Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

April 13, 2020

The Honorable Daniel Cantrell, Mayor
City of Garden City
P.O. Box 20
Garden City, MO 64747

LETTER OF WARNING
PUBLIC DRINKING WATER
SIGNIFICANT DEFICIENCY
RESPONSE REQUIRED

Dear Mayor Daniel Cantrell:

Staff from the Missouri Department of Natural Resources (Department) conducted a Sanitary Survey Inspection on March 10, 2020, of the City of Garden City Public Water System (PWS) located at 30109 South Little Road, Garden City, in Cass County. The entity operates under the authority of Garden City PWS and MO1010301.

Compliance with Missouri Safe Drinking Water Laws and Regulations was evaluated. A Letter of Warning (LOW) is being issued for the violations in the enclosed report.

Please direct your attention to the **Compliance Determination and Listing of Violations and Required Actions** in the enclosed report. The report documents the findings and the actions that you must take to address the violations. **A written response documenting actions taken to correct the violations is required by the date specified in the report.**

Failure to address the required actions will result in the issuance of a Notice of Violation. If you have any questions regarding the report, or would like to schedule a time to meet in person, please contact Scott F. Honig, P.E., at 816-251-0711, in the Kansas City Regional Office, 500 Northeast Colbern Road, Lee's Summit, Missouri 64086-4710 or via email at scott.honig@dnr.mo.gov.

Sincerely,

KANSAS CITY REGIONAL OFFICE

Leigh Mitchell
Environmental Manager

LM/devm

Enclosure

c: Earsholl Brown, Public Utilities Director, via email
Jackie Johnson, Drinking Water Enforcement, via email
Patrick Vavra, Drinking Water Enforcement, via email
Monitoring Section, Public Drinking Water Branch, via exchange drive

Missouri Department of Natural Resources
Kansas City Regional Office, Public Drinking Water Branch
Report of Sanitary Survey Inspection
City of Garden City
30109 South Little Road, Garden City, Cass County
MO1010301

Introduction

On March 10, 2020, I (Denise Eagan) of the Missouri Department of Natural Resources (Department), Kansas City Regional Office (KCRO), conducted a routine sanitary survey of the Garden City Public Water System (PWS) located at 30109 South Little Road, Garden City, in Cass County. Participants included:

Missouri Department of Natural Resources:
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City of Garden City:
Earsholl Brown, Public Works Director
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This inspection was conducted to determine whether the system is operated and maintained in compliance with the Missouri Safe Drinking Water Act and its implementing regulations, in accordance with § 640.120.5, RSMo. This inspection reviewed all eight (8) critical components of a public water system, as defined by the United States Environmental Protection Agency (EPA). Required actions to correct deficiencies identified during this inspection, as well as any recommendations, are described in this report.

Facility Description and History

Garden City PWS is a community PWS located in the South Grand watershed, and requires an operator with a Treatment B certificate and Distribution II certificate issued by the Department. Garden City employs Earsholl Brown as the designated operator. Mr. Brown has a Treatment A certification that expires on June 30, 2021, and a Distribution III certification that expires on February 28, 2021. Raymond "Skip" Schrock is employed as the back-up operator and has a Treatment C certification that expires on July 31, 2021. Mr. Schrock is currently working on obtaining his Treatment B certification. The average water production is 100,000 gallons per day (gpd) with a maximum production of 160,000 gpd. The water system serves approximately 1,642 customers through 676 active service connections. The City is connected to the Cass County Public Water Supply District (PWSD) #11 for emergency purposes only and does not sell any water.

Raw water is pumped from the 'New Lake' via one of two (2) horizontal turbine pumps at the remote pumping station to the water treatment plant (WTP). Sodium permanganate is added when the water enters the WTP before entering the Permanganate Contact Tank. Next in the treatment train is the primary flash tank where powdered activated carbon (PAC), DFLOC 3610,

DFLOC 3612 (in the summer only), and ferric chlorite are added. The water then flows into the clarifier prior to entering the secondary rapid mix. Chlorine dioxide and caustic soda are added at the secondary rapid mix. The chlorine dioxide is generated using sodium hypochlorite, muriatic acid, and chlorite. The water flows through the settling basin to achieve necessary contact time prior to the ultrafiltration units (UF). The water is pressurized and split between two (2) UF units that consists of seven (7) canisters. Phosphate and sodium hypochlorite are added to the water after filtration. The water continues onto the transfer basin for contact time, then two (2) horizontal turbine transfer pumps move the water into the clearwell. The two (2) horizontal turbine high service pumps then distribute the water from the clearwell to the distribution system.

The distribution system has three (3) water storage facilities, one (1) elevated tower and two (2) standpipes. The distribution system also includes one (1) connection with Cass County PWSD #11 located near the '300k Tower' standpipe. This connection is used for emergencies only.

Table 1. Storage Facilities

Storage Facility	Type of Storage	Capacity (gallons)	Construction Year	Last Inspection Date
50k Tower	Elevated Tower	50,000	1958	4/21/2018
300k Tower	Standpipe	300,000	2002	4/22/2018
Clearwell	Standpipe	125,000	NA	4/21/2018

The last inspection of the Garden City PWS was conducted on April 4, 2017. The City was issued a report of Significant Deficiency for holes in the roof of the clearwell, along with a hatch that was not equipped with a locking device. Recommendations included: repairing the crack in the spillway; protecting the storage tanks from trespassing or vandalism; grading the slope around the Elevated Storage Tower to promote drainage away from the concrete footings; install a stopper on the flapper valve on the 50,000-gallon elevated storage tank to prevent it from being stuck open; move the splash pad at the Elevated Storage Tower (50k Tower) to align with the overflow pipe; sand blasting and repainting the Elevated Storage Tower as it was showing signs of corrosion; sand blasting and repainting the pipes inside the WTP as they were showing signs of corrosion; update the program to prohibit the use of lead in water system plumbing as defined by the 2011 Reduction of Lead in Drinking Water Act. The City addressed the Significant Deficiency and submitted supporting documentation to the Department on April 14, 2017, at which time the Department confirmed the system had returned to compliance.

On December 6, 2019, the City received a Referral Notice of Violation for continued disinfection byproduct Maximum Contaminant Limit (MCL) violations, which occurred during the 2nd, 3rd, and 4th quarters of 2019.

Prior to the inspection, I reviewed the files for Garden City PWS, including previous inspection reports, correspondence, monthly compliance reports, and sample results, for familiarization with the requirements specific to this PWS.

Discussion of Inspection and Observations

At the time of inspection, Department staff reviewed Garden City PWS for regulatory compliance with the following eight (8) critical components of public drinking water systems: System Management and Operation, Operator Certification, Monitoring and Reporting, System Source, System Treatment, Pumping Facilities, Finished Water Storage, and Distribution System.

I conducted the inspection during normal business hours and gave prior notification to ensure timely access to the site. Upon arrival at the WTP, I met with Earsholl Brown, and outlined the purpose and scope of the inspection. Mr. Brown granted permission to access the site and accompanied me throughout the tour of the PWS.

We started the tour in the distribution system at the 300,000 (300k) gallon standpipe (Photograph 1). The ladder did not have a ladder guard (**Recommendation 1**). I observed an electrical panel for a mixer on the side of the standpipe. Mr. Brown stated they had purchased a mixer for the standpipe and had the electrical installed before learning that a construction permit was needed for installation. This caused a halt in the installation of the mixer (**Unsatisfactory Finding 1**). The overflow was equipped with a tight fitting flap valve and #18-mesh screening which was adequate to prevent the entrance of contaminants. The overflow was also equipped with a splash pad to prevent erosion during overflows. There is a hydrant onsite for flushing the mains leading to the tower but a separate valve to drain the standpipe for inspections and maintenance was located down the hill from the standpipe in a concrete structure.

Next, we observed the 50,000 (50k) gallon elevated tower (Photograph 2). The tower did not have security fencing but it did have a ladder guard though the style of the legs would allow the legs to be climbed (**Recommendation 2**). There was ponding around the footings of the tower (Photograph 3, **Recommendation 3**). The overflow was equipped with a tight fitting flap valve and #18 mesh screen, which was adequate to prevent the entrance of contaminants. The overflow also had a splash pad to help prevent erosion. Corrosion was observed on the tower (Photograph 4, **Recommendation 4**). Mr. Brown stated they are unable to take the tower out of service, as the pressure loss would prevent supply of water to the west side of the city. Inspections are completed after cold winters to ensure any freezing that may have occurred has not damaged the tower.

We continued across the street to City Hall to collect a bacteriological sample along with free and total chlorine readings. City Hall is sample site R1 located at 107 N 3rd. Results of the sample can be seen in Table 2 below. The operators' certifications and permit to dispense were located here. Next, we observed the bulk water sales station (Photograph 5). Mr. Brown stated an air gap is maintained but they also have a backflow prevention device, which is tested annually.

Ms. Spangler and I left to deliver the bacteriological sample to the Cass County Health Department in Harrisonville for courier pick up. We met Mr. Brown back at the WTP to continue the inspection.

Mr. Brown and Mr. Schrock proceeded to lead us to the Old Lake intake (Photograph 6). The Old Lake intake is screened with 1-inch square grate which was last checked by divers approximately 8-10 years ago (**Recommendation 5**). The intake is fixed at two-and-a-half feet below the surface. The Old Lake is only used for emergency purposes. The Old Lake spillway was located north of the intake (Photograph 7). The concrete of the spillway was starting to deteriorate (**Recommendation 6**). It also had some excess vegetation on the spillway (**Recommendation 7**). Mr. Brown stated the piping for the spillway was replaced approximately nine (9) years ago. We observed the Old Lake Emergency Spillway (Photograph 8). The spillway had some riprap installed to help protect against erosion. Mr. Brown stated he would like to dig out the spillway more to ensure that overflow is more thoroughly redirected away from the WTP. I also observed a burn pile, which included vegetation, treated wood and plastic trash bags at the emergency spillway. The pile was burning at the time of the inspection (Photograph 9, **Recommendation 8**).

We continued to the New Lake Intake (Photograph 10). The intake is adjustable from eight (8) to ten (10) feet depth to the surface. The current setting is at two-and-a-half (2.5) feet below the surface level. The intake is anchored and locked to prevent vandalism. Mr. Brown stated that sometimes he catches members of the public fishing off the intake (**Recommendation 9**). Water system staff visually inspect the intake approximately once every two (2) weeks. Liquid copper sulfate is used on the New Lake to help control algae approximately every two (2) to three (3) weeks based on a visual inspection of the lake conditions. Mr. Brown stated they did not have enough employees to treat the lake late last year. The lake water level depth marker is located next to the spillway. The New Lake Spillway is located on the southeastern side of the lake (Photograph 11). I observed that water was starting to erode under the concrete shelf of the spillway at the base along with some trees growing in the area through the seams of the concrete spillway (**Recommendation 10**). We continued to the Raw Water Pumps at the New Lake (Photograph 12). The pump station consists of two (2) horizontal turbine pumps on variable frequency drives (VFDs) that are designed for approximately 400 gallons per minute (gpm). Their current setting was approximately 60-62% of full capacity. The pumps are alternated every two (2) months and run approximately eight (8) to nine (9) hours per day. The station has a sump pump, which was malfunctioning at the time of the inspection (**Recommendation 11**). The pump station was locked to prevent vandalism. Since the pump station is considered a confined space, Mr. Brown stated they ensure all operators undertake confined space training when it becomes available in the Garden City area. I observed another old burn pile near the pump station, which included some previously burnt mattresses (**Recommendation 8**). Mr. Brown stated if they were unsure how to dispose of an object then they burn it. I recommended against burning any future furniture while on site. The last thing observed at the New Lake was the emergency spillway (Photograph 13). The spillway was not riprapped (**Recommendation 12**).

The last part of the distribution system tour was at the Cass County PWSD #11 connection, which is located south of the 300,000-gallon standpipe (Photograph 14). Both the City and the District have access to the pit. The connection is for emergency use only and the City is currently charged for water usage based on readings from the Cass County PWSD #11 master meter. Mr. Brown stated they have the ability to install a meter in the pit if it becomes necessary. Prior to using the water from the District, the City opens their valve and flushes their end, and a District representative flushes into the pit from the District side before both valves remain open. Even though the pit has a sump pump, there was excess water in the pit (**Recommendation 13**). The City checks the connection once per month to verify its condition. Mr. Brown was unclear regarding who would be responsible for maintenance of the connection.

Upon return to the WTP, I conducted a review of key water system records. The Permit of Approval to Dispense Water was framed on the wall of the laboratory.

Other paperwork reviewed or discussed included:

1) Emergency Operations Plan (EOP) which was last updated in 2020 to include current city contacts but does not include detailed procedures for handling harmful algal blooms (HABs) in their source water (**Recommendation 14**);

2) Backflow prevention program and records, were in compliance;

3) Consumer Confidence Reports (CCR) were in compliance;

4) Primacy fees, had been paid in full;

5) Sample test results, including bacteriological and chemical, were available and in compliance with record keeping regulations;

6) Lead ban ordinance, had not been updated in accordance with the 2011 Reduction of Lead in Drinking Water Act (**Recommendation 15**); and

7) Facility records including disinfection-by-product and lead and copper sampling points, and maps with bacteriological sampling points, hydrants, and valves were available for review.

The City does not currently have a written flushing plan (**Recommendation 16**). Individual valve records are not being maintained (**Recommendation 17**). The City does not currently have a Source Water Protection Plan (**Recommendation 18**).

Based on my review of the tank inspection reports for the finished water storage, the clearwell does not have a gasket on the roof access hatch (**Recommendation 19**). The City currently works with the Fire Department to ensure all water loss is accounted for during the calculations. This includes the number of trucks used during disasters and semi-annual reports of water used during trainings. The current water loss is 11% (**Recommendation 20**). Mr. Brown estimated approximately 60% of the hydrants can be used for fire flow. The water department conducts the flow testing for the fire hydrants. The last flow test was conducted in 2017. Mr. Brown stated he prefers to flush problem areas of the distribution system quarterly, which includes dead ends, problem areas, and low areas. He stated that the last time the water department had the staff to complete the quarterly flushing was in 2018 (**Recommendation 21**). The City tracks complaints using a form that includes the nature of the complaint, the location, the date and time it was received, the time a sample was collected at the location, results of the testing conducted at the location, the staff who worked on the complaint, and what, if any, problems were found. The standard testing conducted during a complaint investigation include pH, alkalinity, hardness, iron, manganese, free chlorine, and total chlorine. Qualitative testing performed includes a visual assessment of color, odor detection by nose, and a taste test. Mr. Brown stated that flushing occurs during the complaint investigation if any of the samples analysis results indicate poor water quality. All complaints are responded to as soon as possible.

The City was recently referred to the Department's Public Drinking Water Branch (PDWB) Compliance and Enforcement Section for disinfection by-product (DBP) violations. One of the enforcement actions taken against the City was requiring samples of haloacetic acids (HAA5) and total trihalomethanes (TTHM) inside the WTP to determine if the disinfection by-products were being produced during treatment instead of in the distribution system. Sample results from the WTP in Table 2 were compared to the maximum contaminant levels (MCL) for the DBPs. Based on these results, DBPs are forming inside the WTP.

Table 2. Results of DBP sampling within the WTP on January 28, 2020

	Transfer Basin Results	Plant Effluent Results	MCL
HAA5	67.6 µg/L	82.6 µg/L	60 µg/L
TTHM	39.7 µg/L	49.1 µg/L	80 µg/L

Mr. Brown stated that he raised the pH in the WTP and took another round of DBP sampling from the same locations on March 3, 2020, and is currently waiting on the results. He stated he works with DF Services to help with jar testing to determine chemical dosages. The Company normally visits three (3) times per year, or as necessary when Mr. Brown requests their assistance. The City was also required to hire an engineer to evaluate options for DBP control.

Three (3) options are being explored: improvements to the WTP and distribution system; buying water from Tri-County Water Authority through the Cass County PWSD #11 interconnection; and selling the drinking water system and wastewater system to Missouri American Water for operation and maintenance. During the inspection, the City's engineers were on site evaluating the WTP. As of the inspection, the City had not yet signed an Abatement Order on Consent (AOC), which would establish deadlines for corrective actions.

After the records review, we started the WTP tour in the laboratory (Photograph 15). All testing is done in house. A finished water continuous turbidity meter and a continuous chlorine monitor were located in the laboratory for easy viewing. The pH probe is stored in 7 SU buffer solution. The operators run a test in the morning to see if the meter is reading 7 SU. If the meter is not reading 7 SU, they recalibrate the meter using three (3) point calibration. The buffer solution is changed weekly. The pH 10 SU buffer solution was expired (**Unsatisfactory Finding 2**).

We then viewed the primary rapid mix (Photograph 16). The basin had four (4) chemical feed lines and none were labeled (**Recommendation 22**). Mr. Brown stated they use flow turbulence to mix the chemicals in the basin and do not use the mechanical mixer (**Recommendation 23**). A sample tap was available prior to the chemical additions and graduated cylinders were available to check the chemical feed outputs. Next, we observed the powdered activated carbon (PAC) feed area (Photograph 17). Empty bags of carbon were discarded in the corner of the room (**Recommendation 24**). Mr. Brown stated the equipment was spark proof. He stated that they could feed a maximum of 30-35 ppm of PAC if necessary during a HAB event before the settling basins would start to discharge black water to the creek.

Next, we viewed the Clarifier (Photograph 18). The water in the clarifier was very dark which made it impossible to evaluate the water and clarifier (**Recommendation 25**). Mr. Brown stated the sludge motor was replaced in 2002. He has noticed some short-circuiting in the clarifier and would like to add a baffle to extend the detention time. The clarifier is approximately fifteen (15) feet deep and they try to maintain a six (6) foot sludge blanket. Sludge is continuously removed to the settling basins. The clarifier is cleaned on an as-necessary basis.

The secondary rapid mix basin has a mechanical mixer (Photograph 19). Caustic soda and chlorine dioxide are the only chemicals added at this location. Caustic soda is used to increase the pH while chlorine dioxide is used as an oxidizer and disinfectant. Mr. Brown stated that he was running at approximately a pH of 8-9 SUs. We went to the ground floor to observe the raw water piping with sodium permanganate feed point (Photograph 20). The sodium permanganate was not in a secondary containment and a drain was located nearby (Photograph 21, **Recommendation 26**). Mr. Brown stated the drain was connected to the WTP sanitary septic system with lateral field. Mr. Brown stated they cannot check the output of the permanganate pump as the water pressure is too high and would give inaccurate readings. The sodium chlorite for chlorine dioxide generation equipment is also stored in the area within secondary containment but was unlabeled (Photograph 22, **Recommendation 27**). After sodium permanganate is added, the water flows to the 5,000-gallon permanganate tank (Photograph 23). The water enters the bottom of the tank and leaves at the top of the tank for approximately eighteen (18) minutes of contact time with the permanganate. There was no lighting in the permanganate room (**Recommendation 28**).

Next, we viewed the chemical storage room (Photograph 24). The bulk tank of sodium hypochlorite is stored over the secondary containment area and is used for post treatment disinfection purposes. There are chemicals stored below the bulk tank inside the secondary containment area and some are potentially no longer used (Photograph 25, **Recommendation 29**). Mr. Brown stated he does not use the sodium hydroxide from the bulk tank for chlorine dioxide generation as the particulates at the bottom of the tank clog the chlorine dioxide generation equipment (**Recommendation 30**). Therefore, a separate 55-gallon barrel of sodium hydroxide is used for chlorine dioxide generation (Photograph 26). The majority of the chemicals in the room did not have secondary containment (Photograph 27, **Recommendation 31**). The exterior door to the room was rusting at the bottom and would allow any spilled chemicals to flow outside (Photograph 28, **Recommendation 32**) into a storm drain, along with some French style drains. The drains were installed to help divert the leaking water from the Old Lake around the plant and discharge into the creek leading to a high likelihood of spilled chemicals entering waters of the state, which is a violation of the Missouri Clean Water Law (Photographs 29-30, **Letter of Warning 1**). Adjacent to the chemical storage area is the chlorine dioxide generation area (Photograph 31). Chlorine dioxide is generated by combining sodium hydroxide, muriatic acid, and sodium chlorite. The safety shower and hose for cleaning the area are also located directly across from the chlorine dioxide generation equipment (Photograph 32). The safety shower is not on any routine flushing schedule (**Recommendation 33**). Mr. Brown stated that he uses it regularly to wash off chemicals to help prevent chemical burns (**Recommendation 34**). I requested to see the backflow prevention device for all water usage in the WTP. Mr. Brown stated that there is no backflow prevention device and that he thought one would not be required for this WTP. I observed that each hose, safety shower, continuous monitoring equipment, and chemical feed equipment have individual tie-ins to the finished water (**Unsatisfactory Finding 3**).

Next, we observed the Settling Basin (Photograph 33). The water enters the settling basins through baffling created from membrane fabric. The detention time is approximately four (4) hours. The basin is cleaned approximately once every seven (7) months or in response to manganese problems, they may be experiencing. The building did not have any interior lighting and I was unable to verify the quality of the floc or view the sludge level (**Recommendation 25**).

We returned to the WTP and observed the Ultra Filtration (UF) system including the pumps (Photograph 34) and the filter trains (Photograph 35). The UF system has two (2) trains consisting of seven (7) canisters per train. Mr. Brown stated they conduct direct integrity testing (DIT) once per week after getting written permission from Maher Jaafari, PDWB Engineering Section. The canisters can have 20-25 straws pinned before they need to be replaced. On February 24, 2020, train 2 had a significant failure of the (DIT) with a final pounds per square inch (psi) of 11.5. It was unclear if this lead to a breakthrough on turbidity because Mr. Brown also indicated that he had recently had a technician out to fix his turbidity meters as he was having turbidity spikes. Either could have been responsible for elevated turbidity readings. We

then observed the two (2) horizontal turbine transfer pumps, which transfer water from the transfer basin to the clearwell (Photograph 36). The transfer pumps turn on once the water has reached a depth of seven (7) feet in the transfer basin and turns off once the water has reached a depth of five (5) feet in the transfer basin (Photograph 37). I observed another cleaning hose tied into the finished water without a backflow prevention device but it did have a meter to help track water loss. Behind the piping was a chemical feed pump, which appeared to no longer be in use, but had a leaked at some point eroded the paint from the wall. The two (2) horizontal turbine high service pumps were located next to the transfer pumps (Photograph 38). The high service pumps rotate automatically after filling the towers.

Next, we observed the UF system backwash pumps and backwash tank (Photograph 39). The backwash has two (2) horizontal turbine pumps. The backwash tank is filled using water directly after filtration. There is no schedule to routinely clean the tank (**Recommendation 35**). The flow is split between the backwash tank and the transfer basin. Backwash occurs automatically every twenty-four (24) minutes. The Clean-In-Place (CIP) tank is also located at this location (Photograph 40). This is used for offline cleaning of the filters which occurs approximately once per month or as the filter plugs. The trigger to perform a non-routine offline cleaning is a transmembrane pressure (TMP) value of nineteen (19) psi verses thirty (30) psi. The cleaning consists of either a high pH or a low pH cleaning, which rinses the filters for forty-five (45) minutes one direction, then forty-five (45) minutes the opposite direction. The CIP tank is filled using finished water while maintaining an air gap, and then the operators add either citric acid or calcium hypochlorite by hand to raise the pH to 12.0 SU or lower the pH to 2.5 SU. The water is also heated to 77°F in the CIP tank for the offline cleaning process.

The continuous turbidity meters are calibrated quarterly by a contractor (Photograph 41). I observed the hoses entering and exiting the meters appeared to be dark, potentially from build-up (**Recommendation 36**). Mr. Brown stated he has the ability to call the contractor to work on the meters when necessary to help with any troubleshooting.

Lastly, we observed the clearwell (Photograph 42). The clearwell had a manway on ground level. The ladder was locked to prevent vandalism. The overflow was fitted with #18 mesh screen to which was adequate to prevent the entrance of contaminants. The overflow also had splash pad to prevent against erosion. During observation of the outside of the clearwell tank, three (3) active leaks were discovered (Photographs 43-45, **Significant Deficiency 1**).

We continued to the backwash basins to conduct a water pollution inspection, the findings of which has been documented in a separate report. I summarized my findings with Mr. Brown, thanked him for his time, and ended the inspection.

Sampling and Monitoring

During the inspection, I field verified the disinfectant residual and collected a routine bacteriological sample to verify that Garden City PWS is meeting several key operational and regulatory requirements (Table 3).

Table 3: Analyses Conducted

Parameter	Result	Statutory Limitation/Range
Free Chlorine	Free= 1.46 mg/L	0.50 – 4.00 mg/L
Total Chlorine	Total= 1.87 mg/L	0.20 – 4.00 mg/L
Bacteriological Sample-Routine Testing Laboratory: State Laboratory		**Result**
Sample Site #: R1 Physical Address: 107 N 3rd Lab ID: 3 Disinfectant Residual; Total Cl = 1.87 mg/L		Coliform: Absent E. Coli: Absent

Analysis Summary: No analysis yielded results that were outside of statutory or acceptable range.

Engineering Assessment - *All engineering advice provided as part of the sanitary survey is preliminary and based on maps and information gathered during field inspection. The information should be used for planning purposes only. A professional engineer, registered in Missouri and acting at the public water supply's consultant, must develop all final designs. A construction permit may be required from the Department's Public Drinking Water Program based on a review of an engineer report, plan, and specifications submitted by your consultant.*

If Garden City decides to burn vegetation or untreated wood, then the following requirements must be met:

1. Burning is limited to 80 cubic yards per week unless an air curtain incinerator (ACI) is used.
2. Burning is to take place only between sunrise and sunset.
3. Burning is to occur at least two hundred (200) yards from the nearest structure not owned by the City, unless an ACI is used AND one of the following two conditions is met:
   a) Waivers are obtained from the owner or occupant of the structure, OR
   b) The local fire department provides approval in those circumstances where the distance cannot be maintained.
4. Burning is to be supervised at all times.
5. The local fire control or other authority with jurisdiction shall be notified of the burning activities prior to initiation.

The City should establish a Source Water Protection Plan. The plan should list the watersheds draining to the lake and identify the land usage in each watershed to help better determine nutrient loadings. Once nutrient sources have been determined, the City can start taking actions to mitigate their impact to the lake. Algae blooms can be triggered by high nutrient levels, warm water temperatures, calm/stagnant water, and long periods of sunlight. The City will also need to further improve their Emergency Operations Plan (EOP) to identify who to contact for sampling in case of a future algal bloom, as well as the type and frequency of sampling that should occur. It should also include how the treatment process can be modified to either avoid the bloom by using a different source of water or intake level. In addition, it should include how the chemical dosing locations or amounts should change to remove any cyanotoxins produced by the algal bloom. The Environmental Protection Agency and the American Water and Wastewater Association (AWWA) both have educational materials available to help optimize treatment for cyanotoxins. The EOP should also take into account what the City plans to do if the treatment is unable to remove the cyanotoxins. The City having an established plan of action along with regular training, will allow for faster responses to any future HAB events.

The City does not run jar tests on a regular basis. Jar tests and verification of chemical feeds are necessary to document process control in the treatment train as required by 10 CSR 60-4.080(1). Inaccuracy in solution feeders, in this instance, peristaltic and piston pumps, could indicate that the interior hose needs to be changed or the pump needs to be serviced. Inaccurate chemical addition can affect the finished water quality and operating costs. Regular jar tests can determine optimal amounts of chemical to feed for the best results based on the current influent water quality, and potentially reduce the amount of chemicals needed to treat the water. Location of the chemical feed point can also alter effectiveness. Longer detention times can help reduce dosages. Overfeeding chemicals can produce the same results but cost much more. Regular jar testing and recording results based on raw water quality criteria such as turbidity, alkalinity, and pH will allow the system to compile a database of chemical feed rates for optimal treatment. Jar testing is also used to determine how different chemicals interact. For example, adding coagulant prior to PAC will result in a higher required dose of PAC to achieve the same amount of adsorption. Treating water based on flow alone does not accurately determine chemical dosage rates to effectively reduce turbidity or ensure the treatment facility is not producing corrosive water. The AWWA has spreadsheets and jar test protocols available to help with chemical optimization.

The operators were not sure of the exact settings on the continuous turbidity meters. The Department has established recommended settings to help Cities ensure optimal operation. The turbidity meters need to be calibrated quarterly to ensure accuracy with bulbs that should be changed annually. The turbidity meters should have a signal span of 0-5 NTUs to verify that all meters catch any large spikes in turbidity. The bubble-reject needs to be turned on to ensure that bubbles do not cause a false turbidity spike. The error hold mode should be set to "Transfer to 0.0" so the operators will notice when the turbidity meters are experiencing issues instead of holding the last reading which could be misleading. Turbidity meters need a specific range of water flow through the meter to ensure proper readings. This should be checked monthly and the range can be found in the meter's operations manual. The signal averaging should be set on 30 seconds to catch all potential spikes in turbidity. The controller datalog interval should be set to every 1 to 5 minutes to ensure the majority of data is saved before encountering an error.

Compliance Determination and Required Actions

The City was found to be out of compliance with the Missouri Safe Drinking Water Act and its implementing regulations, based upon observations made during the inspection.

Significant Deficiencies:

The Missouri Safe Drinking Water Regulations require the Department to identify specific significant deficiencies with water systems that require corrective actions. These significant deficiencies are defects in design, operation, or maintenance that can cause public health concerns, or have the potential to introduce contamination.

1. **The Clearwell has inadequately protected openings, which can allow the entrance of contaminants into the finished water. This is a violation of 10 CSR 60-4.080(7) and a Significant Deficiency under 10 CSR 0-4.025(4)(A)4.**

The clearwell had three (3) active leaks located at difference seams at the time of the inspection.

REQUIRED ACTION: By **May 18, 2020**, the water system must repair the opening on the underside of the tank so that there is a seal in place to prevent water from leaking out from the tank submit photo documentation of repairs to KCRO. The roof and sidewalls must be water tight with no openings except properly constructed vents, manways, overflows, risers, drains, pump mountings, control ports, or piping for inflow and outflow.

Clean Water Law violations – Letter of Warning (LOW):

1. **The City placed water contaminants, muriatic acid along with others, in a location where it is reasonably certain to cause pollution of waters of the state [§ 644.051.1(1) and 644.076.1, RSMo].**

During the inspection, the bottom of the chemical storage room door was rusted in such a way, and the floor is sloped in such a way, that any chemical spill from chemicals not in containment would flow into the storm drain outside the door, which feeds directly into the creek.

REQUIRED ACTION: By **May 18, 2020**, the City must place chemicals in secondary containment, repair the door, obtain a berm structure for the doorway or spill kits to ensure any chemical spills do not reach the environment or waters of the state. The City must provide KCRO a written statement and photographic evidence of the actions taken to correct this violation.

Unsatisfactory Findings

1. **The water system did not obtain a construction permit prior to modifying the water system as required by § 640.115.2 RSMo, 10 CSR 60-3.010(1)(A) and 10 CSR 60-10.010(2).**

At the time of inspection, the City had partially installed a mixer in the 300k gallon standpipe without obtaining a construction permit.

REQUIRED ACTION: By **May 18, 2020**, the City must determine if they intend to finish the project and submit a statement to the KCRO outlining plans to either abandon the project, or complete construction. If the City decides to complete construction of the mixer, they must submit a construction permit application, with detailed as-built plans and specification, prepared by a professional engineer registered in the State of Missouri, to the Public Drinking Water Branch in Jefferson City for review and approval. A construction permit application has been attached to this report and can be obtained on the internet at: http://www.dnr.mo.gov/forms/780-0701-f.pdf or at: http://www.dnr.mo.gov/forms/index.html#DrinkingWater

2. **The water system did not have adequate buffer solutions to ensure proper calibration of the pH meter, which may lead to inaccurate readings limiting the ability of the operator to ensure operational monitoring is being conducted as required by 10 CSR 20-7.031(5)(O) and 10 CSR 60-4.080(1).**

At the time of the inspection, the pH buffer for the 10 SU solution was expired. Having expired buffers when calibrating meters can cause inaccurate results and prevent adequate process control. The pH meter is used both in operation of the WTP through process control and to monitor pH of the effluent from the backwash and sludge holding basins under the MOG64 general permit.

REQUIRED ACTION: By **May 18, 2020**, the City must submit evidence of purchasing new pH 10 SU buffer to the KCRO along with a written statement explaining how the water system will prevent a reoccurrence of this violation in the future. Ensure all chemicals and reagents in the laboratory are within expiration dates on a monthly basis and rotate chemicals regularly. Be sure to properly dispose of all expired chemicals.

3. **The water treatment plant does not have adequate backflow prevention devices between chemical usage points, safety showers, or hoses as required by 10 CSR 60-11.010.**

Each chemical usage point, safety shower, and hose had its own individual tie in into the finished water and while some were metered, none had backflow devices.

REQUIRED ACTION: By **May 18, 2020**, the City shall install backflow prevention devices on all lines connected to the finished water that could potentially be compromised in a low pressure situation. This includes all laboratory usage, cleaning hoses, and chemical feeding equipment. The City must provide a written statement and photographic evidence of the actions taken to correct the unsatisfactory finding to the KCRO.

Recommendations - *The recommendations are not required actions, but they are provided for consideration by the City of Garden City to improve overall facility performance and prevent future compliance issues.*

1. Ensure the ladder guard is placed back on the ladder at the 300k gallon standpipe.

2. Consider obtaining security fencing for the 50k gallon tower to ensure no unauthorized access to the finished water supply or consider the addition of ladder guards on each tower leg to prohibit the climbing of the legs

3. Consider regrading around the 50k gallon tower to promote drainage away from the tower to help ensure the structural integrity of the footings.

4. Consider sand blasting and repainting the 50k gallon tower to prevent further deterioration due to corrosion.

5. Consider checking the condition of the intake grates and screening on a regular basis to verify the condition and ensure operations are not hindered by potential blockages due to wildlife.

6. Consider monitoring the condition of the spillway at the Old Lake to ensure the concrete does not continue to deteriorate which could potentially overwhelm the spillway.

7. Consider removing the excess vegetation at the Old Lake spillway to help reduce further deterioration of the concrete.

8. Understand what is regulatory allowed with respect to burning waste. The burning of trade waste, except untreated wood, is prohibited. The burning of household waste from another's property and the burning of durable goods is also prohibited. There was evidence of illegal open burning of plywood (treated wood), mattresses (durable good), and household waste brought from off-site at the time of the inspection. In order to comply with Missouri Air Conservation Regulation 10 CSR 10-6.045, Open Burning Requirements, only vegetation and untreated wood may be burned. Untreated wood only includes wood that has not been chemically preserved, painted, stained, or composited. Untreated wood does not include plywood, particleboard, chipboard, and wood with other than minimal quantities of paint, coating, or finish. Garden City must not continue burning any items other than vegetation and untreated wood. Ensure to remove any remaining prohibited materials from the burn pile and properly dispose of them at a permitted transfer station or landfill. Please refer to the Engineering Assessment section on how to properly burn vegetation and untreated wood and Attachment 6 to learn more about open burning requirements.

9. Consider the addition of signs at the New Lake Intake that warns the public to keep off the drinking water intake and to be aware of potential dangers of being around an intake.

10. Ensure to monitor the condition of the concrete at the New Lake Spillway to ensure no further deterioration occurs and that all wooded vegetation is removed to help prevent further deterioration.

11. Ensure the sump pump at the Raw Water Pump Station is fixed to prevent standing water and excessive moisture to build up which could harm the pumps and corrode the piping.

12. Consider the addition of riprapping to the emergency spillway at the New Lake to help prevent against erosion during a high water event.

13. Ensure the water level is reduced in the pit if able to prevent excessive corrosion to the connection.

14. Ensure to update the Emergency Operations Plan to include situational responses or treatment responses for natural disasters and harmful algal blooms. All community water systems must develop a plan for assuring continuous water service under emergency conditions. The EOP should be reviewed annually, and updated at least quarterly or as necessary with the change of staff or personnel. The plan must include: all chemicals, equipment, and personnel, all mutual aid agreements and service agreements, alternative source of water when basic system was inoperable, auxiliary sources of power, all persons authorized to expend funds, and written procedures for tank truck disinfection and protection. The current plan does not explicitly list the process and procedures involved in treating a harmful algal bloom.

15. Ensure the lead ban ordinance is updated to reflect the current definition of lead free in the 2011 Reduction of Lead in Drinking Water Act. The 2011 Act amended the definition of "lead free" to mean less than 0.2 percent lead for solder and fluxes, and not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures, and added exemptions for non-potable uses. A model lead ban ordinance was provided during the inspection. The water system should update the lead ban program/ordinance as soon as possible. The lead ban ordinance or policy may not be any less stringent than 2011 Act.

16. Ensure to establish a written main flushing program to help ensure water quality in all portions of the distribution system. Routine flushing of water distribution piping removes deposits and sediments in the water that may restrict flow and cause water quality issues. A whole system flush should be conducted at least once a year with flushing starting at the master meter and working out toward the extremities of the system. The water system should notify the wholesale provider and customers prior to beginning flushing. Flushing should be conducted during periods of low water demand and when weather is suitable (spring or fall) to reduce inconvenience to customers. The water system should record all water used during flushing events and include this as accounted for water in monthly water loss calculations.

17. Ensure to regularly exercise all valves in the distribution system to ensure they are maintained in good working order when needed. Valve records should include location, condition and maintenance records and regular valve exercising schedules.

18. Develop a Source Water Protection Plan for the New Lake. For assistance with developing a Source Water Protection Plan for your reservoir contact Ken Tomlin, Source Water Protection coordinator at the Public Drinking Water Branch at 573-751-5331.

19. Consider verifying the seal on the roof access hatch and installing a gasket on the roof access hatch on the Clearwell to help provide a better seal between the hatch and the tank.

20. If water loss exceeds ten percent (10%), it is considered cost effective to locate and eliminate the water loss. All connections should be metered in the system, including all municipal facilities and unbilled connections. Flushing hydrants, main breaks, and fire suppression activities require an estimation of water loss for reconciliation at the end of the accounting period. Water loss represents lost revenue for the water system, and may indicate main leaks, which cause a loss of pressure and pose a potential risk for backflow. In addition, if the water loss is due to leaks: where water leaks out contaminants can enter. Therefore, active leaks can be a serious contamination threat to the customers. The water system should develop and implement a policy by which to monitor and investigate water loss. The Department has provided the Missouri Rural Water Association with several leak detection devices to assist water systems in locating leaks. You can contact Missouri Rural Water at 573-657-5533, or contact the KCRO Public Drinking Water Unit at 816-251-0700 and our staff can forward your request for assistance.

21. Consider starting a quarterly flushing program of the dead ends, problem areas, and low areas again which could potentially help rid the system of excess disinfection by-products and help with taste and odors.

22. Consider labeling the chemical feed lines throughout the WTP to help quickly identify the chemical source, such as using colorful electrical tape.

23. Consider removing all equipment that is no longer in use to help determine an accurate amount of spare parts and machinery that is functioning. Consider keeping all the spare equipment in one location for easier maintenance and inventory.

24. Ensure to properly dispose of all flammable waste material and trash in the PAC room, including the paper remnants, to help remove potential sources of fuel during a PAC room explosion.

25. Consider the installation of lighting inside the clarifier and settling basin to help determine floc and sludge levels along with any short circuiting issues.

26. Ensure to obtain secondary containment for the sodium permanganate to prevent spills from reaching any drains. Also, consider obtaining a floor drain cover to prevent any spills from reaching the septic system.

27. Ensure all chemicals are labeled for safety and maintenance purposes.

28. Consider installing a lighting device to better see inside the permanganate tank room, clarifier, and the settling basin for maintenance and safety purposes.

29. The chemicals used at your site for water treatment may have expired or have possibly become waste. It is important that you separate the waste chemicals from the chemicals you consider a usable product. Items that are both wastes and products may be incompatible. These need to be separated from each other in their respective groups. After determining what items are waste, you will need to determine if any of those wastes are hazardous wastes. If after making that waste determination you have more than 220 pounds of hazardous waste, you will need to register as a hazardous waste generator. Lastly, it is important to keep any chemicals from coming in contact with the environment as result of washings, spills or any other means. To assist with addressing the recommendations for the management of your chemicals, you can contact the KCRO's Waste Management Program to schedule a compliance assistance visit. These visits are designed to assist facilities with guidance in understanding and complying with the hazardous waste regulations and requirements. If you are interested, please contact Mike Carroll at 816-251-0757 to schedule the compliance assistance visit.

30. Consider cleaning the bulk sodium hypochlorite tank on a regular basis to prevent excessive particulate matter from building inside the tank and ensure the particulates and sludge are disposed of properly.

31. Ensure the chemicals are sorted by type, each type of chemical is in its own secondary containment, and no chemicals are stacked to prevent injury to the operators.

32. Ensure a berm is placed prior to the exterior door in the chemical storage room to prevent chemicals from running outside during spills. Also consider creating or purchasing spill kits to clean chemicals without spraying the chemicals outside.

33. Ensure the safety shower and eye wash station are flushed on a routine basis to ensure fresh water is available when needed.

34. Ensure proper Personal Protective Equipment (PPE) is obtained and worn by all operators working with the chemicals to prevent any potential injuries due to chemical burns.

35. Ensure to clean the backwash and CIP tank on a regular basis, such as annually, to help prevent fouling of filters.

36. Ensure to change the hoses entering the turbidity meters regularly to prevent potential build up in the hoses from fouling the meters or causing false positives.

Additional Comments/Conclusions

The EPA reported that the State of Missouri is among the top 25% of states affected by federal flooding declarations. This was noted during a March 31, 2015 webinar on EPA's new ***Flood Resilience: A Basic Guide for Water and Wastewater Utilities***, which was hosted by the Association of State Drinking Water Administrators and the EPA. The Flood Resilience Guide is geared towards helping small to medium sized water and wastewater utilities prepare for, and recover from, a flood event. This interactive guide is available online at: http://water.epa.gov/infrastructure/watersecurity/emerplan/upload/epa817b14006.pdf. For more information, visit http://water.epa.gov/infrastructure/watersecurity/emerplan/. Additional emergency preparedness information is also available through the Missouri State Emergency Management Agency's website: http://sema.dps.mo.gov/.

On August 28, 2016, House Bill 1717 was signed by Governor Nixon, which requires public water systems to notify the Department of Natural Resources, the Department of Health and Senior Services and its customers at least 90 days prior to a vote on proposed modification (either addition or removal) of fluoridation levels in the water treatment process. Customers must be notified of any change to the treatment process with regard to fluoridation via radio, television, newspaper, regular mail, other electronic means or any combination of methods to most effectively notify customers. Certification of customer notification can be provided to the department on form MO780-2685 located on the department's website at http://dnr.mo.gov/forms/780-2685-f.pdf. Additionally, as with any modification or alteration of a public water system, approval from the Public Drinking Water Branch, Permits and Engineering Section is required.

PLEASE NOTE: All public water systems are required to submit a construction application with engineered plans and specifications to the Department for review and approval prior to any new construction, modification, alteration, or extension of your water system source, treatment, storage, or distribution piping. This requirement includes modifications made to your treatment process that would significantly change or alter plant capacity or treatment processes. Adding, removing, or changing chemical additives and/or their injection locations may significantly alter your treatment process. Water systems must notify the Department at least 60-days in advance of making any changes to the treatment process. Please make sure your water system has written approval prior to beginning any construction or modifications.

For assistance with compliance issues, or general technical assistance, you may contact David Green, KCRO Water Specialist, at 816-251-0700. Water Specialists' duties are primarily intended to provide technical assistance and operator training to systems such as yours. We encourage you to utilize their services.

Signatures

SUBMITTED BY:

Denise Eagan

Denise Eagan, P.E.
Drinking Water Inspector
Kansas City Regional Office

REVIEWED BY:

Scott F Honig

Scott F. Honig, P.E.
Engineering Unit Chief
Kansas City Regional Office

DE/SFH

Attachments

Attachment # 1 – Photographs 1 through 45
Attachment # 2 – Water Treatment Plant Schematic
Attachment # 3 – Aerial View
Attachment # 4 – Construction Permit Application Form 780-0701-f
Attachment # 5 – Facts on Open Burning

Attachment #1 – Photographs
Garden City PWS

	Photograph: 1 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397168/4267366 Description: Viewing the 300k gallon standpipe with overflow and draining piping visible. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 2 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 396250/4268812 Description: Viewing the 50k gallon elevated storage tower with ladder guard, overflow piping visible on the left side leg, and lack of security fencing. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 3 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 396250/4268812 Description: Viewing the ponding around one of the footings at the 50k gallon tower. Date Taken: March 10, 2020 Program: ENG Unit

	Photograph: 4 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 396250/4268812 Description: Viewing some corrosion on the central piping around the manway. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 5 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 396271/4268810 Description: Viewing the bulk water sales station where an air gap is maintained. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 6 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397698/4269179 Description: Viewing the intake at the Old Lake. Date Taken: March 10, 2020 Program: ENG Unit

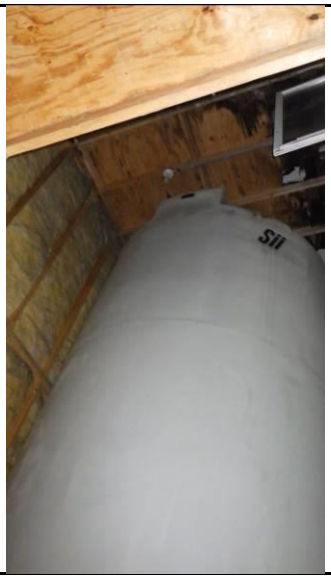
	Photograph: 7 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397719/4269229 Description: Viewing the spillway for the Old Lake with the concrete starting to deteriorate causing uneven flow and some excess vegetation. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 8 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397799/4269357 Description: Viewing the Emergency Spillway at the Old Lake with some riprapping to help prevent erosion. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 9 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397766/4269359 Description: Viewing the burn pile at the Old Lake Emergency Spillway, which included bags of waste and treated lumber. Date Taken: March 10, 2020 Program: ENG Unit

	Photograph: 10 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397968/4264350 Description: Viewing the New Lake Intake. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 11 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 398202/4264330 Description: Viewing the New Lake Spillway with some concrete debris washed away and some wooded vegetation growing in the seams of the spillway. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 12 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397971/4264281 Description: Viewing the Raw Water Pumps with standing water on the floor and sump pump. Date Taken: March 10, 2020 Program: ENG Unit

	Photograph: 13 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397887/4264314 Description: Viewing the emergency spillway at the New Lake without any riprapping. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 14 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397159/4267313 Description: Viewing inside the Cass County PWSD #1 connection pit with excess water, sump pump, and flush valve visible. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 15 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the laboratory with jar testing equipment, various testing equipment, and sample taps. Date Taken: March 10, 2020 Program: ENG Unit

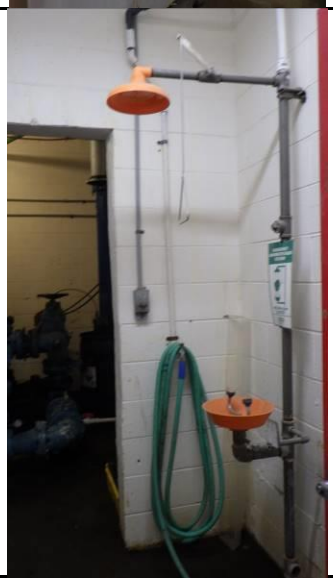
	Photograph: 16 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the primary rapid mix with unlabeled chemical feed lines, sample point, and extra mechanical rapid mixer. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 17 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the PAC feed area with mechanical mixer and discarded PAC bags. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 18 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing inside the clarifier with continuous sludge removal motor visible along with effluent baffles. Date Taken: March 10, 2020 Program: ENG Unit

	Photograph: 19 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the secondary rapid mix with mechanical mixer and caustic chemical feed line. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 20 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the raw water piping with chemical injection points, check valves, and gate valve. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 21 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the sodium permanganate without any secondary containment. Date Taken: March 10, 2020 Program: ENG Unit

	Photograph: 22 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the sodium chlorite on secondary containment, vented outside, and without a label. Piston style chemical feed pump on top of the barrel along with an unknown chemical spray bottle and aerosol can. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 23 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the 5,000 gallon permanganate tank with no lighting in the room. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 24 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the chemical storage room with the bulk sodium hypochlorite tank, muriatic acid, sulfuric acid, and a barrel of sodium hypochlorite. Date Taken: March 10, 2020 Program: ENG Unit

	Photograph: 25 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the chemicals in the secondary containment area, some of which are potentially waste chemicals with the sodium hypochlorite bulk tank resting on the rails. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 26 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the barrel of sodium hypochlorite on the secondary containment while other chemicals to the left and right are not on secondary containment. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 27 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the unused product chemicals stored together, stacked, and located near the exterior door without any secondary containment. Date Taken: March 10, 2020 Program: ENG Unit

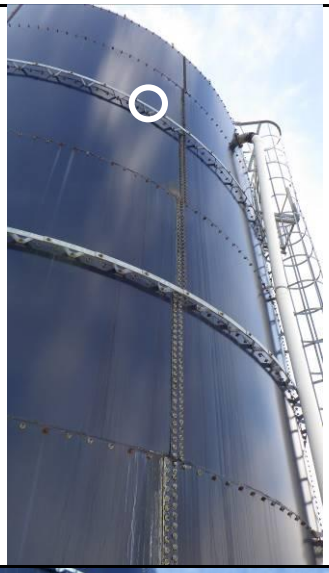
	Photograph: 28 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the exterior door to the chemical storage room which is rusted out the bottom with the door sill starting to bend upwards and no longer connected to the floor. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 29 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the storm drain outside the chemical storage room that discharges to the creek. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 30 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397689/4269239 Description: Viewing the discharge pipe of the storm drain located approximately two feet upstream of the MOG64 settling basin outfall. Date Taken: March 10, 2020 Program: ENG Unit

	Photograph: 31 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the chlorine dioxide generation equipment with water sources on the top right of the photograph. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 32 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the safety shower, eyewash station, and hose used to clean the chemical area. Raw water piping visible through the doorway. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 33 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397650/4269170 Description: Viewing the Settling Basin with baffling in the foreground and no interior lighting. Date Taken: March 10, 2020 Program: ENG Unit

	Photograph: 34 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the two horizontal turbine pumps for the UF system Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 35 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the UF system with pressure gages, canisters, and view ports over the canisters for DIT. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 36 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the two horizontal turbine transfer pumps at the base of the photograph with a cleaning hose directly tired into the finished water main after a meter to track usage, and a chemical feed pump, which is no longer connected. Date Taken: March 10, 2020 Program: ENG Unit

	Photograph: 37 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the exterior of the transfer basin with bulk chemical filling connection points. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 38 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the two horizontal turbine high service pumps. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 39 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the two horizontal turbine backwash pumps, the backwash tank, along with the chemicals used to offline clean the filters. Date Taken: March 10, 2020 Program: ENG Unit

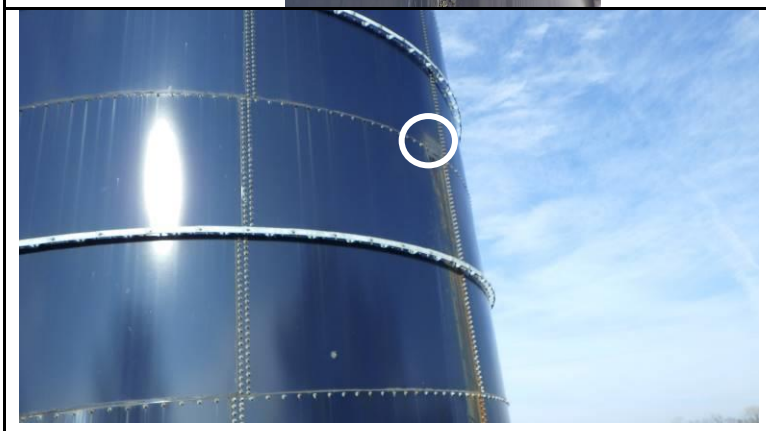
	Photograph: 40 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the CIP tank with staining down the front. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 41 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397647/4269198 Description: Viewing the continuous turbidity meters with display, and dark hoses entering the meters. Date Taken: March 10, 2020 Program: ENG Unit
	Photograph: 42 Taken By: Denise Eagan Facility: Garden City PWS Permit: MO1010301 Location: UTM 15N 397646/4269098 Description: Viewing the clearwell with manway, locked ladder entry, and overflow on the left side of the standpipe. Date Taken: March 10, 2020 Program: ENG Unit



Photograph: 43
Taken By: Denise Eagan
Facility: Garden City PWS
Permit: MO1010301
Location: UTM 15N 397646/4269098

Description: Viewing the active leak on the eastern side of the clearwell marked by the circle. Water can be seen running down the standpipe.

Date Taken: March 10, 2020
Program: ENG Unit



Photograph: 44
Taken By: Denise Eagan
Facility: Garden City PWS
Permit: MO1010301
Location: UTM 15N 397646/4269098

Description: Viewing the active leak on the southern side of the clearwell at a patch location marked with the circle.

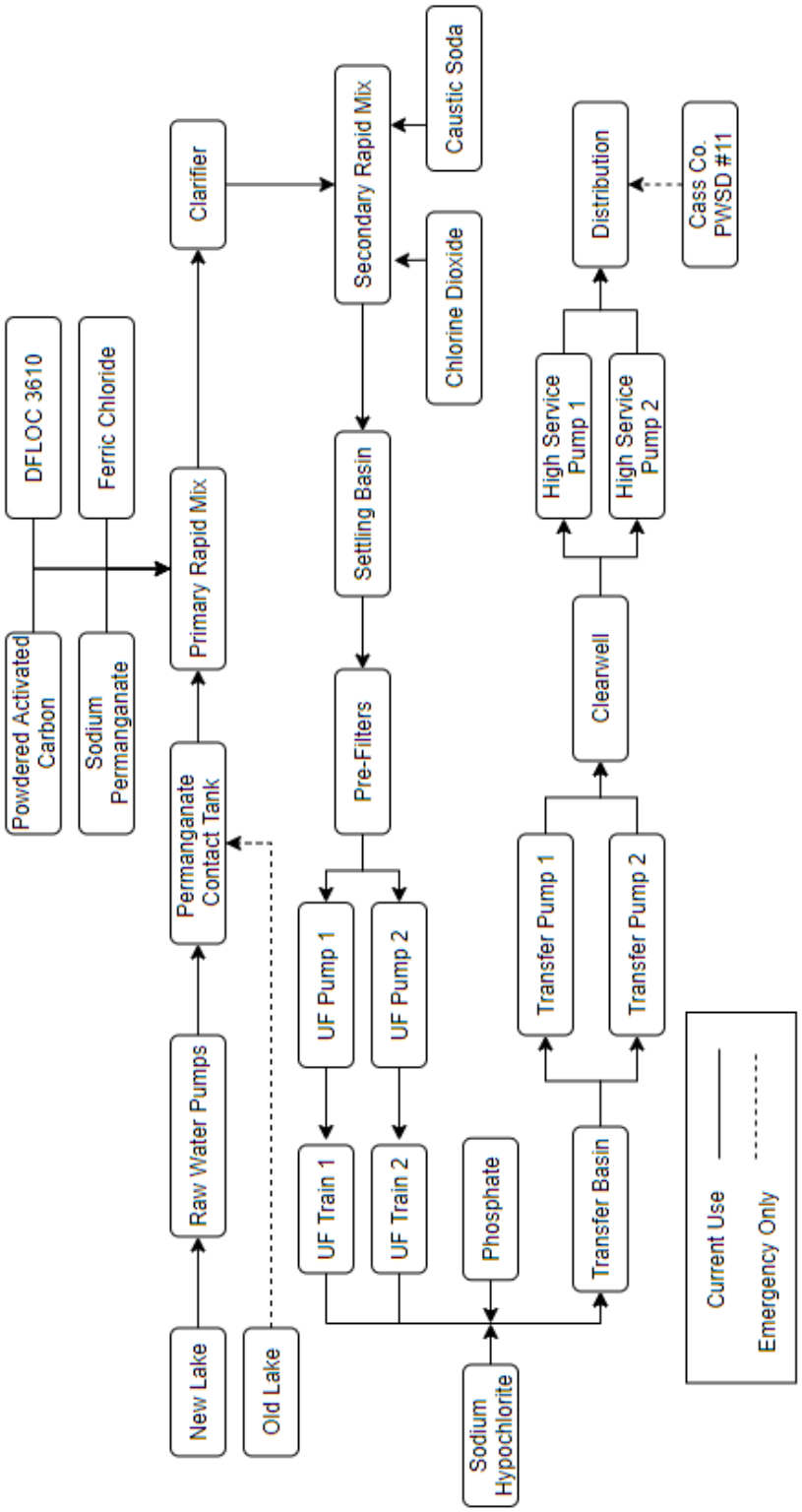
Date Taken: March 10, 2020
Program: ENG Unit

Photograph: 45
Taken By: Denise Eagan
Facility: Garden City PWS
Permit: MO1010301
Location: UTM 15N 397646/4269098

Description: Viewing the third active leak on the western side of the clearwell marked by a circle.

Date Taken: March 10, 2020
Program: ENG Unit

Attachment #2 – Water Treatment Plant Schematic
Garden City PWS



Attachment #3 – Aerial View
Garden City PWS