

STUDY RESULTS

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STREAM QUALITY

Water analysis of samples collected on a regular basis from November 8, 1973, to June 26, 1974, indicate that the lower two to three miles of Mead Run is marginal to alkaline at its mouth. The pH in the upper reaches of the stream averages 4.36 and has an average acid concentration of about 24.57 mg/l. The lower two to three miles from the Horton City discharge (weir 11) to the mouth, improves considerably to an average pH of 5.92 at the mouth with an average alkaline concentration of 9.36 mg/l delivering an average of 703.88 lbs. of alkalinity per day.

The public use of Mead Run is essentially negligible except for some canoeing at its mouth in high water and some trout fishing by area youngsters along the lower two miles of the stream. Brook trout are in evidence from an unnamed tributary at Horton City (weir 13) downstream approximately 1-1/2 miles in the main stream and also in the tributary. Water in the upper-reaches is utilized domestically from the Shawmut Reservoir although it is slightly acid.

Much of the lower reaches of Mead Run is comprised of a series of riffles and pools which would make ideal conditions for a trout fishery if the precipitant depositing on the stream bottom could be minimized as it is detrimental to aquatic insects necessary for trout survival. No aquatic insects were in evidence in Mead Run during the stream survey. The watershed, especially the lower reaches from Horton City downstream, has excellent potential for providing an outdoor recreation setting to augment those of the nearby State Game Lands.

SAMPLING AND MEASURING RESULTS

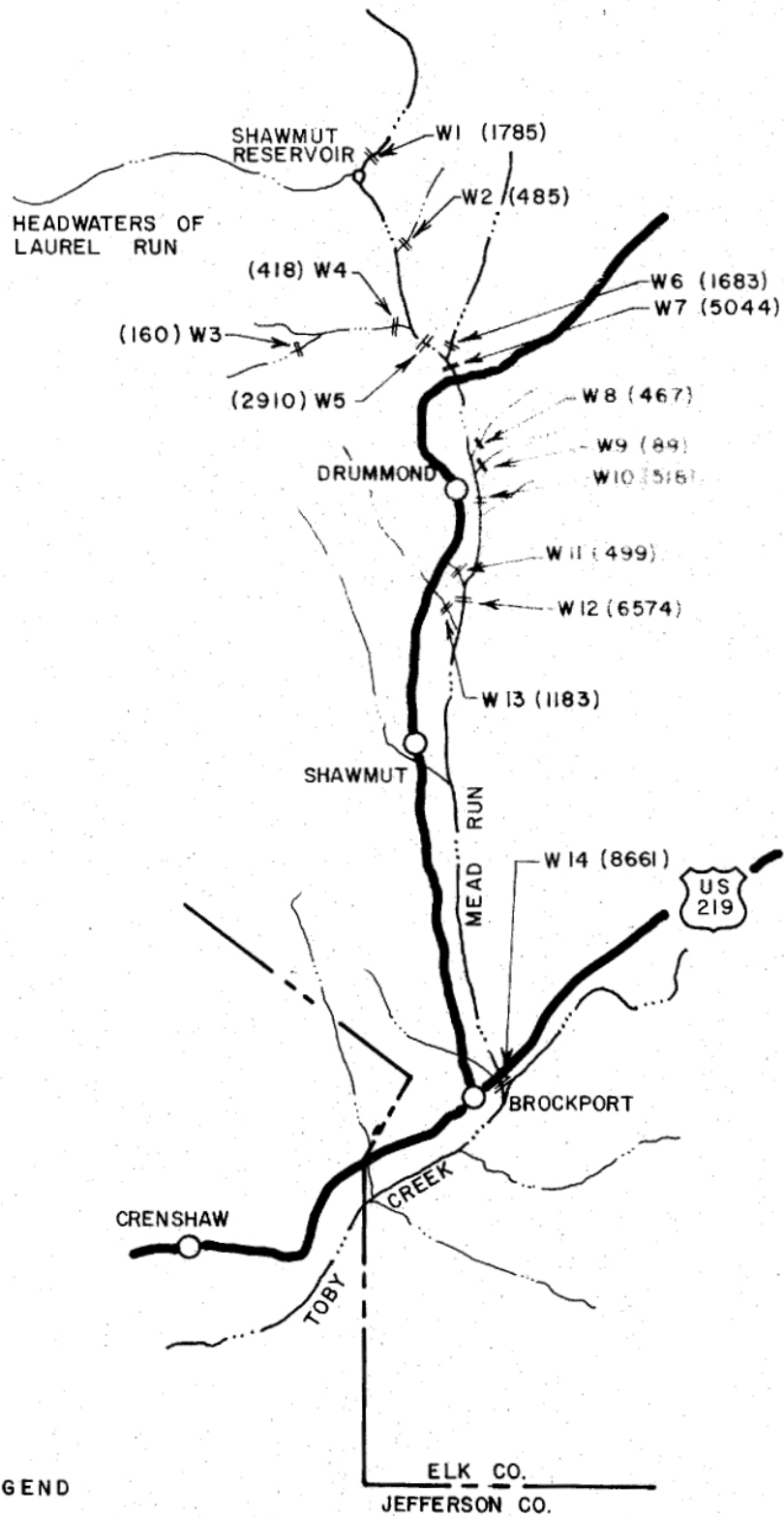
Sampling and flow measurements were taken at fourteen (14) stream and pollution sources. The locations of these sampling stations are shown on the weir location drawing. The sampling results are shown on the Exhibits entitled "Sampling Data".

As these data show, some sampling stations are not complete as some tests were not initially run for such elements as aluminum, magnesium, manganese, calcium and sodium. In other cases, remote sample stations were inaccessible during periods of inclement weather.

The Sulfate Materials Balance

The sulfate ion is present in coal mine drainage in Pennsylvania without exception, and has concentrations in the range of 300 mg./l to 10,000 mg/l. The sulfate concentration observed from a deep mine at Horton City averages 441.26 mg/l. This mine is the Shawmut No. 6. This operation is thought to be in the Lower Freeport coal and the discharge is characteristically alkaline with an, average pH of 5.7. All high acid discharges would be expected to have sulfates in the concentration range noted above. The sulfate ion will not significantly degrade or precipitate from solution, particularly at the relatively stable pH conditions found in natural waters. This allows the use of the ion as an indicator to account for total pollution inputs to a surface stream. Accordingly, a sulfate material balance was prepared and shown in the exhibit entitled "Sulfate Distribution Map".

SULFATE DISTRIBUTION MAP
 MEAD RUN WATERSHED
 ELK CO.



LEGEND

W = SAMPLING POINTS
 (89) = AVERAGE POUNDS/DAY SULFATES

AUG 16, 1974
 SCALE: 1" = 1 MILE

Acid and Alkaline Load Distributions

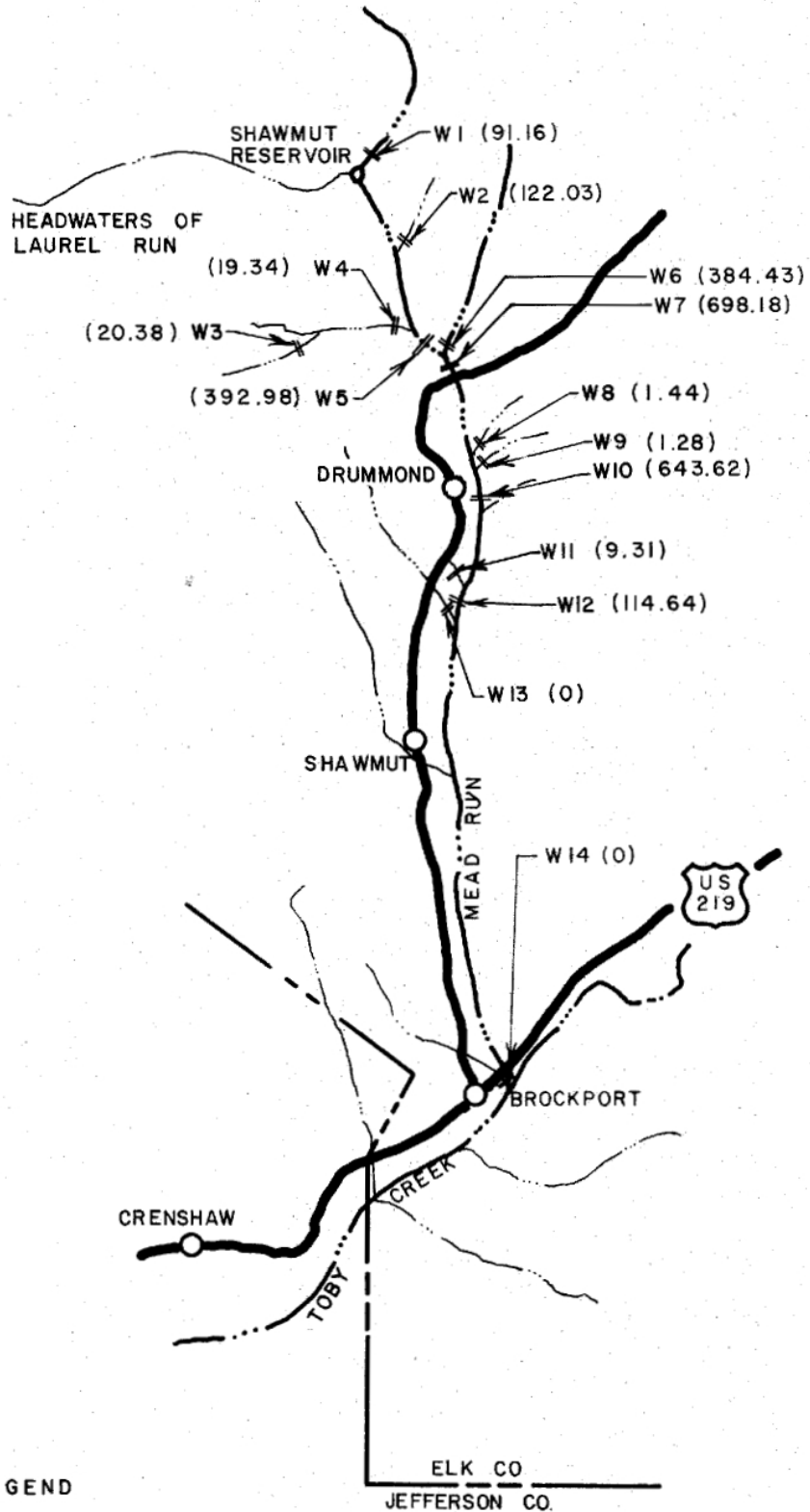
The following, exhibits show the distributions of "average" acid and alkaline loads throughout the watershed. It is not possible to show a percentage distribution for acid and alkaline, since it is really somewhat of a fallacy to show even "average" acid-alkaline loadings. These data are based on approximately a bi-monthly sampling program over an eight month period, and do not reflect the "slugging" effects of trapped pools released by heavy rainfall or the other varying conditions that affect acid-alkaline loadings.

However, the exhibits are useful as visual guides to the geographical areas within the watershed that are usually responsible for most of the high acid-alkaline loads.

Other Load Distributions

The following exhibits are shown as a visual aid to the geographic areas, particularly the sampling points or weir locations, within the watershed that are responsible for loadings of iron, calcium, sodium, magnesium, aluminum and manganese. The purpose of these exhibits is to show the overall effect of the above elements to the degradation of Mead Run Watershed.

ACID DISTRIBUTION MAP MEAD RUN WATERSHED ELK CO.

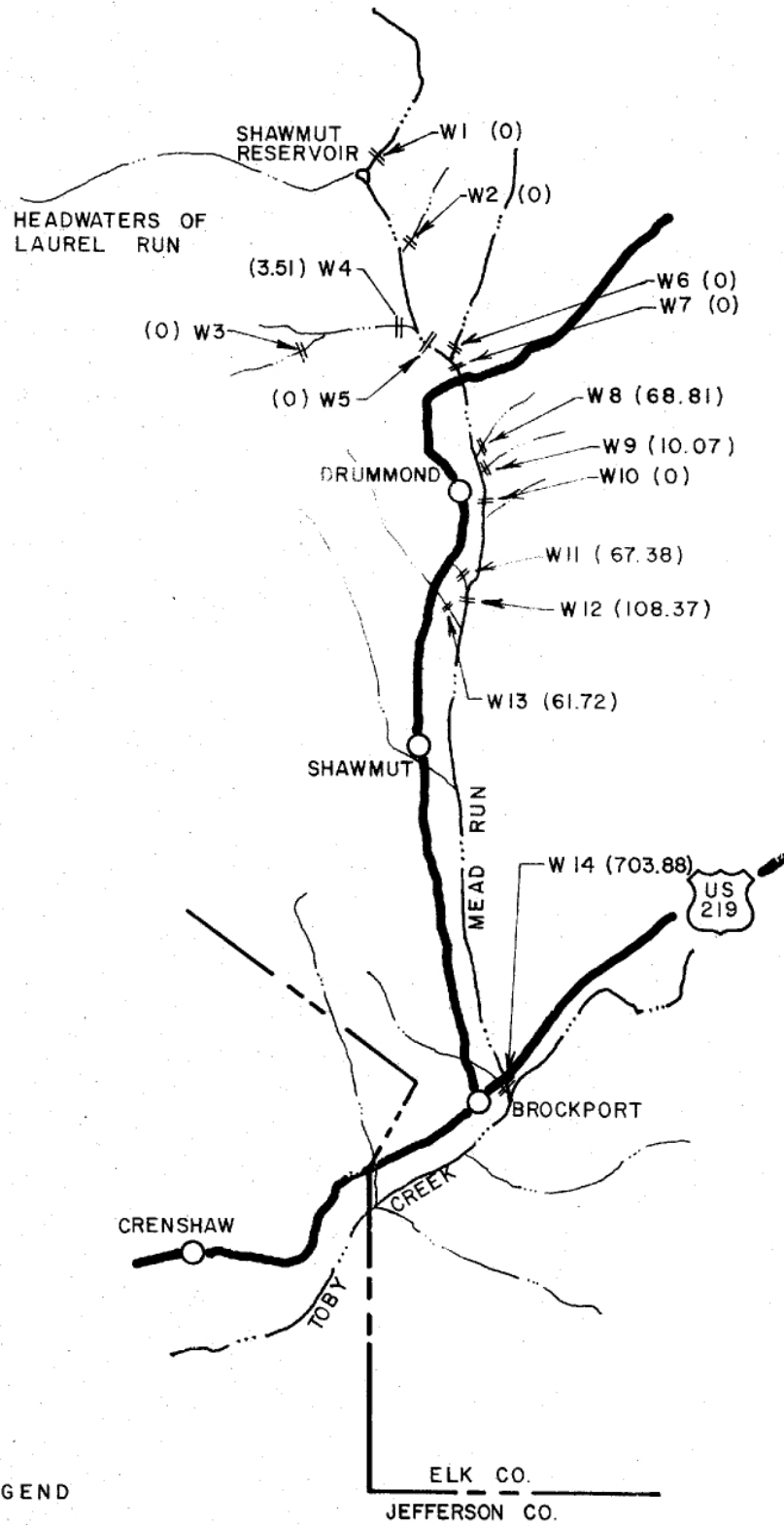


LEGEND

W = SAMPLING POINTS
 (9.31) = AVERAGE POUNDS/DAY ACIDITY

AUG 16, 1974
 SCALE: 1" = 1 MILE

ALKALINITY DISTRIBUTION MAP MEAD RUN WATERSHED ELK CO.

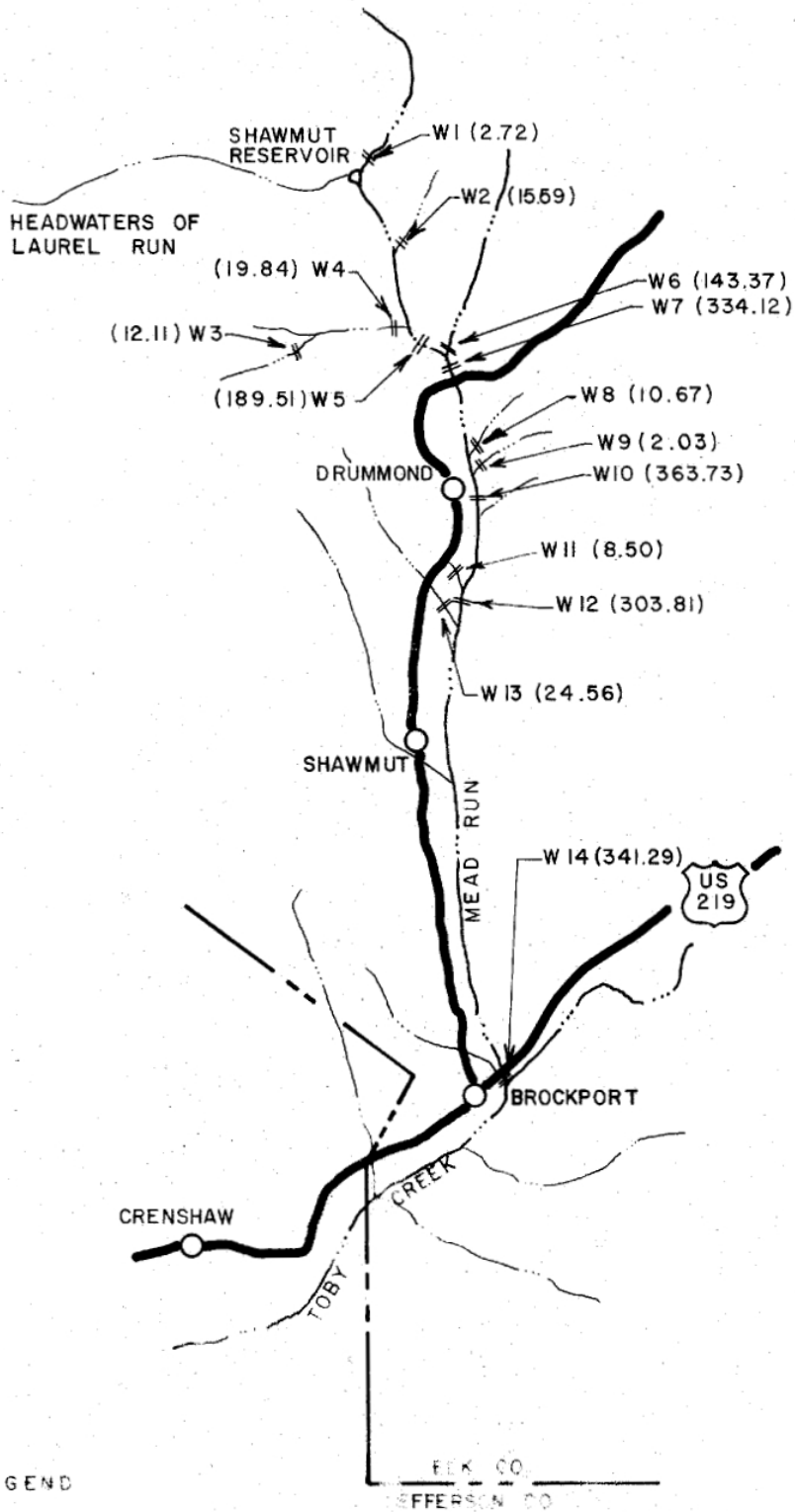


LEGEND

W = SAMPLING POINTS
 (3.51) = AVERAGE POUNDS/DAY ALKALINITY

AUG 16, 1974
 SCALE: 1" = 1 MILE

**MANGANESE DISTRIBUTION MAP
MEAD RUN WATERSHED
ELK CO.**

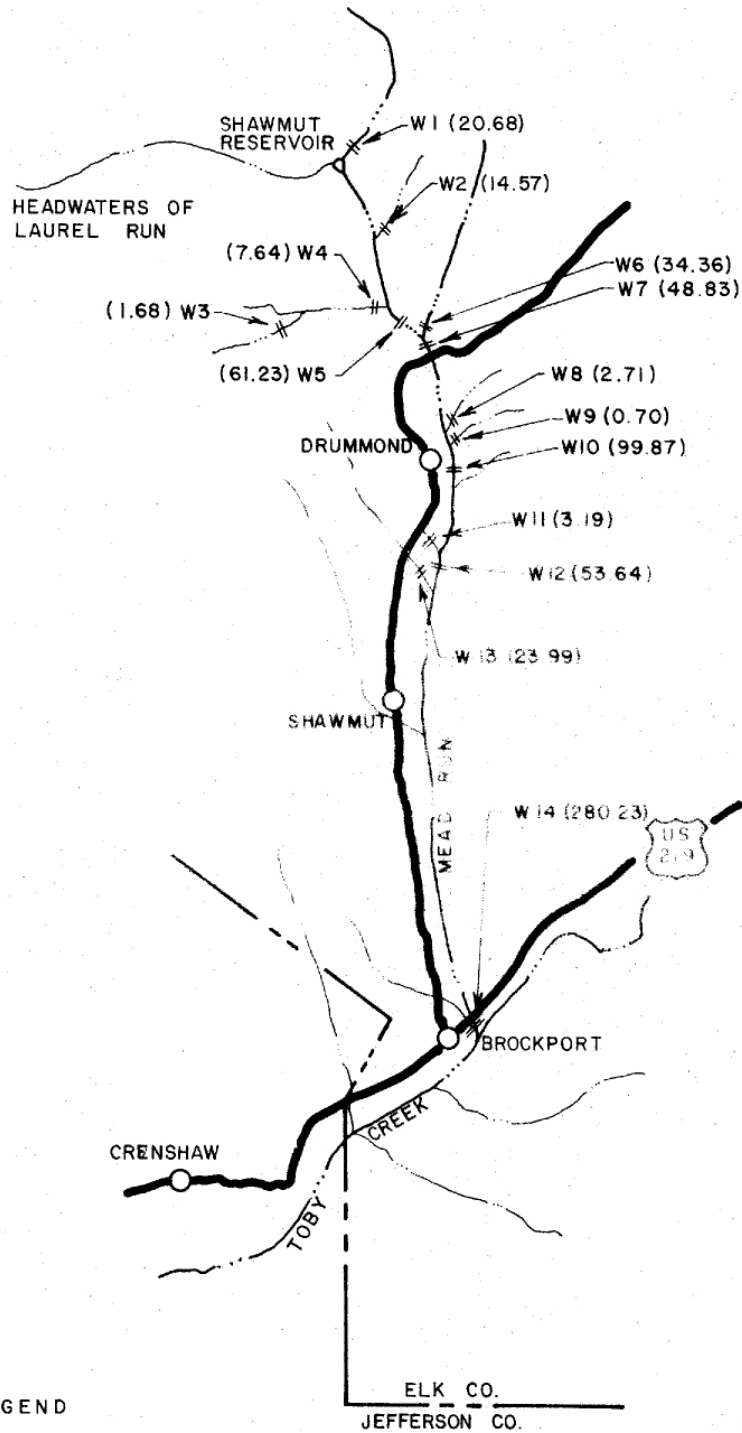


LEGEND

W = SAMPLING POINTS
(8.50) = AVERAGE MANGANESE CONCENTRATION

AUG 16, 1974
SCALE 1" = 1 MILE

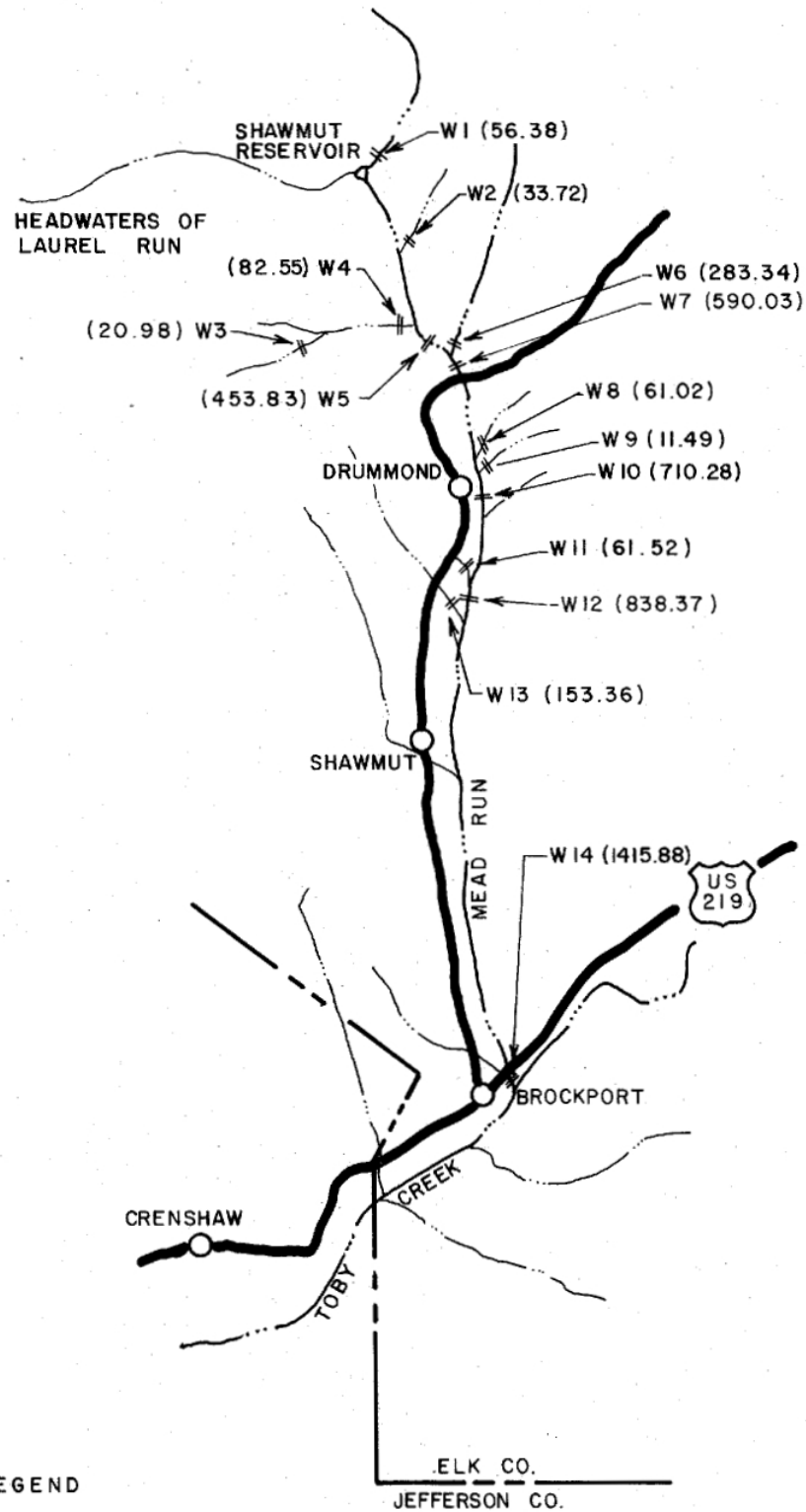
ALUMINUM DISTRIBUTION MAP
MEAD RUN WATERSHED
ELK CO.



LEGEND
W = SAMPLING POINTS
(1.68) = AVERAGE POUNDS/DAY ALUMINUM

AUG 16, 1974
SCALE: 1" = 1 MILE

MAGNESIUM DISTRIBUTION MAP
MEAD RUN WATERSHED
ELK CO.

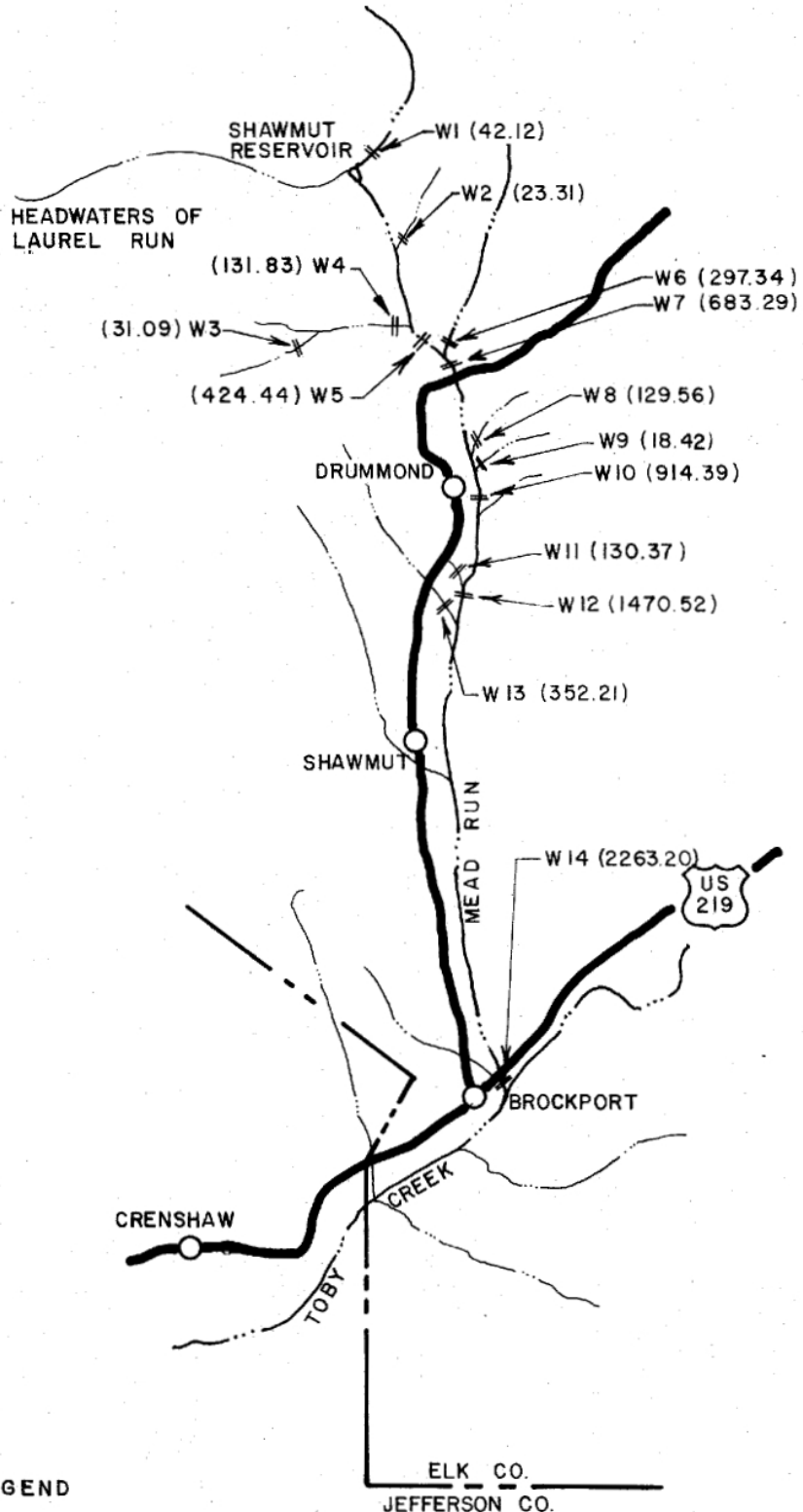


LEGEND

W = SAMPLING POINTS
(61.02) = AVERAGE POUNDS/DAY MAGNESIUM

AUG 16, 1974
SCALE: 1" = 1 MILE

**CALCIUM DISTRIBUTION MAP
MEAD RUN WATERSHED
ELK CO.**



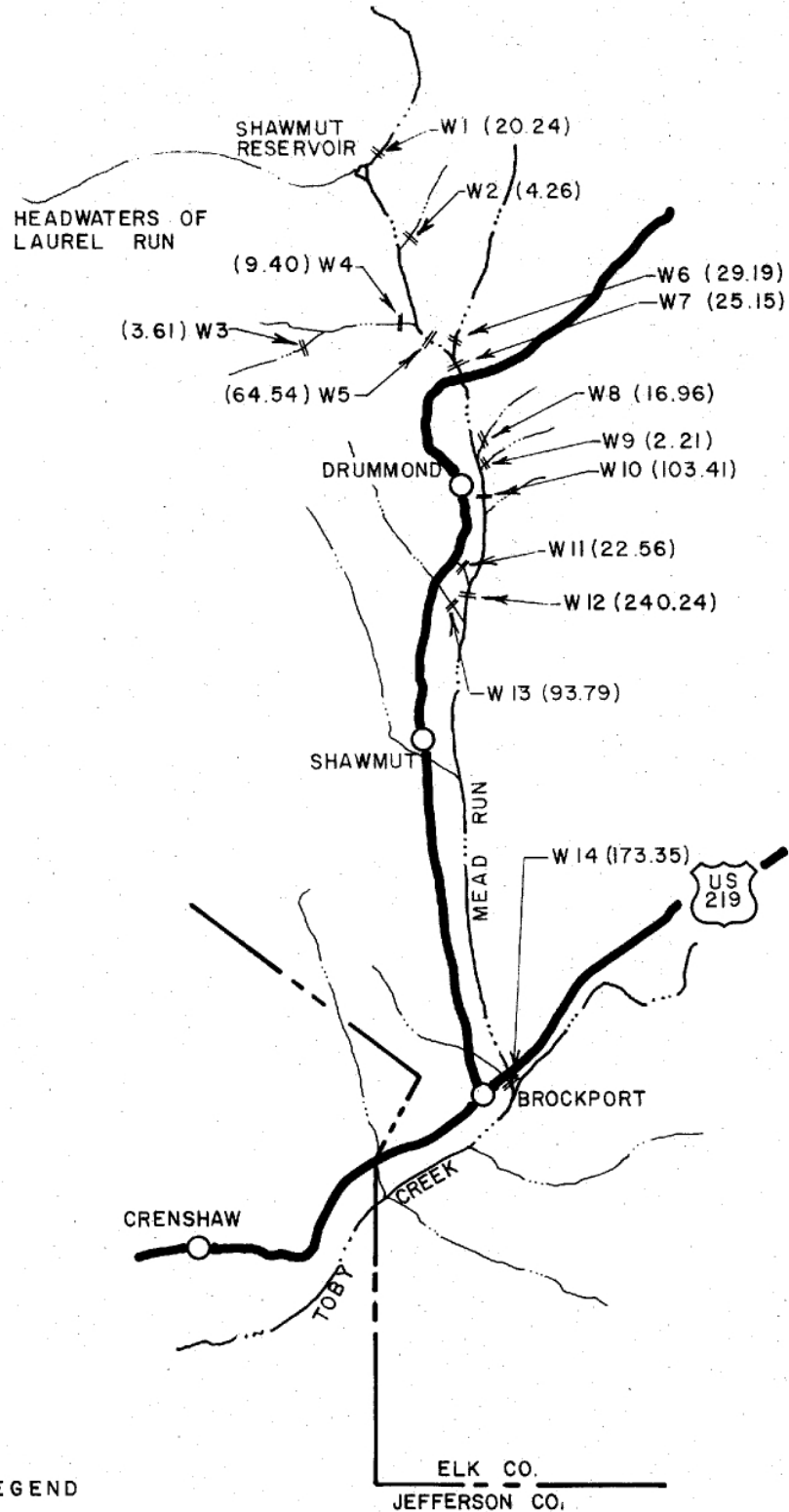
LEGEND

W = SAMPLING POINTS
(18.42) = AVERAGE POUNDS/DAY CALCIUM

ELK CO.
JEFFERSON CO.

AUG 19, 1974
SCALE: 1" = 1 MILE

**SODIUM DISTRIBUTION MAP
MEAD RUN WATERSHED
ELK CO.**

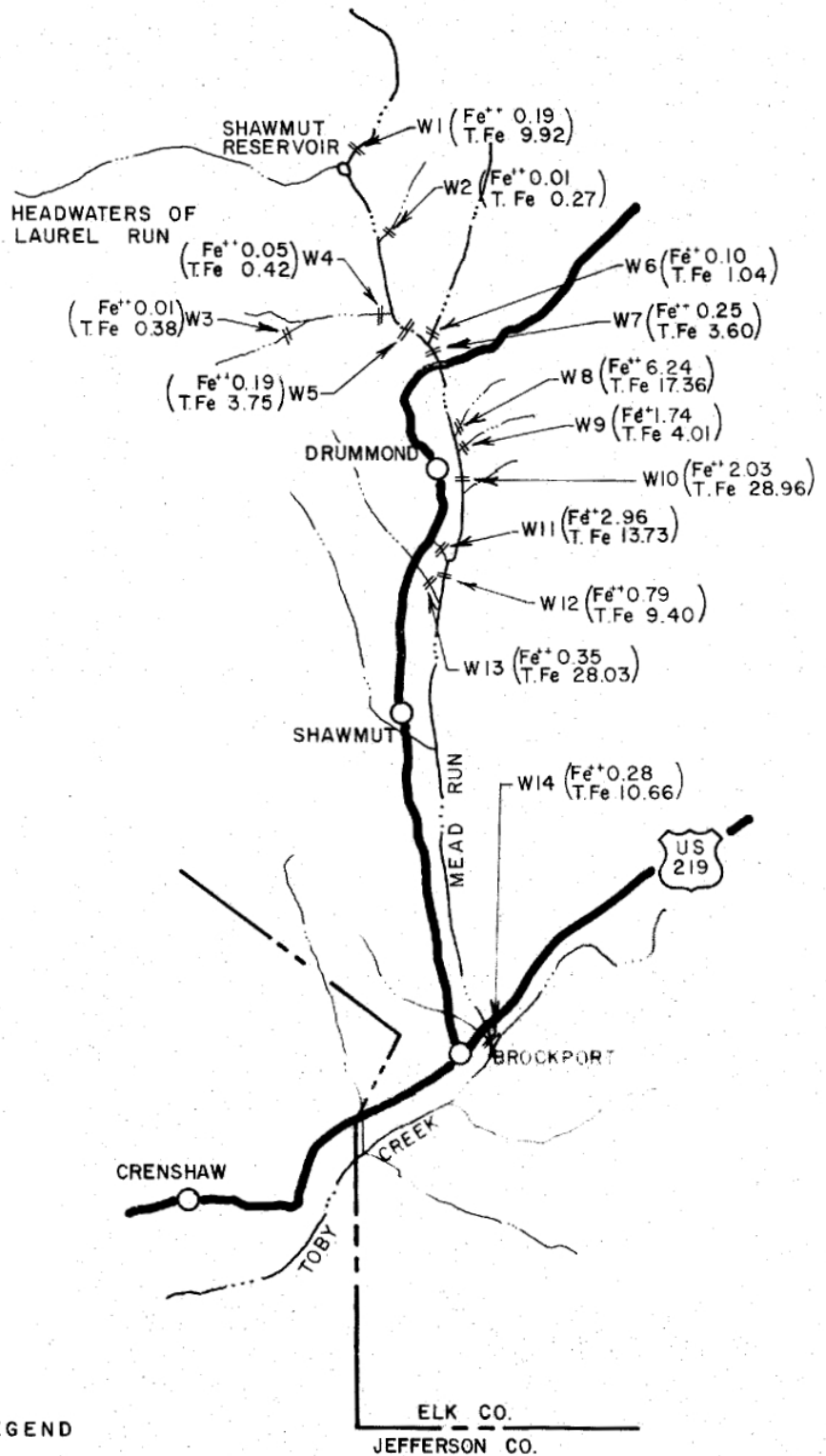


LEGEND

W = SAMPLING POINTS
(2.21) = AVERAGE POUNDS/DAY SODIUM

AUG 19, 1974
SCALE: 1" = 1 MILE

IRON DISTRIBUTION MAP MEAD RUN WATERSHED ELK CO.



LEGEND

W = SAMPLING POINTS
 (Fe 0.10) = AVERAGE POUNDS/DAY FERROUS IRON
 (T.Fe 1.04) = AVERAGE POUNDS/DAY TOTAL IRON

AUG 16, 1974
 SCALE: 1" = 1 MILE