

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Block "P" Tailings</u>	County: <u>Cascade</u>
Legal Description: <u>T 15N R 8E</u>	Section(s): <u>SE 1/4, Sec. 16</u>
Mining District: <u>Barker/Hughesville</u>	Mine Type: <u>Mill Tailings</u>
Latitude: <u>47° 03' 20"</u>	Primary Drainage: <u>Dry Fork Belt Creek</u>
Longitude: <u>110° 38' 56"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>Galena Creek</u>
Quad: <u>Barker</u>	Date Investigated: <u>June 7, 1993</u>
Inspectors: <u>Bullock, Babits, Flammanq, Lasher, Clark / Pierson</u>	P.A. # <u>07-090</u>
Organization: <u>Pioneer Technical Services, Inc./ Thomas, Dean and Hoskins, Inc.</u>	

- The total volume of mill tailings associated with this site was estimated at 625,000 cubic yards, contained in two impoundments (upper and lower). The following elements were elevated at least three times background in previous investigations:

Arsenic: 520 to 2,140 mg/kg	Cadmium: 13.0 to 68.0 mg/kg
Copper: 254 to 688 mg/kg	Iron: 44,200 to 141,000 mg/kg
Mercury: 0.35 to 1.00 mg/kg	Lead: 4,000 to 10,600 mg/kg
- The tailings were poorly contained, and were actively eroding into Galena Creek. The tailings had a very low pH (1.81), were unvegetated, and had large erosion channels cut through them. An additional 10,000 cubic yards of tailing materials were observed in large stream side deposits downstream in Dry Fork Belt Creek.
- No waste rock or flowing adits were associated with this site.
- Surface water samples were collected during the 1993 investigation. Observed releases to surface water were documented for Arsenic in water, and mercury in sediment samples. Drinking water standards (MCL's) were exceeded for arsenic, cadmium, lead, and antimony; acute aquatic life criteria exceedances for cadmium, copper, and zinc were also documented. Upstream samples exceeded MCL's for cadmium, antimony, and lead, and acute aquatic life criteria for cadmium, copper, and zinc; the Hughesville mining district was upstream from the site and contributed to the observed upstream water quality degradation.
- Monitoring wells, sampled previously, indicated that MCL's were exceeded for cadmium, copper, nickel, and lead. These samples also documented an observed release to groundwater for cadmium, copper, iron, and lead. manganese, zinc, and nickel concentrations were very elevated in the downgradient well.
- No hazardous structures or openings were observed at the site.

Block P. Tailings PA# 07-090
 AMRB HAZARDOUS MATERIALS INVENTORY
 INVESTIGATOR: PIONEER - BULLOCK
 INVESTIGATION DATE: 06/07/93

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	Au (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-090-SE-1	396	486	9.4 J	7.7 J	8.5	182 J	51700	0.147 J	3120 J	25 J	705	5 U	1590 J	NR
07-090-SE-2	140	97.3	13.2 J	7 J	3.9	149 J	21600	0.037 J	2720 J	18 J	1070	3 U	2080 J	0.31 U
07-090-SE-3	196	123	11.1 J	7.6 J	2.8	149 J	26700	0.045 J	4030 J	23 J	1110	4 U	1970 J	0.57

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Requested

WATER MATRIX ANALYSES

Metals in Water
 Results in ug/L

FIELD ID	Au	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn (mg CaCO3/L)	HARDNESS CALC.
07-090-SW-1	9.92	40.7	2.9	5.99 U	5 U	23.5	1390	0.038 U	790	8.78 U	6.75	36.9	632	66.2
07-090-SW-2	54.5	45.4	16.3	5.99 U	5 U	121	6040	0.038 U	3890	19.1	38.7	33	3670	105
07-090-SW-3	16.8	45.2	15.5	5.99 U	5 U	100	4360	0.038 U	3640	18.8	39	33.5	3440	97.4

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Requested

Wet Chemistry
 Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-090-SW-1	72	< 5.0	23	< 0.05	NR
07-090-SW-2	190	< 5.0	106	< 0.05	0.02
07-090-SW-3	146	< 5.0	87	< 0.05	0.01

LEGEND

- SE1 - In Dry Fork Belt Creek below confluence with Chelena Creek.
- SE2 - Before confluence with Dry Fork Belt Creek in Chelena Creek, approx. 425.
- SE3 - Upgradient of Block P. Tailings below confluence with Gold Rush Creek.
- SW1 - Same as sample SE1.
- SW2 - Same as sample SE2.
- SW3 - Same as sample SE3.

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Bon Ton</u>	County: <u>Cascade</u>
Legal Description: <u>T 15N R 8E</u>	Section(s): <u>SE 1/4, SE 1/4, Sec. 1</u>
Mining District: <u>Hughesville</u>	Mine Type: <u>Hardrock/Ag, Pb, Zn</u>
Latitude: <u>N 47° 04' 58"</u>	Primary Drainage: <u>Dry Fork Belt Creek</u>
Longitude: <u>W 110° 38' 52"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>McKay Gulch</u>
Quad: <u>Barker</u>	Date Investigated: <u>June 3, 1993</u>
Inspectors: <u>Bullock, Flammang, Clark</u>	P.A. # <u>07-094</u>
Organization: <u>Pioneer Technical Services, Inc.</u>	

- The volume of material tentatively identified as tailings associated with this site was estimated to be approximately 1,200 cubic yards; however, no elements were elevated more than three times background (based on XRF analytical data). Lead and zinc were moderately elevated above background concentrations.
- The volume of waste rock associated with this site was estimated to be approximately 3,300 mg/kg. The following elements were elevated at least three times background:
Arsenic: 523J to 1,330J mg/kg Manganese: 41,100 mg/kg
Cadmium: 187 mg/kg Lead: 9,140 to 12,300 mg/kg
Iron: 109,000 mg/kg Antimony: 61.8J mg/kg
Mercury: 0.556 mg/kg Zinc: 50,900 mg/kg
- One discharging adit was identified at the site during the investigation. MCLs were exceeded for cadmium and antimony in the adit discharge. The acute aquatic life criteria for zinc was exceeded in the adit discharge. The chronic aquatic life criteria for iron, cadmium, and zinc were also exceeded. The pH measurement in the adit discharge was 6.10 and the specific conductance was 980 umhos/cm.
- The intermittent McKay Gulch was flowing directly through the site (through the waste rock dumps in places). Observed releases to McKay Gulch were documented for arsenic, cadmium, iron, manganese, lead, and zinc. The MCL for cadmium was exceeded in the downstream McKay Gulch sample. Acute and chronic aquatic life criteria for zinc were exceeded in the downstream sample; also, chronic aquatic life criteria for iron, cadmium, and lead were exceeded in the downstream sample. No MCLs or aquatic life criteria were exceeded in the upstream sample. All MCL and aquatic life criteria exceedances in McKay Gulch were directly attributable to the site.
- Stream erosion created potentially hazardous (unstable) slopes on WR-1 and WR-3.
- The remains of a wooden building on site was classified a hazardous structure.

**Bon Ton PA# 07-094
AMRB HAZARDOUS MATERIALS INVENTORY
INVESTIGATOR: PIONEER - BULLOCK
INVESTIGATION DATE: 06/03/93**

SOLID MATRIX ANALYSES

Metals in soils
Results per dry weight basis

FIELD ID	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-094-CONC	587 J	127 J	90.2	28.3	13.1 J	25.6 J	41100	0.132	156000	701	2610	98.5 J	93000	NR
07-094-SE-1	51.9 J	75.7 J	2.6	6.87	16.1 J	16.1 J	15600	0.035	959	25.1	335	5.17 UJ	945	NR
07-094-SE-2	219 J	179 J	60.3	4.23	10.3 J	40.5 J	33400	0.105	30700	166	287	25.2 J	21500	NR
07-094-WR-1	523 J	67.3 J	13.5	1.28 U	3.29 J	42.1 J	61700	0.556	11300	51.5	9140	9.24 J	3860	NR
07-094-WR-2	1330 J	36.8 J	187.0	3.27	8.98 J	39.3 J	109000	0.159	41100	175	12300	61.8 J	50900	NR
BACKGROUND	122 J	441 J	5	9.66	26.5 J	22.7 J	33300	0.071	11900	75	375	4.24 J	1570	NR

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Requested

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT		SULFUR ACID BASE POTENT		PYRITIC SULFUR		ORGANIC SULFUR		PYRITIC SULFUR ACID BASE POTENT	
	%	U/1000x	%	U/1000x	%	U/1000x	%	U/1000x	%	U/1000x	%	U/1000x
07-094-WR-1	9.4	294	143	-151	0.29	5.32	5.32	166	3.79	166	-23.1	
07-094-WR-2	23.9	747	182	-565	10.4	9.58	9.58	289	3.99	289	-117	

WATER MATRIX ANALYSES

Metals in Water
Results in ug/L

FIELD ID	As	Ba	Cd	Co	Cr	Cu	Fo	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC. (mg CaCO3/L)
	07-094-GW-1	33.9	11.5	20.1	5.99 U	5 U	4.4 J	7060	0.038 U	7920	54.9	10.2	26.6	13000 JX
07-094-SW-1	1.41	26.8	2.55 U	5.99 U	5 U	5.27 J	35.9	0.038 U	9.9	12.1	4.12	18.3 U	24.7 JX	202
07-094-SW-2	14.1	16	8.27	6.17	5 U	11.2 J	2870	0.038 U	2090	18.9	16.6	18.3 U	3340 JX	359

Wet Chemistry
Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS		CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
	07-094-GW-1	764	< 5.0	353	< 0.05	NR
07-094-SW-1	221	< 5.0	7	< 0.05	NR	NR
07-094-SW-2	427	< 5.0	161	< 0.05	NR	NR

LEGEND

CONC - Small concentrate pile Northeast of mill building
SE1 - Approx. 25' upstream from waste rock dump 3
SE2 - Downgradient of alliged tailings, approx. 10'
WR1 - Composite of subsamples WR1A and 1B
WR2 - Composite of subsamples WR2A and 2B
BACKGROUND - From the Bon Ton Mine (07-094-SS-1)

GW1 - Discharge from a collapsed acid.
SW1 - Same as sample SE1.
SW2 - Same as sample SE2.

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Broadwater</u>	County: <u>Cascade</u>
Legal Description: T <u>14N</u> R <u>8E</u>	Section(s): <u>NE 1/4, SE 1/4, Section 32</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Au, Ag, Cu, Pb, Zn</u>
Latitude: <u>N 46° 56' 03"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 43' 27"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private</u>	Secondary Drainage: <u>Belt Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>July 12, 1994</u>
Inspectors: <u>Tuesday, Bisch, West</u>	P.A. # <u>07-079</u>
Organization: <u>Pioneer Technical Services, Inc.</u>	

- No mill tailings were observed at the site.
- The volume of waste rock observed at the site was estimated to be 41,200 cubic yards. The following elements were elevated to at least three times the background concentrations:

Silver: 34.8JX to 92.8JX mg/kg	Arsenic: 174J to 224J mg/kg
Barium: 599 to 683 mg/kg	Cadmium: 25.8 to 28.7 mg/kg
Copper: 58.1 to 105 mg/kg	Mercury: 0.52J to 1.09J mg/kg
Manganese: 8,700 to 10,600 mg/kg	Nickel: 45.6 mg/kg
Lead: 4,380 to 7,420 mg/kg	Antimony: 14.3J to 23.3J mg/kg
Zinc: 5,360 to 5,710 mg/kg	
- One discharging adit was observed at the site during the investigation. The discharge flowed a short distance over a waste rock dump and eventually seeped into the dump. The MCLs for cadmium and antimony and the acute and chronic aquatic life criteria for cadmium and zinc were exceeded in the adit discharge.
- A surface water sample was collected from a flowing stream that emanated at the foot of the mine's lowermost waste rock dump. The MCL for cadmium and the acute and chronic aquatic life criteria for zinc were exceeded in the stream. Additionally, the chronic aquatic life criteria for cadmium was exceeded in the stream.
- Potential safety hazards observed at the site included an open adit with an unsecured chain-link fence placed at the entrance and two collapsing wooden loadout structures.

Broadwater PA# 07-079
AMRB HAZARDOUS MATERIALS INVENTORY
INVESTIGATOR: PIONEER - TUESDAY
INVESTIGATION DATE: 07/12/94

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	Ag (mg/Kg)	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-079-WR1	92.8 JX	224 J	599	28.7	13.4	10.8	105	28300	0.52 J	8700	14.8	7420	23.3 J	5710	NR
07-079-WR2	34.8 JX	174 J	683	25.8	27.0	38.0	58.1	42600	1.09 J	10600	45.6	4380	14.3 J	5360	NR
BACKGROUND	0.5 B	9.6	87.6	1.32 JX	9.05 J	27.2 J	10.8 J	21100	0.04	708 J	10.3	52.4 JX	4.7 UJ	135	NR

U - Not Detected, J - Estimated Quantity, X - Outline for Accuracy or Precision, NR - Not Requested

Acid/Base Accounting

FIELD ID	TOTAL SULFUR %	TOTAL SULFUR ACID BASE P1000K	NEUTRAL POTENTIAL P1000K		SULFUR ACID BASE POTENTIAL P1000K		PYRITIC SULFUR %		ORGANIC SULFUR %		PYRITIC SULFUR ACID BASE POTENTIAL P1000K	
			POTENTIAL	P1000K	POTENTIAL	P1000K	POTENTIAL	P1000K	POTENTIAL	P1000K	POTENTIAL	P1000K
07-079-WR1	0.93	29.1	11.7	-17	0.38	0.07	0.48	2.19	9.53			
07-079-WR2	0.62	19.4	30.0	10.6	0.20	0.12	0.30	3.75	26.2			

WATER MATRIX ANALYSES

Metals in Water
 Results in ug/L

FIELD ID	Ag	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC. (mg CaCO3/L)
07-079-AD1	0.12 U	1.9 B	2.8 B	20.2 J	8.7 U	4.7 U	4.6 U	99.9 B	0.08 U	3030	99.4	3.1	46.0 B	15400	489
07-079-SW1	0.12 U	1.5 B	30.5 B	14.5 J	8.7 U	4.7 U	4.6 U	128	0.08 U	48.7	13.6 B	15.5	29.4 U	4830	376

Wet Chemistry
 Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-079-AD1	690	<5	472	<0.05	NR
07-079-SW1	521	<5	322	<0.05	NR

LEGEND

WR1 - Composite of subsamples WR1A through 1G.
 WR2 - Composite of subsamples WR2A through 2C.
 BACKGROUND - From the Alpha Meter (P1-143-881).

AD1 - Discharge from leach cell on WR2.
 SW1 - Discharge of mine sludge in untreated discharge.

U - Not Detected, J - Estimated Quantity, X - Outline for Accuracy or Precision, NR - Not Requested

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Vilipa</u>	County: <u>Cascade</u>
Legal Description: T <u>14N</u> R <u>8E</u>	Section(s): <u>SW 1/4, NE 1/4, Sec. 16</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Ag, Au, Pb, Zn, Cu</u>
Latitude: <u>N 46° 58' 31"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 42' 40"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>McKay Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>July 29, 1993</u>
Inspectors: <u>Bullock, Clark/Pierson</u>	P.A. # <u>07-080</u>
Organization: <u>Pioneer Technical Services, Inc./Thomas, Dean and Hoskins, Inc.</u>	

- There were no mill tailings observed at this site during the investigation.
- The volume of waste rock associated with this site was estimated to be approximately 5,700 cubic yards. The following elements were elevated at least three times background:
Copper: 108J to 151J mg/kg Mercury: 0.397J to 0.917 mg/kg
- One minor adit discharge, two shafts with small amounts of accumulated precipitation, and one small seep at the toe of a waste rock dump were identified as groundwater features at the site during the investigation; however, none of these water sources were sampled. Instead, an additional sample was collected from McKay Creek (in the central section of the site) to assess potential impacts.
- McKay Creek flowed directly through the site (WR-4 was actively eroding into McKay Creek); surface water samples were collected upstream, near the center of the site, and downstream from the site. An observed release to McKay creek was documented for copper. No MCLs were exceeded in any of the samples. The acute aquatic life criteria exceedance for copper was directly attributable to the site. Downstream sediment samples indicated elevated concentrations (greater than three times upstream) of copper, mercury, and manganese.
- Four potentially hazardous mine openings were identified at the site including three open but partially collapsed shafts and one open adit. One of the cabins located on site was collapsing and potentially hazardous.

Vilipa PA# 07-080
 AMRB HAZARDOUS MATERIALS INVENTORY
 INVESTIGATOR: PIONEER - BULLOCK
 INVESTIGATION DATE: 07/29/93

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	Au (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-080-SE-1	8	135 J	6.9	23.4 J	24.4	283 J	19500	0.089 J	1820	14 J	242 J	8 U	650 J	NR
07-080-SE-2	14	188 J	14.6	72 J	14.5	425 J	24300	0.074 J	3840	26 J	899 J	8 U	1170 J	NR
07-080-SE-3	5 U	61.3 J	3.3	8.2 J	23.9	33.8 J	10700	0.03 J	372	12 J	100 J	6 U	315 J	NR
07-080-WR-1	14	137 J	2.1	5 J	17.6	108 J	18100	0.917 J	294	10 J	775 J	7 U	258 J	NR
07-080-WR-2	20	130 J	1.6	6 J	36.9	151 J	22000	0.397 J	217	6 J	530 J	7 U	126 J	NR
BACKGROUND	10.5	131	1.4	6.83	22.2	26.1	20600	0.048 U	607	15.6	667	3.39 UJ	548	NR

U - Not Detected, J - Estimated Quantity, X - Outline for Accuracy or Precision, NR - Not Requested

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT		SULFUR ACID BASE POTENT		ORGANIC SULFUR		PYRITIC SULFUR		PYRITIC SULFUR ACID BASE POTENT	
	%	1/1000	1/1000	%	1/1000	%	%	1/1000	%	1/1000	1/1000	1/1000
07-080-WR-1	0.88	27.5	20.6	0.18	-6.85	0.39	0.31	12.2	8.45			
07-080-WR-2	0.20	6.25	1.78	0.13	-4.47	0.01	0.06	0.31	1.46			

WATER MATRIX ANALYSES

Metals in Water
 Results in ug/L

FIELD ID	Au	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC (mg CaCO3/L)
07-080-SW-1	3.22	21.8	2.57 U	9.7 U	6.83 U	18.9	143 J	0.11	24.9	12.7 U	1.8 J	30.7 U	201	36.6
07-080-SW-2	3.51	21.3	2.57 U	9.7 U	6.83 U	20.1	139 J	0.12	23.3	12.7 U	1.5 J	30.7 U	203	34.6
07-080-SW-3	4.05	17.9	2.57 U	9.7 U	6.83 U	4.83	102 J	0.065	4.08 U	12.7 U	1 J	30.7 U	71.8	33.9

U - Not Detected, J - Estimated Quantity, X - Outline for Accuracy or Precision, NR - Not Requested

Wet Chemistry
 Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-080-SW-1	87	< 5.0	27	< 0.05	NR
07-080-SW-2	102	< 5.0	25	< 0.05	NR
07-080-SW-3	85	< 5.0	18	< 0.05	NR

LEGEND

SE1 - Downstream of site on McKay Creek
 SE2 - McKay Creek between WR-3 and WR-4
 SE3 - Upstream from site on McKay Creek
 WR1 - Composite of subsamples WR1A, 2A, 3A, 3B, and 3C.
 BACKGROUND - From the Silver Dyke Adit (07-135-SS-1).

SW1 - Same as SE-1
 SW2 - Same as SE-2
 SW3 - Same as SE-3

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Hartley</u>	County: <u>Cascade</u>
Legal Description: T <u>14N</u> R <u>8E</u>	Section(s): <u>NE 1/4, NE 1/4, Section 32</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Ag. Pb, Zn</u>
Latitude: <u>N 46° 56' 17"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 43' 41"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private</u>	Secondary Drainage: <u>Compromise Gulch</u>
Quad: <u>Neihart</u>	Date Investigated: <u>June 8, 1994</u>
Inspectors: <u>Tuesday, Belanger, Clark, West</u>	P.A. # <u>07-082</u>
Organization: <u>Pioneer Technical Services, Inc.</u>	

- The volume of tailings observed at the site was estimated to be 255 cubic yards. The following elements were elevated to at least three times the background concentrations:

Silver: 105J mg/kg	Manganese: 13,800J mg/kg
Arsenic: 133 mg/kg	Nickel: 48.9 mg/kg
Barium: 658 mg/kg	Lead: 13,900JX mg/kg
Cadmium: 28.9JX mg/kg	Antimony: 21.4J mg/kg
Copper: 118J mg/kg	Zinc: 6,650 mg/kg
Mercury: 0.32 mg/kg	

- The volume of waste rock observed at the site was estimated to be 21,860 cubic yards. The following elements were elevated to at least three times the background concentrations:

Silver: 64.1J to 69.9J mg/kg	Arsenic: 46.3 to 72.9 mg/kg
Barium: 574 mg/kg	Cadmium: 28.1JX to 34.2JX mg/kg
Copper: 64.2J to 266J mg/kg	Mercury: 1.66 mg/kg
Manganese: 3,570J to 7,970J mg/kg	Nickel: 35.7 mg/kg
Lead: 3,260JX to 6,270JX mg/kg	Zinc: 6,310 to 8,490 mg/kg

- No discharging adits, filled shafts, seeps, or springs were observed at the site during the investigation.

- Intermittent Compromise Gulch passes through the center of the site. Compromise Gulch was dry throughout most of the site during the investigation; however, water was flowing near the lower (southeast) boundary. Observed releases to Compromise Gulch (sediment) were documented for arsenic, manganese, lead, antimony, and zinc. No MCLs were exceeded in the downstream surface water sample; however, the acute and chronic aquatic life criteria for zinc and the chronic aquatic life criteria for lead were exceeded.

Hartley PA# 07-082
 AMRB HAZARDOUS MATERIALS INVENTORY
 INVESTIGATOR: PIONEER - TUESDAY
 INVESTIGATION DATE: 06/08/94

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	Ag (mg/Kg)	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-082-SE1	103 J	160	939	29.5 JX	15.5 J	16.4 J	81.0 J	46600	0.16	19800 J	47.8	7980 JX	54.2 J	5340	NR
07-082-SE2	77.7 J	28.6	971	17.4 JX	8.66 J	31.9 J	98.2 J	18600	0.07	1160 J	33.5	1010 JX	8.6 UJ	1000	NR
07-082-TP1	105 J	133	658	28.9 JX	19.6 J	21.8 J	118 J	42000	0.32	13800 J	48.9	13900 JX	21.4 J	6650	NR
07-082-WR1	69.9 J	46.3	574	34.2 JX	6.51 J	21.5 J	266 J	15700	1.66	3570 J	17.1	3260 JX	12.7 J	8490	NR
07-082-WR2	64.1 J	72.9	211	28.1 JX	15.8 J	21.6 J	64.2 J	27100	0.06	7970 J	35.7	6270 JX	12.6 J	6310	NR
BACKGROUND	0.5	9.6	87.6	1.32 JX	9.05 J	27.2 J	10.8 J	21100	0.04	708 J	10.3	52.4 JX	4.7 UJ	135	NR

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Reported

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT		SULFUR ACID BASE POTENT		PYRITIC SULFUR		ORGANIC SULFUR		PYRITIC SULFUR ACID BASE POTENT	
	%	U/1000r	%	U/1000r	%	U/1000r	%	U/1000r	%	U/1000r	%	U/1000r
07-082-TP1	0.89	27.8	21.3	-6.5	0.06	0.44	0.39	12.2	0.48	18.7	25.2	30.7
07-082-WR1	1.26	39.4	43.9	4.58	0.18	0.48	0.60	18.7	0.24	10.0		
07-082-WR2	0.64	20.0	40.7	20.7	0.08	0.24	0.32	10.0				

WATER MATRIX ANALYSES

Metals in Water
 Results in ug/L

FIELD ID	Ag	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC. (mg CaCO ₃ /L)
07-082-SW1	0.76	1.1 U	37.8	2.6 U	8.7 U	4.7 UX	4.6 U	146	0.11 U	4.4 U	8.0 U	9.7	29.4 U	494	70.7

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Reported

Wet Chemistry
 Results in mg/l

FIELD I.D.	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NOMNO ₂ -N	CYANIDE
07-082-SW1	143	<5	39	0.28	NR

LEGEND

- SE1 - Approximately 10' downgradient of WR4
- SE2 - Approximately 50' above the water table
- TP1 - Composite of subsamples TP1A, 1B, and 1C
- WR1 - Composite of subsamples WR1, 2, and 3
- WR2 - Composite of subsamples WR4 and 5
- BACKGROUND - From the Rippe Mine (07-10-081)

SW1 - Same as sample 07-082-SE1

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Molton</u>	County: <u>Cascade</u>
Legal Description: T <u>14N</u> R <u>8E</u>	Section(s): <u>SW 1/4, SE 1/4, Sec. 29</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Ag, Pb, Zn</u>
Latitude: <u>N 46° 56' 21"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 44' 07"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>Rock Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>July 29, 199</u>
Inspectors: <u>Bullock, Clark/Pierson</u>	P.A. # <u>07-084</u>
Organization: <u>Pioneer Technical Services, Inc./Thomas, Dean and Hoskins, Inc.</u>	

- There were no tailings associated with this site.
- The volume of waste rock associated with this site was estimated to be approximately 100,000 cubic yards. The following elements were elevated at least three times background:
Arsenic: 274 mg/kg
Copper: 165J mg/kg
Mercury: 0.622J mg/kg
- There were two adit discharges associated with this site. GW-1 was a sample from the discharge associated with the large adit and dump in the drainage directly upstream from the main level shaft area. This discharge had a flow of approximately 40 gpm, a pH of 7.9, and a specific conductance of 450 umhos/cm. None of the MCLs or MCLGs were exceeded in this sample. The acute aquatic life criteria for zinc and the chronic aquatic life criteria for lead and zinc were exceeded in this sample. GW-2 was a sample from the discharge associated with the caved adit on the hillside north of the main level shaft area. This discharge had a flow of approximately 15 gpm, a pH of 5.75, and a specific conductance of 930 umhos/cm. The MCL/MCLGs for cadmium, nickel, and antimony were exceeded in this sample. Acute and chronic aquatic life criteria were exceeded for cadmium, copper, lead and zinc. This discharge seeped back into the ground prior to reaching the drainage below.
- Rock Creek, a small perennial tributary to Belt Creek flowed though the site. Surface water samples did not document an observed release of any of the metals analyzed. The MCL for cadmium and aquatic life criteria for lead and zinc were exceeded both up and down stream of this site and therefore, were not directly attributable to this site. The stream sediment data did document an observed release of mercury.
- Six large transformers remained on site, possibly containing PCBs.

Molton PA# 07-084
 AMRB HAZARDOUS MATERIALS INVENTORY
 INVESTIGATOR: PIONEER - BULLOCK
 INVESTIGATION DATE: 07/29/93

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-084-SE-1	102 J	348 J	62.5 J	35.1	25.7 J	123 J	34400	2.75 JX	16200	31	4440	21 J	11400 J	NR
07-084-SE-2	149 J	292 J	23.6 J	63.5	29 J	113 J	87500	0.351 JX	20400	34	5320	9 J	4890 J	NR
07-084-WR-1	79	470 J	24	10 J	7.4	40.8 J	31200	0.144 J	16000	24 J	4230 J	8 J	5290 J	NR
07-084-WR-2	274	889 J	3.6	5.7 J	42.6	165 J	37000	0.622 J	1230	19 J	4250 J	8 J	705 J	NR
BACKGROUND	53.3	828	15.3	11.6	72.7	50.1	30600	0.051 U	10400	91.5	5110	2.99 UJ	3530	NR

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Reported

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT.		SULFUR ACID BASE POTENT.		ORGANIC SULFUR		PYRITIC SULFUR		PYRITIC ACID BASE POTENT.	
	%	U/1000x	U/1000x	U/1000x	%	U/1000x	%	U/1000x	%	U/1000x	%	U/1000x
07-084-WR-1	1.77	55.3	29.7	-25.6	0.30	0.73	0.74	0.19	0.73	23.1	6.56	10.1
07-084-WR-2	0.86	26.9	12.3	-14.5	0.60	0.19	0.07	0.19	2.19	10.1		

WATER MATRIX ANALYSES

Metals in Water
 Results in ug/L

FIELD ID	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC (mg CaCO3/L)
07-084-GW-1	2.64 J	20.3	2.83	9.7 U	6.83 U	1.55 U	199	0.13 J	1750	12.7 U	10	30.7 U	2610	204
07-084-GW-2	2.48 J	23.8	173	35.1	6.83 U	72.1	210	0.1 J	51000	231	775	43	33100	362
07-084-SW-1	2.93	22.8	34.3	9.7 U	6.83 U	11.5	582 J	0.094	5900	38.2	20.4 J	30.7 U	11000	130
07-084-SW-2	2.46	26.9	33.3	9.7 U	6.83 U	11.5	869 J	0.094	6890	33.3	21.8 J	30.7 U	11200	105

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Reported

Wet Chemistry
 Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-084-GW-1	516	< 5.0	4800	< 0.05	NR
07-084-GW-2	807	< 5.0	168	< 0.05	NR
07-084-SW-1	243	< 5.0	149	< 0.05	NR
07-084-SW-2	189	< 5.0	130	< 0.05	NR

LEGEND

- SE1 - Rock Creek downgradient, 330' below waste rock dump 3.
- SE2 - Rock Creek, approximately 100' above waste rock dump 2.
- WR1 - Composite of subsamples WR1A, 2A, and 2B.
- WR2 - Composite of subsamples WR2A, 3B, 3C, and 4A.
- BACKGROUND - From the Composite Mine (07-100-SS-1).
- GW1 - Adit at waste rock dump 2 (Adit #2).
- GW2 - Adit on North hill above shaft.
- SW1 - Same as sample SE1.
- SW2 - Same as sample SE2.

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: Queen of the Hills County: Cascade
Legal Description: T 14N R 8E Section(s): SE 1/4, SW 1/4, Section 29
Mining District: Neihart Mine Type: Hardrock/Ag. Pb, Zn
Latitude: N 46° 56' 19" Primary Drainage: Belt Creek
Longitude: W 110° 44' 25" USGS Code: 100301015
Land Status: Private Secondary Drainage: Rock Creek
Quad: Neihart Date Investigated: June 8 and 10, 1994
Inspectors: Tuesday, Belanger, Clark, West P.A. # 07-085
Organization: Pioneer Technical Services, Inc.

- No mill tailings were observed at the site. Tailings from this mill may have been disposed of at the Neihart Tailings site (07-154) located approximately 1/4 mile downstream on Belt Creek.
- The volume of waste rock observed at the site was estimated to be 54,640 cubic yards. The following elements were elevated to at least three times the background concentrations:

Silver: 21.8J to 95.8J mg/kg	Manganese: 4,410J to 32,800J mg/kg
Arsenic: 43.1 to 683 mg/kg	Nickel: 34.7 mg/kg
Barium: 545 to 753 mg/kg	Lead: 1,810JX to 13,900JX mg/kg
Cadmium: 11.4JX to 90.4JX mg/kg	Antimony: 21.8J to 40.1J mg/kg
Copper: 75.4J to 229J mg/kg	Zinc: 2,580 to 21,000 mg
Mercury: 0.26 to 0.44 mg/kg	
- One discharging adit that seeped into waste rock after flowing a short distance was observed at the site. No MCLs were exceeded in the adit discharge; however, the acute and chronic aquatic life criteria for zinc were exceeded.
- No surface water or sediment samples were collected during the investigation due to the extended distance to the nearest surface water (Rock Creek) and the lack of a direct runoff route.
- Potential safety hazards observed at the site included three open adits and several collapsing structures.

Queen of the Hills PA# 07-085
 AMRB HAZARDOUS MATERIALS INVENTORY
 INVESTIGATOR: PIONEER - TUESDAY
 INVESTIGATION DATE: 06/08 & 10/94

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	Ag (mg/Kg)	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-085-WR1	96.8 J	683	753	90.4 JX	19.4 J	5.86 J	229 J	54800	0.26	32800 J	34.7	13900 JX	40.1 J	21000	NR
07-085-WR2	48.7 J	172	570	49.6 JX	14.6 J	12.4 J	75.4 J	35700	0.33	13200 J	28.1	5700 JX	21.8 J	11500	NR
07-085-WR3	21.8 J	43.1	545	11.4 JX	11.9 J	19.9 J	27.1 J	13100	0.44	4410 J	19.5	1810 JX	6.5 J	2580	NR
BACKGROUND	0.5	9.6	87.6	1.32 JX	9.05 J	27.2 J	10.8 J	21100	0.04	708 J	10.3	52.4 JX	4.7 UJ	135	NR

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Reported

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT		SULFUR ACID BASE POTENT		ORGANIC SULFUR		PYRITIC SULFUR		PYRITIC SULFUR ACID BASE POTENT	
	%	U/1000t	%	U/1000t	%	U/1000t	%	U/1000t	%	U/1000t	%	U/1000t
07-085-WR1	3.35	105	38.5	-66	<0.01	2.00	49.0	-10.6				
07-085-WR2	1.31	40.9	36.5	-4.5	0.25	0.67	12.2	24.3				
07-085-WR3	0.17	5.31	11.1	5.80	0.11	0.05	0.31	10.8				

WATER MATRIX ANALYSES

Metals in Water
 Results in ug/L

FIELD ID	Ag	Al	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC (mg CaCO3/L)
07-085-AD1	0.44	1.1 U	42.2	2.6 U	8.7 U	4.7 UX	4.6 U	34.2	0.11 U	57.8	8.0 U	1.8	29.4 U	1120	260	

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Reported

Wet Chemistry
 Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-085-AD1	331	<5	176	0.06	NR

LEGEND

- WR1 - Composite of subsamples WR1A through 1C.
- WR2 - Composite of subsamples WR2A and 2B.
- WR3 - Composite of subsamples WR3, A, and 3.
- BACKGROUND - From the Ripple Mine (07-103-883).

AD1 - Add #2, Subrange

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Evening Star Mine/Millsite</u>	County: <u>Cascade</u>
Legal Description: <u>T 14N R 8E</u>	Section(s): <u>NW 1/4, SW 1/4, Sec. 29</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Ag, Pb, Zn</u>
Latitude: <u>N 46° 56' 39"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 44' 46"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Public</u>	Secondary Drainage: <u>Belt Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>June 2, 1993</u>
Inspectors: <u>Bullock, Flammang, Clark</u>	P.A. # <u>07-087</u>
Organization: <u>Pioneer Technical Services, Inc.</u>	

- The volume of tailings associated with this site was estimated to be approximately 1,200 cubic yards. Precipitation was observed to have collected on TP-1. The following elements were elevated at least three times background:
Barium: 4,150 mg/kg Mercury: 0.277 mg/kg
- The volume of waste rock associated with this site was estimated to be approximately 9,984 cubic yards. The following elements were elevated at least three times background:
Copper: 160 mg/kg Mercury: 0.186 to 0.301 mg/kg
- One discharging adit was observed at the site during the investigation; after flowing through WR-1, the discharge seeped into the ground. No MCLs were exceeded in the adit discharge; however, the acute and chronic aquatic life criteria for zinc were exceeded. The pH measurement in the adit discharge was 6.48. No other groundwater or surface water samples were collected during the investigation
- One potentially hazardous adit opening was identified at the site; also, nine potentially hazardous structures were identified.
- The mill building contained numerous barrels and bags of various hazardous and unknown materials; all barrels were in poor condition.

Evening Star Mill PA# 07-087
 AMRB HAZARDOUS MATERIALS INVENTORY
 INVESTIGATOR: PIONEER - BULLOCK
 INVESTIGATION DATE: 06/02/93

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-087-TP-1	104	4150	32.1	6.49	29.3	98.1	30000	0.277	11000	90.9	5860	5.47 J	7730	1.371 U
07-087-WR-1	86.3	233	26.6	13.4	10.6	180	45000	0.301	12000	87.5	14800	3.58 J	6840	NR
07-087-WR-2	34 J	640 J	7.9	17.5	35.5 J	46.3 J	34700	0.186	8150	93.4	5370	6.56 J	1910	NR
BACKGROUND	53.3	828	15	11.6	72.7	50.1	30600	0.051 U	10400	91.5	5110	2.99 UJ	3530	NR

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Requested

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT		SULFUR ACID BASE POTENT		ORGANIC SULFUR		PYRITIC SULFUR		SULFUR ACID BASE POTENT	
	%	U/1000x	%	U/1000x	%	U/1000x	%	U/1000x	%	U/1000x	%	U/1000x
07-087-TP1	1.24	38.7	28.6	-10	0.26	0.68	0.3	21.2	7.36			
07-087-WR1	2.47	77.2	34	-43	0.28	1.22	0.97	38.1	-4.14			
07-087-WR2	0.76	23.7	64.6	40.8	0.23	0.24	0.29	7.5	57.1			

WATER MATRIX ANALYSES

Metals in Water
 Results in ug/L

FIELD ID	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC (mg CaCO3/L)
07-087-GW-1	0.98 U	6.4	2.55 U	5.99 U	8.93 J	3.23 J	184	0.038 U	8560	86.8	6.64	18.3 U	606 JX	489

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Requested

Wet Chemistry
 Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-087-GW-1	613 <	5.0	215 <	0.05	NR

LEGEND

TP1 - Composite of subsamples TP2A, 1A, and 1B.
 WR1 - Composite of subsamples WR1A, 1B, and 1C.
 WR2 - Sample of the WR2 subsample.
 BACKGROUND - From the Compressair Mine (07-100-SS-1).
 [GW] - Sample from the Evening Star mill.

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Compromise</u>	County: <u>Cascade</u>
Legal Description: <u>T 14N R 8E</u>	Section(s): <u>NW 1/4, NE 1/4, Sec. 32</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Ag, Au, Pb, Zn</u>
Latitude: <u>N 46° 56' 16"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 44' 05"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>Compromise Gulch</u>
Quad: <u>Neihart</u>	Date Investigated: <u>June 1, 1993</u>
Inspectors: <u>Bullock, Flammang, Clark</u>	P.A. # <u>07-100</u>
Organization: <u>Pioneer Technical Services, Inc.</u>	

- No mill tailings were observed at this site during the investigation.
- The volume of waste rock associated with this site was estimated to be approximately 600 cubic yards. The following elements were elevated at least three times background:
Arsenic: 164 to 177 mg/kg Mercury: 0.245 to 0.516 mg/kg
- Two discharging adits and one discharging shaft were identified at the site. MCLs for cadmium and nickel were exceeded in the shaft discharge (GW-1), no MCLs were exceeded in either of the adit discharges. Acute and chronic aquatic life criteria were exceeded for zinc in the shaft discharge as well as chronic aquatic life criteria for iron, mercury, cadmium and lead. Acute and chronic aquatic life criteria were exceeded for zinc in both adit discharges (GW-2 and GW-3), and chronic aquatic life criteria were exceeded for mercury and lead in both adit discharges. Chronic aquatic life criteria were exceeded for iron and copper in the Adit #1 discharge (GW-2).
- The intermittent Compromise Gulch was flowing directly through the site. Three surface water samples were collected from Compromise Gulch during the investigation (upstream, center of site, and downstream). Downstream iron, manganese, nickel, and zinc concentrations were elevated at least three times the upstream concentrations, but were not significantly elevated in the source samples; thus not directly attributable to this site. The MCL/MCLG for nickel was exceeded in the downstream sample. Acute and chronic aquatic life criteria were exceeded for several elements in both the upstream and downstream samples, and were therefore not directly attributable to this site. An observed release to Compromise Gulch was documented for arsenic (sediment).
- One potentially hazardous mine opening (Shaft #1, fenced) was identified at the site. Potentially hazardous structures included the headframe associated with Shaft #1 and two highwalls ranging in height from 15 to 30 feet.
- A recreational cabin was identified at the south end of the site and the site was also determined to be in close proximity to the town of Neihart.

Compromise PA# 07-100
AMRB HAZARDOUS MATERIALS INVENTORY
INVESTIGATOR: PIONEER - BULLOCK
INVESTIGATION DATE: 06/01/93

SOLID MATRIX ANALYSES

Metals in soils Results per dry weight basis

FIELD ID	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Pb (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-100-SE-1	56.2	690	22.5	163	11.1	35.6	30100	0.064 U	604	772	4.18 UJ	5600	NR
07-100-SE-2	78.7	1250	10.7	9.61	11.5	38.6	24600	0.147	66.8	3690	3.19 UJ	2470	NR
07-100-SE-3	6.93	146	0.7	8.98	10.4	9.04	23600	0.059 U	15.6	31.7	2.74 UJ	189	NR
07-100-WR-1	164	323	19.4	16.5	8.64	90.7	43600	0.516	89.8	6680	3.59 UJ	3810	NR
07-100-WR-4	177	311	29.9	20.7	9.29	65.4	43500	0.245	63.5	3160	3.38 UJ	7520	NR
BACKGROUND	53.3	828	15.3	11.6	72.7	50.1	30600	0.051 U	91.5	5110	2.99 UJ	3530	NR

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Requested

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL ACID BASE POTENT.		SULFATE SULFUR		PYRITIC SULFUR		ORGANIC SULFUR		PYRITIC SULFUR		SULFUR ACID BASE POTENT.	
	%	v10000	%	v10000	%	v10000	%	v10000	%	v10000	%	v10000	%	v10000
07-100-WR1	1.12	35	41.4	6.38	0.21	0.48	0.43	15	26.4					

WATER MATRIX ANALYSES

Metals in Water Results in ug/L

FIELD ID	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn (mg CaCO3/L)	HARDNESS CALC.
07-100-GW-1	7.61	7.73	10.2 J	80.7	12.6	25.1	16600 J	0.200	45200 JX	447	34 J	18.3 U	8780	490
07-100-GW-2	3.72	74.3	2.55 U	5.99 U	5 U	10.6	1380 J	0.210	140 JX	47.8	11.2 J	18.3 U	164	81.1
07-100-GW-3	3.48	22.2	2.55 U	5.99 U	5 U	5.77	199 J	0.100	60.4 JX	8.78 U	4.21 J	18.3 U	165	50.5
07-100-SW-1	6.17	11	2.55 U	10.9	5 U	15	12500 J	0.160	7450 JX	106	123 J	18.3 U	3660	262
07-100-SW-2	2.98	43.2	2.55 U	5.99 U	5 U	13.1	152 J	0.170	71.8 JX	8.78 U	9.77 J	18.3 U	454	57.7
07-100-SW-3	4.53	171	2.55 U	5.99 U	5 U	14.1	760 J	0.230	358 JX	9.57	126 J	18.3 U	310	56.7

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Requested

Wet Chemistry Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NORNO2-N	CYANIDE
07-100-GW-1	845	< 5.0	506	0.08	NR
07-100-GW-2	124	< 5.0	26	< 0.05	NR
07-100-GW-3	79	< 5.0	15	0.05	NR
07-100-SW-1	394	< 5.0	246	< 0.05	NR
07-100-SW-2	80	< 5.0	22	< 0.05	NR
07-100-SW-3	74	< 5.0	21	< 0.05	NR

LEGEND

- SE1 - Below small footbridge in bend in road to cabin, approx. 200' South of cabin.
- SE2 - Below confluence of edit #2 with Compromise Dutch stream.
- SE3 - Upgradient, approx. 200' above waste rock dump 5.
- WR1 - Composite of subsamples WR1A, 1B, and 1C.
- WR4 - Composite of subsamples WR4A, 4B, 4C, 5A, 5B, 5c, 6A, 6B, and 6C.
- BACKGROUND - 200' Northeast from edit #3; from the Compromise Mine (07-100-SS-1).
- GW1 - From shaft #1 - boiler grab from 10' below SW1.
- GW2 - Collapsed edit #1 - seep.
- GW3 - Collapsed edit #2 - seep.
- SW1 - Same as sample SE1.
- SW2 - Same as sample SE2.
- SW3 - Same as sample SE3.

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Carpenter Creek Tailings</u>	County: <u>Cascade</u>
Legal Description: T <u>14N</u> R <u>8E</u>	Section(s): <u>SE 1/4, SW 1/4, Sec. 16; NE 1/4, NW 1/4, Sec. 21</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Mill Tailings</u>
Latitude: <u>N 46° 58' 00"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 43' 01"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Pubic</u>	Secondary Drainage: <u>Carpenter Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>May 24 and 25, 1993</u>
Inspectors: <u>Tuesday, Babits, Clark, Belanger, Flammang, Lasher/Pierson</u>	P.A. # <u>07-103</u>
Organization: <u>Pioneer Technical Services, Inc./Thomas, Dean and Hoskins, Inc.</u>	

- The total volume of mill tailings associated with this site was estimated at 111,000 cubic yards, contained in two impoundments (upper and lower). The following elements were elevated at least three times background:

Arsenic: 34.5 to 139 mg/kg	Barium: 663 to 2,820 mg/kg
Cadmium: 12.4 to 34.2 mg/kg	Cobalt: 21.5 mg/kg
Copper: 1,950 to 3,740 mg/kg	Manganese: 2,100 to 6,870 mg/kg
Lead: 3,750 to 18,500 mg/kg	Zinc: 1,790 to 2,990 mg/kg
- The tailings were poorly contained, and were actively eroding into Carpenter Creek from surface runoff and bank undercutting, and were only 25% vegetated. Tailings materials were observed washing into Carpenter Creek during a storm event.
- No waste rock or flowing adits were associated with this site.
- An observed release to surface water for arsenic, barium, and lead was documented with sediment samples. No exceedences of drinking water standards were documented. Aquatic life criteria exceedences for cadmium, copper, lead, and zinc (acute) and mercury, cadmium, copper, lead, and zinc (chronic) were documented at this site.
- A spring was located in the northeast corner of the lower pond and ponded up by the road. This water eventually crossed the lower tailings and discharged to Carpenter Creek.
- No hazardous structures or openings existed at the site, though several old cabins at the site were unsafe.

**Carpenter Creek Tailings PA# 07-103
AMRB HAZARDOUS MATERIALS INVENTORY
INVESTIGATOR: PIONEER-TUESDAY
INVESTIGATION DATE: 6/24/83**

SOLID MATRIX ANALYSES

Metals in soils Results per dry weight basis

FIELD ID	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Min (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-103-LT-1	61.4	927	24.1	11	14.9 J	3450	42600	0.095 J	4720	31.9	7870	4.21 UJ	2370	1.16 U
07-103-LT-2	25.1	2820	30.6	5.49	9.22 J	2740	28600	0.071 J	3950	24.9	4940	3.59 UJ	2150	1.072 U
07-103-SE-1	73	1100	20.3	12.2	13.7 J	3440	43900	0.071 J	4090	30.7	9540	3.99 UJ	1790	NR
07-103-SE-3	139	905	34.2	21.5	11.5 J	3740	49500	0.062 J	4360	36.8	18500	4.06 UJ	1960	NR
07-103-SE-4	46.6	737	25.0	10.2	15.2 J	2670	38000	0.106 J	5030	34.7	6840	3.88 UJ	2090	NR
07-103-SE-5	34.5	168	12.4	8.72	9.27 J	2910	28000	0.045 J	2100	16.7	5100	3.33 UJ	1090	NR
07-103-UT-1	69.8	663	28.0	11.3	19.2	2850	47500	0.015 U	6830	45.8	4620	5.27 J	2990	1.194 U
07-103-UT-2	36.6	1200	21.3	9.93	16.1	1950	40700	0.019 U	6870	45.4	3750	5.24 J	2050	1.231 U
BACKGROUND	10.5	131	1.4	6.83	22.2	26.1	20600	0.048 U	607	15.6	667	3.39 UJ	548	NR

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT		SULFUR ACID BASE POTENT		PYRITIC SULFUR		ORGANIC SULFUR		PYRITIC SULFUR ACID BASE		SULFUR ACID BASE POTENT	
	%	1/10000	%	1/10000	%	1/10000	%	1/10000	%	1/10000	%	1/10000	%	1/10000
07-103-LT-1	1.21	37.8	25.1	-13	0.5	0.61	15.9	9.16						
07-103-LT-2	0.5	15.6	16.1	0.43	0.15	4.69	11.4							
07-103-UT1	0.42	13.1	23.4	10.3	0.05	1.56	21.9							
07-103-UT2	0.57	17.8	21.2	3.40	0.13	4.06	17.1							

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Reported

WATER MATRIX ANALYSES

Metals in Water Results in ug/L

FIELD ID	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Min	Ni	Pb	Sb	Zn (mg CaCO3/L)
07-103-SW-1	2.6	18.6	4.13	5.99 U	8.53 J	62.9 J	174	0.064 J	243	8.78 U	42	18.3 U	560
07-103-SW-3	2.17	18.3	4.5	5.99 U	5.1 J	62.2 J	228	0.15 J	249	8.78 U	45.8	18.3 U	549
07-103-SW-4	2.58	14.9	4.4	5.99 U	5 U	54.9 J	127	0.068 J	244	8.78 U	24.8	18.3 U	539
07-103-SW-5	2.81	15.8	3.37	5.99 U	6.67 J	56.2 J	148	0.083 J	252	9.57	30.4	18.3 U	528

Wet Chemistry Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-103-SW-1	83	< 5.0	14	< 0.05	NR
07-103-SW-3	85	< 5.0	17	< 0.05	NR
07-103-SW-4	74	< 5.0	14	< 0.05	NR
07-103-SW-5	74	< 5.0	10	< 0.05	NR

LEGEND

- LT1 - Composite of subsamples LT-1A, -2A, -3A, and -4A
- LT2 - Composite of subsamples LT-1D, -2D, -3C, and -4B
- SE1 - Just above confluence of Carpenter Creek with Snow Creek approximately 730 feet from SE1
- SE3 - At PPE of lower tailings pond in Carpenter Creek
- SE4 - At PPE of upper tailings pond in Carpenter Creek
- SE5 - Upgradient of upper tailings pond in Carpenter Creek
- UT1 - Composite of subsamples UT1B, 1A, and 3B
- UT2 - Composite of subsamples UT1D, 1C, and 3C
- BACKGROUND - From Silver Dyke Adit (07-135-SS-1)

- SW1 - Above Snow Creek confluence in Carpenter Creek
- SW3 - Same as sample SE3
- SW4 - Same as sample SE4
- SW5 - Same as sample SE5

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Reported

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Rochester</u>	County: <u>Cascade</u>
Legal Description: <u>T 14N R 8E</u>	Section(s): <u>SE 1/4, SE 1/4, Sec. 29</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Au, Ag, Zn, Pb</u>
Latitude: <u>N 46° 56' 24"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 43' 46"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>Rock Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>June 2, 1993</u>
Inspectors: <u>Tuesday, Belanger, Lasher</u>	P.A. # <u>07-110</u>
Organization: <u>Pioneer Technical Services, Inc.</u>	

- No mill tailings were associated with this site.
- The volume of waste rock associated with this site was estimated to be 3,280 cubic yards. The following elements were elevated at least three times background:

Arsenic: 193J mg/kg	Barium: 744J to 1,110J mg/kg
Cadmium: 7.3 to 136 mg/kg	Chromium: 37.9J mg/kg
Copper: 47.4J to 205J mg/kg	Iron: 38,800 to 40,900 mg/kg
Mercury: 0.65 mg/kg	Nickel: 76.5 to 160 mg/kg
Lead: 3,580 to 10,700 mg/kg	Antimony: 51.4J mg/kg
Zinc: 2,060 to 29,700 mg/kg	
- The waste rock dumps had only sparse vegetated.
- Rock Creek was flowing adjacent to WR-6 and undercutting the waste dump and formed an unstable highwall. No samples of Rock Creek were collected. The pH and specific conductance ranged from 5.77, and 330 umhos/cm upstream to 5.94 and, 420 umhos/cm downstream.
- No observed releases, exceedances of drinking water standards or aquatic life criteria were documented at this site.
- No discharging adits, springs or seeps were observed.
- Four hazardous openings existed at the site: partially caved shafts with steep sides.

Rochester PA# 07-110
 AMRB HAZARDOUS MATERIALS INVENTORY
 INVESTIGATOR: PIONEER - TUESDAY
 INVESTIGATION DATE: 06/02/93

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-110-WR-5	193 J	1110 J	136.0	14.7	37.9 J	206 J	38800	0.65	27700	160	10700	51.4 J	29700	NR
07-110-WR-6	32.5 J	744 J	7.3	15.1	14.3 J	47.4 J	40900	0.354	13100	76.5	3580	4.11 J	2060	NR
BACKGROUND	19 J	110	0.4 UJ	7.4	10.4	11	12000	0.142	320	10 J	138	3 UJ	115	NR

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Reported

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT		SULFUR ACID BASE		SULFATE		PYRITIC SULFUR		ORGANIC SULFUR		PYRITIC SULFUR		SULFUR ACID BASE	
	%	U/1000K	%	U/1000K	%	U/1000K	%	U/1000K	%	U/1000K	%	U/1000K	%	U/1000K	%	U/1000K
07-110-WR5	1.32	41.2	1.41	39.4	0.03	99.8	0.47	126	14.7	0.82	126	14.7	0.29	7.19	0.29	32.3
07-110-WR6	0.74	23.1	39.4	16.3	0.22	16.3	0.23	32.3	7.19	0.29	32.3	7.19	0.29	32.3	0.29	32.3

LEGEND

WR5 - Composite of subsamples WR5A, 5B, 5C, and 5D
 WR6 - Composite of subsamples WR6A, 6B, and 6C
 BACKGROUND - From the Masud S. Mine (07-129-SS-1)

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Silver Belt</u>	County: <u>Cascade</u>
Legal Description: <u>T 14 N R 8 E</u>	Section(s): <u>NW 1/4, SW 1/4, Sec. 28</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Ag, Pb, Zn, Au</u>
Latitude: <u>N 46° 56' 39"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 43' 15"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>Rock Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>July 30, 1993</u>
Inspectors: <u>Babits, Flammang/Pierson</u>	P.A. # <u>07-111</u>
Organization: <u>Pioneer Technical Services, Inc./Thomas, Dean and Hoskins, Inc.</u>	

- There were no tailings at this site.
- The volume of uncovered waste rock on site was estimated to be approximately 9,005 cubic yards. The following were elevated at least three times background:

Arsenic: 500 to 581 mg/kg	Cadmium: 35.3 J to 83.8J mg/kg
Copper: 116J to 135J mg/kg	Iron: 57,900 to 59,300 mg/kg
Mercury: 0.645JX mg/kg	Manganese: 2,620 to 3,080 mg/kg
Lead: 4,180 to 5,350 mg/kg	Antimony 24J to 28J mg/kg
Zinc: 9,500J to 18,300J mg/kg	
- One adit discharge was identified at the site; the pH measurement was 6.63. The MCL for cadmium and the acute and chronic aquatic life criteria for cadmium, copper, lead, and zinc were exceeded in the adit discharge. Also, the chronic aquatic life criteria for iron and mercury were exceeded in the adit discharge.
- Rock Creek flowed through waste rock located on site. Observed releases to Rock Creek were documented for cadmium, copper, mercury, manganese, and zinc. The MCL for cadmium and acute and chronic aquatic life criteria for cadmium and copper were exceeded in the downstream sample; these exceedances were directly attributable to the site.

Silver Belt PA# 07-111
AMRB HAZARDOUS MATERIALS INVENTORY
INVESTIGATOR: PIONEER - BABITS
INVESTIGATION DATE: 07/30/93

SOLID MATRIX ANALYSES

Metals in soils
Results per dry weight basis

FIELD ID	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-111-SE-1	144 J	114 J	53.2 J	19.3	7.6 J	187 J	31900	0.143 JX	13200	27	2810	13 J	8060 J	NR
07-111-SE-2	28 J	258 J	10.4 J	13.3	29.8 J	50.9 J	28200	0.104 JX	1010	26	225	17 U	1650 J	NR
07-111-WR-1	581 J	105 J	35.3 J	13.1	29.8 J	116 J	59300	0.39 JX	3080	29	4180	24 J	9500 J	NR
07-111-WR-2	500 J	85.6 J	83.8 J	6	5.1 J	135 J	57900	0.645 JX	2620	5	5350	28 J	18300 J	NR
BACKGROUND	19 J	110	0.4 UJ	7.4	10.4	11	12000	0.142	320	10 J	138	3 UJ	115	NR

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Reported

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT		SULFUR ACID BASE POTENT		SULFATE		PYRITIC		ORGANIC		PYRITIC		SULFUR ACID BASE POTENT	
	%	1/1000x	%	1/1000x	%	1/1000x	%	1/1000x	%	1/1000x	%	1/1000x	%	1/1000x	%	1/1000x
07-111-WR-1	1.56	48.7	5.19	2.45	0.89	-43.5	0.21	0.46	0.21	0.21	0.21	0.46	0.21	0.21	0.21	-1.37
07-111-WR-2	0.55	17.2	2.45	-14.7	0.27	-14.7	0.02	0.26	0.02	0.02	0.26	0.62	0.62	0.62	0.62	1.83

WATER MATRIX ANALYSES

Metals in Water
Results in ug/L

FIELD ID	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC. (mg CaCO3/L)
07-111-GW-1	4.99 J	3.87	37.9	19.7	6.83 U	28.2	1520	0.11 J	14100	48.6	231	30.7 U	8930	68
07-111-SW-1	2.1 J	19.8	13	9.7 U	6.83 U	10.1	22.7	0.14 J	462	12.7 U	3.93	30.7 U	3800	52.5
07-111-SW-2	2.76 J	34.1	2.57 U	9.7 U	6.83 U	1.55 U	32.8	0.038 U	11.4	12.7 U	1.54	30.7 U	86.8	34

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Reported

Wet Chemistry
Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-111-GW-1	176	< 5.0	109	0.05	NR
07-111-SW-1	97	< 5.0	46	< 0.05	NR
07-111-SW-2	76	< 5.0	6	< 0.05	NR

LEGEND

- SE1 - 100 feet below waste rock dump 2 on Rock Creek
- SE2 - Across from cabins above waste rock dump 2
- WR1 - Composite of subsamples WR1A, 1B, 1C, and 1D
- WR2 - Composite of subsamples WR2A and 2B
- BACKGROUND - From Manud S Mine (07-129-SS-1)
- SW1 - Same as SE1
- SW2 - Same as SE2

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Fairplay</u>	County: <u>Cascade</u>
Legal Description: <u>T 14N R 8E</u>	Section(s): <u>SW 1/4, NW 1/4, Sec. 28</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Ag, Pb, Zn, Au</u>
Latitude: <u>N 46° 56' 44"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 43' 10"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>Rock Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>July 30, 1993</u>
Inspectors: <u>Babits, Flammang/Pierson</u>	P.A. # <u>07-112</u>
Organization: <u>Pioneer Technical Services, Inc./Thomas, Dean and Hoskins, Inc.</u>	

- There were no tailings at this site.
- An estimated 2,010 cubic yards of uncovered waste rock were located at this site. The following elements were elevated at least three times background:

Arsenic: 257J mg/kg	Cadmium: 22.9J mg/kg
Copper: 287J mg/kg	Iron: 40,500 mg/kg
Mercury: 1.02JX mg/kg	Manganese: 1,140 mg/kg
Lead: 18,400 mg/kg	Antimony: 20J mg/kg
Zinc: 6,260 mg/kg	
- One discharging adit was identified at the site; the pH measurement was 6.09. The MCL for cadmium and the acute and chronic aquatic life criteria for cadmium, copper, lead, and zinc were exceeded in the adit discharge. Additionally, the chronic aquatic life criteria for iron was exceeded in the adit discharge.
- Waste rock was located approximately 40 feet from an unnamed tributary to Rock Creek. No MCL/MCLG or acute or chronic aquatic life criteria exceedances were attributed to the site.
- An observed release to the unnamed tributary to Rock Creek (sediment) was documented for mercury.
- There were no hazardous openings or structures identified at the site.

**Fairplay PA# 07-112
AMRB HAZARDOUS MATERIALS INVENTORY
INVESTIGATOR: PIONEER - BABBITTS
INVESTIGATION DATE: 07/30/93**

SOLID MATRIX ANALYSES

Metals in soils
Results per dry weight basis

FIELD ID	Au (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-112-SE-1	21 J	230 J	3.5 J	22.6	48.9 J	36.6 J	43600	0.026 JX	2680	26	455	7 U	763 J	NR
07-111-SE-2	28 J	258 J	10.4 J	13.3	29.8 J	50.9 J	28200	0.104 JX	1010	26	225	17 U	1650 J	NR
07-112-WR-1	257 J	44.2 J	22.9 J	3.5	2.5 J	287 J	40500	1.02 JX	1140	4	18400	20 J	6260 J	NR
BACKGROUND	19 J	110	0.4 UJ	7.4	10.4	11	12000	0.142	320	10 J	136	3 UJ	115	NR

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Requested

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT.		SULFUR POTENT.		PYRITIC SULFUR		ORGANIC SULFUR		PYRITIC SULFUR		SULFUR ACID BASE POTENT.	
	%	U/1000x	U/1000x	U/1000x	%	U/1000x								
07-112-WR-1	2.48	77.5	47.4	-30.1	0.44	0.98	1.06	30.6	16.8					

WATER MATRIX ANALYSES

Metals in Water
Results in ug/L

FIELD ID	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC. (mg CaCO3/L)
	07-112-GW-1	15.2 J	9.7	22.9	11.5	6.83 U	58.9	8010	0.038 U	2280	12.7 U	92.7	30.7 U	5350
07-112-SW-1	1.89 J	33.7	2.57 U	9.7 U	6.83 U	1.55 U	37.8	0.066 J	7.9	12.7 U	0.88	30.7 U	20.5	33.9
07-112-SW-2	2.61 J	2.01 U	2.57 U	9.7 U	6.83 U	1.55 U	11.8 U	0.1 J	4.08 U	12.7 U	0.72 UJ	30.7 U	7.57 U	0.1
07-111-SW-2	2.76 J	34.1	2.57 U	9.7 U	6.83 U	1.55 U	32.8	0.038 U	11.4	12.7 U	1.54	30.7 U	86.8	34

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Requested

Wet Chemistry
Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-112-GW-1	158	< 5.0	88	< 0.05	NR
07-112-SW-1	67	< 5.0	5	< 0.05	NR
07-112-SW-2	NR	NR	NR	NR	NR
07-111-SW-2	76	< 5.0	6	< 0.05	NR

LEGEND

07-111-SE2 - Downgradient sample (From Silver Belt)
SE1 - Across from dump where stream first appears
WR1 - A composite of subsamples WR1A and B (2/3 A and 1/3 B)
BACKGROUND - From Maxud S. Mine (07-129-SS-1)
GW1 - Acid discharge from acid #1.
07-111-SW2 - Same as 07-111-SE2 sample
SW1 - Same as SE1.
SW2 - QA Blank.

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Stallabrass</u>	County: <u>Cascade</u>
Legal Description: <u>T 13N R 8E</u>	Section(s): <u>SW 1/4, NW 1/4, Sec. 4</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Au (no significant production)</u>
Latitude: <u>N 46° 55' 11"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 43' 24"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>Belt Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>July 30, 1993</u>
Inspectors: <u>Bullock, Clark/Pierson</u>	P.A. # <u>07-120</u>
Organization: <u>Pioneer Technical Services, Inc./Thomas, Dean and Hoskins, Inc.</u>	

- Neihart tailings were hauled to this site during highway construction in the late 1970's for driveway cover. The material was not used and was presently stock piled adjacent to the MDT Maintenance facility. The volume of mill tailings was estimated to be 50 cubic yards. The following elements were elevated at least three times background:

Arsenic: 181J mg/kg	Manganese: 7,960 mg/kg
Barium: 3,000J mg/kg	Lead: 7,320 mg/kg
Cadmium: 17.9J mg/kg	Antimony: 14J mg/kg
Copper: 157J mg/kg	Zinc: 4,570J mg/kg

- The volume of waste rock associated with this site was estimated to be 5,458 cubic yards. The following elements were elevated at least three time background:

Arsenic: 165J mg/kg	Mercury: 3.54JX mg/kg
Barium: 2,880J mg/kg	Lead: 1,800 mg/kg
Cadmium: 2.4J mg/kg	Antimony: 27J mg/kg
Copper: 76.1J mg/kg	Zinc: 673J mg/kg
Iron: 36,700 mg/kg	

- There were no discharging mine openings, seeps or springs identified at this site.

- No domestic groundwater wells were present on this site. The residents on this site used water directly from Belt Creek instead of groundwater.

- There were no direct runoff pathways between this site and Belt Creek, located approximately 150 yards from the base of the lower waste rock dump.

- There were 3 adits identified at this site, all classified as hazardous mine openings.

Stallabrass Pa# 07-120
AMRB HAZARDOUS MATERIALS INVENTORY
INVESTIGATOR: PIONEER - BULLOCK
INVESTIGATION DATE: 07/30/93

SOLID MATRIX ANALYSES

Metals in soils
Results per dry weight basis

FIELD ID	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-120-TP-1	181 J	3000 J	17.9 J	2.3 U	9.3 J	157 J	30900	0.116 JX	7960	12	7320	14 J	4570 J	NR
07-120-WR-1	165 J	2880 J	2.4 J	5.9	11.5 J	76.1 J	36700	3.54 JX	549	21	1800	27 J	673 J	NR
BACKGROUND	19 J	110	0.4 UJ	7.4	10.4	11	12000	0.142	320	10 J	138	3 UJ	115	NR

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Requested

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT		SULFUR ACID BASE POTENT		SULFATE		PYRITIC		ORGANIC		PYRITIC		SULFUR ACID BASE POTENT	
	%	1/1000x	%	1/1000x	%	1/1000x	%	1/1000x	%	1/1000x	%	1/1000x	%	1/1000x	%	1/1000x
07-120-TP-1	0.74	23.1	10.1	-13.0	<0.01	0.39	0.38	12.2	-2.05							
07-120-TP-1DUP	0.72	22.5	10.9	-11.6	<0.01	0.36	0.37	11.9	-0.98							
07-120-WR-1	0.72	22.5	14.5	-8.02	0.35	0.08	0.29	2.50	12.0							

LEGEND

TP1 - Pile of Nelhart Tailings at MDT maintenance facility
 WR1 - Composite from unvegetated areas on dump.
 BACKGROUND - From the Maud S. Mine (07-129-SS-1)
 TP1DUP - Duplicate of the 07-120-TP-1 sample.

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Dacotah</u>	County: <u>Cascade</u>
Legal Description: <u>T 14N R 8E</u>	Section(s): <u>NW 1/4, SW 1/4, Sec. 28</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Ag, Pb, Zn</u>
Latitude: <u>N 46° 56' 45"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 43' 24"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>Rock Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>June 8, 1993</u>
Inspectors: <u>Bullock, Babits, Flammang, Lasher, Clark/Pierson</u>	P.A. # <u>07-121</u>
Organization: <u>Pioneer Technical Services, Inc.</u>	

- There were no tailings on site.
- There were approximately 10,015 cubic yards of uncovered waste rock on site. The following were elevated at least three times background:

Arsenic: 83 to 255J mg/kg	Cadmium: 9.3J to 40.1 mg/kg
Copper: 66.2J to 129 mg/kg	Iron: 36,300 to 67,500 mg/kg
Mercury: 0.793J mg/kg	Manganese: 2,550 to 12,800J mg/kg
Nickel: 84J mg/kg	Lead: 1,780 to 21,800 mg/kg
Antimony: 26J mg/kg	Zinc: 3,110J to 10,200 mg/kg
- There was one discharging adit on site which entered Belt Creek. A sample of the discharge revealed a pH of 2.38. MCLs for cadmium, nickel, and antimony and acute and chronic aquatic life criteria were exceeded for cadmium and zinc in the adit discharge. Additionally, chronic aquatic life criteria were exceeded for iron, mercury copper, lead, and nickel.
- The Belt Creek flowed immediately adjacent to the site. Observed releases to Belt Creek were documented for cadmium, copper, iron, manganese, nickel, lead, and zinc. The MCL for nickle was exceeded in the downstream sample, which was directly attributable to the site. Additionally, chronic aquatic life criteria were exceeded for iron and copper in the downstream sample, again attributable to the site.
- There was one open adit, numerous hazardous structures, and highwalls on site.

Dacotah PA# 07-121
AMRB HAZARDOUS MATERIALS INVENTORY
INVESTIGATOR: PIONEER - BABITS
INVESTIGATION DATE: 06/08/93

SOLID MATRIX ANALYSES

Metals in soils
Results per dry weight basis

FIELD ID	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-121-SE-1	38	98.9	63.2 J	13.6 J	33.4	54.1 J	9170	0.178 J	7920 J	92 J	398	14 U	11300 J	NR
07-121-SE-2	126	133	3 J	6.1 J	12.1	26.6 J	65200	0.063 J	1000 J	12 J	1710	4 U	1270 J	NR
07-121-WR-1	105	56.1	14.9 J	17.8 J	7.5	78.8 J	36300	0.105 J	12800 J	84 J	1780	4 U	4650 J	NR
07-121-WR-5	83	144	9.3 J	2 J	10.3	66.2 J	67500	0.793 J	379 J	4 J	7510	4 U	3110 J	NR
07-121-WR-6	255 J	205	40.1	5.6	5.3	129	40000	0.416	2550	20 J	21800	26 J	10200	NR
BACKGROUND	19 J	110	0.4 UJ	7.4	10.4	11	12000	0.142	320	10 J	138	3 UJ	115	NR

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Reported

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT.		ACID BASE POTENT.		SULFATE		PYRITIC		ORGANIC		PYRITIC		SULFUR	
	%	V/1000x	%	V/1000x	%	V/1000x	%	V/1000x	%	V/1000x	%	V/1000x	%	V/1000x	%	V/1000x
07-121-WR-1	3.25	102	37.8	-64	1.13	0.56	1.56	17.5	20.3	0.56	0.03	0.47	0.94	5.34	0.94	5.34
07-121-WR-5	2.37	74	6.28	-68	1.87	0.29	0.8	9.06	-1.36	0.29	0.8	9.06	-1.36	0.8	9.06	-1.36
07-121-WR-6DUP	1.65	51.5	7.7	-44	0.56	0.27	0.82	8.43	-0.88	0.27	0.82	8.43	-0.88	0.82	8.43	-0.88
07-121-WR-6	1.63	50.9	7.56	-43	0.54											

WATER MATRIX ANALYSES

Metals in Water
Results in ug/L

FIELD ID	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC (mg CaCO3/L)
07-121-GW-1	5.13	2.24 U	420	196	21.2	90.1	52600	0.047	152000	951	216	220	172000	785
07-121-SW-1	1.61 U	17.7	10.7	5.99 U	6.67	5.07	95.9	0.078	231	12.6	2.52	21.8	3060	51.9
07-121-SW-2	1.96	15	65.9	14	5.33	21.4	1580	0.11	16400	124	48	43.9	22600	141

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Reported

Wet Chemistry
Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-121-GW-1	2330	< 5.0	1400	< 0.05	NR
07-121-SW-1	96	< 5.0	53	< 0.05	NR
07-121-SW-2	340	< 5.0	170	0.06	NR

LEGEND

- SE1 - Upland of Decotah, downgradient of Fairplay.
- SE2 - Sample of Rock Creek at base of waste rock dump 1.
- WR1 - Composite of subsamples WR1A, 1B, 1C, and 2
- WR3 - Composite of subsamples WR3, 5A, 5B, 9A, and 9B.
- WR6 - Composite of subsamples WR6, 7, and 8.
- BACKGROUND - From the Mand S. Mine (07-129-SS-1).

- GW1 - Discharge from adit #1
- SW1 - Same as sample SE1.
- SW2 - Same as sample SE2.

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Maud S.</u>	County: <u>Cascade</u>
Legal Description: <u>T 14N R 8E</u>	Section(s): <u>SW 1/4, SW 1/4, Sec. 28</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Ag, Pb, Zn</u>
Latitude: <u>N 46° 56' 25"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 43' 18"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>Rock Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>June 9, 1993</u>
Inspectors: <u>Babits, Flammang</u>	P.A. # <u>07-129</u>
Organization: <u>Pioneer Technical Services, Inc.</u>	

- There were no tailings on site.
- There were approximately 1,800 cubic yards of uncovered waste rock on site. The following were elevated at least three times background:

Arsenic: 1,380J mg/kg	Barium: 526 mg/kg
Cadmium: 35.9 mg/kg	Copper: 159 mg/kg
Iron: 55,600 mg/kg	Mercury: 1.11 mg/kg
Manganese: 8,290 mg/kg	Nickel: 55J mg/kg
Lead: 7,880 mg/kg	Lead: 7,880 mg/kg
Antimony: 18J mg/kg	Zinc: 5,610 mg/kg
- One adit was identified on site, which held water but was not discharging. The pH of the adit discharge was 6.51. MCLs for cadmium and antimony and acute and chronic aquatic life criteria for cadmium, copper, lead and zinc were exceeded in the sample.
- There was no surface water on site. The nearest surface water was Rock Creek located approximately 0.5 miles away. No surface water or sediment samples were collected.

Maud S. PA# 07-129
 AMRB HAZARDOUS MATERIALS INVENTORY
 INVESTIGATOR: PIONEER - BABITS
 INVESTIGATION DATE: 08/08/93

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-129-WR-1	1380 J	526	35.9	17.9	27	159	55600	1.11	8290	55 J	7880	18 J	5610	NR
BACKGROUND	19 J	110	0.4 UJ	7.4	10.4	11	12000	0.142	320	10 J	138	3 UJ	115	NR

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Requested

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT		SULFUR ACID BASE POTENT		ORGANIC SULFUR		PYRITIC SULFUR		PYRITIC SULFUR ACID BASE POTENT	
	%	U/10000	%	U/10000	%	U/10000	%	U/10000	%	U/10000	%	U/10000
07-129-WR-1	1.14	44	7.25	-37	1.07	0.04	0.3	1.25	6			

WATER MATRIX ANALYSES

Metals in Water
 Results in ug/L

FIELD ID	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC (mg CaCO3/L)
07-129-GW-1	1.61 U	19.5	42.6	5.99 U	5 U	22	89	0.14	2730	31.9	228	28.2	6260	31
07-129-GW-2	1.74	19.2	39.5	5.99 U	7.67	21.9	63.9	0.15	2710	33.3	222	30.2	6360	31.7

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Requested

Wet Chemistry
 Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-129-GW-1	64	< 5.0	43	0.11	NR
07-129-GW-2	51	< 5.0	40	0.12	NR

LEGEND

WR1 - Composite of subsamples WR1A, 1B, and 1C
 BACKGROUND - Approx. 150-200 feet above edit
 From Maud S. Mine (07-129-SS-1)
 GW1 - Filled edit
 GW2 - Duplicate of sample 07-129-GW-1

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Neihart Tailings</u>	County: <u>Cascade</u>
Legal Description: <u>T 14N R 8E</u>	Section(s): <u>SW 1/4, SW 1/4, Sec. 29</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Mill Tailings Pond</u>
Latitude: <u>N 46° 56' 30"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 44' 40"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>Belt Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>June 2, 1993</u>
Inspectors: <u>Bullock, Flammang, Clark</u>	P.A. # <u>07-134</u>
Organization: <u>Pioneer Technical Services, Inc.</u>	

- There were approximately 23,000 cubic yards of tailings associated with this site. The following elements were elevated at least three times background:
Arsenic: 190 to 284 mg/kg Cadmium: 47.4 to 63.1 mg/kg
Lead: 37,400 mg/kg Antimony: 10.1J to 17.4J mg/kg
Zinc: 10,400 to 14,000 mg/kg
- There was no waste rock associated with this site.
- There were no discharging adits or shafts associated with this site.
- Belt Creek flowed between the tailings impoundment and U.S. Highway 89. The northeastern side of the tailings impoundment was heavily ripped during a highway reconstruction project in the 1970's. A run-on diversion ditch, discharged into a small wetlands and then into Belt Creek which encircled the southern end of this site. A sample collected from the wetlands discharge did not exceed any MCL/MCLGs, but did exceed acute aquatic life criteria for cadmium and zinc, as well as chronic aquatic life criteria for cadmium, copper, lead, and zinc. Surface water samples were not collected in Belt Creek due to dilution effects from very high flowrates. Stream sediment samples from Belt Creek documented an observed release of arsenic, directly attributable to this site.
- One residence was located adjacent to this site, but did not appear to have been recently occupied.

Neihart Tailings PA# 07-134
 AMRB HAZARDOUS MATERIALS INVENTORY
 INVESTIGATOR: PIONEER - BULLOCK
 INVESTIGATION DATE: 06/02/83

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	Au (mg/Kg)	Pb (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-134-SE-1	27.2	2440	93.1	11.5	15.5	67.7	17100	0.105 U	71500	488	1060	26.2 J	22800	2.277
07-134-SE-2	8	224	1.0	9.33	18.8	14.1	18400	0.083	865	26.9	327	3.93 UJ	528	1.289 U
07-134-SE-3	29.2	600	3.8	9.02	16	29.8	20100	0.05 U	2240	29.7	792	2.87 UJ	1170	1.227 U
07-134-TP-1-1	190	1630	47.4	3.96	7.31	223	33100	0.118	11100	63.4	10100	10.8 J	11400	1.213 U
07-134-TP-1-2	284	984	63.1	17.8	15.3	371	38300	0.121	20700	151	11400	17.4 J	14000	1.283 U
07-134-TP-2	234	38.7	40.7	5.4	4.22	62.7	53600	0.061 U	707	9.14	37400	10.1 J	10400	1.2 U
BACKGROUND	53.3	828	15.3	11.6	72.7	50.1	30600	0.051 U	10400	91.5	5110	2.99 UJ	3530	NR

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Reported

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT		SULFUR ACID BASE POTENT		ORGANIC SULFUR		PYRITIC SULFUR		PYRITIC SULFUR ACID BASE POTENT	
	%	1/1000%	1/1000%	%	1/1000%	%	1/1000%	%	1/1000%	%	1/1000%	
07-134-TP1-1	1.64	51.2	17.7	0.56	0.55	0.53	17.2	0.54				
07-134-TP1-2DUP	3.39	106	26.5	0.15	2.07	1.17	64.7	-38.2				
07-134-TP1-2	3.37	105	26.3	0.16	2.04	1.17	63.7	-37.4				
07-134-TP-2	4.94	154	-9.1	2.44	0.86	1.64	26.9	-35.9				
07-134-TP-2DUP	4.96	155	-9.3	2.45	0.88	1.63	27.5	-36.8				

WATER MATRIX ANALYSES

Metals in Water
 Results in ug/L

FIELD ID	Au	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC. (mg CaCO3/L)
07-134-SW-1	0.98 U	41.6	3	5.99 U	5 U	8.9 J	223	0.038 U	660	16	12.1	18.3 U	1580 JX	57.3

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Reported

Wet Chemistry
 Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-134-SW-1	86	< 5.0	28	< 0.05	0.01

LEGEND

- SE1 - Same as sample SW1.
- SE2 - Upgradient Belt Creek Tailings.
- SE3 - Downgradient of Belt Creek Tailings.
- TP1-1 - Composite of oxidized zone; from holes 2-5 in tailings pond 1.
- TP1-2 - Composite of TP2-1 all and TP2-2 all.
- TP2 - Composite of reduced zone; from holes 2-5 in tailings pond 1.
- BACKGROUND - From Comprobase (07-1000-SS-1)
- TP1-2DUP - Duplicates of sample 07-134-TP1-2.
- TP2DUP - Duplicate of sample 07-134-TP-2.
- SW1 - Outlet of Belt Creek of Belt Creek of settling pond associated with diversion ditch.

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Silver Dyke Adit</u>	County: <u>Cascade</u>
Legal Description: T <u>14N</u> R <u>8E</u>	Section(s): <u>SE 1/4, SW 1/4, Sec. 10</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock / Ag, Pb, Zn</u>
Latitude: <u>N 46° 58' 57"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 41' 48"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>Squaw Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>June 1, 1993</u>
Inspectors: <u>Tuesday, Belanger, Lasher</u>	P.A. # <u>07-135</u>
Organization: <u>Pioneer Technical Services, Inc.</u>	

- There were no mill tailings associated with this site.
- The volume of waste rock associated with this site was estimated to be 12,100 cubic yards. The following elements were elevated at least three times background:

Arsenic: 124 to 217 mg/kg	Cadmium: 48.6 to 72.7 mg/kg
Copper: 2,530 to 3,330 mg/kg	Iron: 80,900 mg/kg
Mercury: 0.66 to 1.35 mg/kg	Manganese: 4,040 mg/kg
Lead: 16,400 to 31,800 mg/kg	Zinc: 6,050 to 7,050 mg/kg
- The waste rock dumps were unvegetated.
- One discharging adit had a significant flow (1 cfs). The adit water (SW-1) had a pH of 5.12, a high specific conductance of 2,450 us/cm, and exceeded drinking water standards for cadmium, copper, nickel, and antimony; aquatic life criteria for lead, mercury, cadmium, copper, lead, and zinc (chronic) and cadmium, copper, and zinc (acute) were exceeded in the adit discharge.
- The discharge flowed over the waste rock at the site and was the source of water in Squaw Creek. No observed releases were documented due to the lack of an upstream sample; however, downstream sediment data was more than three times background soil data for manganese, lead, and zinc. Exceedances of drinking water standards were documented in Squaw Creek for cadmium, copper, nickel, and antimony. Aquatic life criteria for lead, mercury, cadmium, copper, lead, and zinc (chronic) and cadmium, copper, and zinc (acute) were exceeded downstream in Squaw Creek. No seeps or springs were observed.
- One hazardous opening existed on-site: the glory hole on the hilltop above the adit had dangerously steep sides and the DSL erected fence was down in several places.

**Silver Dyke Adit PA# 07-135
AMRB HAZARDOUS MATERIALS INVENTORY
INVESTIGATOR: PIONEER - TUESDAY
INVESTIGATION DATE: 06/01/93**

SOLID MATRIX ANALYSES

Metals in soils Results per dry weight basis

FIELD ID	As (mg/Kg)	Pb (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-135-SE-2	105	164	50.4	11.2	10.3	1500	36500	0.28	1680	13.8	15000	4.05	6580	NR
07-135-SE-3	33.9	70.7	5.4	11.2	17.5	933	23700	0.062	2230	17	2460	3.07	842	NR
07-135-SE-4	31.4	49.5	9.5	14.6	14.2	875	24200	0.062	1920	14.9	1960	3.22	1330	NR
07-135-WR-1	124	198	72.7	6.9	10.6	3330	60300	1.35	1460	12.3	31800	5.8	7050	NR
07-135-WR-2	217	237	48.6	19	11.2	2530	80900	0.66	4040	29.6	16400	2.8	6050	NR
BACKGROUND	10.5	131	1.4	6.83	22.2	26.1	20600	0.048	607	15.6	667	3.39	548	NR

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Reported

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT.		SULFUR ACID/BASE POTENT.		ORGANIC SULFUR		PYRITIC SULFUR		PYRITIC SULFUR ACID/BASE POTENT	
	%	U/1000x	%	U/1000x	%	U/1000x	%	U/1000x	%	U/1000x	%	U/1000x
07-135-WR1	1.98	61.9	-0.4	-62	0.9	0.94	0.14	4.37	0.81	4.78	-4.78	-5.84
07-135-WR2	1.97	61.5	1.04	-61	0.94	0.81	0.22	6.87	0.81	5.84	-5.84	-5.84

WATER MATRIX ANALYSES

Metals in Water Results in ug/L

FIELD ID	As		Pb		Cd		Co		Cr		Cu		Fe		Hg		Mn		Ni		Pb		Sb		Zn		HARDNESS CALC. (mg CaCO3/L)
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L												
07-135-GW-1	2.5	29.3	2.55	5.99	5	5	5	5.99	5	5	12.3	173	0.150	75.9	8.78	5.24	18.3	497	83.1	83.1	5.24	18.3	497	83.1	83.1	83.1	
07-135-GW-2	2.84	29.4	2.55	5.99	5	5	5	5.99	5	5	25.3	308	0.079	204	8.78	4.76	18.3	1350	83.6	83.6	4.76	18.3	1350	83.6	83.6	83.6	
07-135-SW-1	4.88	2.24	986	260	22.7	22.7	22.7	260	22.7	22.7	8950	37400	0.150	128000	878	826	194	148000	1320	1320	826	194	148000	1320	1320	1320	
07-135-SW-2	7.12	10.6	838	208	18	18	18	208	18	18	9440	21900	0.120	109000	738	1400	147	120000	1090	1090	1400	147	120000	1090	1090	1090	
07-135-SW-3	4.37	16.2	339	69	5	5	5	69	5	5	4220	1540	0.140	43100	310	568	40.6	56900	495	495	568	40.6	56900	495	495	495	
07-135-SW-4	4.79	21.5	223	46	5	5	5	46	5	5	2700	1290	0.160	26000	201	343	37	36800	381	381	343	37	36800	381	381	381	

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Reported

Wet Chemistry Results in mg/l

Field ID	TOTAL DISSOLVED SOLIDS		CHLORIDE		SULFATE		NO3/NO2-N		CYANIDE	
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
07-135-GW-1	130	< 5.0	49	0.26	NR	NR	NR	NR	NR	NR
07-135-GW-2	137	< 5.0	51	0.27	NR	NR	NR	NR	NR	NR
07-135-SW-1	2720	< 5.0	1710	0.1	NR	NR	NR	NR	NR	NR
07-135-SW-2	2280	< 5.0	1410	0.08	NR	NR	NR	NR	NR	NR
07-135-SW-3	1040	< 5.0	642	< 0.05	NR	NR	NR	NR	NR	NR
07-135-SW-4	732	< 5.0	468	0.1	NR	NR	NR	NR	NR	NR

LEGEND

- SE2 - 150 feet below base of waste rock dump 2
- SE3 - At road crossing below residence (40' UP)
- SE4 - Squaw Creek above Savage Mill and Carpenter Creek
- WR1 - Composite of subsamples WR1A, 1B, and 1C
- WR2 - Composite of subsamples WR2A through 2E
- BACKGROUND - 280' West of waste rock dump 1, from the Silver Dyke Adit (07-135-SS-1)
- GW1 - Olen Hawthorne residence
- GW2 - Duplicates of sample 07-135-GW1
- SW1 - Adit discharge
- SW2 - Same as sample SE2
- SW3 - Same as sample SE3
- SW4 - Same as sample SE4

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Silver Dyke Tailings</u>	County: <u>Cascade</u>
Legal Description: T <u>14N</u> R <u>8E</u>	Section(s): <u>SE 1/4, NW 1/4, Sec. 15</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Tailings from Hardrock mining and milling/Ag, Pb, Zn</u>
Latitude: <u>N 46° 58' 32"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 41' 43"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Public</u>	Secondary Drainage: <u>Carpenter Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>May 26, 1993</u>
Inspectors: <u>Tuesday, Belanger, Flammang, Clark, Lasher/Pierson</u>	P.A. # <u>07-137</u>
Organization: <u>Pioneer Technical Services, Inc./Thomas, Dean and Hoskins, Inc.</u>	

- The volume of mill tailings remaining at this site was estimated at 56,350 cubic yards; an unknown volume of tailings, formerly at the site, had been deposited in the Carpenter Creek floodplain following a catastrophic failure of the tailings dam. The following elements were elevated at least three times ground (on-site tailings):

Arsenic: 48.1 to 64.5 mg/kg	Barium: 836J to 1,040J mg/kg
Cadmium: 6.7JX to 8.1JX mg/kg	Copper: 1,140 to 5,510 mg/kg
Manganese: 2,120J mg/kg	Lead: 2,920 to 14,200 mg/kg
- The tailings were uncontained, the dam was washed away during the failure. Tailings were actively eroding into a small tributary that bisected the tailings and discharged to Carpenter Creek. The tailings were unvegetated. Tailings materials were observed in the Carpenter Creek floodplain downstream from the site.
- No waste rock was associated with this site, though one of the tailings piles consists of small rock fragments of uniform size (1/2").
- An observed release to surface water for arsenic, barium, cadmium, copper, manganese, and lead was documented with sediment samples, and for copper, manganese, and lead in water samples. No exceedances of drinking water standards were documented. Aquatic life criteria exceedances for copper, lead, and zinc (acute) and mercury, copper, lead, and zinc (chronic) were documented at this site.
- No discharging adits, springs or seeps were found at the site.
- No hazardous structures or openings existed at the site. Potentially hazardous highwalls existed within the tailings due to the dam failure and subsequent undercut banks.

Silver Dyke Tailings PA# 07-137
AMRB HAZARDOUS MATERIALS INVENTORY
INVESTIGATOR: PIONEER - TUESDAY
INVESTIGATION DATE: 06/26/93

SOLID MATRIX ANALYSES

Metals in soils Results per dry weight basis

FIELD ID	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-137-SE-1	17.7	67.3 J	4.4 JX	18.2 J	28.3	63.5	26400	0.023	855 J	26.4 J	586 J	3.1 UJ	712 J	NR
07-137-SE-2	55.9	469 J	13.0 JX	10.5 J	14.3	6440	37300	0.034	2950 J	26 J	7440 J	3.34 UJ	1430 J	NR
07-137-SE-3	14.1	79.1 J	1.5 JX	16.5 J	31.5	55.8	21300	0.024	317 J	23.3 J	145 J	4.43 UJ	237 J	NR
07-137-SE-4	70.9	724 J	14.7 JX	12.8 J	45.2	3680	45500	0.074	2670 J	48.6 J	7730 J	4.36 UJ	1670 J	NR
07-137-TP-1	48.1	836 J	8.1 JX	4.15 J	11.9	4200	36600	0.057	1080 J	12.1 J	8620 J	2.96 UJ	816 J	NR
07-137-TP-2	64.5	1040 J	6.7 JX	7.49 J	20.7	5510	45000	0.067	2120 J	17.1 J	14200 J	3.51 UJ	798 J	NR
07-137-TP-6	54.2	254 J	6.7 JX	8.55 J	12.5	1140	31300	0.052	1560 J	16 J	2920 J	3.01 UJ	838 J	NR
BACKGROUND	10.5	131	1.4	6.83	22.2	26.1	20600	0.048 U	607	15.6	667	3.39 UJ	548	NR

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Reported

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT		SULFUR ACID BASE		ORGANIC SULFUR		PYRITIC ACID BASE		SULFUR ACID BASE	
	%	v/1000	%	v/1000	%	v/1000	%	v/1000	%	v/1000	%	v/1000
07-137-TP1	0.46	14.4	6.20	-8.17	0.16	0.08	0.22	2.50	3.71			
07-137-TP2	0.26	8.12	8.34	0.27	0.14	0.04	0.08	1.25	7.14			
07-137-TP6	1.09	34.1	8.64	-25.4	<0.01	0.59	0.50	18.4	-9.79			

WATER MATRIX ANALYSES

Metals in Water Results in ug/L

FIELD ID	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC. (mg CaCO3/L)
	07-137-SW-1	1.49 U	8.4	2.55 U	5.99 U	9.03 J	1.35 U	20.1	0.15 J	2.6 U	8.78 U	1 U	18.3 U	20 J
07-137-SW-2	1.49 U	24.2	2.55 U	5.99 U	12.5 J	24.2	85.4	0.17 J	15.8 J	8.78 U	32.2 J	18.3 U	80.5 J	36.5
07-137-SW-3	1.49 U	10.2	2.55 U	5.99 U	12.3 J	1.35 U	45.2	0.29 J	2.6 U	8.78 U	1.2 J	18.3 U	6 U	23.1
07-137-SW-4	1.49 U	11.4	2.55 U	5.99 U	6.43 J	3.8	62.8	0.15 J	4.37 J	8.78 U	8.36 J	18.3 U	9.9 J	23.7

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Reported

Wet Chemistry Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS		CHLORIDE		SULFATE		NO3/NO2-N		CYANIDE	
07-137-SW1	62	<	5.0	8	<	0.05	NR			
07-137-SW2	68	<	5.0	15	<	0.05	NR			
07-137-SW3	47	<	5.0	<	5.0	<	0.05	NR		
07-137-SW4	54	<	5.0	<	5.0	<	0.08	NR		

LEGEND

- SE1 - On unnamed tributary above site.
- SE2 - On unnamed tributary at PPE above road.
- SE3 - On Carpenter Creek above tailings site.
- SE4 - On Carpenter Creek, 350' above confluence with Squaw Creek.
- TP1 - Composite of holes 2A and 3B (estimated to be middle of existing pile).
- TP2 - Composite of holes 2C and 3C (estimated to be lower portion of pile).
- TP6 - Composite of holes on upper most pile closest to mill.
- BACKGROUND - From Silver Dyke Adit (07-135-SS-1).

- SW1 - Same as sample SE1.
- SW2 - Same as sample SE2.
- SW3 - Same as sample SE3.
- SW4 - Same as sample SE4.

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: Silver Dyke Mill
Legal Description: T 14N R 8E
Mining District: Neihart
Latitude: N 46° 58' 42"
Longitude: W 110° 41' 55"
Land Status: Private
Quad: Neihart
Inspectors: Tuesday, Belanger, Flammang,
Lasher, Clark / Pierson
Organization: Pioneer Technical Services,
Inc./ Thomas, Dean and Hoskins, Inc.

County: Cascade
Section(s): NE 1/4, NW 1/4, Sec. 15
Mine Type: Hardrock / Ag, Pb, Zn
Primary Drainage: Belt Creek
USGS Code: 10030105
Secondary Drainage: Squaw Creek
Date Investigated: May 25, 1993
P.A. # 07-138

- There were no mill tailings at this site. Tailings from this mill were transported to the east and were inventoried under the Silver Dyke Tailings, PA# 07-137
- The volume of waste rock associated with this site was estimated to be 82,600 cubic yards. The following elements were elevated at least three times background:

Arsenic: 69.8 to 182 mg/kg	Barium: 450J mg/kg
Cadmium: 12.7JX to 40.8JX mg/kg	Copper: 2,120 to 3,730 mg/kg
Mercury: 0.291 to 0.366 mg/kg	Manganese: 3,610J to 5,050J mg/kg
Lead: 4,830 to 4,380 mg/kg	Zinc: 1,510 to 4,380 mg/kg
- The waste rock dumps were unvegetated and contained abundant sulfides.
- No discharging adits, springs or seeps were observed.
- Two large ore bins were collapsing and the mill building (with machinery) had mostly collapsed; all three were hazardous structures. Asbestos may have be present associated with old bearings and rollers or with insulation.

Silver Dyke Mill PA# 07-138
AMRB HAZARDOUS MATERIALS INVENTORY
INVESTIGATOR: PIONEER - TUESDAY
INVESTIGATION DATE: 05/25/93

SOLID MATRIX ANALYSES

Metals in soils
Results per dry weight basis

FIELD ID	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-138-TP-1	69.8	104 J	12.7 JX	13.4 J	12.1	2120	41700	0.024	5050 J	40.9 J	4830 J	3.03 UJ	1510 J	NR
07-138-WR-1	182	289 J	17.3 JX	7.88 J	13	2140	58900	0.366	996 J	13.4 J	8430 J	3.21 UJ	2300 J	NR
07-138-WR-2	111	450 J	40.8 JX	11.6 J	7.57	3730	39200	0.291	3610 J	28.2 J	8220 J	3.17 UJ	4380 J	NR
BACKGROUND	10.5	131	1.4	6.83	22.2	26.1	20600	0.048 U	607	15.6	667	3.39 UJ	548	NR

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Requested

Acid/Base Accounting

FIELD ID	TOTAL SULFUR %	TOTAL SULFUR /10000	NEUTRAL POTENT. /10000	ACID-BASE POTENT. /10000	SULFATE SULFUR %	PYRITIC SULFUR %	ORGANIC SULFUR %	PYRITIC SULFUR /10000	ACID-BASE POTENT. /10000	SULFUR ACID-BASE POTENT. /10000
07-138-TP1	1.26	39.4	17.9	-21.5	<0.01	0.47	0.80	14.7	3.20	
07-138-WR1	3.08	96.2	-18.8	-115	1.61	0.41	1.06	12.8	-31.7	
07-138-WR2	2.17	67.8	19.1	-48.7	0.60	0.67	0.90	20.9	-1.84	

LEGEND

TP1 - Composite of subsamples TP1A, 1B, 1C, 2A, 2B, and 2C.
 WR1 - Composite of subsamples WR1A, 1B, and 1C.
 WR2 - Composite of subsamples WR2A, 2B, 2C, 3A, 3B, and 3C.
 BACKGROUND - From the Silver Dyke Adit (07-138-SS-1).

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Emma</u>	County: <u>Cascade</u>
Legal Description: <u>T 14N R 8E</u>	Section(s): <u>NW 1/4, NW 1/4, Section 15</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Pb, Zn, Ag</u>
Latitude: <u>N 46° 58' 43"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 42' 04"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private</u>	Secondary Drainage: <u>Squaw Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>June 6, 1994</u>
Inspectors: <u>Tuesday, Belanger, Clark, West</u>	P.A. # <u>07-144</u>
Organization: <u>Pioneer Technical Services, Inc.</u>	

- No mill tailings were observed at the site.
- The volume of waste rock observed at the site was estimated to be 520 cubic yards. The following elements were elevated to at least three times the background concentrations:

Silver: 16.2J mg/kg	Manganese: 2,430J mg/kg
Arsenic: 35.9 mg/kg	Lead: 8,460JX mg/kg
Cadmium: 52.2JX mg/kg	Antimony: 20.2J mg/kg
Copper: 1,210J mg/kg	Zinc: 14,200 mg/kg
- No discharging adits, filled shafts, seeps, or springs were observed at the site during the investigation.
- Squaw Creek flows through the center of the site. Observed releases to Squaw Creek (sediment) were documented for arsenic and copper.
- MCLs for cadmium, copper, nickel, and antimony, as well as the EPA action level for lead, were exceeded in Squaw Creek both upstream and downstream from the site. Flow in Squaw Creek originates at the discharge from the Silver Dyke Adit (07-135). Additionally, acute and chronic aquatic life criteria for cadmium, copper, lead, and zinc were exceeded in Squaw Creek both upstream and downstream from the site.
- Potential safety hazards observed at the site included a collapsing loadout structure and an unstable slope located above a caved adit.

Emma PA# 07-144
 AMRB HAZARDOUS MATERIALS INVENTORY
 INVESTIGATOR: PIONEER - TUESDAY
 INVESTIGATION DATE: 08/06/94

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	Ag (mg/Kg)	Au (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-144-SE1	53.5 J	36.0	67.6	26.0 JX	26.3 J	19.3 J	3510 J	36000	0.03 U	3070 J	9.5	2240 JX	8.9 J	6390	NR
07-144-SE2	12.3 J	29.5	101	20.7 JX	20.1 J	14.8 J	1050 J	28400	0.04 U	2750 J	8.6	2910 JX	7.6 J	4350	NR
07-144-WR1	16.2 J	35.9	42.3	52.2 JX	24.4 J	11.4 J	1210 J	47800	0.04	2430 J	14.6	8460 JX	20.2 J	14200	NR
BACKGROUND	0.5	9.6	87.6	1.32 JX	9.05 J	27.2 J	10.8 J	21100	0.04	708 J	10.3	52.4 JX	4.7 UJ	135	NR

U - Not Detected; J - Estimated Quantity; X - Off-liner for Accuracy or Precision; NR - Not Requested

Acid/Base Accounting

FIELD ID	TOTAL SULFUR %	ACID BASE POTENT %	NEUTRAL POTENT %	SULFUR ACID BASE POTENT %	SULFUR ACID BASE POTENT %	ORGANIC SULFUR %	PYRITIC SULFUR %	PYRITIC ACID BASE POTENT %	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-144-WR1	4.04	126	11.3	-115	<0.01	2.96	2.39	74.7	-63.3							

WATER MATRIX ANALYSES

Metals in Water
 Results in ug/L

FIELD ID	Ag	Au	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC. (mg CaCO3/L)
07-144-SW1	0.73	1.1 U	20.6	397	96.1	4.7 UX	4370	4220	0.11 U	49900	145	618	112 J	59800	594
07-144-SW2	0.92	1.1 U	21.9	447	105	8.6 JX	4980	5180	0.11 U	59000	170	703	131 J	67600	655

Wet Chemistry
 Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-144-SW1	1180	<5	737	0.23	NR
07-144-SW2	1320	<5	859	0.22	NR

LEGEND

SE1 - Square Creek, 80' below lowest dam
 SE2 - Square Creek, 40' above machinery, below road.
 WR1 - Composite of subsamples WR1B and WR2
 BACKGROUND - From the Apple Mine (07-143-SE1).
 SW1 - Same as sample 07-144-SE1
 SW2 - Same as sample 07-144-SE2

U - Not Detected; J - Estimated Quantity; X - Off-liner for Accuracy or Precision; NR - Not Requested

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Big Seven</u>	County: <u>Cascade</u>
Legal Description: <u>T 14N R 8E</u>	Section(s): <u>SE 1/4, NE 1/4, Sec. 28</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Au, Ag, Pb, Zn</u>
Latitude: <u>N 46° 56' 55"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 42' 15"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private/Public</u>	Secondary Drainage: <u>Snow Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>May 27, 1993</u>
Inspectors: <u>Tuesday, Flammang, Lasher, Clark, Belanger / Pierson</u>	P.A. # <u>07-156</u>
Organization: <u>Pioneer Technical Services, Inc./ Thomas, Dean and Hoskins, Inc.</u>	

- The mill tailings associated with this site were impounded in one pond (TP-3) and 2 piles (TP-1 and -2). They were in the floodplain of a small tributary of Snow Creek and extended at least 1,000 feet downstream from the site. The volume of these tailings was estimated at 2,580 cubic yards and were 40% revegetated (naturally). The following elements were elevated at least three times background:

Arsenic: 121 to 212 mg/kg	Cadmium: 9.5 to 13.5JX mg/kg
Mercury: 0.071 mg/kg	Manganese: 2,710 to 6,860 mg/kg
Antimony: 15.2 mg/kg	Zinc: 2,430 to 2,740 mg/kg
- The volume of waste rock associated with this site was estimated to be 25,800 cubic yards. The following elements were elevated at least three times background:

Arsenic: 246 to 381 mg/kg	Cadmium: 2.0 to 10.2 mg/kg
Manganese: 1,280 mg/kg	Lead: 2,880 mg/kg
Zinc: 2,200 mg/kg	
- An observed release to surface water (tributary of Snow Creek) was documented in sediments for mercury and manganese, and in water samples for zinc and manganese. Exceedances of drinking water standards were recorded for cadmium; and aquatic life criteria for mercury, cadmium, lead, and zinc (chronic), cadmium and zinc (acute) were documented in surface water at the Big Seven site.
- One discharging adit had a significant flow (0.06 cfs) with significant iron staining 1,000 feet downstream. The adit water (SW-3) had a pH of 6.63, an specific conductance of 500 us/cm, and exceeded drinking water standards for cadmium and nickel; aquatic life criteria for mercury, cadmium, lead, and zinc (chronic), and cadmium and zinc (acute) were also exceeded in the adit discharge.
- Several buildings were at the site, but most appeared in fair condition. There were two open adits at the site.

Big Seven PA# 07-156
AMRB HAZARDOUS MATERIALS INVENTORY
INVESTIGATOR: PIONEER - TUESDAY
INVESTIGATION DATE: 05/27/93

SOLID MATRIX ANALYSES

Results per dry weight basis (mg/kg)

Metals in soils

FIELD ID	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	CYANIDE
07-156-SE-1	242	161	11.1	19.4	13.4	73.2	37800	0.017 U	2870	36.8	518	14.1 J	2900	NR
07-156-SE-4	10.7	175	0.4 U	20.6	138	48	38400	0.016 U	863	67.4	111	5.12 J	312	NR
07-156-SE-5	124	715 J	22.3 J	42.1 J	31.7 J	98.9	39000	0.129	18300	147	887	5.94 UJ	4150	NR
07-156-TP-2	212	365 J	13.5 JX	7.32 J	13.3	55.7	27100	0.071	4140 J	36 J	2510 J	3.03 UJ	2740 J	NR
07-156-TP-3A	121	174	9.5	3.27	18.1	47.2	17900	0.016 U	2710	20.4	434	9.51 J	2430	NR
07-156-TP-3B	126	139	9.7	7.48	30.3	52.1	29700	0.017 U	6860	47.6	576	15.2 J	2530	1.279 U
07-156-WR-1	381	97.2	2.0	14.8	22.8	56.8	55100	0.014 U	1280	17.2	506	5.29 J	785	NR
07-156-WR-2	288	118	1.0	1.4	11	76	33000	0.014 U	146	3.67	2880	9.94 J	631	NR
07-156-WR-3	246	164	0.5 U	1.71	17.6	39.2	32700	0.016 U	71.2	5.1	966	7.02 J	368	NR
07-156-WR-4	265	62.3	10.2	1.22 U	8.97	53.8	30900	0.014 U	47.8	4.96	1220	11.2 J	2200	NR
BACKGROUND	15.1	166	0.6 U	6.73	25.1	28.3	26600	0.02 U	422	16.5	420	4.33 UJ	336	NR

Acid/Base Accounting

FIELD ID	TOTAL SULFUR		NEUTRAL POTENT		SULFATE		PYRITIC		ORGANIC		PYRITIC		SULFUR		CYANIDE
	%	U/1000	POTENT	U/1000	SULFUR	%	SULFUR	%	SULFUR	%	ACID BASE	U/1000	ACID BASE	POTENT	
07-156-SL1	0.03	0.94	-0.33	-1.27	0.02	<0.01	0.01	0.00	0.01	0.01	0.00	0.00	-0.33		
07-156-TP3A	0.48	15.0	12.9	-2.11	0.05	0.25	0.18	7.81	0.28	0.28	13.7	8.19	5.08		
07-156-TP3B	0.74	23.1	21.4	-1.14	0.02	0.44	0.51	14.4	0.28	0.28	13.7	8.19	5.08		
07-156-TP-2	1.19	35.9	37.3	1.38	0.18	0.46	0.51	14.4	0.28	0.28	13.7	8.19	5.08		
07-156-WR1	2.05	64	-3.97	-68	1.98	0.01	0.06	0.31	0.06	0.06	0.31	-4.28			
07-156-WR2	1.56	48.7	-2.06	-50.8	1.51	<0.01	0.05	0.00	0.05	0.05	0.00	-2.06			
07-156-WRD3	0.83	25.9	-3.37	-29.3	0.8	<0.01	0.03	0.00	0.03	0.03	0.00	-3.37			
07-156-WR-4	0.46	14.4	0.33	-14.0	0.45	<0.01	0.01	0.00	0.01	0.01	0.00	0.33			
07-156-TP3BDUP	0.76	23.7	21.4	-2.31	0.02	0.45	0.29	14.1	0.29	0.29	14.1	7.37			

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Requested

WATER MATRIX ANALYSES

Results in ug/L

Metals in Water

FIELD ID	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC. (mg CaCO3/L)
07-156-SW-1	1.5 J	8.73	5	6.47	5.7 J	9.17	643	0.3 J	2790 J	36.7	6.17 J	18.3 U	1910 J	82.1
07-156-SW-2	2.38 J	18.3	10.2	5.99 U	5 U	12.2	20.1	0.18 J	590 J	13.6	2.25 J	18.3 U	1230 J	25.3
07-156-SW-3	2.84 J	11.1	13.9	45	5 U	34.8	11400	0.13 J	14500 J	169	8.16 J	18.3 U	6810 J	161
07-156-SW-4	1.55 J	24.7	8.17	5.99 U	5 U	10.5	238	0.21 J	2080 J	83.8	3.33 J	18.3 U	4990 J	243
07-156-SW-5	1.49 U	2.24 U	2.55 U	5.99 U	5.17 J	3.67	13.5 U	0.1 J	4.4 J	8.78 U	1 U	18.3 U	6 U	8.8

U - Not Detected, J - Estimated Quantity, X - Outlier for Accuracy or Precision, NR - Not Requested

LEGEND

- TP2 - Sample of the TP2 subsample
 - TP3A - Sample of the TP3A subsample
 - TP3B - Sample of the TP3B subsample
 - WR1 - Composite of subsamples WR1A, 1B, and 1C.
 - WR2 - Composite of WR2A, 2B, and 2C.
 - WR3 - Composite of subsamples WR3A, 3B, and 3C.
 - WR4 - Composite of subsamples WR4A, 4B, and 4C.
-
- SE1 - At junction of two streams below mine.
 - SEA - Below final impoundment from wood culvert.
 - SES - Below site but before confluence with Snow Creek.
 - SW1 - Above tailings
 - SW2 - Below waste rock dump 3.
 - SW3 - Adit #1 discharge
 - SW4 - Same as sample SEA

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Rebellion (Upper & Lower)</u>	County: <u>Cascade</u>
Legal Description: <u>T 14N R 8E</u>	Section(s): <u>SW 1/4, NW 1/4, Section 27; NW 1/4, NW 1/4, Section 27</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Au, Ag, Pb, Zn</u>
Latitude: <u>N 46° 56' 53"; N 46° 57' 00"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 42' 13"; W 110° 42' 00"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private</u>	Secondary Drainage: <u>Snow Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>June 9, 1994</u>
Inspectors: <u>Tuesday, Belanger, Clark, West</u>	P.A. # <u>07-157 & 07-158</u>
Organization: <u>Pioneer Technical Services, Inc.</u>	

- No mill tailings were observed at the site.
- The volume of waste rock observed at the site was estimated to be 64,920 cubic yards. The following elements were elevated to at least three times the background concentrations:

Silver: 7.9J to 98.7J mg/kg	Mercury: 0.34 to 0.48 mg/kg
Arsenic: 53.9 to 181 mg/kg	Lead: 713JX to 3,090JX mg/kg
Barium: 345 to 401 mg/kg	Manganese: 7090J mg/kg
Cadmium: 10.1JX to 12.8JX mg/kg	Zinc: 536 to 2,950 mg/kg
Copper: 64.0J to 117J mg/kg	
- Three discharging adits were associated with the site. The MCL for cadmium and the acute and chronic aquatic life criteria for cadmium, copper, and zinc were exceeded in all three adit discharges. The EPA action level for lead, as well as the acute and chronic aquatic life criteria for lead, were exceeded in the two adit discharges associated with the upper portion of the Rebellion Mine.
- The three adit discharges eventually merged to form the headwaters of a tributary to Snow Creek. A surface water sample was collected from this tributary downstream from the site. The MCL and the acute and chronic aquatic life criteria for cadmium were exceeded in the sample. Additionally, the acute and chronic aquatic life criteria for copper and zinc and the chronic aquatic life criteria for lead were exceeded in the sample.
- Potential safety hazards observed the site included several collapsing structures (two loadout structures and two collapsing sheds).

Rebellion (Upper & Lower) PA# 07-157 & 07-158
 AMRB HAZARDOUS MATERIALS INVENTORY
 INVESTIGATOR: PIONEER - TUESDAY
 INVESTIGATION DATE: 06/09/94

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	Ag (mg/Kg)	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-157-WR1	67.9 J	181	401	10.1 JX	6.37 J	4.86 J	64.0 J	22900	0.48	7090 J	7.6	2380 JX	9.4	2040	NR
07-157-WR2	98.7 J	155	345	12.8 JX	5.18 J	5.89 J	117 J	36300	0.34	1920 J	5.5	3090 JX	11.4	2950	NR
07-158-WR1	7.9 J	53.9	29.5	3.71 JX	10.8 J	8.92 J	71.4 J	24000	0.42	1890 J	15.1	713 JX	4.7 UJ	536	NR
BACKGROUND	0.5	9.6	87.6	1.32 JX	9.05 J	27.2 J	10.8 J	21100	0.04	708 J	10.3	52.4 JX	4.7 UJ	135	NR

0 - Not Detected, J - Estimated Quantity, X - outlier for Accuracy or Precision, NR - Not Reported

Acid/Base Accounting

FIELD ID	TOTAL SULFUR %		SULFUR ACID BASE POTENT 1/1000		SULFUR ACID BASE POTENT 1/1000		PYRITIC SULFUR ACID BASE POTENT 1/1000		PYRITIC SULFUR ACID BASE POTENT 1/1000	
	SULFUR	ACID BASE	SULFUR	ACID BASE	SULFUR	ACID BASE	SULFUR	ACID BASE	SULFUR	ACID BASE
07-157-WR1	1.20	37.5	1.48	0.26	0.59	18.4	20.5	0.35	0.62	2.62
07-157-WR2	0.49	15.3	-12	0.34	0.02	0.13	0.62	0.13	0.62	2.62
07-158-WR1	0.52	16.2	-13	0.26	0.08	0.18	2.50	0.18	2.50	1.21

WATER MATRIX ANALYSES

Metals in Water
 Results in ug/L

FIELD ID	Ag	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC. (mg CaCO3/L)
07-157-AD1	4.42	15.4	15.1	68.5	16.4	7.1 JX	263	6880	0.11 U	10200	45.5	221	29.4 U	10200	113
07-157-AD2	4.23	12.5	15.0	68.1	16.7	5.5 JX	263	5680	0.11 U	10300	40.8	235	29.4 U	10400	115
07-158-AD1	1.12	1.1 U	12.2	22.9	11.7	4.7 UX	45.6	1780	0.11 U	9140	29.8	53.5	29.4 U	4730	124
07-158-SW1	1.13	1.1 U	12.5	42.0	8.7 U	4.7 UX	97.2	25.0	0.11 U	7960	38.9	19.1	29.4 U	7450	116

Wet Chemistry
 Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-157-AD1	284	<5	166	<0.05	NR
07-157-AD2	271	<5	168	0.25	NR
07-158-AD1	233	<5	141	<0.05	NR
07-158-SW1	243	<5	142	<0.05	NR

LEGEND

07-157-WR1 - Composite of subsamples WR1 through WR3.
 07-157-WR2 - Composite of subsamples WR4A through 4C and 5.
 07-158-WR1 - Composite of subsamples WR1A through 1D.
 BACKGROUND - From the Eight Mile (07-143-081).

07-157-AD1 - Add discharge at base of WRA, near WRS.
 07-157-AD2 - Add discharge at base of WRE below old roadcut.
 07-158-AD1 - Add discharge from the second add behind building of Lower Rd.
 07-158-SW1 - Overflows from Lower Substation into unarmored int.
 of Brown Creek.

0 - Not Detected, J - Estimated Quantity, X - outlier for Accuracy or Precision, NR - Not Reported

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: Ripple Mines County: Cascade
Legal Description: T 14N R 8E Section(s): NE 1/4, SW 1/4, Section 27
Mining District: Neihart Mine Type: Hardrock/Ag. Au, Pb, Zn
Latitude: N 46° 56' 43" Primary Drainage: Belt Creek
Longitude: W 110° 41' 52" USGS Code: 10030105
Land Status: Private Secondary Drainage: Snow Creek
Quad: Neihart Date Investigated: June 7, 1994
Inspectors: Tuesday, Belanger, Clark, West P.A. # 07-163
Organization: Pioneer Technical Services, Inc.

- No mill tailings were observed at the site.
- The volume of waste rock observed at the site was estimated to be 6,100 cubic yards. The following elements were elevated to at least three times the background concentrations:

Silver: 77J to 105J mg/kg	Copper: 89.3J to 184J mg/kg
Arsenic: 391 to 687 mg/kg	Mercury: 0.83 to 1.12 mg/kg
Barium: 459 mg/kg	Lead: 6,270JX to 6,920JX mg/kg
Cadmium: 8.47 JX mg/kg	Zinc: 515 to 1,670 mg/kg
- There were four discharging adits observed at the site during the investigation; however, none of the flows reached a flowing surface water source. The MCLs for arsenic and cadmium were exceeded in the Adit #1A discharge; and the MCL for cadmium was exceeded in the Adit #3 discharge. The acute and chronic aquatic life criteria for zinc were exceeded in all four discharges; and the acute and chronic aquatic life criteria for cadmium and copper were exceeded in all discharges except Adit #2. Additionally, the chronic aquatic life criteria for lead was exceeded in all of the discharges.
- The surface water sample collected below the site exceeded the MCL for cadmium. The acute and chronic aquatic life criteria were exceeded for cadmium, copper, lead, and zinc, as well as the chronic aquatic life criteria for iron.
- Potential safety hazards observed at the site included three open adits, a collapsing loadout structure, and a collapsing cabin.

Ripple Mines PA# 07-163
 AMRB HAZARDOUS MATERIALS INVENTORY
 INVESTIGATOR: PIONEER - TUESDAY
 INVESTIGATION DATE: 08/07/84

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	Ag (mg/Kg)	Au (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-163-WR1	105 J	687	156	8.47 JX	1.8 UJ	1.31	89.3 J	34400	1.12	396 J	5.5	6920 JX	13.5 J	1670	NR
07-163-WR3	77 J	391	459	2.83 JX	1.4 UJ	1.21	184 J	25300	0.83	163 J	1.32 U	6270 JX	4.9 UJ	515	NR
BACKGROUND	0.5	9.6	87.6	1.32 JX	9.05 J	27.2 J	10.8 J	21100	0.04	708 J	10.3	52.4 JX	4.7 UJ	135	NR

Acid/Base Accounting

FIELD ID	TOTAL SULFUR %		SULFUR ACID BASE POTENT. /10000		SULFATE SULFUR %		PYRITIC SULFUR %		ORGANIC SULFUR %		PYRITIC SULFUR ACID BASE POTENT. /10000		SULFUR ACID BASE POTENT. /10000	
07-163-WR1	1.09	34.1	0.37	-34	0.62	0.62	0.09	0.09	0.38	2.81	-2.44			
07-163-WR3	1.28	40.0	-1.14	-41	1.17	1.17	0.02	0.02	0.09	0.62	-1.77			

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Reported

WATER MATRIX ANALYSES

Metals in Water
 Results in ug/L

FIELD ID	Ag	As	Ba	Cd	Co	Ct	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC. (mg CaCO ₃ /L)
07-163-AD1A	0.15	115	22.6	30.6	9.8	4.7 UX	175	15500	0.11 U	5500	17.3	5.4	29.4 U	5530	47.9
07-163-AD1B	1.00	1.9	7.5	3.1	8.7 U	4.7 UX	36.9	785	0.11 U	431	8.0 U	42.0	29.4 U	505	31.6
07-163-AD2	0.27	3.1	10.3	2.6 U	8.7 U	11.3 JX	4.6 U	653	0.11 U	29.9	8.0 U	4.0	29.4 U	55.4	21.8
07-163-AD3	0.89	1.1	31.3	8.0	8.7 U	4.7 UX	73.5	665	0.11 U	1030	8.0 U	50.1	29.4 U	882	23.6
07-163-SW1	0.35	24.8	15.2	14.3	8.7 U	4.7 UX	103	3530	0.11 U	3180	8.0 U	33.4	29.4 U	3220	39.9

Wet Chemistry
 Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO ₃ NO ₂ -N	CYANIDE
07-163-AD1A	136	<5	86	0.11	NR
07-163-AD1B	78	<5	22	0.16	NR
07-163-AD2	52	<5	6.0	0.14	NR
07-163-AD3	55	<5	22	0.26	NR
07-163-SW1	132	<5	61	0.18	NR

LEGEND

WR1 - Composite of subsamples WR1A through 1D.
 WR3 - Composite of subsamples WR3A and 3B.
 BACKGROUND - From the Ripple Mine (07-163-SB3).
 AD1A - Discharge from site associated with WR1A
 AD1B - Discharge from site associated with WR1B
 AD2 - Discharge from site associated with WR2
 AD3 - Discharge from site associated with WR3
 SW1 - At confluence of Adts #1A and #1B discharge on dump WR1A.
 U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Reported

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
HAZARDOUS MATERIALS INVENTORY
SITE SUMMARY**

Mine/Site Name: <u>Lexington No. 4</u>	County: <u>Cascade</u>
Legal Description: <u>T 14N R 8E</u>	Section(s): <u>SW 1/4, NE 1/4, Section 28</u>
Mining District: <u>Neihart</u>	Mine Type: <u>Hardrock/Ag. Pb. Au</u>
Latitude: <u>N 46° 56' 50"</u>	Primary Drainage: <u>Belt Creek</u>
Longitude: <u>W 110° 42' 35"</u>	USGS Code: <u>10030105</u>
Land Status: <u>Private</u>	Secondary Drainage: <u>Snow Creek</u>
Quad: <u>Neihart</u>	Date Investigated: <u>June 9, 1994</u>
Inspectors: <u>Tuesday, Belanger, Clark, West</u>	P.A. # <u>07-167</u>
Organization: <u>Pioneer Technical Services, Inc.</u>	

- No mill tailings were observed at the site.
- The volume of waste rock observed at the site was estimated to be 6,600 cubic yards. The following elements were elevated to at least three times the background concentrations:

Silver: 18.9J mg/kg	Mercury: 0.19 mg/kg
Arsenic: 316 mg/kg	Lead: 2,410 mg/kg
Cadmium: 10.8JX mg/kg	Zinc: 2,850 mg/kg
Copper: 46.8J mg/kg	
- One discharging adit was observed at the site during the investigation; however, the adit did not reach a surface water source. The MCL for cadmium and the acute and chronic aquatic life criteria for cadmium, copper, lead, and zinc were exceeded in the adit discharge.
- Potential safety hazards observed at the site included a collapsing shed and several unstable, steep slopes associated with the waste rock dumps and caved adit.

Lexington No. 4 PA# 07-167
 AMRB HAZARDOUS MATERIALS INVENTORY
 INVESTIGATOR: PIONEER - TUESDAY
 INVESTIGATION DATE: 06/09/94

SOLID MATRIX ANALYSES

Metals in soils
 Results per dry weight basis

FIELD ID	As (mg/Kg)	Ba (mg/Kg)	Cd (mg/Kg)	Co (mg/Kg)	Cr (mg/Kg)	Cu (mg/Kg)	Fe (mg/Kg)	Hg (mg/Kg)	Mn (mg/Kg)	Ni (mg/Kg)	Pb (mg/Kg)	Sb (mg/Kg)	Zn (mg/Kg)	CYANIDE (mg/Kg)
07-167-WR1	18.9 J	316	10.8 JX	5.35	7.31 J	46.8 J	36400	0.19	1170 J	8.7	2410 JX	6.8	2850	NR
BACKGROUND	0.5	87.6	1.32 JX	9.05 J	27.2 J	10.8 J	21100	0.04	708 J	10.3	52.4 JX	4.7 UJ	135	NR

Acid/Base Accounting

FIELD ID	TOTAL SULFUR %	ACID BASE POTENTIAL	NEUTRAL POTENTIAL	SULFUR POTENTIAL	SULFUR POTENTIAL	SULFATE %	PYRITIC SULFUR %	ORGANIC SULFUR %	PYRITIC ACID BASE POTENTIAL	PYRITIC ACID BASE POTENTIAL
07-167-WR1	1.51	47.2	8.95	-38	0.86	0.25	0.40	7.81	1.14	

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Reported

WATER MATRIX ANALYSES

Metals in Water
 Results in ug/L

FIELD ID	Ag	As	Ba	Cd	Co	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Sb	Zn	HARDNESS CALC (mg CaCO3/L)
07-167-AD1	0.33	18.5	2.1	9.1	8.7 U	4.7 UX	23.1	2900	0.11 U	1770	8.0 U	96.8	29.4 U	1840	48.4
07-167-SW1	0.12 U	1.1 U	5.7	5.4	8.7 U	4.7 UX	4.6 U	36.4	0.11 U	234	8.0 U	4.5	29.4 U	1090	37.5

U - Not Detected; J - Estimated Quantity; X - Outlier for Accuracy or Precision; NR - Not Reported

Wet Chemistry
 Results in mg/l

FIELD ID	TOTAL DISSOLVED SOLIDS	CHLORIDE	SULFATE	NO3/NO2-N	CYANIDE
07-167-AD1	96	<5	34	0.06	NR
07-167-SW1	73	<5	35	<0.05	NR

WR1 - Composite of subsamples WR1A, 2B, 3C, and 3D.
 BACKGROUND - From the Supply Meter (07-167-001).

AD1 - Lexington #4 acid discharge
 SW1 - AUB discharge below dump and across road.

LEGEND