1980

Environmental degradation of Belt Creek

Dennis L. Veleber

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THE ENVIRONMENTAL DEGRADATION OF BELT CREEK

By

Dennis L. Veleber

B.A., University of Montana, Missoula, 1973

Presented in partial fulfillment of the requirements for the degree of Master of Science

UNIVERSITY OF MONTANA

1980

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The effects of stream pollution and stream management have altered, in one way or another, a north central Montana creek that originates high in the Little Belt Mountains. This thesis studies Belt Creek, a pristine water route changed by man, a transition wrought by white settlers and their evolving technology. The story includes the interplay of many issues. These issues, often conflicting, include industrial exploitation, water pollution, and wildlife management, which are discussed within the framework of the area's history beginning with the 1880s gold rush in the Little Belt Mountains.

Information presented in this thesis is the result of extensive travel by foot and car. Interviews were held with foresters, pioneers, miners, ranchers, fish and wildlife biologists, public health officials, politicians, environmentalists, and industrialists. These interviews, together with published literature and newspaper accounts, provide the substance of the Belt Creek story.

The communities that sprang up along Belt Creek and its tributaries were often completely dependent on the stream. As the residents of these communities mined the ores in the Little Belt Mountains, Belt Creek and its tributaries were used as a means of waste disposal for the operations. It was found that the mining which occurred then has left lasting and irreparable scars, still visible today. As the pollution of Belt Creek worsened, increased social consciousness of the people who enjoyed Belt Creek led to organization. The organized attempts to clean Belt Creek were aided by fluctuating world silver prices and mother nature. The struggle of Belt Creek continues today. Although mining operations no longer operate along its banks or those of its tributaries, Belt Creek is still being polluted by acid mine drainage on the Dry Fork and abandoned coal mines in the town of Belt.
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Chapter I

INTRODUCTION

"Water is more crucial to human beings than any other element in the earth's ecosystem."

--- Water: the Web of Life\(^1\)

I have been aware of the environmental problems of Belt Creek since my childhood. I spent many hours recreating along its banks. As I grew older and moved away, I never forgot the pleasure I received from the creek. Through my studies at the University of Montana I became a concerned conservationist. Studying the creek for this thesis I discovered a fascinating and complex story that needed to be told. This story includes the interplay of many issues. These issues, often conflicting, include industrial exploitation, water pollution, and wildlife management, which are discussed within the framework of the area's history beginning with the 1860s gold rush in the Little Belt Mountains. What I found was that the mining which occurred then has left lasting and irreparable scars, still visible today.

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In a larger context, the world's rivers and streams have been the victims of a continuing disregard of nature's truth: the condition of a river is largely determined by the condition of the land.² Belt Creek is no exception.

Rivers are susceptible to every kind of transition or alteration because their tributaries branch throughout the countryside. They tend to be purest in their headwaters since river sources are often in hilly or mountainous country with sparse population. Steep-walled valleys do not encourage the growth of industries and river volumes are small. Where they are swift and turbulent, rivers have remarkable self-healing powers; air is mixed with the water in falls and rapids, and the dissolved oxygen decomposes organic wastes.³

As rivers pass through farm and pasture land, they are exposed to contamination by animal wastes and fertilizers—sources of nitrates and phosphates. Much of the phosphate applied to the soil becomes fixed, but the excess nitrate dissolves in the soil water, percolates through the soil and eventually winds its way to streams. Because of its role as a plant nutrient, nitrate, like phosphate, can increase the growth rate of aquatic plants and cause

³Hunt and Garrels, p. 184.
eutrophication. As the demand for food accelerates, the livestock numbers increase. As livestock numbers increase, the amount of liquid and solid wastes from cattle, sheep and pigs added to the landscape daily increases yet their contribution to stream pollution is relatively slight.4

Below the headwaters, streams become less turbulent and self-renewing as they near the sites of human occupation. Pollution in towns and cities are organic wastes: sewage, oil, garbage. All are biodegradable; bacteria decomposes these wastes with various levels of efficiency and speed. As in oceans, river oil absorbs water droplets and becomes a dense, sticky mass. This sticky oil picks up sand or silt particles and sinks to the river bottom. There it degrades slowly, depleting the oxygen in the bottom environment and creating hydrogen sulfide and methane. These oil wastes may float back to the surface, accumulate more particles, then return to the bottom. Organic sludges also settle on river bottoms, destroying organisms by covering them and literally causing suffocation. Once a species of organisms have been destroyed, regrowth can occur only after the sludge or oil has been oxidized away, but even then, return is gradual.5

Many chemical wastes, when mixed with water, produce a precipitate--mine wastes form a reddish-brown iron oxide

4Ibid., p. 185.
5Ibid., p. 186.
that fouls the water they flow into. Although the precipitate may be neither toxic to organisms nor damaging to water composition, precipitates, like many solid wastes, prevent light from reaching river plants or settle on bottom-dwelling organisms.  

Heavy metals such as zinc or lead, when released in dissolved form to a stream, quickly settle through the water and accumulate in the bottom muds. Prospectors for these metals learned long ago that they could better trace the origin of lead and zinc in a stream by analyzing the bottom sediments rather than the water.

Most methods of stream management further aggravate the self-regulating ability of rivers. Stream managers shorten river courses, dredge channels, build artificial levees over natural ones in an attempt to control river courses, to speed up currents, and to help rivers carry their burdens. Rivers, in turn, insist on picking their own paths, so the artificial levees are built higher and the damage from floods increases.

To control the danger of flooding, planning requires a long span of observation to know the individual characteristics of a river under normal or flood conditions.

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6 Ibid.
7 Ibid., p. 187.
8 Ibid., p. 101.
different length and can produce a flood controlled by a combination of factors.  

The effects of stream pollution and stream management have altered, in one way or another, a north central Montana creek that originates high in the Little Belt Mountains and races downstream to the Missouri River. This thesis studies Belt Creek, a pristine water route changed by man, a transition wrought by settlements of whites and their evolving technology.

Within the drainage basin of Belt Creek are the communities of Neihart, Monarch and Belt. Neihart, once a prosperous mining camp, has a population of 170, many of whom stay only for the recreation of the summer months. Monarch, located at the mouth of the Dry Fork of Belt Creek, has a summer population of 160. The drainage of the Dry Fork of Belt Creek once had at its confluence the silver and lead mining towns of Barker and Hughesville, towns now replaced by a few cabins occupied in the summer. The town of Belt, once a booming coal center, is located in the lower reaches of the Belt Creek drainage and is the hub of farming and ranching activities to the north of the Little Belt Mountains. Belt's population numbers 650.

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9Ibid.
Chapter II

TOPOGRAPHY AND LOCATION

The headwaters of Belt Creek are in the Little Belt Mountains, a broad, dome-shaped uplift southeast of Great Falls in central Montana. The range is bound on the north by Cascade and Judith Basin counties, on the east by Judith Basin, on the south by Wheatland and Meagher counties and on the west by the Smith River Valley in Meagher and Cascade counties.

Numerous laccolithic domes are the most abundant and prominent features of the mountains. The domes have obscured the simple folds of the uplift by deforming the sedimentary beds. Erosion has removed the tops of many of the domes, exposing igneous cores surrounded by sedimentary rocks with steep, variable dips. Sedimentary rocks near the summit of the dome are nearly horizontal, while the rocks on the flanks dip sharply toward the surrounding plains, especially on the northern and eastern boundaries.

The mountains are deeply dissected by the headwater branch tributaries of the Missouri River: the Smith River, the Musselshell, the Judith, Arrow Creek and Belt Creek. Belt Creek originates in the King's Hill area at an elevation of 8,000 feet. It flows nearly seventy miles, emptying into
the Missouri River below Great Falls at an elevation of 2,800 feet—a total vertical drop from source to mouth of about one mile.

W. H. Weed, in "Geology of the Little Belt Mountains, Montana," reported that Belt Creek drops 1,677 feet in the 27 miles from Neihart to Riceville. The drop from Neihart to Monarch is 82 feet per mile, from Monarch to Logging Creek, 47 feet per mile, and 40 feet per mile through the Sluicebox Canyon. Belt Creek departs the Little Belts and enters a narrow foothills valley at Riceville. The valley widens at Belt, but the general land relief remains moderate. The principal tributaries of Belt Creek are Jefferson, O'Brien, Carpenter, Harley, Logging, Otter, Little Belt, Big Willow, Willow creeks and the Dry Fork of Belt Creek.
Chapter III

DISCOVERY: THE LEWIS AND CLARK EXPEDITION

In June, 1805 the Lewis and Clark expedition was stopped downstream of a string of waterfalls and numerous cataracts on the Missouri River in central Montana. The entire falls group would be named the Great Falls; a city of that name would eventually be built near them.\(^\text{10}\)

Lewis and Clark moved their camp from the north side of the river to the south side, where they discussed the possibility of an overland portage around the series of falls. This camp, later known as the lower or Portage camp, was about three-quarters of a mile below the mouth of a swift and turbulent stream directly opposite of a large, sulfuric mineral spring.\(^\text{11}\)

Aware that they faced a long portage, the two captains examined their surroundings. They were hemmed in between two high cliffs, and the only means of access to the plains above was the creek, named Portage Creek by the two explorers.

\(^\text{10}\)Larry Gill, "The Great Portage," Great Falls Tribune, Great Falls, Montana, August 15, 1965.

\(^\text{11}\)Ibid.
Lewis and Clark surmised that if they ascended Portage Creek they would locate a slope gradual enough to allow them to drag the dugouts and lading to the prairie floor. It was good fortune that the creek emptied from the south side of the mountains for, from what Lewis had observed, the plain there was less gullied than the north side. 12

The next conference between the two men focused on how to transport boats and goods across the plains to a base above the falls. Because of the impossibility of men carrying the six heavy dugouts, the captains put Sergeant Gass in charge of a detail assigned to build four sets of wagon wheels with couplings, tongues and bodies. For the wagons, particularly the wheels, Gass searched for a tree of large diameter, and found one solitary cottonwood 22 inches in diameter. 13

While Gass and his detail worked with their cottonwood, Clark and five others headed upstream to survey the portage route:

We found great difficulty and some danger in even ascending the creek thus far, in consequences of the rapids and rocks of the channel of the creek, which just above where we brought the canoes has a fall of five feet, and high and steep bluffs beyond it.

There are vast quantities of buffalo feeding on the plains or watering in the river, which is also

strewed with floating carcasses and limbs of these animals. They go in large herds to water about the falls, and as all the passages to the river near that place are narrow and steep, the foremost are pressed into the river by the impatience of those behind. In this way we have seen ten or a dozen disappear over the fall in a few minutes. They afford excellent food for the wolves, bears, and birds of prey, and this circumstance may account for the reluctance of the bears to yield their dominion over the neighborhood.\(^{14}\)

Clark devoted four days to selecting and surveying the portage route. The first known white man to see the falls from the south side of the Missouri, he was also the discoverer of the Giant Spring (or the "Large Fountain" as he called it on his map) just above Rainbow Falls.\(^{15}\)

Clark's survey led him beyond Black Eagle Falls to the mouth of Sun River and three miles beyond the river to a point where three small islands decorated the broad, smooth expanse of the Missouri. Clark named the White Bear Islands, and chose the adjacent southern bottom as the terminus of the portage. He concluded that the most direct route for bypassing the falls would run from Portage Creek across the plains southwesterly to White Bear Islands, a distance of about 18 miles. (The Indians at Fort Mandan had led Lewis and Clark to believe the portage would be only about one-half mile.) With his decision made, Clark


\(^{15}\)Cutright, p. 162.
instructed his men to cut sticks and mark the route on their return to the lower camp.  

During Clark's absence the party at Portage Creek had completed two wagons, drawn the white pirogue from the water and hid it under a cover of brush and driftwood, and had taken the dugouts up the creek to the prairie floor.  

Portaging the falls required 11 days, from June 22 to July 2. The four trips tested the endurance of the wagons and men; each trip was accomplished only at the expense of long hours of difficult labor. The hardship of the portage route was multiplied by the presence of prickly pear, which formed a thick, spiny blanket over the ground. Unless the men watched each step, the spines of the plant pierced their thin-soled moccasins and cut their feet and ankles.

Although Lewis, Clark and the others were unimpressed by the prickly pear they so painfully encountered, the plant's abundant growth was a natural step in the ecology of the heavily overgrazed area. The soil was so thin and devoid of organic matter that when the buffalo depleted the normal cover of prairie grass, the prickly pear rapidly established.

\[\text{Ibid., p. 163.}\]
\[\text{Ibid.}\]
\[\text{Ibid, p. 164.}\]
\[\text{Ibid.}\]
Before abandoning the lower camp, the men of the expedition filled another cache with Clark's latest map of the Missouri, Lewis's desk and dispensable items such as kegs of pork and flour, guns and ammunition. After closing the cache, they broke camp and carried the remaining baggage to the high plain three miles distant. Clark's diary entry noted that, "Portage Creek has risen considerably in consequence of the rain, and the water had become of a deep crimson colour, and ill tasted."21

On the Fourth of July, with the portaging complete and the entire party reunited at White Bear Islands, the men celebrated by dining on "a very comfortable dinner" of boiled buffalo beef, bacon, beans and suet dumplings, topped off with the last of their spirits--except a small amount held in reserve for illness.22

The brief period from June 3 to July 14 had been one of outstanding discovery and accomplishment. Lewis and Clark discovered and named hundreds of topographic features, each of which Clark laid down in a series of maps that demonstrated his ability as a cartographer of rare talent. They succeeded in accomplishing Jefferson's instructions: "to explore the Missouri River, and such principal streams

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20 Ibid.
21 Biddle, p. 175.
22 Cutright, p. 164.
of it, as its course of communication with the waters of the Pacific Ocean, may offer the most direct and practicable water communication across the continent."\textsuperscript{23}

Other geographers and cartographers followed Lewis and Clark and soon filled the empty spaces on the maps of Montana with the Marias, Teton and Sun rivers and the Great Falls of the Missouri. In a few instances, they renamed physical features; one of these, Portage Creek, was rechristened Belt Creek.

\textsuperscript{23}Ibid., p. 394
Chapter IV

ONE HUNDRED AND SEVENTY-TWO YEARS LATER:
VELEBER AND KNUCHEL EXPEDITION

Does the man or woman exist who has not at some time stood before evidence of human activity and wondered what the country in view must have looked like in the days of Lewis and Clark? Whether the view is of a town, a farm or ranch, a string of power lines, or forest clear cuts, each of us has wished at one time that we could see the landscape as it was before the changes.

On the Fourth of July weekend 1977, the Veleber-Knuchel expedition set out to rediscover Belt Creek. The purpose of the trip was to take a close look at present-day Belt Creek and record in journals the impressions and evidences of the stream and its tributaries.

The following are revised versions and excerpts of the journals of four people: Jan and Dennis Veleber and Shelly and Karl Knuchel.

Our trip began July 2, 1977 at Porphyry Lookout on the top of King's Hill. From inside the lookout tower Ranger Carl Stubbert pointed out the range of the Little Belt Mountains, indicating Yogo peak and Baldy to the east.
Ranger Stubbert also specified the ranges of the Belt Creek drainage, and informed us that Belt Creek was "fed by a couple of very polluted streams": the Dry Fork of Belt Creek and Carpenter Creek. According to Stubbert the two streams were "barren" and had been that way for several years. He blamed their deterioration on prior mining operations in the area, and pointed to the locations of the two streams. Karl wrote, "From the tower the areas looked as clean as any in sight."

After a brief stay at the lookout tower, the expedition proceeded down King's Hill. The first objective was to find the source of Belt Creek.

It was a cool, windy morning. The fire danger index indicated dry conditions, yet everything looked green and wild flowers were everywhere. On the highway we spotted beaver ponds in the water along the road and stopped to investigate. The ponds were small and much of the land around them was marshy. There was no indication on the maps, but we guessed that this was the source of Belt Creek, since a small creek did issue from the ponds. The crystal clear stream paralleled the highway and the Many Pines Campground until its junction with Jefferson Creek. (After our expedition, we discovered our error—the small creek spilling from the beaver ponds was, according to the Forest Service Ranger, Sawmill Creek. Evidently, there is conflict among residents on the actual source of Belt Creek.)
At the Many Pines Campground, about three miles from the top of King's Hill, we were startled to find the camping area full of out-of-state campers. At the water fountain we observed two young men brushing their teeth. One tossed an empty styrofoam cup into the bushes; the other made him retrieve it.

After leaving Many Pines we noticed a young woman and her two children fishing the creek. In answer to our inquiry, she said she had been reared in Great Falls and frequently fished Belt Creek, although the success that day was minimal.

Continuing our journey on the highway, we arrived at the junction with Jefferson Creek, a small stream that flowed down from the east. The underbrush was gone from the water's edge, making the cold, clear stream accessible on both banks. Here, too, fishermen were gathered, as well as sightseers and visitors walking along the stream.

Driving toward Neihart, Karl observed:

The rock formations were awesome. They looked like limestone layers but had more colors and vegetation. The plants were lush here and grew right over the creek. The area was extremely pretty and was ruined only by the highway and telephone and power lines running along nature's path of least resistance. I've often wondered why man has always taken the most fertile part of the valley to put his highways and as here why he runs a road through a beautiful setting and then puts high tension lines along side it.

In the town of Neihart we drove onto a side road, where a sign informed us that the meandering creek next to the road was Belt Creek. Here we had a chance to see man's
method of stream control--riprapping, with stones, logs and concrete.

The town of Neihart is wedged in a narrow crease between precipitous mountains. The buildings of the town are a strange mixture: small, neat houses, old, chinked log cabins, a few abandoned structures, and outhouses located within 100 to 200 yards of Belt Creek. At the north end of town an isolated mine sat atop a hill overlooking Neihart and Belt Creek. Karl's journal entry noted that "the mine was ugly as hell and seemed to cast a pall over the otherwise pretty setting." About 2,000 feet above the town on the eastern slope was an ugly scar--the remnants of another abandoned mine.

Across the highway from the mine remains of a sediment pond sat in the midst of dead trees as a grim tribute to modern technology:

Man can settle the unwanted minerals out of the water he uses but can do nothing about the ruin left in the process. Another trade-off that cost more in the long run than anyone doing the trading could ever know at the time of the deal.

After leaving Neihart we took a side trip along Carpenter Creek to the east side of the valley, where we came upon the remains of old tailing ponds. Scarred and weathered, Karl described these mineral beds as "deep lines cut through the sediment, reminding me of topographic maps."

Above the ponds the vegetation appeared healthy and strong and in places, seemed to be growing into the pond sediment. The roads past this point were chained shut,
making the Silver Dyke Mine inaccessible to the curious. Although the description of this area may sound isolated, during the two or three mile drive on Carpenter Creek, we saw numerous groups of campers enjoying the shade of the trees along the water.

Our next stop was at the Belt Creek Ranger Station on the highway north of Neihart. The ranger, when asked where Belt Creek started, replied that "it started on high King's Hill beyond the ponds" we had observed earlier that day.

Back on the road, we headed toward Monarch and our destination--the Dry Fork of Belt Creek. We turned off the highway at Monarch and started up the narrow dirt road on the Dry Fork of Belt Creek. Karl wrote, "What a goddamned mess. The stream was running red, as if the earth was bleeding. The water was murky and sickening looking." In reference to the higher-than-expected number of campers on this road, Karl wrote, "I sure hope they carried their own water because that stream was not fit for consumption."

Near the top of the canyon we drove to the old mining camps of Barker and Hughesville, where we encountered additional remnants of man's handiwork. The mining operations seemed to always leave some permanent scar on the landscape.

Leaving the camps, we returned to Monarch, drove to the top of Monarch canyon and then headed west to the site where Logging Creek drains into Belt Creek. We started
walking on a path along the creek at this point. Karl wrote, "The country was beautiful if not quite pristine. The pine forests surrounded us and towered into the clear blue sky." The path started on the east side of the creek and went along a high ledge above it. After a half mile, the path dropped alongside the water. Crossing the creek was treacherous--the stream was deeper than it looked and startlingly cold. The current pushed our bare feet off the slippery rocks and into water that was thigh deep.

Once across the stream, we were able to follow an old railroad right-of-way, and eventually arrived at a rock quarry once called Albright. Huge lime kilns still stood beside a few decaying structures.

About four miles downstream we encountered a young couple in the process of cooking dinner on an open fire. They acted quite surprised to see anyone this far downstream, and we learned that they made a special camping trip to the canyon once a year.

Leaving the campers, we entered the famous Sluice Box Canyon, a point of grandeur and beauty. The waters of Belt Creek rush through a magnificent gorge--the nearly perpendicular sides of the canyon are limestone cliffs from 500 to 2,000 feet in height.

It was a steep climb out of the canyon and we were grateful to the woman who offered us a ride back to the truck. Appreciating the opportunity to rest, we followed
Belt Creek to the town of Belt. The stream leaves the limestone canyon at Riceville, and meanders, easily observed through hay fields and past farm houses.

A few miles from Riceville we passed Waltham Springs, a year-around stream of fresh, clear spring water. Otter Creek emerges with Belt at the Armington Wye, where we noted the impact of new road construction on the channel of the creek. We turned off the old highway and followed the creek into Belt.

Early the next morning we left Belt and headed north. The highway follows the stream through the prairie valley to the Four Corners Junction. Several miles beyond the junction, the road drops and crosses Belt Creek at the Peck and Lacy crossing, a crossing used by early travelers who needed to forge Belt Creek.

Backtracking, we returned to Four Corners and joined the highway to Great Falls in search of the mouth of Belt Creek. We stopped at the Charles Urquhart property and asked for access permission. He was delighted at our request and entertained us with a number of stories detailing Lewis and Clark and the portage.

The discovery of the site where Belt Creek empties into the Missouri River has been made countless times, but not previously by the Veleber-Knuchel expedition. Our discovery on July 3 was the highlight of our journey and, looking at Belt Creek, 40 to 50 feet wide at this point,
engulfed by the mighty Missouri, we could imagine, for once, that we were seeing it just as Lewis and Clark had in 1805. We could see the mineral spring directly across the river, still discharging a flow of water over a rock shelf into the Missouri. Within view, too, was the small bottom where the first whites established their base camp in the midst of beaver-gnawed cottonwoods. About a mile up Belt Creek we spotted the slopes Lewis and Clark's party dragged dugouts up to the prairie floor above. Our nostalgia, however, did not extend to one other aspect of the 1805 journals--prickly pear was everywhere.
Chapter V

THE FIRST ENVIRONMENTAL UPSET
IN THE LITTLE BELTS

During the 1880s and 1890s people worked to change the Little Belts. The change began rather quietly and on a small scale, but before long, it drastically altered the canyons and forests.

Gold was discovered in 1865 in the gravels of Yogo Gulch, but because of trouble with Indians, the pace of extraction was slow. In 1879, placer mining was in full swing in Yogo Gulch, but miner's attention was soon directed over the mountain to Galena Creek, where two prospectors discovered rich silver and lead deposits. On October 23, 1879, while E. A. "Buck" Barker was hunting, Patrick Hughes found and named the Barker mine in the center of the creek. Soon after, H. L. Wright and H. K. Edwards staked out the Wright and Edwards claim. Within one year "a hundred men were working the area near the head of the Dry Fork of Belt Creek."\(^\text{24}\)

\(^{24}\text{Nels Thoreson, Belt Creek--Cascade County, Montana, Montana Fish and Game, Great Falls, Montana, May, 1971.}\)
At first the high-grade ore was transported by pack horses, mules and horse- or oxen-drawn wagons to Fort Benton and then shipped to various smelters along the river. In some instances, the high-grade ore was shipped to smelters as distant as Wales. Later, to avoid the difficulties of the hauling route, smelters were built in the Galena Creek area. Colonel George Clendennin built a water-jacketed furnace that produced $375,000 of bullion in 18 months. Clendennin was killed by falling rock at the Wright and Edwards mine in 1883, and the smelter shut down after his death.25

Deep exploration in the Little Belt mines yielded a lower-grade ore that slowed production, but with the completion of a silver smelter at Great Falls in 1888 and the extension of the Belt Mountain branch of the Montana Central Railroad to the Barker vicinity in October 1891, the mines resumed full operations.26

In 1881 a party of prospectors from Barker found rich ore near what is now the town of Neihart, named for J. L. Neihart. The "Montana District" was linked by the railroad, later a part of the Great Northern, on November 15, 1891. The building of the branch line railroad enlisted every effort to ensure that no channel changes were made to Belt Creek. The company preferred to build bridges rather

25 Ibid.
26 Ibid.
than reroute the stream.27

Because the ores at Barker and Neihart were predominantly silver ores, the price fluctuations of this precious metal were mirrored by the district mining activities.28 The Hudson Mining Company, owner of the Mountain Chief mines near Neihart, built a concentrator and smelter in 1885-86. The works closed down in 1887; the rich surface ores were exhausted. From 1887 to 1890 the Neihart camp was nearly deserted, and camp life was restored only after the completion of the railroad in November 1891, providing cheap transportation to the smelter at Great Falls. Unfortunately, the renewed activity was short lived: in 1892 the demonetization of silver resulted in a price drop and mining operations faltered.29 With the decline of Neihart, mining activity moved elsewhere and the new mining camps of Barker and Hughesville grew into lusty towns.

In 1870 an adventurous pioneer from Pennsylvania, John K. Castner, initiated a horseback touring expedition to explore the great stretches before him—stretches supposedly inhabited by wild, roaming beasts and friendly Indian hunters.30 In his boyhood days, Castner lived in the famous coal regions of the Monongahela Valley, and his

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27 Nels A. Thoreson, personal interview, August, 1978.
28 Thoreson, Belt Creek.
29 Paul A. Schafer, Geology and Ore Deposits of the Neihart Mining District, Cascade County, Montana, Montana School of Mines, Butte, Montana, 1935, p. 3.
30 Belt Valley Times, August 24, 1911.
years there taught him how to look for coal-bearing forma-
tions. While fording one of the many streams in the Belt
country on his horseback tour, Castner noted, with acute
interest, the existence of promising-looking formations. 31

Seven years later, with an increased demand for coal
in the west, Castner returned to the Belt mountains, staked
a claim and organized coal freighting operations to Fort
Benton, 40 miles away. In good weather, two wagons loaded
with coal and hauled by eight mules, made the trip to Fort
Benton in three days, but when the weather was bad, it was
not unusual for the teams and drivers to arrive in Fort
Benton two weeks after leaving the mines. 32

In 1879 two Easterners, H. W. Millard and George
Watson, got off the train in Belt. Millard filed on land
east of town and promptly opened a coal mine. Watson applied
for work with Castner and induced him to make a coke sample
from Belt coal—a sample exhibited by the Eastern pair at
the first Montana State Fair in 1890. Millard built several
coke ovens and it was the product of these ovens that later
attracted the attention of officials of the Anaconda Copper
Mining Company of Butte. 33

31 Ibid.

32 Dennis L. Veleber, "A Brief History of the Early
Mining Days in Belt, Montana," Problems in History 493,
University of Montana, Missoula, Montana, Fall 1972.

33 Ibid.
The Anaconda Company, managed by Marcus Daly, bought out Castner's interests—mining claims, townsite property and coal freighting operations—and those of Senator T. C. Powers in 1894. The Company's investment success permitted the expansion of operations to Belt and the town, once a hamlet of few settlers, began to grow. The level section of the townsite was quickly dotted with tents, and 200 carpenters worked continually constructing houses and business buildings. Miners came from Pennsylvania, Illinois, Colorado and New Mexico, and were joined by immigrants from Finland, Sweden, Czechoslovakia and Germany. Over 1,000 miners dug coal, while trainload after trainload of ore was pulled up the hill by Great Northern locomotives and sent to smelters in Great Falls or Anaconda.

Along Belt Creek and its tributaries near the town of Belt, extensive prospecting efforts resulted in a number of mines in full operation at the turn of the century. The mine of the Anaconda Copper Mining Company was the largest in the district, but there were four smaller ones working continuously: the Schmauch, the Millard, the Richardson and the Orr Mine.

The A.C.M. mine was located on the west side of Belt Creek, and first opened in 1895. In continuous operation till its closure in 1913, the mine was not continually worked at full capacity, although the output was controlled by requirements of the company's plant in Anaconda.
With the sudden, large-scale expansion of mining activity in Belt, the demand for water to wash the impurities contained in the machine-mined coal accelerated. Although Belt Creek was a vigorous mountain stream that carried a substantial flow of water year around, especially in its upper course, at the town of Belt all the water sinks into the soft, porous sandstone, becoming an underground flow during the late summer months, and leaving the streambed dry. From a point a short distance below the town of Belt, the stream usually reappears as a small but continuous flow. The sinking of the flow of Belt Creek at Belt was a distinct disadvantage for the coal-mining operations, for it was then necessary to sink numerous wells in the valley to obtain sufficient amounts of water. For the A.C.M. mine, this search for water was critical, for the amount of coal cleaned daily ranged from 250 to 300 tons.
EARLY ENVIRONMENTAL ATTITUDES

The water in Belt Creek is so filthy that we will all have the typhoid fever or some other dreaded disease if the creek is still used to dump coal and every other conceivable filth in.

--Belt Valley Times
April 7, 1904

When mining and concentrating activities began along Belt Creek and its tributaries, "environment" and "ecology" were hardly household words. The wilderness was something to be subdued, and the pioneers who wrestled with the forests, the prairie sod, the Indians and the ore-bearing strata were the folk heroes of the day.

Located amid the northern peaks of the Belt Mountains, the region seven miles wide and eight miles long known as the Neihart/Barker mining district was highly mineralized, although tons of rock had to be blasted, moved and crushed to yield silver, lead and zinc. The leftover tailings were deposited at the bottom of the Dry Fork of Belt Creek Canyon and Belt Creek Canyon. Waste water from the smelting operations also were discharged down these creeks.

At the turn of the century, one of the first Belt
Creek stories appeared in the Neihart Herald, reprinted from the Belt Knocker, the school paper.

Last Monday one of Belt's leading citizens, ignoring custom, rule and precedent started out to collect a bill without as much as by your leave, to the disciples of Blackstone.

His bill was nearing that particular stage where nature covers it with a coat of dust and the law says you can get it nit, not yet.

The wiley son of smoke and coal dust, but creditor called him a different son, came to the conclusion that Kent and Blackstone and all the others who passed as legal illuminaries were mistaken when they proclaimed by the way of political balm, that bills after a certain date became a matter of red ink on the right side of the ledgerpage, and to demonstrate his proposition he threw the Marque of Queensberry in the mud and took Coke Oven Flat rules wherein one has the privilege of showing his antagonist stars instead of stripes, just as the son went down.

It was only a blow, but one that did not kill father, for no sooner did the one who struck the ground land upon his six feet of dust, than he was up and off like a shot, with the man who sought for his filthy lucre of good second, seeing that he could not keep up the pace he took to the water that is paluted by the Neihart concentrator and Belt coal dust, and ran out to the middle of the stream.

Neihart Herald, June 23, 1900

The June 21, 1900 issue of the Belt Valley Times carried a notice about the lack of fish in Belt Creek that season. Apparently, the people of the area were having very poor luck on the stream, and they stated that the slum from the concentrator at Neihart was killing or driving the fish from the water. This was bad news for area fishermen, who made an annual tour to the grand scenery of Sluice Box Canyon, famous for its fine fishing. The editor stated:

We believe the residents of the county will take the right view of the matter, as the concentrator is
of more benefit to the county at large than the fish . . . . Besides there are plenty of fine trout streams left and the angler need have no fear but that he can obtain plenty of sport as long as there are no saw mills, concentrators or stamp mills on such streams as the Highwood, Little Belt, Tenderfoot, Davis, Otter, and Arrow Creeks. Hundreds of others of less note could also be named whose waters are teeming with trout, and we can well spare one.

In an effort to restock the stream's "wealth of trout," in August 1901 the Bureau of Fisheries arrived in Belt with thousands of trout destined for streams in the area. The Belt Rod and Gun Club received 1,500 brook trout to scatter from Riceville to Monarch. Another 10,000 black-spotted trout were placed in Belt Creek between Albright and Logging Creek. The Neihart Sportsman's Club received 10,000 black-spotted trout for Belt Creek near Neihart, and the town's mayor received 1,200 brook trout to be planted in Harley and Carpenter creeks.

Yet the anglers weren't the only ones--the people of Monarch complained that the concentrator spoiled their drinking water. The editor of the Times again rebuffed his townspeople, saying that there were worse things than concentrator slum in Belt Creek.

Between 1895 and 1915 the low market price of silver left only the exceptionally high-grade mines open for operation: the Florence, Galt, Broadwater, Big Seven, Ripple, Silver Belt, Hartley, Benton, Queen of the Hills, and Moulton mines. Of the other local facilities, three mills were opened sporadically: the Morning Star, a mill with
a crusher, one set of rolls and jig tables; the I.X.L.-Eureka, a ten-stamp cyanidation plant; and the Broadwater, a concentrator equipped with crushers and tables.

As the mines expanded and modernized their facilities, electrically driven rod-and-ball systems ground ore into particles as fine as confectioner's sugar. The fine-grinding process increased the silt load in the river and created sedimentation problems downstream. Although the sedimentation is aided by the use of settling ponds, the majority of the mines did not have them.

Silver Dyke Mine used a more efficient selective flotation method of processing ores, a method that resulted in the nearly complete extraction of all metals of economic importance. The waste slurries from this process, discharged directly into the natural drainage, were high in residues of metals and chemical additives.

The Neihart concentrator--the target of the complaints by residents along Belt Creek--was operated by the Diamond R Mining Company. The Diamond R perfected a simple treatment for reducing mine rock to two-inch and then one-half inch chunks through a series of crushers and screens. The waste or tailings material from the 150 tons of rock crushed daily was high in lead because a method for treating the rock powder was unavailable at that time. Further mill expansion doubled the amount of rock crushed each day--and the amount of lead washed into Belt Creek. Stamp mills, using mechanical hammers, crushed the mine ore to a fine
powder. These stamping operations produced tremendous volumes of waste waters as they carried pulverized rock and ore. The stamping process did not remove zinc from the ore, and the mass of mill tailings from these years were high in zinc and lead sulfides. Owners of the Diamond R Concentrator illustrated the pioneer attitude toward the "highest and best use" of flowing water. Water was siphoned from Belt Creek and forced through the concentrator, picking up mill tailings that were then discharged down the creek.

The complaints of people living below the concentrator seemed trivial to the majority of people. Most residents were concerned about the recreational aspects the creek afforded, fishing opportunities and the continual threat of flooding.
Chapter VII

THE BELT CREEK VALLEY PROTECTIVE ASSOCIATION
VERSUS THE SILVER DYKE MINING COMPANY

Although the silver mines produced only intermittently between 1895 and 1915, Belt Creek remained "filthy." In 1915 the price of silver started to rise, followed by increased mining activity, but the improved market was not solely responsible. The development of selective flotation processes made it possible to mine and concentrate low-grade ore. When the price of silver slumped again in 1919, a few of the large mines continued production with the aid of the improved concentrating processes that made it profitable to produce copper, lead and zinc concentrates.

In 1916 a new era began in the Neihart district. The steady improvement in the price of silver, over $1.10 an ounce in 1919 before the price fell, enabled many of the mines to reopen. The concentrating plant in Neihart was remodeled and improved to handle 300 tons a day.

In 1918 the Great Falls Barker Mine at old Barker responded to the increase in silver prices by stepping up production. Carloads of ore were trucked to Monarch, then shipped by rail to the East Helena smelter. In 1922 the Block P Mining Company of Barker, under the direction of
ex-senator T. C. Power, operated a 100-ton concentrator that processed 100 to 200 tons a day.

Harvey Mathews, superintendent of construction for the Stearns-Rodgers Manufacturing Company of Denver, manufacturers of mining and milling machinery, was contracted to supply material and supervise the erection of the new mill at the Silver Dyke Mine on Carpenter Creek near Neihart. When asked about the disposal of the tailings and the probability of pollution in Belt Creek, Mathews replied, "absolutely no possibility."

The tailing would be carried through trenches around the hill side and deposited into large settling basins in the canyon, and topography of the country being such that there is no chance of tailings getting into Carpenter Creek, much less Belt Creek, into which Carpenter Creek empties.

---Belt Valley Times
September 28, 1922

The controlling interest in the Silver Dyke property was purchased by the American Zinc, Lead and Smelting Company in 1922 and, in accordance with a previous agreement, a reserve of nearly one million tons of milling ore, containing copper, lead and silver, was set aside. In preparation for large-scale production, a 500-ton flotation plant was completed in March 1923. From that time until the mine closed down in April 1929, the Silver Dyke Mine was the largest producer of silver in Montana, excluding Silver Bow County. Development work totaling more than 4,000 feet of core drilling was done in 1925 and the following year
the mill was enlarged to a production capacity of 950 tons.

In April 1924 members of the Great Falls Sportsmen's Association met with Mr. Wampler, superintendent of the Silver Dyke Mining Company, to discuss the waters of Belt Creek--made uninhabitable for fish by the slum from the Silver Dyke Mine. The association was aware that state laws gave the residents no recourse from mining-induced pollution and that only voluntarily could the corporation be convinced to alleviate conditions. Wampler appeared willing to remedy the situation.

The Sportsmen's Association suggested that an Easterner who had invented a method of purifying streams be brought to Neihart. The Dyke Company agreed to pay half the travel expenses of J. T. Travers if the Sportsmen's Association would pay half.

That summer Travers, supervisor of streams in Ohio, arrived to study the condition of Carpenter Creek and the settling basins at the Silver Dyke Mine with the hope that the mining slum could be diverted from Belt Creek. Members of the Great Falls Sportsmen's Association accompanied Travers to the operations and escorted their visitor on a 45-mile inspection of a once-beautiful trout stream ruined by the waste of mining operations.

Travers was no newcomer to water pollution and expressed no surprise at the swampy water or the muddy odor
that was noticeable some distance from the stream. The bed of the creek was coated with a slimy yellow deposit, making it impossible to approach the water without ruining shoes and pant legs.

The Silver Dyke Company was keenly interested in any attempt to purify the water, not because of the appearance of Belt Creek or the pressure of neighboring landowners and fishermen, but because they were periodically short of water and could reuse the purified water in their operations. The company was already precipitating two-thirds of the mining slum in an upper dam and if they could find a sufficiently large reservoir site on Carpenter Creek, they could, by the use of a modification of calcium chloride, purify the water expelled into Belt Creek. But no site for this purpose existed on Carpenter Creek--no site could hold an accumulation of five car loads of wastes a day for an indefinite period.

Realizing the magnitude of the storage problem, Neihart residents were convinced the company was doing everything possible to alleviate the trouble. Knowing that the problem would take time to solve, people hoped that it would be possible later to find a dry coulee where the water could be flumed and allowed time to precipitate properly.

In the meantime, the slum from the mill continued to run into a coulee above the camp where, as the waste accumulated, the dam was raised. This 90-foot high dam
took care of 60 percent of the waste. The other 40 percent of the waste that escaped the dam consisted of particles small enough to pass through a 325 mesh. This waste was fine as flour and, when taken between the fingers and rubbed, produced the same sensation. This fine-grained waste was the reason for bringing Mr. Travers from Ohio--without success, for no available storage reservoir could hold precipitate for 22 days.

The following spring very few fish were reeled in from the waters of Belt Creek. The few that were caught were pale, long and attenuated and usually returned to the muddy waters of the creek or kept to show as curiosities.

In July 1925, S. A. Remington, the editor of the Belt Valley Times, held a candid discussion with the officials of the Silver Dyke Mining Company. He cited concrete evidence of instances of dry wells, ruined irrigation systems and loss of stock along Belt Creek. He, like the other residents, still believed the company could and would return the almost golden brown waters of Belt Creek to a clear condition.

Oddly, Belt Creek water and city water were apparently separate. The city obtained its water from a well dug by the Anaconda Copper Mining Company during an excessively dry season when additional water was needed to keep the mine's washer running. The city water carried markedly less minerals and lime than the creek water. The cementing
of the bottom of Belt Creek by the slum from the Silver Dyke produced no marked effect on the flow of the city well.

In the middle of July 1925, the Silver Dyke dam, used to contain the waste and slum from the Silver Dyke Mill, was weakened by earthquakes and, with repeated shocks in a two-week period, broke. Without warning, the dam--more than 100 feet in height--gave way and a flood of water and tailings swept across the valley of Carpenter Creek. Two young children were caught and drowned in the swirl of water. Two days later Belt Creek was liquid mud and the mine shut down to accommodate the work of rebuilding the dam.

Residents of Belt Creek quickly grouped to form the Belt Creek Valley Protective Association in August 1925. Spurred by descriptions of the damage done by the flood, the association pledged cooperation to induce the mining companies operating in the upper Belt Valley to use a reasonable amount of precaution when dumping the waste of their mills into Belt Creek. The membership was clearly opposed to the damage done to their property by the flood of slime from Belt Creek, and expressed a desire to insure the safe, future use of Belt Creek water for drinking and irrigation. Additionally, the Association wanted to obtain this objective without legal injunctions or damage suits.

Some members of the Belt Creek Valley Protective Association thought that the Block P and Silver Dyke would automatically take the necessary measures to protect the waters of Belt Creek when the enormous amount of damage
already done was called to their attention. But the people who lived in the valley realized clearly that the situation was growing steadily worse—to the extent of driving people from their farms and homes. Everyone knew of formerly fertile and beautiful ranches that were no longer saleable. In an area where water was precious, who would buy land bordering a creek saturated with lime? Who wanted water that, when boiled, produced a layer of scum and a heavy deposit in the container?

A meeting date was set in Belt to discuss the pollution problem and to decide a means of eradicating the "evil." As one concerned citizen commented,

Picture to yourself the valley of Belt Creek after a few more years use as a sewer and you will see a condition as undesirable as it is ruinous.

--Belt Valley Times
September 10, 1925

An editorial in the newspaper (September 10, 1925) reflected the sentiments of the mass meeting:

Belt Creek can be cleared at some expense to the mining companies. When they have an opportunity to hear the other side of the question, we feel certain that they will be willing to meet the public half way. The public has suffered considerable damage up to the present time and will suffer much more before the waste is controlled. A wealthy mining company can not afford to follow a policy of the public be damned. Neither can the people living in the community afford to be selfish or unreasonable. Right is right and when the operations of one set of individuals bring loss and poverty to another set an adjustment must in justice and equity be made.

--Belt Valley Times
The mass meeting drew a large crowd. The hall was filled with ranchers from Monarch to the Missouri, residents of Belt and surrounding communities and a large delegation from Great Falls. President Russell Strain of the Belt Creek Valley Protective Association called the meeting to order and declared "that it was in no way an indignation meeting but a gathering of those interested to proceed in a business-like manner in steps working toward the clearing up of Belt Creek." (Belt Valley Times, September 10, 1925)

... The residents of the valley had waited patiently or otherwise for the causes of dissatisfaction to be remedied but in vain and it had seemed best that this organization should be formed so that the mining companies would have some organization with which to deal, and because the fact of such organization would render easier the placing of the facts of the case before the proper authorities ... the executive committee was ready to confer with the officials of the Silver Dyke Mining Company or the Block P at any time.

--Belt Valley Times
September 10, 1925

So that the audience might know the general purpose of the BCVPA, the constitution and by-laws of the organization were read. After reports given by the association's attorney, the Belt city attorney and the secretary of the Great Falls Sportsmen's Association, the meeting was opened and a general invitation was made for any representation of the Silver Dyke or Block P interests to address the meeting. No one responded.

A call was then made for BCVPA membership. The response was immediate and about 100 names were added to
the roll.

After consideration by the membership, it was proposed that the first step should be to present the case to the Montana Attorney General for his consideration. A few days later the officers of the BCVPA appeared before L. H. Foote, as well as to officials of the Montana Health Department and the Fish and Game Commission. The following month Attorney General Foote decided to allow the suit to be entered in his name on behalf of the state.

In November D. I. Hayes, manager of the Silver Dyke Mining Company at Neihart, arranged a meeting with the executive committee of the Belt Creek Valley Protective Association. He discussed with members methods by which the company voluntarily proposed to correct the situation resulting from the dumping of mill tailings in Carpenter Creek, a tributary of Belt Creek. Hayes stated that the character of the materials handled in operating the mine was distinctly different from any the company had previously employed. Use of the flotation process required that the ore be reduced to fine particles, leaving a residue that caused entirely new problems. The extreme complexity of the ores made a modification of the processes employed necessary before the mine could be placed on a practical working basis.

Manager Hayes thought that the period of experimentation was past. Results in the last six months gave promise
of permanency to the methods used in the mining and milling operations: the tailings dam destroyed by the July earthquake was efficiently disposing of the sediment. According to Hayes, the coloration of the water from the dam was virtually the only result of the mill's operation.

Further, the company intended to construct a series of three dams—dams that would in effect eliminate objections about the condition of water in Belt Creek and allow Belt residents the same pure, clear mountain stream as the residents of Neihart. The new settling pond was to be much larger than the one destroyed by the earthquake and the proportionately greater elimination of residue from the stream should create a universally satisfactory situation.

The hope that the trouble might be settled and eliminated without recourse to the courts was lost because the Silver Dyke failed to gain adequate assurance of tailings control. The BCVPA filed suit, demanding an abatement of the nuisance caused by the dumping of the tailings from the Silver Dyke Mill into the waters of Belt Creek. No longer would the Belt Creek property owners accept the "maybe" assurances that the condition of Belt Creek would improve after the construction of dams. The suit called for positive guarantees of the alleviation of pollutants.

As the complaint stated:

Belt Creek is and from time immemorial has been, a natural stream of water with a well defined channel
flowing through or near the lands of these plaintiffs, and many other persons similarly situated, and through the towns of Monarch, Riceville, Armington, and Belt. And until the wrongful and unlawful acts of the defendant there was a continuous flow of a large volume of fresh, pure, healthful and usable water in and through said stream, which for more than 30 years has been used by these plaintiffs and their predecessors in interest.

This condition, the complaint continued, has existed for the last four years, when the Silver Dyke Company began operation of ore mines, mills and concentrators. At that time, the water of Belt Creek became polluted and contaminated by slack, slime and mineral deposits in Carpenter Creek. The plaintiffs contended that an impervious coating had formed over the bed and banks of the creek, preventing water from seeping through the banks into adjacent fields, that springs and wells had dried up, to the "great inconvenience and irreparable damage and injury of owners and users" of the water. (Belt Valley Times, February 18, 1926)

In requesting abatement, the plaintiff stated:

that the defendant threatens to, and will unless restrained by the court continue to deposit, dump, discharge refuse into said Carpenter Creek, from where they are discharged into Belt Creek, and to continue to thus pollute and contaminate the water of Belt Creek.

--Belt Valley Times
February 18, 1926

The suit summed up by claiming that the entire territory traversed by Belt Creek lent itself to great scenic beauty, that it was rough and thickly wooded by trees,
shrubbery and flowers and that as a consequence of the pollution, hundreds of large trees died, marring and partially destroying the beauty of the territory. The stream had been abundantly supplied with game fish, providing an excellent resort for fishermen. At the present time, however, the mineral deposits had destroyed the fish.

The following month the Silver Dyke attorneys filed papers requesting that the creek suit be thrown out of Federal court. The resulting motion to dismiss the abatement proceedings filed against the Silver Dyke Mining Company by nine Belt Creek property owners asserted that the suit was one of common interest to persons constituting a class so numerous that it was impracticable to bring them all before the court and that the plaintiffs had been designated to prosecute the action for other persons than themselves. The defense alleged that the charge contained in the complaint did not constitute a valid cause of action in equity.

The case was filed in Federal court. Oral arguments were presented by attorneys representing the property owners in support of the complaint.

In addition to a 24-page memorandum of authorities in support of the motion to dismiss the charges, Silver Dyke attorneys also filed a second brief citing reasons for striking certain sections of the complaint and asking further particulars. The mining company asked that the
section of the complaint describing the scenic beauty of Belt Creek be stricken on the ground that it was not pertinent. The brief also stated that a specific statement as to the loss of water in springs and failure of the water from the creek to percolate through the banks to adjoining farms was necessary to make the complaint intelligible. The company contended that no two bodies of land along Belt Creek are situated in exactly the same relation to the stream and that a general statement of the damage done to property along the creek as a result of the alleged pollution was insufficient to prove the case. (Belt Valley Times, May 13, 1926)

Jude Hubber and other Belt Creek property owners asked the court to grant an injunction restraining the mining company from dumping tailings from its operations at Neihart into Carpenter Creek. The plea stated that water was no longer available for domestic or livestock use, and that mineral matter washed down from the Neihart mine had encrusted the banks of the creek so that water could not percolate through the soil, affecting wells and springs on property near the creek.

During these legal manipulations, the Silver Dyke Company constructed the first promised settling dam—a dam 15 feet high and capable of holding back several acres of water and tailings. Tailings flumed from the mill were dumped behind the dam face, where the heavy sand settled
and the water spreads out over the pond, continually precipitating slum. As the water cleared, it flowed back to the outlet and was led under the pond to the creek bed below the dam, where it emerged just slightly discolored and devoid of heavy waste.

A few hundred yards below the first dam, construction work was continuing on a second dam that would impound a still larger body of water, capable of additional tailings disposal.

The associate editor of the Engineering and Mining Journal wrote an article describing these new works. Titled "Novel Mining and Milling Methods at the Silver Dyke Property at Neihart, Montana," the last paragraph of the article stated:

Tailings disposal presents certain difficulties, as the colloidal content of the ore causes it to settle very slowly. The small area available for settling ponds introduces a severely limiting condition. Hydraulic fill and crib dams have been constructed, and the available area for ponds has been utilized to the best advantage.

---Belt Valley Times
February 5, 1927

Prior to 1908 Belt Creek had posed no flooding danger and the people believed that there was no occasion for alarm. However, in May 1908 15 inches of rain combined with heavy mountain snowfall caused the creek to rise rapidly. The riprapping that had not been touched in twenty years withstood the tremendous current near the town of Belt but there were breaks elsewhere in the valley and
the creek cut new channels, destroying meadows, farmland and homes.

One month after the flood an inspection was made of the Belt water supply. During the high water marked change occurred in the chemical quality of the Belt water. Compared with an analysis made the previous February, the State Board of Health's study indicated that the total dissolved solids carried by the creek increased nearly eight times—from 448 ppm to 3,508 ppm. This chemical analysis noted that the change in the character of the city's water was not due to mine sediment—the mine water contained iron and free sulfur but the well water was free of both. Additionally, the well water was perfectly clear while the river water was turbid due to the tailings from the Neihart mine. The mine's insistence that Belt Creek's water did not affect Belt City water was no longer believed by Belt residents, armed with the Board of Health Study.

Before the suit filed by the Belt Creek Valley Protective Association was heard by Federal court, the Silver Dyke Mine announced its closing in March of 1928. The given reason was exhaustion of local ore and the inability of purchasing further ore reserves.

A general feeling of regret surrounding the closure was mixed with relief that the cause of Belt Creek contamination was gone. With the reluctance at seeing the genial, companionable personnel of the Dyke scattered, came the pleasureable thought that within a few years Belt Creek might
regain its pristine purity and beauty, that trout would again some day inhabit its cool waters and that the creek's banks would again be ideal campgrounds for Sunday family parties.

The Silver Dyke Mining Company attempted to keep waste materials out of Belt Creek but the narrow, short valley of Carpenter Creek made it difficult, for few holding dam sites could be found. With 600 tons of waste turned out of the mill daily, the volume of tailings could eventually fill all available space and made a mud wallow of Belt Creek. To postpone this day, high water was allowed to carry away the winter's accumulation of tailings and only during the summer months was there an attempt to keep Belt Creek clean. But the summer was too short a time period to restore the plant life or lure back the once-abundant trout.

The people of Belt wanted no argument with the mining industries of the Little Belts but most of them depended directly or indirectly on Belt Creek for water for domestic and farm purposes. With the water unfit for consumption, a struggle for self-preservation was inevitable.

Although the Silver Dyke no longer polluted Belt Creek, drab-colored water from Dry Fork was now attracting attention in Belt. Unlike the Silver Dyke Mining Company, the St. Joe Lead Company had twelve miles of creek bed for building settling ponds and Belt residents believed that, in this instance, the mine would not have any trouble holding back tailings from the mill. Whereas they had been willing
to compromise with the slime of the Silver Dyke, the townspeople openly complained about the offensive coloring and the possibility of lead poisoning in Belt Creek.
Chapter VIII

BELT CREEK: A RESPITE IN THE 1930s
FOLLOWED BY THE RECKLESS 1940s

The Izaak Walton League, dedicated to cleaning polluted waters and establishing rearing ponds for fish, formed a branch in Belt in April 1929. The impetus for the league's organization was Belt Creek's spring runoff—the water carried a sizable overload of tailings from Carpenter Creek.

D. I. Hayes, the Silver Dyke manager, claimed that by sending everything possible downstream during high water, the creek would be clear later that summer. As a result of the heavy load of suspended particles, the county health officer posted warnings: Belt Creek was polluted and unfit for drinking purposes.

In July, the Izaak Walton League Chapter of Great Falls, assisted by a small membership from Belt, began work on a rearing pond at Riceville, with the hope that the trout would someday be transferred to Belt Creek. At the next Izaak Walton League meeting, members confidently expected that if Belt Creek was freed from the contamination of tailings, fishing would improve.
In 1930 silver prices plunged to below 40 cents an ounce and Belt Area mines were forced to close, with the exception of a few shipments made by lessees working the Silver Dyke. Mines remained idle from 1930 through the summer of 1933. That fall renewed activity was reflected by shipments of ore from Carpenter Creek and the construction of a small mill at the Morning Star Mine.

Unexpectedly, it was announced that the St. Joseph Lead Company of Hughesville was also closing. The specific cause of the shutdown was unknown, but it was locally attributed to the general depression.

As silver prices continued to fall during the early 1930s—reaching a low of 30 cents—mine closures halted all further water contamination. For the first time in years, vegetation reappeared and trout were planted in Belt Creek.

The fishing in Belt Creek improved in the 1930s and more recreationists were attracted by the clean-flowing Belt Creek, the abundance of deep holes for fishing and swimming and the scenery.

Without regulation, Belt Creek continued to overflow its banks every spring. To combat the flooding the residents of Belt spent time and money on riprapping, receiving funds from the federal government through the Works Projects Administration (WPA).

In 1934, the price of silver was fixed and small-scale mining operations reopened. The price of silver rose in 1936, as did the amount of mining activity in Neihart. With
the increased mining and milling, Belt Creek again became the vehicle for mine tailing disposal. As the country entered the stable price years of World War II, pressure for increased mine production put an even heavier burden on Belt Creek. The operations of mines during and after World War II was purely economic and without environmental consciousness. For example, no thought was given to the construction of settling ponds to protect the streams in the 1940s whereas ponds were of primary concern 20 years earlier.

By 1950, the haphazard use of stream water in mining and milling operations led observers to note that for weeks the flow of water in Belt Creek lessened at an unusual rate. The thin trickle of remaining water was dark, and yellow sediment lined both sides of the stream. One experienced resident remarked: "The bed of the creek needs a good bath and nothing but the high water of spring will give it." (Belt Valley Times, April 16, 1950)
Chapter IX

THE 1950s: RAIN

"Rain is like catsup in a bottle, none then all."
--Gladstone

The worst flood in nearly a half century struck the communities of Neihart, Monarch and Belt in 1953 as the result of a month of unusually heavy rainfall—a concentration of 18 inches of rain fell between May 23 and June 4. Situated in the heart of the major storms of that May-June period, the town of Belt was covered by nearly five feet of flood water. The flood crested on June 3, and caused an estimated damage of $372,000 to residential, business and public property, making it the worst known flood in Belt Creek history.

Heavy rainfall usually falls in the months of April, May, June and July. In 1892, 1897, 1902, 1906, 1907, 1908, 1909, 1914, 1916, 1917, 1923, 1927, 1928 and 1948 flood conditions existed on Belt Creek, brought by rainfall augmented by snow melt from the upper reaches of the mountain to the south and east of Belt.\(^{34}\)

\(^{34}\)U. S. Army Corps of Engineers, Report on Flood Control of Belt Creek, Belt Montana, 1953.
From 1900 to 1937, efforts to stabilize the channel of Belt Creek through the town were made by riprapping banks and raising the low levees along the creek. In 1937, under a WPA program, an extensive bank stabilization project was initiated and this work adequately protected the residential area from Belt Creek's usual annual spring rise.

Shortly after floodwaters subsided, Belt city officials and other concerned townspeople met with the Army Corps of Engineers. At the request of the local interests, the corps studied the recent flood, and designed maps and plans that would afford a high degree of protection against similar disasters.

The plan, called "Design Storm," was based on corps engineers' surveys of the flooded area. This information enabled the corps to draw plans for the future safety of the community.

The Army Corps of Engineers recommended that Belt's protection would be assured by a system of earth and stone levees 6,100 feet long on both banks of the channel. And, in order to improve the section of Belt Creek within the town limits, the corps proposed to dredge and widen the channel.

That winter Belt Creek was dredged and straightened. The new channel varied in width from 40 to 60 feet and eliminated a particularly bad "S" curve south of town.

In late summer of 1956, the mine-mill of the Lexington Mining Company, located at the site of the Big Seven
Mine, began dumping their operational wastes into tributaries of Carpenter Creek which flowed, milky and murky, into Belt Creek.

On December 20, 1956, the Montana Water Pollution Council met in Helena to consider the Belt Creek pollution problem. Walter M. Allen represented the Montana Fish and Game Department, and Nels Thoreson, District Four Representative, attended to present photographic information. In the course of this meeting, the Montana Water Pollution Council initiated action to prevent further pollution of Belt Creek by restricting its classification.

In the spring of 1958 winning essays on Operation Facelift by Belt school children were published in the Times. One problem was mentioned in almost every essay—the disgusting condition of Belt Creek. The following brief quotations were taken from the essays submitted:

There should be a law that prevents the people from throwing trash and other junk in the creek. Sewage should be prevented from running into the creek. Instead a sewage plant should be built to take care of the sewage. The creek should be stocked with fish.

There is junk in the creek like old tires, broken boxes, tree limbs, and glass that should be cleaned out.

People should not throw garbage into the creek.

The citizens of Belt could make our community 100 percent better. Do you think the creek is pretty? It could be if mine water, sewers, and junk were not allowed to run or be thrown in the creek. After a year or so the creek would be beautiful. Be a good citizen. Help make our community attractive!
You and others can get up a petition and try to stop mine water that comes into Belt Creek and kills fish and trees.

We should plug up mine water running into Belt Creek. We should plug up the sewers that run into the creek and not throw garbage in it.

I think that the law of a $100 fine for dumping rubbish in the creek should be enforced.

--Belt Valley Times
April 17, 1958
Chapter X


An infinite variety of reports surfaced from 1960-1976 concerning a wide variety of perceived problems of the Belt Creek Drainage. The detailed reports were published by individuals and agencies concerned with the past and future activities of the area. In most cases, reports simply stated the obvious deficiencies without listing solutions or alternatives.

In 1960 the Montana Water Pollution Council met to consider and adopt standards of water purity and quality and assign classifications to the Missouri River and all tributaries in Montana. In reference to Belt Creek, the council stated that the stream was used for industrial waste disposal from mines near Neihart, Hughesville and Monarch.

Nels Thoreson, Montana Department of Fish and Game, Great Falls, testified that he objected to the statement: "It seems to be established on Belt Creek that there is present use of industrial wastes." Thoreson stated that at the present time there was no industrial waste, no mine-mills in operation, and that there hadn't been for some time.
The statement contained, according to Thoreson, an inference that industrial waste is discharged into Belt Creek from or near the cities of Neihart, Hughesville and Monarch. Thoreson did not want Belt Creek designated a polluted stream because the designation would allow an increase in the stream's pollution level. F. F. Palmer, chairman of the Montana Water Pollution Council, remarked that the council had received more directives, discussions, complaints, and other comments about Belt Creek than any other creek in the state.

In May 1962 the Belt area was soaked by a much-awaited five-inch rainfall that covered parched land and filled streams and reservoirs. The creek flowed to the top of the banks, carrying logs, roots, scraps and other debris. At last, the creek bed received a long-neglected cleaning.

In June 1964 the stream swelled again and overflowed its banks in several places but with minimal damage. Since the channel through Belt had been widened and deepened after the disastrous flood of 1953, the channel was capable of carrying the increased volume of water effectively.

In 1962, the Montana Department of Fish and Game surveyed 12 trout streams or rivers located throughout the state to assess the impact of manmade channel alterations. The purpose of the inventory was to measure the amount of stream channel changed by man, the type of channel alteration and the party responsible for the alteration. The
study also wanted to note the amount of reduction in the
carrying capacity for trout in the altered waters.

The Division of Environmental Sanitation investigated the Dry Fork of Belt Creek in 1965, collecting water samples for pH and heavy metal tests. The tests were also used to determine the chemical nature of mine water flowing into Galena Creek and to locate possible sources of mine water pollution. A previous study of the aquatic fauna population of the Dry Fork of Belt Creek revealed that bottom fauna were abundant above the confluence of Galena Creek and the Dry Fork, but virtually absent below that point.

The results of the 1965 investigation showed that seepage from the American Smelter and Refining Block P Mine contained high levels of heavy metals—particularly iron. It was evident that levels of iron and zinc in the Dry Fork were toxic to aquatic fauna at least four miles below the junction with Galena Creek. The deposition of heavy metals on the stream bottom over a period of years completely coated the stream bottom, creating intolerable conditions for fish food organisms.

As the stockpile of evidence increased, in 1968, federal and state officials were concerned about the need for a pollution control program for the Dry Fork of Belt Creek.

A Montana Department of Fish and Game official reported that trout placed in cages below one pollution
source on the creek failed to survive 25 hours of immersion.

In a hearing on the pollution of the Dry Fork, conducted by State Senator William H. Bertsche of Cascade County, health officials testified that it was inadvisable to swim in the polluted area of Belt Creek or to drink the water. Bertsche, who conducted the hearing as a member of the Lewis and Clark National Forest Advisory Board, emphasized that the decision to clean the polluted stream hinged on money, not technology. (Great Falls Tribune, October 18, 1968) The hearing consensus was that public pressure and well-informed, persuasive officials were needed to push an aggressive water purity program.

In 1969, Governor Forrest A. Anderson received a letter from a father who took his son fishing near Hughesville. His eight-year-old son asked why there weren't any fish in Belt Creek, why the creek was red colored, and why nothing was done about it? The father, in his letter to Governor Anderson, asked,

Why should a few people be able to use the resources of this state and leave them polluted for me and my son and that is to say nothing of his son. Who are these people that they can infringe on my land without any concern for me or mine? Their pollution runs through the lands of Montana that are for public use. Can our government do something to stop this and what can I do to help?

The governor directed Frank H. Dunkle, then Fish and Game Director, to furnish a detailed report of the pollution of the Dry Fork of Belt Creek by acid mine drainage.
Dunkle's report and State Health Department reports accompanied the Governor's letter to the father, with the plea that the father tell his son that the governor was doing everything he could to determine why Belt Creek did not have fish, and why it was colored red.

In 1974 the Montana Department of Fish and Game proposed to establish the Belt Creek Fishing Access, located along an eight-mile section of Belt Creek between Logging Creek and Riceville. The Department of State Lands rejected the proposed title and the access area was renamed the Sluicebox Canyon State Monument. As an area of natural and historic qualities, the monument was fenced and an effort made to protect the vegetation.

Cascade County residents applauded the creation of the Sluicebox Canyon State Monument, but revived complaints of sewage discharge pipes jutting into Belt Creek.

Pat M. Goodover, in conjunction with the Cascade County Health Department, was instructed to determine the nature of sewage disposal facilities of land owners along Belt Creek above Belt, to locate discharge pipes in or near the creek, and to recommend changes in undesirable sewage disposal facilities.

Goodover's study listed a total of 12 direct sewage discharges, six dishwater discharges, eight old unused sewage discharge pipes and 26 outhouses within 50 feet of Belt Creek. Coliform test results indicated temporary
degradation of the water as Belt Creek passed through Neihart.

All tributaries of Belt Creek were relatively free from sewage contamination, except Otter Creek, which enters Belt Creek above Armington. The coliform test stations on Otter Creek showed a high fecal coliform count, indicating the presence of sources of sewage contamination. (In an interview with a Cascade County health official in 1978, sewage contamination of Belt Creek or its tributaries was no longer a problem.)

In 1974 the Water Quality Inventory and Management Plan was prepared by the Water Quality Bureau of the Environmental Sciences Division of Department of Health and Environmental Sciences for the State of Montana. This report presented information concerning water quality and water quality inventory and management in the Missouri-Sun-Smith basin, one of 16 basins designated by Montana for preparation of water quality management plans. The Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) directed states to prepare plans as part of a nation-wide water pollution control plan.

The report indicated that even with the application of best practicable treatment of industrial and municipal discharges, the waters in the Missouri-Sun-Smith basin would not meet state water quality standards. Sand Coulee Creek, the Dry Fork of Belt Creek and Belt Creek below the Dry Fork
were classified as water-quality limited segments as a result of severe acid mine drainage.

The report noted the occurrence of ground-water pollution in areas of the Missouri-Sun-Smith basin. Agricultural wastes included irrigation return flows, animal wastes, runoff from range and cultivated lands and from land treated with pesticides and fertilizers. Acid mine drainage was present from metal mines in Carpenter, Galena, Lump Gulch and Spring creeks, and acid waters drained from coal mines near Belt into the Sand Coulee drainage. Belt Creek suffered from acid mine discharges in its headwaters and was dewatered naturally in its lower reaches.

The Barker Mining District, 45 miles southeast of Great Falls, was the site of an Environmental Protection Agency-sponsored study of acid mine drainage. Seepage from inactive mines near Hughesville degraded the water quality of the Dry Fork of Belt Creek, which joins Belt Creek at Monarch.

Belt Creek near Neihart contained moderately hard, calcium bicarbonate water with low sulfate, chloride, magnesium and sodium concentrations and low turbidity. Metal concentrations—attributed to mineralization of the area—at the nearby Neihart station generally were low, except during spring runoff. Metal concentrations near Monarch (above the Dry Fork) were significantly higher than
near Neihart. Carpenter Creek, site of the Montana Mining District, drains into this reach of Belt Creek and was the probable metal source. Belt Creek below Riceville loses much of its flow to channel seepage and often is dry above its confluence with Otter Creek (near Belt, Montana). Seeps from inactive coal mines near Belt contributed additional acid mine drainage to Belt Creek.

Waste Load Allocations section of the report stated that Sand Coulee Creek and Belt Creek below but including the Dry Fork of Belt Creek were classified as water-quality limited because of acidity and metal problems due to past mining activities. Effluent from the Belt sewage lagoon was the only discharge into Belt Creek.

A report on Acid Mine Drainage in the Hughesville, Montana area was prepared in 1970 by the Montana State Department of Health as a preliminary plan for correcting the mine drainage problem. The report stated that in 1963 the Great Falls district of the Montana Department of Fish and Game reported that drainage from abandoned mines in the Hughesville area was adversely affecting the water quality of the Dry Fork of Belt Creek. Field investigations to determine the extent of this problem were conducted in 1963, 1965, 1966 and 1967. The biological condition of approximately 12 miles of stream was altered by the mine drainage. Chemical analysis of water from the stream revealed that low pH and high concentrations of iron and
zinc were the chief causes of the changed biological conditions.

In 1972 a pre-feasibility study entitled "Control of Acid Mine Drainage On Galena Creek, Hughesville, Montana" was prepared jointly by the Board of Cascade County Commissioners, the Department of Natural Resources and Conservation and the Department of Health and Environmental Sciences. The study was conducted to select a demonstration area suitable for a grant application from the Environmental Protection Agency, as provided by the Federal Water Pollution Control Act, Section 14, "Area Acid and Other Mine Water Pollution Control Demonstrations."

In the Hughesville area, 15 miles of Galena Creek and the Dry Fork of Belt Creek were affected by acid mine drainage from the Block P and the McBride Mine. This area was selected for a demonstration project because of strong local interest in drainage control.

The water coming from the mines was thought to be surface water percolated through oxidized mine diggings into shafts and tunnels. The mines themselves were considered dry mines.

The United States Environmental Protection Agency sponsored a grant for the Montana Department of Natural Resources and Conservation to initiate a feasibility study to examine the acid mine drainage problems of the Dry Fork of Belt Creek and recommend abatement methods.
The study disclosed that water quality in Galena Creek and the Dry Fork of Belt Creek was significantly influenced by acid mine drainage from old lead and silver mines. Water quality in this drainage was extremely poor at the Liberty Mine seep, a spring at the Block P Mine, and a spring in Galena Creek near abandoned mine cars. The quality improved in the Dry Fork of Belt Creek below Galena Creek, but the water was still toxic to most aquatic life.

The EPA report noted that during the spring months, the Block P Mine spring contributed from 20 to 80 percent of the total metal load in Galena Creek; the spring at the abandoned mine cars in Galena Creek contributed from 20 to 60 percent of the metal load.

Several methods were considered for treatment and abatement of the study area's acid mine drainage problem. Surface manipulation of minewaste dumps and streams was considered a feasible method in terms of effectiveness and adaptability to extreme climate changes. A second alternative for acid mine drainage treatment focused on the use of limestone neutralization--which reduced concentrations of iron and copper, raised the pH, but did not significantly reduce loads of zinc, manganese or cadmium in Galena Creek. Another alternative, Cottrell dust (a lime waste from cement plants) was tested for neutralization ability and was found to significantly reduce loads of all metals investigated. A fourth alternative, a combination of lime-
stone treatment and reaction with Cottrell dust, appeared to be the most economical alternative for neutralization.

Neutralization was not recommended because of the high cost of annual maintenance and poor winter accessibility to the site.
Chapter XI

SUMMARY AND CONCLUSION

"When the well's dry, we know the worth of water."
--Benjamin Franklin

At the outset of my summary it should be stated that this thesis was not meant to be an accusation, but a recording of events. The reader should assess the impact of environmental change and judge the alternatives. The narrative simply describes attempts to correct obvious, unpalatable abuses of a region in North Central Montana.

Here, a small creek, originating from the spruce and fir-covered slopes of the Little Belt Mountains, flows through a beautiful, pine-dotted mountain valley from King's Hill in the Neihart vicinity to Monarch. At Monarch, the stream enters a picturesque limestone canyon that emerges from chokecherry and rose bushes at Riceville. The stream then meanders through a prairie valley, finally emptying into the turbulent Missouri River.

The stream has a diverse population of mammals and fowl. Species such as black bear, long-tailed weasel, mink, striped skunk, little brown bat, badger, coyote, bobcat, Richardsons ground squirrel, beaver, bushytailed
wood rat, meadow vole, muskrat, porcupine, elk, white-tailed and mule deer, pronghorn antelope and bighorn sheep can be spotted from the banks of the water. Fowl inhabiting this region include ruffed grouse, blue grouse, cat birds, king birds, water ouzel, song sparrows and species of warblers, fly catcher, vireos and rushes. From the waters of Belt Creek, fishermen can snag rainbow, brook, cutthroat (the only species native to the stream) and brown trout; mountain whitefish; long-nosed white and mountain sucker; sculin and long-nosed dace. 

The number of different types of animals and plants are a valuable means of testing the health and stability of a stream's ecological community. Where many different species of plants and animals exist, there is opportunity for the "consumers" to feed on several different organisms and, in turn, are themselves prey for more than one predator. The more complex the food chain, the greater the possibility for the system to compensate from imposed changes.

The human communities that sprang up along Belt Creek and its tributaries were often completely dependent on the stream. As the residents of these communities mined the ores in the Little Belt Mountains, Belt Creek and its tributaries were used as a means of waste disposal for the mining operations. Some residents and mine operators failed to recognize these streams as the life blood of their communities.
It is impossible to evaluate the creek before the advent of man. Natural forces have polluted waters for eons. As water eroded mountains, carved valleys and washed away the plains, it carried with it particles of soil, rock and vegetable debris. This silt—sometimes the richest, most valuable soil—was at one time the major pollutant of streams and rivers. Normally nature has a remarkable ability to clean up its own water by the processes of filtering through the soil, aeration in waterfalls and sedimentation in quieter waters.

In Belt Creek the load of natural pollution, combined with man's refuse, mine wastes, sewage and chemicals, became too heavy and the stream could no longer purify itself. Belt Creek is a tragic testimony of man's careless abuse and misuse of a most precious resource. But, unlike the forces of nature, man could not easily purify his own wastes.

The first complaints of pollution in Belt Creek were not legal suits, they were instead letters to the local newspaper from residents who were interested in the recreational aspects of the stream. Not everyone shared the recreationists' view: some residents above the Neihart concentrator were undisturbed by the pollution in Belt Creek, as were some who lived below the concentrator—people who apparently felt that pollution was not affecting their interests.

The perennial conflict of resource exploitation versus the resource conservation is demonstrated in this
paper. In the American tradition of exploitation, nature is a commodity to be used by man--even if it means the eventual destruction of that resource. This utilitarian attitude was foremost then and is still strong today.

When applied to individual resources, "multiple use" refers to the utilization of a resource for various purposes. Water, for example, may be used for irrigation, municipal and industrial water supply, recreation and other varied functions.

As the pollution of Belt Creek worsened, increased social consciousness of the people who enjoyed Belt Creek led to organization. The Great Falls Sportsman Association, the Belt Rod and Gun Club and the Belt Creek Valley Protective Association were instrumental in bringing the pollution problem of Belt Creek to the attention of all. The organized attempts to clean Belt Creek were aided by fluctuating world silver prices that resulted in sporadic periods of mining--in the depressed periods, the stream was left to rejuvenate its waters. Nature periodically flooded the creek, cleansing the channel and washing away the wastes dumped into the water. By comparison, the efforts of the anti-pollution organizations were superseded by the stronger, more effective control imposed by the world silver market--a non-human factor totally unconcerned with fishing.

The struggle of Belt Creek continues today. Although mining operations no longer operate along its banks or those of its tributaries, Belt Creek is still being polluted by
acid mine drainage on the Dry Fork and abandoned coal mines in the town of Belt. In addition, unlucky accidents seem to choose Belt Creek for a place to happen: in 1976 a Burlington Northern freight train hauling propane, gasoline and liquid asphalt derailed in Belt, touching off explosions and fires. Burning asphalt spilling from one ruptured tanker car flowed quickly down a street lined with businesses but was diverted into adjacent Belt Creek, where it ignited the vegetation along a five-block stretch of the stream before being contained and extinguished. Within hours of the disaster, water pollution experts had built dams made of straw bales at various locations across the creek to absorb the oily substance. Vacuums were later used to suck the asphalt that had settled on the creek bottom. According to state water officials, the stream was not detrimentally affected.

In March 1978, a Continental Oil Company pipeline leaked a liquid condensed from natural gas into Belt Creek about 1 1/2 miles above the Missouri River. The Fish and Game Department assessed the situation and concluded that there was no evidence of damage to fish and wildlife.

In addition to pollution, the land adjacent to Belt Creek is undergoing a phenomenal rate of development by realtors. Twenty-acre parcels of land near Riceville are selling for $16,500 to $32,500. The only restraint on a helter-skelter type of development by county officials is
for health reasons. For practical purposes, this leaves the developers virtually free to do as they wish. Fortunately, the Montana State Fish and Game Department bought sizable parcels of land from the Anaconda Copper Mining Company.

Recent population trend indicators for Cascade County note that the county's 1980 population will mark a 32 percent increase over the 1970 figure. It seems likely, considering this substantial increase, that the recreation needs of 108,000 Cascade County residents will put additional pressure on the Little Belt Mountains for fishing, hunting, hiking and camping.

Could future mining activities aggravate the impact of the recreationists on the Little Belt Mountains and Belt Creek? The passage of the National Environmental Policy Act in 1970 required that organizations must file an impact statement if discharging substances in the water. Every company or individual must prove that the substance released into the water is not harmful before a permit can be issued granting use. Additionally, the amendments to the Federal Water Pollution Act enables individuals to assist state and governmental agencies in monitoring water systems.

Environmental Protection Agency procedures need strengthening to be fully effective. Independent agencies should monitor the discharge of industrial wastes rather than relying on the mining industry to monitor its own
effluents. The EPA should consider the long-term, chronic effects of heavy metals on plants and animals, as well as human beings—problems are not currently addressed in impact statements.

With a renewed interest in the Little Belts for mineral deposits, these policies and their shortcomings become crucial. Environmental legislation is only as good as the paper it is written on. A number of good, sensible laws decorate the law books but many are not implemented. Insatiable demands for more oil at any price or the relaxation of air standards to burn high sulfur coal illustrate only two instances of hard-fought-for legislation which is undermined.

Because the Little Belt Mountains are a reasonably highly mineralized area with lead, copper, zinc, molybdenum, gold and silver deposits, it is likely that these minerals will be mined in the near future. In reference to the development and mining of silver-copper, the process of cyanide leaching would be employed to extract the precious metals from low grade ores. Normally concentrators are built at each mining site, to concentrate the minerals into a smaller amount of material in order to save transportation costs. At the ore milling facility the rock would be crushed to the texture of fine sand or sugar in a series of crushing mills, then chemical reagents would be added to separate particles rich in ore from those containing none. This process is called cyanide leaching. The development
of the cyanide leaching process makes the extraction of precious metals from low grade ores economically feasible. Some mine critics have questioned whether excess reagents might end up flowing into the mine tailings ponds. Furthermore, some have raised questions about the potential for underground contamination by waste water leaching from the mine tailing pond. Thus, Belt Creek could be threatened with tailing pond seepage of acid wastes, arsenic, cyanide and heavy metals.

The AMAX Corporation and the Houston Oil and Mineral Corporation are currently performing exploratory core drilling in the Carpenter Creek Drainage. The AMAX activities began in 1959, when the Corporation purchased the Big Ben from Frank "Strawberry" Munsika. Although current economic circumstances allow only exploratory drilling of the mineral molybdenum, "tin-horn silver," the company expects that extraction of the mineral will develop into a full-scale operation—an operation the Corporation predicts is desired by the "poverty area" of Neihart. Molybdenum is used as a hardening agent in steel production and is in demand for pipeline construction.

It is the responsibility of the Montana Board of Land Commissioners (Board) and Montana Department of State Lands (Department) for the administration of the MONTANA HARD ROCK LAW (Title 50, Chapter 12, R. C. M. 1947). Pursuant to it duties as administering agency for the HARD ROCK LAW, the Department must review and then grant or deny
a Hard Rock-mine permit or permit amendment within a limited period. The Department reviews applications for conformance with provisions of the Hard Rock Law regarding the method of operation, water control, air quality, mine waste disposal, topsoiling and for the reclamation of lands affected by the proposed mining operations. The Board may adopt rules to accomplish the purpose of the Hard Rock Law, and the Department may adopt rules with respect to the filing of reports and the issuance of permits. To insure compliance with the Hard Rock Law and rules adopted pursuant to the Law, the Department is required to make mine inspections and investigations as necessary.¹

The Department may not approve Hard Rock-mining in areas which meet the criteria for selective denial provisions as specified in Section 50-1214 of the Hard Rock Law. The Department may conduct studies or encourage others to conduct studies of hard rock-mining and hard rock-mining land reclamation.

When the operator is not in compliance with requirements of the Hard Rock Law, rules pursuant to the Law, or orders of the Department and has not achieved compliance within time limits set by the Department, the commissioner shall serve a notice of noncompliance on the operator or if

¹The Board of Land Commissioners consists of the Governor, Attorney General, Superintendent of Public Instruction, State Auditor and Secretary of State. The Commissioner of State Lands is the chief administrative officer for the Department of State Lands and is appointed by and serves at the pleasure of the Governor.
necessary, he shall order the suspension of the permit. After a hearing, the Board shall order the Department to revoke the permit if requirements specified in the notice of noncompliance, in the order of suspension, or if an order of the Board requiring remedial measures have not been satisfied.

The Montana Environmental Policy Act (MEPA) requires that Environmental Impact Statements (EIS) be prepared on proposals for projects, programs, legislation, and other major actions of state government significantly affecting the quality of the human environment (Section 69-6504, R. C. M. 1947). Pursuant to MEPA, the Department, after permit application review, determined that a draft EIS must be prepared on the proposed actions. The Department has adopted rules pursuant to MEPA (MAC 26-2.2(18)-P250).

The United States Government encourages mining development by subsidizing mine owners. One Little Belt mine owner has received federal funds for the last five years for core drilling operations. The time could certainly come when many of the area mines reopen, and when that does happen, what assurances will be made that Belt Creek remains free of additional pollution or that pollution cleanup costs will be born by the responsible parties?

In 1976, Joseph A. McElwain, then president of Montana Power Company, predicted that "the coal fields in the Sand Coulee, Stockett and Belt areas would be developed in the next 25 to 30 years. Furthermore, coal would not
be developed for use in power plants but rather for plastics and petrochemical uses. Today abandoned coal mines in Belt and the Sand Coulee area still excrete acid mine drainage into Belt Creek and Sand Coulee Creek. With a renewed interest in these coal deposits the creeks may once again pay the price for development."

Numerous reports have been written detailing the pollution of Belt Creek. Perhaps this is the time for action, not just reports. It is the responsibility of individuals to pressure the Department of Natural Resources into action. The ultimate goal is to restore Belt Creek to a clean, free-flowing stream, available to all for enjoyment.

To prevent the reoccurrence of a mentality that allows indiscriminate waste and degradation, our highest priority must be to give increased attention to environmental education at all school levels—kindergarten to college. We must teach this and future generations the basic ecological and biological facts about the environment we live in, and make them aware of the necessity for direct involvement in decisions and actions surrounding the disposal of wastes from industry, agriculture and all other forms of human activity.
Looking East at Baldy and Yogo Peak from Porphyry Lookout top of King's Hill in the Little Belt Mountains.

Looking toward Carpenter and Dry Fork of Belt Creek from Porphyry Lookout top of King's Hill in the Little Belt Mountains.
Beaver Ponds on High King's Hill, Little Belt Mountains.

Beaver ponds and marsh on High King's Hill, Little Belt Mountains.
Sawmill Creek near Many Pines Campground.

Confluence of Jefferson Creek and Belt Creek.
Highway bridge on Belt Creek South of Neihart.

In town of Neihart--Outhouse along Belt Creek.
Belt Creek in Neihart Stream Control--riprapping, with stones, logs, and concrete.

North of Neihart--Remnants of abandoned mine.
Northeast of Neihart--Remnants of an abandoned mine.

Neihart concentrator tailings--North of Neihart.
Neihart concentrator tailings. Abandoned mine in background--North of Neihart.

Looking toward Belt Creek from Neihart Concentrator tailings North of Neihart.
Looking at Neihart Concentrator tailing pile from Belt Creek. North of Neihart.

Silver Dyke tailing ponds along Carpenter Creek.
Tailing pile along Carpenter Creek.

Silver Dyke mine--middle of picture on side of mountain. Tailings in foreground.
Tailing ponds along Carpenter Creek.

Carpenter Creek above tailing ponds.
Dry Fork of Belt Creek below Block "P" mine.

Galena Creek below Block "P" mine.
Acid mine drainage flowing into Galena Creek at Block "P" mine.

Block "P" mine.
Acid mine drainage from Block "P" mine.

Acid mine drainage from Block "P" mine.
Mine-tailing pile at Block "P" mine--Galena Creek.

Buildings of Block "P" mine.
Block "P" mine.

Block "P" mine.

Stream Gaging Recorder on Galena Creek above Block "P" mine.

Belt Creek just below where Logging Creek empties into Belt Creek.
Belt Creek--1 or 2 miles from Logging Creek.

Belt Creek Canyon--Lime kilns at Albright.
Limestone Cliffs at Albright--Belt Creek Canyon.

Belt Creek Canyon near Albright.
Sluice Box of Belt Creek Canyon.

Rock formations along Belt Creek--Belt Creek Canyon.
Belt Creek Canyon.

Belt Creek Canyon.
Belt Creek Canyon.

Belt Valley with Belt Butte in background.
Belt Butte East of Belt.

Belt Creek North of Belt—Near 4-Corners.
Belt Creek North of Belt near 4-Corners.

Near Peck and Lacy Crossing. Looking North.
Peck and Lacy Crossing.

Confluence of Belt Creek and Missouri River--North side of Missouri sulfuric mineral spring.
Cow grazing at Lewis and Clark's Expedition Campsite. Confluence of Belt Creek and Missouri River.

Missouri River looking West toward Great Falls from confluence of Belt Creek and Missouri River.
Confluence of Belt Creek and Missouri River.

Looking across Missouri River at confluence of Belt Creek and Missouri River Mineral Spring.
Livestock along Belt Creek near the confluence of Belt Creek.

Cottonwood near confluence of Belt Creek--gnawed by beavers.
Belt Creek South of confluence of Belt Creek and Missouri River.
Prickly Pear.

Billboard--10th Avenue South, Great Falls, Montana.
APPENDIX II

BELT AND BELT CREEK

PHOTOGRAPHS TAKEN AROUND 1900
Looking South on Castner Street in Belt, 1898.

A. C. M. coal mine, Belt, 1900.
The Neihart Branch through Belt Creek Canyon around 1900.

Dam on Belt Creek at Albright around 1900.
Recreation on Belt Creek around 1900.

High walls of the Sluice Boxes on Belt Creek around 1900.
APPENDIX III

1953 FLOOD
Map of Belt 1953 flood.
Belt--1953 Flood.
Belt--1953 Flood.

Belt--1953 Flood--Business district East side of town.
APPENDIX IV

BELT CREEK CANYON

1960s
Belt Creek Canyon.

Belt Creek Canyon, 1965.
Sluice Boxes--Belt Creek Canyon.

Hand built rock wall for railroad in Belt Creek Canyon (Sluice Boxes).
Railroad tunnel (abandoned) through Belt Creek Canyon (Sluice Boxes), 1960.

Belt Creek Canyon Sluice Boxes, 1960.
Abandoned railroad trestle built along Belt Creek through Belt Creek Canyon, 1960.

Abandoned Railroad bridge over Belt Creek at the Belt Creek Canyon, 1960.
APPENDIX V

POLLUTION--BELT CREEK DRAINAGE

1950s - 1960s - 1970s
Silver Dyke Mine--1950s.

Silver Dyke Mine--1960s.
Silver Dyke Mine—tailing piles.

Silver Dyke Mine—tailing piles.
Confluence of Belt Creek and Harley Creek—mine tailings in Belt Creek from Carpenter Creek, 1950s.

Belt Creek, July 1957.
Pollution from abandoned concentrator, 1950s.

Confluents of Dry Fork and Belt Creek--mine mill wash, late 1950s.
Tailings from Big 7 Mill, 1960s.

Mine tailings--Belt Creek.
Confluence of Dry Fork of Belt Creek and Galena Creek. Mine-mill wash from Galena Creek, 1965.

Highway construction along Belt Creek, 1960s.

Mine tailings--Belt Creek.
Silt pollution from Montana Stone into Belt Creek, Spring 1964.

Mine tailings--Belt Creek.
Straw bales across Belt Creek in Belt to absorb oily substances. BN freight derailment, 1976.

Oily substances in Belt Creek--BN freight derailment, 1976.
Refuse dump between A.C.M. mine and Belt Creek, 1979.

Refuse dump looking North, Belt Valley, 1979.
Looking West of town of Belt. A.C.M. mine refuse dump adjacent to Belt Creek, 1979.

APPENDIX VI

BELT CREEK DRAINAGE
Big Baldy--Located in the Little Belt Mountains.

Upper Belt Creek Drainage.
Little Belt Mountains.

Belt Creek North of Monarch--July 1964.
Belt Creek through Armington, July 1964.

Belt Creek through Belt, 1964.
Belt--looking West.

Stream management, Belt Creek, North of Belt, 1964.
Stream management, Belt Creek, North of Belt, 1964.
APPENDIX VIII

GALENA CREEK DRAINAGE MAP
Feasibility Study of the Dry Fork of Belt Creek, Montana. Montana Department of Natural Resources and Conservation.
APPENDIX IX

MONTANA FISH AND GAME DEPARTMENT

AND U.S. FOREST SERVICE

MAP OF LITTLE BELT MOUNTAINS
Little Belt Mountains
THE ULTIMATE IN COUNTRY LIVING

THE

'BELT CREEK PALISADES'

NESTLED IN THE FOOT HILLS OF THE LITTLE BELT MOUNTAINS

CONTACT HOLIDAY REALTY
OPEN HOUSE
Saturday & Sunday,
July 16 & 17
10 A.M. TO 8 P.M.
BOTH DAYS!

DRIVE OUT and SEE these BEAUTIFUL

20 + ACRE HOMESITES
Just 20 Miles from Great Falls

JUST 4 LOTS LEFT . . . HURRY!

Just drive east on U.S. 89 (200) to the flashing yellow
light, (Sand Coulee Corner), turn left and come straight out on the High-
wood Highway, (228). The sites are just 2½ miles east of the "Four Corners" Junction.

CHECK THESE ADVANTAGES!

• BEAUTIFUL VIEW of HIGHWOOD MOUNTAINS • 20-MILE COMMUTE on GOOD ROAD
• ALL UTILITIES BURIED . . . NO POLES; NO OVERHEAD WIRES • WATER EASILY ACCESSIBLE
• WILLOW CREEK FLOWS thru ALL BLOCKS • CHILDREN BUSSED to BELT SCHOOLS
• HIGHWOOD HIGHWAY SOON to be COMPLETELY REPAIRED and RESURFACED
• OWNER WILL FINANCE with 10% DOWN; BALANCE at 8½%, 15 YEARS, CONTRACT for DEED

DRIVE OUT & SEE
OR CALL US NOW!

PHONE 761-3374 OR 727-3488

ENVIRONMENTAL PROPERTIES
BIBLIOGRAPHY

Books


Magazines


Newspapers

Belt Mountain Miner, Barker, Montana. August 26, 1891 to January 27, 1894.
Newspapers, continued

**Belt Valley Times**, Belt, Montana, 1894-Present, 1968 (microfilm).


Reports

Belt Creek Natural Area Negative Declaration Impact Statement prepared by Montana Department of Fish and Game, Recreation and Parks Division. Helena, MT.


Montana Department of State Lands, Draft Environmental Impact Statement Proposed Plan of Mining and Reclamation Zortman Mining Company and Landusky Mining Company, Phillips County, Montana.

Montana Water Pollution Council Public Hearings. Transcript of proceedings, Great Falls, MT. 1960.


Prefeasibility Study: Control of Acid Mine Drainage Galena Creek, Hughesville, Montana. Prepared jointly by: Board of Cascade County Commissioners, Department of Natural Resources and Conservation, and Department of Health and Environmental Sciences. 1972.

Schafer, Paul A. *Geology and Ore Deposits of the Neihart Mining District*, Cascade County, Montana. Montana School of Mines, Butte MT. 1935.

Reports, continued


Thorson, Nels. "Belt Creek--Cascade County, Montana." Montana Fish and Game Department, Great Falls, Montana. May 1971.

U. S. Army Corps of Engineers. Report on Flood Control of Belt Creek, Belt, Montana. 1953.


Bulletins


Theses and Research Papers


Theses and Research Papers, continued


Interviews


Photographs

Nels Thoreson
Karl Knuchel
Mildred Veleber
Dennis L. Veleber
Residents of Belt

Brochures

'Belt Creek Palisades' prepared by Holiday Realty, 901 Ninth Street South, Great Falls, Montana 59405.

'Little Willow Homesites' prepared by Environmental Properties, Great Falls, Montana.

Maps

Belt Creek Drainage Map, Montana Fish and Game Department, Great Falls Division. From Nels Thoreson.


Maps, continued

Little Belt Mountains. Prepared by Montana Fish and Game Department and the U.S. Forest Service.