



United States Department of the Interior
GEOLOGICAL SURVEY

5 71347

EVALUATION OF
WAPI LAVA FIELD,
IDAHO,
FOR INCLUSION IN THE
NATIONAL REGISTRY OF NATIONAL LANDMARKS

By
Donald E. Trimble

Administrative report prepared for
the National Park Service

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U.S. Geological Survey

NATURAL LANDMARK BRIEF

1. Site: Wapi Lava Field, Power County, Idaho.
2. Description: Pillar Butte, a complex of pit craters that forms the eruptive vent source for the voluminous basaltic lavas of the Wapi Lava Field, is at the southern end of the Idaho Rift System-- a system of fractures that extends for about 50 miles across the Snake River Plain. Craters of the Moon National Monument is at its north end. Eruption of the Wapi Lava Field took place only about 2,000 years ago, and consequently the surface features of the lava flows are fresh enough to preserve, in chilled form, a moment in a long record of volcanism. The lava surfaces are adorned with ropy festoons, chaotic blocks, pressure ridges, and collapsed lava tubes--features characteristic of fresh basaltic lava flows. The preserved forms are an object lesson in the mechanisms of eruption and flow for basaltic lavas.
3. Owner: The area occupied by the Wapi Lava Field is Federally-owned and administered by the Bureau of Land Management.
4. Proposed by: Wapi Lava Field was proposed as a natural landmark by Robert H. Rose, Chief Geologist National Park Service, January 1970.
5. Significance: The Pillar Butte source-vent area of the Wapi Lava Field is especially instructive of the mechanisms of volcanism, particularly the eruption and flow of basaltic lava.

6. Land use: This barren area of young lava presently is unused except for limited scientific and recreational visitation.
7. Dangers to the integrity of the area: The only danger to the integrity of the area that is foreseen is possible damage to the fragile features on the lava surfaces that could result from heavy tourist impact. That danger likely is minimal because of the supervisory control of the Bureau of Land Management and the general remoteness of the proposed landmark from the normal routes of tourist travel.
8. Special conditions: The Wapi Lava Field is at the south end of the Idaho Rift System, which already is registered as a National Natural Landmark, with a bronze plaque placed at Crystal Ice Caves only 6-7 miles to the north. The Pillar Butte source area of the Wapi Lava Field, however, is sufficiently different from other parts of the rift system and sufficiently illustrative to warrant separate recognition as a National Natural Landmark.
9. Studied by: Donald E. Trimble, Geologist, U.S. Geological Survey, Denver Federal Center, Denver, Colorado 80225, telephone 234-2825.

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THE STUDY METHOD

The evaluation of the Wapi Lava Field was prepared by Donald E. Trimble, Geologist, U.S. Geological Survey, Denver Federal Center, Denver, Colorado 80225, telephone 234-2825. The original recommendation of the Wapi Lava Field to landmark status was made by Robert H. Rose, Chief Geologist, National Park Service, in a theme study on the Works of Volcanism: Sites recommended as potential natural landmarks, January, 1970. The Wapi Lava Field is on land administered by the Idaho Falls District Office of the Bureau of Land Management, and Mr. Richard Geier, Assistant Chief of the Division of Resources, Office of the State Director of the Bureau of Land Management, was notified by telephone of the proposed onsite evaluation and Mr. Walter E. Jones, District Manager of the Idaho Falls District was informed by letter. I visited both the State Office and the District Office prior to the onsite evaluation, and discussed the landmark program at some length with Martin Benham, Chief of Division of Resources, Idaho Falls District. The onsite evaluation was made by a car traverse completely around the Wapi Lava Field (fig. 1 and 2), discussion with James L. Papadakis, operator of Crystal Ice Caves on the Great Rift, and a foot traverse of about 2 miles from Wapi Park, at the northwest edge of the field, to Pillar Butte, the vent-source area.

POCASTELLO

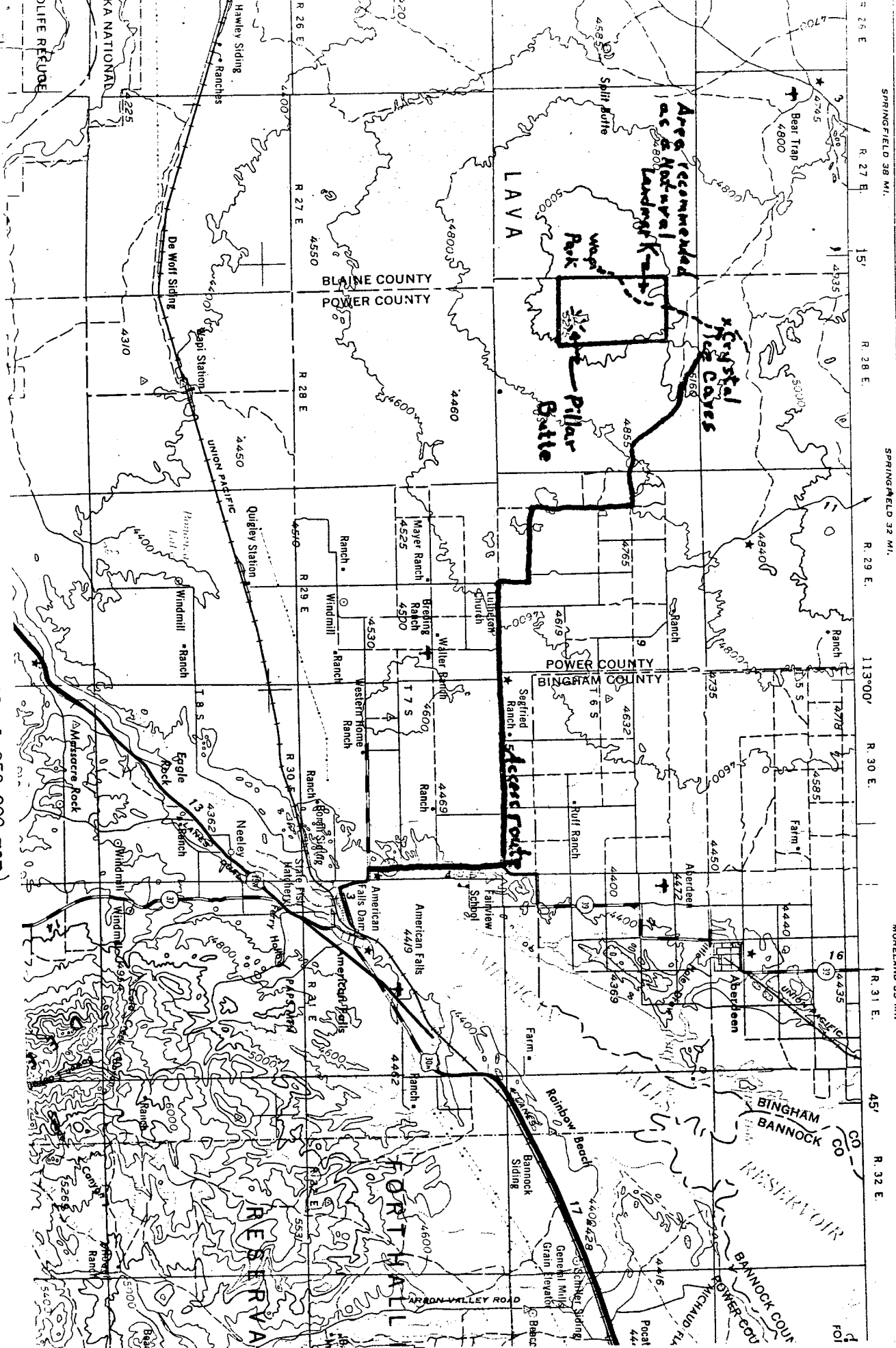


Figure 1.--Index map of Wapi Lava Field (from Pocatello 1:250,000 map).

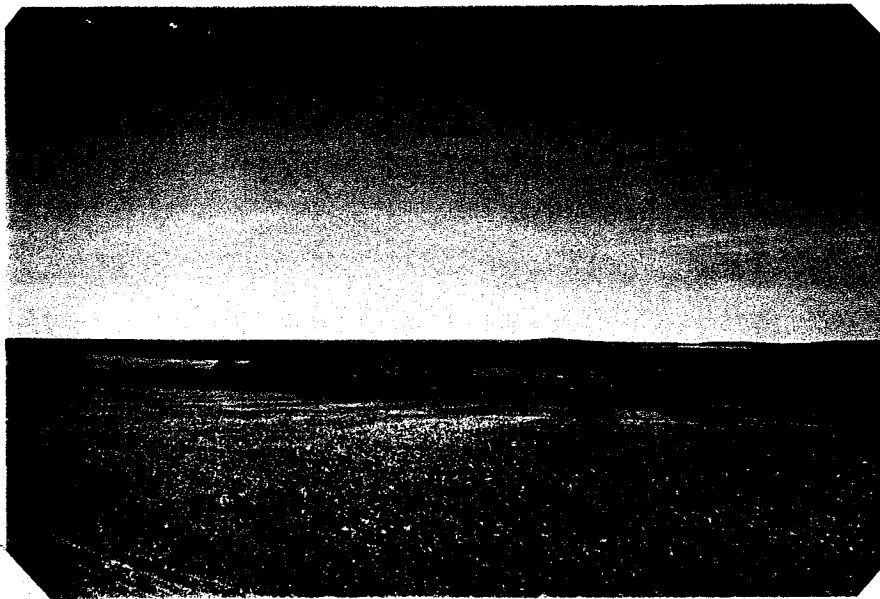


Figure 2.- Wapi Lava Field and Pillar Butte from the east.

LOCATION

The Wapi Lava Field covers parts of six townships, T. 6, 7, and 8 S., R. 27 and 28 E., north of the Union Pacific Railroad and the Snake River in Blaine and Power Counties, southeastern Idaho. Only about six square miles including the Wapi Park access area, the Pillar Butte vent area, and part of the lava field and its north edge (fig. 3) are here recommended to landmark status. Wapi Park, a natural park at the north edge of the lava field is accessible by unimproved road 6-7 miles south of Crystal Ice Caves, which is about 30 miles by paved and gravelled roads from the town of American Falls, Idaho on Interstate Highway 15 W (see fig. 1).

SIZE AND BOUNDARIES

The area recommended as the Wapi Lava Field National Landmark is the area covered by secs. 7, 8, 17, 18, 19, and 20, T. 6 S., R. 28 E., Power County, Idaho, as shown on the Pocatello quadrangle, Idaho 1° x 2° topographic map, scale 1:250,000 (fig. 1). The county line between Blaine and Power Counties forms the western boundary of this area. The northern boundary lies north of the north edge of the lava field, and the south boundary is near the southern base of Pillar Butte. The recommended landmark having boundaries as proposed would include six square miles, or 3,840 acres of land. This part of the Wapi Lava Field includes the most illustrative features of this Holocene volcanic area.

OWNERSHIP

The entire Wapi Lava Field is on federally-owned land administered by the Bureau of Land Management, and the part recommended as a natural landmark is under the jurisdiction of the Idaho Falls District office.

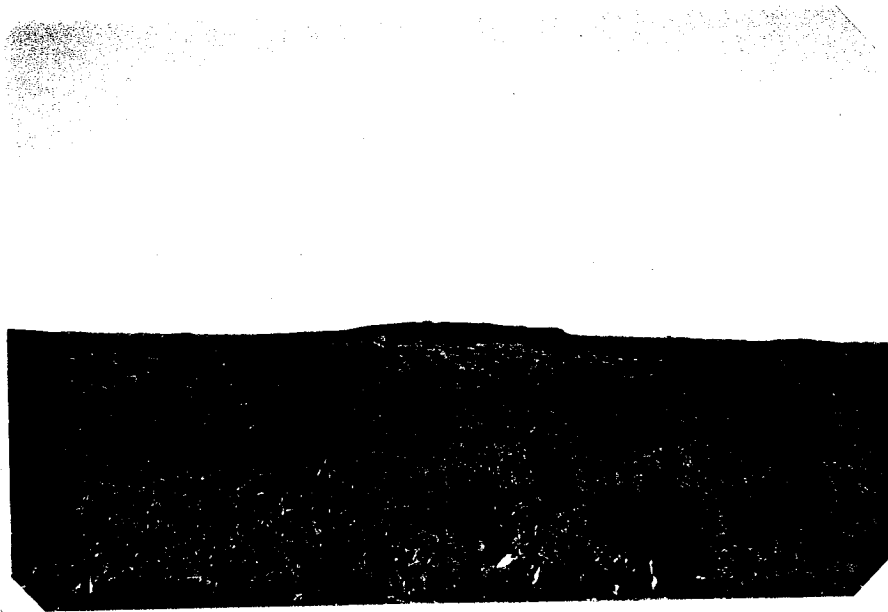


Figure 3.- Pressure ridge at north edge of Wapi Lava Field,
and Pillar Butte.

CORRESPONDENT

I suggest that Mr. Walter E. Jones, District Manager, Idaho Falls District, Bureau of Land Management, P. O. Box 1867, Idaho Falls, Idaho 83401, be invited to make application for registration of the Wapi Lava Field as a National Natural Landmark.

LAND USE

The area of the Wapi Lava Field is a barren tract of rough Holocene basalt that is sparsely vegetated and it is used only for very limited scientific and recreational visitation.

DANGERS TO THE INTEGRITY OF THE AREA

Many of the surface features of these very young basalt flows are fragile and subject to destruction by large-scale uncontrolled visitor impact. Such impact, however, is not foreseen because of the supervisory control of the Bureau of Land Management and because of the relative remoteness of this area from main tourist routes.

DESCRIPTION OF NATURAL VALUES

The Wapi Lava Field is an extremely interesting area of Holocene basaltic volcanism, probably about 2,000 years old. It lies at the southern end of the Idaho Rift System as described by Prinz (1970); the lavas conceal the rift in this area. The rift system extends 35-40 miles to the north and northwest from the Wapi Lava Field. Other parts of the system, from south to north, are: an area of basalt flows immediately to the north that only partly fill and conceal the rift fractures, which Prinz (1970) called the King's Bowl Rift set; about 13 miles of open rift (the Open-Crack Rift set of Prinz); and the Great Rift set at the north end of the rift, which comprises mainly the Craters of the Moon. The Great Rift Natural Landmark established May 8, 1968, does not have well-established boundaries, but presumably includes the King's Bowl Rift set, the Open-Crack Rift set, and the Great Rift set of Prinz, inasmuch as the plaque designating the National Natural Landmark is placed at the Crystal Ice Caves which is in the King's Bowl Rift set.

The Wapi Lava Field probably is the largest area of young basaltic lavas along the Idaho Rift, and it appears to have had its source mainly in a complex of 8-10 pit craters that form Pillar Butte, the highest point of which (5,215 feet in altitude) is part of the rim of the southernmost pit crater (figs. 4, 5, 6).

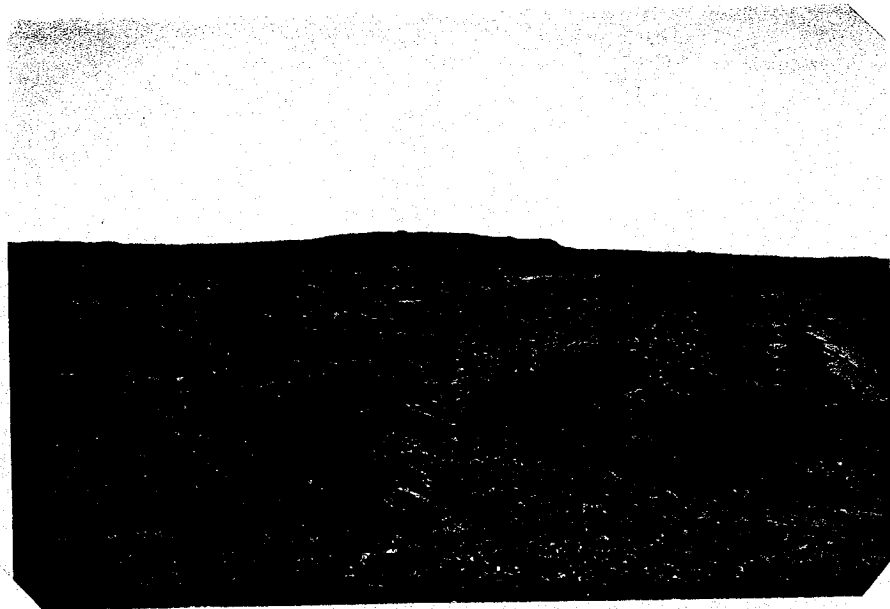


Figure 4.- Pillar Butte and Wapi Lava Field from crest of pressure ridge shown in figure 3.



Figure 5.- Pillar Butte from northwest, near Wapi Park.

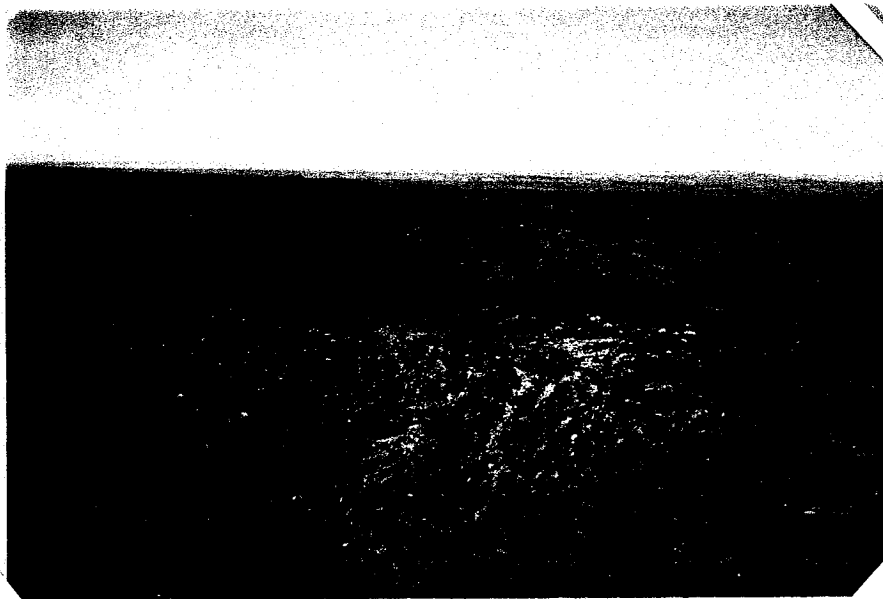


Figure 6.--View north across pit craters on top of Pillar Butte. Snow-capped mountains in distance are on north side of Snake River Plain.

The Pillar Butte source area and surrounding part of the Wapi Lava Field are marvelously instructive of the mechanisms of eruption and flow of basaltic lavas. Innumerable examples may be seen of festooned pahoehoe flow patterns, rills, gutters, dikes, squeeze-ups, collapsed lava tubes (fig. 7), pressure ridges, and lava-lake pahoehoe flooring some of the pit craters. The volcanism they so faithfully and fully document took place about 2,000 years ago. Lava at the Crystal Ice Caves has been dated by radiometric methods as only slightly more than 2,000 years old (Prinz, 1970, p. 946) and James Papadakis tells me that the lavas from Pillar Butte overlap the King's Bowl lavas and, therefore, are somewhat younger. It is likely, however, that all of these eruptions were penecontemporaneous, and that lava erupted from the rift or fissure nearly simultaneously with the opening of the rift at the surface.

The features of the Wapi Lava Field compliment rather than duplicate what can be seen at Craters of the Moon. The lava of the Wapi Field is almost entirely gas-rich "shelly" pahoehoe, rather than aa, which is abundant at Craters of the Moon. Pit craters and lava lakes are the main Wapi vent features, along with larger collapse structures; whereas cinder and spotter cones are the main vent features at the Craters of the Moon.

Many of the surface features of these pahoehoe flows are so fragile that they are easily broken. The lesson of the Wapi Lava Field, however, is sufficiently different from other parts of the Idaho Rift, and sufficiently obvious, that this area is deserving of National Landmark status on its own merits--despite the proximity of the Great Rift Natural Landmark and despite the fragility of part of the natural display.



Figure 7.- Sinuous path of small lava flow near northeast base of Pillar Butte. Arched crust forms tunnel-like structure. Much of surface crust has collapsed into hollow or tube-like interior of flow.

SIGNIFICANCE STATEMENT

The Pillar Butte area of the Wapi Lava Field is so marvelously illustrative of the mechanism of basaltic eruption and flow that this locality certainly has national importance in being outstandingly illustrative of a geologic process.

SIGNIFICANCE SOURCES

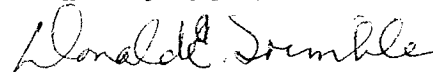
The conclusion concerning the significance of this locality is my own, based on broad personal experience in volcanic terrain in the Columbia Basalt Plateau and the Snake River Plain supplemented by visits to many other outstanding areas of basaltic volcanism including: Craters of the Moon National Monument, Sunset Crater National Monument, Hawaii Volcanoes National Park, and Haleakala National Park. This conclusion, however, was reinforced by subsequent discussion with James L. Papadakis, a geologist who is the operator of the Crystal Ice Caves and who probably is the person most knowledgeable about the entire Idaho Rift System.

RECOMMENDATION

In my opinion, the site appears to meet the natural landmark criteria. I recommend that it be so designated, and included in the National Registry of Natural Landmarks.

SIGNATURES

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Geologist

U.S. Geological Survey

6/17/74

REFERENCES CITED

Prinz, Martin, 1970, Idaho Rift System, Snake River Plain, Idaho: Geol.
Soc. America Bull. v. 81, no. 3, p. 941-948.