Attachment 3

Revision FSAR Chapter 2, Subsection 2.5.4

Subsection 2.5.4	**FIGURE 2.5.4-209**	**Figure 2.5.4-233a**
Table 2.5.4-202	**Figure 2.5.4-210**	**Figure 2.5.4-233b**
Table 2.5.4-203	**Figure 2.5.4-211**	**Figure 2.5.4-233c**
Table 2.5.4-211	**Figure 2.5.4-212**	**Figure 2.5.4-233d**
Table 2.5.4-216	**Figure 2.5.4-213**	**Figure 2.5.4-233e**
Table 2.5.4-217	**Figure 2.5.4-214**	**Figure 2.5.4-233f**
Table 2.5.4-222	**Figure 2.5.4-215**	**Figure 2.5.4-233g**
Table 2.5.4-224A	**Figure 2.5.4-216**	**Figure 2.5.4-234**
Table 2.5.4-224B	**Figure 2.5.4-218**	**Figure 2.5.4-235**
Table 2.5.4-224C	**Figure 2.5.4-219**	**Figure 2.5.4-236**
Table 2.5.4-225A	**Figure 2.5.4-220**	**Figure 2.5.4-237**
Table 2.5.4-225B	**Figure 2.5.4-221**	**Figure 2.5.4-238**
Table 2.5.4-225C	**Figure 2.5.4-222**	**Figure 2.5.4-239**
Table 2.5.4-226 – Deleted	**Figure 2.5.4-223**	**Figure 2.5.4-240**
Table 2.5.4-226A	**Figure 2.5.4-224**	**Figure 2.5.4-241**
Table 2.5.4-226B	**Figure 2.5.4-225**	**Figure 2.5.4-243**
Table 2.5.4-227	**Figure 2.5.4-226**	**Figure 2.5.4-244a**
Table 2.5.4-228	**Figure 2.5.4-227**	**Figure 2.5.4-244b**
Table 2.5.4-229	**Figure 2.5.4-228**	**Figure 2.5.4-244c**
Table 2.5.4-230	**Figure 2.5.4-229**	**Figure 2.5.4-244d**
Figure 2.5.4-201	**Figure 2.5.4-230**	**Figure 2.5.4-244e**
Figure 2.5.4-202	**Figure 2.5.4-231**	**Figure 2.5.4-245**
Figure 2.5.4-207	**Figure 2.5.4-232**	**Figure 2.5.4-246 - Deleted**
Figure 2.5.4-208	**Figure 2.5.4-233 - Deleted**	**Figure 2.5.4-247**

Attachment 3

Revision FSAR Chapter 2, Subsection 2.5.4

(Continued)

Figure 2.5.4-248

Figure 2.5.4-249 - Deleted

Figure 2.5.4-250

Figure 2.5.4-251a

Figure 2.5.4-251b

Figure 2.5.4-251c

Figure 2.5.4-252 - Deleted

Figure 2.5.4-252a

Figure 2.5.4-252b

Figure 2.5.4-252c

Figure 2.5.4-255a

Figure 2.5.4-255b

Figure 2.5.4-255c

Figure 2.5.4-256a

Figure 2.5.4-256b

Figure 2.5.4-260

Figure 2.5.4-261

Figure 2.5.4-262

Figure 2.5.4-263

Figure 2.5.4-264

Figure 2.5.4-265

Figure 2.5.4-266

Figure 2.5.4-267

1. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4, third paragraph is revised as follows:

The information presented in this Subsection was developed on the basis of evaluations of historic field explorations performed for the Cherokee Nuclear Station (CNS) and field investigations for Lee Nuclear Station, Units 1 and 2 completed between early 2006 and mid-2007, and the 2012 field data (described below). Further information was gathered using geophysical investigations and laboratory tests conducted on soil and rock samples obtained during the field exploration program for Lee Nuclear Station. Results from historic site investigations for Cherokee Nuclear Station are presented in the Preliminary Safety Analysis Report (PSAR) (Reference 201) and Final Safety Evaluation Report (Reference 202).

Additional field work consisting of borings and geophysical tests was performed in 2012 to obtain additional geotechnical data at the nuclear islands to confirm the applicability of the 2006-2007 data. The information provided for the Lee Nuclear Station Units 1 and 2 is based on data from historic field explorations for the Cherokee Nuclear Station, the field explorations for the Lee Nuclear Station completed in 2006 and 2007, and the 2012 field data.

2. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.2.1.1, eighth paragraph, bulleted list is revised to add a new last bullet as follows:

- Appendix 2AA, Attachment 6, Lee Nuclear Station Geotechnical Boring Logs, 2012 Exploration.

3. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.2.1.6.3, first paragraph, fourth sentence is revised as follows:

The borehole geophysical test locations performed as part of the Lee Nuclear Station 2006-2007 exploration and 2012 exploration are shown on Figure 2.5.4-215.

4. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.2.2.2, first paragraph, first sentence is revised as follows:

For the borings of the Lee Nuclear Station exploration in 2006-2007 and 2012 ~~and 2007~~, rock coring was performed, when assigned, for those materials that could not be penetrated with soil drilling methods.

5. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.2.2.5, first paragraph, first sentence is revised as follows:

An on-site sample storage facility was established for the Lee Nuclear Station exploration in 2006-2007 and 2012 in a warehouse building that remained on-site from Cherokee Nuclear Station Site construction activities.

6. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.2.3, first paragraph is revised to add a new sentence after the third sentence as follows:

No additional laboratory tests were performed in 2012.

8. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.2.4.1, first paragraph is revised to add a new sentence after the fourth sentence as follows:

The explorations in 2012 encountered only rock and the pre-existing concrete; these materials are already included in the geotechnical model.

9. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.2.4.1.6, first paragraph, third sentence is revised as follows:

At the time of the Lee Nuclear Station exploration program in 2006, ~~and~~ 2007 and 2012, the pre-existing concrete was encountered in the Cherokee Nuclear Station Unit 1 construction area.

10. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.3, second paragraph, first sentence is revised as follows:

The Lee Nuclear Station Site investigation program was conducted in 2006, ~~and~~ 2007 and 2012.

11. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.3.1 is revised as follows:

A comprehensive exploration program of surface geophysics, in situ testing, and subsurface drilling and sampling was conducted in 2006-2007 as shown in a site view on Figure 2.5.4-208 and Power Block and Adjacent Areas on Figure 2.5.4-209. These figures show the principal and secondary exploration borings and other field explorations performed. The historic boring locations on this figure are identified to distinguish them from the 2006-2007 boring and test locations. The locations of groundwater monitoring wells constructed and packer test performed as part of the Lee Nuclear Station exploration are shown on Figure 2.5.4-210. Figure 2.5.4-211 shows the location of SASW survey lines at the Lee Nuclear Station Site. The location of CPT tests performed as part of the Lee Nuclear Station exploration is shown on Figure 2.5.4-212. The location of test pits and trenches excavated as part of the Lee Nuclear Station exploration is shown on Figure 2.5.4-213. The Goodman Jack and borehole pressuremeter test locations performed as part of the Lee Nuclear Station exploration are shown on Figure 2.5.4-214. The borehole geophysical test locations performed as part of the Lee Nuclear Station 2006-2007 exploration and 2012 exploration are shown on Figure 2.5.4-215. The petrographic test locations performed as part of the Lee Nuclear Station exploration are shown on Figure 2.5.4-216.

The geotechnical field exploration program in 2012 consisted of additional borings, some with borehole geophysical tests consisting of P-S velocity measurements and/or acoustic televiewer logging. The locations of the borings made in 2012 are shown on Figure 2.5.4-209 in addition to those made in 2006-2007. The locations of the borings with borehole geophysical tests in 2012 are shown on Figure 2.5.4-215 in addition to those made in 2006-2007.

12. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.3.2, first paragraph, fourth sentence is revised and a fifth sentence added as follows:

The exploration locations made in 2006-2007 are shown on Figure 2.5.4-208. The locations of the borings made in 2012 are shown on Figure 2.5.4-209 in addition to those made in 2006-2007.

13. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.3.3, first and second paragraphs are revised as follows:

Contemporary and historic geotechnical data sets were used to compile the geotechnical figures contained in this Subsection. The Lee Nuclear Station field exploration records are presented in Appendix 2AA, Attachments 1 through 5. The boring logs for the geotechnical borings made in 2012 are contained in Appendix 2AA, Attachment 6. The Cherokee Nuclear Station field exploration records are presented in Appendix 2BB.

As-built survey data and topographic surveys were used to prepare maps of the final geotechnical data exploration program as presented in Figures 2.5.4-208 (2006-2007 explorations only) and 2.5.4-209 (2012 explorations in addition to 2006-2007 explorations). The locations of exploratory borings, monitoring wells, test pits, and surface geophysical lines were recorded in digital format. These data were uploaded into a geographic information system (GIS). The GIS was used to prepare plan view maps and profile drawings that were used to develop geologic interpretations.

14. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.3.4, third sentence is revised as follows:

An explanatory figure showing these data sources is included as Figure 2.5.4-218, followed by 214 Borehole Summaries, Figures 2.5.4-219 through 2.5.4-232 and Figures 2.5.4-233a through 2.5.4-232233g.

15. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.3.5, first and second paragraphs are revised as follows:

The borehole summaries are evaluated in the geologic context described in more detail in Subsections 2.5.1 and 2.5.4.1 to construct geotechnical profiles. Seven Eight geologic cross sections intersecting the Lee Nuclear Station Unit 1 and 2 nuclear islands and adjacent areas are presented; the locations of these cross sections are shown on Figure 2.5.4-2089. Geologic Cross Sections A-A', BB-BB', CC-CC', EE-EE', F-F', FF-FF', R-R', UU-UU', and ZZ-ZZ'V-V' are shown on Figures 2.5.4-234233 through 2.5.4-240.

Key cross sections in this evaluation include the following:

- Figure 2.5.4-234, Cross Section BB-BB', west-east profile through Unit 1 and Unit 2 centerline
- Figure 2.5.4-235, Cross Section CC-CC', west-east profile through the south ends of Unit 1 and Unit 2 turbine buildings
- Figure 2.5.4-239, Cross Section UU-UU', west-east profile through the north end of the Units 1 and 2 nuclear island
- Figure 2.5.4-240, Cross Section ZZV-ZZV', west-east north-south profile through the south end of along the west wall of the Units 1 and 2 nuclear island
- Figure 2.5.4-236, Cross Section EE-EE', north-south profile through the Unit 1 centerline
- Figure 2.5.4-237, Cross Section F-F', north-south profile through the Unit 2 centerline
- Figure 2.5.4-238, Cross Section FF-FF', north-south profile through the east side of Unit 2 nuclear island

16. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.3.6, first and second paragraphs are revised as follows:

To indicate the extent of the granular fill to be placed around the nuclear islands and extending out to form the supporting materials for the adjacent buildings (radwaste, annex, and turbine buildings), ~~seveneight~~ geologic cross sections intersecting the Lee Nuclear Station Unit 1 and 2 nuclear islands and adjacent areas are presented. The locations of these cross sections are shown on Figure 2.5.4-2098. Cross Sections BB-BB', CC-CC', EE-EE', F-F', FF-FF', UU-UU', ~~V-V', Y-Y'~~, and ZZ-ZZ' are shown on Figures 2.5.4-245, ~~2.5.4-246,~~ and 2.5.4-260 through 2.5.4-265. All of these ~~Six of these eight~~ planned excavation geologic cross sections correspond to the geotechnical profiles presented in Subsection 2.5.4.3.5.

Geologic cross sections depicting the granular fill are the following:

- Figure 2.5.4-260, Planned Excavation Profile, Cross Section BB-BB', west-east profile through Unit 1 and Unit 2 centerline
- Figure 2.5.4-261, Planned Excavation Profile, Cross Section CC-CC', west-east profile through the south end of Units 1 and 2 turbine building
- Figure 2.5.4-245, Planned Excavation Profile, Cross Section UU-UU', west-east profile through the north end of the Unit 1 and Unit 2 nuclear islands
- ~~Figure 2.5.4-246, Planned Excavation Profile, Cross Section V-V', north-south profile along the west wall of the Unit 1 nuclear island~~
- Figure 2.5.4-262, Planned Excavation Profile, Cross Section EE-EE', north-south profile through the Unit 1 centerline
- Figure 2.5.4-263, Planned Excavation Profile, Cross Section F-F', north-south profile through the Unit 2 centerline
- Figure 2.5.4-264, Planned Excavation Profile, Cross Section FF-FF~~Y-Y~~', north-south ~~west-east~~ profile along the east side ~~through the north end~~ of the Unit 2~~1~~ nuclear island
- Figure 2.5.4-265, Planned Excavation Profile, Cross Section ZZ-ZZ', west-east profile through the south end of the Unit 1 and Unit 2 nuclear islands

17. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.4, first paragraph, first sentence is revised as follows:

Surface and borehole geophysical surveys were conducted on the Lee Nuclear Station Site in 2006-2007 and 2012 to characterize the subsurface conditions of the soil and bedrock including dynamic properties and geologic features.

18. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.4.1.2, first paragraph, second sentence is revised as follows:

The results of SASW and borehole Vs measurements are presented on the Boring Summary Sheets, Figures 2.5.4-219 through 2.5.4-232 and Figures 2.5.4-233a through~~to~~ 2.5.4-~~232~~233g.

19. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.4.3, first paragraph is revised as follows:

A total of ~~13~~ 16 borehole velocity surveys were performed at the Lee Nuclear Station site. The borehole velocity surveys consisted of 13 P-S suspension logging tests with four companion downhole velocity tests in 2006-2007, and three P-S suspension logging tests in 2012. The surveys were performed within uncased and cased boreholes. Downhole surveys were performed in four boreholes with P-S suspension surveys as a means to compare and validate P-S suspension results. Comparison of downhole velocity measurements to the companion P-S suspension measurements indicated good correlation of velocity values. Table 2.5.4-216 provides a summary of the borehole geophysical testing performed in 2006-2007 and 2012. Figure 2.5.4-215 shows the locations of the borehole surveys. The objective of the suspension and downhole logging tests was to obtain shear wave (Vs) and compressional wave (Vp) velocity measurements as a function of depth within each borehole. The Vs velocity values were used to determine whether the unweathered rock met the hard rock requirements for the site response analyses and development of the GMRS as discussed in Subsection 2.5.2. The seismic hazard model defines hard rock as having a minimum Vs of 9200 fps.

20. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.4.3.3, first paragraph is revised as follows:

The travel-time data from the P-S suspension logging and the downhole tests were used to create velocity layer models. The resultant velocity layers are presented on the Lee Nuclear Station boring summary sheets Figures 2.5.4-218 through 2.5.4-232 and Figures 2.5.4-233a through~~to~~ 2.5.4-233g~~2~~. The interpreted P-S Suspension and Downhole velocity layer models are presented in Tables 2.5.4-217 and 2.5.4-218, respectively for 2006-2007 borehole tests. The interpreted P-S Suspension velocity layer models for the 2012 borehole tests are also presented in Table 2.5.4-217.

21. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.4.4, first paragraph, first sentence is revised as follows:

Acoustic televiewer logging was conducted in seventeen~~thirteen~~ boreholes and optical televiewer logging was conducted in nine boreholes on the Lee Nuclear Station Site.

22. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.5 is revised as follows:

The Lee Nuclear Station utilizes a combination of excavation slopes and temporary retaining structures to facilitate construction of below grade portions of the nuclear island. The excavation remaining from Cherokee Nuclear Station construction activities is utilized and enlarged or reconfigured, as needed, to support Lee Nuclear Station construction. Backfill is placed within the excavation against the below grade nuclear island walls to create the ground surface surrounding the nuclear island structure. The ground surface surrounding the nuclear island is generally at about Elevation 589 feet which is ~~1~~4.0 feet below the building floor slab elevation 593 ft (AP1000 Grade El. 100'-00"). The yard grade adjacent to the buildings is at Elevation 592 ft (AP1000 Grade El. 99'-00")

The seismic Category I structures consist of the Unit 1 and Unit 2 nuclear islands. Other structures within the power block are not seismic Category I structures and are not safety related. The location of the nuclear island structures is shown on Figures 2.5.4-201 and 2.5.4-208. The Lee Nuclear Station nuclear island is constructed with a building floor slab elevation of ~~approximately 590~~ 593 feet (AP1000 Grade El. 100'-00"). Below grade portions of the nuclear island extend ~~approximately~~ 39.5 feet below building slab elevation, to Elevation ~~550~~553.5 feet (AP1000 Grade El. 60'-6"). Foundation materials, consisting of continuous rock or concrete, are located at this elevation or below for support of the nuclear island. Fill concrete is used in areas where continuous rock or Cherokee Nuclear Station concrete is below Elevation ~~550~~553.5 feet (AP1000 Grade El. 60'-6") to bring that surface up to the Lee Nuclear Station base of foundation elevation.

23. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.5.1, first paragraph, first sentence is revised as follows:

The Lee Nuclear Station Site requires granular backfill material described in Subsection 2.5.4.5.3.5 to fill the area around the below-grade nuclear island walls out to the extents shown on Figures 2.5.4-245 ~~and 2.5.4-246,~~ and 2.5.4-260 through 2.5.4-265.

24. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.5.2, first and second paragraphs are revised as follows:

A large excavation was constructed during site preparation work for Cherokee Nuclear Station construction. This excavation is utilized as the initial excavation for the Lee Nuclear Station. Additional excavation for Lee Nuclear Station extends about 10 feet laterally into the fill and natural soil materials comprising the Cherokee Nuclear Station construction slope ~~and removes~~or as necessary to remove softened, sloughed, or other loose soil and rock materials. This excavation extends only a sufficient distance into the slope to reach materials that are relatively undisturbed by erosion or shallow sloughing during the time the excavation remained open following Cherokee Nuclear Station construction.

In addition to the slope trimming described above, additional excavation of the soil and partially weathered rock slope that formed the Cherokee Nuclear Station excavation limits is necessary to provide relatively uniform thickness of fill for support conditions beneath the Lee Nuclear Station power block structures adjacent to the nuclear island. Excavation to a reasonably uniform subgrade elevation is performed within the limits of the adjacent non safety-related power block structures and outside the structure limits to a point defined by a line extended at ~~0.5~~1.~~0~~ horizontal to 1 vertical or flatter from the base edge of the structure foundations. This geometery defines the foundation support zone for the non-safety annex, turbine and radwaste buildings. For the nuclear island foundation, the line is 0.5 horizontal to 1 vertical or flatter and the line begins at a point located 6 feet or more horizontally from the perimeter of the nuclear island foundation limits. This geometry defines the foundation support zone for the nuclear island. These nuclear island area excavation limits, as estimated prior to construction of Lee Nuclear Station, are shown on Figure 2.5.4-243. Excavation to a uniform subgrade elevation for adjacent non-safety and non-seismic structures exposes fill concrete, rock, partially weathered rock, or saprolite. The adjacent non-safety related structures include two areas designated as Seismic Category II (SC-II) structures because of their characteristics and proximity to the nuclear island. These are the annex building area outlined by columns E-I.1 and 2-13 and the turbine building, first bay adjacent to the nuclear island as outlined by columns I.1 to R and 11.05 to 11.2. Excavations within the support zone of these SC-II structures expose concrete or rock.

Excavation to a subgrade elevation for the seismic category II portions of the adjacent non-safety structures exposes concrete or rock. The foundation support zone for the Unit 1 annex building (SC-II) may expose a relatively small area of partially weathered rock to fractured rock in the northwest corner, but the majority of the foundation support zone for this structure will encounter rock or concrete overlying rock. Within the foundation support zone these SC-II structures, in areas where the pre-existing concrete and/or rock are at a lower elevation than the base of the nuclear island, fill concrete will be used to build up the base level of the nuclear island. If rock within the support zones of the SC-II structures is higher than the base of the nuclear island, the rock will be removed to the elevation of the base of the nuclear island.

25. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.5.2.1, second paragraph is revised as follows:

Excavation to the foundation subgrade elevation includes removal of the Cherokee Nuclear Station reactor building superstructure and portions of the Cherokee Nuclear Station auxiliary building mat foundations within the nuclear island foundation support zone. The Cherokee Nuclear Station reactor building foundation mat ~~is~~and some of the Cherokee auxiliary building basemat are left in place. To avoid damage to the reactor building mat, 3 to 6 inches of the vertical walls may remain above the mat surface after the walls are removed. In areas where the

Cherokee auxiliary building basemat is removedwithin the foundation support zone for the Lee Nuclear Station Unit 1 nuclear island, the isolation joint surrounding the Cherokee Nuclear Station reactor building mat is also removed to reduce the discontinuity between reactor building basemat and new fill concrete. Removal of the Cherokee Nuclear Station foundation mats exposes underlying fill concrete or continuous rock. AThe Lee Nuclear Station nuclear island for Unit 1 is positioned so that additional excavation is performed beyond the Cherokee Nuclear Station concrete edges as needed to reach theis not necessary. The foundation support zone for the Lee Nuclear Station Unit 1 nuclear island is entirely underlain by the existing concrete of Cherokee Nuclear Station Unit 1 which is underlain by continuous rocksubgrade.

26. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.5.2.1, beginning with the fourth paragraph is revised as follows:

The Cherokee Nuclear Station foundation mat for the reactor building and auxiliary building was underlain by a groundwater drainage system. When this drainage system is exposed by excavation for the Lee Nuclear Station nuclear island foundation it is sealed with fill concrete material as illustrated by Figures 2.5.4-244a through 2.5.4-244d244e. Exposure of this drainage system is most likely to occur at the perimeter of the Cherokee Nuclear Station reactor building mat and at the perimeter of the Lee Nuclear Station nuclear island foundationwhere a portion of the Cherokee Nuclear Station auxiliary building basemat is removed to take out the existing isolation joint (Figures 2.5.4-244b and 2.5.4-244c) or in the southern end of the Lee Nuclear Station nuclear island where the Cherokee Nuclear Station auxiliary building basemat must be removed because it is above the bottom of the Nuclear Island (Figure 2.5.4-244d).

The existing Cherokee Nuclear Station concrete foundation has several local pits (referred to as pump rooms) that were to serve various purposes (Figure 2.5.4-266). These local pits were typically to be provided with horizontal and vertical waterproofing membranes. The horizontal membrane was to be installed on a fill concrete layer resting on the continuous rock and then covered by a fill concrete mudmat approximately 3.5 inches thick. The vertical membrane was to be secured to the outside face of the vertical structural walls and covered by a protective sheathing. The space between the surrounding rock and the vertical pit walls with their protective sheathing and vertical membrane was then backfilled with fill concrete. In pits having the horizontal and vertical waterproofing membranes, these features will be removed down to the top of the fill concrete layer resting on the continuous rock and outward to the surrounding rock and replaced with new fill concrete as depicted on Figure 2.5.4-244e. The width of the pits, thus excavated, will be increased by an estimated 13 feet which is equal to the combined width of the structural pit walls (estimated to be 3.5 feet for each typical wall) plus the combined widths of the concrete fill behind the structural pit walls (having an estimated typical width of 3 feet from the back of each structural pit wall). The depth of the pits, thus excavated, will be increased by an estimated 4.3 feet, which is equal to the thickness of the structural basemat (estimated to be typically 4 feet) plus the horizontal membrane and the 3.5 inch thick mudmat. The pits, thus excavated and backfilled with new fill concrete, will continue to be localized areas of deeper fill concrete below the nuclear island of Unit 1.

The foundation support zone for the Lee Nuclear Station nuclear island is entirely underlain by the footprint of the existing concrete foundation of Cherokee Nuclear Station Unit 1 which is underlain by continuous rock.

One area where Cherokee Nuclear Station concrete does not underlie the Lee Nuclear Station nuclear island foundation is at the northwest corner of the Lee Nuclear Station Unit 1 nuclear island. At this location the Lee Nuclear Station nuclear island structure extends beyond the limits of the Cherokee Nuclear Station structure. Because this area is outside the limits of the

~~Cherokee Nuclear Station structure, the area was not excavated down to continuous rock during Cherokee Nuclear Station construction. This area therefore remained underlain by naturally existing soil and weathered rock. Geotechnical borings drilled in 2006 and 2007 in this area, but west of the nuclear island footprint, revealed a deep weathered rock profile with low Rock Quality Designation values extending to as deep as approximately Elevation 448 feet. Under the limits of the nuclear island area the geotechnical borings encountered continuous rock at Elevation 529.5 feet or higher.~~

~~Excavation of soil and weathered rock materials is required to reach suitable foundation quality continuous rock material in this northwest corner area of Lee Nuclear Station Unit 1. A concept of the excavation required at the northwest corner of the Unit 1 nuclear island is shown on Figures 2.5.4-245, 2.4.5-246, and 2.5.4-264. The excavation at this location requires sloped excavation in the upper soil and partially weathered rock materials and a near vertical excavation in the weathered rock materials. Excavation support for the weathered rock in the form of rock bolts, or similar reinforcement, is used as needed to provide support for this material during construction. Excavation support also maintains the strength and density of the weathered rock material where it underlies power block structures adjacent to the Lee Nuclear Station Unit 1 nuclear island. Soil or other materials that may have been deposited on top of continuous rock or concrete materials in the time following the excavation and foundation preparation activities for Cherokee Nuclear Station Unit 1 are also removed.~~

27. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.5.2.2, is revised as follows:

Excavation to a uniform foundation subgrade elevation of approximately ~~549~~553.5 feet is possible for Lee Nuclear Station because some of the Cherokee Nuclear Station excavation in this area~~ generally~~ remained above this elevation.

During the site exploration for Lee Nuclear Station in 2006 and 2007, the base of the Cherokee Nuclear Station excavation generally consisted of exposed rock beneath the location of the Lee Nuclear Station Unit 2 nuclear island. The same is true for the Lee Nuclear Station Unit 2 nuclear island in the 2012 exploration, but to a somewhat lesser extent because of the raised plant elevation. At 2012 boring B-2006 near the northeast corner of the Unit 2 nuclear island the continuous rock level is 2 feet above the foundation elevation 553.5 feet. In much of the Lee Nuclear Station Unit 2 nuclear island foundation area the elevation of the rock was higher than the Lee Nuclear Station foundation elevation. Excavation into soil, partially weathered rock, weathered or loose rock, and continuous rock is required to reach the Lee Nuclear Station Unit 2 nuclear island foundation elevation. These materials are excavated and removed down ~~below~~ to the Unit 2 nuclear island foundation elevation. Below this elevation soil, partially weathered rock, and weathered or loose rock materials are excavated until continuous rock is reached.

Backfill material is required where the rock surface elevation is below the Lee Nuclear Station foundation elevation or where additional rock removal is required to reach continuous rock due to localized weathering conditions. One area where the rock surface was already below the Lee Nuclear Station Unit 2 nuclear island foundation elevation is the east side of the nuclear island near the boring locations B-1014 and B-1018. At 2012 boring B-2005 near the southeast corner of the Unit 2 nuclear island, the continuous rock is 8 feet below the foundation elevation 553.5 feet. Fill concrete is used in this and any other area to bring the bearing surface back up to the Unit 2 nuclear island foundation elevation (Figure 2.5.4-267).

28. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.5.3.1, third and fourth paragraphs are revised as follows:

Geologic mapping of the final exposed excavation rock surface beneath ~~both of~~ the nuclear island~~s~~, and any required extension due to depth of suitable continuous rock material, is performed at a scale of 1 inch equals 10 feet. Geologic mapping is performed at a scale of 1 inch equals 5 feet for local areas where further detail is needed to document significant features. The geologic mapping program includes photographic documentation of the exposed surface and laboratory testing and documentation for significant features.

Lee Unit 1 is entirely underlain by Cherokee concrete over previously-mapped rock. Because of different footprints of legacy Cherokee structures, some additional excavation will be required, and may expose previously-mapped foundation rock. Exposed rock at Lee Unit 1 will be mapped and compared to the previous Cherokee mapping to confirm interpretations discussed in Subsection 2.5.1.2.5.5.

29. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.5.3.2, is revised to add a new first paragraph as follows:

The following requirements are also applicable to the fill concrete that is used to build up the rock surface exposed by excavation to the same level as the bottom of the nuclear island foundation in the foundation support zones of the SC-II building areas (annex building and turbine building first bay).

30. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.5.3.2, third paragraph, third sentence is revised as follows:

At Unit 1, fill concrete is placed on top of the Cherokee Nuclear Station Unit 1 reactor building and auxiliary building basemat, or on Cherokee Nuclear Station fill concrete or underlying rock exposed by removal of the Cherokee Nuclear Station auxiliary building basemat.

31. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.5.3.3 is revised as follows:

Outside the limits of the nuclear island support zone, steps are used to determine the presence of suitable foundation materials prior to placement of granular backfill materials within the foundation support zones beneath the non safety-related structures. For the structures not designated as SC-II, or for areas to be supported only on granular fill, ~~T~~this applies to continuous rock, existing concrete remaining from Cherokee Nuclear Station construction, weathered rock, partially weathered rock, or saprolite that remains in place below the non safety-related power block structures adjacent to the SC-II structures or the nuclear island. This also applies to areas to support only the granular fill. For the structures designated as SC-II (part of the annex building and the turbine building first bay as described in Subsection 2.5.4.5.3) the acceptable subgrade exposes concrete, rock, or the limited area of partially weathered rock in the northwest corner of the foundation support zone for the Unit 1 annex building. Steps for verification of proper foundation conditions consist of:

- Removing loose soil, rock, and any organic materials.
- Determine if the base of excavation consists of saprolite having N_{60} values, equal to or greater than 15 blows per foot, measured at a depth of 3 feet below the base of the excavation. Partially weathered rock, weathered rock, or rock would also be suitable in these areas provided it meets or exceeds the minimum criteria stated for saprolite and any loose material or soft zones are removed. For the SC-II building areas, rock is the acceptable support material, with limited areas of partially weathered rock such as in the northwest corner of the foundation support zone for the Unit 1 annex building. For the SC-II building areas, if rock within the foundation support zone is higher than the elevation of the

bottom of the nuclear island, remove the rock to the elevation of the bottom of the nuclear island to be replaced with granular fill materials.

- For the SC-II building areas, fill any depressions in the surface of the subgrade rock with fill concrete, then use fill concrete to backfill to the elevation level with that of the nuclear island (elevation 553.5 ft). This forms a uniform surface grade for the placement of granular backfill to support the SC-II building areas. If the rock in the foundation support zone of the SC-II buildings is above the elevation of the bottom of the nuclear island, the rock will be excavated to the elevation of the nuclear island bottom and replaced with granular fill materials.
- For the structures not designated as SC-II or for areas that support only granular fill, Ffill any depressions or cavities in the surface of the foundation soil or rock with fill concrete or properly compacted granular fill materials. This forms a uniform surface grade for the placement of additional granular fill, to support the non SC-II buildings or to complete the area of granular fill.
- Continue placing granular fill materials in layers according to the procedures described in Subsection 2.5.4.5.3.5.

32. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.5.3.4, is revised to add a new first paragraph as follows:

For fill concrete used within the foundation support zone of the SC-II building areas adjacent to the nuclear island, see Subsection 2.5.4.5.3.2.

33. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.5.3.5, is revised to add a new paragraph immediately following the fourth paragraph as follows:

Compactors equivalent to those used in the test fill may be utilized in the production backfill provided that results of in situ tests of the backfill compacted using the equivalent compactors are capable of producing acceptable and consistent results.

34. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.5.3.5, fifth paragraph, sixth through ninth bullets are revised as follows:

- ~~The moisture content is maintained generally within 3 percentage points above or below the optimum moisture content as determined by the modified Proctor (ASTM D 1557) laboratory compaction test. Moisture contents outside this range do not cause rejection of the constructed material providing compaction requirements are achieved.~~
- The lift thickness is appropriate for the type of compaction equipment, but generally does not exceed about 8 inches (compacted thickness) for mechanized equipment nor about 4 to 6 inches for hand-guided compactors. Lift thicknesses may vary from the above values depending on the capability of the equipment being used as demonstrated by the test fill and in situ tests in the production fill.
- ~~Steel wheel tandem drum rollers weighing on the order of 10 tons are generally effective for compacting granular fill materials.~~
- Within confined areas, or within ~~5 feet~~ close proximity of the nuclear island walls, ~~hand-guided~~ appropriate compactors are used to prevent excessive lateral pressures against the walls from the residual soil stress caused by heavy compactors. The compactors have sufficient weight and striking power to produce the same degree of compaction that is obtained on the other portions of the fill by the rolling equipment, as specified.

35. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.6, first paragraph, first sentence is revised as follows:

The nuclear island structure extends below grade to Elevation ~~550~~553.5 feet.

36. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.6.1, last paragraph, fourth sentence is revised as follows:

The upper end of this groundwater elevation range is below the design groundwater elevation of ~~588~~ 591 feet (standard plant Elevation 98 feet) used in the DCD Table 2-1.

37. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.6.4, first paragraph, third sentence is revised as follows:

Monitoring of groundwater elevations following cessation of site dewatering to confirm long term site groundwater elevations is not needed because the design groundwater level per the DCD (elevation ~~588~~591-feet [AP1000 Grade El. 98'-00"]) exceeds the upper bound of the expected groundwater elevation range (elevation 584-feet) (see Table 2.0-201).

38. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.7.1, second paragraph, third sentence is revised as follows:

Continuity of bedrock below, between, and adjacent to the Lee Nuclear Station Units 1 and 2 nuclear islands is confirmed in the subsurface by a dense network of continuously-logged vertical and inclined rock core borings (to a maximum depth of 255 feet) as shown in Figures 2.5.4-23~~3~~4 to 2.5.4-240.

39. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.7.2, beginning with the second paragraph is revised as follows:

In 2006-2007 and 2012, ~~B~~borehole P-S suspension log seismic velocity surveys were performed in the nuclear island footprint areas for both Lee Nuclear Station Unit 1 and 2, ~~at the northwest corner of Unit 1,~~ and between the two plant footprints, as shown on Figure 2.5.4-215. The distribution of velocity measurements allowed confirmation of uniform seismic response under the Lee Nuclear Station nuclear island structures, evaluation of the local lower velocities at the Lee Nuclear Station Unit 1 northwest corner, and also within selected existing engineered fills. Each individual borehole velocity profile was evaluated and compared against the stratigraphic logging and laboratory test data of borehole samples to correlate velocities with rock type and structure (e.g., comparison of host and dike rock velocity) by elevation and corresponding depth below ground surface. After each individual borehole velocity data set was evaluated, borehole profiles were grouped based on site-specific location and were compiled using a common reference point (elevation or depth below ground surface).

In 2006-2007, ~~F~~four downhole seismic surveys were completed in boreholes that also were surveyed using P-S Suspension logging methods to provide an independent verification of rock velocity. The two methods produced velocity profiles that are very similar, as shown in Figure 2.5.4-219, Figure 2.5.4-222, Figure 2.5.4-226, and Figure 2.5.4-227. Data from both borehole survey techniques were integrated for development of the site velocity profiles. The comparative P-S suspension and downhole methods show quite consistent Vs values in the continuous rock throughout the 255 foot maximum velocity survey depth range with most borehole-average shear wave velocities generally centered at about 9,500 to 10,000 feet per second indicating uniform hard rock conditions. The P-S and downhole surveys show a good match, providing an independent check of the accuracy of measured velocities. The P-S velocity profiles show discrete velocity "spikes" or zones that range from about 1-foot to several tens of feet thick that are not observed by the "averaging" method inherent in the downhole surveys. These velocity differences are attributed to differing sample measurement intervals and methods between P-S suspension and downhole techniques. Additionally, the P-S velocity spikes may also correlate to variations in rock type, structure (e.g., jointing intensity), and intrusional dikes, but in other cases appear to represent limited randomness in velocity or possible survey-induced fluctuations, as measurement intervals using the P-S method are more closely spaced (3.3-foot intervals) than the downhole method (10-foot intervals). Even though the profiles are jagged with these localized vertical variations, the ranges in velocity fall within a tight range for the composite of all surveys.

In 2006-2007, ~~A~~a third geophysical method, Spectral Analysis of Surface Waves (SASW) described in Subsection 2.5.4.4 was performed in the Lee Nuclear Station Unit 2 footprint area in the floor of the excavation and in existing fill materials located in both Unit 1 and Unit 2 Cooling Tower Pads. The SASW is a surface method, and penetration into the hard bedrock exposed in the Cherokee Nuclear Station excavation floor was limited using the attempted wave generation sources. Therefore, a complete velocity profile for comparison against the borehole surveys was not possible. However, the shear wave velocities measured at the rock surface in the excavation floor by the SASW technique generally agree with the borehole survey measurements as shown on Figure 2.5.4-224 and Figure 2.5.4-225.

In 2006-2007, ~~A~~a fourth geophysical method, Seismic Cone Penetrometer Test (SCPT) surveys, was performed in soil.

40. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.7.4, first paragraph is revised as follows:

Figure 2.5.4-241 shows the Lee Nuclear Station Units 1 and 2 footprints superimposed on a contour map showing the surface of continuous rock (rock defined with ~~a minimum~~an RQD of at least 65 percent). The contours illustrated on this figure represent the top of continuous rock surface, defined as continuous rock displaying fresh to moderate weathering with an ~~-minimum~~ RQD of at least 65 percent, developed using borehole data from historic field explorations for the Cherokee Nuclear Station and the field explorations for the Lee Nuclear Station completed in 2006 and 2007. Figure 2.5.4-241 also shows the extent of the partially constructed Cherokee Nuclear Station Unit 1 structures and the position of the Lee Nuclear Station Units 1 and 2 power block structures relative to the Cherokee Nuclear Station excavation.

41. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.7.4.1, beginning with the second paragraph is revised as follows:

Within the influence zone of the nuclear island foundation, the Lee Nuclear Station Unit 1 nuclear island footprint is ~~mainly (approximately 90 percent)~~entirely underlain by sound concrete that was placed over continuous rock during construction of the Cherokee Nuclear Station Unit 1 as shown on Figure 2.5.4-241. The Cherokee Nuclear Station concrete was placed over a prepared rock surface of sound, continuous rock that met the DCD Subsection 2.5.4.5 Subsurface Uniformity criteria. In some places, new fill concrete is placed over a sound prepared rock surface, or a cleaned and roughened Cherokee Nuclear Station concrete surface, to develop the level basemat grade as part of the Lee Nuclear Station Unit 1 foundation construction. The thicknesses of the composite concrete, defined as Lee Nuclear Station and Cherokee Nuclear Station Unit 1 fill and structural concretes, under Lee Nuclear Station Unit 1 nuclear island basemat generally ranges between several feet to about 25 feet thick and contains localized areas underlain by CNS pump room that will be backfilled with approximately

22 ft of new fill concrete. The localized condition associated with the CNS pump rooms is limited to a small portion of the Unit 1 nuclear island footprint as depicted in Figure 2.5.4-266. For development of the Lee Nuclear Station dynamic velocity model, the Unit 1 concrete materials are assumed to be of similar composition, strength, quality, and dynamic properties. Assumed dynamic properties for Cherokee Nuclear Station fill and structural concrete materials are estimated using static and dynamic field and laboratory correlations developed by Boone (2005) (Reference 211). The composite sound rock and fill concrete underlying the Lee Nuclear Station Unit 1 nuclear island basemat comply with the subsurface uniformity criteria as described in DCD Subsection 2.5.4.5.

Rock conditions change beneath the northwest corner of the Lee Nuclear Station Unit 1 nuclear island. In this area, the Lee Nuclear Station Unit 1 nuclear island overlies a localized zone of weathered and fractured rock, extending approximately 15 to 25 feet deep, below the Unit 1 basemat footprint Elevation 550.5 feet (AP1000 El. 60'-6"), as shown in Figures 2.5.4-239 and 2.5.4-240. This minor localized weathered zone of rock, exhibits lower Vs velocities, ranging from approximately 4500 to 6000 fps, than the underlying and adjacent sound rock with average Vs of approximately 9500 fps, and represents a different velocity profile condition. Excavation of this isolated lower velocity material to continuous rock at northwest corner of Lee Nuclear Station Unit 1 nuclear island to a depth of 15 to 25 feet below basemat subgrade removes a significant portion of the lower velocity weathered rock, and extends the excavation deeper within the support zone beyond the Lee Nuclear Station Unit 1 nuclear island footprint shown in Figures 2.5.4-245, 2.5.4-246, 2.5.4-264, and 2.5.4-265, as described in Subsection 2.5.4.10. The remaining continuous rock with Vs below 9200 fps represents less than 2 percent of the total rock volume beneath the Unit 1 nuclear island with an average Vs of 7300 fps and does not represent a potential for differential site amplification or foundation performance. The rock conditions described for the Lee Nuclear Station Unit 1 nuclear island northwest corner have no practical significance on differential shear wave velocity, site amplification or foundation performance and comply with the subsurface uniformity criteria as described in DCD Subsection 2.5.4.5. The excavation backfill condition for the Lee Nuclear Station Unit 1 northwest corner is described in Subsection 2.5.4.5. The foundation support zone for the Lee Nuclear Station nuclear island is entirely underlain by the footprint of the existing concrete foundation of Cherokee Nuclear Station Unit 1 which is underlain by continuous rock.

The nuclear island foundation rock is characterized as sound, massive meta-granodioritic to meta-quartz dioritic rock, no dipping layers exist and the rock supporting the nuclear island foundation meet DCD case 1 criteria.

42. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.7.4.2, first paragraph is revised as follows:

The Lee Nuclear Station Unit 2 nuclear island basemat at subgrade elevation is underlain by sound, massive meta-granodiorite and meta-quartz diorite bedrock with meta-diorite dikes. Rock in these intrusions is strong and similar in strength to the host rock, and contact margins are tight with minor local narrow altered/-weathered zones. The rock underlying the Lee Nuclear Station Unit 2 nuclear island complies with the subsurface uniformity criteria as described in DCD Subsection 2.5.4.5. Minor localized areas of rock excavation or infilling with fill concrete is required under portions of the Lee Nuclear Station Unit 2 nuclear island footprint to develop a level bearing surface. Low areas will be backfilled with fill concrete to achieve basemat subgrade of similar composition and quality as that described above for Lee Nuclear Station Unit 1 nuclear island concrete fill to provide a dense, coupled interface with sound rock. The maximum thickness of fill concrete is about 16 20 feet beneath the east portion of the nuclear island, but generally will be less than about 1 to 2 feet. The excavation backfill condition for the Lee Nuclear Station Unit 1 northwest corner is described in Subsection 2.5.4.5. Unit 2 excavation conditions will require about 20 ft. of fill concrete between the bottom of the nuclear island and the top of continuous rock along the eastern edge of the nuclear island, Subsection 2.5.4.2.2. This relatively small area of concrete fill required to build up the eastern edge of the Unit 2 nuclear island basemat will not result in localized adverse conditions due to the relatively small difference in shear wave velocity of fill concrete (7,500 ft/sec) and rock (8391 to 8983 ft/sec) in this area. The fill concrete conditions described for the Lee Nuclear Station Unit 2 nuclear island eastern portion have no practical significance on differential shear wave velocity, site amplification or foundation performance. The nuclear island foundation rock is characterized as sound, massive meta-granodioritic to meta-quartz dioritic rock, no dipping layers exist and the rock supporting the nuclear island foundation meet DCD case 1 criteria.

43. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.7.5 is revised as follows:

This subsection presents the methodology and approach to develop site-specific dynamic velocity profiles at the Lee Nuclear Station site. Dynamic velocity profiles were compiled and applied at two~~hree~~ locations for evaluation of site ground motion characteristics of Class I safety-related plant facilities with a third~~fourth~~ profile developed to evaluate generic engineered granular fill properties. These profiles are defined below.

- Smoothed Dynamic Profile A, Unit 1 nuclear island centerline
- ~~Smoothed Dynamic Profile B, Unit 1, nuclear island northwest corner~~
- Smoothed Dynamic Profile C, Unit 2 nuclear island centerline
- Best Estimate Layer Velocity Profile G, Generic engineered granular fill

Figure 2.5.4-247 shows the locations of the dynamic profiles (Profiles A and ~~through~~ C) developed for the Duke Lee Nuclear Station. Smoothed dynamic profiles, Dynamic Profiles A and~~through~~ C, are shown on Figures 2.5.4-248 and ~~through~~ 2.5.4-250, respectively. The site GMRS, discussed below and in Subsection 2.5.2, is represented by Profile A. ~~Dynamic Profile B is applied for sensitivity site response analysis to evaluate possible ground motion variability between Profile A, Unit 1 centerline, and the Unit 1 northwest corner.~~ Dynamic Profile C is used to evaluate possible differences in site response between Lee Nuclear Station Units 1 (Profile A) and 2 (Profile C) as a result of the spatial separation and possible lateral variability in the rock properties.

A third~~fourth~~, artificial generic engineered granular fill profile, identified as Best Estimate Layer Velocity Profile G, was developed to represent engineered granular fill placed over the bedrock and around the plant nuclear islands to develop the plant grade. It represents a reasonable range of granular engineered fill materials, well-graded gravel (GW) (Figure 2.5.4-251a), poorly-graded gravel (GP) (Figure 2.5.4-251b), and well graded sand (SW) (Figure 2.5.4-251c) that may be placed adjacent to the AP1000 nuclear islands. These generic engineered granular fill seismic velocity profiles were constructed by estimating the maximum shear wave velocities, the elastic modulus values and the corresponding Poisson's ratio, and compression wave velocities for granular fill materials, well-graded gravel (GW) (Table 2.5.4-224~~a~~A), poorly-graded gravel (GP) (Table 2.5.4-224~~b~~B), and well graded sand (SW) (Table 2.5.4-224~~c~~C) that may be typical of that to be placed at the site. The modulus ratio and damping ratio at various values of shear strain for generic granular fill materials, well-graded gravel (GW), poorly-graded gravel (GP), and well-graded sand (SW) are summarized in Tables 2.5.4-224~~d~~D, 2.5.4-224~~e~~E, and 2.5.4-224~~f~~F. Shear modulus and damping ratio plots of these data are illustrated in Figures 2.5.4-253a, 2.5.4-253b, and 2.5.4-253c. During site preparation, the area forming the foundation support zone, as defined in Subsection 2.5.4.5.2 of the DCD, of the SC-II areas of the annex building and the turbine building first bay will be excavated to pre-existing concrete or to rock and built up to the level of the bottom of the nuclear island foundation with fill concrete.

If the rock in the foundation support zones of the SC-II buildings is above the elevation of the bottom of the nuclear island, the rock will be excavated to the elevation of the nuclear island bottom and replaced with granular fill materials. Generic granular fill Profile G extends to a depth that envelops the greatest estimated depth of granular fill to be placed in the vicinity of the northwest corner of Lee Nuclear Station Unit 1is consistent with this condition. The generic granular fill is described in Subsection 2.5.4.5.3.5.

The shear wave velocities of granular fill in Tables 2.5.4-224A, 2.5.4-224B and 2.5.4-224C are estimated based on the ground surface (yard elevation) at Elevation 592 feet. The modulus ratio and damping ratio results for the granular fill are in Tables 2.5.4-224D, 2.5.4-224E and 2.5.4-224F. In these tables, the depth reference is the ground surface.

Following the development of the dynamic profiles, two one base case dynamic velocity profiles wereas developed for the Lee Nuclear Station Unit 1 centerline and one base case dynamic profile was developed for Lee Nuclear Station Unit 2. Theis base case models the Lee Units 1 and 2 -nuclear island configuration and areis described below.

- Base Case A1, Unit 1 Nuclear Island Centerline

  Defines the GMRS and the typical relationship of the Lee Nuclear Station fill concrete (85.5 feet) overlying Cherokee Nuclear Station structural and fill concrete (composite 23.515 feet) above continuous rock.

- Base Case A5, Unit 1 CNS Pump Rooms

  Defines the GMRS and localized condition of the Lee Unit 1 nuclear island that will overlie legacy CNS pump rooms at approximately 527 ft (NAVD). Base Case Profile A5 is based on the Lee Nuclear Station GMRS developed at the top of a hypothetical outcrop fixed at 523 ft (NAVD) transferred up through previously placed Cherokee Nuclear Station concrete materials and newly placed Lee Nuclear Station concrete materials to the basemat foundation level at 553.5 ft (NAVD). Base Case Profile A5 models the localized as-built areas of the Lee Unit 1 nuclear island that will overlie legacy CNS pump rooms (Figure 2.5.4-266). As depicted in Figure 2.5.4-244e, the horizontal slab concrete of these pump rooms and existing waterproofing membrane will be removed during Lee construction and the pump rooms will then be backfilled using approximately 22 feet of fill concrete up to CNS basemat elevation 545 feet MSL with an additional 8.5 feet of fill concrete placed up to the basemat floor elevation (553.5 feet MSL) (Reference 239).

- Base Case C4, Unit 2 Nuclear Island Eastern Edge

  Defines the GMRS and the typical relationship of proposed new leveling fill concrete above continuous rock. The location of Lee Unit 2 will require the emplacement of between 8 and 20 feet of new leveling fill concrete beneath the eastern extents of the Lee Unit 2 Nuclear Island as depicted in Figure 2.5.4-267. Base Case C4 defines the GMRS and the maximum concrete thickness along the eastern extents of Lee Nuclear Station Unit 2.

The model representing Dynamic Profile Base Case A1, Unit 1 Centerline is shown on Figure 2.5.4-252a. Base Case A1 defined for the Lee Nuclear Station Unit 1 considers variability of site conditions such as material thickness and lateral variability within foundation rock, including Cherokee and Lee Nuclear Station concrete materials based on an average shear wave velocity of 7500 ft/sec. Assumed typical index properties for Cherokee Nuclear Station and Lee Nuclear Station concrete materials are summarized in Table 2.5.4-223. The site GMRS and Unit 1 FIRS (Base case profile A1) analysis are described in Subsections 2.5.2.6 and 2.5.2.7, respectively.

The model representing Dynamic Profile Base Case A5, Unit 1 CNS Pump Rooms is shown on Figure 2.5.4-252b. Base Case A5 defined for the localized as-built areas of the Lee Unit 1 nuclear island that will overlie legacy CNS pump rooms considers variability of site conditions such as as-built Lee constructed condition, material thickness and lateral variability within foundation rock, including Cherokee and Lee Nuclear Station concrete materials based on an average shear wave velocity of 7500 ft/sec. The additional thickness of fill concrete amounts to a 30% increase in the fill concrete profile is applicable for this small portion of the nuclear island foundation. Considering the limited area beneath the Unit 1 nuclear island represented by Base Case Profile A5, the increased fill concrete thickness will have no practical significance on differential shear wave velocity, site amplification or foundation performance and comply with the subsurface uniformity criteria as described in DCD Subsection 2.5.4.5. Base Case Profile FIRS A1 represents the dominant dynamic profile for Lee Nuclear Station Unit 1.

The model representing Dynamic Profile Base Case C4, Unit 2 Nuclear Island Eastern Edge is shown on Figure 2.5.4-252c. Base Case C4 defined for the location-specific as-built conditions beneath the eastern edge of the Unit 2 nuclear island considers variability of site conditions such as as-built Lee constructed condition, material thickness and lateral variability within foundation rock, including Lee Nuclear Station concrete materials based on an average shear wave velocity of 7500 ft/sec. The concrete profile represented in Base Case C4 is very similar to Base Case A1, (Figure 2.5.4-252a.) The placement of up to about 20 ft of new fill concrete along the eastern edge of the Unit 2 nuclear island represents a minor difference in the base case profile and will have no practical significance on differential shear wave velocity, site amplification or foundation performance and comply with the subsurface uniformity criteria as described in DCD Subsection 2.5.4.5.

Assumed typical index properties for Cherokee Nuclear Station and Lee Nuclear Station concrete materials are summarized in Table 2.5.4-223. The site GMRS, Unit 1 FIRS (Base Case Profiles A1 and A5) and Unit 2 FIRS (Base Case Profile C4) analysis are described in Subsections 2.5.2.6 and 2.5.2.7, respectively.

44. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.8, second through the sixth paragraphs are revised as follows:

All seismic Category I safety-related plant foundations for Lee Nuclear Station Units 1 and 2 will bear on rock, or fill concrete over rock. Neither fill concrete nor rock is susceptible to liquefaction. Plan maps, cross sections, and summary boring logs presented in Subsection 2.5.4.3 show the locations and rock foundation conditions of the Category I nuclear island structures that have a design subgrade elevation of ~~550~~553.5 feet (AP1000 El. 60'-6"). The design basemat subgrade places the foundation for the Lee Nuclear Station Unit 1 nuclear island on existing concrete that was placed over a sound and cleaned rock surface remaining from the Cherokee Nuclear Station Unit 1, and directly on a newly-excavated and cleaned sound rock surface for the Lee Nuclear Station Unit 2 nuclear island. Therefore, a liquefaction hazard does not exist that could affect the Category I plant structures and facilities.

Outside the nuclear islands, compacted engineered granular fill is placed adjacent to seismic Category I structures over the exposed rock/fill concrete surfaces to the extent shown on Figures 2.5.4-245~~, 2.5.4-246,~~ and 2.5.4-260 through 2.5.4-265. This granular backfill forms the supporting materials for the power block structures outside but adjacent to the nuclear islands. The typical thickness of granular fill is about ~~30 to~~ 40 feet with a maximum thickness of about ~~80~~ 55 feet under the radwaste building where fill concrete is not used to build up to the bottom of the nuclear island foundation. Beyond the perimeter of the granular fill as shown on the above-referenced figures, Group I engineered soil fill is placed as necessary to completely backfill the Cherokee Nuclear Station excavation, encompassing the granular backfill around the Lee Nuclear Station nuclear island structures up to yard grade. As discussed in Subsection

2.5.4.6, groundwater will rise above the bedrock surface within the engineered granular fill to elevations between about 574 feet to 584 feet msl.

Shallow foundations for non-Category I plant facilities adjacent to the nuclear island (i.e., seismic Category II part of the annex building, non-seismic radwaste building, and seismic Category II part of the turbine building) are completely founded on or over compacted engineered granular fill over partially weathered rock/continuous rock, or compacted engineered granular fill over ~~fill~~ concrete and partially weathered rock/continuous rock. The non-seismic part of the annex building and non-seismic part of the turbine building and the radwaste building are founded on or over compacted engineered granular fill over partially weathered rock/continuous rock, compacted engineered granular fill over ~~fill~~ concrete and partially weathered rock/ continuous rock, or compacted engineered granular fill over saprolite soils overlying partially weathered rock/continuous rock.

Subsection 2.5.4.5.1 describes the sources and extents of granular fill. The granular fill will likely have Unified Soil Classification System (USCS) classification symbol GW to GP (well-graded gravel to poorly-graded gravel) or SW (well-graded sand). Subsection 2.5.4.5 describes material specifications and compaction for engineered granular fill. Granular fill will be compacted to 96 percent modified Proctor (ASTM D 1557) maximum dry density. Using an empirical relationship from Reference 225 (Lee and Singh, 1971), the relative density of the granular fill compacted to 96 percent of the modified Proctor maximum dry density is 80 percent. According to an empirical correlation from Reference 232 (Rollins, et al., 1998), gravel having 80 percent relative density would have a corresponding $(N_1)_{60}$ blow count of 45 blows per foot. According to Reference 230 (Idriss and Boulanger, 2008), sand having 80 percent relative density would have a corresponding $(N_1)_{60}$ blow count of 29-30 blows per foot. These $(N_1)_{60}$ values may be considered as $(N_1)_{60cs}$ values owing to the low fines contents of the typical granular fill materials. Granular soils having $(N_1)_{60cs}$ blow counts of 29-30 or higher are classified as non-liquefiable according to Figure 2 of Reference 231 (Youd, et al., 2001). Therefore the granular fill compacted to 96 percent modified Proctor relative compaction is not subject to liquefaction. Additionally, the floor of the excavation is relatively flat, and potential sloping basal surfaces do not exist adjacent to or below the granular fill that could present a potential lateral spread condition.

Subsection 2.5.4.5.3.3 describes the criteria and steps for verification of proper foundation support conditions below the base of the granular fill. Figures 2.5.4-245~~, 2.5.4-246,~~ and 2.5.4-260 through ~~2.5.4-26~~2.5.4-265 depict the conditions below the base of the granular fill. No saprolite underlies the granular fill supporting the seismic Category II parts of the annex and turbine buildings for Unit 1 and Unit 2 or the non-seismic radwaste buildings for Unit 1 and Unit 2. The same is true for the northern portions of the non-seismic part of the annex buildings for Unit 1 and Unit 2, the non-seismic part of the turbine building for Unit 1, and the northern portion of the non-seismic part of the turbine building for Unit 2. Some saprolite may underlie the granular fill supporting the southernmost areas of the non-seismic part of the annex buildings for Unit 1 and Unit 2 and for the southern area of the non-seismic part of the turbine building for Unit 2.

45. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.10, third paragraph, sixth sentence is revised as follows:

As discussed in Subsection 2.5.4.6.1, the generic design groundwater elevation is ~~588~~ 591 feet (AP1000 Elevation 98'-00") per the DCD.

46. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.10.1.1, second and third paragraphs are revised as follows:

The Peck, Hanson, and Thornburn method utilizes an empirical relationship between allowable bearing pressure and average Rock Quality Designation. The allowable bearing pressure determined from this empirical relationship is compared to the required allowable bearing capacity provided in the DCD Subsection 2.5.4.2. The FSAR specifically considers 2006-2007 data, 2012 data, and historic boring data relevant to the positions of the nuclear islands. Calculations using this method estimate a minimum allowable bearing pressure of 190,000 lb/ft^2 at Unit 1 and ~~285,000~~242,000 lb/ft^2 at Unit 2. These allowable bearing pressures exceed the bearing requirements of 8,900 lb/ft^2 static and 35,000 lb/ft^2 combined (static plus seismic) loading provided in the DCD Subsection 2.5.4.2 and DCD Table 2-1.

The Ultimate Bearing Capacity method utilizes Hoek-Brown parameters of the rock mass to establish the Mohr-Coulomb parameters of friction angle and cohesion for the rock. The bearing capacity factors, as developed in EM 1110-1-2908 (Reference 214) and in Sowers (Reference 215), are determined based on the established Mohr-Coulomb parameters. Shape, size, and eccentricity correction factors are applied to the foundation conditions based on the size and shape of the nuclear island. The ultimate bearing capacity is then calculated using these parameters and factors. Bearing capacity calculations using these methods estimate an ultimate bearing capacity of at least ~~3,725,000~~2,539,000 lb/ft^2 under static conditions and ~~3,590,000~~2,444,000 lb/ft^2 under combined (static plus seismic) loading conditions.

47. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.10.1.2, ninth paragraph is revised as follows:

Due to the yard surface not being level, the operative values of D_f shown in Table 2.5.4-230 are used for computing C_w. The future water table may be as high as an elevation of 584 ft, which would be about ~~5~~ 8 ft below the yard surface at the perimeter of the buildings. The yard surface slopes down away from the buildings and therefore is not level; the datum for measuring D_w is the average yard surface. For example, for an average depth to the bottom of the mat equal to ~~3.5~~3.0 ft, below the average sloping yard level this would place the future water table at a depth of ~~1.5~~7.5 ft below the ~~bottom of the perimeter foundation~~ average yard level for computing C_w. This depth of water table, about ~~1.5~~7.5 ft ~~below the bottom of the foundation~~, is reasonable to apply to the foundations for the radwaste and annex buildings. The foundation bearing levels in the turbine building are at generally differing elevations than those of the radwaste and annex buildings, and D_f and D_w are appropriately assigned.

48. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.10.2.1, sixth paragraph is revised as follows:

Lee Nuclear Station nuclear island structures are founded on rock and fill concrete which does not incur sufficient settlement to disrupt the operation of the structure. The FSAR considers the 2006-2007 data, 2012 data, and historic CNS data. Settlement of Lee Nuclear Station Unit 1 and Unit 2 nuclear island structures founded on rock or fill concrete is calculated to be less than 1/10 of an inch~~1/15 of an inch or less~~. The maximum estimated settlement is ~~0.055~~0.047 inches beneath Unit 1 and 0.048 inches beneath Unit 2 using the elastic modulus methods. The maximum estimated settlement is ~~0.023~~0.071 inches beneath Unit 1 and ~~0.015~~0.055 inches beneath Unit 2 using the empirical Rock Quality Designation based method. Differential settlement, even if equivalent to the estimated maximum total settlement, is within the limits allowed by DCD Subsection 2.5.4.3 (0.5 inch in 50 ft allowable).

49. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.10.3 is revised as follows:

The highest water table (Elevation 584 feet) is below the design water table from the DCD (AP1000 Elevation 98'-00", corresponding to Lee Nuclear Station Elevation 591 ft).

Lateral pressures are developed against the below-grade nuclear island wall resulting from the placement and compaction of granular backfill materials. Earth pressure envelopes are calculated for active, at-rest, and passive pressure conditions as developed in Figures 2.5.4-255a, 2.5.4-255b, and 2.5.4-255c. Lateral earth pressure values based on the maximum groundwater elevation are provided in Tables 2.5.4-225aA, 2.5.4-225bB, and 2.5.4-225cC. Potential compaction-induced earth pressures are presented in Figure 2.5.4-256a. Numerical values of compaction-induced earth pressure are given in Table 2.5.4-226A. The compaction-induced earth pressures in Table 2.5.4-226A do not result in excessive lateral pressures on the nuclear island walls (Reference 240). Table 2.5.4-226B provides some generic combinations of soil compaction equipment and closest distance from the nuclear island wall the compaction equipment can be operated without exceeding the envelope of residual + at-rest pressure values adjacent to the nuclear island wall in Table 2.5.4-226A. Assumptions or references used to develop the active, at-rest, passive, and compaction-induced earth pressure envelopes are described in the following list.

Earth Pressure Assumptions:

- The granular fill used to backfill around the nuclear islands will likely come from an off-site borrow source such as an operating quarry, as described in Subsection 2.5.4.5. The granular fill will likely be USCS group symbol GW to GP (well-graded gravel to poorly-graded gravel) or SW (well-graded sand) and have material properties as described in Subsection 2.5.4.2.
- Granular backfill is compacted to 96 percent of the maximum dry density determined from the modified Proctor laboratory test performed in accordance with ASTM D 1557.
- ~~To achieve the required degree of compaction, the moisture content should be maintained at or near the optimum moisture content as determined by the ASTM D 1557 laboratory compaction test.~~
- ~~Light hand-guided~~ Appropriate compaction equipment is used to compact the granular fill within ~~5 feet~~ close proximity of the nuclear island walls. Heavier compaction equipment may be used at greater distances ~~greater than 5 feet~~ from the walls. The use of ~~light, hand-guided~~ appropriate compaction equipment near the wall avoids excessive compaction-induced stresses against the wall.
- The potential compaction-induced earth pressures for vibratory roller compactors are~~a~~ computed using the method in Peck and Mesri, 1987 (Reference 229). The potential compaction-induced earth pressures for vibratory plate compactors are computed using information in Duncan, et al., 1991 (Reference 238).
- The groundwater table elevation may vary over time between elevations 584 and 574 feet. The design water table elevation from the Design Control Document is up to elevation ~~588~~591 feet (AP1000 Elevation 98'-00").
- The nuclear island walls do not yield due to the lateral earth pressure applied to them. The at-rest pressure is the appropriate earth pressure to assume for design of the walls.

The Rankine earth pressure theory is used to compute the active and passive (ultimate) earth pressure.

The dynamic lateral earth pressure in Table 2.5.4-227 and plotted on Figure 2.5.4-256b is calculated in accordance with Reference 220 - ASCE 4-98, Section 3.5.3, Figure 3.5-1, "Variation of Normal Dynamic Soil Pressures for the Elastic Solution." Backfill properties for granular fill adjacent to the vertical surface of the nuclear island exterior walls and basemat for dynamic earth pressure calculation are as follows:

- Saturated unit weight of backfill ((γ)) = 150 lb/ft^3 (GW)
  = 142 lb/ft^3 (GP)
  = 136 lb/ft^3 (SW)

  (from Table 2.5.4-211)
- Poisson's ratio (ν) = 0.5 (see discussion below)

The Poisson's ratio, ν = 0.5, is used because the granular fill is predominantly below the design groundwater table.

The seismic acceleration used, (a) = 0.30g, is applied as a uniform seismic acceleration to the granular backfill along the height of the nuclear island wall.

The lateral earth pressure is calculated for a ground surface associated with the presence of the adjacent buildings; this is not affected by changes to the ground surface contour elevations beyond the outside walls of these buildings.

50. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.12, first paragraph, fourth sentence is revised as follows:

Continuous rock is based on criteria of fresh to moderate weathering and ~~Rock Quality Designation (~~RQD~~)~~ ~~greater than~~of at least 65%, based on the boring logs.

51. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.12, fifth paragraph is revised as follows:

The Cherokee Nuclear Station Unit 1 circular reactor building and the structures adjacent to it were designed for the dewatered condition and were constructed with an under slab drainage system. This drainage system consists of a network of channels located below the Cherokee Nuclear Station foundation slabs. The under slab drainage network is contained within the footprint of the Cherokee Nuclear Station structures and was sealed at the Cherokee foundation perimeter. Removal of the ~~structures~~ isolation joint surrounding the Cherokee Nuclear Station circular reactor building exposes portions of this existing drainage network within the foundation support zone of the nuclear island. Removal of the Cherokee Nuclear Station auxiliary building basemat because of its high elevation in the southern end of the Lee Nuclear Station nuclear island basemat exposed portions of this existing drainage network. Where the Cherokee Nuclear Station drainage system is exposed by Lee Nuclear Station construction it is sealed off to keep the Lee Nuclear Station fill materials from eroding into the Cherokee Nuclear Station drainage channels. The sealing of these drainage channels ~~applies to portions of~~is not an issue where the Cherokee Nuclear Station foundation structures ~~left in place below~~ are not removed; the drainage channels do not extend to the edges of the Lee Nuclear Station ~~foundations as well as any portions of the Cherokee Nuclear Station structures~~ basemats and thus pose no risk that ~~are left in place outside the limits of~~ the Lee Nuclear Station~~ structure areas~~fill materials can erode into the drainage channels. The Cherokee Nuclear Station foundation basemat drainage system and an outline of the Lee Nuclear Station nuclear island foundation limits are shown on Figures 2.5.4-244a through 2.5.4-244~~d~~e.

52. COLA Part 2, FSAR Chapter 2, Subsection 2.5.4.13 is revised to add new references as follows:

238. Duncan, J. M., Williams, G. W., Sehn, A. L., and Seed, R. B., 1991. Estimation Earth Pressures Due to Compaction, Journal of Geotechnical Engineering, Vol. 117, No. 12.

239. Shaw, 2011, Constructability Study: Methodology and Sequence for Final Demolition Activities for the Removal of Cherokee Legacy Waterproofing Membrane and Sheathing of Steel-lined Collection Puts, Pump Rooms and Other Localized Sumps and Pits, Rev. 0, December 20, 2011.

240. Westinghouse Electric Company LLC, 2013. "William S. Lee Site-Specific Assessment of Lateral Pressure Load Due to Relocation 3' Higher," No. WLG-1000-S2R-806, Rev. 1, Approved Feb. 13, 2013.

53. COLA Part 2, FSAR Chapter 2, Table 2.5.4-202 is revised as follows:

TABLE 2.5.4-202
SUMMARY OF LEE NUCLEAR STATION GEOTECHNICAL EXPLORATION

WLS COL 2.5-1

Test Type	Number (2006-2007 Exploration)	Number (2012 Exploration)
Soil and Rock Borings/Geotechnical Monitoring Well Borings	124/24	7/0
Monitoring Wells/Packer Tests	21/4	0/0
Cone Penetrometer Test/SCPT	29/10	0/0
Geotechnical Test Pits and Geologic Trenches	14	0/0
Goodman Jack	14 (2 borings)	0
Pressuremeter Testing	24 (2 borings)	0
P-S Suspension Log	13	3
Downhole Velocity	4	0
Televiewer Survey	13	4
Spectral Analysis of Surface Waves (SASW) Survey	15	0
Petrographic Analysis	15	0

54. COLA Part 2, FSAR Chapter 2, Table 2.5.4-203 is revised as follows:

WLS COL 2.5-1

TABLE 2.5.4-203 (Sheet 1 of 5)
SUMMARY OF COMPLETED EXPLORATION BORINGS AND FIELD TESTS

Facility or Zone	Boring Number	Coordinates and Elevation			Boring Type					SPT Interval		Depth (ft bgs)[a]		Borehole Geophysical Testing			In-situ Testing	
		Northing	Easting	Elevation (ft MSL)[b]	Rock Coring		Soil Sampling Method			From	To	Proposed	Actual	P-S Velocity	Tele-viewer	Packer Test	Goodman Jack	Pressure-meter
					HQ	NQ	SPT	UD	CME									
Power Block and Adjacent Structures																		
Unit 1	**B-1000**	1166072.097	1846189.261	581.537	X		X			0	60	150	151	X	X			
(Basemat elevation 5530.5 ft.)	**B-1000-UD**	1166063.067	1846192.595	581.519				X		--	--	--	23					
	B-1000-UDA	1166062.371	1846181.346	581.615				X		--	--	--	29.2					
	B-1000-UDB	1166107.231	1846117.365	588.931				X		--	--	--	48					
	B-1001	1166067.122	1846370.397	565.473	X					--	--	100	118.1		X			
	B-1001A	1166085.286	1846293.470	568.083		X				--	--	--	270.8 (length)					
	B-1002	1166061.781	1846444.433	565.338	X					--	--	150	170.3	X	X		X	
	B-1003	1165938.073	1846226.728	597.163	X					--	--	100	100					
	B-1004	1165831.988	1846407.915	558.997	X	X				--	--	175	175	X	X	X	X	
	B-1004A	1165831.298	1846430.369	558.997		X				--	--	--	284.7 (length)					
	B-1074	1166069.515	1846246.401	569.244	X	X	X			--	--	--	67.5					X
	B-1074A	1166067.457	1846252.141	569.233	X	X				--	--	--	121.9	X	X			X
	B-1075	1166030.303	1846255.956	569.667			X			--	--	--	23.7					
	B-1075A	1166035.846	1846256.754	569.535	X					--	--	--	150.4	X	X			
	B-2000	1166027.29	1846301.71	544.45	X					--	--	125	126	X	X			
	B-2001	1165894.29	1846423.34	544.47		X				--	--	100	100.5					
	B-2002	1165782.16	1846364.98	558.84		X				--	--	100	225.6	X	X			
	B-2003	1165773.77	1846448.63	559.03	X					--	--	225	54.6		X			
	B-2004	1165936.81	1846506.19	544.55		X				--	--	100	101					
Adjacent Structures	**B-1005**	1165715.711	1846277.806	562.189		X				--	--	50	50					
	B-1006	1165456.872	1846165.621	589.158		X				--	--	50	30					
	B-1006A	1165453.953	1846160.471	589.622		X				--	--	--	90					
	B-1007	1165712.405	1846489.105	563.038		X				--	--	50	51.25					
	B-1008	1165623.375	1846335.376	563.175		X				--	--	50	51					

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TABLE 2.5.4-203 (Sheet 2 of 5)
SUMMARY OF COMPLETED EXPLORATION BORINGS AND FIELD TESTS

Facility or Zone	Boring Number	Coordinates and Elevation			Boring Type					SPT Interval		Depth (ft bgs)[a]		Borehole Geophysical Testing			In-situ Testing	
		Northing	Easting	Elevation (ft MSL)[b]	Rock Coring		Soil Sampling Method			From	To	Proposed	Actual	P-S Velocity	Tele-viewer	Packer Test	Goodman Jack	Pressur e-meter
					HQ	NQ	SPT	UD	CME									
	B-1009	1165530.408	1846393.253	562.965						–	–	50	2.5					
	B-1009A	1165529.086	1846392.312	562.948		X				–	–	–	51					
	B-1010	1165551.531	1846525.693	563.107		X				–	–	75	51					
	B-1011	1165997.940	1846673.057	537.714	X					–	–	150	220	X	X			
Unit 2	B-1012	1166228.569	1847098.384	566.153	X					–	–	150	150.2	X	X		X	
(Basemat elevation 5530.5 ft.)	B-1013	1166266.998	1847167.699	558.699		X				–	–	50	52					
	B-1014	1166150.213	1847262.006	544.382	X	X				–	–	75	75.5		X		X	
	B-1015	1166134.365	1847192.566	560.052	X					–	–	400	250.3	X	X	X		
	B-1016	1166124.243	1847132.581	559.249		X	X			0	3	100	100					
	B-1017	1166004.443	1847155.562	560.724	X					–	–	175	175.6	X	X		X	
	B-1018	1166028.814	1847265.117	552.733		X				–	–	100	100.3					
	B-2005	1165972.37	1847267.57	550.28	X					–	–	225	225	X	X			
	B-2006	1166175.58	1847173.13	558.37		X				–	–	100	101					
Adjacent Structures	B-1019	1166204.465	1847001.388	558.168		X	X			0	9	75	75					
	B-1020	1166389.650	1847104.154	589.996		X	X			0	13.5	75	75					
	B-1021	1165897.314	1847301.608	565.519		X	X			0	5	75	75.4					
	B-1022	1165733.403	1847334.894	571.450		X	X			0	40	75	76					
	B-1023	1165696.674	1847233.087	571.173		X	X			0	27	75	75					
	B-1024	1166077.813	1846927.534	539.369	X	X				–	–	150	220.2	X	X			
	B-1037	1166205.496	1847506.541	589.279			X			0	78.75	50	78.75					
	B-1037A	1166215.133	1847504.721	589.279	X					–	–	–	96.6	X	X			
	B-1037-UD	1166209.149	1847500.977	589.246				X		–	–	–	68					
	B-1038	1166165.152	1847350.980	546.544		X				–	–	50	50.2					
Pipelines (Non-Safety Related)																		
Unit 1	B-1050	1164915.459	1846053.459	596.956		X	X			–	–	50	73.4					
	B-1051	1164991.018	1846392.558	587.676		X	X			–	–	50	71.5					
	B-1052	1165181.111	1846736.893	587.367		X	X			–	–	50	70.7					

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TABLE 2.5.4-203 (Sheet 3 of 5)
SUMMARY OF COMPLETED EXPLORATION BORINGS AND FIELD TESTS

Facility or Zone	Boring Number	Coordinates and Elevation			Boring Type					SPT Interval		Depth (ft bgs)[a]		Borehole Geophysical Testing			In-situ Testing	
		Northing	Easting	Elevation (ft MSL)[b]	Rock Coring		Soil Sampling Method			From	To	Proposed	Actual	P-S Velocity	Tele-viewer	Packer Test	Goodman Jack	Pressure-meter
					HQ	NQ	SPT	UD	CME									
Unit 2	**B-1053**	1165781.941	1847797.307	589.279			X			--	--	50	13.5					
	B-1053A	1165778.372	1847798.567	589.279			X			--	--	--	16					
	B-1053B	1165778.077	1847780.641	589.583						--	--	--	13.5					
	B-1053C	1165682.617	1847809.363	589.482		X	X			--	--	--	69.2					
	B-1053-UD	1165682.863	1847817.422	589.327				X		--	--	--	26.3					
	B-1054	1165836.297	1847569.662	590.947		X	X			--	--	50	83.5					
	B-1055	1166463.354	1847463.729	590.486		X	X			--	--	50	66					
Cooling Tower																		
Unit 1	**B-1025**	1165263.848	1845471.841	609.654		X	X			0	28.5	50	52					
	B-1025-UD	1165268.740	1845470.006	609.654				X		--	--	--	21					
	B-1026	1164883.450	1845089.201	610.168		X				0	99.9	50	99.9					
	B-1026-UD	1164870.682	1845091.797	609.875				X		--	--	--	47					
	B-1027	1165384.243	1845448.133	609.673		X	X			--	--	--	50					
Cooling Tower Unit 2	**B-1028**	1166140.124	1848027.639	609.765			X			0	103.55	80	103.55					
	B-1028-UD	1166150.119	1848024.643	609.875				X		--	--	--	94.6					
	B-1029	1165581.365	1848117.315	609.811			X			0	99.25	80	99.25					
	B-1030	1165963.148	1848403.477	609.697			X			0	98.8	80	98.8					
	B-1070	1165725.759	1848283.701	610.663			X			--	--	--	106	X				
	B-1070-UD	1165720.845	1848293.604	610.657				X		--	--	--	57.7					
	B-1071	1165707.327	1848320.308	610.545			X			--	--	--	100					
Switchyard (525 and 230 kV)																		
	B-1031	1164731.622	1847445.498	603.991			X			0	38.8	50	38.8					
	B-1031-UD	1164740.021	1847445.261	603.991				X		--	--	--	16					
	B-1031-UDA	1164728.537	1847439.841	603.836				X		--	--	--	37					

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TABLE 2.5.4-203 (Sheet 4 of 5)
SUMMARY OF COMPLETED EXPLORATION BORINGS AND FIELD TESTS

Facility or Zone	Boring Number	Coordinates and Elevation			Boring Type					SPT Interval		Depth (ft bgs)[a]		Borehole Geophysical Testing			In-situ Testing	
		Northing	Easting	Elevation (ft MSL)[b]	Rock Coring		Soil Sampling Method			From	To	Proposed	Actual	P-S Velocity	Tele-viewer	Packer Test	Goodman Jack	Pressur e-meter
					HQ	NQ	SPT	UD	CME									
	B-1032	1164553.105	1846696.598	603.938			X			0	40.2	40	40.2					
	B-1033	1164557.162	1847059.050	604.405			X			0	40.5	40	40.5					
	B-1033-UD	1164563.916	1847059.310	604.110				X		--	--	--	28					
	B-1034	1164327.544	1847522.550	603.997			X			0	39.3	40	29					
	B-1035	1164164.327	1847146.518	604.562			X			--	--	--	40.1					
	B-1068	1164807.458	1847481.381	605.704			X			--	--	--	39	X				
	B-1068-UD	1164805.263	1847471.664	605.786				X		--	--	--	32					
	B-1069	1164802.003	1847447.979	604.878			X			--	--	--	40					
Make-Up Pond B Dam																		
	B-1036	1166863.111	1844076.180	591.051			X			0	23.5	160	23.5					
General Site Coverage and Facilities																		
	B-1044	1167711.138	1847455.765	587.987		X	X			0	13.6	--	43.6					
	B-1045	1167756.187	1847636.642	588.394		X	X			--	--	--	54					
	B-1045-UD	1167749.848	1847628.174	588.394				X		--	--	--	16					
	B-1046	1167815.000	1847834.473	588.315		X	X			--	--	--	93.3					
	B-1046-UD	1167822.860	1847835.327	588.046				X		--	--	--	54					
	B-1047	1167543.561	1847907.867	588.079		X	X			--	--	--	93.5					
	B-1047-UD	1167548.776	1847908.725	588.231				X		--	--	--	40					
	B-1048	1167477.305	1847718.329	587.526		X	X			--	--	--	84.5					
	B-1048-UD	1167471.096	1847715.977	587.526				X		--	--	--	26					
	B-1049	1167470.743	1847541.280	587.444		X	X			--	--	--	81					

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TABLE 2.5.4-203 (Sheet 5 of 5)
SUMMARY OF COMPLETED EXPLORATION BORINGS AND FIELD TESTS

Facility or Zone	Boring Number	Coordinates and Elevation			Boring Type					SPT Interval		Depth (ft bgs)[a]		Borehole Geophysical Testing			In-situ Testing	
		Northing	Easting	Elevation (ft MSL)[b]	Rock Coring		Soil Sampling Method			From	To	Proposed	Actual	P-S Velocity	Tele-viewer	Packer Test	Goodman Jack	Pressure-meter
					HQ	NQ	SPT	UD	CME									
Borrow Areas																		
	B-1056	1163896.899	1846786.571	642.830			X			0	58.9	45	58.9					
	B-1057	1163743.790	1846819.978	639.064			X			0	54.8	50	54.8					
	B-1058	1163577.599	1846860.987	638.355			X			0	44.96	45	44.96					
	B-1059	1164621.202	1845733.239	686.991			X			0	55	40	55					
	B-1060	1163796.990	1847079.841	634.499			X			0	54.4	40	54.4					
	B-1061	1164300.248	1845630.540	685.282			X			0	50	40	50					
	B-1062	1164027.320	1847313.772	621.610			X			0	40	30	40					
	B-1063	1165768.794	1845001.137	610.939			X			0	28.8	30	28.8					
	B-1064	1166042.294	1845355.995	609.393			X			0	20	30	20					
	B-1065	1165642.457	1845273.637	610.082			X			0	30	25	30					
	B-1066	1163965.942	1847564.670	632.799			X			0	35	25	35					
	B-1067	1163861.880	1847598.060	629.049			X			0	60	25	60					
	B-1072	1164001.659	1847171.959	630.173			X			--	--	--	45					
	B-1073	1163676.681	1847239.214	626.706		X	X			--	--	--	78.5					

Notes:

~~1. ft b.g.s. = feet below ground surface~~

~~2. ft MSL = feet above mean sea level~~

a) ft bgs. = feet below ground surface.

b) ft MSL = feet above mean sea level.

55. COLA Part 2, FSAR Chapter 2, Table 2.5.4-211 is revised as follows:

TABLE 2.5.4-211 (Sheet 1 of 2)
AVERAGE ENGINEERING PROPERTIES OF SOIL

(Reported Values are Mean ± One Standard Deviation, except for Granular Fill)

		All Fill Samples(a)			Granular Fill			Residual Soil			Saprolite			PWR
WLS COL 2.5-6		$N_{60} \le 10$ $(N \le 8)^{(\beta)}$	$11 < N_{60} \le 30$ $(8 < N \le 23)^{(b)}$	$31 < N_{60} \le 100$ $(23 < N \le 75)^{(b)}$	GW	GP	SW	$N_{60} \le 10$ $(N \le 8)^{(b)}$	$11 < N_{60} \le 30$ $(8 < N \le 23)^{(b)}$	$31 < N_{60} \le 100$ $(23 < N \le 75)^{(b)}$	$N_{60} \le 10$ $(N \le 8^{(b)})$	$11 < N_{60} \le 30$ $(8 < N \le 23)^{(b)}$	$31 < N_{60} \le 100$ $(23 < N \le 75)^{(b)}$	$N_{60} > 100$ $(N > 75)^{(b)}$
N_{60}-value(c)		21 ± 8 [75]			45(d)	45(d)	29-30(d)	25 ± 26 [14]			28 ± 23 [64]			-
Corrected tip resistance, qc	tsf	46.6 ± 31.4 [1,646]			-	-	-	62.5 ± 41.1 [330]			69.3 ± 61.2 [367]			-
Friction ratio, FR	ft/sec	5.4 ± 1.7 [1,646]			-	-	-	3.5 ± 1.5 [330]			4.0 ± 2.0 [367]			-
Percent gravel(e)	%	0 [1](f)	4 ± 6 [36]	6 ± 8 [6]	40-70(g)	40-70(g)	0-10(g)	0 [1]	0 [4]	0 [1]	3 ± 3 [8]	3 ± 7 [20]	1 ± 1 [11]	9 ± 14 [8]
Percent sand(e)	%	42 [1](f)	34 ± 8 [36]	47 ± 19 [6]	18-60(g)	18-60(g)	86-100(g)	57(f) [1]	46 ± 15 [4]	40(f) [1]	44 ± 11 [8]	52 ± 12 [20]	52 ± 13 [11]	55 ± 19 [8]
Percent fines (<#200 sieve)(e)	%	58[1](f)	62 ± 11 [36]	47 ± 21 [6]	0-12(g)	0-12(g)	0-4(g)	43(f) [1]	54 ± 14 [4]	60(f) [1]	54 ± 13 [8]	46 ± 15 [20]	47 ± 13 [11]	36 ± 22 [8]
Percent silt	%	-	41 ± 9 [13]	42(f) [1]	-	-	-	-	55(f) [1]	56(f) [1]	53(f) [2]	41 ± 10 [3]	34(f) [1]	-
Percent clay (<5μm)	%	-	18 ± 9 [13]	19(f) [1]	-	-	-	-	19(f) [1]	4(f) [1]	6(f) [2]	5 ± 2 [3]	8(f) [1]	-
Plasticity index, PI	%	-	NP [20]	NP [1]	~~NP~~≤6 (g)	~~NP~~≤6 (g)	NP (g)	-	NP [2]	-	NP [5]	NP [10]	NP [5]	NP [1]
Liquid limit, LL	%	-	NV [20]	NV [1]	~~NV~~≤25 (g)	~~NV~~≤25 (g)	NV (g)	-	NV [2]	-	NV [5]	NV [10]	NV [5]	NV [1]
Water content(e), w	%	33(f) [1]	23 ± 6 [59]	21 ± 10 [9]	-	-	-	22(f) [1]	32 ± 6 [9]	28 ± 10 [3]	32 ± 6 [15]	30 ± 12 [27]	20 ± 6 [16]	14 ± 4 [9]
Initial void ratio, e_o		-	0.69 ± .17 [13]	-	0.18	0.29	0.39	-	0.94(f) [2]	-	0.84 ± 0.23 [4]	0.84 ± 0.33 [8]	0.83(f) [2]	-
Specific gravity, G_s		-	2.71 ± .06 [20]	2.68(f) [1]	2.65(g)	2.65(g)	2.65(g)	-	2.72(f) [2]	2.70(f) [1]	2.72 ± 0.04 [6]	2.71 ± .04 [11]	2.69 ± .04 [4]	-
Dry unit weight, γ_{dry}	pcf	-	101 ± 8 [13]	-	140	128	119	-	88(f) [2]	-	93 ± 11 [4]	94 ± 15 [8]	93(f) [2]	-
Wet unit weight, γ_t	pcf	-	122 ± 5 [13]	-	150	142	136	-	113(f) [2]	-	116 ± 11 [4]	117 ± 7 [8]	114(f) [2]	135(h)
Saturated unit weight, γ_{sat}	pcf	-	125 ± 5 [13]	-	150	142	136	-	118(f) [2]	-	121 ± 7 [4]	124 ± 7 [7]	121(f) [2]	140(h)
Overconsolidation ratio(i), OCR		4.9 ± 2.8(j) [11]			-	-	-	-	1.6(f) [1]	-	4.2 ± 2.4 [3]	3.5 ± 2.0 [7]	2.4(f) [2]	-
Preconsolidation pressure(i), σp'	ksf	8.8 ± 1.6(j) [11]			-	-	-		10.0(f) [1]		10.0 ± 1.5 [3]	9.4 ± 2.0 [7]	8.9(f) [2]	-
Compression index(i), C_c		0.19 ± 0.09(j) [11]			-	-	-	-	0.34(f) [1]	-	0.29 ± 0.03 [3]	0.33 ± 0.22 [7]	0.19(f) [2]	-
Re-compression index(i), C_r		0.024 ± 0.015(j) [11]			-	-	-	-	0.030(f) [1]	-	0.024 ± 0.016 [3]	0.027 ± 0.012 [7]	0.026(f) [2]	-
Consolidation coefficient(i), C_v	ft2 /day	5.6 ± 2.2(j) [11]			-	-	-	-	6(f) [1]	-	6.3 ± 0.6 [3]	5.1 ± 2.3 [7]	7(f) [2]	-
Total cohesion(i), c	psf	1,887 ± 178(j) [13]			-	-	-	224 ± 61(k)	-1,243 ± 346(k)	1,406(k)	224 ± 61 [4]	1,243 ± 346 [6]	1,406(f) [2]	1,000(h)
Total friction angle(i), φ	deg	20 ± 2(j) [13]			-	-	-	27 ± 5(k)	20 ± 5(k)	19(k)	27 ± 5 [4]	20 ± 5 [6]	19(f) [2]	45(h)

TABLE 2.5.4-211 (Sheet 2 of 2)
AVERAGE ENGINEERING PROPERTIES OF SOIL

(Reported Values are Mean ± One Standard Deviation, except for Granular Fill)

		All Fill Samples(a)			Granular Fill			Residual Soil			Saprolite			PWR
WLS COL 2.5-6		$N_{60} \le 10$ ($N \le 8$)(β)	$11 < N_{60} \le 30$ ($8 < N \le 23$)(b)	$31 < N_{60} \le 100$ ($23 < N \le 75$)(b)	GW	GP	SW	$N_{60} \le 10$ ($N \le 8$)(b)	$11 < N_{60} \le 30$ ($8 < N \le 23$)(b)	$31 < N_{60} \le 100$ ($23 < N \le 75$)(b)	$N_{60} \le 10$ ($N \le 8$(b))	$11 < N_{60} \le 30$ ($8 < N \le 23$)(b)	$31 < N_{60} \le 100$ ($23 < N \le 75$)(b)	$N_{60} > 100$ ($N > 75$)(b)
Effective cohesion(i)(l), c'	psf	276 ± 49(j) [14]			0	0	0	-	130(f) [3]	-	0 [4]	439 ± 94 [6]	230(f) [2]	1,000(h)
Effective friction angle(i)(l), ϕ'	deg	28 ± 4 (j) [14]			≥35	≥35	≥35	-	30(f) [3]	-	31 ± 4 [4]	23 ± 5 [6]	28(f) [2]	45(h)
Hydraulic conductivity(m), k	ft/year	-	-	-	<~5,173 to 51,730	<~5,173 to 77,598	~5,173 to 17,589	-	-	-	-	-	-	-
	cm/sec	-	-	-	<~5.0E-03 to 5.0E-02	<~5.0E-03 to ~7.5E-02	~5.0E-03 to ~1.7E-02	-	-	-	-	-	-	-

a) All Fill includes samples classified as fill on boring logs.

c) N_{60}- value is obtained from field values corrected to Energy Transfer Ratios of 60%. The values for granular fill are $(N_1)_{60}$, and are for typical materials (see footnote d).

d) Reported value is for $(N_1)_{60}$. Value obtained using correlations in Reference 230 (Idriss and Boulanger, 2008) for sand (SW) and Reference 232 (Rollins et al., 1998) for gravel (GW and GP) for relative density = 80% corresponding to relative compaction = 96% (ASTM D 1557).

e) Three samples of alluvium were tested for moisture content and two underwent grain size analysis; the results are not shown in this table.

f) Insufficient data to determine standard deviation.

g) Values listed are for typical granular fill materials and will be verified by laboratory testing when the source of and specific materials to be used are known. Unit weight, friction angle, and hydraulic conductivity values reported are obtained from
Reference 228 (NAVFAC, 1986). Grain sizes and PI, LL for typical granular fill materials are obtained from Reference 224 (SCDOT, 2007). The specific gravity of granular fill material is assumed as 2.65, a typical value.

h) These values are from PSAR, Table 2D-3 and Table 2A-1 (Reference 201).

i) The design engineer (i.e., engineer that will use data for design) must give careful consideration to compressibility and strength parameters based on test data, and the values reported in this table are estimates.

j) Samples tested were all in the $11 < N_{60} \le 30$ range. The resulting consolidation and shear parameters may be applied to existing fill regardless of N_{60}.

k) Insufficient data to determine total strength parameters; strength parameters have been assigned same as for saprolite having similar N_{60}. Little residual soil remains.

a) All Fill includes samples classified as fill on boring logs.

l) For consolidated-undrained triaxial tests on undisturbed specimens, failure was said to occur at peak pore pressure.

m) 1 ft/year * 9.67×10^{-7} = 1 cm/sec.

Note: The number in brackets is the count. [Number]

56. COLA Part 2, FSAR Chapter 2, Table 2.5.4-216 is revised as follows:

TABLE 2.5.4-216 (Sheet 1 of 5)
BOREHOLE GEOPHYSICAL TEST LOCATIONS – P-S SUSPENSION, DOWNHOLE, AND TELEVIEWER TESTS

WLS COL 2.5-1

WLS COL 2.5-6

Borehole	Tool and Run Number	Depth Range (ft.)	Total Depth as Drilled (ft.)	Depth to Bottom of Casing (ft)	Sample Interval (ft)
B1000	Suspension	6.6 - 142.7	151.0	60.0 PVC	1.6
B1000	Downhole	3.0 - 150.0	151.0	60.0 PVC	3.0-10.0
B1000	Optical Televiewer	60.0 - 153.2	151.0	60.0 PVC	0.008
B1000	Acoustic Televiewer 1	60.0 - 153.2	151.0	60.0 PVC	0.008
B1000	Acoustic Televiewer 2	60.0 - 153.0	151.0	60.0 PVC	0.008
B1001	Acoustic Televiewer	29.3 - 120.6	120.0	29.3 PVC	0.008
B1002	Suspension	24.6 - 157.5	170.0	24.5 PVC	1.6
B1002	Acoustic Televiewer	24.8 - 169.9	170.0	24.5 PVC	0.008
B1004	Suspension	9.8- 162.4	175.0	---	1.6
B1004	Optical Televiewer	6.2 - 174.0	175.0	---	0.008
B1004	Acoustic Televiewer	9.8 - 174.6	175.0	---	0.008
B1011	Suspension 1	8.2 - 211.6	220.5	---	1.6
B1011	Suspension 2	6.6 - 196.9	220.5	---	1.6

TABLE 2.5.4-216 (Sheet 2 of 5)
BOREHOLE GEOPHYSICAL TEST LOCATIONS – P-S SUSPENSION, DOWNHOLE, AND TELEVIEWER TESTS

Borehole	Tool and Run Number	Depth Range (ft.)	Total Depth as Drilled (ft.)	Depth to Bottom of Casing (ft)	Sample Interval (ft)
B1011	Downhole	3.0 - 217.0	220.5	---	20
B1011	Optical Televiewer	4.5 - 222.0	220.5	---	0.008
B1011	Acoustic Televiewer	1.6 - 160.8	220.5	---	0.008
B1012	Suspension	13.1 - 137.8	150.0	---	1.6
B1012	Optical Televiewer	4.5 - 149.8	150.0	---	0.008
B1012	Acoustic Televiewer	12.5 - 149.8	150.0	---	0.008
B1014	Optical Televiewer	6.4 - 67.4	75.0	3.0 PVC	0.008
B1014	Acoustic Televiewer	3.6 - 67.3	75.0	3.0 PVC	0.008
B1015	Suspension	6.6 - 241.1	255.0	5.0 PVC	1.6
B1015	Optical Televiewer	5.0 - 255.0	255.0	5.0 PVC	0.008
B1015	Acoustic Televiewer	5.5 - 254.7	255.0	5.0 PVC	0.008
B1017	Suspension	8.2 - 162.4	175.0	10.0 PVC	1.6
B1017	Optical Televiewer	6.5 - 176.2	175.0	10.0 PVC	0.008
B1017	Acoustic Televiewer	6.7 - 175.9	175.0	10.0 PVC	0.008

TABLE 2.5.4-216 (Sheet 3 of 5)
BOREHOLE GEOPHYSICAL TEST LOCATIONS – P-S SUSPENSION, DOWNHOLE, AND TELEVIEWER TESTS

Borehole	Tool and Run Number	Depth Range (ft.)	Total Depth as Drilled (ft.)	Depth to Bottom of Casing (ft)	Sample Interval (ft)
B1024	Suspension	18.0 - 208.3	220.2	4.0 STEEL	1.6
B1024	Downhole	5.0 - 210.0	Blocked at 210.0	4.0 STEEL	5.0-10.0
B1024	Optical Televiewer	5.4 - 222.0	220.2	4.0 STEEL	0.05
B1024	Acoustic Televiewer	15.5 - 115.0	220.2	4.0 STEEL	0.05
B1037A	Suspension	5.3 - 85.3	97.5	70.6 PVC	1.6
B1037A	Downhole	3.0 - 84.0	97.5	70.6 PVC	3
B1037A	Optical Televiewer	71.8 - 97.8	97.5	70.6 PVC	0.008
B1037A	Acoustic Televiewer	72.0 - 97.5	97.5	70.6 PVC	0.008
B1068	Suspension	1.6 - 25.3	38.0	---	0.82
B1070	Suspension	1.6 - 91.9	105.0	---	1.6
B1074A[(a)]	Acoustic Televiewer 1	28.0 - 40.2	121.9	29.4 STEEL	0.008
B1074A[(a)]	Acoustic Televiewer 2	28.0 - 108.2	121.9	29.4 STEEL	0.008
B1074A[(a)]	Acoustic Televiewer 2	108.2 - 28.0	121.9	29.4 STEEL	0.008
B1074A[(a)]	Suspension 1	27.9 - 95.1	121.9	29.4 STEEL	1.6

TABLE 2.5.4-216 (Sheet 4 of 5)
BOREHOLE GEOPHYSICAL TEST LOCATIONS – P-S SUSPENSION, DOWNHOLE, AND TELEVIEWER TESTS

Borehole	Tool and Run Number	Depth Range (ft.)	Total Depth as Drilled (ft.)	Depth to Bottom of Casing (ft)	Sample Interval (ft)
B1075A [(a)]	Acoustic Televiewer 1	18.0 - 28.0	150.4	18.5 STEEL	0.008
B1075A [(a)]	Acoustic Televiewer 2	27.7 - 18.0	150.4	18.5 STEEL	0.008
B1075A [(a)]	Acoustic Televiewer 3	18.0 - 149.7	150.4	18.5 STEEL	0.008
B1075A [(a)]	Acoustic Televiewer 4	149.7 - 23.0	150.4	18.5 STEEL	0.008
B1075A [(a)]	Suspension 1	26.3 - 136.2	150.4	18.5 STEEL	1.6
B-2000	Acoustic Televiewer 1	4.7 – 124.1	126.0	---	0.04
B-2000	Acoustic Televiewer 2	124.0 – 4.0	126.0	---	0.004
B-2000	Suspension 1	4.9 – 113.2	126.0	---	1.6
B-2000	Suspension 2	105.0 – 95.1	126.0	---	1.6
B-2002	Suspension 1	11.5 – 211.6	225.6	---	1.6
B-2002	Suspension 2	180.5 – 170.6	225.6	---	1.6
B-2002	Acoustic Televiewer 1	11.5 – 224.3	225.6	---	0.04
B-2002	Acoustic Televiewer 2	224.0 – 7.5	225.6	---	0.004
B-2003	Acoustic Televiewer 1	13.0 – 53.9	54.6	---	0.04

TABLE 2.5.4-216 (Sheet 5 of 5)
BOREHOLE GEOPHYSICAL TEST LOCATIONS – P-S SUSPENSION, DOWNHOLE, AND TELEVIEWER TESTS

Borehole	Tool and Run Number	Depth Range (ft.)	Total Depth as Drilled (ft.)	Depth to Bottom of Casing (ft)	Sample Interval (ft)
B-2003	Acoustic Televiewer 2	53.8 – 5.0	54.6	---	0.004
B-2005	Suspension 1	4.9 – 211.6	225.0	---	1.6
B-2005	Suspension 2	180.5 – 167.3	225.0	---	1.6
B-2005	Acoustic Televiewer 1	3.6 – 223.4	225.0	---	0.04
B-2005	Acoustic Televiewer 2	223.0 – 1.5	225.0	---	0.004

Notes:

(a) Borings B-1074A and B-1075A are not representative of the Unit 1 nuclear island.

57. COLA Part 2, FSAR Chapter 2, Table 2.5.4-217 is revised as follows:

TABLE 2.5.4-217(Sheet 1 of 4)
SUMMARY OF INTERPRETED P-S SUSPENSION VELOCITY LAYER MODELS

Boring Number	Layer No.	Depth to Top (ft.)	Depth to Bottom (ft.)	Layer model V_s (ft./sec.)	Layer model V_p (ft./sec.)
B-1000	1	4.1	23.8	1069.47	--
	2	23.8	36.9	1741.59	5024.47
	3	36.9	46.8	2921.97	6270.22
	4	46.8	63.2	2138.64	6846.60
	5	63.2	97.6	3858.39	9498.04
	6	97.6	107.5	5163.41	12097.82
	7	107.5	120.6	9011.92	18208.60
	8	120.6	138.6	10960.66	21638.16
B-1002	1	27.1	32.0	8248.31	14766.43
	2	32.0	104.2	9998.31	18750.08
	3	104.2	156.7	10240.85	19149.11
B-1004	1	10.7	22.2	6099.08	11869.06
	2	22.2	50.0	8459.07	16006.10
	3	50.0	161.6	9891.54	18465.19
B-1011	1	9.0	210.8	9835.41	17208.75

TABLE 2.5.4-217(Sheet 2 of 4)
SUMMARY OF INTERPRETED P-S SUSPENSION VELOCITY LAYER MODELS

Boring Number	Layer No.	Depth to Top (ft.)	Depth to Bottom (ft.)	Layer model V_s (ft./sec.)	Layer model V_p (ft./sec.)
B-1012	1	15.6	22.2	7424.31	15025.56
	2	22.2	137.0	9588.94	18728.29
B-1015	1	9.0	71.4	8435.61	17102.59
	2	71.4	174.7	9288.90	18530.31
	3	174.7	240.3	9889.88	18932.41
B-1017	1	10.7	59.9	8474.78	17928.08
	2	59.9	122.2	9582.69	18860.15
	3	122.2	161.6	10197.85	18191.23
B-1024	1	18.9	48.4	9440.02	17871.07
	2	48.4	207.5	10263.27	20293.93
B-1037A[a]	1	5.9	13.9	728.00	1228.23
	2	13.9	28.7	763.42	1780.00
	3	28.7	64.8	740.24	4853.70
	4	64.8	84.5	3971.86	9785.20
B-1068	1	2.0	7.7	676.51	1418.23
	2	7.7	24.9	796.06	1779.29

TABLE 2.5.4-217 (Sheet 3 of 4)
SUMMARY OF INTERPRETED P-S SUSPENSION VELOCITY LAYER MODELS

Boring Number	Layer No.	Depth to Top (ft.)	Depth to Bottom (ft.)	Layer model V_s (ft./sec.)	Layer model V_p (ft./sec.)
B-1070	1	2.5	5.7	601.80	1503.77
	2	5.7	36.9	812.54	1852.83
	3	36.9	77.9	1011.06	2321.05
	4	77.9	91.0	1262.00	2621.05
B-1074A	1	28.7	40.2	4600.92	11333.75
	2	40.2	59.9	4424.71	12588.16
	3	59.9	68.1	6209.01	16494.41
	4	68.1	94.3	8086.92	16969.15
B-1075A	1	27.1	32.0	3238.00	7888.55
	2	32.0	43.5	4578.38	10703.25
	3	43.5	61.5	6315.67	14688.74
	4	61.5	135.3	9242.34	17840.32
B-2000[(a)]	1	5.7	9.0	8995.32	16635.48
	2	9.0	112.4	9943.75	18255.12
B-2002[(a)]					
	1	12.3	15.6	4628.73	10239.46
	2	15.6	210.8	10002.68	18099.98

TABLE 2.5.4-217 (Sheet 4 of 4)
SUMMARY OF INTERPRETED P-S SUSPENSION VELOCITY LAYER MODELS

Boring Number	Layer No.	Depth to Top (ft.)	Depth to Bottom (ft.)	Layer model V_s (ft./sec.)	Layer model V_p (ft./sec.)
B-2005[(a)]	1	5.7	9.0	8742.89	16876.74
	2	9.0	210.8	10156.19	18585.93

a) As B-1037A ~~was~~, B-1074A, and B-1075A were not used to calculate the smoothed velocity profiles, this data was not used in the evaluations presented herein. The layers presented in this table were developed by GEOVision (Subsection 2.5.4.4).

58. COLA Part 2, FSAR Chapter 2, Table 2.5.4-222, Sheet 1 of 4 is revised as follows:

WLS COL 2.5-6
WLS COL 2.5-7

TABLE 2.5.4-222 (Sheet 1 of 4)
QUALITY CONTROL RECOMMENDATIONS FOR GENERIC ENGINEERED GRANULAR BACKFILL

Material	Test	Minimum Sampling and Testing Frequency
Granular Backfill	Field Density	Minimum 1 sample per lift per 10,000 square feet. One test for every 2,500 square feet per lift when manually operated compactors are used. Use sand cone (ASTM D 1556) or rubber balloon (ASTM D 2167) for at least ~~33~~10% of field density measurements. Nuclear gauge (ASTM D 6938) may be used for ~~67~~90% of measurements. The sand cone or rubber balloon test shall be performed at the location of at least two of the nuclear gauge tests (if used) for each day's work.
	Moisture	One test for each sand cone or rubber balloon test. (ASTM D 2216)
	Moisture-Density Relationship (Modified Proctor)	One test for every borrow source and material type and any time material type changes. Additional test for every 40 Field Density tests, or as directed by geotechnical engineer in responsible charge. (ASTM D 1557)
	Gradation	One test for each Moisture-Density test. (ASTM D 422 and D 1140)
	Atterberg Limits	One test for each Moisture-Density test. (ASTM D 4318)
	Material Type	Granular fill must come from an approved borrow source (e.g. a quarry) and be the approved material for the project.

59. COLA Part 2, FSAR Chapter 2, Table 2.5.4-224A is revised as follows:

TABLE 2.5.4-224A (Sheet 1 of 5)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (GW OR MACADAM BASE COURSE) FOR YARD EL. 592 FT.

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight[a] (pcf)	Best Estimates: V_p[b] (ft/sec)	Best Estimates: V_s[b] (ft/sec)	Best Estimates: Poisson's Ratio, v	Best Estimates: G_{max}[b] (ksf)	Best Estimates: E_{max}[b] (ksf)	G_{max}[b] Lower Range (ksf)	G_{max}[b] Upper Range (ksf)
Fill	0-~~5.5~~8	-	150	~~1306~~1375	~~754~~794	0.25	~~2649~~2936	~~6621~~7341	~~1766~~1957	~~3973~~4404
	~~5.5~~8-10.5	584[c]	150	~~1504~~ 1587 [5000][d]	~~868~~916	0.25 [0.5][d]	~~3512~~3910	~~8779~~ 9775 [~~10536~~11729][d]	~~2341~~2606	~~5267~~5865
Fill	10.5-~~15.5~~18	-	150	~~1601~~ 1676 [5000][d]	~~925~~968	0.25 [0.5][d]	~~3982~~4363	~~9955~~ 10909 [~~11946~~13089][d]	~~2655~~2909	~~5973~~6545
	~~15.5~~18-20	-	150	~~1685~~ 1765 [5000][d]	~~973~~1019	0.25 [0.5][d]	~~4410~~4839	~~11026~~ 12096 [~~13230~~14516][d]	~~2940~~3226	~~6616~~7258
Fill	20-30	-	150	~~1869~~ 1910 [5000][d]	~~1079~~1103	0.25 [0.5][d]	~~5426~~5667	~~13565~~ 14167 [~~16278~~17000][d]	~~3617~~3778	~~8139~~8500
Fill	30-40	-	150	~~2082~~ 2116 [5000][d]	~~1202~~1222	0.25 [0.5][d]	~~6733~~6955	~~16831~~ 17387 [~~20199~~20865][d]	~~4488~~4637	~~10099~~10432

TABLE 2.5.4-224A (Sheet 2 of 5)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (GW OR MACADAM BASE COURSE) FOR YARD EL. 592 FT.

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight[(a)] (pcf)	Best Estimates					G_{max}[(b)] Lower Range (ksf)	G_{max}[(b)] Upper Range (ksf)
				V_p[(b)] (ft/sec)	V_s[(b)] (ft/sec)	Poisson's Ratio, v	G_{max}[(b)] (ksf)	E_{max}[(b)] (ksf)		
Fill	40-50	-	150	~~2263~~ 2292 [5000][(d)]	~~1306~~1323	0.25 [0.5][(d)]	~~7949~~8159	~~19874~~ 20396 [~~23847~~24476][(d)]	~~5300~~5439	~~11924~~12238
Fill	50-60	-	150	~~2421~~ 2447 [5000][(d)]	~~1398~~1413	0.25 [0.5][(d)]	~~9100~~9299	~~22749~~ 23246 [~~27300~~27896][(d)]	~~6066~~6199	~~13649~~13948
Fill	60-70	-	150	~~2563~~ 2586 [5000][(d)]	~~1480~~1493	0.25 [0.5][(d)]	~~10197~~10388	~~25493~~ 25970 [~~30591~~31164][(d)]	~~6798~~6925	~~15296~~15582
Fill	70-80	-	150	~~2692~~ 2714 [5000][(d)]	~~1554~~1567	0.25 [0.5][(d)]	~~11252~~11436	~~28130~~ 28590 [~~33756~~34308][(d)]	~~7501~~7624	~~16878~~17154
Fill	80-90	-	150	~~2811~~ 2831 [5000][(d)]	~~1623~~1635	0.25 [0.5][(d)]	~~12271~~12449	~~30678~~ 31123 [~~36813~~37347][(d)]	~~8181~~8299	~~18407~~18674

TABLE 2.5.4-224A (Sheet 3 of 5)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (GW OR MACADAM BASE COURSE) FOR YARD EL. 592 FT.

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight(a) (pcf)	Best Estimates					G_{max}(b) Lower Range (ksf)	G_{max}(b) Upper Range (ksf)
				V_p(b) (ft/sec)	V_s(b) (ft/sec)	Poisson's Ratio, v	G_{max}(b) (ksf)	E_{max}(b) (ksf)		
Fill	90-100	-	150	~~2922~~ 2941 [5000](d)	~~1687~~1698	0.25 [0.5](d)	~~13259~~13432	~~33147~~ 33580 [~~39777~~40296](d)	~~8839~~8955	~~19888~~20148
Fill	0-~~5.5~~8	-	150	~~1306~~1375	~~754~~794	0.25	~~2649~~2936	~~6621~~7340	~~1766~~1957	~~3973~~4404
	~~5.5~~8-10.5	-	150	~~1563~~1614	~~902~~932	0.25	~~3793~~4046	~~9483~~10115	~~2529~~2697	~~5690~~6069
Fill	10.5-~~15.5~~18	-	150	~~1753~~1795	~~1012~~1036	0.25	~~4772~~5005	~~11930~~12511	~~3181~~3336	~~7158~~7507
	~~15.5~~18-20	574(e)	150	~~1868~~ 1935 [5000](d)	~~1079~~1117	0.25 [0.5](d)	~~5419~~5817	~~13547~~ 14541 [~~16257~~17450](d)	~~3612~~3878	~~8128~~8725
Fill	20-30	-	150	~~2025~~ 2061 [5000](d)	~~1169~~1190	0.25 [0.5] (d)	~~6367~~6594	~~15918~~ 16486 [~~19101~~19783](d)	~~4245~~4396	~~9551~~9891
Fill	30-40	-	150	~~2213~~ 2244 [5000](d)	~~1278~~1296	0.25 [0.5] (d)	~~7607~~7820	~~19017~~ 19549 [~~22821~~23459] (d)	~~5071~~5213	~~11410~~11729

TABLE 2.5.4-224A (Sheet 4 of 5)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (GW OR MACADAM BASE COURSE) FOR YARD EL. 592 FT.

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight[a] (pcf)	Best Estimates					G_{max}[b] Lower Range (ksf)	G_{max}[b] Upper Range (ksf)
				V_p[b] (ft/sec)	V_s[b] (ft/sec)	Poisson's Ratio, v	G_{max}[b] (ksf)	E_{max}[b] (ksf)		
Fill	40-50	-	150	~~2377~~ 2404 [5000][d]	~~1372~~1388	0.25 [0.5][d]	~~8775~~8976	~~21937~~ 22441 [~~26325~~26929][d]	~~5850~~5984	~~13162~~13464
Fill	50-60	-	150	~~2523~~ 2548 [5000][d]	~~1457~~1471	0.25 [0.5][d]	~~9886~~10079	~~24716~~ 25198 [~~29658~~30238][d]	~~6591~~6720	~~14829~~15119
Fill	60-70	-	150	~~2656~~ 2678 [5000][d]	~~1533~~1546	0.25 [0.5][d]	~~10953~~11138	~~27382~~ 27846 [~~32859~~33415][d]	~~7302~~7426	~~16429~~16708
Fill	70-80	-	150	~~2778~~ 2799 [5000][d]	~~1604~~1616	0.25 [0.5][d]	~~11981~~12161	~~29953~~ 30402 [~~35943~~36483][d]	~~7988~~8107	~~17972~~18241
Fill	80-90	-	150	~~2891~~ 2910 [5000][d]	~~1669~~1680	0.25 [0.5][d]	~~12978~~13152	~~32444~~ 32880 [~~38934~~39456][d]	~~8652~~8768	~~19466~~19728

TABLE 2.5.4-224A (Sheet 5 of 5)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (GW OR MACADAM BASE COURSE) FOR YARD EL. 592 FT.

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight[(a)] (pcf)	Best Estimates					G_{max}[(b)] Lower Range (ksf)	G_{max}[(b)] Upper Range (ksf)
				V_p[(b)] (ft/sec)	V_s[(b)] (ft/sec)	Poisson's Ratio, v	G_{max}[(b)] (ksf)	E_{max}[(b)] (ksf)		
Fill	90-100	-	150	~~2997~~ 3015 [5000][(d)]	~~1730~~1741	0.25 [0.5][(d)]	~~13946~~14116	~~34865~~ 35289 [~~41838~~42347][(d)]	~~9297~~9410	~~20919~~21174

a) Moisture unit weight above water table = saturated unit weight below water table.

b) Free field condition, confining stress of building foundation not considered. G_{max} lower range = G_{max}/1.5; G_{max} upper range = 1.5xG_{max} (ASCE 4-98) (Reference 220).

c) Upper range of water table.

d) Below the water table, V_p will be 5000 ft/sec, Poisson's ratio of soil-water system will be 0.5, and E_{max} = 3xG_{max}, as shown in brackets [ ].

e) Lower range of water table.

60. COLA Part 2, FSAR Chapter 2, Table 2.5.4-224B is revised as follows:

TABLE 2.5.4-224B (Sheet 1 of 5)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (GP OR MACADAM BASE COURSE) FOR YARD EL. 592 FT.

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight[a] (pcf)	Best Estimates					G_{max}[b] Lower Range (ksf)	G_{max}[b] Upper Range (ksf)
				V_p[b] (ft/sec)	V_s[b] (ft/sec)	Poisson's Ratio, v	G_{max}[b] (ksf)	E_{max}[b] (ksf)		
Fill	0-~~5.5~~8	-	142	~~1167~~1217	~~674~~703	0.25	~~2003~~2177	~~5007~~5442	~~1335~~1451	~~3004~~3265
	~~5.5~~8-10.5	584[c]	142	~~1306~~ 1365 [5000][d]	~~754~~788	0.25 [0.5][d]	~~2506~~2740	~~6266~~ 6849 [~~7518~~8219][d]	~~1671~~1826	~~3759~~4110
Fill	10.5-~~15.5~~18	-	142	~~1370~~ 1423 [5000][d]	~~791~~822	0.25 [0.5][d]	~~2759~~2978	~~6897~~ 7446 [~~8277~~8935][d]	~~1839~~1986	~~4138~~4467
	~~15.5~~18-20	-	142	~~1425~~ 1480 [5000][d]	~~823~~855	0.25 [0.5][d]	~~2985~~3221	~~7462~~ 8052 [~~8955~~9662][d]	~~1990~~2147	~~4477~~4831
Fill	20-30	-	142	~~1546~~ 1576 [5000][d]	~~893~~910	0.25 [0.5][d]	~~3515~~3652	~~8789~~ 9131 [~~10545~~10957][d]	~~2344~~2435	~~5273~~5479
Fill	30-40	-	142	~~1686~~ 1711 [5000][d]	~~974~~988	0.25 [0.5][d]	~~4181~~4303	~~10452~~ 10757 [~~12543~~12908][d]	~~2787~~2868	~~6271~~6454

TABLE 2.5.4-224B (Sheet 2 of 5)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (GP OR MACADAM BASE COURSE). FOR YARD EL. 592 FT

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight[a] (pcf)	Best Estimates					G_{max}[b] Lower Range (ksf)	G_{max}[b] Upper Range (ksf)
				V_p[b] (ft/sec)	V_s[b] (ft/sec)	Poisson's Ratio, ν	G_{max}[b] (ksf)	E_{max}[b] (ksf)		
Fill	40-50	-	142	~~1803~~ 1824 [5000][d]	~~1041~~1053	0.25 [0.5][d]	~~4780~~4891	~~11949~~ 12227 [~~14340~~14673][d]	~~3186~~3261	~~7169~~7336
Fill	50-60	-	142	~~1904~~ 1923 [5000][d]	~~1099~~1110	0.25 [0.5][d]	~~5330~~5434	~~13326~~ 13584 [~~15990~~16301][d]	~~3553~~3622	~~7995~~8150
Fill	60-70	-	142	~~1994~~ 2010 [5000][d]	~~1151~~1161	0.25 [0.5][d]	~~5844~~5941	~~14610~~ 14852 [~~17532~~17823][d]	~~3896~~3961	~~8766~~8911
Fill	70-80	-	142	~~2075~~ 2090 [5000][d]	~~1198~~1207	0.25 [0.5][d]	~~6328~~6420	~~15820~~ 16050 [~~18984~~19260][d]	~~4219~~4280	~~9492~~9630
Fill	80-90	-	142	~~2149~~ 2163 [5000][d]	~~1241~~1249	0.25 [0.5][d]	~~6788~~6875	~~16969~~ 17188 [~~20364~~20626][d]	~~4525~~4584	~~10182~~10313

TABLE 2.5.4-224B (Sheet 3 of 5)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (GP OR MACADAM BASE COURSE) FOR YARD EL. 592 FT.

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight[(a)] (pcf)	Best Estimates					G_{max}[(b)] Lower Range (ksf)	G_{max}[(b)] Upper Range (ksf)
				V_p[(b)] (ft/sec)	V_s[(b)] (ft/sec)	Poisson's Ratio, v	G_{max}[(b)] (ksf)	E_{max}[(b)] (ksf)		
Fill	90-100	-	142	~~2217~~ 2230 [5000][(d)]	~~1280~~1288	0.25 [0.5][(d)]	~~7227~~7311	~~18067~~ 18276 [~~21681~~ 21932][(d)]	~~4818~~4874	~~10840~~10966
Fill	0-~~5.5~~8	-	142	~~1167~~1217	~~674~~703	0.25	~~2003~~2177	~~5007~~5442	~~1335~~1451	~~3004~~3265
	~~5.5~~8-10.5	-	142	~~1350~~1385	~~779~~800	0.25	~~2678~~2821	~~6694~~7053	~~1785~~1881	~~4017~~4232
Fill	10.5-~~15.5~~18	-	142	~~1481~~1510	~~855~~872	0.25	~~3225~~3352	~~8062~~8379	~~2150~~2234	~~4837~~5027
	~~15.5~~18-20	574[(e)]	142	~~1558~~ 1603 [5000][(d)]	~~899~~926	0.25 [0.5][(d)]	~~3568~~3778	~~8920~~ 9444 [~~10704~~11333][(d)]	~~2379~~2519	~~5352~~5667
Fill	20-30	-	142	~~1659~~ 1684 [5000][(d)]	~~958~~972	0.25 [0.5][(d)]	~~4044~~4168	~~10109~~ 10421 [~~12132~~12505][(d)]	~~2696~~2779	~~6065~~6252
Fill	30-40	-	142	~~1779~~ 1801 [5000][(d)]	~~1027~~1040	0.25 [0.5][(d)]	~~4655~~4768	~~11637~~ 11920 [~~13965~~14304][(d)]	~~3103~~3179	~~6982~~7152

TABLE 2.5.4-224B (Sheet 4 of 5)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (GP OR MACADAM BASE COURSE) FOR YARD EL. 592 FT.

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight[a] (pcf)	Best Estimates V_p[b] (ft/sec)	V_s[b] (ft/sec)	Poisson's Ratio, ν	G_{max}[b] (ksf)	E_{max}[b] (ksf)	G_{max}[b] Lower Range (ksf)	G_{max}[b] Upper Range (ksf)
Fill	40-50	-	142	~~1883~~ 1902 [5000][d]	~~1087~~1098	0.25 [0.5][d]	~~5215~~5320	~~13037~~ 13299 [~~15645~~15959][d]	~~3476~~3546	~~7822~~7979
Fill	50-60	-	142	~~1975~~ 1992 [5000][d]	~~1140~~1150	0.25 [0.5][d]	~~5736~~5834	~~14339~~ 14585 [17502~~208~~][d]	~~3824~~3889	~~8603~~8751
Fill	60-70	-	142	~~2058~~ 2073 [5000][d]	~~1188~~1197	0.25 [0.5][d]	~~6226~~6319	~~15564~~ 15796 [18956~~678~~][d]	~~4150~~4212	~~9338~~9478
Fill	70-80	-	142	~~2133~~ 2147 [5000][d]	~~1232~~1240	0.25 [0.5][d]	~~6690~~6779	~~16726~~ 16947 [~~20070~~20336][d]	~~4460~~4519	~~10035~~10168
Fill	80-90	-	142	~~2203~~ 2216 [5000][d]	~~1272~~1279	0.25 [0.5][d]	~~7133~~7218	~~17834~~ 18045 [~~21399~~21654][d]	~~4756~~4812	~~10700~~10827

TABLE 2.5.4-224B (Sheet 5 of 5)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (GP OR MACADAM BASE COURSE) FOR YARD EL. 592 FT.

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight[(a)] (pcf)	Best Estimates					G_{max}[(b)] Lower Range (ksf)	G_{max}[(b)] Upper Range (ksf)
				V_p[(b)] (ft/sec)	V_s[(b)] (ft/sec)	Poisson's Ratio, v	G_{max}[(b)] (ksf)	E_{max}[(b)] (ksf)		
Fill	90-100	-	142	~~2268~~ 2280 [5000][(d)]	~~1309~~1316	0.25 [0.5][(d)]	~~7558~~7640	~~18896~~ 19099 [~~22674~~22919][(d)]	~~5039~~5093	~~11337~~11459

a) Moisture unit weight above water table = saturated unit weight below water table.

b) Free field condition, confining stress of building foundation not considered. G_{max} lower range = G_{max}/1.5; G_{max} upper range = 1.5xG_{max} (ASCE 4-98) (Reference 220).

c) Upper range of water table.

d) Below the water table, V_p will be 5000 ft/sec, Poisson's ratio of soil-water system will be 0.5, and E_{max} = 3xG_{max}, as shown in brackets [ ].

e) Moisture unit weight above water table = saturated unit weight below water table.

f) Free field condition, confining stress of building foundation not considered. G_{max} lower range = G_{max}/1.5; G_{max} upper range = 1.5xG_{max} (ASCE 4-98) (Reference 220).

61. COLA Part 2, FSAR Chapter 2, Table 2.5.4-224C is revised as follows:

TABLE 2.5.4-224C (Sheet 1 of 4)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (SW) FOR YARD EL. 592 FT.

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight[a] (pcf)	Best Estimates					G_{max}[b] Lower Range (ksf)	G_{max}[b] Upper Range (ksf)
				V_p[b] (ft/sec)	V_s[b] (ft/sec)	Poisson's Ratio, ν	G_{max}[b] (ksf)	E_{max}[b] (ksf)		
Fill	0-~~5.5~~8	-	136	~~964~~1003	~~557~~579	0.25	~~1309~~1415	~~3272~~3538	~~873~~943	~~1963~~2123
	~~5.5~~8-10.5	584[c]	136	~~1070~~ 1116 [5000](d)	~~618~~645	0.25 [0.5](d)	~~1611~~1755	~~4028~~ 4386 [~~4833~~5264] (d)	~~1074~~1170	~~2417~~2632
Fill	10.5-~~15.5~~18	-	136	~~1117~~ 1159 [5000](d)	~~645~~669	0.25 [0.5](d)	~~1755~~1890	~~4388~~ 4724 [~~5265~~5669] (d)	~~1170~~1260	~~2633~~2835
	1~~5.5~~8-20	-	136	~~1157~~ 1200 [5000](d)	~~668~~693	0.25 [0.5](d)	~~1884~~2028	~~4710~~ 5070 [~~5652~~6084] (d)	~~1256~~1352	~~2826~~3042
Fill	20-30	-	136	~~1248~~ 1272 [5000](d)	~~720~~734	0.25 [0.5](d)	~~2192~~2278	~~5480~~ 5694 [~~6576~~6833] (d)	~~1461~~1518	~~3288~~3416
Fill	30-40	-	136	~~1353~~ 1372 [5000](d)	~~781~~792	0.25 [0.5](d)	~~2575~~2651	~~6438~~ 6627 [~~7725~~7953] (d)	~~1717~~1767	~~3863~~3976
Fill	40-50	-	136	~~1440~~ 1456 [5000](d)	~~831~~841	0.25 [0.5](d)	~~2918~~2986	~~7294~~ 7465 [~~8754~~8958] (d)	~~1945~~1991	~~4376~~4479

TABLE 2.5.4-224C (Sheet 2 of 4)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (SW)
FOR YARD EL. 592 FT.

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight[(a)] (pcf)	Best Estimates V_p[(b)] (ft/sec)	Best Estimates V_s[(b)] (ft/sec)	Best Estimates Poisson's Ratio, ν	Best Estimates G_{max}[(b)] (ksf)	Best Estimates E_{max}[(b)] (ksf)	G_{max}[(b)] Lower Range (ksf)	G_{max}[(b)] Upper Range (ksf)
Fill	50-60	-	136	~~1515~~ 1529 [5000][(d)]	~~875~~883	0.25 [0.5][(d)]	~~3230~~3293	~~8075~~ 8233 [~~9690~~9880][(d)]	~~2153~~2196	~~4845~~4940
Fill	60-70	-	136	~~1581~~ 1594 [5000][(d)]	~~913~~921	0.25 [0.5][(d)]	~~3520~~3579	~~8800~~ 8948 [~~10560~~10737][(d)]	~~2347~~2386	~~5280~~5369
Fill	70-80	-	136	~~1641~~ 1653 [5000][(d)]	~~948~~954	0.25 [0.5][(d)]	~~3792~~3848	~~9480~~ 9619 [~~11376~~11543][(d)]	~~2528~~2565	~~5688~~5772
Fill	80-90	-	136	~~1696~~ 1707 [5000][(d)]	~~979~~986	0.25 [0.5][(d)]	~~4049~~4102	~~10123~~ 10255 [~~12147~~12306][(d)]	~~2699~~2735	~~6074~~6153
Fill	90-100	-	136	~~1746~~ 1757 [5000][(d)]	~~1008~~1014	0.25 [0.5][(d)]	~~4294~~4344	~~10735~~ 10861 [~~12882~~13033][(d)]	~~2863~~2896	~~6441~~6516
Fill	0-~~5.5~~8	-	136	~~964~~1003	~~557~~579	0.25	~~1309~~1415	~~3272~~3538	~~873~~943	~~1963~~2123
Fill	~~5.5~~8-10.5	-	136	~~1105~~1133	~~638~~654	0.25	~~1719~~1806	~~4298~~4515	~~1146~~1204	~~2579~~2709

TABLE 2.5.4-224C (Sheet 3 of 4)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (SW)
FOR YARD EL. 592 FT.

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight(a) (pcf)	Best Estimates					G_{max}(b) Lower Range (ksf)	G_{max}(b) Upper Range (ksf)
				V_p(b) (ft/sec)	V_s(b) (ft/sec)	Poisson's Ratio, v	G_{max}(b) (ksf)	E_{max}(b) (ksf)		
Fill	10.5-~~15.5~~18	-	136	~~1206~~1228	~~696~~709	0.25	~~2047~~2123	~~5119~~5308	~~1365~~1415	~~3071~~3185
Fill	~~15.5~~18-20	574(e)	136	~~1264~~ 1299 [5000](d)	~~730~~750	0.25 [0.5](d)	~~2248~~2374	~~5621~~ 5936 [~~6744~~7123](d)	~~1499~~1583	~~3373~~3562
Fill	20-30	-	136	~~1338~~ 1358 [5000](d)	~~772~~784	0.25 [0.5](d)	~~2520~~2597	~~6300~~ 6492 [~~7560~~7791](d)	~~1680~~1731	~~3780~~3895
Fill	30-40	-	136	~~1427~~ 1444 [5000](d)	~~824~~834	0.25 [0.5](d)	~~2868~~2937	~~7169~~ 7342 [~~8604~~8811](d)	~~1912~~1958	~~4301~~4405
Fill	40-50	-	136	~~1504~~ 1519 [5000](d)	~~868~~877	0.25 [0.5](d)	~~3184~~3248	~~7960~~ 8120 [~~9552~~9744](d)	~~2123~~2165	~~4776~~4872
Fill	50-60	-	136	~~1572~~ 1585 [5000](d)	~~907~~915	0.25 [0.5](d)	~~3477~~3537	~~8693~~ 8842 [~~10431~~10611](d)	~~2318~~2358	~~5216~~5305
Fill	60-70	-	136	~~1632~~ 1645 [5000](d)	~~942~~950	0.25 [0.5](d)	~~3752~~3808	~~9379~~ 9520 [~~11256~~11424](d)	~~2501~~2539	~~5628~~5712

TABLE 2.5.4-224C (Sheet 4 of 4)
BEST ESTIMATE LAYERING, VELOCITIES, MODULI, AND RANGES OF GRANULAR FILL (SW) FOR YARD EL. 592 FT.

Layer Name	Depth Below ~~589.5~~592.0 MSL (ft)	Water Table Elev. (ft)	Unit Weight(a) (pcf)	Best Estimates					G_{max}(b) Lower Range (ksf)	G_{max}(b) Upper Range (ksf)
				V_p(b) (ft/sec)	V_s(b) (ft/sec)	Poisson's Ratio, ν	G_{max}(b) (ksf)	E_{max}(b) (ksf)		
Fill	70-80	-	136	~~1688~~ 1699 [5000](d)	~~974~~981	0.25 [0.5](d)	~~4011~~4064	~~10027~~ 10160 [~~12033~~12193](d)	~~2674~~2709	~~6016~~6096
Fill	80-90	-	136	~~1739~~ 1749 [5000](d)	~~1004~~1010	0.25 [0.5](d)	~~4257~~4308	~~10643~~ 10770 [~~12771~~12924](d)	~~2838~~2872	~~6386~~6462
Fill	90-100	-	136	~~1786~~ 1796 [5000](d)	~~1031~~1037	0.25 [0.5](d)	~~4493~~4541	~~11232~~ 11354 [~~13479~~13624](d)	~~2995~~3028	~~6739~~6812

a) Moisture unit weight above water table = saturated unit weight below water table.

b) Free field condition, confining stress of building foundation not considered. G_{max} lower range = $G_{max}/1.5$; G_{max} upper range = $1.5xG_{max}$ (ASCE 4-98) (Reference 220).

c) Upper range of water table.

d) Below the water table, V_p will be 5000 ft/sec, Poisson's ratio of soil-water system will be 0.5, and $E_{max} = 3xG_{max}$, as shown in brackets [ ].

e) Lower range of water table.

62. COLA Part 2, FSAR Chapter 2, Table 2.5.4-225A is revised as follows:

TABLE 2.5.4-225A
ACTIVE EARTH PRESSURE FROM GRANULAR BACKFILL

Depth Below ~~589.5~~592.0 ft MSL (ft)	Active earth pressure, WLS, for design water (d_w) table at ~~5.5~~8.0 ft: GW (psf)	GP (psf)	SW (psf)
0	0	0	0
~~5.5~~8.0	~~224~~325	~~212~~308	~~203~~295
~~10.5~~13.0	~~342~~444	~~319~~416	~~302~~395
~~15.5~~18.0	~~461~~563	~~427~~524	~~402~~494
33.0	~~876~~919	~~805~~847	~~751~~793
~~39.0~~38.5	~~1019~~1049	~~934~~966	~~871~~903

63. COLA Part 2, FSAR Chapter 2, Table 2.5.4-225B is revised as follows:

TABLE 2.5.4-225B
AT-REST EARTH PRESSURE FROM GRANULAR BACKFILL

Depth Below ~~589.5~~92.0 ft MSL	At-rest earth pressure, WLS, for design water (d_w) table at ~~5.5~~8.0 ft:		
(ft)	GW (psf)	GP (psf)	SW (psf)
0	0	0	0
~~5.5~~8.0	~~352~~512	~~333~~484	~~319~~464
~~10.5~~13.0	~~539~~698	~~503~~654	~~476~~621
~~15.5~~18.0	~~725~~885	~~672~~824	~~633~~778
33.0	~~1379~~1446	~~1266~~1333	~~1182~~1249
~~39.0~~38.5	~~1603~~1651	~~1470~~1520	~~1370~~1421

64. COLA Part 2, FSAR Chapter 2, Table 2.5.4-225C is revised as follows:

TABLE 2.5.4-225C
PASSIVE EARTH PRESSURE FROM GRANULAR BACKFILL

Depth Below ~~589.5~~592.0 ft MSL (ft)	Passive earth pressure, WLS, for design water (d_w) table at ~~5.5~~8.0 ft: GW (psf)	GP (psf)	SW (psf)
0	0	0	0
~~5.5~~8.0	~~3044~~4428	~~2882~~4192	~~2760~~4015
~~10.5~~13.0	~~4661~~6045	~~4351~~5661	~~4118~~5373
~~15.5~~18.0	~~6277~~7661	~~5819~~7129	~~5476~~6731
33.0	~~11,934~~12,510	11,535~~10,960~~	10,~~229~~805
~~39.0~~38.5	~~13,874~~14,288	~~12,722~~13,151	~~11,859~~12,229

65. COLA Part 2, FSAR Chapter 2, Table 2.5.4-226 is deleted as follows:

TABLE 2.5.4-226

Deleted

66. COLA Part 2, FSAR Chapter 2, Table 2.5.4-226A is added as follows:

TABLE 2.5.4-226A (Sheet 1 of 3)
COMPACTION-INDUCED EARTH PRESSURE FROM GRANULAR BACKFILL MATERIAL

		Hand-Guided Roller[a] Adjacent to NI Wall		Heavy Roller[b] 5 ft from NI Wall	
Depth (ft)	At-Rest Pressure (lb/ft^2)	Residual + At-Rest Pressure (lb/ft^2)	Residual Pressure (lb/ft^2)	Residual + At-Rest Pressure (lb/ft^2)	Residual Pressure (lb/ft^2)
0.0	0	0	0	0	0
0.5	32	277	245	36	4
1.0	64	416	352	105	41
1.5	96	432	336	169	73
2.0	128	448	320	225	97
2.5	160	463	304	274	114
3.0	192	479	287	316	124
3.5	224	495	271	352	128
4.0	256	511	255	383	128
4.5	288	527	239	412	124
5.0	320	542	222	438	118
5.5	352	558	206	463	111
6.0	384	574	190	487	104
6.5	416	590	174	512	96
7.0	448	605	158	536	88
7.5	480	621	141	560	80
8.0	512	637	125	585	73

TABLE 2.5.4-226A (Sheet 2 of 3)
COMPACTION-INDUCED EARTH PRESSURE FROM GRANULAR BACKFILL MATERIAL

		Hand-Guided Roller[(a)] Adjacent to NI Wall		Heavy Roller[(b)] 5 ft from NI Wall	
Depth	At-Rest Pressure	Residual + At-Rest Pressure	Residual Pressure	Residual + At-Rest Pressure	Residual Pressure
8.5	544	653	109	610	66
9.0	576	668	93	636	60
9.5	608	684	77	662	54
10.0	640	700	60	689	49
10.5	672	716	44	716	44
11.0	704	732	28	744	40
11.5	736	747	12	772	36
12.0	768	768	0	800	33
12.5	800	800	0	829	30
13.0	832	832	0	858	27
13.5	864	864	0	888	24
14.0	895	895	0	917	22
14.5	927	927	0	947	20
15.0	959	959	0	977	18
15.5	991	991	0	1008	16
16.0	1023	1023	0	1038	15
16.5	1055	1055	0	1069	13

TABLE 2.5.4-226A (Sheet 3 of 3)
COMPACTION-INDUCED EARTH PRESSURE FROM GRANULAR BACKFILL MATERIAL

		Hand-Guided Roller[a] Adjacent to NI Wall		Heavy Roller[b] 5 ft from NI Wall	
Depth	At-Rest Pressure	Residual + At-Rest Pressure	Residual Pressure	Residual + At-Rest Pressure	Residual Pressure
17.0	1087	1087	0	1100	12
17.5	1119	1119	0	1131	11
18.0	1151	1151	0	1162	10
18.5	1183	1183	0	1193	9
19.0	1215	1215	0	1224	8
19.5	1247	1247	0	1255	8
20.0	1279	1279	0	1286	7

a) Steel drum, p = 190 lb/in, roller width = 21.6 in.

b) Steel drum, p = 800 lb/in, roller width = 84 in.

67. COLA Part 2, FSAR Chapter 2, Table 2.5.4-226B is added as follows:

TABLE 2.5.4-226B (Sheet 1 of 2)
CRITERIA FOR SOIL COMPACTORS OPERATED IN CLOSE PROXIMITY OF NUCLEAR ISLAND FOUNDATION WALL

Compactor Type	Criteria
Vibratory Drum[(a)]	• Drum width and operating weight that are within ±25% of the values applicable for the particular models used during the test fill program; • [Static weight at drum + maximum centrifugal force applied by drum] ÷ width of drum that is within ±25% of the values applicable for the particular models used during the test fill program, but with the following limitations[(b)]: o not to exceed 190 lbs/inch on drum width = 21.6 inches for compactors operated immediately adjacent to the nuclear island foundation wall; o not to exceed 500 lbs/inch on drum width = 24 inches for compactors operated as close as 1.2 feet to the nuclear island foundation wall; o not to exceed 600 lbs/inch on drum width = 66 inches for compactors operated as close as 1.75 feet to the nuclear island foundation wall; o not to exceed 800 lbs/inch for compactors on drum width = 84 inches operated as close as 2.5 feet to the nuclear island foundation wall; o not to exceed 1,000 lbs/inch on drum width = 84 inches for compactors operated as close as 3.0 feet to the nuclear island foundation wall.

TABLE 2.5.4-226B (Sheet 2 of 2)
CRITERIA FOR SOIL COMPACTORS OPERATED IN CLOSE PROXIMITY OF NUCLEAR ISLAND FOUNDATION WALL

Compactor Type	Criteria
Hand-Guided Vibratory Plate	• Operating weight and plate dimensions (area) that are within ±25% of the values applicable for the particular models used during the test fill program; • [Static weight of compactor + maximum centrifugal force applied] ÷ area of plate that is within ±25% of the values applicable for the particular models used during the test fill program, but with the following limitations [(b)]: ○ not to exceed 20 lbs/inch^2 for compactors with plate area up to 910 inch^2 on lift thickness 6 inches operated immediately adjacent to the nuclear island foundation wall; ○ not to exceed 18.5 lbs/inch^2 for compactors with plate area = 1088 inch^2 on lift thickness 6 inches operated immediately adjacent to the nuclear island foundation wall; ○ not to exceed 20 lbs/inch^2 for compactors with plate area = 1088 inch^2 on lift thickness 6 inches operated as close as 0.25 feet to the nuclear island foundation wall

Notes:
[(a)] Drum roller compactor is operated rolling parallel to the wall.

[(b)] Limitations are combinations that produce stresses that do not exceed the envelope of residual + at-rest pressure in FSAR Table 2.5.4-226A.

68. COLA Part 2, FSAR Chapter 2, Table 2.5.4-227 is revised as follows:

TABLE 2.5.4-227
DYNAMIC EARTH PRESSURE FROM GRANULAR BACKFILL MATERIAL

AP-1000 Plant Grade Elevation 100 ft.	Site-Specific WLS Backfill Dynamic Earth Pressure by Typical Backfill Group Symbol[(a)] GW γ = 150 lb/ft^3	GP γ = 142 lb/ft^3	SW γ = 136 lb/ft^3
99._~~5~~0 (=592.0 WLS)	~~1888~~1864	~~1788~~1765	1~~1712~~690
97.~~55~~075	~~2124~~2096	~~2010~~1985	~~1925~~1901
95.~~6~~150	~~2252~~2223	~~2132~~2104	~~2042~~2015
91.~~7~~300	~~2369~~2339	~~2243~~2214	~~2148~~2121
87.~~8~~450	~~2397~~2367	~~2269~~2240	~~2174~~2146
83~~.9~~.600	~~2353~~2323	~~2228~~2199	~~2134~~2106
~~80.0~~79.750	~~2252~~2223	~~2132~~2104	~~2042~~2015
7~~6.1~~5.900	~~2095~~2069	~~1984~~1958	~~1900~~1876
75.~~71~~515	~~2080~~2053	~~1969~~1944	~~1886~~1861
72.~~2~~050	~~1895~~1871	~~1794~~1771	~~1718~~1696
68.~~3~~200	~~1637~~1616	~~1550~~1530	~~1485~~1466
66.~~35~~275	~~1486~~1467	~~1407~~1389	~~1348~~1330
64.4350	~~1320~~1303	~~1249~~1233	~~1197~~1181
60.500	944~~56~~	~~905~~894	~~867~~856

a) Per Reference 220, ASCE 4-98, Section 3.5.3, Figure 3.5-1, "Variation of Normal Dynamic Soil Pressures for the Elastic Solution."
Soil Properties:
γ = unit weight as shown
ν = 0.5
Acceleration:
a = 0.30g, applied uniform along the height of the wall.

69. COLA Part 2, FSAR Chapter 2, Table 2.5.4-228 is revised as follows:

TABLE 2.5.4-228
Allowable Bearing Pressure Based on Factor of Safety

Structure	Subsurface	B x L (ft)	Bearing Pressure (k/ft²) q_{ult}(a)	q_{safe}(b)	$q_{applied}$ (k/ft²)	$q_{safe} > q_{applied}$
SW Sand Granular Fill						
Annex Building	Granular Fill - SW	70 x 289	~~82.43~~8 6.92	2~~7.48~~8 .97	2.43	Yes
Turbine Building	Granular Fill - SW	127 x 312	11~~1.60~~ 5.46	3~~7.20~~8 .49	3.51	Yes
Radwaste Building	Granular Fill - SW	69 x 178	~~68.59~~7 8.79	2~~2.86~~6 .26	1.31	Yes
GP Gravel Granular Fill						
Annex Building	Granular Fill - GP	70 x 289	~~88.31~~9 2.81	~~29.44~~3 0.94	2.43	Yes
Turbine Building	Granular Fill - GP	127 x 312	~~120.01~~ 123.88	4~~0.00~~4 1.29	3.51	Yes
Radwaste Building	Granular Fill - GP	69 x 178	~~73.69~~8 4.16	~~24.56~~2 8.05	1.31	Yes
GW Gravel Granular Fill						
Annex Building	Granular Fill - GW	70 x 289	~~96.16~~1 00.66	~~32.05~~3 3.55	2.43	Yes
Turbine Building	Granular Fill - GW	127 x 312	~~131.23~~ 135.09	4~~3.74~~4 5.03	3.51	Yes
Radwaste Building	Granular Fill - GW	69 x 178	~~80.50~~9 1.31	~~26.83~~3 0.44	1.31	Yes

a) Groundwater level is assumed to be at elevation 584 ft.
b) Factor of safety of 3 is used in the analyses.

70. COLA Part 2, FSAR Chapter 2, Table 2.5.4-229 is revised as follows:

TABLE 2.5.4-229
ALLOWABLE BEARING PRESSURE BASED ON LIMITING SETTLEMENT

Structure	Subsurface	q_{allow}[a] (k/ft^2)	$q_{applied}$ (k/ft^2)	q_{allow} > $q_{applied}$	Anticipated Settlement (inches)
SW Sand Granular Backfill					
Annex Building	Granular Fill - SW	7.~~02~~29	2.43	Yes	< 2
Turbine Building	Granular Fill - SW	6.~~81~~96	3.51	Yes	< 2
Radwaste Building	Granular Fill - SW	~~6.87~~7.24	1.31	Yes	< 2
GP Gravel Granular Backfill					
Annex Building	Granular Fill - GP	10.~~52~~93	2.43	Yes	< 2
Turbine Building	Granular Fill - GP	10.~~21~~44	3.51	Yes	< 2
Radwaste Building	Granular Fill - GP	10.~~31~~86	1.31	Yes	< 2
GW Gravel Granular Backfill					
Annex Building	Granular Fill - GW	10.~~52~~93	2.43	Yes	< 2
Turbine Building	Granular Fill - GW	10.~~21~~44	3.51	Yes	< 2
Radwaste Building	Granular Fill - GW	10.~~31~~86	1.31	Yes	< 2

a) For limiting settlement to 2 inches.

71. COLA Part 2, FSAR Chapter 2, Table 2.5.4-230 is revised as follows:

TABLE 2.5.4-230
STRUCTURE SIZES

Structure	Seismic Category	Elevation of Base of Foundation[a] (ft)	Depth of Foundation D_f (ft)	Width[b] B (ft)	Length L (ft)	$q_{applied}$[c] (k/ft^2)
Annex Building	II	~~585~~588.5	3.1	70	289	2.43
Turbine Building	II and Non-seismic	~~586~~ 589 – ~~569~~572[d]	2.1	127	312	3.51
Radwaste Building	Non-seismic	~~585~~588.5	~~1~~2.4	69	178	1.31

a) See Reference 237, raised 3 ft per Reference 240.

b) Smallest width of building shown; Reference 235.

c) See Reference 236.

d) Higher elevation used.

72. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-201 is revised as follows:

WLS COL 2.5-1
WLS COL 2.5-5

Sources: 1. Site topography and structure - Sanborn 2006
Shaw, Stone & Webster, September, 2007.
2. Shaw, Stone & Webster, Inc. Drawing WLG-0000-X2-800005, Revision H, 2/11/13.
Title: Lee Nuclear Station Units 1 & 2 Site Plan.

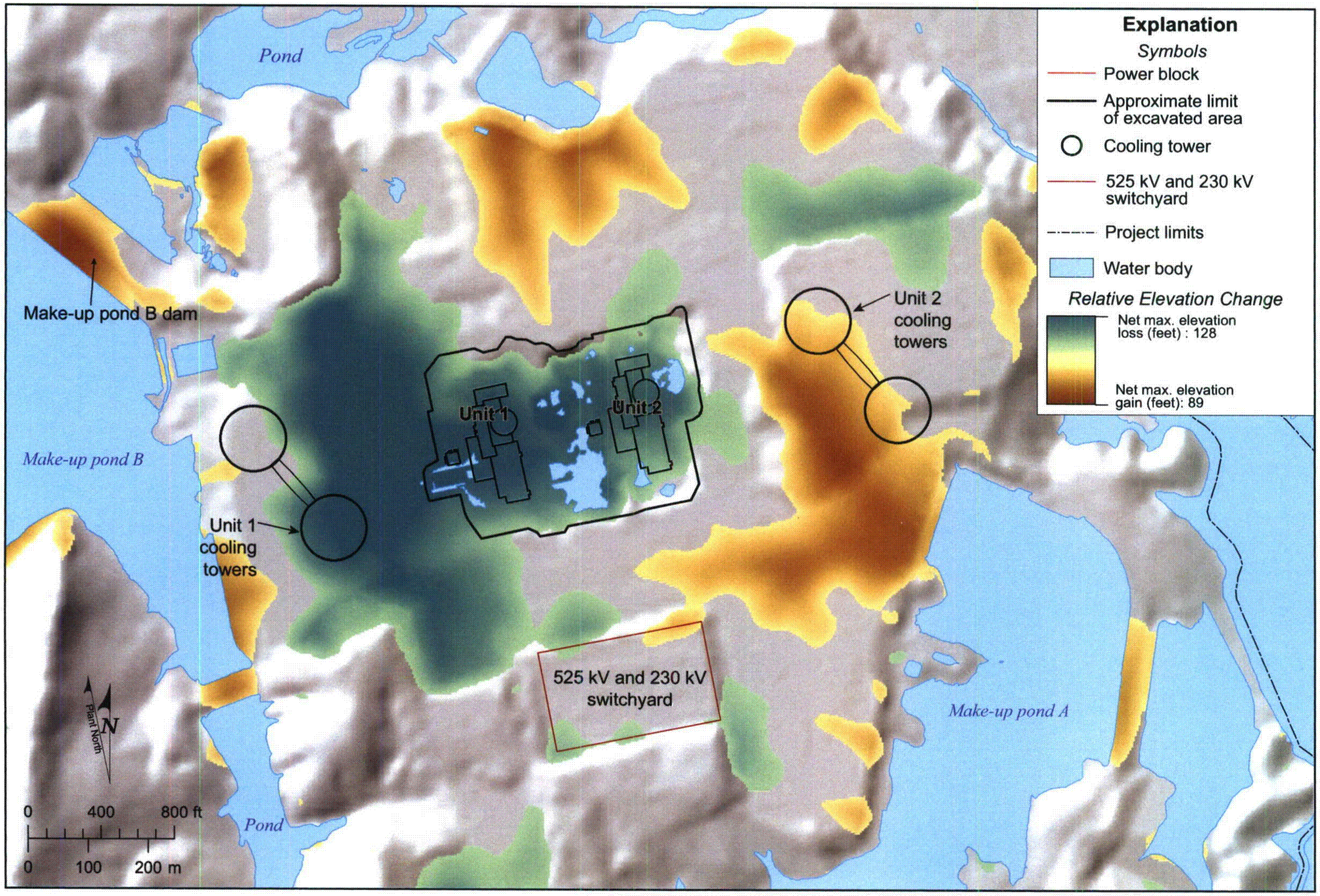
Coordinate System: South Carolina State Plane, NAD83 Int'l Feet
Vertical - NAVD88

WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Site Features of Lee Nuclear Station Units 1 and 2

FIGURE 2.5.4-201

73. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-202 is revised as follows:



WLS COL 2.5-1
WLS COL 2.5-5

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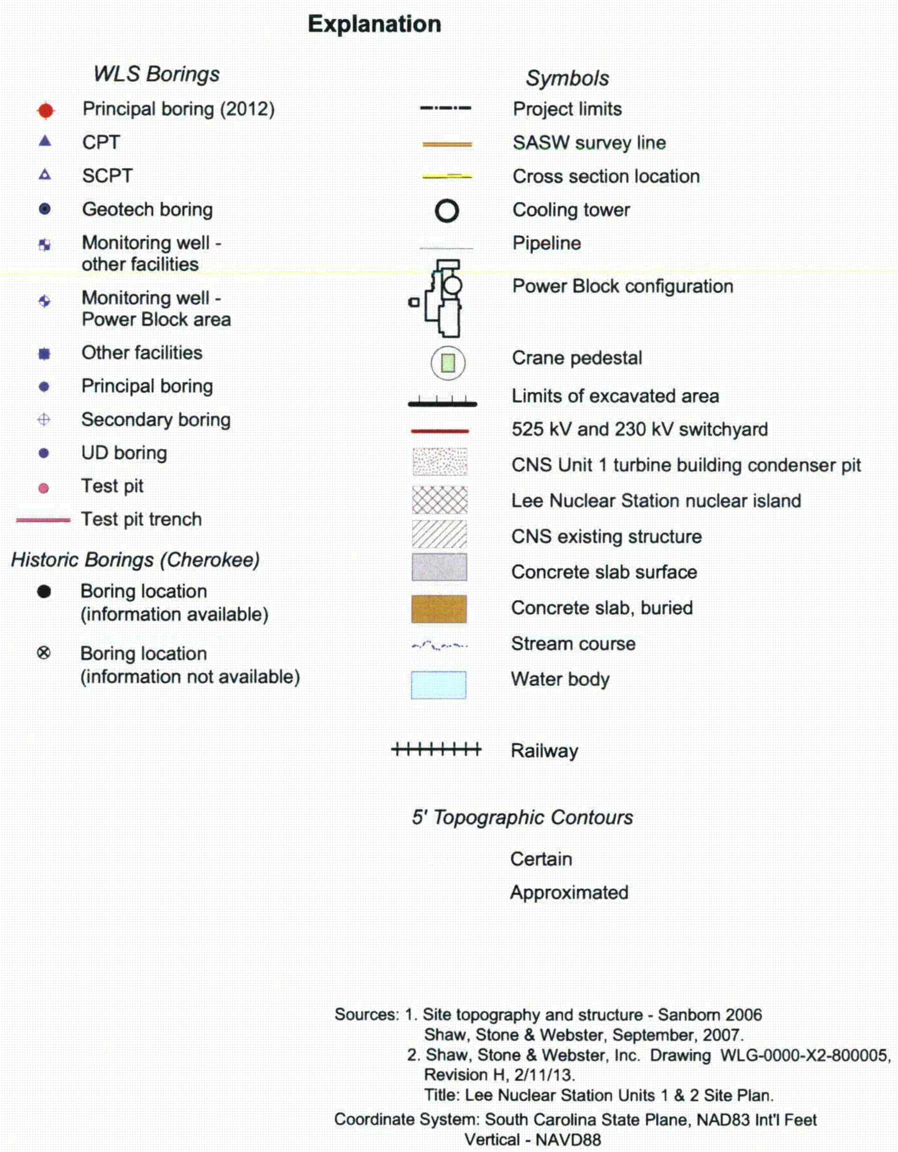
NUCLEAR STATION UNITS 1 & 2

Topographic Comparison - Representation of Net Topographic Change between 1971 and 2006

FIGURE 2.5.4-202

74. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-207 is revised as follows:



WLS COL 2.5-6

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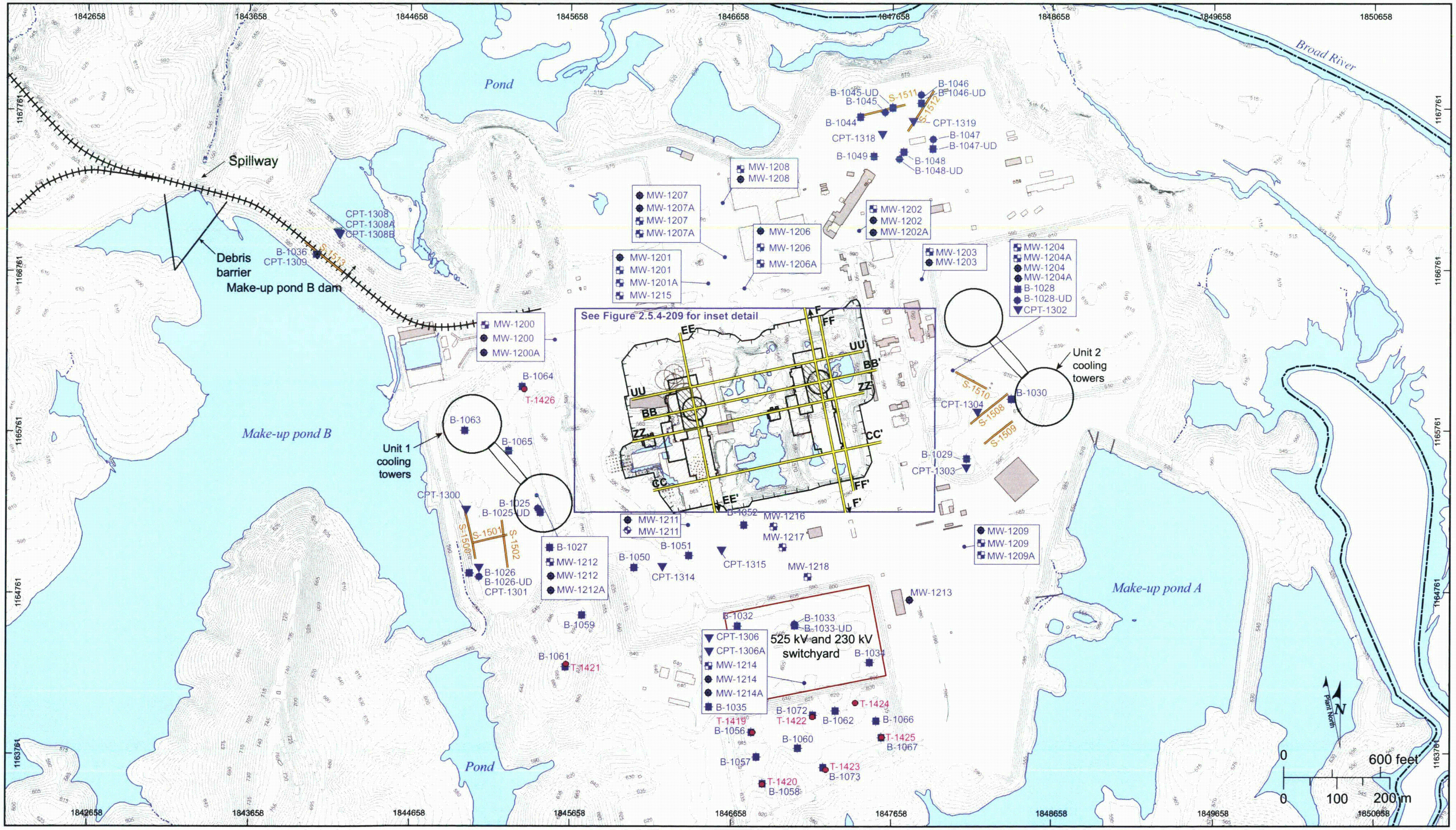
NUCLEAR STATION UNITS 1 & 2

Site Exploration Map - Explanation

FIGURE 2.5.4-207

75. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-208 is revised as follows:



See Figure 2.5.4-207 for explanation

WLS COL 2.5-6

Sources: 1. Site topography and structure - Sanborn 2006
Shaw, Stone & Webster, September, 2007.
2. Shaw, Stone & Webster, Inc. Drawing WLG-0000-X2-800005, Revision H, 2/11/13.
Title: Lee Nuclear Station Units 1 & 2 Site Plan.

Coordinate System: South Carolina State Plane, NAD83 Int'l Feet
Vertical - NAVD88

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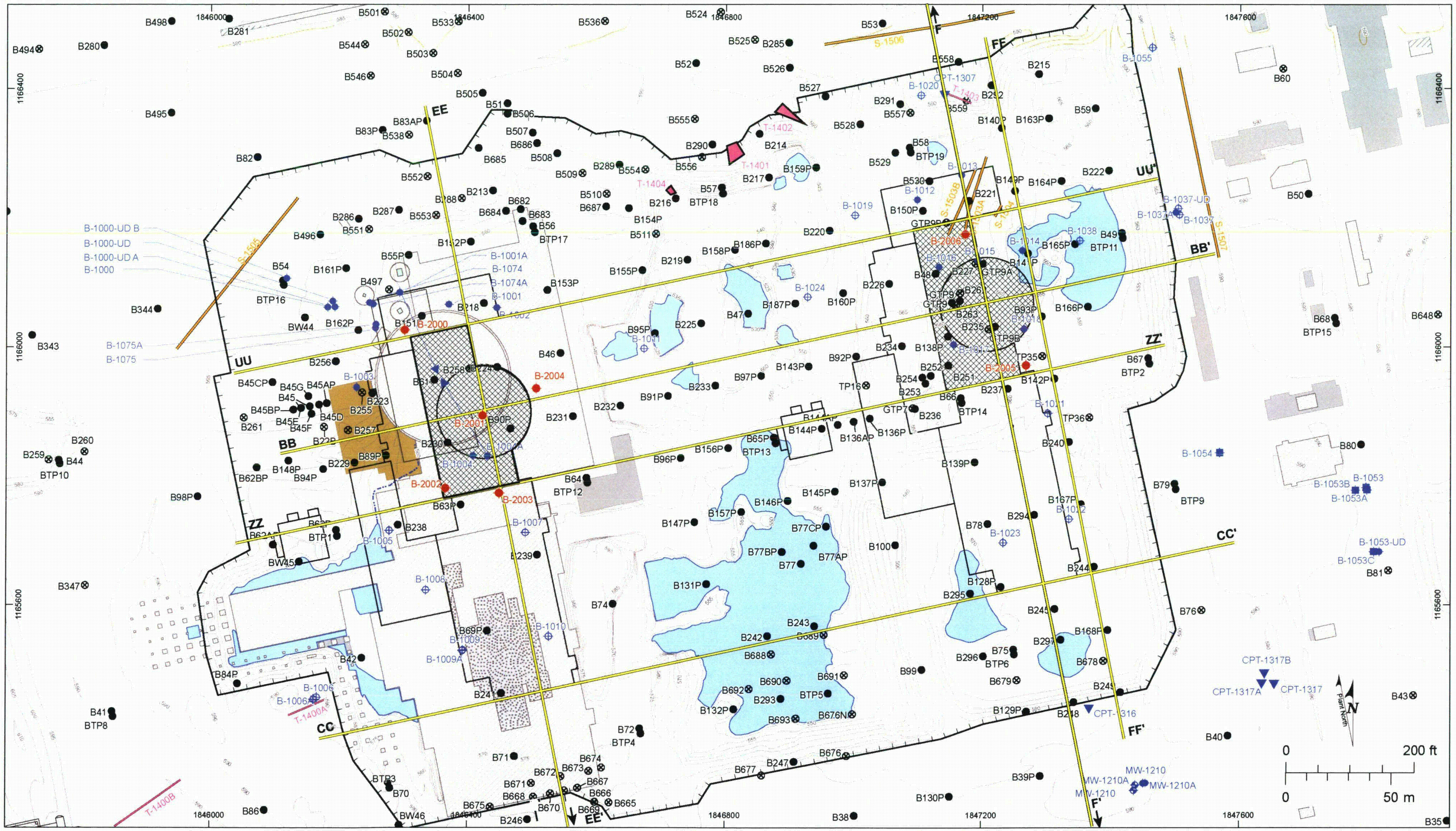
NUCLEAR STATION UNITS 1 & 2

Site Exploration Map - Overview

FIGURE 2.5.4-208

76. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-209 is revised as follows:



WLS COL 2.5-6

Sources: 1. Site topography and structure - Sanborn 2006
Shaw, Stone & Webster, September, 2007.
2. Shaw, Stone & Webster, Inc. Drawing WLG-0000-X2-800005, Revision H, 2/11/13.
Title: Lee Nuclear Station Units 1 & 2 Site Plan.

Coordinate System: South Carolina State Plane, NAD83 Int'l Feet
Vertical - NAVD88

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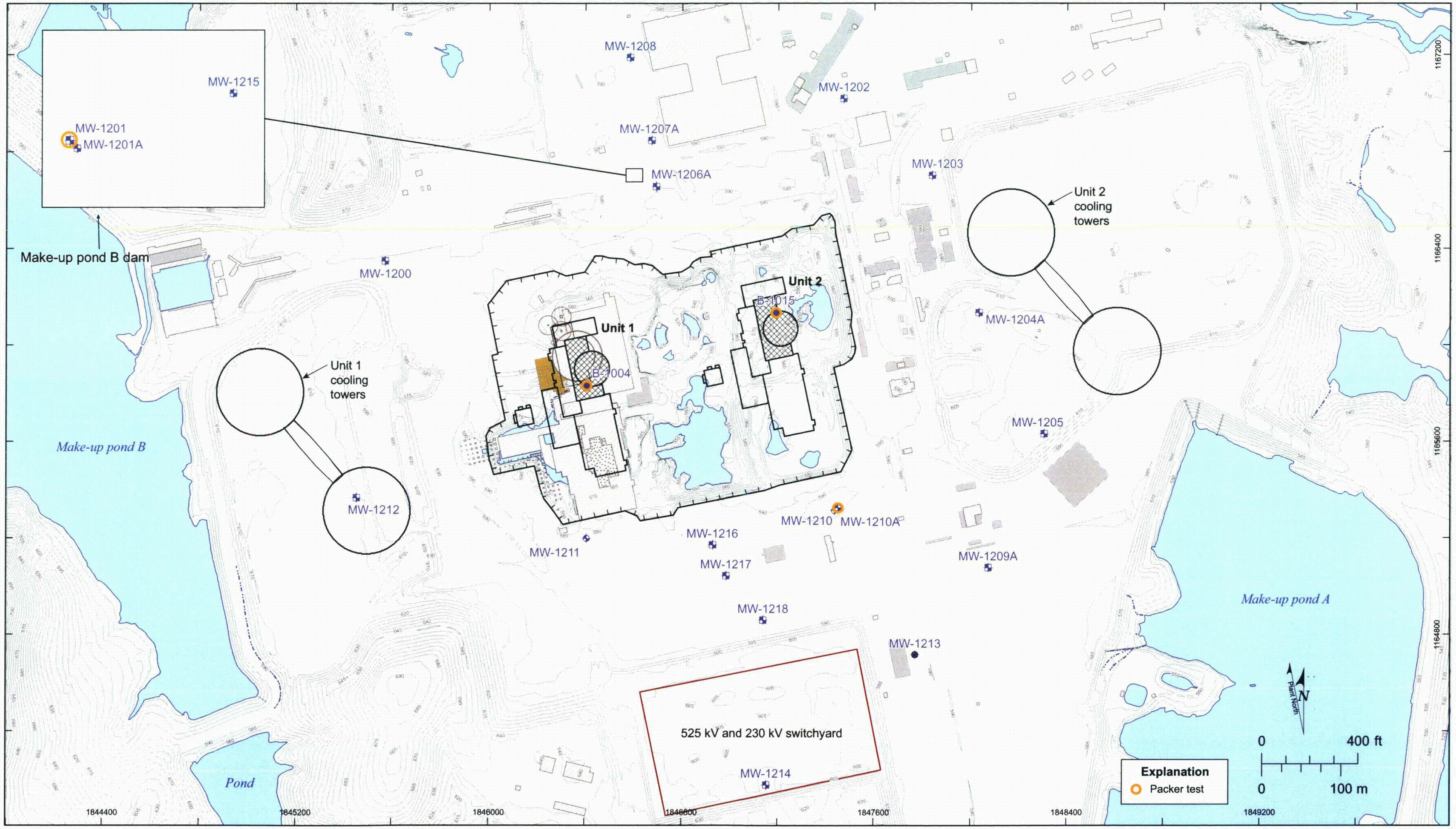
NUCLEAR STATION UNITS 1 & 2

Site Exploration Map - Power Block and Adjacent Areas - Map

FIGURE 2.5.4-209

77. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-210 is revised as follows:



See Figure 2.5.4-207 for explanation

WLS COL 2.5-6

WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Groundwater Monitoring Well and Packer Test Locations

FIGURE 2.5.4-210

78. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-211 is revised as follows:

See Figure 2.5.4-207 for explanation

WLS COL 2.5-1

Sources: 1. Site topography and structure - Sanborn 2006
Shaw, Stone & Webster, September, 2007.
2. Shaw, Stone & Webster, Inc. Drawing WLG-0000-X2-800005, Revision H, 2/11/13.
Title: Lee Nuclear Station Units 1 & 2 Site Plan.

Coordinate System: South Carolina State Plane, NAD83 Int'l Feet
Vertical - NAVD88

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NUCLEAR STATION UNITS 1 & 2

Surface Geophysical Test Locations

FIGURE 2.5.4-211

79. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-212 is revised as follows:

See Figure 2.5.4-207 for explanation

WLS COL 2.5-6

Sources: 1. Site topography and structure - Sanborn 2006 Shaw, Stone & Webster, September, 2007.
2. Shaw, Stone & Webster, Inc. Drawing WLG-0000-X2-800005, Revision H, 2/11/13. Title: Lee Nuclear Station Units 1 & 2 Site Plan.

Coordinate System: South Carolina State Plane, NAD83 Int'l Feet
Vertical - NAVD88

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NUCLEAR STATION UNITS 1 & 2

CPT Test Locations

FIGURE 2.5.4-212

80. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-213 is revised as follows:

See Figure 2.5.4-207 for explanation

WLS COL 2.5-6

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NUCLEAR STATION UNITS 1 & 2

Geotechnical Test Pit
and Geologic Trench Locations

FIGURE 2.5.4-213

81. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-214 is revised as follows:

See Figure 2.5.4-207 for explanation

WLS COL 2.5-6

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NUCLEAR STATION UNITS 1 & 2

Borehole In-Situ Test Locations

FIGURE 2.5.4-214

82. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-215 is revised as follows:

Sources: 1. Site topography and structure - Sanborn 2006
Shaw, Stone & Webster, September, 2007
2. Shaw, Stone & Webster, Inc. Drawing WLG-0000-X2-800005,
Revision H, 2/11/13.
Title: Lee Nuclear Station Units 1 & 2 Site Plan.

Coordinate System: South Carolina State Plane, NAD83 Int'l Feet
Vertical - NAVD88

WLS COL 2.5-6

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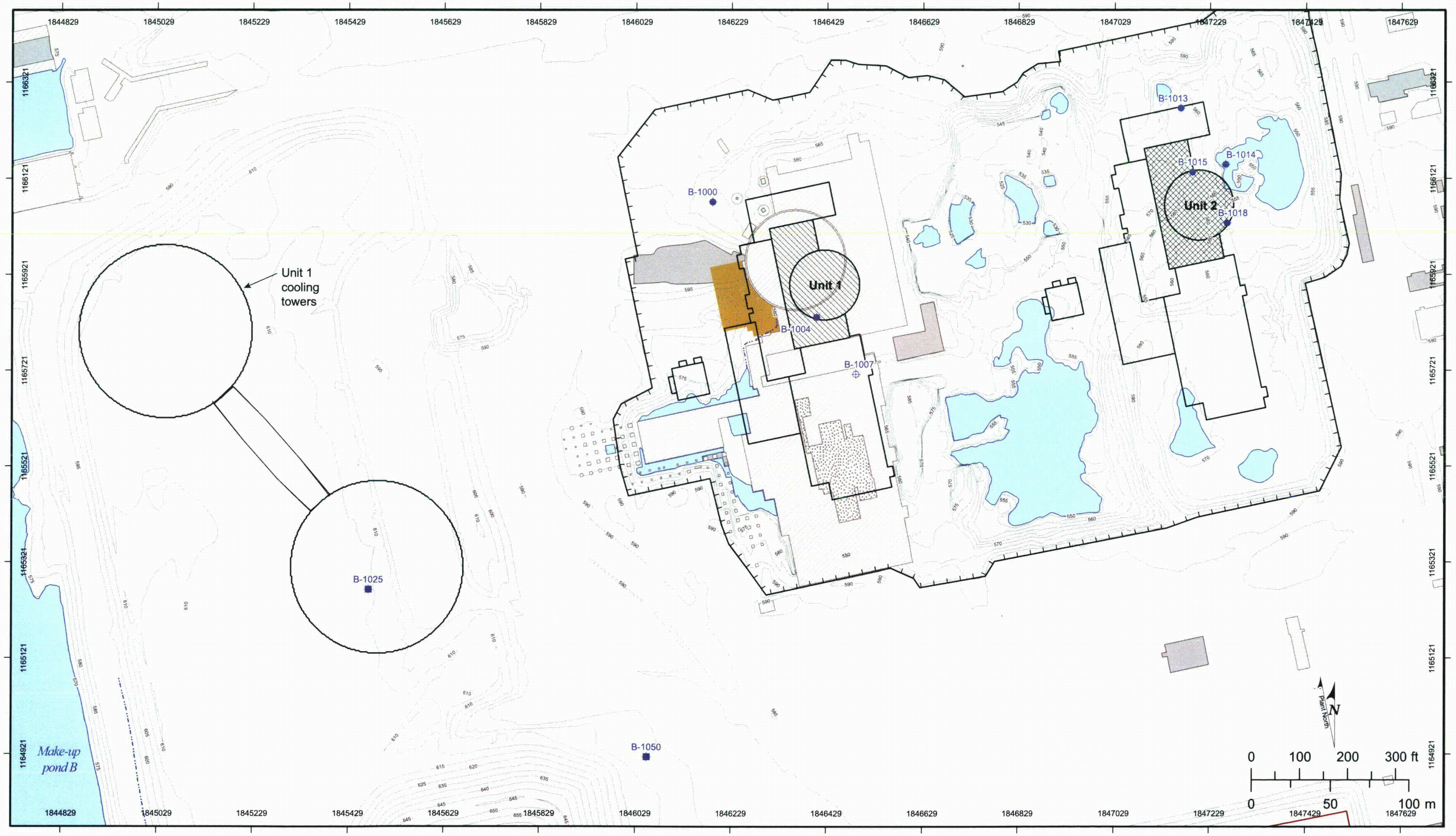
NUCLEAR STATION UNITS 1 & 2

Borehole Geophysical
Test Locations

FIGURE 2.5.4-215

83. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-216 is revised as follows:



WLS COL 2.5-6

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NUCLEAR STATION UNITS 1 & 2

Petrographic Test Locations

FIGURE 2.5.4-216

84. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-218 is revised as follows:

Explanation

Symbols

Lab test

RQD / Percent of recovery (0 – 100%)	Rock Quality Designation (RQD) and percent of recovery
● 16,930 psi	Laboratory unconfined compression test result (E, psi)
(8,238,000 psi)	Young's Modulus (psi)
(P)	Petrographic analysis
UTA-54-A ⬢	Resonant column and torsional shear test

In situ test

3,200,000 psi 4,300,000 psi	Goodman Jack (True Young's Modulus, Et, psi)
90,000 psi ◆	Pressuremeter (Shear Modulus, G, psi)

Abbreviations

Res = Residuum
Sap = Saprolite
Col = Colluvium
PWR = Partially weathered rock
MW = Moderately weathered
SL-F = Slightly weathered to fresh rock
BOH = Bottom of hole

Lithology

- Concrete
- Silty sand (SM)
- Sandy silt (ML)
- Gravel
- Diabase
- Meta-granodiorite
- Meta-quartz Diorite
- Meta-diorite

WLS COL 2.5-1

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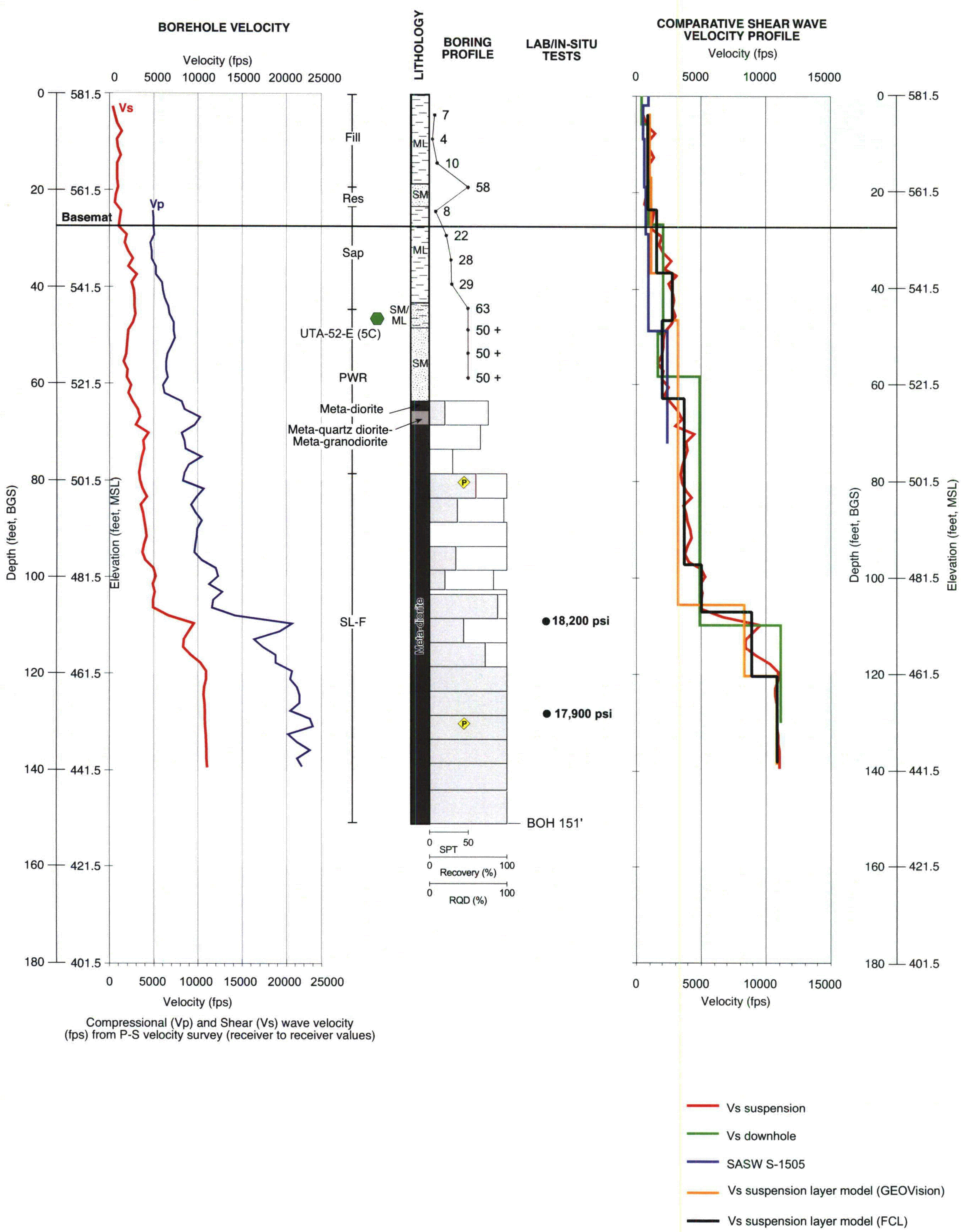
NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet Explanation

FIGURE 2.5.4-218

85. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-219 is revised as follows:



Notes:
1. Borehole geophysics performed by R. Stellar of GEOVision Geophysical Services
2. Surface geophysics performed by Dr. K. Stokoe, U. Texas
3. SPT field blows determined with a 140 lb. hammer, 30" drop - uncorrected
4. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

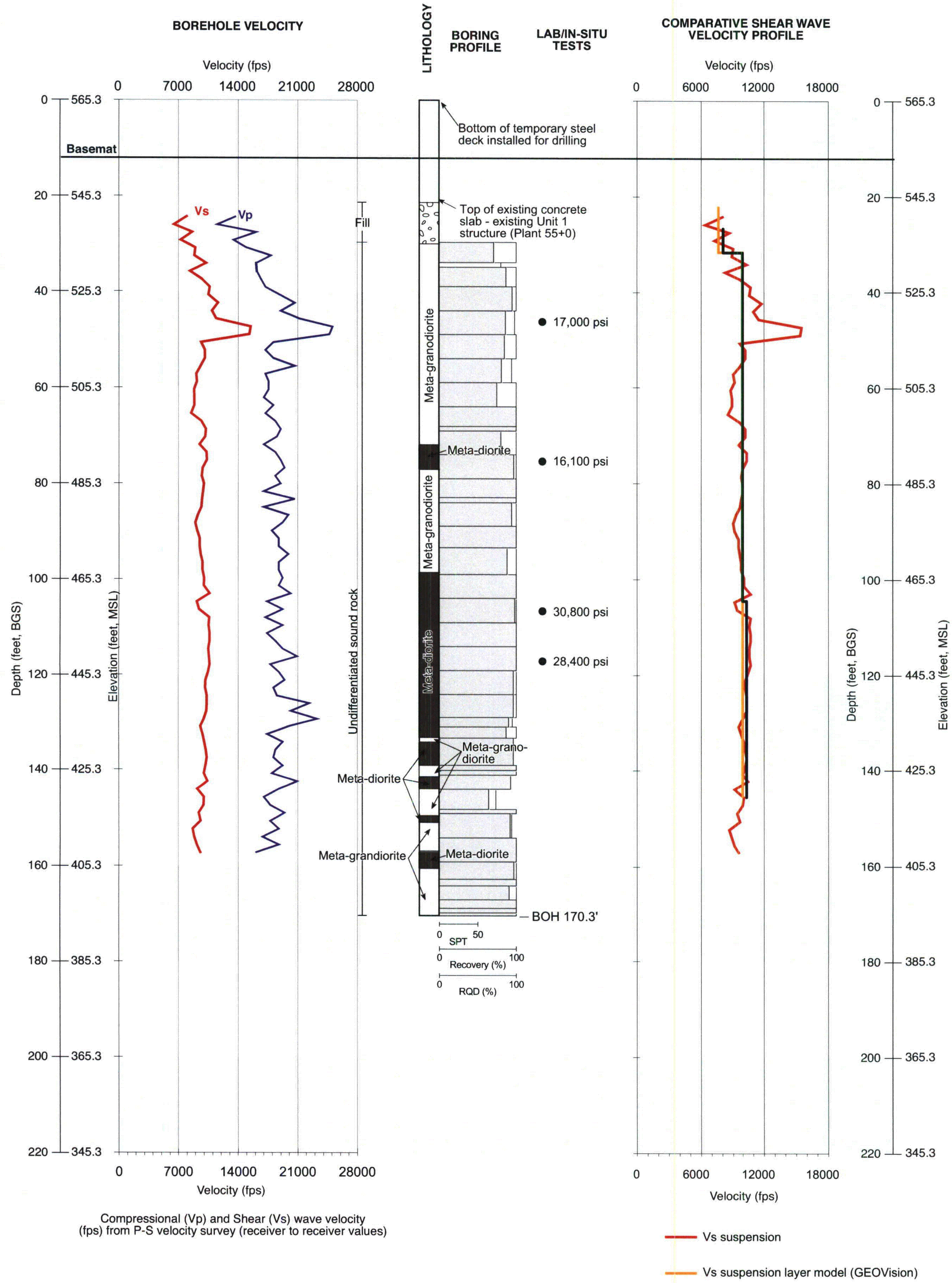
WLS COL 2.5-1

WILLIAM STATES LEE III NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, Boring B-1000

FIGURE 2.5.4-219

86. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-220 is revised as follows:



Notes:
1. Borehole geophysics performed by R. Stellar of GEOVision Geophysical Services
2. Surface geophysics performed by Dr. K. Stokoe, U. Texas
3. SPT field blows determined with a 140 lb. hammer, 30" drop - uncorrected
4. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

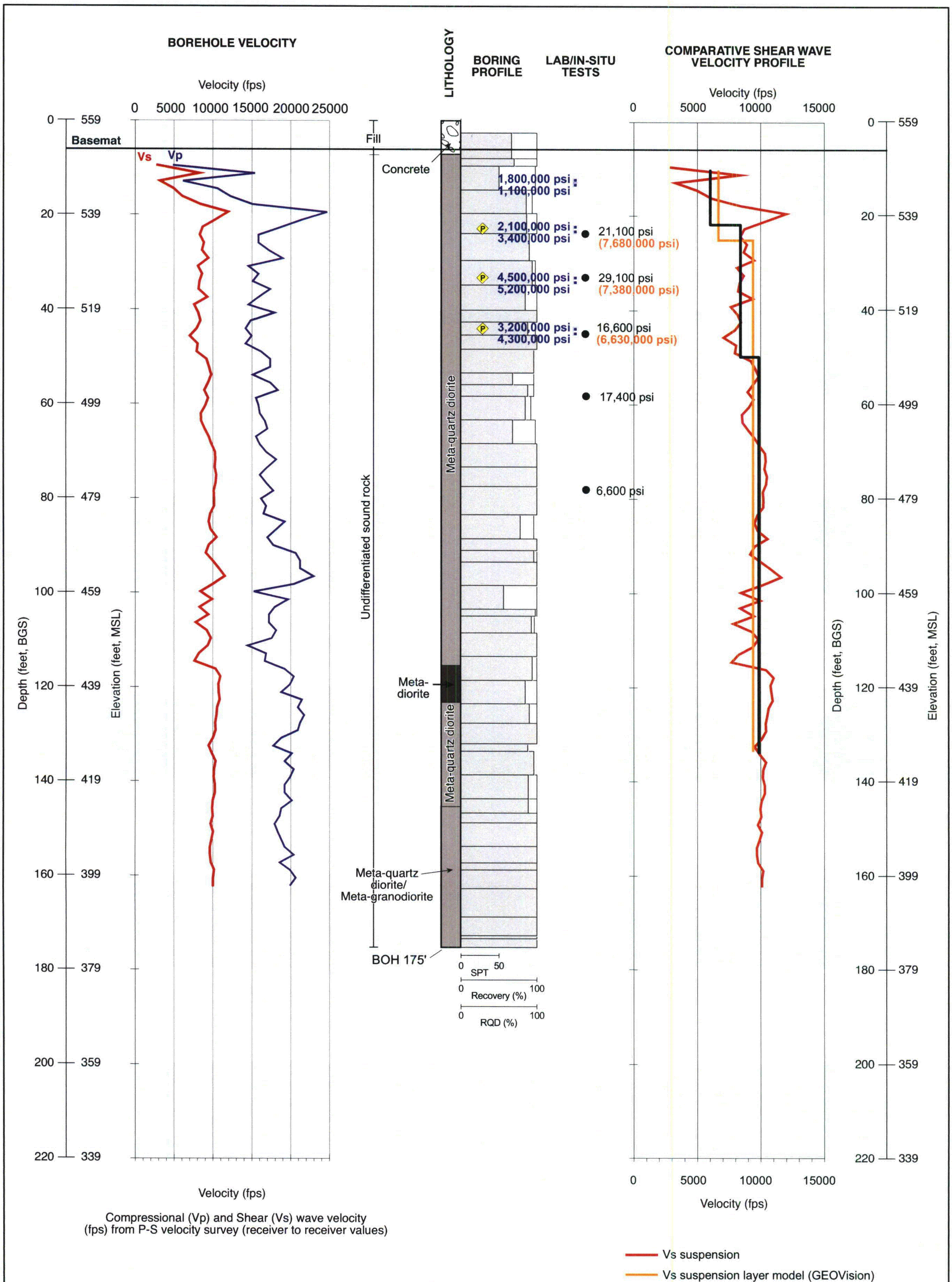
WLS COL 2.5-1

WILLIAM STATES LEE III NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, Boring B-1002

FIGURE 2.5.4-220

87. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-221 is revised as follows:



Notes:
1. Borehole geophysics performed by R. Stellar of GEOVision Geophysical Services
2. Surface geophysics performed by Dr. K. Stokoe, U. Texas
3. SPT field blows determined with a 140 lb. hammer, 30" drop - uncorrected
4. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WLS COL 2.5-1

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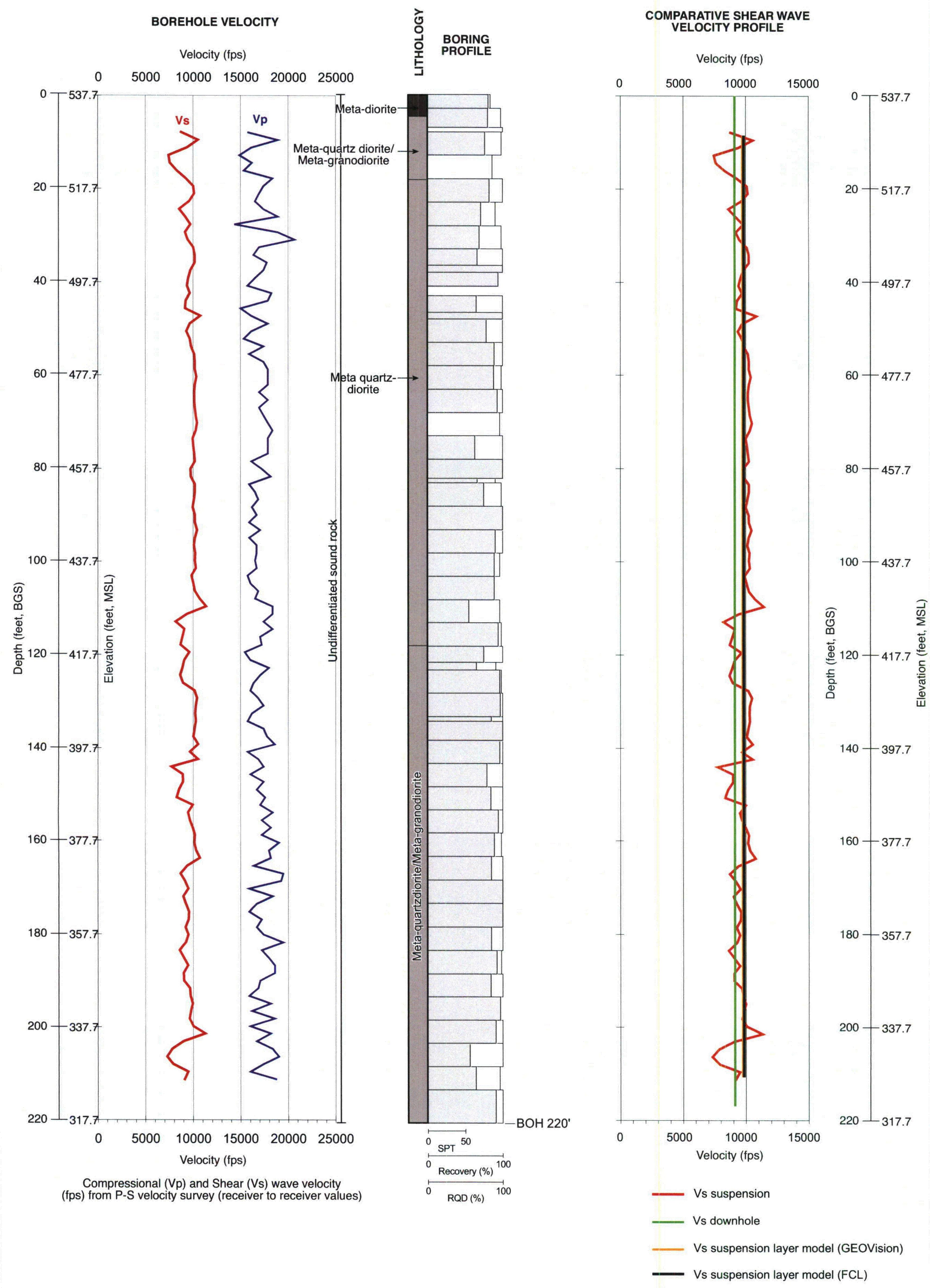
NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, Boring B-1004

FIGURE 2.5.4-221

88. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-222 is revised as follows:



Notes:
1. Borehole geophysics performed by R. Stellar of GEOVision Geophysical Services
2. Surface geophysics performed by Dr. K. Stokoe, U. Texas
3. SPT field blows determined with a 140 lb. hammer, 30" drop - uncorrected
4. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WLS COL 2.5-1

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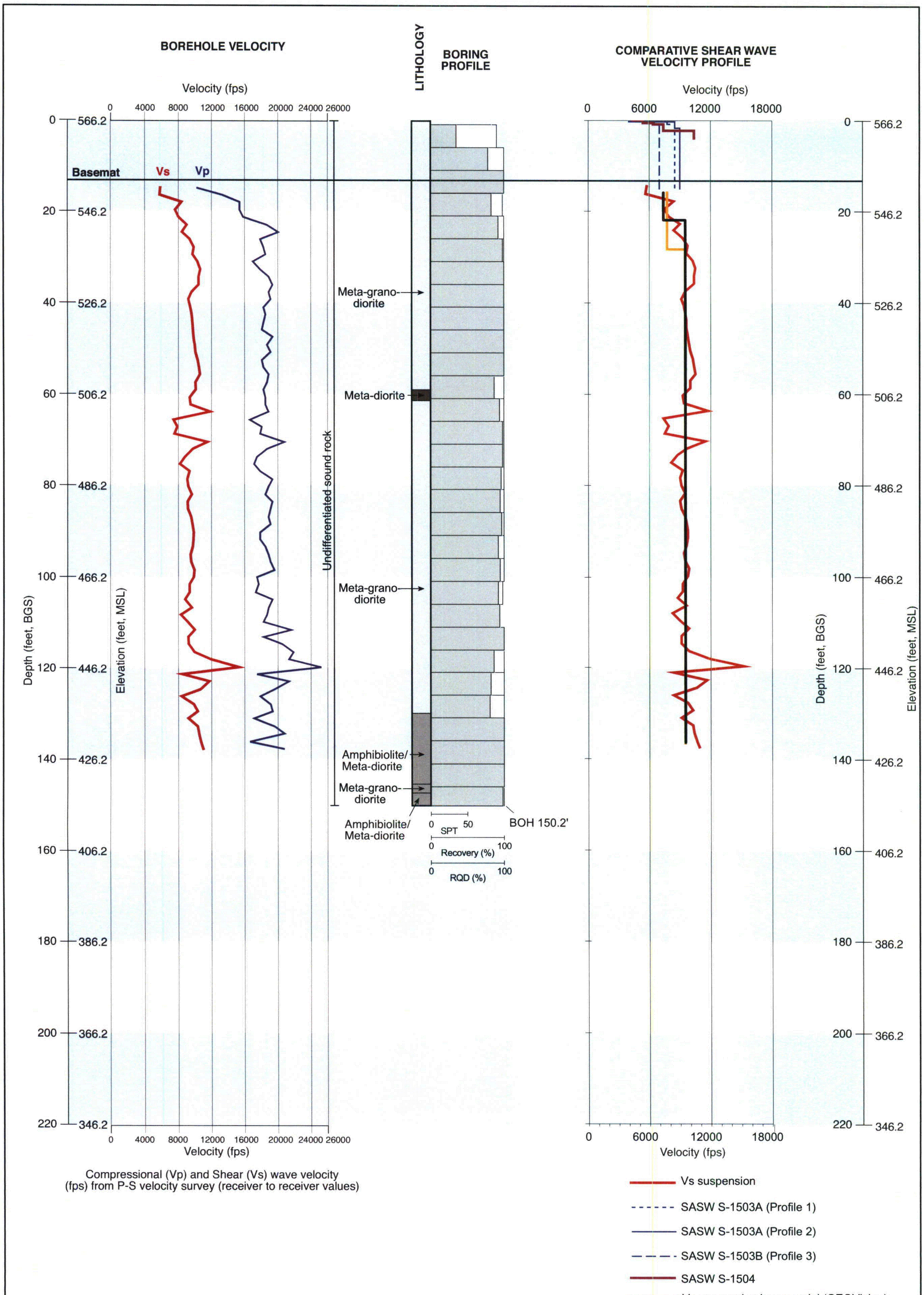
Boring Summary Sheet, Boring B-1011

FIGURE 2.5.4-222

89. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-223 is revised as follows:



WLS COL 2.5-1

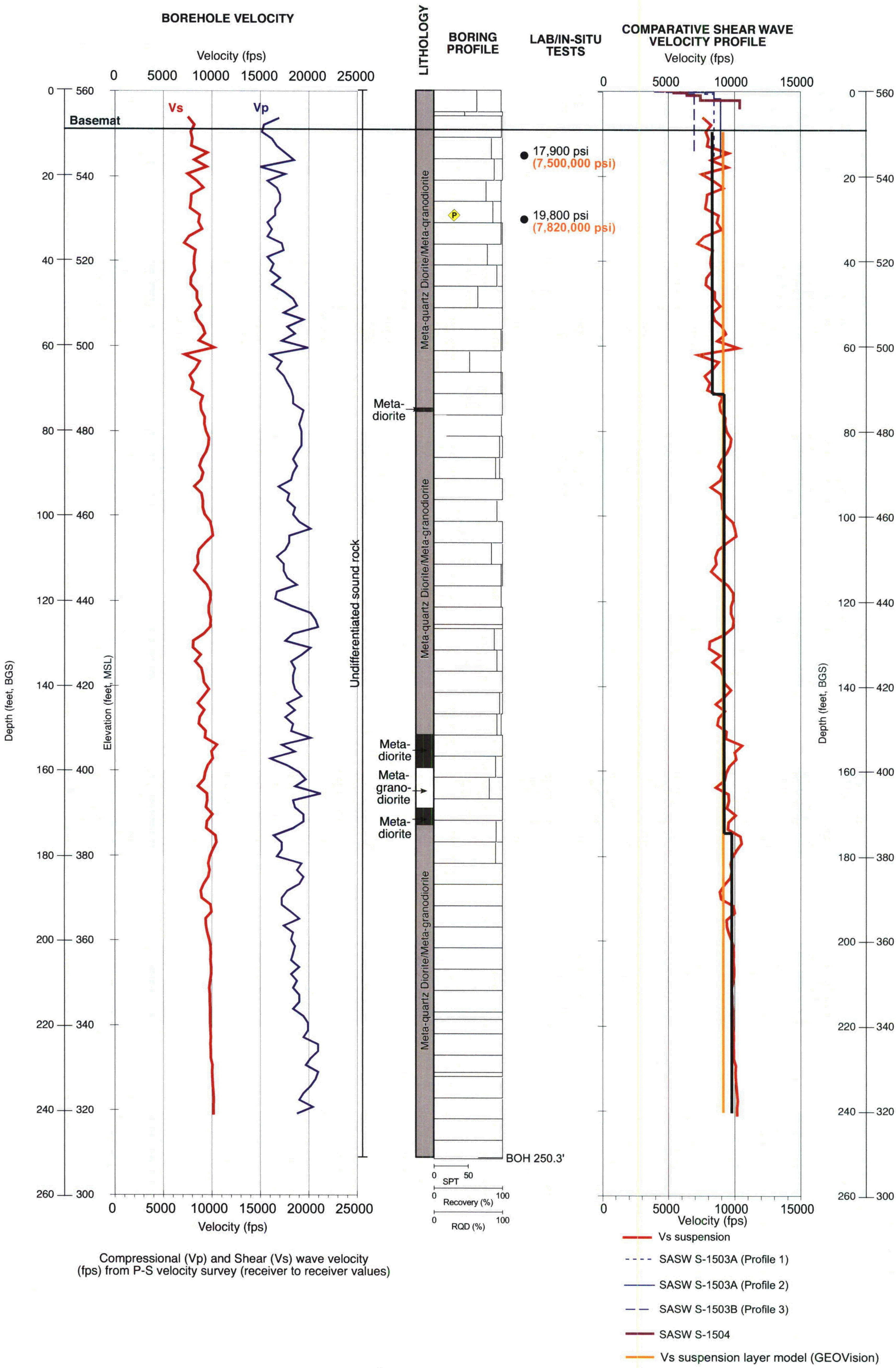
Notes:
1. Borehole geophysics performed by R. Stellar of GEOVision Geophysical Services
2. Surface geophysics performed by Dr. K. Stokoe, U. Texas
3. SPT field blows determined with a 140 lb. hammer, 30" drop - uncorrected
4. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WILLIAM STATES LEE III NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, Boring B-1012

FIGURE 2.5.4-223

90. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-224 is revised as follows:



Notes:
1. Borehole geophysics performed by R. Stellar of GEOVision Geophysical Services
2. Surface geophysics performed by Dr. K. Stokoe, U. Texas
3. SPT field blows determined with a 140 lb. hammer, 30" drop - uncorrected
4. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WLS COL 2.5-1

WILLIAM STATES LEE III NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, Boring B-1015

FIGURE 2.5.4-224

91. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-225 is revised as follows:

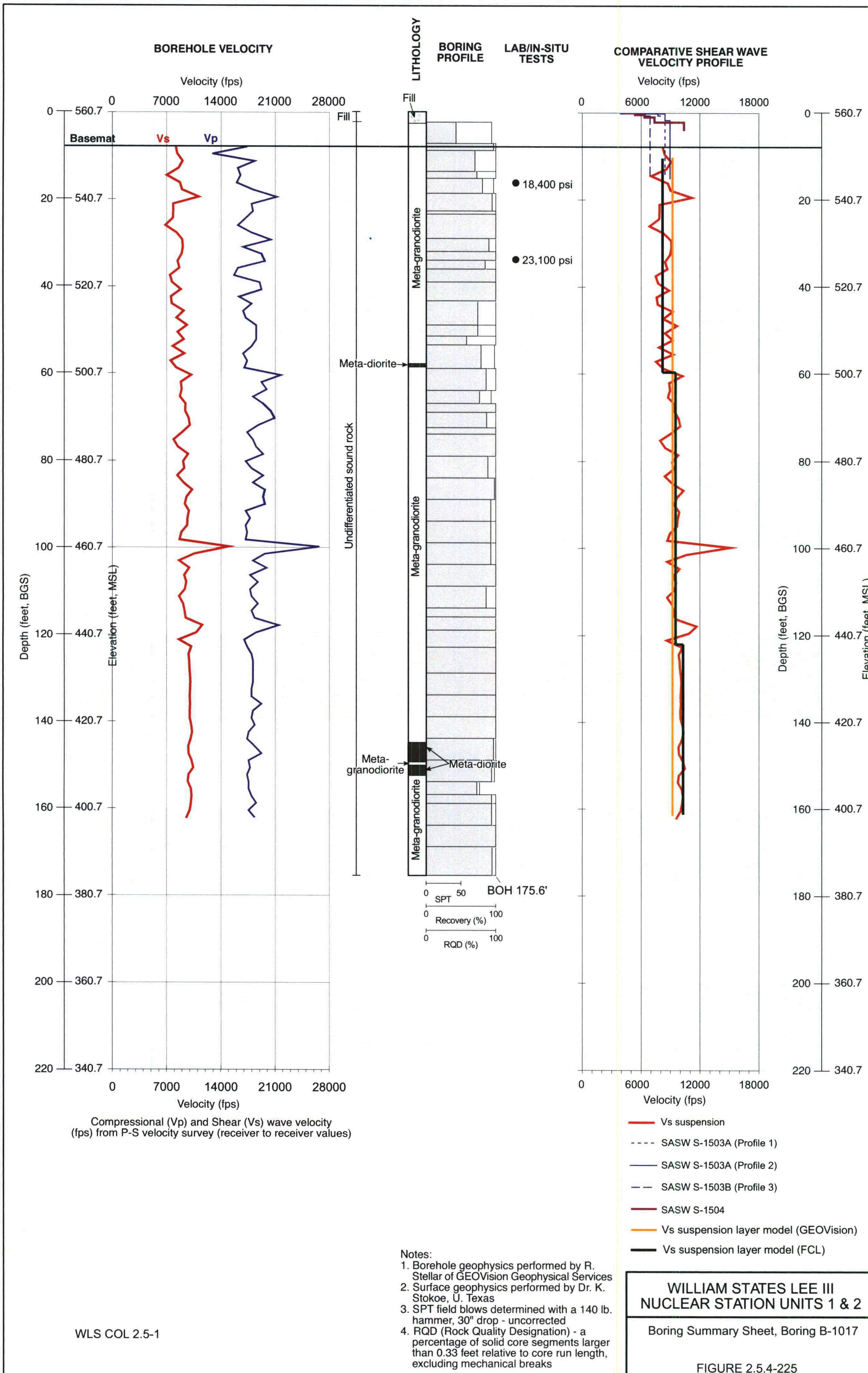
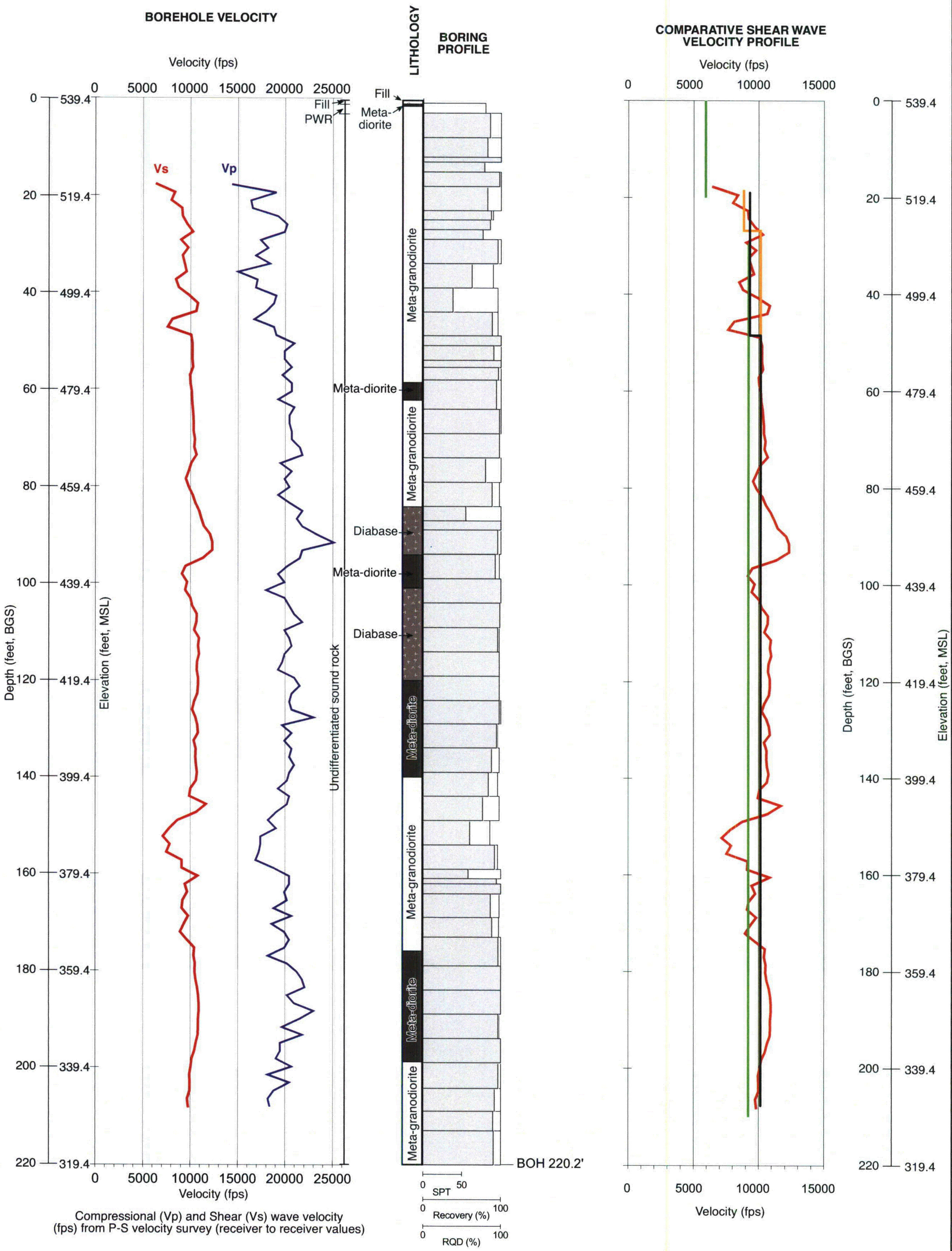


FIGURE 2.5.4-225

92. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-226 is revised as follows:



Notes:
1. Borehole geophysics performed by R. Stellar of GEOVision Geophysical Services
2. Surface geophysics performed by Dr. K. Stokoe, U. Texas
3. SPT field blows determined with a 140 lb. hammer, 30" drop - uncorrected
4. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WLS COL 2.5-1

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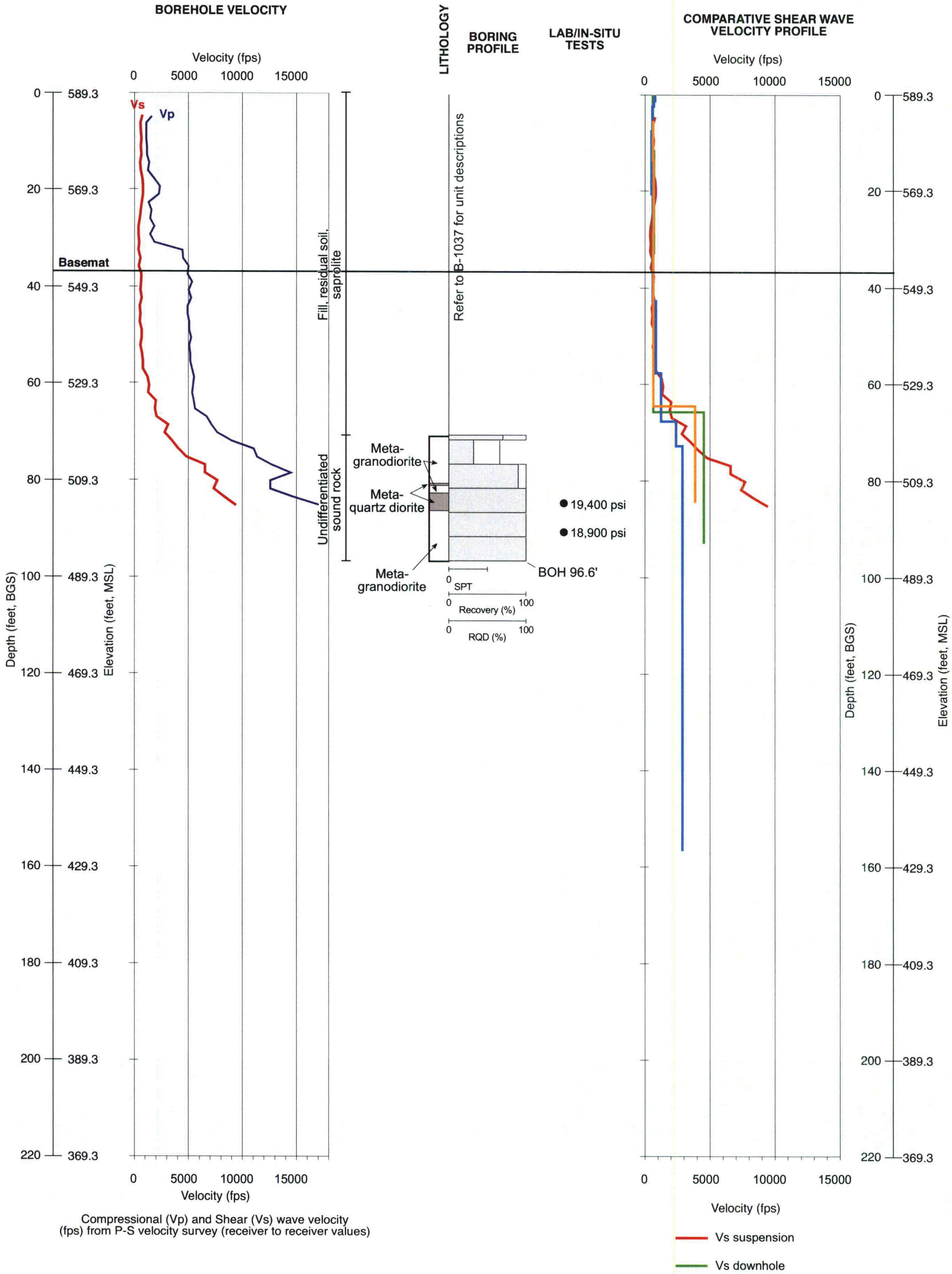
NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, Boring B-1024

FIGURE 2.5.4-226

93. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-227 is revised as follows:



WLS COL 2.5-1

Notes:
1. Borehole geophysics performed by R. Stellar of GEOVision Geophysical Services
2. Surface geophysics performed by Dr. K. Stokoe, U. Texas
3. SPT field blows determined with a 140 lb. hammer, 30" drop - uncorrected
4. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

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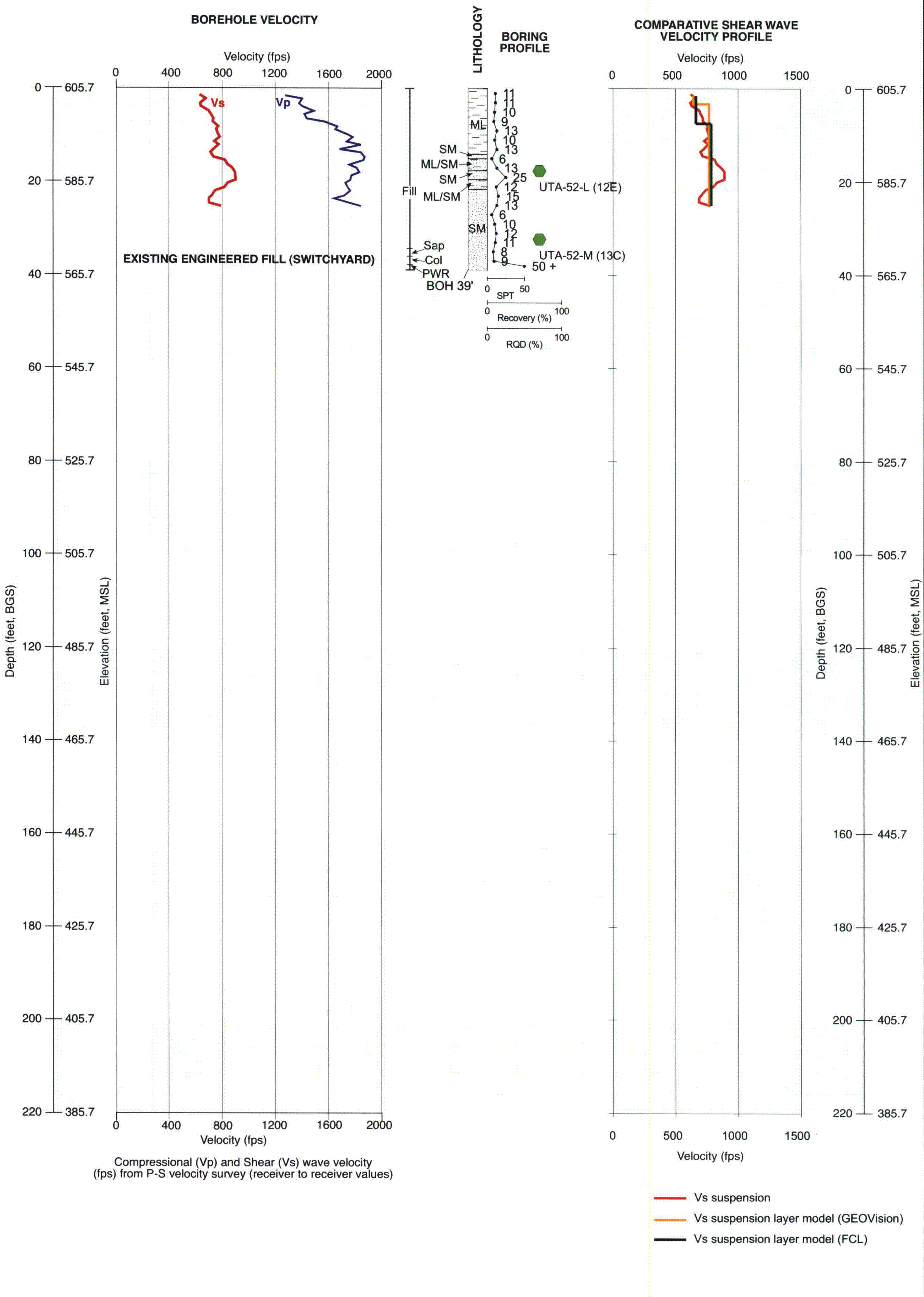
NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, Boring B-1037A

FIGURE 2.5.4-227

94. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-228 is revised as follows:



Notes:
1. Borehole geophysics performed by R. Stellar of GEOVision Geophysical Services
2. Surface geophysics performed by Dr. K. Stokoe, U. Texas
3. SPT field blows determined with a 140 lb. hammer, 30" drop - uncorrected
4. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WLS COL 2.5-1

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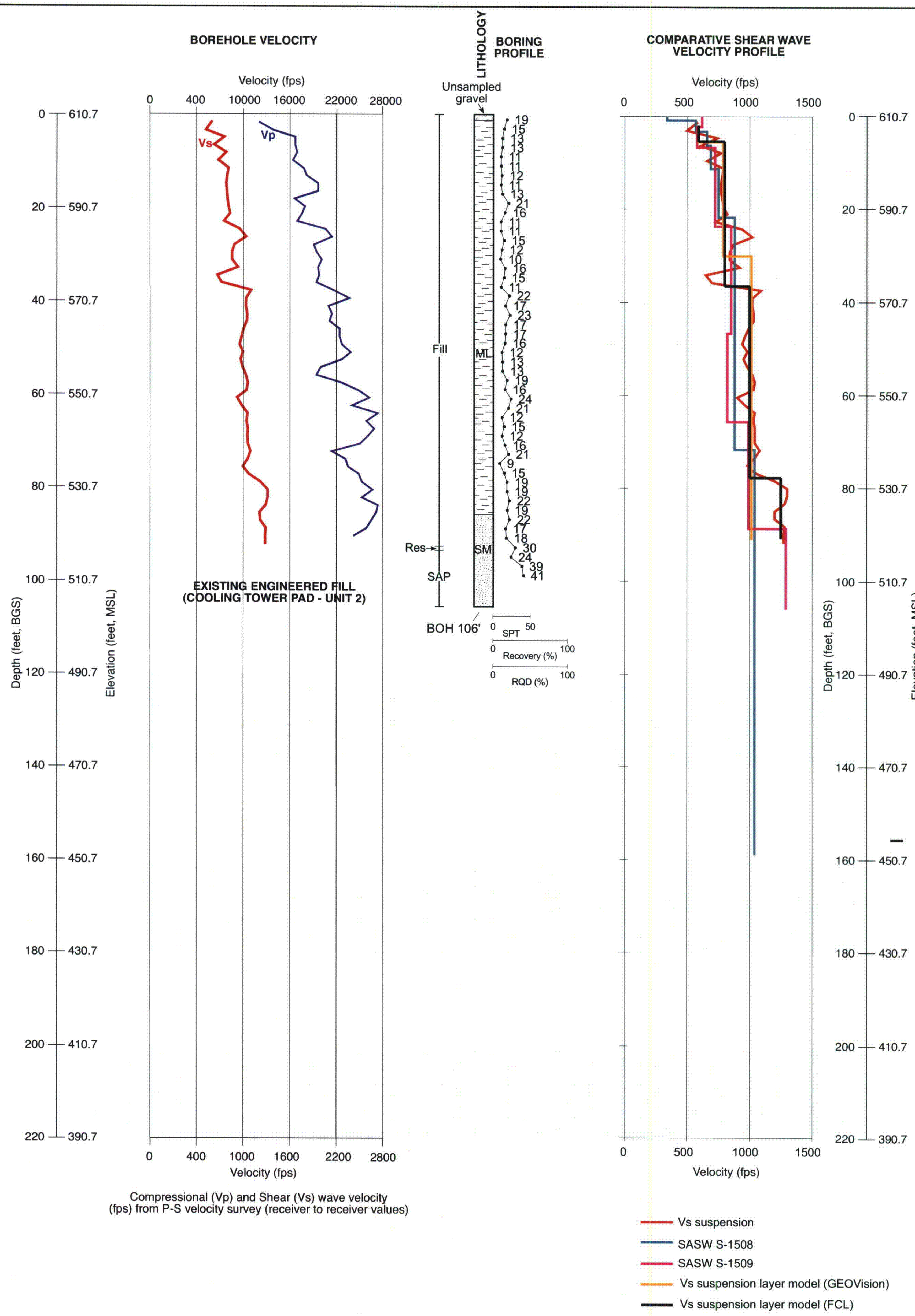
NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, Boring B-1068

FIGURE 2.5.4-228

95. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-229 is revised as follows:



Notes:
1. Borehole geophysics performed by R. Stellar of GEOVision Geophysical Services
2. Surface geophysics performed by Dr. K. Stokoe, U. Texas
3. SPT field blows determined with a 140 lb. hammer, 30" drop - uncorrected
4. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WLS COL 2.5-1

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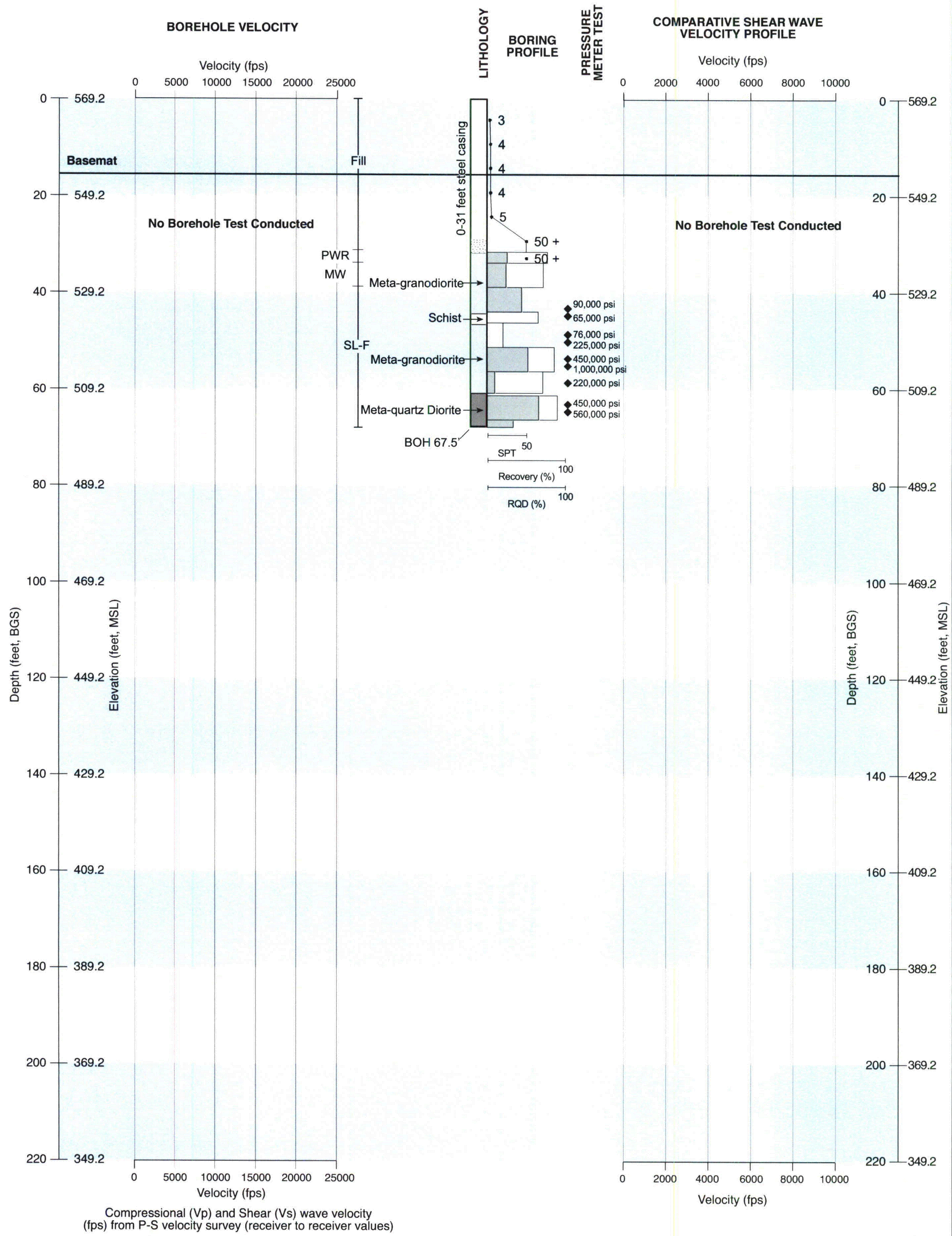
NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, Boring B-1070

FIGURE 2.5.4-229

96. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-230 is revised as follows:



Notes:
1. Borehole geophysics performed by R.Stellar of GEOVision Geophysical Services
2. Surface geophysics performed by Dr. K. Stokoe, U. Texas
3. SPT field blows determined with a 140 lb. hammer, 30" drop - uncorrected
4. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

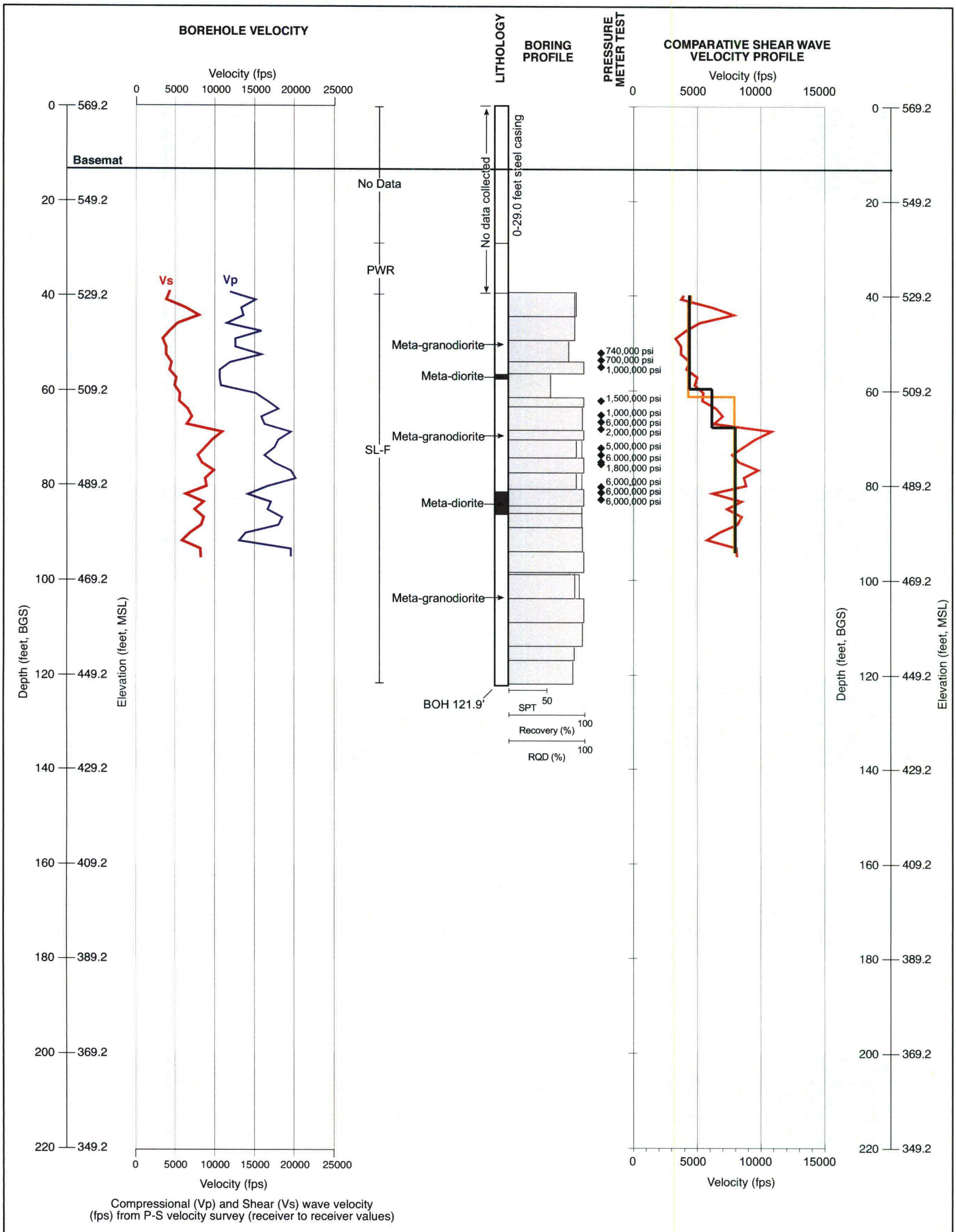
WLS COL 2.5-1

WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, Boring B-1074

FIGURE 2.5.4-230

97. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-231 is revised as follows:



Notes:
1. Borehole geophysics performed by R. Stellar of GEOVision Geophysical Services
2. Surface geophysics performed by Dr. K. Stokoe, U. Texas
3. SPT field blows determined with a 140 lb. hammer, 30" drop - uncorrected
4. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

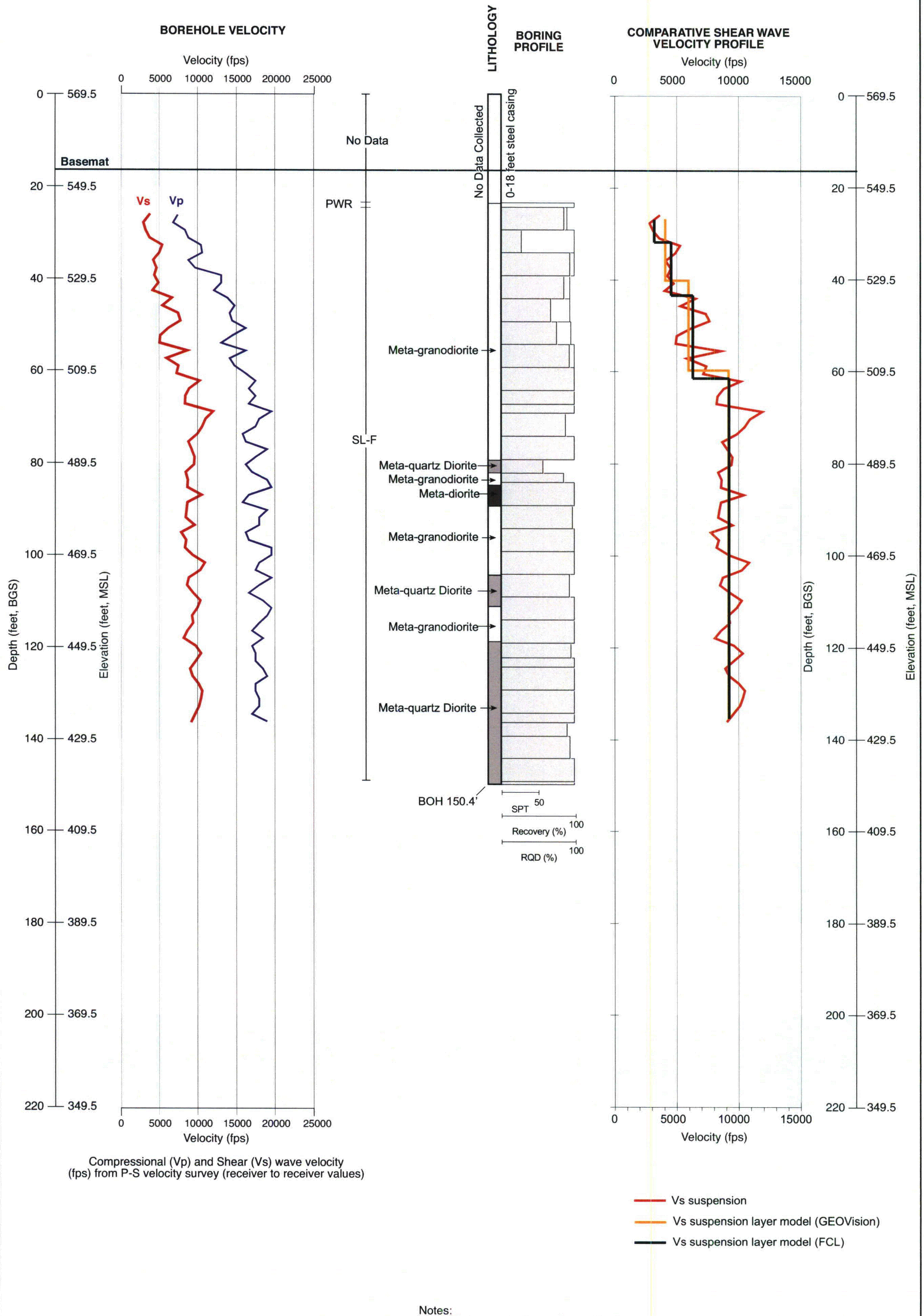
WLS COL 2.5-1

WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, Boring B-1074A

FIGURE 2.5.4-231

98. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-232 is revised as follows:



Notes:
1. Borehole geophysics performed by R. Stellar of GEOVision Geophysical Services
2. Surface geophysics performed by Dr. K. Stokoe, U. Texas
3. SPT field blows determined with a 140 lb. hammer, 30" drop - uncorrected
4. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WLS COL 2.5-1

WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, Boring B-1075A

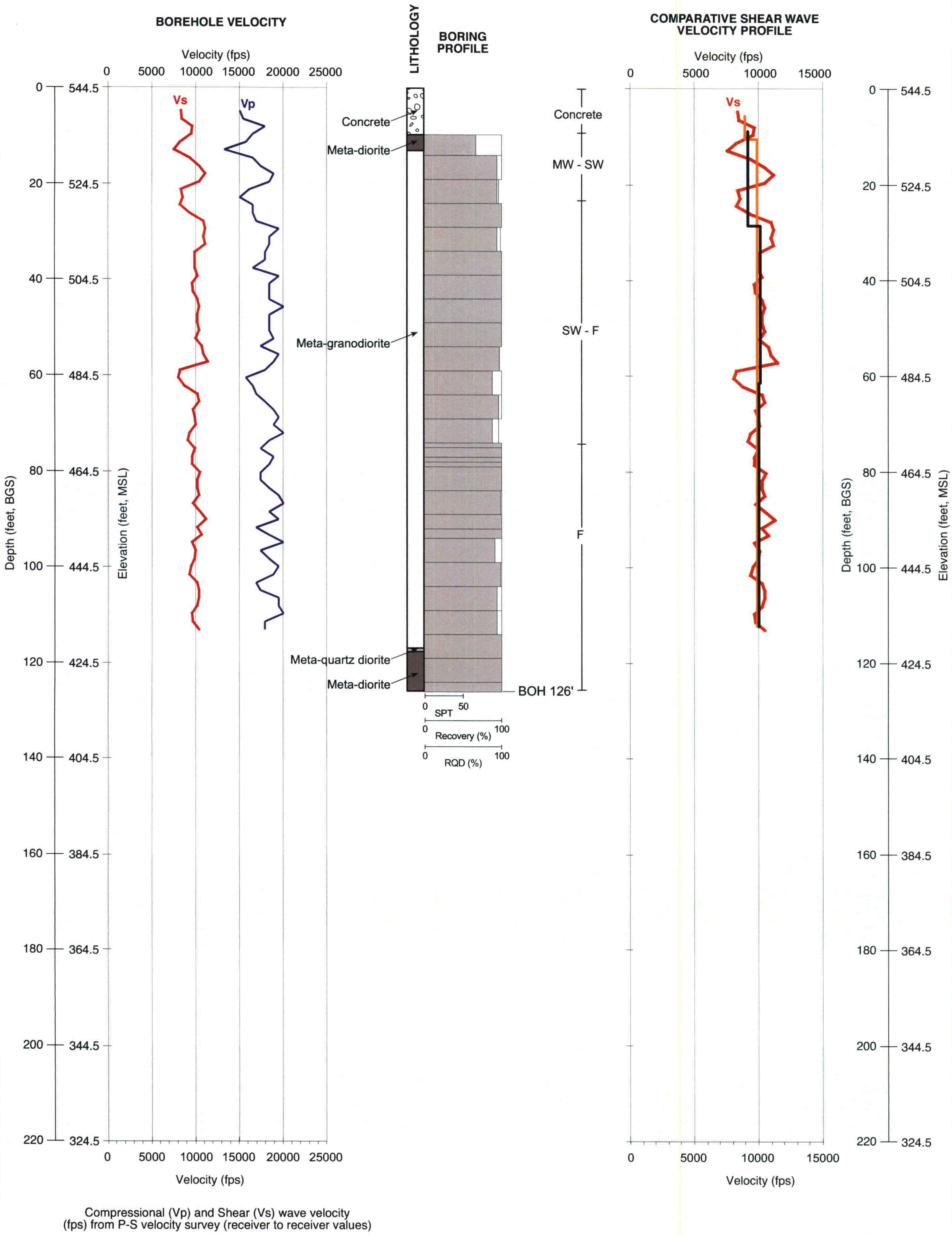
FIGURE 2.5.4-232

99. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-233 is deleted and presented as Figure 2.5.4-233a as follows:

Figure 2.5.4-233

Deleted

100. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-233a is revised as follows:



WLS COL 2.5-1

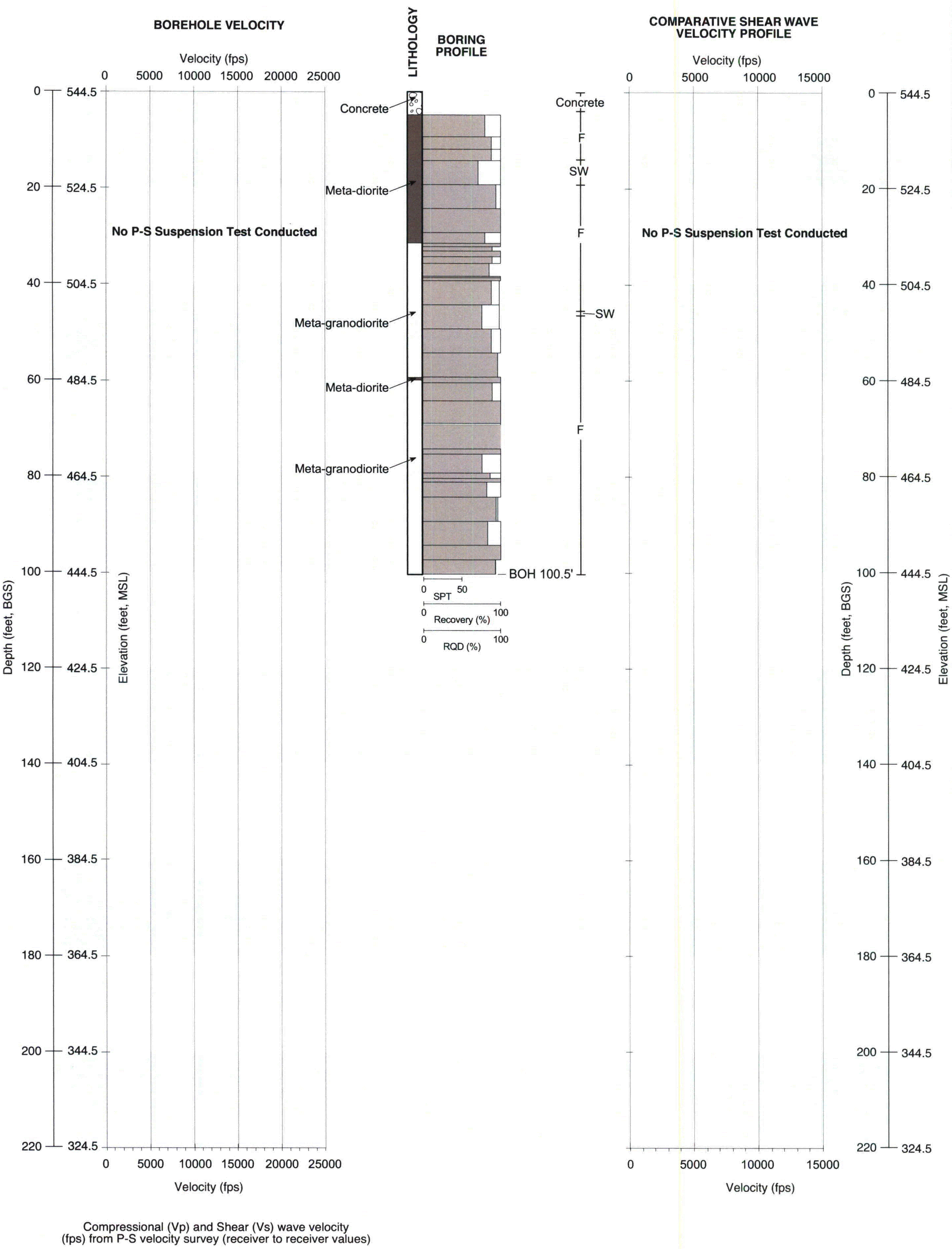
Notes:
1. Borehole geophysics performed by V. Gonzales of GEOVision Geophysical Services
2. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WILLIAM STATES LEE III NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, B-2000

FIGURE 2.5.4-233a

101. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-233b is revised as follows:



WLS COL 2.5-1

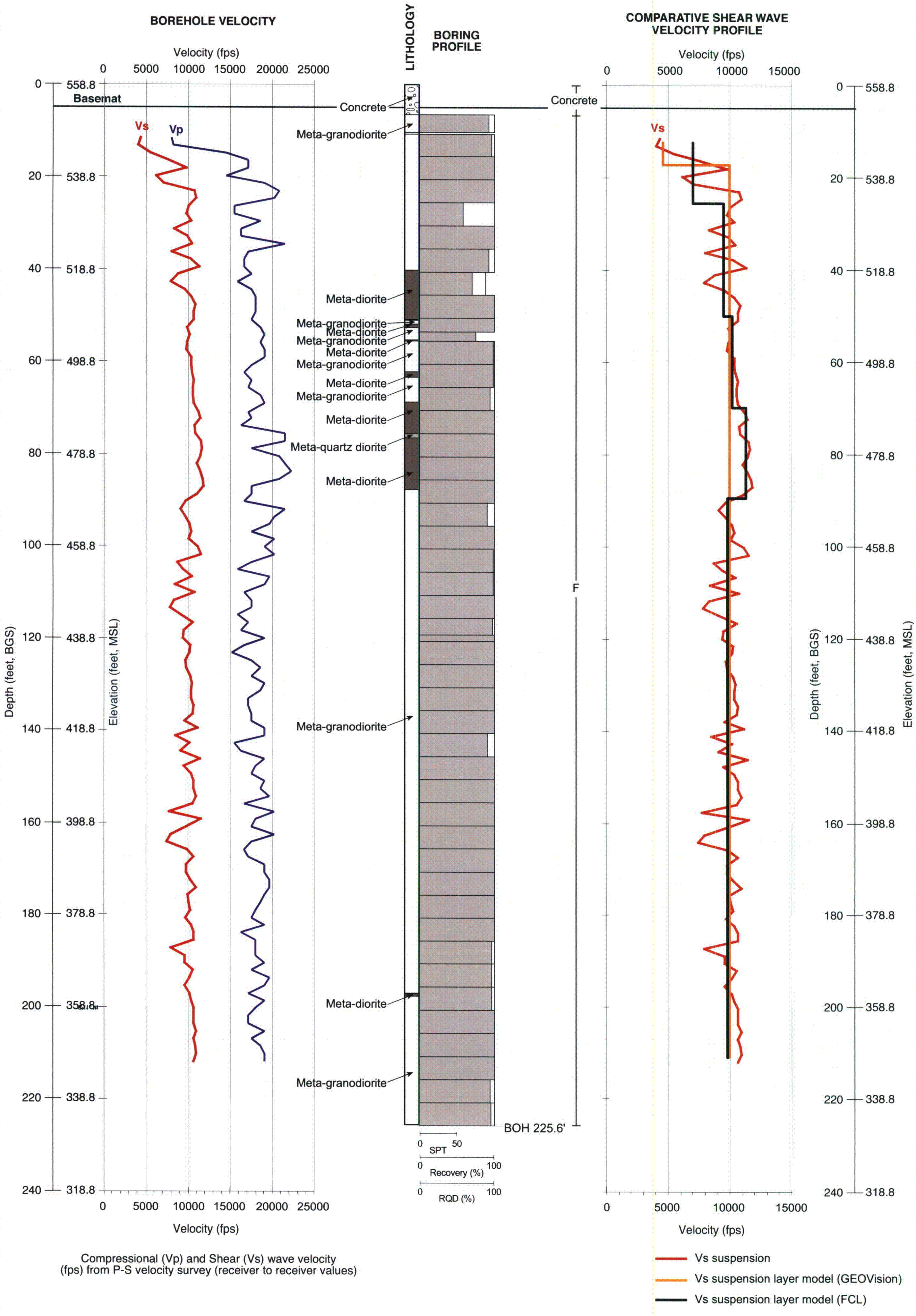
Note:
RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, B-2001

FIGURE 2.5.4-233b

102. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-233c is revised as follows:



WLS COL 2.5-1

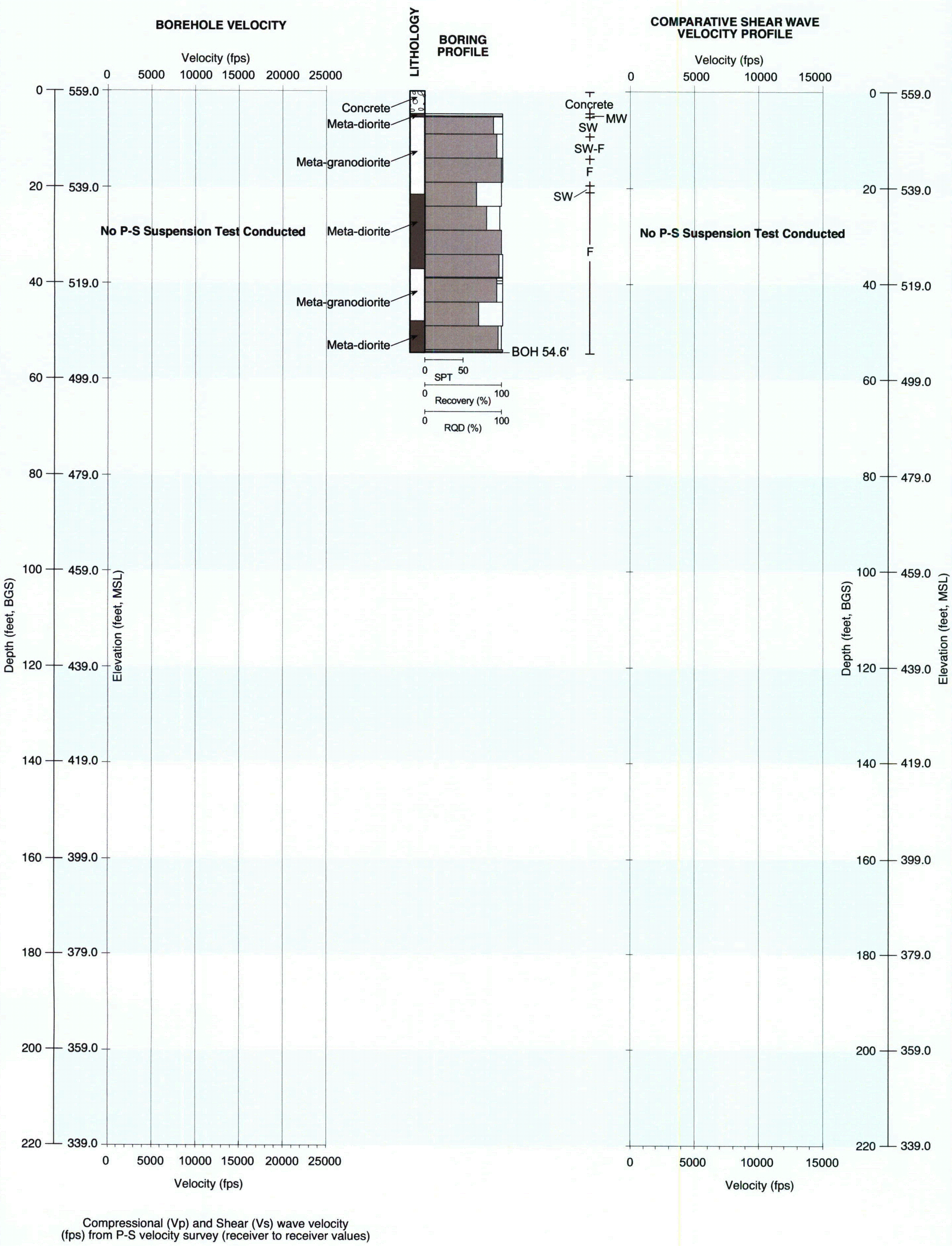
Notes:
1. Borehole geophysics performed by V. Gonzales of GEOVision Geophysical Services
2. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WILLIAM STATES LEE III NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, B-2002

FIGURE 2.5.4-233c

103. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-233d is revised as follows:



WLS COL 2.5-1

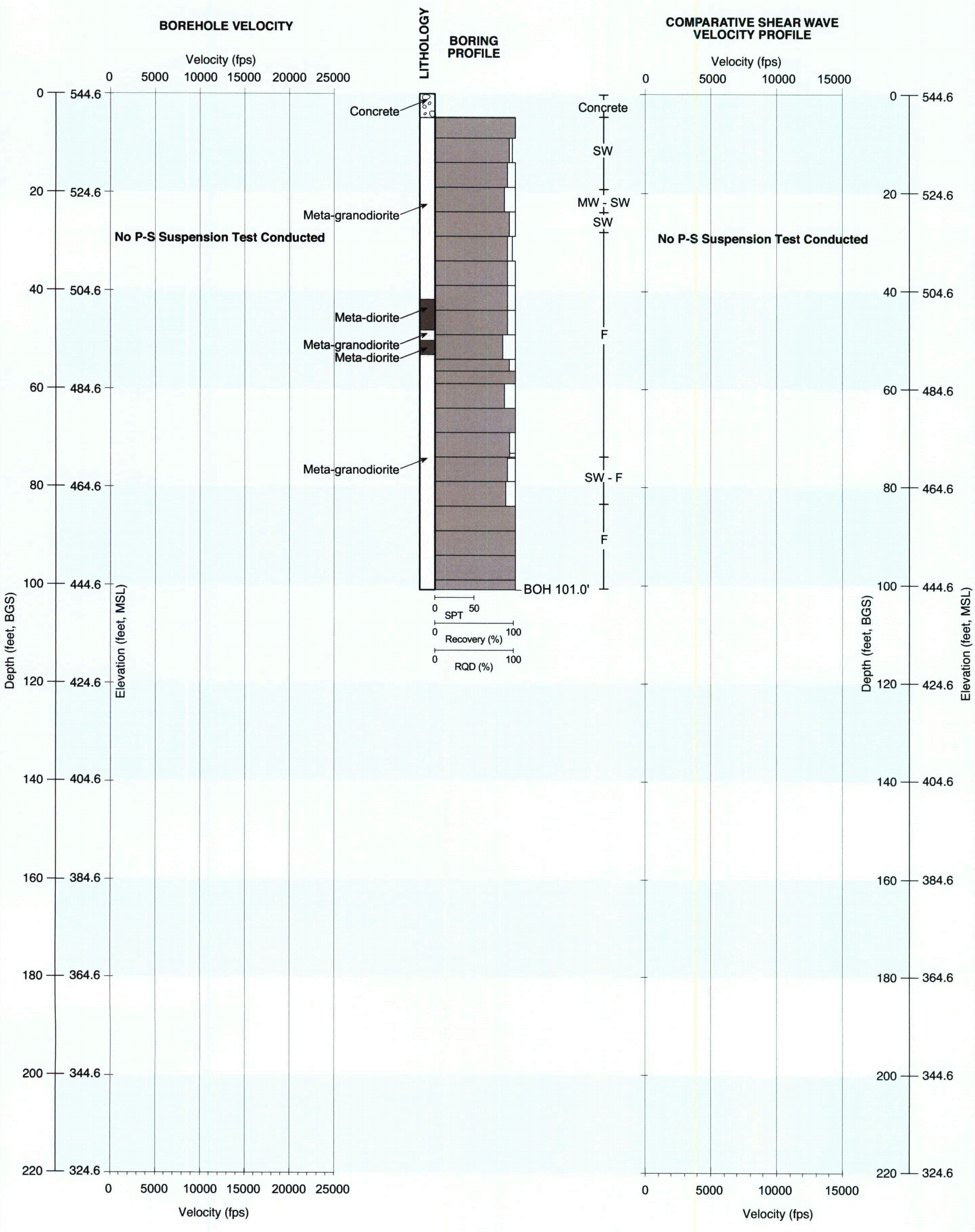
Note:
RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, B-2003

FIGURE 2.5.4-233d

104. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-233e is revised as follows:



Compressional (Vp) and Shear (Vs) wave velocity (fps) from P-S velocity survey (receiver to receiver values)

WLS COL 2.5-1

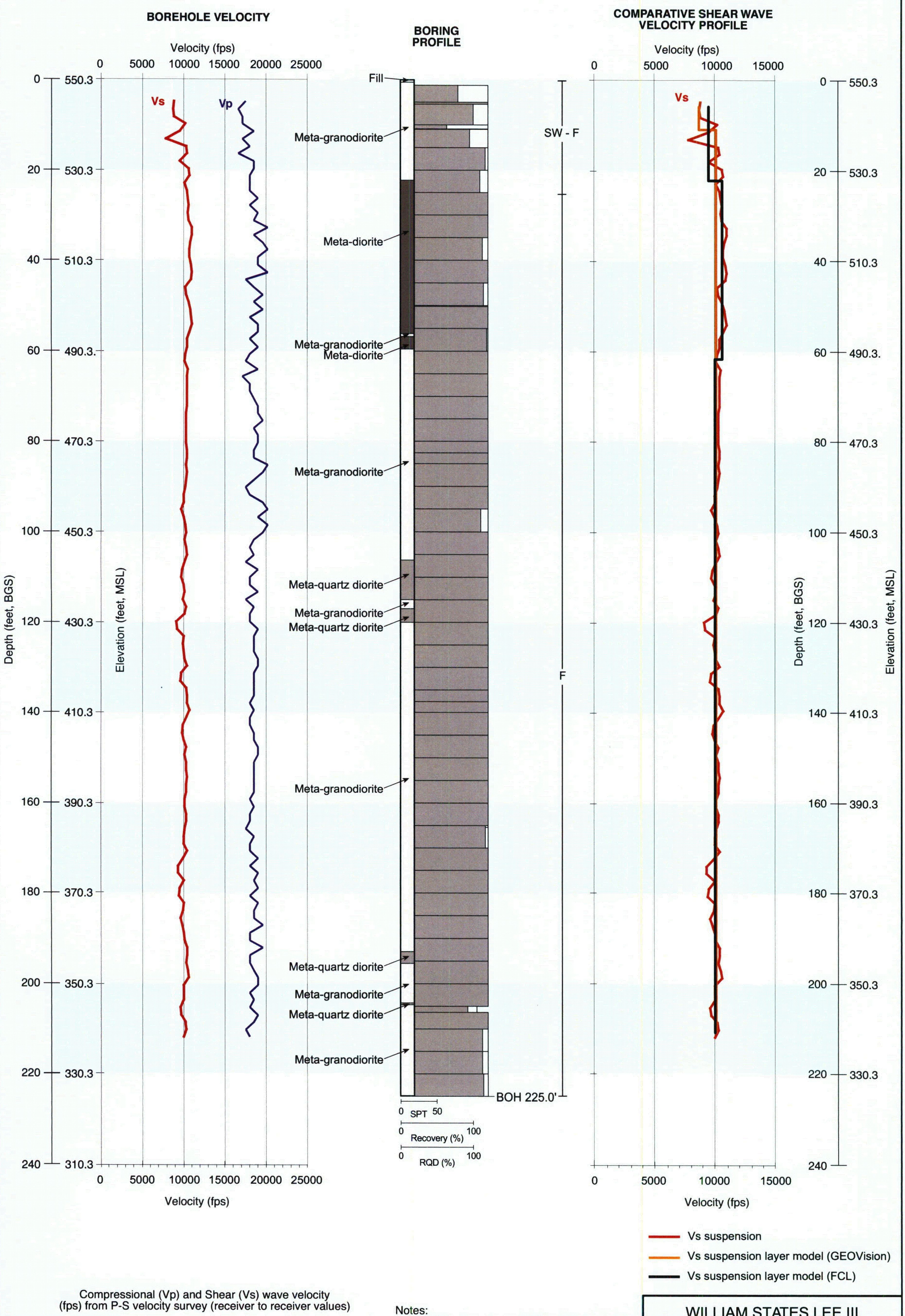
Note:
RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, B-2004

FIGURE 2.5.4-233e

105. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-233f is revised as follows:



Compressional (Vp) and Shear (Vs) wave velocity (fps) from P-S velocity survey (receiver to receiver values)

WLS COL 2.5-1

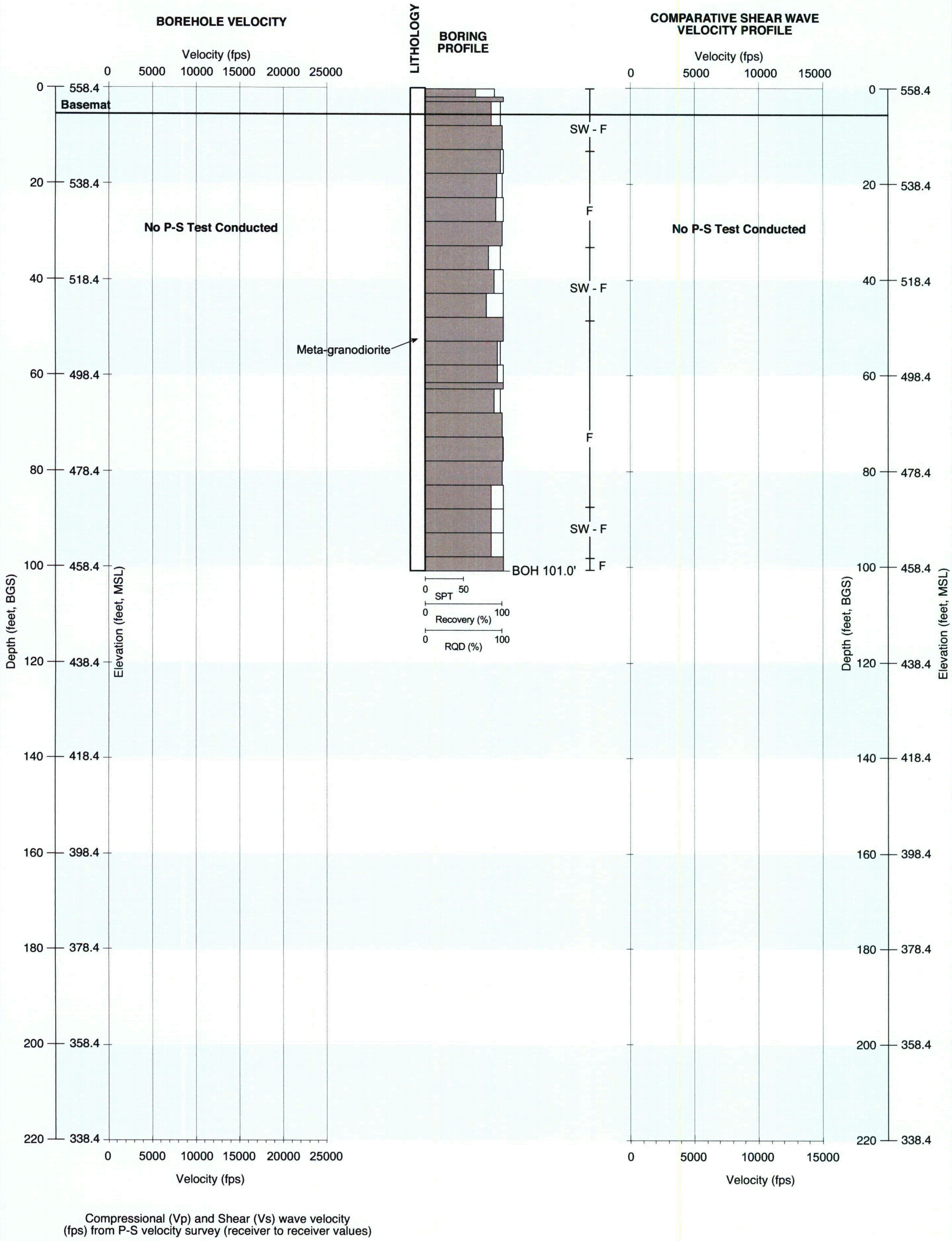
Notes:
1. Borehole geophysics performed by V. Gonzales of GEOVision Geophysical Services
2. RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WILLIAM STATES LEE III NUCLEAR STATION UNITS 1 & 2

Boring Summary Sheet, B-2005

FIGURE 2.5.4-233f

106. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-233g is revised as follows:



WLS COL 2.5-1

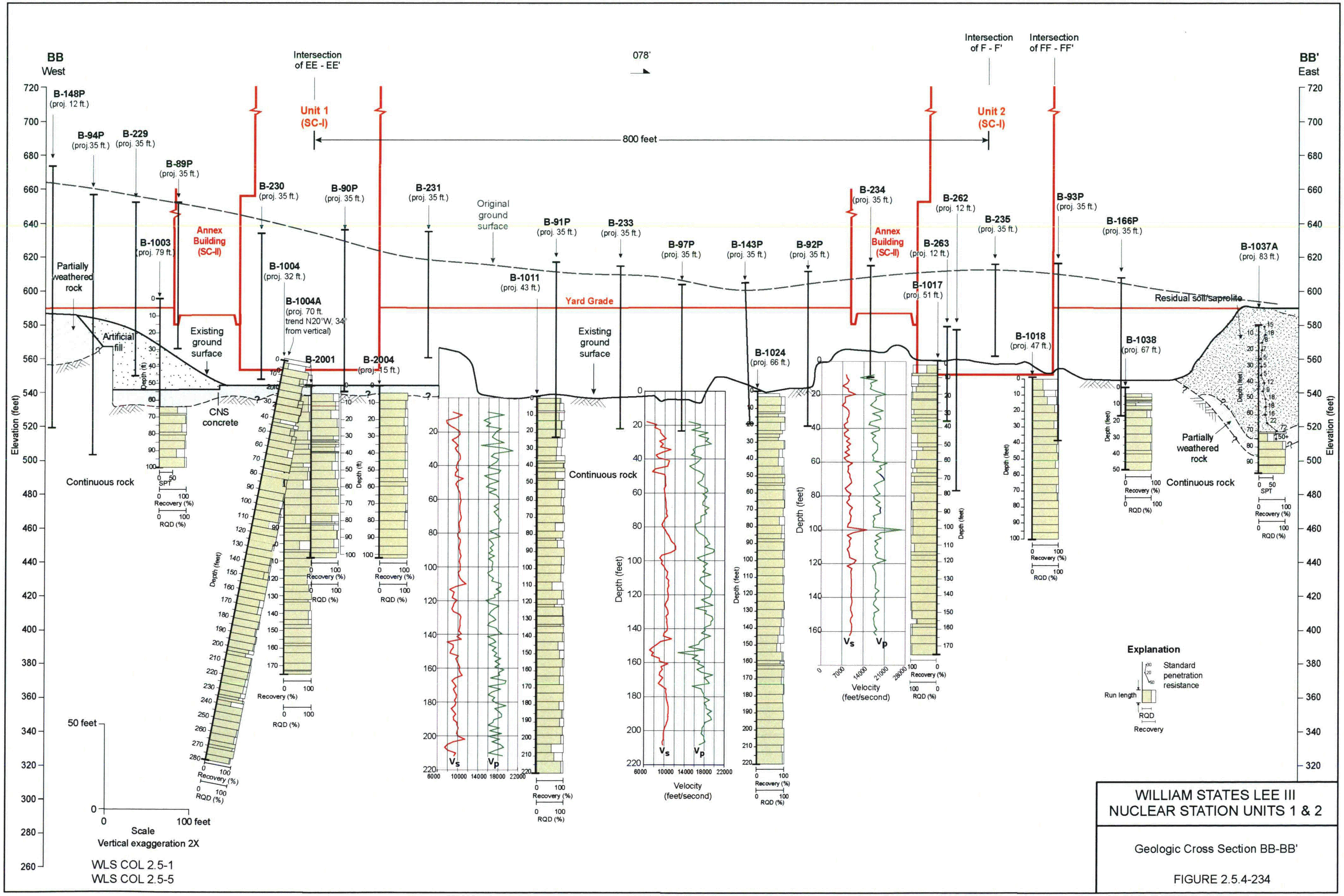
Note:
RQD (Rock Quality Designation) - a percentage of solid core segments larger than 0.33 feet relative to core run length, excluding mechanical breaks

WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

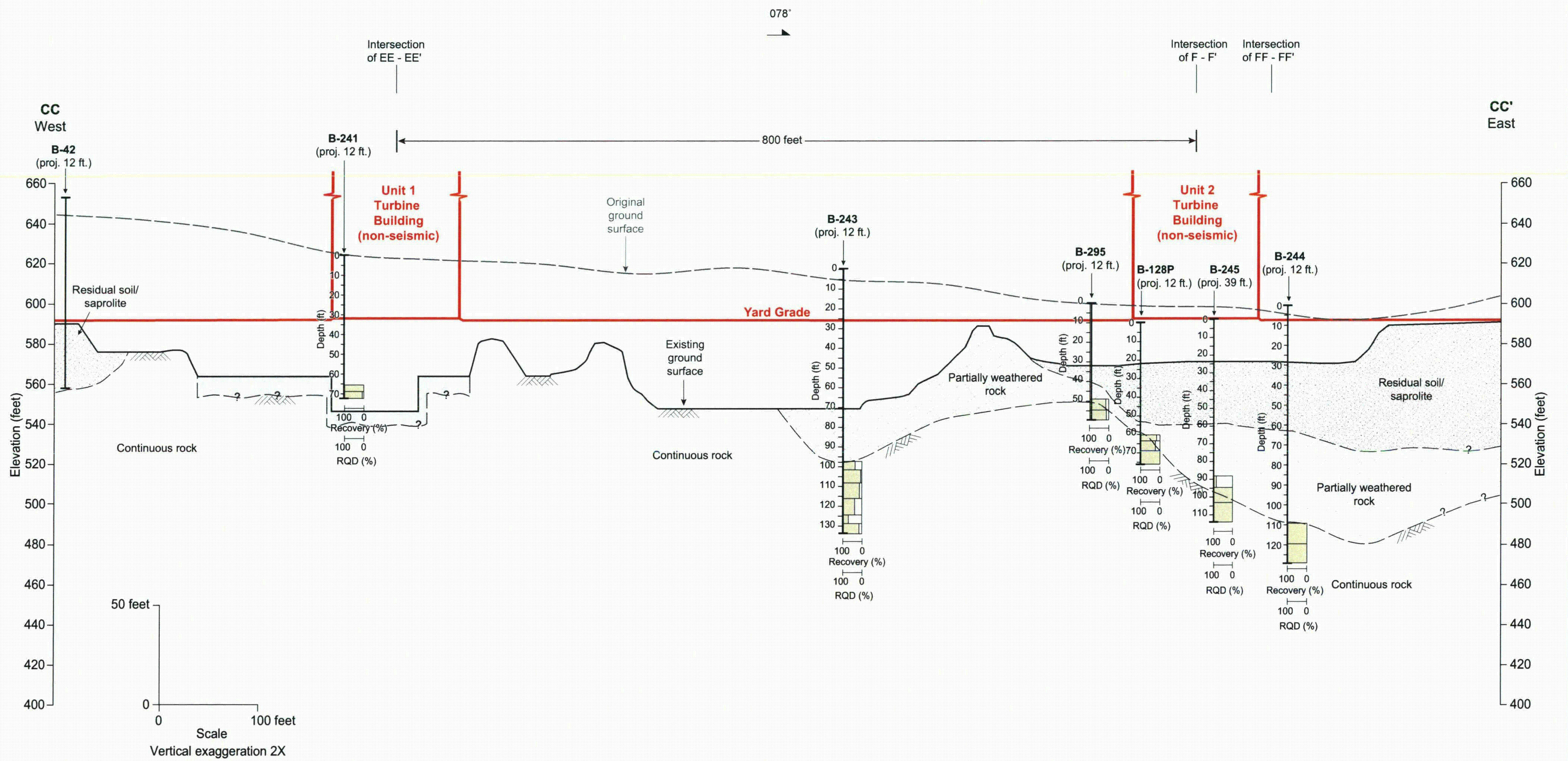
Boring Summary Sheet, B-2006

FIGURE 2.5.4-233g

107. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-234 is revised as follows:



108. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-235 is revised as follows:



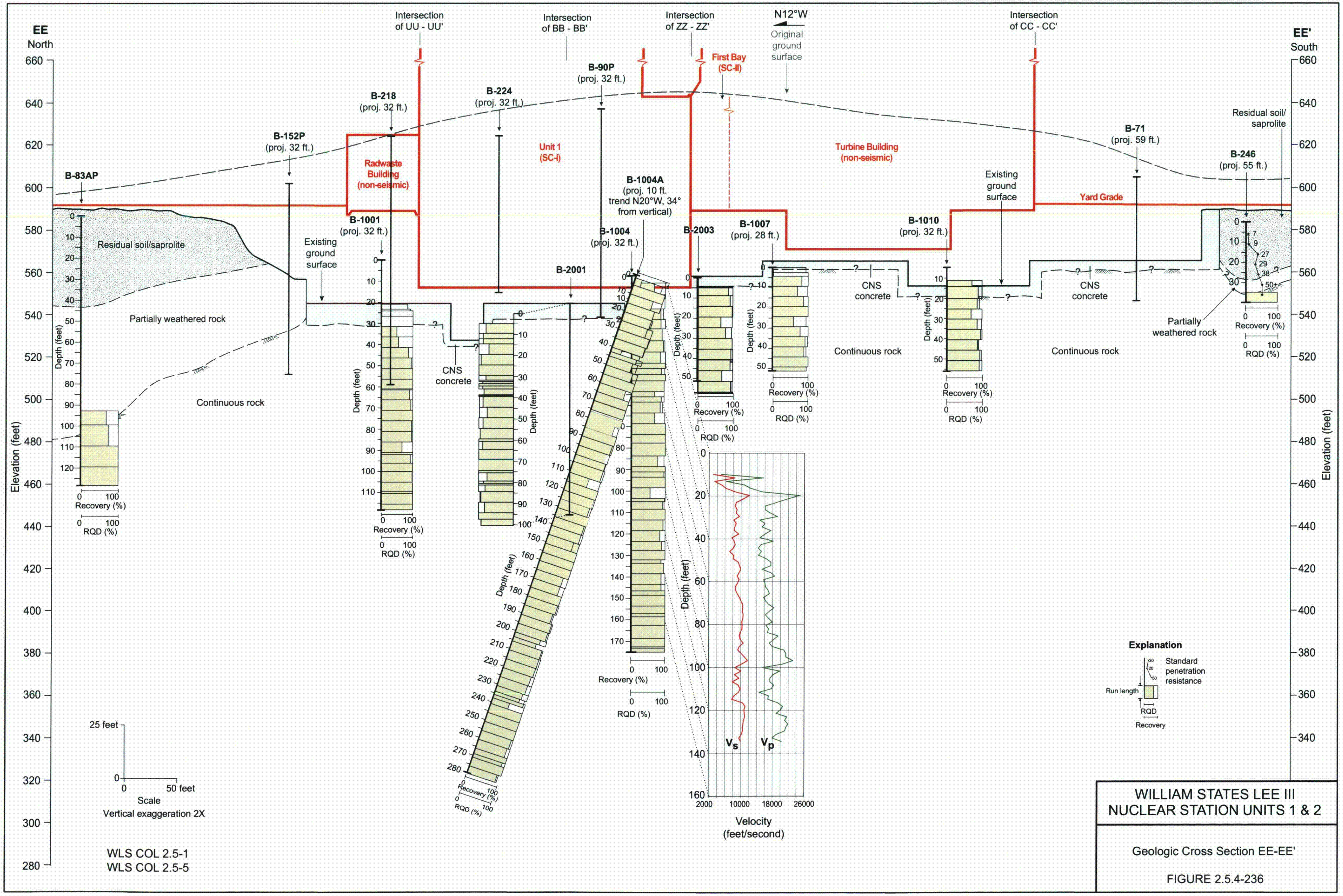
WLS COL 2.5-1
WLS COL 2.5-5

WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

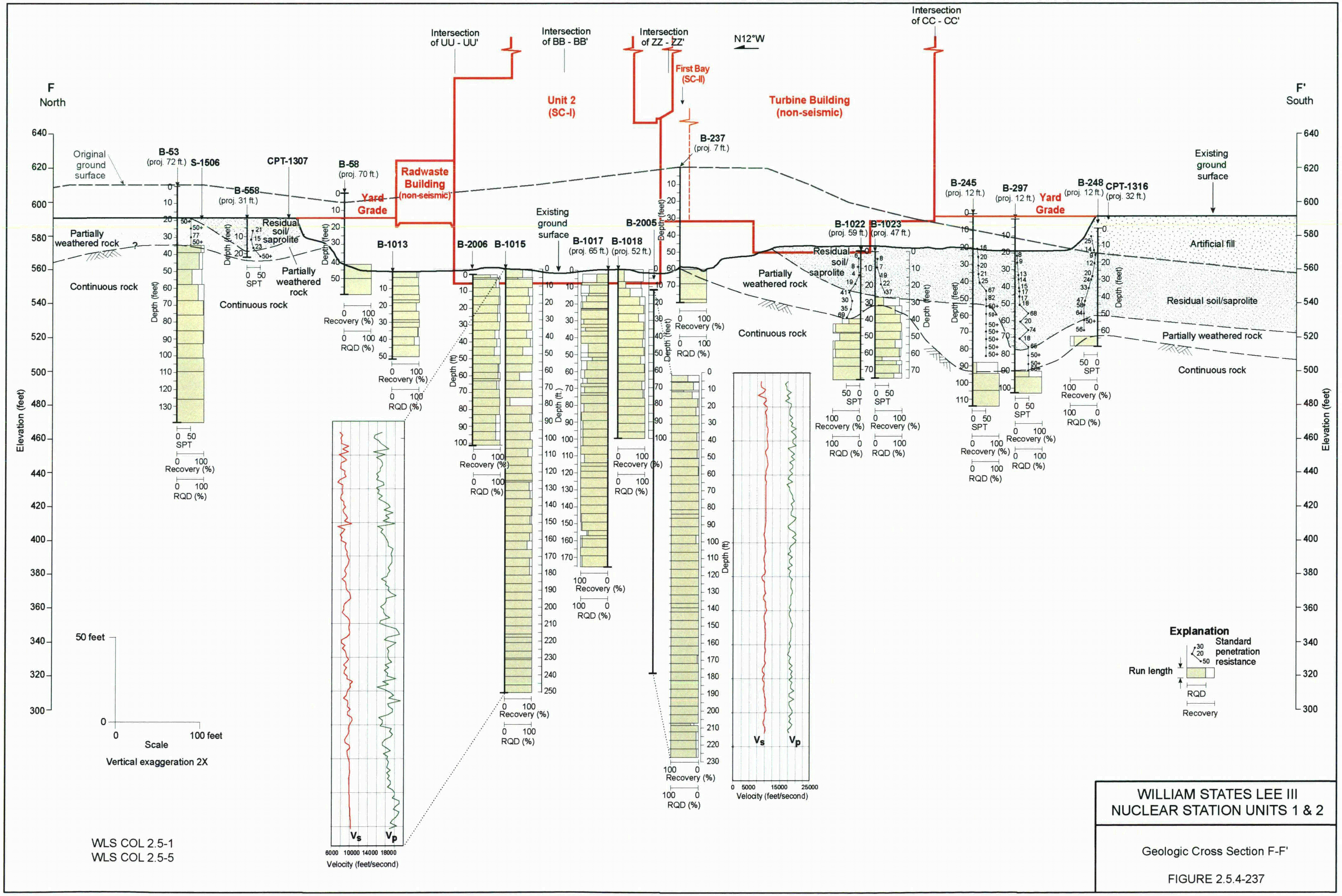
Geologic Cross Section CC-CC'

FIGURE 2.5.4-235

109. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-236 is revised as follows:



110. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-237 is revised as follows:

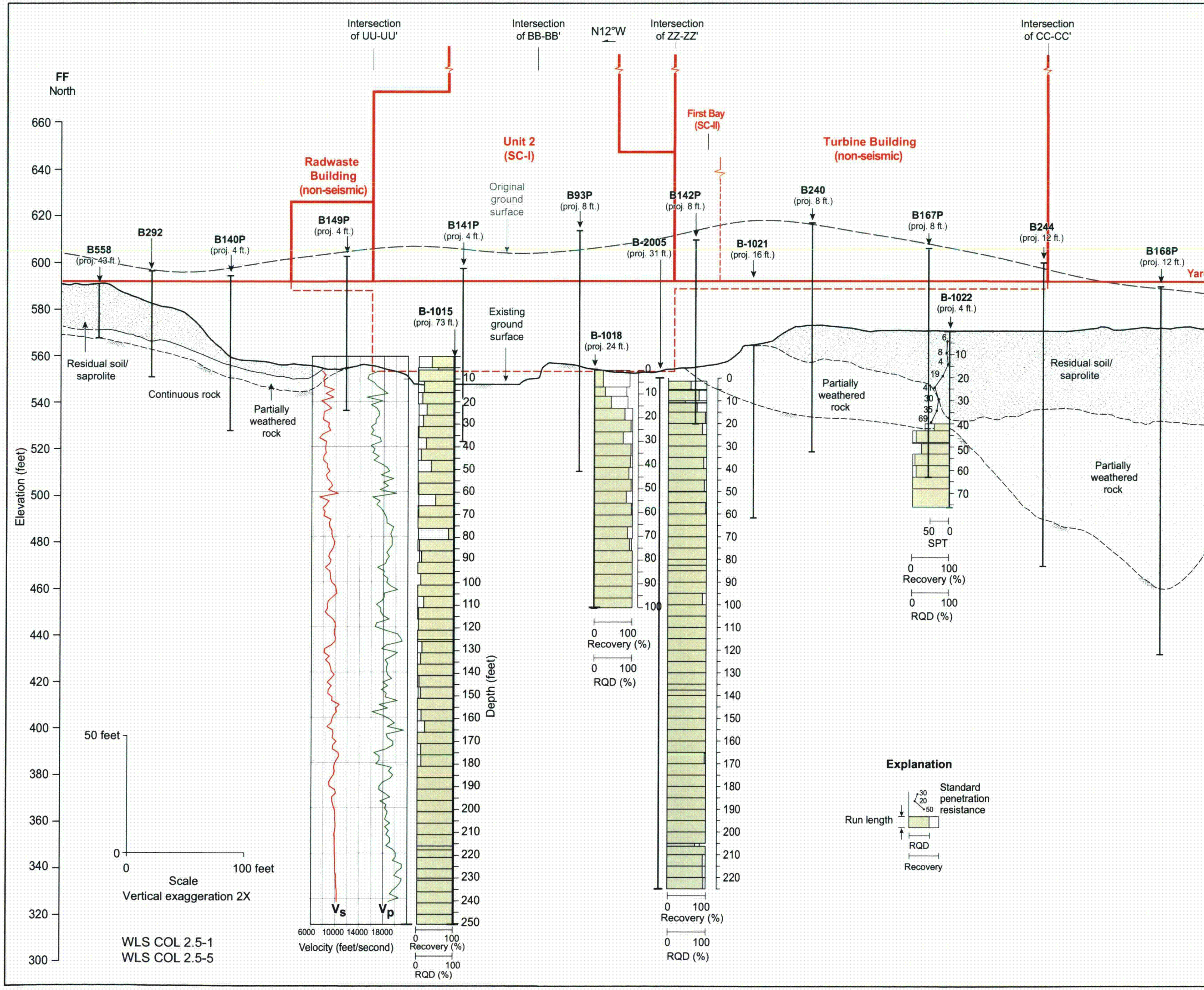


WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Geologic Cross Section F-F'

FIGURE 2.5.4-237

111. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-238 is revised as follows:

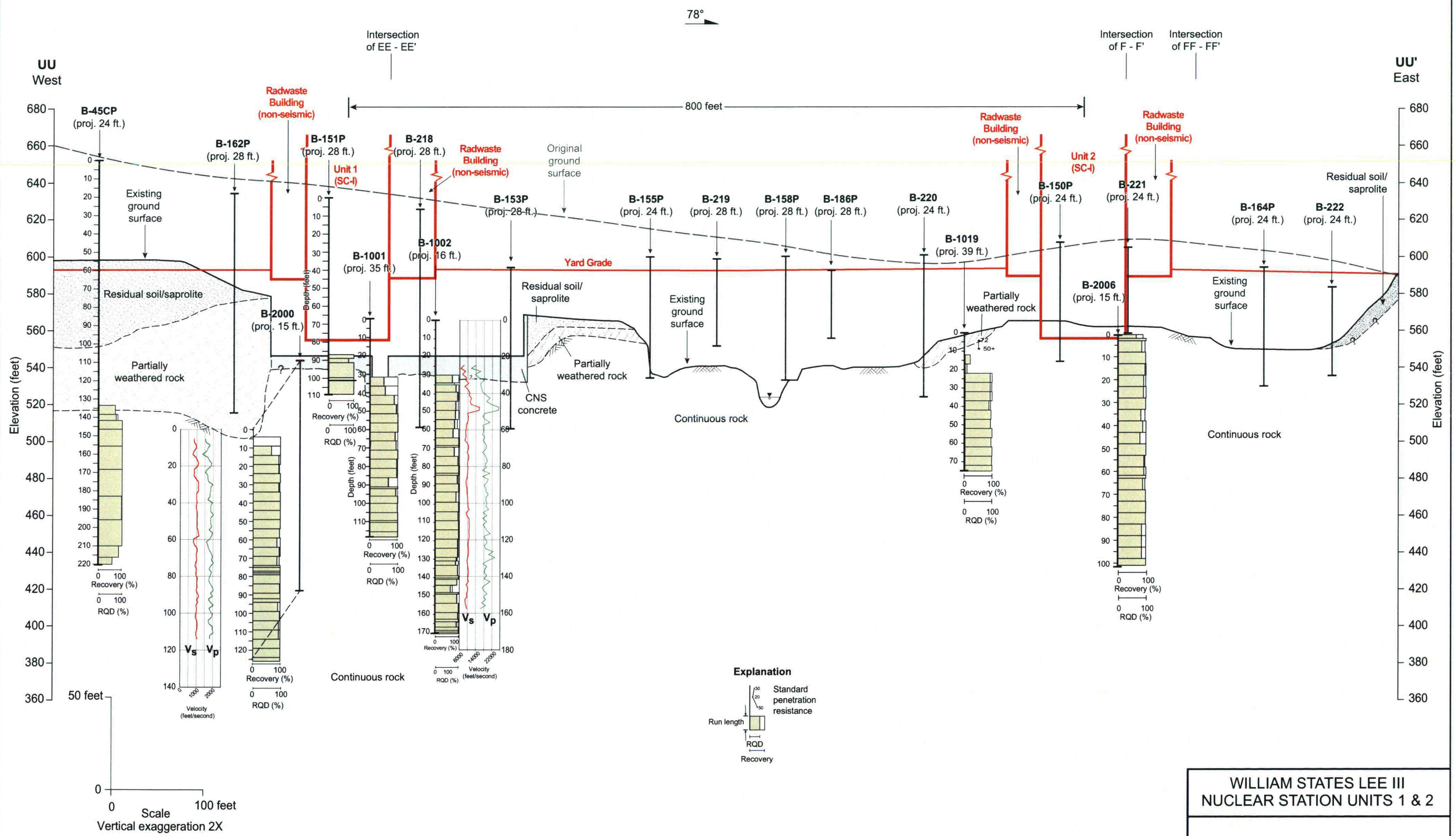


WILLIAM STATES LEE III NUCLEAR STATION UNITS 1 & 2

Geologic Cross Section FF-FF'

FIGURE 2.5.4-238

112. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-239 is revised as follows:



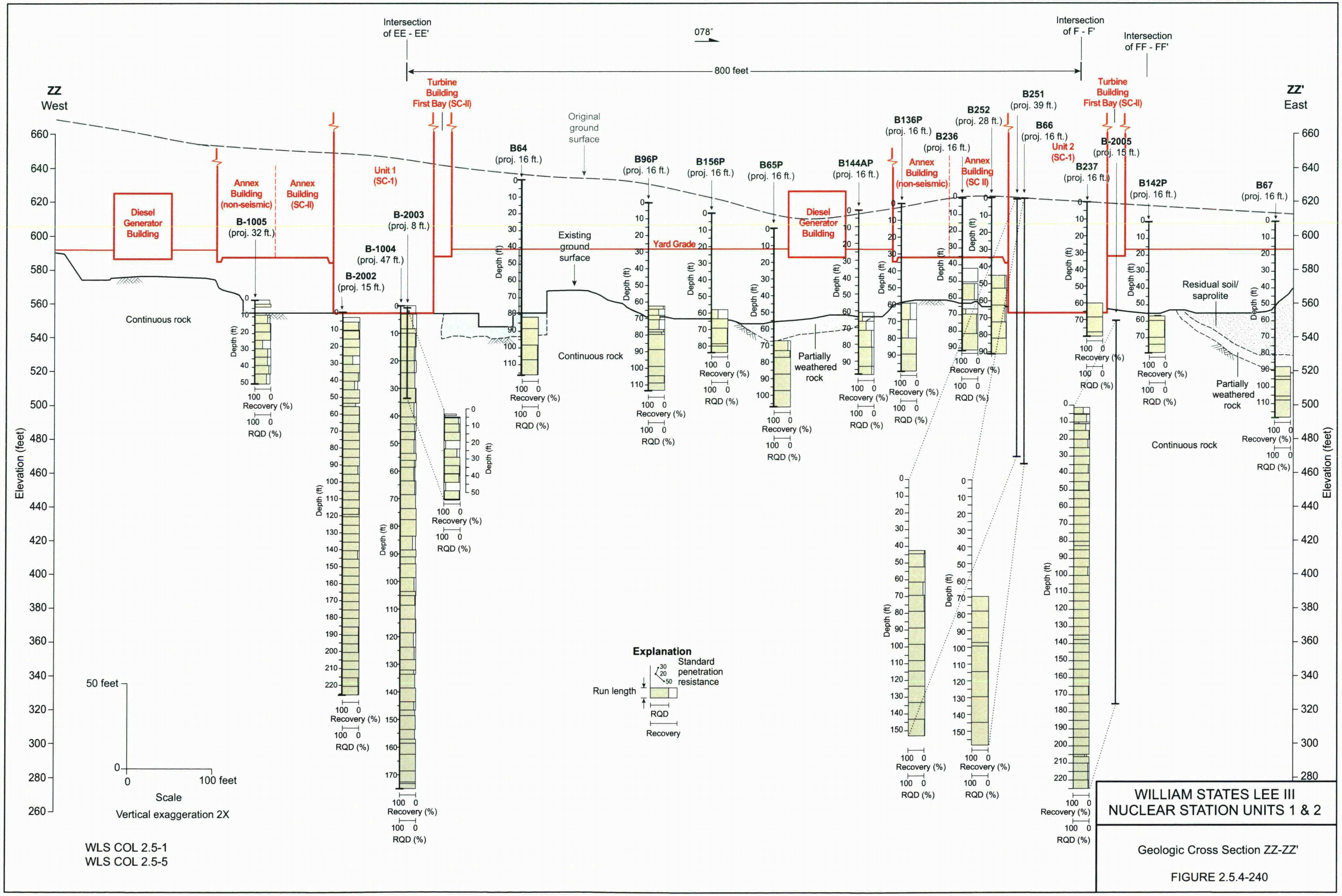
WLS COL 2.5-1
WLS COL 2.5-5

WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Geologic Cross Section UU-UU'

FIGURE 2.5.4-239

113. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-240 is revised as follows:



114. COLA Part 2, FSAR Chapter 2, Figure 2.5.4-241 is revised as follows: