

APPENDIX A
ANOMALY REPORTS

ANOMALY REPORT NUMBER: MHAR-1

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/16/84 DEPOSIT CLASS:

MAJOR METALS: Pb, Zn

MINOR METALS: Bi, W

AREA NAME: Winfield Mining District

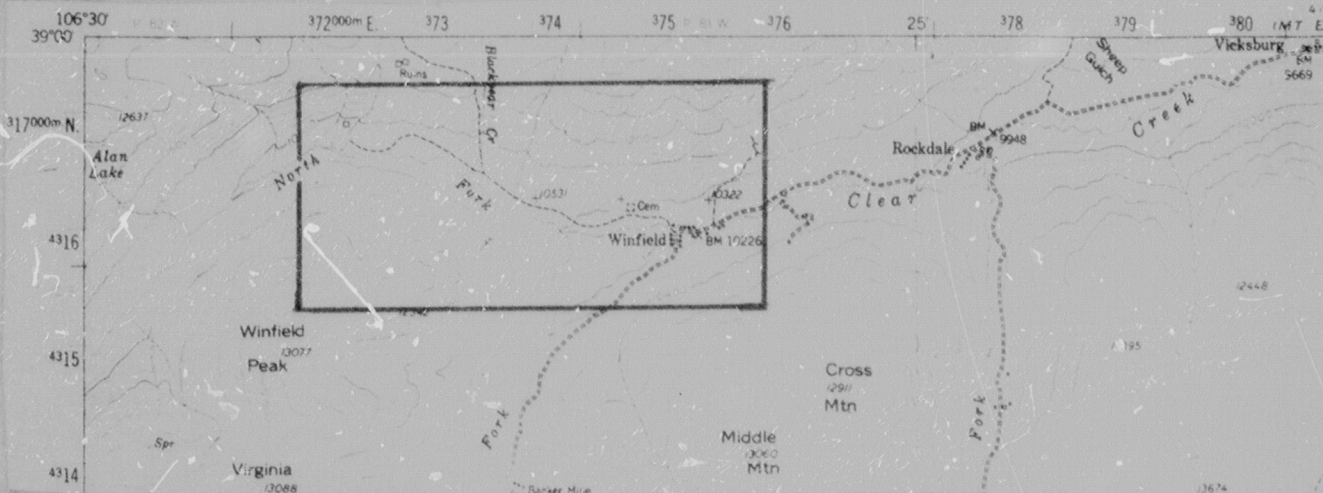
QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 59' 45", 106° 28' 45" NE CORNER: 38° 59' 45", 106° 26' 00"

SW CORNER: 38° 58' 45", 106° 28' 45" SE CORNER: 38° 58' 45", 106° 26' 00"

LOCATION MAP:



GEOCHEMICAL FEATURES: Anomalous Zinc (237-281 ppm) and Pb (114-116 ppm) with slightly anomalous Cu (28-235 ppm), W (21-82 ppm), and Bi (12-19 ppm) in stream sediments. Moderate Factor 5 (Cu, Pb, Zn) loadings for combined data.

RADIOMETRIC FEATURES: Detailed data -- K high in south-central portion of area = +3 std (4.2%), eU is variable but averages +1.5 std (4.3 ppm), eTh is near mean concentrations (11.4 ppm)

OTHER GEOPHYSICAL FEATURES: The area lies within a broad magnetic low associated with the Twin Lakes intrusion.

STRUCTURAL FEATURES: The area includes the northern portion of the Winfield Peak shear zone of Ranta (1974). Ranta also postulates that an east-west structure, subparallel to the North Fork of Clear Creek passes through this area. Numerous minor faults, veins, and shear zones are *

ANOMALY REPORT NUMBER: MHAR-1

TYPE OF MINERALIZATION: Magmatic hydrothermal vein deposits. Reported

mineralization includes pyrite, fluorite, galena, sphalerite, chalcopyrite and aikinite (Ranta, 1974). Other reported minerals include **

HOST ROCK(S): Tertiary age Twin Lakes Granodiorite (quartz monzonite)

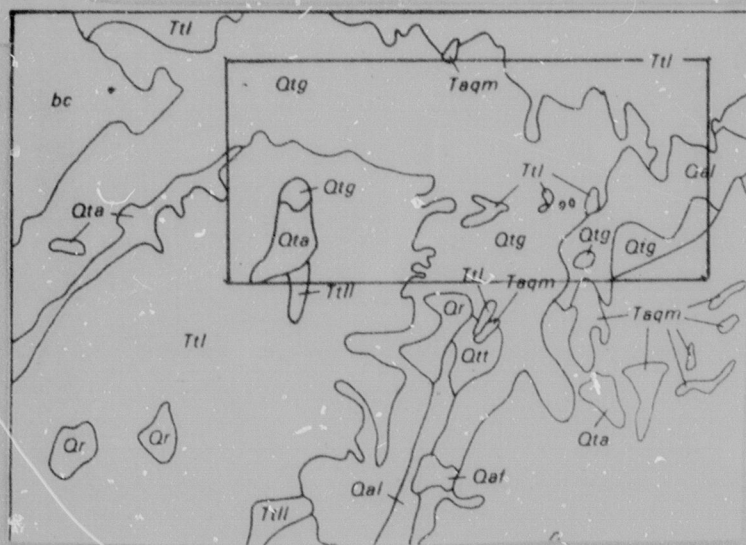
REFERENCES: Ranta, 1974

COMMENTS: * present in the area.

** molybdenite, wolframite, bismuthinite, and beryl.

GEOLOGIC SKETCH MAP

106°30'
39°00'



LEGEND

QUATERNARY	Gal, Qal — Alluvial deposits Qta, Ql — Colluvial deposits Ar, Qlg, Qtg, Qtl, Qtr — Glacial deposits
TERTIARY	Trp — Rhyolite porphyry Tqlp — Quartz latite porphyry Tqmp — Quartz monzonite porphyry Taqm — Aplitic quartz monzonite T — Tincup Quartz Monzonite porphyry T ₁ , T ₂ — Mount Princeton Quartz Monzonite Ttl, Ttl ₁ , Ttl ₂ — Twin Lakes Granodiorite (normal, late-stage, and border facies) Tg — Granodiorite
PALEOZOIC	Pal — Cambrian to Pennsylvanian rocks undivided
PRECAMBRIAN	dc — Denny Creek Granodiorite Gneiss dca — Penny Creek interlayered with Kroenke Granodiorite dchd, dchm, dcbs — Denny Creek and older rocks K — Kroenke Granodiorite bp — Browns Pass Quartz Monzonite gr — Complex of brecciated gneisses g — Gneissic granitic rocks hd — Hornblende diorite bs — Biotite-quartz-plagioclase schist lg — Biotite-muscovite-quartz-plagioclase schist ms — Muscovite-quartz schist h — Hornblende-plagioclase gneiss and amphibolite b — Biotite-quartz-plagioclase gneiss q — Quartzite bc — Complex of layered gneiss
	U/D — Fault (dashes indicate approximate location)
	Thrust fault

RECOMMENDATIONS: No further work warranted. The data reflects known mineralization.

ANOMALY REPORT NUMBER: MHAR-2

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/04/84 DEPOSIT CLASS:

MAJOR METALS: Zn

MINOR METALS: Cu, Pb

AREA NAME: Cloyses (Clohesey) Lake

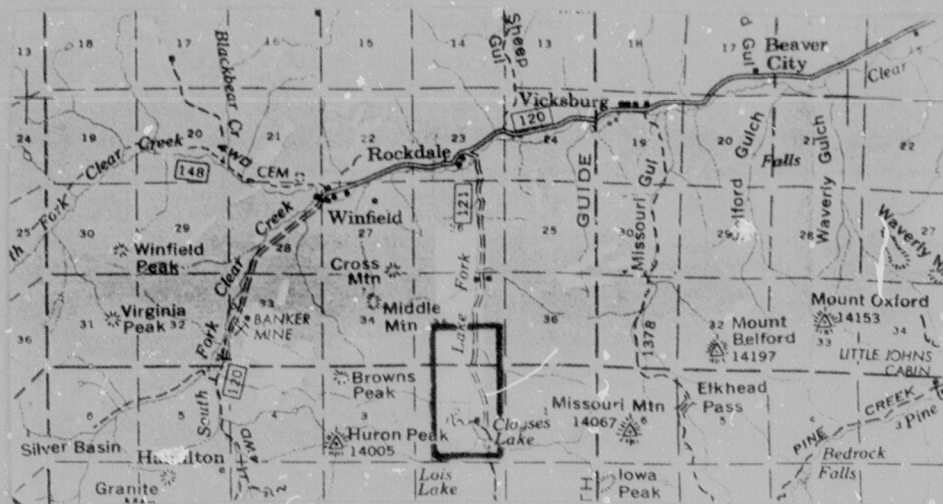
QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 57' 50", 106° 25' 00" NE CORNER: 38° 57' 50", 106° 24' 10"

SW CORNER: 38° 56' 33", 106° 25' 00" SE CORNER: 38° 56' 33", 106° 24' 10"

LOCATION MAP:



GEOCHEMICAL FEATURES: Anomalous Zinc concentrations in stream sediments of 525, 554, 565, 679, and 802 ppm. Slightly elevated concentrations of Cu (52-103 ppm) and Pb (50-78 ppm); strong Factor 5 loadings (Cu, Pb, Zn) in combined data. Anomalous Pb in ground water.

RADIOMETRIC FEATURES: Equivalent concentrations of K, U, and Th are low in this area. Average K = -0.5 std below the mean (2.1%), eU = -1.5 std below the mean (0.4 ppm), and eTh = -1 std below the mean (6.8 ppm).

OTHER GEOPHYSICAL FEATURES: The anomalous area corresponds to a steep negative magnetic gradient.

STRUCTURAL FEATURES: Chapman (1931) describes a fault (which he named the Sheep Creek fault) as passing up the valley of Clohesy's Creek (Cloyses), gradually climbing the mountain on the west side of the valley. The fault was described as a reverse fault. Brock and Barker (1972) did not recog-

ANOMALY REPORT NUMBER: MHAR-2

TYPE OF MINERALIZATION: Base-metal vein deposit

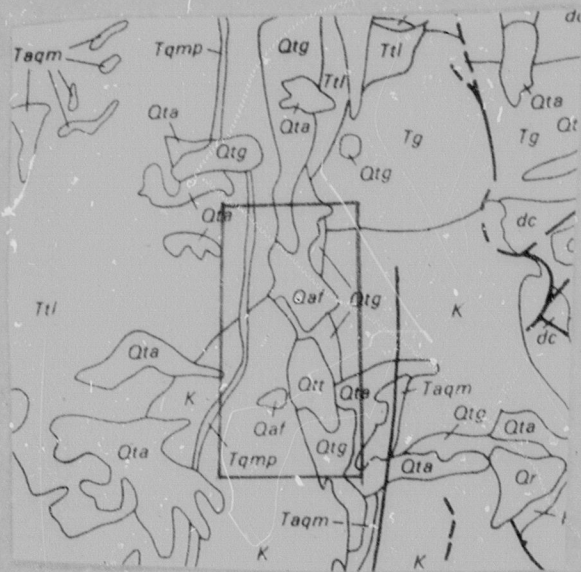
HOST ROCK(S): Precambrian Kroenke granodiorite intruded by Tertiary ase aplitic quartz monzonite on the eastern edge of the area.

REFERENCES: Chapman (1935), Brock and Barker (1972)

COMMENTS: -size this structure on their geologic map.

This area contains the highest average concentrations of Zinc in the entire study area.

GEOLOGIC SKETCH MAP



LEGEND	
QUATERNARY	[Qaf, Qaf — Alluvial deposits Qr, Ql — Colluvial deposits Qr, Qg, Qit, Qit, Qh — Glacial deposits
TERTIARY	[Tmp — Rhyolite porphyry Tqp — Quartz latite porphyry Tqm — Quartz monzonite porphyry Tqm — Aplitic quartz monzonite Tl — Tincup Quartz Monzonite porphyry Tpr — Mount Princeton Quartz Monzonite Ttl, Ttl, Ttlb — Twin Lakes Granodiorite (normal, late stage, and border facies) Tg — Granodiorite
PALEOZOIC	[Pal — Cambrian to Pennsylvanian rocks undivided
PRECAMBRIAN	[dc — Denny Creek Granodiorite Gneiss dca — Denny Creek interlayered with Kroenke Granodiorite dchd, dchm, dchs — Denny Creek and older rocks K — Kroenke Granodiorite bp — Browns Pass Quartz Monzonite gc — Complex of brecciated gneisses g — Gneissic granitic rocks hd — Hornblende diorite bs — Biotite-quartz plagioclase schist ls — Biotite-muscovite-quartz-plagioclase schist ms — Muscovite-quartz schist h — Hornblende plagioclase gneiss and amphibolite b — Biotite-quartz-plagioclase gneiss q — Quartzite bc — Complex of layered gneiss
	[U — Fault (dashes indicate approximate location) D — Thrust fault

RECOMMENDATIONS: Since known mines and prospects are not present in this area, followup study of the area is warranted for vein-type mineral deposits.

ANOMALY REPORT NUMBER: MHAR-3

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/16/84 DEPOSIT CLASS:

MAJOR METALS: REE

MINOR METALS:

AREA NAME: Little John's Cabin

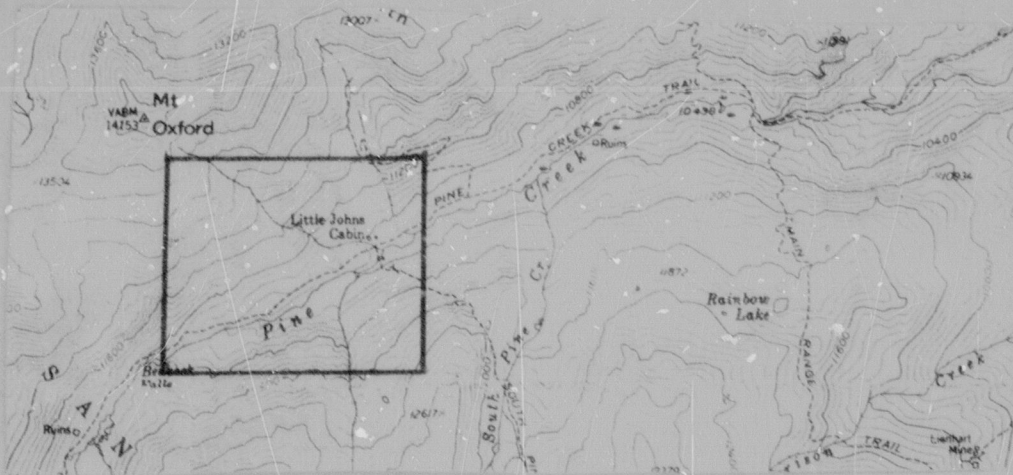
QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 57' 45", 106° 20' 15" NE CORNER: 38° 57' 45", 106° 18' 38"

SW CORNER: 38° 56' 45", 106° 20' 15" SE CORNER: 38° 56' 45", 106° 18' 38"

LOCATION MAP:



GEOCHEMICAL FEATURES: The Pine Creek drainage contains elevated concentrations of REE. A sample taken adjacent to mines near Little John's Cabin contained anomalous Ce, Dy, Eu, Hf, La, Lu, Sc, Ta, Tb, Sm, Yb, and Zr. Many of the values were the highest recorded in the Mt. Harvard area.

RADIOMETRIC FEATURES: Average concentrations of K, eU, and eTh are near the mean concentrations for the entire Mt. Harvard survey area.

OTHER GEOPHYSICAL FEATURES: No significant features observed.

STRUCTURAL FEATURES: No major structures observed.

ANOMALY REPORT NUMBER: MHAR-4

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/16/84 DEPOSIT CLASS:

MAJOR METALS: Cs, Li, Be

MINOR METALS: K, Rb

AREA NAME: South Fork of Pine Creek

QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 56' 42", 106° 18' 07" NE CORNER: * 00' 00", * 00' 00"

SW CORNER: * 00' 00", * 00' 00" SE CORNER: * 60' 00", * 00' 00"

LOCATION MAP:



GEOCHEMICAL FEATURES: Single-point anomaly containing Be = 9 ppm, Li = 117 ppm, and Cs=36 ppm. Strong Factor 3 (Li, Al, Cs, Be) in detailed data

RADIOMETRIC FEATURES: Detailed aerial radiometric K = +0.5 std (2.7%), eU = +2 std (5 ppm), eTh = +1 std (15 ppm).

OTHER GEOPHYSICAL FEATURES: Single-point anomaly containing Be = 9 ppm, Li = 117 ppm, and Cs=36 ppm. Strong Factor 3 (Li, Al, Cs, Be) in detailed data

STRUCTURAL FEATURES: data

Detailed aerial radiometric K = +0.5 std (2.7%), eU = +2 std (5 ppm), eTh = +1 std (15 ppm).

ANOMALY REPORT NUMBER: MHAR-4
TYPE OF MINERALIZATION:

Unknown-possible late-stage pegmatitic minerali-

HOST ROCK(S): zation.

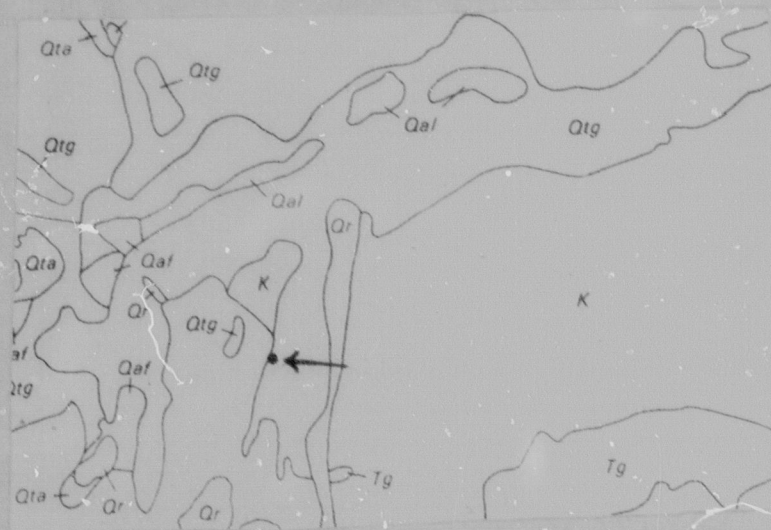
Contact between the Precambrian X ase Kroenke Granodiorite

REFERENCES: and a complex of brecciated gneisses.

COMMENTS: Brock and Barker (1972)

Significance unknown. The elements present are indicative of minerals commonly associated with pegmatites.

GEOLOGIC SKETCH MAP



LEGEND

QUATERNARY	[Qal, Qaf — Alluvial deposits Qta, Qf — Colluvial deposits Qr, Qfg, Qfg, Qff, Qff — Glacial deposits
TERTIARY	[Tsp — Rhyolite porphyry Tqlp — Quartz latite porphyry Tqmp — Quartz monzonite porphyry Taqm — Aplitic quartz monzonite Tt — Tincup Quartz Monzonite porphyry Tpr — Mount Princeton Quartz Monzonite Ttl, Ttlb, Ttlc — Twin Lakes Granodiorite (normal, late stage, and border facies) Tg — Granodiorite
PALEOZOIC	[Pal — Cambrian to Pennsylvanian rocks undivided
PRECAMBRIAN	[dc — Denny Creek Granodiorite Gneiss dck — Denny Creek interlayered with Kroenke Granodiorite dcdh, dchm, dcbs — Denny Creek and older rocks K — Kroenke Granodiorite bp — Browns Pass Quartz Monzonite gc — Complex of brecciated gneisses g — Gneissic granitic rocks hd — Hornblende Gneiss bs — Biotite-quartz-plagioclase schist bj — Biotite-muscovite-quartz-plagioclase schist ms — Muscovite-quartz schist h — Hornblende-plagioclase gneiss and amphibolite b — Biotite-quartz-plagioclase gneiss q — Quartzite bc — Complex of layered gneiss
	[U — Fault [dashes indicate approximate location] D — Thrust fault

RECOMMENDATIONS:

Minor follow-up stream sediment sampling is warranted.

ANOMALY REPORT NUMBER: MHAR-5

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/16/84 DEPOSIT CLASS:

MAJOR METALS: Zn

MINOR METALS: Bi, Cu, Pb, U, W

AREA NAME: Hamilton

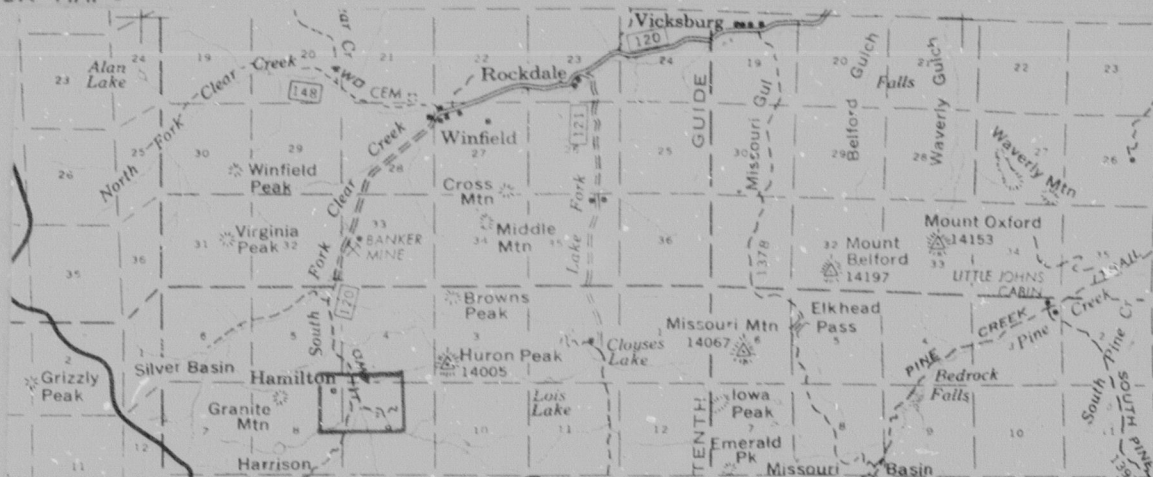
QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 56' 34", 106° 27' 50" NE CORNER: 38° 56' 34", 106° 26' 42"

SW CORNER: 38° 56' 00", 106° 27' 50" SE CORNER: 38° 56' 00", 106° 26' 42"

LOCATION MAP:



GEOCHEMICAL FEATURES: Anomalous Zn in stream sediments (222-435 ppm) with elevated Cu and Pb. Two samples contain anomalous W (30 and 31 ppm). Elevated U (35, 35, and 35 ppm) has corresponding U/Th ratios of 1.9, 1.8, and 1.7.

RADIOMETRIC FEATURES: Aerial radiometric (detailed) K = -1 std below the mean (1.850%), eU = mean (2.370 ppm), eTh = mean (11.421 ppm). The area corresponds with the border facies of the Twin Lakes Granodiorite. N of the border facies is a N-trending eU high related to the normal facies *

OTHER GEOPHYSICAL FEATURES: The anomalous area lies within a broad magnetic low.

STRUCTURAL FEATURES: Several veins occupy small shear zones in the area.

ANOMALY REPORT NUMBER: MHAR-6

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/16/84 DEPOSIT CLASS:

MAJOR METALS: Zn

MINOR METALS: Cu

AREA NAME: Harrison Flat

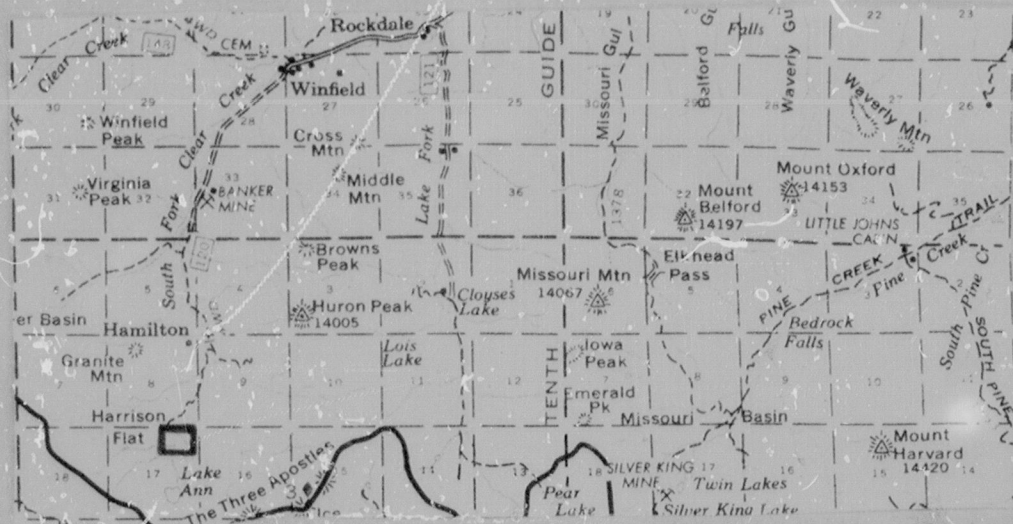
QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 55' 36", 106° 28' 10" NE CORNER: 38° 55' 36", 106° 27' 39"

SW CORNER: 38° 55' 18", 106° 28' 10" SE CORNER: 38° 55' 18", 106° 27' 39"

LOCATION MAP:



GEOCHEMICAL FEATURES: Anomalous Zn in stream sediments = 398 and 326 PPM.
Elevated Cu = 93 and 71 PPM.

RADIOMETRIC FEATURES: Detailed aerial radiometric K = +1.5 std (3.3%),
eU = mean (2.3 PPM), eTh = +1 std (16.0 PPM).

OTHER GEOPHYSICAL FEATURES:

STRUCTURAL FEATURES: No major structures observed

ANOMALY REPORT NUMBER: MHAR-6

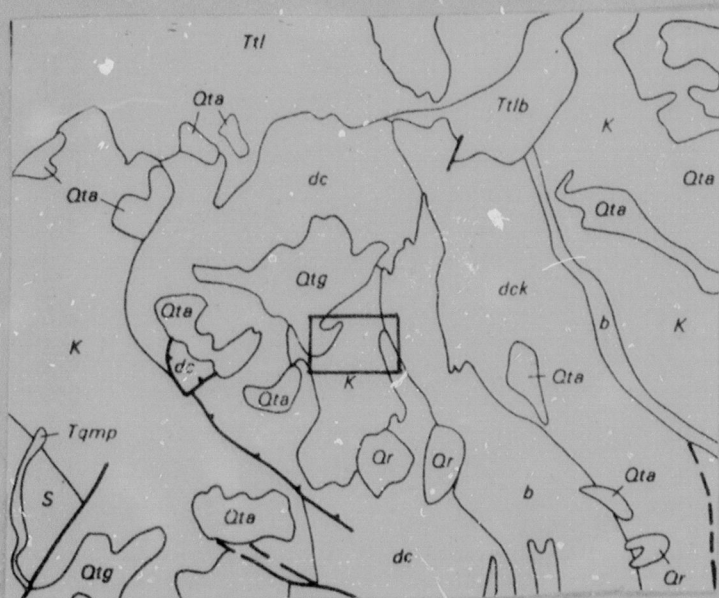
TYPE OF MINERALIZATION: Vein-type base-metal mineralization

HOST ROCK(S): Contact zone between Precambrian X age Kroenke Granodiorite, Denny Creek Granodiorite Gneiss, and biotite-quartz-plagioclase gneiss

REFERENCES: Brock and Barker (1972)

COMMENTS: No evidence of mining activity exists in the immediate area of the anomalies.

GEOLOGIC SKETCH MAP



LEGEND	
QUATERNARY	[Qal, Qal - Alluvial deposits Qta, Ql - Colluvial deposits Qr, Qlg, Qtg, Qtl, Qtl - Glacial deposits
TERTIARY	[Ttp - Rhyolite porphyry Tqlp - Quartz laite porphyry Tqmp - Quartz monzonite porphyry Taqm - Aplitic quartz monzonite Tt - Tincup Quartz Monzonite porphyry Tpr - Mount Princeton Quartz Monzonite Ttl, Ttl, Ttlb - Twin Lakes Granodiorite (normal, late-stage, and border facies) Tg - Granodiorite
PALEOZOIC	[Pal - Cambrian to Pennsylvanian rocks undivided
PRECAMBRIAN	[dc - Denny Creek Granodiorite Gneiss dck - Denny Creek interlayered with Kroenke Granodiorite dchd, dchm, dcbs - Denny Creek and older rocks K - Kroenke Granodiorite bp - Browns Pass Quartz Monzonite gc - Complex of brecciated gneisses g - Gneissic granitic rocks hd - Hornblende diorite bs - Biotite-quartz-plagioclase schist lg - Biotite-muscovite-quartz-plagioclase schist ms - Muscovite-quartz schist h - Hornblende-plagioclase gneiss and amphibolite b - Biotite-quartz-plagioclase gneiss q - Quartzite bc - Complex of layered gneiss
	[U D - Fault (dashes indicate approximate location)
	[- - - - - Thrust fault

RECOMMENDATIONS: Warrants further investigation for base-metal mineral occurrences or deposits.

ANOMALY REPORT NUMBER: MHAR-7

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/16/84 DEPOSIT CLASS:

MAJOR METALS: U

MINOR METALS: Cs, Au

AREA NAME: Waterloo Gulch

QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 55' 30", 106° 26' 00" NE CORNER: 38° 55' 30", 106° 24' 30"

SW CORNER: 38° 52' 36", 106° 26' 00" SE CORNER: 38° 52' 36", 106° 24' 30"

LOCATION MAP:



GEOCHEMICAL FEATURES: Anomalous uranium in stream sediments = 111, 133, 137, and 156 ppm. U/Th ratios = 17.1, 16.6, 15.2, and 22.9 respectively. Associated element is Cs. One sample contains detectable Au and one sample contains slightly anomalous Zn (254 ppm).

RADIOMETRIC FEATURES: Average K = +1 std (3.0%), eU = +1.5 std (5.0 ppm), and eTh = +1.5 std (20.4 ppm) in reconnaissance data. Detailed data K = +2 std (3.6%) in NW 1/4 of area, eU = +5 std (8.8 ppm) in N-central portion, and eTh = +2 std (20.5 ppm) in NW 1/4 of area.

OTHER GEOPHYSICAL FEATURES: A NW-trending closed magnetic low corresponds to the Waterloo Gulch area.

STRUCTURAL FEATURES: NW-trending fault follows ridge on west side of Waterloo Gulch. NE-trending shear zone is present on NE edge of the area. Small mineralized veins are present at several localities within the area.

ANOMALY REPORT NUMBER: MHAR-7

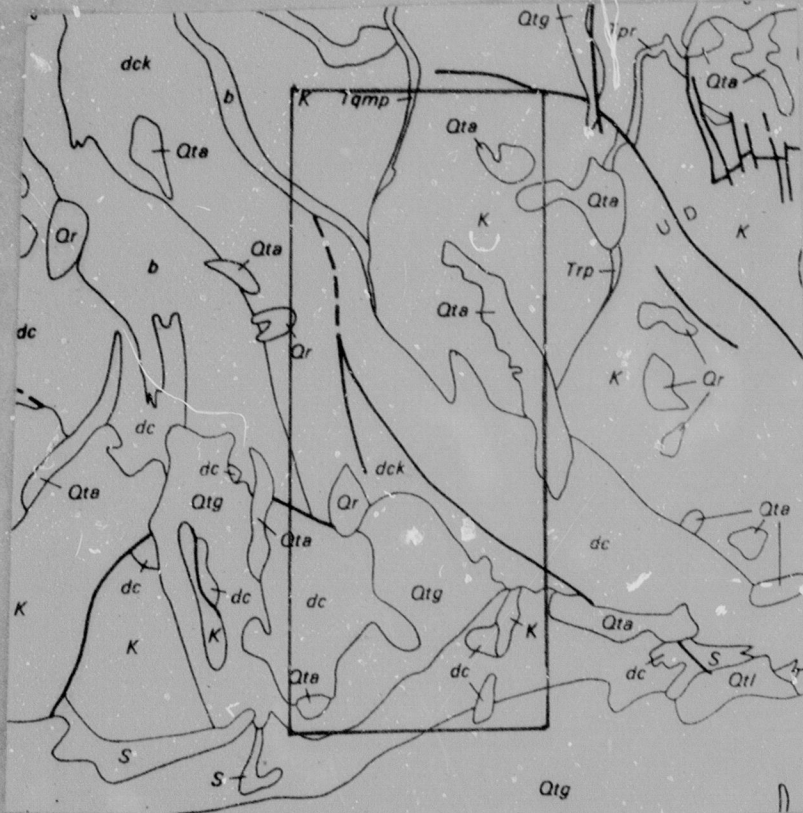
TYPE OF MINERALIZATION: Polymetallic vein-type in metamorphic rocks small veins contains minor base- and precious-metals are known to be present in the area.

HOST ROCK(S): Precambrian X ase Denny Creek Granodiorite Gneiss and Kroenke Granodiorite.

REFERENCES: Ludlam and others (1984)

COMMENTS: Ludlam and others conducted followup stream sediment sampling and ground radiometric traverses to verify HSSR and ARM anomalies. Anomalous uranium values in stream sediments were confirmed but were thought to be a result of absorption by humic materials. The source of the uranium was suspected to be small uranium-bearing polymetallic veins

GEOLOGIC SKETCH MAP



LEGEND	
QUATERNARY	[Qal, Qaf — Alluvial deposits Qta, Qf — Colluvial deposits Qr, Qlg, Qgl, Qil, Qll — Glacial deposits
TERTIARY	[Trp — Rhyolite porphyry Tqlp — Quartz latite porphyry Tqmp — Quartz monzonite porphyry Tqmn — Aplitic quartz monzonite It — Incup Quartz Monzonite porphyry Tpr — Mount Princeton Quartz Monzonite Til, Ttl, Ttlb — Twin Lakes Granodiorite (normal, late-stage, and border facies) Tg — Granodiorite
PALEOZOIC	[Pal — Cambrian to Pennsylvanian rocks undivided
PRECAMBRIAN	[dc — Denny Creek Granodiorite Gneiss dck — Denny Creek interlayered with Kroenke Granodiorite dchd, dclm, dcbs — Denny Creek and older rocks K — Kroenke Granodiorite bp — Browns Pass Quartz Monzonite gc — Complex of brecciated gneisses g — Gneissic granitic rocks hd — Hornblende diorite bs — Biotite-quartz-plagioclase schist ls — Biotite-muscovite-quartz-plagioclase schist ms — Muscovite quartz schist h — Hornblende-plagioclase gneiss and amphibolite b — Biotite-quartz-plagioclase gneiss q — Quartzite bc — Complex of layered gneiss
	[U D — Fault (dashes indicate approximate location)
	[— Thrust fault

RECOMMENDATIONS: Does not warrant further investigation except from an academic standpoint. Magmatic differentiation within the Kroenke Granodiorite appears to have taken place in this area based on HSSR, ARM, and rock data.

ANOMALY REPORT NUMBER: MHAR-8

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/04/84 DEPOSIT CLASS:

MAJOR METALS: U

MINOR METALS:

AREA NAME: Mt. Yale - Tributaries of N. Cottonwood Creek

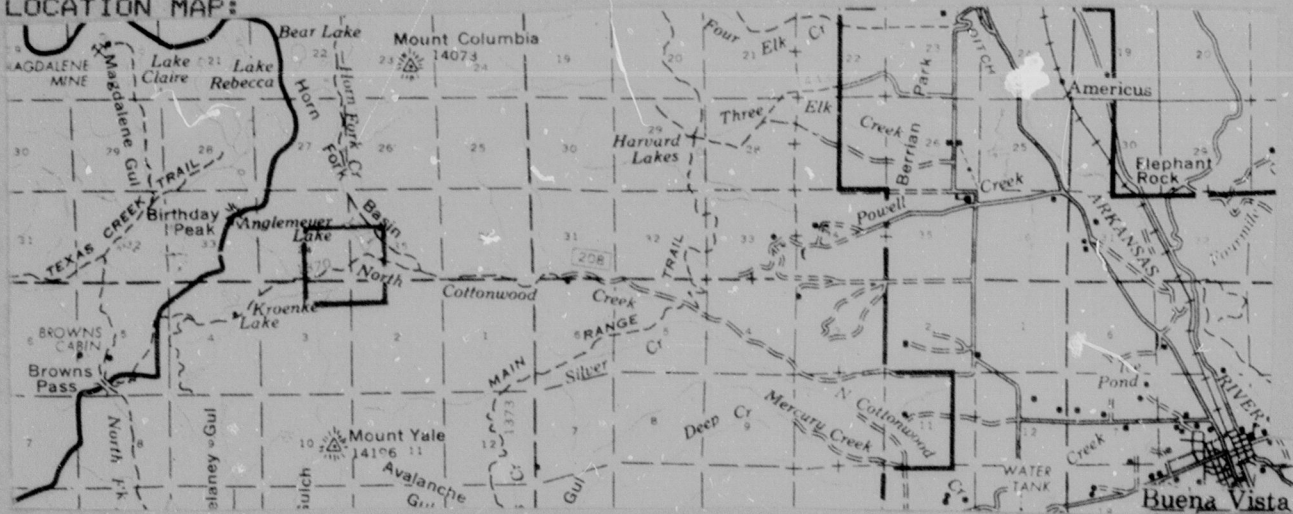
QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 52' 54", 106° 19' 03" NE CORNER: 38° 52' 54", 106° 18' 08"

SW CORNER: 38° 52' 00", 106° 19' 03" SE CORNER: 38° 52' 00", 106° 18' 08"

LOCATION MAP:



GEOCHEMICAL FEATURES: U in stream sediments = 34-141 ppm with U/Th ratios from 1.8-8.8. No other elements appear to be anomalous. U in stream water = 2.3, 3.3, and 3.7 ppb. U/Conductivity ratios = 32, 30, and 30

RADIOMETRIC FEATURES: Aerial-radiometric K = -1.5 std (1.5%), eU = mean (2.4 ppm), and eTh = mean (11.4 ppm).

OTHER GEOPHYSICAL FEATURES: No significant features observed

STRUCTURAL FEATURES: No major structures observed.

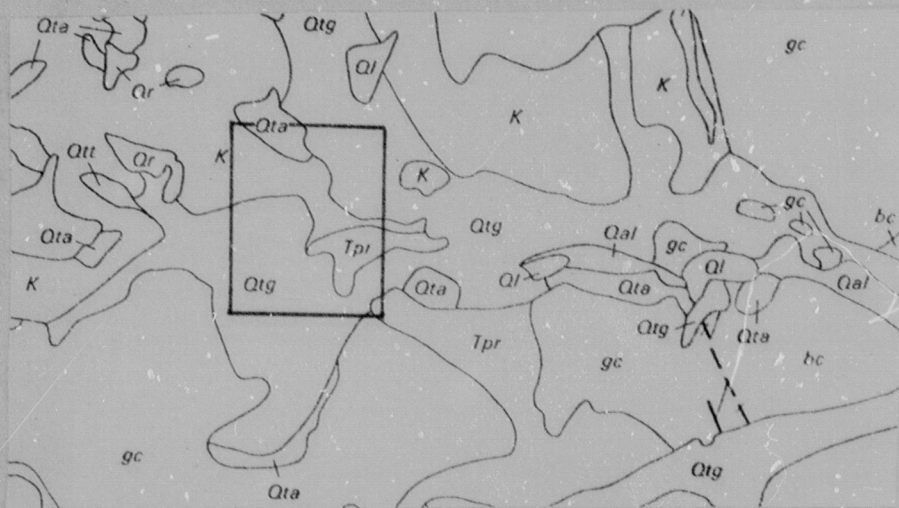
ANOMALY REPORT NUMBER: MHAR-8
 TYPE OF MINERALIZATION: Unknown

HOST ROCK(S): Locally-derived glacial till

REFERENCES: Brock and Barker (1972)

COMMENTS: Significance unknown

GEOLOGIC SKETCH MAP



LEGEND	
QUATERNARY	<ul style="list-style-type: none"> Qal, Qaf — Alluvial deposits Qta, Ql — Colluvial deposits Or, Qta, Qtg, Qil, Qit — Glacial deposits
TERTIARY	<ul style="list-style-type: none"> Tep — Rhyolite porphyry Tqlp — Quartz late porphyry Tqmp — Quartz monzonite porphyry Taqm — Aplitic quartz monzonite Tt — Tincup Quartz Monzonite porphyry Tpr — Mount Princeton Quartz Monzonite Ttl, Ttlb, Ttlc — Twin Lakes Granodiorite (normal, late stage, and border facies) Tg — Granodiorite
PALEOZOIC	<ul style="list-style-type: none"> Pal — Cambrian to Pennsylvanian rocks undivided
PRE-CAMBRIAN	<ul style="list-style-type: none"> dc — Denny Creek Granodiorite Gneiss dck — Denny Creek interlayered with Kroenke Granodiorite dchd, dchm, dcbs — Denny Creek and older rocks ka — Kroenke Granodiorite bp — Browns Pass Quartz Monzonite gc — Complex of brecciated gneisses g — Gneissic granitic rocks hd — Hornblende diorite bs — Biotite-quartz-plagioclase schist lg — Biotite-muscovite-quartz-plagioclase schist ms — Muscovite-quartz schist h — Hornblende-plagioclase gneiss and amphibolite b — Biotite-quartz-plagioclase gneiss q — Quartzite bc — Complex of layered gneiss
	<ul style="list-style-type: none"> U — Fault (dashes indicate approximate location) D — Thrust fault

RECOMMENDATIONS: Warrants further investigation

ANOMALY REPORT NUMBER: MHAR-9

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/16/84 DEPOSIT CLASS:

MAJOR METALS: Pb, W, Zn

MINOR METALS: Cu, U

AREA NAME: North Cottonwood district

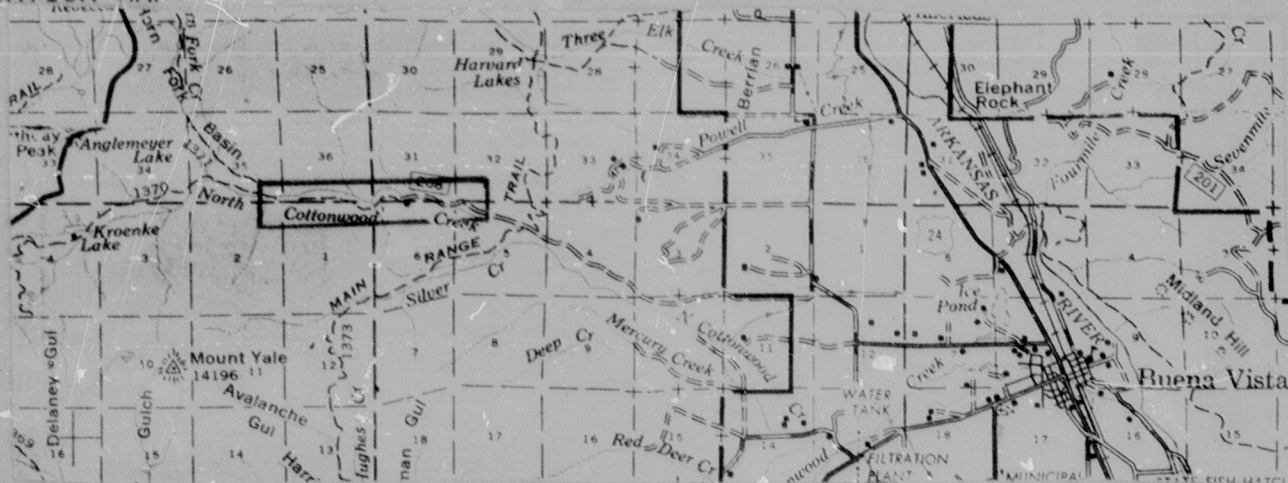
QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 53' 00", 106° 17' 30" NE CORNER: 38° 53' 00", 106° 15' 00"

SW CORNER: 38° 52' 00", 106° 17' 30" SE CORNER: 38° 52' 00", 106° 15' 00"

LOCATION MAP:



GEOCHEMICAL FEATURES: Anomalous Pb in stream sediments = 51-336 ppm, W = 16-36 ppm, and Zn = 104-360 ppm. One sample contains anomalous Cu = 187 ppm. Sample at extreme eastern edge also contains anomalous U = 74 ppm with a U/Th ratio of 4.6.

RADIOMETRIC FEATURES: Slightly elevated K = +0.5 std (2.66%), eU = +1 std in western 1/2 of area (4.187 ppm) and -1 std in eastern half (0.815 ppm), eTh = +1 std across entire area (17.603 ppm).

OTHER GEOPHYSICAL FEATURES:

STRUCTURAL FEATURES: Mines correspond with a NW-trending fault that is present on the southern edge of the N Cottonwood Crk drainage. NW-trending shear zones are mapped to the north of N. Cottonwood Crk. The shear zones probably extend across N Cottonwood Crk beneath the glacial till.

ANOMALY REPORT NUMBER: MHAR-9

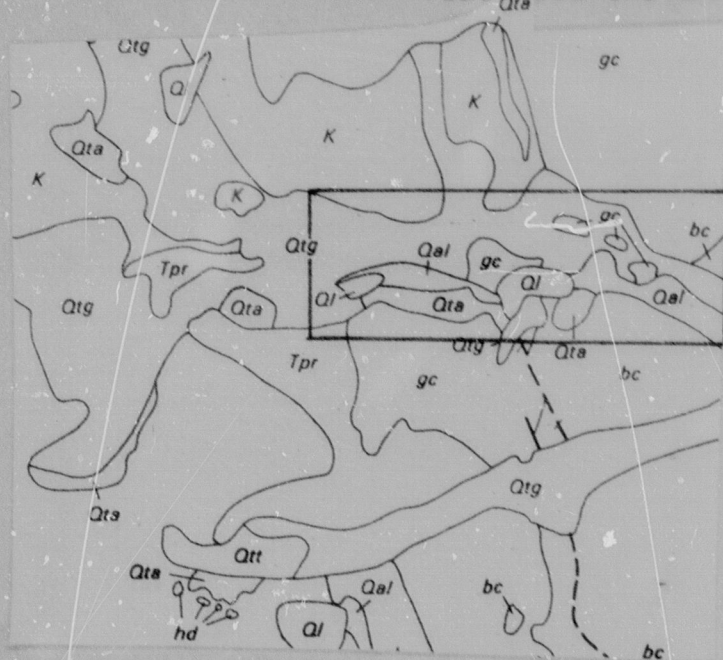
TYPE OF MINERALIZATION: Base-metal vein-type deposits

HOST ROCK(S): Fault and shears zones in Precambrian X age brecciated gneisses and X age Kroenke Granodiorite.

REFERENCES: Brock and Barker (1972)

COMMENTS: Mineralization is probably related to the intrusion of the Mt. Princeton batholith to the south.

GEOLOGIC SKETCH MAP



LEGEND

- QUATERNARY
- Qal, Qal — Alluvial deposits
 - Qta, Ql — Colluvial deposits
 - Qr, Qg, Qtg, Qtl, Qtl — Glacial deposits
- TERTIARY
- Tpr — Rhyolite porphyry
 - Tqlp — Quartz latite porphyry
 - Tqmp — Quartz monzonite porphyry
 - Taqm — Aplitic quartz monzonite
 - Tt — Tincup Quartz Monzonite porphyry
 - Tpr — Mount Princeton Quartz Monzonite
 - Ttl, Ttl, Ttlb — Twin Lakes Granodiorite (normal, late stage, and border facies)
 - Tg — Granodiorite
- PALEOZOIC
- Pal — Cambrian to Pennsylvanian rocks undivided
- PRECAMBRIAN
- etc — Denny Creek Granodiorite Gneiss
 - dck — Denny Creek interlayered with Kroenke Granodiorite
 - dchd, cchm, dcbs — Denny Creek and older rocks
 - K — Kroenke Granodiorite
 - dp — Browns Pass Quartz Monzonite
 - gc — Complex of brecciated gneisses
 - g — Gneissic granitic rocks
 - hd — Hornblende diorite
 - h — Biotite-quartz-plagioclase schist
 - ms — Muscovite-quartz schist
 - b — Biotite-muscovite-quartz-plagioclase schist
 - ms — Muscovite-quartz schist
 - h — Hornblende-plagioclase gneiss and amphibolite
 - b — Biotite-quartz-plagioclase gneiss
 - q — Quartzite
 - bc — Complex of layered gneiss
- U — Fault (dashes indicate approximate location)
- D — Thrust fault

RECOMMENDATIONS: No further work is warranted.

ANOMALY REPORT NUMBER: MHAR-10

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/16/84 DEPOSIT CLASS:

MAJOR METALS: U

MINOR METALS:

AREA NAME: Mt. Yale - Avalanche Gulch

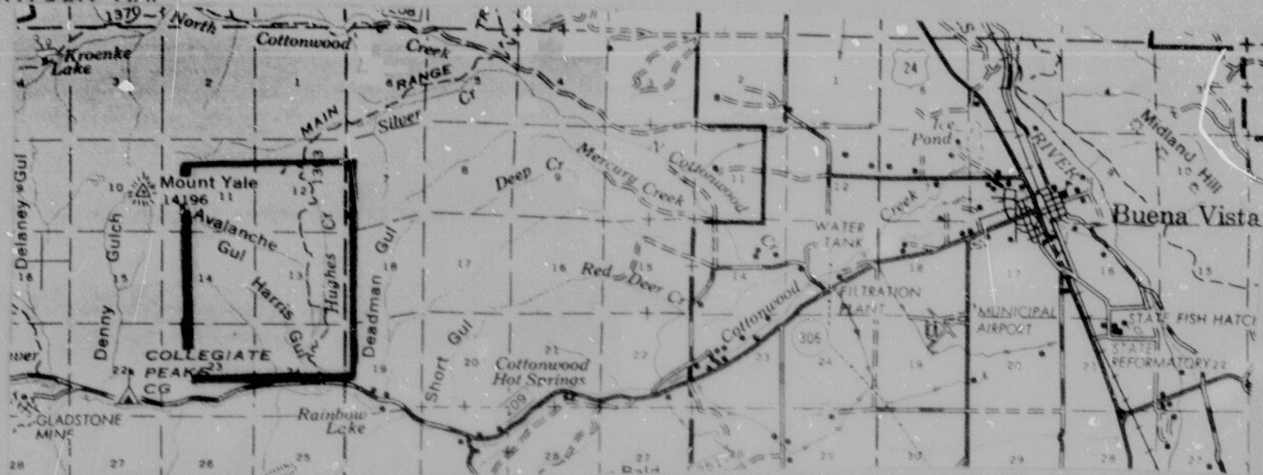
QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 50' 54", 106° 18' 00" NE CORNER: 38° 50' 54", 106° 16' 15"

SW CORNER: 38° 48' 48", 106° 18' 00" SE CORNER: 38° 48' 48", 106° 16' 15"

LOCATION MAP:



GEOCHEMICAL FEATURES: Anomalous uranium is stream sediments of 92, 94, 107, and 116 ppm. U/Th ratios = 3.2, 2.8, 5.7, and 5.9 respectively. Residual uranium (not associated with resistate minerals) is high ranging from 26-39 ppm.

RADIOMETRIC FEATURES: Anomalous eU ≥ 3 std above the mean (7.559 ppm) in northern portion near Silver Creek (reconnaissance data). Average eTh = 2 std above the mean (23.260 ppm) throughout the anomaly area. Average K = 1.5 std above the mean (3.373 %) throughout the area

OTHER GEOPHYSICAL FEATURES: A closed magnetic low is centered over Avalanche Gulch.

STRUCTURAL FEATURES: No structures observed

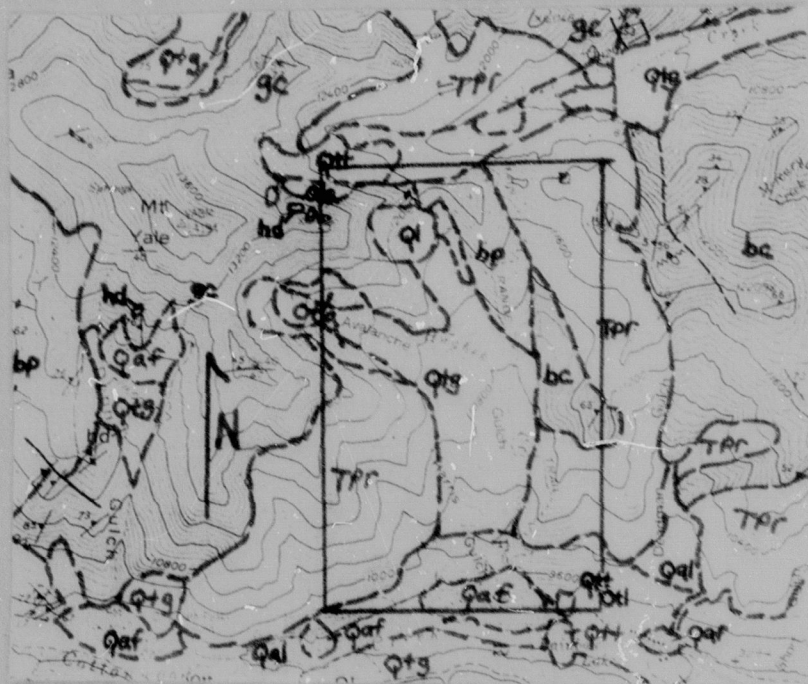
ANOMALY REPORT NUMBER: MHAR-10
 TYPE OF MINERALIZATION: Unknown

HOST ROCK(S): Tertiary Mount Princeton Quartz Monzonite, Precambrian
 X age Browns Pass Quartz Monzonite, or Precambrian X age brecciated
 gneisses

REFERENCES: Brock and Barker (1972)

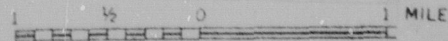
COMMENTS: The lack of elements associated with resistate minerals indi-
 cates the uranium present is likely to be oxidized and in a leachable
 form.

GEOLOGIC SKETCH MAP



LEGEND

- QUATERNARY [Qal, Qaf — Alluvial deposits
 Qta, Qf — Colluvial deposits
 Qr, Qlg, Qig, Qil, Qit — Glacial deposits
- TERTIARY [Tgp — Rhyolite porphyry
 Tqlp — Quartz latite porphyry
 Tqmp — Quartz monzonite porphyry
 Tqgm — Aplitic quartz monzonite
 Tt — Tincup Quartz Monzonite porphyry
 Tpr — Mount Princeton Quartz Monzonite
 Ttl, Ttl', Ttlb — Twin Lakes Granodiorite (normal, late stage, and border facies)
 Tg — Granodiorite
- PALEOZOIC [Pal — Cambrian to Pennsylvanian rocks undivided
- PRECAMBRIAN [dc — Denny Creek Granodiorite Gneiss
 dck — Denny Creek interlayered with Kroenke Granodiorite
 dcdh, dchm, dcbs — Denny Creek and/or rocks
 ka — Kroenke Granodiorite
 bp — Browns Pass Quartz Monzonite
 gc — Complex of orecciated gneisses
 g — Gneissic granitic rocks
 hd — Hornblende diorite
 bs — Biotite-quartz-plagioclase schist
 ls — Biotite-muscovite-quartz-plagioclase schist
 ms — Muscovite-quartz schist
 h — Hornblende-plagioclase gneiss and amphibolite
 b — Biotite-quartz-plagioclase gneiss
 q — Quartzite
 bc — Complex of layered gneiss
- U — Fault (dashes indicate approximate location)
 — D — Thrust fault



RECOMMENDATIONS: This area warrants further study for potential uranium mineralization.

ANOMALY REPORT NUMBER: MHAR-11

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/16/84 DEPOSIT CLASS:

MAJOR METALS: U

MINOR METALS: La, Sm, Yb

AREA NAME: Mt. Yale - Delaney Gulch

QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 51' 30", 106° 20' 36" NE CORNER: 38° 51' 30", 106° 20' 00"

SW CORNER: 38° 48' 50", 106° 20' 36" SE CORNER: 38° 48' 50", 106° 20' 00"

LOCATION MAP:



GEOCHEMICAL FEATURES: Anomalous U in stream sediments = 56, 57, 69, and

93 ppm. U/Th ratios = 1.4, 1.6, 2.2, and 2.9 respectively. No other anomalous elements. Concentrations of La, Sm, and Yb are elevated. U in stream water = 1.97, 1.97, and 2.77 ppb with U/Conductivity ratios of ---

RADIOMETRIC FEATURES: Detailed aerial radiometric K = mean (2.4%) except along N border where K = +2 std (3.6%). eU = mean (2.4 ppm). eTh = mean (11.4 ppm) except along N border where eTh = +1.5 std (18.2 ppm). Recon. data indicates all three radioelements are elevated in N 1/2 of the area.

OTHER GEOPHYSICAL FEATURES: A narrow N-trending magnetic low corresponds with the Delaney Gulch drainage.

STRUCTURAL FEATURES: No major structures observed.

ANOMALY REPORT NUMBER: MHAR-12

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/16/84 DEPOSIT CLASS:

MAJOR METALS: Cu, Pb, Zn, U

MINOR METALS:

AREA NAME: Gladstone Mine - Cottonwood district

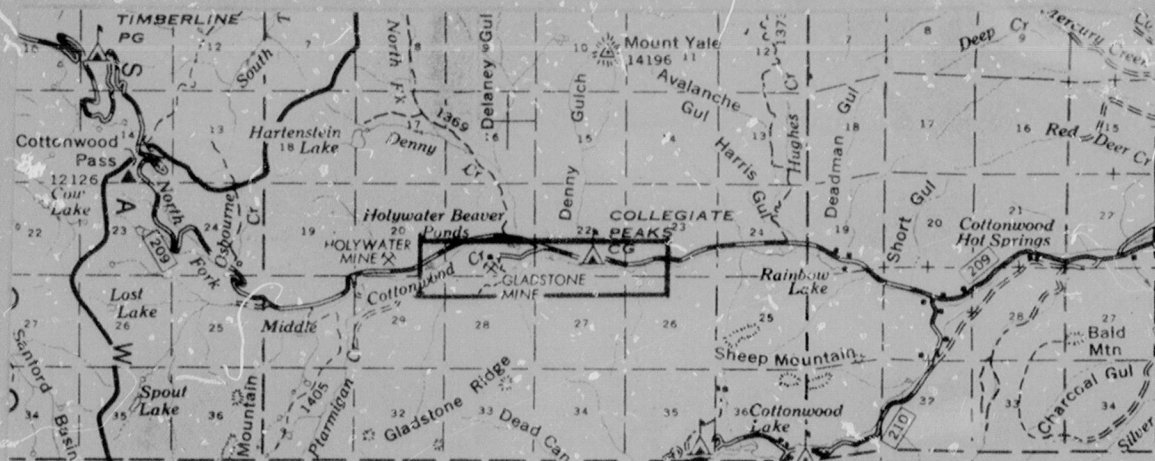
QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 48' 50", 106° 21' 00" NE CORNER: 38° 48' 50", 106° 18' 00"

SW CORNER: 38° 48' 20", 106° 21' 00" SE CORNER: 38° 48' 20", 106° 18' 00"

LOCATION MAP:



GEOCHEMICAL FEATURES: Stream sediment sample taken downstream from the Gladstone Mine contained 294 ppm Cu, 1,069 ppm Pb, 879 ppm Zn, and 172 ppm U. U/Tn ratio = 13. Stream sediment samples to the east of the mine contain only slightly elevated Cu, Pb, and Zn. U = 33, 39, and 82 ppm *
RADIOMETRIC FEATURES: Average detailed aerial radiometric K = -1.5 std (1.5%), eU = mean (2.4 ppm), and eTh = -1 std (6.873 ppm).

OTHER GEOPHYSICAL FEATURES: Two areas of magnetic highs are separated by N-trending magnetic low in the immediate vicinity of the Gladstone Mine.

STRUCTURAL FEATURES: Two NE-trending faults are present near the western edge of the area. The Gladstone Mine appears to be located along the trace of one of the faults.

ANOMALY REPORT NUMBER: MHAR-12

TYPE OF MINERALIZATION: Base- and precious-metal vein-type deposit

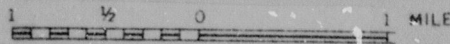
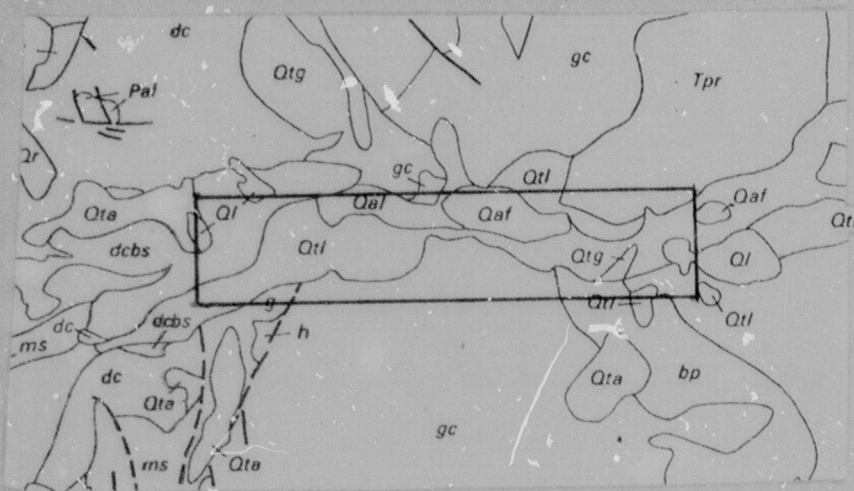
HOST ROCK(S): Precambrian X ase brecciated gneisses near contact with Precambrian X ase Denny Creek Granodiorite Gneiss. Contact is concealed by glacial till.

REFERENCES: Brock and Barker (1972)

COMMENTS: * with U/Th ratios of 2.7, 3.7, and 6.1.

The uranium associated with base-metals in the sediment sample taken below the Gladstone Mine may represent magmatic hydrothermal uranium mineralization.

GEOLOGIC SKETCH MAP



LEGEND	
QUATERNARY	[Qaf, Qaf — Alluvial deposits Qta, Ql — Colluvial deposits Qr, Qtg, Qtr, Qtl, Qtr — Glacial deposits
TERTIARY	[Tpr — Rhyolite porphyry Tqtp — Quartz latite porphyry Tqmp — Quartz monzonite porphyry Tqgm — Aplitic quartz monzonite Tt — Tincup Quartz Monzonite porphyry Tpr — Mount Princeton Quartz Monzonite Ttl, Ttl, Ttlb — Twin Lakes Granodiorite (normal, late stage, and border facies) Tg — Granodiorite
PALEOZOIC	[Pal — Cambrian to Pennsylvanian rocks undivided
PRECAMBRIAN	[dc — Denny Creek Granodiorite Gneiss dck — Denny Creek interlayered with Kroenke Granodiorite dchd, dchm, dcbs — Denny Creek and older rocks ka — Kroenke Granodiorite bp — Browns Pass Quartz Monzonite gc — Complex of brecciated gneisses g — Gneissic granitic rocks f.d — Hornblende diorite bs — Biotite-quartz-plagioclase schist lg — Biotite-muscovite-quartz-plagioclase schist ms — Muscovite-quartz schist h — Hornblende-plagioclase gneiss and amphibolite b — Biotite-quartz-plagioclase gneiss q — Quartzite bc — Complex of layered gneiss
	[U — Fault (dashes indicate approximate location) D — Thrust fault

RECOMMENDATIONS: Warrants further work to assess the uranium potential of vein deposits in the area.

ANOMALY REPORT NUMBER: MHAR-13

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/04/84 DEPOSIT CLASS:

MAJOR METALS: Au, Ag, Cu, Pb

MINOR METALS: As, Sb, Zn

AREA NAME: Tincup District - Northern extent

QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 48' 30", 106° 30' 00" NE CORNER: 38° 48' 30", 106° 27' 50"

SW CORNER: 38° 45' 00", 106° 30' 00" SE CORNER: 38° 45' 00", 106° 27' 50"

LOCATION MAP:



GEOCHEMICAL FEATURES: Anomalous Cu (122-331 ppm), Pb (106-338 ppm), Sb (6-29 ppm), Zn (265-629 ppm) in stream sediments. Minor anomalous As (39 and 40 ppm) and W (20 ppm). Strong Factor 5 (Cu, Pb, Zn) loadings in combined data. No multielement water data is anomalous area.

RADIOMETRIC FEATURES: Low equivalent concentrations of all three radioelements (K, U, Th) in reconnaissance data. Average K = -2 std below the mean (0.885%), eU = -1 std below the mean (0.915 ppm) and eTh = -1.5 std below the mean (3.461 ppm)

OTHER GEOPHYSICAL FEATURES: No significant features observed

STRUCTURAL FEATURES: The anomalous area is bounded on the east by the major NE-trending Tincup Fault. Minor NW-trending normal faults are present in the vicinity of Tincup and Kentucky Gulch.

ANOMALY REPORT NUMBER: MHAR-13

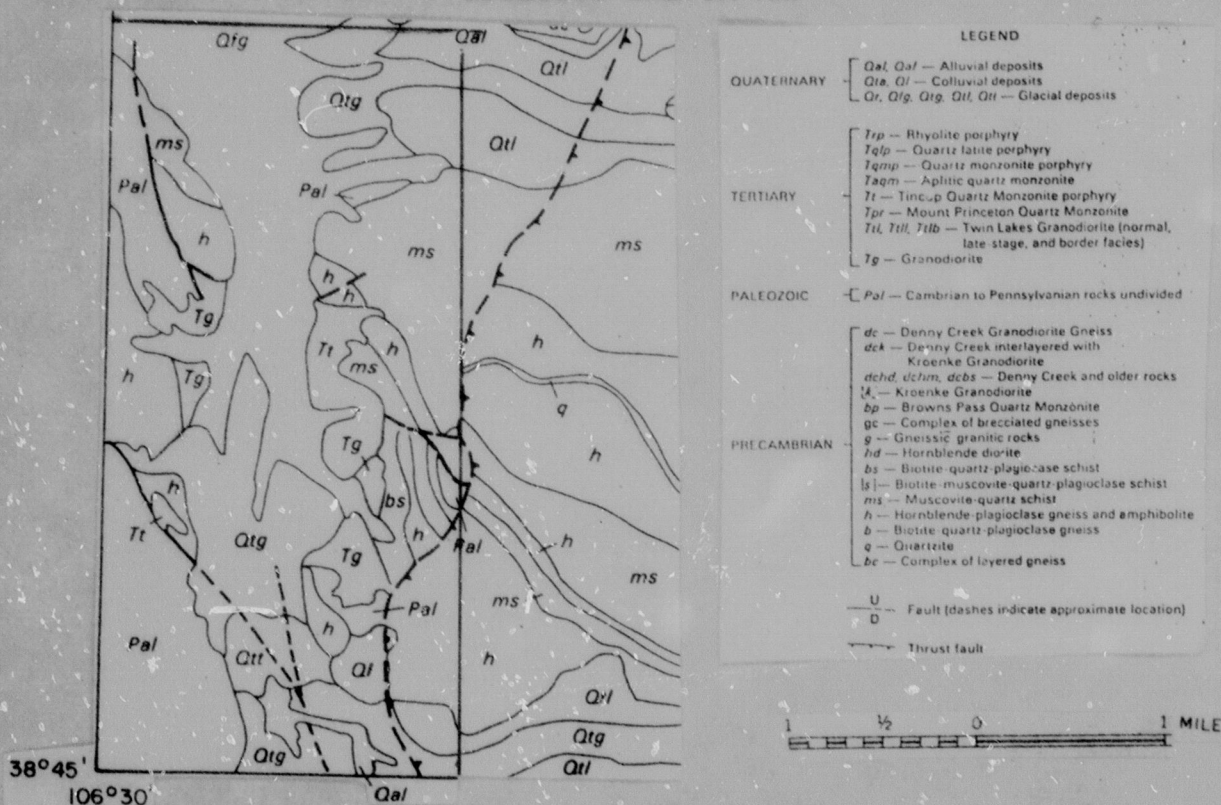
TYPE OF MINERALIZATION: Blanket replacement and vein base- and precious-metal deposits containing As, Au, Pb, Mo, W.

HOST ROCK(S): Paleozoic sedimentary rocks with most ore being found in limestones. Minor ore occurs in the adjacent Precambrian metamorphic rocks.

REFERENCE: Goddard (1935)

COMMENTS: The main portion of the Tincup district is south of the Mt. Harvard quadrangle. However numerous mines and prospects are located in the immediate area of this anomaly.

GEOLOGIC SKETCH MAP



RECOMMENDATIONS: Data merely confirm the presence of known mineral occurrences and deposits in the area. No additional work is recommended.

ANOMALY REPORT NUMBER: MHAR-14

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/04/84 DEPOSIT CLASS:

MAJOR METALS: Cu, Zn

MINOR METALS: Mn, Co, U

AREA NAME: Jones Mountain Mining area

QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 46' 08", 106° 24' 30" NE CORNER: 38° 46' 08", 106° 22' 15"

SW CORNER: 38° 45' 00", 106° 24' 30" SE CORNER: 38° 45' 00", 106° 22' 15"

LOCATION MAP:



GEOCHEMICAL FEATURES: Elevated Cu (46-112 ppm) and Zn (152-261 ppm). One sample contains anomalous Mn = 14,610 ppm. Also anomalous Co in same sample = 29 ppm. One sample contains anomalous U = 66 ppm with a U/Th ratio = 5.7. Water from same location contains 3 ppb U.

RADIOMETRIC FEATURES: Reconnaissance aerial radiometric K = -2 std (0.88%), eU = -1.5 std (0 ppm), and eTh = -1.5 std (3.4 ppm). These low concentrations appear to be related to paleozoic sedimentary rocks (limestones, dolomites, and quartzites).

OTHER GEOPHYSICAL FEATURES: The anomalous area is centered over a steep positive magnetic gradient.

STRUCTURAL FEATURES: Complex folding and faulting at Jones Mountain includes normal, reverse and thrust faulting.

ANOMALY REPORT NUMBER: MHAR-14

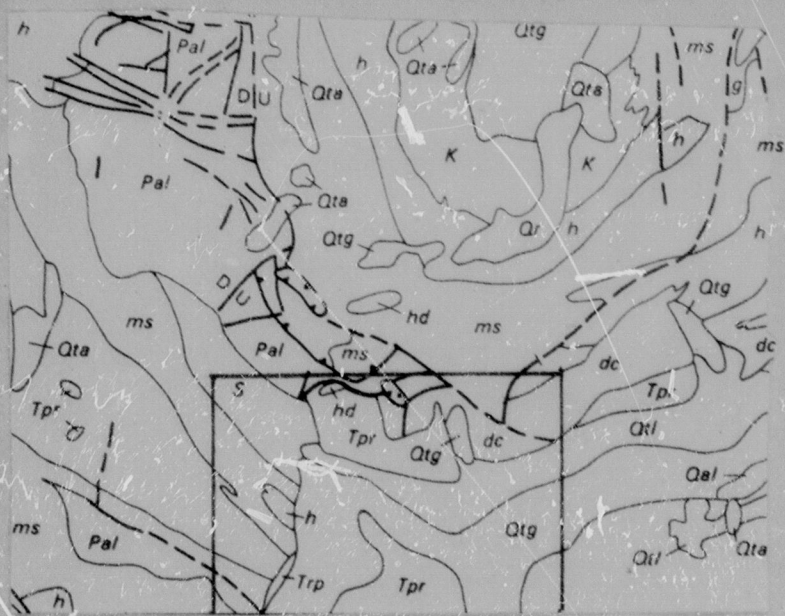
TYPE OF MINERALIZATION: Vein and blanket base-metal deposits associated with complex faulting.

HOST ROCK(S): Paleozoic limestones, dolomites, and quartzites

REFERENCES: Goodknight and Ludlam (1981)

COMMENTS:

GEOLOGIC SKETCH MAP



LEGEND

QUATERNARY	[Qal, Qaf — Alluvial deposits Qta, Qf — Colluvial deposits Qr, Qfg, Qtg, Qtl, Qtr — Glacial deposits
TERTIARY	[Trp — Rhyolite porphyry Tqlp — Quartz latic porphyry Tqmp — Quartz monzonite porphyry Taqm — Aplitic quartz monzonite Tt — Tincup Quartz Monzonite porphyry Tpr — Mount Princeton Quartz Monzonite Ttl, Ttlr, Ttlb — Twin Lakes Granodiorite (normal, late-stage, and border facies) Tg — Granodiorite
PALEOZOIC	[Pal — Cambrian to Pennsylvanian rocks undivided
PRECAMBRIAN	[dc — Denny Creek Granodiorite Gneiss dcl — Denny Creek interlayered with Kroenke Granodiorite dchd, dchm, dcbs — Denny Creek and Alder rocks K — Kroenke Granodiorite cn — Browns Pass Quartz Monzonite gc — Complex of brecciated gneisses g — Gneissic granitic rocks hd — Hornblende diorite bs — Biotite-quartz-plagioclase schist ls — Biotite-muscovite-quartz-plagioclase schist ms — Muscovite-quartz schist h — Hornblende-plagioclase gneiss and amphibulite b — Biotite-quartz-plagioclase gneiss c — Quartzite br — Complex of layered gneiss
	[— U — Fault (dashes indicate approximate location) — D — Thrust fault



RECOMMENDATIONS: No further work warranted

ANOMALY REPORT NUMBER: MHAR-15

TYPE:

AUTHOR: J. LUDLAM

DATE: 04/16/84 DEPOSIT CLASS:

MAJOR METALS: Cu, Pb, Zn

MINOR METALS:

AREA NAME: South Cottonwood district

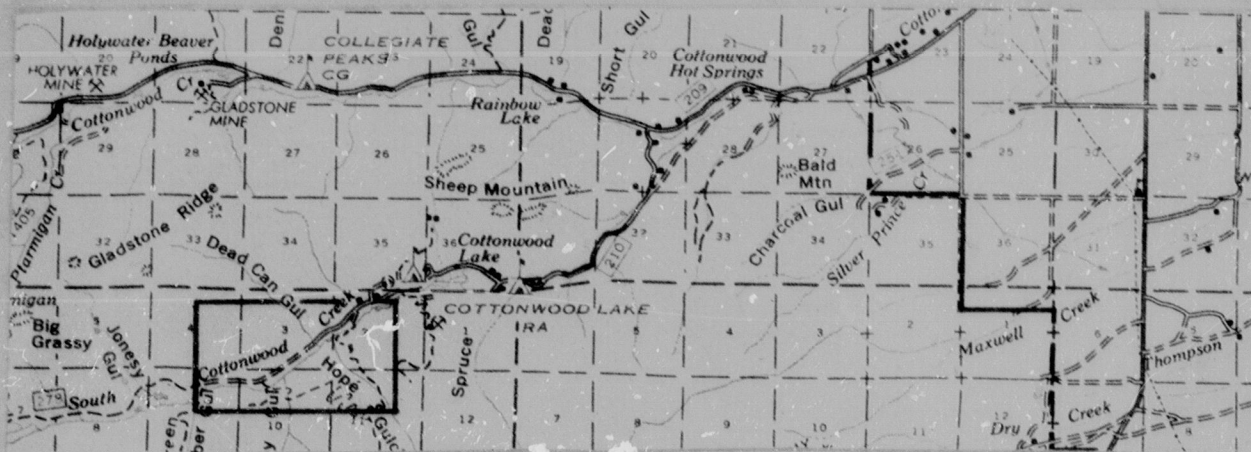
QUADRANGLE: Mt. Harvard 15 minute

AREA LOCATION (LATITUDE, LONGITUDE)

NW CORNER: 38° 46' 45", 106° 20' 15" NE CORNER: 38° 46' 45", 106° 17' 45"

SW CORNER: 38° 45' 38", 106° 20' 15" SE CORNER: 38° 45' 38", 106° 17' 45"

LOCATION MAP:



GEOCHEMICAL FEATURES: Elevated Cu (65-134 ppm), Pb (55-81 ppm), and Zn (222-276 ppm).

RADIOMETRIC FEATURES: No data within area

OTHER GEOPHYSICAL FEATURES: The anomalous area is within a closed magnetic low.

STRUCTURAL FEATURES: No major structures observed

