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SENATE BILL NO. 1173

Offered January 8, 2025

Prefiled January 7, 2025

A BILL to amend and reenact §§ 1-600 through 1-603, 1-605, 1-606, 1-608, and 45.2-542 of the Code of Virginia, relating to Virginia coordinate systems; federal updates.

Patron—Suetterlein

Referred to Committee on Transportation

Be it enacted by the General Assembly of Virginia:

1. That §§ 1-600 through 1-603, 1-605, 1-606, 1-608, and 45.2-542 of the Code of Virginia are amended and reenacted as follows:

§ 1-600. Virginia coordinate systems designated.

The systems of plane coordinates that have been established by the National Ocean Service/National Geodetic Survey or its successors for defining and stating the positions or locations of points on the surface of the earth within the Commonwealth are to be known and designated as the "Virginia Coordinate System of 1927," and the "Virginia Coordinate System of 1983," and the "Virginia Coordinate System of 2022."

§ 1-601. North and South Zones.

For the purpose of the use of the Virginia Coordinate System of 1927 and, the Virginia Coordinate System of 1983, and the Virginia Coordinate System of 2022, the Commonwealth is divided into a "North Zone" and a "South Zone."

The area now included in the following counties and cities shall constitute the North Zone: Arlington, Augusta, Bath, Caroline, Clarke, Culpeper, Fairfax, Fauquier, Frederick, Greene, Highland, King George, Loudoun, Madison, Orange, Page, Prince William, Rappahannock, Rockingham, Shenandoah, Spotsylvania, Stafford, Warren, and Westmoreland Counties and the Cities of Alexandria, Fairfax, Falls Church, Fredericksburg, Harrisonburg, Manassas, Manassas Park, Staunton, Waynesboro, and Winchester.

The area now included in the following counties and cities shall constitute the South Zone: Accomack, Albemarle, Alleghany, Amelia, Amherst, Appomattox, Bedford, Bland, Botetourt, Brunswick, Buchanan, Buckingham, Campbell, Carroll, Charles City, Charlotte, Chesterfield, Craig, Cumberland, Dickenson, Dinwiddie, Essex, Floyd, Fluvanna, Franklin, Giles, Gloucester, Goochland, Grayson, Greenville, Halifax, Hanover, Henrico, Henry, Isle of Wight, James City, King and Queen, King William, Lancaster, Lee, Louisa, Lunenburg, Mathews, Mecklenburg, Middlesex, Montgomery, Nelson, New Kent, Northampton, Northumberland, Nottoway, Patrick, Pittsylvania, Powhatan, Prince Edward, Prince George, Pulaski, Richmond, Roanoke, Rockbridge, Russell, Scott, Smyth, Southampton, Surry, Sussex, Tazewell, Washington, Wise, Wythe, and York Counties and the Cities of Bristol, Buena Vista, Charlottesville, Chesapeake, Colonial Heights, Covington, Danville, Emporia, Franklin, Galax, Hampton, Hopewell, Lexington, Lynchburg, Martinsville, Newport News, Norfolk, Norton, Petersburg, Poquoson, Portsmouth, Radford, Richmond, Roanoke, Salem, Suffolk, Virginia Beach, and Williamsburg.

§ 1-602. Designation of systems in land description.

A. As established for use in the North Zone, the Virginia Coordinate System of 1927 ~~or~~, the Virginia Coordinate System of 1983, or the Virginia Coordinate System of 2022 shall be named, and in any land description in which it is used, it shall be designated the "Virginia Coordinate System of 1927, North Zone," ~~or~~ "Virginia Coordinate System of 1983, North Zone," or "Virginia Coordinate System of 2022, North Zone."

B. As established for use in the South Zone, the Virginia Coordinate System of 1927 ~~or~~, the Virginia Coordinate System of 1983, or the Virginia Coordinate System of 2022 shall be named, and in any land description in which it is used, it shall be designated the "Virginia Coordinate System of 1927, South Zone," ~~or~~ "Virginia Coordinate System of 1983, South Zone," or "Virginia Coordinate System of 2022, South Zone."

§ 1-603. Plane coordinates used in systems.

The plane coordinates of a point on the earth's surface, to be used in expressing the position or location of such point in the appropriate zone of these systems, shall be expressed in U.S. survey international feet and decimals of a foot. One of these distances, to be known as the "x-coordinate," shall give the position in an east-and-west direction; the other, to be known as the "y-coordinate," shall give the position in a north-and-south direction. These coordinates shall be made to depend upon and conform to the coordinate values for the monumented points of the North American Horizontal Geodetic Control Network as published by the National Ocean Service/National Geodetic Survey, or its successors, and whose plane coordinates have been computed on the systems defined in this chapter. Any such station may be used for establishing a survey connection to either Virginia coordinate system.

When converting coordinates in the Virginia Coordinate System of 1983 or the Virginia Coordinate

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59 *System of 2022* from meters and decimals of a meter to feet and decimals of a foot, the ~~U.S. survey I~~  
 60 *nternational* foot conversion factor (one foot equals ~~1200/3937~~ 0.3048 meters) shall be used. ~~This~~  
 61 ~~requirement does not preclude the continued use of the International foot conversion factor (one foot equals~~  
 62 ~~0.3048 meters) in those counties and cities where this factor was in use prior to July 1, 1992.~~ The plat or plan  
 63 shall contain a statement of the conversion factor used and the coordinate values of a minimum of two project  
 64 points in feet.

65 **§ 1-605. Definition of systems by National Ocean Service/National Geodetic Survey; adopted.**

66 A. For purposes of more precisely defining the Virginia Coordinate System of 1927, the following  
 67 definition by the National Ocean Service/National Geodetic Survey is adopted:

68 The Virginia Coordinate System of 1927, North Zone, is a Lambert conformal projection of the Clarke  
 69 spheroid of 1896, having standard parallels at north latitudes 38° 02' and 39° 12', along which parallels the  
 70 scale shall be exact. The origin of coordinates is at the intersection of the meridian 78° 30' west of Greenwich  
 71 with the parallel 37° 40' north latitude, such origin being given the coordinates: x = 2,000,000'; and y = 0'.

72 The Virginia Coordinate System of 1927, South Zone, is a Lambert conformal projection of the Clarke  
 73 spheroid of 1896, having standard parallels at north latitudes 36° 46' and 37° 58', along which parallels the  
 74 scale shall be exact. The origin of coordinates is at the intersection of the meridian 78° 30' west of Greenwich  
 75 with the parallel 36° 20' north latitude, such origin being given the coordinates: x = 2,000,000'; and y = 0'.

76 B. For purposes of more precisely defining the Virginia Coordinate System of 1983, the following  
 77 definition by the National Ocean Service/National Geodetic Survey is adopted:

78 The Virginia Coordinate System of 1983, North Zone, is a Lambert conformal conic projection based on  
 79 the North American Datum of 1983, having standard parallels at north latitudes 38° 02' and 39° 12', along  
 80 which parallels the scale shall be exact. The origin of coordinates is at the intersection of the meridian 78° 30'  
 81 west of Greenwich and the parallel 37° 40' north latitude, such origin being given the coordinates: x =  
 82 3,500,000 meters and y = 2,000,000 meters.

83 The Virginia Coordinate System of 1983, South Zone, is a Lambert conformal conic projection based on  
 84 the North American Datum of 1983, having standard parallels at north latitudes 36° 46' and 37° 58', along  
 85 which parallels the scale shall be exact. The origin of coordinates is at the intersection of the meridian 78° 30'  
 86 west of Greenwich and the parallel 36° 20' north latitude, such origin being given the coordinates: x =  
 87 3,500,000 meters and y = 1,000,000 meters.

88 C. For purposes of more precisely defining the Virginia Coordinate System of 2022, the following  
 89 definition by the National Ocean Service/National Geodetic Survey is adopted:

90 The Virginia Coordinate System of 2022, North Zone, is a Lambert conformal conic, one parallel  
 91 projection based on the North American Terrestrial Reference Frame of 2022, having one standard parallel  
 92 at north latitude 38° 36', along which parallel the scale shall be exact. The origin of coordinates is at the  
 93 intersection of the meridian 78° 15' west of Greenwich and the parallel 38° 36' north latitude, such origin  
 94 being given the coordinates: x = 457,2000 meters and y = 190,500 meters.

95 The Virginia Coordinate System of 2022, South Zone is a Lambert conformal conic, one parallel  
 96 projection based on the North American Terrestrial Reference Frame of 2022, having one standard parallel  
 97 at north latitude 37° 21', along which parallel the scale shall be 0.999990. The origin of coordinates is at the  
 98 intersection of the meridian 79° 30' west of Greenwich and the parallel 37° 21' north latitude, such origin  
 99 being given the coordinates: x = 685,800 meters and y = 190,500 meters.

100 **§ 1-606. Position of systems.**

101 The position of the Virginia coordinate systems shall be as marked on the ground by triangulation or  
 102 traverse stations established in conformity with the standards of accuracy and specifications for first-order  
 103 and second-order geodetic surveying as prepared and published by the Federal Geodetic Control  
 104 Subcommittee of the Federal Geographic Data Committee of the U.S. Department of Commerce. The  
 105 geodetic position of stations defining the position of the Virginia Coordinate System of 1927 shall have been  
 106 rigidly adjusted on the North American Datum of 1927, and the plane coordinates shall have been computed  
 107 on the Virginia Coordinate System of 1927. The geodetic position of stations defining the position of the  
 108 Virginia Coordinate System of 1983 shall have been rigidly adjusted on the North American Datum of 1983,  
 109 and the plane coordinates shall have been computed on the Virginia Coordinate System of 1983. *The geodetic*  
 110 *position of stations defining the position of the Virginia Coordinate System of 2022 shall have been rigidly*  
 111 *adjusted on the North American Terrestrial Reference Frame of 2022, and the plane coordinates shall have*  
 112 *been computed on the Virginia Coordinate System of 2022.* Any such station may be used for establishing a  
 113 survey connection with the Virginia coordinate systems.

114 **§ 1-608. Limitation on use of name of systems.**

115 The use of the terms "Virginia Coordinate System of 1927," ~~or~~ "Virginia Coordinate System of 1983," *or*  
 116 *" Virginia Coordinate System of 2022"* on any map, report of survey, or other document shall be limited to  
 117 coordinates based on the Virginia coordinate systems as defined in this chapter.

118 **§ 45.2-542. Maps of mines required to be made; contents; extension and preservation; use by**  
 119 **Department; release; posting of map.**

120 A. Prior to commencing mining activity, the operator of a coal mine or his agent shall make or cause to be

121 made, unless already made and filed, an accurate map of such mine. Such map shall be submitted to the Chief  
 122 prior to producing coal at the mine. All maps shall be presented on the Virginia Coordinate System of 1983  
 123 2022, South Zone, unless otherwise approved by the Chief. At intervals not to exceed 12 months and when a  
 124 coal mine is abandoned, the operator shall submit to the Chief copies of an up-to-date map of the entire mine  
 125 in an electronic format approved by the Chief. The operator shall also submit to the Chief revisions that show  
 126 directional changes whenever mine projections deviate more than 600 feet from the approved mine map.  
 127 Only maps in an electronic format shall be accepted unless otherwise approved by the Chief. If there are no  
 128 changes in the information required to be submitted pursuant to this section at the time an updated map is  
 129 due, the operator may submit a notice that there are no changes to the map in lieu of submitting an updated  
 130 map to the Department.

131 B. Underground coal mine maps shall show:

- 132 1. The active workings;
- 133 2. All pillared, worked out, and abandoned areas, except as provided in this section;
- 134 3. Entries and air courses with the quantity of airflow, direction of airflow indicated by arrows, and  
 135 ventilation controls;
- 136 4. Contour lines of all elevations;
- 137 5. Dip of the coalbed;
- 138 6. Escapeways;
- 139 7. The locations that are known or should be known of (i) adjacent mine workings within 1,000 feet, (ii)  
 140 mines above or below, and (iii) water pools above;
- 141 8. Either producing or abandoned oil and gas wells located within 500 feet of such mine and in any  
 142 underground area of such mine; and
- 143 9. Other information the Chief requires.

144 Such map shall identify those areas of the mine that have been pillared, worked out, or abandoned that are  
 145 inaccessible or that cannot be entered safely.

146 C. Additional information required to be shown on underground coal mine maps includes:

- 147 1. The mine name, company name, mine index number, and name of the person responsible for  
 148 information on the map;
- 149 2. The scale and orientation of the map and symbols used on the map;
- 150 3. The property or boundary lines of the mine;
- 151 4. All known drill holes that penetrate the coalbed being mined;
- 152 5. All shaft, slope, drift, and tunnel openings and auger and strip mined areas of the coalbed being mined;
- 153 6. The location of all surface mine ventilation fans. The location may be designated on the mine map by  
 154 symbols;
- 155 7. The location of railroad tracks and public highways leading to the mine and mine buildings of a  
 156 permanent nature with identifying names shown;
- 157 8. The location and description of a least two permanent base line points coordinated with the  
 158 underground and surface mine traverses and the location and description of at least two permanent elevation  
 159 bench marks used in connection with establishing or referencing mine elevation surveys;
- 160 9. The location and elevation of any body of water dammed or held back in any portion of the mine;  
 161 however, such bodies of water may be shown on overlays or tracings attached to the mine maps used to show  
 162 contour lines as provided under subdivision 12;
- 163 10. The elevations of tops and bottoms of shafts and slopes and the floor at the entrance to drift and tunnel  
 164 openings;
- 165 11. The elevation of the floor at intervals of not more than 200 feet in (i) at least one entry of each  
 166 working section and main and cross entries; (ii) the last line of open crosscuts of each working section, and  
 167 main and cross entries before such sections and main and cross entries that are abandoned; and (iii) rooms  
 168 advancing toward or adjacent to property or boundary lines or adjacent mines; and
- 169 12. Contour lines passing through whole number elevations of the coalbed being mined. The spacing of  
 170 such lines shall not exceed 10-foot elevation levels, except that a broader spacing of contour lines may be  
 171 approved by the Chief for steeply pitching coalbeds. Contour lines may be placed on overlays or tracings  
 172 attached to mine maps.

173 D. Underground coal mine maps submitted to the Chief shall be on a scale of not less than 100 or more  
 174 than 500 feet to the inch. Mapping of the underground mine works shall be completed by a closed loop  
 175 survey method of traversing or other equally accurate methods of traversing. All closed loop surveys shall  
 176 meet a minimum accuracy standard of one part in 5,000. Elevations shall be tied to either the United States  
 177 Geological Survey or the National Geodetic Survey bench mark system. A registered engineer or licensed  
 178 land surveyor shall certify that the map of the mine workings is accurate.

179 E. Underground coal mine maps shall be kept up to date by temporary notations and revised and  
 180 supplemented at intervals not to exceed six months based on a survey made and certified by a registered  
 181 engineer or licensed land surveyor who has exercised complete direction and control over the work to which

182 it is affixed. Temporary notations shall include:  
183 1. The location of each working face of each working place;  
184 2. Pillars mined or other such second mining;  
185 3. Permanent ventilation controls constructed or removed, such as seals, overcasts, undercasts, regulators,  
186 and permanent stoppings, and the direction of air currents indicated; and  
187 4. Escapeways designated by means of symbols.  
188 F. At underground coal mines, an accurate map of the mine showing clearly all avenues of ingress and  
189 egress in case of fire shall be posted in a place accessible to all miners.  
190 G. Surface coal mine maps shall show:  
191 1. The name and address of the mine;  
192 2. The property or boundary lines of the active areas of the mine;  
193 3. Contour lines passing through whole number elevations of the coalbed being mined. The spacing of  
194 such lines shall not exceed 25-foot elevation levels, except that a broader spacing of contour lines may be  
195 approved by the Chief for steeply pitching coalbeds. The Chief may approve alternate means of delineating  
196 seam elevations where multiple seams are being mined. Contour lines may be placed on overlays or tracings  
197 attached to mine maps;  
198 4. The general elevation of each coalbed being mined and the general elevation of the surface;  
199 5. Each producing or abandoned gas or oil well or gas transmission line located on the mine property;  
200 6. The location and elevation of any body of water dammed or held back in any portion of the mine;  
201 however, such body of water may be shown on overlays or tracings attached to the mine maps;  
202 7. Every prospect drill hole that penetrates a coalbed being mined on the mine property;  
203 8. Every auger or surface-mined area of a coalbed being mined on the mine property together with the line  
204 of maximum depth of holes drilled during auger mining operations;  
205 9. All worked out and abandoned areas;  
206 10. The location of railroad tracks and public highways leading to the mine and mine buildings of a  
207 permanent nature with identifying names shown;  
208 11. Underground coal mine workings underlying and within 1,000 feet of any active area of the mine;  
209 12. The location and description of at least two permanent baseline points and the location and description  
210 of at least two permanent elevation bench marks used in connection with establishing or referencing mine  
211 elevation surveys;  
212 13. The scale of the map; and  
213 14. Other information required by the Chief.  
214 H. Surface coal mine maps shall be kept up to date by temporary notations and revised and supplemented  
215 at intervals not to exceed six months based on a survey made and certified by a registered engineer or  
216 licensed land surveyor who has exercised complete direction and control over the work to which it is affixed.  
217 Temporary notations shall include:  
218 1. The location of each working pit;  
219 2. Auger or highwall miner workings; and  
220 3. Other information that might affect the safety of miners, including updates of gas well or gas line  
221 locations.  
222 I. Each surface survey shall originate from at least two permanent survey monuments on the mine  
223 property located with a minimum accuracy standard of one part in 10,000. The monuments shall be clearly  
224 referenced on the mine map. Elevations shall be tied to either the United States Geological Survey or the  
225 National Geodetic Survey bench mark system.  
226 J. The original map, or a true copy thereof, shall be left by the operator at the active mine, open at all  
227 reasonable times for the examination and use of the mine inspector.  
228 K. Such maps may be used by the Department for the evaluation of the coal resources of the  
229 Commonwealth.  
230 L. The map shall be filed and preserved among the records of the Department and copies of such maps  
231 shall be made available at a reasonable cost.  
232 M. Any person who has conducted mining operations or prepared mine maps and who has a map or  
233 surveying data of any worked out or abandoned underground coal mine shall on request make such map or  
234 data available to the Department to copy or reproduce.  
235 **2. That the provisions of this act shall become effective upon the official release by the National**  
236 **Oceanic and Atmospheric Administration's National Geodetic Survey of the State Plane Coordinate**  
237 **System of 2022. Old Dominion University, in its capacity as the authorized state agency for Virginia**  
238 **coordinate systems pursuant to Chapter 6 (§ 1-600 et seq. of the Code of Virginia) of Title 1, shall**  
239 **certify in writing to the Virginia Code Commission when such contingency has been met.**