HISTORY OF THE PERU WASTEWATER SYSTEM

The current infrastructure in Peru is a combination of different projects conducted through the years beginning with a realization many years ago that sewers needed to exist in Peru for the health and well-being of the citizens. Exploring back through a variety of information a story developed that tells about Peru’s efforts to grow and become a city. The story begins in late 1800’s.

In the volume titled: History of Miami County Indiana, A Narrative Account of Its Historical Progress, Its People and Its Principal Interests, published by The Lewis Publishing Company in 1914, edited by Mr. Arthur L Bodurtha an account is given concerning the beginning of sewers in Peru. That account follows:

Shorty after completion of the waterworks the question of sewers came up for consideration by the people and the city council. The first sewer in the city was built on Cass Street and the second on Tippecanoe. It is said that these two sewers were constructed through the influence of two members of the council who lived on the two streets, and that they were put in without regard to a general sewer system. A little later a system was planned by Michael Horan, the city civil engineer, and the work of building sewers was commenced according to that plan.

At the close of 1913 that city had eleven main lines and thirty-five laterals, and several new lines were under contemplation. The sewer on Broadway was a double sewer, i.e., there is a conduit on each side of the street, so that easy access is afforded to the buildings on either side. The work has proceeded gradually, in order that the burden of expense might be distributed over a number of years. When the system is completed Peru will be as well supplied with sewers as any city of its size in the country.

From those early days of planning by Michael Horan, Peru continued to expand. In 1938, the need for upgrades to the sewer system led to a very large improvement project. From the original specifications written by Chas W. Cole, Consulting Engineer, we find that Peru is not only improving the sewers but also building a treatment plant on the south side of the river.
The project is defined as follows:

*The Project*

*The project consists of the construction of sewers and appurtenances, pumping stations, and constructing a complete treatment plant. The project as a whole is identified as P.W. A. Docket Indiana 1277-F.*

The wastewater plant was constructed on the south side of the river. An intercept line was constructed on the north side of the river and a main pump station was placed at the intersection of Cass Street and Canal with a 16” force main run under the river. The new plant would assure that the needs of the public would be met and that the treatment plant would clean up polluted water that was previously discharged directly to the river.

The new facility was full of technology:
- Control building with Office and Laboratory
- 2 Primary settling tanks
- 6 Aeration tanks
- 3 Secondary settling tanks
- Grit removal
- 2 Anaerobic digesters
- Sludge Drying Beds
- Waste Gas Burner
- Gas Storage
- Gas Purifier
- Chlorine Disinfection

Even today, 2015, if a smaller community built this facility it would take little modification to the plans to make it as new and modern as most other facilities presently in operation.

Peru operated and maintained this facility for many years; the facility was upgraded several times in the course of its lifetime. Records indicate that several minor upgrades occurred through the years with some notable upgrades in 1967 and 1982 with additional upgrades in 1991, 1996, and 1998. The upgrades did not change the face of the first treatment facility drastically but added tanks, an anaerobic digester, replacing digester lids, mixers to the digesters and modifications to the drying beds. The original plant stayed fairly intact.
The 1998 upgrade in particular changed some of the treatment aspects of the facility. The treatment plant relied on drying bed technology for many years. However in 1998 a sludge storage lagoon was constructed. The lagoon can store 1.5 million gallons of sludge. The sludge can then be hauled away as liquid and used for beneficial land application on secondary food crops. This upgrade greatly increased the plant’s capacity to handle solids and eliminated the reliance on drying beds.

In 1998 the facility was subject to an Agreed Order from the Indiana Department of Environmental management. The Agreed Order stated that the facility needed to be upgraded to increase the capacity and address violations that had occurred in previous years. Plans were developed to build a plant that would partially utilize the old facility. The upgrade dramatically changed the existing plant with many of the original tanks being abandoned. They remain standing as a testimony to the history and progress of wastewater treatment in Peru. The facility upgrade which started planning in 1998 was finished in 2006.

Peru, Indiana now maintains a state of the art wastewater treatment facility. The facility is capable of dry weather flows of 8 million gallons per day and wet weather flows of 26 million gallons per day. The treatment facility is operated as a solids reduction process. One of the greatest expenses facing wastewater treatment in any community is the
Vertical Loop Reactors constructed in the 2006 facility upgrade.

handling and ultimate removal of bio-solids. The plant in Peru is run so that the volume handled and disposed of is significantly less than that of a conventional plant.

Peru also maintains approximately 65 miles of collection system. Part of this system is known as a combined system. Combined sewers take in normal residential and commercial flows but in rain events they are designed to transport storm water as well as the normal wastewater flows. In large rain events the combined sewers fill to capacity and part of the flow that cannot travel through the full pipes is discharged through a collection system overflow (CSO). Peru has 10 CSO locations in the community, until recently there were 16 that were permitted. Part of the future goals for the collection system is to eliminate CSO points and treat as much water as possible prior to discharge.

It is interesting to note that decisions made 100 years ago influence the operations and decisions made today. The original lines that ran directly to the river for almost forty years were brought together with an intercept line and pumped to the new treatment facility. The technology of the time was sound, the engineers and people that designed the collection system and treatment facility were qualified professionals. What has changed is the need to further reduce pollutants being discharged to our receiving streams. Weather influences these processes in many ways but the primary concern is the ability to effectively treat water being discharged from the city treatment processes.

In understanding some of the rationale presented to the early leaders in Peru. An article published by ASTM Standardization News, August 2004 talks about early sewers in the United States. The article is titled: ASTm and the National Pipe Institute, 100 Years of Teamwork and Achievement is written by Edward J. Sikora. Some excerpts from the article are of interest:

Early Sewers Were Aided by Infiltration and Inflow

From its inception, the main purpose of a sanitary sewer was to convey sewage from populated area to drainage ditches or natural water courses. The practice of treating wastewater would not begin for another 50 years. Early sewers depended upon infiltration and other forms of flushing to clean the sewer and
dilute sewage. Storm and sanitary sewers were combined to increase hydraulic flow since the entire system needed to be flushed periodically. Water tanks were often installed along the sewer route and routinely discharged to flush the sewer. Inflow from roof drains, sumps, and building drains was permitted by most communities. The number one requirement of the sewer was conveyance. As long as the sewer drained by gravity flow and light could be seen from one manhole to the next, it was considered acceptable.

Literally thousands of miles of clay pipe were installed by the end of the 19th century and for the next 30 years, the nation’s sanitary sewer systems expanded further to include even smaller cities and towns. Dilution was the most cost-effective and practical method of sewage treatment as evidenced by the high infiltration rates that many cities adopted.

In the classic 1935 book, American Sewerage Practice, by Metcalf and Eddy, the authors report that “The Nuisance Removal Act of 1855” was passed in England with the following stated purpose: “to prevent rivers and other receivers of sewage from becoming offensive to the eye and nose. If neither of these conveyances could detect anything unpleasant, it was believed that there was no ground for serious complaint against the method of disposal.” For many years, dilution continued to be the most economical, the most efficient, and the most used method of treating sewage. As reported in Metcalf and Eddy’s book, dilution was used in 99.3 percent of U.S. cities having a population of 100,000 or more in 1930.

Wastewater treatment has changed the way infiltration was viewed. For over 50 years, infiltration and inflow provided the extra water that would help move sewage from the nation’s homes and factories, which, at that time, used very small amounts of water. An occasional rain was a natural opportunity to flush the system. With the onset of wastewater treatment in the 1950s, infiltration suddenly became undesirable. The asset that had served so well for so long had become a liability.

In fact, the Environmental Protection Agency promulgated legislation to curb the practice and requires that communities with combined sewers and combined sewer overflows (CSO) find methods to limit and or cease CSO activities. Peru was required to submit a Long Term Control Plan for CSO activities. The document outlines the steps Peru Utilities will take to limit CSO activity to the point of meeting the requirements of both IDEM and EPA.

The history of wastewater treatment in Peru is very interesting. The people of the time were convinced that they were making sound decisions for the citizens of the community. They used ideas and technology available to them to build a healthier community. Today we are seeking to change some of those ideas and thinking. Many technological developments have occurred in 100 years; the next 100 years may radically change, again, the way wastewater treatment is practiced.
Plaques

This plaque is located in the old control building entranceway.

This plaque is located in the old control building entranceway directly below the PWA plaque.
Plaque located in upper level of old control building.

Plaque located inside entrance doorway to Laboratory/Pretreatment building.
This journal was left on site after it was completed. The June 30, 1966 entry states “97°4:00 PM a Real Dandy, 70° at 4:00 AM The Last Day of June, my Last Day of Keeping Records of the Weather + Numerous things, I have run out of Pages. Thanks, WAH.

This journal is full of snapshots of day to day events. It is the lives of people doing the job just as we are doing them today. From the handwriting in the journal it appears more than one person wrote it, the last being WAH, who may be Weldon Hanson.

Thank you, men, for writing this unique piece of utility history!
July, 1948

9 Canning waste no longer present. Final effluent in good condition.

12 Blower No. 1 on. Return sludge pump No. 2 on. No 1 off. Exhausted all gas from storage tank to check valves in gas line and drain water from line to tank. Safety valve on gas tank corroded beyond repair. Also other valves were found to be badly corroded. Started painting railing and equipment on outside deck.

14 Spencer, Yergin and Mulloch attended sewage operators school in Elwood.

15 Using new Jacobson mower on banks. Seems to be doing a good job. Very low flow.

16 Sewage flow still very low.

19 Hauling sludge from open beds. Broke gas analyzer. Can't make test for H2S.

20 Spencer and Yergin made trip to Fr. Wayne to exchange bearings for motors and then to Anderson to buy used carborundum diffuser tubes.

21 Spencer, Yergin and Mulloch attended final session of sewage operators school in Elwood. Heavy rainfall (82)

22 Hauling sludge from glasshouse. Sold some iron junk.

More rain today.

25 More rain. 80 inch. Gas production falling off.

26 Repair work on interceptors started. Blower No. 1 on high speed. No. 2 off. Tested for H2S and found none.

28 GREASED No. 1 Blower VRM.

28 Used new chlorine comparator to test for residual Cl2

Pattison had piece of rust fly into right eye while working on interceptor at Canal and Broadway. Received treatment at hospital.

30 Work on interceptors completed. New float cables, complete cleaning and greasing. Five days to do the job.
February, 1959 Account of Plant Flooding

February, 1959 Newspaper clipping of water pouring over flood wall, south Peru flooded.
February, 1959, Newspaper Clipping of River Gauge Readings.
February, 1959, Account of efforts to keep the wastewater plant from flooding.
Other Notes from the Journal

The plant had a dog from 1943 to 1951 named “Ginny”. Ginny passed away on February 17, 1951. A new pup was brought in named “Blivit”

Plant Upset Event – 1957 (example of life as a wastewater operator)

August 31, 1957 – Started getting complaints about odor.

September 1 – Had Fire Department bring over their pump to flush edge of river bank to move the sludge blanket that had formed and causing big stink. Blocked off regulator at Benton St. so that waste from the canner is going directly to the river. The plant has turned septic and H2S is everywhere but good!

September 3 – Went to Indianapolis to get HTH and Ozone to help control odor.

September 5 – Foam on aerators very heavy and high. Hosed them off several times.

September 6 – Still lots of foam

September 9 – Plant in much better condition. Still lots of foam.

September 11 – Barrett from the Board of Health was here to investigate the “big stink.”

September 12 – Benton Street sewer back in operation. Reduced flow into final way down. Most of sewage going to river after primary treatment.

September 14 – Nice weather. Still bypassing

After this entry the event isn’t mentioned again. One crisis averted, on to the next!!

Notes are made throughout the journal concerning various events including deaths of co-workers, births, some World Series scores, the assassination of President Kennedy, and winners of local elections.

Other Interesting Facts about Peru’s Wastewater Facility

The engineer for the first plant in 1938 was Chas W. Cole. His Indiana professional engineer’s registration number was 3, one of the first recognized professional engineers in the State of Indiana.

The Indiana State Board of Health was responsible for inspections on wastewater systems prior to the formation of the Indiana Department of Environmental Management in the 1980s.
The new facility has been visited by utility representatives and engineers from all over the continental United States and Hawaii. It has also been visited by groups from The Netherlands, Italy, Austria, Turkey, China, Australia, and New Zealand.

The Peru wastewater facility received the 2008 Pisces Award presented by the CWSRF and The United States Environmental Protection Agency:

Copied from the announcement is the following:

*Congratulations to the winners of the 4th annual Performance & Innovation in the SRF Creating Environmental Success (PISCES) Awards. The 2008 PISCES Awards recognize those individual projects that best represent the CWSRF’s commitment to innovative and sustainable water quality financing.*

**City of Peru, Indiana:**

*Using CWSRF funds, the City of Peru upgraded its wastewater treatment plant to convert the existing anaerobic digestion process to an aerobic/anaerobic sequencing digestion and sludge-holding process. This innovative project has doubled the average daily capacity of the plant and increased peak flow fourfold, while significantly reducing the amount of sludge produced. This has reduced operational costs as Peru spends less money to pump, haul, and land apply sludge. The sludge that is now produced is cleaner and better for the environment due to its reduced levels of nitrogen.*
Odds and Ends

Technology is an amazing!! Here are some examples from our laboratory:

This microscope is on display in the wastewater lab in Peru. It would have aided the operators many years ago in looking at the microbiology in the plant. The microscope is complete along with additional objective lens and a handy manual.

Modern Microscope made by Fisher Scientific, this is a phase contrast scope with the ability to connect to an external screen and view microbiology without eye fatigue.
Photo taken through the Fisher Scientific phase contrast scope of microorganisms.

Another photo taken of microorganisms, the large one in center frame is called a stalked ciliate.
Vintage Sargent Scale. It is in excellent condition and would have been used many years ago for weighing solids.

Modern Sartorius Digital Scale reads to 4 decimal points. Used for weighing solids in the lab.