GROUND-WATER AVAILABILITY ALONG THE BLUE RIDGE PARKWAY, VIRGINIA

By Herbert T. Hopkins

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CONTENTS

ILLUSTRATIONS

TABLES

FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM (SI) UNITS

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI):

Multiply inch-pound units	by	To obtain SI units
Length		
inch (in)	25.40	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
Area		
square mile (mi^2)	2.590	square kilometer (km^2)
Volume		
gallon (gal)	3.785	liter (L)
million gallons (Mgal)	3785	cubic meter (m^3)
Flow		
gallon per minute (gal/min)	0.06308	liter per second (L/s)
million gallons per day (Mgal/d)	0.04381	cubic meters per second (m^3/s)

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ABSTRACT

The Blue Ridge Parkway, operated and maintained by the U.S. National Park Service, extends 470 miles from Rockfish Gap, Augusta County, central Virginia to Great Smoky Mountain National Park, Swain County, southwestern North Carolina. The Parkway in Virginia covers a distance of 220 miles. The purpose of this study was to describe the geohydrologic conditions and to identify favorable areas for future ground-water development along the Parkway.

The location of the Parkway along the crest of the Blue Ridge Mountains precludes any ground-water or surface-water inflow from adjoining areas. Precipitation is the only source of ground-water recharge.

Draws, valleys, lower slopes, and meadows at or near the base of peaks and ridges provide the best well sites. Such locations serve as collecting areas that funnel ground water from the highlands toward the lowlands.

Areas designated "good" and "fair" for developing ground-water supplies along the Parkway are shown on 55 map sections compiled from the U.S. Geological Survey topographic map series at a scale of 1:24,000. Each map section covers about four miles of the Parkway.

The chemical quality of water from wells and springs is suitable for public supply. It is low in dissolved solids, and iron, and is classified as soft (less than 60 milligrams per liter hardness). Concentrations of trace metals arsenic, cadmium, chromium, copper, lead, mercury, selenium, and zinc, are below the limits set for public supplies by the U.S. Environmental Protection Agency. Higher concentrations of zinc are reported only from wells in which galvanized iron pipe is used as pump columns and (or) casing.

INTRODUCTION

The Blue Ridge Parkway, operated and maintained by the U.S. National Park Service, extends 470 miles from Rockfish Gap, Augusta County, central Virginia, southward to Great Smoky Mountain National Park, southwestern North Carolina. The Blue Ridge Parkway in Virginia covers a distance of 220 miles.

The Parkway with its numerous overlooks, hiking trails, and recreation facilities is visited by an increasing number of people each year. To meet the increasing demands of the public, the Park Service has developed long range plans which include expansion of existing recreational facilities and development of new facilities at selected sites along the Parkway. Water supplies for these facilities will be developed from drilled wells and (or) springs. Drilled wells are preferred because they are less susceptible to surface contamination than are springs.

Purpose and Scope

The purpose of this report is to identify areas most favorable for future ground-water supplies along the Blue Ridge Parkway in Virginia. The report describes the relation of several factors, including topography and geology, on well yield, and the relation of location to spring yield. The most favorable areas, designated as "fair" and "good," are shown on 55 maps and described in accompanying text.

Hydrologic data used in this report was collected in August and September of 1979. The data collected consisted primarily of sampling wells and springs used for water supply, collecting well construction data, and field locations for these wells and springs.

Previous Studies

The geologic information used in this report is provided by previous publications. The Virginia Division of Mineral Resources Geologic Map of Virginia (Calver and Hobbs, 1963) was used extensively, while more detailed reports covering smaller areas were used to supplement the map (Bartholomew, 1977; Gaithright and others, 1977; and Espenshade and others, 1975).

Hydrologic data were compiled, in part, from a number of unpublished reports prepared for the National Park Service during the period 1963-1971, by the Geological Survey. These letter reports describe the selection of sites for drilling test holes and (or) production wells and some of the reports include compilations of data collected during the drilling and testing of individual wells.

Location of Study Area

The Blue Ridge Parkway extends 470 miles from Rockfish Gap, Augusta County, Virginia to Great Smoky Mountain National Park, North Carolina. This study covered the approximately 220 miles of the Parkway located in Virginia (fig. 1). From Rockfish Gap to the James River, a distance of about 64 miles, the Parkway is in George Washington National Forest. From the James River to the intersection with U.S. Highways 221 and 460 near Roanoke, a distance of about 41 miles, the Parkway is in Jefferson National Forest. The remainder of

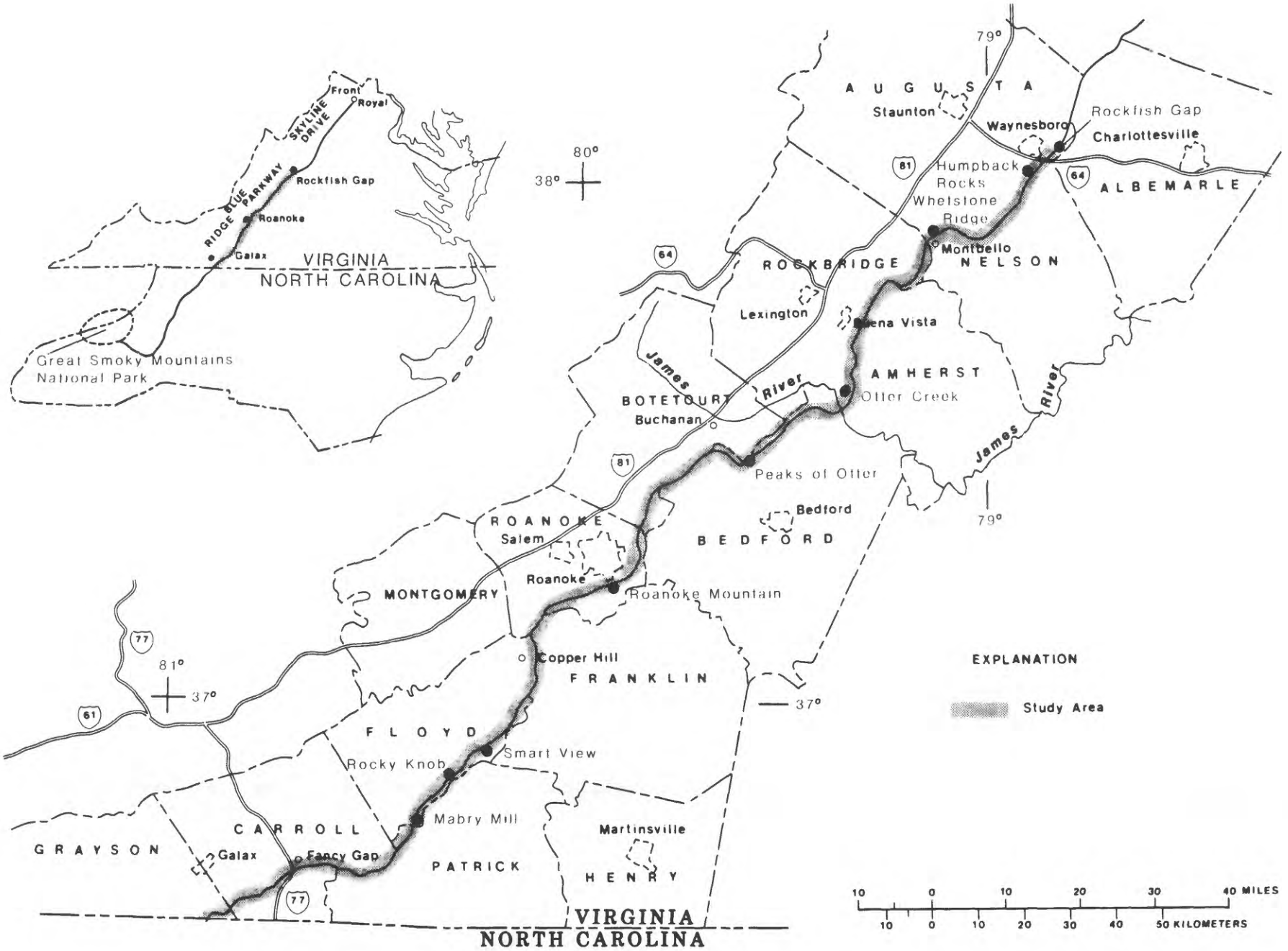


Figure 1.--Location of study area.

the Parkway in Virginia, a distance of 115 miles, occupies only a narrow strip of land that in places is less than several hundred feet wide.

Physical Features

The Parkway ranges from less than 500 to more than 2,800 feet above the adjoining lowlands and lies entirely within the Blue Ridge Physiographic Province. The highest point along the Parkway in Virginia is 3,950 feet above sea level, and the lowest point is 649 feet above sea level.

The rocks of the Blue Ridge Province are highly folded and faulted and are primarily gneiss, schist, sandstone, quartzite, and phyllite, ranging in age from Precambrian to Cambrian. Metabasalts and diabase dikes of Triassic age are present in the northern part of the area. Most of these rock types crop out in road cuts, along hiking trails, water falls, some of the stream valleys and at some overlooks and picnic areas along the Parkway.

The consolidated rocks are overlain by saprolite, weathered bedrock which ranges in thickness from less than 5 feet to more than 100 feet. The thickest saprolite generally is present along valley slopes. Thick sections in meadow areas at the base of higher peaks may be overlain by talus deposits. Talus deposits (a sloping mass formed of cobbles, boulders and angular blocks in a sand matrix that have been broken off by weathering from rock faces) are present on slopes throughout the length of the Parkway. In many upland valleys and draws (a small natural drainage or depression, usually dry on a hillside or upland) the saprolite may be overlain by a veneer of alluvial deposits (recent unconsolidated deposits consisting of sand, silt, cobbles, rounded boulders and angular blocks). These deposits range from less than two to more than 10 feet in thickness.

Climate and Precipitation

The climate is moderate with an average annual temperature of about 10°C (Celsius). Summer temperatures average about 20°C and winter temperatures average about 0°C. Precipitation averages 42 inches annually and is distributed fairly uniformly throughout the year. Precipitation is disbursed as evapotranspiration (about 21 inches), runoff (about 18 inches), and ground-water recharge (about three inches per year) (fig. 2). About two inches of the ground-water recharge returns to the surface as seepage to streams or as springs.

Seasonal variation in temperature influences the form of precipitation, and the rate of evapotranspiration, runoff, and ground-water recharge. From April through September, precipitation occurs principally as rain, but occasionally as hail accompanied by high winds and severe thunder and lightning. During winter most of the precipitation is snow, sleet and (or) freezing rain. Deep accumulations of snow are not common because of frequent winter thaws. From October through March, when vegetation is dormant and evapotranspiration is minimal, runoff to streams, spring discharge and ground-water recharge are at their maximum.

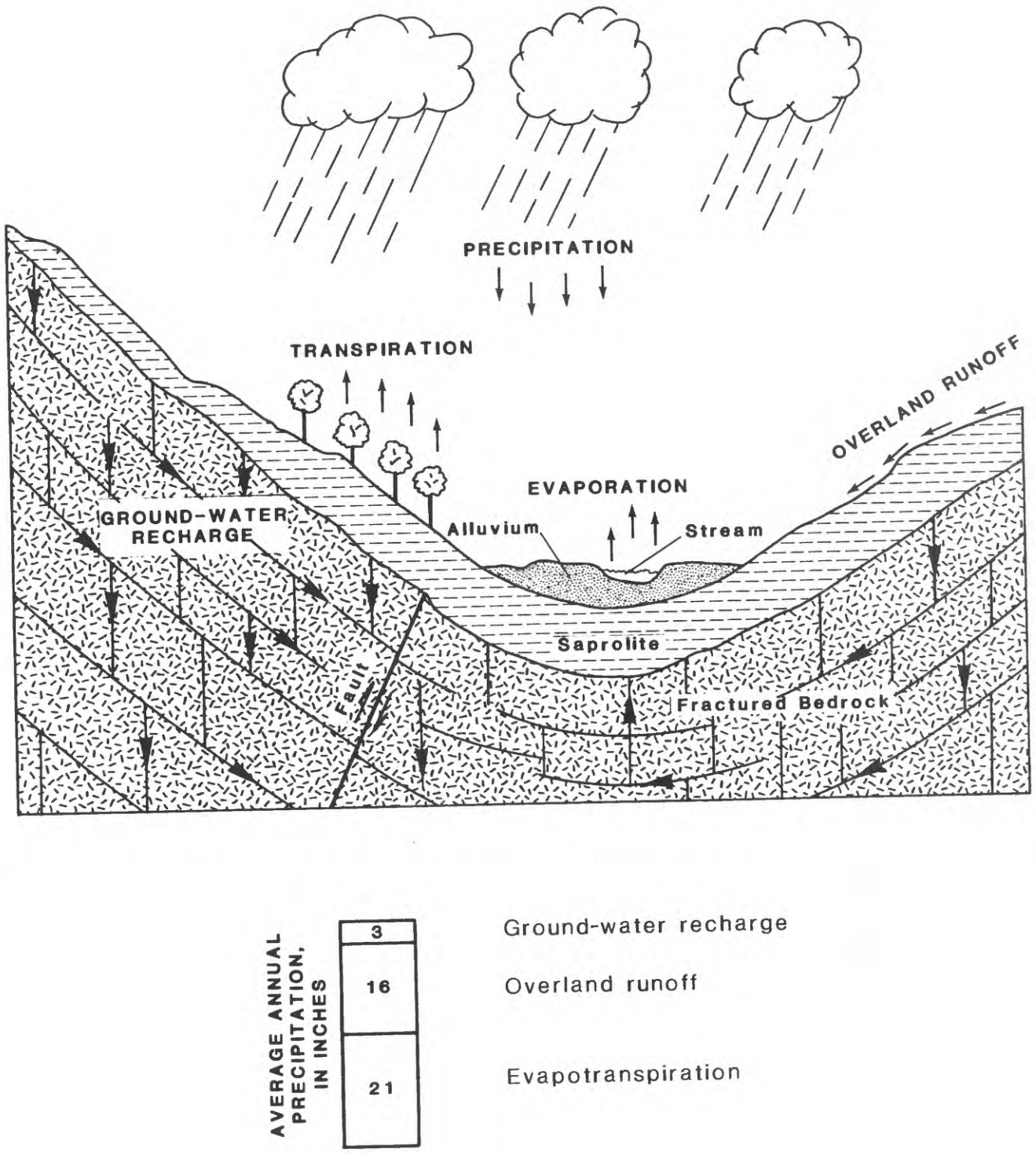


Figure 2.--Generalized diagram showing hydrologic cycle in study area.

OCCURRENCE AND MOVEMENT OF GROUND WATER

Precipitation is the only source of ground-water recharge along the Parkway. The location of the Parkway along the crest of the Blue Ridge Mountains precludes any ground-water or surface-water inflow from adjoining areas.

The storage and movement of ground water is dependent on the number, type, and size of openings within an unconsolidated deposit or rock. In alluvium, water is stored and moves in the openings between the various size particles making up the deposits. Water storage ranges from 20 to 40 percent of the volume of the sediments. Ground-water velocities may exceed several tenths of a foot per day in the sands and gravels. These deposits, when present, cover very small areas.

In the saprolite, storage and movement of water is in the small interstitial openings between the clay- and silt-sized particles making up this rock. The porosity may be as high as 50 percent in the highly weathered upper part of the saprolite, but decreases with depth as the material grades into unweathered rock. Because of the very small size of the openings in saprolite, the rate of ground-water movement is slow--velocities are measured in hundreths or tenths of a foot per day. These inherent characteristics of the saprolite, high porosity and low permeability, provide a ground-water reservoir with a relatively slow but uniform discharge to streams, springs, and the underlying rock. It is this ground-water discharge that sustains the flow in streams and springs during periods of little or no precipitation.

In partially weathered rock at the base of saprolite, the storage and movement of water occurs in the openings developed by solution and weathering. Because of the lack of uniformity in size and continuity of these openings, both the amount of ground water in storage and its rate of movement vary. Ground-water storage ranges from about 5 to 25 percent of the volume of the rock. Velocities range from less than a hundreth to more than several tenths of a foot per day.

In the unweathered bedrock, there is some storage and movement of water in interstitial openings, but most occurs in the secondary openings--joints, bedding planes and faults. The volume of these openings is small, probably very seldom more than a few percent of the rock mass (Trainer and Watkins, 1975). In general, ground-water velocities in the interstitial openings are similar to those in the saprolite but may exceed one foot per day in the secondary openings.

Though the movement and relative amount of water stored will vary in the different rock units, all units are hydraulically connected.

RELATIONSHIP OF WELL LOCATION TO YIELD

Topography and Geologic Setting

Topography and geologic structure are important criteria to be considered in selecting well sites. Areal photography and topographic maps aid in delineating structural and physiographic features, such as faults or linear section of streams that are not always apparent from on site visits. In general,

wells drilled on uplands will have lower yields than wells drilled in lowlands. The overall direction of ground-water flow is from the highlands to the lowlands.

Mundorff (1948) discussed the influence of topographic setting, thickness of saprolite, and rock type on well yield in the area just east of the Blue Ridge Mountains of North Carolina. Data compiled from several reconnaissance reports in western North Carolina (Winner, 1977) show that wells in valleys and draws have greater yields than wells on hilltops.

Table 1.--Number of wells and well yields at different topographic locations in western North Carolina, from Winner (1977).

Topography	Hill	Slope	Flat	Valley	Draw
Number of wells	208	513	194	206	162
Average, reported yield, in gal/min	12.2	15.2	15.8	22.2	32.9

The data shown in table 1 are from wells finished in rocks similar to those of the Blue Ridge Mountains and show yields will vary with their physical setting.

Draws, valleys, lower parts of slopes, and meadows at or near the base of peaks and ridges are the best well sites. Such locations serve as collecting areas that funnel ground water from the highlands toward the lowlands.

The configuration of the water table commonly resembles a subdued version of the local topography, with the depth to water being greater beneath hilltops and ridges than in draws and valleys. The overall direction of ground-water flow is from points of higher head beneath the hilltops and ridges toward points of lower head in the adjoining lowlands (fig. 3).

In addition to local structure and topographic setting, the yield of a well depends on the thickness of the overlying saprolite and partially weathered rock and on the number, size, and spacing of water-bearing fractures. The greatest density and largest water-bearing fractures are generally present within the first 300 feet below the land surface. Water from fractures at depths greater than 300 feet is likely to be highly mineralized, making the water less desirable for domestic and public supply. Most of the wells drilled for public supply along the Parkway have been finished at depths of less than 300 feet because a sufficient yield was obtained at these shallower depths.

In a well drilled in an upland draw for public supply at the Smartview

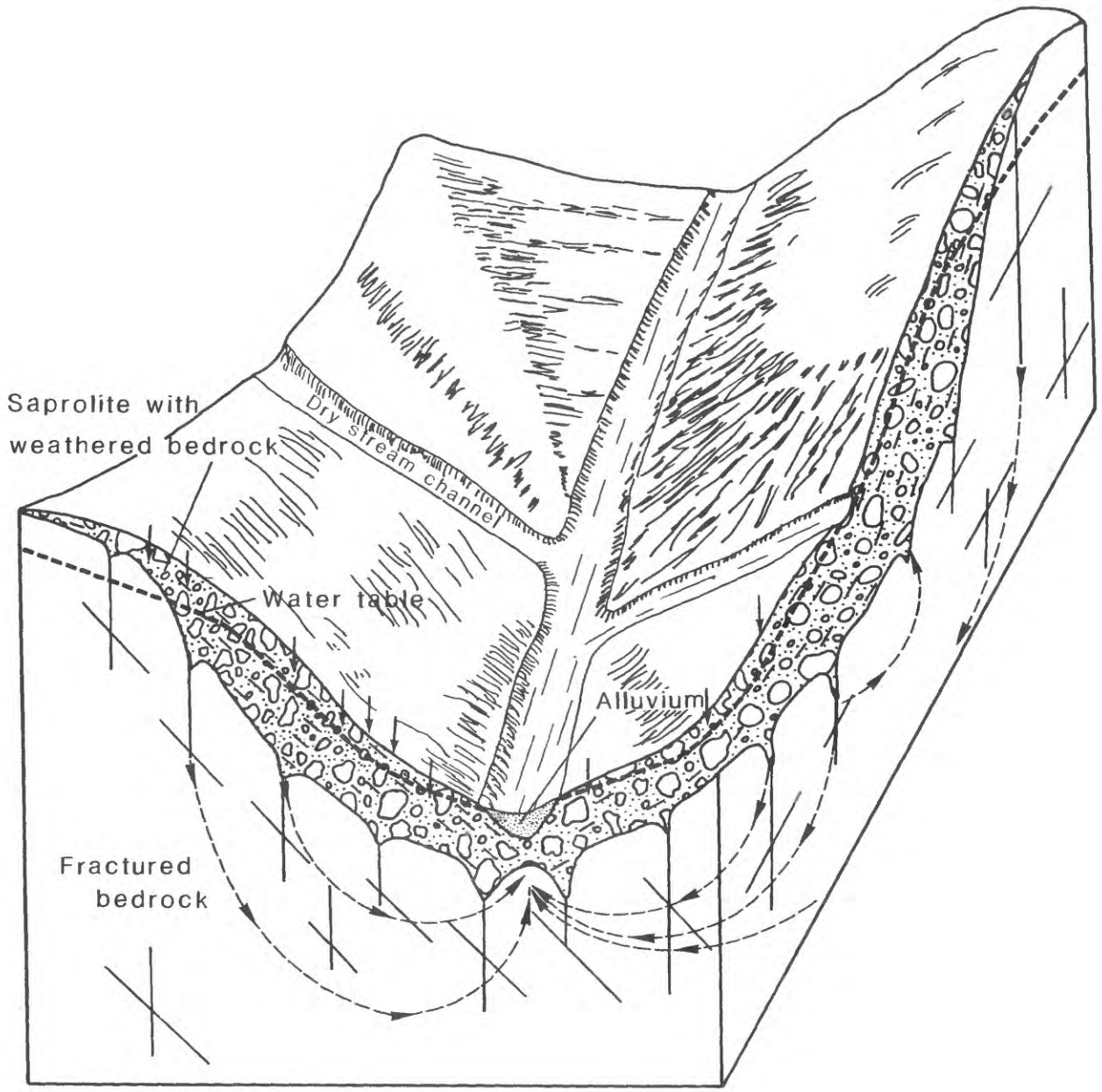


Figure 3.--Generalized ground-water flow system.

picnic area in Franklin County, significant increases in yield were reported at about 67, 100, and 231 feet below land surface (fig. 4). The unconsolidated material (saprolite) and partially weathered rock overlying the bedrock were cased off and the annular space between the casing and saprolite grouted with cement to prevent any contamination from the surface; in the bedrock the well was finished as an open hole. All wells inventoried for this report were similarly constructed.

The yield of well 29D1 at 100 feet below land surface was 2 gallons per minute and at 231 feet below land surface was 31 gallons per minute. The large increase in yield, 29 gallons per minute between 100 and 231 feet below land surface, may be due to either small amounts of water entering the well through either a number of openings in this 131 foot interval or larger fractures at or just above 230 feet below land surface.

Table 2.--Summary of yield in gallons per minute and specific-capacity data for public-supply wells at different topographic settings along the Blue Ridge Parkway.

Well No.	Topographic Setting and Yield (gallons per minute)				Specific Capacity (gallons per foot of drawdown)
	Hilltop	Hillside	Draw	Valley	
26B3	2.0				0.2
26B4	1.4				<0.1
26B1		1.4			<0.1
27C1		26.0			1.2
28C3		51			19.4
28C7		26			2.9
35J1		10.7			.2
25B1			15		0.1
27B1			25		1.3
39U1			53.5		1.2
29D1			31		.1
28C6				51	5.6
34H1				15	.3
34H2				20	.5
34H3				45	.6
36J1				30	.6
36J5				30	.4
Total	3.4	115.10	124.5	191	
Average Yield	1.7	23.0	31.1	31.8	

The topographic setting, yield, and specific capacity of 17 public-supply wells along the Parkway are listed in table 2. The specific capacity of a well, the rate of discharge of water in gallons per minute divided by the amount of drawdown, may vary with the duration of pumping.

Data available for each of the wells inventoried for this study are listed in table 3. Of the 32 wells listed, 17 were completed as public-supply wells,

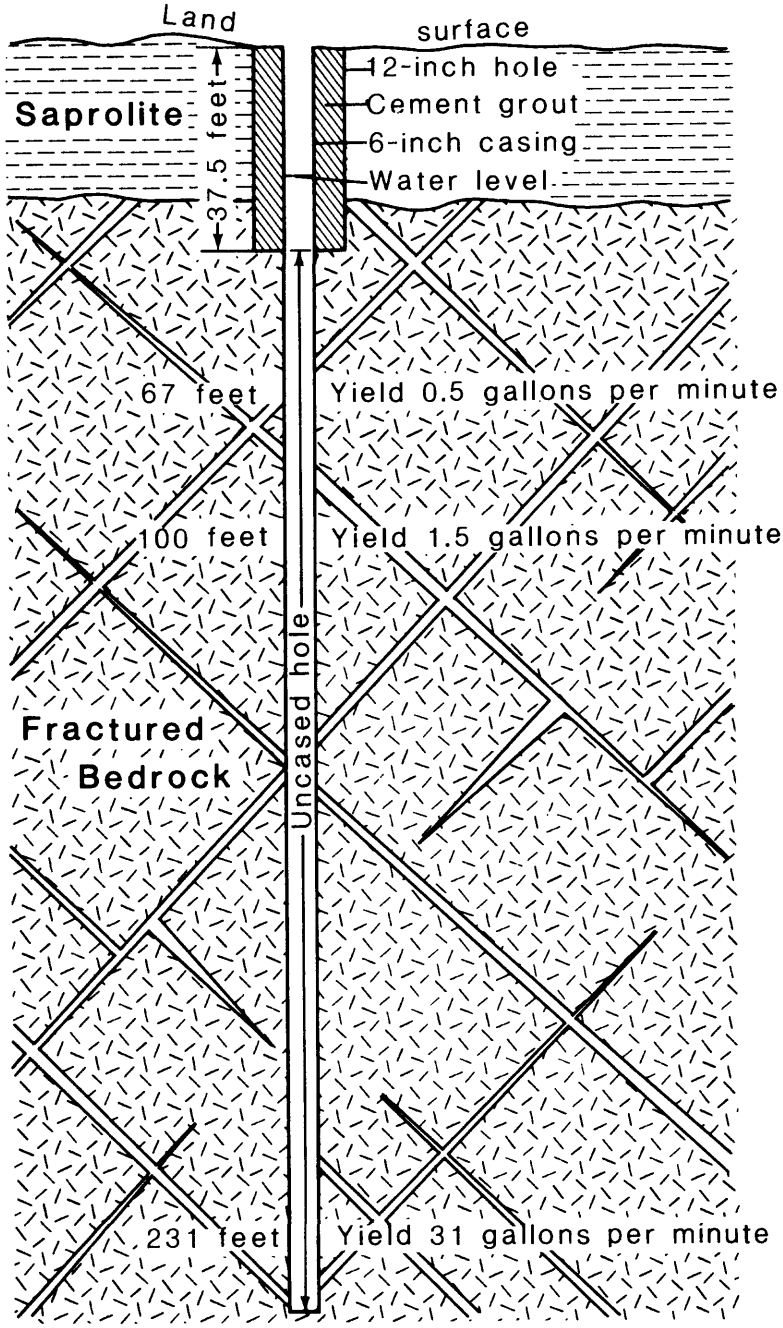


Figure 4.--Construction features and typical yields of well 29D1 at Smartview picnic area, Franklin County, Virginia (refer to figure 45 for location).

Table 3.--Records of well data along the Blue Ridge Parkway, Virginia (depths are in feet below land surfac

Explanation of symbols used:

LOCATION
MA-Maintenance area
PA-Picnic area
RA-Recreation area
VC-Visitor center

USE OF SITE
U-unused
W-withdrawal
Z-destroyed

USE OF WATER
F-fire
H-domestic
P-public supply
U-unused

PRINCIPAL AQUIFER
000 SPRL Saprolite
300 AGBK Alligator Back Formation
400 ASHE Ashe Formation
400 CTCN Catoctin Formation
400 LCBG Lynchburg Formation
400 MHRL Marshall Formation
400 PDLR Pedlar Formation
400 SFRN Swift Run Formation
400 VGBG Virginia Complex Blue Ridge

METHOD OF CONSTRUCTION
A-air rotary
P-air percussion
C-cable tool

OTHER DATA AVAILABLE
QW-quality of water
B-common chemical analysis
WL-frequency of water level measurements
O-only one measurement available
I-intermittent measurements
LG-logs available
G-geologist log
GK-field check
C-data field checked
U-unchecked

WELL FINISH
O-open end casing
X-open hole in rock

LOCAL NUMBER	SITE IDENTIFICATION NUMBER	LOCATION	USE OF SITE	USE OF WATER	ALTITUDE OF LAND SURFACE (FEET)	PRINCIPAL AQUIFER
		AMHERST COUNTY				
36J 1	373631079190601	NPS OTTER, CREEK	W	U	1018	400SFRN
36J 2	373630079190801	NPS OTTER, CREEK	Z	--	1010	400SFRN
36J 3	373634079191401	NPS OTTER, CREEK	Z	--	1040	400SFRN
36J 4	373634079191402	NPS OTTER, CREEK	Z	--	1040	000SPRL
36J 5	373430079202701	NPS OTTER, CREEK R A	W	P,F	820	400MRHL
36J 6	373319079215901	NPS JAMES, RIVER V C	W	P,F	670	400MRHL
		AUGUSTA COUNTY				
39M 1	375813078535401	NPS HMPBAK, ROCKS V C	W	P,F	2315	400CTCN
39M 2	375813078535402	NPS HMPBAK, ROCKS V C	U	U	2315	400CTCN
		BEDFORD COUNTY				
34H 1	372636079364301	NPS PEAKS, OF OTTER	W	U	2535	400VGBG
34H 2	372639079363301	NPS PEAKS, OF OTTER	W	P,F	2525	400VGBG
34H 3	372656079362201	NPS PEAKS, OF OTTER	W	P,F	2515	400VGBG
35J 1	373325079244501	NPS JAMES, RIVER MA	W	P,F	1080	400MRHL
		CARROLL COUNTY				
25B 1	363959080412001	NPS FANCY, GAP M A	W	P,F	2950	300AGBK
25B 2	363940080415001	NPS FANCY, GAP QTRS	W	H,F	2950	300AGBK
26B 1	363852080313601	NPS GROUND, HOG MT	W	P,F	2840	300AGBK
26B 2	363844080313601	NPS-GROUND, HOG MT	Z	--	3030	300AGBK
26B 3	363847080314601	NPS GROUND, HOG MT	W	U	2995	300AGBK
26B 4	363853080314501	NPS GROUND, HOG MT	W	P,F	2960	300AGBK
26B 5	363840080315501	NPS GROUND, HOG MT P A	Z	--	2975	300AGBK
		FLOYD COUNTY				
27B 1	364456080241801	NPS MABRY, MILL	W	P,F	2870	300AGBK
28C 1	364818080214401	NPS GRASSY, KNOLL	Z	--	3335	400ASHE
28C 2	364818080214101	NPS GRASSY, KNOLL	Z	--	3390	400ASHE
28C 4	364836080211501	NPS ROCKY, KNOB P A	W	U	3085	400LCBG
28C 5	364834080211501	NPS ROCKY, KNOB P A	Z	--	3090	400ASHE
28C 6	364839080211601	NPS ROCKY, KNOB P A	W	P,F	3085	400ASHE
28C 7	364911080205101	NPS ROCKY, KNOB MA	W	P,F	3000	400ASHE
28C 8	364910080205301	NPS ROCKY, KNOB MA	U	P,F	2990	400ASHE
28C 9	364913080205101	NPS ROCKY, KNOB MA	Z	--	3040	400ASHE
		FRANKLIN COUNTY				
29D 1	365550080110901	NPS SMART, VIEW P A	W	P	2540	400ASHE
		NELSON COUNTY				
37L 1	375201079085401	NPS WHSTON, RIDGE	W	P,F	2900	400PDLR
		PATRICK COUNTY				
27C 1	364635080233201	NPS ROCKY, KNOB CABIN	W	P,F	3083	300AGBK
28C 3	364801080215901	NPS GRASSY, KNOLL	W	P,F	3210	400ASHE

Table 3.--Records of well data along the Blue Ridge Parkway, Virginia -- Continued.
(depths are in feet below land surface).

LOCAL NUMBER		DEPTH OF WELL (FEET)	DATE COMPLETED	DEPTH CASED	CASING DIAMETER (INCHES)	FINISH	METHOD CONSTRUCTED	WATER LEVEL (FEET)	DATE WATER LEVEL MEASURED
					AMHERST COUNTY				
36J	1	154.00	08/02/1967	10	6	X	P	6.75	08/02/1967
36J	2	245.00	07/29/1967	8	6	X	A	--	--
36J	3	155.00	08/02/1967	11	6	O	P	6.00	08/02/1967
36J	4	45.00	08/01/1967	--	--	X	P	--	--
36J	5	273.00	04/20/1959	25	6	X	--	22.24	04/20/1959
36J	6	229.00	06/03/1960	--	6	X	C	55.00	06/28/1961
					AUGUSTA COUNTY				
39M	1	120.00	05/03/1965	55	8	X	P	10.00	05/05/1965
39M	2	--	--	--	--	--	--	--	--
					BEDFORD COUNTY				
34H	1	200.00	08/03/1967	58	6.25	X	P	1.40+	08/07/1967
34H	2	185.00	08/04/1967	40	6.25	X	P	8.10	08/08/1967
34H	3	140.00	10/21/1960	32	6	X	--	7.50	10/ /1960
35J	1	156.00	09/27/1963	48	6	X	P	21.00	09/27/1963
					CARROLL COUNTY				
25B	1	126.50	05/03/1963	88	6	X	P	4.10	05/03/1963
25B	2	--	05/ /1963	--	--	--	--	59.96	07/12/1979
26B	1	302.00	06/14/1963	64	6	X	C	7.00	06/14/1963
26B	2	120.00	10/14/1971	--	--	O	P		--
26B	3	164.00	10/15/1971	34	6	X	P	35.48	10/15/1971
26B	4	320.00	05/30/1979	60	6	X	P	49.97	07/13/1979
26B	5	425.00	05/16/1979	60	6	X	P	20.00	05/16/1979
					FLOYD COUNTY				
27B	1	200.00	08/28/1963	47	6	X	P	3.60	08/28/1963
28C	1	300.00	10/18/1971	--	--	X	P		--
28C	2	100.00	10/20/1971	--	--	--	P	--	--
28C	4	100.00	08/10/1965	12	6	X	P	4.60	08/11/1965
28C	5	100.00	08/11/1965	14	--	X	P	--	--
28C	6	100.00	08/16/1965	25	6	X	P	7.30	08/17/1965
28C	7	320.00	10/30/1978	35	6	--	A	12.00	10/30/1978
28C	8	125.00	11/15/1978	50	6	O	P	20.00	11/15/1978
28C	9	245.00	11/06/1978	--	--	X	A		11/06/1978
					FRANKLIN COUNTY				
29D	1	245.00	07/24/1979	39	6	X	A	20.96	08/13/1979
					NELSON COUNTY				
37L	1	80.00	07/27/1967	27	6.25	X	P	--	--
					PATRICK COUNTY				
27C	1	245.00	08/02/1979	113	6	X	P	35.82	12/17/1979
28C	3	200.00	10/14/1971	49	6	X	P	58.95	10/14/1971

Table 3.--Records of well data along the Blue Ridge Parkway, Virginia--Continued.
(depths are in feet below land surface).

LOCAL NUMBER		DISCHARGE (GALLONS PER MINUTE)	DATE DISCHARGE MEASURED	SPECIFIC CAPACITY (GPM/FT)	OTHER DATA AVAILABLE QW	WL	LG	CK
			AMHERST COUNTY					
36J	1	10	08/02/1967	0.6	B		G	C
36J	2	0.75	07/29/1967	--			G	C
36J	3	0.75	08/02/1967	--				C
36J	4	--	--	--				U
36J	5	30	04/20/1959	0.4			G	C
36J	6	9.0	06/03/1960	--				C
			AUGUSTA COUNTY					
39M	1	54	05/05/1965	1.2	B			C
39M	2	--	--	--				C
			BEDFORD COUNTY					
34H	1	15	08/07/1967	0.3	B		G	C
34H	2	20	08/08/1967	0.5	B		G	C
34H	3	20	10/21/1960	1.2			G	C
35J	1	11	09/27/1963	0.2	B			C
			CARROLL COUNTY					
25B	1	15	05/03/1963	0.1	B	O		C
25B	2	--	--	--	B	O		C
26B	1	1.4	06/14/1963	0.0	B			U
26B	2	--	--	--				C
26B	3	2.0	10/15/1971	0.2	B	O	G	C
26B	4	1.4	08/27/1979	0.0		O	G	C
26B	5	0.50	05/16/1979	--				U
			FLOYD COUNTY					
27B	1	25	08/25/1963	0.3	B			C
28C	1	--	--	--				C
28C	2	--	--	--				C
28C	4	6.5	08/11/1965	7.0	B			U
28C	5	--	--	--				U
28C	6	51	08/17/1965	5.6	B			C
28C	7	26	12/13/1978	2.9				U
28C	8	3.0	11/15/1978	--				C
28C	9	--	--	--				U
			FRANKLIN COUNTY					
29D	1	31	08/13/1979	0.1	B	O	G	C
			NELSON COUNTY					
37L	1	60	07/28/1967	--	B			C
			PATRICK COUNTY					
27C	1	26	12/17/1979	0.2			G	U
28C	3	5.9	10/14/1971	5.9	B	I	G	C

5 are unused and 10 were abandoned and plugged with cement or drill cuttings immediately following completion because of low yield.

Proximity to Other Wells

In areas where more than one well is required to meet peak demands for water, spacing of wells becomes important. Closely-spaced wells will interfere with one another when pumped simultaneously from at or near the same horizon. The cone of influence of a pumping well expands outward until the amount of recharge is equal to the amount of the withdrawal. When cones of influence overlap, drawdown in each of the pumping wells increases. This effect is cumulative so that the total drawdown is equal to the drawdown caused by pumping the well at a specific rate plus the drawdown caused by expanding cone(s) of influence from other well(s) in the area. To avoid interference among wells, spacing probably should be greater than 1,000 feet. The supply wells for Peaks of Otter recreation area, 34H2 and 34H3 shown in figure 27, are examples of proper well spacing. These wells are situated in separate valleys and are about 2,000 feet apart.

POTENTIAL WELL SITES

Potential well sites along the Parkway have been delineated on the maps in the supplemental-data section following the text (figs. 7-61). Areas designated "good" were selected based on proximity to a valley containing a perennial stream, contact between rock units and (or) fault, moderate slopes of adjoining highlands with a relatively thick overburden of saprolite, or, as in the Peaks of Otter Recreation area, a thick overburden of talus and alluvial deposits overlying saprolite and (or) bedrock. "Fair" areas were selected based on proximity to valleys containing intermittent streams or to draws along relatively steep slopes of adjoining highlands.

The presence of valleys and draws were the main criteria for designation of "good" and "fair" areas because they generally develop along joint systems and are an area of ground-water discharge. Some of the valleys and draws probably developed along the contact between different rock units and (or) faults. However, geologic information at this time is insufficient to define where this may have occurred. The more moderate slopes of adjoining highlands are more likely to have thicker overburdens of saprolite than the steeper slopes.

RELATIONSHIP OF SPRING LOCATION TO YIELD

Springs along the Parkway are of the contact and fracture types. Contact springs are found at the contact between saprolite and the underlying bedrock. The bedrock surface serves as a relatively impermeable surface along which water can move toward a spring outlet. However, most of the springs inventoried along the Parkway issued/discharged from bedrock fractures. Table 4 lists the locations, types, and uses of all springs inventoried for this report.

Spring discharge varies with time. Immediately after a rain there is an increase in the amount of water in storage and spring discharges increase. This is especially true for springs near the crests of the ridges and hilltops. Here the soil cover and (or) saprolite may be thin or absent and

Table 4.--Records of spring data along the Blue Ridge Parkway, Virginia (discharge is in gallons per minute).

Explanation of symbols:

LOCATION

PA-Picnic area

TYPE OF SITE

F-fracture
C-contact

PRINCIPAL AQUIFER

000 SPRL Saprolite
300 AGBK Alligator Back Formation
400 CTCN Catoctin Formation
400 PDLR Pedlar Formation
400 VGBG Virginia Blue Ridge Complex

OTHER DATA AVAILABLE

QW-quality of water
B-common chemical analysis
CK-field check
C-data field checked

USE OF WATER

F-fire
H-domestic
N-industrial
P-public supply
S-stock
U-unused

IMPROVEMENTS

B-boxed basin
C-concrete basin
P-pond

LOCAL NUMBER	SITE IDENTIFICATION NUMBER	LOCATION	NAME OF SPRING	TYPE OF SPRING	USE OF WATER
		AUGUSTA COUNTY			
38MS 1	375306079001401	NPS LOVE, MAINT AREA	LOVE MAINT A	F	N,F
39MS 1	375603078542101	NPS HUMP, BACK	HUMPBACK P A	F	H
39MS 2	375652078545701	NPS HUMP, BACK P A	HUMPBACK P A	F	H
39MS 3	375524078575801	NPS HICKRY, SPRING	HICKORY	F	H
39MS 4	375812078535201	NPS HUMP, BACK ROCKS	--	F	U
		BEDFORD COUNTY			
34HS 1	372634079355201	NPS BIG, SPRING	BIG SPRING	F	U
34HS 2	372651079370401	NPS EDWARD, HOUSE	EDWARDSHOUSE	F	H,S,F
34HS 3	373351079285601	NPS HEDFMT, MOUNTAIN	HEADFOREMOST	C	P,F
34JS 1	373110079300401	NASA BEDFD, STATION 2	NASA 2	F	P,F
		FLOYD COUNTY			
27CS 2	364516080243401	NPS MABRY, MILL	MABRY MILL	F	U
28CS 1	364816080214401	NPS GRASSY, KNOLL	GRASSY KNOLL	C	U
29DS 1	365548080111701	NPS SMART, VIEW P A	SMARTVIEW	C	P,F
		FRANKLIN COUNTY			
30ES 1	370300080064201	NPS JAMES, HOUSE	JAMES HOUSE	F	H,F
		NELSON COUNTY			
37LS 2	375203079085501	NPS WHSTON, RIDGE	WHETSTONE RD	F	--
		PATRICK COUNTY			
27CS 1	364639082232801	NPS ROCKY, KNOB CABIN	ROCKY KNOB	F	P,F
		ROANOKE COUNTY			
30FS 1	371119080030401	NPS BENT, MOUNTAIN	SECTION N 1	F	P,F
		ROCKBRIDGE COUNTY			
37LS 1	375027079093001	NPS STILL, HOUSE HOL	STILLHOUSE	C	H

Table 4.--Records of spring data along the Blue Ridge Parkway, Virginia--Continued (discharge is in gallons per minute).

LOCAL NUMBER	ALTITUDE OF LAND SURFACE (FEET)	PRINCIPAL AQUIFER	PERM-AN-ENCE	FLOW DIS-CHARGE	FLOW VARIA-BILITY	IM-PROVE-MENTS	OTHER DATA AVAILABLE QW	WL	LG	CK
				AUGUSTA COUNTY						
38MS 1	2850	400PDLR	P	20.00	160	C	B			C
39MS 1	3330	400CTCN	P	2.00	210	--	B			C
39MS 2	3050	400CTCN	--	6.00		C	B			C
39MS 3	2960	400CTCN	P	6.70	317	B	B			C
39MS 4	2350	400CTCN	P	3.00		C	B			C
				BEDFORD COUNTY						
34HS 1	2420	400VGBG	P	150.00	--	P	B			C
34HS 2	2720	400VGBG	P	5.00	--	C	B			C
34HS 3	2935	400VGBG	P	3.50	179	C	B			C
34JS 1	3690	400PDLR	--	--	--	--	B			C
				FLOYD COUNTY						
27CS 2	2920	300AGBK	--	--	243	C	C			C
28CS 1	3370	000SPRL	--	3.00	--	C	B			C
29DS 1	2520	--	P	7.50	110	C	B			C
				FRANKLIN COUNTY						
30ES 1	2640	400VGBG	--	--	58	C	B			C
				NELSON COUNTY						
37LS 2	2950	400PDLR	P	--	--	C	B			C
				PATRICK COUNTY						
27CS 1	3080	300AGBK	P	6.00	125	C	B			C
				ROANOKE COUNTY						
30FS 1	1920	400VGBG	P	.50	88	C	B			C
				ROCKBRIDGE COUNTY						
37LS 1	2995	400PDLR	I	--	333	C	B			C

precipitation may enter directly into openings in bedrock where the storage capacity is small and velocities are high. Consequently, springs near hilltops will increase in discharge shortly after a rain. If there is an extended period of drought, the water table may fall below a spring outlet and discharge will cease.

Springs situated along lower slopes, at the base of ridges, and in the valleys have a greater volume of water in storage above their outlets than springs near hilltops. The discharge from valley springs increases following periods of precipitation and decrease during periods of drought, but these fluctuations are more subdued than those for springs at the higher altitudes. Discharge may decline during extended periods of drought but usually will not cease.

Most springs inventoried for this study are along slopes at relatively high altitudes. This physical setting precludes large amounts of ground water in storage above outlets, and consequently variabilities in flow are great.

QUALITY OF GROUND WATER

The chemical quality of water from wells and springs along the Parkway is suitable for public-water supply. The water is low in dissolved solids, iron, and is soft (less than 60 mg/L hardness). Analyses of water from wells and springs along the Parkway are given in tables 5 and 6, respectively.

Analyses of samples collected in 1979 from selected wells and springs are plotted on a trilinear diagram, and show the ground water is of the calcium-magnesium-sodium-bicarbonate type (fig. 5).

Dissolves solids are less than 100 milligrams per liter (mg/L) at all but one well, No. 6 (36J6), where the dissolved solids are 178 mg/L. This is the only well in which iron (0.470 mg/L) exceeds the U.S. Environmental Protection Agency's Quality Criteria for Drinking Water of 0.3 mg/L (U.S. Environmental Protection Agency, 1976). The probable cause for the relatively high dissolved solids and iron is that this well has induced infiltration from the river and (or) its alluvial deposits. Well No. 2 (28C6) is cased into partially weathered rock, which allows some of the less mineralized water from the saprolite and partially weathered rock to enter the well. The dissolved solids for water from this well are 33 mg/L.

Analyses show that arsenic, cadmium, chromium, copper, lead, mercury, selenium, and zinc, are below the limits set for public supplies by the U.S. Environmental Protection Agency. Higher concentrations of zinc are reported from wells using galvanized iron as pump column and (or) casing than from wells using copper or plastic.

Analyses from selected springs are plotted in figure 6. This plot shows that ground water discharging from springs is a calcium-magnesium-sodium-bicarbonate water. Spring No. 5 (34JS1) which plots out of the field, has dissolved chloride of 20 mg/L while all other spring samples contain less than 3.0 mg/L chloride. The exact cause of the high chloride at this spring is not known. However, the relatively high dissolved solids, 77 mg/L, for this spring, suggest that contamination is occurring.

Table 5.--Chemical analysis of water from wells along the Blue Ridge Parkway, Virginia

Explanation of symbols:

PRINCIPAL AQUIFER

300 AGBG Alligator Back Formation
400 ASHE Ashe Formation
400 CTCN Catoctin Formation
400 LCB Lynchburg Formation
400 PDLR Pedlar Formation
400 VGBV Virginia Blue Ridge Complex

LOCATION

MA Maintenance area
PA Picnic area
VC Visitor center

LOCAL NUMBER	LOCATION	SITE IDENTIFICATION NUMBER	GEOLOGIC UNIT	DATE OF SAMPLE	SAMPLING DEPTH (FT)	SPECIFIC CONDUCTANCE (UMHOS)	PH (UNITS)
		AMHERST COUNTY					
36J 1	NPS OTTER CREEK	373631079190601	400MRHL	67-11-17	--	102	6.7
36J 5	NPS OTTR CK CMPGD	373430079202701	400MRHL	79-07-10	--	163	6.9
36J 6	NPS JMES RIVER VC	373319079215901	400MRHL	79-07-10	--	225	7.0
		AUGUSTA COUNTY					
39M 1	NPS HUMPBCK ROCKS	375813078535401	400CTCN	79-07-09	--	54	8.6
		BEDFORD COUNTY					
34H 1	NPS PK OF OTTER	372636079364301	400VGBG	67-08-04	--	53	6.6
				79-07-19	200	52	6.4
34H 2	NPS PK OF OTTER	372639079363301	400VGBG	67-08-08	--	41	6.3
				79-07-11	--	43	8.2
34H 3	NPS PK OF OTTER	372656079362201	400VGBG	79-07-11	--	41	8.3
				79-08-06	140	38	5.9
35J 1	NPS JMES RIVER MA	373325079244501	400VGBG	63-09-27	--	68	7.0
				79-07-11	--	47	8.0
		CARROLL COUNTY					
25B 1	NPS FANCY GAP MA	363959080412001	400LCBG	63-05-03	--	23	6.1
				79-07-12	--	35	6.8
25B 2	NPS FANCY GAP RES	363940080415001	400LCBG	79-07-12	--	37	7.8
26B 1	NPS GROUNDHOG MT	363852080313601	400LCBG	79-07-12	--	103	7.2
26B 3	GROUND HOG MT	363847080314601	400LCBG	71-10-15	--	350	8.0
		FLOYD COUNTY					
27B 1	NPS MABRY MILL	364456080241801	400LCBG	63-08-28	--	63	6.7
				79-07-25	200	45	6.2
28C 4	NPS RCKY KNB PA	364836080211501	400LCBG	65-08-11	--	60	7.5
28C 6	NPS RCKY KNOB PA	364839080211601	400LCBG	65-08-17	--	15	6.7
				79-07-12	--	25	7.3
		FRANKLIN COUNTY					
29D 1	NPS SMART VIEW PA	365550080110901	400LCBG	79-07-24	245	175	6.7
		NELSON COUNTY					
37L 1	NPS WHETESTNE RDG	375201079085401	400PDLR	67-07-28	--	113	6.7
				79-07-10	--	45	6.1
		PATRICK COUNTY					
28C 3	NPS GRASSY KNOL	364801080215901	400LCBG	71-10-15	--	38	6.4
				79-07-12	--	25	7.3

Table 5.--Chemical analysis of water from wells along the Blue Ridge Parkway, Virginia--Continued.

DATE OF SAMPLE	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY FIELD (MG/L AS CACO3)
				AMHERST COUNTY					
67-11-17	--	7	38	0	9.2	3.6	5.5	1.4	39
79-07-10	13.0	2	58	0	16	4.5	8.3	.6	71
79-07-10	14.5	10	95	0	22	9.7	9.0	3.8	98
				AUGUSTA COUNTY					
79-07-09	11.5	5	17	0	4.3	1.4	4.4	.3	22
				BEDFORD COUNTY					
67-08-04	--	7	19	0	5.6	1.2	4.0	1.4	24
79-07-19	11.5	3	15	0	4.6	.9	4.4	1.5	26
67-08-08	--	1	12	0	4.2	.3	3.6	.8	17
79-07-11	12.0	5	15	0	4.8	.7	3.8	1.0	21
79-07-11	11.5	5	12	0	3.9	.6	2.5	1.3	15
79-08-06	11.0	--	--	--	--	--	--	--	--
63-09-27	19.0	10	24	0	6.1	2.1	4.7	2.7	33
79-07-11	13.0	5	18	0	4.3	1.7	3.8	1.3	24
				CARROLL COUNTY					
63-05-03	12.0	2	6	0	1.4	.6	4.0	.5	7
79-07-12	10.5	2	7	0	1.4	.7	1.4	.6	10
79-07-12	11.0	2	12	0	3.0	1.0	2.1	.6	17
79-07-12	15.0	5	41	0	15	.9	4.0	2.2	48
71-10-15	12.0	2	131	22	50	1.1	20	1.6	109
				FLOYD COUNTY					
63-08-28	17.0	3	20	0	4.1	2.3	2.8	1.2	20
79-07-25	11.0	1	18	1	3.9	2.0	2.2	1.0	17
65-08-11	18.0	6	20	0	7.4	.1	5.5	1.5	29
65-08-17	16.0	4	4	0	1.1	.3	1.1	.6	7
79-07-12	11.0	5	5	0	1.3	.4	3.5	.6	7
				FRANKLIN COUNTY					
79-07-24	12.5	4	66	0	22	2.8	5.9	2.5	75
				NELSON COUNTY					
67-07-28	17.0	1	27	0	8.3	1.6	13	.6	34
79-07-10	11.5	2	16	0	4.8	.9	3.0	.6	20
				PATRICK COUNTY					
71-10-15	11.0	5	14	0	4.7	.6	1.6	1.5	16
79-07-12	11.0	5	5	0	1.3	.4	3.5	.6	7

Table 5.--Chemical analysis of water from wells along the Blue Ridge Parkway, Virginia--Continued.

DATE OF SAMPLE	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P)	PHOSPHATE, ORTHO, DISSOLVED (MG/L AS PO4)	ARSENIC DISSOLVED (UG/L AS AS)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COPPER, DISSOLVED (UG/L AS CU)
				AMHERST COUNTY					
67-11-17	0.05	--	--	--	0.01	--	--	--	--
79-07-10	.00	<.010	--	.030	.09	3	2	<20	ND
79-07-10	.09	<.010	--	<.010	.00	3	<2	20	ND
				AUGUSTA COUNTY					
79-07-09	.14	<.010	--	.100	.31	3	ND	20	<2
				BEDFORD COUNTY					
67-08-04	.29	--	--	--	.19	--	--	--	--
79-07-19	.32	.010	--	.060	.18	--	--	--	--
67-08-08	.18	--	--	--	.32	--	--	--	--
79-07-11	.01	<.010	--	.010	.03	3	ND	20	ND
79-07-11	.20	<.010	--	.030	.09	3	<2	20	3
79-08-06	--	--	--	--	--	<1	<2	<20	ND
63-09-27	.00	--	--	--	.50	--	--	--	--
79-07-11	.05	<.010	--	.100	.31	3	ND	20	2
				CARROLL COUNTY					
63-05-03	.50	--	--	--	.20	--	--	--	--
79-07-12	1.30	<.010	--	.020	.06	--	--	--	--
79-07-12	.01	<.010	--	.020	.06	3	2	20	6
79-07-12	.91	<.010	--	<.010	.00	--	--	--	--
71-10-15	--	--	--	--	.05	--	5	--	--
				FLOYD COUNTY					
63-08-28	.77	--	--	--	.00	--	--	--	--
79-07-25	1.10	<.010	--	.010	.03	<1	<2	<20	ND
65-08-11	.07	--	--	--	.00	--	--	--	--
65-08-17	.05	--	--	--	.00	--	--	--	--
79-07-12	.33	<.010	--	<.010	.00	3	ND	20	3
				FRANKLIN COUNTY					
79-07-24	.01	.010	--	.010	.03	<1	ND	<20	ND
				NELSON COUNTY					
67-07-28	.20	--	--	--	.02	--	--	--	--
79-07-10	.10	<.010	--	.010	.03	<1	ND	<20	ND
				PATRICK COUNTY					
71-10-15	.32	--	--	--	.01	--	0	--	10
79-07-12	.33	<.010	--	<.010	.00	3	ND	20	3

Table 5.--Chemical analysis of water from wells along the Blue Ridge Parkway, Virginia--Continued.

	LOCAL IDENTIFIER	DATE OF SAMPLE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
				AMHERST				
36J	1 NPS OTTER CREEK 4	67-11-17	11	.6	.2	25	80	84
36J	5 NPS OTTR CK CMPGD	79-07-10	6.2	1.2	.1	23	65	103
36J	6 NPS JMES R VIS CR	79-07-10	13	2.8	.3	46	178	167
				AUGUSTA				
39M	1 NPS HUMPBCK ROCKS	79-07-09	.4	.6	.1	26	22	52
				BEDFORD				
34H	1 NPS PK OF OTTER 1	67-08-04	1.0	1.0	.3	22	51	52
		79-07-19	.4	1.6	.2	22	55	53
34H	2 NPS PK OF OTTER 2	67-08-08	1.0	1.9	.3	19	46	42
		79-07-11	.3	2.2	.3	18	52	44
34H	3 NPS PK OF OTTER 3	79-07-11	<1.0	1.7	.2	11	40	32
		79-08-06	--	--	--	--	--	--
35J	1 NPS JMES R MAINTE	63-09-27	.6	.8	.2	29	64	67
		79-07-11	2.0	.7	.1	27	58	56
				CARROLL				
25B	1 NPS FANCY GAP MNT	63-05-03	.2	3.0	.0	8.4	--	25
		79-07-12	.1	2.3	<.1	8.0	40	26
25B	2 NPS FANCY GAP RES	79-07-12	.1	1.2	<.1	13	40	32
26B	1 NPS GROUNDHOG MT	79-07-12	6.5	.6	.1	17	81	79
26B	3 GROUND HOG MT 3	71-10-15	6.8	45	--	10	208	200
				FLOYD				
27B	1 NPS MABRY MILL	63-08-28	3.6	1.0	.1	20	63	51
		79-07-25	2.6	1.0	<.1	18	52	46
28C	4 NPS ROCKY KNB PA 1	65-08-11	3.0	1.6	.2	11	48	48
28C	6 NPS ROCKY KNOB PA3	65-08-17	1.0	1.4	.0	7.9	19	18
		79-07-12	.7	3.2	<.1	7.8	33	23
				FRANKLIN				
29D	1 NPS SMART VW PIC	79-07-24	3.2	.7	.1	16	96	99
				NELSON				
37L	1 NPS WHITESTNE RDG	67-07-28	.8	15	.1	17	80	77
		79-07-10	.1	2.5	<.1	18	52	42
				PATRICK				
28C	3 NPS GRASSY KNOL 3	71-10-15	1.4	2.8	.0	10	29	34
		79-07-12	.7	3.2	<.1	7.8	33	23

Table 5.--Chemical analysis of water from wells along the Blue Ridge Parkway, Virginia--Continued.

LOCAL NUMBER	SITE IDENTIFICATION NUMBER	DATE OF SAMPLE	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MERCURY DIS-SOLVED (UG/L AS HG)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	ZINC, DIS-SOLVED (UG/L AS ZN)
			AMHERST				
36J 1	NPS OTTER CREEK 4	67-11-17	3000	--	--	--	--
36J 5	NPS OTTR CK CMPGD	79-07-10	<10	15	<.5	<1	470
36J 6	NPS JMES R VIS CR	79-07-10	470	ND	<.5	<1	240
			AUGUSTA				
39M 1	NPS HUMPBCK ROCKS	79-07-09	<10	5	<.5	<1	330
			BEDFORD				
34H 1	NPS PK OF OTTER 1	67-08-04	10	--	--	--	--
		79-07-19	<10	--	--	--	--
34H 2	NPS PK OF OTTER 2	67-08-08	0	--	--	--	--
		79-07-11	1	3	<.5	<1	30
34H 3	NPS PK OF OTTER 3	79-07-11	<10	11	<.5	<1	9
		79-08-06	--	ND	<.5	<1	60
35J 1	NPS JMES R MAINTE	63-09-27	20	--	--	--	--
		79-07-11	<10	8	<.5	<1	50
			CARROLL				
25B 1	NPS FANCY GAP MNT	63-05-03	--	--	--	--	--
		79-07-12	20	--	--	--	--
25B 2	NPS FANCY GAP RES	79-07-12	<10	10	<.5	<1	660
26B 1	NPS GROUNDHOG MT	79-07-12	<10	--	--	--	--
26B 3	GROUND HOG MT 3	71-10-15	--	0	--	--	20
			FLOYD				
27B 1	NPS MABRY MILL	63-08-28	70	--	--	--	--
		79-07-25	<10	5	<.5	<1	120
28C 4	NPS RCKY KNB PA 1	65-08-11	230	--	--	--	--
28C 6	NPS RCKY KNOB PA3	65-08-17	290	--	--	--	--
		79-07-12	<10	ND	<.5	<1	<20
			FRANKLIN				
29D 1	NPS SMART VW PIC	79-07-24	20	12	<.5	<1	4
			NELSON				
37L 1	NPS WHITESTNE RDG	67-07-28	20	--	--	--	--
		79-07-10	<10	13	<.5	<1	20
			PATRICK				
28C 3	NPS GRASSY KNOL 3	71-10-15	--	2	--	--	50
		79-07-12	<10	ND	<.5	<1	<20

Table 6.--Chemical analysis of water from springs along the Blue Ridge Parkway, Virginia.

Explanation of symbols:

PRINCIPAL AQUIFER

000 SPRL	Saprolite	400 CTCN	Catoctin Formation
300 AGBG	Alligator Back Formation	400 PDLR	Pedlar Formation
400 ASHE	Ashe Formation	400 VGBV	Virginia Blue Ridge Complex

LOCATION

PA	Picnic area
VC	Visitor center

LOCAL NUMBER	LOCATION	SITE IDENTIFICATION NUMBER	GEOLOGIC UNIT	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (UMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
		AUGUSTA COUNTY					
38M S1	NPS MEADOW MT SPR	375306079001401	400PDLR	74-09-26	14	6.2	9.0
				79-07-20	13	6.7	9.5
39M S1	NPS HUMPBK RCKS	375603078542101	400CTCN	74-09-26	19	6.0	9.0
				79-07-18	19	4.7	10.0
39M S2	NPS HUMPBK RCKS	375652078545701	400CTCN	74-09-26	19	6.2	9.0
				79-07-18	17	4.8	9.5
39M S3	NPS HICKORY SPR	375524078575801	400CTCN	74-09-26	16	6.0	9.0
				79-07-18	15	5.2	9.0
39M S4	NPS HMPBK RCK VC	375812078535201	400CTCN	79-07-09	33	6.4	11.0
		BEDFORD COUNTY					
34H S1	NPS BIG SPRING	372634079355201	400VGBG	74-07-27	18	6.9	11.0
				79-07-19	18	8.2	11.0
34H S2	NPS EDWARDS HOUSE	372651079370401	400VGBG	74-09-27	61	6.5	13.0
				79-07-19	31	5.8	11.0
34H S3	NPS HDFRMST MT SP	373351079285601	400VGBG	74-09-27	16	6.1	11.0
				79-07-19	14	6.8	10.0
34J S1	NASA BEDFD, STATI	373110079300401	400PDLR	56-09-20	83	7.5	--
				79-07-23	79	5.8	10.0
		FLOYD COUNTY					
27C S2	NPS MABRY MILL	364516080243401	300AGBK	79-07-25	14	5.8	12.0
28C S1	NPS GRASSY KNOLL	364816080214401	000SPRL	71-10-13	26	6.1	11.0
				79-07-25	33	7.9	10.0
		FRANKLIN COUNTY					
29D S1	NPS SMARTVIEW PA	365548080111701	400ASHE	74-10-10	63	6.9	11.5
				79-07-24	63	7.5	15.0
30E S1	NPS JAMES HOUSE	370300080064201	400UGBG	74-10-10	28	6.8	12.0
				79-07-24	19	6.7	11.5
		NELSON COUNTY					
37L S2	WHETSTONE RIDGE	375203079085501	400PDLR	79-07-10	79	5.5	10.5
		PATRICK COUNTY					
27C S1	NPS RCKY KNOB CAB	364639082232801	300AGBK	74-10-10	20	6.6	11.5
				79-07-25	32	6.4	11.0
		ROANOKE COUNTY					
30F S1	NPS BENT MOUNTAIN	371119080030401	400VGBG	74-10-10	48	5.6	12.0
				79-07-24	48	7.4	17.0
		ROCKBRIDGE COUNTY					
37L S1	STILLHOUSE HOLLOW	375027079093001	400PDLR	79-07-20	27	6.8	9.0

Table 6.--Chemical analysis of water from springs along the Blue Ridge Parkway, Virginia--Continued.

DATE OF SAMPLE	COLOR (PLATINUM-COBALT UNITS)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY FIELD (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)
				AUGUSTA COUNTY					
74-09-26	3	5	0	1.2	.4	.7	.6	7	.2
79-07-20	0	3	0	.7	.3	1.2	.6	3	.2
74-09-26	5	8	0	1.9	.7	.6	.4	9	.8
79-07-18	3	6	0	1.5	.6	1.2	.2	6	3.1
74-09-26	1	6	0	1.4	.7	1.1	.2	10	.3
79-07-18	3	6	0	1.6	.6	1.1	.2	8	.2
74-09-26	5	6	0	1.1	.7	.9	.2	9	.6
79-07-18	0	5	0	1.2	.6	1.0	.2	6	<1.0
79-07-09	5	10	0	2.5	1.0	1.8	.2	11	1.3
				BEDFORD COUNTY					
74-07-27	3	8	0	2.2	.7	1.0	.4	8	.8
79-07-19	0	4	0	1.1	.3	1.7	.6	7	.5
74-09-27	5	17	0	3.9	1.8	4.5	.7	28	1.2
79-07-19	3	8	0	2.4	.6	3.3	.6	13	.7
74-09-27	1	5	0	1.3	.4	.9	.7	9	.6
79-07-19	1	3	0	.8	.3	1.4	.8	6	.4
56-09-20	70	40	1	14	1.2	.9	.4	39	.7
79-07-23	0	21	16	5.9	1.6	6.0	.8	6	2.5
				FLOYD COUNTY					
79-07-25	2	3	0	.6	.4	1.1	.4	5	.4
71-10-13	2	8	4	2.0	.8	1.4	.7	5	4.0
79-07-25	3	7	0	1.8	.5	1.1	.5	7	2.5
				FRANKLIN COUNTY					
74-10-10	5	24	0	5.0	2.8	1.6	.4	30	1.6
79-07-24	1	25	0	6.2	2.4	1.8	.3	28	1.8
74-10-10	3	4	0	.8	.4	2.7	1.5	11	.2
79-07-24	0	3	0	.9	.3	1.6	1.3	6	1.3
				NELSON COUNTY					
79-07-10	2	10	0	3.1	.5	2.2	.8	11	.1
				PATRICK COUNTY					
74-10-10	5	6	0	1.4	.7	.8	.5	8	.4
79-07-25	0	7	0	1.3	.8	1.3	.5	7	.5
				ROANOKE COUNTY					
74-10-10	3	16	0	3.3	1.9	3.0	.4	23	<1.0
79-07-24	4	15	0	3.7	1.3	4.9	.7	24	3.0
				ROCKBRIDGE COUNTY					
79-07-20	2	5	0	1.4	.3	1.6	.7	6	.2

Table 6.--Chemical analysis of water from springs along the Blue Ridge Parkway, Virginia--Continued.

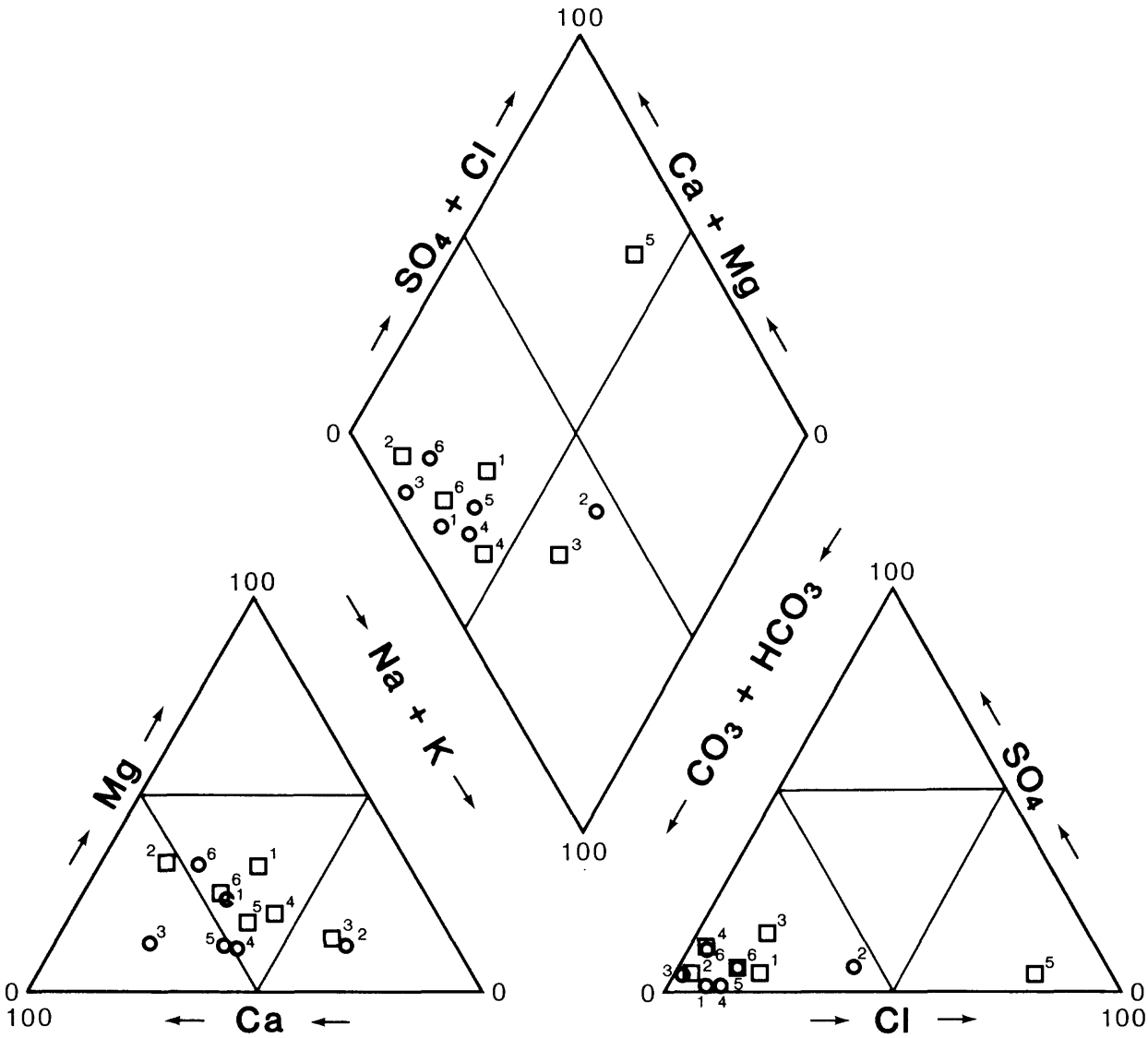
LOCAL IDENTIFIER	DATE OF SAMPLE	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)
		AUGUSTA COUNTY					
38M S1 NPS MEADOW MT SPR	74-09-26	.8	<.1	8.6	19	17	.09
	79-07-20	.5	<.1	7.8	20	14	.24
39M S1 NPS HUMPBK RCKS	74-09-26	.9	<.1	8.1	--	21	.36
	79-07-18	.6	<.1	7.5	26	20	.43
39M S2 NPS HUMPBK RCKS	74-09-26	.6	.1	10	23	20	.02
	79-07-18	.7	<.1	9.3	20	19	.14
39M S3 NPS HICKORY SPR	74-09-26	.7	<.1	8.7	20	18	.00
	79-07-18	.8	<.1	7.9	18	16	.14
39M S4 NPS HMPBK ROCK VC	79-07-09	.7	<.1	15	36	29	.01
		BEDFORD COUNTY					
34H S1 NPS BIG SPRING	74-07-27	1.2	<.1	8.5	22	21	.16
	79-07-19	1.5	<.1	7.9	34	19	.28
34H S2 NPS EDWARDS HOUSE	74-09-27	1.7	.2	24	50	55	.05
	79-07-19	1.1	.2	23	61	40	.01
34H S3 NPS HDFRMST MT SP	74-09-27	1.0	.3	10	24	21	.01
	79-07-19	1.1	<.1	9.3	20	18	.04
34JS 1NASA BEDFD, STATI	56-09-20	1.9	.0	6.0	54	49	--
	79-07-23	20	<.1	5.5	77	49	.67
		FLOYD COUNTY					
27C S2 NPS MABRY MILL	79-07-25	.7	<.1	6.7	18	14	.20
28C S1 NPS GRASSY KNOLL	71-10-13	2.4	.0	7.5	22	25	.16
	79-07-25	1.0	<.1	7.7	27	21	.45
		FRANKLIN COUNTY					
29D S1 NPS SMARTVIEW PA	74-10-10	.6	<.1	21	54	51	.01
	79-07-24	.6	<.1	18	56	48	.05
30E S1 NPS JAMES HOUSE	74-10-10	2.9	<.1	9.5	28	26	.20
	79-07-24	.9	<.1	9.3	23	21	.34
		NELSON COUNTY					
37L S2 WHETSTONE RIDGE	79-07-10	1.9	<.1	12	46	33	1.30
		PATRICK COUNTY					
27C S1 NPS RCKY KNOB CAB	74-10-10	1.0	<.1	7.2	22	18	.29
	79-07-25	1.2	<.1	6.9	24	19	.57
		ROANOKE COUNTY					
30F S1 NPS BENT MOUNTAIN	74-10-10	.7	<.1	20	47	44	.03
	79-07-24	.7	.1	24	58	53	.03
		ROCKBRIDGE COUNTY					
37L S1 STILLHOUSE HOLLOW	79-07-20	.5	<.1	11	26	22	.74

Table 6.--Chemical analysis of water from springs along the Blue Ridge Parkway, Virginia--Continued.

DATE OF SAMPLE	ARSENIC DIS-SOLVED (UG/L AS AS)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MERCURY DIS-SOLVED (UG/L AS HG)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	ZINC, DIS-SOLVED (UG/L AS ZN)
				AUGUSTA COUNTY					
74-09-26	<1	--	--	ND	20	--	--	--	75
79-07-20	<1	2	<20	2	<10	ND	<.5	<1	4
74-09-26	<1	--	--	5	<10	--	--	--	100
79-07-18	<1	ND	<20	3	<10	ND	<.5	<1	7
74-09-26	<1	--	--	8	<10	--	--	--	80
79-07-18	<1	<2	<20	ND	<10	10	<.5	<1	8
74-09-26	<1	--	--	6	<10	--	--	--	70
79-07-18	--	--	--	--	<10	--	--	--	--
79-07-09	--	--	--	--	<10	--	--	--	--
				BEDFORD COUNTY					
74-07-27	<1	--	--	2	60	--	--	--	80
79-07-19	--	--	--	--	<10	--	--	--	--
74-09-27	<1	--	--	4	50	--	--	--	85
79-07-19	--	--	--	--	<10	--	--	--	--
74-09-27	<1	--	--	3	<10	--	--	--	80
79-07-19	--	--	--	--	<10	--	--	--	--
56-09-20	--	--	--	--	0	--	--	--	--
79-07-23	2	<2	<20	67	<10	4	<.5	<1	3
				FLOYD COUNTY					
79-07-25	--	--	--	--	<10	--	--	--	--
71-10-13	--	0	--	0	20	2	--	--	10
79-07-25	--	--	--	--	<10	--	--	--	--
				FRANKLIN COUNTY					
74-10-10	<1	--	--	4	<10	--	--	--	90
79-07-24	<1	ND	<20	ND	<10	6	<.5	<1	4
74-10-10	<1	--	--	40	<10	--	--	--	310
79-07-24	<1	<2	<20	<2	<10	2	<.5	<1	2
				NELSON COUNTY					
79-07-10	--	--	--	--	<10	--	--	--	--
				PATRICK COUNTY					
74-10-10	<1	--	--	4	<10	--	--	--	80
79-07-25	<1	<2	<20	ND	<10	27	<.5	<1	<2
				ROANOKE COUNTY					
74-10-10	<1	--	--	9	<10	--	--	--	100
79-07-24	--	--	--	--	<10	--	--	--	--
				ROCKBRIDGE COUNTY					
79-07-20	--	--	--	--	<10	--	--	--	--

Table 6.--Chemical analysis of water from springs along the Blue Ridge Parkway, Virginia--Continued.

DATE OF SAMPLE	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P)	PHOSPHATE, ORTHO, DISSOLVED (MG/L AS PO4)
		AUGUSTA COUNTY	
74-09-26	<.010	<.010	.00
79-07-20	.010	<.010	.00
74-09-26	<.010	.010	.03
79-07-18	.010	.030	.09
74-09-26	<.010	<.010	.00
79-07-18	.010	.010	.03
74-09-26	<.010	<.010	.00
79-07-18	.010	.010	.03
79-07-09	<.010	.040	.12
		BEDFORD COUNTY	
74-07-27	<.010	.010	.03
79-07-19	.010	.040	.12
74-09-27	<.010	.080	.25
79-07-19	.010	.120	.37
74-09-27	<.010	<.010	.00
79-07-19	.010	.030	.09
56-09-20	--	--	--
79-07-23	.010	<.010	.00
		FLOYD COUNTY	
79-07-25	.010	.010	.03
71-10-13	--	--	.00
79-07-25	<.010	.010	.03
		FRANKLIN COUNTY	
74-10-10	<.010	<.010	.00
79-07-24	<.010	.020	.06
74-10-10	<.010	.040	.12
79-07-24	.010	.010	.03
		NELSON COUNTY	
79-07-10	<.010	.060	.18
		PATRICK COUNTY	
74-10-10	.010	<.010	.00
79-07-25	<.010	.010	.03
		ROANOKE COUNTY	
74-10-10	<.010	.040	.12
79-07-24	.010	.020	.06
		ROCKBRIDGE COUNTY	
79-07-20	.010	.020	.06



EXPLANATION

o^6 Well and plot number $\square^5$ Spring and plot number

PLOT NUMBER	WELL NUMBER	PLOT NUMBER	SPRING NUMBER
1	25B2	1	27GS1
2	28C6	2	29DS1
3	29D1	3	30ES1
4	34H2	4	30FS1
5	34H3	5	34JS1
6	36J6	6	39MS2

Figure 5.--Chemical quality of water from selected wells and springs along the Blue Ridge Parkway, Virginia.

Comparison of analyses from springs and wells shows that water from springs generally has lower dissolved solids and less calcium and bicarbonate than waters from wells which are cased to solid rock. Analyses from wells with shallow surface casing set in partially weathered rock show that the water is similar to that of springs.

SUMMARY AND CONCLUSIONS

There is sufficient ground water available of suitable quality for public supply at all major recreation areas along the Blue Ridge Parkway in Virginia.

The only source of recharge to the area is from precipitation, which averages 42 inches per year. There is virtually no surface or ground water inflow into the area because most of the Parkway lies along the crest of the Blue Ridge Mountains.

The saprolite, which ranges in thickness from less than 5 feet to more than 100 feet, forms a ground-water reservoir that slowly releases water to openings in the underlying rocks and to the local streams. The overall ground-water flow is from the higher altitudes of the ridges and hilltops toward the lower altitudes in the draws and valleys. The valleys and draws act as local collecting areas for ground water moving from the highlands to the lowlands. Thus, configuration of the water table reflects, but is a more subdued version, of the local topography.

Topographic and geologic structure are important criteria to be considered in selecting a well site. Good areas for well development are in the valleys and draws. Other good areas are at the base of ridges or peaks where a relatively thick section of alluvial and talus deposits overlie saprolite and (or) bedrock, along faults or contact between different rock units.

Fair areas for wells are along the lower moderate slopes of peaks, knobs and stream valleys, especially those where thick sections of saprolite may be present, in gaps between knobs and along valleys of intermittent streams and draws in the highlands.

Spring discharge varies with time and physical setting. Springs near hilltops and crests of ridges have an increase in flow from local precipitation but this flow declines rapidly within hours after precipitation ceases. Springs along lower slopes generally have higher yields and less variation in discharge with time.

The chemical quality of ground water is suitable for public supply; it is low in dissolved solids iron and is soft. Analyses for arsenic, cadmium, chromium, copper, lead and zinc are below the limits set for public supplies by the U.S. Environmental Protection Agency. Water from springs generally has lower dissolved solids and less calcium and bicarbonate than water from uncased in rock.

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SUPPLEMENTAL DATA

DESCRIPTION OF MAPS SHOWING AREAS FAVORABLE FOR GROUND-WATER DEVELOPMENT AND FIGURES 7-61 AND TABLES 7-8

DESCRIPTION OF MAP SECTIONS

A total of 55 map sections (figs. 7-61) covering the Parkway from its northern end at Rockfish Gap to the North Carolina-Virginia border were extracted from 1:24,000-scale (1 inch = 2000 feet) U.S. Geological Survey 7.5 minute quadrangles. The miles values in the figure captions refer to the interval between Rockfish Gap and the North Carolina-Virginia border. An index map showing the location of each of these map sections along the Parkway is provided in figure 6.

The text accompaning each map describes the local geology and defines the favorable areas for developing ground-water supplies. The meaning of good and fair areas for developing a ground-water supply (as defined in the section "Potential Well Sites") is limited to those areas within the Parkway boundaries. Good areas for wells were delineated based on proximity to a valley with a perennial stream, contact between rock units and (or) faults; moderate slopes of adjoining highlands with a relatively thick overburden of saprolite; or where a thick overburden of talus and alluvial deposits overlay saprolite and (or) bedrock (as at Peaks of Otter Recreation area). Fair areas were delineated based on proximity to valleys with intermittent streams and draws on a relatively steep slope of adjoining highlands. The discussions of the local geology are taken from previously published reports on the Blue Ridge Mountains of Virginia.

A generalized correlation of rock units along the Blue Ridge Parkway shown on figures 7-61 is given in table 7. The rocks along the Parkway range in age from Precambrian to Quaternary, and most, with the exception of the Quarternary rocks, have been metamorphosed to some degree.

A description of each rock unit shown on figures 7-61 is given in table 8. The descriptions are arranged from youngest, Quaternary to oldest, Pre-Cambrian.

The Ashe Formation of Espenshade and others (1975) and shown on figures 43-51, is considered equivalent in part to the Lynchburg Formation of Stose and Stose (1957).

Hydrologic data for wells and springs referenced in the following map sections are given in tables 3 and 4 respectively and quality of water data are given in tables 5 and 6 respectively.

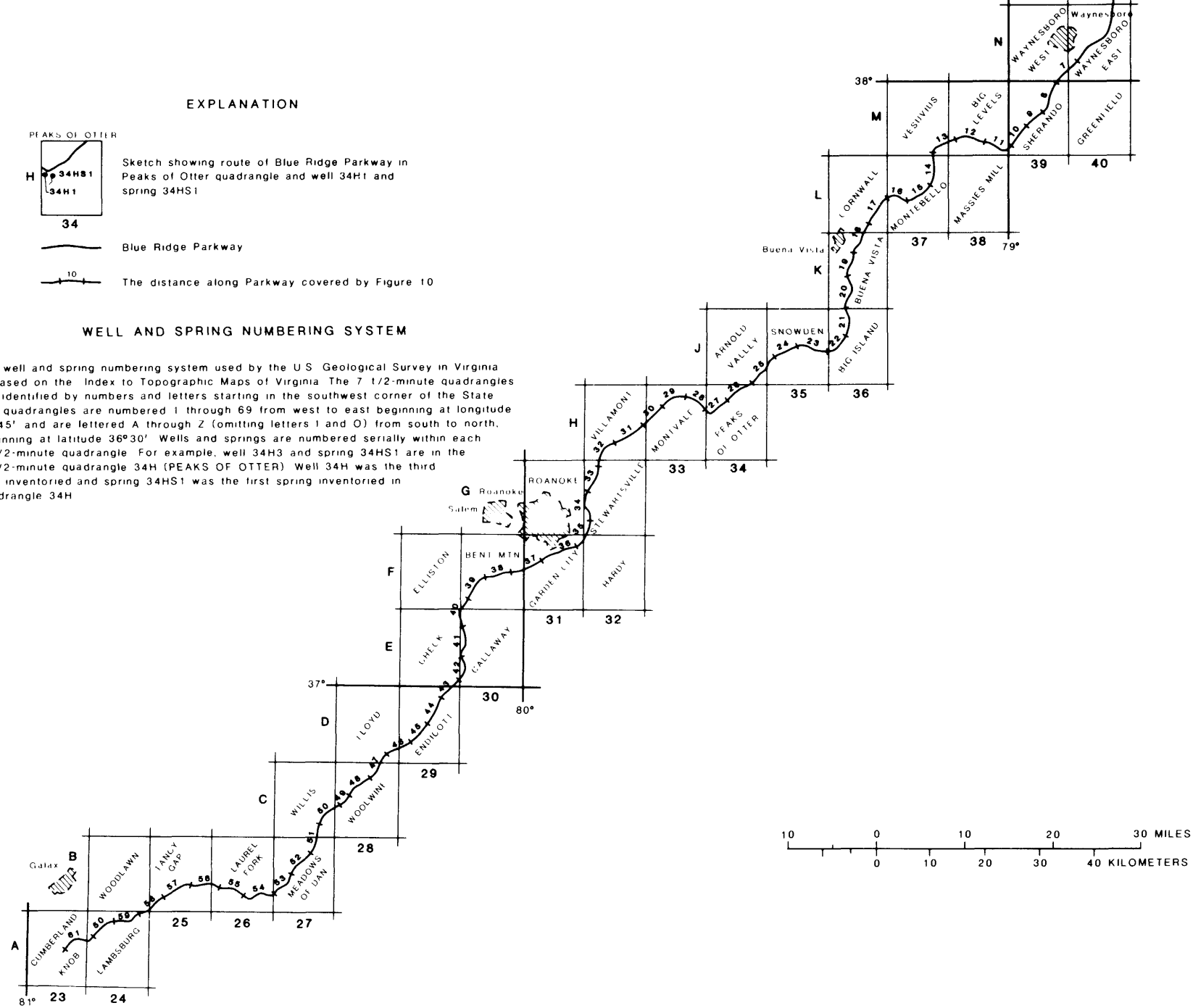


Figure 6.--Index map showing location of map section along the Blue Ridge Parkway, Virginia.

Table 7.--Generalized correlation of map (or rock units) units along Blue Ridge Parkway (see figures 9 - 63) in Virginia.
(Compiled and modified from Bartholomew, 1977, Calver and others, 1963, Espenshade and others, 1975, Gaithright and others, 1977, Spencer, 1968; stratigraphic order of some units is uncertain.)

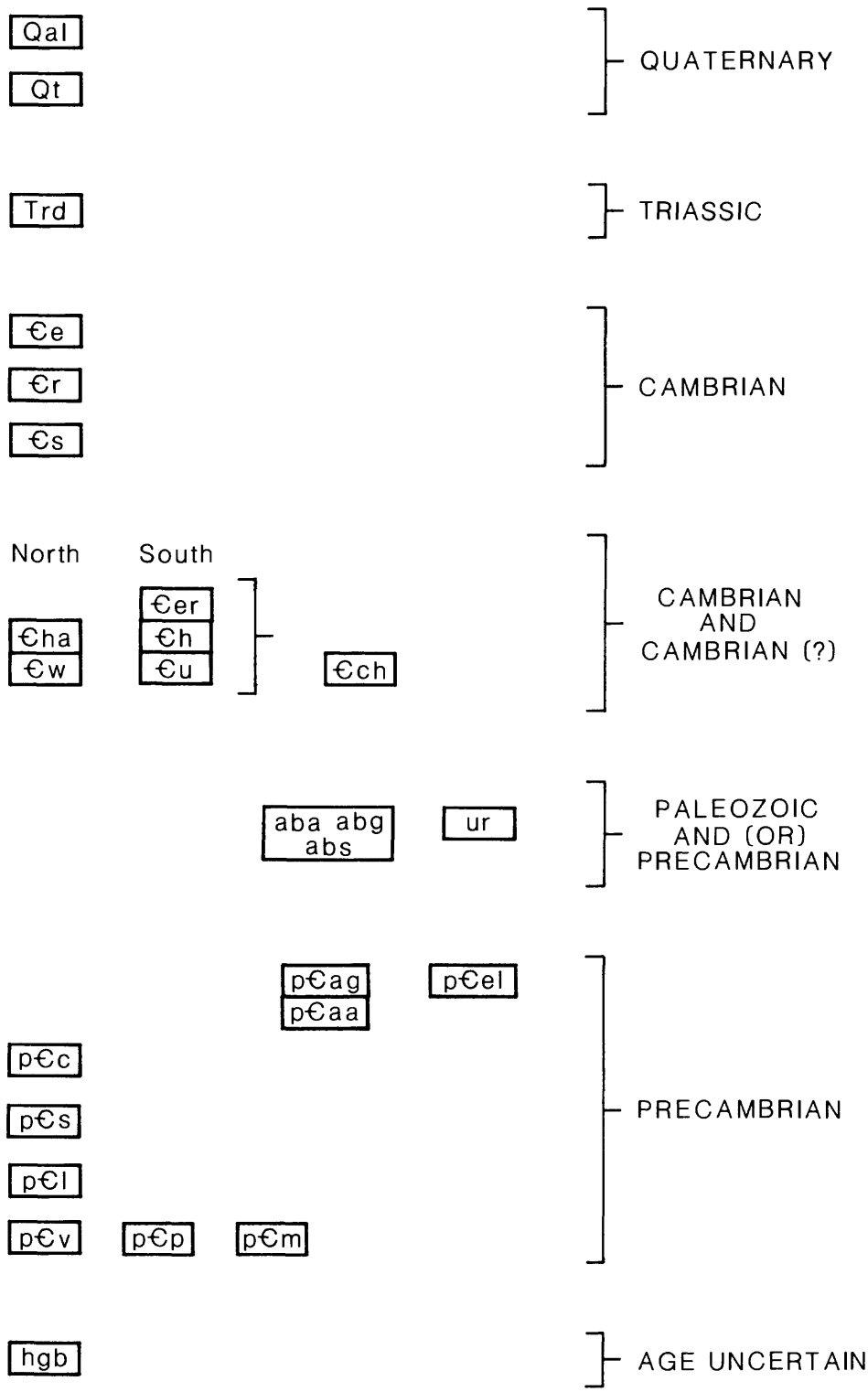


Table 8.-- Description of rocks along the Blue Ridge Parkway, Virginia.

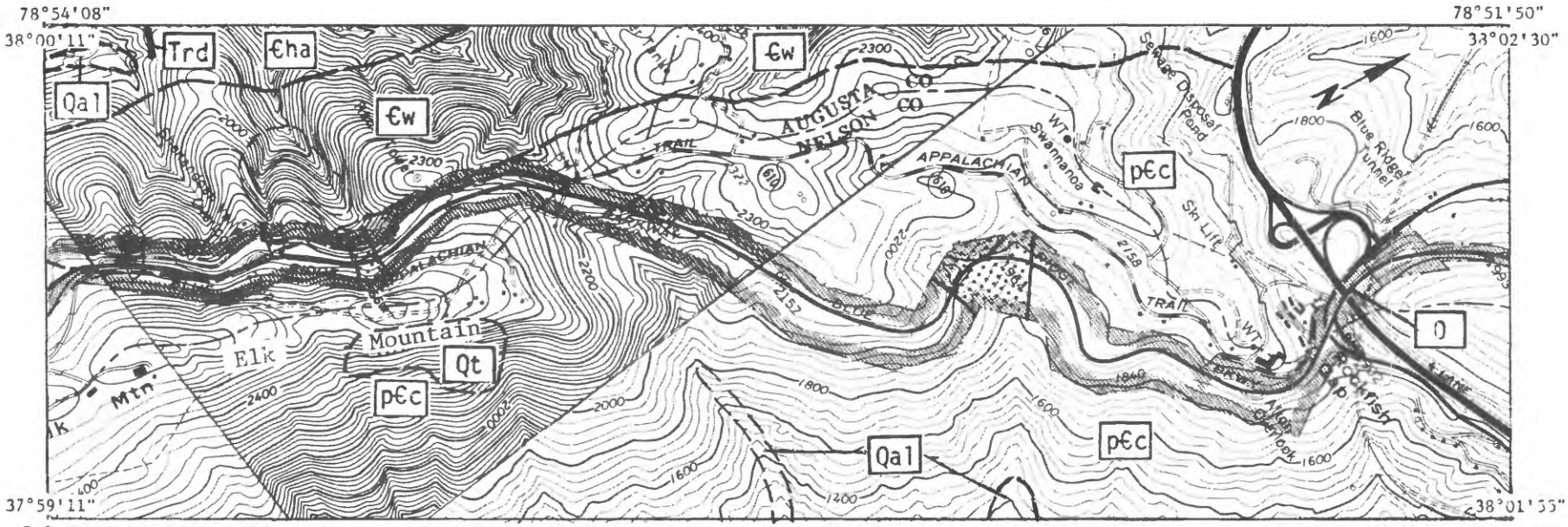
Qal	ALLUVIUM (QUATERNARY)--Sand, cobbles, rounded boulders, and angular blocks along upland streams. (From Gathright and others, 1977)
Qt	TALUS DEPOSITS (QUATERNARY)--Cobble boulders, and angular blocks on a sand matrix. (From Gathright and others, 1977)
Trd	DIABASE DIKES (TRIASSIC)--Dark greenish to black diabase; predominantly composed of labradorite and augite. (From Gathright and others, 1977)
€e	ELBROOK FORMATION (CAMBRIAN)--Dolomite thick bedded, shaly, argillaceous, some limestone. (From Calver and others, 1963)
€r	ROME FORMATION (CAMBRIAN)--Shale and sandstone, variegated with dolomite. (From Calver and others, 1963)
€s	SHADY DOLOMITE (CAMBRIAN)--Dolomite, thick bedded with some limestone. (From Calver and others, 1963)
€ch	CHILHOWEE GROUP (CAMBRIAN AND CAMBRIAN?)--Includes Erwin, Hampton, and Unicoi Formations. (From Calver and others, 1963)
€ha	HARPERS FORMATION OF THE CHILHOWEE GROUP (CAMBRIAN?)--Green to bluish-gray, quartz-chlorite-sericite phyllite with thin to massive interbeds of grayish-green to bluish-gray metamorphosed sandstone; light-tan, prominent quartzite and ferruginous, metamorphosed sandstone. (From Gathright and others, 1977)
€w	WEVERTON FORMATION OF THE CHILHOWEE GROUP (CAMBRIAN?)--Weathering light-brown to green phyllite; coarse-grained, reddish-purple, metamorphosed ferruginous sandstone and light-gray pebble quartzite; laminated green or dark purple gray phyllite locally at base. (From Gathright and others, 1977)
€er	ERWIN FORMATION OF THE CHILHOWEE GROUP (CAMBRIAN)--Sandstone and quartzite, thick bedded well sorted, grayish to white sand. (From Calver and others, 1963)
€h	HAMPTON FORMATION OF THE CHILHOWEE GROUP (CAMBRIAN ?)--Sandstone, shale, and quartzite. Equivalent to the Harpers formation. (From Calver and others, 1963)

Table 8.--Description of rocks along the Blue Ridge Parkway, Virginia--Continued.

Cu	UNICOI FORMATION OF THE CHILHOWEE GROUP (CAMBRIAN?)-- Conglomerate shale and quartzite with basalt flows. (From Calver and others, 1963)
aba	ALLIGATOR BACK FORMATION (PALEOZOIC and/or PRECAMBRIAN)-Amphibolite, garnet amphibolite, and greenstone interlayered with biotite-muscovite gneiss and metapelite. (From Espenshade and others, 1975)
abg	LAMINATED GNEISS OF THE ALLIGATOR BACK FORMATION (PALEOZOIC and/or PRECAMBRIAN)--Typically finely laminated gneiss composed of quartzo-feldspathic layers a few millimeters thick separated by very thin micaceous partings; "pinstripe" appearance. Thicker schist or phyllite and amphibolite or greenstone layers are common. Some massive gneiss layers and micaceous granule conglomerate; largest occurrences of conglomerate are shown by small circles on map. Gneiss is generally more micaceous than similar units in the Ashe Formation. Epidote, magnetite, and tourmaline are common, locally abundant constituents. Calcsilicate lenses are locally abundant. (From Espenshade and others, 1975)
abs	MICA SCHIST OF THE ALLIGATOR BACK FORMATION (PALEOZOIC and/or PRECAMBRIAN)--Mica schist or phyllite typically contains garnet and magnetite, both of which are locally abundant. Interlayered with minor biotite-muscovite gneiss and amphibolite. Phyllite is commonly graphitic. Some chlorite-muscovite schist containing albite porphyroblasts. (From Espenshade and others, 1975)
ur	ULTRAMAFIC ROCK (PALEOZOIC and/or PRECAMBRIAN)--Mainly chlorite-tremolite-magnetite schist that commonly contains either serpentine or talc; has relict olivine locally. Most bodies were probably emplaced tectonically. (From Espenshade and others, 1975)
pCag	ASHE FORMATION (UPPER PRECAMBRIAN)--Typically fine-grained thinly layered sulfidic biotite-muscovite gneiss interlayered with varying amounts of mica schist or phyllite and minor amphibolite. Gneiss layers as thick as five feet predominate locally. Gneissic conglomerate containing granule to pebble-size quartz and feldspar detritus is common; largest occurrences of conglomerate are shown on map by small circles. (From Espenshade and others, 1975)
pCaa	AMPHIBOLITE GNEISS OF THE ASHE FORMATION (UPPER PRECAMBRIAN--Amphibolite, garnet amphibolite, and interlayered biotite-muscovite gneiss and mica schist. Mostly metamorphosed mafic volcanic rock but includes thinly layered amphibolite of uncertain origin and coarser grained rock that may be of shallow intrusive origin. (From Espenshade and others, 1975)

Table 8.--Description of rocks along the Blue Ridge Parkway, Virginia--Continued.

p€el	LITTLE RIVER GNEISS OF DIETRICH, 1959 (PRECAMBRIAN)--Porphyritic phase (augen gneiss) relatively more common. (From Espenshade and others, 1975)
p€c	CATOCTIN FORMATION (PRECAMBRIAN)--Fine-grained, dark greenish-gray chlorite-epidote-albite schist; massive schistose metabasalt and amygdaloidal metabasalt; fine-grained, light greenish-gray epidosite; coarse-grained, massive epidote-quartz breccia; greenish-gray metatuff; mottled greenish-purple phyllitic metatuff; and medium- to coarse-grained, light-green, metamorphosed lithic sandstone. (From Gathright and others, 1977)
p€s	SWIFT RUN FORMATION (PRECAMBRIAN)--Medium- to coarse-grained, tan-weathering, light- to greenish-gray quartz-sericite schist and quartz-sericite-chlorite schist; some schistose, metamorphosed lithic sandstone. (From Gathright and others, 1977)
p€l	LYNCHBURG FORMATION (PRECAMBRIAN)--Phyllite, quartzite, graywacke and conglomerate. (Modified from Calver and others, 1963)
p€v	VIRGINIA BLUE RIDGE COMPLEX (PRECAMBRIAN)--Includes the Pedlar Formation of Bloomer and Werner, 1955, and Marshall Formation of Jonas, 1928. (From Calver and others, 1963)
p€p	PEDLAR FORMATION OF BLOOMER AND WERNER, 1955 (PRECAMBRIAN)--Granite, granodiorite, hypersthene granodiorite, syenite, quartz diorite anorthosite and unakite. (Part of the Virginia Blue Ridge complex.) (From Calver and others, 1963)
p€m	MARSHALL FORMATION OF JONAS, 1928 (PRECAMBRIAN)--Biotite, quartz, feldspar, granite and quartz monzonite. (Part of the Virginia Blue Ridge complex.) (From Calver and others, 1963)
hgb	HORNBLENDE GABBRO AND GNEISS: TALC (AGE UNCERTAIN)--Amphibolite chlorite schist, chloritic hornblende gneiss, and some amphibolite, chloritic diorite and hornblende diorite and kyanite schist and kyanite quartzite. (From Calver and others, 1963)



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CONTOUR INTERVAL 20 and 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- Qal — Alluvium
- Qt — Talus Deposit
- Trd — Diabase Dike
- €ha — Harper's Formation--Phyllite with thin to massive interbeds of metamorphosed sandstone.
- €w — Weverton Formation--Phyllite and coarse-grained metamorphosed sandstone.
- p€c — Catoctin Formation--Schist, metabasalt, quartz breccia and metamorphosed sandstone.

— — — Approximate boundary between rock units

— · — Boundary of the Blue Ridge Parkway

— – — Boundary between counties

3 — NPS Milepost

Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 7.--Rockfish Gap area (Miles 0.0 to 3.5).

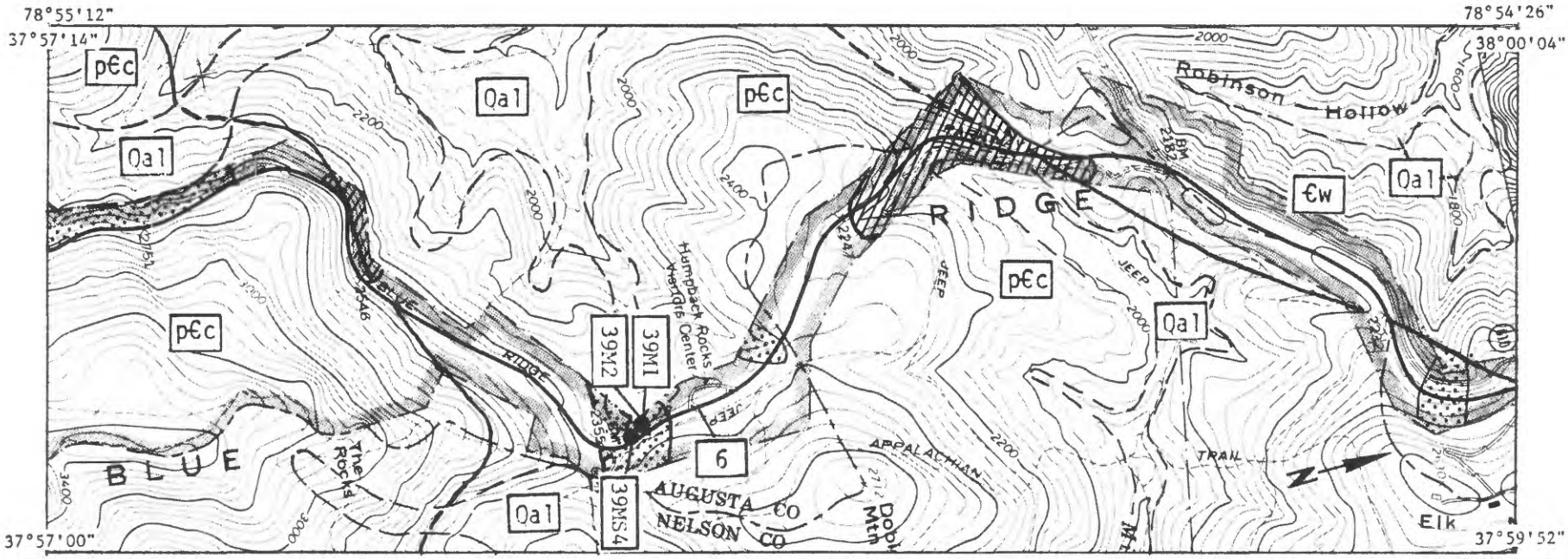
Rockfish Gap area (Miles 0 to 3.5).--The Blue Ridge Parkway begins at Rockfish Gap just south of Waynesboro at the southern terminus of the Skyline Drive, Augusta County, central Virginia.

From Rockfish Gap, the Parkway ascends from an altitude of about 1,900 feet to about 2,400 feet above sea level along the flank of Elk Mountain just beyond Shenandoah Valley Overlook. The Parkway continues at about this altitude to the end of this section.

There are two overlooks with parking facilities along this section--Afton at mile 0.2 and Shenandoah Valley at mile post 2.9.

The rocks along this section of the Parkway are a dark greenish-gray schist and light-green lithic sandstone of the Catoctin Formation. Except in outcrops where they are generally highly weathered, all of these rocks are covered by saprolite. Talus deposits are present along the length of the Parkway at the base of cliffs on distant ridges.

There are several fair areas for developing a ground-water supply within the Parkway boundaries along this section. All but one of the areas are located along the northwestern flank of Elk Mountain. These areas are located in valleys that act as collecting areas for ground-water moving from higher points along Elk Mountain toward the adjoining lowlands.



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CONTOUR INTERVAL 20 AND 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- Qal — Alluvium
- €w — Weverton Formation--Phyllite and coarse-grained metamorphosed sandstone.
- p€c — Catoctin Formation--Schist, metabasalt, quartz breccia and metamorphosed lithic sandstone.

- Fault-Dashed where approximately located
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 6 — NPS Milepost

- Good area for wells
- Fair area for wells
- 39M1 — Well and local no.
- 39MS4 — Spring and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 8.--Humpback Rocks area (Miles 3.5 to 7.7).

Humpback Rocks area (Miles 3.5 to 7.7).--The Parkway continues southwest from Elk Mountain along the western flank of Dobie Mountain through Humpback Gap to Humpback Mountain. The Parkway ascends from an altitude of about 2,400 feet to about 2,800 feet above sea level along this section.

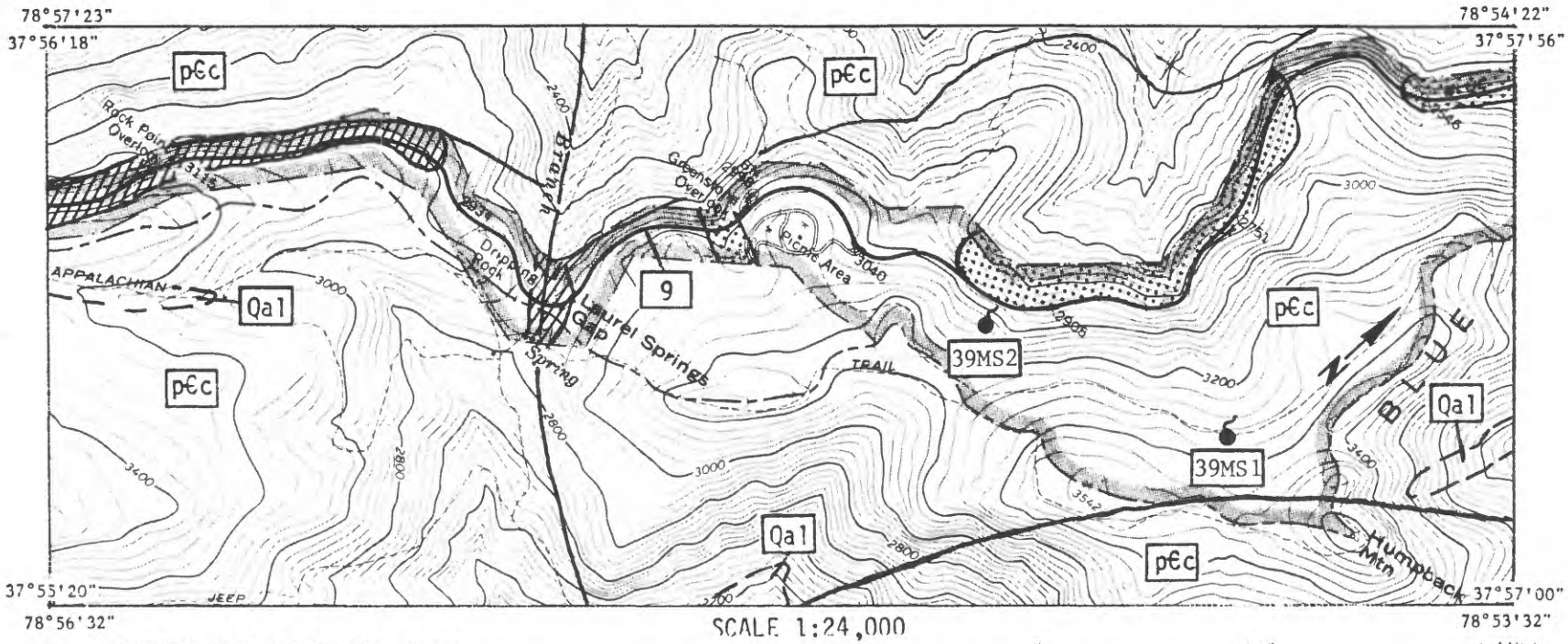
The entrance to Humpback Rocks Visitor Center and Pioneer Exhibit is at mile 5.8. A self-guiding trail from the visitor center to the pioneer exhibit and a reconstructed mountain farmstead are located here.

The rocks west of the fault in the northwestern part of this section are a dark greenish-brown to brown sandstone of the Weverton Formation. The rocks in the rest of this section are a dark greenish-gray schist and light-green lithic sandstone of the Catoctin Formation. Except in outcrop along road cuts where they are highly weathered, all of these rocks are covered by saprolite. In the valleys the saprolite is generally overlain by a veneer of alluvium. Unnamed faults cross the Parkway in the northern and southern parts of this section.

Two wells, 39M1 and 2, and spring 39MS4 are located at the Pioneer Exhibit area of the Humpback Rocks Visitor Center. Well 39M1 is the supply well for the visitor center, well 39M2 is unused. Spring 39MS4 was used as a domestic supply by early settlers.

Both the wells and the spring are located in a draw below the saddle at Humpback Gap. A saddle, as used here, is a low point on a ridge or crest line, generally a divide between the heads of streams flowing in opposite directions. (Trowbridge and others, editors, 1960). Ground-water flows toward this draw from the higher elevations along Dobie Mountain to the north and Humpback Mountain to the south.

There are a number of good and fair areas for developing a ground-water supply within the Parkway boundaries along this section. Good areas are along the faults that cross the Parkway in the northern and southern parts of this section. All of the wells and springs inventoried along this section are located in fair areas.



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CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

Qal — Alluvium

p€c — Catoctin Formation--Schist, metabasalt, quartz breccia and metamorphosed lithic sandstone.

Fault-Dashed where approximately located

Approximate boundary between rock units

Boundary of the Blue Ridge Parkway

Boundary between counties

9 — NPS Milepost

Good area for wells

Fair area for wells

39MS2 — Spring and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 9.--Laurel Springs Gap area (Miles 7.7 to 10.7).

Laurel Springs Gap area (Miles 7.7 to 10.7).--The Parkway continues southwest ascending to about 3,200 feet above sea level just beyond Rock Point Overlook.

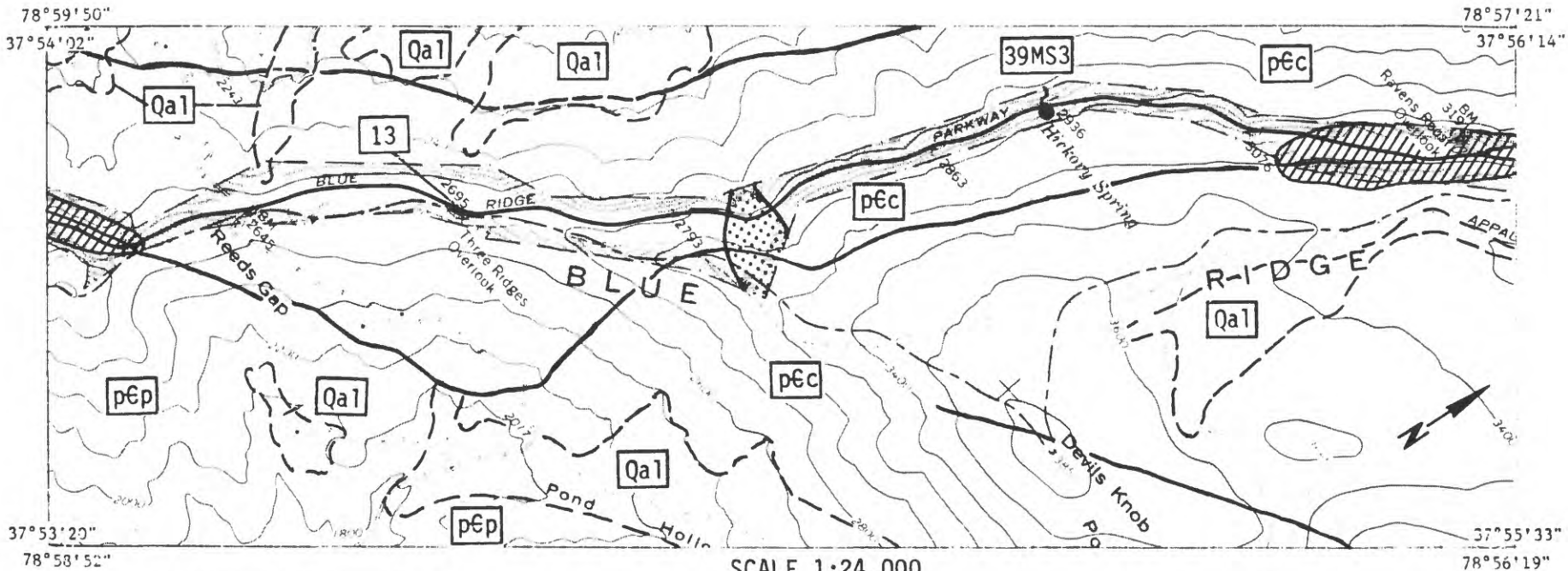
The entrance to Humpback Rock picnic area is at mile 8.4 near the middle of this section.

The rocks along this section of Parkway are a dark greenish-gray schist and light-green lithic sandstone of the Catoctin Formation overlain by saprolite. In outcrop they are generally highly weathered. A veneer of alluvium is present in many of the valleys.

There are several unnamed faults. One of these, a northwest trending fault, crosses the Parkway at Laurel Gap and offsets a northeast trending fault just west of the Parkway.

Two springs, 39MS1 and 2, are located on the west slope of Humpback Mountain. The combined flow from these springs is used as a supply for the Humpback Rocks picnic area. Ground water flows toward these springs from the higher elevations along Humpback Mountain.

Good areas for developing a ground-water supply within the Parkway boundaries are along the fault which parallels the Parkway at the end of this section and where the fault crosses the Parkway at Laurel Springs Gap. Fair areas for wells are at the Greenstone Overlook and picnic area and along the western flank of Humpback Mountain near the beginning of this section.



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0 1/2 1 MILE

0 1/2 1 KILOMETER

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

EXPLANATION

- Qal — Alluvium
- pЄc — Catoctin Formation--Schist, metabasalt, quartz breccia and metamorphosed lithic sandstone.
- pЄp — Pedlar Formation--Granite
- Fault-Dashed where approximately located
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 13 — NPS Milepost
- Good area for wells
- Fair area for wells
- 39MS3 — Spring and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 10.--Reeds Gap area (Miles 10.7 to 14.2).

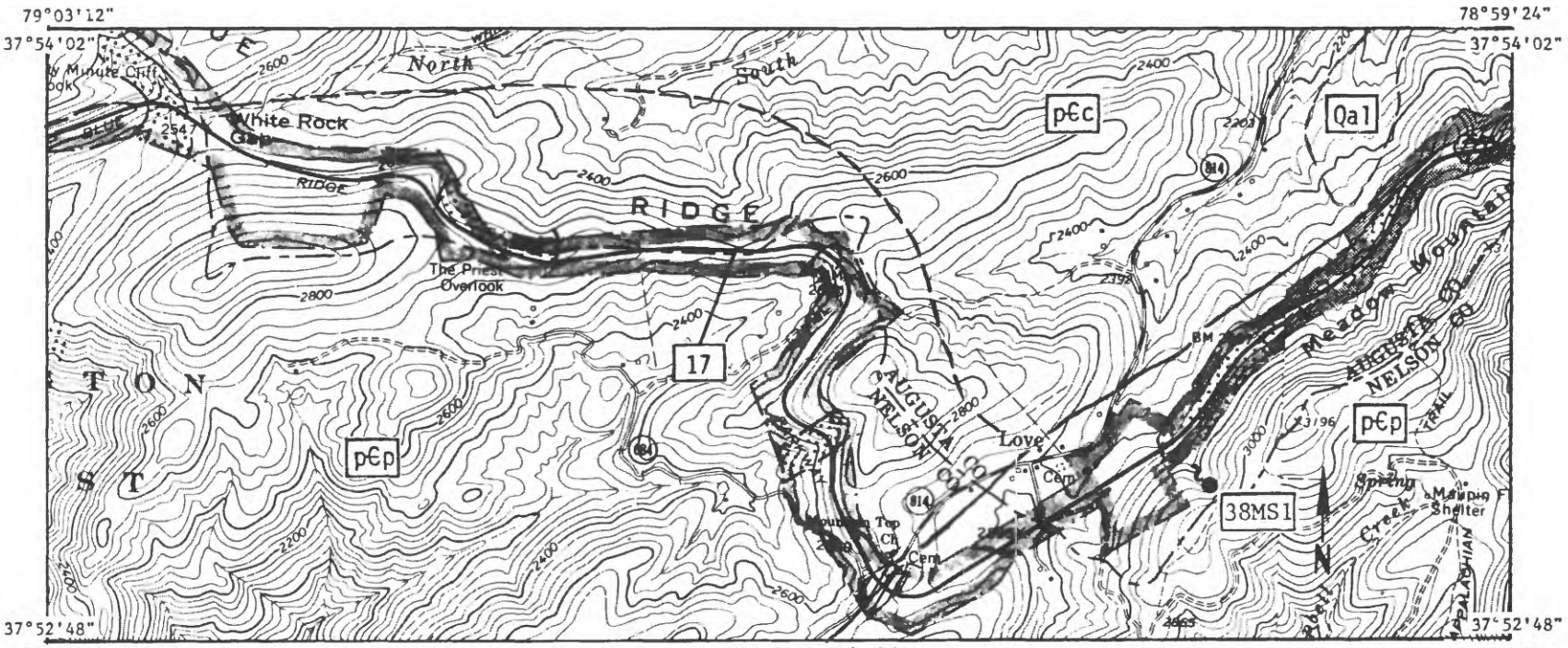
Reeds Gap area (Miles 10.7 to 14.2).--The Parkway continues southwest descending from about 3,200 feet above sea level to about 2,640 feet near the end of this section. The altitude at Reeds Gap is about 2,645 above NGVD.

There are two overlooks with parking facilities--Ravens Roost near the beginning at mile 10.7 and Three Ridges at mile 13.1 just before Reeds Gap.

The rocks along this section of the Parkway are offset by several faults. The fault to the southeast of the Parkway is a continuation of the fault shown on the previous section. Northeast of this fault the rocks are a dark greenish-gray schist of the Catoctin Formation and to the southeast a dark greenish-gray granite of the Pedlar Formation. Except in outcrops along road cuts, such as at Hickory Spring all of these rocks are covered by saprolite. Landslide deposits may be seen along the slopes to the southeast near the end of this section.

Hickory Spring, 39MS3, is located on the southeast side of the Parkway along the west slope of Devils Knob. Ground-water flow toward this spring is from the higher elevations along Devils Knob.

Good areas for developing a ground-water supply within the Parkway boundaries are along the fault which crosses the Parkway near the beginning and end of this section. Fair areas occur along the west slope of Devils Knob.



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0 1/2 1 MILE

0 1/2 1 KILOMETER

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

EXPLANATION

- Qal — Alluvium
- pЄc — Catoctin Formation--Schist, metabasalt, quartz breccia and metamorphosed sandstone.
- pЄp — Pedlar Formation--Granite
- Fault-Dashed where approximately located
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 17 — NPS Milepost
- Good area for wells
- Fair area for wells
- 38MS1 — Spring and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 11.--White Rock Gap area (Miles 14.2 to 18.8).

White Rock Gap area (Miles 14.2 to 18.8).--The Parkway continues southwest along the crest of the Blue Ridge but makes a sharp turn to the north near the community of Love just north of the Augusta-Nelson County line for about 0.9 of a mile before turning west. The Parkway is relatively level along this section. The highest point is about 2,700 feet above sea level at the Priest Overlook.

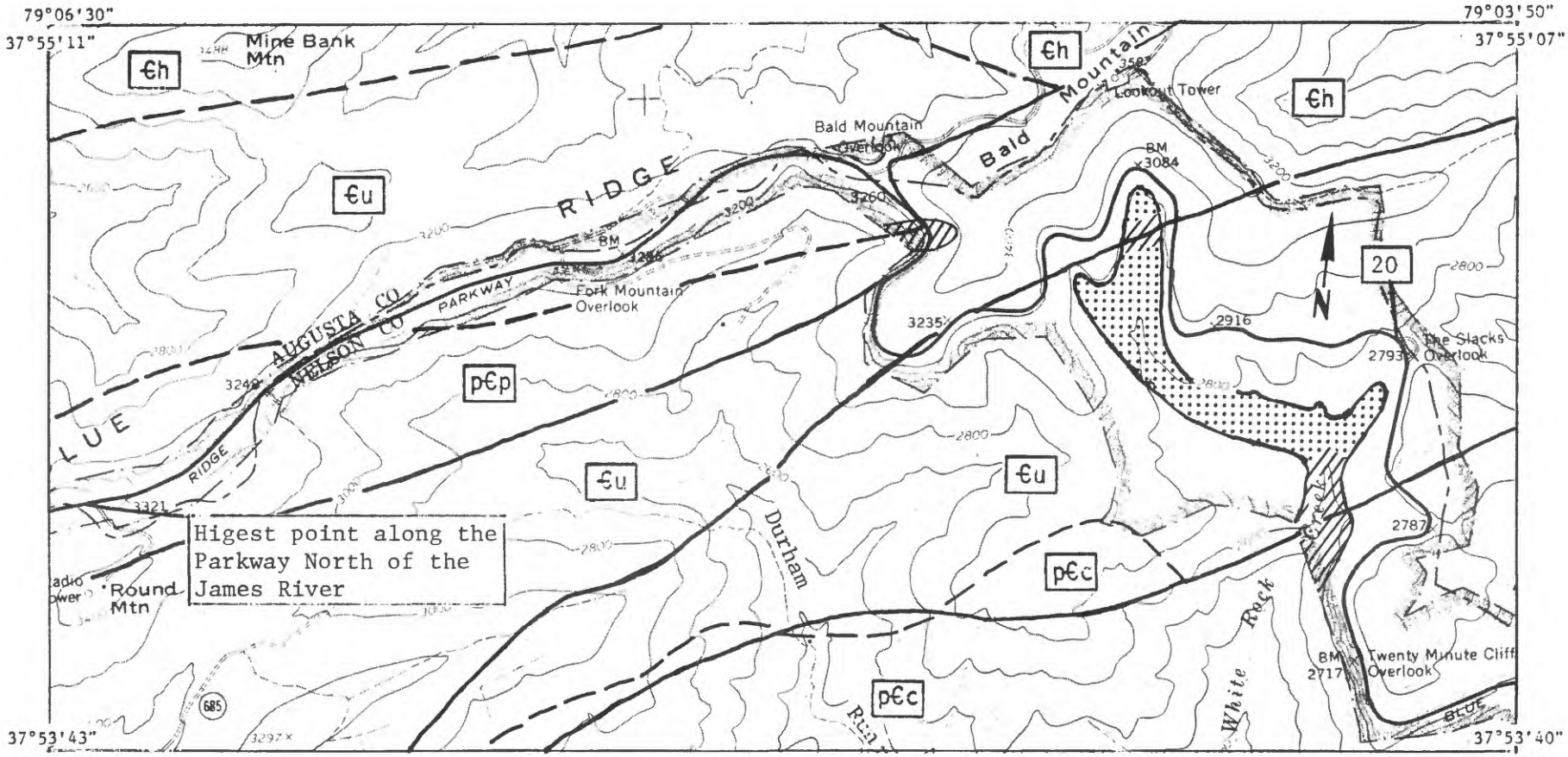
The Priest Overlook with parking facilities is located near the middle of this section at mile 17.6. Sherando Lake in George Washington National Forest, which has swimming, picnicking and camping facilities is about 4.5 miles to the north along State Route 814.

The rocks along this section of the Parkway are a dark greenish-gray granite of the Pedlar Formation. Except in outcrop along roadcuts and in open fields, these rocks are covered by saprolite. There is some alluvium present in the valleys.

The fault paralleling the Parkway from Meadow Mountain to near Mountain Top Church is a continuation of the fault crossed by the Parkway at Reeds Gap on the previous map.

Spring 38MS1 is located along the northwest slope of Meadow Mountain and is the supply for the Love submaintenance area. Ground-water flow toward this spring is from the higher elevations along Meadow Mountain.

Good areas for wells within the Parkway boundaries are along the fault that parallels the Parkway, just below the crest of Meadow Mountain near the beginning of this section. Fair areas for wells are along the northwestern flank at Meadow Mountain and near the Priest Overlook and White Rock Gap.



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CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- €h — Hampton Formation--Sandstone, shale and quartzite
- p€p — Pedlar Formation--Granite.
- €u — Unicoi Formation--Conglomerate, shale, and quartzite with lava flows
- p€c — Catoctin Formation--Schist, metabasalt, quartz breccia and metamorphosed sandstone.

- Fault
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 20 — NPS Milepost

- Good area for wells
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

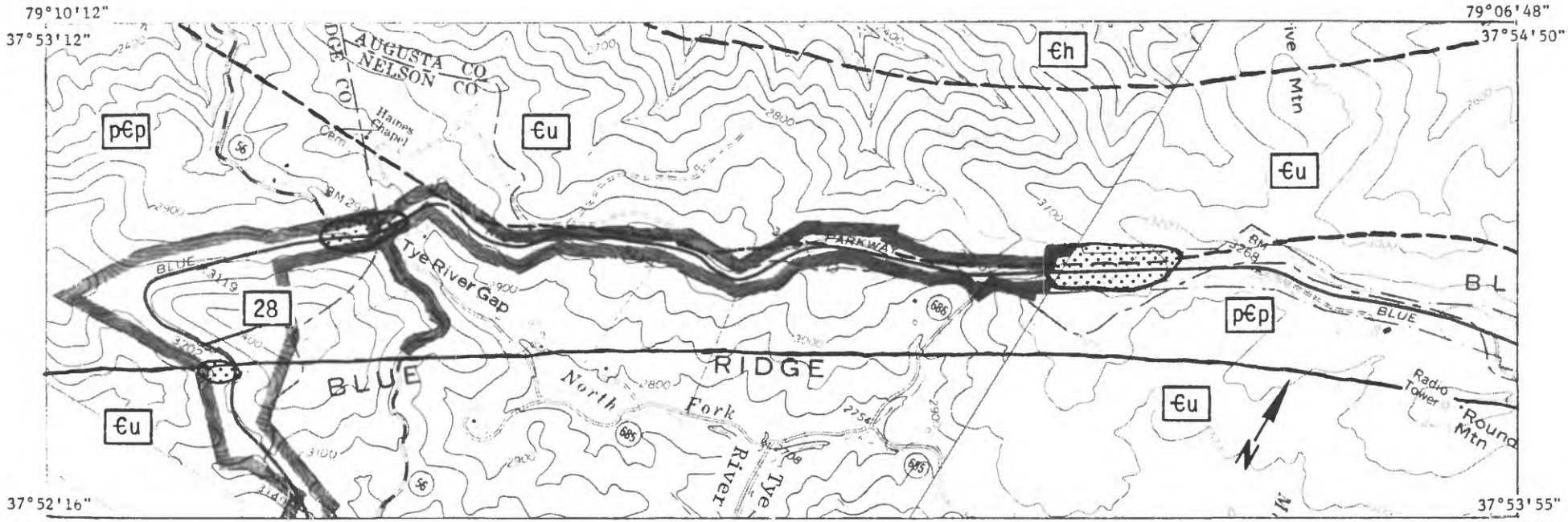
Figure 12.--Bald Mountain area (Miles 18.8 to 24.4).

Bald Mountain area (Miles 18.8 to 24.4).--The Parkway ascends from about 2,640 feet to about 3,320 feet above sea level. The Parkway turns north along the crest of the Blue Ridge from Twenty Minute Cliff Overlook to the Stacks Overlook where it turns west following the valley of White Rock Creek, along the south slope of Bald Mountain. From the Bald Mountain Overlook the Parkway trends southwest to the end of this section. The highest point along the Parkway north of the James River, 3,334 feet above sea level, is at the access road to the radio tower on top of Round Mountain at the end of this section.

There are four overlooks with parking facilities along this section--Twenty Minute Cliff at mile 19, The Stacks at mile 19.9, Bald Mountain at mile 22.2 and Fork Mountain at mile 23.

The rocks along this section are a dark greenish-gray schist, sandstone and pebble conglomerate of the Catoctin Formation. A number of faults cross the Parkway between Twenty Minute Cliff Overlook near the beginning of this section and Bald Mountain Overlook about midway along this section.

Good areas for wells within the Parkway boundaries are along the fault traces in the valleys of White Rock Creek near the beginning of this section and Durhan Run near the middle of this section.



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0 1/2 1 MILE

0 1/2 1 KILOMETER

CONTOUR INTERVAL 20 AND 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

EXPLANATION

- Єh — Hampton Formation--Sandstone, shale and quartzite
- Єu — Unicoi Formation--Conglomerate, shale, and quartzite with lava flows
- pЄp — Pedlar Formation--Granite.

- Fault
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 28 — NPS Milepost

Fair area for wells

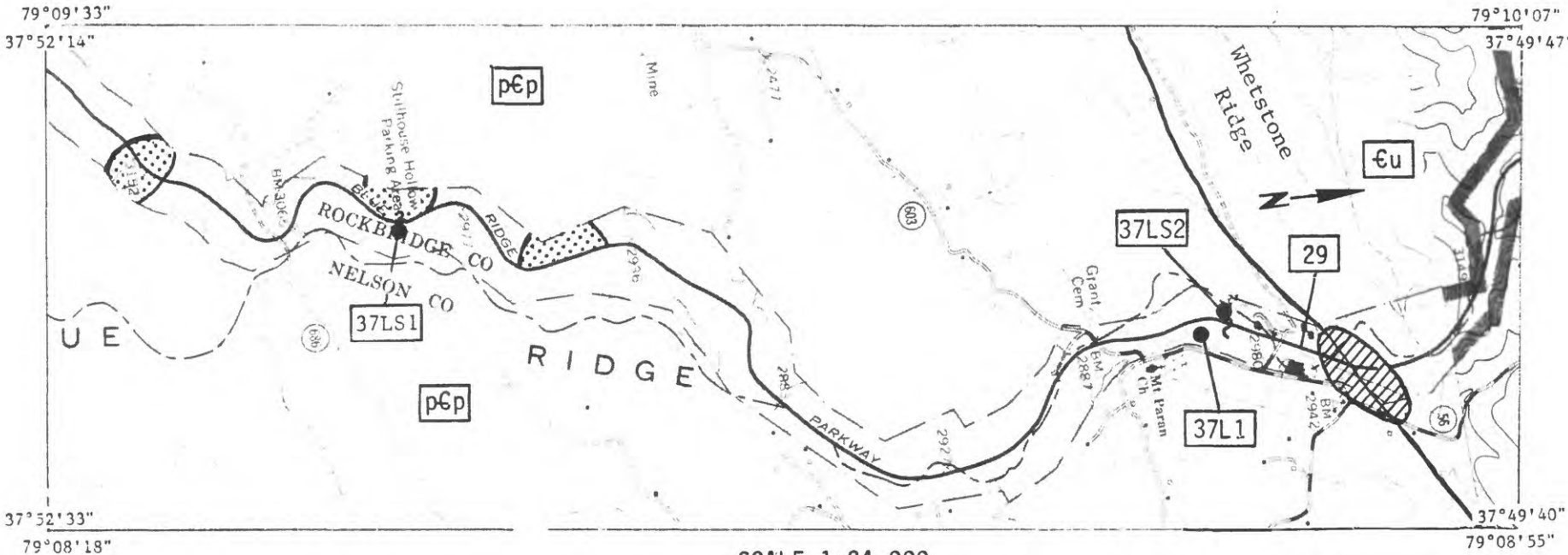
See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 13.--Tye River Gap area (Miles 24.4 to 28.5).

Tye River Gap area (Miles 24.4 to 28.5).--The Parkway continues southwest along the crest of the Blue Ridge to just beyond Tye River Gap where it swings sharply to the southwest. The Parkway descends from about 3,320 feet to about 3,000 feet above sea level along this section. There are no recreation areas or overlooks along this section.

The Parkway throughout most of this section follows the contact between the dark-gray granite of the Pedlar Formation and undifferentiated conglomerate, shale and quartzite with lava flows of the Unicoi Formation.

Good areas for wells are outside the Parkway boundaires in the valleys of tributaries to the Tye River and are not delineated. Fair areas for wells are near the middle of this section and at Tye River Gap near the end of this section.



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0 1/2 1 MILE

0 1/2 1 KILOMETER

CONTOUR INTERVAL 20 AND 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

EXPLANATION

- Єu — Unicoi Formation--Conglomerate, shale, and quartzite with lava flows
- pЄp — Pedlar Formation--Granite.
- Fault
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 29 — NPS Milepost
- Good area for wells
- Fair area for wells
- 37L1 — Well and local No.
- 37LS1 — Spring and local No.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 14.--Stillhouse Hollow area (Miles 28.5 to 32.6).

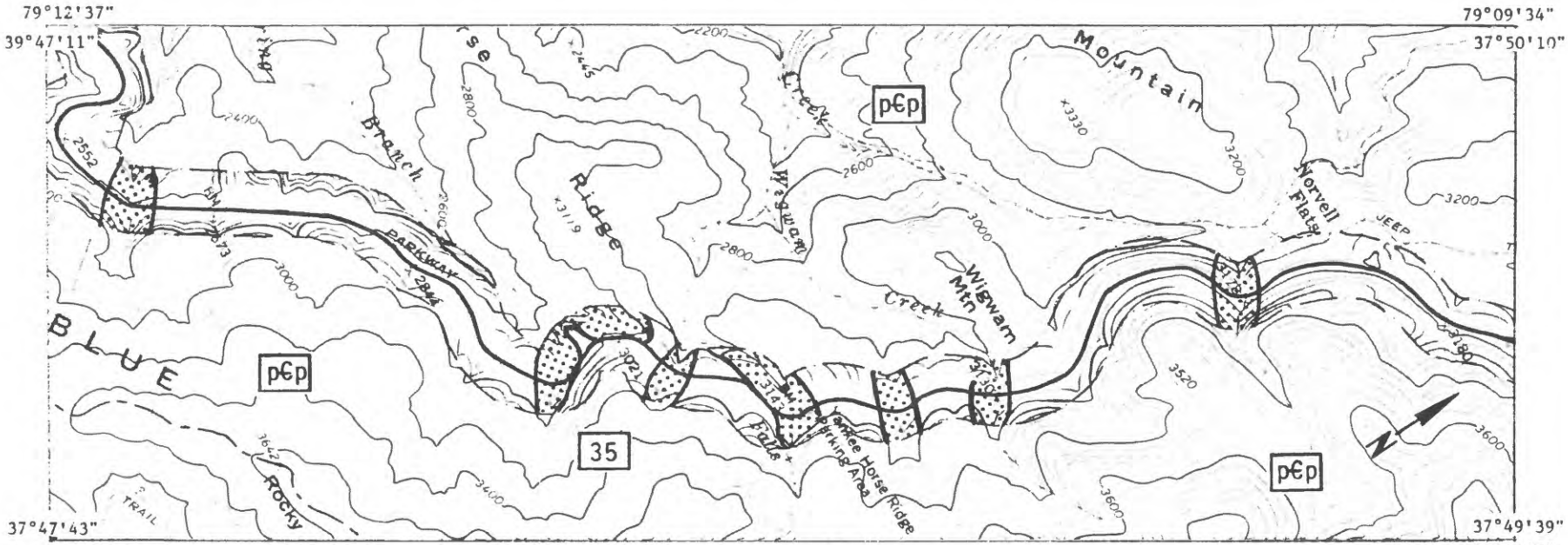
Stillhouse area (Miles 28.5 to 32.6).--The Parkway trends south-southwest along this section at an altitude of about 3,000 feet above sea level. Variation in altitude is less than 200 feet. The community of Montebello is just east of the Parkway on State Route 56.

A restaurant and service station are located at Whetstone Ridge at about mile 29. Stillhouse Hollow parking area is near the end of this section.

The rocks south of the fault crossing the Parkway near mile 29 are a light to dark-gray granite of the Pedlar Formation; north of the fault the rocks are a light-gray undifferentiated conglomerate, shale and quartzite with lava flows of the Unicoi Formation.

Spring 37LS2 and well 37L1 are in a draw just west of the Parkway near the Whetstone Ridge service area. Spring 37LS2 was abandoned as a water supply when well 37L1 was drilled in 1967. This well had a measured yield of 60 gallons per minute (gpm) when drilled. Spring 37LS1 is located on the west flank of an unnamed knob at the Stillhouse Hollow Overlook near the end of this section.

Good areas for wells are along the fault just south of Whetstone Ridge near the beginning of this section. Fair area for wells are near the end of this section.



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CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

pЄp Pedlar Formation--Granite.

Boundary of the Blue Ridge Parkway

Boundary between counties

35 NPS Milepost

Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

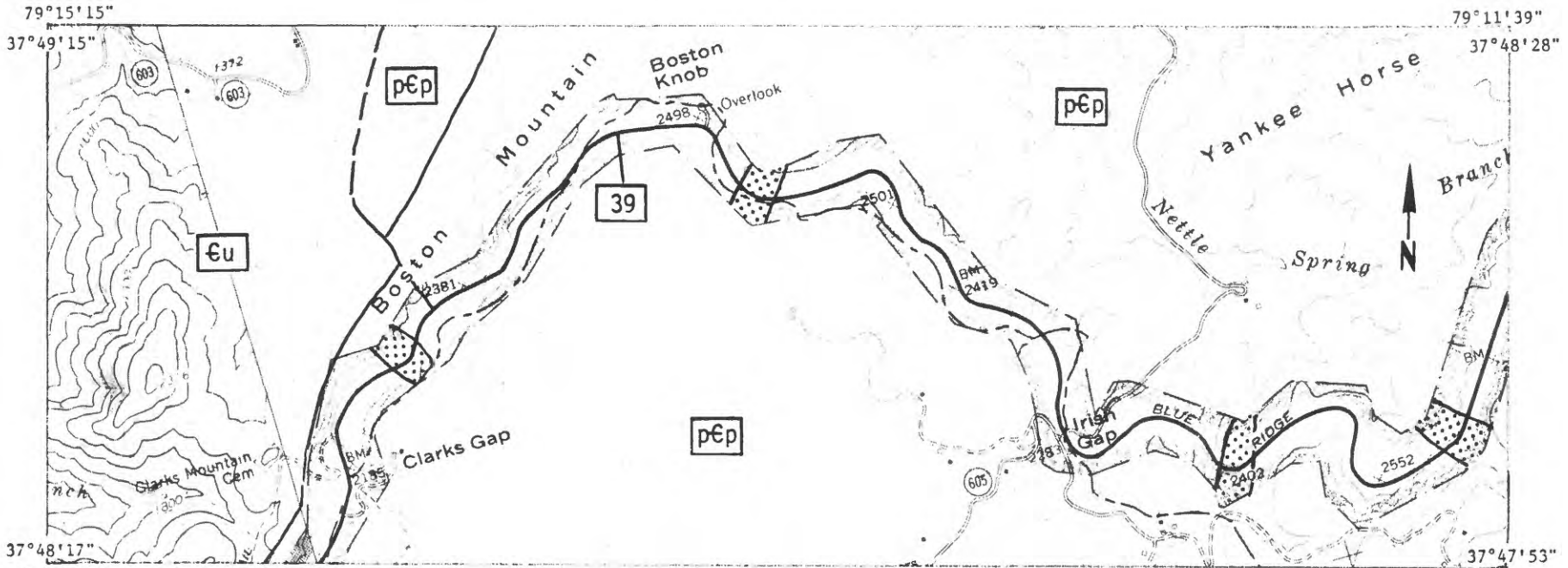
Figure 15.--Wigwam Mountain area (Miles 32.6 to 36.8).

Wigwam Mountain area (Miles 32.6 to 36.8).--The Parkway trends southwest along this section and descends from about 3,180 feet above sea level near Painter Mountain to about 2,470 feet above sea level at the end of this section.

The Yankee Horse Ridge parking area, with a foot trail to Wigwam Falls and reconstructed spur of a logging railroad, is located at mile 34.4, midway along this section.

The rocks along this section of the Parkway are a light to dark-gray granite of the Pedlar Formation.

There are no good areas for wells but there are a number of fair areas in the valley of small streams draining the ridges just east of the Parkway.



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CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

Єu — Unicoi Formation--Conglomerate, shale, and quartzite with lava flows.

pЄp — Pedlar Formation--Granite.

Fault-Dashed where approximately located

Boundary of the Blue Ridge Parkway

Boundary between counties

39 — NPS Milepost

Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

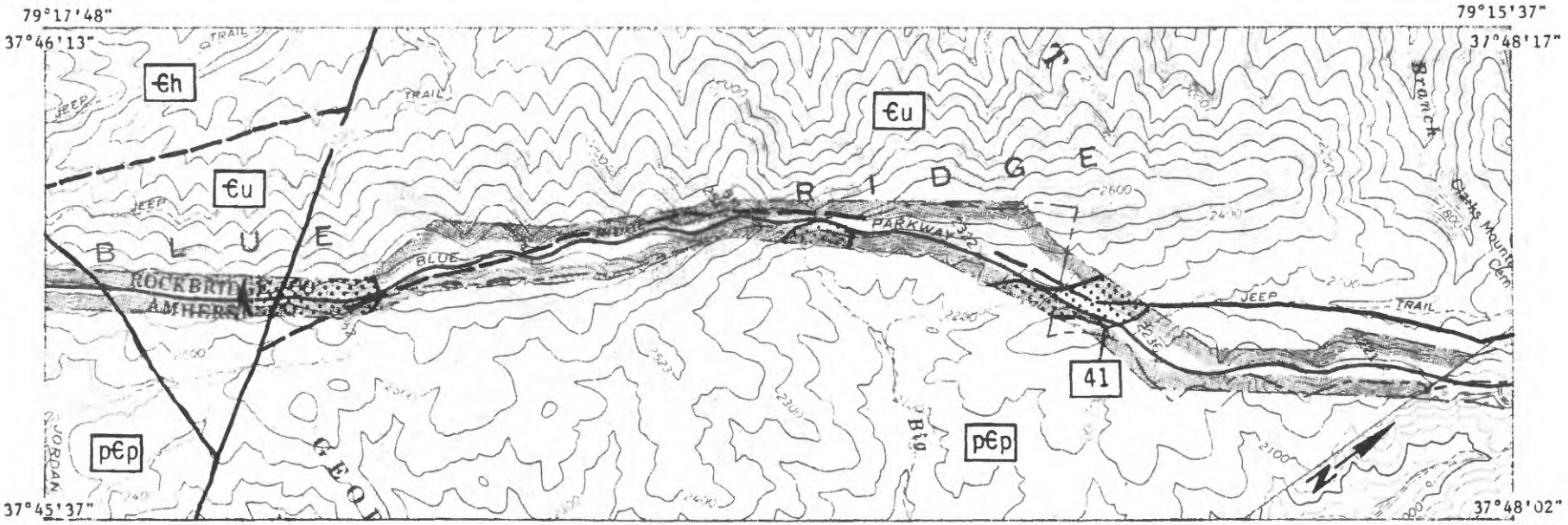
Figure 16.--Boston Knob area (Miles 36.8 to 40.2).

Boston Knob area (Miles 36.8 to 40.2).-- The Parkway turns to the northwest at Irish Gap and continues in this direction to Boston Knob, where it swings back to the southwest along the crest of Boston Mountain. The highest point along this section is at Boston Knob Overlook about 2,500 feet above sea level.

The entrance to Boston Knob Overlook and foot trail is at mile 38.8.

The rocks along this section are a light to dark-gray granite of the Pedlar Formation. Along the western slope of Boston Mountain the rocks are undifferentiated conglomerate, shale and quartzite with lava flows of the Unicoi Formation. An unnamed fault parallels the Parkway for about the last mile of this section. Just northeast of Clarks Gap, this fault is offset by a northwest trending fault.

There are no good areas for wells along this section. Fair areas for wells are in the valleys of tributaries to Nettle Spring Branch near the beginning of this section and just northeast of Clarks Gap near the end of this section.



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CONTOUR INTERVAL 20 AND 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- €h — Hampton Formation--Sandstone, shale and quartzite.
- €u — Unicoi Formation--Conglomerate, shale, and quartzite with lava flows.
- p€p — Pedlar Formation--Granite.

- Fault
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 41 — NPS Milepost
- Fair area for wells

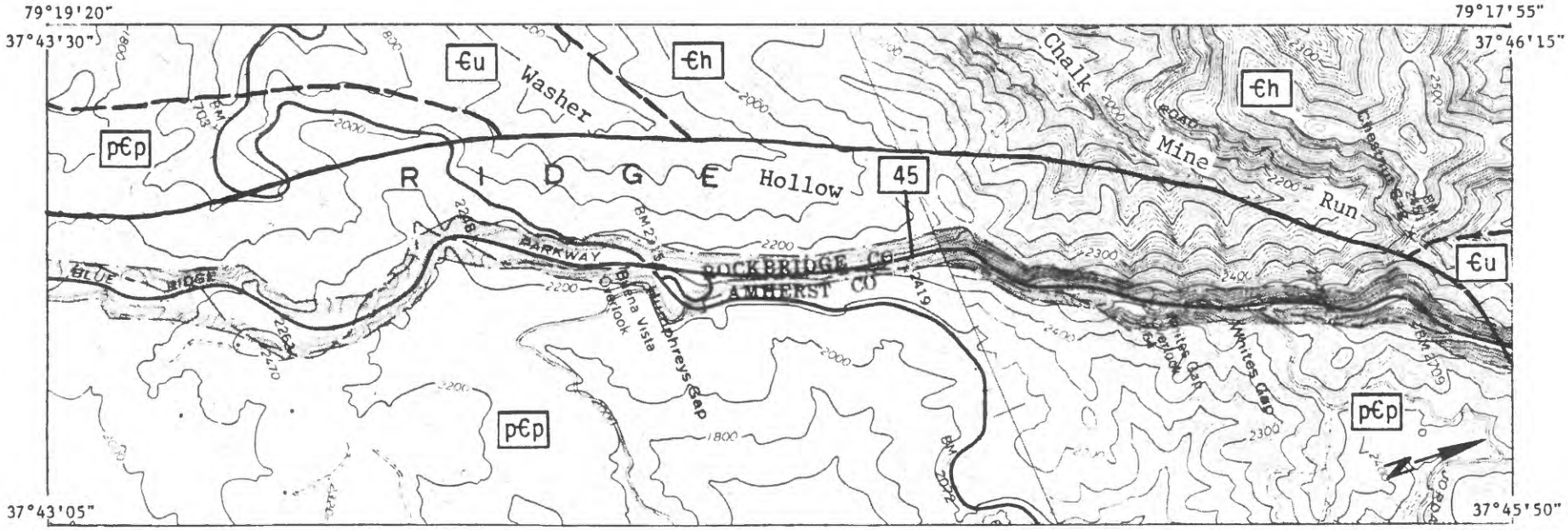
See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 17.--Coates Mountain area (Miles 40.2 to 43.6).

Coates Mountain area (Miles 40.2 to 43.6).-- The Parkway continues southwest along the crest of the Blue Ridge ascending from about 2,200 feet to about 2,700 feet above sea level. Coates Mountain lies to the northwest of this section. There are no recreation areas or overlooks.

Throughout most of this section the Parkway follows the contact between rocks of the Pedlar and Unicoi Formations. The granite of the Pedlar Formation is to the southwest and the undifferentiated conglomerate, shale and quartzite with lava flows of the Unicoi Formation are to the northwest. Near the end of this section, rocks of the Unicoi Formation are exposed on both sides of the Parkway within the triangle shaped area between the faults.

There are no good areas for wells along this section within the Parkway boundaries. Fair areas for wells are near the middle and end of this section.



SCALE 1:24,000

CONTOUR INTERVAL 20 AND 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- €h — Hampton Formation--Sandstone, shale and quartzite.
- €u — Unicoi Formation--Conglomerate, shale, and quartzite with lava flows.
- p€p — Pedlar Formation--Granite.

- Fault
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 45 — NPS Milepost

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

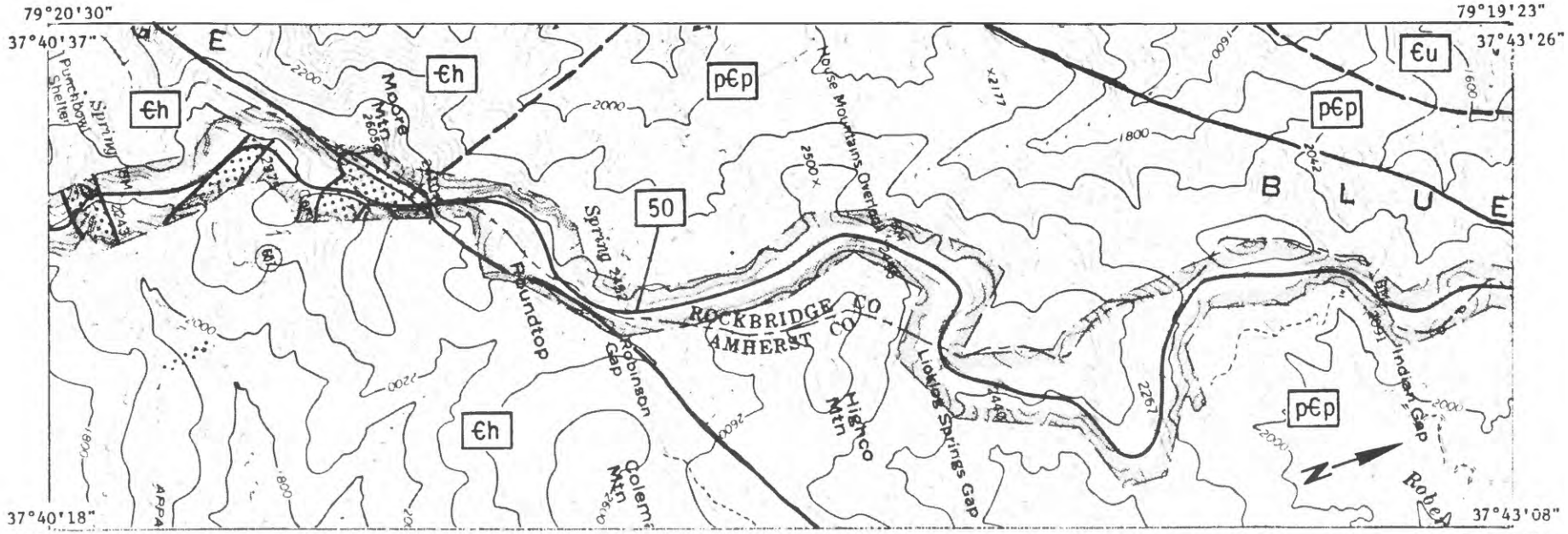
Figure 18.--Humphreys Gap area (Miles 43.6 to 47.1).

Humphreys Gap area (Miles 43.6 to 47.1).--The Parkway continues southwest along the crest of the Blue Ridge descending from about 2,700 feet to about 2,200 feet above sea level.

There are two parking overlooks along this section, Whites Gap at mile 44.4 and Buena Vista at mile 45.7. Buena Vista is located about four miles west of the Parkway along US 60.

The rocks in the vicinity of the Parkway are light to dark-gray granite of the Pedlar Formation. West of the fault paralleling the Parkway the rocks are undifferentiated sandstone, shale and quartzite of the Hampton and Unicoi Formations.

There are no good or fair areas for wells within the Parkway boundaries. The best areas for wells are along the fault in the valleys of Chalk Mine Run, Washer Hollow, and the unnamed tributary south of Washer Hollow with the latter two being the most accessible.



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0 1/2 1 MILE

0 1/2 1 KILOMETER

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

EXPLANATION

€u Unicoi Formation--Conglomerate, shale, and quartzite with lava flows.

€h Hampton Formation--Sandstone, shale and quartzite

pЄp Pedlar Formation--Granite.

Fault

Approximate boundary between rock units

Boundary of the Blue Ridge Parkway

Boundary between counties

50 NPS Milepost

Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

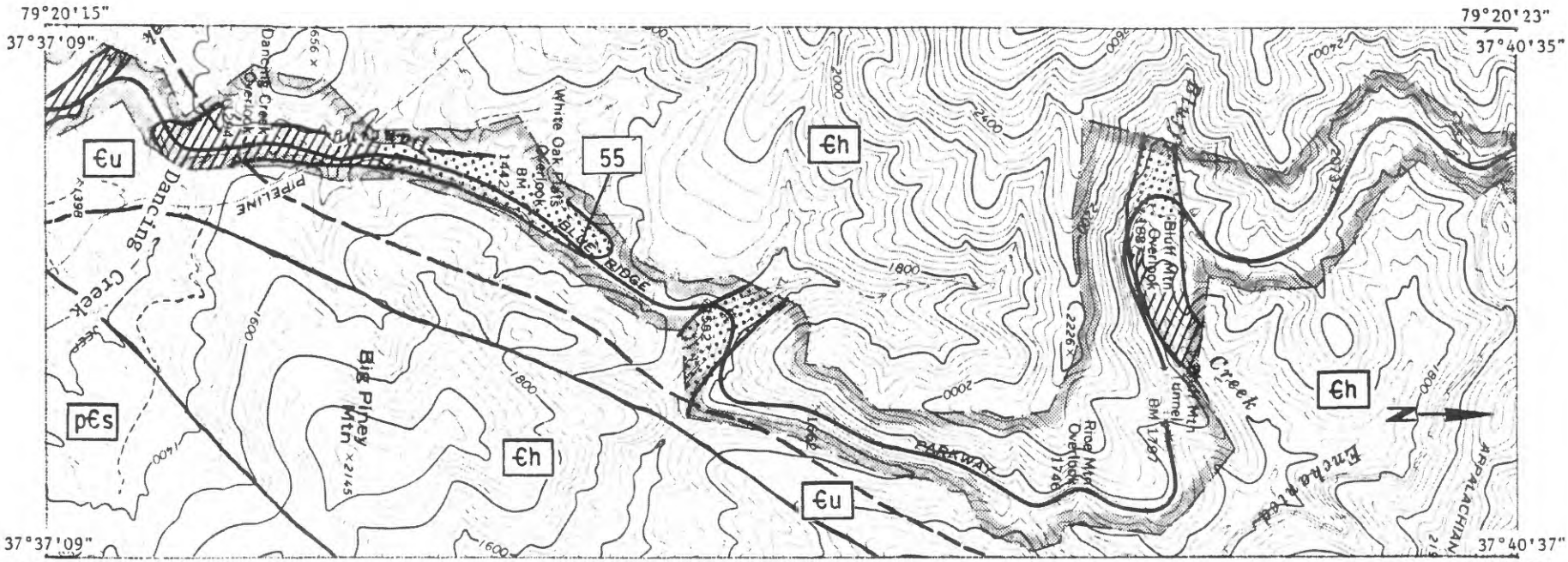
Figure 19.--Highco Mountain area (Miles 47.1 to 51.5).

Highco Mountain area (Miles 47.1 to 51.5).-- The Parkway continues southwest along the crest of the Blue Ridge ascending from about 2,120 feet above sea level near Indian Gap, to about 2,200 feet at the south end of this section.

House Mountain Overlook is at mile 49.3.

The rocks in the vicinity of the Parkway throughout most of this section are granite of the Pedlar Formation. South of the northeast trending fault near the end of this section the rocks are undifferentiated sandstone, shale and quartzite of the Hampton Formation. The fault just west of the Parkway near the beginning of this section is a continuation of the fault shown on the previous section.

There are no good areas for wells within the Parkway boundaries. A fair area for wells is on the southeast flank of Moore Mountain at the intersection of the fault which separates the rocks of the Pedlar and Hampton Formations.



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0 1/2 1 MILE

0 1/2 1 KILOMETER

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

EXPLANATION

€h Hampton Formation--Sandstone, shale and quartzite.

€u Unicoi Formation--Conglomerate, shale, and quartzite with lava flows.

pCs Swift Run Formation--Sandstone, graywacke and greenstone

Fault

Approximate boundary between rock units

Boundary of the Blue Ridge Parkway

Boundary between counties

55 NPS Milepost

Good area for wells

Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

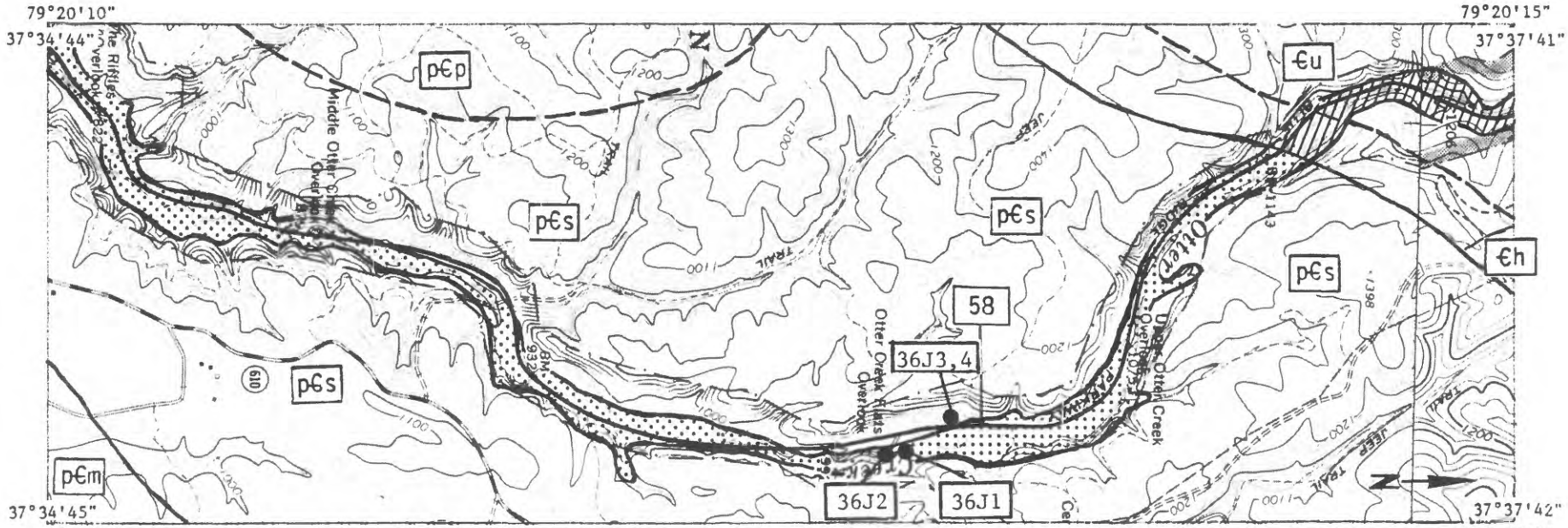
Figure 20.--Big Piney Mountain area (Miles 51.5 to 56.3).

Big Piney Mountain area (Miles 51.5 to 56.3).-In this section the Parkway begins its descent toward the James River descending from about 2,200 feet to 1,240 feet above sea level. The Parkway trends south-southwest after passing through Bluff Mountain Tunnel near the beginning of this section.

There are four overlooks with parking facilities--Bluff Mountain at mile 52.8, Rice Mountain at mile 53.1, White Oak Flats at mile 55.1, and Dancing Creek at mile 55.9.

Throughout most of this section the rocks are undifferentiated sandstone, shale and quartzite of the Hampton Formation. Near the middle of this section and just southeast of the Parkway is a narrow band of undifferentiated conglomerate shale, and quartzite with lava flows of the Unicoi Formation. This band of rocks crosses the Parkway just south of Dancing Creek Overlook. There is a small area underlain by undifferentiated sandstone, graywacke and greenstone of the Swift Run Formation in the southeastern part of this section. Two faults lie to the southeast of Parkway from near the middle of this section. The fault closest to the Parkway terminates against the southeastern most fault on the next section.

Good and fair areas for wells are along Bluff Creek near the beginning of this section and in the valley of Dancing Creek near the southern end of this section.



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0 1/2 1 MILE

0 1/2 1 KILOMETER

CONTOUR INTERVAL 20 AND 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

EXPLANATION

- Є h — Hampton Formation--Sandstone, shale and quartzite.
- Є u — Unicoi Formation--Conglomerate, shale, and quartzite with lava flows.
- pЄs — Swift Run Formation--Sandstone, graywacke and greenstone.
- pЄp — Pedlar Formation--Granite.
- pЄm — Marshall Formation--Granite, gneiss and quartz monzonite.

- Fault
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 58 — NPS Milepost

- Good area for wells
- Fair area for wells
- 36J1 ● — Well and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 21.--Otter Creek Flats area (Miles 56.3 to 60.5).

Otter Creek Flats area (Miles 56.3 to 60.5).--The Parkway trends north-south as it descends from about 1200 feet to about 800 feet above sea level toward the James River, following the valley of Otter Creek.

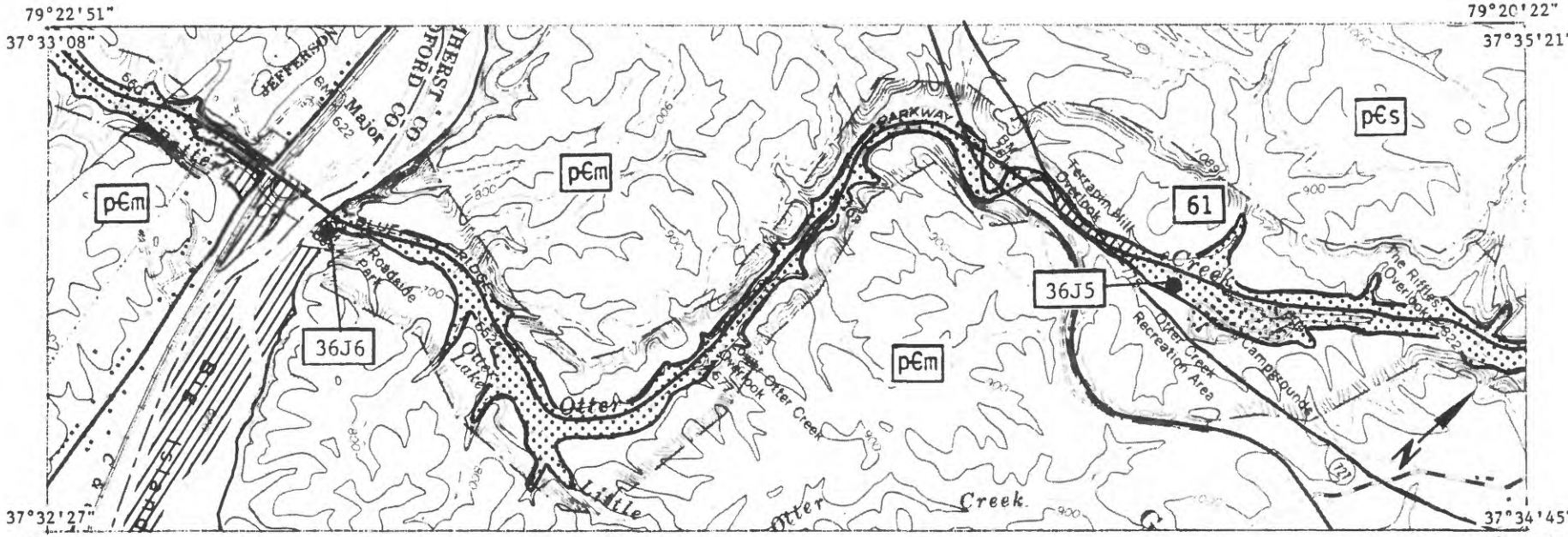
There are four overlooks--Upper Otter Creek at mile 57.6, Otter Creek Flats at mile 58.2, Middle Otter Creek at mile 59.7 and The Riffles at mile 60.4.

The rocks along this section are mainly undifferentiated sandstone, graywacke and greenstone of the Swift Run Formation. At the beginning of this section the rocks are undifferentiated conglomerate, shale and quartzite with lava flows of the Unicoi Formation that is separated from the Swift Run Formation by a narrow band of granite of the Pedlar Formation. There is a small area underlain by sandstone, shale and quartzite of the Hampton Formation near the beginning of this section where the two faults intersect. A small area of granite, gneiss and quartz monzonite is present in the extreme southeastern part of this section.

The faults shown near the beginning of this section are continuations of those shown on the previous section.

Four wells were drilled near Otter Creek Flats Overlook. Only one of these wells, 36J1, drilled to a depth of 154 feet along the valley flat was successful. This well was pumped at rates of 10, 15, 20 and 30 gpm during an 8 hour pumping test. Well 36J2 near 36J1 was originally drilled to a depth of 205 feet but yielded less than 1 gpm. The well was deepened to 245 feet and dynamited in an effort to improve the yield. This was unsuccessful and the well was abanoned and filled in. Well 36J3 was drilled to 155 feet, abandoned, and filled in due to low yield; well 36J4 was drilled to 45 feet and abandoned because of caving.

Good and fair areas for wells are located within the Parkway boundaries in the valley of Otter Creek. A good area is where the fault crosses the Parkway just north of Upper Otter Creek Overlook near the beginning of this section.



EXPLANATION

p€s — Swift Run Formation--Sandstone, graywacke and greenstone.

p€m — Marshall Formation--Granite, gneiss and quartz monzonite.

Fault

Boundary of the Blue Ridge Parkway

Boundary between counties

61 — NPS Milepost

Good area for wells

Fair area for wells

36J5 ● — Well and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 22.--Big Island area (Miles 60.5 to 64.4).

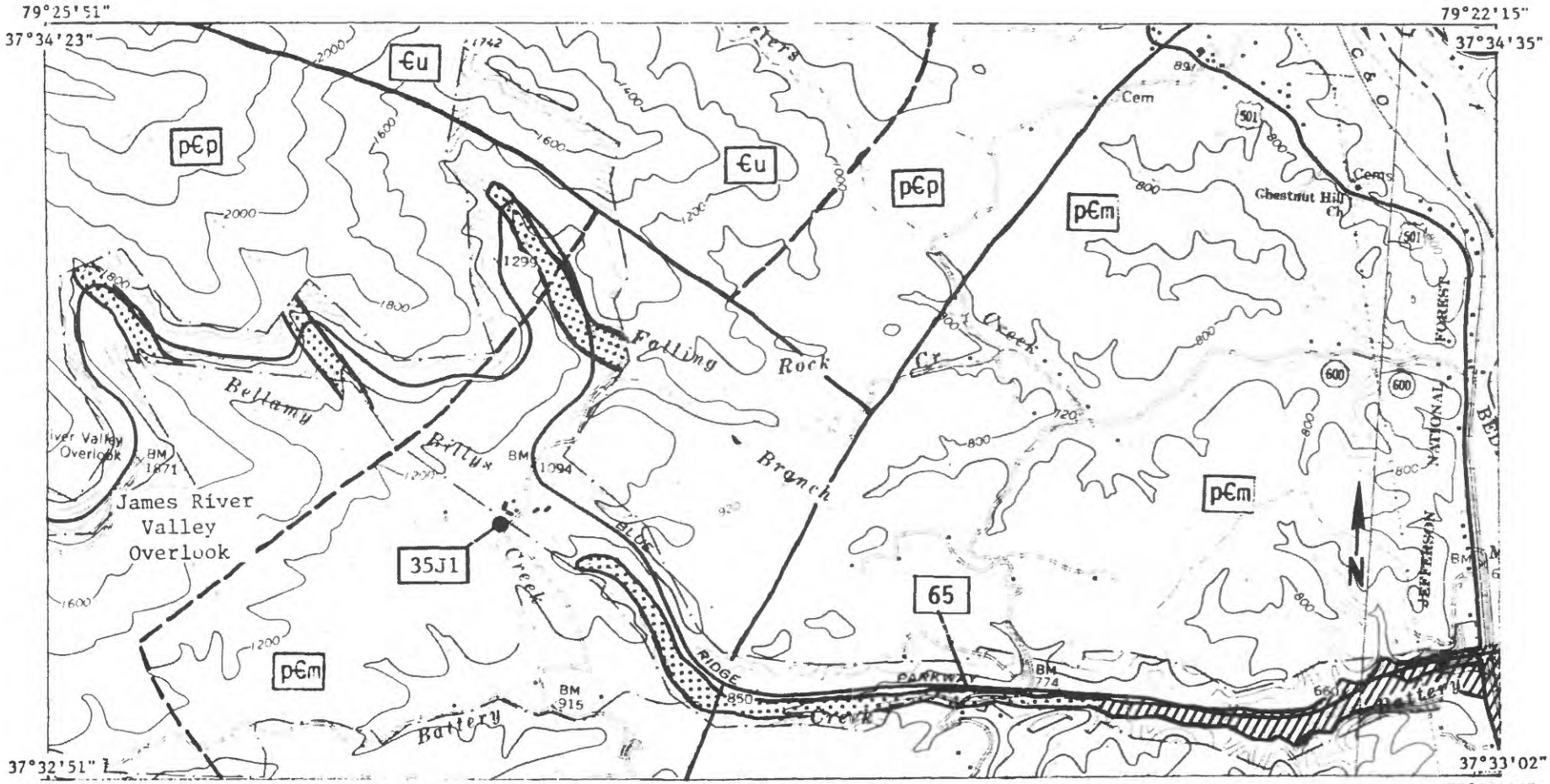
Big Island area (Miles 60.5 to 64.4).--The Parkway continues its descent southwest following the valley of Otter Creek to its confluence with the James River at mile 63.7. After crossing the James River the Parkway ascends along the valley of Battery Creek. The lowest altitude along the Parkway, about 650 feet above sea level, is just north of the James River crossing.

Recreation facilities are located at the Otter Creek Campground and Restaurant at mile 60.8, Otter Lake at mile 63.1 and the James River Visitor Center at mile 63.6. At the James River Visitor Center there is a foot bridge across the River to a restored lock along the Kanawha Canal.

The rocks along this section of the Parkway northwest of the fault are undifferentiated sandstone, graywacke, and greenstone of the Swift Run Formation; southwest of the fault the rocks are granite, gneiss and quartz monzonite of the Marshall Formation. An east-west trending fault crosses the Parkway at the Otter Creek recreation area near the beginning of this section.

Well 36J5, the supply well for the Otter Creek Campground and Restaurant, is located along a fault and has a yield of about 30 gpm. Well 36J6, the supply well for the James River Visitor Center is along the bluff overlooking the James River. This well was originally drilled to 270 feet with a yield of less than 1 gpm. The yield was increased to 9 gpm by setting off dynamite in the hole. Rock dislodged by the dynamite was left in the hole so that the final depth of the well was 205 feet. Chemical analysis of water from this well indicate that during periods of pumping there is induced infiltration of water from the James River and (or) its flood-plane deposits.

Good areas for wells within the Parkway boundaries are along the fault where it crosses the Parkway near Otter Creek Recreation Area and along the flood plain of the James River. Fair areas for wells are in the valley of Otter Creek.



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0 1/2 1 MILE

0 1/2 1 KILOMETER

CONTOUR INTERVAL 20 AND 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

p€m Marshall Formation--Granite, gneiss and quartz monzonite.

p€p Pedlar Formation--Granite.

€u Unicoi Formation--Conglomerate, shale, and quartzite with lava flows.

EXPLANATION

Fault

Approximate boundary between rock units

Boundary of the Blue Ridge Parkway

65 NPS Milepost

Good area for wells

Fair area for wells

35J1 Well and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 23.--Battery Creek area (Miles 64.4 to 69.4).

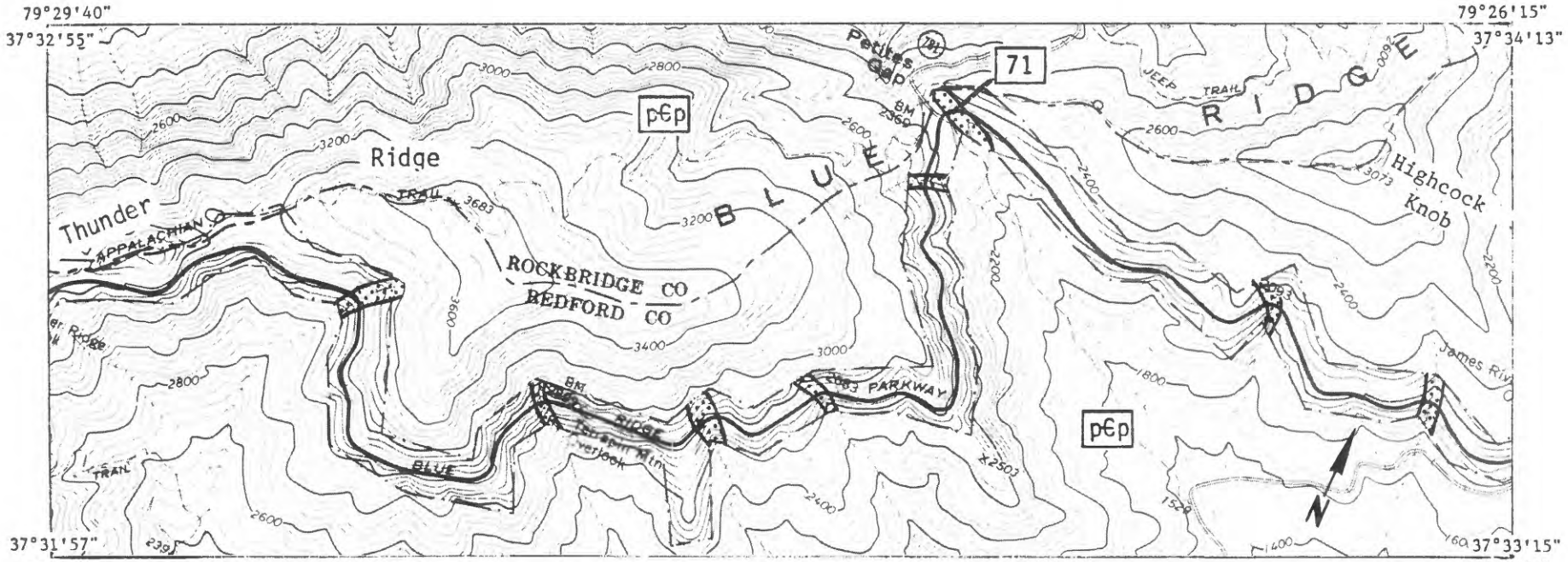
Battery Creek area (Miles 64.4 to 69.4).--The Parkway runs due west along the valley of Battery Creek to about the middle of this section, then turns to the north and then west, following the valley of Falling Rock Creek, Billy's Branch, and Bellamy Creek. The Parkway ascends about 650 feet to about 1,880 feet above sea level along this section.

The James River Valley Overlook near mile post 69 is the only parking area along this section.

East and south of the intersection of the two faults the rocks are granite, gneiss and quartz monzonite of the Marshall Formation. Dark-gray granite of the Pedlar Formation is present at the end of this section.

Well 35J1, at the James River maintenance area in the valley of Bellamy Creek, has a yield of about 10 gpm.

There are good and fair areas for wells within the Parkway boundaries along the valley of Battery Creek, Bellamy Creek, Billy's Branch, and Falling Rock Creek.



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CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

pЄp Pedlar Formation--Granite.

Approximate boundary between rock units

Boundary of the Blue Ridge Parkway

Boundary between counties

71 NPS Milepost

Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

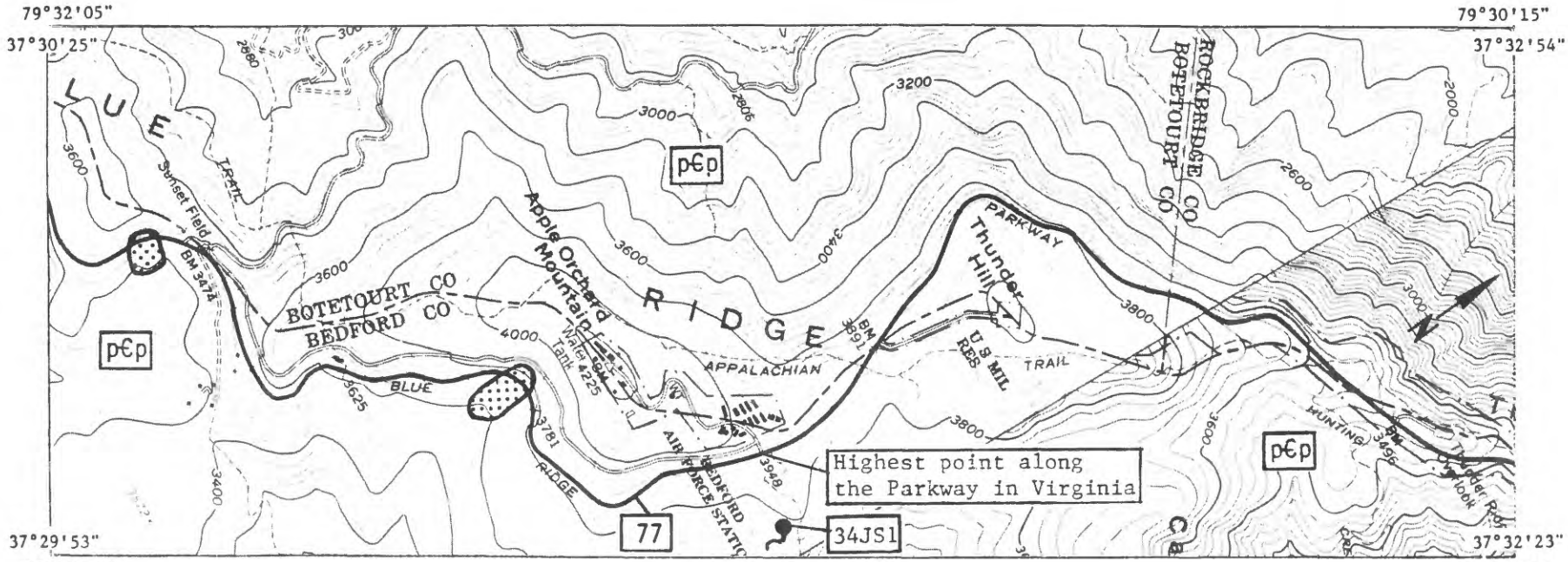
Figure 24.--Petites Gap area (Miles 69.4 to 74.5).

Petites Gap area (Miles 69.4 to 74.5).--The Parkway trends southwest along this section turning north to Petites Gap between Highcock Knob and Thunder Ridge. From Petites Gap the Parkway turns south and then continues southwest along the crest of Thunder Ridge. The Parkway ascends from about 1,880 feet to about 3,440 feet above sea level.

The only recreational area along this section is Terrapin Mountain Overlook at mile 72.6. Cave Mountain Lake in Jefferson National Forest is about seven miles to the northwest of Petites Gap along State Route 781.

The rocks along this section are the light to dark-gray granite of the Pedlar Formation.

There are a number of fair areas for wells within the Parkway boundaries along the flanks of Highcock Knob near the beginning and Thunder Ridge near the end of this section.



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CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- p€v — Virginia Blue Ridge Complex--Granite, gneiss and unakite.
- p€p — Pedlar Formation--Granite.
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 77 — NPS Milepost
- Fair area for wells
- 34JS1 — Spring and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 25.--Apple Orchard area (Miles 74.5 to 78.9).

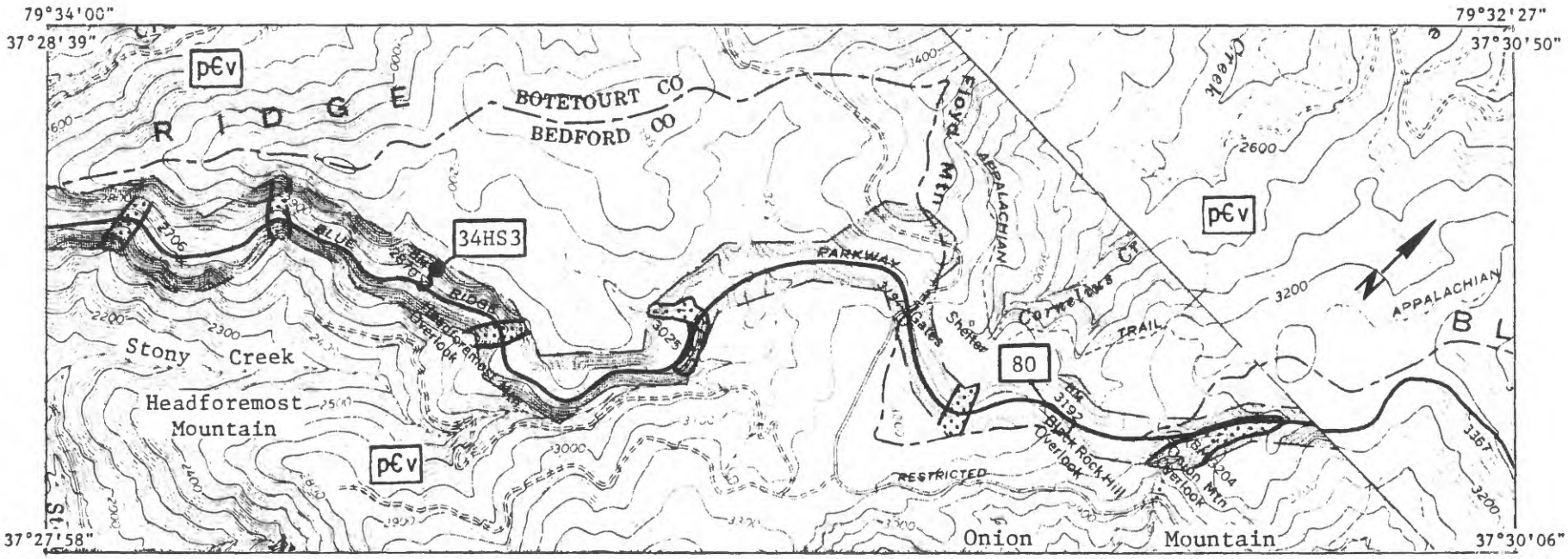
Apple Orchard Mountain area (Miles 74.5 to 78.9).--The Parkway continues southwest along the crest of the Blue Ridge. The highest point along the Parkway in Virginia, about 3,950 feet above sea level, is on the east slope of Apple Orchard Mountain about midway along the section.

There are two overlooks with parking facilities--Thunder Ridge at mile 74.7 and Sunset Field at mile 78.4.

The rocks along this section are primarily the light to dark-gray granite of the Pedlar Formation. Near the end of this section the rocks are granite and gneiss of the Virginia Blue Ridge Complex.

Spring 34JS1 is located on the west flank of Apple Orchard Mountain about 170 feet below the Parkway. Chemical analysis taken in September 1956 and July 1979 show chloride here increased from 1.9 to 20 mg/L, dissolved solids from 54 to 77 mg/L, and specific conductance from 83 to 91 micromhos. These increases may reflect road salts applied to the highway during the winter months and (or) possible contamination from service and maintenance buildings just above the spring.

There are no good areas for wells within the Parkway boundaries along this section. Fair areas are near the end of this section. A number of undeveloped springs are present on the slopes above and below the Parkway.



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CONTOUR INTERVAL 20 AND 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- pεv — Virginia Blue Ridge Complex--Granite, gneiss and unakite.
- pεp — Pedlar Formation--Granite.
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 80 — NPS Milepost
- Fair area for wells
- 34HS3 — Spring and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 26.--Headforemost Mountain area (Miles 78.9 to 82.9).

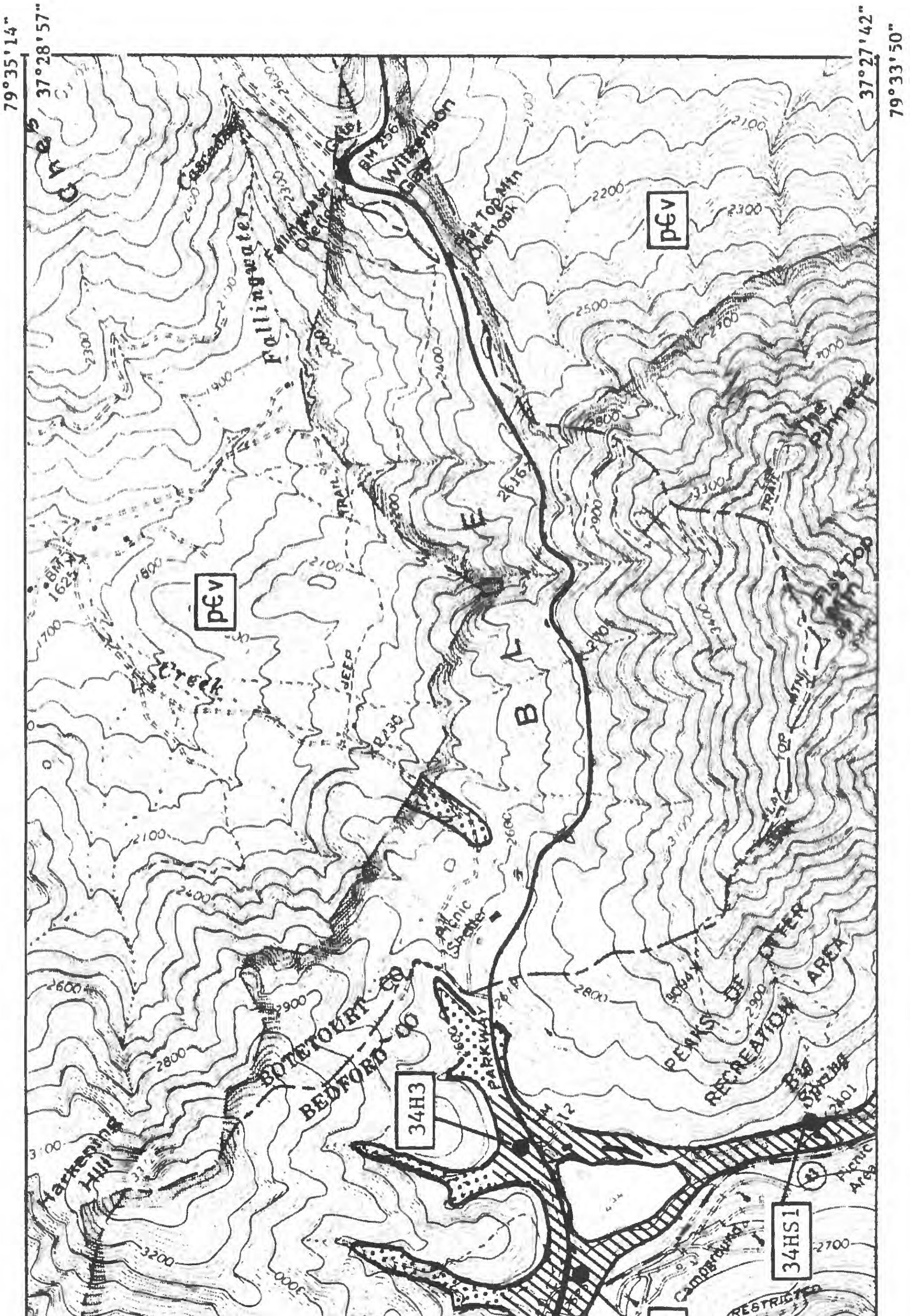
Headforemost Mountain area (Miles 78.9 to 82.9).--The Parkway continues southwest along the west slope of Onion Mountain and Headforemost Mountain. The Parkway descends from about 3,440 feet to 2,600 feet above sea level along this section.

There are three overlooks with parking facilities--Onion Mountain at mile 79.7, Black Rock Hill at mile 80, and Headforemost Mountain at mile 81.9. At Onion Mountain Overlook there is a short loop trail.

The rocks along this section are granite and gneiss of the Virginia Blue Ridge Complex, generally a light-gray to light greenish-gray in color.

Spring 34HS3 is located near the Headforemost Mountain Overlook on the northwest side of the Parkway; it has an average yield of about 3.5 gpm. A number of undeveloped springs are present above and below the Parkway.

There are fair areas for wells within the Parkway boundaries along the valleys of Stony Creek and Cornelius Creek and their tributaries.


79°35'14"
37°28'57"
37°27'42"
79°33'50"
79°37'56"
37°27'07"
37°27'42"
79°35'43"
34H3
34H2
34H1
34HS1
34HS2
86
pЄv
pЄv
pЄv
BOTETOURT CO
BEDFORD CO
PEAKS OF OTTER
RECREATION AREA
Big Spring
Picnic Area
Picnic Shelter
Campground
PARKWAY
Harkening Hill
Fallingwater
Creek
Wilkinson Gap
Flat Top Mtn Overlook
The Pinnacle
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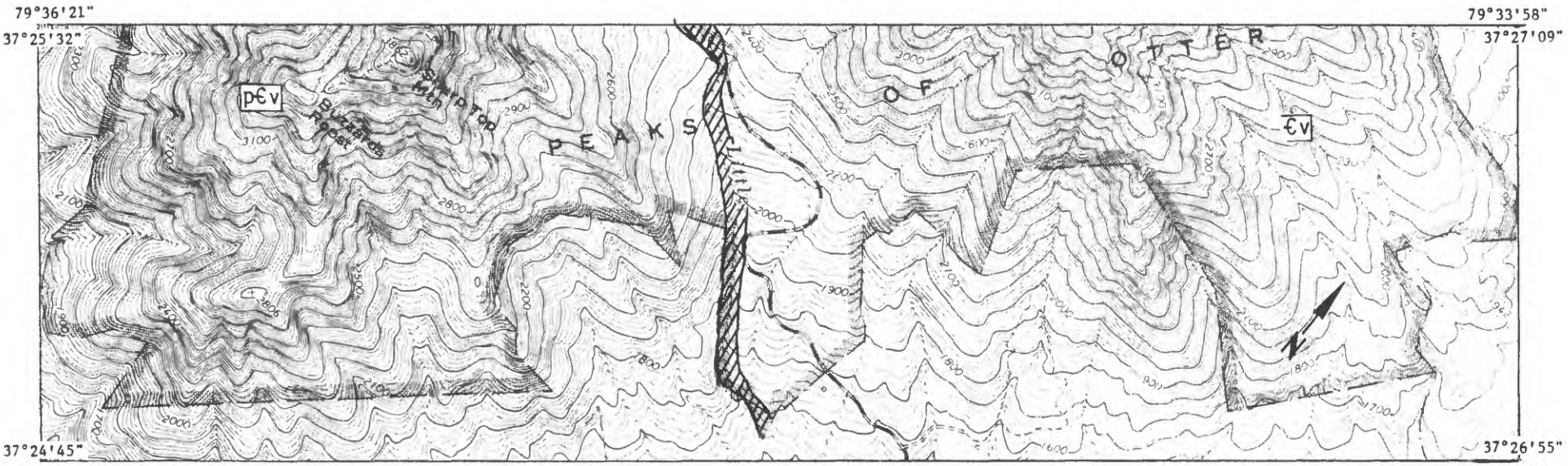

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CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

pЄv Virginia Blue Ridge Complex--Granite, gneiss and unakite.

Boundary of the Blue Ridge Parkway

Boundary between counties

86 NPS Milepost

Good area for wells

Fair area for wells

34H1 Well and local no.

34HS1 Spring and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 27.--Peaks of Otter Recreation area (Miles 82.9 to 87.4).

Peaks of Otter area (Miles 82.9 to 87.4).--The Parkway continues southwest through Wilkerson Gap past Peaks of Otter recreation area to State Route 43 where it turns northwest for the remainder of this section.

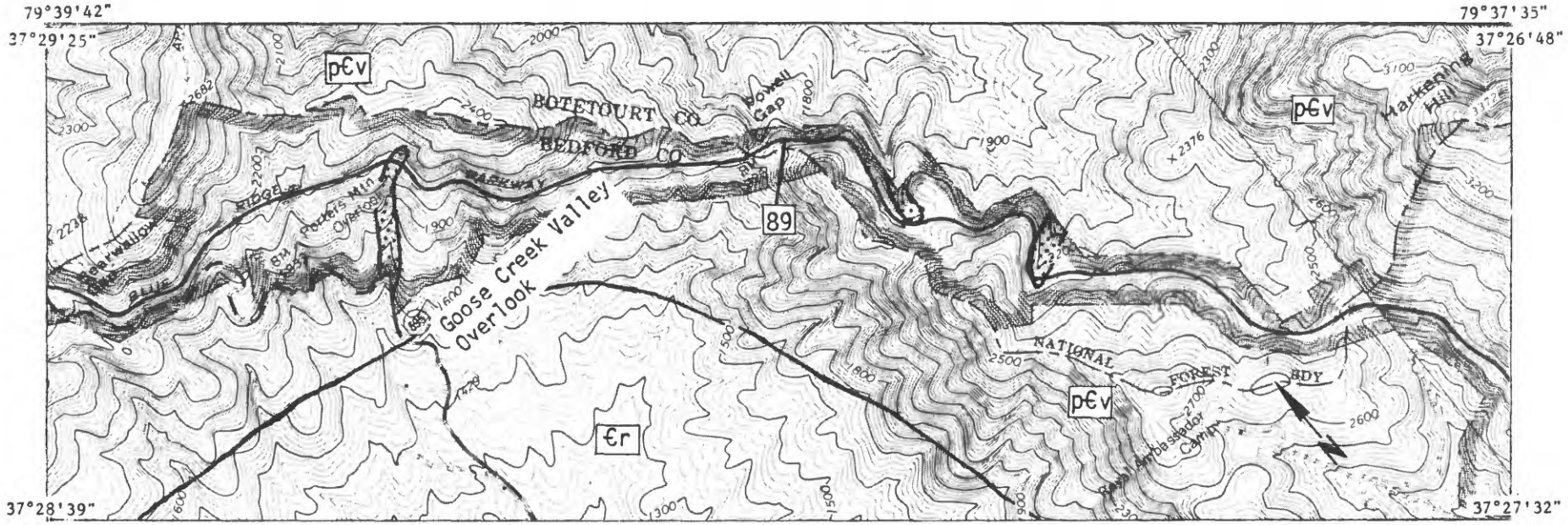
The Fallingwater Overlook and Peaks of Otter recreation area are located along this section. At Fallingwater Overlook there is a scenic loop trail about 1.5 miles long past Fallingwater Cascades. At Peaks of Otter recreation area there is a lodge, restaurant, coffee shop, fishing lake, visitor center, service station, picnic area, campground, store for provisions, and hiking trails. There are rather arduous hiking trails up Sharp Top Mountain, Buzzards Roost, Flat Top Mountain and The Pinnacle. A bus may be taken from the parking area at the base of Sharp Top Mountain to a hiking trail near the top.

The rocks along this section are granite and gneiss of the Virginia Blue Ridge Complex. Outcrops of these rocks are found along most of the trails. Alluvial deposits about 20 feet thick overlie saprolite at wells 34H1 and 2. The saprolite is about 40 feet thick at well 34H1 and about 20 feet at well 34H2.

Wells 34H2 and 3 are supply wells with yields of 20 and 45 gpm respectively. Well 34H1 is a flowing well, currently unused with a yield of 15 gpm. Big Spring, 34HS1, at the base of Flat Top Mountain is unused with a flow of more than 150 gpm at times. This was the highest yield of any of the springs inventoried. Spring 34HS2 is used for domestic supply.

Well 34H1, located in a valley flat between Sharp Top Mountain and Harkening Hill, is a flowing well. The water level in this well was about 1.4 feet above land surface when drilled in the late summer of 1967 and more than 3.5 feet above land surface in the spring of 1978. Wells 34H2 and 34H3 in the same general area are not flowing wells. Both of these wells are located close to Little Stony Creek, the major surface drainage way, whose flow is sustained by ground-water discharge, causing reduction in head in these wells.

There are a number of good and fair areas for wells within the immediate vicinity of all the recreation facilities in this area.



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CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- pEv — Virginia Blue Ridge Complex--Granite, gneiss and unakite.
- Er — Rome Formation--Shale and sandstone with dolomite.
- Fault
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 89 — NPS Milepost
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

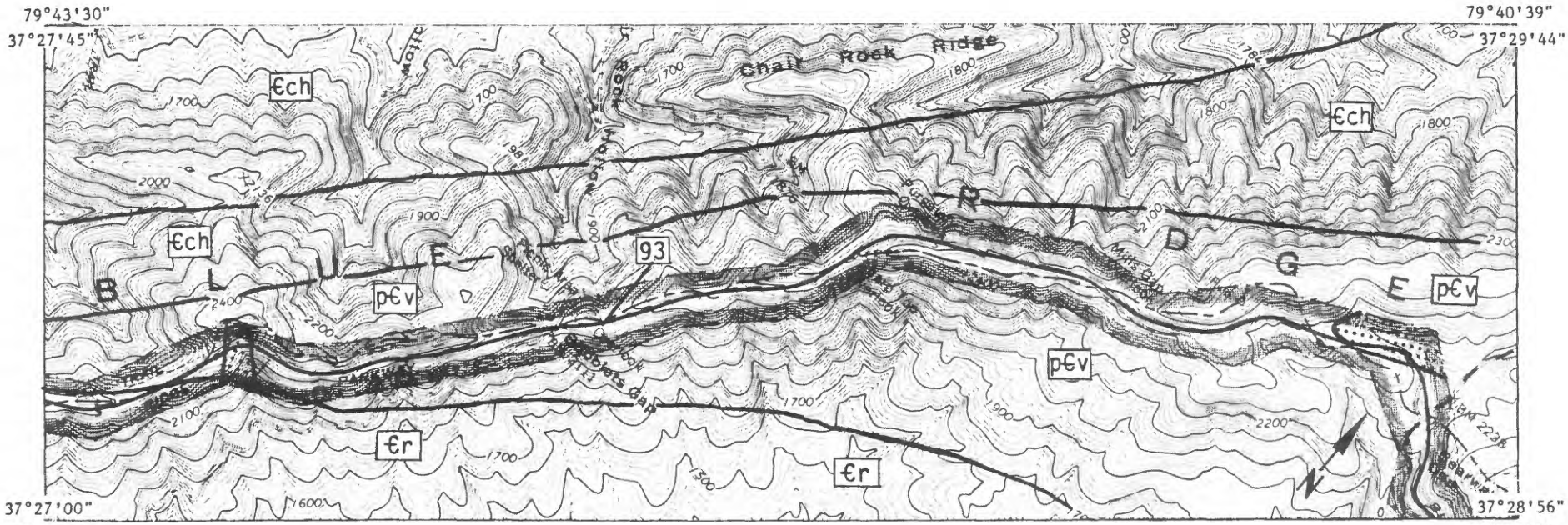
Figure 28.--Powell Gap area (Miles 87.4 to 90.8).

Powell Gap area (Miles 87.4 to 90.8).--The Parkway trends northwest through Powell and Bearwallow Gaps, descending from about 2,510 feet to about 1,925 feet above sea level at Powell Gap. From Powell Gap it ascends to about 2,300 feet above sea level at the end of this section.

There are two overlooks, Goose Creek Valley at mile 89.3 and Porters Mountain at mile 90.0

The rocks are granite and gneiss of the Virginia Blue Ridge Complex. Shale, dolomite and sandstone of the Rome Formation lie to the west of the Arcuate Fault.

There are several fair areas for wells within the Parkway boundaries along this section.



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CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929.

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- p€v — Virginia Blue Ridge Complex--Granite, gneiss and unakite.
- €ch — Chilhowee Group--Undifferentiated sandstone, shale and quartzite with lava flows.
- €r — Rome Formation--Shale and sandstone with dolomite.
- Fault
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 93 — NPS Milepost
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

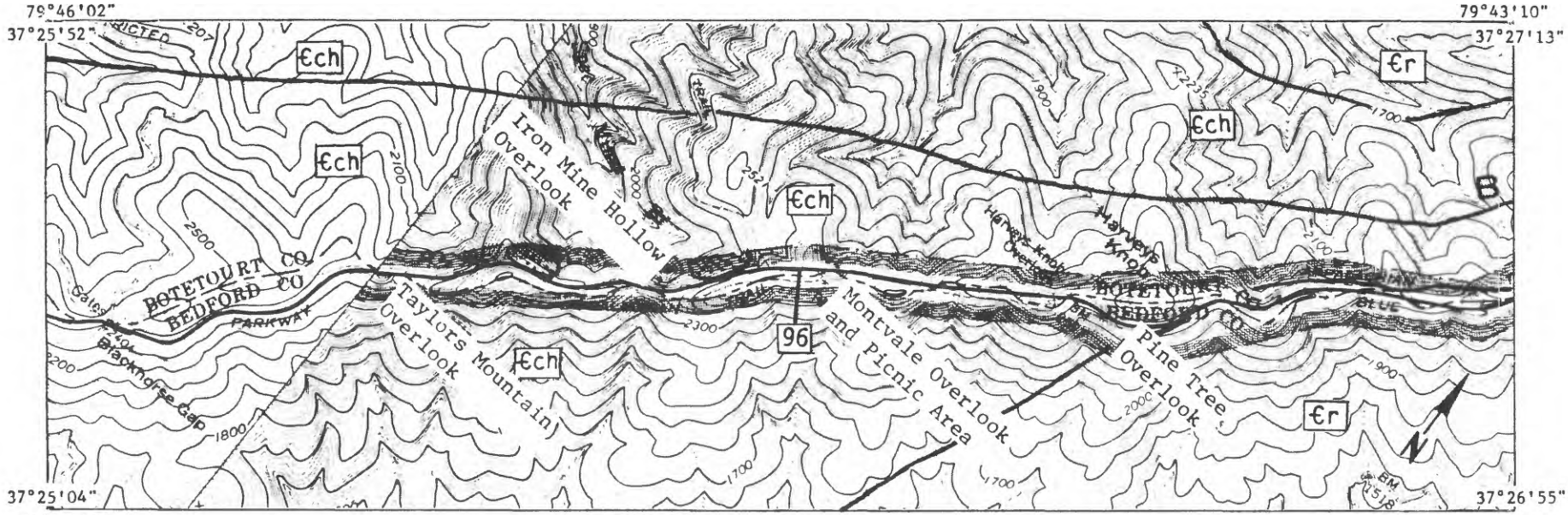
Figure 29.--Bobblets Gap area (Miles 90.8 to 94.4).

Bobbletts Gap area (Miles 90.8 to 94.4).-- The Parkway turns to the southwest just beyond Bearwallow Gap and continues in this direction along the crest of the Blue Ridge. There is little change in altitude along this section, the lowest point is about 2,110 feet above sea level at Bobbletts Gap and the highest point is about 2,400 feet near Purgatory Overlook.

There are several overlooks--Mills Gap at mile 91.8, Purgatory at mile 92.2, Sharp Top at mile 92.6, and Bobbletts Gap at mile 93.2. A picnic area and shelter are available at Bobbletts Gap.

The Parkway meanders back and forth across the contact between the undifferentiated sandstone, shale and quartzite of the Chilhowee Group and the granite and gneiss of the Virginia Blue Ridge Complex. Near the end of this section shale, sandstone and dolomite of the Rome Formation underlie the Parkway. Two eastward trending faults lie north of and parallel the Parkway. The contact between the rocks of the Blue Ridge Complex and Rome Formation is a fault which terminates near the end of this section at the contact between the rocks of the Chilhowee Group and Virginia Blue Ridge Complex. Chain Rock Ridge near the middle of this section and to the northwest of the Parkway is due to faulting.

There are two fair areas for wells within the Parkway boundaries. Most, however, are outside the Parkway boundaries and not delineated in relatively inaccessible areas. Good to fair areas are present along the fault north of the Parkway where it cuts across the valleys several hundred feet below the crest of the Blue Ridge Mountains.



SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- Er — Rome Formation-Shale and sandstone with dolomite.
- Ech — Chilhowee Group-Undifferentiated with lava flows
- Fault
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 96 — NPS Milepost
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

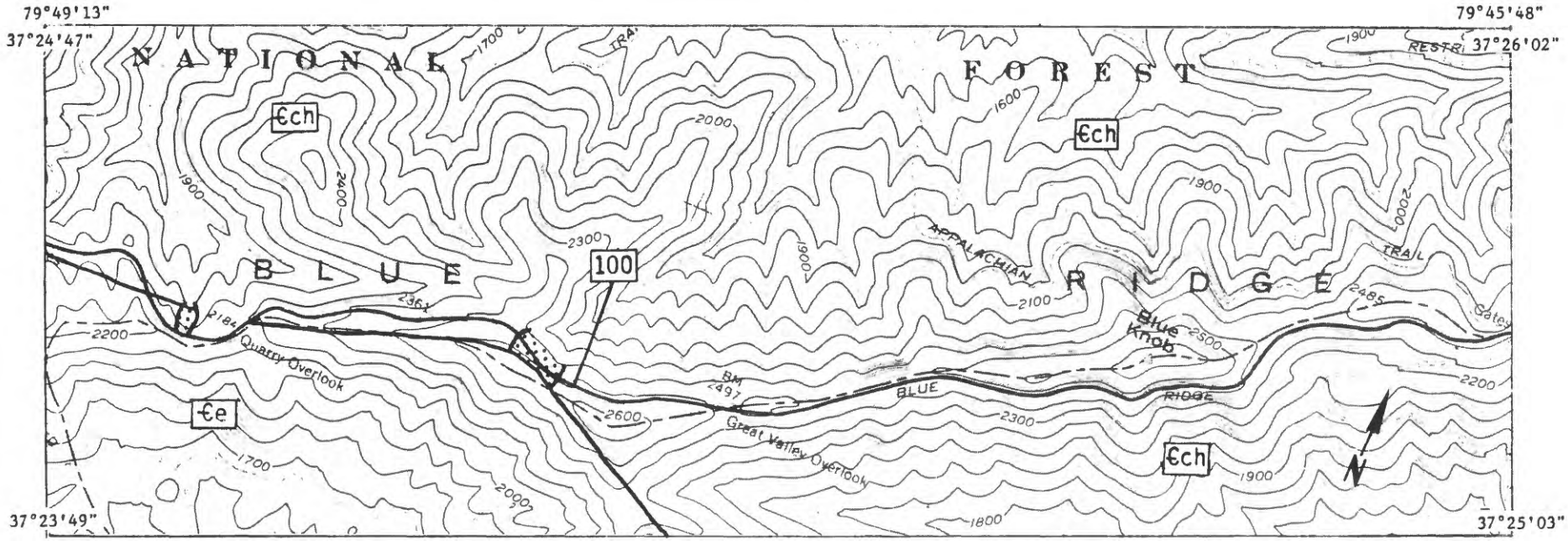
Figure 30.--Harvey Knob area (Miles 94.4 to 97.7).

Harveys Knob area (Miles 94.4 to 97.7).--The Parkway continues southwest along the crest of the Blue Ridge Mountains. There is little change in altitude and the Parkway is at about 2,400 feet above sea level.

There are a number of overlooks along this section--Pine Tree at mile 95.2, Harvey's Knob at mile 95.4, Montvale at mile 95.9, Iron Mine Hollow at mile 96.2 and Taylors Mountain at 96.9. A picnic area is present at Montvale Overlook.

The rocks in the immediate vicinity of the Parkway are undifferentiated sandstone, shale, and quartzite of the Chilhowee Group. The northeast trending fault and the southwest trending fault are continuations of the faults shown on the previous section.

Good areas for wells are outside the Parkway boundaries in relatively inaccessible places. Fair areas for wells area near the middle of this section.



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CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

€e Elbrook Formation-Dolomite with some limestone.

€ch Chilhowee Group-Undifferentiated sandstone, shale, and quartzite with lava flows.

Fault

Boundary between counties

100 NPS Milepost

Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock unit.

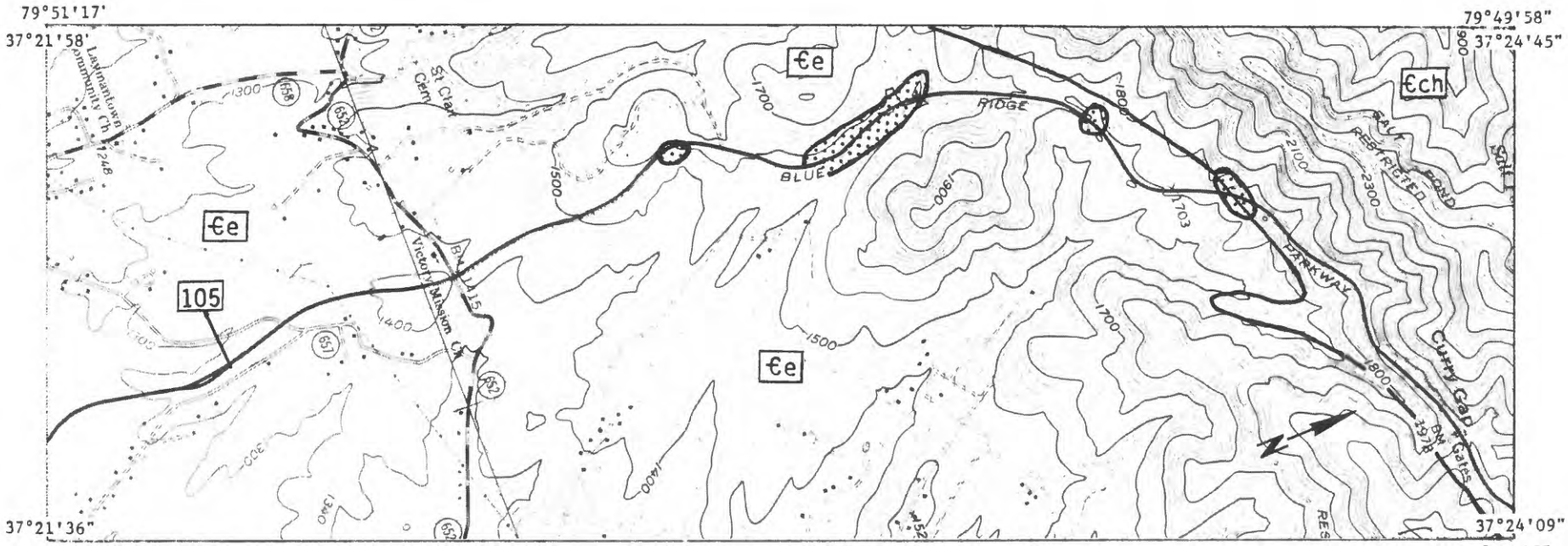
Figure 31.--Blue Knob area (Miles 97.7 to 101.4).

Blue Knob area (Miles 97.7 to 101.4).--The Parkway continues southwest along the crest of the Blue Ridge Mountains. Throughout most of this section the Parkway is at an altitude of about 2,500 feet above sea level. Just beyond Great Valley Overlook the Parkway descends from about 2,500 to 2,000 feet above sea level.

There are two overlooks--Great Valley at mile 99.6 and Quarry Overlook at mile 100.9.

The rocks in the immediate vicinity of the Parkway are undifferentiated sandstone, shale, and quartzite of the Chilhowee Group. At Quarry overlook the rocks are sandstone, shale, dolomite and limestone of the Elbrook Formation. The rocks of the Chilhowee and Elbrook Formation are separated by the fault which swings to the southeast midway between Great Valley and Quarry Overlooks.

Fair areas for wells are near the end of this section where the fault crosses the Parkway.



CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

EXPLANATION

€e Elbrook Formation-Dolomite with some limestone.

€ch Chilhowee Group-Undifferentiated sandstone, shale and quartzite with lava flows.

Fault

Fair area for wells

105 NPS Milepost

See Table 7 for a generalized correlation and Table 8 for a description of rock unit.

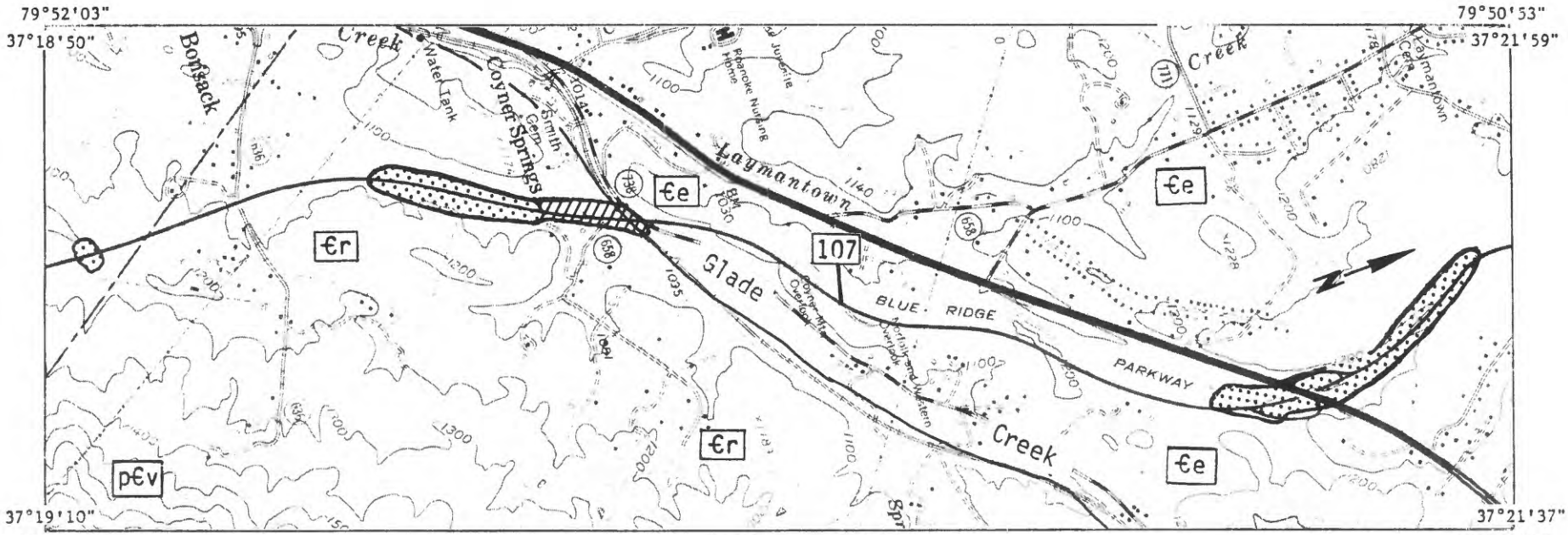
Figure 32.--Curry Gap area (Miles 101.4 to 105.4).

Curry Gap area (Miles 101.4 to 105.4).--The Parkway continues southwest through Curry Gap to about midway in the section and then turns to the south away from the crest of the Blue Ridge Mountains. The Parkway descends from about 2,000 feet to about 1,300 feet above sea level.

There are no overlooks or recreation areas along this section.

The rocks between Curry Gap and the northeast trending fault which cuts across the Parkway near the beginning of this section are undifferentiated sandstone, shale and quartzite of the Chilhowee Group. The rocks to the south of the fault are shale, limestone and dolomite of the Elbrook Formation.

There are several fair areas for wells along this section.



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CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- €e — Elbrook Formation-Dolomite and shale with limestone.
- €r — Rome Formation-Sandstone and shale with dolomite.
- pEv — Virginia Blue Ridge-Complex granite, gneiss and unakite.
- Fault
- 107 — NPS Milepost
- Good area for wells
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock unit.

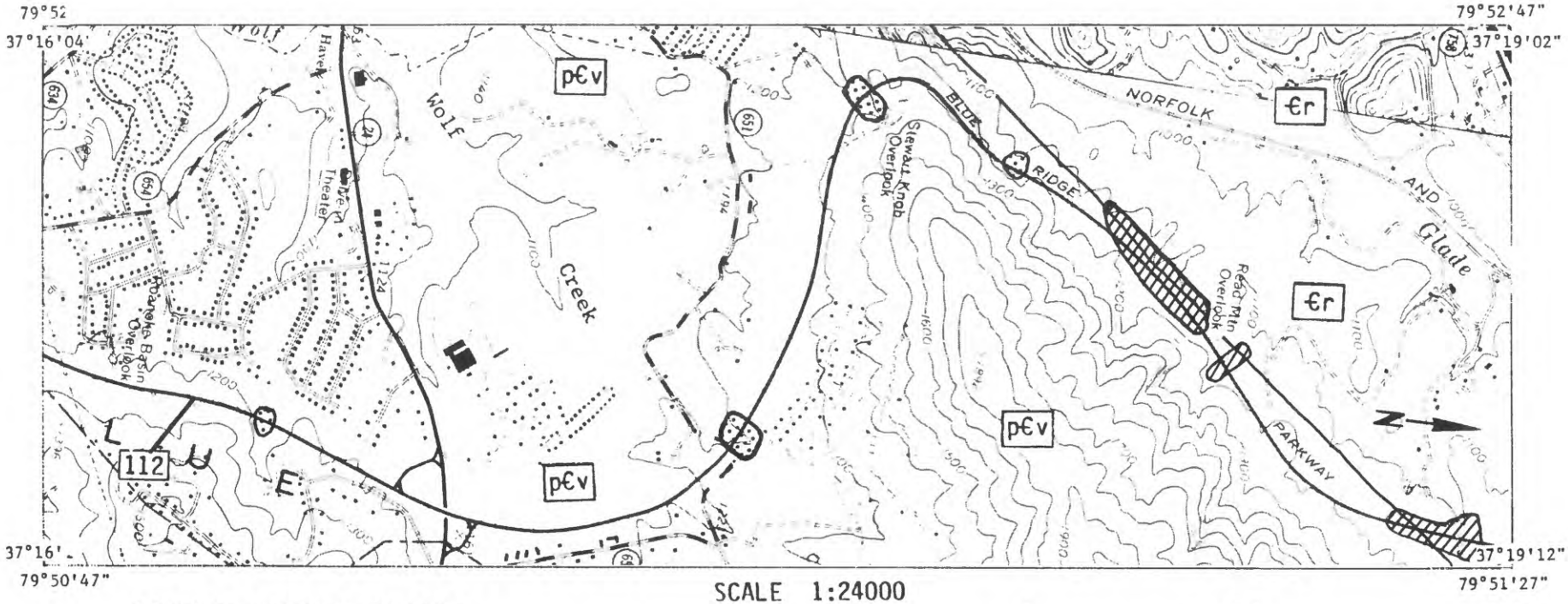
Figure 33.--Coyner Springs area (Miles 105.4 to 108.9).

Coyner Springs area (Miles 105.4 to 108.9).--The Parkway continues south to U.S. Highway 460 then turns southwest for the remainder of this section. It is relatively flat descending from about 1220 feet above sea level at the beginning of this section to about 1120 feet near the end of this section. The cities of Roanoke and Salem are about five and eleven miles respectively to the west.

The Norfolk and Western and Coyner Mountain Overlooks are near the middle of this section at about mile 106.9 and 107.1, respectively.

The rocks to the north of the northeast trending fault which crosses the Parkway near the middle of this section are dolomite and limestone of the Elbrook Formation. Shale, sandstone, and dolomite of the Rome Formation underlie the area between the two faults. Granite and gneiss of the Blue Ridge Complex are present in the southwest part of this section.

A good area for wells is where the fault crosses the Parkway near the middle of this section. Fair areas for wells are along tributaries to Glade Creek that parallels the Parkway near the beginning and middle of this section.



EXPLANATION

- €r — Rome Formation-Sandstone and shale with dolomite.
- p€v — Virginia Blue Ridge-Complex granite, gneiss and unakite.
- Fault
- 112 — NPS Milepost
- Good area for wells
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock unit.

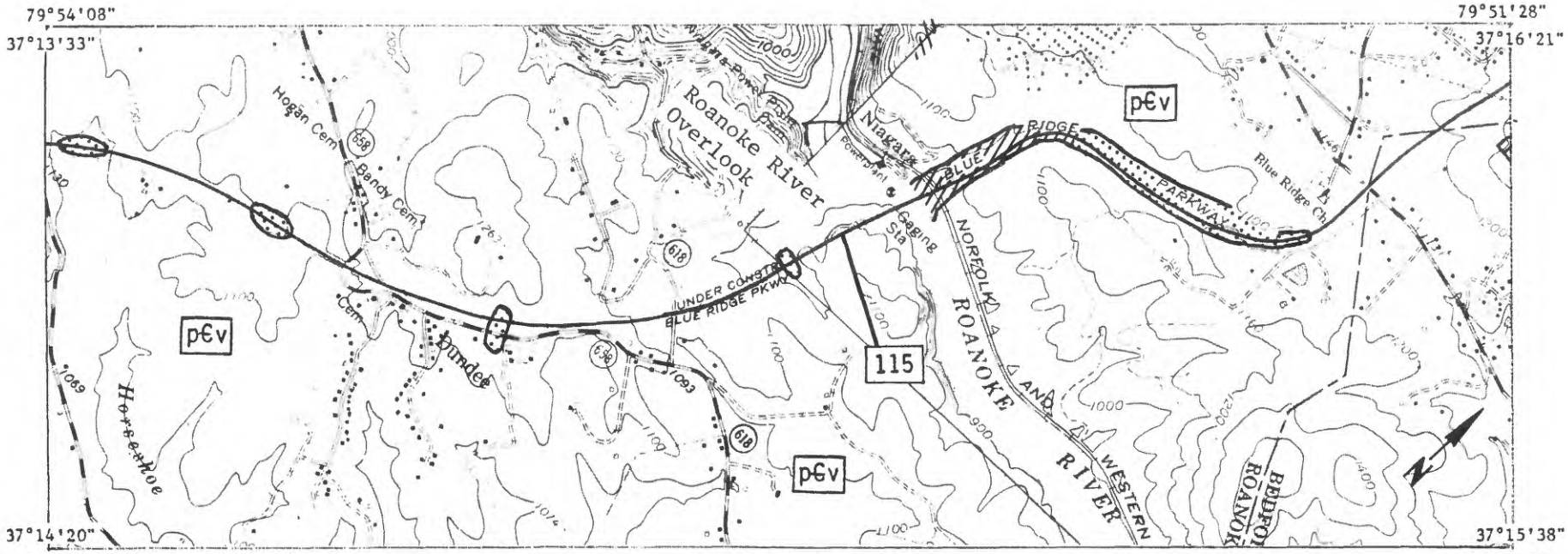
Figure 34.--Stewarts Knob area (Miles 108.9 to 103.3).

Stewarts Knob area (Miles 108.9 to 113.3).--The Parkway follows the base of Stewart Knob then heads almost due south for the remainder of this section. There is little change in altitude, about 1,200 feet above sea level, along this section. Roanoke is about four miles to the west via State Route 28 and U.S. Highway 220.

There are two overlooks with parking facilities--Read Mountain at mile 109.6 and Stewart Knob at mile 110.6.

Northwest of the fault the rocks are undifferentiated sandstone, shale and dolomite of the Rome Formation. Southeast of the fault the rocks are granite and gneiss of the Virginia Blue Ridge Complex.

Good areas for wells are where the fault crosses the Parkway near the beginning of this section and parallels the Parkway near Reed Mountain Overlook. Fair areas for wells are located in the valleys of tributaries to Wolf Creek.



EXPLANATION

pεv — Virginia Blue Ridge-Complex granite, gneiss and unakite.

Boundary between counties

115 — NPS Milepost

Good area for wells

Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock unit.

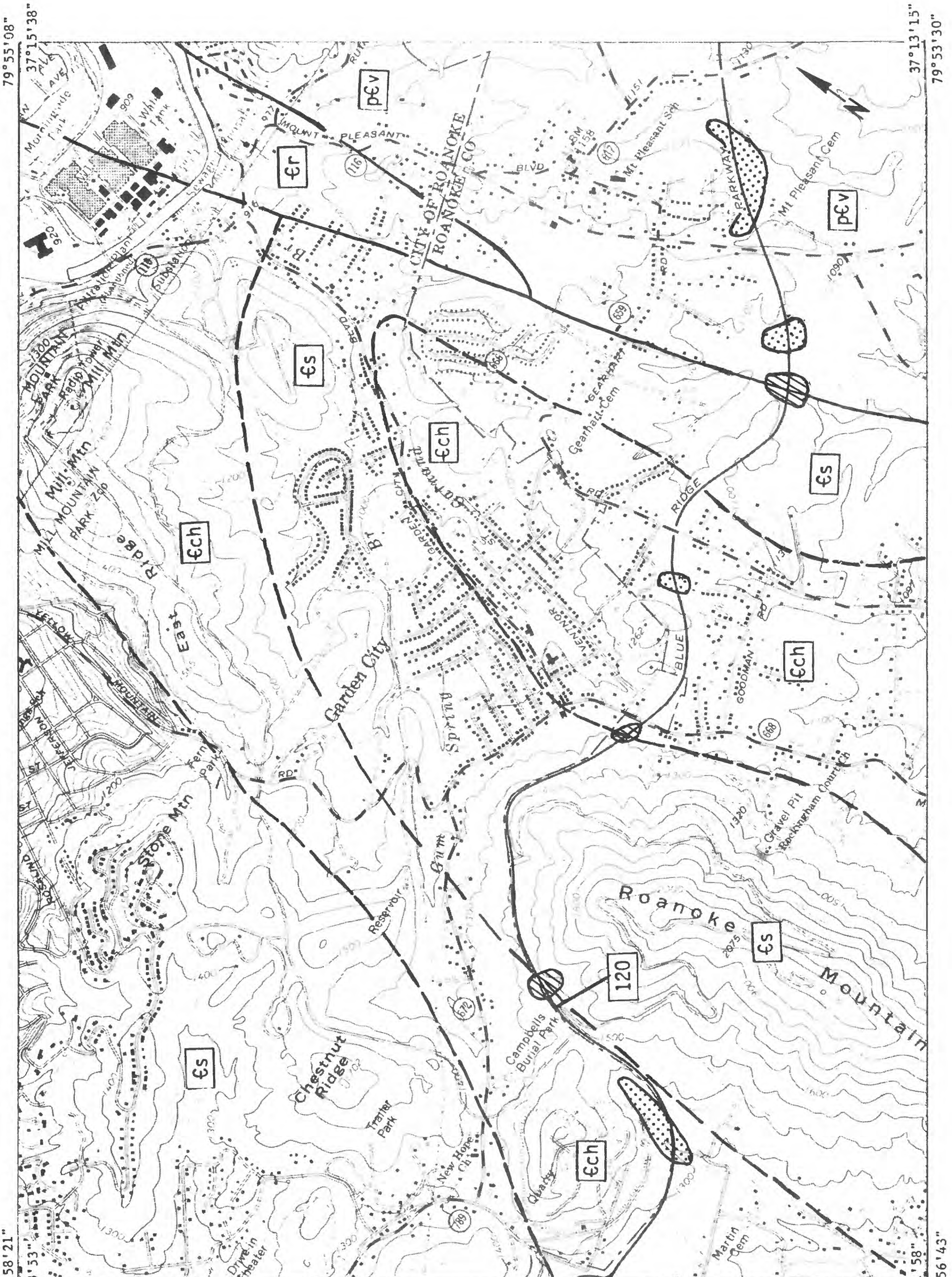
Figure 35.--Roanoke River area (Miles 113.3 to 117.0).

Roanoke River area (Miles 113.3 117.0).--The Parkway continues south for about three-fourths of a mile and then turns to the southwest before crossing the Roanoke River at Niagara. The Parkway descends from about 1,200 feet to about 900 feet above sea level at the bridge across the Roanoke River and then ascends to about 1,100 feet above sea level at the south end of this section.

The Roanoke River Overlook, with parking facilities is at mile 113, just south of the river. There is a trail to an overlook above the Roanoke River Gorge.

The rocks along this section of the Parkway are granite and gneiss of the Blue Ridge Complex. Outcrops of these rocks are present in the stream bed below the Niagara Power Plant Dam and along the Roanoke River bed.

A good area for wells is along the flood plain of the Roanoke River. Fair areas are in the valleys of tributaries to the Roanoke River.



79°55'08"
37°15'38"
37°13'15"
79°53'30"
79°58'21"
37°13'53"
37°11'58"
79°56'43"
CITY OF ROANOKE
ROANOKE CO
MOUNT PLEASANT
Mt Pleasant Sch
Mt Pleasant Cem
PARKWAY
RIDGE
BLUE
Gearhart Cem
VENTNOR
GOODMAN
Garden City
Spring
Mill Mtn
MILL MOUNTAIN PARK
Zoo
East
Ridge
MOUNTAIN
Fern Park
Stone Mtn
Chestnut Ridge
Trailer Park
New Hope Ch
Reservoir
Campbells Burial Park
Quarry
Drive-in Theater
Martin Cem
Roanoke Mountain
Gravel Pit
Rockingham Courtch
120
p€v
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SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- €r — Rome Formation-Sandstone and shale with dolomite.
- €s — Shady Dolomite-Thin bedded dolomite with some limestone.
- €ch — Chilhowee Group-Undifferentiated sandstone, shale and quartzite with lava flows.
- p€v — Virginia Blue Ridge-Complex granite, gneiss and unakite.

- Fault
- Approximate boundary between rock units
- Boundary between city and county
- 120 — NPS Milepost

- Good area for wells
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

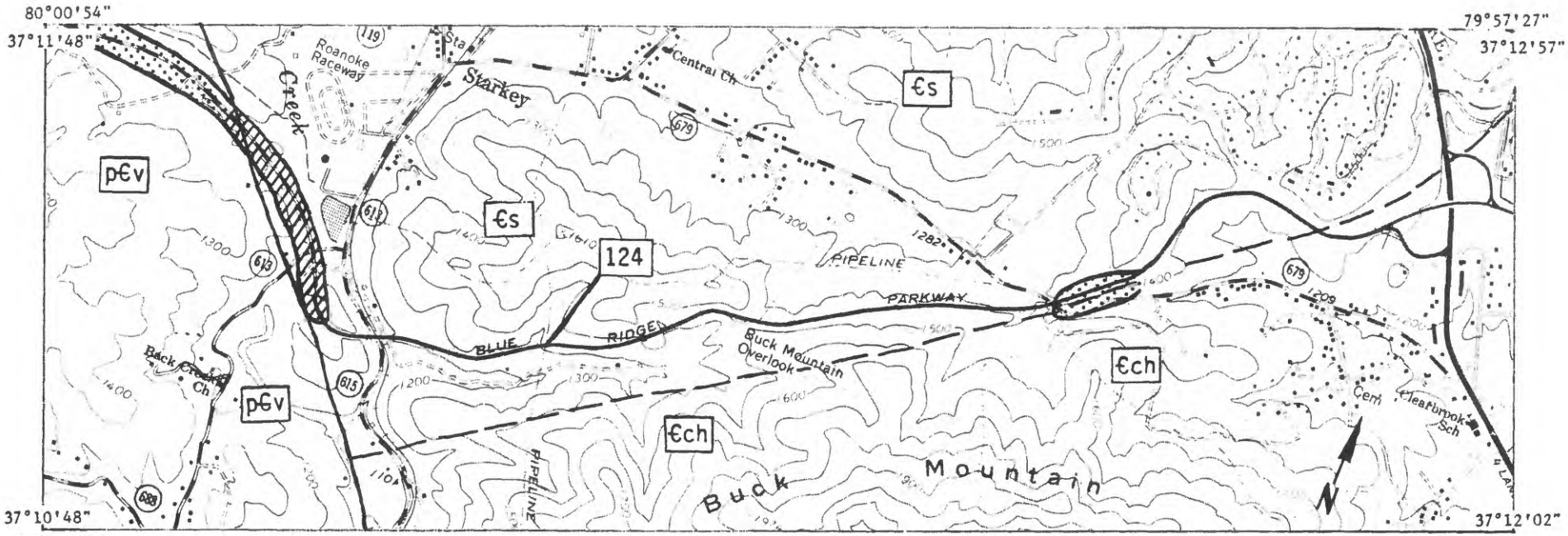
Figure 36.--Roanoke Mountain area (Miles 117.0 to 121.2).

Roanoke Mountain area (Miles 117.0 to 121.2).-- The Parkway continues southwest swinging to the northwest around the base of the Roanoke Mountain. The Parkway ascends from about 1,100 feet, to about 1,500 feet above sea level along Roanoke Mountain and then descends to about 1,240 feet at the end of this section.

There are several recreation areas. There is a one way road with steep grades to the overlook on top of Roanoke Mountain at mile 120.4. Because of the steep grades no towed vehicles are allowed on this road. Mill Mountain Park, a City of Roanoke park, may be reached by the spur road at mile 120.5 just south of the entrance to Roanoke Mountain Overlook. Camping and picnicking facilities, hiking trails and a zoo are located here.

The rocks in the beginning of this section and east of the fault are granite and gneiss of the Virginia Blue Ridge Complex. West of the fault, folding has produced repetition of the different formations. Immediately west of the fault the rocks are dolomite with some limestone of the Shady Dolomite, followed by undifferentiated sandstone, shale and quartzite of the Chilhowie Group. This sequence is repeated to the end of this section.

There are several good and fair areas for wells near the base of Roanoke Mountain and where the fault and contact between rock units cross the Parkway. All recreational facilities in this area are supplied with water from the City of Roanoke municipal supply.



EXPLANATION

- Єch — Chilhowee Group-Undifferentiated sandstone, shale and quartzite with lava flows.
- Єs — Shady Dolomite-Thin bedded dolomite with some limestone.
- pЄv — Virginia Blue Ridge-Complex granite, gneiss and unakite.
- Fault
- Approximate boundary between rock units
- 124 — NPS Milepost
- Good area for wells
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

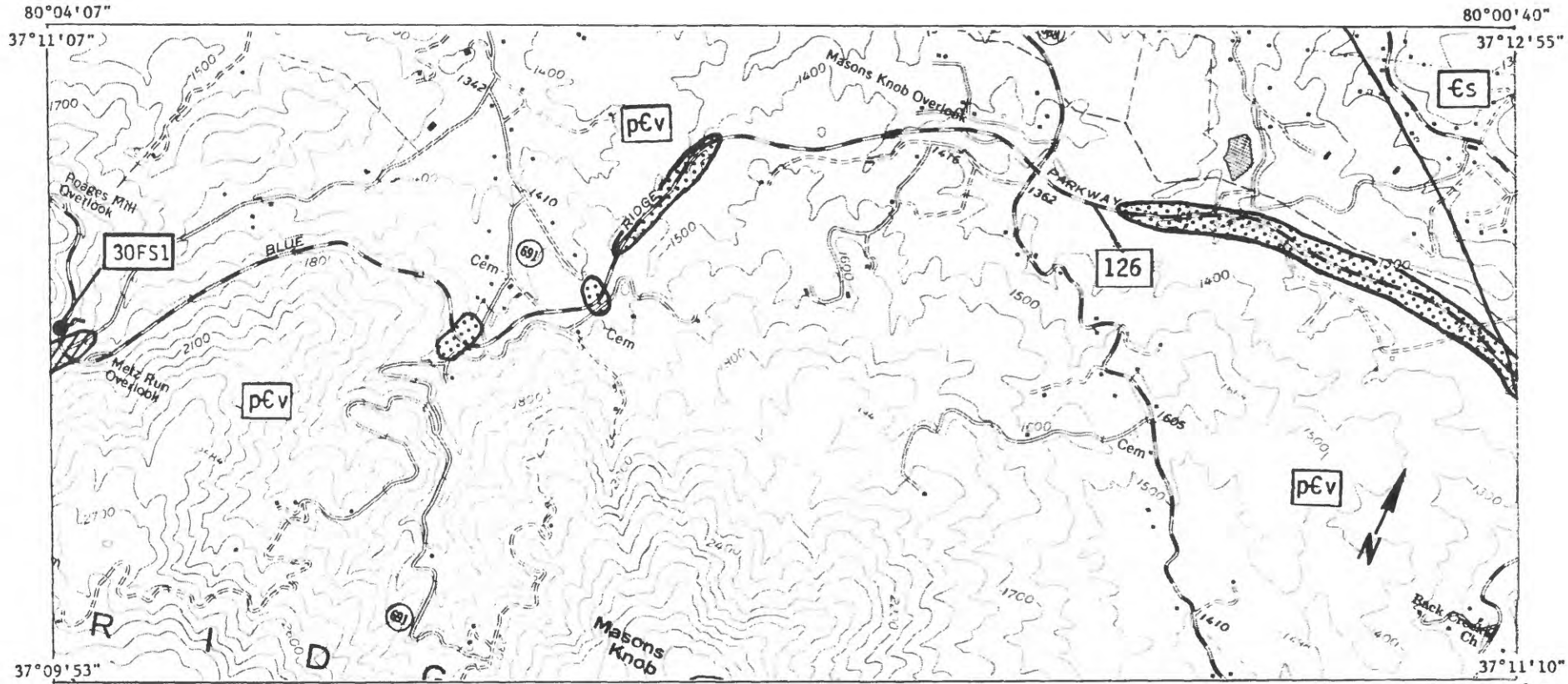
Figure 37.--Buck Mountain area (Miles 121.2 to 125.1).

Buck Mountain area (miles 121.2 to 125.1).--The Parkway continues southwest to its intersection with State Route 615 where it turns to the north. The Parkway ascends from about 1,240 feet to about 1,500 feet above sea level near Buck Mountain Overlook and then descends to about 1,300 feet above sea level near the end of this section.

Buck Mountain Overlook is about midway along this section at mile 123.5.

The rocks to the north of the Parkway are dolomite and limestone of the Shady Formation, and to the south undifferentiated sandstone, shale, and quartzite of the Chilhowee Group. The rocks west of the northwest trending fault are undifferentiated granite and gneiss of the Virginia Blue Ridge Complex.

Good and fair areas for wells are where the fault crosses the Parkway near the end of this section. Another fair area is where the Parkway follows the contact between rocks of the Shady Dolomite and Chilhowie Formations near the beginning of this section.



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CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

Es	Shady Dolomite-Thin bedded dolomite with some limestone.	126 NPS Milepost	Good area for wells
pEv	Virginia Blue Ridge-Complex granite, gneiss and unakite.		Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 38.--Mason Knob area (Miles 125.1 to 129.1).

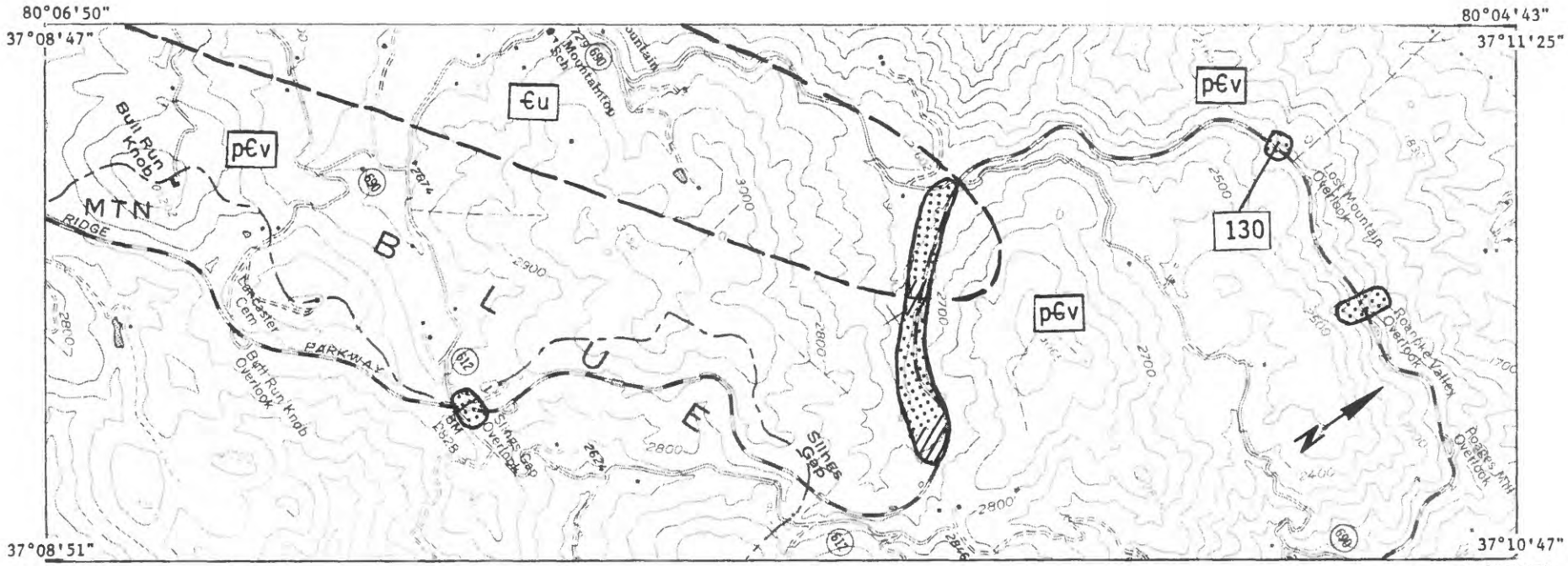
Masons Knob area (miles 125.1 to 129.1).--The Parkway continues its southwest trend as it winds around the base of Masons Knob. The Parkway leaves the Roanoke River Valley and ascends toward the crest of the Blue Ridge Mountains. The altitude at the end of this section is about 2,040 feet above sea level.

There are several overlooks with parking facilities along the Parkway--Masons Knob at mile 126.2, Metz Run at mile 128.7 and Poaques Mill at mile 129.3.

The rocks are granite and gneiss of the Virginia Blue Ridge Complex and outcrop near spring 30FS1.

Spring 30FS1 is located at mile 128.8 between Metz Run Overlook and Poaqes Mill Overlook on the southwest side of the Parkway. This spring is no longer used for supply.

There are good and fair areas for wells in the draws and valleys of streams draining Masons Knob.



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0 1/2 1 KILOMETER

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

EXPLANATION

- €r — Unicoi Formation-Undifferentiated conglomerate, shale and quartzite with lava flows.
- pEv — Virginia Blue Ridge-Complex granite, gneiss and unakite.
- Approximate boundary between rock units
- Boundary between counties
- 130 — NPS Milepost
- Good area for wells
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

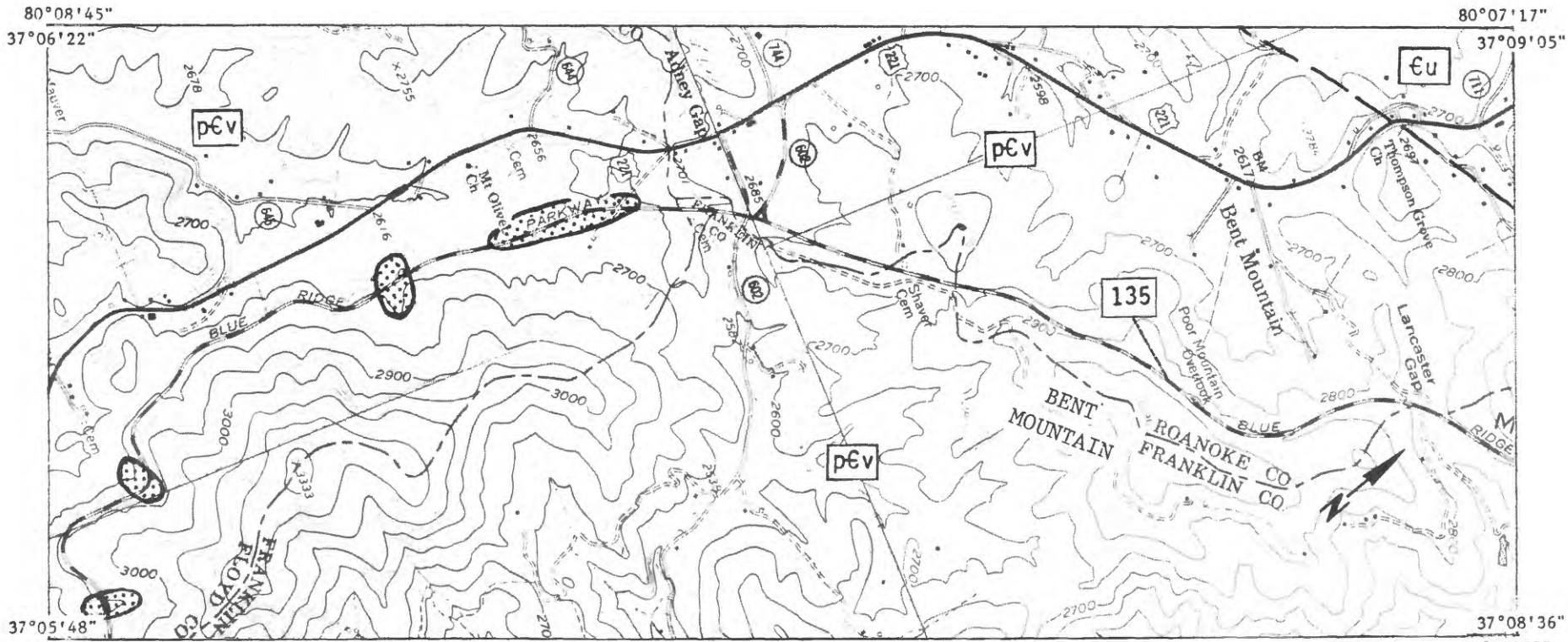
Figure 39.--Slings Gap area (Miles 129.1 to 134.1).

Slings Gap area (miles 129.1 to 134.1).--The Parkway continues its overall southwest direction but turns to the northwest, southwest and southeast as it follows the base of the unnamed knobs near the beginning of the section. The Parkway ascends from about 2040 feet near Poages Mill Overlook to above 2800 feet avove sea level along this end of this section. The altitude at Slings Gap Overlook is about 2860 feet above sea level.

There are several overlooks with parking facilities. A good view of Roanoke, the largest city along the Parkway, may be seen from the Roanoke Valley Overlook, mile 129.6, near the beginning of this section.

The rocks along this section are granite and gneiss of the Virginia Blue Ridge Complex. There is a section of undifferentiated, conglomerate, shale and quartzite with lava flows of the Unicoi Formation near where the Parkway swings from southwest to southeast around the unnamed knobs about one-third of the way along this section.

There are good and fair areas for wells along the Parkway where it crosses and (or) follows valleys several hundred feet below the tops of the knobs along this section.



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CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- Cu — Unicoi Formation-Undifferentiated conglomerate, shale and quartzite with lava flows.
- pEv — Virginia Blue Ridge-Complex granite, gneiss and unakite.
- Approximate boundary between rock units
- Boundary between counties
- 135 — NPS Milepost
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

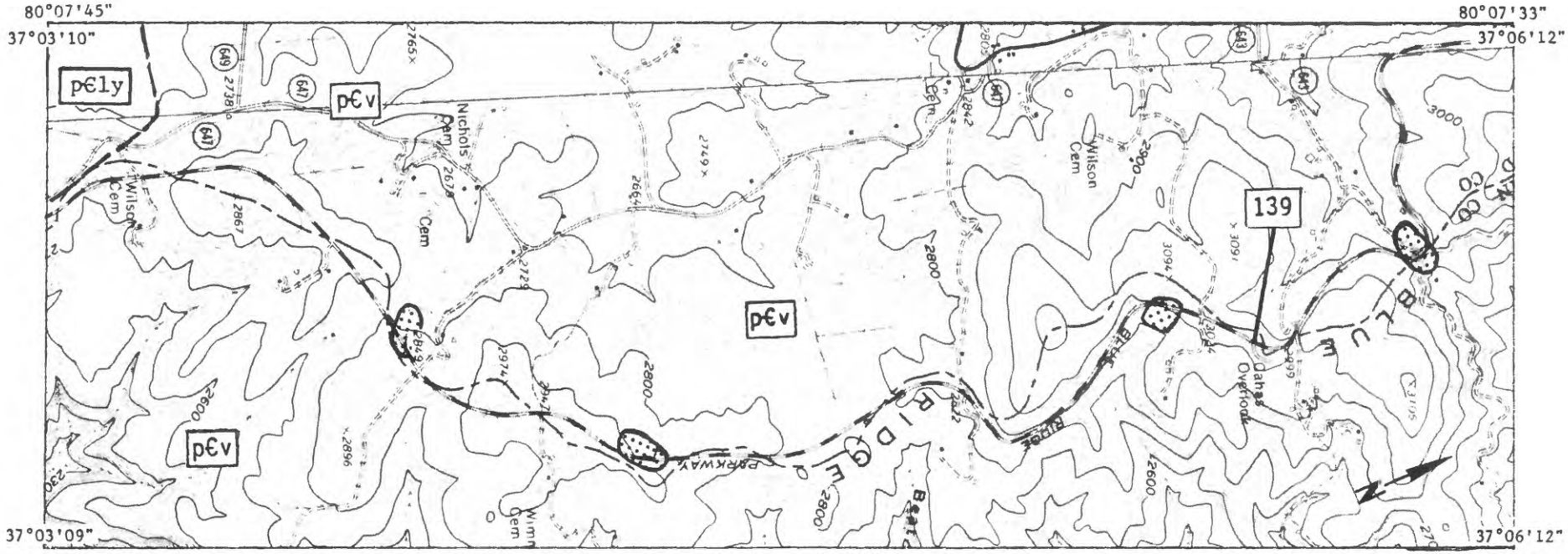
Figure 40.--Adney Gap area (Miles 134.1 to 138.2).

Adney Gap area (miles 134.1 to 138.2).--The Parkway continues southwest through Adney Gap near the middle of this section swinging almost due east near the end of this section. The altitude is between 2800 feet and 2900 feet above sea level throughout most of this section.

There is one overlook with parking facilities--Poor Mountain at mile 134.9.

The rocks along this section are granite and gneiss of the Virginia Blue Ridge Complex.

There are fair areas for wells where the Parkway crosses valleys along the west and south flank of the unnamed knob in the last half of this section.



EXPLANATION

pCly Lynchburg Formation-Phyllite, quartz, graywacke and conglomerate.

pCv Virginia Blue Ridge-Complex granite, gneiss and unakite.

Approximate boundary between rock units

Boundary between counties

139 NPS Milepost

Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

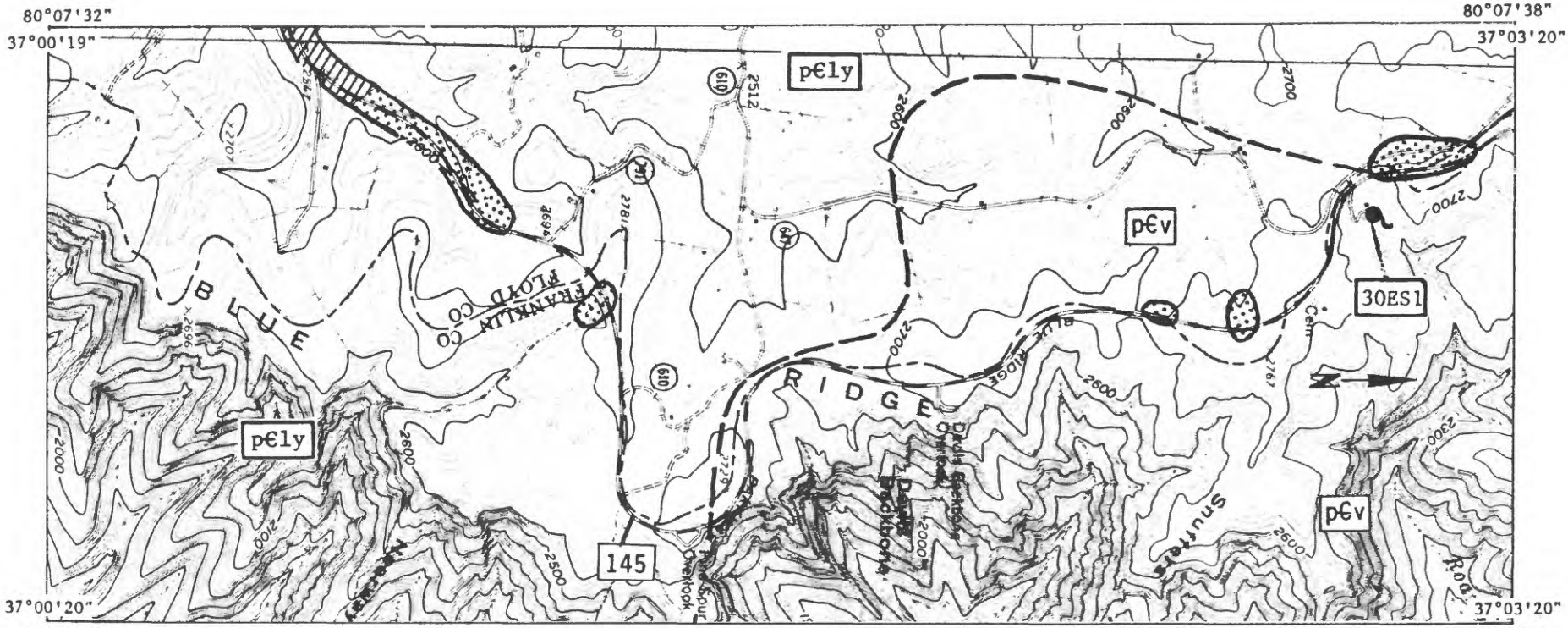
Figure 41.--Cahas Overlook area (Miles 138.2 to 142.4).

Cahas Overlook area (miles 138.2 to 142.4).--The Parkway swings to the east for a short distance at the beginning of this section then follows a southerly trend along the crest of the Blue Ridge Mountains. The Parkway descends from about 2,900 feet above sea level just south of Cahas Overlook to about 2,700 feet above sea level near the end of this section.

There is one overlook with parking facilities--Cahas Mountain at mile 139.

The rocks throughout this section are granite and gneiss of the Virginia Blue Ridge Complex. Just south and west of State routes 649 and 647 in the extreme southwest corner of this section there are undifferentiated phyllite, quartzite, graywacke and conglomerate of the Lynchburg Formation.

There are several fair areas for wells along this section of the Parkway.



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CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- pЄly — Lynchburg Formation-Undifferentiated phyllite, quartzite, graywacke and conglomerate.
- pЄv — Virginia Blue Ridge-Complex granite, gneiss and unakite.
- Approximate boundary between rock units
- Boundary between counties
- 145 — NPS Milepost
- Good area for wells
- Fair area for wells
- 30ES1 — Spring and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 42.--Devils Backbone area (Miles 142.4 to 146.4).

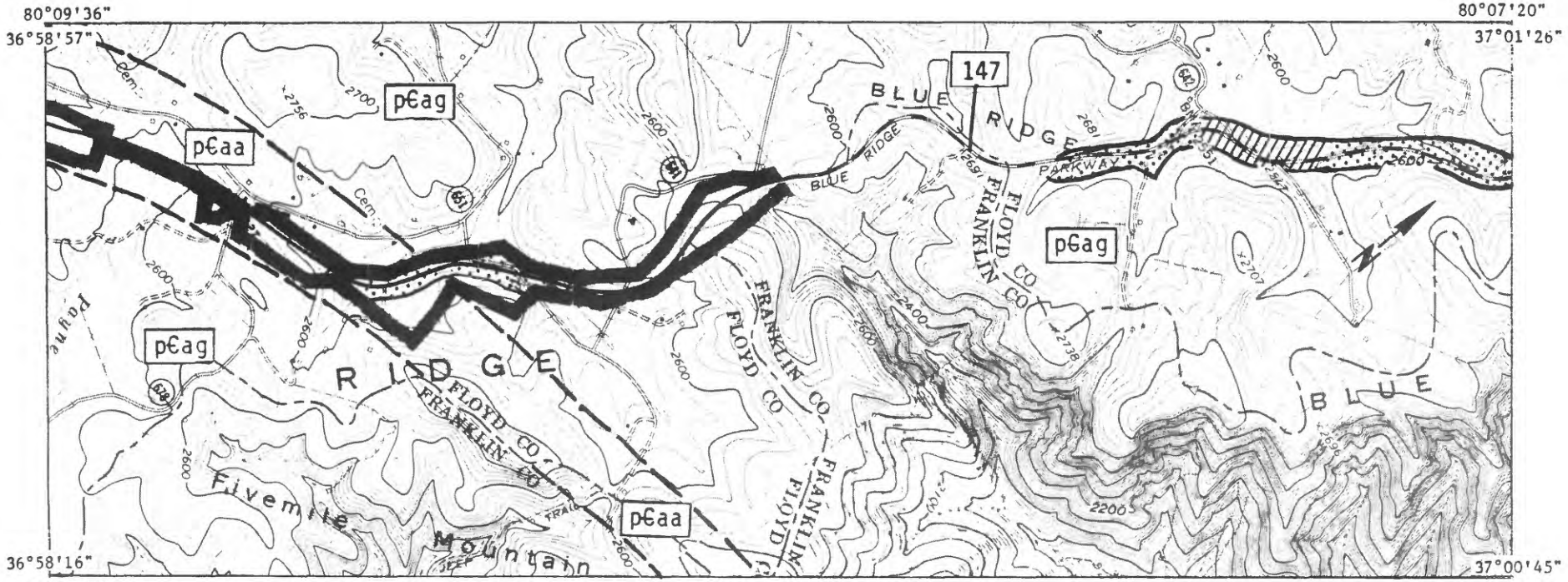
Devils Backbone area (miles 142.4 to 146.4).--The Parkway continues in a southerly direction along the crest of the Blue Ridge Mountains in this section. Near Pine Spur Overlook the Parkway swings to the east and then west as it follows the valley of a tributary to Little River (not shown on map). There is little variation in altitude, from about 2,700 feet above sea level. At the end of this section the altitude is about 2620 above sea level.

There are two overlooks with parking facilities along this section--a picnic area is proposed for the Devils Backbone Overlook at mile 143.9 near the middle of this section. Pine Spur Overlook is at mile 144.8.

The contact between the granite and gneiss of the Virginia Blue Ridge Complex and the undifferentiated phyllite, quartzite and conglomerate of the Lynchburg Formation crosses the Parkway near the middle of this section.

There is one spring, 30ES1, at the James House near the beginning of this section.

A good area for wells is located at the end of this section where the Parkway descends along the valley. There are several fair areas for wells. The best area for developing a ground-water supply for the Devils Backbone Overlook and the recreation area is below the saddle between the two knobs just north of the parking area.



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CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- pEag — Ashe Formation-Thinly layered gneiss interlayered with schist or phyllite.
- pEaa — Amphibolite Gneiss of the Ashe Formation--Amphibolite with interlayered gneiss and schist.
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 147 — NPS Milepost
- Good area for wells
- Fair area for wells

Note: The Lynchburg Formation is equivalent in part to the Ashe Formation.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

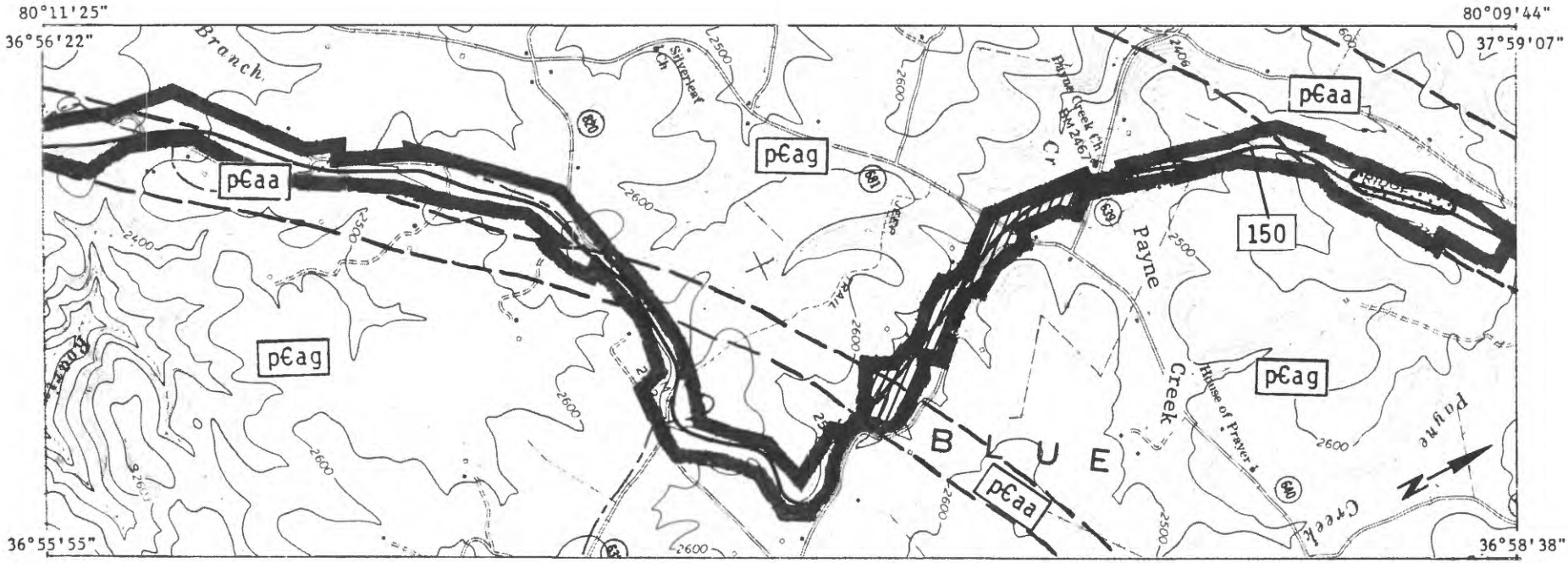
Figure 43.--Five Mile Mountain area (Miles 146.4 to 149.4).

Five Mile Mountain area (miles 146.4 to 149.4).--The Parkway continues its overall southwest trend along the crest of the Blue Ridge Mountains. The altitude ranges from about 2,620 feet to about 2,720 feet above sea level.

There are no recreation facilities along this section of the Parkway.

The rocks along this section are thinly layered biotite-muscovite gneiss interlayered with mica schist or phyllite of the Ashe Formation. Near the end of this section the gneiss is called an amphibolite gneiss and contains some garnet.

The good area for wells at the beginning of this section is a continuation of the area shown at the end of the previous section. Fair areas for wells are where the Parkway crosses or follows valleys.



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CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- pEag — Ashe Formation-Thinly layered gneiss interlayered with schist or phyllite.
- pEaa — Amphibolite Gneiss of the Ashe Formation--Amphibolite with interlayered gneiss and schist.
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 150 — NPS Milepost
- Good area for wells
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

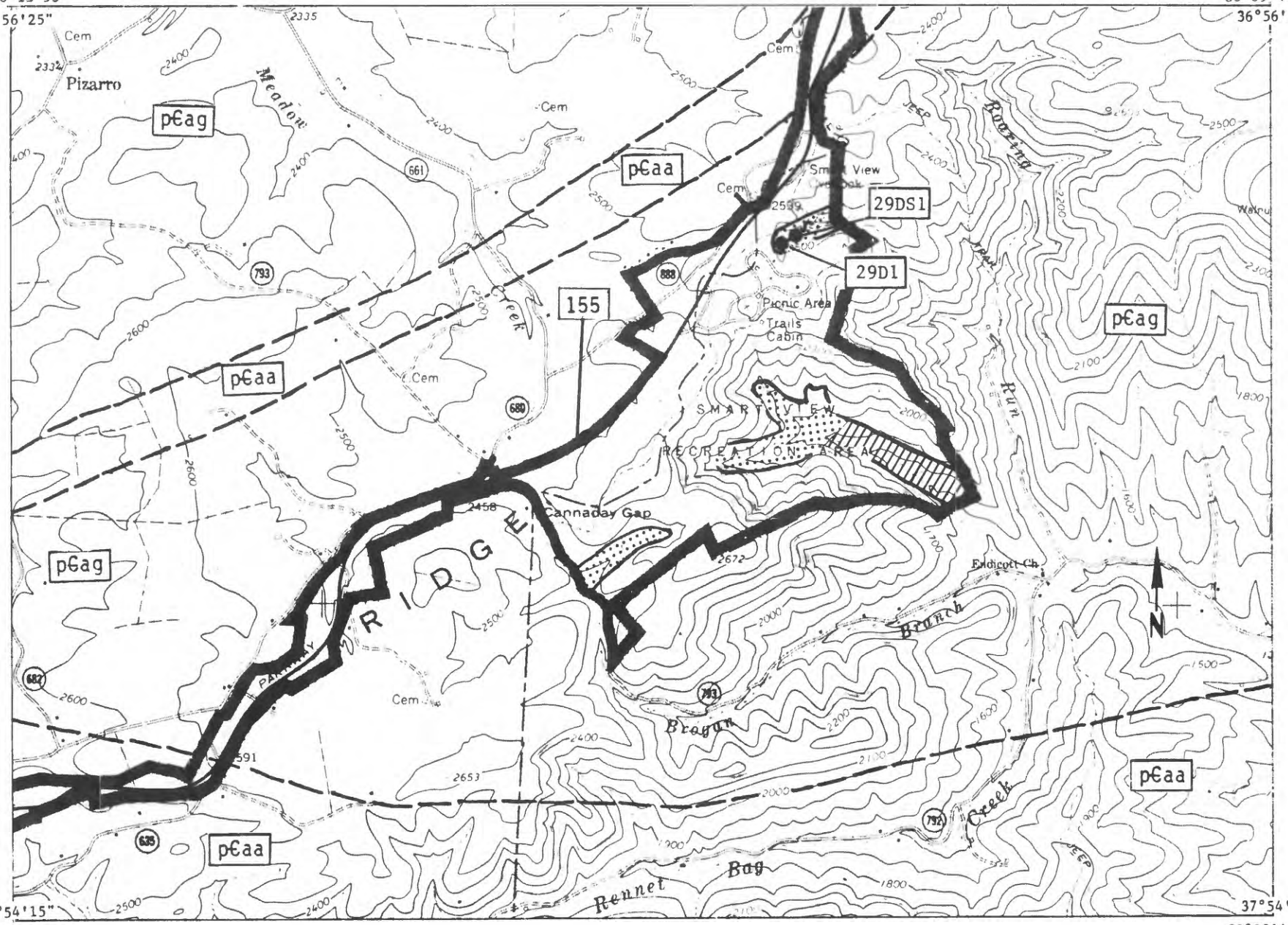
Figure 44.--Payne Creek area (Miles 149.4 to 153.7).

Payne Creek area (miles 149.4 to 153.7).--In this section, the Parkway continues its southwest trend along the crest of the Blue Ridge Mountains. The Parkway crosses Payne Creek several hundred feet south of State Highway 639, and follows the valley of an unnamed tributary to Payne Creek for about one mile. The altitude along this section ranges from about 2500 feet to 2700 feet above sea level with the higher altitude near the middle of the section.

There are no recreation facilities or parking overlooks.

The rocks along this section are thinly layered biotite-muscovite gneiss interlayered with mica schist or phyllite of the Ashe Formation. Near the beginning and middle of this section the gneiss is an amphibolite gneiss and contains some garnet.

A good and fair area for wells within the Parkway boundaries is where the Parkway crosses over Payne Creek and follows the valley of its tributaries near the beginning of this section.


80°13'53"
36°56'25"
80°09'44"
36°56'25"
Pizarro
Meadow
Cem
pEag
pEaa
661
793
680
682
635
888
792
155
29DS1
29D1
Picnic Area
Trails
Cabin
SMART VIEW
RECREATION AREA
Cannaday Gap
2458
2672
RIDGE
PARKWAY
Creek
Run
Branch
Broyan
Bog
Rennet
Endicott Ch
Roaring
Walnu
JEEP
N
36°54'15"
80°13'53"
37°54'15"
80°09'44"

SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

p€ag Ashe Formation-Thinly layered gneiss interlayered with schist or phyllite.

p€aa Amphibolite Gneiss of the Ashe Formation--Amphibolite with interlayered gneiss and schist.

Approximate boundary between rock units

Boundary of the Blue Ridge Parkway

Boundary between counties

155 NPS Milepost

Good area for wells

Fair area for wells

29D1 Well and local no.

29DS1 Spring and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 45.--Smart View Recreation area (Miles 153.7 to 157.0).

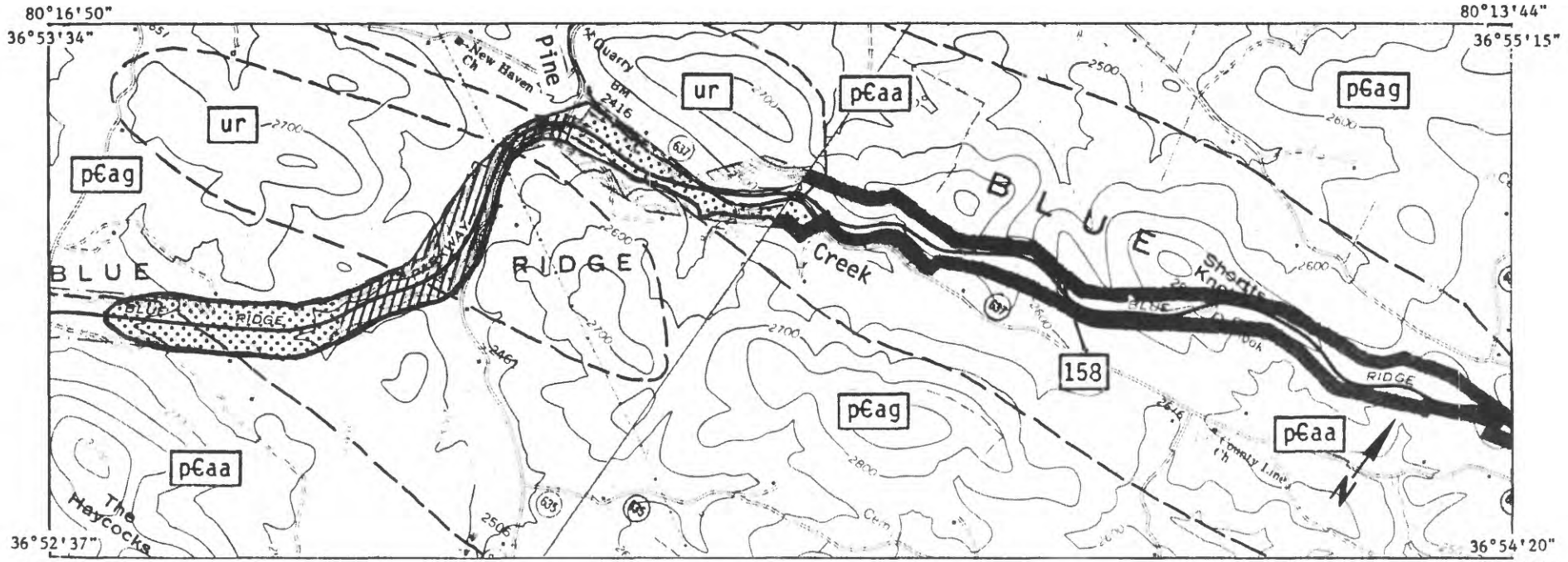
Smart View recreation area (miles 153.7 to 157.0).--The Parkway continues its southwest trend along the crest of the Blue Ridge Mountains. The Parkway is relatively flat ascending from about 2500 feet at the beginning to about 2625 about sea level at the end of this section.

The Smart View Overlook and recreation area are located at mile 154.5. There are hiking trails and a picnic area with a one room trail cabin built in the 1890's at this recreation area.

The rocks along this section are thinly layered biotite-muscovite gneiss interlayered with mica schist or phyllite of the Ashe Formation.

Well 29D1 is the supply well for the picnic area, spring 29DS1 is unused. Both are located in a draw just north of the picnic area. There is no water quality data for the spring.

Good and fair areas for wells within the Smart View recreation area are in the valley of the tributaries to Rennet Bag Creek just southeast of the picnic area. Well 29D1, just north of the picnic area is located in a fair area. The yield from this well could possibly be increased by deepening another 100 feet.



SCALE 1:24000

0 1/2 1 MILE

0 1/2 1 KILOMETER

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

EXPLANATION

- ur — Ultramafic Rock-Mainly schist
- pEag — Ashe Formation-Thinly layered gneiss interlayered with schist or phyllite.
- pEaa — Amphibolite Gneiss of the Ashe Formation--Amphibolite with interlayered gneiss and schist.

- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 158 — NPS Milepost

- Good area for wells
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

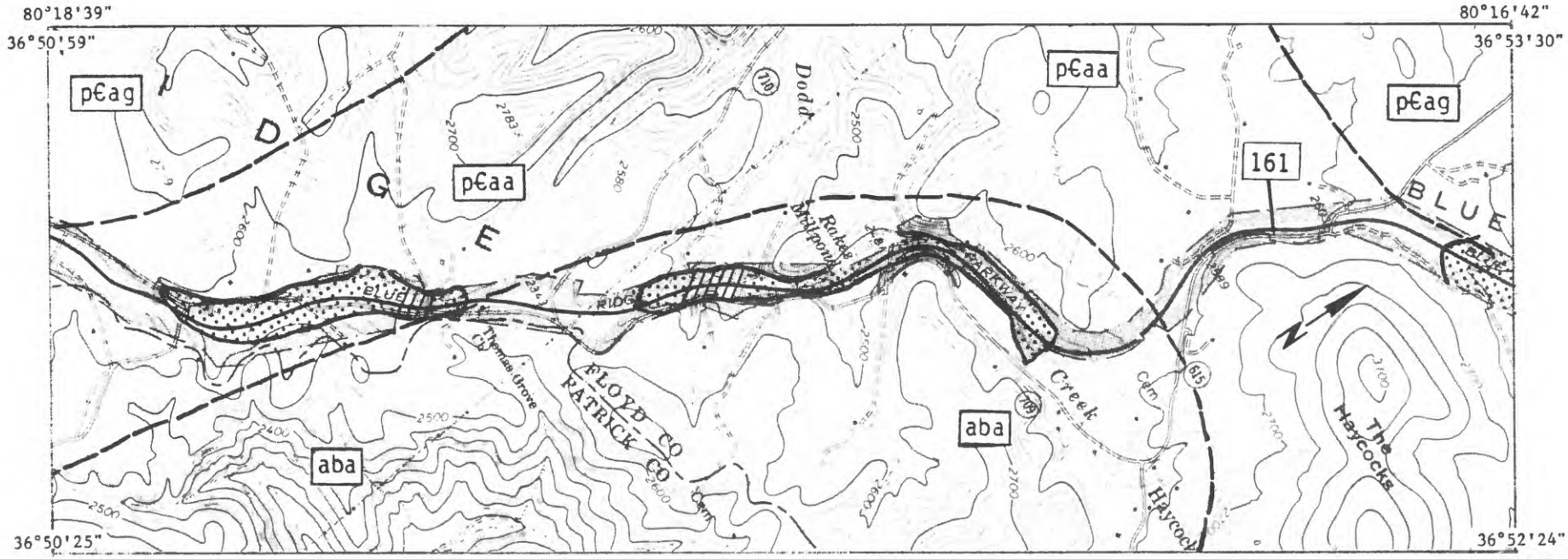
Figure 46.--Shortts Knobs area (Miles 157.0 to 160.6).

Shortts Knob area (miles 157.0 to 160.6).--The Parkway continues southwest just below the top of the knobs. The Parkway ascends from about 2625 to about 2810 feet above sea level at Shortts Knob Overlook and then descends to about 2650 feet near the end of this section. The lowest point is about 2400 feet above sea level at the intersection of the Parkway and State Route 860.

Shortts Knob Overlook, the highest point along this section, is at mile 157.6.

The rocks along this section are thinly layered biotite-muscovite gneiss interlayered with mica schist or phyllite of the Ashe Formation. Near the end of this section there is some ultramafic rock, chlorite-tremolite-magnetite schist.

Good and fair areas for wells are present along most of the last half of this section where the Parkway follows the valley of Pine Creek.



SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- pEaa — Amphibolite Gneiss of the Ashe Formation--Amphibolite with interlayered gneiss and schist.
- pEag — Ashe Formation-Thinly layered gneiss interlayered with schist or phyllite.
- aba — Alligator Back Formation-Amphibolite gneiss
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 161 — NPS Milepost
- Good area for wells
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

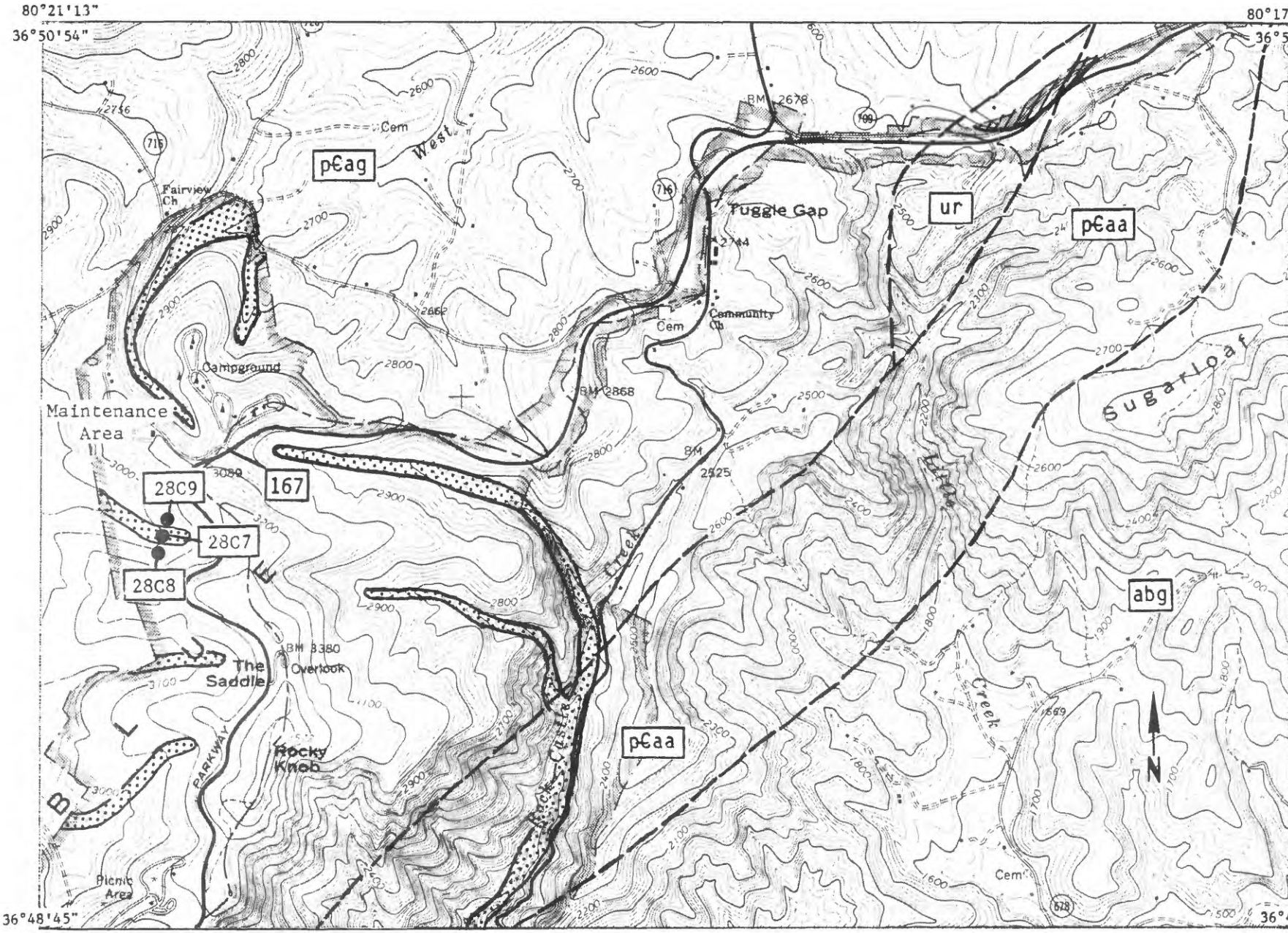
Figure 47.--The Haycocks area (Miles 160.6 to 160.1).

The Haycocks area (Miles 160.6 to 164.1).--The Parkway continues its southwest trend along the crest of the Blue Ridge Mountains. There is less than 125 foot change in altitude along this section. The lowest point, about 2540 feet above sea level, is at the intersection of the Parkway and State Route 710 and the highest point about 2650 above sea level at the end of this section.

There are no overlooks or recreation areas along this section.

The rocks at the beginning and end of this section are amphibolite gneiss and interlayered biotite-muscovite gneiss and mica schist of the Ashe Formation, and in the middle of this section amphibolite and greenstone interlayered with biotite-muscovite gneiss and metapelite of the Alligator Back Formation. In the extreme northwest and southwest part of this section there are the thinly layered biotite muscovite gneiss interlayered with mica schist or phyllite of the Ashe Formation.

Good and fair areas for wells are along the valley of Dodd Creek and its tributaries where they parallel the Parkway.


80°21'13"
36°50'54"
80°17'33"
36°50'54"
p€ag
West
Fairview Ch
Cem
2756
716
2700
2900
2800
2600
2662
Campground
Maintenance Area
3089
3000
28C9
28C7
28C8
167
BM 3380
Overlook
The Saddle
Rocky Knob
PARKWAY
BLUE RIDGE
Picnic Area
BM 2678
109
Puggle Gap
2744
Community Cb
Cem
BM 2868
BM 2525
ur
p€aa
2500
2400
2300
2200
2100
Sugarloaf
Little Creek
Rock Castle Creek
abg
1900
1800
1700
1600
1500
N
Cem
678
36°48'45"
80°21'13"
36°48'45"
80°17'33"

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

SCALE 1:24000

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- ur — Ultramafic Rock-Mainly schist
- pЄaa — Amphibolite Gneiss of the Ashe Formation--Amphibolite with interlayered gneiss and schist.
- pЄag — Ashe Formation-Thinly layered gneiss interlayered with schist or phyllite.
- abg — Alligator Back Formation-Laminated gneiss

- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 167 — NPS Milepost

- Good area for wells
- Fair area for wells
- 28C7 ● — Well and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 48.--Rocky Knobs area, north section (Miles 164.1 to 168.6).

Rocky Knob recreation area, north section (Miles 164.1 to 168.6).--The Rocky Knob recreation area is covered in three sections. The northern section begins just north of Tuggle Gap.

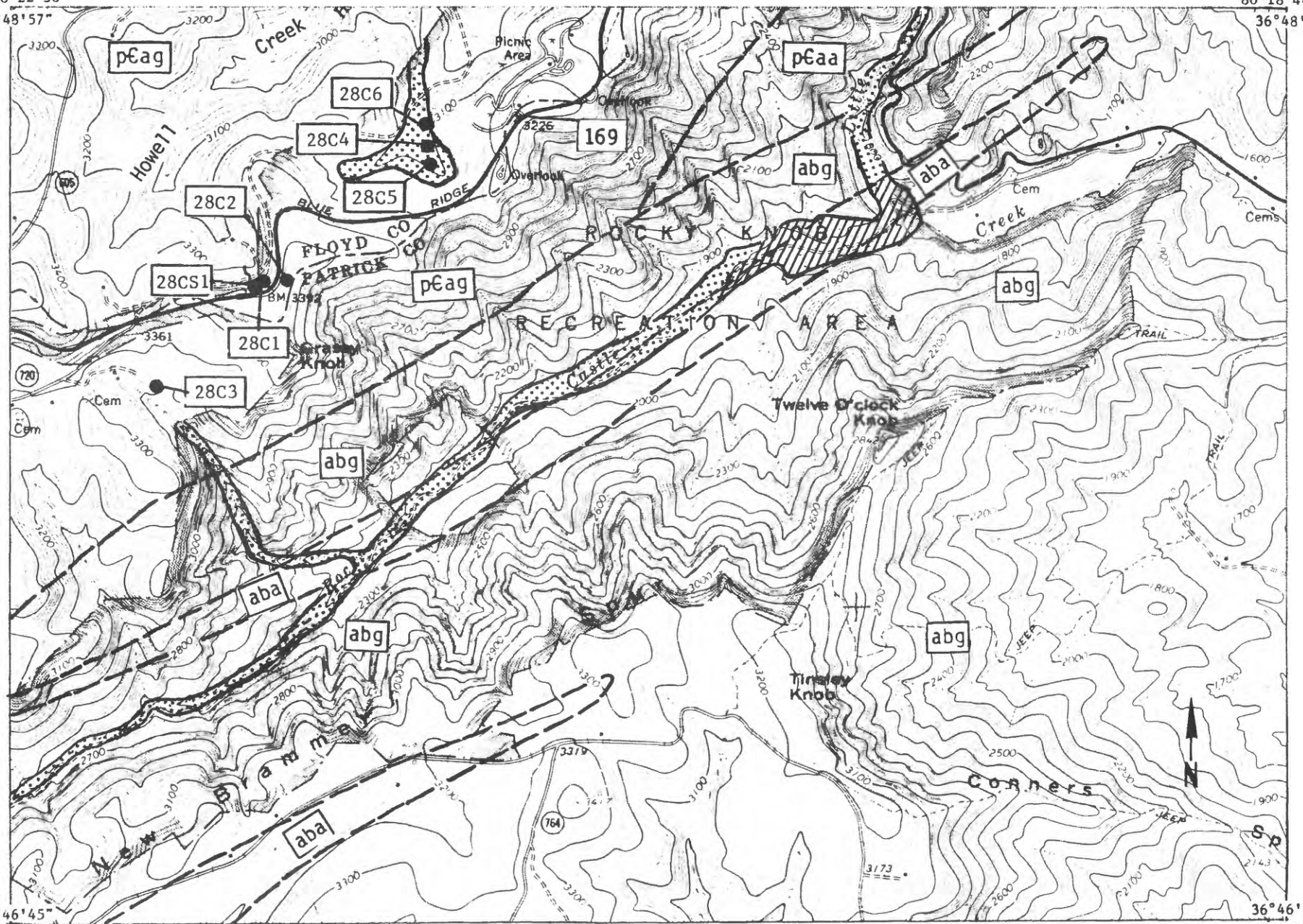
The Parkway continues southwest along the crest of the Blue Ridge Mountains and the Floyd-Patrick County line through Tuggle Gap and The Saddle. The Parkway ascends from about 2650 feet to about 3350 feet above sea level at The Saddle (about mile 168) and then descends to about 3225 feet above sea level near the picnic area at the end of this section.

There are several overlooks, a picnic area and campground. The entrance to the campground is near the beginning of this section at mile 167. There is a hiking trail from The Saddle Overlook along the top of Rocky Knob, to the picnic area near the end of this section.

At the beginning of this section the rocks are the amphibolite interlayered with biotite-muscovite gneiss and mica schist of the Ashe Formation. These rocks form a narrow belt trending northeast, and lie mainly to the east of the Parkway. A small area of ultramafic rocks, chlorite-tremolite-magnetite schist adjoin these rocks. Thinly layered biotite-muscovite gneiss interlayered with mica schist or phyllite of the Ashe Formation underlie the Parkway in the remainder of this section.

Three wells, 28C7-9, were drilled in a valley just south of the maintenance area. Well 28C7 was drilled to 320 feet along the alignment of the valley and has a yield of 26 gpm. This is the supply well for the campground and maintenance area. Well 28C8 was drilled to a depth of 125 feet and has a yield of 3 gpm. This well is not used. Well 28C9 was drilled to a depth of 245 feet and was reported as a dry hole. This well was abandoned and filled in.

Good and fair areas for wells within the Parkway boundaries are along the deeply incised valley of Little Rock Castle Creek and outside the Parkway boundaries in the valley of Little Creek and its tributaries.


80°22'30"
36°48'57"
80°18'44"
36°48'57"
pEag
Creek
Picnic Area
pEaa
28C6
28C4
28C5
169
Howell
Overlook
abg
aba
28C2
BLUE RIDGE
Cem
Cems
FLOYD CO
PATRICK CO
ROCKY KNOB
28CS1
pEag
BM 3312
RECREATION AREA
abg
28C1
Crabtree Knob
TRAIL
3361
28C3
Cem
Cem
Twelve O'clock Knob
JEEP
TRAIL
abg
aba
abg
abg
Tinsley Knob
Corners
JEEP
JEEP
N
Sp
aba
3319
3173
36°46'45"
80°22'30"
36°46'45"
80°18'44"

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

SCALE 1:24000

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- p€ag — Ashe Formation-Thinly layered gneiss interlayered with schist or phyllite.
- p€aa — Amphibolite Gneiss of the Ashe Formation--Amphibolite with interlayered gneiss and schist.
- aba — Alligator Back Formation-Amphibolite gneiss.
- abg — Alligator Back Formation-Laminated gneiss

- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 169 — NPS Milepost

- Good area for wells
- Fair area for wells
- 28C1 — Well and local no.
- 28CS1 — Spring and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 49.--Rocky Knobs Recreation area, middle section (Miles 168.6 to 170.6).

Rocky Knob recreation area, middle section (Miles 168.6 to 170.6).--This is the middle section of the three sections covering the Rocky Knob recreation area. The Parkway continues its southwest trend along the crest of the Blue Ridge Mountains and Floyd-Patrick County border. The Parkway ascends from about 3,225 feet near the picnic area to about 3,425 feet above sea level near the end of this section.

The picnic area shown at the beginning of this section is the same area shown at the end of the previous section.

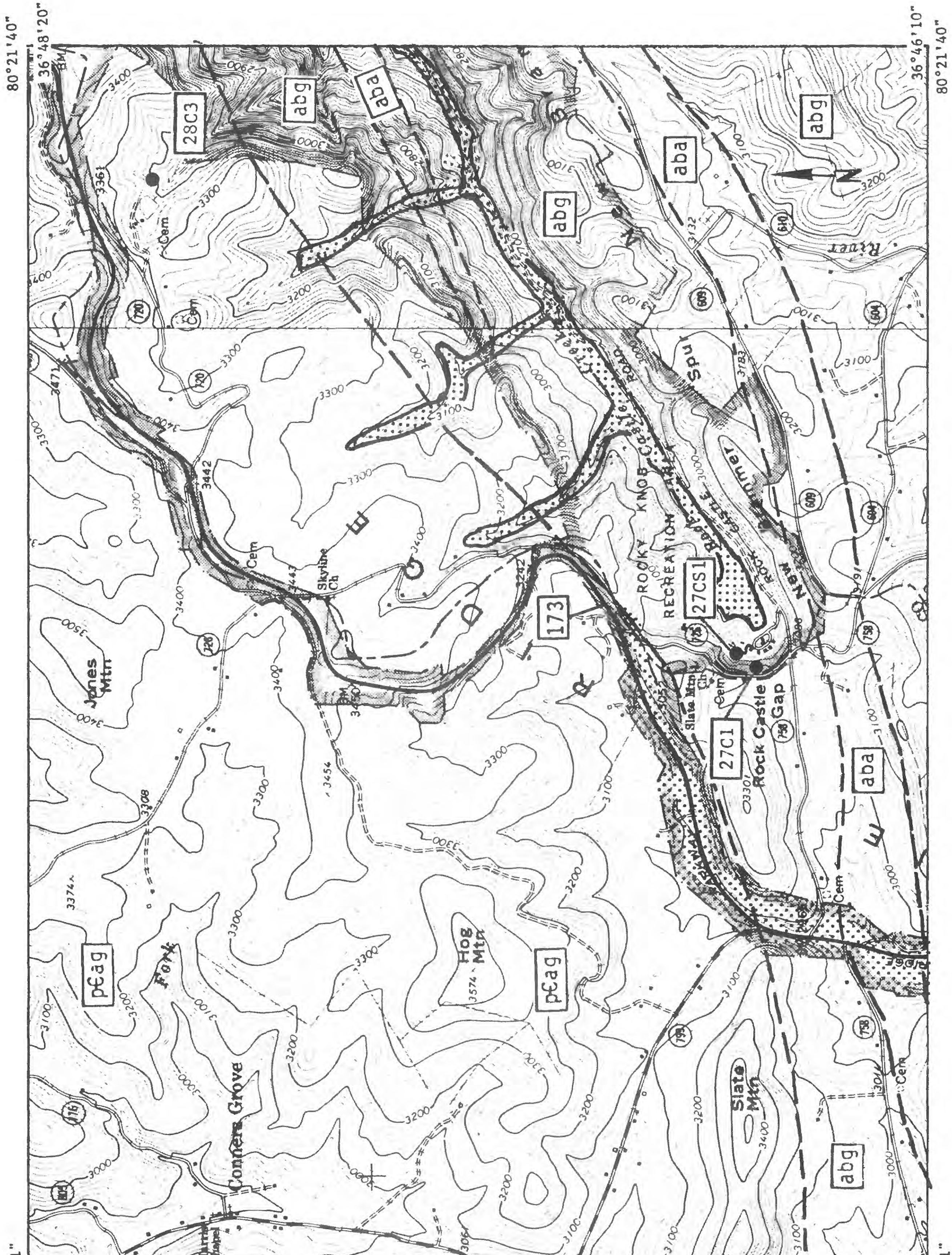
The rocks near the beginning of this section are finely laminated gneiss commonly having thicker layers of schist or phyllite and amphibolite and greenstone of the Alligator Back Formation. Thin sections of amphibolite and greenstone interlayered with biotite-muscovite gneiss and metapelite trending northeast are present. The northwestern part of this section is underlain by thinly layered biotite-muscovite gneiss interlayered with mica schist or phyllite of the Ashe Formation. A small area of amphibolite and interlayered biotite muscovite gneiss and mica schist of the Ashe Formation is present in the north-central part of this section.

Six wells, 28C1-6, and one spring, 28CS1, were inventoried in this area. The first two wells, 28C1 and 2, were drilled on the northwest slope of Grassy Knoll near the end of this section. Well 28C1 was drilled to a depth of 300 feet and was reported as a dry hole, abandoned and filled in; well 28C2 was drilled to a depth of 200 feet and had a reported yield of 2 gpm and was abandoned and filled in. Well 28C3 was drilled in a valley just southwest of Grassy Knoll. This well was drilled to a depth of 200 feet and had a reported yield of 51 gpm. Of these three wells, 28C3 with the highest yield, was drilled in a valley with a much larger recharge area and storage above the well site than either wells 28C1 or 2.

Spring 28CS1 is on the northwest flank of Grassy Knoll near well 28C1, which was reported as a dry hole and abandoned and filled in. This spring is a contact type spring. The discharge for this spring is from storage in the saprolite along the western and southern flanks of Grassy Knoll above the spring outlet. The spring is reported to flow all year.

Wells 28C4-6 are located in a valley just southwest of the picnic area near the beginning of this section. Well 28C4 was drilled to a depth of 100 feet and had a reported yield of 6.5 gpm. This well is currently unused; well 28C5 was drilled to a depth of 100 feet with a yield of less than 1 gpm and abandoned and filled in. Well 28C6 was drilled to a depth of 100 feet with a yield of 51 gpm and is used as a supply well for the picnic area.

There are good and fair areas for wells along the deeply incised valleys of Rock Castle and Little Rock Castle Creeks. The most accessible areas are along Howell Creek and its tributaries just northwest of the Parkway boundary near the picnic area.



80°21'40"
36°48'20"
36°46'10"
80°25'21"
28C3
abg
aba
173
27CS1
27C1
pЄag
ROCKY KNOB RECREATION AREA
Rock Castle Gap
Slate Mtn
Hog Mtn
Jones Mtn
Conners Grove
Skyline Ch
Spur
River

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

SCALE 1:24000

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- p€ag Ashe Formation-Thinly layered gneiss interlayered with schist or phyllite.
- aba Alligator Back Formation-Amphibolite gneiss.
- abg Alligator Back Formation-Laminated gneiss

- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 173 NPS Milepost

- Fair area for wells
- 27C1 Well and local no.
- 27CS1 Spring and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 50.--Rocky Knobs Recreation area, south section (Miles 170.6 to 174.3).

Rocky Knob recreation area, south section (Miles 170.6 to 174.3).-This is the southernmost section of the three sections covering the Rocky Knob recreation area. In this section, the Parkway continues its southwest trend along the crest of the Blue Ridge Mountains at or near the Floyd-Patrick County line. The altitude varies from about 3,425 feet above sea level at the beginning to about 2,960 feet near the end of this section. There is an overlap of about one mile with the preceding section.

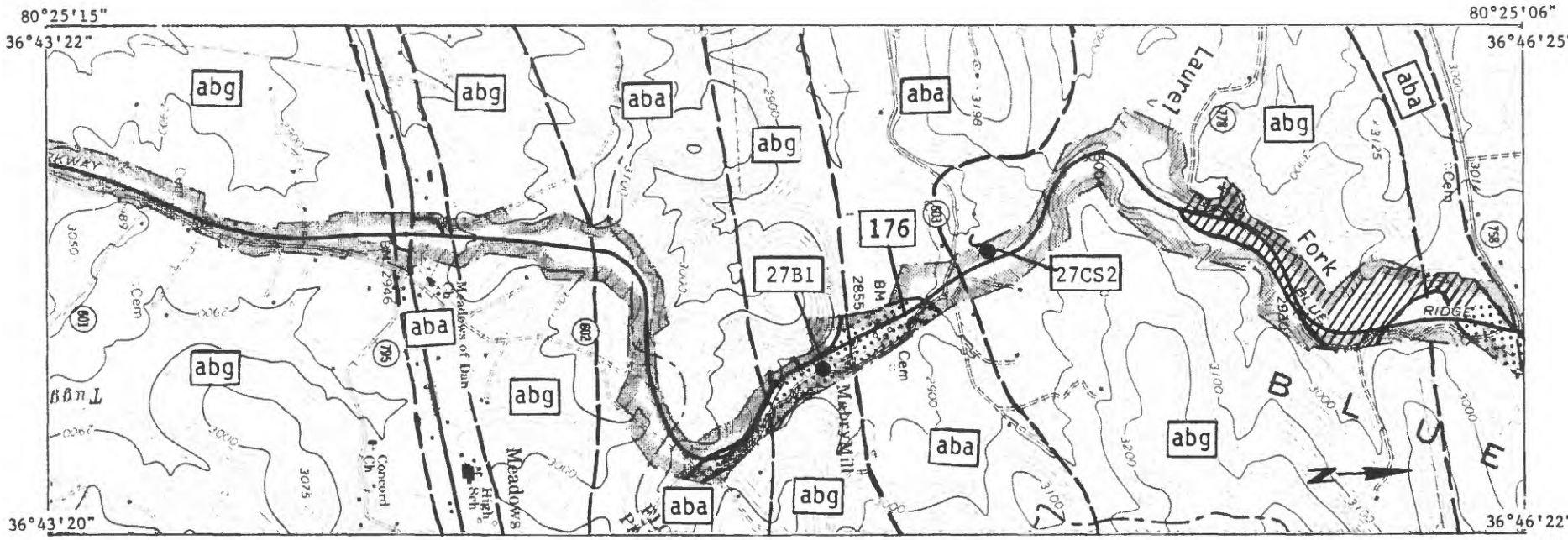
The entrance to the Rocky Knob cabins at the southwest end of the Rocky Knob recreation area is at mile 174.

The rocks in the immediate vicinity of the Parkway with the exception of the southern part are thinly layered biotite muscovite gneiss interlayered with mica schist or phyllite. The rocks in southern part are finely laminated gneiss, and amphibolite and greenstone interlayered with biotite-muscovite gneiss and metapelite of the Alligator Back Formation. These rocks are trending northeast as on the previous section.

Well 27C1 and spring 27CS1 are located at Rock Castle Gap the headwaters for Rock Castle Creek. The well was drilled to a depth of 245 feet and has a yield of 26 gpm. The yield of the spring ranges from 1.5 to 7.5 gpm for the period of record 1959 to 1963. Both the well and spring are used as a supply for the Rocky Knob cabins at Rock Castle Gap. Wells 28C1, 2 and 3 and Spring 28CS1 shown at the beginning of this section were discussed in the preceding section.

Well 27C1 and spring 27CS1 provide the water for the Rocky Knob cabins. Data for this well and spring are given in table 4 and 5 respectively.

Fair areas for wells are along the deeply incised valley of Rock Castle Creek at the Rocky Knob recreation area and along the valley of Laurel Fork which parallels the Parkway in the lower half of this section.



SCALE 1:24000

0 1/2 1 MILE

0 1/2 1 KILOMETER

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

EXPLANATION

- aba — Alligator Back Formation-Amphibolite gneiss.
- abg — Alligator Back Formation-Laminated gneiss
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 176 — NPS Milepost
- Good area for wells
- Fair area for wells
- 27B1 — Well and local no.
- 27CS2 — Spring and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 51.--Mabry Mill area (Miles 174.3 to 178.4).

Mabry Mill area (Miles 174.3 to 178.4).--The Parkway trends south along this section. There is little variation in altitude, from about 2,900 feet above sea level.

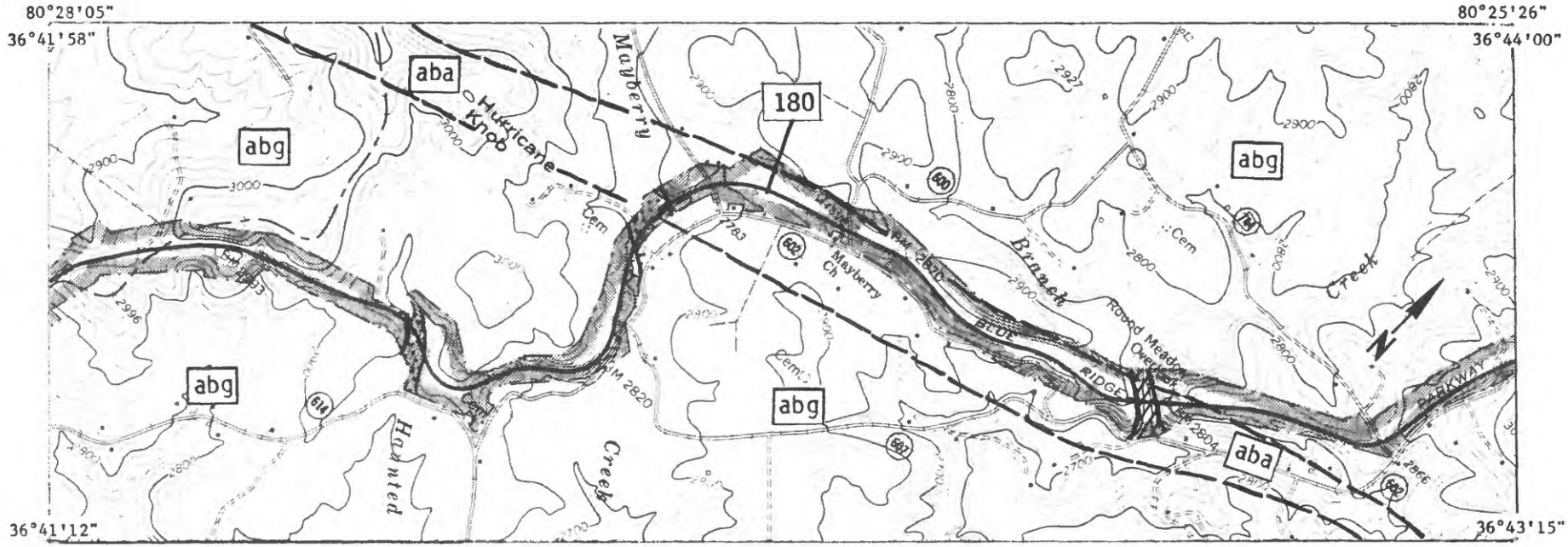
At Mabry Mill near the middle of this section is a visitor center, self-guiding trails, and a restaurant. The self-guiding trails lead to the pioneer exhibit with log cabins, farm buildings, a church, an operating blacksmith shop and a waterpowered grist mill.

The rocks along this section of Parkway are amphibolite and greenstone interlayered with biotite-muscovite gneiss and metapolite separated by bands of finely laminated gneiss of the Alligator Back Formation. These rocks trend almost due east.

Well 27B1 and spring 27CS2 are located at Mabry Mill near the middle of this section. Well 27B1 is located in a draw on the east side of the Parkway just south of the restaurant. The well was drilled to a depth of 200 feet and has a yield of 25 gpm. This is the supply well for the Mabry Mill area. Spring 27CS2 is located in a draw just west of the Parkway about three-tenths of a mile north of Mabry Mill. This spring served as the water supply for Mabry Mill before well 27B1 was drilled in 1963.

All of the residences and commercial buildings at Meadows of Dan have drilled or dug wells for water supply.

There are fair areas for wells within the Parkway boundaries in the valley of Laurel Fork which parallels the Parkway near the beginning of this section and a tributary to Laurel Fork which crosses the Parkway near Mabry Mill.



SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- aba — Alligator Back Formation-Amphibolite gneiss.
- abg — Alligator Back Formation-Laminated gneiss
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 180 — NPS Milepost
- Good area for wells
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 52.--Hurrican Knob area (Miles 178.4 to 182.3).

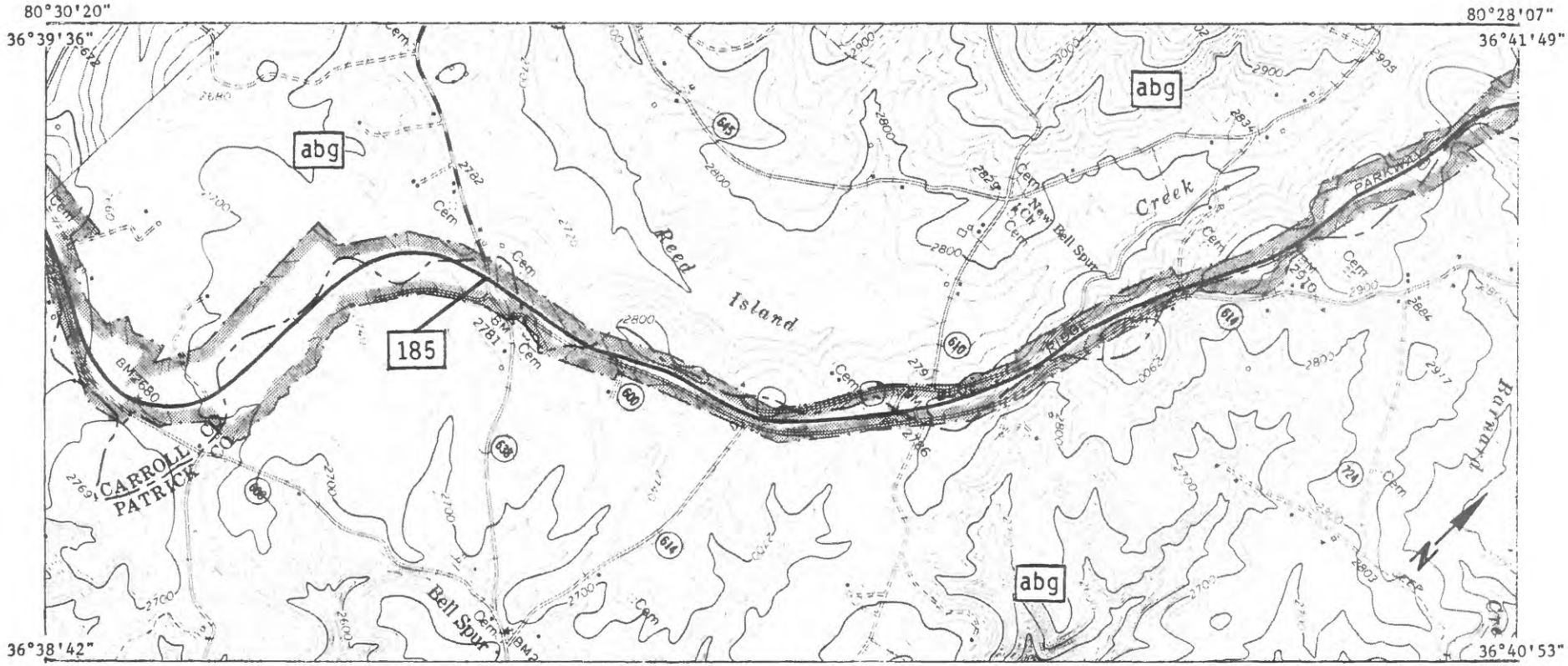
Hurricane Knob area (Miles 178.4 to 182.3).--The Parkway turns back to its southwest trend along this section. The altitude ranges from about 2,700 feet to about 3,000 feet above sea level. The lowest point is where the Parkway crosses Mayberry Creek.

The entrance to Round Meadow Overlook is about three-tenths of a mile beyond mile post 179. There are no other recreation facilities along this section.

The rocks along this section are finely laminated gneiss with thicker layers of schist or phyllite. A band of amphibolite and greenstone interlayered with biotite-muscovite gneiss and metapelite trending northeast crosses the Parkway near the middle of this section. All of these rocks belong to the Alligator Back Formation.

All the homes and farms along this section of the Parkway have wells and (or) springs for their supply.

A good area for wells is near Round Meadow Overlook. A fair area for wells is where the Parkway crosses Mayberry Creek and Haunted Branch.



SCALE 1:24000

0 1/2 1 MILE

0 1/2 1 KILOMETER

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

EXPLANATION

aba — Alligator Back Formation-Laminated gneiss.

— . — Boundary of the Blue Ridge Parkway

— – — Boundary between counties

185 — NPS Milepost

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

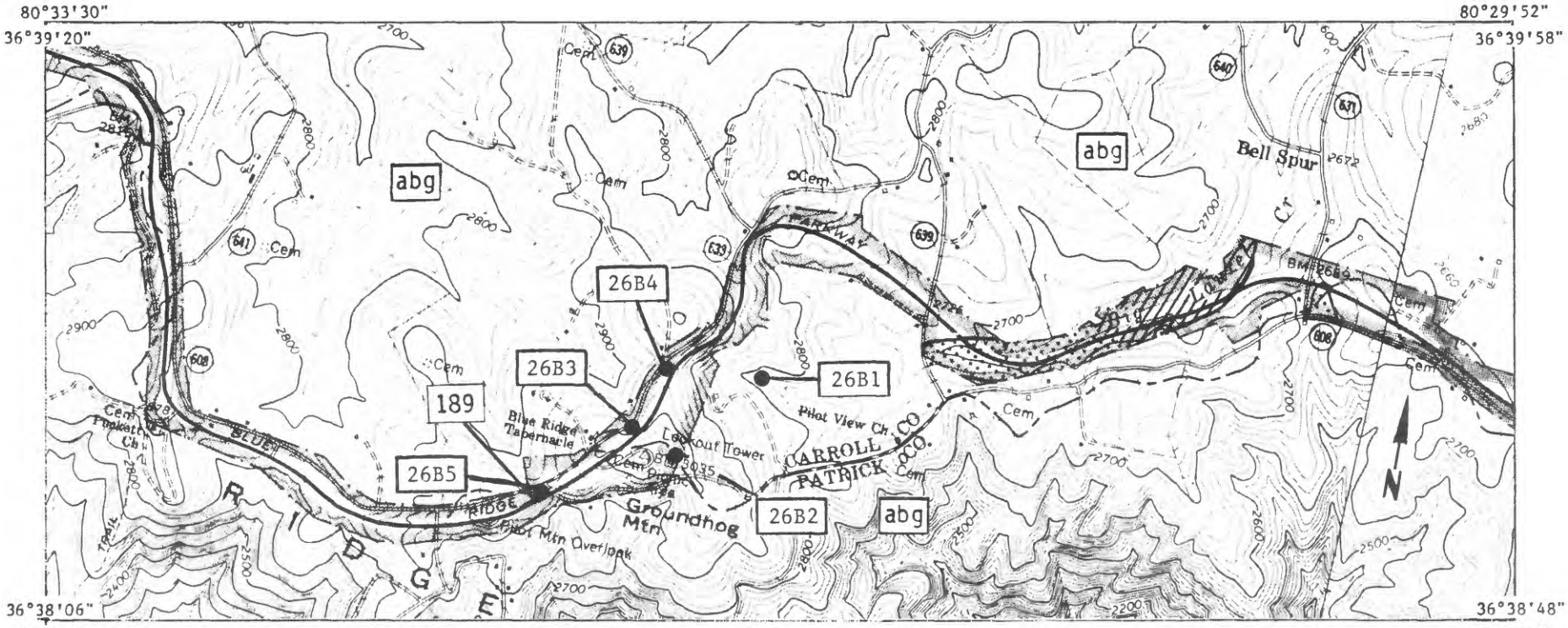
Figure 53 .--Bell Spur area (Miles 182.3 to 186.3).

Bell Spur area (Miles 182.3 to 186.6).--The Parkway continues southwest along the crest of the Blue Ridge Mountains descending from about 2,900 feet to about 2,670 feet above sea level.

There are no recreation facilities or overlooks along this section of the Parkway.

The rocks are laminated gneiss commonly with thicker layers of schist or phyllite of the Alligator Back Formation.

There are no good or fair areas for wells within the Parkway boundaries along this section. There are, however, several fair areas for wells not delineated in the valley of Reed Island Creek, just west of the Parkway boundaries. All the homes and farms along this section of the Parkway have wells and (or) springs for their supply.



SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- abg — Alligator Back Formation-Laminated gneiss.
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 185 — NPS Milepost
- Good area for wells
- Fair area for wells
- 26B1 ● — Well and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 54.--Ground Hog Mountain area (Miles 186.3 to 190.9).

Groundhog Mountain area (Miles 186.3 to 190.9).--In this section the Parkway has a westerly trend then turns due north for about the last mile following Carroll-Patrick County boundary. The altitude varies from about 2,670 feet near the beginning of the section to about 2,940 feet above sea level at Pilot Mountain Overlook, then descends to about 2,800 feet.

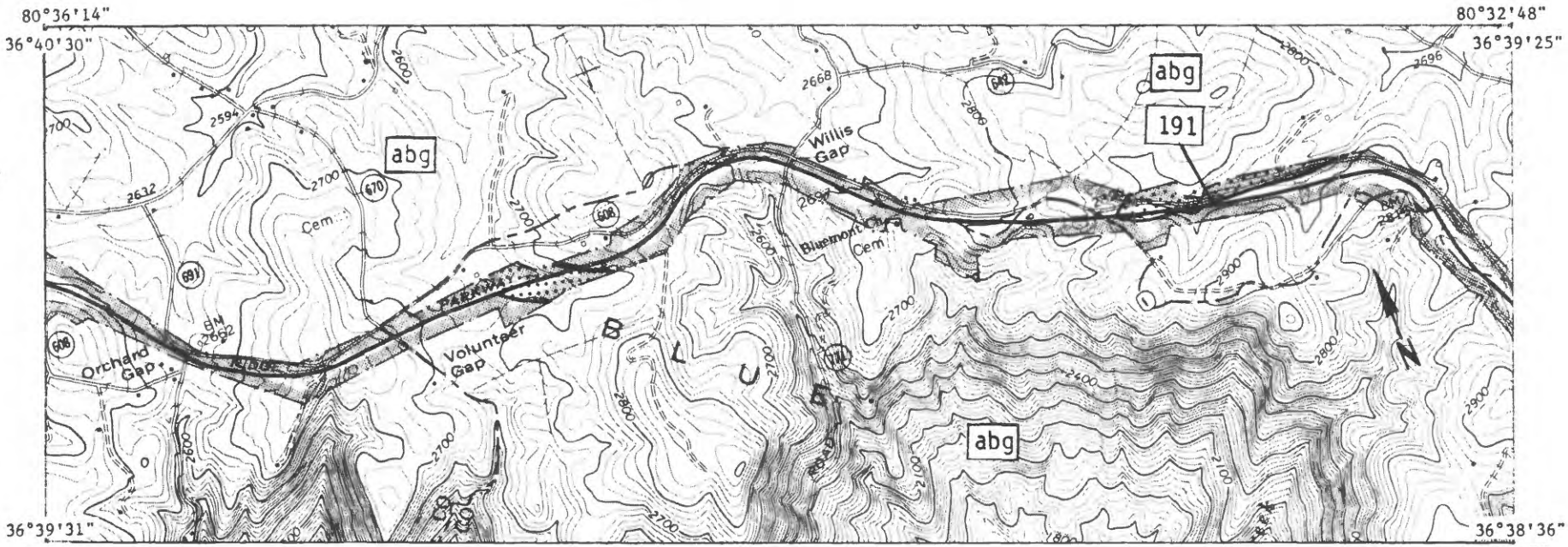
The Groundhog Mountain picnic area, Puckett Cabin and Pilot Mountain Overlook, are located along the last half of this section. At the Groundhog Mountain picnic area, there are several different types of rail fences and a look-out tower.

The rocks along this section are finely laminated gneiss commonly with thicker layers of schist or phyllite of the Alligator Back Formation.

Five wells, 26B1-5, were drilled in this area because of their physical setting along the flank of Groundhog Mountain. None have had adequate yields. Well 26B1, drilled to a depth of 302 feet, has a reported yield of 1.4 gpm. This is the supply well for Groundhog Mountain picnic area. Well 26B2 was drilled to 120 feet and reported as a dry hole. This well was abandoned and filled in. Well 26B3 was drilled to 164 feet with a reported yield of 2 gpm. this well is unused. Well 26B4 was drilled to a depth of 320 feet with a reported yield of 1.4 gpm. This well is being considered for use as a supply well for the picnic area. Well 26B5 was drilled to a depth of 425 feet with a reported yield of .5 gpm. This well was abandoned and filled in.

A good and fair area for wells is along the valley of Big Laurel Creek where it parallels the Parkway near the beginning of this section.

There are no accessible good or fair areas for wells within the Parkway boundaries at Groundhog Mountain picnic area. There are however two fair areas for wells just outside the Parkway boundaries in draws at the north and south end of the picnic area.



SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

abg — Alligator Back Formation-Laminated gneiss.

Boundary of the Blue Ridge Parkway

Boundary between counties

191 — NPS Milepost

Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

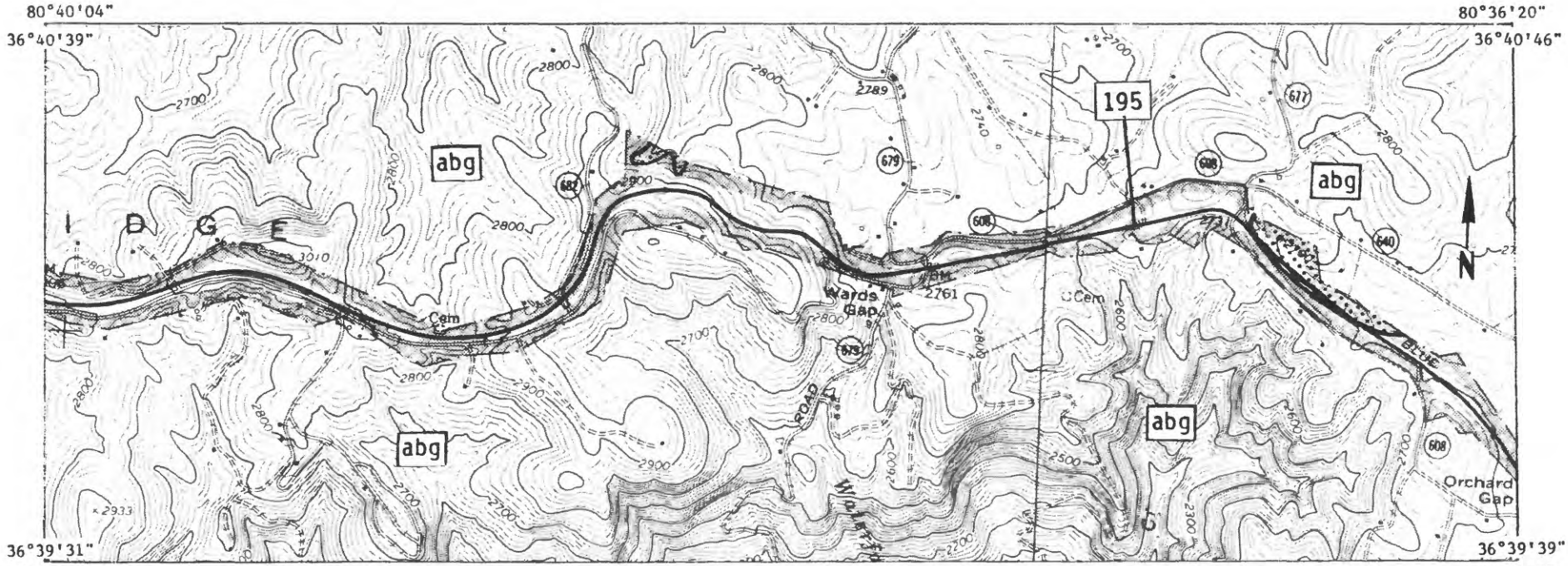
Figure 55.--Willis Gap area (Miles 190.9 to 194.0).

Willis Gap area (Miles 190.9 to 194.0).--The Parkway trends northwest along the crest of the Blue Ridge Mountains following the Carroll-Patrick County boundary. At Volunteer Gap the county boundary swings due south and the remainder of this section is in Carroll County. The Parkway descends from about 2,800 feet to about 2,600 feet above sea level near Willis Gap. From Willis Gap to the end of this section there is about a 60 foot variation in altitude.

There are no overlooks or recreation areas along this section.

The rocks along this section are finely laminated gneiss commonly with thicker layers of schist or phyllite of the Alligator Back Formation.

Fair areas for wells are near the beginning of this section and near Volunteer Gap.



SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

abg — Alligator Back Formation-Laminated gneiss.

Boundary of the Blue Ridge Parkway

Boundary between counties

195 — NPS Milepost

Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

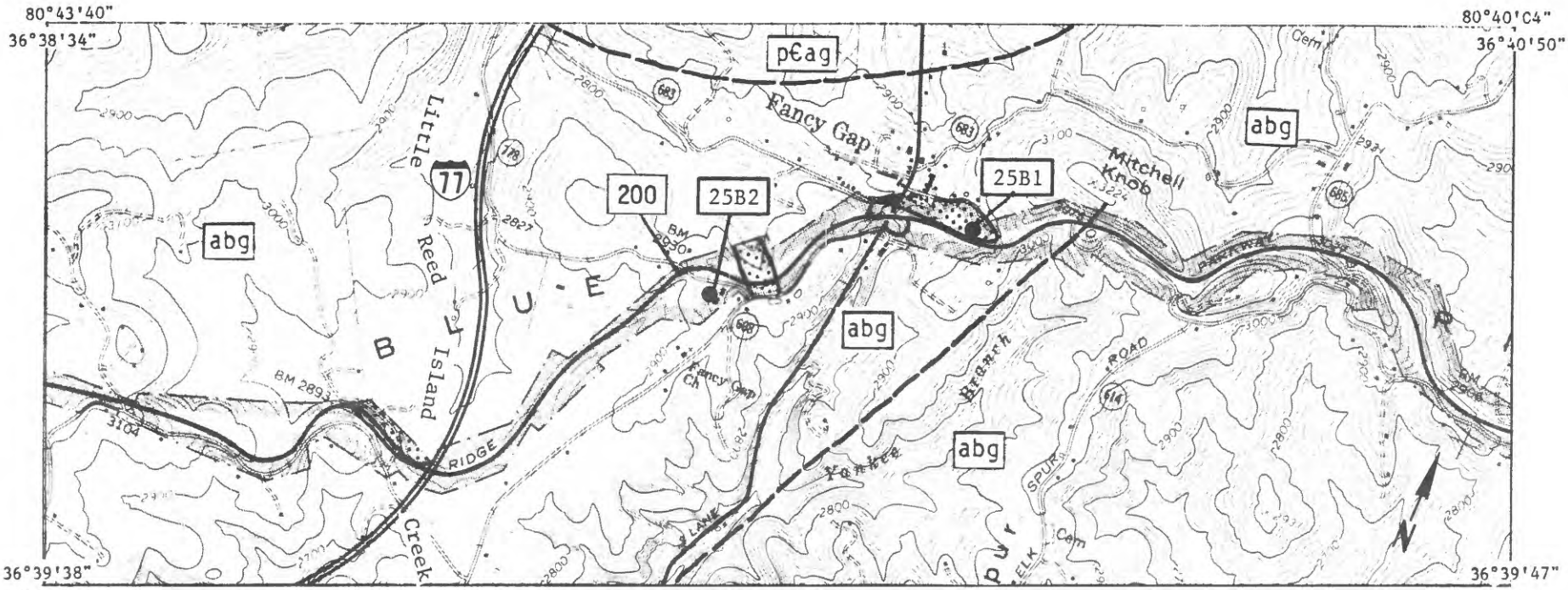
Figure 56.--Wards Gap area (Miles 194.0 to 197.7).

Wards Gap area (Miles 194.0 to 197.7).--This section of the Parkway trends due west along the crest of the Blue Ridge Mountains in Carroll County. The Parkway ascends from about 2,660 feet to about 2,900 feet above sea level near the unnamed knob at the end of this section.

There are no overlooks or recreation areas along this section.

The rocks are laminated gneiss commonly with thicker layers of schist or phyllite of the Alligator Back Formation.

There are no good areas for wells along this section. A fair area for wells is in the valley paralleling the Parkway near the beginning of this section.



SCALE 1:24000

0 1/2 1 MILE

0 1/2 1 KILOMETER

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

EXPLANATION

p€ag — Ashe Formation-Thinly layered gneiss interlayered with schist and phyllite.

abg — Alligator Back Formation-Laminated gneiss.

— — — Approximate boundary between rock units

— · — Boundary of the Blue Ridge Parkway

— – — Boundary between counties

200 — NPS Milepost

Fair area for wells

25B1 ● Well and local no.

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 57.--Fancy Gap area (Miles 197.7 to 201.8).

Fancy Gap Area (Miles 197.7 to 201.8).--The Parkway continues its southwest trend along the crest of the Blue Ridge Mountains in Carroll County. Altitude varies from about 2,900 feet to about 3,180 feet above sea level. The town of Hillsville is eight miles north of the Parkway via U.S. Highway 52.

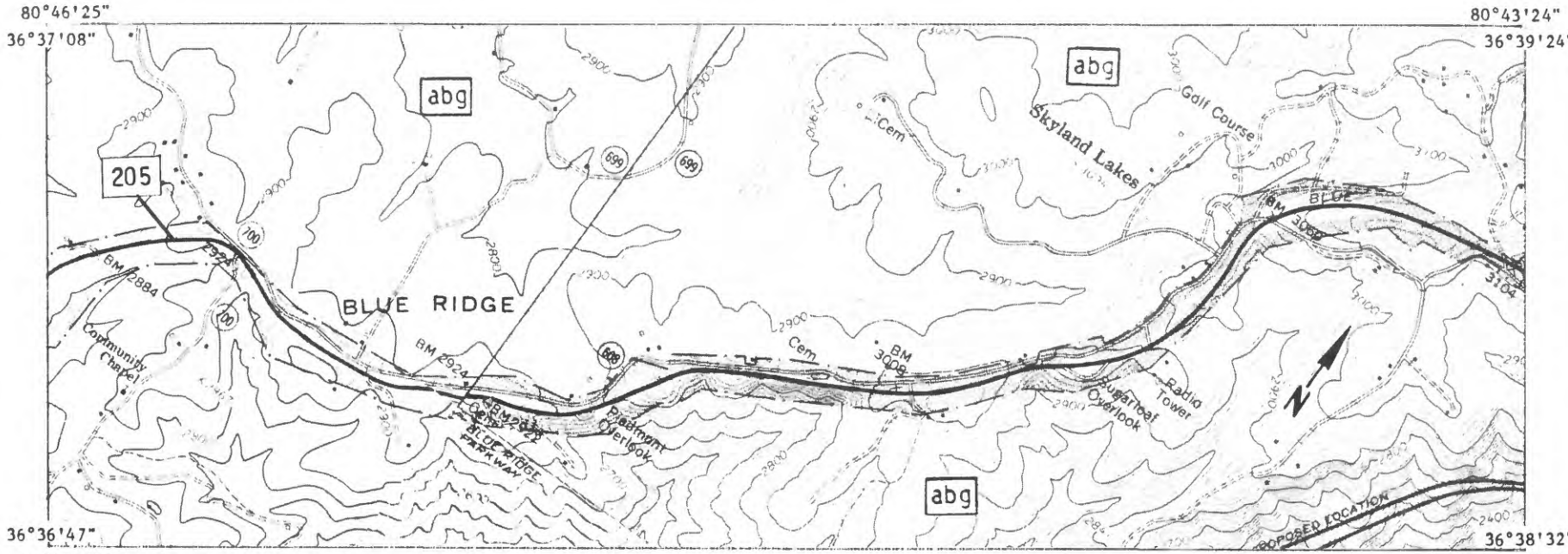
There are no overlooks along this section.

The rocks are the finely laminated gneiss, commonly with thicker layers of schist or phyllite of the Alligator Back Formation. Just north of Fancy Gap is a small area of thinly layered biotite-muscovite-gneiss with mica schist or phyllite of the Ashe Formation. A north-south trending fault crosses the Parkway and terminates at Mitchell Knob.

There are 2 wells, 25B1 and 2, near the middle of this section. Well 25B1 is located in a draw just north of the Parkway was drilled to a depth of 126 feet and has a yield of 15 gpm. This is the supply well for the maintenance area. Well 25B2 is located along the slope just below the top of a knob. The depth drilled is unknown, the yield is reported as 5 gpm.

All of the residences and commercial buildings at Fancy Gap have wells for water supply.

Fair areas for wells within the Parkway boundaries are in the draw at the Fancy Gap maintenance area just east of well 25B2, and in the valley of the Little Reed Island Creek where the proposed location for Interstate Highway 77 crosses the Parkway.



SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

abg — Alligator Back Formation-Laminated gneiss.

— . — Boundary of the Blue Ridge Parkway

205 — NPS Milepost

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

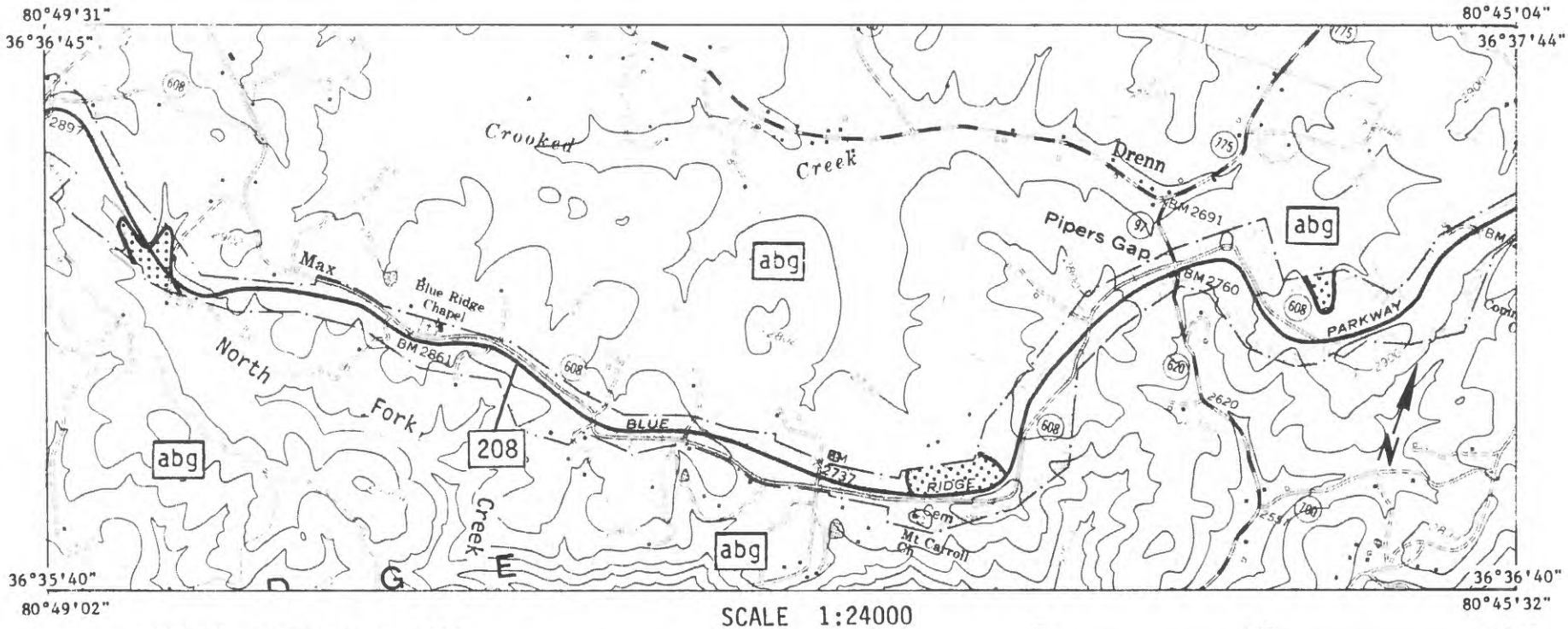
Figure 58.--Skyland Lakes area (Miles 201.8 to 205.3).

Skyland Lakes area (Miles 201.8 to 205.3).--The Parkway continues its southwest trend along the crest of the Blue Ridge Mountains in Carroll County. The Parkway descends from about 3,180 feet to about 2,880 feet above sea level at the end of this section.

There are two overlooks with parking facilities along this section--Sugarloaf at mile 202.8 and Piedmont at mile 203.9

The rocks along this section are thinly laminated gneiss commonly with thicker layers of schist or phyllite of the Alligator Back Formation.

There are no good or fair areas for wells within the Parkway boundaries. A fair area for wells is in the valley of the stream whose headwaters are Skyland Lakes just northwest of the Parkway, near the beginning of this section.



EXPLANATION

abg — Alligator Back Formation-Laminated gneiss.

Boundary of the Blue Ridge Parkway

Fair area for wells

208 — NPS Milepost

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

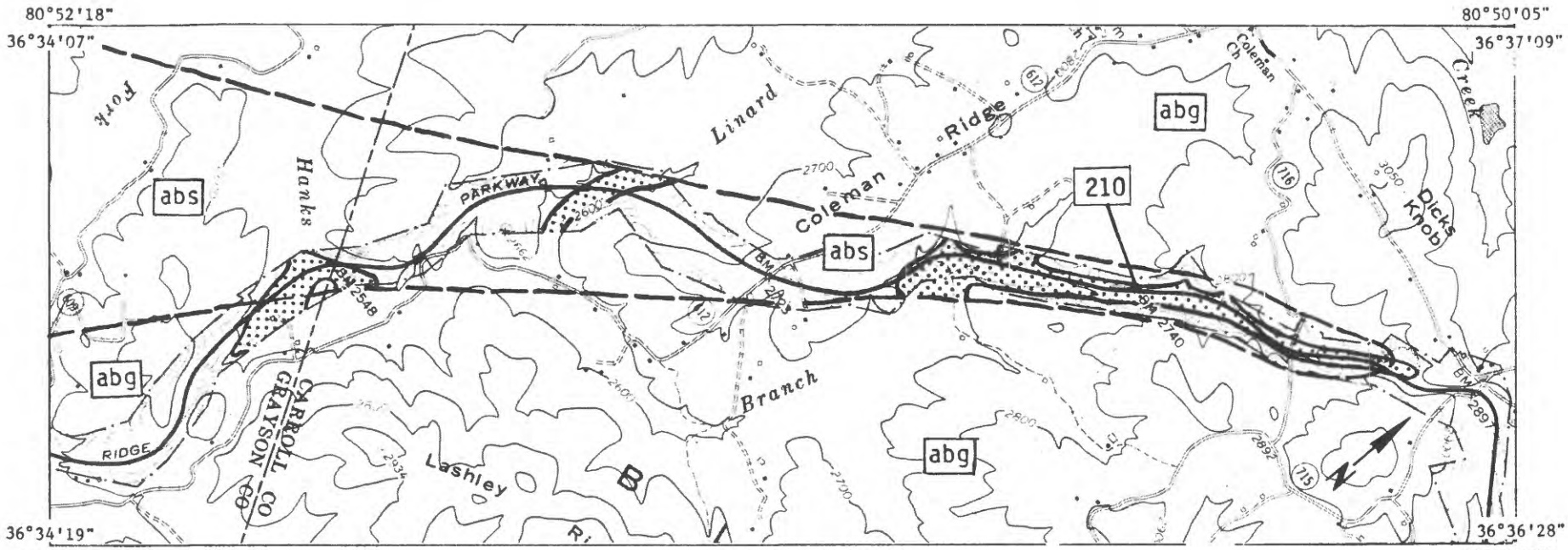
Figure 59.--Pipers Gap area (Miles 205.3 to 209.3).

Pipers Gap area (Miles 205.3 o 209.3).--The Parkway continues its southwest trend along the crest of the Blue Ridge Mountains. The Parkway descends from about 2880 feet to 2740 above sea level at Pipers Gap and then ascends to about 2900 feet above sea level near the end of this section. The town of Galax is about 10 miles to the northwest along State Route 97.

There are no overlooks along this section.

The rocks are thinly laminated gneiss commonly with thicker layers of schist or phyllite of the Alligator Back Formation.

There are no good areas for wells within the Parkway boundaries along this section. A fair area for wells is where North Fork crosses the Parkway near the end of this section.



SCALE 1:24000

CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- abg — Alligator Back Formation--Laminated gneiss.
- abs — Mica Schist of the Alligator Back Formation--Mica schist of phyllite.
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 210 — NPS Milepost
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

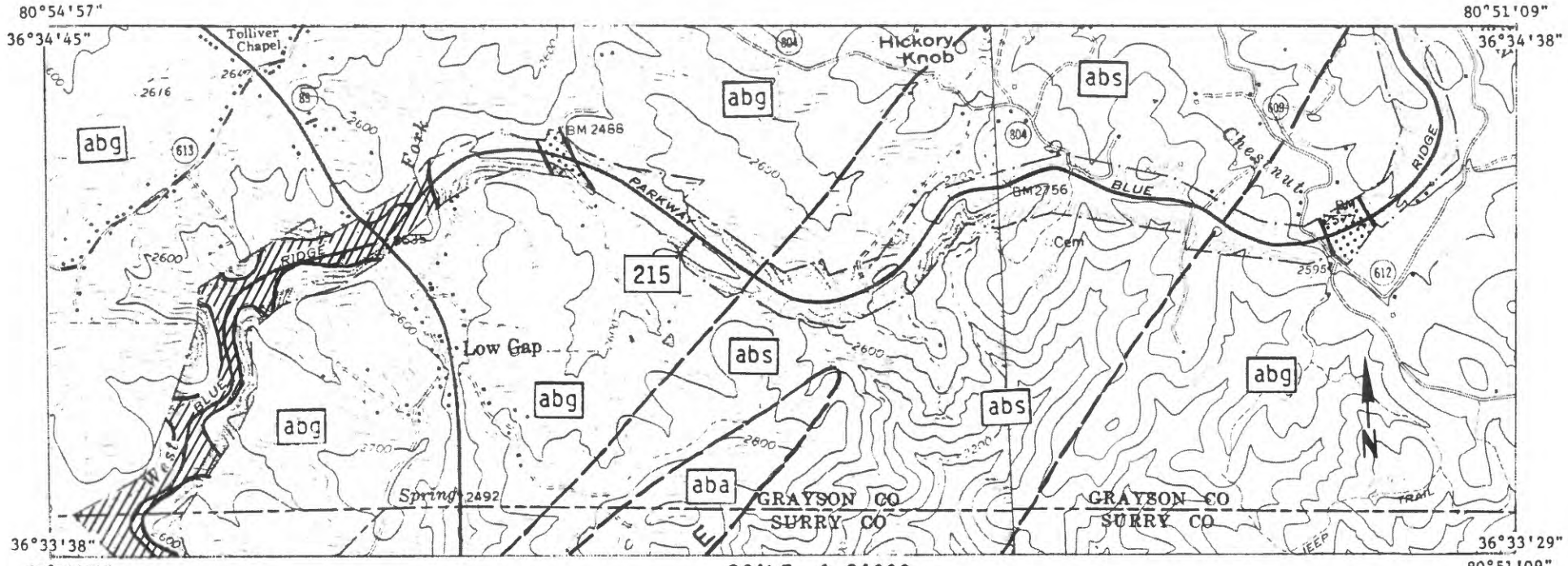
Figure 60.--Dicks Knob area (Miles 209.3 to 213.1).

Dicks Knob area (Miles 209.3 to 213.1).--The Parkway continues southwest along the crest of the Blue Ridge Mountains. The Parkway descends from about 2900 feet above sea level at the beginning of this section to about 2550 feet where it crosses Hanks Branch and the Carroll-Grayson County line, near the southern end of the section.

There are no overlooks or recreation areas along this section.

The rocks along this section are a thinly laminated gneiss with thicker layers of schist or phyllite. A wedge of mica schist or phyllite thickening toward the southeast, extends from near the beginning to the end of this section. All of these rocks are part of the Alligator Back Formation.

Fair areas for wells are in the valley of Hanks Branch and its tributary, Linard Creek.



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CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

0 1/2 1 MILE
0 1/2 1 KILOMETER

EXPLANATION

- aba — Alligator Back Formation amphibolite gneiss.
- abg — Alligator Back Formation-Laminated gneiss.
- abs — Mica Schist of the Alligator Back Formation--Mica schist or phyllite.
- Approximate boundary between rock units
- Boundary of the Blue Ridge Parkway
- Boundary between counties
- 215 — NPS Milepost
- Good area for wells
- Fair area for wells

See Table 7 for a generalized correlation and Table 8 for a description of rock units.

Figure 61.--Low Gap area (Miles 213.1 to 216.9).

Low Gap area (Miles 213.1 to 216.9).--The Parkway continues its southwest trend along the crest of the Blue Ridge Mountains to the Virginia-North Carolina border at mile 216.9. The altitude varies from about 2,490 feet to about 2,755 feet above sea level. Galax is seven miles north of the Parkway along State Route 89.

There are no overlooks or recreation areas along this section of the Parkway. The Cumberland Knob picnic area in North Carolina is about 0.3 miles below the Virginia-North Carolina boundary.

The rocks along this section are finely laminated gneiss commonly with thicker layers of schist or phyllite of the Alligator Back Formation. A northeast trending band of mica schist is present near the beginning of this section.

Good areas for wells within the Parkway boundaries are in the valley of West Fork where it meanders back and forth across the Parkway near the end of this section.

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