**Meeting Agenda**

4:00 – 5:30 PM, Wednesday, May 4th, 2016

Lyons Town Hall

I. Roll Call, Agenda, Minutes

- Amendments to Agenda
- Approve Minutes from Apr 20th
- Upcoming Meetings - May 16th Lyons BOT -Utility Quarterly Review Update
  May 18th MEAN meeting - Jim Kerr Attending

II. Audience Business

III. Liaison Updates

- Board of Trustees Update
- Staff, Engineering Update

IV. Continued Business

- 2015 Review 2016 Goals
- Wastewater Pretreatment
- Utility Funds Review Q1 2016

V. New Business

- CSU Energy Assessment Meeting Review
-

VI. Parking Lot

- Municipal Code Corrections
- Town Utility Account Tracking
- Pipe Water Rates

# UEB Meeting Minutes, 20 Apr 2016

**Meeting Time and Location:** Began at 4:10 at Lyons Town Hall

**Attendance:**, Aaron Caplan, Coco Gordon, Steve Wratten, Lee Hall, John Cowdry

**Staff:** Scott Olson (Public Works), Jim Blankenship **Liaisons:** Jim Kerr (BoT) **Guests:**

**Previous Minutes:** Reviewed and Approved Minutes from Mar 16th and Apr 6th. We will start emphasizing if action items in the minutes were accomplished. As part of the discussion it was mentioned to watch the Water and Wastewater study to see if RGA mentions capital replacement should be covered by user fees. For the Electric Substation it was mentioned that we should have some type of secondary back up at the substation for an emergency, regardless of the need for it for maintenance.

**BOT Update:** The new mayor, Connie Sullivan, plans to offer a 15 minute time slot for boards and commissions to speak. She also wants to give the boards and commissions more direction.
The MEAN Ad Hoc Committee teleconference discussed a draft on Net Metering regulations. It will deal with solar gardens or larger municipal projects. It will exclude rooftop solar.
Jim Kerr was asked by a Lyons resident if they could go off grid. According to Lyons Municipal Code everyone in Lyons must have a connection to the electric system and therefore would need to pay the base fee. They might not need to purchase anything.
The town is still having cash flow issues because of the time it takes to get reimbursed by the State. Some of the trustee were going to the capital to talk with them.

**Staff Update:** An RFP has been put together to repair the SCADA system for the Water Utility that should soon be posted to the Rocky Mountain E-bid website. It included 2 extras; finding out the cost to tie the lift station and water plant into the SCADA system, and adding meters at the Pressure Reducing Valve (PRV) stations.
An RFP for an electric services utility contractor was posted to E-bid. This is the work N Line Electric currently does. Because the town did not have an official contract that met federal guidelines we needed to submit this contract out for bid.
The Main St. project is estimated to be finished around Jun 1st.
The McConnell Bridge project has a couple more months in FEMA's 6 month versioning review process. Staff is hoping to still get it done this year.
Sewer System Extension Analysis into Apple Valley and Old St. Vrain has a kick off meeting tomorrow. We should soon get a draft report.

**2015 Review & 2016 Priorities:** We reviewed the document in the packet. Added the Utility Meter Upgrade project, Wastewater Pretreatment Policy and Tap Fees to the Priorities. Also add some details to the current list of priorities.
Discussed if updating the Construction Design Manual (CDM)needed to be a priority. The Town Engineer thought it needed to be done. There has already been some discussion about the CDM during the Primary Planning Area Review that is currently underway. If we don't update the manual, exceptions can be made during the site planning process. It is really a decision on a larger overhaul of the manual vs one off exceptions being made.
**Aaron will update the document for the next meeting.** When approved we will forward to Mayor and BOT.

**Wastewater Pretreatment:** The LMC does not have any code for Pretreatment of wastewater. Pretreatment is needed to reduce Biochemical Oxygen Demand (BOD) when there is too much organic matter in the wastewater. The LMC has great detail on determining a surcharge when a users BOD goes over a certain level. What is really needed is to get the pretreatment to be done by those users who have large BOD in their wastewater.
During a meeting with Honeywell the new wastewater treatment plant builder it was pointed out that Lyons currently really only has 2 possible establishments that might produce large BOD loads because of high organic content in their wastewater, the brewery and the distillery.
We could use business license renewal as a time to make sure pretreatment is being done where needed.
**Direct staff to have a meeting with the 2 establishments to see what it would take to get them to pretreat their wastewater.**
There was also a question on whether LMC Sec 13-4-70 Wastewater Demand Surcharge has been implemented. The end of part (a) says implementation of this section may be delayed , postponed , suspended and commenced at any time by adoption of a resolution of the Board of Trustees.

**Meeting ended:** 5:50 pm. **Minutes Submitted by**: Aaron Caplan

# 2015 Review

Calculated 2016 budget for the utility funds.

Reviewed the Request For Proposals (RFPs) and the Proposals themselves for

1. Water and Wastewater, Rate and Capital Improvement Project Studies
2. Storm Drainage Master Plan

Worked on the Lyons Recovery Action Plan (LRAP), Infrastructure Section 1.1.1 - Update the Long Range Water Plan, the Master Wastewater Plan and the Storm Drainage Master Plan to reflect the Town's existing conditions and expanded planning area. Develop a master plan for the electric utility.

1. The Water, Wastewater and Storm Drainage are all under study by independent companies paid for by grant funding.
2. The Electric Utility first needed some analysis. We determined that it would be complicated and costly to try and break the contract with our current electric provider, MEAN. This would have allowed us to either sell the utility or find another provider.
3. Proposals for a Study of the Electric Rates and Capital Improvement Projects came in way over bid. Staff is working on new RFP for this..

Reviewed Lyons Environmental Sustainability Action Plan, (LESAP).

Planned and Budgeted to upgrade Lyons electric metering system.

Had a meeting with Longmont Water to discuss water rights including options for sources of water rights other than Colorado Big Thompson, (C-BT), and a Cash In-lieu policy

# 2016 Priorities

Supply the Trustees with a quarterly review of utility funds with regards to 3 months operating expenses, currently electric fund, as well as an annual budget for the utilities

Develop Wastewater Pretreatment Ordinance for Lyons Municipal Code (LMC)

Monitor Electric Utility Meter Upgrade

Finish Work on LRAP Infrastructure 1.1.1. Once the studies being done are in we will review and aggregate data for the various master plans.

Tap or Connection Fee policy

Begin Work on LRAP INF 2.2.1 - Develop and implement a capital improvement and maintenance plan for Lyons' transportation system that considers emergency and normal operating conditions, future land use, collector connections, street master plans, street connections and multi-modal transportation.

Review and suggest updates for the LMC utility sections.

Update the Lyons Design and Construction Manual (DCM) or Manual of Design Criteria and Standard Specifications for Construction of Public Improvements of the Town.

Utility Performance 2016

| | Revenue ($) | Expenses ($) | | | | | Rev - Exp. | Utility (MwH or Kgal) | | Fund Total ($)* | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (All Sources) | Purchase | Capital | Debt | All Other | Total Exp. | | Purch. Amt | Sold Amt | Start | Finish |
| **Electric Fund** | | | | | | | | | 91.1% | | |
| Jan-16 | $130,353 | $85,354 | $0 | $0 | $10,769 | $96,123 | $34,230 | 1,185 | 1,015 | | |
| Feb-16 | $147,407 | $79,687 | $0 | $0 | $14,873 | $94,560 | $52,847 | 1,009 | 1,088 | | |
| Mar-16 | $113,051 | $78,343 | $2,399 | $0 | $5,640 | $86,382 | $26,669 | 994 | 802 | | |
| 1st Quarter | $390,812 | $243,384 | $2,399 | $0 | $31,283 | $277,066 | $113,746 | 3,188 | 2,905 | | |
| Budget (1st Q) | $413,839 | $247,002 | $26,869 | $38,057 | $93,275 | $405,202 | $8,637 | | | | |
| 2nd Quarter | | | | | | | | | | | |
| Budget (2nd Q) | | | | | | | | | | | |
| 3rd Quarter | | | | | | | | | | | |
| Budget (3rd Q) | | | | | | | | | | | |
| 4th Quarter | | | | | | | | | | | |
| YTD | $390,812 | $243,384 | $2,399 | $0 | $31,283 | $277,066 | $113,746 | | | | |
| Budget (annual) | $1,655,355 | $988,007 | $107,475 | $152,228 | $373,098 | $1,620,808 | $34,548 | | | | |
| | 24% | 25% | 2% | 0% | 8% | 17% | | | | | |
| **Water Fund** | | | | | | | | | | | |
| 1st Quarter | $152,404 | $17,370 | $2,100 | $155,691 | $61,847 | $237,008 | -$84,603 | 5,915 | 10,521 | | |
| Budget (1st Q) | $257,000 | $36,720 | $1,794 | $76,345 | $138,612 | $253,471 | $3,529 | | | | |
| 2nd Quarter | | | | | | | | | | | |
| Budget (2nd Q) | | | | | | | | | | | |
| 3rd Quarter | | | | | | | | | | | |
| Budget (3rd Q) | | | | | | | | | | | |
| 4th Quarter | | | | | | | | | | | |
| YTD | $152,404 | $17,370 | $2,100 | $155,691 | $61,847 | $237,008 | -$84,603 | | | | |
| Budget (annual) | $1,028,000 | $146,880 | $7,175 | $305,381 | $554,447 | $1,013,883 | $14,117 | | | | |
| | 15% | 12% | 29% | 51% | 11% | 23% | | | | | |
| **Sanitation **** | | | | | | | | | | | |
| 1st Quarter | $115,210 | $0 | $1,943 | $0 | $88,915 | $90,858 | $24,351 | | | | |
| Budget (1st Q) | $138,373 | $0 | $1,100 | $75,111 | $96,714 | $172,925 | -$34,552 | | | | |
| 2nd Quarter | | | | | | | | | | | |
| Budget (2nd Q) | | | | | | | | | | | |
| 3rd Quarter | | | | | | | | | | | |
| Budget (3rd Q) | | | | | | | | | | | |
| 4th Quarter | | | | | | | | | | | |

# section four

## Onsite Wastewater Treatment

In the previous section, best practices that lower water use and thus incoming water costs are outlined. A reduction in water usage will help lower wastewater costs when charges are based on the amount of incoming water.

Best practice reduction measures were discussed as well as ways to lower the strength of effluent. Since surcharges are applied based on this effluent strength, these measures make sense to implement.

The remaining effluent volume and strength is typically discharged by most craft brewers through a public sewer system to a municipal or private treatment system. Some brewers have installed onsite pre-treatment systems before discharge to a municipal treatment system. This decision is typically based on regulatory compliance or economics. It is also highly dependent upon land space available at the brewery site. Most pre-treatment units require a large footprint that may not be available to space limited sites.

**When Should You Consider Advanced Treatment?**

*Some smaller brewers have been forced to install advanced pre-treatment units to meet local regulatory requirements. In general, advanced systems do not have an economic payback until there are some economies of scale associated with larger volumes of wastewater. As a rule of thumb, consider advanced wastewater pre-treatment when annual sewer discharge costs approach, or are greater than, $250,000. This cost equates to a brewery size of 150,000 – 300,000 bbl/year based on flows of 2-4 bbl wastewater/bbl beer. This assumes sewer surcharge rates of $0.30/lb BOD, TSS.*

Onsite pre-treatment can reduce the amount of solids and organics sent offsite for treatment. It usually does not treat any sanitary waste, since that may be discharged through a separate sewer system.

Effluent pre-treatment systems reduce effluent loads using either aerobic or anaerobic methods. Both require large holding tanks, de-sludge operations, and sensitive controls and/or operating conditions. In the dynamic field of wastewater pre-treatment, increasing numbers of new systems are being trialed at food and beverage facilities.

There are three primary pre-treatment processes utilized at breweries:

- pH neutralization
- Solids removal
- biological treatment

Regulatory limits usually dictate the need to install pH neutralization. Solids removal is typically driven by regulatory or cost savings requirements. Biological treatment normally is driven by cost savings; however there are situations where a municipality requires some form of organic pre-treatment.

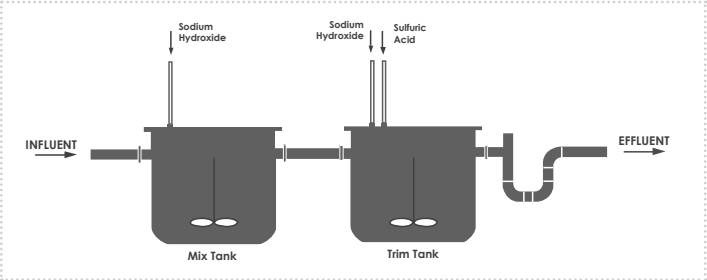
### 4.1 pH Neutralization

Adjusting the pH in a waste stream can be one of the most difficult processes in wastewater treatment. Good pH neutralization and adjustment includes proper mixing, tank configuration, and instrument control.

Brewery wastewater can contain slugs of materials that can be very low in pH or very high, depending upon the timing of acid or caustic usage. Over a longer period of time, brewery pH may be closer to neutral. However, municipal treatment

ordinances typically regulate pH to protect workers that may be doing maintenance on sewer lines, the integrity of the sewer lines, and to protect aerobic bacteria in their biological treatment systems.

**Typical pH Neutralization**




Two key components of these systems include the following:

- Flow equalization is a technique used to consolidate wastewater effluent in holding tanks for "equalizing" temperature or pH before introducing wastewater into downstream treatment processes.
- Chemical adjustment of brewery pH and flocculation of solids are the most common pre-treatment techniques used at breweries. The acidity or alkalinity of wastewater affects both wastewater treatment and the environment. Brewery wastewater tends to gravitate towards a higher pH due to the amount of caustic used for cleaning. Low pH indicates increasing acidity while a high pH indicates increasing alkalinity (a pH of 7 is neutral).

**Small Brewer pH Neutralization Example**

*The Lone Tree Brewing Company in Colorado installed a simple 500-gallon plastic tank for pH equalization. This allows the discharge to the municipal plant to be more consistent by leveling high and low pH swings from cleaning operations.*

## 4.2 Solids Removal

Brewers that install pH pre-treatment facilities or those that cannot meet regulatory restrictions for solids may install onsite solids removal systems. These systems can be categorized as follows:

- Physical treatment is for removing coarse solids and other large materials, rather than dissolved pollutants. This may be a passive process, such as sedimentation to allow suspended pollutants to settle out or float to the top naturally.
- Screening is typically a first step to remove glass, labels, and bottle caps, floating plastic items and spent grains.
- After the wastewater has been screened, it may flow into a grit chamber where sand, grit, and small stones settle to the bottom.
- With the screening completed and the grit removed, wastewater still contains dissolved organic and inorganic constituents along with suspended solids. The suspended solids consist of minute particles of matter that can be removed from the wastewater with further treatment, such as sedimentation or chemical flocculation. Flocculation is the stirring or agitation of chemically-treated water to induce coagulation. Flocculation enhances sedimentation performance by increasing particle size, resulting in increased settling rates.

## 4.3 Biological Treatment

After the brewery wastewater has undergone physical and chemical treatment, it can be biologically treated. Biological treatment of wastewater can be either aerobic (with air/oxygen supply) or anaerobic (without oxygen). Generally, municipalities have relied upon aerobic systems for the treatment of brewery wastewater. Recently, anaerobic systems have become a more attractive option since biogas can be generated for energy use.

Anaerobic wastewater treatment is the biological treatment of wastewater without the use of air or elemental oxygen. Anaerobic treatment is characterized by biological conversion of organic compounds by anaerobic microorganisms into biogas. Biogas is mainly methane (55-75 vol%) and carbon dioxide (25-40 vol%) with traces of hydrogen sulfide.

Anaerobic Treatment in the Brewing Industry

- Suited for brewery wastewater
- Generally soluble organics and medium to high strength
- Produces low amounts of sludge
- Requires small amounts of chemicals
- Produces valuable biogas and sludge
- It is a 'tried & true' technology

Smallest entry-level anaerobic system

- The smallest is a 50 kl UASB system
- Equivalent to a brewery size of between 118,000 – 236,000 bbl per year production
- Installed cost: $700,000 - $1,200,000 U.S.

Aerobic biological treatment is performed in the presence of oxygen by aerobic microorganisms (principally bacteria) that metabolize the organic matter in the wastewater, thereby producing more microorganisms and inorganic end products.

Aerobic treatment utilizes biological treatment processes, in which microorganisms convert non-settleable solids to settleable solids. Sedimentation typically follows, allowing the settleable solids to settle out.

**Aerobic Treatment System[10]**

Smallest entry- level aerobic system

- There are packaged systems available that can treat as little as 3,785 lpd or less
- Practically speaking, the smallest aerobic system will be sized to treat 37,854 lpd
- Equivalent to a brewery size of between 17,000 - 33,000 bbl per year production
- Installed cost: $400,000 - $900,000 U.S.

Pre-treatment of brewery wastewater will reduce the effluent strength as an end-of-pipe solution. Both aerobic and anaerobic treatment options are available. There are differences, advantages and disadvantages of these two systems.

**Comparison Of Two Pre-Treatment Options**

| | AEROBIC TREATMENT | ANAEROBIC TREATMENT |
|---|---|---|
| CONS | Higher energy use | 80+% COD reduction |
| | Generates biomass (sludge) requiring disposal | |
| | High operating costs | |
| | Larger Footprint | |
| PROS | 99+% BOD reduction | Provides renewable energy (biogas) and low biomass |
| | | Low operating costs |
| | | Smaller Footprint |
| | | Capital equal or slightly lower than aerobic |

A common problem with effluent pre-treatment systems is the long retention time required. Brewery effluent is highly biodegradable and contains active micro-organisms. If the effluent remains for an extended period in the balancing tank, microbial action consumes all the available dissolved oxygen and the effluent becomes anaerobic leading to increasing acidity. Acidic conditions cause damage to concrete structures and inhibit subsequent biological treatment processes. This can result in discharge limit violations and odor problems.

**Small Brewer Organic Treatment Example**

*CB's Brewing Company installed an organic pre-treatment system at their brewery in Honeoye Falls, New York. The system reduced BOD levels by 90%. The project was built in partnership with the village of Honeoye, a small community that has the capability to treat mainly residential wastewater. CB's brews about 7,500 BBLs annually. Installation of an organic pre-treatment system was driven as a condition of village approvals, not from an economic return perspective.*

**Optimizing Wastewater Pre-Treatment Operations**

*Reducing the retention time in the balancing tank reduces trade effluent charges*

*The effluent treatment plant at George Bateman & Son's Brewery consists of a large effluent pumping station, an unmixed balancing tank, a biotower and a settlement tank. The Brewery had experienced problems with a low pH in the final effluent and poor COD removal.*

*Measurements of pH at the inlet and outlet of the balancing tank revealed that the pH was falling from 7.0 to less than 5.0 during balancing. Although degradation of organic acids in the biofilter allowed the pH to rise slightly, the brewery was not reliably achieving compliance with the consent minimum of pH 6.0.*

*The Brewery plans to overcome these problems by using low-cost methods to reduce the retention time in the balancing tank. As well as improved compliance with consent limits, savings in trade effluent charges of around £3 000/year are anticipated.*

**Other Biological Treatment Options**

The number and variety of biological treatment solutions scaled for craft brewers is increasing rapidly. Advantages to such smaller systems can include relative affordability, smaller footprint, engineering support and lower operating (power, water, reagent and maintenance) costs.

Notable features of treatment solutions provided by two vendors during the compilation of this manual include:

- Integrated aerobic and anaerobic media technologies (Baswood "AIMS" system)
- Multiple integrated treatment processes for various effluent types (Contech "Magellan" system).

A directory of waste and effluent treatment system suppliers can be found in the Supplier Directory on BrewersAssociation.org.