

Water WoRDs

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Jack Frost's Essay, Part 1

When we started writing Water WoRDs back in October, 2012, one of our early posts celebrated the 40th anniversary of the federal Clean Water Act. However, as the Great Lakes State, Michigan was a leader in water quality protection long before the federal law was enacted in 1972. We in the Water Resources Division think Michigan's history is something to be proud of. So as Jack Frost is nipping at our noses (as the saying goes) and another year is drawing to a close, we thought we'd share the thoughts of Michigan's own Jack Frost by posting a treasure that has been passed around to new staff within our programs for many years. Francis "Jack" Frost was one of the first people in Michigan to work in water quality protection, starting in the 1930's with what was then the Stream Control Commission. Jack was a decorated World War II veteran who returned to Michigan to continue his service to the state, eventually becoming the Chief Engineer for the Water Resources Commission in the 1970's. We believe that this essay was written as part of a training program for new staff as Michigan geared up to implement wastewater discharge permitting required by the "new" Clean Water Act.

We hope our readers enjoy this charming commentary from the past. A word of caution: in transcribing the type-written document for publication here, we took care to minimally edit Jack's essay. Please be mindful that both the public and private entities mentioned within Jack's anecdotes were operating under a very different regulatory environment. They- and we- have made great strides in the past 40+ years.



Jack Frost - photo courtesy of the Frost Family

In preparing a "Short History of Water Pollution Abatement in Michigan," I thought of starting with "In the beginning," but I finally settled on "Once upon a time."

From about 1923 to 1929, (before my time) efforts for the control of pollution were divided between the Pollution Division of the Department of Conservation and a Stream Pollution Unit within what is now the Bureau of Engineering of the Health Department. Both had separate personnel, budget allowances and so forth (and they had a lot of "so forth," I'll tell you). From March of '28 until the organization of the Stream Control Commission in 1929, Michigan had a non-statutory commission for the control of stream pollution, consisting of the Commissioner of Health, Director of Conservation and the Attorney General. The Stream Control Commission was created by Act 245 of the Public Acts of 1929. The Stream Control Commission Act was necessary to bring about a legal correlation of State interests and to present a united State trust to attack complex and die-hard problems of the State. Existence of the Commission was challenged in nearly every Legislative session from 1931 to about 1946. Every year the Legislature had a bill before it to abolish the old Stream Control Commission. Usually, the legislator who sponsored the bill came from a town which had been ordered by the commission to build a sewage plant during the previous two years.

In 1930, separate staff efforts of the Health and Conservation Departments for pollution control were abandoned in favor of the new Commission's employed staff. From 1923 to 1929 there had been quite a battle going on. One unit of government would tell a municipality or industry to do something and the other unit would tell it to do something else. There was no correlation. Act 245 straightened this out by stating that it would be unlawful for any person to discharge any substance which tends to destroy fish life or be injurious to the public health, in that order. (When you have met as many characters in the human race as I have in the last 40 years, you may say that is the proper order.) Act 245 did not make the discharge of pollution, sewage or anything else into the water illegal. The injury created was illegal. It was the duty of the Commission to prove these injuries before anything could be done. The staff at that time, beginning in 1929, consisted of an executive secretary, one pollution investigator and one office secretary. The Commissioner started with three people and when I came they had a 33% staff increase. Like the budget they had early in the '30's. From 1929 to 1930, (their first year) \$21,300; '30 and '31 it went up to \$27,200; '31 and '32, \$18,500. Then the Depression set in: '32 and '33, \$16,900; the following year \$10,400 total budget for the Commission; '34 and '35, \$16,600. As I recall, the primary concern of the Commission in those early days was the sampling of bathing beaches and the installation of "water polluted" signs. Fellows went around taking bacti samples, and if they found a bad count, they put up a sign saying "Danger- water polluted by sewage." The public really appreciated those signs. It gave them a place to hang their clothes when they went swimming. Some of the local artists had a chance then to add pictures and words to the signs.

Some of the first problems tackled by the Commissioner were the brine and the oil fields. The Vernon oil field started up in 1930 and the Porter field in 1931. At one time, 25,000 barrels a day of brine was being discharged to the Pine River, which provided several water supplies downstream. There were some unhappy people around Saginaw. People didn't drink water from their mains, they carried it. There was a well on every corner and those provided the only drinking water they had. Chlorides in the Saginaw River during 1934 and 1935 averaged over 500 parts per million. The first flash of oil was gushed, of course and came up with no brine, but within a year they were getting more brine than oil. The Commission, at my persuasion, asked the oil industrialists to build lagoons or ponds for their discharges. They (the oil companies) would take a drag line out, dig a hole which made a big dike and pour their brine into that. The water table in that area was contaminated with salt for about 20 years. Since that effort didn't work too well, in 1935 the Commission ordered all brine producers to return the brine to the deep underground. This has solved the problem pretty well, although in later years, 1940, we still had problems in Saginaw. Surveys throughout the Vernon field disclosed a

thousand barrels of brine a day being lost from many sources, a little bit here and a little bit there, to the Pine River.

About the time that was taken care of, Dow Chemical's growth also created brine problems. Dow created some brine lagoons, one of them 167 acres and about 10 feet deep. I remember they had about 10 million barrels of brine stored there, upstream from the water supply. If the water was high in the Tittabawassee River they would dump 3 or 4 million barrels over a 24-hour period, that would slide back down past the water supplies on into Saginaw Bay. We would detect chlorides in the bottom of Saginaw Bay out to Charity Islands of over 1,000 parts per million. This too was corrected by reinjecting it back into the deep ground layers.

At the same time in 1935 the sugar mills, primarily in the Saginaw Valley, were causing problems. On the Cass River at Frankenmuth every year there were fish kills by the millions. Farmers would take their wagons with the dead fish, which they used for fertilizer.

The Saginaw River through Saginaw often was covered with dead fish, bank to bank. So the Commission issued its first Order against the sugar mills in 1935 and put a limit of 5 pounds of BOD per ton of beets. This required the mills to install their big lagoons. There was no happiness generated because of this Order. So when they built their lagoons and dikes, they just took a drag line and piled dirt up right to a peak. Along about Christmas time the lagoons would be getting pretty full. If they could leak them a little bit, the dikes would just evaporate and they would call it an act of God. At that time I visualized the Almighty as an old man with a white beard and a white coat. He always had a shovel in his hand, and every Saturday night he was out digging holes in the sugar beet lagoons. All they needed was a little water going over the top of those dikes to wash the entire thing out. Then they would patch the dike and start over. This way the lagoon was big enough to hold the entire season.

In Saginaw at that time when you'd go into a hotel and take a shower, you would swear you were standing in the middle of the sugar beet plant. They used to have what was known as Steffin houses where they make molasses out of the sugars and these really smelled (they had a BOD of 40,000 or 50,000, as I remember).

One time we were working near one of the sugar beet lagoons and we got into some of the liquid with our shoes and on us. That night while we were in a restaurant in Alma, people started getting up and moving away from us. The waitress said, "I wish one of you fellows would sit on one side of the room and the other on the other side."

We asked how that would solve the problem. She said it wouldn't solve it, but it would give the smell sort of a stereo effect and people won't know where it is coming from.

The Commission was quite reluctant to take on early polluters in the courts because it didn't have the staff to develop a case. An example of how the courts felt about water pollution control in the early '30's was a case in Monroe where we had five paper mills discharging wastes into the Raisin River. The Raisin River below Monroe was one awful mess. There was a fellow who built a carp pond at the mouth of the Raisin, and in taking water out of the Raisin River for the fish he killed all of his carp. He sued the paper mills. The judge said the paper mills had been there a long time and that they more or less had a right to discharge these wastes into the Raisin River. Since the carp pond builder was a "Johnny-come-lately," the judge's view was he knew the problem existed before he started his carp pond. The Court recognized that he might have been injured financially and that maybe he should have a little cash from the paper mills, so the Court did set a fine on the paper mills which went to this carp pond owner. The Court then instructed the carp pond owner to get his carp someplace else. Quite a contrast to how we operate today.

In 1932, a group of farmers became quite disenchanted with State efforts in pollution control below the City of Jackson. They sued the city, and they asked the Commission to supply technical advice and witnesses for their suit. The Commission had taken many samples of the river there and had quite a lot of data. I believe Milton Adams, the Executive Secretary, was one of the witnesses. He testified all about the BOD, the DO, the coliform and the suspended solids. This had absolutely no influence on the judge.

There was an old farmer who lived down below who was one of the witnesses. The farmer was a hunter who had been hunting along the Grand River one time with his dog. He had shot a duck which fell back into the river with the dog after it. When the dog came out of the water, the farmer said, he couldn't anywhere near the dog or the duck because of the stench. This old farmer was a witness, he was a good one. I kind of think of that old farmer as the Commission's first biologist. His description of what he saw coming out of the Jackson sewers, what he saw in the Grand River, what that mess smelled like and what his dog looked like, was more convincing than any report we had. It is kind of terrifying to think that the whole progress of pollution control once depended on a dog that smelled like a polecat! The judge said he wasn't interest in BOD, but the condition of that dog and the odor of the duck meant something to him, and he ordered the City of Jackson to build a sewage treatment plant. That was called "dogma."

Most of the sewage treatment plants built in the early '30's were the result of persuasion. The Commission didn't tackle many of these communities in court until 1939. But we kept bringing these communities before the Commission for hearings and kind of working on them a little bit. I remember one fellow who said we reminded him of angels. We were always up in the air and harping about everything.

So we did get sewage treatment plants built in some places, and generally it was where the conditions were so darn bad that the municipality couldn't stand it themselves—like Bad Axe and Cedar Springs. Dearborn is a good example, two plants were built in Dearborn.

We hope you enjoyed this trip into the past. Next week, we'll be back with Part II of Jack Frost's adventures advancing Michigan's water quality.