UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

# SEMIQUANTITATIVE SPECTROGRAPHIC ANALYSES OF STREAM-SEDIMENT SAMPLES FROM THE WENAHA TUCANNON WILDERNESS, WASHINGTON AND OREGON

by

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Open-File Report

83-297

This report is preliminary and

has not been edited or reviewed

for conformity with Geological

Survey standards or nomenclature

## Studies Related to Wilderness

Under the provisions of the Wilderness Act (Public Law 88-577, September 3, 1964) and the Joint Conference Report on Senate Bill 4, 88th Congress, the U. S. Geological Survey and the U. S. Bureau of Mines have been conducting mineral surveys of wilderness and primitive areas. Areas officially designated as "wilderness," "wild,", or "canoe" when the act was passed were incorporated into the National Wilderness Preservation System, and some of them are presently being studied. The act provided that areas under consideration for wilderness designation should be studied for suitability for incorporation into the Wilderness System. The mineral surveys constitute one aspect of the suitability studies. The act directs that the results of such surveys are to be made available to the public and be submitted to the President and the Congress. This report presents spectrographic analyses of stream sediments collected within the Wenaha Tucannon Wilderness, Umatilla National Forest, Columbia, Garfield, and Asotin Counties, Washington and Wallowa County, Oregon. The area was established as a wilderness in 1978 by Public Law 95-237.

Bedrock in the Wenaha Tucannon Wilderness in southeast Washington and northeast Oregon consists entirely of the Columbia River Basalt Group of Miocene age, except for a small area of pre-Tertiary metavolcanic rocks in the extreme northern tip of the wilderness, near the site of sample 19 (Fig. 1; Swanson and Wright, 1983). Table 1 presents semiquantitative spectrographic analyses of 20 samples of stream silt collected throughout the wilderness. Locations of the samples are shown in figure 1. The sample sites were selected at or just downstream from major stream junctions and near the exposures of pre-Tertiary rocks. The samples were collected by D. A. Swanson and T. L. Wright in the summer of 1979 as part of a study of the mineral resource potential of the wilderness. The samples were dried, sieved to minus-80 mesh, split, and pulverized before analysis by standard semiquantitative emission spectrography by William A. Bowes and Associates, Hayden, Colorado. Lower detection limits for the elements analyzed, in parts per million (ppm) except where noted, are presented in table 1. These analyses form part of the data used in the assessment of mineral resource potential of the wilderness (Swanson and others, 1983).

## References cited

Swanson, D.A., and Wright, T.L., 1983, Geologic map of the Wenaha Tucannon Wilderness, Washington and Oregon: U.S. Geological Survey Miscellaneous Field Studies Map MF-1536, scale 1:48,000.

Swanson, D.A., Wright, T.L., and Muntz, S.R., 1983, Mineral resource potential of the Wenaha Tucannon Wilderness, Washington and Oregon: U.S. Geological Survey Open-file report, in press.

Figure 1. Map of Wenaha Tucannon Wilderness showing location of stream-sediment samples, chemical analyses of which are in Table 1.

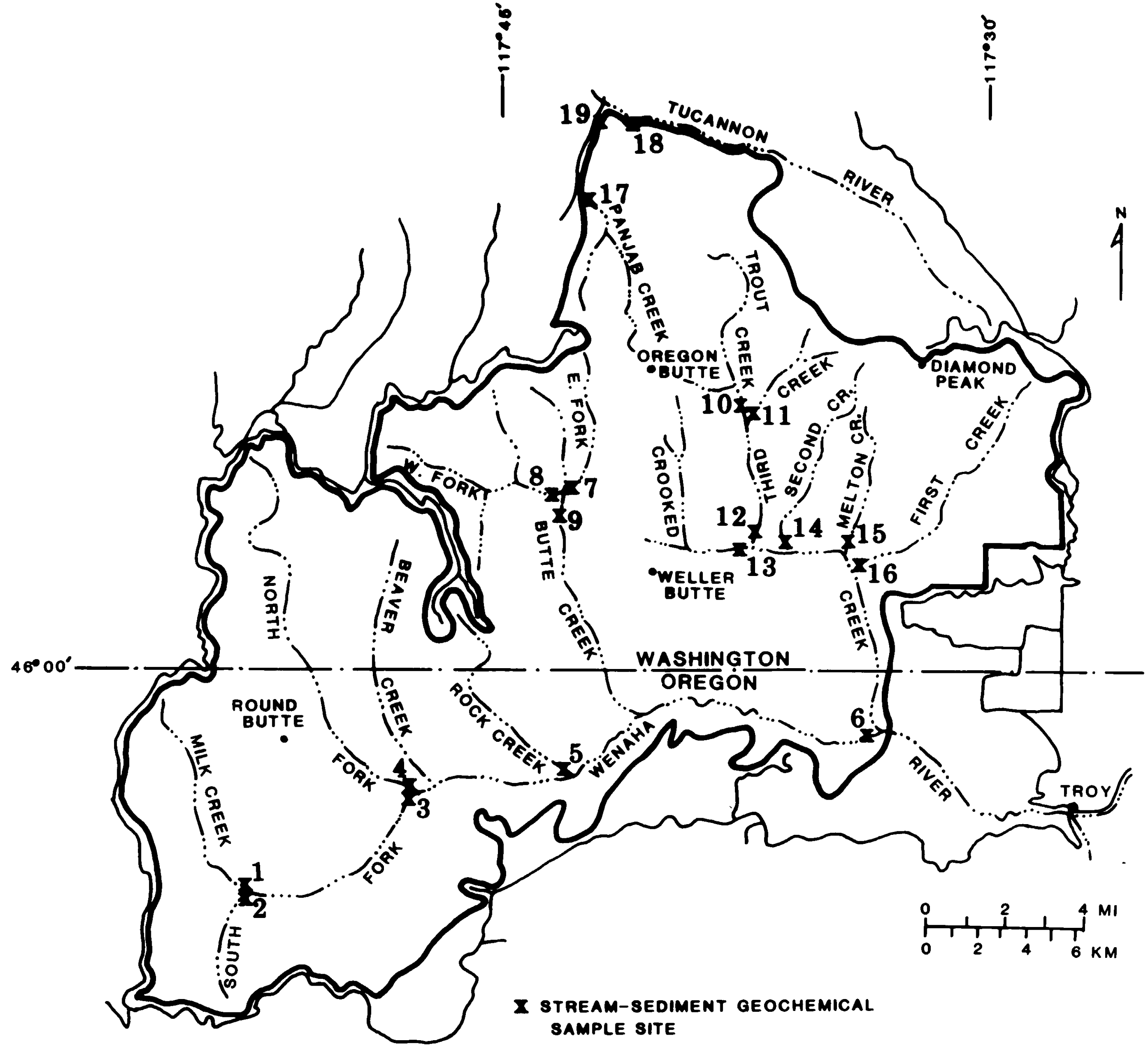
117°45'
117°30'
N
TUCANNON
RIVER
19
18
17
PANJAB CREEK
TROUT
CREEK
OREGON
BUTTE
CREEK
DIAMOND
PEAK
10
11
E. FORK
CROOKED
THIRD
SECOND CR.
MELTON CR.
FIRST
CREEK
W. FORK
8
7
9
12
14
15
13
16
BUTTE
CREEK
WELLER
BUTTE
NORTH
BEAVER
CREEK
46°00'
WASHINGTON
OREGON
CREEK
ROUND
BUTTE
ROCK CREEK
6
5
WENAHA
RIVER
MILK CREEK
FORK
4
3
TROY
FORK
1
2
SOUTH
0 2 4 MI
0 2 4 6 KM
STREAM-SEDIMENT GEOCHEMICAL
SAMPLE SITE

Table 1. Semiquantitative Spectrographic Analyses of Stream-Sediment Samples From the Wenaha Tucannon Wilderness, Washington and Oregon
(Fe in percent; all other elements in ppm; N, Not detected; L, Detected, but below limit of determination)

| Field No. | Map No. | Au | Ag | Cu | Pb | Zn | Mo | Fe | W | Ni | Co | Cr | Cd | As | Sb | Mn | V | Bi | Sn | Zr | B | Ba | Be | La | Nb | Sc | Sr | Y | Li | Th |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SS-1 | 1 | N | .5 | 30 | 20 | 200 | N | 10 | N | 30 | 30 | 70 | N | N | N | 1000 | 500 | N | N | 200 | 15 | 700 | L | 50 | N | 30 | 300 | 50 | N | N |
| SS-2 | 2 | N | N | 30 | 10 | L | N | 5 | N | 15 | 15 | 70 | N | N | N | 1000 | 200 | N | N | 200 | 10 | 1000 | 5 | 50 | N | 50 | 500 | 70 | N | N |
| SS-3 | 3 | N | N | 30 | 30 | 200 | N | 7 | 1 | 20 | 20 | 100 | N | N | N | 1000 | 300 | N | N | 150 | L | 1000 | 1 | 20 | N | 30 | 500 | 50 | N | N |
| SS-4 | 10a | N | N | 30 | 20 | N | N | 3 | N | 10 | 15 | 20 | N | N | N | 1000 | 150 | N | N | 150 | 10 | 700 | 1 | 20 | N | 20 | 300 | 30 | N | N |
| SS-5 | 11 | N | N | 15 | 10 | N | N | 3 | N | 7 | 10 | 10 | N | N | N | 700 | 150 | N | N | 150 | 10 | 300 | 1 | 50 | N | 20 | 200 | 30 | N | N |
| SS-6 | 12 | N | N | 30 | 20 | 200 | N | 10 | N | 20 | 20 | 30 | N | N | N | 1000 | 300 | N | N | 200 | 10 | 1000 | 1 | 20 | N | 30 | 300 | 70 | N | N |
| SS-7 | 13 | N | N | 30 | 30 | L | N | 5 | N | 15 | 15 | 20 | N | N | N | 1000 | 150 | N | N | 150 | 10 | 1000 | 1 | 50 | N | 30 | 300 | 70 | N | N |
| SS-8 | 14 | N | N | 30 | 20 | 200 | N | 10 | N | 30 | 30 | 100 | N | N | N | 1000 | 500 | N | N | 200 | 10 | 700 | N | 50 | N | 30 | 200 | 70 | N | N |
| SS-9 | 15 | N | N | 30 | 20 | 200 | N | 7 | N | 15 | 20 | 50 | N | N | N | 700 | 300 | N | N | 150 | 10 | 700 | 1 | 20 | N | 30 | 300 | 70 | N | N |
| SS-10 | 16 | N | 1 | 30 | 10 | N | N | 7 | N | 20 | 20 | 30 | N | N | N | 1000 | 300 | N | N | 150 | 10 | 700 | 1 | 50 | N | 30 | 300 | 70 | N | N |
| SS-11 | 17 | N | N | 30 | 20 | N | N | 7 | N | 20 | 20 | 70 | N | N | N | 700 | 30 | N | N | 300 | 15 | 1500 | 1 | 50 | N | 30 | 500 | 70 | N | N |
| WS-1 | 5 | N | N | 30 | 20 | 200 | N | 7 | N | 30 | 20 | 150 | N | N | N | 1000 | 200 | N | N | 150 | L | 700 | 1 | 50 | N | 30 | 500 | 50 | N | N |
| WS-2 | 4 | N | N | 30 | 20 | 200 | N | 7 | N | 30 | 30 | 50 | N | N | N | 1000 | 300 | N | N | 150 | 15 | 700 | L | 20 | N | 30 | 200 | 30 | N | N |
| WS-3 | 7 | N | N | 30 | 20 | L | N | 7 | N | 15 | 20 | 30 | N | N | N | 1000 | 200 | N | N | 150 | 10 | 700 | 1 | 20 | N | 30 | 300 | 30 | N | N |
| WS-4 | 8 | N | N | 30 | 20 | L | N | 7 | N | 15 | 20 | 30 | N | N | N | 700 | 300 | N | N | 150 | 15 | 700 | 1 | 20 | N | 30 | 500 | 70 | N | N |
| WS-5 | 9 | N | N | 30 | 30 | N | N | 5 | N | 7 | 15 | 20 | N | N | N | 700 | 200 | N | N | 300 | L | 1000 | 1 | 20 | N | 300 | 500 | 70 | N | N |
| WS-6 | 10b | N | .5 | 30 | 30 | L | N | 7 | N | 15 | 20 | 30 | N | N | N | 1000 | 200 | N | N | 150 | 10 | 700 | 1 | 20 | N | 30 | 300 | 50 | N | N |
| WS-7 | 6 | N | N | 30 | 30 | 200 | N | 10 | N | 30 | 30 | 70 | N | N | N | 1000 | 300 | N | N | 150 | 10 | 1000 | 1 | 20 | N | 30 | 300 | 50 | N | N |
| WS-8 | 18 | N | N | 30 | 30 | N | N | 5 | N | 15 | 15 | 30 | N | N | N | 700 | 200 | N | N | 150 | 10 | 700 | 1 | 20 | N | 30 | 300 | 30 | N | N |
| WS-9 | 19 | N | .5 | 30 | 20 | N | N | 3 | N | 15 | 15 | 50 | N | N | N | 700 | 200 | N | N | 200 | 15 | 700 | 3 | 50 | N | 30 | 500 | 70 | N | N |
| Lower Detection Limit | | 10 | .5 | 5 | 10 | 200 | 5 | .05 | 50 | 5 | 5 | 10 | 20 | 200 | 100 | 10 | 10 | 10 | 10 | 10 | 10 | 20 | 1 | 20 | 20 | 5 | 100 | 10 | 100 | 100 |