with the Commission within 90 days of the effective date of this regulation. If a utility makes a change in its vegetation management program, the utility shall file a copy of the change with the Commission no later than 30 days prior to implementing the change, unless exigent circumstances warrant implementation without prior notice, in which case the change shall be filed by no later than 30 days after implementation.

C. Training, Record Keeping, and Reporting.

(1) Each utility shall adopt standards, to the extent not covered by other existing law, to be used by all persons who perform vegetation management for the utility, whether employees or contractors, for the proper care of trees and other woody plants, including safety practices and line clearance techniques.

(2) The utility shall monitor and document scheduled vegetation management and related activities the utility or its contractor performs. Documentation shall include, but is not limited to:

(a) Identification of each circuit or substation or, if applicable, both circuit and substation where vegetation management was performed;

(b) The type of vegetation management performed including removal, trimming, and spraying and methods used;

(c) The name of the Maryland Licensed Tree Expert responsible for oversight of vegetation management at the circuit or substation level;

(d) The approximate date of activity;

(e) Any occurrence resulting in serious injury to a person as a result of vegetation management activities; and

(f) When a utility seeks to remove a tree or limb, but is unable to do so because permission or cooperation is not obtained.

(3) Each utility shall include a summary of the information required under §C(2) of this regulation about its vegetation management during the preceding calendar year, and shall describe vegetation management planned for the current calendar year, as part of the annual performance report required to be filed with the Commission under Regulation .11 of this chapter. The annual performance report also shall include:

(a) Expenditures for vegetation management in the preceding calendar year;

(b) Vegetation management budget for the current calendar year;

(c) Circuits or substations, completion dates, and the estimated number of overhead circuit miles trimmed in the preceding calendar year in compliance with the cyclical vegetation management requirements set forth under §F of this regulation;

(d) Circuits or substations and the estimated number of overhead circuit miles scheduled for the current calendar year in compliance with the cyclical vegetation management requirements set forth under §F of this regulation;

(e) Total overhead circuit miles for the system; and

(f) If applicable, a corrective action plan, preferably in its annual performance report or, if necessary, in the supplemental annual performance report.

(4) Each utility shall report its own violation of this chapter to the Commission within 60 days of discovery and include its plan for correcting each violation.

D. Public Notice of Planned Vegetation Management.

(1) Each utility shall make a reasonable attempt to notify an owner or occupant of all properties upon which cyclical, planned vegetation management is to be performed. This requirement will be satisfied if the utility provides notice to affected property owners or occupants at least 7 days, but not more than 120 days, prior to performing cyclical, planned vegetation management activity. Notice shall be provided by direct mailing, door hanger, postcard, personal contact, or a different method if approved by the Commission, but may not be made solely by bill insert. Nothing in this regulation prohibits a utility from using more than one of these methods.

(2) Each utility or its contractor shall provide written notice of any cyclical, planned vegetation management activities to a primary contact for each county and municipality affected at least 2 months before commencing the activities unless the county or municipality notifies the utility that written notification is not required.

E. Outreach Programs.

(1) Each utility shall conduct an annual public education program to inform its customers, as well as a primary contact for each county and municipality in the utility's service territory, of the importance of vegetation management, and of the utility's role and responsibility in managing vegetation near electric lines, poles, and substations.

(2) The public education program required under this section shall be implemented by direct mail, bill inserts, or a different method if approved by the Commission.

(3) Each utility shall post its vegetation management public education materials on its website.

F. Specific Requirements. Each utility shall perform vegetation management based on the following schedule:

(1) Initially beginning on January 1 of the year immediately following the effective date of this regulation, a utility on a 4-year trim cycle shall within:

(a) 12 months perform vegetation management on not less than 15 percent of its total distribution miles;

(b) 24 months perform vegetation management on not less than 40 percent of its total distribution miles;

(c) 36 months perform vegetation management on not less than 70 percent of its total distribution miles; and

(d) 4 years perform vegetation management on not less than 100 percent of its total distribution miles.

(2) Initially beginning on January1 of the year immediately following the effective date of this regulation, a utility on a 5-year trim cycle shall within:

(a) 12 months perform vegetation management on not less than 12 percent of its total distribution miles;

(b) 24 months perform vegetation management on not less than 32 percent of its total distribution miles;

(c) 36 months perform vegetation management on not less than 56 percent of its total distribution miles;

(d) 48 months perform vegetation management on not less than 75 percent of its total distribution miles; and

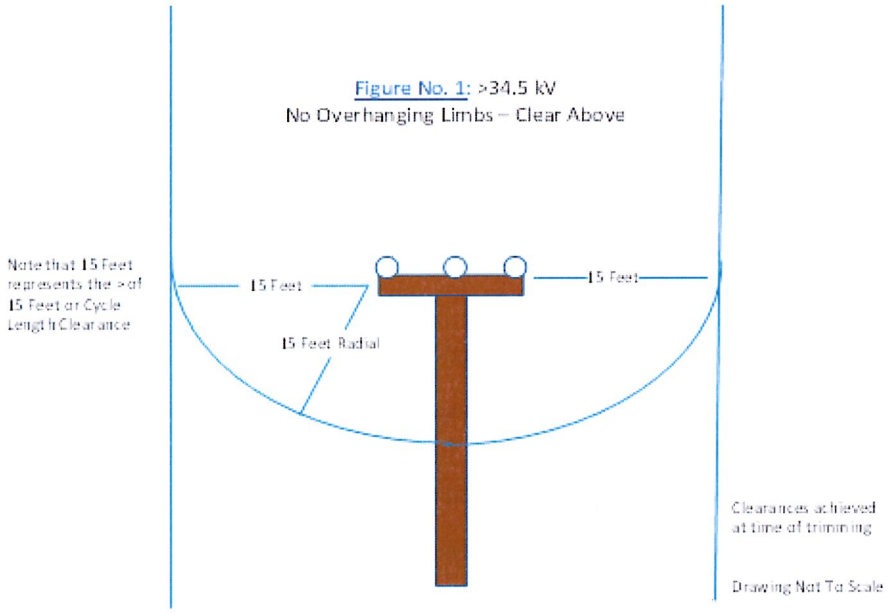
(e) 5 years perform vegetation management on not less than 100 percent of its total distribution miles.

(3) Each utility shall follow the vegetation management performance requirement under §F(1) or (2) of this regulation for each subsequent trim cycle.

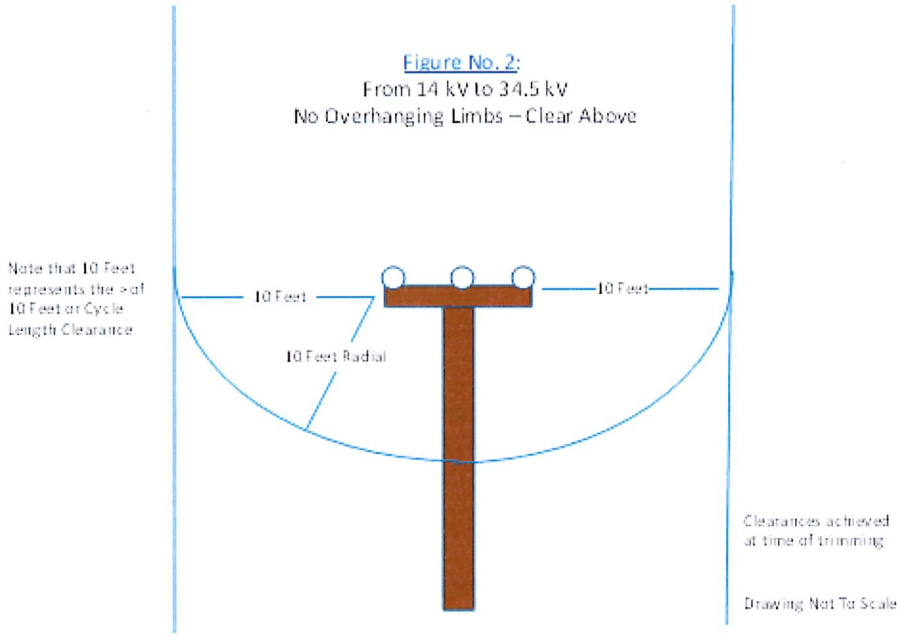
G. Vegetation management shall be performed based on the factors set forth under §B(3) of this regulation. The following minimum clearances shall be obtained at the time vegetation management is conducted to the extent not limited by contract rights, property rights or other controlling legal authority:

(1) Horizontal clearances:

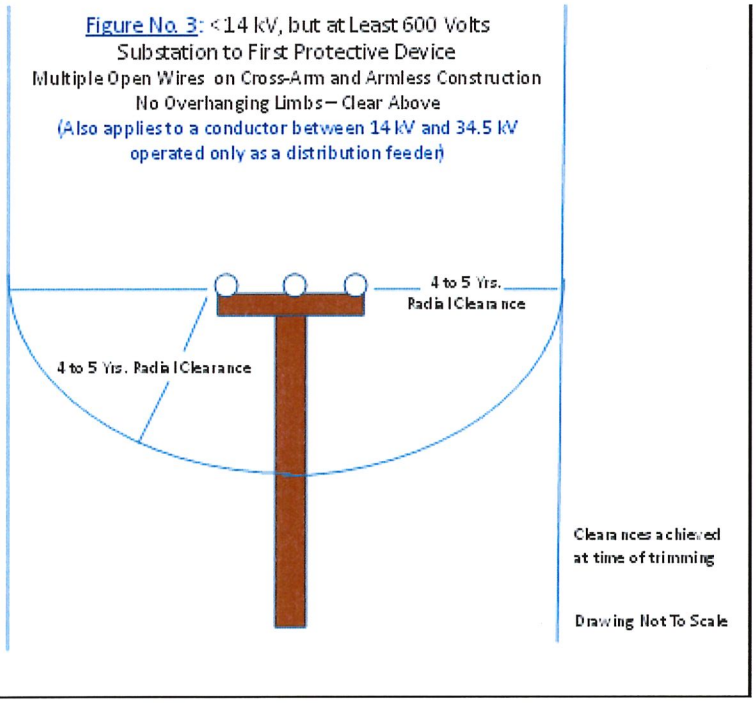
(a) Greater than 34.5 kV: The clearance from the conductors shall be the greater of 15 feet or 4 years' growth if using a 4-year trim cycle (or 5 years' growth if using a 5-year trim cycle). Horizontal clearance beneath the conductors shall be measured radially.



(b) From 14 kV to 34.5 kV: The clearance from the conductors shall be the greater of 10 feet or 4 years' growth if using a 4-year trim cycle (or 5 years' growth if using a 5-year trim cycle). Horizontal clearance beneath the conductors shall be measured radially.



(c) Less than 14 kV but at least 600 volts: The clearance from the conductors shall be 4 years' growth if using a 4-year trim cycle (or 5 years' growth if using a 5-year trim cycle). Horizontal clearance beneath the conductors shall be measured radially.



(d) For a conductor with a voltage from 14 kV to 34.5 kV which is operated only as a distribution feeder, the horizontal clearance shall be as set forth under §G(1)(c) of this regulation as if its voltage were less than 14 kV but at least 600 volts.

(e) The horizontal clearances are the minimum clearances the utility shall establish during each cyclical planned vegetation management trim cycle.

(2) Vertical clearances:

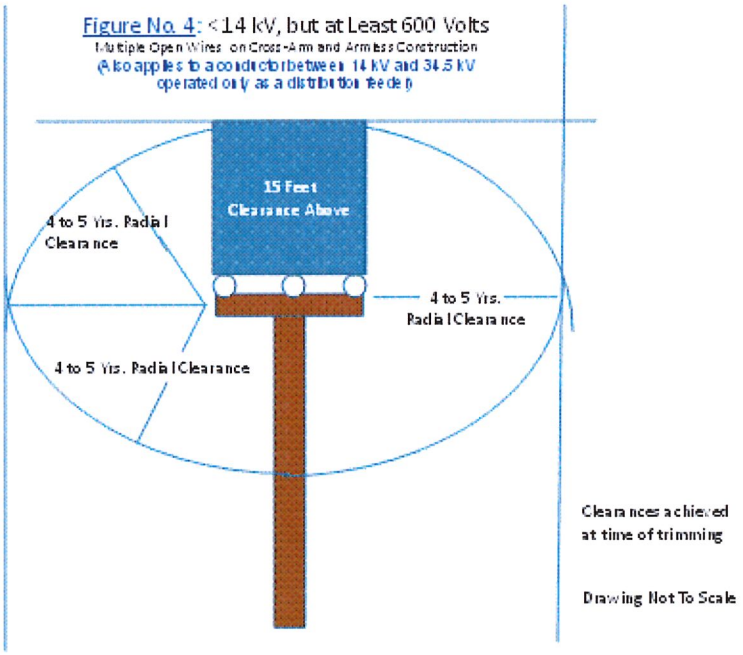
(a) Greater than 34.5 kV: The vertical clearance above the conductors shall be established by removing all overhanging limbs within the maximum horizontal clearance zone specified under §G(1)(a) of this regulation. The vertical clearance below the conductors shall be the greater of 15 feet or 4 years' growth (or 5 years' growth if using a 5-year trim cycle). The vertical clearance below the conductors shall be measured radially. See Figure No. 1

(b) From 14 kV to 34.5 kV: The vertical clearance above the conductors shall be established by removing all overhanging limbs above the conductors within the horizontal clearance zone specified under §G(1)(b) of this Regulation. The vertical clearance below the conductors shall be the greater of 10 feet or 4 years' growth (or 5 years' growth if using a 5-year trim cycle). The vertical clearance below the conductors shall be measured radially. See Figure No. 2.

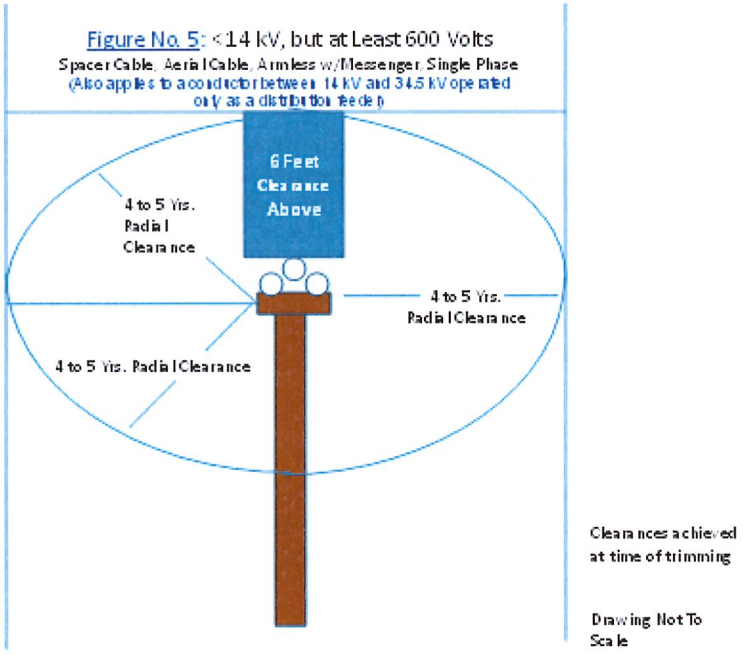
(c) Less than 14 kV but at least 600 volts:

(i) Multiple open wires on a cross-arm or armless construction from the substation to the first protective device: The vertical clearance above the conductors shall be established by removing all overhanging limbs above the conductors within the horizontal clearance zone specified under §G(1)(c) of this regulation. The vertical clearance below the conductors shall be 4 years' growth (or 5 years' growth if using a 5-year trim cycle). The vertical clearance below the conductors shall be measured radially. See Figure 3.

(ii) Except as provided in §G(2)(c)(i) for multiple open wires on a cross-arm or armless construction, the vertical clearance above the conductors shall be 15 feet. The vertical clearance below the conductors shall be 4 years' growth (or 5 years' growth if using a 5-year trim cycle). The vertical clearances above and below the conductor shall be measured radially.



(iii) Spacer cable, tree wire with messenger cable above, aerial cable, and single-phase: The vertical clearance above the conductors shall be 6 feet. The vertical clearance below the conductors shall be 4 years' growth (or 5 years' growth if using a 5-year trim cycle). The vertical clearance above and beneath the conductors shall be measured radially.



(d) For a conductor with a voltage from 14 kV to 34.5 kV which is operated only as a distribution feeder, the vertical clearance shall be as set forth in the corresponding standard contained in §G(2)(c) of this regulation as if its voltage were less than 14 kV but at least 600 volts.

(e) The vertical clearances are the minimum clearances the utility shall establish during each cyclical planned vegetation management trim cycle.

(3) Mature trees may be exempt from the minimum clearance requirements specified above at the utility's reasonable discretion for voltage levels at 34.5 kV and below

H. Federal Energy Regulatory Commission Jurisdictional Transmission Plant. Each utility shall file with the Commission's Engineering Division

a copy of all vegetation management related filings associated with a transmission line in Maryland to the Federal Energy Regulatory Commission or an entity approved by the Federal Energy Regulatory Commission. If the information is confidential or critical energy infrastructure information, the utility shall advise the Commission's Engineering Division in writing and make the information available for review at a mutually agreeable time and location.

A. Introduction

1. **Title:** **Transmission Vegetation Management**

2. **Number:** **FAC-003-4**

3. **Purpose:** **To maintain a reliable electric transmission system by using a defense-in-depth strategy to manage vegetation located on transmission rights of way (ROW) and minimize encroachments from vegetation located adjacent to the ROW, thus preventing the risk of those vegetation-related outages that could lead to Cascading.**

4. **Applicability:**

   4.1. Functional Entities:

   4.1.1. Applicable Transmission Owners

   4.1.1.1. Transmission Owners that own Transmission Facilities defined in 4.2.

   4.1.2. Applicable Generator Owners

   4.1.2.1. Generator Owners that own generation Facilities defined in 4.3.

   4.2. Transmission Facilities: Defined below (referred to as "applicable lines"), including but not limited to those that cross lands owned by federal[1], state, provincial, public, private, or tribal entities:

   4.2.1. Each overhead transmission line operated at 200kV or higher.

   4.2.2. Each overhead transmission line operated below 200kV identified as an element of an IROL under NERC Standard FAC-014 by the Planning Coordinator.

   4.2.3. Each overhead transmission line operated below 200 kV identified as an element of a Major WECC Transfer Path in the Bulk Electric System by WECC.

   4.2.4. Each overhead transmission line identified above (4.2.1. through 4.2.3.) located outside the fenced area of the switchyard, station or substation and any portion of the span of the transmission line that is crossing the substation fence.

   4.3. Generation Facilities: Defined below (referred to as "applicable lines"), including but not limited to those that cross lands owned by federal[2], state, provincial, public, private, or tribal entities:

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[1] EPAct 2005 section 1211c: *"Access approvals by Federal agencies."*

[2] *Id.*

4.3.1. Overhead transmission lines that (1) extend greater than one mile or 1.609 kilometers beyond the fenced area of the generating station switchyard to the point of interconnection with a Transmission Owner's Facility or (2) do not have a clear line of sight[3] from the generating station switchyard fence to the point of interconnection with a Transmission Owner's Facility and are:

4.3.1.1. Operated at 200kV or higher; or

4.3.1.2. Operated below 200kV identified as an element of an IROL under NERC Standard FAC-014 by the Planning Coordinator; or

4.3.1.3. Operated below 200 kV identified as an element of a Major WECC Transfer Path in the Bulk Electric System by WECC.

5. **Effective Date:** See Implementation Plan

6. **Background:** This standard uses three types of requirements to provide layers of protection to prevent vegetation related outages that could lead to Cascading:

   a) Performance-based defines a particular reliability objective or outcome to be achieved. In its simplest form, a results-based requirement has four components: *who, under what conditions (if any), shall perform what action, to achieve what particular bulk power system performance result or outcome?*

   b) Risk-based preventive requirements to reduce the risks of failure to acceptable tolerance levels. A risk-based reliability requirement should be framed as: *who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome that reduces a stated risk to the reliability of the bulk power system?*

   c) Competency-based defines a minimum set of capabilities an entity needs to have to demonstrate it is able to perform its designated reliability functions. A competency-based reliability requirement should be framed as: *who, under what conditions (if any), shall have what capability, to achieve what particular result or outcome to perform an action to achieve a result or outcome or to reduce a risk to the reliability of the bulk power system?*

   The defense-in-depth strategy for reliability standards development recognizes that each requirement in a NERC reliability standard has a role in preventing system failures, and that these roles are complementary and reinforcing. Reliability standards should not be viewed as a body of unrelated requirements, but rather should be viewed as part of a portfolio of requirements designed to achieve an overall defense-in-depth strategy and comport with the quality objectives of a reliability standard.

[3] "Clear line of sight" means the distance that can be seen by the average person without special instrumentation (e.g., binoculars, telescope, spyglasses, etc.) on a clear day.

This standard uses a defense-in-depth approach to improve the reliability of the electric Transmission system by:

- Requiring that vegetation be managed to prevent vegetation encroachment inside the flash-over clearance (R1 and R2);
- Requiring documentation of the maintenance strategies, procedures, processes and specifications used to manage vegetation to prevent potential flash-over conditions including consideration of 1) conductor dynamics and 2) the interrelationships between vegetation growth rates, control methods and the inspection frequency (R3);
- Requiring timely notification to the appropriate control center of vegetation conditions that could cause a flash-over at any moment (R4);
- Requiring corrective actions to ensure that flash-over distances will not be violated due to work constrains such as legal injunctions (R5);
- Requiring inspections of vegetation conditions to be performed annually (R6); and
- Requiring that the annual work needed to prevent flash-over is completed (R7).

For this standard, the requirements have been developed as follows:

- Performance-based: Requirements 1 and 2
- Competency-based: Requirement 3
- Risk-based: Requirements 4, 5, 6 and 7

R3 serves as the first line of defense by ensuring that entities understand the problem they are trying to manage and have fully developed strategies and plans to manage the problem. R1, R2, and R7 serve as the second line of defense by requiring that entities carry out their plans and manage vegetation. R6, which requires inspections, may be either a part of the first line of defense (as input into the strategies and plans) or as a third line of defense (as a check of the first and second lines of defense). R4 serves as the final line of defense, as it addresses cases in which all the other lines of defense have failed.

Major outages and operational problems have resulted from interference between overgrown vegetation and transmission lines located on many types of lands and ownership situations. Adherence to the standard requirements for applicable lines on any kind of land or easement, whether they are Federal Lands, state or provincial lands, public or private lands, franchises, easements or lands owned in fee, will reduce and manage this risk. For the purpose of the standard the term "public lands" includes municipal lands, village lands, city lands, and a host of other governmental entities.

This standard addresses vegetation management along applicable overhead lines and does not apply to underground lines, submarine lines or to line sections inside an electric station boundary.

This standard focuses on transmission lines to prevent those vegetation related outages that could lead to Cascading. It is not intended to prevent customer outages due to tree contact with lower voltage distribution system lines. For example, localized customer service might be disrupted if vegetation were to make contact with a 69kV transmission line supplying power to a 12kV distribution station. However, this standard is not written to address such isolated situations which have little impact on the overall electric transmission system.

Since vegetation growth is constant and always present, unmanaged vegetation poses an increased outage risk, especially when numerous transmission lines are operating at or near their Rating. This can present a significant risk of consecutive line failures when lines are experiencing large sags thereby leading to Cascading. Once the first line fails the shift of the current to the other lines and/or the increasing system loads will lead to the second and subsequent line failures as contact to the vegetation under those lines occurs. Conversely, most other outage causes (such as trees falling into lines, lightning, animals, motor vehicles, etc.) are not an interrelated function of the shift of currents or the increasing system loading. These events are not any more likely to occur during heavy system loads than any other time. There is no cause-effect relationship which creates the probability of simultaneous occurrence of other such events. Therefore these types of events are highly unlikely to cause large-scale grid failures. Thus, this standard places the highest priority on the management of vegetation to prevent vegetation grow-ins.

B. Requirements and Measures

R1. Each applicable Transmission Owner and applicable Generator Owner shall manage vegetation to prevent encroachments into the Minimum Vegetation Clearance Distance (MVCD) of its applicable line(s) which are either an element of an IROL, or an element of a Major WECC Transfer Path; operating within their Rating and all Rated Electrical Operating Conditions of the types shown below[4] *[Violation Risk Factor: High] [Time Horizon: Real-time]*:

[4] This requirement does not apply to circumstances that are beyond the control of an applicable Transmission Owner or applicable Generator Owner subject to this reliability standard, including natural disasters such as earthquakes, fires, tornados, hurricanes, landslides, wind shear, fresh gale, major storms as defined either by the applicable Transmission Owner or applicable Generator Owner or an applicable regulatory body, ice storms, and floods; human or animal activity such as logging, animal severing tree, vehicle contact with tree, or installation, removal, or digging of vegetation. Nothing in this footnote should be construed to limit the Transmission Owner's or applicable Generator Owner's right to exercise its full legal rights on the ROW.

1.1. An encroachment into the MVCD as shown in FAC-003-Table 2, observed in Real-time, absent a Sustained Outage,[5]

1.2. An encroachment due to a fall-in from inside the ROW that caused a vegetation-related Sustained Outage,[6]

1.3. An encroachment due to the blowing together of applicable lines and vegetation located inside the ROW that caused a vegetation-related Sustained Outage[7],

1.4. An encroachment due to vegetation growth into the MVCD that caused a vegetation-related Sustained Outage.[8]

M1. Each applicable Transmission Owner and applicable Generator Owner has evidence that it managed vegetation to prevent encroachment into the MVCD as described in R1. Examples of acceptable forms of evidence may include dated attestations, dated reports containing no Sustained Outages associated with encroachment types 2 through 4 above, or records confirming no Real-time observations of any MVCD encroachments. (R1)

R2. Each applicable Transmission Owner and applicable Generator Owner shall manage vegetation to prevent encroachments into the MVCD of its applicable line(s) which are not either an element of an IROL, or an element of a Major WECC Transfer Path; operating within its Rating and all Rated Electrical Operating Conditions of the types shown below[9] *[Violation Risk Factor: High] [Time Horizon: Real-time]*:

2.1. An encroachment into the MVCD, observed in Real-time, absent a Sustained Outage,[10]

2.2. An encroachment due to a fall-in from inside the ROW that caused a vegetation-related Sustained Outage,[11]

2.3. An encroachment due to the blowing together of applicable lines and vegetation located inside the ROW that caused a vegetation-related Sustained Outage,[12]

2.4. An encroachment due to vegetation growth into the line MVCD that caused a vegetation-related Sustained Outage.[13]

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[5] If a later confirmation of a Fault by the applicable Transmission Owner or applicable Generator Owner shows that a vegetation encroachment within the MVCD has occurred from vegetation within the ROW, this shall be considered the equivalent of a Real-time observation.

[6] Multiple Sustained Outages on an individual line, if caused by the same vegetation, will be reported as one outage regardless of the actual number of outages within a 24-hour period.

[7] *Id.*

[8] *Id.*

[9] See footnote 4.

[10] See footnote 5.

[11] See footnote 6.

[12] *Id.*

[13] *Id.*

M2. Each applicable Transmission Owner and applicable Generator Owner has evidence that it managed vegetation to prevent encroachment into the MVCD as described in R2. Examples of acceptable forms of evidence may include dated attestations, dated reports containing no Sustained Outages associated with encroachment types 2 through 4 above, or records confirming no Real-time observations of any MVCD encroachments. (R2)

R3. Each applicable Transmission Owner and applicable Generator Owner shall have documented maintenance strategies or procedures or processes or specifications it uses to prevent the encroachment of vegetation into the MVCD of its applicable lines that accounts for the following: *[Violation Risk Factor: Lower] [Time Horizon: Long Term Planning]:*

3.1. Movement of applicable line conductors under their Rating and all Rated Electrical Operating Conditions;

3.2. Inter-relationships between vegetation growth rates, vegetation control methods, and inspection frequency.

M3. The maintenance strategies or procedures or processes or specifications provided demonstrate that the applicable Transmission Owner and applicable Generator Owner can prevent encroachment into the MVCD considering the factors identified in the requirement. (R3)

R4. Each applicable Transmission Owner and applicable Generator Owner, without any intentional time delay, shall notify the control center holding switching authority for the associated applicable line when the applicable Transmission Owner and applicable Generator Owner has confirmed the existence of a vegetation condition that is likely to cause a Fault at any moment *[Violation Risk Factor: Medium] [Time Horizon: Real-time].*

M4. Each applicable Transmission Owner and applicable Generator Owner that has a confirmed vegetation condition likely to cause a Fault at any moment will have evidence that it notified the control center holding switching authority for the associated transmission line without any intentional time delay. Examples of evidence may include control center logs, voice recordings, switching orders, clearance orders and subsequent work orders. (R4)

R5. When an applicable Transmission Owner and an applicable Generator Owner are constrained from performing vegetation work on an applicable line operating within its Rating and all Rated Electrical Operating Conditions, and the constraint may lead to a vegetation encroachment into the MVCD prior to the implementation of the next annual work plan, then the applicable Transmission Owner or applicable Generator Owner shall take corrective action to ensure continued vegetation management to prevent encroachments [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Planning*].

M5. Each applicable Transmission Owner and applicable Generator Owner has evidence of the corrective action taken for each constraint where an applicable transmission line was put at potential risk. Examples of acceptable forms of evidence may include initially-planned work orders, documentation of constraints from landowners, court orders, inspection records of increased monitoring, documentation of the de-rating of lines, revised work orders, invoices, or evidence that the line was de-energized. (R5)

R6. Each applicable Transmission Owner and applicable Generator Owner shall perform a Vegetation Inspection of 100% of its applicable transmission lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.) at least once per calendar year and with no more than 18 calendar months between inspections on the same ROW[14] [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Planning*].

M6. Each applicable Transmission Owner and applicable Generator Owner has evidence that it conducted Vegetation Inspections of the transmission line ROW for all applicable lines at least once per calendar year but with no more than 18 calendar months between inspections on the same ROW. Examples of acceptable forms of evidence may include completed and dated work orders, dated invoices, or dated inspection records. (R6)

R7. Each applicable Transmission Owner and applicable Generator Owner shall complete 100% of its annual vegetation work plan of applicable lines to ensure no vegetation encroachments occur within the MVCD. Modifications to the work plan in response to changing conditions or to findings from vegetation inspections may be made (provided they do not allow encroachment of vegetation into the MVCD) and must be documented. The percent completed calculation is based on the number of units actually completed divided by the number of units in the final amended plan (measured in units of choice - circuit, pole line, line miles or kilometers, etc.). Examples of reasons for modification to annual plan may include [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Planning*]:

7.1. Change in expected growth rate/environmental factors

7.2. Circumstances that are beyond the control of an applicable Transmission Owner or applicable Generator Owner[15]

7.3. Rescheduling work between growing seasons

7.4. Crew or contractor availability/Mutual assistance agreements

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[14] When the applicable Transmission Owner or applicable Generator Owner is prevented from performing a Vegetation Inspection within the timeframe in R6 due to a natural disaster, the TO or GO is granted a time extension that is equivalent to the duration of the time the TO or GO was prevented from performing the Vegetation Inspection.

[15] Circumstances that are beyond the control of an applicable Transmission Owner or applicable Generator Owner include but are not limited to natural disasters such as earthquakes, fires, tornados, hurricanes, landslides, ice storms, floods, or major storms as defined either by the TO or GO or an applicable regulatory body.

7.5. Identified unanticipated high priority work

7.6. Weather conditions/Accessibility

7.7. Permitting delays

7.8. Land ownership changes/Change in land use by the landowner

7.9. Emerging technologies

M7. Each applicable Transmission Owner and applicable Generator Owner has evidence that it completed its annual vegetation work plan for its applicable lines. Examples of acceptable forms of evidence may include a copy of the completed annual work plan (as finally modified), dated work orders, dated invoices, or dated inspection records. (R7)

C. Compliance

1. Compliance Monitoring Process

1.1. Compliance Enforcement Authority:

"Compliance Enforcement Authority" means NERC or the Regional Entity, or any entity as otherwise designated by an Applicable Governmental Authority, in their respective roles of monitoring and/or enforcing compliance with mandatory and enforceable Reliability Standards in their respective jurisdictions.

1.2. Evidence Retention:

The following evidence retention period(s) identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full-time period since the last audit.

The applicable entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

- The applicable Transmission Owner and applicable Generator Owner retains data or evidence to show compliance with Requirements R1, R2, R3, R5, R6 and R7, for three calendar years.
- The applicable Transmission Owner and applicable Generator Owner retains data or evidence to show compliance with Requirement R4, Measure M4 for most recent 12 months of operator logs or most recent 3 months of voice recordings or transcripts of voice recordings, unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

- If an applicable Transmission Owner or applicable Generator Owner is found non-compliant, it shall keep information related to the non-compliance until found compliant or for the time period specified above, whichever is longer.

1.3. Compliance Monitoring and Enforcement Program

As defined in the NERC Rules of Procedure, "Compliance Monitoring and Enforcement Program" refers to the identification of the processes that will be used to evaluate data or information for the purpose of assessing performance or outcomes with the associated Reliability Standard.

1.4. Additional Compliance Information

Periodic Data Submittal: The applicable Transmission Owner and applicable Generator Owner will submit a quarterly report to its Regional Entity, or the Regional Entity's designee, identifying all Sustained Outages of applicable lines operated within their Rating and all Rated Electrical Operating Conditions as determined by the applicable Transmission Owner or applicable Generator Owner to have been caused by vegetation, except as excluded in footnote 2, and including as a minimum the following:

- The name of the circuit(s), the date, time and duration of the outage; the voltage of the circuit; a description of the cause of the outage; the category associated with the Sustained Outage; other pertinent comments; and any countermeasures taken by the applicable Transmission Owner or applicable Generator Owner.

  A Sustained Outage is to be categorized as one of the following:

- Category 1A — Grow-ins: Sustained Outages caused by vegetation growing into applicable lines, that are identified as an element of an IROL or Major WECC Transfer Path, by vegetation inside and/or outside of the ROW;
- Category 1B — Grow-ins: Sustained Outages caused by vegetation growing into applicable lines, but are not identified as an element of an IROL or Major WECC Transfer Path, by vegetation inside and/or outside of the ROW;
- Category 2A — Fall-ins: Sustained Outages caused by vegetation falling into applicable lines that are identified as an element of an IROL or Major WECC Transfer Path, from within the ROW;
- Category 2B — Fall-ins: Sustained Outages caused by vegetation falling into applicable lines, but are not identified as an element of an IROL or Major WECC Transfer Path, from within the ROW;
- Category 3 — Fall-ins: Sustained Outages caused by vegetation falling into applicable lines from outside the ROW;
- Category 4A — Blowing together: Sustained Outages caused by vegetation and applicable lines that are identified as an element of an IROL or Major WECC Transfer Path, blowing together from within the ROW;

- Category 4B — Blowing together: Sustained Outages caused by vegetation and applicable lines, but are not identified as an element of an IROL or Major WECC Transfer Path, blowing together from within the ROW.

  The Regional Entity will report the outage information provided by applicable Transmission Owners and applicable Generator Owners, as per the above, quarterly to NERC, as well as any actions taken by the Regional Entity as a result of any of the reported Sustained Outages.

Violation Severity Levels (Table 1)

R #	Table 1: Violation Severity Levels (VSL)			
	Lower VSL	Moderate VSL	High VSL	Severe VSL
R1.			The responsible entity failed to manage vegetation to prevent encroachment into the MVCD of a line identified as an element of an IROL or Major WECC transfer path and encroachment into the MVCD as identified in FAC-003-4-Table 2 was observed in real time absent a Sustained Outage.	The responsible entity failed to manage vegetation to prevent encroachment into the MVCD of a line identified as an element of an IROL or Major WECC transfer path and a vegetation-related Sustained Outage was caused by one of the following: • *A fall-in from inside the active transmission line ROW* • *Blowing together of applicable lines and vegetation located inside the active transmission line ROW* • *A grow-in*
R2.			The responsible entity failed to manage vegetation to prevent encroachment into the MVCD of a line not identified as an element of	The responsible entity failed to manage vegetation to prevent encroachment into the MVCD of a line not identified as an element of

			an IROL or Major WECC transfer path and encroachment into the MVCD as identified in FAC-003-4-Table 2 was observed in real time absent a Sustained Outage.	an IROL or Major WECC transfer path and a vegetation-related Sustained Outage was caused by one of the following: • *A fall-in from inside the active transmission line ROW* • *Blowing together of applicable lines and vegetation located inside the active transmission line ROW* • *A grow-in*
R3.		The responsible entity has maintenance strategies or documented procedures or processes or specifications but has not accounted for the inter-relationships between vegetation growth rates, vegetation control methods, and inspection frequency, for the responsible entity's applicable lines. (Requirement R3, Part 3.2.)	The responsible entity has maintenance strategies or documented procedures or processes or specifications but has not accounted for the movement of transmission line conductors under their Rating and all Rated Electrical Operating Conditions, for the responsible entity's applicable lines. (Requirement R3, Part 3.1.)	The responsible entity does not have any maintenance strategies or documented procedures or processes or specifications used to prevent the encroachment of vegetation into the MVCD, for the responsible entity's applicable lines.
R4.			The responsible entity experienced a confirmed	The responsible entity experienced a confirmed

			vegetation threat and notified the control center holding switching authority for that applicable line, but there was intentional delay in that notification.	vegetation threat and did not notify the control center holding switching authority for that applicable line.
R5.				The responsible entity did not take corrective action when it was constrained from performing planned vegetation work where an applicable line was put at potential risk.
R6.	The responsible entity failed to inspect 5% or less of its applicable lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.)	The responsible entity failed to inspect more than 5% up to and including 10% of its applicable lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.).	The responsible entity failed to inspect more than 10% up to and including 15% of its applicable lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.).	The responsible entity failed to inspect more than 15% of its applicable lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.).
R7.	The responsible entity failed to complete 5% or less of its annual vegetation work plan for its applicable lines (as finally modified).	The responsible entity failed to complete more than 5% and up to and including 10% of its annual vegetation work plan for its applicable lines (as finally modified).	The responsible entity failed to complete more than 10% and up to and including 15% of its annual vegetation work plan for its applicable lines (as finally modified).	The responsible entity failed to complete more than 15% of its annual vegetation work plan for its applicable lines (as finally modified).

D. Regional Variances

None.

E. Associated Documents

- FAC-003-4 Implementation Plan

Version History

Version	Date	Action	Change Tracking
1	January 20, 2006	1. Added "Standard Development Roadmap." 2. Changed "60" to "Sixty" in section A, 5.2. 3. Added "Proposed Effective Date: April 7, 2006" to footer. 4. Added "Draft 3: November 17, 2005" to footer.	New
1	April 4, 2007	Regulatory Approval - Effective Date	New
2	November 3, 2011	Adopted by the NERC Board of Trustees	New
2	March 21, 2013	FERC Order issued approving FAC-003-2 (Order No. 777) FERC Order No. 777 was issued on March 21, 2013 directing NERC to "conduct or contract testing to obtain empirical data and submit a report to the Commission providing the results of the testing."[16]	Revisions

[16] *Revisions to Reliability Standard for Transmission Vegetation Management, Order No. 777,* 142 FERC ¶ 61,208 (2013)

2	May 9, 2013	Board of Trustees adopted the modification of the VRF for Requirement R2 of FAC-003-2 by raising the VRF from "Medium" to "High."	Revisions
3	May 9, 2013	FAC-003-3 adopted by Board of Trustees	Revisions
3	September 19, 2013	A FERC order was issued on September 19, 2013, approving FAC-003-3. This standard became enforceable on July 1, 2014 for Transmission Owners. For Generator Owners, R3 became enforceable on January 1, 2015 and all other requirements (R1, R2, R4, R5, R6, and R7) became enforceable on January 1, 2016.	Revisions
3	November 22, 2013	Updated the VRF for R2 from "Medium" to "High" per a Final Rule issued by FERC	Revisions
3	July 30, 2014	Transferred the effective dates section from FAC-003-2 (for Transmission Owners) into FAC-003-3, per the FAC-003-3 implementation plan	Revisions
4	February 11, 2016	Adopted by Board of Trustees. Adjusted MVCD values in Table 2 for alternating current systems, consistent with findings reported in report filed on August 12, 2015 in Docket No. RM12-4-002 consistent with FERC's directive in Order No. 777, and based on empirical testing results for flashover distances between conductors and vegetation.	Revisions
4	March 9, 2016	Corrected subpart 7.10 to M7, corrected value of .07 to .7	Errata
4	April 26, 2016	FERC Letter Order approving FAC-003-4. Docket No. RD16-4-000.	

FAC-003 — TABLE 2 — Minimum Vegetation Clearance Distances (MVCD)[17]

For **Alternating Current** Voltages (feet)

(AC) Nominal System Voltage (KV)*	(AC) Maximum System Voltage (kV)[18]	MVCD (feet) Over sea level up to 500 ft	MVCD feet Over 500 ft up to 1000 ft	MVCD feet Over 1000 ft up to 2000 ft	MVCD feet Over 2000 ft up to 3000 ft	MVCD feet Over 3000 ft up to 4000 ft	MVCD feet Over 4000 ft up to 5000 ft	MVCD feet Over 5000 ft up to 6000 ft	MVCD feet Over 6000 ft up to 7000 ft	MVCD feet Over 7000 ft up to 8000 ft	MVCD feet Over 8000 ft up to 9000 ft	MVCD feet Over 9000 ft up to 10000 ft	MVCD feet Over 10000 ft up to 11000 ft	MVCD feet Over 11000 ft up to 12000 ft	MVCD feet Over 12000 ft up to 13000 ft	MVCD feet Over 13000 ft up to 14000 ft	MVCD feet Over 14000 ft up to 15000 ft
765	800	11.6ft	11.7ft	11.9ft	12.1ft	12.2ft	12.4ft	12.6ft	12.8ft	13.0ft	13.1ft	13.3ft	13.5ft	13.7ft	13.9ft	14.1ft	14.3ft
500	550	7.0ft	7.1ft	7.2ft	7.4ft	7.5ft	7.6ft	7.8ft	7.9ft	8.1ft	8.2ft	8.3ft	8.5ft	8.6ft	8.8ft	8.9ft	9.1ft
345	362[19]	4.3ft	4.3ft	4.4ft	4.5ft	4.6ft	4.7ft	4.8ft	4.9ft	5.0ft	5.1ft	5.2ft	5.3ft	5.4ft	5.5ft	5.6ft	5.7ft
287	302	5.2ft	5.3ft	5.4ft	5.5ft	5.6ft	5.7ft	5.8ft	5.9ft	6.1ft	6.2ft	6.3ft	6.4ft	6.5ft	6.6ft	6.8ft	6.9ft
230	242	4.0ft	4.1ft	4.2ft	4.3ft	4.3ft	4.4ft	4.5ft	4.6ft	4.7ft	4.8ft	4.9ft	5.0ft	5.1ft	5.2ft	5.3ft	5.4ft
161*	169	2.7ft	2.7ft	2.8ft	2.9ft	2.9ft	3.0ft	3.0ft	3.1ft	3.2ft	3.3ft	3.3ft	3.4ft	3.5ft	3.6ft	3.7ft	3.8ft
138*	145	2.3ft	2.3ft	2.4ft	2.4ft	2.5ft	2.5ft	2.6ft	2.7ft	2.7ft	2.8ft	2.8ft	2.9ft	3.0ft	3.0ft	3.1ft	3.2ft
115*	121	1.9ft	1.9ft	1.9ft	2.0ft	2.0ft	2.1ft	2.1ft	2.2ft	2.2ft	2.3ft	2.3ft	2.4ft	2.5ft	2.5ft	2.6ft	2.7ft
88*	100	1.5ft	1.5ft	1.6ft	1.6ft	1.7ft	1.7ft	1.8ft	1.8ft	1.8ft	1.9ft	1.9ft	2.0ft	2.0ft	2.1ft	2.2ft	2.2ft
69*	72	1.1ft	1.1ft	1.1ft	1.2ft	1.2ft	1.2ft	1.2ft	1.3ft	1.3ft	1.3ft	1.4ft	1.4ft	1.4ft	1.5ft	1.6ft	1.6ft

* Such lines are applicable to this standard only if PC has determined such per FAC-014 (refer to the Applicability Section above)

* *Table 2 – Table of MVCD values at a 1.0 gap factor (in U.S. customary units), which is located in the EPRI report filed with FERC on August 12, 2015. (The 14000-15000 foot values were subsequently provided by EPRI in an updated Table 2 on December 1, 2015, filed with the FAC-003-4 Petition at FERC)*

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[17] The distances in this Table are the minimums required to prevent Flash-over; however prudent vegetation maintenance practices dictate that substantially greater distances will be achieved at time of vegetation maintenance.

[18] Where applicable lines are operated at nominal voltages other than those listed, the applicable Transmission Owner or applicable Generator Owner should use the maximum system voltage to determine the appropriate clearance for that line.

[19] The change in transient overvoltage factors in the calculations are the driver in the decrease in MVCDs for voltages of 345 kV and above. Refer to pp.29-31 in the Supplemental Materials for additional information.

TABLE 2 (CONT) — Minimum Vegetation Clearance Distances (MVCD)[20]

For **Alternating Current** Voltages (meters)

(AC) Nominal System Voltage (KV)+	(AC) Maximum System Voltage (kV)[21]	MVCD meters Over sea level up to 153 m	MVCD meters Over 153m up to 305m	MVCD meters Over 305m up to 610m	MVCD meters Over 610m up to 915m	MVCD meters Over 915m up to 1220m	MVCD meters Over 1220m up to 1524m	MVCD meters Over 1524m up to 1829m	MVCD meters Over 1829m up to 2134m	MVCD meters Over 2134m up to 2439m	MVCD meters Over 2439m up to 2744m	MVCD meters Over 2744m up to 3048m	MVCD meters Over 3048m up to 3353m	MVCD meters Over 3353m up to 3657m	MVCD meters Over 3657m up to 3962m	MVCD meters Over 3962 m up to 4268 m	MVCD meters Over 4268m up to 4572m
765	800	3.6m	3.6m	3.6m	3.7m	3.7m	3.8m	3.8m	3.9m	4.0m	4.0m	4.1m	4.1m	4.2m	4.2m	4.3m	4.4m
500	550	2.1m	2.2m	2.2m	2.3m	2.3m	2.3m	2.4m	2.4m	2.5m	2..5m	2.5m	2.6m	2.6m	2.7m	2.7m	2.7m
345	362[22]	1.3m	1.3m	1.3m	1.4m	1.4m	1.4m	1.5m	1.5m	1.5m	1.6m	1.6m	1.6m	1.6m	1.7m	1.7m	1.8m
287	302	1.6m	1.6m	1.7m	1.7m	1.7m	1.7m	1.8m	1.8m	1.9m	1.9m	1.9m	2.0m	2.0m	2.0m	2.1m	2.1m
230	242	1.2m	1.3m	1.3m	1.3m	1.3m	1.3m	1.4m	1.4m	1.4m	1.5m	1.5m	1.5m	1.6m	1.6m	1.6m	1.6m
161*	169	0.8m	0.8m	0.9m	0.9m	0.9m	0.9m	0.9m	1.0m	1.0m	1.0m	1.0m	1.0m	1.1m	1.1m	1.1m	1.1m
138*	145	0.7m	0.7m	0.7m	0.7m	0.7m	0.7m	0.8m	0.8m	0.8m	0.9m	0.9m	0.9m	0.9m	0.9m	1.0m	1.0m
115*	121	0.6m	0.6m	0.6m	0.6m	0.6m	0.6m	0.6m	0.7m	0.7m	0.7m	0.7m	0.7m	0.8m	0.8m	0.8m	0.8m
88*	100	0.4m	0.4m	0.5m	0.5m	0.5m	0.5m	0.6m	0.6m	0.6m	0.6m	0.6m	0.6m	0.6m	0.6m	0.7m	0.7m
69*	72	0.3m	0.3m	0.3m	0.4m	0.4m	0.4m	0.4m	0.4m	0.4m	0.4m	0.4m	0.4m	0.4m	0.5m	0.5m	0.5m

* Such lines are applicable to this standard only if PC has determined such per FAC-014 (refer to the Applicability Section above)

+ Table 2 – Table of MVCD values at a 1.0 gap factor (in U.S. customary units), which is located in the EPRI report filed with FERC on August 12, 2015. (The 14000-15000 foot values were subsequently provided by EPRI in an updated Table 2 on December 1, 2015, filed with the FAC-003-4 Petition at FERC)

[20] The distances in this Table are the minimums required to prevent Flash-over; however prudent vegetation maintenance practices dictate that substantially greater distances will be achieved at time of vegetation maintenance.

[21] Where applicable lines are operated at nominal voltages other than those listed, the applicable Transmission Owner or applicable Generator Owner should use the maximum system voltage to determine the appropriate clearance for that line.

[22] The change in transient overvoltage factors in the calculations are the driver in the decrease in MVCDs for voltages of 345 kV and above. Refer to pp.29-31 in the supplemental materials for additional information.

TABLE 2 (CONT) — Minimum Vegetation Clearance Distances (MVCD)[23]

For **Direct Current** Voltages feet (meters)

(DC) Nominal Pole to Ground Voltage (kV)	MVCD meters Over sea level up to 500 ft (Over sea level up to 152.4 m)	MVCD meters Over 500 ft up to 1000 ft (Over 152.4 m up to 304.8 m	MVCD meters Over 1000 ft up to 2000 ft (Over 304.8 m up to 609.6m)	MVCD meters Over 2000 ft up to 3000 ft (Over 609.6m up to 914.4m	MVCD meters Over 3000 ft up to 4000 ft (Over 914.4m up to 1219.2m	MVCD meters Over 4000 ft up to 5000 ft (Over 1219.2m up to 1524m	MVCD meters Over 5000 ft up to 6000 ft (Over 1524 m up to 1828.8 m)	MVCD meters Over 6000 ft up to 7000 ft (Over 1828.8m up to 2133.6m)	MVCD meters Over 7000 ft up to 8000 ft (Over 2133.6m up to 2438.4m)	MVCD meters Over 8000 ft up to 9000 ft (Over 2438.4m up to 2743.2m)	MVCD meters Over 9000 ft up to 10000 ft (Over 2743.2m up to 3048m)	MVCD meters Over 10000 ft up to 11000 ft (Over 3048m up to 3352.8m)
±750	14.12ft (4.30m)	14.31ft (4.36m)	14.70ft (4.48m)	15.07ft (4.59m)	15.45ft (4.71m)	15.82ft (4.82m)	16.2ft (4.94m)	16.55ft (5.04m)	16.91ft (5.15m)	17.27ft (5.26m)	17.62ft (5.37m)	17.97ft (5.48m)
±600	10.23ft (3.12m)	10.39ft (3.17m)	10.74ft (3.26m)	11.04ft (3.36m)	11.35ft (3.46m)	11.66ft (3.55m)	11.98ft (3.65m)	12.3ft (3.75m)	12.62ft (3.85m)	12.92ft (3.94m)	13.24ft (4.04m)	13.54ft (4.13m)
±500	8.03ft (2.45m)	8.16ft (2.49m)	8.44ft (2.57m)	8.71ft (2.65m)	8.99ft (2.74m)	9.25ft (2.82m)	9.55ft (2.91m)	9.82ft (2.99m)	10.1ft (3.08m)	10.38ft (3.16m)	10.65ft (3.25m)	10.92ft (3.33m)
±400	6.07ft (1.85m)	6.18ft (1.88m)	6.41ft (1.95m)	6.63ft (2.02m)	6.86ft (2.09m)	7.09ft (2.16m)	7.33ft (2.23m)	7.56ft (2.30m)	7.80ft (2.38m)	8.03ft (2.45m)	8.27ft (2.52m)	8.51ft (2.59m)
±250	3.50ft (1.07m)	3.57ft (1.09m)	3.72ft (1.13m)	3.87ft (1.18m)	4.02ft (1.23m)	4.18ft (1.27m)	4.34ft (1.32m)	4.5ft (1.37m)	4.66ft (1.42m)	4.83ft (1.47m)	5.00ft (1.52m)	5.17ft (1.58m)

[23] The distances in this Table are the minimums required to prevent Flash-over; however prudent vegetation maintenance practices dictate that substantially greater distances will be achieved at time of vegetation maintenance.

Guideline and Technical Basis

Effective dates:

The Compliance section is standard language used in most NERC standards to cover the general effective date and covers the vast majority of situations. A special case covers effective dates for (1) lines initially becoming subject to the Standard, (2) lines changing in applicability within the standard.

The special case is needed because the Planning Coordinators may designate lines below 200 kV to become elements of an IROL or Major WECC Transfer Path in a future Planning Year (PY). For example, studies by the Planning Coordinator in 2015 may identify a line to have that designation beginning in PY 2025, ten years after the planning study is performed. It is not intended for the Standard to be immediately applicable to, or in effect for, that line until that future PY begins. The effective date provision for such lines ensures that the line will become subject to the standard on January 1 of the PY specified with an allowance of at least 12 months for the applicable Transmission Owner or applicable Generator Owner to make the necessary preparations to achieve compliance on that line. A line operating below 200kV designated as an element of an IROL or Major WECC Transfer Path may be removed from that designation due to system improvements, changes in generation, changes in loads or changes in studies and analysis of the network.

Date that Planning Study is completed	PY the line will become an IROL element	Date 1	Date 2	Effective Date The later of Date 1 or Date 2
05/15/2011	2012	05/15/2012	01/01/2012	05/15/2012
05/15/2011	2013	05/15/2012	01/01/2013	01/01/2013
05/15/2011	2014	05/15/2012	01/01/2014	01/01/2014
05/15/2011	2021	05/15/2012	01/01/2021	01/01/2021

Defined Terms:

Explanation for revising the definition of ROW:
The current NERC glossary definition of Right of Way has been modified to include Generator Owners and to address the matter set forth in Paragraph 734 of FERC Order 693. The Order pointed out that Transmission Owners may in some cases own more property or rights than are needed to reliably operate transmission lines. This definition represents a slight but significant departure from the strict legal definition of "right of way" in that this definition is based on engineering and construction considerations that establish the width of a corridor from a technical basis. The pre-2007 maintenance records are included in the current definition to allow the use of such vegetation widths if there were no engineering or construction standards that

referenced the width of right of way to be maintained for vegetation on a particular line but the evidence exists in maintenance records for a width that was in fact maintained prior to this standard becoming mandatory. Such widths may be the only information available for lines that had limited or no vegetation easement rights and were typically maintained primarily to ensure public safety. This standard does not require additional easement rights to be purchased to satisfy a minimum right of way width that did not exist prior to this standard becoming mandatory.

Explanation for revising the definition of Vegetation Inspection:
The current glossary definition of this NERC term was modified to include Generator Owners and to allow both maintenance inspections and vegetation inspections to be performed concurrently. This allows potential efficiencies, especially for those lines with minimal vegetation and/or slow vegetation growth rates.

Explanation of the derivation of the MVCD:
The MVCD is a calculated minimum distance that is derived from the Gallet equation. This is a method of calculating a flash over distance that has been used in the design of high voltage transmission lines. Keeping vegetation away from high voltage conductors by this distance will prevent voltage flash-over to the vegetation. See the explanatory text below for Requirement R3 and associated Figure 1. Table 2 of the Standard provides MVCD values for various voltages and altitudes. The table is based on empirical testing data from EPRI as requested by FERC in Order No. 777.

Project 2010-07.1 Adjusted MVCDs per EPRI Testing:
In Order No. 777, FERC directed NERC to undertake testing to gather empirical data validating the appropriate gap factor used in the Gallet equation to calculate MVCDs, specifically the gap factor for the flash-over distances between conductors and vegetation. See, Order No. 777, at P 60. NERC engaged industry through a collaborative research project and contracted EPRI to complete the scope of work. In January 2014, NERC formed an advisory group to assist with developing the scope of work for the project. This team provided subject matter expertise for developing the test plan, monitoring testing, and vetting the analysis and conclusions to be submitted in a final report. The advisory team was comprised of NERC staff, arborists, and industry members with wide-ranging expertise in transmission engineering, insulation coordination, and vegetation management. The testing project commenced in April 2014 and continued through October 2014 with the final set of testing completed in May 2015. Based on these testing results conducted by EPRI, and consistent with the report filed in FERC Docket No. RM12-4-000, the gap factor used in the Gallet equation required adjustment from 1.3 to 1.0. This resulted in increased MVCD values for all alternating current system voltages identified. The adjusted MVCD values, reflecting the 1.0 gap factor, are included in Table 2 of version 4 of FAC-003.

The air gap testing completed by EPRI per FERC Order No. 777 established that trees with large spreading canopies growing directly below energized high voltage conductors create the

greatest likelihood of an air gap flash over incident and was a key driver in changing the gap factor to a more conservative value of 1.0 in version 4 of this standard.

Requirements R1 and R2:
R1 and R2 are performance-based requirements. The reliability objective or outcome to be achieved is the management of vegetation such that there are no vegetation encroachments within a minimum distance of transmission lines. Content-wise, R1 and R2 are the same requirements; however, they apply to different Facilities. Both R1 and R2 require each applicable Transmission Owner or applicable Generator Owner to manage vegetation to prevent encroachment within the MVCD of transmission lines. R1 is applicable to lines that are identified as an element of an IROL or Major WECC Transfer Path. R2 is applicable to all other lines that are not elements of IROLs, and not elements of Major WECC Transfer Paths.

The separation of applicability (between R1 and R2) recognizes that inadequate vegetation management for an applicable line that is an element of an IROL or a Major WECC Transfer Path is a greater risk to the interconnected electric transmission system than applicable lines that are not elements of IROLs or Major WECC Transfer Paths. Applicable lines that are not elements of IROLs or Major WECC Transfer Paths do require effective vegetation management, but these lines are comparatively less operationally significant.

Requirements R1 and R2 state that if inadequate vegetation management allows vegetation to encroach within the MVCD distance as shown in Table 2, it is a violation of the standard. Table 2 distances are the minimum clearances that will prevent spark-over based on the Gallet equations. These requirements assume that transmission lines and their conductors are operating within their Rating. If a line conductor is intentionally or inadvertently operated beyond its Rating and Rated Electrical Operating Condition (potentially in violation of other standards), the occurrence of a clearance encroachment may occur solely due to that condition. For example, emergency actions taken by an applicable Transmission Owner or applicable Generator Owner or Reliability Coordinator to protect an Interconnection may cause excessive sagging and an outage. Another example would be ice loading beyond the line's Rating and Rated Electrical Operating Condition. Such vegetation-related encroachments and outages are not violations of this standard.

Evidence of failures to adequately manage vegetation include real-time observation of a vegetation encroachment into the MVCD (absent a Sustained Outage), or a vegetation-related encroachment resulting in a Sustained Outage due to a fall-in from inside the ROW, or a vegetation-related encroachment resulting in a Sustained Outage due to the blowing together of the lines and vegetation located inside the ROW, or a vegetation-related encroachment resulting in a Sustained Outage due to a grow-in. Faults which do not cause a Sustained outage and which are confirmed to have been caused by vegetation encroachment within the MVCD are considered the equivalent of a Real-time observation for violation severity levels.

With this approach, the VSLs for R1 and R2 are structured such that they directly correlate to the severity of a failure of an applicable Transmission Owner or applicable Generator Owner to manage vegetation and to the corresponding performance level of the Transmission Owner's

vegetation program's ability to meet the objective of "preventing the risk of those vegetation related outages that could lead to Cascading." Thus violation severity increases with an applicable Transmission Owner's or applicable Generator Owner's inability to meet this goal and its potential of leading to a Cascading event. The additional benefits of such a combination are that it simplifies the standard and clearly defines performance for compliance. A performance-based requirement of this nature will promote high quality, cost effective vegetation management programs that will deliver the overall end result of improved reliability to the system.

Multiple Sustained Outages on an individual line can be caused by the same vegetation. For example initial investigations and corrective actions may not identify and remove the actual outage cause then another outage occurs after the line is re-energized and previous high conductor temperatures return. Such events are considered to be a single vegetation-related Sustained Outage under the standard where the Sustained Outages occur within a 24 hour period.

If the applicable Transmission Owner or applicable Generator Owner has applicable lines operated at nominal voltage levels not listed in Table 2, then the applicable TO or applicable GO should use the next largest clearance distance based on the next highest nominal voltage in the table to determine an acceptable distance.

Requirement R3:
R3 is a competency based requirement concerned with the maintenance strategies, procedures, processes, or specifications, an applicable Transmission Owner or applicable Generator Owner uses for vegetation management.

An adequate transmission vegetation management program formally establishes the approach the applicable Transmission Owner or applicable Generator Owner uses to plan and perform vegetation work to prevent transmission Sustained Outages and minimize risk to the transmission system. The approach provides the basis for evaluating the intent, allocation of appropriate resources, and the competency of the applicable Transmission Owner or applicable Generator Owner in managing vegetation. There are many acceptable approaches to manage vegetation and avoid Sustained Outages. However, the applicable Transmission Owner or applicable Generator Owner must be able to show the documentation of its approach and how it conducts work to maintain clearances.

An example of one approach commonly used by industry is ANSI Standard A300, part 7. However, regardless of the approach a utility uses to manage vegetation, any approach an applicable Transmission Owner or applicable Generator Owner chooses to use will generally contain the following elements:

1. *the maintenance strategy used (such as minimum vegetation-to-conductor distance or maximum vegetation height) to ensure that MVCD clearances are never violated*

2. *the work methods that the applicable Transmission Owner or applicable Generator Owner uses to control vegetation*
3. *a stated Vegetation Inspection frequency*
4. *an annual work plan*

The conductor's position in space at any point in time is continuously changing in reaction to a number of different loading variables. Changes in vertical and horizontal conductor positioning are the result of thermal and physical loads applied to the line. Thermal loading is a function of line current and the combination of numerous variables influencing ambient heat dissipation including wind velocity/direction, ambient air temperature and precipitation. Physical loading applied to the conductor affects sag and sway by combining physical factors such as ice and wind loading. The movement of the transmission line conductor and the MVCD is illustrated in Figure 1 below.

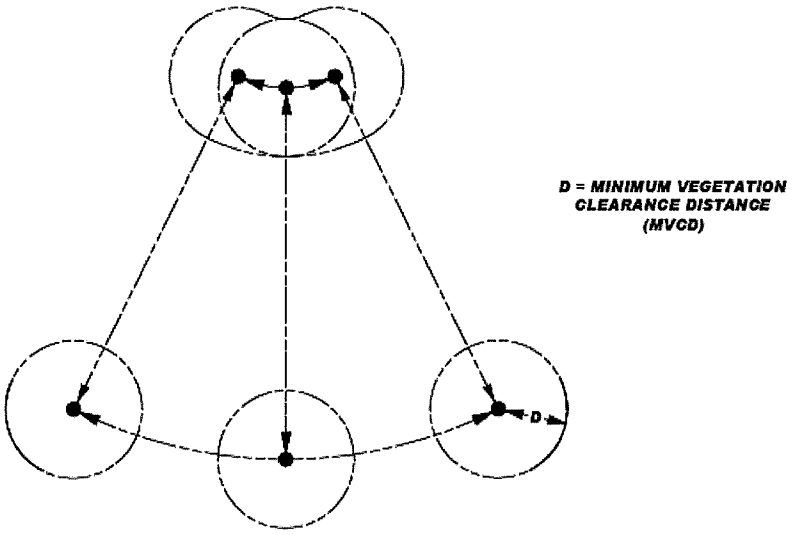

Figure 1

A cross-section view of a single conductor at a given point along the span is shown with six possible conductor positions due to movement resulting from thermal and mechanical loading.

Requirement R4:

R4 is a risk-based requirement. It focuses on preventative actions to be taken by the applicable Transmission Owner or applicable Generator Owner for the mitigation of Fault risk when a vegetation threat is confirmed. R4 involves the notification of potentially threatening vegetation conditions, without any intentional delay, to the control center holding switching authority for that specific transmission line. Examples of acceptable unintentional delays may

include communication system problems (for example, cellular service or two-way radio disabled), crews located in remote field locations with no communication access, delays due to severe weather, etc.

Confirmation is key that a threat actually exists due to vegetation. This confirmation could be in the form of an applicable Transmission Owner or applicable Generator Owner employee who personally identifies such a threat in the field. Confirmation could also be made by sending out an employee to evaluate a situation reported by a landowner.

Vegetation-related conditions that warrant a response include vegetation that is near or encroaching into the MVCD (a grow-in issue) or vegetation that could fall into the transmission conductor (a fall-in issue). A knowledgeable verification of the risk would include an assessment of the possible sag or movement of the conductor while operating between no-load conditions and its rating.

The applicable Transmission Owner or applicable Generator Owner has the responsibility to ensure the proper communication between field personnel and the control center to allow the control center to take the appropriate action until or as the vegetation threat is relieved. Appropriate actions may include a temporary reduction in the line loading, switching the line out of service, or other preparatory actions in recognition of the increased risk of outage on that circuit. The notification of the threat should be communicated in terms of minutes or hours as opposed to a longer time frame for corrective action plans (see R5).

All potential grow-in or fall-in vegetation-related conditions will not necessarily cause a Fault at any moment. For example, some applicable Transmission Owners or applicable Generator Owners may have a danger tree identification program that identifies trees for removal with the potential to fall near the line. These trees would not require notification to the control center unless they pose an immediate fall-in threat.

Requirement R5:
R5 is a risk-based requirement. It focuses upon preventative actions to be taken by the applicable Transmission Owner or applicable Generator Owner for the mitigation of Sustained Outage risk when temporarily constrained from performing vegetation maintenance. The intent of this requirement is to deal with situations that prevent the applicable Transmission Owner or applicable Generator Owner from performing planned vegetation management work and, as a result, have the potential to put the transmission line at risk. Constraints to performing vegetation maintenance work as planned could result from legal injunctions filed by property owners, the discovery of easement stipulations which limit the applicable Transmission Owner's or applicable Generator Owner's rights, or other circumstances.

This requirement is not intended to address situations where the transmission line is not at potential risk and the work event can be rescheduled or re-planned using an alternate work methodology. For example, a land owner may prevent the planned use of herbicides to control incompatible vegetation outside of the MVCD, but agree to the use of mechanical clearing. In

this case the applicable Transmission Owner or applicable Generator Owner is not under any immediate time constraint for achieving the management objective, can easily reschedule work using an alternate approach, and therefore does not need to take interim corrective action.

However, in situations where transmission line reliability is potentially at risk due to a constraint, the applicable Transmission Owner or applicable Generator Owner is required to take an interim corrective action to mitigate the potential risk to the transmission line. A wide range of actions can be taken to address various situations. General considerations include:

- Identifying locations where the applicable Transmission Owner or applicable Generator Owner is constrained from performing planned vegetation maintenance work which potentially leaves the transmission line at risk.
- Developing the specific action to mitigate any potential risk associated with not performing the vegetation maintenance work as planned.
- Documenting and tracking the specific action taken for the location.
- In developing the specific action to mitigate the potential risk to the transmission line the applicable Transmission Owner or applicable Generator Owner could consider location specific measures such as modifying the inspection and/or maintenance intervals. Where a legal constraint would not allow any vegetation work, the interim corrective action could include limiting the loading on the transmission line.
- The applicable Transmission Owner or applicable Generator Owner should document and track the specific corrective action taken at each location. This location may be indicated as one span, one tree or a combination of spans on one property where the constraint is considered to be temporary.

Requirement R6:
R6 is a risk-based requirement. This requirement sets a minimum time period for completing Vegetation Inspections. The provision that Vegetation Inspections can be performed in conjunction with general line inspections facilitates a Transmission Owner's ability to meet this requirement. However, the applicable Transmission Owner or applicable Generator Owner may determine that more frequent vegetation specific inspections are needed to maintain reliability levels, based on factors such as anticipated growth rates of the local vegetation, length of the local growing season, limited ROW width, and local rainfall. Therefore it is expected that some transmission lines may be designated with a higher frequency of inspections.

The VSLs for Requirement R6 have levels ranked by the failure to inspect a percentage of the applicable lines to be inspected. To calculate the appropriate VSL the applicable Transmission Owner or applicable Generator Owner may choose units such as: circuit, pole line, line miles or kilometers, etc.

For example, when an applicable Transmission Owner or applicable Generator Owner operates 2,000 miles of applicable transmission lines this applicable Transmission Owner or applicable

Generator Owner will be responsible for inspecting all the 2,000 miles of lines at least once during the calendar year. If one of the included lines was 100 miles long, and if it was not inspected during the year, then the amount failed to inspect would be 100/2000 = 0.05 or 5%. The "Low VSL" for R6 would apply in this example.

Requirement R7:
R7 is a risk-based requirement. The applicable Transmission Owner or applicable Generator Owner is required to complete its annual work plan for vegetation management to accomplish the purpose of this standard. Modifications to the work plan in response to changing conditions or to findings from vegetation inspections may be made and documented provided they do not put the transmission system at risk. The annual work plan requirement is not intended to necessarily require a "span-by-span", or even a "line-by-line" detailed description of all work to be performed. It is only intended to require that the applicable Transmission Owner or applicable Generator Owner provide evidence of annual planning and execution of a vegetation management maintenance approach which successfully prevents encroachment of vegetation into the MVCD.

When an applicable Transmission Owner or applicable Generator Owner identifies 1,000 miles of applicable transmission lines to be completed in the applicable Transmission Owner's or applicable Generator Owner's annual plan, the applicable Transmission Owner or applicable Generator Owner will be responsible completing those identified miles. If an applicable Transmission Owner or applicable Generator Owner makes a modification to the annual plan that does not put the transmission system at risk of an encroachment the annual plan may be modified. If 100 miles of the annual plan is deferred until next year the calculation to determine what percentage was completed for the current year would be: 1000 – 100 (deferred miles) = 900 modified annual plan, or 900 / 900 = 100% completed annual miles. If an applicable Transmission Owner or applicable Generator Owner only completed 875 of the total 1000 miles with no acceptable documentation for modification of the annual plan the calculation for failure to complete the annual plan would be: 1000 – 875 = 125 miles failed to complete then, 125 miles (not completed) / 1000 total annual plan miles = 12.5% failed to complete.

The ability to modify the work plan allows the applicable Transmission Owner or applicable Generator Owner to change priorities or treatment methodologies during the year as conditions or situations dictate. For example recent line inspections may identify unanticipated high priority work, weather conditions (drought) could make herbicide application ineffective during the plan year, or a major storm could require redirecting local resources away from planned maintenance. This situation may also include complying with mutual assistance agreements by moving resources off the applicable Transmission Owner's or applicable Generator Owner's system to work on another system. Any of these examples could result in acceptable deferrals or additions to the annual work plan provided that they do not put the transmission system at risk of a vegetation encroachment.
In general, the vegetation management maintenance approach should use the full extent of the applicable Transmission Owner's or applicable Generator Owner's easement, fee simple and

other legal rights allowed. A comprehensive approach that exercises the full extent of legal rights on the ROW is superior to incremental management because in the long term it reduces the overall potential for encroachments, and it ensures that future planned work and future planned inspection cycles are sufficient.

When developing the annual work plan the applicable Transmission Owner or applicable Generator Owner should allow time for procedural requirements to obtain permits to work on federal, state, provincial, public, tribal lands. In some cases the lead time for obtaining permits may necessitate preparing work plans more than a year prior to work start dates. Applicable Transmission Owners or applicable Generator Owners may also need to consider those special landowner requirements as documented in easement instruments.

This requirement sets the expectation that the work identified in the annual work plan will be completed as planned. Therefore, deferrals or relevant changes to the annual plan shall be documented. Depending on the planning and documentation format used by the applicable Transmission Owner or applicable Generator Owner, evidence of successful annual work plan execution could consist of signed-off work orders, signed contracts, printouts from work management systems, spreadsheets of planned versus completed work, timesheets, work inspection reports, or paid invoices. Other evidence may include photographs, and walk-through reports.

Notes:

The SDT determined that the use of IEEE 516-2003 in version 1 of FAC-003 was a misapplication. The SDT consulted specialists who advised that the Gallet equation would be a technically justified method. The explanation of why the Gallet approach is more appropriate is explained in the paragraphs below.

The drafting team sought a method of establishing minimum clearance distances that uses realistic weather conditions and realistic maximum transient over-voltages factors for in-service transmission lines.

The SDT considered several factors when looking at changes to the minimum vegetation to conductor distances in FAC-003-1:

- avoid the problem associated with referring to tables in another standard (IEEE-516-2003)
- transmission lines operate in non-laboratory environments (wet conditions)
- transient over-voltage factors are lower for in-service transmission lines than for inadvertently re-energized transmission lines with trapped charges.

FAC-003-1 used the minimum air insulation distance (MAID) without tools formula provided in IEEE 516-2003 to determine the minimum distance between a transmission line conductor and vegetation. The equations and methods provided in IEEE 516 were developed by an IEEE Task Force in 1968 from test data provided by thirteen independent laboratories. The distances provided in IEEE 516 Tables 5 and 7 are based on the withstand voltage of a dry rod-rod air gap,

or in other words, dry laboratory conditions. Consequently, the validity of using these distances in an outside environment application has been questioned.

FAC-003-1 allowed Transmission Owners to use either Table 5 or Table 7 to establish the minimum clearance distances. Table 7 could be used if the Transmission Owner knew the maximum transient over-voltage factor for its system. Otherwise, Table 5 would have to be used. Table 5 represented minimum air insulation distances under the worst possible case for transient over-voltage factors. These worst case transient over-voltage factors were as follows: 3.5 for voltages up to 362 kV phase to phase; 3.0 for 500 - 550 kV phase to phase; and 2.5 for 765 to 800 kV phase to phase. These worst case over-voltage factors were also a cause for concern in this particular application of the distances.

In general, the worst case transient over-voltages occur on a transmission line that is inadvertently re-energized immediately after the line is de-energized and a trapped charge is still present. The intent of FAC-003 is to keep a transmission line that is in service from becoming de-energized (i.e. tripped out) due to spark-over from the line conductor to nearby vegetation. Thus, the worst case transient overvoltage assumptions are not appropriate for this application. Rather, the appropriate over voltage values are those that occur only while the line is energized.

Typical values of transient over-voltages of in-service lines are not readily available in the literature because they are negligible compared with the maximums. A conservative value for the maximum transient over-voltage that can occur anywhere along the length of an in-service ac line was approximately 2.0 per unit. This value was a conservative estimate of the transient over-voltage that is created at the point of application (e.g. a substation) by switching a capacitor bank without pre-insertion devices (e.g. closing resistors). At voltage levels where capacitor banks are not very common (e.g. Maximum System Voltage of 362 kV), the maximum transient over-voltage of an in-service ac line are created by fault initiation on adjacent ac lines and shunt reactor bank switching. These transient voltages are usually 1.5 per unit or less.

Even though these transient over-voltages will not be experienced at locations remote from the bus at which they are created, in order to be conservative, it is assumed that all nearby ac lines are subjected to this same level of over-voltage. Thus, a maximum transient over-voltage factor of 2.0 per unit for transmission lines operated at 302 kV and below was considered to be a realistic maximum in this application. Likewise, for ac transmission lines operated at Maximum System Voltages of 362 kV and above a transient over-voltage factor of 1.4 per unit was considered a realistic maximum.

The Gallet equations are an accepted method for insulation coordination in tower design. These equations are used for computing the required strike distances for proper transmission line insulation coordination. They were developed for both wet and dry applications and can be used with any value of transient over-voltage factor. The Gallet equation also can take into account various air gap geometries. This approach was used to design the first 500 kV and 765 kV lines in North America.

If one compares the MAID using the IEEE 516-2003 Table 7 (table D.5 for English values) with the critical spark-over distances computed using the Gallet wet equations, for each of the nominal voltage classes and identical transient over-voltage factors, the Gallet equations yield a more conservative (larger) minimum distance value.

Distances calculated from either the IEEE 516 (dry) formulas or the Gallet "wet" formulas are not vastly different when the same transient overvoltage factors are used; the "wet" equations will consistently produce slightly larger distances than the IEEE 516 equations when the same transient overvoltage is used. While the IEEE 516 equations were only developed for dry conditions the Gallet equations have provisions to calculate spark-over distances for both wet and dry conditions.

Since no empirical data for spark over distances to live vegetation existed at the time version 3 was developed, the SDT chose a proven method that has been used in other EHV applications. The Gallet equations relevance to wet conditions and the selection of a Transient Overvoltage Factor that is consistent with the absence of trapped charges on an in-service transmission line make this methodology a better choice.

The following table is an example of the comparison of distances derived from IEEE 516 and the Gallet equations.

Comparison of spark-over distances computed using Gallet wet equations vs. IEEE 516-2003 MAID distances

(AC) Nom System Voltage (kV)	(AC) Max System Voltage (kV)	Transient Over-voltage Factor (T)	Clearance (ft.) Gallet (wet) @ Alt. 3000 feet	Table 7 (Table D.5 for feet) IEEE 516-2003 MAID (ft) @ Alt. 3000 feet
765	800	2.0	14.36	13.95
500	550	2.4	11.0	10.07
345	362	3.0	8.55	7.47
230	242	3.0	5.28	4.2
115	121	3.0	2.46	2.1

Rationale:
During development of this standard, text boxes were embedded within the standard to explain the rationale for various parts of the standard. Upon BOT approval, the text from the rationale text boxes was moved to this section.

Rationale for Applicability (section 4.2.4):
The areas excluded in 4.2.4 were excluded based on comments from industry for reasons summarized as follows:

1) There is a very low risk from vegetation in this area. Based on an informal survey, no TOs reported such an event.
2) Substations, switchyards, and stations have many inspection and maintenance activities that are necessary for reliability. Those existing process manage the threat. As such, the formal steps in this standard are not well suited for this environment.
3) Specifically addressing the areas where the standard does and does not apply makes the standard clearer.

Rationale for Applicability (section 4.3):
Within the text of NERC Reliability Standard FAC-003-3, "transmission line(s)" and "applicable line(s)" can also refer to the generation Facilities as referenced in 4.3 and its subsections.

Rationale for R1 and R2:
Lines with the highest significance to reliability are covered in R1; all other lines are covered in R2.

Rationale for the types of failure to manage vegetation which are listed in order of increasing degrees of severity in non-compliant performance as it relates to a failure of an applicable Transmission Owner's or applicable Generator Owner's vegetation maintenance program:

1. This management failure is found by routine inspection or Fault event investigation, and is normally symptomatic of unusual conditions in an otherwise sound program.
2. This management failure occurs when the height and location of a side tree within the ROW is not adequately addressed by the program.
3. This management failure occurs when side growth is not adequately addressed and may be indicative of an unsound program.
4. This management failure is usually indicative of a program that is not addressing the most fundamental dynamic of vegetation management, (i.e. a grow-in under the line). If this type of failure is pervasive on multiple lines, it provides a mechanism for a Cascade.

Rationale for R3:
The documentation provides a basis for evaluating the competency of the applicable Transmission Owner's or applicable Generator Owner's vegetation program. There may be many acceptable approaches to maintain clearances. Any approach must demonstrate that the

applicable Transmission Owner or applicable Generator Owner avoids vegetation-to-wire conflicts under all Ratings and all Rated Electrical Operating Conditions.

Rationale for R4:

This is to ensure expeditious communication between the applicable Transmission Owner or applicable Generator Owner and the control center when a critical situation is confirmed.

Rationale for R5:

Legal actions and other events may occur which result in constraints that prevent the applicable Transmission Owner or applicable Generator Owner from performing planned vegetation maintenance work.

In cases where the transmission line is put at potential risk due to constraints, the intent is for the applicable Transmission Owner and applicable Generator Owner to put interim measures in place, rather than do nothing.

The corrective action process is not intended to address situations where a planned work methodology cannot be performed but an alternate work methodology can be used.

Rationale for R6:

Inspections are used by applicable Transmission Owners and applicable Generator Owners to assess the condition of the entire ROW. The information from the assessment can be used to determine risk, determine future work and evaluate recently-completed work. This requirement sets a minimum Vegetation Inspection frequency of once per calendar year but with no more than 18 months between inspections on the same ROW. Based upon average growth rates across North America and on common utility practice, this minimum frequency is reasonable. Transmission Owners should consider local and environmental factors that could warrant more frequent inspections.

Rationale for R7:

This requirement sets the expectation that the work identified in the annual work plan will be completed as planned. It allows modifications to the planned work for changing conditions, taking into consideration anticipated growth of vegetation and all other environmental factors, provided that those modifications do not put the transmission system at risk of a vegetation encroachment.

Sayers, Margery

From: Mike McCann <mike.mccann@fcc-eng.com>
Sent: Monday, September 23, 2019 7:11 PM
To: CouncilMail
Subject: testimony AGAINST CB38

Good evening, Council Chair Mercer Rigby, Council Vice Chair Jones and esteemed Council Members.

I am here this evening to testify **AGAINST** CB38. I am a principal in a small business in Ellicott City that has spent our entire 42-year existence in Ellicott City. We are a local engineering firm that has and continues to do business with various County departments, private property owners like the gentlemen and previous speaker that wished to build a home in his backyard, and YES, developers, too. I am not an expert in SWM.

I do not envy your position. You have been given a great responsibility. You must consider all sides of an issue, the impacts and consequences, and then comprehensively balance this information with consideration given to all stakeholders of Howard County. In this regard, this Bill is very complicated. Among the many issues I've heard discussed related to this Bill, and in no order, there are central concerns related to the protection of Ellicott City from future floods, Life Safety, unintended consequences from this Bill, and dare I say, growth of our tax base. These are all very important issues, and are not the only issues that may be considered in this debate. Related to these issues, I offer the following:

- I must agree that the land use items impacted by this Bill do impact SWM, but they are proposed and under consideration in a vacuum. As you have heard from County Engineers and County Consultants alike, SWM can be provided to mimic the existing hydrologic conditions of a property, and consequently, could be provided to improve the hydrologic conditions of a property, too. This means that development could improve our ability to protect EC. If proposed SWM measures in design or under construction by the County helps to protect EC, why would SWM from the few undeveloped properties in the watershed be any different. This Bill seems well intended, but I believe it misses the mark. This is an anti-business, stop development Bill, not a protect EC Bill.

- This Bill is an anti-business, stop development Bill. CB 38 is not a Life Safety Bill.

- I realize the bill contains certain exemptions for the County to build SWM to help protect EC, but if the items identified in this bill are so important to life safety and the protection of EC why wouldn't the County follow the same edict?

- Given that the County is one of the biggest property owners in the watershed, has the Council asked for, received, and evaluated information pertaining to the impact of this bill of County properties and their future use (Courthouse parking lot, the building we are in right now, the County T1 SWM facility, etc.). How about the impacts of less growth in this watershed, and it's impacts on the HCPSS current and future budget issues? Has this been considered by this Council and HCPSS?

- Based on the drawing of the map to accompany this bill, many properties along the perimeter of the watershed boundary that drain away from the watershed are shown as in the watershed (based on County topo drawings). This is very problematic, and should be addressed prior to any vote on CB38.

Since CB does not address life safety and/or the protection of EC and is fraught with negative impacts to other issues critically important to Howard County's continued overall success, I am against this Bill, and I hope you will be, too.

Thank you for your time and consideration.
-Michael J. McCann

Sayers, Margery

From: Paul Marzin <paul.marzin@gmail.com>
Sent: Monday, September 23, 2019 6:41 PM
To: CouncilMail
Cc: Walsh, Elizabeth
Subject: observation of CB38 testimony today
Attachments: Testimony observations from today.pdf

[Note: This email originated from outside of the organization. Please only click on links or attachments if you know the sender.]

I watched the entire testimony from the Live video feed this afternoon for CB38. Just wanted to share some observations and thoughts to help you maybe get through your work session tasks. I already submitted written testimony. This is not testimony but just for all of you or you can add it as testimony. Whatever helps with your process. Hopefully, I'm using the Councilmail address to get to you. If not, Liz could you please share with your colleagues?

Thanks,

Paul Marzin
Ellicott City - District 1

FYI - the live video feed experience was awful. It stops every couple of minutes and you have to restart it constantly. I think you need to get on your IT department to provide a better streaming solution that is more reliable for people. It is very useful but has to be scaled to handle lots of connections and work properly.

PASS CB38-2019

September 23, 2019

Paul Marzin
4450 Ilchester Road
Ellicott City, MD 21043

Dear Council Members,

Here are a couple of counter points that I would like you to consider after I observed the entire opposition testimony on September 23rd.

(1) Home properties will decline in value - I don't think so...

I know my property will be reduced in value because of developing the property next to and above me. Buying a piece of property that borders the State Park and environmental areas is a calculated risk. I took that risk because I wanted the protection and I thought I'd get it from Howard County and the State of Maryland.

I created something unique that requires the unique landscape to stay that way. I see it as my responsibility to keep it that way. Allowing an adjacent development with the current site plan will destroy it. This is very similar to what Cathy Hudson's testimony described. I have a lot of wildlife, birds, and life around me and I cherish it and feel very lucky to have that. I want it to stay and not have a dead land zone. I have a Well for water and nobody seems to be concerned about studying the hydrology around that and any impact of dry wells with their runoff.

It seems to me that District One properties are targets for small developers to go after and many times exploiting the financial need of the property owners. Many property owners who I have talked to have regretted selling their properties after seeing how the development was done. There is no accountability here for a developer nor engineering firms. At least not from DPZ.

(2) Doing nothing, postponing, amendments, veto, or extending the bill for further study - Same old.

My thoughts are to do the opposite. Pass it first, then others have opportunities to bring up other Bills in the future to address concerns. Influence change here. The status quo has been to table, delay, extend for another day. This is not going to go away. A lot of people have spent a lot of time voicing their concerns on this with testimony, personal experiences and how it applies to them. Don't do the same and allow the inequality to continue in Howard County. Just the notion of passing this Bill will send a very strong message to the rest. The gentleman from UBMC has some

great points here. It is time to take a different approach. The old one is not working. DPZ is not going to do anything here unless you pass legislation to force it to.

My sister-in-law just became a US citizen last week. She is from Germany and married to my brother. I was invited to her swearing in ceremony which was unbelievable. 28 people from 26 countries at the White House. Vice President Mike Pence spoke and stayed the entire hour and half with the candidates and guests. Politics aside, it was an amazing experience and a symbol of our processes around freedom. In his speech to the new citizens, he asked them to get involved in our government, voice your opinions, work with our processes, and work hard and you will be able to accomplish whatever you want to achieve here. Again, amazing experience. It's on the C-SPAN website if you don't believe me :-). Never thought I'd be watching C-SPAN so much.

Being a US citizen from birth, I take this for granted and it was a great reminder to me and should be to all of us. I commend all of you for doing what you are doing and thank you. I know you are working on a lot of important things but they always seems to all come about at the same time. This is important as well.

Please take action on CB38 and influence change. We need it.

Thanks again,

Paul Marzin

Sayers, Margery

From: Twele, Larry
Sent: Monday, September 23, 2019 4:23 PM
To: Jones, Diane; Jones, Opel; Jung, Deb; Meyers, Jeff; Rigby, Christiana; Rosen, Lynne; Sayers, Margery; Singleton, Julia; Walsh, Elizabeth; Wimberly, Theo; Yungmann, David
Cc: Sidh, Sameer; Jones, Jennifer D.; Arthurs, Maureen
Subject: CB 38 Memo
Attachments: 190923- CB 38 Letter v1.pdf

Councilmembers –

Attached is the information requested on CB 38 addressing the points I covered in the work session last Friday.

LAWRENCE F. TWELE
CEO
Howard County Economic Development Authority

410-313-6500 (Office)
6751 Columbia Gateway Drive – Suite 500
Columbia, MD 21046
ltwele@hceda.org
www.hceda.org

HOWARD COUNTY
ECONOMIC DEVELOPMENT AUTHORITY
Grow. Here's how.

Members of the County Council:

CB 38 seeks to amend development regulations in the Patapsco Lower North Branch Watershed. The area of the Watershed extends from north of Woodstock Road down the Patapsco east to Elkridge and south to encompass both sides of the Route 1 Corridor to Route 175.

The bill speaks specifically to strict controls on residential development. The bill, however, also has a significant impact on both commercial and industrial properties and job growth. The consequences could be:

CB 38 will effectively freeze employment and levels of existing business along Route 1 to Route 175 due to the land use restrictions placed on commercial and industrial property owners. Without the ability to build new, expand an existing or redevelop older facilities job growth will be curtailed.

CB 38 discourages new commercial and industrial investment along the impacted areas and eliminates any additional contributions to the commercial/industrial tax base.

CB 38 will lessen property values of industrial and commercial land due to the land use restrictions.

CB 38 severely impacts the Route 1 Master Plan and Amendments which stress the assembly of small underperforming parcels into larger more productive commercial and industrial land use.

CB 38 sends a clear and negative message to corporate site location consultants and investors that will eliminate Howard County from consideration for larger corporate relocation projects.

The Economic Development Authority has done an analysis of the impact of CB 38 on job growth and tax revenues along the impacted areas of the Route 1 Corridor. Based on FY 2017 employment levels, 22,339 jobs exist on the impacted area. The breakdown is approximately 5,975 Industrial and 16,364 Commercial (Retail and Office) jobs. Using the most recent employment figures and the total developed acreage, HCEDA derived an average employment per acre of developed land. This figure was used to forecast the employment potential of the remaining undeveloped acreage. Undeveloped commercial and industrial land in the CB 38 affected area could have the capacity to provide for 940 jobs for Industrial and 1,511 for Commercial for a total of 2,452 jobs.

Figure 1: Potential Undeveloped Employment

	Industrial	Commercial	Total
2017 Jobs	5975	16364	22339
Existing Acreage	1131	877	2008
Jobs per Acre	5.3	18.7	11.1
Potential Acreage	178	81	259
Estimated Jobs Undeveloped	940	1511	2452

(Source: HCEDA analysis of US Census data and HC Department of Planning and Zoning)

Using a sample real property tax assessments from within the CB 38 affect area, HCEDA derived a range of real property tax values per acre for both commercial and industrial properties. Applying this range of values to the undeveloped commercial and industrial lands in the CB 38 affected area, equated to a

potential $1.8 to $4.3 million annually of industrial real property tax and a potential $940,000 to $1.9 million of annually of commercial real property tax in these spaces.

Figure 2: Potential Undeveloped Real Property Tax

	Industrial	Commercial	Total
Potential Acreage	178	81	259
Existing Tax Per Acre Range	$9,421 to $27,071	$11,607 to $22,876	N/A
Real Property Tax Low	$1,676,950	$940,162	$2,617,112
Real Property Tax High	$4,284,620	$1,852,972	$6,137,592

(Source: HCEDA analysis of CoStar data, HC Department of Finance and HC Department of Planning and Zoning)

The samples were chosen randomly, while ensuring a distribution of building class and location. Main Street Ellicott City properties were not included as the resulted in extremely high tax per acre rates. Specific properties can be found attached.

Figure 3: Sample Properties from CB 38 Affected Area

Property Address	PropertyType	Real Property Tax	Land Area (AC)	Tax per Acre
7079 Brookdale Dr	Industrial	$17,805.82	1.9	$9,421
6635 Business Pky	Industrial	$174,061.43	16.4	$10,614
7461 Coca Cola Dr	Industrial	$288,850.78	12.0	$24,071
6820 Deerpath Rd	Office	$68,248.79	5.9	$11,607
6085 Marshalee Dr	Office	$305,854.70	13.4	$22,876
8300 Baltimore National Pike	Retail	$18,733.46	1.3	$14,795

(Source: HCEDA analysis of CoStar data, Department of Finance, Department of Planning and Zoning)
Enactment of CB38 could potentially forgo 2,452 jobs and $2.6 to $6.2 million of annual total real property tax revenue.

HCEDA would urge the council to consider the overall impacts on the employment growth potential and commercial industrial tax base of Howard County and amend CB 38 to exclude these two sectors.

Sincerely,

Lawrence F. Twele
Chief Executive Officer
Howard County Economic Development Authority

Sayers, Margery

From: Judy Yolken <judlar@verizon.net>
Sent: Monday, September 23, 2019 1:40 PM
To: CouncilMail
Subject: CB38

[Note: This email originated from outside of the organization. Please only click on links or attachments if you know the sender.]

Council members - Vote for CB 38! Enough of the destruction of Ellicott City and its watershed. Save our beautiful area for future residents of this great county.
Eastern Howard County is over developed. Traffic is choking this area; schools are crowded!
Not only that, Dr. Taylor wants to develop the watershed into Ellicott City. He claims additional development will not impact the watershed. So untrue. Drainage has become an issue in the Village Crest area and homeowners paid for corrective drainage.

Vote to protect the community!
Judith Yolken
8120 Hickory High Ct. Unit Q
Ellicott City, Md 21043

Sent from my iPhone

Sayers, Margery

From: Michael Kreft <mikekreft92@hotmail.com>
Sent: Monday, September 23, 2019 1:33 PM
To: CouncilMail
Subject: Support for CB 38 from District One resident

Howard County Council,

I'm a long time resident of Howard County. I fully support the protections in Council Bill 38 that will protect undeveloped land in the Patapsco watershed near Ellicott City, reduce flood risks and limit developers from skirting environmental laws. These protections are long overdue.

Sincerely,

Michael Kreft
4616 Beechwood Road

Sayers, Margery

From: glissando77 <glissando77@gmail.com>
Sent: Monday, September 23, 2019 10:22 AM
To: CouncilMail
Subject: In Support of CB38 - Pass it Now!

As a long-time resident (34 years) of Howard County, I have seen the county progress from a relatively quiet set of thriving communities that had everything we needed nearby to an overcrowded and often unsafe urban/suburban county where making more money seems to be the driving factor for every council decision. When I drive along 175 or Broken Land Parkway, the first thought that comes to mind is HIDEOUS!! It's beginning to look like Baltimore ... no trees, no wildlife, tall buildings crowding out the sun, trash, and increased crime in the area, too much traffic (esp when Merriweather has an event ... hard to get home). Drives me away from supporting businesses in the area.

The continued development in this county has been a detriment to the citizens who live here ... remember them? the ones with the voting power? The council is charged to protect and serve the residents of the county ... your job is not to cater to the investers who seem to want to pave/build on every square inch possible, nor to draw new businesses into the county9. There seems to be blatant disregard for the environmental impact, especially on our very vulnerable watersheds. The impact on our rivers and streams in recent years has been devastating ... this has caused far greater problems than any climate change ever could (the overdevelopment also contributes negatively to climate change as well)

It is time to STOP NON-ESSENTIAL DEVELOPMENT!!! It is time to STOP GRANTING WAIVERS AND IN LIEU OF FEES!! It is time to STOP CATERING TO INVESTERS. It is time to TAKE CARE OF OUR ENVIRONMENT and PROTECT OUR PEOPLE!!

Fix the existing problems that have already been caused by overdevelopment!! Overcrowded schools ... infrastructure that cannot handle the increased demands ... unsafe roads ... horrible traffic ... increased flooding ... increased crime. The taxpayers should not have to support this development and the environment should not have to suffer. No new development should be approved within the watershed. Policies which protect the environment should be strengthened and enforced ... no more waivers ... PERIOD!! No residential development should be approved until ALL school overcrowding has been eliminated (including the numerous temporary trailers being used as permanent classrooms). No development should be initiated untill ALL supporting infrastructure impacts and upgrades have been completed (schools, water, roads, etc). Developers must be held accountable for these costs as well.

Please STOP FOCUSING ON MORE MONEY!! Take care of your people and your county first and foremost!! Pass CB38 NOW!!

Thank you for your consideration.
Kim Pelech

Sayers, Margery

From: Lorri Harle <lorri@lightingenvironments.com>
Sent: Monday, September 23, 2019 9:54 AM
To: CouncilMail
Subject: CB38

[Note: This email originated from outside of the organization. Please only click on links or attachments if you know the sender.]

I am in total support of CB38

LORRI HARLE
6230Latchlift Ct
Elkridge, MD 21075

Sayers, Margery

From: Marisa McCurdy <marisahiggins@hotmail.com>
Sent: Sunday, September 22, 2019 10:17 PM
To: CouncilMail; Jones, Diane; Walsh, Elizabeth; Dvorak, Nicole
Subject: Testimony for CB 38
Attachments: County Council Testimony for CB 38.docx

All,

I signed up to testify in favor of CB 38 and was in attendance last week but was not called to testify. I'm unable to attend tomorrow's meeting due to work conflicts, but please see my attached testimony.

Marisa McCurdy
6802 Norris Lane
Elkridge MD 20175

My name is Marisa McCurdy and I live in a historic Elkridge neighborhood tucked back into Patapsco State Park. My property is adjacent to Patapsco River (just above Cascade Falls). I hiked to the Falls last Memorial Day during the flooding and witnessed first-hand the destruction brought to my immediate surroundings due partially due to overdevelopment.

I am here tonight to represent the large swath of public that is too busy to be engaged in a public hearing for something that seems to be so obviously in their interest. I am a busy mom of 3 kids (involved in PTA, cub scouts, debate club, church, etc) who came straight from back-to-school night because of how important it is to represent all those parents and concerned citizens who couldn't get childcare or have an emergency work project that they are dealing with this evening. I am also here for my children, their generation, and the following generation. So when you hear my voice, please hear thousands of people supporting me from their households tonight.

Whenever I talk to neighbors, friends, and family living locally, they unanimously support the concepts captured in CB 38. To be clear... climate change is real; our schools are overcrowded; our watershed is threatened; and our government officials are elected to represent ALL of our interests, not just those that fund re-election campaigns. I wish to personally thank Liz Walsh for having the courage to bring forth this legislation.

CB 38 proposes common sense legislation to help protect our watershed. We need to stop the exemptions, waivers, alternative compliance measures, entitlements, etc. In electing Liz Walsh, the people have spoken that we want CB 38 and the positive effects it will have in our County. I urge the remainder of the Council to listen to the general populous (your constituents) and pass CB 38.

Sayers, Margery

From: Brenda Schweiger <bkschweiger7@msn.com>
Sent: Sunday, September 22, 2019 8:25 PM
To: CouncilMail
Subject: CB38

[Note: This email originated from outside of the organization. Please only click on links or attachments if you know the sender.]

I am writing in support of bill CB38

Sincerely,
Brenda Schweiger
6230 Latchlift Ct.
Elkridge, MD 20175

Sent from my iPhone

Sayers, Margery

From: Larry <larrymcguigan@gmail.com>
Sent: Sunday, September 22, 2019 3:09 PM
To: CouncilMail
Cc: Ball, Calvin B
Subject: Support for CB38

[Note: This email originated from outside of the organization. Please only click on links or attachments if you know the sender.]

To the County Council of Howard County,

I'm writing to share my support for Council Bill 38 so that we can protect against future flooding risks in the Patapsco Lower North Branch Watershed. Developers are already destroying this county, why are they also getting so many waivers that excuse them from the current environmental laws? Stop the development so close to floodplains, wetlands, and on steep slopes. This is an excellent bill! Please do the right thing for this county.

Larry McGuigan
District 1, Hanover

Sent from my iPhone

Sayers, Margery

From: Sevanick, Jason <jason.sevanick@woodplc.com>
Sent: Friday, September 20, 2019 1:27 PM
To: CouncilMail
Subject: Written testimony for CB-38
Attachments: HOWARD CB38 Testimony - MAFSM Board Approved.pdf

[Note: This email originated from outside of the organization. Please only click on links or attachments if you know the sender.]

Dear Council Members,

The Maryland Association of Floodplain and Stormwater Managers (MAFSM) appreciates the opportunity to provide the attached written testimony in support of the general principals of Howard County Council Bill 38, and we appreciate your continued focus on implementing solutions to mitigate flood risk for your community.

Sincerely,
Jason Sevanick Durant
MAFSM Chair

Jason Sevanick Durant, CFM, GISP
Maryland Association of Floodplain and Stormwater Managers
Chair
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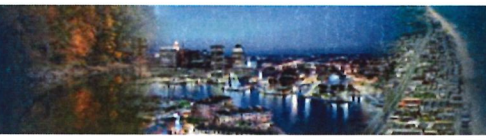
MAFSM
The Maryland Association of
Floodplain and Stormwater Managers



Testimony Regarding Howard County Council Bill 38
September 20, 2019

The Maryland Association of Floodplain and Stormwater Managers (MAFSM), a state-wide non-profit organization dedicated to reducing flood losses in the country and protecting the natural functions of floodplains, is in support of the general principals of Howard County Council Bill 38.

MAFSM's purpose is:

- to provide education opportunities and dissemination of general and technical information to individuals concerned with sound floodplain and stormwater management;
- to promote public awareness of sound floodplain and stormwater management and the linkages between them;
- to encourage the exchange of information, ideas, experiences, etc. among practitioners of floodplain and stormwater management;
- to promote the professional status of floodplain and stormwater managers;
- to inform and provide technical information relative to legislation pertinent and necessary to the effective implementation of sound floodplain and stormwater management practices; and
- to promote environmentally sound solutions to floodplain and stormwater management problems.

It is known from experience that flood risk is very present in the Patapsco Lower North Branch watershed including many parts of Ellicott City and the historic Main Street, in particular. The potential for more intense rain over shorter durations in the future means current standards may not protect people and property within areas of the Patapsco Lower North Branch watershed. When local communities have data and experience to support higher standards, we encourage them to do so.

This legislation limits the stormwater runoff impacts of future development, prohibits residential infill development, and eliminates waivers from stormwater management requirements in some instances within the designated areas.

We encourage the County Council to make use of tools and resources that help them understand their current and potential flood risk such as Maryland Department of the Environment's Flood Risk Application found here: https://mdfloodmaps.net/. We also encourage the County Council to support Howard County's continued participation in the Federal Emergency Management Agency's Community Rating System. This voluntary incentive program recognizes community floodplain management activities that exceed the minimum requirements and, in return, residents receive a reduction in cost on their flood insurance premiums.

We support legislation that protects against future flooding risks and believe that CB38 does that. Please feel free to engage our organization as needed to help support these efforts by contacting us through http://www.mafsm.org/MAFSM/about-us/1948-2/.