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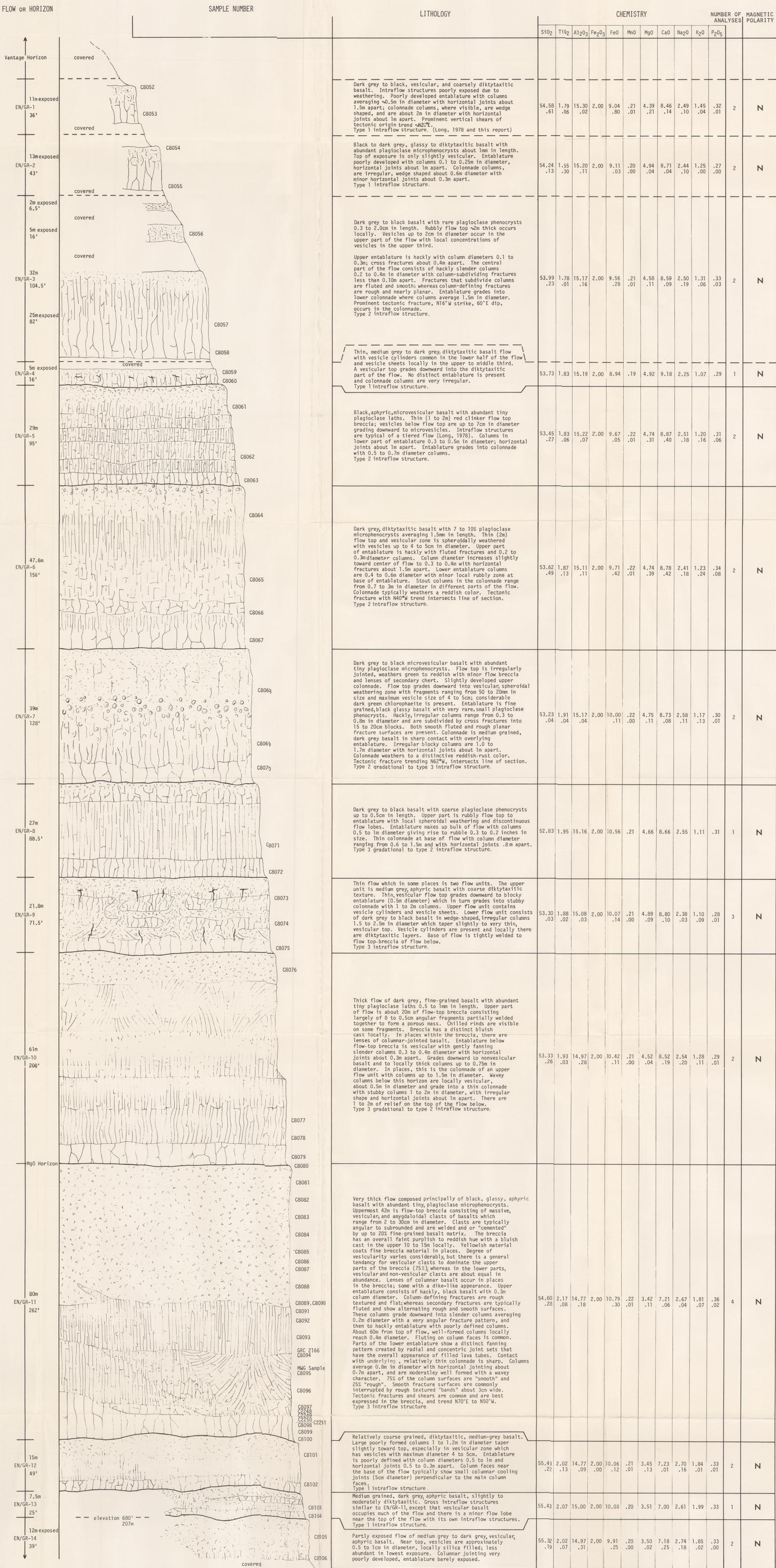
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Geologic Studies of the
COLUMBIA PLATEAU
A Status Report

PLATE III-3a EMERSON NIPPLE STRATIGRAPHIC SECTION
PLATE III-3b SENTINEL BLUFFS STRATIGRAPHIC SECTION
PLATE III-3c SCHWANA STRATIGRAPHIC SECTION

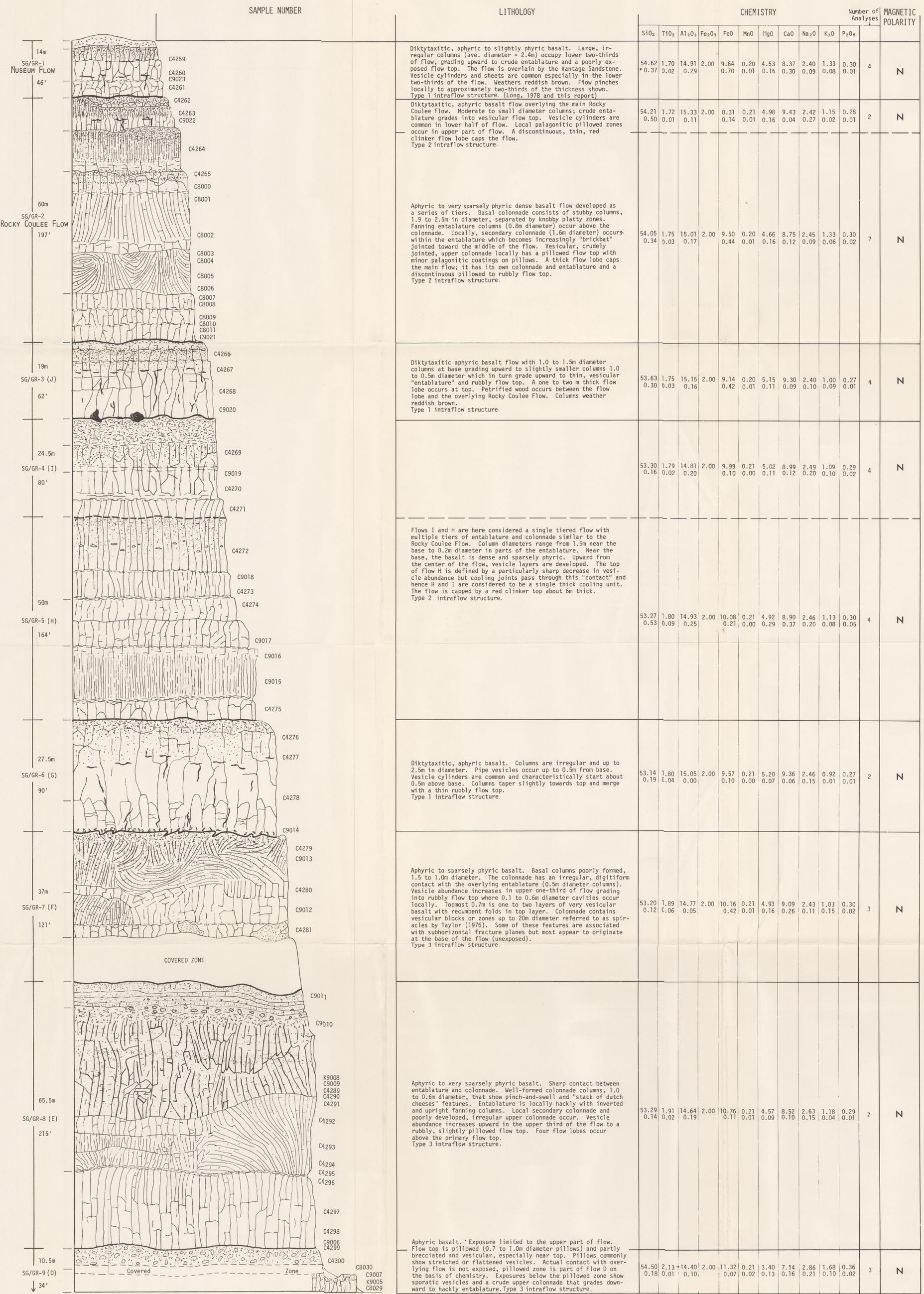
EMERSON NIPPLE STRATIGRAPHIC SECTION



vertical scale: 1 inch equals 32.8 feet (10 meters)

References: P. E. Long (1978)
Field geology by: P. E. Long (1979), F. E. Goff (1977), R. W. Cross (1979)

SENTINEL BLUFFS STRATIGRAPHIC SECTION



SG denotes Sentinel Gap section designation for a composite of the Sentinel Bluffs and Schwana stratigraphic sections.
Letter designations in parentheses and as referred to under LITHOLOGY part of this diagram are from Taylor (1976).

vertical scale: 1 inch equals 32.8 feet (10 meters)

*One standard deviation values are given below the entry for each oxide. All analyses by X-ray fluorescence on a volatile free basis. Fe₂O₃ is arbitrarily set at 2.00 weight percent.

Stratigraphic nomenclature after Mackin (1961) and Taylor (1976).

SCHWANA STRATIGRAPHIC SECTION

SAMPLE NUMBER	LITHOLOGY	CHEMISTRY										Number of Analyses	MAGNETIC POLARITY
		SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O ₃	FeO	MnO	MgO	CaO	Na ₂ O	K ₂ O		
<p>↑ 7.5m SG/GR-7 (F) 25'</p> <p>69.5m SG/GR-8 (E) 228'</p> <p>80m SG/GR-9 (D) 262'</p> <p>25m SG/GR-10 (C) 82'</p> <p>70m SG/GR-11 (B) 230'</p> <p>8m SG/GR-12 (A) 26'</p>	<p>C9045</p> <p>C9044</p> <p>COVERED ZONE</p> <p>C8028</p> <p>C8027</p> <p>C8026</p> <p>C8025</p> <p>C8024</p> <p>C9043</p> <p>C8023</p> <p>C8022</p> <p>C9042</p> <p>COVERED ZONE</p> <p>C8021</p> <p>BREAK IN SECTION</p> <p>COVERED ZONE</p> <p>C9041</p> <p>C9020</p> <p>C9040</p> <p>C8019</p> <p>COVERED ZONE</p> <p>C8018</p> <p>BREAK IN SECTION</p> <p>C8017</p> <p>C8016</p> <p>COVERED ZONE</p> <p>C9039</p> <p>C9038</p> <p>C8015</p> <p>C8014</p> <p>C9037</p> <p>C9036</p> <p>C9035, C8013</p> <p>C9034, C8012</p>	<p>Aphyric to slightly phyrlic basalt. Basal columns 0.2 to 0.5m diameter. Type 3 intraflow structure. (Long, 1978 and this report)</p> <p>COVERED EXCEPT FOR VESICULAR FLOW TOP WITH PILLOWED CARAPACE (SEE SENTINEL BLUFFS SECTION). ABRUPT CHANGES IN VESICLE ABUNDANCE SUGGEST FLOW LOBES IN UPPER PART OF FLOW. PILLOWS AT TOP ARE 0.5 TO 1.5m DIAMETER. INTERSTICES ARE PALAGONITE AND PILLOW MARGINS ARE DISTINCTLY MORE VESICULAR THAN PILLOW INTERIORS. PETRIFIED WOOD OCCURS AS FLOAT NEAR THE CONTACT BETWEEN FLOWS E AND F. Type 3 intraflow structure.</p> <p>Aphyric basalt. Irregular, undulatory columns at base with near-horizontal and near-vertical tectonic fractures superimposed across cooling joints. Sharp to slightly gradational contact between entablature and colonnade. Entablature shows hackly jointing with localized tectonic fractures concentrated in zones of intense brittle deformation. Fractures are typically stained with hematite and limonite. Isolated exposures at the extreme base of Flow D may or may not be part of Flow D. They could represent a separate flow but no positive evidence to this effect has been found. Type 3 intraflow structure.</p> <p>Vesicular, aphyric basalt with irregular fracture distribution. Some large columns typical of upper colonnade. Vesicle abundance increases at top of exposure suggesting an eroded flow top. Base of best exposure is a narrow (~15cm) tectonic breccia zone but no evidence of a flow base is exposed. Stratigraphic relationship of Flow C to Flow B is uncertain. Lithology is consistent with its being the top of Flow B but magnetic inclination suggests this may not be the case. Type 3 intraflow structure.</p> <p>Aphyric basalt. Basal columns are 0.5 to 0.8m in diameter. Entablature and colonnade both show tectonic fractures with local preferred orientation as conjugate joint sets which transect cooling joints. The contact between entablature and colonnade is sharp, and fanning columns are common in the upper entablature which grades upward to discontinuously exposed vesicular basalt. This part of the flow is aphyric and contains abundant vesicles with white siliceous fillings lithologically very similar to Taylor's (1976) Flow C. Type 3 intraflow structure.</p> <p>Aphyric basalt. Poorly exposed vesicular flow top suggestive of upper colonnade. Vesicles are filled or partly filled with white siliceous material.</p>	<p>52.78 1.92 14.77 2.00 10.53 .22 4.93 9.03 2.26 1.25 .30</p> <p>53.34 1.92 14.77 2.00 10.71 .22 4.59 8.52 2.35 1.29 .29 *.04 .02 .07 .19 .00 .01 .04 .07 .02 .01</p> <p>54.50 2.16 14.43 2.00 11.26 .22 3.47 7.26 2.51 1.82 .35 .25 .03 .17 .14 .00 .14 .11 .16 .11 .01</p> <p>55.58 1.95 14.88 2.00 9.94 .20 3.49 7.25 2.53 1.97 .31 .32 .03 .12 .47 .01 .09 .28 .16 .09 .01</p> <p>55.41 1.95 14.82 2.00 10.32 .21 3.43 7.20 2.40 1.96 .31 .19 .07 .27 .25 .01 .08 .14 .07 .08 .02</p> <p>55.33 1.92 14.95 2.00 10.10 .22 3.62 7.57 2.18 1.86 .28 .03 .01 .12 .01 .01 .08 .01 .23 .08 .01</p>	<p>1</p> <p>3</p> <p>8</p> <p>3</p> <p>7</p> <p>2</p>	<p>N</p> <p>N</p> <p>N</p> <p>N</p> <p>N</p> <p>R</p>								

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TOP OF THE WANAPUM BASALT
STRUCTURE CONTOUR MAP

RHO-BWL-ST-4
PLATE III-41b
SHEET 1 OF 2

