BEFORE THE PUBLIC SERVICE COMMISSION OF THE STATE OF MISSOURI

SUMMIT INVESTMENT, LLC, Complainant,	)	
vs.	)	Case No.: SC-2014-0214 WC-2014-0215
OSAGE WATER COMPANY, Respondent.	)	

OSAGE WATER COMPANY'S RESPONSE TO STAFF'S STATUS REPORT

Comes now Osage Water Company, by and through its Court-Appointed Receiver, and for its Response to Staff's Status Report, states to the Commission as follows:

1. Osage Water Company acknowledges that on October 22, 2015, the Commission entered its Report and Order directing the Staff to work with Osage to determine what steps are necessary to expand services to the undeveloped lots in Eagle Woods.

2. Attached hereto, and incorporated herein by reference and denoted as Exhibit "A", is a report from LAKE Professional Engineering Services, Inc. which complies with the Commission's Order to "determine what steps are necessary to expand services to the undeveloped lots in Eagle Woods".

3. The highlights of the report are as follows:

> "Therefore, to repair this treatment and collection system so that it can handle the current flow, it will cost an estimated:
>
> | | |
> |---|---|
> | Lift/Septic tank replacement | $ 25,000 |
> | 4" gravity pipe replacement | $ 75,000 |
> | 2" pressure line replacement | $ 26,000 |
> | Treatment plant replacement | $350,000 |
> | Total replacement/upgrade | $475,000 |
>
> Therefore, to repair this treatment and collection system so that it can handle the current and additional flow, it will cost an estimated:

Lift/Septic tank replacement	$ 25,000
4" gravity pipe replacement	$ 75,000
2" pressure line replacement	$ 26,000
Treatment plant replacement	$525,000
Total replacement/upgrade	$650,000

It is recommended that there be no additional connections made to this treatment plant or collection system until the treatment plant and collection system is replaced and expanded to handle the additional flow."

4. Relative to the issue of expanding the water system of Eagle Woods to the undeveloped lots, attached hereto and denoted as Exhibit "B" is correspondence from Lake of the Ozarks Water & Sewer, the Court-Mandated operator of the Osage Water Company. The highlight of that report is as follows:

"Total anticipated costs $190,000.00."

WHEREFORE, Osage Water Company prays that the Commission accept the information set forth herein and find that said information complies with the Commission's Order of October 22, 2015; and for such other and further relief as the Court deems just and proper under the premises.

COVER & HILTON LAW, LLC

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Attorney & Receiver for Osage Water Company

REVIEW OF THE SEWAGE COLLECTION SYSTEM AND TREATMENT PLANT

FOR

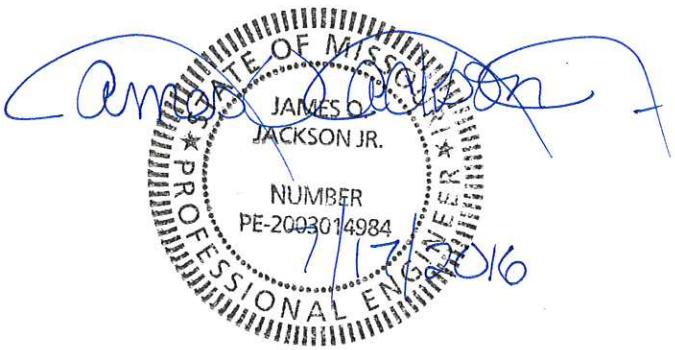
OSAGE WATER COMPANY
840 THUNDER MOUNTAIN ROAD
CAMDENTON, MO 65020

AT

EAGLEWOODS SEWAGE TREATMENT PLANT

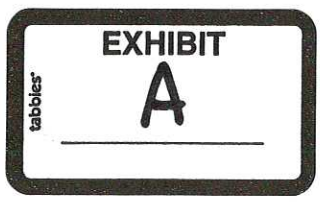
CAMDEN COUNTY
MISSOURI

JULY 2016



JAMES O. JACKSON, JR.
ENGINEER - MO.# PE-2003014984

LAKE PROFESSIONAL ENGINEERING SERVICES, INC.
CONSULTING ENGINEERS
CAMDENTON, MISSOURI 65020
573-873-3898
CERTIFICATE OF AUTHORITY #E001584



The sewage treatment facility at Eaglewoods Subdivision consists of a gravity collection system, a four pump/septic tanks, a gravity sewer main, pressure sewer line, a recirculation tank, two sand filter beds, a chlorinator, a chlorine contact tank, and a dechlorinator. Each of these systems will be looked at individually for both capacity and for their existing condition.

There are several septic tanks on the north side of Eagle Crossing. Each serving three (3) to four (4) houses. Each tank has a liquid capacity of two thousand five hundred (2,500) gallons.

According to the Missouri Department of Natural Resources regulations, 10 CSR 20-8.020, each house has a population equivalent (PE) of 3.7 and generates 100 gallons per PE. This would give a flow for the four (4) houses:

(4 houses)(3.7 PE/house)(100 gallons/PE/day) = 1,480 gallons/day

The minimum size of a septic tank is given as one and a half (1.5) times the average daily flow.

Minimum tank #1 size = (1,480 gallons)(1.5) = 2,220 gallons.

There is only one septic tank on the south side of Eagle Crossing. This tank serves six (6) houses and has a liquid capacity of three thousand seven hundred eighty (3,780) gallons.

Calculating the flow generated by the six (6) houses:

(6 houses)(3.7 PE/house)(100 gallons/PE/day) = 2,220 gallons/day

The minimum size of a septic tank is given as one and a half (1.5) times the average daily flow.

Minimum tank #1 size = (2,220 gallons)(1.5) = 3,330 gallons.

All of these septic tanks around Eagle Crossing are at or near capacity. There are several vacant lots in this area. Any new construction in this area would require either the appropriate septic tank to be expanded or a new septic tanks be put in place to service the new construction.

All of the septic tanks around Eagle Crossing flow into a common pump tank #1. The pump tank will need to have a storage capacity for two hours of peak flow. There are eighteen (18) houses flowing to this tank.

Figure 1-Houses Served By Pump Station #1

The average daily flow to the pump tank is:

ADF = (18 houses)(3.7 PE/house)(100 gallons/PE/Day) = 6,660 gallons/day

Peak flow is given as four times the average daily flow.

Peak = (4)(6,660 gallons/day) = 26,640 gallons/day

With a two (2) hour peak flow at

2 hr peak flow = (26,640 gallons/day)(1 day/24 hours)(2 hours) = 2,220 gallons.

Pump tank #1 is constructed from concrete and appears to be in satisfactory condition and has a capacity of three thousand seven hundred eighty (3,780) gallons. Therefore, there is capacity for:

Capacity = (3,780 gal. – 2,220 gal.)/(2 hrs)(24 hrs/day)/4 = 4,680 gallons/day

This is equivalent to:

(4,680 gal/day)/(100 gal/day)/(3.7 gal/day) = 12.6 houses

Pump tank #1 can handle the settled sewage for an additional twelve (12) houses.

Inside pump tank #1 is a set of duplex pumps discharging into a three inch (3") pressure sewer line. The pumps have the capability of pumping 20 gpm which is not sufficient to maintain a scouring velocity of at least two feet/sec (2 fps). This section of line should have been installed as a two inch (2") line to ensure the scouring velocity inside the pipe is meet.

During the site visit on January 30, 2016, the tank was overflowing and sewage was running across the ground and into the neighboring gully. Although there were no apparent leaks around the tank during the site visit on July 1, 2016, there were signs that the tank had been overflowing recently.

Figure 2-Lift Station #1

There is a four inch (4") gravity sewer collection line servicing all eighteen (18) houses around Eagle Crossing. According to the Missouri Department of Natural Resources regulations, 10 CSR 20-8.020, the minimum size sewer line for subdivisions located rural areas is six inches (6"). There is a provision allowing for the use of a four inch (4") line to carry raw sewage or settled sewage for no more than one hundred fifty feet (150') in length. This line is approximately six hundred fifty feet (650').

The Missouri Department of Natural Resources regulation 10 CSR 20-8.020 states the gravity sewer lines must handle 100 gallons/person/day with a peak factor of four (4). Therefore, the four inch (4") line must handle a minimum of:

(6,660 gallons/day)(4) = 26,640 gallons/day.

If the flow is over an eighteen (18) hour period during the day, the flow is:

(26,640 gallons/day)(1 day/18 hours)(1 hour/60 min) = 24.67 gallons/min.

To find the flow capacity of 4" variable grade sewer line at minimum slope of 1 ft. in 100 ft.

Given:

$$V = \frac{1.486}{n}(R)^{\frac{2}{3}}(S)^{\frac{1}{2}}$$

$$Q = \frac{\pi(D\text{ in})^2}{4(12\text{in/ft})^2}\frac{1.486}{n}(R)^{\frac{2}{3}}(S)^{\frac{1}{2}}$$

R = Hydraulic Radius

S = Slope

N = 0.013 for PVC

$S = 1.00\%$

D = 4" PVC

$$Q = AV \qquad V = \frac{1.486}{n}(R)^{\frac{2}{3}}(S)^{\frac{1}{2}}$$

$$Q = \frac{\pi(4\text{ in})^2}{4(12\text{ in/ft})^2}\left(\frac{1.486}{0.013}\right)\left(\frac{4\text{ in}}{4(12\text{ in/ft})}\right)^{\frac{2}{3}}\left(\frac{1.00\text{ ft}}{100\text{ ft}}\right)^{\frac{1}{2}}(60\text{ sec/min})(7.48\text{ gal/ft}^3)$$

= 85.4 GPM flowing full or 42.7 GPM flowing ½ full

Even though the four inch (4") pipe is under the minimum required size the Missouri Department of Natural Resources will allow, it will have sufficient capacity to serve this part of the development. However, four inch (4") gravity sewer line does not meet the Department of Natural Resources minimum and it should be replaced with a six inch line (6") line minimum.

Pump/septic tank #2 is located to the north of Red Fox Lane. There are seven (7) houses being serviced by this pump/septic tank. The seven (7) houses do not have individual septic tanks and are relying on this pump/septic tank to act as a septic tank before having the effluent pumped to the sand filter for final treatment.

Figure 3-Houses Served By Pump/Septic Tank #2

The flow generated by the seven (7) houses:

(7 houses)(3.7 PE/house)(100 gallons/PE/day) = 2,590 gallons/day

The minimum size of a septic tank is:

Minimum tank #2 size = (2,590 gallons)(1.5) = 3,885 gallons.

The actual size of the pump/septic tank #2 is two thousand five hundred (2,500) gallons consisting of a one thousand five hundred (1,500) gallon septic tanks coupled with a one thousand (1,000) gallon pump tank. Even with the combined capacity of both the septic tank and pump tank, this is still below the required minimum of three thousand eight hundred eighty-five (3,885) gallons. Using a tank as both a

pump tank and a septic tank is not an ideal situation. This increases the probability that solids could be passed through to the sand filter.

Both tanks are constructed from PVC. The tank does not appear to be bedded correctly as the sides of the tank appear to be collapsing and forcing the bottom of the tank up. This is causing the pump vault and pumps to be forced upwards towards the tank lid. With the pump vault and pumps no longer sitting plum in the tank, the floats operating the pumps could be effected and causing the pumps to not be turning on and off at the proper times. In order for a PVC tank to operate as a pump tank, the tank must be constructed as a heavy wall PVC. If the tanks is not a heavy wall PVC construction, when the tank is pumped down, the weight of the soil/bedding surrounding the outside of the tank could cause the sides of the tank to collapse inward.

Figure 4-Cambered Pump Vault Inside Pump Tank #2

The gravity collection sewer line coming to pump station #1 is a four inch (4") pvc line. This is smaller than the required minimum of six inch (6"). This part of the collection system will need to be upgraded to required minimum size of six inches (6").

During the site visit on January 30, 2016, the pump tank #2 was overflowing and raw sewage was flowing down the hillside. On the July 1, 2016 site visit, the tank was not overflowing but the inlet pipe to the tank was.

Inside the pump tank is a set of duplex pumps discharging into a three inch (3") pressure sewer line. The pumps have the capability of pumping 20 gpm which is not sufficient to maintain a scouring velocity of at least two feet/sec (2 fps). This is because statistical analysis has shown that when there are two (2) pump on a pressure system, there is high probability that both pumps will be running.

Figure 5-Overflowing Inlet Pump Tank #2

Figure 6-Pump Tank #2

Pump/septic tank #3 is located to the west of pump/septic tank #2. There are five (5) houses being serviced by this pump/septic tank. The five (5) houses do not have individual septic tanks and are relying on this pump/septic tank to act as a septic tank before having the effluent pumped to the sand filter for final treatment.

Figure 7-Houses Served by Pump/Septic Tank #3

The flow generated by the five (5) houses:

(5 houses)(3.7 PE/house)(100 gallons/PE/day) = 1,850 gallons/day

The minimum size of a septic tank is:

Minimum tank #3 size = (1,850 gallons)(1.5) = 2,775 gallons.

The actual size of the pump/septic tank #3 is two thousand five hundred (2,500) gallons consisting of a one thousand five hundred (1,500) gallon septic tanks coupled with a one thousand (1,000) gallon pump tank. Even with the combined capacity of both the septic tank and pump tank, this is still below the minimum of two thousand seven hundred seventy-five (2,775) gallons. This will cause the pump tank to act as a septic tank in addition to a septic tank. This is not ideal as it increases the chances that solids will be pumped to the treatment plant.

The gravity collection sewer line coming to pump station #3 is a four inch (4") PVC line. This is smaller than the required minimum of six inch (6"). This part of the collection system will need to be upgraded to required minimum size.

Inside the pump tank is a set of duplex pumps discharging into a three inch (3") pressure sewer line. The pumps have the capability of pumping 20 gpm which is not sufficient to maintain a scouring velocity of at least two feet/sec (2 fps). This is because statistical analysis has shown that when there are three (3) pump on a pressure system, there is high probability that two (2) pumps will be running.

The pump/septic tank #3 has two (2) tanks. The septic tank is constructed of concrete and the pump tank is constructed from PVC. The tanks appear to be in satisfactory condition. However, they were overflowing during both site visits on January 30, 2016 and July 1, 2016. If the pump tank is not a heavy wall PVC construction, when the tank is pumped down, the weight of the soil/bedding surrounding the outside of the tank could cause the sides of the tank to collapse inward.

Figure 8-Septic Tank #3

Figure 9-Pump #3

The gravity collection sewer line pump/septic tank #3 is a four inch (4") PVC line. This is smaller than the required minimum of six inch (6"). This part of the collection system will need to be upgraded to required minimum size.

Pump/septic tank #4 is located to the north of pump/septic tank #3. There are three (3) houses being serviced by this pump/septic tank. The three (3) houses do not have individual septic tanks and are

relying on this pump tank to also act as a septic tank before having the effluent pumped to the sand filter for final treatment. This increase the likelihood that solids will be sent to the treatment plant

Figure 10-Houses Served by Pump/Septic Tank #4

The flow generated by the three (3) houses:

(3 houses)(3.7 PE/house)(100 gallons/PE/day) = 1,110 gallons/day

The minimum size of a septic tank is:

Minimum tank #4 size = (1,110 gallons)(1.5) = 1,665 gallons.

The actual size of pump/septic tank #4 is two thousand five hundred (2,500 gallons) consisting of a one thousand five hundred (1,500) gallon septic tanks coupled with a one thousand (1,000) gallon pump tank. Even with the combined capacity of both the septic tank and pump tank, this is still below the minimum of one thousand six hundred sixty-five (1,665) gallons.

Pump/septic tank #4 is also two (2) tanks. The septic tank is constructed of concrete and the pump tank is constructed from PVC. The tanks appear to be in satisfactory condition. However, they were overflowing during both site visits on January 30, 2016 and July 1, 2016 but on both visit there was a tree fallen across the tanks. If the pump tank is not a heavy wall PVC construction, when the tank is pumped down, the weight of the soil/bedding surrounding the outside of the tank could cause the sides of the tank to collapse inward.

Inside the pump tank is a set of duplex pumps discharging into a three inch (3") pressure sewer line. The pumps have the capability of pumping 20 gpm which is sufficient to maintain a scouring velocity of at least two feet/sec (2 fps). This is because statistical analysis has shown that when there are four (4) pump on a pressure system, there is high probability that three (3) pumps will be running.

Figure 11-Septic Tank #4 with Tree Over the Top of It

Figure 12-Pump Tank #4

The gravity collection sewer line coming to pump/septic #4 is a four inch (4") PVC line. This is smaller than the required minimum of six inch (6"). This part of the collection system will need to be upgraded to required minimum size of six inches (6").

The gravity sewer main running from the manhole to the recirculation tank at the treatment plant is a six inch (6") line. The gravity line not only carries effluent from the thirty-four (34) residences of Eaglewoods but also the twelve (12) residences of Golden Glade.

The total flow generated by both subdivisions is:

Average Daily Flow = (34 houses + 12 houses)(3.7 PE/House)(100 gal/PE/day) = 17,020 gal/day

Peak Flow = (17,020 gal/day)(4) = 68,080 gal/day

Peak GPM = (68,080 gal/day)(1 day/18 hours)(1 hour/60 min) = 66.0 gpm.

The flow capacity of 6" variable grade sewer line at minimum slope of 0.6 ft. in 100 ft.

Given:

$$V = \frac{1.486}{n}(R)^{\frac{2}{3}}(S)^{\frac{1}{2}}$$

$$Q = \frac{\pi(D\text{ in})^2}{4(12\text{in/ft})^2}\frac{1.486}{n}(R)^{\frac{2}{3}}(S)^{\frac{1}{2}}$$

R = Hydraulic Radius

S = Slope

N = 0.013 for PVC

$S = 0.6\%$

D = 4" PVC

$$Q = AV \qquad V = \frac{1.486}{n}(R)^{\frac{2}{3}}(S)^{\frac{1}{2}}$$

$$Q = \frac{\pi(6\text{ in})^2}{4(12\text{ in/ft})^2}\left(\frac{1.486}{0.013}\right)\left(\frac{6\text{ in}}{4(12\text{ in/ft})}\right)^{\frac{2}{3}}\left(\frac{0.6\text{ ft}}{100\text{ ft}}\right)^{\frac{1}{2}}(60\text{ sec/min})(7.48\text{ gal/ft}^3)$$

= 195.0 GPM flowing full or 97.5 GPM flowing ½ full

As long as the existing gravity sewer main is meeting the minimum slope of 0.6%, it has the capacity to handle the flow generated by the two (2) subdivisions.

With the six inch (6") gravity main having a capacity of ninety-five and five tenths gallons per minute (97.5 gpm), the gravity main can handle:

Peak Flow = (97.5 gallon/min)(60 min/1 hour)(18 hours/1 day) = 105,300 gallons/day

Average Day Flow = Peak Flow/4 = (105,300 gallons/day)/4 = 26,325 gallons/day

Connections = (26,325 gal/day)/(100 gal/day/PE)/(3.7 PE/House) = 71.2 Houses

This will allow for 25 more houses to be connected to this section of the system.

The treatment plant consists of two (2) recirculating filter beds. Each bed is thirty feet by forty-two feet (30'x42'). The total square footage to the recirculating filter beds is:

Square footage = (2)(30 ft)(42 ft) = 2,520 ft^2

This area will give a maximum allowable flow of:

Flow = (2,520 ft^2)(5 gal/day/$ft.^2$) = 12,600 gpd

Although the Missouri Department of Natural Resources Regulations require the sewage collection system to be designed to handle one hundred gallons per person per day (100 gpd/PE), a recirculating sand filter can be designed at seventy-five gallons per person per day (75 gpd/PE). This will allow for a total number of connections that the treatment plant can handle at:

Total Connections = (12,600 gal/day)/(75 gal/day/PE)/(3.7 PE/House) = 45.4 Connections

Currently both Eaglewoods Subdivion and Golden Glade Subdivision are connected to the treatment plant. The total number of connections for the two (2) subdivisions is at forty-six (46) houses. This is one (1) more house connected to the system than the treatment plant can adequately handle. The actual average daily flow (ADF) that the treatment plant is receiving from both subdivisions is:

Actual ADF = (34 houses + 12 houses)(3.7 PE/House)(75 gal/PE/day) =12,765 gal/day

In addition to the recirculating filter beds being over capacity, they are also in a state of disrepair. During both site visits on January 30, 2016 and July 1, 2016, the treatment plant was leaking water through cracks down the sides of the concrete walls as well as water could be visibly seen bubbling up along the footing of the bed allowing partially treated sewage to run into the nearby stream.

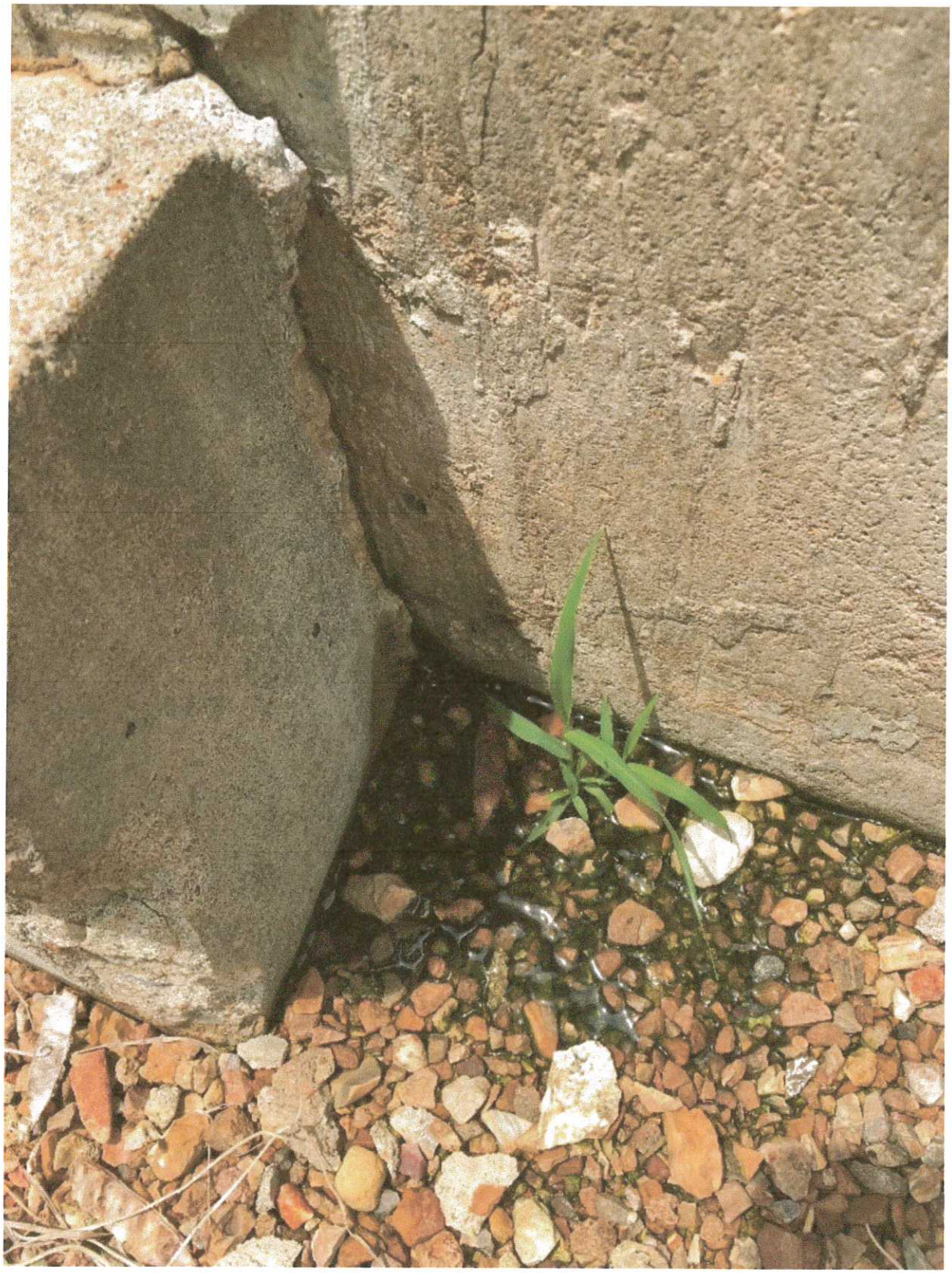


Figure 13-Leaking Under Sand Filter Bed, During July 1, 2016

Figure 14-Sand Filter Bed Crack Was Leaking During January 30, 2016 Visit

Figure 15-Sand Filter Bed Crack was Leaking During January 30, 2016 Visit

Figure 2-Sand Filter Bed Crack was Leaking During January 30, 2016 Visit

Figure 37-Sand Filter Bed Leaking on the Ground During July 1, 2016 Visit

Figure 4-Sand Filter Bed Crack was Leaking During January 30, 2016 Visit

The filter beds were constructed in such a way that one wall is below grade. Although this is a common practice, the wall below grade could not be inspected for cracks and it should be assumed that it is in the same shape as the three (3) visible walls. This would lead to believe that the treatment plant is actually leaking more than what can been seen.

There is also a large crack running down the southern corner of the eastern wall of the treatment plant. This crack is nearly one half inch (1/2") wide and is an indication that either the southern wall, the eastern wall, or both could fail catastrophically in the future. Although the crack did not show signs of leaking during either site visits, a leak should be expected to form from this size of a crack.

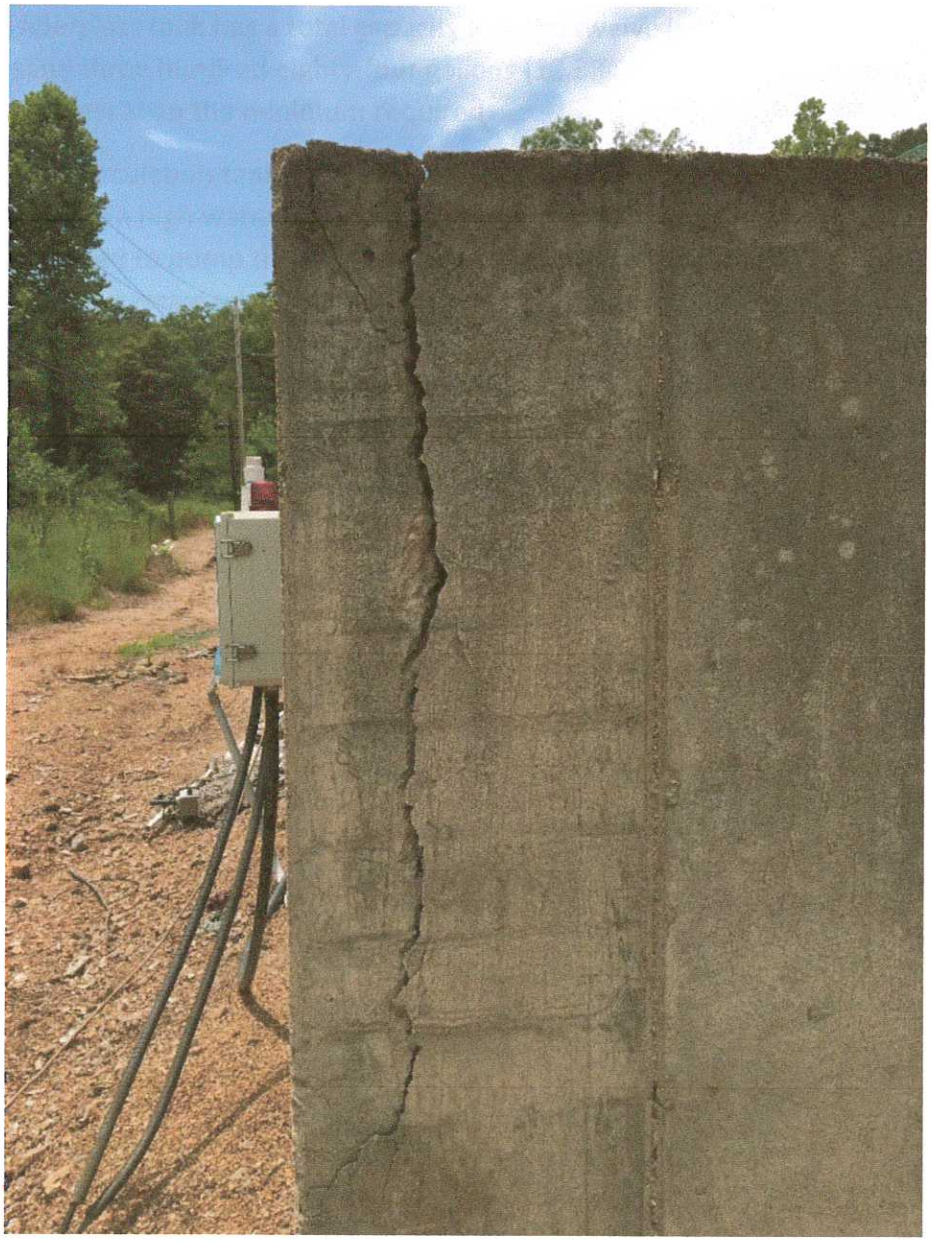


Figure 5-Large Crack Down Corner of Sand Filter Bed

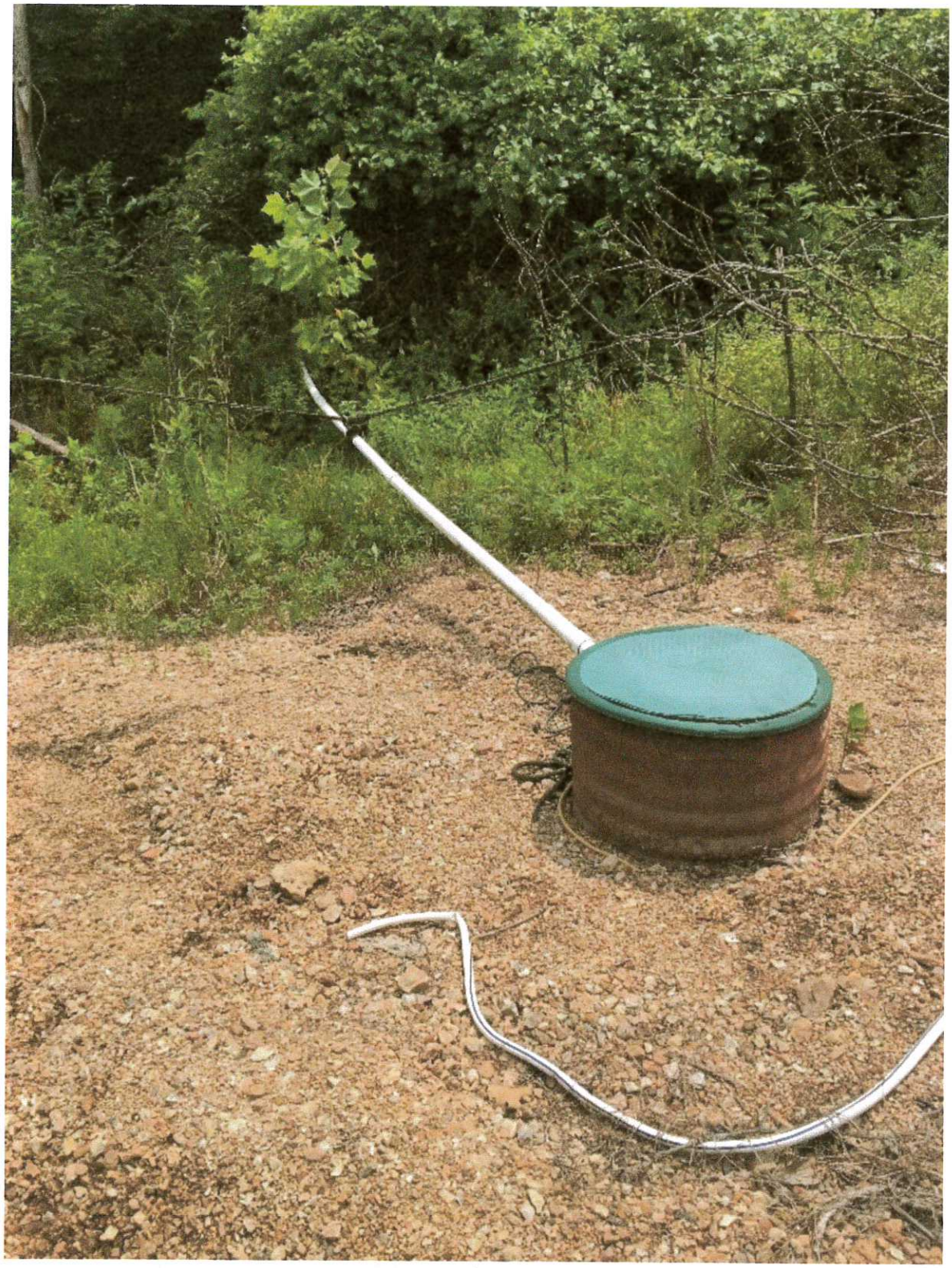


Figure 21-Recirculation Tank Sump Pump

The chlorinator is a homemade type and not a commercially premolded type. This type of chlorinator does not adequately ensure contact between the chlorine tables and the effluent. The correct size chlorinator would be capable of handling:

Size = peak flow + rain

= (4)(12,765 gpd) + ((6.25 in)(2)(30 ft)(42ft)/12 in)(7.48 gal/ft^3) = 60,877 gpd = 42.3 gpm

There is no way to predict the capacity of this chlorinator since there is no performance data available.

Figure 23-Homemade Chlorinator

The chlorine contact tank needs to have a volume so that it allows for a twenty (20) minute contact time and have 40:1 baffling to prevent water from short circuiting through the tanks. The current chlorine contact tank is a water tank and has a volume of seven hundred fifty (750) gallons and is approximately 1/3 full. This give the total volume of the tank at:

Actual Volume = (750 gallons)/(3) = 250 gallons

There are two (2) twenty gallon/min (20 gpm) pumps for each filter bed. If all the pumps were to operate at the same time which could happen during times of high flow, the total flow to the sand filter would be eighty gallons per minute (80 gpm). If twenty percent (20%) were discharged, the capacity of the chlorine contact tank would need to be:

Volume = 0.2[(20.0 gpm) (4 pumps) + 6.8 gpm] (20 min.) = 347.2 gal.

This indicates that the chlorine contact tank is undersized and rather than giving the required contact time of twenty (20) minutes, it is actually only providing less than fifteen (15) minutes of contact time. This little contact time is possibly allowing pathogens to discharge in the nearby stream and ultimately in to the Lake of the Ozarks.

Figure 24-Chlorine Contact Tank

The baffling inside the tank is a series of concrete cinder blocks. To maintain a 40:1 baffling, the distance traveled by the fluid has to be greater than or equal to forty (40) times the distance between the baffles. Currently the distance between the cinder blocks is approximately one foot (1 ft). This would require the fluid to travel forty feet (40 ft) to meet the 40:1 requirement.

two hundred feet (3,200 ft) of four inch (4") line. This will cost nearly $75,000 to preplace with the six inch (6") line.

The three inch (3") pressure sewer line running from lift station #1 to pump station #4 will need to be replaced to two inch (2") pressure sewer line to ensure that scouring velocity is meet. Therefore, a two inch (2") line will need to be installed in its place. This will require an estimated $26,000 to complete.

The six inch (6") gravity sewer main appears to be adequate for up to seventy-one (71) houses as long as it maintains a minimum slope of 0.6%. This is more than what is currently connected to the system, leaving it the capacity to handle twenty-five (25) more house.

The filter bed, recirculation tank, chlorinator, and chlorine contact tank are all of inadequate size to handle the existing flow. Due to the condition of the recirculating filter beds, recirculation tank, chlorinator, and chlorine contact tank, it is recommended that they be scrapped and a new treatment plant be constructed further up the hill so to be removed from the flooding effect of the nearby stream. It is also recommended that the treatment plant be replaced and an additional filter bed of thirty feet by forty-two feet (30' x 42') be also constructed for additional flow which may be generated by the future development in the subdivision. This treatment plant reconstruction will cost an estimated $350,000 and reconstruction with an expansion of one (1) additional filter bed is estimated at $525,000

Therefore, to repair this treatment and collection system so that it can handle the current flow, it will cost an estimated:

Lift/Septic tank replacement	$ 25,000
4" gravity pipe replacement	$ 75,000
2" pressure line replacement	$ 26,000
Treatment plant replacement	$350,000
Total replacement/upgrade	$475,000

Therefore, to repair this treatment and collection system so that it can handle the current and additional flow, it will cost an estimated:

Lift/Septic tank replacement	$ 25,000
4" gravity pipe replacement	$ 75,000
2" pressure line replacement	$ 26,000
Treatment plant replacement	$525,000
Total replacement/upgrade	$650,000

It is recommended that there be no additional connections made to this treatment plant or collection system until the treatment plant and collection system is replaced and expanded to handle the additional flow.

JOJJR		Date: 7/3/2016		PRELIMINARY LOW PRESSURE													
Pipe: SCH 40				SEWER SYSTEM PIPE SCHEDULE AND BRANCH													
Prepared for: Osage Water Company				ANALYSIS OF: Eaglewoods							AE						
											Sheet No. 1 Of 1				Rev. 1		
1 Branch No.	2 No. of Pumps	3 Accum. Total	4 Max. No. On	5 Max. Flow (gpm)	6 Pipe Size (in)	7 Max. Velocity (ft./sec)	8 Length (ft)	9 Fitting Equivalent Length (ft)	10 Total Length (ft)	11 Friction Loss (ft/100 ft)	12 Friction Loss Total (ft)	13 Accum Friction Loss (ft)	14 Max Main Elev (ft)	15 Min. Pump Elev (ft)	16 Elev. Diff (ft.)	17 Max Total Head (ft)	
1	1	1	1	20	3.026	0.89	350	100	450	0.17	0.77	25.84	800	765	35	60.84	
2	2	3	2	40	3.026	1.78	750	100	850	0.62	5.27	25.07	800	750	50	75.07	
3	1	4	3	60	3.026	2.68	1400	100	1500	1.32	19.8	19.8	800	750	50	69.8	

LAKE OZARK WATER & SEWER LLC

Wastewater and water specialists

840 Thunder Mountain Road
Camdenton, MO 65020

Phone 573 346-2092
Fax 573 346-4676

OSAGE WATER COMPANY WELL ESTIMATE FOR EAGLE WOODS SUBDIVISION

Gary Cover; Receiver

1) Bid from Moreland Well Drilling on Camden County lot #08-3.0-7.0-0-001-51.0 "Common Area" of Eagle Woods Subdivision

2) Engineering costs

3) Excavating new well lot, new 4" lines(Approx. 1750'), tapping costs, testing costs

4) Well house construction

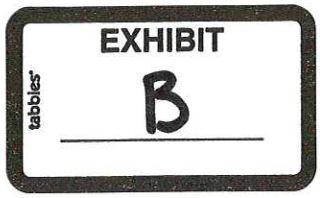
5) Permitting

6) Moving and reinstalling storage tanks, booster pumps, gauges, valves

7) Road repair and seeding

1. $85000.00
2. $ 7500.00
3. $45500.00
4. $12150.00
5. $ 1500.00
6. $10500.00
7. $ 6000.00

$168150.00
Plus cost of lot if HOA will not donate it
Plus overages 10-15%
TOTAL
$190,000.00



Eagle Woods Subdivision - KK

BID FORM

BIDDER AGREES TO PERFORM ALL THE WORK DESCRIBED IN THE SPECIFICATIONS AND SHOWN ON THE PLANS FOR THE FOLLOWING PRICES:

	ITEM	DESCRIPTION	QUANTITIES	UNIT	UNIT PRICE	EXTENSIONS
1.	10	Grundfos H.P. SUBERGIAL PUMP + Control Box		L.F.	$	$6,158.00
2.	3"	GAL. COLUMN PIPE - Domestic	354	L.F.	$ 18.50	$6,604.50
3.	#4	Flat Pipe DOUBLE JACKET ELECTRICAL CABLE	370	L.F.	$ 5.50	$2,035.00
4.	4	350 WELL X TROL PRESSURE TANK	4	L.S.	$1,400.00	$5,600.00
5.		FITTINGS FOR TANK & FLOW 3" METER - Flow Turbine meter		L.S.	$	$6,000.00 # 1,850.00
6.		H.P. BOOSTER ALTERNATING STARTER		L.S.	$	$
7.		GALLONS VERTICAL WATER TANK		L.S.	$	$

SALES TAX $1,546.55

LABOR ON PUMPS & TANKS $2,000.00

TOTAL COST ON ESTIMATE $31,794.05

Floyd Moreland 7-12-2016

SIGNATURE

COMPANY Moreland Well Drilling

MORELAND WELL DRILLING
1783 N. STATE HWY 5
Camdenton, MO. 65020
573-346-2883 OR 573-346-3175