

MARSHALL MUNICIPAL UTILITIES  
ANNUAL REPORT  
2017-2018

TO: Board of Public Works  
City Council

January 16, 2019

This annual report summarizes some of the key issues and many of the accomplishments and improvements to Marshall's publicly owned utility systems during the fiscal year ending September 30, 2018.

**The top story** for fiscal year 2017/2018: For the third year the trihalomethane reduction project at MMU's Water Treatment Plant is our top story. The project took nearly 2 years to complete and changed the City's disinfection process from free chlorine to a chloramines process which adds ammonia. Substantial completion was signed off in October 2018.

In June of 2017, a major rain caused flooding at the site. The nearly completed 50,000 gallon ground storage clear-well floated off its base. It had to be demolished and rebuilt. Therefore, completion of this project was delayed from March to October 2018.

- Installation of mixing systems in the elevated and ground storage tanks in town,
- Construction of a 500,000 gallon ground storage clearwell at the water treatment plant,
- Installation of new high service pumps,
- Installation of an ammonia feed system to convert to chloramines as the residual disinfectant,
- Installation of baffles in the existing clearwells and conversion to contact basins,
- Upgrade of the SCADA system, and
- Construction of a new administration building to house the plant office, laboratory, a conference/training room, bathrooms, and SCADA control instrumentation.

Completion of this project was very important to several rural water districts that purchase all or part of their water from MMU. We were all having difficulty staying below the regulated level of 80 ( $\mu\text{g}/\text{l}$ ) level for disinfection by-products. The good news is our testing in December 2018 shows regulated limits well below the 80 ( $\mu\text{g}/\text{l}$ ) level.

**The second top story** of 2017/2018 is the AMI meter project. In February of 2017 the Board approved a pilot project to install 270 advance metering infrastructure (AMI) electric meters to evaluate a replacement for the current system that was failing. The pilot project was with Landis and Gyr and would use their meters, modules and software. After a short period of use, the decision was made in December of 2017 to replace all the electric meters with a new AMI system from Landis and Gyr.

The early part of 2018 was spent designing the system, ordering equipment and providing training. We began receiving equipment in June of 2018 and started deployment of the new system. Deployment was done completely "in-house" using MMU meter technicians, billing and IT staff. Replacement of single-phase meters was completed in October of 2018 and we started replacing three-phase meters, these should be completed in January, 2019. When completed, we will have replaced approximately 6,000 electric meters with new AMI meters.

Initial benefits of the new system are improved customer service. We have the ability to do remote connects/disconnects, read customer voltage, e-mail usage reports, real time outage/restoration monitoring and

on demand readings. The new meters are also “Zigbee” compatible to allow customers to monitor to their usage real time (third party device required).

Possible benefits the AMI system could provide in the future include demand readings for every meter and time of use (TOU) rate compatible. Depending on the future of the wholesale market, these options could help lower costs and provide savings to our customers.

**The third top story:** Completion of the new 23,800 square foot warehouse. This warehouse was in our future needs budget since the early 1990’s. MMU has been using a section of an older Power Plant built in the 1920’s, along with several remote buildings and lay-down yards to accommodate all the material necessary to run the utilities. The shell of the new facility was completed in late winter 2017. This past fiscal year in-house crews from the warehouse staff, electric department, power plant and underground facilities completed the interior and it was ready for occupancy in April 2018. Improvements are still being made, but its new location at the Service Center and consolidating 90% of the many lay-down areas that we had, have increased efficiencies and productivity in all departments.

It is our responsibility to provide for the current needs and to plan for the future needs of Marshall’s citizens. We must never forget that Marshall’s citizens are the owners of MMU. The citizens of Marshall can be assured that the employees of MMU are committed to continuing the efforts necessary to fulfill our mission, which is to:

Provide reliable utility service for our owners at the lowest reasonable cost; maintain and operate facilities that will assure safe, dependable electricity, potable water and wastewater treatment, giving due consideration to conservation and environmental impacts; plan for the future to assure adequate resources with progressive but sound economic reasoning.

The following bulleted points provide a glimpse of some of the accomplishments and operations during this past year.

### Wholesale Energy

MoPEP wholesale energy in fiscal year 2017/2018 averaged approximately \$65.75/mw. Compared to fiscal year 2016/2017, wholesale energy went down approximately \$4.5/mw. Most of the savings was due to a much higher consumption by our residential customers due to the warmer weather we experienced last year. Forecast energy prices by MoPEP management for this coming year are between \$68 - \$69/mw.

### Electric Distribution

The following is a summary of the accomplishments of the Electric Distribution department for the fiscal year 2017-2018.

- 161 KV Emergency Tie: The easements were purchased along Watermill Rd. from MMU’s 161 KV line to Central’s 161 KV line and the right of way has been cleared. Bids were sent out for the construction of the new 161 KV Emergency Tie and the demolition of the old 161 KV line. PAR Electrical Contractors was selected for this project and should start construction in January 2019.
- Overhead to Underground Projects: Crews completed overhead to underground projects in easements behind Edsel, S. Grant, Crestwood, and Briarwood. We buried approximately 5,000 ft of primary and secondary lines. We also buried electric services to 39 homes.

- **Street/Area Light Conversion:** We continue the conversion of High Pressure Sodium Street and Area lights to new LED fixtures. We installed 411 new LED fixtures in 2018 bringing the total to approximately 1,881 new LED fixtures installed since the beginning of the project.
- **Tree Trimming:** As part of our annual tree trimming program Poor Boy Tree Service trimmed trees on the 161 right of way. They used a side trimmer to trim and remove trees on the edge of the right of way. We will now mow or spray those areas to prevent future tree growth.

Miscellaneous:

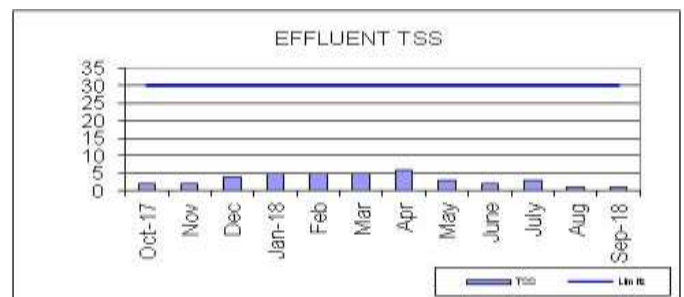
- Replaced/Installed 113 utility poles
- Assisted the City with removal of pad mount transformers and pulling out old primary underground at the Hab Center Property.
- Installed service to the new Sonic.
- Installed new service to Jackson’s
- Replaced underground feeder 22 at North St. Sub
- Performed maintenance/upgraded services:
  - Coreslab
  - Water Treatment Plant

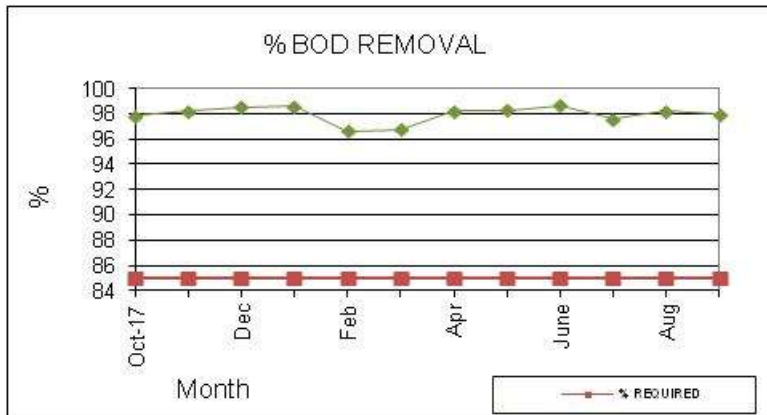
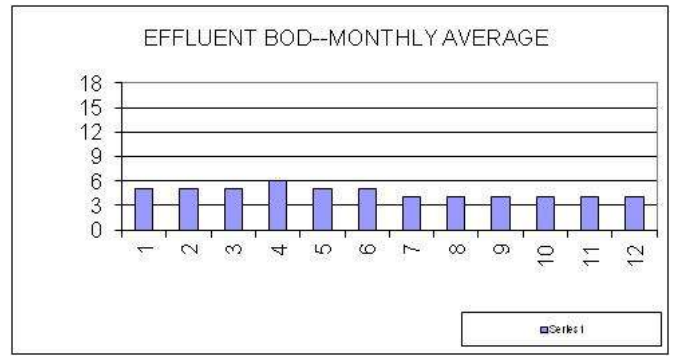
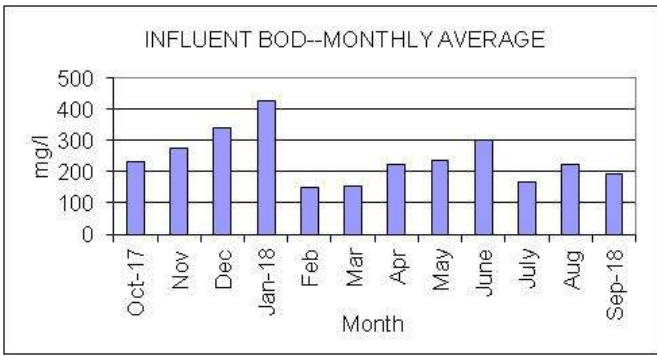
Water Treatment Plant

- The plant produced 875,351,276 gallons of water up from 868,128,353 gallons produced in FY17. The daily average was 2.39 million gallons.
- We published and mailed the annual consumer confidence report for 2017.

Wastewater Treatment Plant

- The plant treated 757,942,000 gallons of wastewater, an approximate 12% decrease from the 860,974,000 gallons for FY 17/18. We applied roughly 362 tons of sludge to local farmland.
- Following are charts showing the wastewater treatment plant’s effluent sampling results for FY17/18 compared against the effluent limits set by DNR.





BOD – biochemical oxygen demand

TSS – total suspended solids

mg/l – milligrams per liter or parts per million

There currently is no discharge limit, only a monitoring requirement, for ammonia.

## Electric Production

- One of the top stories in Electric Production for the 2018 year was the restructuring of the Department itself. Over the past years there has been significant reductions in personnel simply by not filling positions as they were vacated. This was possible because of several changes that required fewer personnel. A couple of changes that allowed for fewer personnel were the way we handled our coal and ash. As we went forward, we ran the steam units less and as such required less maintenance on those units. Since then all steam units have been decommissioned. In the meantime, operations in the recycle center increased. Management within the Power Plant consisted of the Director, Maintenance Supervisor and the Operations Supervisor. When the Plant Director retired and that position was filled in house by the Maintenance Supervisor it created a situation where the Operations Supervisor was in part acting as the Assistant Director but the title wasn't changed. With all the changes the scope of work evolved to a point it became necessary to rewrite job descriptions and restructure the department to have the job description match the job. Overall this process went very well.
- Another change in the 2018 year was the relocation of the Control Room. The Power Plant Control Room was centrally located on the second floor of the Plant. This was an idea location because of its accessibility to the steam turbines and generator controls. With the decommissioning of the steam turbines it was no longer in a convenient part of the Plant and was somewhat isolated. The new Control/Dispatching room is located on the west end of the Power Plant building in what used to be the engineering room. This location has accessibility to all essential facilities that were not available in its old location.

Electric Production went to a one-man shift for dispatching on September 30<sup>th</sup>, 2018. We do still have two men on the 8-4 shift on weekends and holidays to keep up with the recycle center operations. After the decommissioning of the steam units in Electric Production and following the changes listed above the former Fireman and Operator positions were no longer necessary. During the restructure process the job description was rewritten and became a Dispatcher position. The dispatcher monitors the Electric Distribution grid, water tower and reservoir levels, security cameras and weighs and logs trucks in and out of the facility. The Dispatcher also answers all incoming phone calls after business hours and on weekends and holidays.

## Underground Facilities

- Approximately 9,200 feet of sewer main was reconditioned with cured-in-place pipe (CIPP) method. This type of trenchless main replacement consists of a flexible, resin saturated fabric liner that is installed inside the old main. The liner takes the shape of the old pipe and is cured with hot water or steam. There were different sections throughout the collection system. In some of the areas the mains were located in backyards in an easement. To replace the mains in these areas by the traditional open excavation method would take many months to complete. The main liner should last for 50 years and possibly up to 100 years. This was the eleventh year that repairs were made to the collection system using the CIPP method.
- Inspection and cleaning of the sewer mains continue throughout the collection system. Water from a high pressure sewer cleaner was used to clean over fourteen miles of sewer main. The sewer camera was used to videotape over fourteen miles of sewer mains. These video inspections reveal areas that need to be repaired, totally replaced or reconditioned, as well as identifying other potential problems in the collection system.
- MMU personnel have also made fourteen sewer main repairs this last year. There were six new water services installed, twenty-three main breaks in the distribution system, and thirteen main breaks on the transmission line between the Water Treatment Plant near Malta Bend and the reservoirs at the Power Plant.

- Improvements and maintenance in the wastewater collection system are an on-going process. A sewer main replacement project was completed on North English Avenue in July. The existing 6" main was in poor condition and unable to be cured in place. The project consisted of approximately 500 feet of 8" PVC and two new precast manholes.
- A second sewer main replacement project was completed on High Street from English Avenue to North Ellsworth Avenue. The existing 6" clay main was under the south curb and in poor condition. A flow study was conducted by Bartlet & West Engineering to determine the feasibility of rerouting the flow to the newly renovated North English Lift Station. The study determined it was feasible. The project consisted of approximately 400 feet of 8" PVC and three new manholes.
- The 147foot tall, 500,000 gallon spherical elevated water tank was cleaned and repainted. With cooperation from Missouri Valley College and Marshall Public Schools, both school logos were painted on the tank.
- A 6" main extension was started in November for new construction at Missouri Valley College. The project will consist of approximately 1,700 feet of 6" PVC main, three fire hydrants and one 2" water service. The project should be completed in the spring of 2019.
- Three swinging check valves were replaced at Southwest Lift Station. A new metal roof was also installed.
- The Owner Supervised Plan (OSP) was updated and renewed in October. The OSP is a MoDNR required plan of future water main installations and replacements. The plan is mandated to be renewed every five years. The next renewal will be in 2023.
- A 6" fire line tap was installed at the Leo Hayob High Rise on Redman Avenue. In addition, two 2" water services were installed outside the City Limits with board approval to serve Fisher Concrete.

In fiscal year 2018, a total of 3 people were hired. All people were hired to fill vacancies created by departing personnel. During the year, two people were hired for Wastewater (Operator), and one for Administrative Services (Meter Reader). The Electric Production Department also went through a reorganization that resulted in the departure of three full time employees and the elimination of six additional positions that were vacant at the time. At year's end, we have 12 vacancies created by personnel who have departed or retired. Ten of these vacancies will remain unfilled indefinitely. December 1, 2018, started year four of the HSA-qualified high deductible health plan (HDHP) the number of employees using this plan has grown to 82%, in lieu of the traditional PPO option.

The information and statistics above are intended to give you a feel for what was accomplished this last year, but these statistics do not begin to convey the importance of the utility services provided to the citizens of Marshall by the citizens of Marshall. This local ownership yields many hometown advantages, not the least of which is having the Business Office right here in town and having decisions made by citizen owners.

Kyle D. Gibbs  
General Manager

KDG/jm

TABLE A

Free Services  
Fiscal Year 2017-2018

WATER:

Fire Hydrant Maintenance	\$	5,439
Depreciation of Fire Hydrants	\$	6,680
Labor and Material Donated	\$	6,958
Utilities Donated to City	\$	<u>89,111</u>
	\$	<b>108,188</b>

ELECTRIC:

Street Lighting Energy	\$	105,236
Street Lighting Maintenance	\$	4,253
Depreciation of Street Lighting	\$	51,233
Labor and Material Donated	\$	8,820
Marshall-Saline Development Corp.	\$	30,000
Utilities Donated to City	\$	<u>137,906</u>
	\$	<b>337,448</b>

WASTEWATER:

Utilities Donated to City	\$	<u>11,748</u>
	\$	<b>11,748</b>

INTERNET:

Utilities Donated to City		<u>428</u>
		<b>428</b>

TOTAL	\$	<b>457,812</b>
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Payments in Lieu of Taxes

Water Transfers to City General Fund	\$	186,499
Electric Transfers to City General Fund	\$	<u>1,833,100</u>
	\$	<b>2,019,599</b>

TABLE B

	<u>Operating Statistics</u>				
	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Average # Elec. Customers	5,920	5,933	5,949	5,957	5,934
Average # Water Customers	4,947	4,933	4,957	4,974	4,980
Average # Internet Customers	1,075	1,456	1,821	2,131	2,403
Average Residential Bill (monthly)					
Water	\$26.82	\$27.48	\$29.92	\$30.45	\$31.03
Electric	\$93.04	\$92.91	\$98.93	\$95.72	\$105.05
Wastewater	\$37.99	\$37.84	\$37.60	\$37.31	\$37.25
Uncollectables (Bad Debts)	\$67,187	\$60,930	\$77,665	\$69,528	\$79,395
Customers Assisted	420	456	474	500	474
MVCAA	\$59,924	\$49,956	\$68,433	\$59,634	\$66,072
Other*	\$17,868	\$15,430			
Peak Day Water (on production)	4/8	8/13	8/20	6/13	8/14
(1,000,000 gal.)	6.66	5.37	4.75	4.65	4.7
Water Sold (1,000,000 gal.)					
Residential	229	209	216	211	214
Commercial	70	68	59	64	72
Small General	42	44	42	42	44
Large General	55	48	54	58	54
Industrial	247	234	212	201	201
Wholesale	243	239	243	231	227
TOTAL	886	842	830	807	812
Total Annual Water from Wells	970	927	913	886	885
(1,000,000 gal.)					
Water % Losses	8.66	9.17	9.10	8.92	8.25
Tons Waste Lime (land applied)	486	2,300	0	7,693	7,326
# Acres	180	1,040	0	3,847	3,240

\* Includes churches and Salvation Army.



TABLE B - Operating Statistics (cont.)

	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Peak Day Wastewater (1,000,000 gal.)	4/4 6.41	7/9 12.03	8/1 18.31	4/30 18.88	3/20 13.53
Total Annual Wastewater (1,000,000 gal.)	779	1,057	1,124	861	759
Tons Wastewater Sludge # Acres	806 1,303	384 643	378 673	284 277	362 726
Golf Course Irrigation Water (1,000,000 gal.)					
Effluent	17,421	0	0	0	0
Potable	0	10,643	11,452	12,939	20,559
Peak Load KW Date	37,800 8/25	38,351 7/28	38,600 7/20	37,200 7/20	38,200 7/12
MWH sold					
General Lighting	154	138	122	100	118
Residential	50,117	48,121	48,439	46,684	51,929
Commercial	15,127	14,497	13,140	13,068	14,085
Small General	18,808	17,376	18,601	17,911	17,543
Large General	22,383	22,283	22,032	24,880	25,373
Industrial	68,872	70,222	67,898	65,443	65,831
Interruptible	39	37	38	57	80
Area Light	0	632	693	525	450
TOTAL	178,459	173,316	170,963	168,668	175,409
Total MWH Purchased	188,373	185,042	179,472	176,710	180,581
Total MWH Generated *	166	4,527	249	121	521
% Losses	4.92	6.34	4.74	4.55	2.87
Natural Gas Burned (MCF)	1,944	4,368	3,260	2,715	7,654
#2 Fuel Oil Burned (gal)	4,470	1,680	2,272	2,040	3,050
Coal Burned (tons)	0	2,896	0	0	0
Paper Sold (tons)	1,051	879	893	659	583
Cardboard Sold (tons)	531	534	544	2,324	3,086

\* Beginning in June 2006, all energy generated is sold to MoPEP.

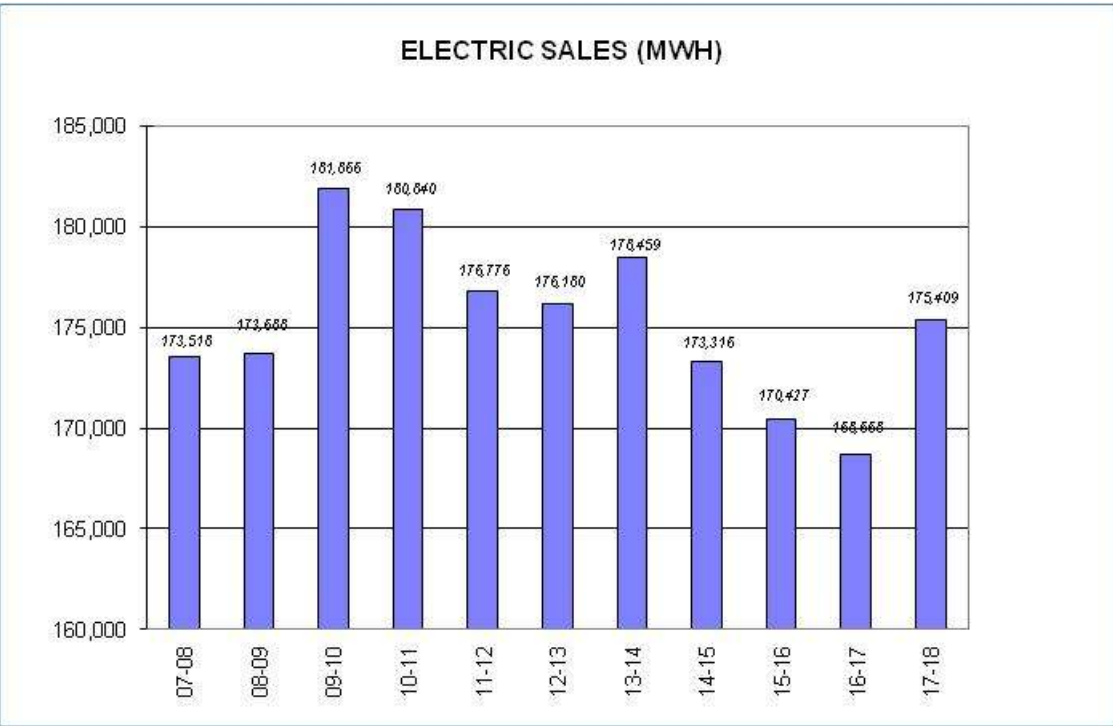
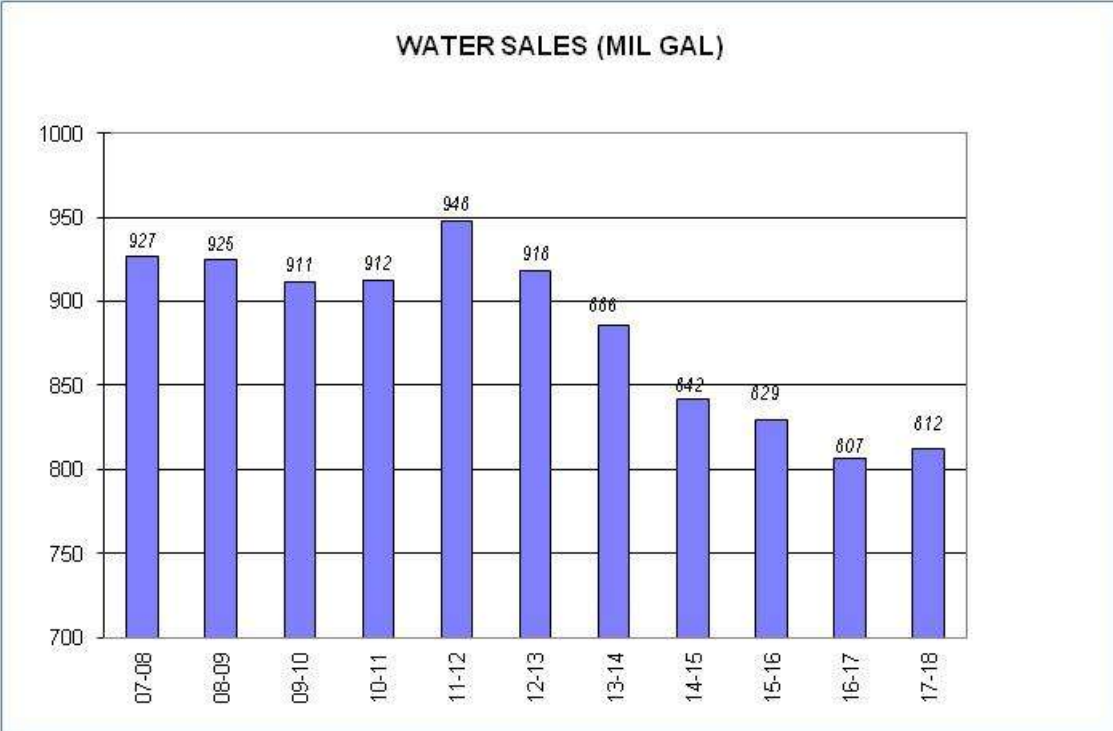


TABLE C

Cash Transaction Report

Fiscal Year 2017/18

	<u>WATER</u>	<u>ELECTRIC</u>	<u>SEWER</u>	<u>INTERNET</u>	<u>GAS</u>	<u>TOTAL</u>
Fund Balance (10/1/17)*	\$1,906,498	\$21,145,653	\$2,279,882	\$341,808	\$2,674,210	\$28,348,051
Revenues	\$3,994,777	\$21,704,446	\$2,956,806	\$1,112,184	\$261,412	\$30,029,625
Disbursements	\$6,382,258	\$21,097,891	\$2,205,992	\$796,902	\$66,553	\$30,549,596
Net Transfers	\$1,835,411	(\$1,235,411)	(\$480,000)	(\$120,000)	-	-
Fund Balance (9/30/18)*	\$1,354,428	\$20,516,797	\$2,550,696	\$537,090	\$2,869,069	\$27,828,080
Investments (9/30/18)	-	\$14,842,949	\$1,234,868	-	\$2,472,384	\$18,550,171

\* Includes Investments

TABLE D

Water and Wastewater Debt

(Subject to interest rate change semi-annually)

Estimated payments due for year ending:

Principal & Interest	Water	Wastewater
9/30/2019	\$397,947	\$539,259
9/30/2020	\$392,760	\$529,667

TABLE E-1

	<u>Cash and Investments</u>		
	9/30/18		
	<u>Total</u>	Cash	Investments (at cost)
<b>WATER:</b>			
Operating	\$628,552	\$628,552	\$0
Water Plant	\$263,314	\$263,314	\$0
Insurance Reserve	\$500,000	\$500,000	\$0
Equipment Reserve	\$0	\$0	\$0
	<u>\$1,391,866</u>	<u>\$1,391,866</u>	<u>\$0</u>
<b>ELECTRIC:</b>			
Operating	\$5,056,619	\$5,056,619	\$0
Consumer Deposits	\$506,874	\$506,874	\$0
Insurance Reserve	\$5,001,567	\$54,018	\$4,947,549
Equipment Reserve	\$10,251,203	\$355,803	\$9,895,400
	<u>\$20,816,263</u>	<u>\$5,973,314</u>	<u>\$14,842,949</u>
<b>WASTEWATER:</b>			
Operating	\$370,582	\$370,582	\$0
Inflow & Infiltration	\$1,203,564	\$463,645	\$739,919
Insurance Reserve	\$500,000	\$5,081	\$494,919
Main Replacement	\$498,313	\$498,313	\$0
Equipment Reserve	\$0	\$0	\$0
	<u>\$2,572,459</u>	<u>\$1,337,621</u>	<u>\$1,234,838</u>
<b>INTERNET:</b>			
Operating	\$552,076	\$552,076	\$0
<b>NATURAL GAS</b>			
Operating	\$365,620	\$365,620	\$0
Equipment	\$2,503,732	\$31,348	\$2,472,384
	<u>\$2,869,352</u>	<u>\$396,968</u>	<u>\$2,472,384</u>
	<b>\$28,202,016</b>	<b>\$9,651,845</b>	<b>\$18,550,171</b>

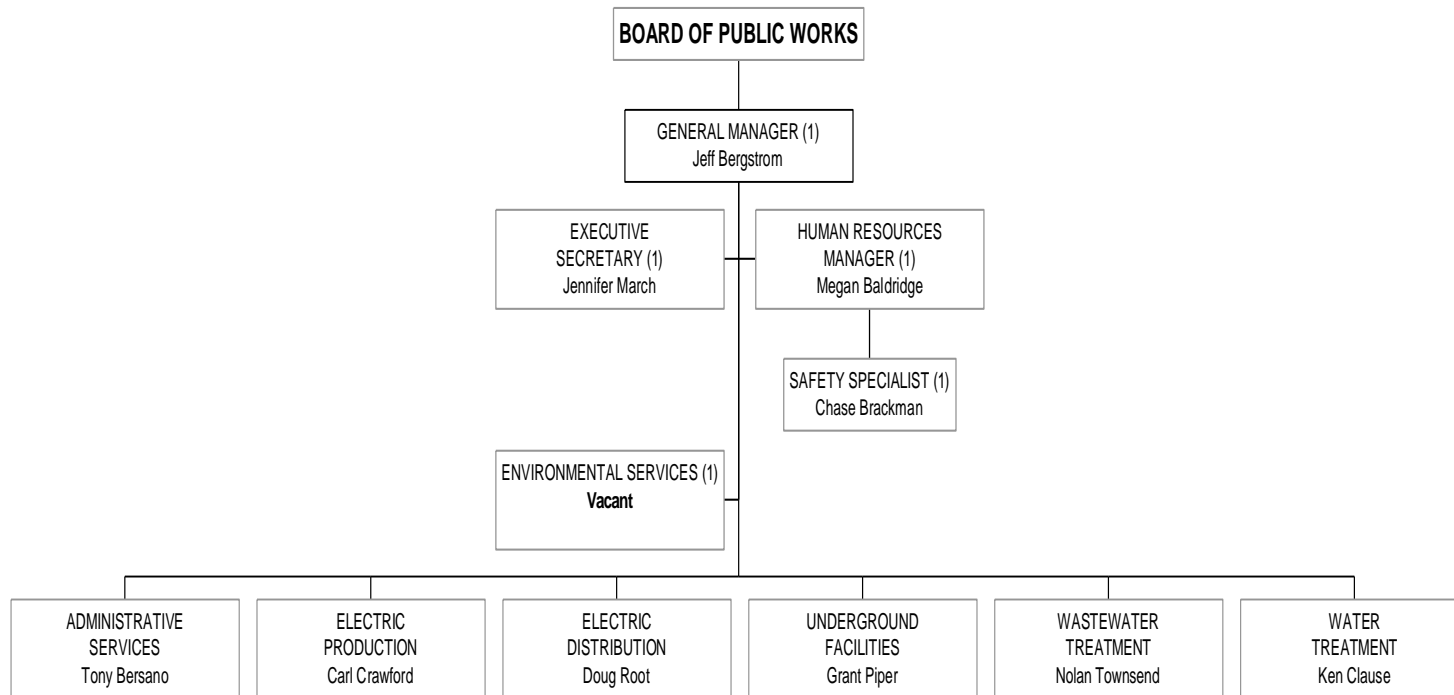
TABLE E-2(Detail of Table E-1)  
Investments 9/30/18

	<u>Cost</u>	<u>Face Value</u>	<u>% Yield</u>
ELECTRIC (Wood & Huston)			
Treasury Bill Maturing 11/1/18	\$4,949,697	\$5,000,000	2.038%
Treasury Bill Maturing 12/13/18	\$4,947,549	\$5,000,000	2.126%
Treasury Bill Maturing 1/17/19	\$2,967,543	\$3,000,000	1.632%
Treasury Bill Maturing 1/31/19	\$1,978,160	\$2,000,000	2.214%
	<u>\$14,842,949</u>	<u>\$15,000,000</u>	
WASTEWATER (Community Bank):			
CD - Community Bank 12/17/18	\$245,000	\$245,000	0.30%
Treasury Bill Maturing 1/18/18 1/17/19	\$989,838	\$1,000,000	2.06%
	<u>\$1,234,838</u>	<u>\$1,245,000</u>	
NATURAL GAS (Wood & Huston)			
Treasury Bill Maturing 2/21/19	\$2,472,384	\$2,500,000	2.24%
	<u><u>\$18,550,171</u></u>	<u><u>\$18,745,000</u></u>	

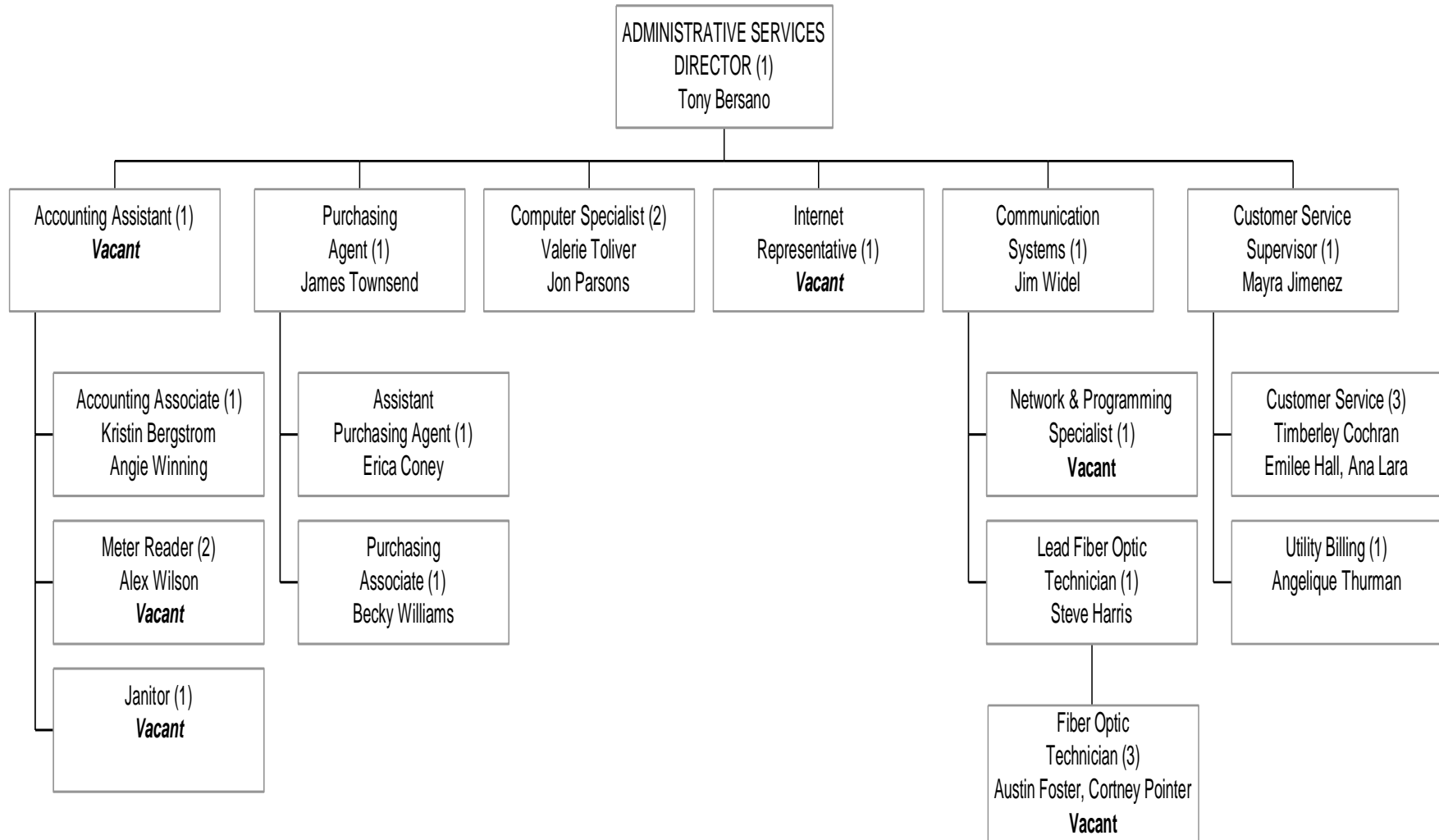
## **Recycling**

Revenue	\$357,451
Expense	
Supplies	\$10,916.00
Fuel	\$10,951.46
Repairs	\$18,608.00
Labor	\$216,712.12
Benefit Allowance (50%)	\$108,356.06
Utilities	\$13,628.00
Depreciation - large baler	\$24,216.00
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	\$403,387.64
Net	(\$45,936.64)

# MARSHALL MUNICIPAL UTILITIES

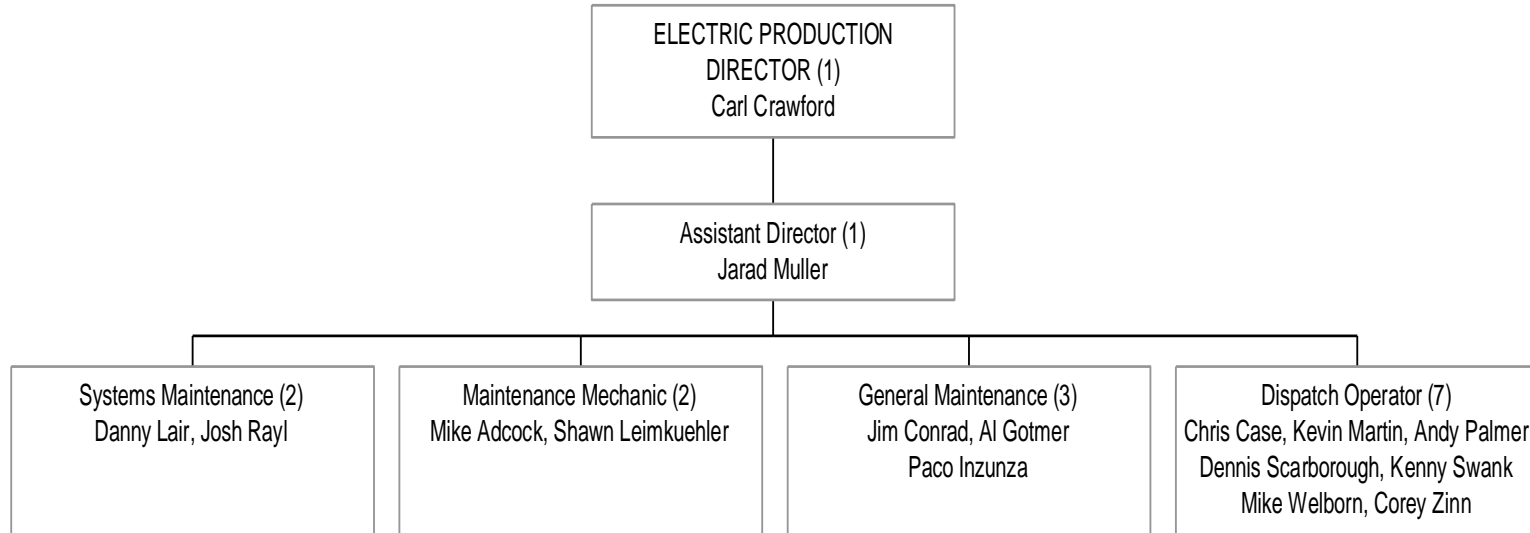


# ADMINISTRATIVE SERVICES

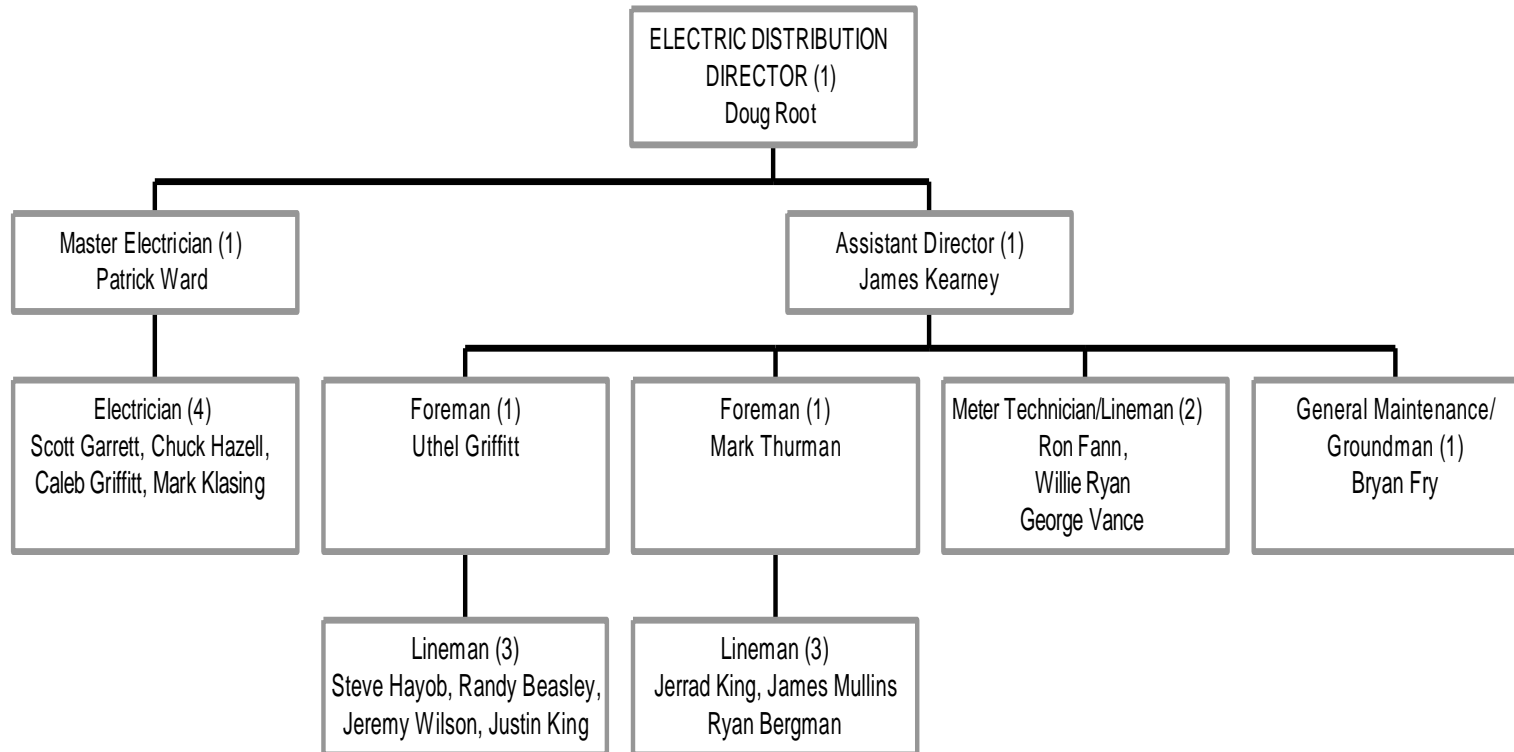




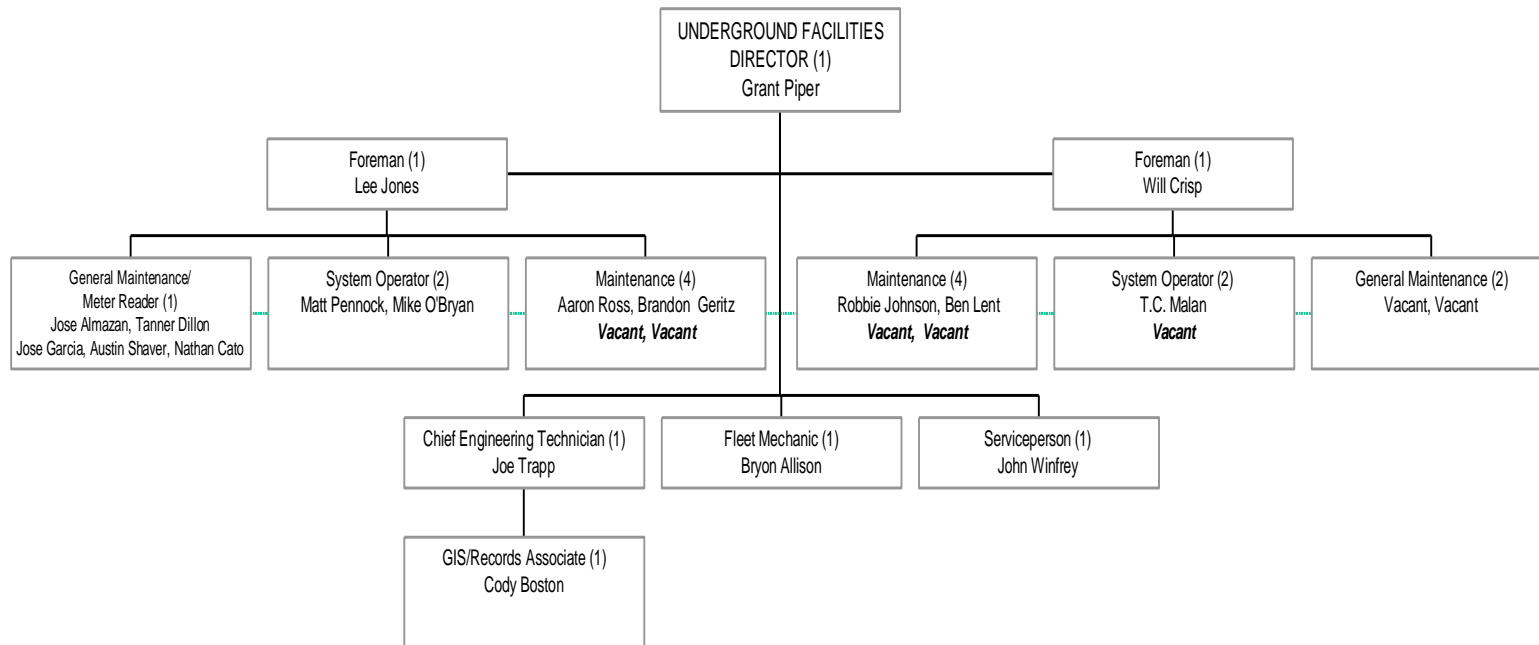
# *ELECTRIC PRODUCTION*



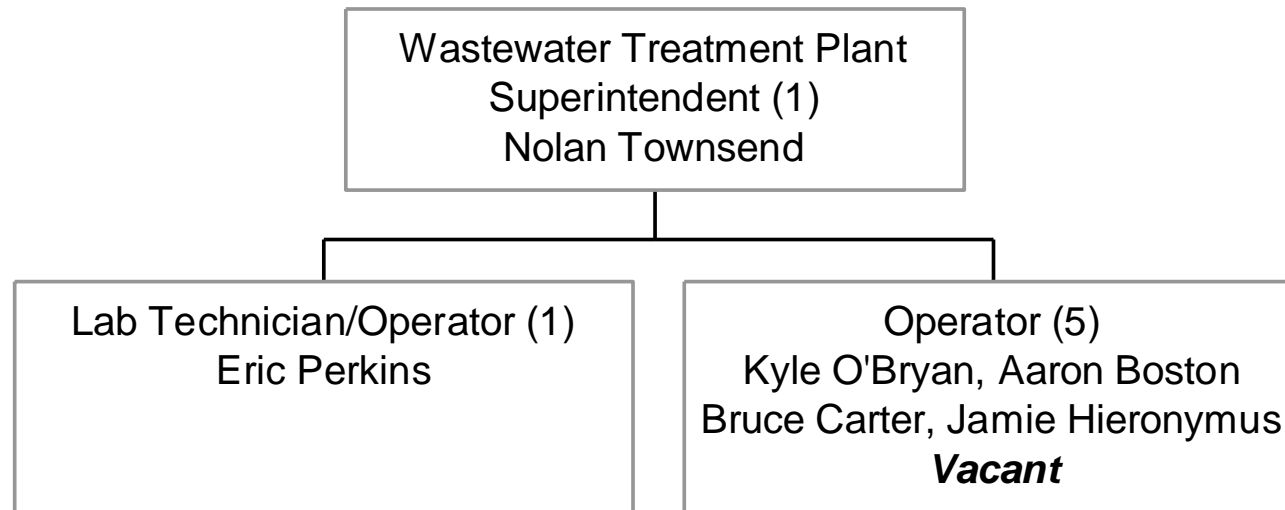
# *ELECTRIC DISTRIBUTION*



# UNDERGROUND FACILITIES



# WASTEWATER TREATMENT



# *WATER TREATMENT*

