



## Forward

Damage to underground facilities can cause far-reaching consequences, from serious injury and environmental damage to the loss of vital services we depend upon everyday. Preventing damage to these facilities is a responsibility shared by all stakeholders and is accomplished through various damage prevention measures.

At the heart of any damage prevention program is the exchange of accurate and consistent information between excavators and operators of underground facilities. Locating and marking underground facilities is the way operators show the approximate horizontal location of their facilities in advance of an excavation. This information helps the excavators to safely excavate around underground facilities.

In an effort to enhance the current marking practices and encourage the use of uniform marking symbols across Virginia, stakeholder representatives have agreed on a set of marking best practices that are found in this document. All participants in this effort are to be complimented on their dedication and contributions in devising these best practices. Operators and their locators are strongly encouraged to follow these best practices to mark their facilities.

This document also includes a reproduction of the State Corporation Commission's General Marking Requirements (Rule 20VAC5-309-110.) which must be followed when marking underground utilities in Virginia. This reproduction is provided solely as a convenience for the person or persons reading this document and is not a legal reference. Persons seeking a legal reference should utilize 20VAC5-309-110. of the Virginia Administrative Code itself.

***Nothing contained in the description of the best practices herein is intended to supersede the existing State law or Commission regulations. The State Corporation Commission does not assume any responsibility for the acts or conduct of any reader of this document.***

Some of the information in this document is subject to change without notice.

## Virginia

### Underground Utility Marking Best Practices

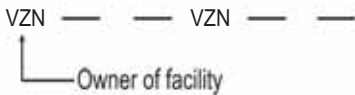
1. The American Public Works Association's ("APWA") color codes shall be used to mark underground utility lines. Unless otherwise noted, marks shall be placed as closely over the utility line as possible consistent with the State Corporation Commission's Rule 20VAC5-309-110 M. (See page 9.)
2. Markings shall be adequate for its intended purpose and not be excessive or oversized.
3. The marker types that are most suitable to the terrain and site conditions shall be used. Examples: Flags and stakes in landscaped areas, snow or loose soil; flags, stakes or whiskers in high traffic areas.



4. Arrows shall be used to indicate that the utility line continues outside the ticket area but shall not be relied upon as to the direction of the utility line.



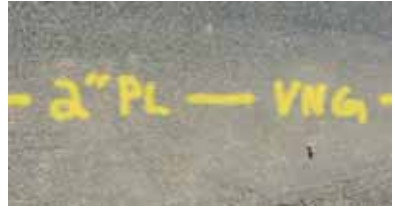
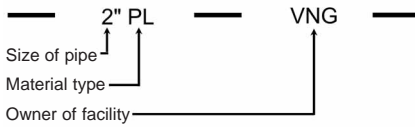
5. The owner of a utility line shall be indicated by a letter or letters, designated by the State Corporation Commission, utilizing the APWA color codes. These letters shall be legible and placed at the beginning and end of the locate and at sufficient intervals throughout the locate.



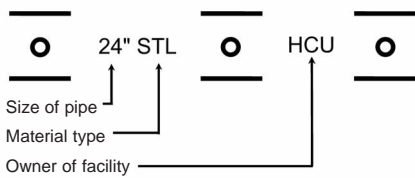
6. When permitted by the operator's records, all utility lines of the same type in the same trench owned by the same operator shall be marked individually or by a single mark. If a single mark is used, the number of the utility lines shall be indicated at every other mark (Commission Rule 20VAC5-309-110. L. See page 9).



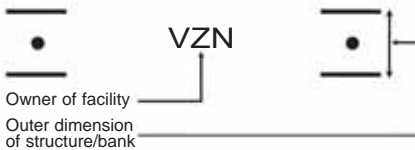
7. When known, the size and material type of the underground pipelines whose nominal outside dimensions are 2-inches or greater but less than 12-inches shall be indicated at every other mark.



8. Pipelines of 12-inches and larger in nominal outside dimension shall be marked as follows:



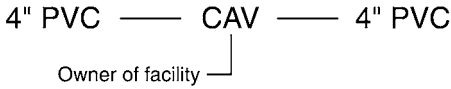
9. To mark a conduit structure or duct bank, the following symbol shall be used:



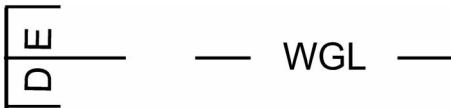
10. In situations where multiple conduits/ducts which are owned and/or operated by different operators are placed together in a bundle fashion, a conduit structure or duct bank marking symbol shall be used by the first operator marking the facility. Other operators owning facilities within the bundle shall verify the marks and add their operator letter designation.



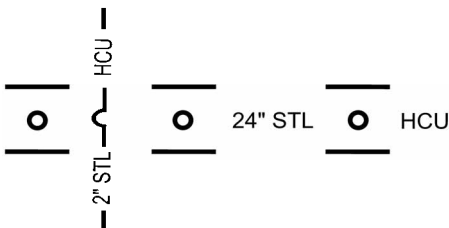
11. When known, the size and material type of a single conduit or duct shall be indicated at every other mark. When size or material type is not known, the conduit or duct shall be marked with the known information and letter "C" at every other mark. If neither size nor material is known, the conduit or duct shall be marked with a letter "C" at every other mark.



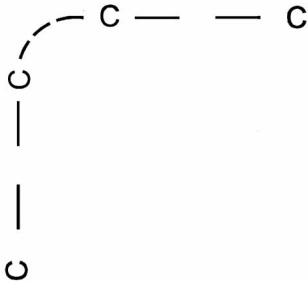
12. Termination points, stub outs, and dead ends shall be marked as follows:



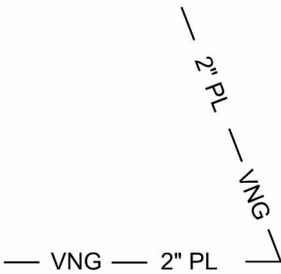
13. Similar utility line crossings with no turns or splices shall be shown by a "hump" crossing over the other utility. Note: The hump does not indicate which line is on top.



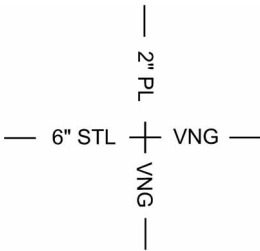
14. Changes in direction and lateral connection to the underground utility lines shall be clearly indicated. On changes in direction, marks shall be placed closer together to show accurately the changes in direction. On lateral connections, marks shall show where the connection exists and the direction of the lateral.



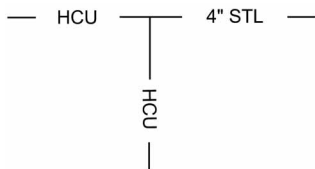
Change in direction



Change in direction



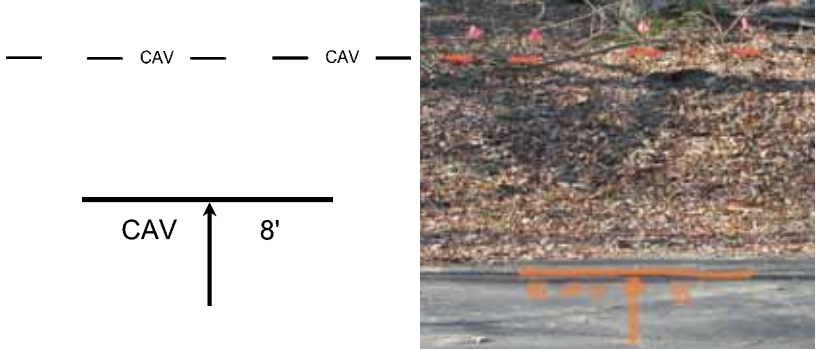
Cross Connection



Lateral Connection



15. In areas where marks may be destroyed (high traffic areas, gravel areas, dirt areas, etc.), or where surface conditions are such that the placement of marks directly over the utility line is not possible, offset markings shall be used. The offset marks should be placed on a permanent surface, which is not likely to be destroyed. When possible, offset marks shall be used in conjunction with marks placed in accordance with (1) above. Offset marks shall include an arrow, pointing in the direction of the utility line, with the distance in feet (measured with an appropriate instrument) to the location of the utility line shown on the right side of the arrow, and size, material type and other information on the left side of the arrow.



16. Valve box covers that are at grade and visible shall be marked with the appropriate color in accordance with the Act (Commission Rule 20VAC5-309-110. F. See page 8). Manhole perimeter, if known, shall be marked. Manhole covers and other surface indicators (test station covers, etc.) shall be marked with the appropriate color, if necessary.



Manhole cover marking

Manhole perimeter marking

Valve box cover marking

17. Marking errors shall be corrected by the locator/operator and communicated to the excavator as soon as possible after the discovery of such errors. Appropriate methods shall be used to remove or cover up the erroneous markings (Example: black paint may be used to cover up erroneous markings on paved areas). In the event of a utility line damage, marking errors shall be preserved in the vicinity of the damaged area of the utility line, if possible, until such marks are documented.



18. The locator shall completely and accurately document markings of utility lines. Documentation shall include, at a minimum:
- a. Date manifest was prepared
  - b. Ticket number
  - c. Address where markings were placed
  - d. Time locate was completed
  - e. A clear sketch of markings with measurements to permanent reference points
  - f. Facility type marked
  - g. Size of utility line (if known)
  - h. Utility line material type (if known)
  - i. Marking types (flags, paint, stakes, etc.)
  - j. Marking symbols used
  - k. Locator's signature
19. Designer ticket marking symbols shall be the same as excavation ticket marking symbols.
20. The following definitions and utility line material type abbreviations shall be used with the above marking Best Practices.

**Definitions**

*Conduit/duct* - A single enclosed raceway (channel, tube, or cylinder) containing one or more lines or cables.

*Conduit structure/duct bank* - A structure containing two or more conduits/ducts.

*Division* - The State Corporation Commission's Division of Utility and Railroad Safety.

*Operator* - Any person who owns, furnishes or transports materials or services by means of a utility line.

*Pipelines* - Underground utility lines used for the transportation of hazardous liquid, steam, water, sewer, storm and gaseous materials.

**Material Type Abbreviations**

- AC . . . . .Asbestos concrete
- CI . . . . .Cast iron
- CPR . . . . .Copper
- DI . . . . .Ductile iron
- FO . . . . .Fiber optic
- FM . . . . .Forced main
- PL . . . . .Plastic
- PVC . . . . .Polyvinyl chloride
- RFC . . . . .Reinforced concrete
- SCC . . . . .Steel cylinder concrete
- STL . . . . .Steel
- TC . . . . .Terra cotta
- TR . . . . .Transite
- W/STL . . . . .Wrapped steel



**State Corporation Commission**  
**Rule 20VAC5-309-110. General Marking Requirements**

- A. All markings shall be suitable for their intended purpose for a period of 15 working days beginning at 7:00 a.m. on the next working day following notice by the excavator to the notification center.
- B. Markings shall be made at sufficient intervals to clearly indicate the approximate horizontal location and direction of the underground utility line. However, the distance between any two marks indicating the same utility line shall not exceed 20 feet. Site conditions or directional changes of the underground utility line shall be considered to determine the need for shorter distance between marks.
- C. Markings of underground utility lines shall be by means of stakes, paint, flags, or combination thereof. The terrain, site conditions, and the type and extent of the proposed excavation shall be considered to determine the most suitable means to mark underground utility lines.
- D. Paint marks shall be approximately 8 to 10 inches in length and one to two inches in width except when "spot" marking is necessary.
- E. A minimum of three separate marks shall be made for each underground utility line marking.
- F. Valve box covers that are at grade and visible shall be marked with the appropriate color in accordance with the Act.
- G. If in the process of marking an underground utility line, a customer-owned underground utility line of the same type is discovered, the operator or its contract locator shall make a reasonable effort to contact the excavator or the customer to advise of the presence of the line.
- H. Where the proposed excavation crosses an underground utility line, markings shall be at intervals that clearly define the route of the underground line.
- I. All markings shall extend if practical, a reasonable distance beyond the boundaries of the specific location of the proposed work as detailed on the ticket.
- J. If the use of line marking is considered damaging to property (driveways, landscaping, historic locations to the extent boundaries are known), "spot" marking or other suitable marking methods shall be used.

- K. Markings shall be valid for an excavation site for 15 working days beginning at 7:00 a.m. on the next working day following notice to the notification center by the excavator or until one of the following events occurs:
1. The markings become faded, illegible or destroyed; or
  2. If the markings were placed in response to an emergency and the emergency condition has ceased to exist.
- L. Where permitted by the operator's records, all utility lines of the same type in the same trench owned by the same operator shall be marked individually or by a single mark. If a single mark is used, the number of the utility lines shall be indicated at every other mark.
- M. Operators or their contract locators shall use all information necessary to mark their facilities accurately.
- N. Markings of an underground pipeline greater than 12 inches in nominal outside dimension shall include the size in inches at every other mark.
- O. Duct structures and conduit systems shall be marked in accordance with the horizontal marking symbols for such structures and conduit systems as shown in item nine of the Virginia Underground Utility Marking Best Practices as provided in the Virginia Underground Utility Marking Standards (March 2004) published by the division ([http://www.state.va.us/scc/division/urs/mutility/va\\_uums.pdf](http://www.state.va.us/scc/division/urs/mutility/va_uums.pdf)).<sup>1</sup>
- P. In areas where marks would be destroyed, offset markings shall be made using horizontal marking symbols as shown in item 15 of the Virginia Underground Utility Marking Best Practices as provided in the Virginia Underground Utility Marking Standards (March 2004) published by the division ([http://www.state.va.us/scc/division/urs/mutility/va\\_uums.pdf](http://www.state.va.us/scc/division/urs/mutility/va_uums.pdf)).<sup>1</sup>
- Q. The assigned letter designations for each operator to be used in conjunction with markings of underground utility lines shall be the same as those assigned by the notification center certified for a geographic area, subject to the review of the same and approval of such designations in writing by the advisory committee. Such approved designations by the advisory committee shall be deemed final unless appealed to the commission within 30 days of the advisory committee's written evidence of approval. Operators wishing to appeal the letter designations assigned in accordance with this section may file an appropriate formal pleading with the commission seeking review of the assigned letter designation within 30 days of the issuance of the written approval of the advisory committee.
- R. The symbols for marking of underground utility lines in compliance with §56-265.19 F(ii) of the Act shall be the same as those shown in the Virginia Underground Utility Marking Standards (March 2004) published by the division ([http://www.state.va.us/scc/division/urs/mutility/va\\_uums.pdf](http://www.state.va.us/scc/division/urs/mutility/va_uums.pdf)).<sup>1</sup>

<sup>1</sup> ***Effective January 3, 2005, The Virginia Underground Utility Marking Standards booklet is located at [http://www.scc.virginia.gov/division/urs/mutility/va\\_uums.pdf](http://www.scc.virginia.gov/division/urs/mutility/va_uums.pdf)***

## Locator Response Codes

*Effective May 2005*

### **10 Marked.**

Code 10 shall be used when all utility lines within the area of proposed excavation have been marked.

### **11 Marked; abandoned utility lines may be in area.**

Code 11 shall be used when all utility lines within the area of proposed excavation have been marked and the operator/locator is aware of the presence of abandoned utility lines.

### **12 Marked up to privately owned utility; contact private utility owner for locate.**

Code 12 shall be used when all utility lines within the area of proposed excavation have been marked and the operator/locator is aware of the presence of a private utility line.

### **13 Marked up to privately owned utility; contact private utility owner for locate. Abandoned utility lines may be in area.**

Code 13 shall be used when all utility lines within the area of proposed excavation have been marked and the operator/locator is aware of the presence of both private utility lines and abandoned utility lines.

### **30 No conflict; utility is outside of stated work area.**

Code 30 shall be used when the operator/locator has determined that no utility lines are in the area of proposed excavation.

### **31 No conflict; utility is outside of stated work area. Abandoned utility lines may be in area.**

Code 31 shall be used when the operator/locator has determined that no utility lines are in the area of proposed excavation and the operator/locator is aware of the presence of abandoned utility lines.

### **32 No conflict; privately owned utility on property. Contact private utility owner for locate.**

Code 32 shall be used when the operator/locator has determined that no utility lines are in the area of proposed excavation and the operator/locator is aware of the presence of private utility lines.

**33 No conflict; privately owned utility on property. Contact private utility owner for locate. Abandoned utility lines may be in area.**

Code 33 shall be used when the operator/locator has determined that no utility lines are in the area of proposed excavation and the operator/locator is aware of the presence of both private utility lines and abandoned utility lines.

**40 Agree to meeting as proposed by excavator.**

Code 40 shall be used when the operator/locator agrees to a meeting as proposed by the excavator. The meeting must take place by 7:00 a.m. on the third working day following the meeting notice.

**42 Mutually agreed to alternative meeting time and location.**

Code 42 shall be used when an operator/locator is unable to attend a meeting as proposed by the excavator. The operator/locator shall set up a mutually agreeable time and location to meet no later than 7:00 a.m. on the third working day following the meeting notice. Both excavator and operator/locator are encouraged to document the arrangements.

**50 Installation records, maps or other documents have been provided.**

Code 50 shall be used in response to a designer ticket when the designer does not request field markings to be placed. The information provided by the operator/locator may include, but is not limited to, maps, surveys, installation records, as-built records, or other means.

**60 Locator and excavator agreed and documented marking schedule.**

Code 60 shall be used when an operator/locator is unable to mark the ticket within 48 hours beginning at 7:00 a.m. the next working day following the excavator's call to the notification center. The operator/locator must contact the excavator and all parties must agree to an alternate marking schedule before the placement of this code. Operator/locator must document agreement in writing (electronic or paper) to include, at a minimum, full name of excavator representative agreeing to the schedule, the excavator's phone number, excavator's signature if possible, reasons for the marking schedule, and date and time of the agreement.

**61 Locator and excavator agreed and documented marking schedule. Abandoned utility lines may be in the area.**

Code 61 shall be used when an operator/locator is unable to mark the ticket within 48 hours beginning at 7:00 a.m. the next working day following the excavator's call to the notification center and the operator/locator is aware of the presence of abandoned utility lines. The operator/locator must contact the excavator and all parties must agree to an alternate marking schedule before the placement of this code. Operator/locator must document agreement in writing (electronic or paper) to include, at a minimum, full name of excavator representative agreeing to the schedule, the excavator's phone number, excavator's signature if possible, reasons for the marking schedule, and date and time of the agreement.

**70 Critical facility marked; locator or utility operator must contact excavator and must be present during excavation.**

Code 70 shall only be used when the operator's presence is necessary during the excavation due to the fact that the underground utility line is of such importance to the utility's system operation that an outage of the facility will have significant impact on the company's operation and its customers. Such underground utility line must be marked. When an operator/locator responds to a ticket with a code 70, it shall be the operator/locator's responsibility to provide the excavator with the appropriate name and contact information for the excavator to use to inform the operator of the date and time when the excavation will commence. Operator must be present during excavation.

**71 Critical facility not marked; locator or utility operator must contact excavator and must be present during excavation.**

Code 71 shall only be used when the operator's presence is necessary during the excavation due to the fact that the underground utility line is of such importance to national security that marking it in accordance with the Underground Utility Damage Prevention Act is not appropriate. When an operator/locator responds to a ticket with code 71, it shall be the operator/locator's responsibility to provide the excavator with the appropriate name and contact information for the excavator to use to inform the operator of the date and time when excavation will commence. Operator must be present during excavation.

**90 Locator could not gain access to property; locator will contact excavator.**

When an operator/locator responds to a ticket with code 90, it shall be the operator/locator's responsibility to inform the excavator of their inability to gain access to the property to mark the area of excavation. The operator/locator shall inform the excavator before the response is due on the positive response system. It shall be the excavator's responsibility to make the property accessible to the operator/locator and call a new ticket for those operators who initially responded to the ticket with a code 90, if necessary.

**91 Incorrect address information; please call Miss Utility and provide correct information.**

Code 91 shall be used when the excavator has provided incorrect address information to the notification center. The operator/locator shall make a reasonable attempt to contact the excavator to verify the address information before the placement of this code. It shall be the excavator's responsibility to verify the address information and call the notification center to request a new ticket with the correct information.

**93 Scope of work is too large; please call Miss Utility to reschedule.**

Code 93 shall be used when the area of proposed excavation exceeds the limits of a work area as defined in § 56-265.17. F. It shall be the excavator's responsibility to call the notification center and request a new ticket or tickets that complies with § 56-265.17. F.

**94 Marking instructions are unclear; please call Miss Utility to reschedule.**

Code 94 shall be used when the operator/locator is unable to determine the area of proposed excavation according to the marking instructions on the ticket. The operator/locator must make a reasonable attempt to contact the excavator to clarify the instructions. It shall be the excavator's responsibility to call the notification center and request a new ticket with clear marking instructions.

**96 No response required from this terminal.**

Code 96 shall be used if no response is required from a specific terminal ID code. If an operator has multiple terminal codes that overlap, they may choose to use Code 96 to display that a certain terminal is not responding. If a ticket is cancelled, the operator/locator shall use this code to respond. (VUPS will not post responses on a cancelled ticket to the Positive Response system.) Operator/locators are encouraged to document the reason that no response was required.

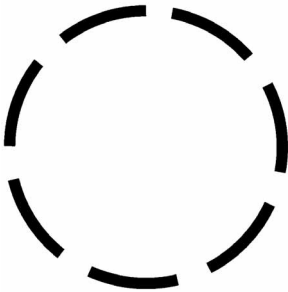
**97 Extraordinary circumstances exist.**

Code 97 is only used in the event that extraordinary circumstances exist. These circumstances may include: floods, snow, ice storms, tornadoes, earthquakes, other natural disasters, blackouts, and massive computer network failures.

## Virginia White Lining Best Practices

In the event a specific description of a location of excavation cannot be given, the route or boundary of the excavation site shall be marked by white paint ("white lining"), if practical.

1. Excavators are encouraged to use white lining, when practical, to show the locators the area where excavation will take place. This will reduce the need to precisely describe the area of planned excavation in words, reduce unnecessary work locating underground utility lines that are not involved in the excavation area and reduce unnecessary paint on our streets, roads, sidewalks, etc.
2. For single point excavation, mark (using white paint) the area by the use of dots or dashes to show the operators/locators the area of excavation. If necessary, use white flags. If utility markings are desired outside a white lined area, the excavator shall provide clear instructions (including distance in feet outside the white lined area) to the notification center. Instances where this would be desirable are installing poles, pedestals, manholes, landscaping, etc.



3. For continuous excavation (trenching, boring, etc.), mark the center line of excavation with dots or dashes. Excavation width (in feet) shall be indicated on either side of the center line in legible figures or noted in the marking instructions given to the notification center.





## Local Damage Prevention Committees

Local damage prevention committees are groups of stakeholders who are concerned about preventing damage to underground utilities.

By becoming an active member, you will have the opportunity to discuss, in an informal setting, your concerns and ideas related to preventing damage to underground utility lines, and become part of a local and statewide network of stakeholders through which important damage prevention information is communicated quickly and effectively.

Additionally, your local damage prevention committee fosters partnership! Developing partnerships with other stakeholders can result in open communication, problem solving and avoiding conflicts.

There is no cost to become a member, and in fact, regular participation at meetings builds "educational credits." Educational credits can be applied to reduce the amount of a potential civil penalty associated with a violation of the Miss Utility Law!

Local damage prevention committees meet on a regular basis in the following five geographic areas of the Commonwealth:

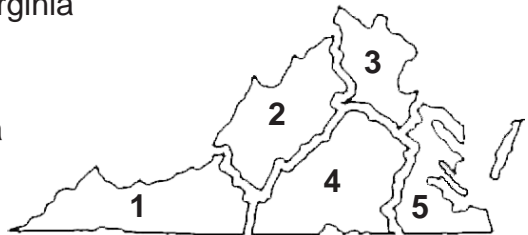
Area 1: Southwestern Virginia

Area 2: Western Virginia

Area 3: Northern Virginia

Area 4: Central Virginia

Area 5: Eastern Virginia, including the Eastern Shore



For more information on the next meeting in your area, contact the Virginia State Corporation Commission at 804.371.9980, or visit Miss Utility on the web at [www.missutilityofvirginia.com](http://www.missutilityofvirginia.com) (hyperlink "Events").





## APWA Color Codes



RED - Electric Power Lines, Cables, Conduit and Lighting Cables



YELLOW - Gas, Oil, Steam, Petroleum or Gaseous Materials



ORANGE - Communications, Alarm or Signal Lines, Cables or Conduit



BLUE - Potable Water



PURPLE - Reclaimed Water, Irrigation and Slurry Lines



GREEN - Sewer and Drain Lines



PINK - Temporary Survey Markings



WHITE - Proposed Excavation

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### Miss Utility's Statewide Telephone Numbers:

**Miss Utility . . . . .1-800-552-7001**

**Check Ticket Status . . . .1-800-552-3120**