2016 Water System
Capital Improvements Plan

prepared for

LAWRENCE UTILITIES
CITY OF LAWRENCE, IN

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TABLE OF CONTENTS

LIST OF APPENDICES

APPENDIX A TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

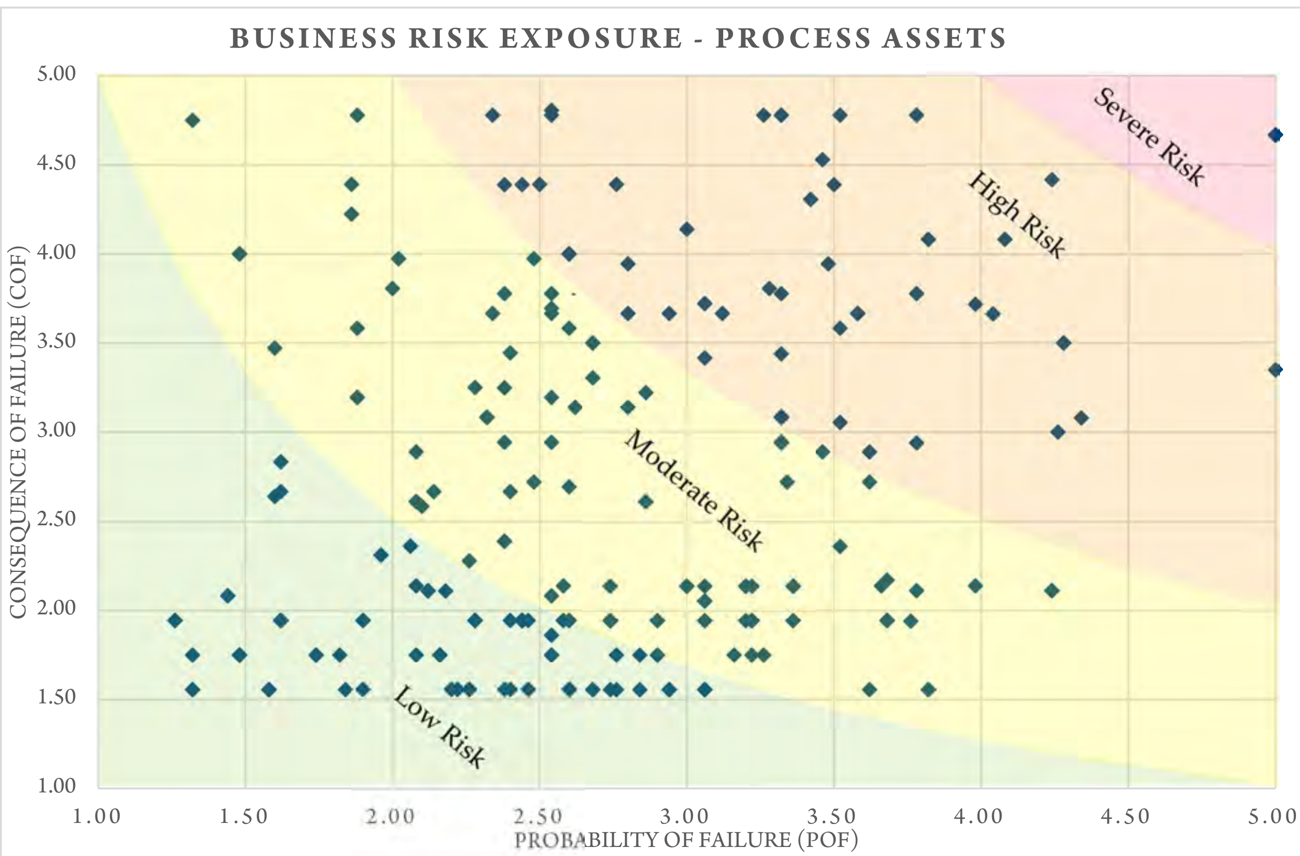
1.1 Introduction

The 2016 Water System Capital Improvements Plan (CIP) has been developed for the Lawrence Utilities (Lawrence) to serve as a planning document for a 20-year planning period. The projects included in the CIP have been developed based on a Business Risk Exposure (BRE) analysis of existing water system components that are valued at $1,000 or more (e.g. assets). Each asset was analyzed to determine its probability of failure and consequence of failure. The assets each received a calculated BRE rating based on these two criteria. Projects were developed to address assets' risk that scored high enough to be considered for rehabilitation or replacement. Other assets with a lower risk were identified for maintenance.

1.2 Process Assets - Results Summary

The assets located at the Richardt water treatment plant (WTP), Fort Harrison WTP, Indian Lake WTP, Winding Ridge Booster Station, Fort Harrison and Indian Lake well fields, 52nd St. Tank, and Oaklandon Rd. Tank were considered process assets. They were evaluated and their BRE rating was calculated for each. The BRE rating results are plotted, using their probability of failure and consequence of failure, as shown on **Chart 1.2.1**. Assets that are rated as "severe" or "high" are in need of repair or replacement.

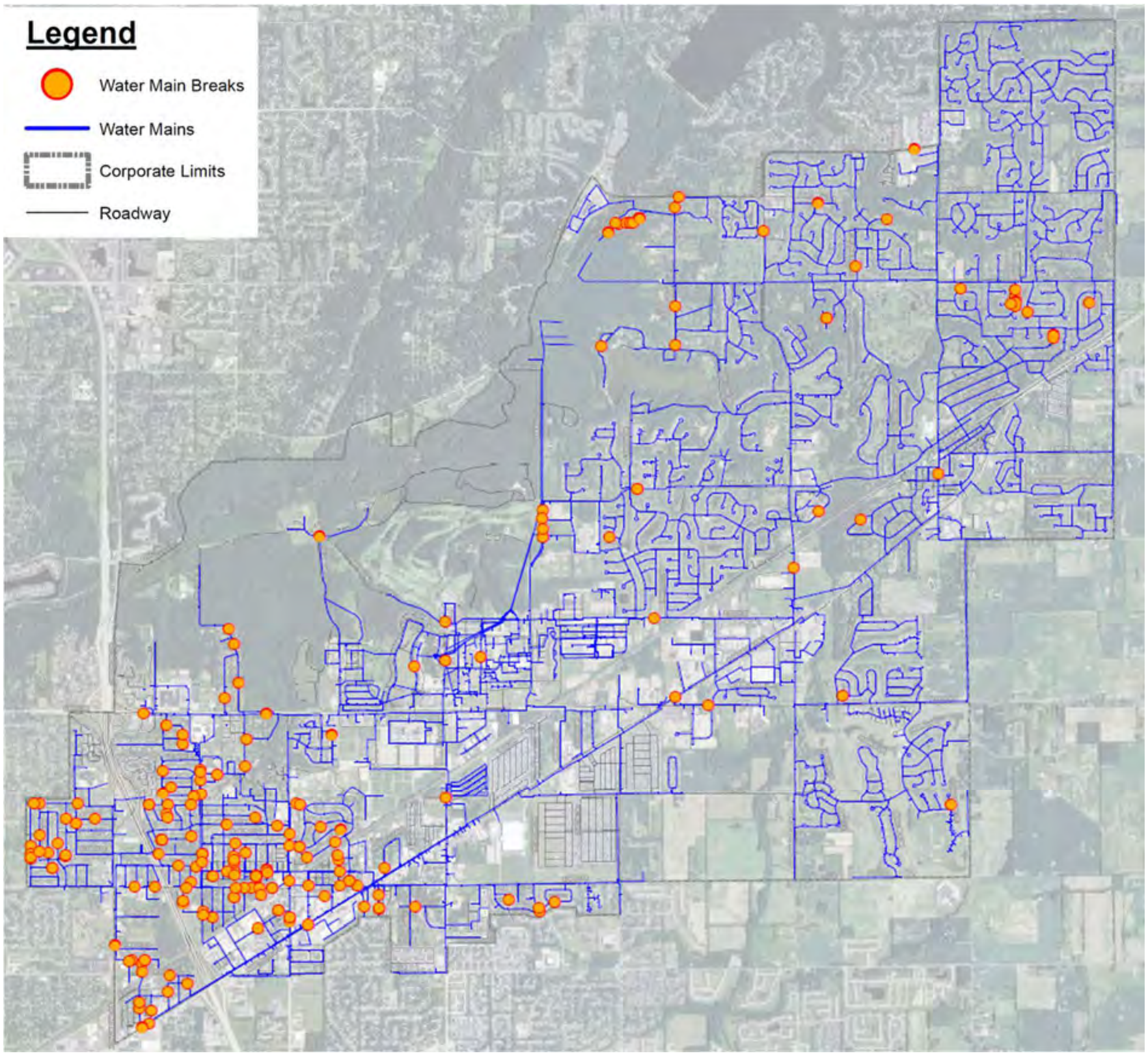
Chart 1.2.1: Process Assets' BRE Ratings



1.3 Water Mains Results Summary

The distribution system was evaluated using water main break information from 2010-2015. Areas with a high number of water main breaks were identified and plotted on a water system map. Probability of failure and consequence of failure ratings were developed to determine the area's BRE rating. The water main breaks from 2010-2015 are shown on **Figure** Error! Reference source not found.**.1.** Based on this map, water main breaks are most frequent in the west portion of the City which contains the oldest water mains.

Figure** Error! Reference source not found.**.1: Water Main Break Distribution Map



1.4 Project Summary

The projects were prioritized and planned for completion over the next 20-year period. The CIP does not include any additions to the water system but instead aims to maintain the current system at an acceptable level of service for the community.

1.4.1 Process Assets

High priority projects include work at the Richardt WTP, Fort Harrison WTP, Indian Lake WTP, Fort Harrison and Indian Lake well fields, 52nd St. Tank, and Oaklandon Rd. Tank. **Table 1.4.1.1** shows the project priorities and estimated total project costs for each proposed project.

Table 1.4.1.1: Process Assets Project Summary

Project No.	*Project Name*	*BRE Rating*	*Estimated Total Project Cost*
P1	Richardt WTP Phase IA	23.33	$170,000
P2	Richardt WTP Phase II	14.23	$5,420,000
P3	Indian Lake Well Field Rehabilitation	13.76	$1,025,000
P4	Oaklandon Rd. Tank Rehabilitation	13.73	$600,000
P5	Indian Lake WTP Rehabilitation	12.31	$790,000
P6	52nd St. Tank Rehabilitation	11.04	$476,000
P7	Fort Harrison WTP Improvements	10.60	$6,137,500
P8	Fort Harrison Well Field Rehabilitation	9.97	$2,765,000
		TOTAL	**$17,383,500**

The costs are based on 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The costs are provided on the basis of Wessler's qualifications and experience. Wessler makes no warranty, expressed or implied, as to the accuracy of such cost estimates compared to bids or actual costs.

1.4.2 Distribution System Assets

High priority projects generally include work in the downtown area. **Table 1.4.2.1** shows the project priorities and estimated total project costs for each proposed project.

Table 1.4.2.1: Distribution System Assets Project Summary

Project No.	*Project Name*	*BRE Rating*	*Estimated Total Project Cost*
D1	Downtown (E 47th St, between N Sadler Dr and N Franklin Rd)	16.74	$1,528,000
D2	N Kitley Ave, Leone Dr, Karen Dr Area	16.00	$1,844,000
D3	Lee Rd Raw Water Main (at golf course)	13.50	$373,000
D4	Downtown (E 46th St, between Payton Ave and N Franklin Rd)	10.72	$920,000
D5	E 43rd St (between N Shadeland Ave and Elmhurst Dr)	7.56	$453,000
D6	Elmhurst and Kingman Dr (between Picton Dr and Pendleton Pike	7.56	$497,000
D7	E 46th St (between Van Cleave St and Pendleton Pike)	7.56	$459,000
D8	Fall Creek Dr and Sumac Ln (south of Hermosa Dr)	7.11	$144,100

Project No.	*Project Name*	*BRE Rating*	*Estimated Total Project Cost*
D9	N Franklin Rd (between Plummer St and Records St)	6.48	$197,000
D10	E 49th St (between Elmhurst Dr and N Sadler Dr)	6.21	$425,000
D11	Pebblebrooke Dr and Stacie Cir (between E 75th St and Richie Cir)	5.60	$424,000
D12	E 52nd St (between N Kitley Ave and Katherine Dr)	4.92	$105,000
D13	E 50th St (between N Franklin Rd and Barlow Dr)	4.92	$125,000
D14	Zoeller Ave (south of E 46th St)	4.86	$223,000
D15	N Hartman Dr (between E 45th St and E 46th St)	3.69	$194,000
D16	Barbour Ct (north of E 51st St)	2.87	$112,000
D17	Water Main Replacement Program	-	$51,381,000
		TOTAL	**$59,404,100**

The costs are based on 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The costs are provided on the basis of Wessler's qualifications and experience. Wessler makes no warranty, expressed or implied, as to the accuracy of such cost estimates compared to bids or actual costs.

2.0 EXISTING CONDITIONS

2.1 Richardt Well Field

There are a total of four active groundwater wells which serve the existing Richardt WTP. This well field is located on the existing Richardt WTP property near the intersection of 56th St. and Richardt Ave. None of the existing wells have an onsite/stationary backup power source. The total well field capacity is 3,000 gpm (4.32 MGD). With the largest well out of service (Well #1), the well field firm operating capacity is 1,750 gpm (2.52 MGD).

In 2016, an aquifer performance test and safe yield analysis was completed by Peerless Midwest to determine the safe yield capacity of the aquifer. The pump testing results were analyzed using groundwater modeling software to determine the safe yield. The resulting safe yield from the aquifer recommended by Peerless Midwest is 4,200 gpm, which is 1,200 gpm higher than the current total capacity of the wells. Wells 1, 2, and 3 are capable of being upgraded to larger pumps and motors.

2.1.1 Well 1

The well was constructed in 1959. It is a rock well, reportedly 242 feet deep, 16-inches in diameter with a 125 HP premium efficient inverter duty motor. The well has a rated capacity of 1,200 gpm and a current pumping capacity of 1,250 gpm. The well is enclosed in a masonry well house. A 2002 variable frequency drive (VFD) located in the well house is used to set the discharge rate of the well. Flow testing in 2012 indicated that the specific capacity of the well was 216. A flow totalizer and pressure switch are located on the pump discharge. The existing well house roof, door, and windows are in need of repair.

Well 1 Pump Head

Well 1 Motor

2.1.2 Well 2

The well was constructed in 1963. It is a rock well, reportedly 250 feet deep, 16-inches in diameter with a 100 HP premium efficient inverter duty motor. The well has a rated capacity of 1,100 gpm and a current pumping capacity of 1,000 gpm. The well is enclosed in a masonry well house. A 2011 VFD located in the well house is used to set the discharge rate of the well. Flow testing in 2012 indicated that the specific capacity of the well was 161.8. A flow totalizer and pressure switch are located on the pump discharge. The existing well house roof, door, and windows are in need of repair.

Well 2

2.1.3 Well 3

The well was constructed in 1954. It is a rock well, reportedly 291 feet deep, 12-inches in diameter with a 50 HP across the line motor. The well has a rated capacity of 580 gpm and a current pumping capacity of 750 gpm. The well is enclosed in a masonry well house which also contains Well #4 and formerly contained the chlorine gas feed equipment for the water treatment plant. A flow totalizer and pressure switch are located on the pump discharge. The existing well house electrical, roof, doors, and windows are in need of repair.

Well 3

2.1.4 Well 4

The well was constructed in 1954. It is a rock well, reportedly 289 feet deep, 8-inches in diameter with a 30 HP across the line motor. The well has a rated capacity of 250 gpm but is currently not in operation. The well is enclosed in a masonry well house which also contains Well #3 as noted above. A flow totalizer and pressure switch are located on the pump discharge.

Well 4

2.1.5 Well 5

Well 5 is currently not in operation. There is no well pump or motor currently installed. The well should be evaluated to determine the casing condition and whether it is possible to utilize the well in the future or if it needs to be abandoned.

2.2 Fort Harrison Well Field

There are three active groundwater wells which serve the existing Fort Harrison WTP. This well field is located on Indiana DNR property northeast of the Ft. Harrison WTP. None of the existing wells have an onsite/stationary backup power source. The total well field capacity is 3,000 gpm (4.32 MGD). With the largest well out of service (Well #8), the well field firm operating capacity is 1,750 gpm (2.52 MGD). The Wells are fed from independent 480V power sources. The motors are on Variable Frequency Drives (VFDs) that act as soft starts to help mitigate voltage drop upon motor startup. The VFDs are controlled through the existing Mission SCADA system and are cycled on and off based on the 52nd Street Elevated storage tank level.

2.2.1 Well 8

The well was constructed in 2004 and last rehabilitated in 2009. It is a tubular well, reportedly 105 feet deep, 16-inches in diameter with a 100 HP premium efficient inverter duty motor. The well has a rated capacity of 1,250 gpm and a current pumping capacity of 1,250 gpm. The well is located on an elevated platform exposed to the elements. Flow testing in 2010 indicated the well had a specific capacity of 52.26.

Well 8 Pump Head

Well 8 Motor

2.2.2 Well 9

The well was constructed in 1968 and last rehabilitated in 2008. It is a gravel pack well, reportedly 111.5 feet deep, 18-inches in diameter with a 60 HP motor. The well has a rated capacity of 500 gpm and a current pumping capacity of 1,000 gpm. The well is located in a well house. Flow testing in 2010 indicated the well had a specific capacity of 32 which is substantially off from its peak production potential according to Peerless Midwest. The well house is in fair condition and in need of minor repairs.

Well 9

Well 9 Well House

2.2.3 Well 10

The well was constructed in 1975 and was rehabilitated in 2010. It is a gravel pack well, reportedly 86 feet deep, 18-inches in diameter with a 100 HP premium efficient inverter duty motor. The well has a rated capacity of 1,000 gpm and a current pumping capacity of 750 gpm. The pump was replaced in 2010 with a six stage pump rated at 650 gpm at 372 feet of TDH. The well is located in a well house. Flow testing in 2010 indicated the well had a specific capacity of 28.05. The well house is in poor condition and requires rehabilitation.

Well 10

Well 10 Well House

2.3 Indian Lake Well Field

There are a total of three active groundwater wells which serve the existing Indian Lake WTP. This well field is located on private property in a utility easement west of the Indian Lake WTP. None of the existing wells have an onsite/stationary backup power source. The total well field capacity is 3,000 gpm (4.32 MGD). With the largest well out of service (Well #15), the well field firm operating capacity is 1,450 gpm (2.09 MGD). Well 14 is powered out of an existing 480/277V MCC located in Well House No. 14. Wells 15R and 16 are powered out of an existing 480/277V MCC located in old Well House No. 15. The Indian lake wells employ VFDs acting as soft starts to help decrease voltage drop upon motor startup. The VFDs are controlled by Mission SCADA and are cycled on and off based on the Oaklandon Elevated Storage Tank level. Historically, the wells have had issues with fine silt and iron plugging the pumps. Well 15R was cleaned using the double disc method. Well 16 was relined after the well screen failed. Since the cleaning and relining of these wells, no major cleaning has been required. However, Well 15R casing is currently settling and moving. The casing is going to be secured to attempt to resolve the issue.

2.3.1 Well 14

The well was constructed in 1990 and cleaned in 2007. It is a tubular well, reportedly 91 feet deep, 16-inches in diameter with a 125 HP premium efficient inverter duty motor. The well has a rated capacity of 1,000 gpm and a current pumping capacity of 700 gpm. The well is located in a well house. Flow testing in 2010 indicated the well had a specific capacity of 24.5.

Well 14 Pump Head

Well 14 Motor

2.3.2 Well 15R

The well was constructed in 2008. It is a tubular well, reportedly 85 feet deep, 16-inches in diameter a 75 HP premium efficient inverter duty motor. The well has a rated capacity of 1,000 gpm and a current pumping capacity of 900 gpm. The well is located on an elevated platform exposed to the elements.

Well 15R Pump Head

Well 15R Motor

2.3.3 Well 16

The well was constructed in 2001. It is a gravel pack well, reportedly 87 feet deep, 20-inches in diameter with a 75 HP premium efficient inverter duty motor. The well has a rated capacity of 1,400 gpm and a current pumping capacity of 750 gpm. The well is located on an elevated platform. Flow testing in 2010 indicated the well had a specific capacity of 35.5.

Well 16

Well 16 Pump Head

2.4 Fort Harrison WTP

The Fort Harrison WTP was originally constructed in 1980. The Fort Harrison well field pumps groundwater through the nine (9) vertical pressure filters located in the filter building into the 3 MG finished water ground storage reservoir. Three (3) high service pumps are located in the pumping building that pump water from the reservoir into the distribution system. The site is surrounded by a security fence.

2.4.1 Filters

The nine (9) filters at Fort Harrison are each rated at 174 gpm and are in fair condition. Filters 7-9 were originally installed as water softeners and have since been converted to vertical pressure filters. In the past, a foam protectant was placed around the filter body to minimize corrosion. Recently, the foam was removed from the exterior of the filters exposing the metal body of the filters. If the plant continues to operate in its current condition, the chemical vapors present in the filter building will begin to cause corrosion on the newly exposed filter body. The other portions of the filters which have been exposed are showing signs of corrosion.

Also according to the *Recommended Standards for Water Works*, the filters shall be capable of providing the maximum demand of the system with any filter out of service. The firm rated capacity of the filters is 1,392 gpm with one filter out of service.

The filter media in the pressure filters reportedly consists of anthracite over a gravel support bed. Typically, filter media has an expected useful life of 15 years before its filtration capacity begins to diminish and must be replaced. The condition of the existing media, interior coating, and interior steel is unknown and in need of evaluation.

Filter 6

2.4.2 High Service Pumps

The current high service pump firm rated capacity with the largest pump out of service is approximately 1,800 gpm (2.59 MGD). The high service pumps are controlled by the water level in the 52nd St. Elevated Water Storage Tank.

2.4.2.1 High Service Pump 1

High service pump 1 is located in the pumping building and produces 800 gpm. The pump is a horizontal centrifugal pump with a 50 HP motor and VFD. The pump is in fair condition and the motor is in good condition.

High Service Pump 1

High Service Pump 1 Motor

2.4.2.2 High Service Pump 2

High service pump 2 is located in the pumping building and produces 1,200 gpm. The pump is a horizontal centrifugal pump with a 75 HP motor and VFD. The pump and motor are in fair condition.

High Service Pump 2

High Service Pump 2 Motor

2.4.2.3 High Service Pump 3

High service pump 3 is in the pumping building and produces 1,000 gpm. The pump is a horizontal centrifugal pump with a 75 HP motor and VFD. The pump was not in operation at the time of this report, but the motor is in good condition.

High Service Pump 3

High Service Pump 3 Motor

2.4.3 Process Piping

The process piping located in the pumping building is all in good condition. There are no signs of corrosion and it appears that portions of the process piping were recently coated. However, the process piping shows signs of significant corrosion in the filter building. The existing coating system is flaking off the pipe exposing the metallic pipe to the corrosive chemical vapors present in the filter building.

Process Piping in Pumping Building

Process Piping in Filter Building

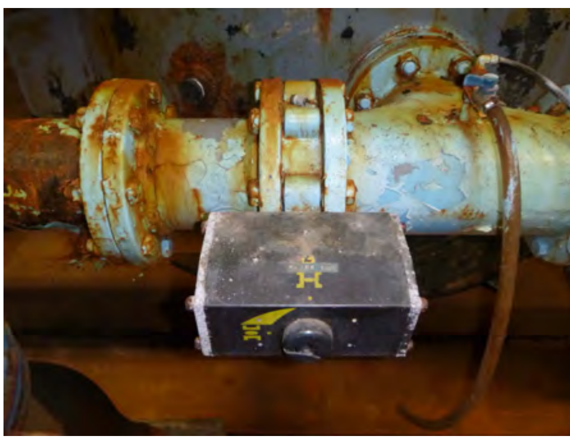
2.4.4 Valves

The valves located in the pumping building are butterfly, singer, or silent check valves. There is one gate valve that is no longer used in the process. The butterfly valves all have manual actuators. They are all in good condition and there are no operating issues with the valves. In the filter building, the valves are all butterfly valves with either manual or pneumatic actuators. Many of the valves are missing actuators and are showing signs of corrosion. There are several valves in poor operating condition.


Process Piping in Pumping Building *Process Piping in Filter Building*

2.4.5 Actuators

The valve actuators in the pumping building are all manual and in good condition. The actuators for the butterfly valves in the filter building are electric and in poor condition or missing altogether.




Electric Actuator in Filter Building *Manual Actuator in Pumping Building*

2.4.6 Chemical Feed Systems

The Fort Harrison plant feeds phosphates and chlorine in the filter building. However, the chlorine and phosphate feeds and storage tanks are located in the filter room. As a result, the process piping, actuator components, valves, etc. are corroding due to the chemical vapors present in the building.

Process Piping & Chlorine Feed

Corroded Process Piping

2.4.6.1 Chlorine Feed System

Lawrence feeds bulk sodium hypochlorite at the Fort Harrison WTP as their method of disinfection. There are two chlorine feed points in the WTP located prior to and after the filters. The sodium hypochlorite is stored outside of the filter building in a polyethylene storage tank. Lawrence uses breakpoint chlorination for disinfection. According to the MROs for 2016, the amount of chlorine fed per day varies from an average of 15 pounds per day (ppd) to 50 ppd. The pre-chlorination chemical feed pump is set to feed 51 gpd with a maximum capacity of 190 gpd. The post-chlorination chemical feed pump is set to feed 6 gpd with a maximum capacity of 190 gpd. The sodium hypochlorite is stored in a day tank inside the filter building. The pre-filtration sodium hypochlorite feed is injected by a metering pump. The chemical feed is not contained and there is not a secondary containment in place for the day tank inside the building. In addition, chemical vapors are corroding metallic surfaces due to the lack of chemical isolation. The post-filtration chlorine feed pump is in good condition.

Pre-Filtration Chlorine Feed

Post-Filtration Chlorine Feed

2.4.6.2 Fluoride Feed System

Fluoride was added to the Fort Harrison WTP beginning in 1992 and is fed to promote dental health for consumers. The fluoride chemical feed pump is set to feed 2.9 gpd with a maximum capacity of 24 gpd.

2.4.6.3 Phosphate Feed System

Lawrence also feeds phosphate for conditioning of the existing distribution system and to sequester any iron present in the system. According to the 2016 MROs, the amount of phosphate used ranges from approximately five to 25 ppd. The phosphate is fed with a Watson Marlow metering pump in the filter building. The phosphate chemical feed pump is set to feed 9.6 gpd with a maximum capacity of 44 gpd.

2.4.7 Electrical

The Fort Harrison WTP consists of two buildings the Pump Building and the Filter Building. The Filter Building has a 480/277V, 600A, MCC that powers miscellaneous three phase loads including unit heaters. The HSPs are on VFDs to help reduce voltage drop during start-up. The Filter Building has miscellaneous single phase electrical loads including chemical feed pumps, building lighting, and control panels for chemical dosing and filter backwash operation. Due to the corrosive environment in the filter building the control panels, conduit, and actuators are in poor physical condition.

2.4.8 SCADA

The Mission Control system is the only form of SCADA system located at the plant. Operators can monitor and call the high service pumps into operation, but the existing controller at the plant is no longer working. The system operation is clumsy and would be extremely difficult to manage if the current operators were not able to assist with daily operations. There are miscellaneous Click PLCs throughout the complex to control simple controls such as chemical systems and backwash, but the systems do not integrate with one another for a true SCADA system.

2.4.9 Standby Power

The Fort Harrison WTP has a 200 kW, 480/277V, standby diesel generator to power the operations at the pumping and filter buildings. The generator has been in error mode due to a fault in the oil and lubrication system recently. Maintenance crews have been sent multiple times but the problem persists. The generator will not function unless the error is cleared and manual starting is initiated so the existing ATS located in the Pump House will not operate as it should.

2.4.10 3 MG Water Storage Reservoir

The 3 MG ground storage reservoir located at the Fort Harrison WTP site was installed circa 1913, last cleaned in 2004 and needs inspection. The roof of the tank requires a structural evaluation by a certified structural engineer. Due to the apparent age of the tank and lack of periodic maintenance, it is probable that the tank will require some rehabilitation.

3 MG Ground Storage Reservoir

3 MG Ground Storage Reservoir Roof

2.5 Indian Lake WTP

The Indian Lake WTP was originally constructed in 1989. The Indian Lake well field pumps groundwater to the two (2) aerators located on top of the detention tank. Three (3) high service pumps are located in the building that pump water from the detention tank through the four (4) horizontal pressure filters and into the distribution system. The site is surrounded by a security fence.

2.5.1 Aeration

There are two General Filter aluminum forced draft aerators rated at 1,300 gpm each that were installed in 1989.

Aerator

2.5.2 Detention

A single 50,000-gallon detention tank is located under the building. The tank was constructed with the original plant construction in 1989. The detention tank volume provides over 30 minutes of detention time at 1,500 gpm plant production, which is the firm operating rate of the WTP. According to the *Recommended Standards for Water Works*, a minimum of 30 minutes of detention time is required to ensure that oxidation reactions are as complete as possible.

2.5.3 High Service Pumps

The current high service pump firm rated capacity is approximately 2,084 gpm (3.00 MGD). The high service pumps are controlled by the water level in the Oaklandon Road Elevated Water Storage Tank.

2.5.3.1 High Service Pump 1

High service pump 1 has a current operating capacity of 1,000 gpm. The pump is a vertical turbine pump with a 50 HP motor and VFD. The pump and motor were installed in 2012 and are in good condition.

High Service Pump Head 1

High Service Pump 1 Motor

2.5.3.2 High Service Pump 2

High service pump 2 has a current operating capacity of 1,000 gpm. The pump is a vertical turbine pump with a 50 HP motor and VFD. The pump and motor were installed in 2012 and are in good condition.

High Service Pump 2

High Service Pump 2 Motor

2.5.3.3 High Service Pump 3

High service pump 3 has a current operating capacity of 1,000 gpm. The pump is a vertical turbine pump with a 50 HP motor and VFD. The pump and motor were installed in 2012 and are in good condition.

High Service Pump 3

High Service Pump 3 Motor

2.5.4 Filters

There are four (4), two-cell horizontal pressure filters at the Indian Lake WTP each with a capacity of 486 gpm installed in 1989. The filter faces and face piping are located inside of the WTP masonry building. The remainders of the filter vessels are located outside of the building. The pressure filters are all in good condition.

Also according to the *Recommended Standards for Water Works*, the filters shall be capable of providing the maximum demand of the system with any filter out of service. The firm rated capacity of the filters is 1,944 gpm with one filter out of service. The condition of the existing media, interior coating, and interior steel was evaluated in 2011 by Peerless Midwest. The filter media was installed in 1990 and is well past its useful life of 7-10 years. The edges of the filter media are sub-rounded to rounded and are significantly smaller than their original size. In addition, the particles are soft and turn to dust when subjected to “finger” pressure.

Filter E2

2.5.5 Process Piping

2.5.5.1 Piping

The process piping is showing signs of corrosion due to chemical off gassing present in the filter room.

2.5.5.2 Valves

The process valves are all butterfly or gate valves. All of the filter face piping valves were replaced in 2015 with new butterfly valves. The valves are all in good condition but some are showing signs of corrosion due to the chemical odors present in the environment.

2.5.5.3 Actuators

The actuators for the filter face valves were all replaced with new pneumatic vane style actuators in 2015. The remaining actuators are manual.

Filter W2, Process Piping, Valves, and Actuators

2.5.6 Chemical Feed Systems

Lawrence feeds chlorine, fluoride, and phosphates. However, the phosphate feed pump and storage tank are located in the filter room. As a result, the process piping, actuator components, valves, etc. are corroding due to the chemical vapors present in the building.

2.5.6.1 Chlorine Feed System

Lawrence feeds bulk sodium hypochlorite at the Indian Lake WTP as their method of disinfection. There are two chlorine feed points in the WTP located prior to and after the filters. The sodium hypochlorite is stored in an isolated room in the filter building in a polyethylene storage tank. The pre-chlorination chemical feed pump is set to feed 65.5 gpd with a maximum capacity of 190 gpd. The post-chlorination chemical feed pump is set to feed 14.5 gpd with a maximum capacity of 190 gpd. Both pumps are in good condition.

2.5.6.2 Fluoride Chemical Feed System

Fluoride was added to the Indian Lake WTP in 1992 and is added to the water for the dental health benefits to consumers. The fluoride feed pump is currently set to feed 2.1 gpd with a maximum capacity of 24 gpd.

2.5.6.3 Phosphate Chemical Feed System

Lawrence also feeds phosphate for conditioning of the existing distribution system and to sequester any iron present in the system. According to the 2016 MROs, the amount of phosphate used ranges from approximately 10 to 30 ppd. The phosphate is fed with a peristaltic Watson Marlow pump in the filter building. The phosphate chemical feed pump is currently set to feed 16.7 gpd with a maximum capacity of 44 gpd.

2.5.7 Electrical

The Indian Lake WTP has a 480/277V, 800A, MCC as its main power distribution center. Due to the highly corrosive environment the MCC is in poor condition. The exterior of the MCC shows extensive rust which may be an early indication of potential failure should the internal contacts begin to rust and eventually stick. The HSPs are powered by VFDs that are used as "Soft Starters" to help reduce voltage drop upon starting.

2.5.8 SCADA

Mission SCADA has been commissioned to control the high service pumps based on the level in the Oaklandon elevated storage tank. Mission also controls the remote wells at the Indian Lake well field. Mission SCADA is used for data collection including chlorine residual, basin (detention tank) level, effluent flow rate, backwash flow rate, alarm thresholds, system pressure, and pump run times. A local Click PLC is used to control automatic backwash sequencing as well as chemical dosing.

2.5.9 Standby Power

Indiana Lake does not have standby power but has a portable generator connection. However, the portable generator receptacle is not connected to the WTP and is unable to be used.

2.6 Richardt WTP

The Richardt Street WTP was originally constructed in 1958 and expanded in 1971 to its current capacity and configuration. Two (2) high service pumps and an aerator are located on top of each of the two (2) detention tanks. A separate masonry building houses the plant electrical controls, telemetry equipment, face piping and control valves of the four (4) horizontal pressure filters, and metering equipment. A backwash holding tank is located on the north side of the building. The chlorine feed equipment is currently located in an isolated room in the building housing Wells 3 & 4. The site is surrounded by a 6-foot security fence.

2.6.1 Aeration

One induced draft aerator is located on top of each detention tank, for a total of two aerators. Each aerator has a reported capacity of 1,200 gpm. The aerators can be bypassed allowing flow from the wells directly to the pressure filters using valves on the site. The aerators are in poor condition but the aerator located on top of the east detention tank (Aerator 2) has failed and is not currently in operation. The internal wooden slats in the east aerator failed in early 2016 and resulted in debris getting lodged in the high service pumps. The aerator slats were replaced but the high service pumps were not.

Aerator 1

Aerator 2

2.6.2 Detention

Two detention tanks are located on the site. The east tank was constructed with the original plant construction of 1958 and the west tank was added with the plant expansion in 1971. These tanks follow the aeration process. The detention tanks were originally designed to operate independent of each other, but in 2002 the Utility installed an interconnect pipe to allow the detention tanks to be hydraulically connected. Each detention tank is partially below ground. Each detention tank has a reported volume of 15,000 gallons, however, the west tank is approximately 4 feet lower than the east tank, and so only about 75% of the east tank volume can be utilized, resulting in a total detention volume of 26,000 gallons. This volume provides 15 minutes of detention time at 1,700 gpm plant production, which is the maximum operating rate currently used according to Utility pumping data. According to the *Recommended Standards for Water Works*, a minimum of 30 minutes of detention time is required to ensure that oxidation reactions are as complete as possible. This reduced detention time does not appear to have an impact on the oxidation of iron and manganese in the raw water, as indicated by the filter influent water quality for these parameters. The amount of ferric iron (aqueous) is 0 mg/L at the filter influent indicating the iron has been oxidized. The detention tanks are taken out of service, cleaned, and inspected annually. Currently, the east detention tank is not utilized due to inoperable high service pumps located above the tank.

West Detention Tank

East Detention Tank

2.6.3 High Service Pumps

Four (4) high service pumps are used to pump water from the detention tanks through the pressure filters and into the distribution system. Two (2) high service pumps are located on top of each detention tank. The high service pumps located over the east detention tank are currently not in operation. The existing pumps were last serviced more than 10 years ago. Typically, the expected useful life of a high service pump is 20 years, and all pumps have exceeded this expected useful life.

The current high service pump firm capacity is approximately 850 gpm (1.22 MGD). However, this capacity is not typically utilized due to the limiting filtration capacity downstream of the high service pumps.

The Utility does experience some pump cavitation when the level in the detention tanks drops too low, and the operators have to closely monitor pumping rates of the high service pumps and the wells to ensure that a suitable detention tank level is maintained.

The high service pumps are controlled by the US Filter pump control panel in the filter building based on the water level in the 52nd Street Elevated Water Storage Tank.

2.6.3.1 High Service Pump No. 1 & 2

High service pump No. 1 and No. 2 are located on top of the east detention tank and were installed as part of the 1971 plant expansion. Both high service pumps are no longer in operation.

High Service Pump 2

High Service Pump 2

2.6.3.2 High Service Pump No. 3 & 4

High service pump No. 3 and No. 4 are located on top of the west detention tank. High service pump No. 3 has a current operating capacity of 850 gpm and is equipped with a VFD. High service pump No. 4 has a current operating capacity of 1,000 gpm and is equipped with a VFD. The existing motor starters for high service pumps 3 and 4 are located in the same building as the pumps.

High Service Pump 3

High Service Pump 4

2.6.4 Pressure Filters

The four (4) horizontal pressure filters are approximately 10 feet in diameter and 22 feet in length. The filter faces and face piping are located inside of the WTP masonry building. The remainders of the filter vessels are located outside of the building.

Each two-cell filter has a reported total filtering area of 220 square feet and a design capacity of 500 gpm. The maximum loading rate based on the *Recommended Standards for Water Works* is 3gpm/ft^2 of filter area. Also according to the *Recommended Standards for Water Works*, the filters shall be capable of providing the maximum demand of the system with any filter out of service. With one filter out of service, the remaining rated filter capacity is 1,500 gpm (2.16 MGD). However, in order to meet the secondary maximum contaminant level (MCL) for iron, the WTP's current operating capacity is less than 1,000 gpm.

Recently, the pressure filters have been operating as biological filters to consume the ammonia present in the raw water. In March 2016, Peerless Midwest completed an evaluation of the pressure filter and filter media conditions. The filters are experiencing corrosion resulting in structural deficiencies including failure of the bracket system holding the interior PVC headers, the poor condition of the access hatches and associated appurtenances resulting in difficult access, and corrosion of nuts and bolts. The filter media in the pressure filters consists of anthracite over a gravel support bed. Typically, filter media has an expected useful life of 15 years before its filtration capacity begins to diminish and must be replaced. The existing media in the filters was last replaced more than 15 years ago. However, the anthracite filter media in the filters are in fair condition but is not performing as intended.

Horizontal Pressure Filters

2.6.5 Backwash System

The existing pressure filters are backwashed on a rotating basis with one filter backwashed daily from the high service pumps. The Utility currently uses a backwash rate of approximately 1,300 gpm until a desired backwash water turbidity level is achieved.

Each two-cell filter reportedly produces 10,000 to 15,000 gallons of backwash water per wash that discharges into a 40,000-gallon concrete backwash holding tank. This tank equalizes the flow while the backwash flows by gravity to the sanitary lift station which pumps to the sanitary sewer.

The existing filters are operated on a declining rate method, where the filters will decrease their filtration rate as the filter media collects iron and manganese. The Utility is not currently able to measure the individual filtration rate on each filter, which can be useful in maximizing filter run times and backwash frequencies.

2.6.6 Chemical Feed Systems

The existing chemical feed equipment includes provisions for feeding chlorine, polyphosphate, and fluoride.

2.6.6.1 Chlorine Feed System

The chlorination equipment consists of a bulk sodium hypochlorite feed system located in an isolated room in the building housing wells 3 and 4. The equipment was added in 2014 to replace the on-site generation disinfection system. According to 2016 MROs, a range of approximately 3 to 102 pounds of chlorine were fed per day.

The plant provides pre-chlorination for the treatment process by the injection of sodium hypochlorite into the detention tank. Post-chlorination is injected in the common discharge pipe leaving the pressure filters. The post-chlorination chemical feed pump is set to feed 18.8 gallons per day (gpd) with a maximum capacity of 139.2 gpd. Breakpoint chlorination is used as the primary disinfectant.

2.6.6.2 Phosphate Chemical Feed System

Phosphate is added to sequester iron in the finished water as it leaves the WTP. The phosphate feed pump is currently set to feed 25.4 gpd with a maximum capacity of 190 gpd.

2.6.7 Electrical

The main service panel in the WTP was replaced as part of the 1971 plant addition. The electrical service to the plant is distributed through a 480V, 3phase, 3wire, 1200A main disconnect and a 600A 480V, MCC, which then feeds a local 400Amp, 480V, MCC in the filter building. The electrical main distribution gear is well passed its design life and after years of manipulation poses a potential shock hazard to staff as the front safety shields are no longer isolating the inner electrical equipment from operators. The overhead electrical service to the plant poses a danger to the staff as it is within reach while entering the main power distribution building.

2.6.8 SCADA

The existing SCADA system consists of a US Filter system that collects the 52nd Street Elevated storage tank level from mission and controls the HSPs based on tank level. The onsite wells at Richardt are controlled via the US Filter system control panel based on the level in the clear well. Data collection and monitoring is completed using Mission. The plant lacks a full functioning and integrated SCADA system and instead operates as separate entities.

2.6.9 Standby Power

There is currently no standby power at the Richardt WTP.

2.7 Winding Ridge Booster Station

The Winding Ridge Booster Station is located on 56th Street just east of German Church Road. The packaged booster station was installed in 2004. During higher demand periods, the operation of the Winding Ridge Tank makes it difficult to fill the 52nd Street Tank. Because of this, the Utility takes the winding ridge tank offline during the summer or other high demand periods.

2.7.1 Booster Pumps

The booster station contains two pumps installed in 2004. Booster pump No. 1 and No. 2 currently produce 1,500 gpm at 185′ TDH. The motor starters for the booster pumps are located in the packaged booster station.

2.7.2 Electrical

The booster station is fed 480/277V from a utility pole mount transformer. A distribution power panel feeds the lighting panel transformer as well as the Flowtronex pump control panel which houses the booster pumps single VFD. The station is not on the Mission SCADA system and has been known to flood when the main valve isolating the station from the system becomes stuck and fails to close.

2.7.3 Standby Power

The Booster Station has a Cummins 230kW, 480/277V, standby, diesel generator as an alternate power source. The generator enclosure houses the ATS which cycles power for the station from the utility to the generator in the event of a power outage.

2.7.4 Ground Storage Tank

The Winding Ridge tank is a 1.10 MG bolted steel finished water ground storage tank erected in 2004 by Engineered Storage Products, Co. The purpose of the tank is to provide additional storage in the southeast portion of the distribution system. However, the entire tank volume is not able to be utilized. Thus, approximately 750,000 gallons of the total volume can be utilized for storage. There is a modulating valve connected to a timed program that controls the level in the tank. In general, the tank fills at night and water is drawn out during the day.

2.8 52nd St. Elevated Storage Tank

The 52nd Street tank is a 0.50 MG toro-ellipsoidal steel legged tank erected in 1973 by Universal Tank & Iron Works. It is located on East 52nd Street at Briar Creek Lane. The water level in this tank controls the operation of the high service pumps at Richardt Street and Fort Harrison WTPs.

In 2008, the tank was inspected by Tank Industry Consultants. The following are items that were observed in 2008 that have not been addressed:

- Interior coating was in adequate condition at the time of inspection but was recommended to be recoated within three to four years from the time of inspection
- ANSI/OSHA and other safety related deficiencies that include:
    - The rust on the exterior ladder safe-climbing devices may not allow the devices to function properly
    - The head clearance on the tower ladder at the balcony access is not dimensionally compliant
    - The exterior ladder side rails are not dimensionally compliant

  - The rungs are not of a slip-resistant design
  - The tower ladder is not equipped with a vandal deterrent
  - The balcony access opening is not equipped with closure chains or a cover to deter personnel from accidentally falling from the balcony
  - The balcony railing is not dimensionally compliant
  - Pipes and other debris on the balcony floor create a trip hazard
  - The transition cone opening in the bowl is not equipped with a safety grate or railing
- AWWA and operational deficiency:
  - A gap is present at the perimeter of the roof vent pallet

2.9 Oaklandon Elevated Storage Tank

The Oaklandon tank is a 0.50 MG elevated pedestal spheroid steel tank erected in 1983 by Universal Tank & Iron Works. It is located on Oaklandon Road at Broadway Street. The water level in this tank controls the operation of the high service pumps at Indian Lake WTP.

In 2008, the tank was inspected by Tank Industry Consultants. The following are items that were observed in 2008 that have not been addressed:

- Exterior coating does not have strong adhesion to the tank
- Interior dry coating is showing signs of surface rust and the topcoating is peeling off
- Interior wet coating is showing signs of surface rust
- ANSI/OSHA and other safety related deficiencies that include:
  - A uncovered junction box on the lighting system conduit exposed wiring
  - The base cone, pedestal, bowl manhole, and interior wet ladder side rails are dimensionally too small
  - The base cone, pedestal, bowl manhole, and interior wet ladder head clearances are dimensionally too small
  - The base cone, pedestal, bowl manhole, access tube, and interior wet ladder rungs are not of a slip resistant design
  - The base cone, pedestal, and bowl manhole ladder rungs are not spaced at consistent intervals
  - Conduits and cables are attached to the base cone, pedestal, and access tube ladders which could interfere with the climber's use of the ladder side rails
  - The base cone and pedestal ladder safe-climbing devices do not extend the industry recommended height above the condensate and top platforms
  - The spacing between horizontal bars and vertical bars on the base cone ladder safety cage exceed the maximum allowed spacing intervals
  - The base cone ladder safety cage width is dimensionally too small
  - The toe rooms on the access tube ladder and interior wet ladder are dimensionally too small
  - The access tube and interior wet ladders are not equipped with safe-climbing devices
  - The top platform access opening is not equipped with a cover
- AWWA, sanitary, and operational deficiencies that include:
  - The gap between the overflow pipe and flap gate could allow the ingress of insects into the tank
  - The screening on the overflow pipe flap gate is not restrictive enough to prevent the ingress of insects in the tank

- The roof vent is not of a clog-resistant design
- The vertically-orientated roof vent screening is not shielded from wind-driven dust and debris
- The gaps in the roof vent protective screening could allow the ingress of insects into the tank

2.10 Distribution System Facilities

The water distribution system contains approximately 224 miles of water mains, 5,050 valves, and 2,100 municipal hydrant assemblies (this does not include private hydrants on the system). There are approximately 14,900 service connections (domestic, commercial, and industrial) within the system. All water customers are on metered services. The system has a single pressure zone with a typical pressure range of 50-75 psi. The distribution system is bound on all sides by the City of Indianapolis water system (Citizens Water).

The existing water distribution system was analyzed for hydraulic capacity, flow, pressure, and water age. This analysis was completed with the use of WaterCAD hydraulic modeling software. The existing system model analyzed was based on the hydraulic model provided by the Utility and then updated to reflect the existing water demand data discussed in **Chapter 2**. The existing system model contained information on the existing water mains, pumps, wells, and tanks. No water main size smaller than 6 inches was included in the modeling analysis or distribution system evaluation. No additional verification or calibration of the existing WaterCAD model was made as part of this evaluation.

According to the *Recommended Standards for Water Works*, the normal working pressure in the distribution system should not be less than 35 psi, and the system shall be designed to maintain a minimum pressure of 20 psi at ground level at all points in the distribution system under all flow requirements.

2.10.1 Citizens Energy Group Connections

The Utility currently has ten physical connection points with Citizens Energy Group (CEG). Four of these connections are metered and will remain and include:

- Glennway Dr. and Fox Rd.
- Timberline Dr. and Fall Creek Rd.
- 8450 Carroll Rd.
- 46th and Mitthoeffer Rd.

The connections without meters will be disconnected. The connections are normally isolated by closed valves, but are considered a standby source of water by Utility personnel. At this time, the Utility is able to purchase water from CEG at their wholesale rate.

2.10.2 Water Quality

2.10.2.1 Field Data

The average amount of iron measured at the filter discharge for April 2016 was 0.06 mg/L with a maximum of 0.11 mg/L. The average amount of manganese for April 2016 was 0.044 mg/L with a maximum of 0.055 mg/L. The levels of iron and manganese exceeded the SMCL 25 and 4 times, respectively. The iron levels are regularly exceeding the SMCL at flow rates required to meet the system's average day demands.

The Richardt WTP was evaluated to determine the cause of the iron and manganese levels above the SMCL at higher flow rates. The water quality was analyzed from the pre-filtration point to determine the amount of iron being oxidized. By doing so, the detention time of less than 30 minutes at 1,200 gpm could be evaluated as the cause of the elevated iron and manganese levels.

Water quality tests were performed in April 2016 to determine the quality of the water entering the pressure filters. The existing filter media requires that iron and manganese be oxidized from an aqueous form to a particulate form in order for the physical filtration process to take place. Total iron and manganese were tested, with and without ascorbic acid to identify the oxidized amount of these constituents prior to entering the filters. Refer to **Tables 2.10.2.1 and 2.10.2.2** for the water quality summary for manganese and iron.

Table 2.10.2.1: Filter Influent – Manganese Levels

Manganese (oxidized)	*Manganese (aqueous)*	*Total Manganese*	*Manganese SMCL*
0.038 mg/L	0.028 mg/L	0.066 mg/L	0.05 mg/L

Table 2.10.2.2: Filter Influent – Iron Levels

Ferrous Iron (oxidized)	*Ferric Iron (aqueous)*	*Total Iron*	*Iron SMCL*
1.29 mg/L	0 mg/L	1.29 mg/L	0.30 mg/L

3.0 ASSET MANAGEMENT EVALUATION

Lawrence's water system is comprised of hundreds of assets, all of which are aging and deteriorating. For the purpose of this report, an asset was considered to be any item related to the operation of the water system exceeding $1,000 in value. These assets affect the level of service able to be provided by Lawrence. If the assets are not actively managed, operation and maintenance (O&M) costs can continue to increase and costs can exceed affordable levels. To assist with making decisions on which assets require replacement or maintenance, Wessler completed an asset management evaluation for Lawrence's water system. The asset management evaluation identifies assets that are of high risk to Lawrence. The evaluation includes two categories of assets: process and distribution. The process assets include assets at the WTPs, well fields, storage tanks, and booster stations. The distribution assets include the water mains. The asset management evaluation develops a probability of failure and consequence of failure rating for each asset. The process assets also include a redundancy score to indicate the importance of the asset for Lawrence to meet an acceptable level of service for the community. Using the probability of failure rating, consequence of failure rating, and redundancy score, the business risk exposure (BRE) is calculated.

3.1 Business Risk Exposure (BRE)

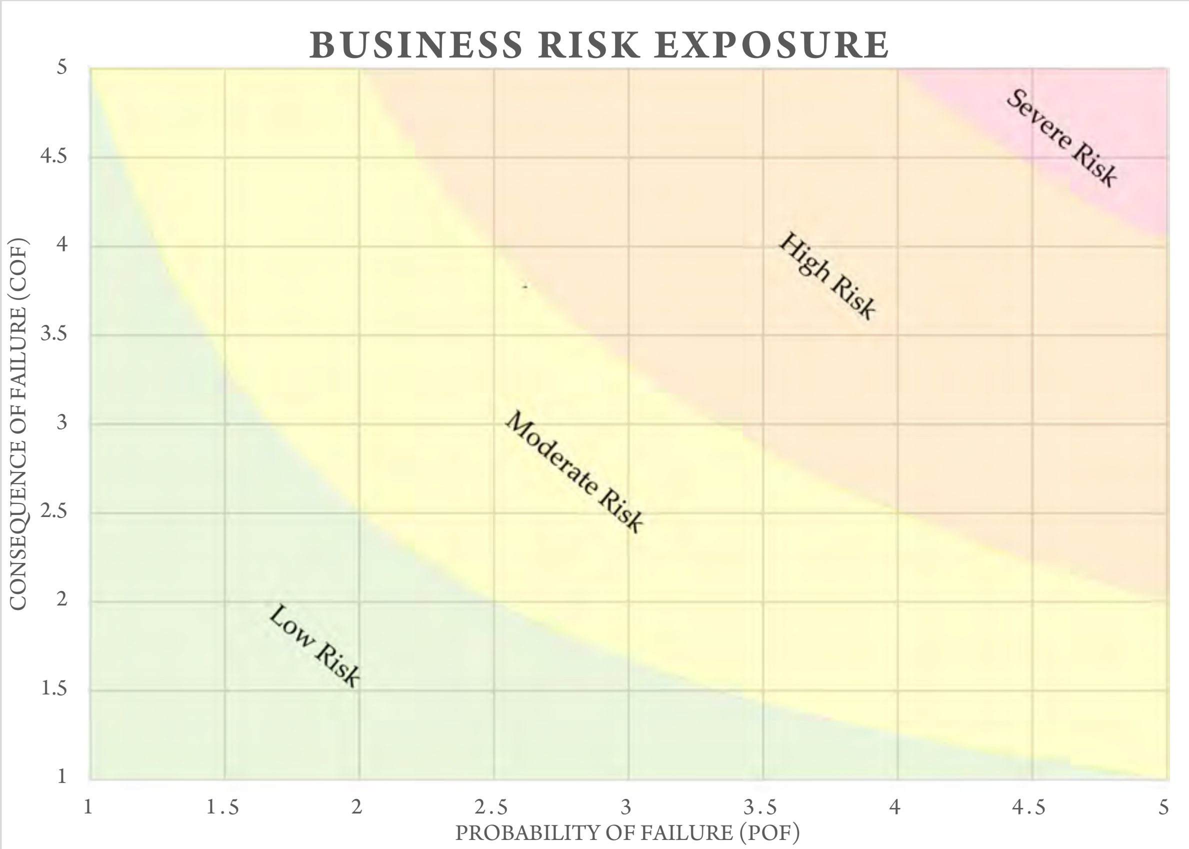
The BRE rating has a maximum value of 25 where the higher the value, the higher the risk associated with that asset. In this analysis, different categories were provided for rating ranges as listed in **Table 3.1.1**.

Table 3.1.1: BRE Rating Scale

BRE Rating	*Risk Category*
20-25	Severe
10-20	High
5-10	Moderate
0-5	Low

Different asset index and grading criteria were developed for the process and distribution piping assets. However, the overall BRE rating allows the assets and projects to be compared using their BRE rating. The BRE rating is calculated by multiplying the probability of failure, consequence of failure, and redundancy score, if applicable. **Chart 3.1.1** shows the areas of varying risk based on the probability of failure and consequence of failure.

Chart 3.1.1: BRE Rating Scale Chart



Generally, assets that have a rating of "severe" or "high" are in need of repair or replacement, while assets that have a rating of "moderate" or "low" only require maintenance at this time.

3.2 Process Assets

3.2.1 Data Acquisition

Field investigations were completed at the Fort Harrison, Indian Lake, and Richardt Water Treatment Plants (WTP), Richardt, Fort Harrison, and Indian Lake well fields, and the Winding Ridge Booster Station. Historical information on the 52nd St. and Oaklandon Rd. elevated storage tanks was used to evaluate those assets. While conducting the field investigations, information was gathered that included physical condition, operational condition, installation year, and photographs of each asset. For record keeping purposes, manufacturers, model numbers, and serial numbers of the assets were documented where possible. Refer to **Appendix E** for general asset information and **Appendix F** for photos of each asset.

3.2.2 Asset Index and Grading Criteria

After gathering the field data and historical information from Lawrence, an asset index and grading criteria was developed with Lawrence personnel for process assets. The criteria consist of a probability of failure, consequence of failure, and redundancy score to determine the asset's BRE rating.

3.2.2.1 Probability of Failure

The probability of failure is the overall rating of weighted criteria for an asset's likelihood of failure. The criteria contributing to the probability of failure include physical condition, age, O&M protocols, repair history, and operation condition. A weight was given to each criterion, with input from Lawrence, to identify the most important criteria. The probability of failure is the weighted average of the criteria ratings.

- **Physical Condition Rating**: The physical condition rating of an asset is based upon the visual inspection, input from Lawrence on the asset, and historical information such as inspection reports.
- **Age Factor Rating**: The age factor rating is calculated from the age and effective life of the asset. The percentage of its useful life is used to determine the age factor rating. The effective life for each asset is based on the EPA's rating for water assets and previous experience for typical effective life for the assets in Indiana.
- **O&M Protocol Rating**: The O&M protocol rating takes into account whether or not O&M manuals are complete, written or online, and whether or not they are easily accessible.
- **Repair History Rating**: The repair history rating is determined by the number of repairs required for an asset over the past 10 years.
- **Operational Condition Rating**: The operational condition rating looks at the asset from how well it functions and whether the asset needs to be rebuilt or upgraded. The operational condition received the highest weight factor for the probability of failure criteria.

Table 3.2.2.1.1: Probability of Failure Criteria

Criteria	*Rating*					*Weighting Factor*
	5	*4*	*3*	*2*	*1*	
Physical Condition	Very Poor	Poor	Fair	Good	Very Good	0.8
Age Factor	Greater than 80% of useful	Between 60%-80% of useful life	Between 40%-60% of useful life	Between 20%-40% of useful life	Age less than 20% of useful life	1.3
O&M Protocols	None	Written/ online, but not complete, not current or location unknown	Written/ online, but not complete, not current or not easily accessible	Complete, written/online, current, but not easily accessible	Complete, written/online, current, and easily accessible	0.3
Repair history	Very Poor (Repaired more than 15 times in the last 10 years)	Poor (Repaired 10 to 15 times in the last 10 years)	Moderate (Repaired 5 to 10 times in the last 10 years)	Good (Repaired 1 to 5 times in the last 10 years)	Very Good (Not repaired in the last 10 years)	1.1

Criteria	*Rating*					*Weighting Factor*
	5	*4*	*3*	*2*	*1*	
Operational Condition	Not operational and not repairable	Operational but needs to be rebuilt or upgraded	Operational but needs some restoration	Operational with minimal problems	No operational problems	1.5

3.2.2.2 *Consequence of Failure*

The consequence of failure is the overall rating of weighted criteria for the effect of failure an asset poses to Lawrence. The criteria included for the consequence of failure are process, financial impact, safety, IDEM compliance, community disruption, and required response time. A weight was given to each criterion, with input from Lawrence, to identify the most important criteria. The consequence of failure is the weighted average of the criteria ratings.

- **Process Rating**: The process rating provides input on how critical the asset is for completing the intended purpose of the process.
- **Financial Impact Rating**: The financial impact rating provides an idea of the impact of the failure of an asset on Lawrence's budget.
- **Safety Rating**: The safety rating takes into account the effect of an asset failure on the health of personnel. Safety received the highest weight factor for the consequence of failure criteria.
- **IDEM Compliance Rating**: The IDEM compliance rating takes into account the importance of the asset and whether or not the issue is enforceable by IDEM.
- **Community Disruption Rating**: The community disruption rating provides a rating on the area of the community's service interrupted by the failure of the asset.
- **Required Response Time Rating**: The required response time rating takes into account how quickly Lawrence personnel need to address the issue in the event of an asset failure.

Table 3.2.2.2.1: Consequence of Failure Criteria

Criteria	*Rating*					*Weighting Factor*
	5	*4*	*3*	*2*	*1*	
Process	Mission Critical	Process shut-down	Loss of Redundancy	Low	Very Low	1.17
Financial Impact	May require new borrowing or impact rates	May require transfer from reserves	Absorbed within current budget	Potential process upset	No impact on process	0.83
Safety	Loss of life	Severe Injury to employees or public	Minor injury requiring treatment off-site or	Absorbed within applicable line item	Budgeted expense	1.67

Criteria	*Rating*					*Weighting Factor*
	5	*4*	*3*	*2*	*1*	
IDEM Compliance	Enforcement action by IDEM	Major issue but no enforceme nt action	Localized issue	Minor injury requiring no medical treatment with no lost time	No injury	0.33
Disruption to the community	Long term impact; area wide disruption	Short term impact but substantial disruption	Sporadic service disruptions	Minimal Issue	100% compliance	1.5
Required response time	1/2 hour	1/2 to 2 hours	2 to 4 hours	Minor disruption	No disruption	0.5

3.2.2.3 Redundancy Score

The redundancy score is a value from zero to one which accounts for assets that have multiple assets of the same type above the required amount for system operation. The redundancy score is calculated by dividing the number of required assets by the total number of assets. For example, if two pumps are required but there are three pumps available, the redundancy score would be 0.67.

3.2.3 Results

The asset grading of individual criteria resulted in a BRE rating for each asset. The BRE asset rating was used to identify the assets in need of replacement, repair, or routine maintenance. To determine the assets to be rehabilitated or replaced as a part of a capital improvements project or repaired as a part of routine maintenance, the BRE rating was used. Generally, assets with a BRE rating equal to and above 10 are included as a part of a capital improvements project, while assets with a rating below 10 should receive routine maintenance. The process assets were analyzed to determine where risk is present and develop a plan to alleviate it. The following sections summarize the assets with the highest risk, organized by the location of each asset.

3.2.3.1 Richardt WTP

The Richardt WTP is in poor condition with many components in need of repair or replacement. Most of the items in need of rehabilitation or replacement include aerators, detention tanks, high service pumps, filters, electrical, SCADA, and buildings and are described in the following sections in more detail. **Table 3.2.3.1.1** includes a summary of the BRE rating for the assets in need of repair or replacement. Refer to **Appendices C and E** for a detailed breakdown of the Richardt WTP assets.

Table 3.2.3.1.1: Richardt WTP Rehabilitation Assets

Asset Name	*Probability of Failure*	*Consequence of Failure*	*Redundancy Score*	*BRE*
Filter E1	5.00	4.67	1.00	23.33
Filter E2	5.00	4.67	1.00	23.33
Filter W1	5.00	4.67	1.00	23.33
Filter W2	5.00	4.67	1.00	23.33
MCC - HSP1, HSP2 and Wells	4.24	4.42	1.00	18.73
Filter Room Transformer	3.78	4.78	1.00	18.06
High Service Pump 4	5.00	3.35	1.00	16.75
East Detention Tank	4.08	4.08	1.00	16.66
Filter Building Transformer	3.32	4.78	1.00	15.86
Main Service Disconnect Switch	3.32	4.78	1.00	15.86
Chlorine Building	3.46	4.53	1.00	15.67
West Detention Tank	3.82	4.08	1.00	15.60
Post-filtration Chlorination	3.50	4.39	1.00	15.36
Motor Control Center	4.04	3.67	1.00	14.81
Filter Building	3.52	4.14	1.00	14.57
Motor Starter	2.80	4.78	1.00	13.38
I&C	3.58	3.67	1.00	13.13
Well No. 4	4.26	3.00	1.00	12.78
Backwash Holding Tank	3.28	3.81	1.00	12.48
U.S. Filter Control Panel	2.94	3.67	1.00	10.78
RP Backflow Preventer	3.52	3.06	1.00	10.75
Aerator #2 Building	3.62	2.89	1.00	10.46
Aerator #1 Building	3.46	2.89	1.00	10.00

3.2.3.1.1 Aeration

The aerators and the buildings have a high probability of failure due to their physical condition, age, and operational condition. The consequence of failure is high as a result of the elevated ratings for their impact on process, finances, IDEM compliance, and community disruption. However, only one aerator is required to meet demands with the other WTPs operating at capacity. As a result, the redundancy score of the aerators is a 0.5 which drops them below a BRE rating of 10.

3.2.3.1.2 Detention

The detention tanks are not operating properly and are in poor physical condition. As a result, the probability of failure is high. In addition, the high ratings for the process, financial impact, IDEM compliance, and community disruption criteria result in a high consequence of failure.

3.2.3.1.3 High Service Pumps

Currently, high service pump 4 is not in operation and received a high probability of failure. Since the average day demands are currently able to be met with only one high service pump in operation during normal operation, the consequence of failure of all of the high service pumps is low.

3.2.3.1.4 Filters

The Richardt WTP is currently unable to produce more than 600-700 gpm prior to experiencing high levels of iron in the finished water supply. As a result, the probability of failure is high. In addition, Lawrence might be unable to meet the maximum day demand during the summer without higher production from the Richardt WTP. Therefore, the consequence of failure is high as well.

3.2.3.1.5 Electrical

The MCCs appear to be in working condition, but are showing wear due to age. The MCCs at the plant are outdated and new parts will be difficult to locate. Due to the high consequence of failures, the MCCs have high BRE ratings. Lighting transformers appear to be in working order but also show wear from age. The chemical feed and well pump building wiring as well as the main plant distribution gear was not National Electric Code (NEC) compliant and presented a potential shock/fire hazard. Overhead electrical lines at the plant pose a threat to electrical shock. The electrical equipment at the plant is out dated and needs to be updated to ensure continuous uninterrupted operation.

3.2.3.1.6 SCADA

The SCADA equipment appears to be in good working order but is beginning to reach the mature stage in its life. This will require more maintenance and parts will become difficult to acquire. Control wires are not in conduit and are cluttered. The US Filter Control Panel is missing a switch and due to age is a potential process disruption hazard as it is the main plant control panel.. As a result, the consequence of failure is high. The U.S. Filter Control panel is reaching a post mature stage and with that comes maintenance issues and possibilities of failure, because of this the U.S. Filter Control panel received a high BRE rating.

3.2.3.1.7 Buildings

Most of the buildings have a high probability of failure based on physical condition, age, and operational condition. The consequence of failure is high for the chlorine and filter buildings due to the presence of chemicals, safety, and the disruption to the community if the Richardt WTP is not able to disinfect or filter raw water.

3.2.3.2 Fort Harrison WTP

The Fort Harrison WTP has two buildings of varying age and condition. The filter building is in poor condition with many of the components in need of repair or replacement, including the process piping and are described in the following sections in more detail. **Table 3.2.3.2.1** includes a summary of the BRE rating for the assets in need of repair or replacement. Refer to **Appendices C and E** for a detailed breakdown of the Fort Harrison WTP assets.

Table 3.2.3.2.1: Fort Harrison WTP Rehabilitation Assets

Asset Name	*Probability of Failure*	*Consequence of Failure*	*Redundancy Score*	*BRE*
Ground Storage Reservoir	3.68	4.31	1.00	15.84
Filter House MCC	3.26	4.78	1.00	15.58
I&C	3.58	3.67	1.00	13.13
Filter Building	3.26	3.97	1.00	12.95
Well Pump Control Panel	3.12	3.67	1.00	11.44
Well Set Points	3.06	3.72	1.00	11.39
HSP MCC	2.34	4.78	1.00	11.18
High Service Pump 3	3.88	2.72	1.00	10.56
Chlorine Analyzer/PH	2.60	4.00	1.00	10.40
Chlorine Analyzer	2.60	4.00	1.00	10.40
Chlorine Controller	2.60	4.00	1.00	10.40
Chlorine Analyzer	2.60	4.00	1.00	10.40
Filter Control PLC	2.80	3.67	1.00	10.27
Sodium Hypo Bulk Storage Tank bottom	2.54	3.78	1.00	9.60
Filter 1	3.32	3.08	0.89	9.10
Filter 2	3.32	3.08	0.89	9.10
Filter 3	3.32	3.08	0.89	9.10
Filter 4	3.32	3.08	0.89	9.10
Filter 5	3.32	3.08	0.89	9.10
Filter 6	3.32	3.08	0.89	9.10
Filter 7	3.32	3.08	0.89	9.10
Filter 8	3.32	3.08	0.89	9.10
Filter 9	3.32	3.08	0.89	9.10
High Service Pump 1	3.34	2.72	1.00	9.09

3.2.3.2.1 *Filters*

The probability of failure is higher due to the age and O& M protocols. Since there are nine (9) filters, the consequence of a single filter failing is low. However, considering the peak demands during the summer with the Richardt WTP producing at far below the rated capacity, all the filters have a higher importance to the process.

3.2.3.2.2 *High Service Pumps*

High service pump 1 has a higher probability of failure due to the pumps age and O&M protocols. High service pump 3 has a higher probability of failure as a result of its physical and operational condition. The consequence of failure is low since the firm rated capacity of the WTP is limited by the filters, not the high service pumps.

3.2.3.2.3 Process Valves and Actuators

All the process valves and actuators have a high probability of failure due to the physical condition, age, and operational condition of the valves and actuators. The consequence of failure for the valves and actuators is low due to the low impact on the process and community.

3.2.3.2.4 Chemical Feed Systems

All of the chemical feed items have a high consequence of failure rating resulting in a higher BRE score. The effect on the process, safety, IDEM compliance, and required response time criteria all received high ratings. These assets are in need of maintenance, but are operating normally and have a low probability of failure.

3.2.3.2.5 Electrical

The Filter House electrical equipment shows extensive wear from being exposed to chlorine vapors. The motor control center (MCC) and control panels no longer maintain their enclosure ratings which were meant to protect the electrical components from water, dust, and human interaction. Due to the high consequence and probability of failures the electrical equipment has a high BRE rating.

3.2.3.2.6 SCADA

The filter house SCADA showed extensive wear, especially on the well pump control panel. The well pump control panel does not maintain its housing integrity which is meant to help protect the electrical components. The filter control programmable logic controller (PLC) is in working condition and is installed in an enclosure that protects the equipment from the environment. The high humidity and chemical off gassing is not a suitable environment for electrical equipment and has led to a shorter lifespan and pre-mature failures. As a result, the probability of failure, consequence of failure, and BRE ratings are high.

3.2.3.2.7 3 MG Ground Storage Reservoir

The 3 MG ground storage reservoir received a moderate probability of failure rating due to its age and physical condition. The consequence of failure is high as a result of the impact on the process, finances, and community. If the 3 MG ground storage reservoir is out of service, the Fort Harrison WTP would be out of service. As a result, the average day demand would not be able to be met with production from the Richardt WTP and Indian Lake WTP. In addition, the *Recommended Standards for Water Works* recommends having a minimum storage capacity equal to the average day demand. Without the reservoir, Lawrence would not be able to meet this recommendation.

3.2.3.3 Indian Lake WTP

The Indian Lake WTP is in good condition with few components in need of repair or replacement. Most of the items in need of rehabilitation or replacement include electrical and chemical feed systems and are described in the following sections in more detail. **Table 3.2.3.3.1** includes a summary of the BRE rating for the assets in need of repair or replacement. Refer to **Appendices C and E** for a detailed breakdown of the Indian Lake WTP assets.

Table 3.2.3.3.1: Indian Lake WTP Rehabilitation Assets

Asset Name	*Probability of Failure*	*Consequence of Failure*	*Redundancy Score*	*BRE*
Indian Lake WTP MCC	3.52	4.78	1.00	16.82
I&C	3.58	3.67	1.00	13.13
Chlorine Analyzer	3.52	4.81	1.00	12.61
Sodium Hypo Bulk Tank	2.54	4.81	1.00	12.21
Post-filtration Chlorination Pump	2.64	4.39	1.00	11.59
Safety switch x2 (Aerators)	3.06	3.72	1.00	11.39
Chlorine Controls	3.06	3.42	1.00	10.46
High Service Pump Control Panel	2.80	3.67	1.00	10.27

3.2.3.3.1 Chemical Feed Systems

All of the chemical feed items have a high consequence of failure rating resulting in a higher BRE score. The effect on the process, safety, IDEM compliance, and required response time criteria all received high ratings. These assets are in need of maintenance, but are operating normally and have a low probability of failure.

3.2.3.3.2 Electrical

The electrical equipment appears to be in working order but showed wear from exposure to chlorine off gassing. The MCC has the highest BRE rating as the consequence of failure is high. If the MCC were to fail, the WTP would be without power since there are no provisions for standby power generation. Continuous exposure to the current environment without proper ventilation and protection will likely result in all electrical equipment failing pre-maturely.

3.2.3.3.3 SCADA

The filter control PLC and human machine interface (HMI) panel appear to be new. However, the PLC does not work properly and as a consequence the plant must be manually controlled and maintained. Since there is not an isolated chemical feed room, the chlorine off gassing has caused corrosion on some components. The SCADA components have a low probability of failure but a high consequence of failure due to their age and high impact on the process.

3.2.3.4 Fort Harrison Well Field

The Fort Harrison well field was rehabilitated in 2009, 2012, and 2013. Despite the wells being in good overall condition, the amount of repairs and loss of specific capacity of the wells over the past few years continue to pose issues. **Table 3.2.3.4.1** includes a summary of the BRE rating of the wells. Refer to **Appendices C and E** for a detailed breakdown of the well field assets.

Table 3.2.3.4.1: Fort Harrison Well Field Rehabilitation Assets

Asset Name	*Probability of Failure*	*Consequence of Failure*	*Redundancy Score*	*BRE*
Well No. 9	3.78	2.94	1.00	11.13
Well No. 10	3.32	2.94	1.00	9.78

Asset Name	*Probability of Failure*	*Consequence of Failure*	*Redundancy Score*	*BRE*
Lighting Panel – Well 10	3.32	2.94	1.00	9.78
Well No. 8	2.86	3.22	1.00	9.22

3.2.3.4.1 Pumps

The Fort Harrison wells have been repaired frequently but have been recently rehabilitated. The pumps were included in the recent rehabilitation. As a result, the probability of failure and consequence of failure ratings are both at moderate levels.

3.2.3.4.2 Motors

The Fort Harrison wells have been repaired frequently but have been recently rehabilitated. The motors were included in the recent rehabilitation. As a result, the probability of failure and consequence of failure ratings are both at moderate levels.

3.2.3.4.3 Electrical

The electrical equipment at the well houses is in working but poor condition. Equipment is not properly sized and wiring is not up to code. Unit heaters are not in working condition and pose a threat during freezing conditions. The environment was not suitable for the electrical equipment installations and because of this creates a risk to pre-mature failure. Due to the poor electrical environments and the safety risks well #9 received the highest BRE ratings.

3.2.3.5 Indian Lake Well Field

The Indian Lake well field was rehabilitated in 2011 and 2013. Despite the wells being in good overall condition, the amount of repairs and loss of specific capacity of the wells over the past few years continue to pose issues. Refer to **Table 3.2.3.5.1** for a summary of the BRE rating of the wells. Refer to **Appendices C and E** for a detailed breakdown of the well field assets.

Table 3.2.3.5.1: Indian Lake Well Field Rehabilitation Assets

Asset Name	*Probability of Failure*	*Consequence of Failure*	*Redundancy Score*	*BRE*
Well No. 15R	3.98	3.72	1.00	14.81
Well No. 16	3.78	3.78	1.00	14.28
Well No. 14	3.22	3.78	1.00	12.18

3.2.3.5.1 Pumps

The Indian Lake wells have been repaired frequently but have been recently rehabilitated. The pumps were included in the recent rehabilitation. As a result, the probability of failure rating is at a moderate level. Lawrence is able to meet the average and maximum day demands with a single well out of service. Therefore, the consequence of failure for a single well to fail is moderate.

3.2.3.5.2 Motors

The Indian Lake wells have been repaired frequently but have been recently rehabilitated. The motors were included in the recent rehabilitation. As a result, the probability of failure and consequence of failure ratings are both at moderate levels.

3.2.3.5.3 Electrical

The electrical equipment at the Fort Harrison well field shows extensive wear. The electrical equipment is cluttered and retired equipment was not removed. Enclosures do not provide adequate protection from the damp environment. Well #15's electrical equipment appears to have overheated and continues to operate under the same conditions. The variable frequency drive (VFD) in the well house was in the off position yet appeared to still be running. The well house needs ventilation to prevent electrical component corrosion.

3.2.3.6 52nd St. Elevated Storage Tank

The last inspection of the 52nd St. elevated storage tank was completed by Tank Industry Consultants in 2008. At that time, the 52nd St. elevated storage tank was in generally good condition. Based upon the available information, the tank has a low probability of failure. The consequence of failure is high due to the impact on the process, finances, and community. If the 52nd St. tank is out of service, pressure loss and fire flow reductions are expected in the community. Refer to **Appendices C and E** for a detailed breakdown of the 52nd St. elevated storage tank.

Table 3.2.3.6.1: 52nd St. Elevated Storage Tank Asset

Asset Name	*Probability of Failure*	*Consequence of Failure*	*Redundancy Score*	*BRE*
52nd St. Elevated Storage Tank	2.80	3.94	1.00	11.04

3.2.3.7 Oaklandon Road Elevated Storage Tank

The last inspection of the Oaklandon Road elevated storage tank was completed by Tank Industry Consultants in 2008. At that time, the Oaklandon Road elevated storage tank was in generally good condition. Based upon the available information, the tank has a low probability of failure. The consequence of failure is high due to the impact on the process, finances, and community. If the Oaklandon Road tank is out of service, pressure loss and fire flow reductions are expected in the community. Refer to **Appendices C and E** for a detailed breakdown of the Oaklandon Road elevated storage tank.

Table 3.2.3.7.1: Oaklandon Road Elevated Storage Tank Asset

Asset Name	*Probability of Failure*	*Consequence of Failure*	*Redundancy Score*	*BRE*
Oaklandon Rd. Elevated Storage Tank	3.48	3.94	1.00	13.73

3.2.3.8 Winding Ridge Booster Station

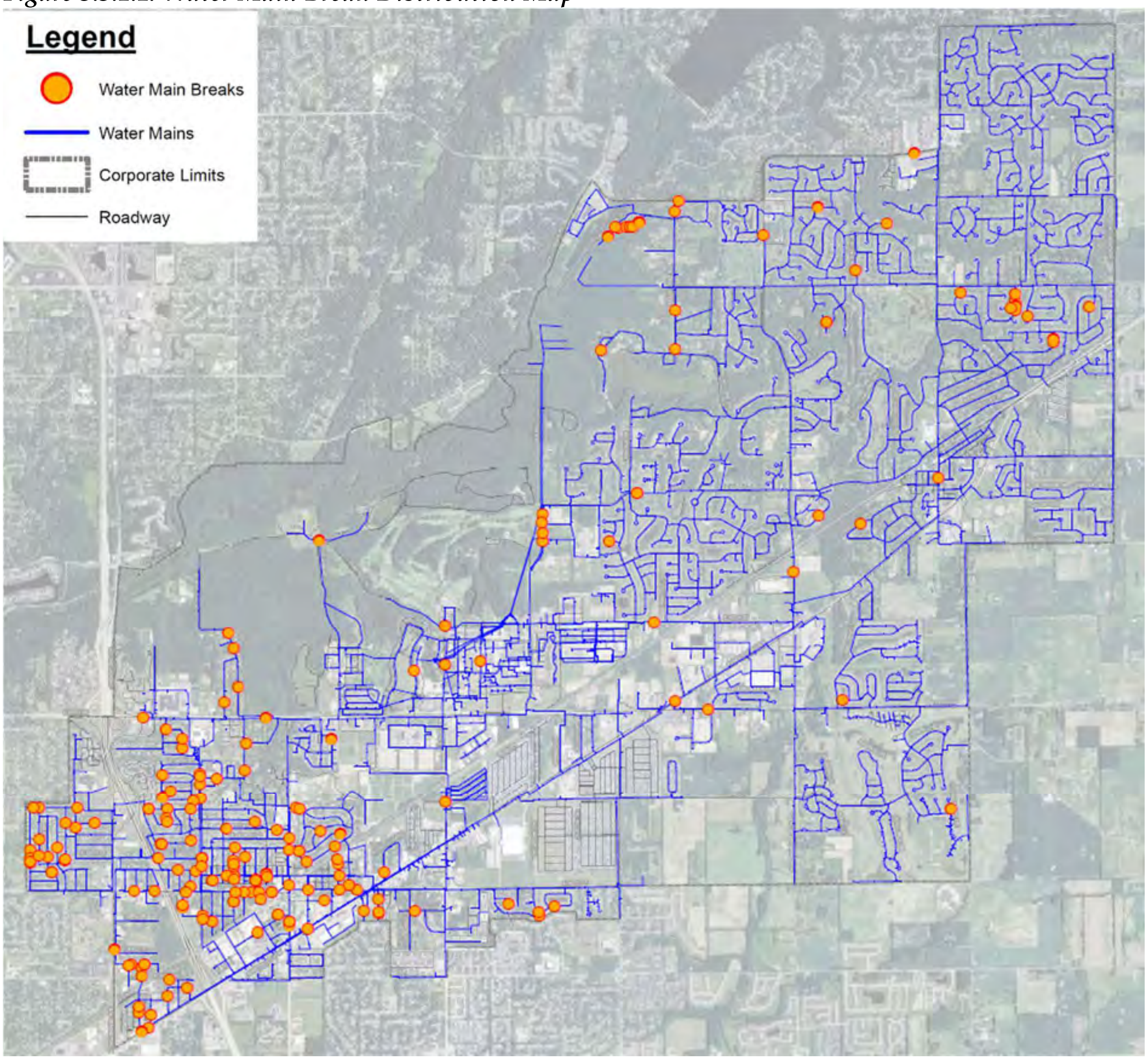
The Winding Ridge booster station is operating properly and there are no issues with the components. In addition, Lawrence is able to meet system demands without the Winding Ridge booster station in operation. As a result, the assets all have low probability of failure and consequence of failure ratings. Refer to **Appendices C and E** for a detailed breakdown of the Winding Ridge Booster Station assets.

3.3 Distribution Assets

3.3.1 Data Acquisition

Historical water main break and customer complaint information was used to prepare the distribution system asset management evaluation. The date and location of each break and customer complaint was provided by Lawrence. Water main break data was available from 2010 to 2015 and customer complaint information was available from mid-2013 until early 2016. Both water main breaks and customer complaints were mapped in geographical information system (GIS) to evaluate the data points. Areas throughout the distribution system with a high concentration of data points were then assessed on an individual basis to further understand the nature of the water main break or customer complaint point cluster. Refer to **Figure 3.3.1.1** and **Appendix A** for exhibits illustrating the geographical concentration of water main breaks and customer complaints throughout the distribution system.

Figure 3.3.1.1: Water Main Break Distribution Map



High concentration areas of water main breaks were reviewed and compared to Lawrence's distribution system map to determine if the high number of breaks were occurring on the same water main, parallel mains, branch mains, services or failing appurtenances. The type of breaks was also considered to help understand what may be causing the failures (i.e. corrosive environment, defective pipe, installation error) in addition to asset age. If applicable, these areas were then considered for potential replacement and evaluated to determine the project area's business risk exposure (BRE) rating. Each water main replacement project scope was developed considering any surrounding, less frequent breaks and practical extents for each replacement project.

Customer complaint information was reviewed when it occurred within or adjacent to a water main replacement project area or when complaints were tightly clustered but outside the scope of a water main replacement project. The majority of complaints around project areas were a result of the leak, break or repair work completed. Typically, tightly clustered complaints outside of project areas were not a result of distribution system caused issues but rather a result of issues caused by the main break. For this reason, customer complaints were not considered as a sole basis for a potential project area.

3.3.2 Asset Index and Grading Criteria

After gathering the historical information from Lawrence, an asset index and grading criteria, different from the process asset criteria, was developed. The criteria consist of a probability of failure, consequence of failure, and redundancy score to determine the asset's BRE rating. Refer to **Appendix E** for the asset ratings.

3.3.2.1 Probability of Failure

The probability of failure is the overall rating of weighted criteria for an asset's likelihood of failure. The criteria contributing to the probability of failure include age and repair history. A weight was given to each criterion to identify the most important criteria. The probability of failure is the weighted average of the criteria ratings.

- **Age Factor Rating**: The age factor rating is calculated from the assumed age of the asset and the effective life of the asset. The percentage of its useful life is used to determine the age factor rating. As the installed date is unavailable for piping in the distribution system, age is assumed based on pipe material type as reported from break history data.
- **Repair History Rating**: The repair history rating is calculated based on the total number of breaks within the scope of the water main replacement project area. The total number of breaks is divided by the years within the data set (e.g. 6-years) to determine the average number of breaks per year.

Table 3.3.2.1.1: Probability of Failure Criteria

Criteria	*Rating*					*Weighting Factor*
	5	*4*	*3*	*2*	*1*	
Age Factor	Greater than 80% of useful life	Age between 60% and 80% of useful life	Age between 40% and 60% of useful life	Age between 20% and 40% of useful life	Age less than 20% of useful life	0.7

Criteria	*Rating*					*Weighting Factor*
	5	*4*	*3*	*2*	*1*	
Repair history (Breaks per year)	Very Poor (More than 2.3 breaks per year within the project area)	Poor (between 1.7 and 2.3 breaks per year within the project area)	Moderate (between 1.1 and 1.7 breaks per year within the project area)	Good (between 0.5 and 1.1 breaks per year within the project area)	Very Good (less than 0.5 breaks per year within the project area)	1.3

3.3.2.2 Consequence of Failure

The consequence of failure is the overall rating of weighted criteria for the effect of failure an asset poses to Lawrence's distribution system. The criteria contributing to the consequence of failure include main & area criticality, financial impact, and service impact. These criteria evaluate the water main replacement project area's failure with respect to itself and to the distribution system as a whole. A weight was given to each criterion to identify the most important criteria. The consequence of failure is the weighted average of the criteria ratings.

- **Main & Area Criticality Rating**: The main & area criticality rating is determined by the project area's importance to convey water throughout the distribution system. It is assumed that a failure would result in the entire project area being without service and not effect a larger area of the distribution system. If water could not be conveyed outside of the project area as a result of the failure, it would score very high and if the failure had no service impact outside of the project area, it would score very low.
- **Financial Impact Rating**: The financial impact rating provides an idea of the impact of the replacement of a project area on Lawrence's budget.
- **Service Impact Rating**: The service impact rating is determined by the total number of customers within the project area. It is assumed that a failure would result in all customers within the project area being impacted. Similarly, this factor is reflective of the number of customers whose level of service would be improved by replacing the water mains within the project area.

Table 3.3.2.2.1: Consequence of Failure Criteria

Criteria	*Rating*					*Weighting Factor*
	5	*4*	*3*	*2*	*1*	
Main & Area Criticality (Impact on water mains adjacent to project area)	Mission Critical - Unable to convey water around the project area	Loss of Redundancy - Smaller diameter water main conveying water around project area	Loss of Redundancy - Identical size water main conveying water around project area	Loss of Redundancy - Larger diameter water main conveying water around project area	No impact outside the project area	1.5
Financial Impact	May require new borrowing or impact rates	May require transfer from reserves	Absorbed within current budget	Absorbed within applicable line item	Budgeted expense	0.3
Service Impact (number of customers impacted)	140 or more customers within the project area	100-139 customers within the project area	60-99 customers within the project area	20-59 customers within the project area	Less than 20 customers within the project area	1.2

3.3.2.3 Redundancy Score

Since the main and area criticality and service impact ratings take into account the redundancy built into the distribution system in the event of a main break, the redundancy score was not used for the distribution piping assets.

3.3.3 Results

The distribution system was evaluated using the main break information from 2010 to 2015 and the criteria described in Section 3.3.2.

3.3.3.1 Downtown E. 47th St. Water Main Replacement

The 2-inch to 8-inch cast iron water mains located in this project area are cast iron water mains with a high number of breaks and service connections. As a result, the probability of failure and consequence of failure ratings are high.

3.3.3.2 N. Kitley Ave., Leone Dr., Karen Dr. Water Main Replacement

The 4-inch and 6-inch cast iron water mains located in this project area are cast iron water mains with a high number of breaks and service connections. As a result, the probability of failure and consequence of failure ratings are high.

3.3.3.3 Lee Road Water Main Replacement

The 16-inch cast iron water main is the existing raw water main from the Fort Harrison well field. The water main currently in operation replaced an older main but is breaking at a high rate in a particular section. Since the water main is the only raw water main from the well field to the WTP, the service impact, financial impact, and main criticality contributed to a high consequence of failure.

3.3.3.4 Downtown E. 46th St. Water Main Replacement

The 6-inch cast iron water main is located in the downtown area and has experienced a high number of breaks. The water main project area contains a high number of service connections. As a result, the probability of failure and consequence of failure ratings are high.

3.3.3.5 E. 43rd St. Water Main Replacement

The 6-inch and 8-inch cast iron water mains located in the project area serve a moderate number of customers and have experienced a moderate number of breaks. As a result, the BRE rating is moderate.

3.3.3.6 Elmhurst and Kingman Dr. Water Main Replacement

The 6-inch and 8-inch cast iron water mains located in the project area serve a moderate number of customers and have experienced a moderate number of breaks. As a result, the BRE rating is moderate.

3.3.3.7 E. 46th St. Water Main Replacement

The 4-inch and 6-inch cast iron water mains located in the project area serve a moderate number of customers and have experienced a moderate number of breaks. As a result, the BRE rating is moderate.

3.3.3.8 Fall Creek Dr. and Sumac Ln. Water Main Replacement

The 6-inch and 8-inch ductile iron water mains located in the project area serve a low number of customers but have experienced a high number of breaks. As a result, the BRE rating is moderate.

3.3.3.9 N. Franklin Rd. Water Main Replacement

The 6-inch cast iron water mains located in the project area serve a moderate number of customers and have experienced a moderate number of breaks. As a result, the BRE rating is moderate.

3.3.3.10 E. 49th St. Water Main Replacement

The 6-inch cast iron water mains located in the project area serve a moderate number of customers and have experienced a moderate number of breaks. As a result, the BRE rating is moderate.

3.3.3.11 Pebblebrook Dr. and Stacie Circle Water Main Replacement

The 6-inch ductile iron water mains located in the project area serve a moderate number of customers and have experienced a moderate number of breaks. As a result, the BRE rating is moderate.

3.3.3.12 E. 52nd St. Water Main Replacement

The 6-inch cast iron water mains located in the project area serve a low number of customers and have experienced a low number of breaks. As a result, the BRE rating is low.

3.3.3.13 E. 50th St. Water Main Replacement

The 6-inch cast iron water mains located in the project area serve a low number of customers and have experienced a low number of breaks. As a result, the BRE rating is low.

3.3.3.14 Zoeller Ave. Water Main Replacement

The 4-inch cast iron water mains located in the project area serve a low number of customers and have experienced a low number of breaks. As a result, the BRE rating is low.

3.3.3.15 N. Hartman Dr. Water Main Replacement

The 6-inch cast iron water mains located in the project area serve a low number of customers and have experienced a low number of breaks. As a result, the BRE rating is low.

3.3.3.16 Barbour Ct. Water Main Replacement

The 4-inch cast iron water mains located in the project area serve a low number of customers and have experienced a low number of breaks. As a result, the BRE rating is low.

4.0 PROPOSED PROJECTS

Once the assets were assigned a BRE score, projects were developed from the asset list. Since the grading criteria of assets is based upon a set of objective, quantitative components, the subjective input for the development of projects is minimized. As a result, the BRE rating allows projects to be developed and prioritized based upon risk to Lawrence.

4.1 Process Assets

Generally, capital improvement projects include process assets with a BRE rating of 10 or higher. Process assets with a BRE rating of below 10 are considered maintenance items. However, some maintenance items are included in capital projects due to location where continued maintenance is not feasible due to the scope of an associated capital improvement project. For example, the Richardt WTP Phase II includes valves as a part of the project due to the location of assets in the filter building. The valves have a BRE rating below 10, but the replacement of the filter building requires that these assets be replaced. Refer to **Table 4.0.1** for the process assets project summary.

Table 4.0.1: Process Assets Project Summary

Project No.	*Project Name*	*BRE Rating*	*Estimated Total Project Cost*
P1	Richardt WTP Phase IA	23.33	$170,000
P2	Richardt WTP Phase II	14.23	$5,420,000
P3	Indian Lake Well Field Rehabilitation	13.76	$1,025,000
P4	Oaklandon Rd. Tank Rehabilitation	13.73	$600,000
P5	Indian Lake WTP Rehabilitation	12.31	$790,000
P6	52nd St. Tank Rehabilitation	11.04	$476,000
P7	Fort Harrison WTP Improvements	10.60	$6,137,500
P8	Fort Harrison Well Field Rehabilitation	9.99	$2,765,000
TOTAL			$17,383,500

The costs are based on 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The costs are provided on the basis of Wessler's qualifications and experience. Wessler makes no warranty, expressed or implied, as to the accuracy of such cost estimates compared to bids or actual costs.

4.1.1 Richardt WTP Phase IA (BRE = 23.33)

The Richardt WTP is producing approximately 600 gpm which is 40% of the WTP's firm rated capacity of 1,500 gpm. The production capacity is currently limited by the amount of iron and manganese present in the finished water if the flow rate exceeds 600 gpm. To remediate the issue, it is recommended to investigate the condition of the filter media and proceed as necessary. It is expected that the filter media and hatches will need to be replaced with new air valves added to the filters.

The estimated project cost of the work is **$170,000**. A more detailed cost estimate can be found in **Appendix B.**

4.1.2 Richardt WTP Phase II (BRE = 14.23)

This alternative includes the construction of a new groundwater treatment plant on the existing Richardt Street site. The new treatment plant will have a total capacity of 3,000 gpm (4.32 MGD) and a firm rated capacity of 2,000 gpm (2.88 MGD). The existing wells will be used to supply the new facility.

In 2013 and 2014, the Richardt WTP Phase II project was designed by Wessler Engineering and bid. The recommendations listed below are a summary of the designed WTP. The project was not awarded at that time.

4.1.2.1 Treatment Building

A new treatment building will be constructed to house the filter piping and high service pumps for the new treatment process. The new building (Phase II) will add on to the Phase I facility to be constructed in the winter of 2012-2013.

The treatment building will be sized to contain three (3) pressure filters with room for a fourth, and three (3) high service pumps with room and below-grade piping for a fourth. This plan will require a building footprint of 30’ by 70’ at a minimum, and is based on the high service pumps being installed in the same room and across from the filter piping.

4.1.2.2 Raw Water Connection

The connection for the new treatment facility will be made to the raw water piping between well No. 1 and the west detention basin with a new ductile iron main. A tapping sleeve and valve can be used to maintain continued operation of the existing wells and treatment facility until the new facility is ready for startup.

4.1.2.3 Aerators

Two (2) induced draft aerators, each having a rated capacity of 1,500 gpm, will be provided. Piping provisions will be provided to bypass the aerators or to isolate one aerator at a time for service.

4.1.2.4 Detention Tank

A cast-in-place concrete detention tank will be provided. The detention tank will be sized based on a plant firm capacity of 3,000 gpm for 30 minutes of detention time, which results in a tank volume of 90,000 gallons. The detention tank will be below-grade and located remotely from the treatment building. The location of the detention tank away from the treatment building will reduce the construction duration for the facility and eliminate the constant source of humidity and other atmospheric influences of the tank compared to if it were located under the treatment building floor. The detention tank will be configured so that one half of the tank can be taken off-line at a time for maintenance and cleaning. Pressure transmitters will be provided in each half of the detention tank to monitor the water levels in the tank.

4.1.2.5 High Service Pumps

Three (3) high service pumps will be provided. Each high service pump will be of the vertical turbine type and have a rated capacity of 1,000 gpm to match the plant filtration rate. The high service pumps will be configured to pump from the detention tank through the pressure filters and into the distribution system. It is anticipated that the required total dynamic head of the pumps will be around 160-170 feet, which will result in 60 HP motors on the pumps. Premium efficiency inverter duty rated motors with VFDs will be provided for the high service pumps. The overall height of the treatment building will be coordinated with the high service pump dimensions.

4.1.2.6 Pressure Filters

Three (3) pressure filters will be provided. Each filter will have a filtration capacity of 1,000 gpm based on a filter loading rate of 3 gpm/ft^2. The filters will be horizontal, end-piped, two cell units with anthracite filter media for iron and manganese removal. The filters are expected to be 12′ diameter by 38′ long with the face piping inside the treatment building and the remainder of the filters located outside. The total filtration capacity will be 3,000 gpm, and the firm filtration capacity will be 2,000 gpm with one filter out of service. At a backwash rate of 15 gpm/ ft^2 of filter area, each cell will require 2,500 gpm for a backwash cycle.

Each filter will be provided with a flow meter and loss of head gauge. An online turbidity meter will be provided on the backwash header for monitoring backwash effluent quality. Backwash cycles will be fully automated with manual overrides, and filter valves will be pneumatically actuated by a compressed air system.

4.1.2.7 Backwash Tank

A new cast-in-place backwash tank will be provided on the site. The backwash tank will be sized to accept one complete filter backwash. Using a backwash rate of 2,500 gpm per cell for 15 minutes, a two-cell backwash will require a detention tank volume of 75,000 gallons. The backwash tank will discharge to the existing sanitary sewer collection system.

4.1.2.8 Chemical Feed Improvements

New chlorine feed points will be provided in the detention tank and post-filtration. The chemical pumps will be adjustable based on the process flow rate at each respective feed point.

4.1.2.9 Electrical Improvements

The new electrical room will be located in the north end of the Phase I building. The new MCC will contain the starters for all the non-VFD motors as well as circuit breakers for the high service pump and on-site well VFDs. The new VFDs for the on-site wells and high service pumps will be located in the Phase I building electrical room and the necessary electrical modifications at the well houses themselves will be provided. The relocation of the well and high service pump VFDs to the new facility will greatly improve the environmental conditions for those pieces of equipment, which will result in increased longevity and reduced service requirements.

A new electrical service to the facility will be required. The location of the service feed and transformer will be based on the location of the electrical room and coordinated with the electric utility. A new service to the facility will allow the existing plant to operate on the existing feed without disruption to service for reconfiguration to the new plant.

4.1.2.10 Standby Power Improvements

According to the *Recommended Standards for Water Works*, a dedicated standby power source shall be provided so that water may be treated and/or pumped to the distribution system during power outages to meet the average day demand. To meet this requirement, a new standby power generator will be provided. The generator will be pad mounted with a diesel fuel supply, fuel polishing system, and a sound attenuating enclosure. The generator will be sized to run the new plant and wells based on the firm rated capacity (i.e. 2 high service pumps and 3 wells). Preliminary sizing of the generator indicates that a 500 kW unit will be sufficient.

4.1.2.11 SCADA Improvements

The SCADA system will tie in local control equipment as well as remote sites located throughout the township. Unlicensed radios and/or cellular modems will be utilized where applicable. The SCADA system will provide a common monitoring and control platform for all equipment, in addition to system wide alarming and reporting capability.

The SCADA system will allow for full monitoring, control, and partial automation of the treatment process, including the status of well pumps, detention tank levels, high service pumps, filter rates, filter backwash automation, valve status, chemical feed rates, and flow metering.

4.1.2.12 Existing Facility Demolition

Once the new treatment plant is complete and online, the existing detention basins, aerators, high service pumps, filter building, filters, backwash tank, piping, electrical, and other items will be demolished. The existing wells, well houses, and raw water piping will remain in service with the new WTP. The existing site will be re-graded and seeded.

4.1.2.13 Site Work and Yard Piping

The site work consists of new yard piping, electrical, water, and sewer connections, backwash water piping, drives and sidewalks, new fencing, grading, asphalt, drainage systems, new site entrance, and landscaping.

The estimated project cost for work is **$5,420,000**. A more detailed cost estimate can be found in **Appendix B.**

4.1.3 Indian Lake Well Field Rehabilitation (BRE = 13.76)

In 2011 and 2013, the Indian Lake wells were rehabilitated and were operating well below their original specific capacity. At that time, Wells 15R and 16 were not causes for concern. To maintain the production levels of Wells 15R and 16, it is recommended to continuously monitor and inspect the wells. Since the previous rehabilitation work was completed in 2011 and 2013, it is recommended to have Wells 15R and 16 inspected and cleaned. In addition, the electrical equipment at Well 15R has previously overheated and continues to operate under the same conditions. The electrical equipment should be replaced as the equipment has shown degradation from the outdoor environment. New equipment will be installed inside the existing well house to ensure protection from the elements and to allow for remote monitoring and control. The wells do not have permanent standby power, and are located in a wooded area, so new permanent standby generator is recommended for the Indian Lake wells.

According to a report completed by Peerless Midwest in 2010, Well 14 was a cause for concern and was operating at 76% off its original specific capacity. As a result of the steep decline in the specific capacity of the well, abandonment of Well 14 and a new well is recommended. The new well includes the well drilling and development, well house, electrical components, process piping and valves, SCADA equipment and programming, fencing and gates, and meter. However, prior to completing any work at the Indian Lake Well Field, a well field study is recommended and included in the estimated project cost. In addition, periodic well field inspections are recommended to properly maintain the wells.

The estimated project cost of the work is **$1,025,000**. A more detailed cost estimate can be found in **Appendix B.**

4.1.4 Oaklandon Rd. Tank Rehabilitation (BRE = 13.73)

The Oaklandon Rd. Tank was inspected in 2008 by Tank Industry Consultants. At the time, the exterior coating system was in good condition and the interior coating system was in fair condition. The report recommended that the interior of the tank be repainted in the next two years. In addition, the report recommended that the exterior be repainted in the next four to five years. There were a number of ANSI/OSHA safety-related deficiencies and AWWA operating deficiencies that have not been addressed. The 2008 report listed a cost for minimum recommended repairs for the tank which was used to determine an approximate rehabilitation cost. Since the exterior and interior have not been repainted and the safety and operating deficiencies have not been addressed, this work should all be completed to maintain the integrity of the tank. An inspection of the tank is recommended prior to completing any work and subsequent inspections of the tank are recommended every 5 years.

The estimated project cost of the work is **$600,000**. A more detailed cost estimate can be found in **Appendix B.**

4.1.5 Indian Lake WTP Rehabilitation (BRE = 12.31)

The Indian Lake WTP is in good condition but is experiencing some issues with electrical, SCADA, and chemical feed systems.

4.1.5.1 Chemical Feed Systems

The chemical feed systems at the Indian Lake WTP are causing corrosion on the process piping and electrical components. Due to the presence of chlorine odor in the WTP, it is also recommended to move the chlorine feed to an isolated structure.

4.1.5.1.1 Chlorine Feed System

A new chlorine feed system will be located in a separate structure located at the northeast corner of the existing WTP building. The chlorine feed system structure will include chlorine feed piping, chlorine feed pump, alarm, louver, exhaust fan, and unit heater.

4.1.5.2 Electrical

The existing Indian Lake WTP electrical equipment will be replaced. A new MCC will contain starters and circuit breakers for the aerators, high service pumps, and miscellaneous electrical equipment. The VFDs for the high service pumps are relatively new and will remain in service. Power monitoring equipment will be installed in the new MCC to enable operators to track electrical usage for the plant.

4.1.5.3 Standby Power

The WTP does not meet IDEM's backup power standards. As a result, it is recommended that a 250kW standby generator with automatic switchover be installed with this project. The Automatic Transfer Switch (ATS) will monitor the utility service for a loss in power and, in the event of a power loss, the generator will be brought online to provide power to the WTP. During a power outage, the ATS will alert operators with an alarm to inform them the plant is running on backup power. In addition, the ATS will provide generator info to the SCADA system.

4.1.5.4 SCADA

The SCADA system will tie in local control equipment as well as remote sites located throughout the township. Unlicensed radios and/or cellular modems will be utilized where applicable. The SCADA system will provide a common monitoring and control platform for all equipment, in addition to system wide alarming and reporting capability.

The SCADA system will allow for full monitoring, control, and partial automation of the treatment process, including the status of well pumps, detention tank levels, high service pumps, filter rates, filter backwash automation, valve status, chemical feed rates, and flow metering.

The estimated project cost of the work is **$790,000**. A more detailed cost estimate can be found in **Appendix B.**

4.1.6 52nd St. Tank Rehabilitation (BRE = 11.04)

The 52nd St. Tank was inspected in 2008 by Tank Industry Consultants. At the time, the exterior and interior coating system was in generally good condition. The report recommended that cathodic protection be added to the interior of the tank or the interior of the tank be repainted in the next three or four years. In addition, the report recommended that the exterior be repainted in the next four to five years. The exterior of the tank was repainted in 2014 by L.C. United Painting Co. However, cathodic protection has not been added to the interior of the tank and it has not been repainted. There were a number of ANSI/OSHA safety-related deficiencies and one AWWA operating deficiency that have not been addressed. The 2008 report listed a cost for minimum recommended repairs for the tank which was used to determine an approximate rehabilitation cost. An inspection of the tank is recommended prior to completing any work and subsequent inspections of the tank are recommended every 5 years.

The estimated project cost of the work is **$476,000**. A more detailed cost estimate can be found in **Appendix B.**

4.1.7 Fort Harrison WTP Improvements (BRE = 10.60)

The filter building and interior process components are in extremely poor condition. The chlorine day tank, fluoride tank, and phosphate tank are located in the same room as the filters and process piping causing extensive corrosion. According to the *Recommended Standards for Water* Works, fluoride should be isolated from other chemicals to prevent contamination, vented to the outdoors, secondary controls in place to prevent overfeeding, and personal protective equipment nearby including emergency deluge showers and eye wash stations. As a result, it is recommended that the filter building be demolished and a new building be constructed. Select components, as noted below, will be sized for a 3,000 gpm (4.32 MGD) future firm capacity to accommodate expansion of the entire facility in the future.

4.1.7.1 Filter Building

In the new filter building, larger, end-piped horizontal pressure filters will be used to reduce the filter building footprint. The new filter building will be constructed of brick facia and white siding for the gable to match the existing pump house building and a minimum of 2,200 square feet.

4.1.7.2 Aerators

Two (2) induced draft aerators, each having a rated capacity of 1,500 gpm, will be provided. Piping provisions will be provided to bypass the aerators or to isolate one aerator at a time for service.

4.1.7.3 Detention Tank

A new cast-in-place concrete detention tank will be provided. The detention tank will be sized based on a plant firm capacity of 3,000 gpm for 30 minutes of detention time, which results in a tank volume of 90,000 gallons. The detention tank will be below-grade and located remotely from the treatment building. The location of the detention tank away from the treatment building will reduce the construction duration for the facility and eliminate the constant source of humidity and other atmospheric influences of the tank compared to if it were located under the treatment building floor. The detention tank will be configured so that one half of the tank can be taken off-line at a time for maintenance and cleaning. Pressure transmitters will be provided in each half of the detention tank to monitor the water levels in the tank.

4.1.7.4 Filters

Currently, the filters are the limiting factor at the WTP resulting in a firm rated capacity of 2 MGD. The new filter building will increase the filter capacity to 3 MGD with three (3) new 700 gpm horizontal pressure filters and room for a fourth. It is anticipated that once the new Fort Harrison well field is online, the overall production from the Fort Harrison WTP will increase.

4.1.7.5 Backwash Tank

A new cast-in-place backwash tank will be provided on the site. The backwash tank will be sized to accept the wash water from three pressure filters. Using a backwash rate of 2,500 gpm per cell for 12 minutes, a two-cell backwash for three filters will require a backwash tank volume of approximately 60,000 gallons.

The backwash tank will discharge to the existing sanitary sewer collection system. The pumping station rate will be based on emptying the detention tank over a 12-hour period, which will result in a backwash pumping rate of approximately 85 gpm.

4.1.7.6 3 MG Ground Storage Reservoir

The 3 MG ground storage reservoir requires an inspection and structural evaluation of the roof. It is assumed that the tank will remain and continue to be used.

4.1.7.7 High Service Pumps

High service pumps 1 & 3 have a high BRE rating and are recommended for replacement as a part of this project. Each high service pump will be of the horizontal centrifugal type and have a rated capacity of 1,200 gpm equipped with VFDs. The high service pumps will be configured to pump from the 3 MG storage reservoir into the distribution system. Premium efficiency inverter duty rated motors with VFDs will be provided for the high service pumps.

4.1.7.8 Process Valves and Actuators

The new filter building will have flanged ductile iron process piping with valves and pneumatic actuators. The actuators and backwash process will be automatically controlled via SCADA, but provisions will be available to manually control the backwash process.

4.1.7.9 Chemical Feed Systems

The chemical feed systems at the existing filter building are causing extensive corrosion on the process piping and electrical components. The chemical feeds will be in isolated rooms meeting the *Recommended Standards for Water Works* requirements.

4.1.7.9.1 Chlorine Feed System

A new chlorine feed system will be located in an isolated chlorine room. The chlorine feed system will include chlorine feed piping, chlorine feed pump, alarm, louver, exhaust fan, and unit heater.

4.1.7.9.2 Fluoride Feed System

A new fluoride feed system will be located in an isolated room. The feed system will include feed piping, feed pump, louver, and exhaust fan.

4.1.7.10 Electrical

The new filter house will include an electrical room which will serve to isolate the electrical equipment. A power panel will be installed to serve the HVAC loads as well as a new lighting panel transformer. Power to the new filter building will be served by the high service pump MCC, ensuring both buildings remain in operation in the event of a power outage.

4.1.7.11 SCADA

The SCADA system will tie in local control equipment as well as remote sites located throughout the township. Unlicensed radios and/or cellular modems will be utilized where applicable. The SCADA system will provide a common monitoring and control platform for all equipment, in addition to system wide alarming and reporting capability.

The SCADA system will allow for full monitoring, control, and partial automation of the treatment process, including the status of well pumps, detention tank levels, high service pumps, filter rates, filter backwash automation, valve status, chemical feed rates, and flow metering.

The estimated project cost of the work is **$6,137,500**. A more detailed cost estimate can be found in **Appendix B.**

4.1.8 Fort Harrison Well Field Rehabilitation (BRE = 9.97)

In 2009, 2012, and 2013, the Fort Harrison wells were rehabilitated by Peerless Midwest and are operating well below their original specific capacity. According to a report completed by Peerless Midwest in 2010, Well 8 was not a serious cause for concern. All other wells were showing a steep decline in specific capacity compared to their original levels. The electrical equipment should be replaced as the equipment is not properly sized and the wiring does not meet the NEC requirements. Old electrical equipment remains at the well houses and should be removed. The well house buildings appear to be degrading and are in need of extensive repair. In addition, some of the unit heaters are not operational which could result in the piping freezing during the winter months. The wells do not have any standby power or means by which to connect a portable generator. Since the wells are located in a wooded area and are difficult to access, a new permanent standby generator is recommended at for the Fort Harrison wells.

As a result of the steep decline in the specific capacity of the wells, electrical issues, building degradation, and lack of standby power, abandonment of the existing wells and three (3) new wells are recommended. The new wells include new wells, well houses, electrical components, process piping and valves, SCADA equipment and programming, fencing and gates, and individual well flow meters. However, prior to completing any work at the Fort Harrison Well Field, a well field study is recommended and included in the estimated project cost. In addition, periodic well field inspections are recommended to properly maintain the wells. Expansion of the well field in lieu of improvements to the Indian Lake well field should be studied prior to any related improvements.

The estimated project cost of the work is **$2,765,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2 Distribution System Assets

The distribution system projects were developed using the geographical proximity of the water main breaks instead of the method used for process assets. Once the frequent break areas were identified, the projects were developed and prioritized using the BRE rating. Refer to **Appendices C and D** for the project tables and charts showing the individual assets. Refer to **Exhibit 2** in **Appendix A** for an overview of the water main replacement projects. Refer to **Table 4.2.1** for the distribution system assets project summary.

Table 4.2.1: Distribution System Assets Project Summary

Project No.	*Project Name*	*BRE Rating*	*Estimated Total Project Cost*
D1	Downtown (E 47th St, between N Sadler Dr and N Franklin Rd)	16.74	$1,528,000
D2	N Kitley Ave, Leone Dr, Karen Dr Area	16.00	$1,844,000
D3	Lee Rd Raw Water Main (at golf course)	13.50	$373,000
D4	Downtown (E 46th St, between Payton Ave and N Franklin Rd)	10.72	$920,000
D5	E 43rd St (between N Shadeland Ave and Elmhurst Dr)	7.56	$453,000
D6	Elmhurst and Kingman Dr (between Picton Dr and Pendleton Pike	7.56	$497,000
D7	E 46th St (between Van Cleave St and Pendleton Pike)	7.56	$459,000
D8	Fall Creek Dr and Sumac Ln (south of Hermosa Dr)	7.11	$144,100
D9	N Franklin Rd (between Plummer St and Records St)	6.48	$197,000
D10	E 49th St (between Elmhurst Dr and N Sadler Dr)	6.21	$425,000
D11	Pebblebrooke Dr and Stacie Cir (between E 75th St and Richie Cir)	5.60	$424,000
D12	E 52nd St (between N Kitley Ave and Katherine Dr)	4.92	$105,000

Project No.	*Project Name*	*BRE Rating*	*Estimated Total Project Cost*
D13	E 50th St (between N Franklin Rd and Barlow Dr)	4.92	$125,000
D14	Zoeller Ave (south of E 46th St)	4.86	$223,000
D15	N Hartman Dr (between E 45th St and E 46th St)	3.69	$194,000
D16	Barbour Ct (north of E 51st St)	2.87	$112,000
D17	Water Main Replacement Program	-	$51,381,000
		TOTAL	**$59,404,100**

The costs are based on 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The costs are provided on the basis of Wessler's qualifications and experience. Wessler makes no warranty, expressed or implied, as to the accuracy of such cost estimates compared to bids or actual costs.

4.2.1 Downtown E. 47th St. Water Main Replacement (BRE = 16.74)

The Downtown E. 47th St. Water Main Replacement project consists of the replacement of approximately 5,950 feet of 2-inch to 8-inch cast iron water mains with PVC water mains including valves, hydrants, and other related appurtenances necessary for installation. The project is located on E. 47th St. between N. Sadler Dr. and N. Franklin Rd.

The estimated project cost of the work is **$1,528,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.2 N. Kitley Ave., Leone Dr., Karen Dr. Water Main Replacement (BRE = 16.00)

The N. Kitley Ave., Leone Dr., Karen Dr. Water Main Replacement project consists of the replacement of approximately 6,950 feet of 4-inch to 6-inch cast iron water mains with PVC water mains including valves, hydrants, and other related appurtenances necessary for installation. The project is located on N. Kitley Ave., Katherine Dr., N. Kenyon Dr., Karen Dr., and Leone Dr. on the west side of the distribution system.

The estimated project cost of the work is **$1,844,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.3 Lee Road Water Main Replacement (BRE = 13.50)

The Lee Road Water Main Replacement project consists of the replacement of approximately 1,500 feet of 16-inch cast iron water main with PVC water main including other related appurtenances necessary for installation. The project area is located just south of 63rd St. on Lee Road.

The estimated project cost of the work is **$373,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.4 Downtown E. 46th St. Water Main Replacement (BRE = 10.72)

The Downtown E. 46th St. Water Main Replacement project consists of the replacement of approximately 3,090 feet of 6-inch cast iron water main with PVC water main including valves, hydrants, and other related appurtenances necessary for installation. The project area is located on Sarnia St., E. 46th St., Dunn St., and Payton Ave.

The estimated project cost of the work is **$920,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.5 E. 43rd St. Water Main Replacement (BRE = 7.56)

The E. 43th St. Water Main Replacement project consists of the replacement of approximately 1,600 feet of 6-inch to 8-inch cast iron water mains with PVC water mains including valves, hydrants, and other related appurtenances necessary for installation. The project area is located on 43rd St. between N. Shadeland Ave. and Elmhurst Dr.

The estimated project cost of the work is **$453,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.6 Elmhurst and Kingman Dr. Water Main Replacement (BRE = 7.56)

The Elmhurst and Kingman Dr. Water Main Replacement project consists of the replacement of approximately 2,080 feet of 6-inch to 8-inch cast iron water mains with PVC water mains including valves, hydrants, and other related appurtenances necessary for installation. The project area is located on Elmhurst Dr., Pendleton Pike, and Kingman Dr. between Picton Dr. and Pendleton Pike.

The estimated project cost of the work is **$497,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.7 E. 46th St. Water Main Replacement (BRE = 7.56)

The E. 46th St. Water Main Replacement project consists of the replacement of approximately 2,040 feet of 4-inch to 6-inch cast iron water mains with PVC water mains including valves, hydrants, and other related appurtenances necessary for installation. The project area is located on E. 46th St. between Van Cleave St. and Pendleton Pike.

The estimated project cost of the work is **$459,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.8 Fall Creek Dr. and Sumac Ln. Water Main Replacement (BRE = 7.11)

The Fall Creek Dr. and Sumac Ln. Water Main Replacement project consists of the replacement of approximately 1,095 feet of 6-inch to 8-inch cast iron water mains with HDPE and PVC water mains including valves, hydrants, and other related appurtenances necessary for installation. The project area is located on Fall Creek Dr. and Sumac Ln. south of Hermosa Dr.

The estimated project cost of the work is **$144,100**. A more detailed cost estimate can be found in **Appendix B.**

4.2.9 N. Franklin Rd. Water Main Replacement (BRE = 6.48)

The N. Franklin Rd. Water Main Replacement project consists of the replacement of approximately 540 feet of 6-inch cast iron water main with PVC water main including valves, hydrants, and other related appurtenances necessary for installation. The project area is located on N. Franklin Rd. between Plummer St. and Records St.

The estimated project cost of the work is **$197,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.10 E. 49th St. Water Main Replacement (BRE = 6.21)

The E. 49th St. Water Main Replacement project consists of the replacement of approximately 1,750 feet of 6-inch cast iron water main with PVC water main including valves, hydrants, and other related appurtenances necessary for installation. The project area is located on E. 49th St. between Elmhurst Dr. and N. Sadler Dr.

The estimated project cost of the work is **$425,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.11 Pebblebrook Dr. and Stacie Circle Water Main Replacement (BRE = 5.60)

The Pebblebrook Dr. and Stacie Circle Water Main Replacement project consists of the replacement of approximately 1,500 feet of 6-inch cast iron water main with PVC water main including valves, hydrants, and other related appurtenances necessary for installation. The project area is located on Pebblebrook Dr. and Stacie Circle between E. 75th St. and Richie Circle.

The estimated project cost of the work is **$424,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.12 E. 52nd St. Water Main Replacement (BRE = 4.92)

The E. 52th St. Water Main Replacement project consists of the replacement of approximately 300 feet of 6-inch cast iron water main with PVC water main including valves, hydrants, and other related appurtenances necessary for installation. The project area is located on E. 52nd St. between N. Kitley Ave. and Katherine Dr.

The estimated project cost of the work is **$105,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.13 E. 50th St. Water Main Replacement (BRE = 4.92)

The E. 50th St. Water Main Replacement project consists of the replacement of approximately 530 feet of 6-inch cast iron water main with PVC water main including valves, hydrants, and other related appurtenances necessary for installation. The project area is located on E. 50th St. between N. Franklin Rd. and Barlow Dr.

The estimated project cost of the work is **$125,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.14 Zoeller Ave. Water Main Replacement (BRE = 4.86)

The Zoeller Ave. Water Main Replacement project consists of the replacement of approximately 910 feet of 4-inch cast iron water main with PVC water main including valves, hydrants, and other related appurtenances necessary for installation. The project area is located on Zoeller Ave. south of E. 46th St.

The estimated project cost of the work is **$223,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.15 N. Hartman Dr. Water Main Replacement (BRE = 3.69)

The N. Hartman Dr. Water Main Replacement project consists of the replacement of approximately 680 feet of 6-inch cast iron water main with PVC water main including valves, hydrants, and other related appurtenances necessary for installation. The project area is located on N. Hartman Dr. between E. 45th St. and E. 46th St.

The estimated project cost of the work is **$194,000**. A more detailed cost estimate can be found in **Appendix B.**

4.2.16 Barbour Ct. Water Main Replacement (BRE = 2.87)

The Barbour Ct. Water Main Replacement project consists of the replacement of approximately 300 feet of 4-inch cast iron water main with PVC water main including valves, hydrants, and other related appurtenances necessary for installation. The project area is located on Barbour Ct. north of E. 51st St.

The estimated project cost of the work is **$112,000**. A more detailed cost estimate can be found in **Appendix B.**

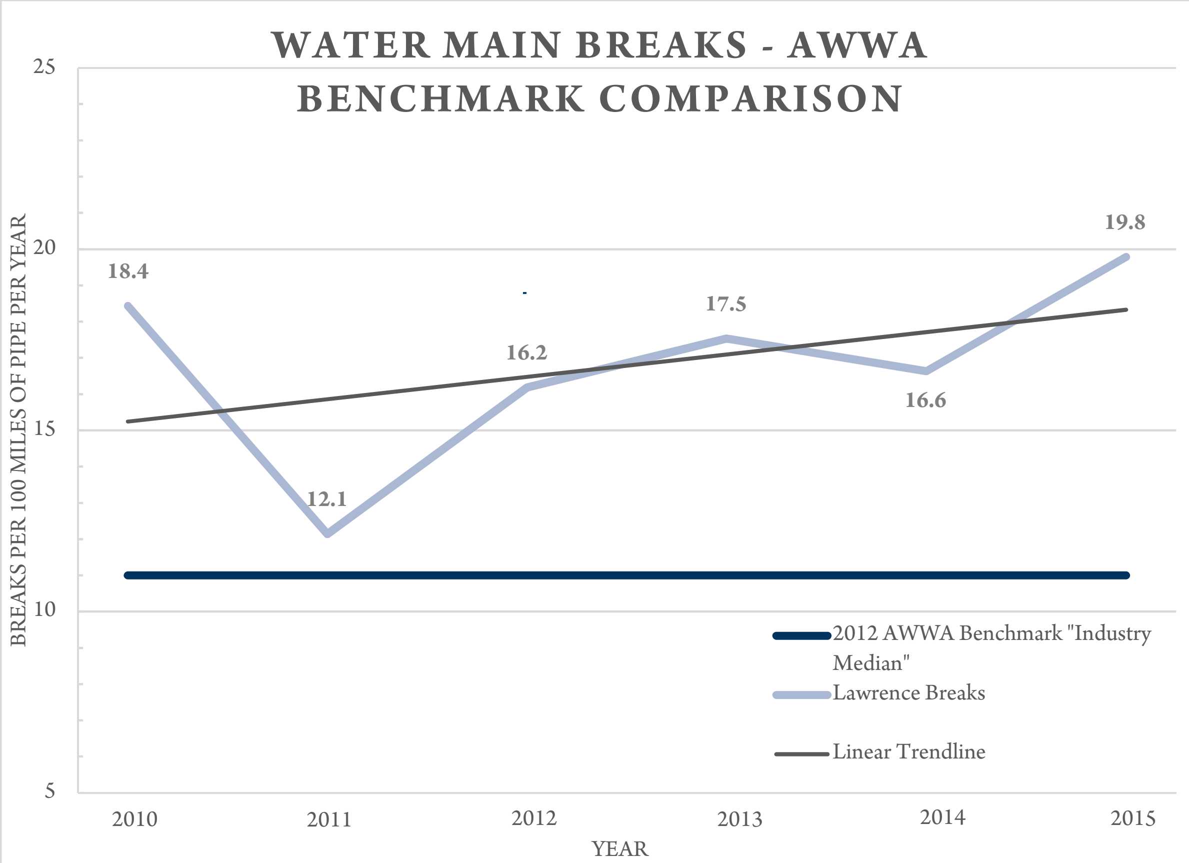
4.3 Annual Water Main Replacement Program

In order to develop a successful long term water main replacement program (WMRP), additional water main break and replacement data should be evaluated. By doing so, a proactive approach can be adapted to replace aging water main infrastructure beyond the projects identified in this report. For the purpose of this report, the number of main breaks were analyzed to determine an acceptable rate of replacement for Lawrence. Once the identified projects are completed, annual main replacement should continue to mitigate and reduce the number of annual breaks. It is recommended that water main break information be continuously monitored and evaluated to identify future water main replacement projects.

4.3.1 Water Main Break Rate

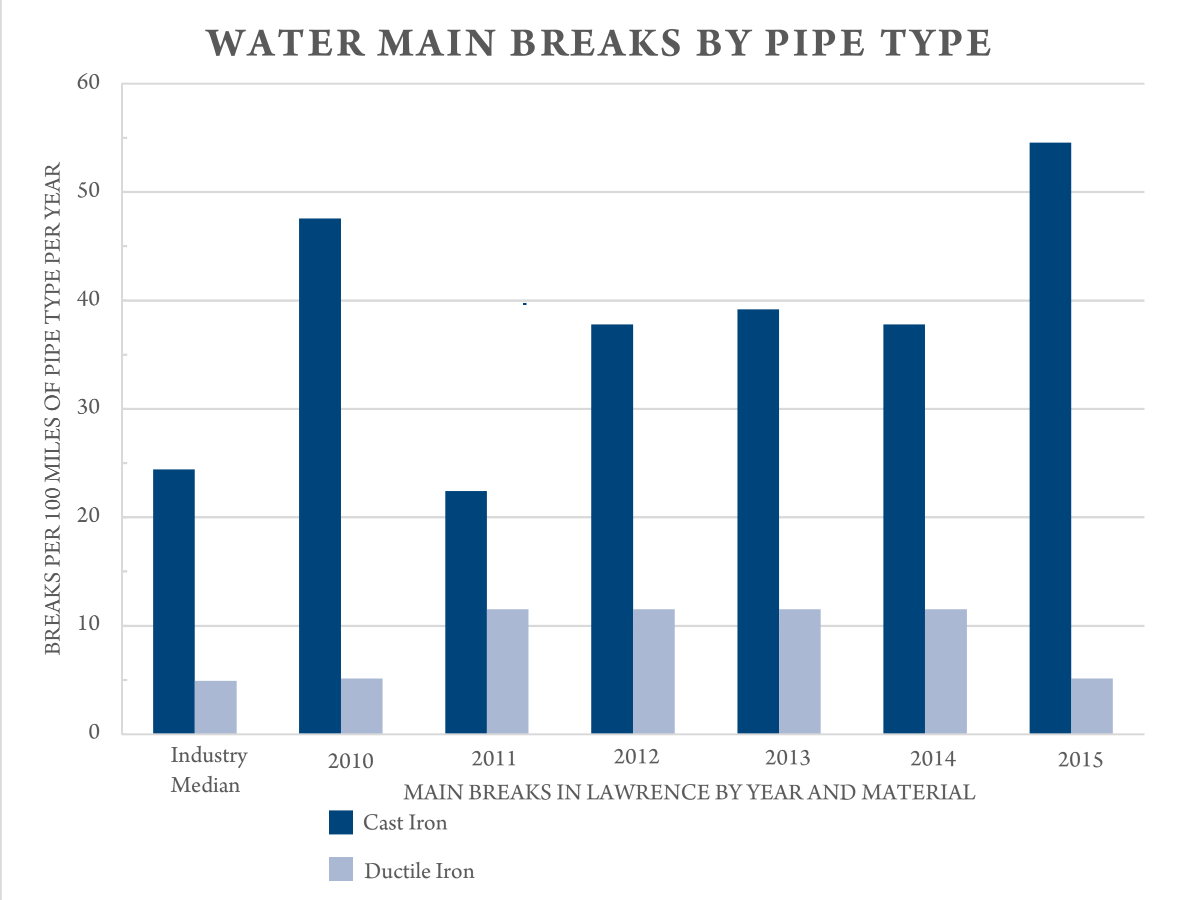
According to the 2012 AWWA benchmark survey, the median number of water main breaks for all pipe materials per year is 11 per 100 miles of pipe for systems of comparable size. During 2010-2015, the system experienced a total of 224 breaks. This equals an average of 16.8 main breaks per year per 100 miles of pipe which is roughly 1.5 times the AWWA median. In addition, the trend line of annual breaks in Lawrence shows an increasing number of water main breaks per year. Water main breaks should be continually documented to evaluate this trend in the future and identify future water main replacement projects. **Chart 4.3.1.1** shows the AWWA benchmark for water main breaks per 100 miles across the country compared to the number of water main breaks per 100 miles in Lawrence over the past six years.

Chart 4.3.1.1: 2010-2015 Water Main Breaks



The majority of Lawrence's water main breaks are cast iron or ductile iron water mains. **Chart 4.3.1.2** only includes the number of main breaks that are of these materials. Other main breaks were documented but totaled 9 breaks over the six-year period and were excluded to compare the data for older pipe materials against the industry data. The industry median value is also shown on the chart for comparison.

Chart 4.3.1.2: 2010-2015 Water Main Breaks by Type



4.3.2 WMRP Recommendations

Lawrence's system contains a total of approximately 225 miles of water mains. The water main replacement projects identified in this report resulting from the BRE analysis total approximately 6.15 miles or 2.7% of the total length of the distribution system. Typical replacement rates for utilities across the country range from 0-2% per year. Assuming the replacement rate is 1% of the system per year to achieve a system wide replacement rate of 100 years, additional water mains should be identified for replacement based on age. After replacing water mains at a certain rate, the number of water main breaks should begin to decrease over time. If the number of breaks continues to increase, the replacement rate should be increased. The goal is to have a replacement rate that allows for the number of water main breaks to decrease each year until reaching near the industry standard. Based on the estimated project cost per foot for the BRE projects (approximately $250/ft.), the estimated remaining cost for the 20-year planning period to maintain a 1% annual replacement rate for the system is estimated at $51,381,000 or **$2,569,000 per year**.

A complete WMRP evaluation was not completed as a part of this report. Further evaluation of the system after additional data is obtained is recommended to develop the annual WMRP.

4.4 Vehicle Replacement Plan

The vehicle fleet for Lawrence was analyzed to determine the approximate replacement cost to maintain the current fleet. During the evaluation, the salvage value of each vehicle was not included in the assessment since the salvage value can vary greatly for vehicles depending on mileage, condition, accident history, and maintenance records. In order to maintain the current fleet, the estimated cost is approximately **$115,000 per year.**

5.0 CAPITAL IMPROVEMENTS PLAN SUMMARY

Based on the information gathered and provided by Lawrence, review of the existing facilities, asset management development, results of the asset ratings, and project development, a capital improvements plan (CIP) was developed over the 20-year planning period.

5.1 Project Prioritization and Schedule

The probability of failure, consequence of failure, and redundancy score (where applicable) were used to determine the BRE rating for the assets. By using the BRE ratings, projects were developed and prioritized based upon the average BRE rating of the assets included as a part of that project. As a result of the BRE ratings, the amount of risk has been quantified and project priorities and schedules are able to be determined. The CIP should serve as a framework for future improvements in Lawrence's water system required to achieve an acceptable level of service for the community. Refer to **Table 5-1** on the following page for the CIP Schedule.

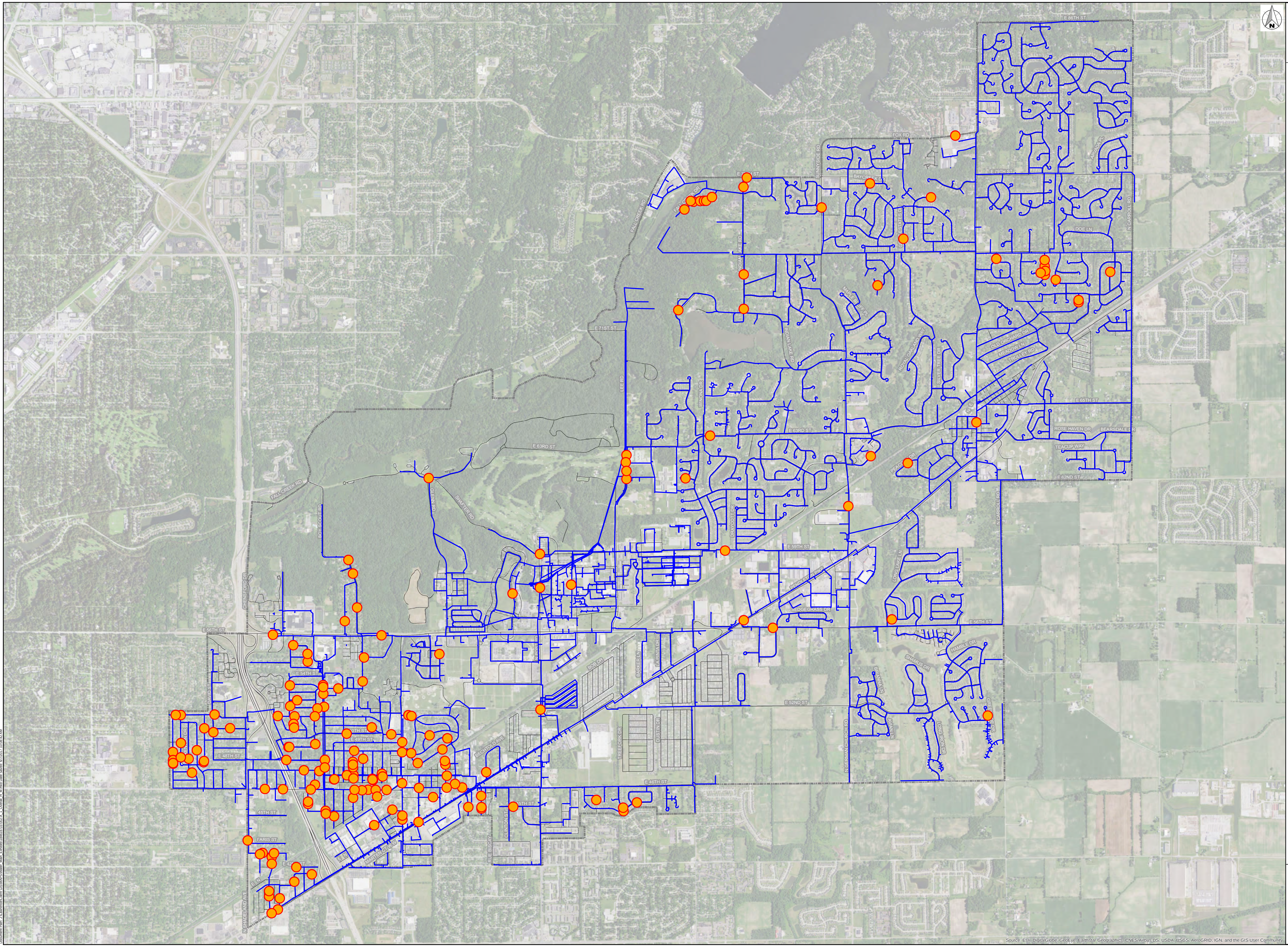
TABLE 5-1 - CAPITAL IMPROVEMENTS PLAN SCHEDULE

Project No.	CIP Item	Total Project Cost	Yearly Cost				
			2017	2018	2019	2020	2021
Process Assets							
P1	Richardt WTP Phase IA	$ 170,000	$ 170,000				
P2	Richardt WTP Phase II*	$ 5,420,000	$ 2,710,000	$ 2,710,000			
P3	Indian Lake Well Field Rehabilitation	$ 1,025,000	$ 60,000	$ 356,000			
P4	Oaklandon Rd. Tank Rehabilitation	$ 600,000		$ 600,000			
P5	Indian Lake WTP Rehabilitation	$ 790,000			$ 76,000	$ 301,000	
P6	52nd St. Tank Rehabilitation	$ 476,000			$ 476,000		
P7	Fort Harrison WTP Improvements	$ 6,137,500			$ 3,068,750	$ 3,068,750	
P8	Fort Harrison Well Field Rehabilitation	$ 2,765,000	$ 70,000	$ 700,000			
Distribution Assets							
D1	Downtown (E 47th St, between N Sadler Dr and N Franklin Rd)	$ 1,528,000			$ 306,000	$ 1,222,000	
D2	N Kitley Ave, Leone Dr, Karen Dr Area	$ 1,844,000			$ 369,000	$ 1,475,000	
D3	Lee Rd Raw Water Main (at golf course)	$ 373,000					$ 373,000
D4	Downtown (E 46th St, between Payton Ave and N Franklin Rd)	$ 920,000					$ 920,000
D5	E 43rd St (between N Shadeland Ave and Elmhurst Dr)	$ 453,000					$ 453,000
D6	Elmhurst and Kingman Dr (between Picton Dr and Pendleton Pike	$ 497,000					$ 497,000
D7	E 46th St (between Van Cleave St and Pendleton Pike)	$ 459,000					$ 459,000
D8	Fall Creek Dr and Sumac Ln (south of Hermosa Dr)*	$ 144,100	$ 144,100				
D9	N Franklin Rd (between Plummer St and Records St)	$ 197,000					$ 197,000
D10	E 49th St (between Elmhurst Dr and N Sadler Dr)	$ 425,000					$ 425,000
D11	Pebblebrooke Dr and Stacie Cir (between E 75th St and Richie Cir)	$ 424,000					
D12	E 52nd St (between N Kitley Ave and Katherine Dr)	$ 105,000					$ 105,000
D13	E 50th St (between N Franklin Rd and Barlow Dr)	$ 125,000					
D14	Zoeller Ave (south of E 46th St)	$ 223,000					
D15	N Hartman Dr (between E 45th St and E 46th St)	$ 194,000					
D16	Barbour Ct (north of E 51st St)	$ 112,000					
D17	Water Main Replacement Program	$ 51,381,000					
		TOTAL ANNUAL SRF PROJECT COST	$ 3,154,100	$ 4,366,000	$ 4,295,750	$ 6,066,750	$ -
		TOTAL ANNUAL CAPITAL COST (NON-SRF)	$ -	$ -	$ -	$ -	$ 3,429,000
		TOTAL ANNUAL CAPITAL COST	$ 3,154,100	$ 4,366,000	$ 4,295,750	$ 6,066,750	$ 3,429,000
		SRF LOAN	$ 3,154,100	$ 4,366,000	$ 4,295,750	$ 6,066,750	$ -
		ALLOWANCE FOR CAPITAL IMPROVEMENTS	$ -	$ 500,000	$ 1,000,000	$ 1,000,000	$ 1,000,000
		TOTAL ANNUAL BUDGET	$ 3,154,100	$ 4,866,000	$ 5,295,750	$ 7,066,750	$ 1,000,000
		YEARLY BALANCE	$ -	$ 500,000	$ 1,000,000	$ 1,000,000	$ (2,429,000)
		RUNNING BALANCE	$ -	$ 500,000	$ 1,500,000	$ 2,500,000	$ 71,000

* - Bid prices are incorporated

APPENDIX A

Exhibits



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ENGINEERING
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Legend

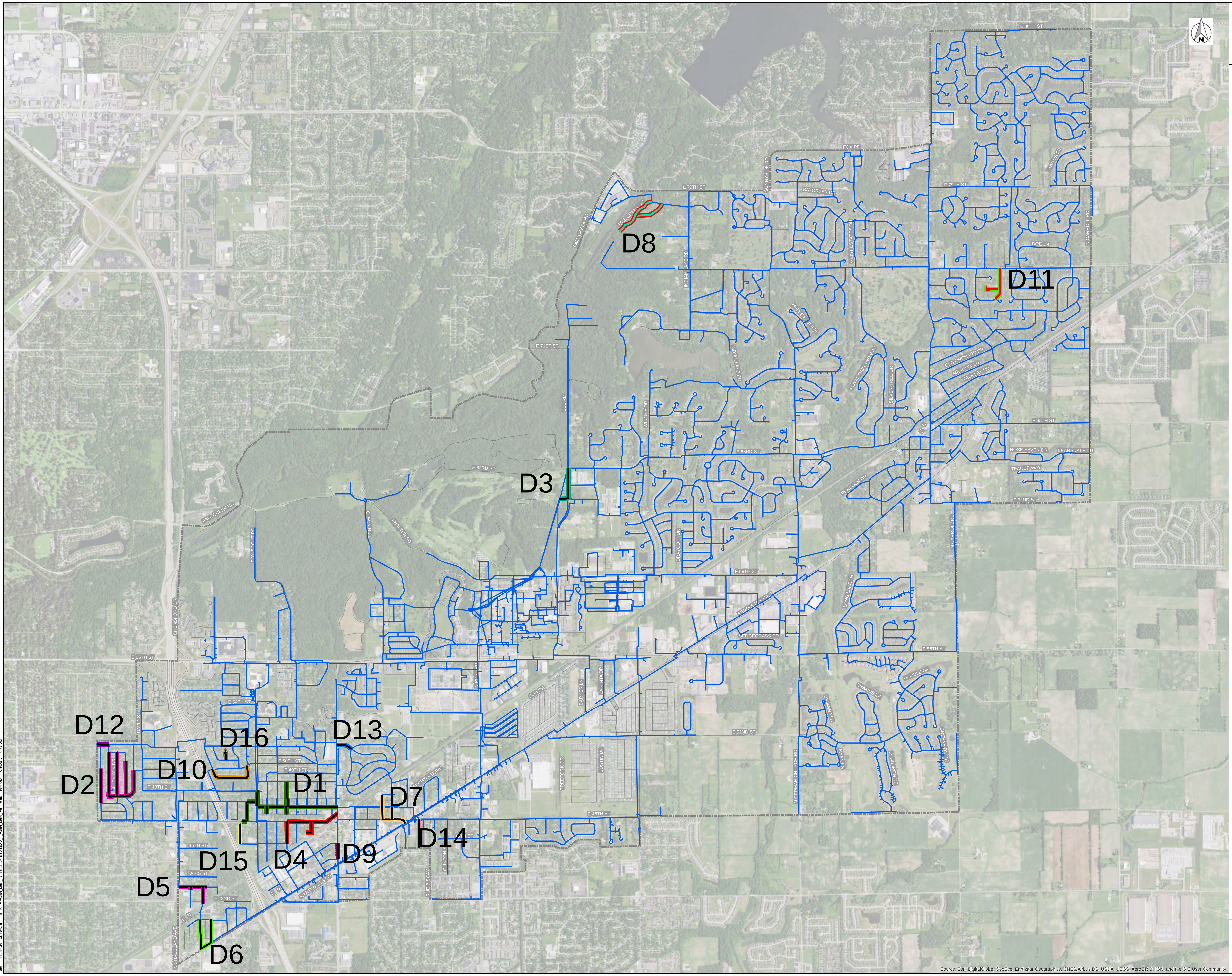
Water Main Breaks
Water Mains
Corporate Limits
Roadway

0 650 1,300 2,600
Feet

EXHIBIT A1
Water Main Break Distribution Map

City of Lawrence
Lawrence, Indiana
Distribution System Map

July 2017
184616.03.02



WESSLER ENGINEERING
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Legend

CIP Water Main Projects

CIP Project ID

- D1 *Downtown (E 47th St, between N Sadler Dr and N Franklin Rd)*
- D2 *N Kitley Ave, Leone Dr, Karen Dr*
- D3 *Lee Rd Raw Water Main (at golf course)*
- D4 *Downtown (E 46th St, between Payton Ave and N Franklin Rd)*
- D5 *E 43rd St (between N Shadeland Ave and Elmhurst*
- D6 *Elmhurst & Kingman Dr (between Picton Dr and Pendleton Pike)*
- D7 *E 46th St (between Van Cleave St and Pendleton Pike)*
- D8 *Fall Creek Dr & Sumac Ln (south of Hermosa Dr)*
- D9 *N Franklin Rd (between Plummer St & Records St)*
- D10 *E 49th St (between Elmhurst Dr and N Sadler Dr)*
- D11 *Pebblebrooke Dr & Stacie Cir (between E 75th St and Richie Cir)*
- D12 *E 52nd St (between N Kitley Ave and Katherine*
- D13 *E 50th St (between N Franklin Rd and Barlow Dr)*
- D14 *Zoeller Ave (south of E 46th St)*
- D15 *N Hartman Dr (between E 45th St and E 46th St)*
- D16 *Barbour Ct (north of E 51st St)*
- Water Mains
- Corporate Limits
- Roadway

0 650 1,300 2,600 Feet

EXHIBIT A2
Distribution System Proposed Projects

City of Lawrence
Lawrence, Indiana
Distribution System Map

July 2017
184616.03.02

APPENDIX B

Cost Estimates

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Engineer's Opinion of Probable Costs

Project No. **184616.03.002**

Process Assets
Project Cost Summary

I. Project Costs

Project No.	Description	BRE	Cost
P1	Richardt WTP Phase IA	23.33	$ 170,000
P2	Richardt WTP Phase II	14.23	$ 5,420,000
P3	Indian Lake Well Field Rehabilitation	13.88	$ 1,025,000
P4	Oaklandon St. Tank Rehabilitation	13.73	$ 600,000
P5	Indian Lake WTP Rehabilitation	12.16	$ 790,000
P6	52nd St. Tank Rehabilitation	11.04	$ 476,000
P7	Fort Harrison WTP Improvements	10.65	$ 6,137,500
P8	Fort Harrison Well Field Rehabilitation	9.99	$ 2,765,000
		Total Probable Project Costs	**$ 17,383,500**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Engineer's Opinion of Probable Costs - Project No. P1

Project No. **184616.03.002** — **Asset Management and Capital Improvements Plan**
Preliminary Cost Estimate — **Richardt WTP Phase IA**
BRE Score **23.33** — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Filter Rehabilitation (new media, hatches, air valves)	4	EA	$ 35,000	$ 140,000
				Subtotal	$ 140,000
				20% Contingency	$ 30,000
				Total Probable Construction Costs	**$ 170,000**

Note:

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Engineer's Opinion of Probable Costs - Project No. P2

Project No. **184616.03.002** — **Asset Management and Capital Improvements Plan**
Preliminary Cost Estimate — **Richardt WTP Phase II**
BRE Score 14.23 — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Existing Facility Demolition	1	LSUM	$ 140,000	$ 140,000
2	Excavation/Backfill	1	LSUM	$ 130,000	$ 130,000
3	Detention Tank - 90,000 gallon	1	LSUM	$ 160,000	$ 160,000
4	Backwash Holding Tank - 60,000 gallon	1	LSUM	$ 115,000	$ 115,000
5	Aerator - 1,500 gpm	2	EA	$ 68,000	$ 136,000
6	Filter - 1,000 gpm	3	EA	$ 295,000	$ 885,000
7	High Service Pump - 1,000 gpm	3	EA	$ 25,000	$ 75,000
8	Process Piping	1	LSUM	$ 230,000	$ 230,000
9	Chemical Feed Piping and Equipment	1	LSUM	$ 75,000	$ 75,000
10	Chlorine Analyzers	1	LSUM	$ 35,000	$ 35,000
11	Fluoride Feed System	1	LSUM	$ 7,500	$ 7,500
12	Turbidimeter	1	LSUM	$ 12,000	$ 12,000
13	Level and Pressure Instruments	1	LSUM	$ 30,000	$ 30,000
14	Lab & Control Room Furnishings	1	LSUM	$ 25,000	$ 25,000
15	Plumbing	1	LSUM	$ 40,000	$ 40,000
16	HVAC	1	LSUM	$ 65,000	$ 65,000
17	Electrical (MCC, transformers, lighting panels, conduit, and wire)	1	LSUM	$ 250,000	$ 250,000
18	SCADA Equipment	1	LSUM	$ 120,000	$ 120,000
19	SCADA Programming & Startup Support	1	LSUM	$ 120,000	$ 120,000
20	Meters	1	LSUM	$ 35,000	$ 35,000
21	Generator - 500 kW Diesel	1	LSUM	$ 160,000	$ 160,000
22	Doors & Windows	1	LSUM	$ 20,000	$ 20,000
23	Building - 30'x72'	2,200	SQ FT	$ 185	$ 407,000
24	Fencing/Gates	1	LSUM	$ 35,000	$ 35,000
25	Building Specialties	1	LSUM	$ 25,000	$ 25,000
26	Miscellaneous Metals	1	LSUM	$ 35,000	$ 35,000
27	Detention Tank Transfer Valves	1	LSUM	$ 15,000	$ 15,000
28	Pump Crane & Clearwell Hoist	1	LSUM	$ 15,000	$ 15,000
29	Well Motor VFD's (Wells 1, 2, 3, and 4)	4	EA	$ 15,000	$ 60,000
30	Coatings - Filters and Piping	1	LSUM	$ 65,000	$ 65,000
31	Concrete Sidewalk	1	LSUM	$ 17,000	$ 17,000
32	Stone Drives	1	LSUM	$ 13,712	$ 13,712
33	Dewatering	1	LSUM	$ 14,000	$ 14,000
34	Site Grading, Seeding, & Landscaping	1	LSUM	$ 15,000	$ 15,000
35	Site Asphalt	1	LSUM	$ 180,000	$ 180,000
36	Storm Drainage	1	LSUM	$ 55,000	$ 55,000
37	Well Rehabilitation	1	LSUM	$ 25,000	$ 25,000
38	Well House Rehabilitation	1	LSUM	$ 140,000	$ 140,000
39	Mob./Demob./Bonds/Insurance	1	LSUM	$ 138,000	$ 138,000
40	Final Cleanup & Restoration	1	LSUM	$ 92,000	$ 92,000
				Subtotal	$ 4,212,212
				10% Contingency	$ 421,000
				Total Probable Construction Costs	**$ 4,633,212**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Study	1	LSUM	$ 15,000	$ 15,000
2	Well Field Safe Yield Analysis	1	LSUM	$ 15,000	$ 15,000
3	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 756,000	$ 756,000
				Total Probable Non-Construction Costs	**$ 786,000**

Total Probable Project Costs	**$ 5,420,000**

Note:

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WESSLER ENGINEERING

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Engineer's Opinion of Probable Costs - Project No. P3

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **Indian Lake Well Field Rehabilitation**

BRE Score 13.88 — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Well 14 Abandonment	1	LSUM	$ 10,000	$ 10,000
2	Well 15R Rehabilitation	1	LSUM	$ 25,000	$ 25,000
3	Well 16 Rehabilitation	1	LSUM	$ 25,000	$ 25,000
4	Electrical	1	LSUM	$ 76,000	$ 76,000
5	SCADA	1	LSUM	$ 50,000	$ 50,000
6	VFDs (Wells 14, 15R, 16)	1	LSUM	$ 32,000	$ 32,000
7	Generator	1	LSUM	$ 100,000	$ 100,000
8	New Well (drilling, casing, pump, motor, installation, and testing)	1	LSUM	$ 100,000	$ 100,000
9	Piping and Valves	1	LSUM	$ 25,000	$ 25,000
10	Fencing and Gates	1	LSUM	$ 15,000	$ 15,000
11	Well House Building Complete	1	LSUM	$ 50,000	$ 50,000
12	Erosion & Sediment Control	1	LSUM	$ 18,000	$ 18,000
13	Mob./Demob./Bonds/Insurance	1	LSUM	$ 29,000	$ 29,000
14	Final Cleanup & Restoration	1	LSUM	$ 18,000	$ 18,000
				Subtotal	$ 573,000
				20% Contingency	$ 115,000
				Total Probable Construction Costs	**$ 688,000**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Study (Test Drilling, Production Tests, Aquifer Performance Test)	1	LSUM	$ 165,000	$ 165,000
2	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 172,000	$ 172,000
				Total Probable Non-Construction Costs	**$ 337,000**

Total Probable Project Costs	**$ 1,025,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

WESSLER ENGINEERING

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Engineer's Opinion of Probable Costs - Project No. P4

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**
Preliminary Cost Estimate — **Oaklandon St. Tank Rehabilitation**
BRE Score 13.73 — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Oaklandon St. Tank Rehabilitation	1	LSUM	$ 394,000	$ 394,000
				Subtotal	$ 394,000
				20% Contingency	$ 79,000
				Total Probable Construction Costs	**$ 473,000**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Study	1	LSUM	$ 15,000	$ 15,000
2	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 112,000	$ 112,000
				Total Probable Non-Construction Costs	**$ 127,000**

Total Probable Project Costs	**$ 600,000**

Note:

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Engineer's Opinion of Probable Costs - Project No. P5

Project No. 184616.03.002
Preliminary Cost Estimate
BRE Score 12.16

Asset Management and Capital Improvements Plan
Indian Lake WTP Rehabilitation
Lawrence Utilities

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Electrical (MCC, conduit, and wire)	1	LSUM	$ 40,000	$ 40,000
2	SCADA Equipment	1	LSUM	$ 150,000	$ 150,000
3	SCADA Programming	1	LSUM	$ 150,000	$ 150,000
4	Generator	1	LSUM	$ 80,000	$ 80,000
5	Post-filtration Chlorination Pump	1	EA	$ 5,000	$ 5,000
6	Chlorine Analyzer Maintenance	1	LSUM	$ 2,000	$ 2,000
7	Chemical Feed Rooms	2	EA	$ 45,000	$ 90,000
				Subtotal	$ 517,000
				20% Contingency	$ 103,000
				Total Probable Construction Costs	**$ 620,000**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Study	1	LSUM	$ 15,000	$ 15,000
2	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 155,000	$ 155,000
				Total Probable Non-Construction Costs	**$ 170,000**

Total Probable Project Costs	**$ 790,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

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Engineer's Opinion of Probable Costs - Project No. P6

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**
Preliminary Cost Estimate — **52nd St. Tank Rehabilitation**
BRE Score 11.04 — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	52nd St. Tank Rehabilitation	1	LSUM	$ 312,000	$ 312,000
				Subtotal	$ 312,000
				20% Contingency	$ 62,000
				Total Probable Construction Costs	**$ 374,000**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Study	1	LSUM	$ 7,500	$ 7,500
2	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 94,000	$ 94,000
				Total Probable Non-Construction Costs	**$ 102,000**

Total Probable Project Costs	**$ 476,000**

Note:

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WESSLER ENGINEERING

More than a Project

Engineer's Opinion of Probable Costs - Project No. P7

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **Fort Harrison WTP Improvements**

BRE Score 10.65 — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Existing Building Demolition	1	LSUM	$ 150,000	$ 150,000
2	Excavation/Backfill	1	LSUM	$ 170,000	$ 170,000
3	Detention Tank - 90,000 gallon	1	LSUM	$ 180,000	$ 180,000
4	Aerator - 1,500 gpm	2	EA	$ 68,000	$ 136,000
5	Horizontal Pressure Filter - 1,000 gpm	3	EA	$ 310,000	$ 930,000
6	Backwash Holding Tank - 60,000 gallon	1	LSUM	$ 125,000	$ 125,000
7	High Service Pumps 1 & 3 Replacement - 1,200 gpm	2	EA	$ 30,000	$ 60,000
8	Process Piping	1	LSUM	$ 185,000	$ 185,000
9	Chemical Feed Piping & Equipment	1	LSUM	$ 90,000	$ 90,000
10	Chemical Feed Analyzers	1	LSUM	$ 30,000	$ 30,000
11	Fluoride Chemical Feed System	1	LSUM	$ 7,500	$ 7,500
12	Lab Equipment	1	LSUM	$ 30,000	$ 30,000
13	Plumbing	1	LSUM	$ 50,000	$ 50,000
14	HVAC	1	LSUM	$ 85,000	$ 85,000
15	Electrical (MCC, conduit, wire, and lighting)	1	LSUM	$ 140,000	$ 140,000
16	SCADA Equipment (Does not incl. Wells- See WS-1)	1	LSUM	$ 150,000	$ 150,000
17	SCADA Programming & Startup Support (Does not incl. Wells- See WS-1)	1	LSUM	$ 100,000	$ 100,000
18	Doors & Windows	1	LSUM	$ 30,000	$ 30,000
19	Filter Building	2,200	SQ FT	$ 200	$ 440,000
20	Storage Building	500	SQ FT	$ 150	$ 75,000
21	New Pump Building Standing Seam Metal Roof	1	LSUM	$ 50,000	$ 50,000
22	Micellaneous Metals	1	LSUM	$ 40,000	$ 40,000
23	Gantry Crane	1	LSUM	$ 20,000	$ 20,000
24	Coatings - Filters & Piping	1	LSUM	$ 80,000	$ 80,000
25	Asphalt Paving	1	LSUM	$ 110,000	$ 110,000
26	Dewatering	1	LSUM	$ 20,000	$ 20,000
27	Site Grading, Seeding, & Landscaping	1	LSUM	$ 20,000	$ 20,000
28	3 MG Storage Reservoir Rehabilitation	1	LSUM	$ 750,000	$ 750,000
29	Mob./Demob./Bonds/Insurance	1	LSUM	$ 125,000	$ 125,000
30	Final Cleanup & Restoration	1	LSUM	$ 85,000	$ 85,000
				Subtotal	$ 4,463,500
				10% Contingency	$ 446,000
				Total Probable Construction Costs	**$ 4,909,500**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 1,228,000	$ 1,228,000
				Total Probable Non-Construction Costs	**$ 1,228,000**

Total Probable Project Costs	**$ 6,137,500**

Note:

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Engineer's Opinion of Probable Costs - Project No. P8

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**
Preliminary Cost Estimate — **Fort Harrison Well Field Rehabilitation**
BRE Score 9.99 — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Abandon Fort Harrison Wells 7, 9, 10	3	EA	$ 10,000	$ 30,000
2	Well 8 Rehabilitation	1	LSUM	$ 25,000	$ 25,000
3	New Well (drilling, casing, pump, motor, installation, and testing)	3	EA	$ 100,000	$ 300,000
4	Electrical (power service and distribution, lighting, and motor starter)	1	LSUM	$ 200,000	$ 200,000
5	Well VFDs	3	EA	$ 15,000	$ 45,000
6	Generator	1	LSUM	$ 100,000	$ 100,000
7	Piping and Valves	1	LSUM	$ 75,000	$ 75,000
8	SCADA updates, PLC, and Flow Meter	1	LSUM	$ 135,000	$ 135,000
9	Fencing and Gates	1	LSUM	$ 45,000	$ 45,000
10	Well House Building Complete	3	EA	$ 150,000	$ 450,000
11	Erosion & Sediment Control	1	LSUM	$ 48,000	$ 48,000
12	Mob./Demob./Bonds/Insurance	1	LSUM	$ 79,000	$ 79,000
13	Final Cleanup & Restoration	1	LSUM	$ 48,000	$ 48,000
				Subtotal	$ 1,580,000
				20% Contingency	$ 316,000
				Total Probable Construction Costs	**$ 1,896,000**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Study (Test Drilling, Production Tests, Aquifer Performance Test)	1	LSUM	$ 395,000	$ 395,000
2	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 474,000	$ 474,000
				Total Probable Non-Construction Costs	**$ 869,000**

Total Probable Project Costs	**$ 2,765,000**

Note:

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Engineer's Opinion of Probable Costs

Project No. **184616.03.002**

Distribution Assets
Project Cost Summary

I. Project Costs

Project No.	Description	BRE	Cost
D1	Downtown (E 47th St, between N Sadler Dr and N Franklin Rd)	16.74	$ 1,528,000
D2	N Kitley Ave, Leone Dr, Karen Dr Area	16.00	$ 1,844,000
D3	Lee Rd Raw Water Main (at golf course)	13.50	$ 373,000
D4	Downtown (E 46th St, between Payton Ave and N Franklin Rd)	10.72	$ 920,000
D5	E 43rd St (between N Shadeland Ave and Elmhurst Dr)	7.56	$ 453,000
D6	Elmhurst & Kingman Dr (between Picton Dr and Pendleton Pike)	7.56	$ 497,000
D7	E 46th St (between Van Cleave St and Pendleton Pike)	7.56	$ 459,000
D8	Fall Creek Dr & Sumac Ln (south of Hermosa Dr)	7.11	$ 144,100
D9	N Franklin Rd (between Plummer St & Records St)	6.48	$ 197,000
D10	E 49th St (between Elmhurst Dr and N Sadler Dr)	6.21	$ 425,000
D11	Pebblebrooke Dr & Stacie Cir (between E 75th St and Richie Cir)	5.60	$ 424,000
D12	E 52nd St (between N Kitley Ave and Katherine Dr)	4.92	$ 105,000
D13	E 50th St (between N Franklin Rd and Barlow Dr)	4.92	$ 125,000
D14	Zoeller Ave (south of E 46th St)	4.86	$ 223,000
D15	N Hartman Dr (between E 45th St and E 46th St)	3.69	$ 194,000
D16	Barbour Ct (north of E 51st St)	2.87	$ 112,000
D17	Water Main Replacement Program	-	$ 51,381,000
	Total Probable Project Costs		**$ 59,404,100**

Note:

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More than a Project

Engineer's Opinion of Probable Costs - Project D1

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **Downtown (E 47th St, between N Sadler Dr and N Franklin Rd)**

BRE 16.74 — **Lawrence Utilities**

I. Line D1A - N Sadler Dr (between W 46th St and E 47th St)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	655	LFT	$ 55	$ 36,025
2	H-3 Hydrant Assembly	1	EA	$ 5,500	$ 5,500
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	6" Connect to Existing Main	1	EA	$ 4,000	$ 4,000
5	3/4" Water Service Reconnect	16	EA	$ 1,800	$ 28,800
6	Pavement Repair	200	LFT	$ 85	$ 17,000
7	Mob./Demob./Bonds/Insurance	1	LSUM	$ 10,000	$ 10,000
8	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 10,000	$ 10,000
				Subtotal	$ 114,000
				10% Contingency	$ 11,000
				Total Probable Construction Costs	**$ 125,000**

II. Line D1B - E 46th St (between N Sadler Dr and N Hartman Dr)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	180	LFT	$ 55	$ 9,900
2	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
3	6" Connect to Existing Main	1	EA	$ 4,000	$ 4,000
4	3/4" Water Service Reconnect	6	EA	$ 1,800	$ 10,800
5	Pavement Repair	75	LFT	$ 85	$ 6,375
6	Mob./Demob./Bonds/Insurance	1	LSUM	$ 3,000	$ 3,000
7	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 3,000	$ 3,000
				Subtotal	$ 39,000
				10% Contingency	$ 4,000
				Total Probable Construction Costs	**$ 43,000**

III. Line D1C - E 47th St (between N Sadler Dr and N Richardt Ave)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	300	LFT	$ 55	$ 16,500
2	H-3 Hydrant Assembly	1	EA	$ 5,500	$ 5,500
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	6" Connect to Existing Main	1	EA	$ 4,000	$ 4,000
5	3/4" Water Service Reconnect	1	EA	$ 1,800	$ 1,800
6	Pavement Repair	50	LFT	$ 85	$ 4,250
7	Mob./Demob./Bonds/Insurance	1	LSUM	$ 4,000	$ 4,000
8	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 4,000	$ 4,000
				Subtotal	$ 42,000
				10% Contingency	$ 4,000
				Total Probable Construction Costs	**$ 46,000**

IV. Line D1D - N Richardt Ave (between E 47th St and E 48th St)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	8" C900 PVC Water Main (Open Cut)	550	LFT	$ 80	$ 44,000
2	8" Gate Valve & Box	1	EA	$ 2,500	$ 2,500
3	8" Connect to Existing Main	2	EA	$ 5,500	$ 11,000
4	3/4" Water Service Reconnect	12	EA	$ 1,800	$ 21,600
5	Pavement Repair	550	LFT	$ 85	$ 46,750
6	Mob./Demob./Bonds/Insurance	1	LSUM	$ 13,000	$ 13,000
7	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 13,000	$ 13,000
				Subtotal	$ 152,000
				10% Contingency	$ 15,000
				Total Probable Construction Costs	**$ 167,000**

V. Line D1E - E 47th St (between N Richardt Ave and N Franklin Rd)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" RJ C900 PVC Water Main (HDD)	2,650	LFT	$ 75	$ 198,750
2	H-3 Hydrant Assembly	6	EA	$ 5,500	$ 33,000
3	6" Gate Valve & Box	4	EA	$ 1,700	$ 6,800
4	6" Connect to Existing Main	15	EA	$ 4,000	$ 60,000
5	3/4" Water Service Reconnect	30	EA	$ 1,800	$ 54,000
6	Pavement Repair	700	LFT	$ 85	$ 59,500
7	Mob./Demob./Bonds/Insurance	1	LSUM	$ 40,000	$ 40,000
8	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 40,000	$ 40,000
				Subtotal	$ 493,000
				10% Contingency	$ 49,000
				Total Probable Construction Costs	**$ 542,000**

VI. Line D1F - Longworth Ave (south of E 47th St)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	4" RJ C900 PVC Water Main (HDD)	270	LFT	$ 70	$ 18,900
2	4" Connect to Existing Main	1	EA	$ 3,500	$ 3,500
3	3/4" Water Service Reconnect	8	EA	$ 1,800	$ 14,400
4	Concrete Sidewalk Repair	40	LFT	$ 35	$ 1,400
5	Pavement Repair	25	LFT	$ 85	$ 2,125
6	Mob./Demob./Bonds/Insurance	1	LSUM	$ 5,000	$ 5,000
7	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 5,000	$ 5,000
				Subtotal	$ 51,000
				10% Contingency	$ 5,000
				Total Probable Construction Costs	**$ 56,000**

VII. Line D1G - Payton Ave (south of E 47th St)

Item	Description	Quantity	Unit	Unit Price		Total Price	
1	4" RJ C900 PVC Water Main (HDD)	260	LFT	$	70	$	18,200
2	4" Connect to Existing Main	1	EA	$	3,500	$	3,500
3	3/4" Water Service Reconnect	10	EA	$	1,800	$	18,000
4	Pavement Repair	75	LFT	$	85	$	6,375
5	Mob./Demob./Bonds/Insurance	1	LSUM	$	6,000	$	6,000
6	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$	6,000	$	6,000
					Subtotal	$	59,000
					10% Contingency	$	6,000
					Total Probable Construction Costs	**$**	**65,000**

VIII. Line D1H - Payton Ave (between E 47th St and E 48th St)

Item	Description	Quantity	Unit	Unit Price		Total Price	
1	6" RJ C900 PVC Water Main (HDD)	820	LFT	$	75	$	61,500
2	6" Connect to Existing Main	2	EA	$	4,000	$	8,000
3	3/4" Water Service Reconnect	26	EA	$	1,800	$	46,800
4	Abandon Parallel Water Main	1	LSUM	$	3,500	$	3,500
5	Pavement Repair	160	LFT	$	85	$	13,600
6	Mob./Demob./Bonds/Insurance	1	LSUM	$	14,000	$	14,000
7	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$	14,000	$	14,000
					Subtotal	$	162,000
					10% Contingency	$	16,000
					Total Probable Construction Costs	**$**	**178,000**

Total Probable Project Construction Costs	**$**	**1,222,000**

IX. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price		Total Price	
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$	306,000	**$**	**306,000**

Total Probable ProjectCosts	**$**	**1,528,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.
2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.
3.) Remaining valve placement based on location of existing valves.
4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.
5.) Number of services based on GIS parcel data.

More than a Project

Engineer's Opinion of Probable Costs - Project D2

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**
Preliminary Cost Estimate — **N Kitley Ave, Leone Dr, Karen Dr Area**
BRE 16.00 — **Lawrence Utilities**

I. Line D2A - N Kitley Ave (between Brookhaven Dr and E 49th St)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	1,200	LFT	$ 55	$ 66,000
2	H-3 Hydrant Assembly	2	EA	$ 5,500	$ 11,000
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	4" Connect to Existing Main	1	EA	$ 3,500	$ 3,500
5	6" Connect to Existing Main	1	EA	$ 4,000	$ 4,000
6	3/4" Water Service Reconnect	38	EA	$ 1,800	$ 68,400
7	Pavement Repair	630	LFT	$ 85	$ 53,550
8	Concrete Sidewalk Repair	20	LFT	$ 35	$ 700
9	Concrete Curb & Gutter Repair	20	LFT	$ 75	$ 1,500
10	Mob./Demob./Bonds/Insurance	1	LSUM	$ 22,000	$ 22,000
11	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 22,000	$ 22,000
				Subtotal	$ 255,000
				10% Contingency	$ 26,000
				Total Probable Construction Costs	**$ 281,000**

II. Line D2B - Katherine Dr (between N Kenyon Dr and Karen Dr)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	1,750	LFT	$ 55	$ 96,250
2	H-3 Hydrant Assembly	3	EA	$ 5,500	$ 16,500
3	6" Gate Valve & Box	2	EA	$ 1,700	$ 3,400
4	6" Connect to Existing Main	3	EA	$ 4,000	$ 12,000
5	3/4" Water Service Reconnect	54	EA	$ 1,800	$ 97,200
6	Pavement Repair	700	LFT	$ 85	$ 59,500
7	Concrete Sidewalk Repair	20	LFT	$ 35	$ 700
8	Concrete Curb & Gutter Repair	20	LFT	$ 75	$ 1,500
9	Mob./Demob./Bonds/Insurance	1	LSUM	$ 30,000	$ 30,000
10	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 30,000	$ 30,000
				Subtotal	$ 348,000
				10% Contingency	$ 35,000
				Total Probable Construction Costs	**$ 383,000**

III. Line D2C - N Kenyon Dr (between Leone Dr and Karen Dr)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	1,480	LFT	$ 55	$ 81,400
2	H-3 Hydrant Assembly	2	EA	$ 5,500	$ 11,000
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	6" Connect to Existing Main	2	EA	$ 4,000	$ 8,000
5	3/4" Water Service Reconnect	46	EA	$ 1,800	$ 82,800
6	Pavement Repair	520	LFT	$ 85	$ 44,200
7	Concrete Sidewalk Repair	20	LFT	$ 35	$ 700
8	Concrete Curb & Gutter Repair	20	LFT	$ 75	$ 1,500
9	Mob./Demob./Bonds/Insurance	1	LSUM	$ 24,000	$ 24,000
10	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 24,000	$ 24,000
				Subtotal	$ 280,000
				10% Contingency	$ 28,000
				Total Probable Construction Costs	**$ 308,000**

IV. Line D2D - Karen Dr (between Leone Dr and E 49th St)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	1,200	LFT	$ 55	$ 66,000
2	H-3 Hydrant Assembly	2	EA	$ 5,500	$ 11,000
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	6" Connect to Existing Main	2	EA	$ 4,000	$ 8,000
5	3/4" Water Service Reconnect	34	EA	$ 1,800	$ 61,200
6	Pavement Repair	415	LFT	$ 85	$ 35,275
7	Concrete Sidewalk Repair	35	LFT	$ 35	$ 1,225
8	Concrete Curb & Gutter Repair	20	LFT	$ 75	$ 1,500
9	Mob./Demob./Bonds/Insurance	1	LSUM	$ 20,000	$ 20,000
10	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 20,000	$ 20,000
				Subtotal	$ 226,000
				10% Contingency	$ 23,000
				Total Probable Construction Costs	**$ 249,000**

V. Line D2E - Leone Dr (between N Kenyon Dr and E 49th St)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	1,320	LFT	$ 55	$ 72,600
2	H-3 Hydrant Assembly	1	EA	$ 5,500	$ 5,500
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	4" Connect to Existing Main	1	EA	$ 3,500	$ 3,500
5	6" Connect to Existing Main	4	EA	$ 4,000	$ 16,000
6	3/4" Water Service Reconnect	30	EA	$ 1,800	$ 54,000
7	Pavement Repair	400	LFT	$ 85	$ 34,000
8	Concrete Sidewalk Repair	40	LFT	$ 35	$ 1,400
9	Concrete Curb & Gutter Repair	20	LFT	$ 75	$ 1,500
10	Mob./Demob./Bonds/Insurance	1	LSUM	$ 20,000	$ 20,000
11	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 20,000	$ 20,000
				Subtotal	$ 231,000
				10% Contingency	$ 23,000
				Total Probable Construction Costs	**$ 254,000**

Total Probable Project Construction Costs	**$ 1,475,000**

VI. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 369,000	**$ 369,000**

Total Probable ProjectCosts	**$ 1,844,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.
2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.
3.) Remaining valve placement based on location of existing valves.
4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.
5.) Number of services based on GIS parcel data.

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Engineer's Opinion of Probable Costs - Project D3

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **Lee Rd Raw Water Main (at golf course)**

BRE 13.50 — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	16" C900 PVC Water Main (Open Cut)	1,500	LFT	$ 130	$ 195,000
2	16" Connect to Existing Main	2	EA	$ 12,000	$ 24,000
3	Pavement Repair	50	EA	$ 85	$ 4,250
4	Mob./Demob./Bonds/Insurance	1	LSUM	$ 12,000	$ 12,000
5	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 12,000	$ 12,000
				Subtotal	$ 248,000
				20% Contingency	$ 50,000
				Total Probable Construction Costs	**$ 298,000**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 75,000	**$ 75,000**

Total Probable ProjectCosts	**$ 373,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.

2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.

3.) Remaining valve placement based on location of existing valves.

4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.

5.) Number of services based on GIS parcel data.

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Engineer's Opinion of Probable Costs - Project D4

Project No. **184616.03.002** — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **Downtown (E 46th St, between Payton Ave and N Franklin Rd)**

BRE 10.72 — **Lawrence Utilities**

I. Line D4A - E 46th St (between Payton Ave and N Franklin Rd)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	1,800	LFT	$ 55	$ 99,000
2	H-3 Hydrant Assembly	2	EA	$ 5,500	$ 11,000
3	6" Connect to Existing Main	4	EA	$ 4,000	$ 16,000
4	3/4" Water Service Reconnect	39	EA	$ 1,800	$ 70,200
5	Large Water Service Reconnect	1	EA	$ 2,500	$ 2,500
6	Pavement Repair	1,700	LFT	$ 85	$ 144,500
7	Mob./Demob./Bonds/Insurance	1	LSUM	$ 18,000	$ 18,000
8	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 18,000	$ 18,000
				Subtotal	$ 380,000
				20% Contingency	$ 76,000
				Total Probable Construction Costs	**$ 456,000**

II. Line D4B - Payton Ave (between E 46th St and E 45th St)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	750	LFT	$ 55	$ 41,250
2	H-3 Hydrant Assembly	2	EA	$ 5,500	$ 11,000
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	6" Connect to Existing Main	1	EA	$ 4,000	$ 4,000
5	3/4" Water Service Reconnect	25	EA	$ 1,800	$ 45,000
6	Pavement Repair	500	LFT	$ 85	$ 42,500
7	Mob./Demob./Bonds/Insurance	1	LSUM	$ 8,000	$ 8,000
8	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 8,000	$ 8,000
				Subtotal	$ 162,000
				20% Contingency	$ 32,000
				Total Probable Construction Costs	**$ 194,000**

III. Line D4C - Dunn St

Item	6" C900 PVC Water Main (Open Cut)	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	540	LFT	$ 55	$ 29,700
2	H-3 Hydrant Assembly	2	EA	$ 5,500	$ 11,000
3	6" Gate Valve & Box	2	EA	$ 1,700	$ 3,400
4	3/4" Water Service Reconnect	10	EA	$ 1,800	$ 18,000
5	Crushed Stone Drive Repair	100	LFT	$ 15	$ 1,500
6	Mob./Demob./Bonds/Insurance	1	LSUM	$ 4,000	$ 4,000
7	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 4,000	$ 4,000
				Subtotal	$ 72,000
				20% Contingency	$ 14,000
				Total Probable Construction Costs	**$ 86,000**

Total Probable Project Construction Costs	**$ 736,000**

IV. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 184,000	**$ 184,000**

Total Probable ProjectCosts	**$ 920,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.

2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.

3.) Remaining valve placement based on location of existing valves.

4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.

5.) Number of services based on GIS parcel data.

Engineer's Opinion of Probable Costs - Project D5

Project No. 184616.03.002 **Asset Management and Capital Improvements Plan**
Preliminary Cost Estimate **E 43rd St (between N Shadeland Ave and Elmhurst Dr)**
BRE 7.56 **Lawrence Utilities**

I. Line D5A - E 43rd St (between N Shadeland Ave and Elmhurst Dr)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	8" RJ C900 PVC Water Main (HDD)	950	LFT	$ 100	$ 95,000
2	H-3 Hydrant Assembly	2	EA	$ 5,500	$ 11,000
3	8" Gate Valve & Box	2	EA	$ 2,500	$ 5,000
4	8" Connect to Existing Main	2	EA	$ 5,500	$ 11,000
5	3/4" Water Service Reconnect	15	EA	$ 1,800	$ 27,000
6	Pavement Repair	165	LFT	$ 85	$ 14,025
7	Mob./Demob./Bonds/Insurance	1	LSUM	$ 9,000	$ 9,000
8	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 9,000	$ 9,000
				Subtotal	$ 182,000
				20% Contingency	$ 36,000
				Total Probable Construction Costs	**$ 218,000**

II. Line D5B - Englewood Dr (south of E 43rd St)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	100	LFT	$ 55	$ 5,500
2	H-3 Hydrant Assembly	1	EA	$ 5,500	$ 5,500
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	6" Connect to Existing Main	1	EA	$ 4,000	$ 4,000
5	3/4" Water Service Reconnect	5	EA	$ 1,800	$ 9,000
6	Crushed Stone Drive Repair	30	LFT	$ 15	$ 450
7	Pavement Repair	20	LFT	$ 85	$ 1,700
8	Mob./Demob./Bonds/Insurance	1	LSUM	$ 2,000	$ 2,000
9	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 2,000	$ 2,000
				Subtotal	$ 32,000
				20% Contingency	$ 6,000
				Total Probable Construction Costs	**$ 38,000**

III. Line D5C - Elmhurst Dr (between E 43rd St and E 42nd St)

Item	Description	Quantity	Unit	Unit Price		Total Price	
1	6" C900 PVC Water Main (Open Cut)	550	LFT	$	55	$	30,250
2	H-3 Hydrant Assembly	2	EA	$	5,500	$	11,000
3	6" Gate Valve & Box	1	EA	$	1,700	$	1,700
4	6" Connect to Existing Main	1	EA	$	4,000	$	4,000
5	3/4" Water Service Reconnect	13	EA	$	1,800	$	23,400
6	Crushed Stone Drive Repair	60	LFT	$	15	$	900
7	Pavement Repair	100	LFT	$	85	$	8,500
8	Mob./Demob./Bonds/Insurance	1	LSUM	$	4,000	$	4,000
9	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$	4,000	$	4,000
					Subtotal	$	88,000
					20% Contingency	$	18,000
					Total Probable Construction Costs	**$**	**106,000**

Total Probable Project Construction Costs	**$**	**362,000**

IV. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price		Total Price	
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$	91,000	**$**	**91,000**

Total Probable ProjectCosts	**$**	**453,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.
2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.
3.) Remaining valve placement based on location of existing valves.
4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.
5.) Number of services based on GIS parcel data.

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Engineer's Opinion of Probable Costs - Project D6

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **Elmhurst & Kingman Dr (between Picton Dr and Pendleton Pike)**

BRE 7.56 — **Lawrence Utilities**

I. Line D6A - Kingman Dr (between Picton Dr and Pendleton Pike)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	730	LFT	$ 55	$ 40,150
2	H-3 Hydrant Assembly	1	EA	$ 5,500	$ 5,500
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	6" Connect to Existing Main	1	EA	$ 4,000	$ 4,000
5	3/4" Water Service Reconnect	14	EA	$ 1,800	$ 25,200
6	Crushed Stone Drive Repair	100	LFT	$ 15	$ 1,500
7	Pavement Repair	80	LFT	$ 85	$ 6,800
8	Mob./Demob./Bonds/Insurance	1	LSUM	$ 5,000	$ 5,000
9	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 5,000	$ 5,000
				Subtotal	$ 95,000
				20% Contingency	$ 19,000
				Total Probable Construction Costs	**$ 114,000**

II. Line D6B - Elmhurst Dr & Pendleton Pike (between Kingman Dr and Picton Dr)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	8" C900 PVC Water Main (Open Cut)	890	LFT	$ 80	$ 71,200
2	8" RJ C900 PVC Water Main (HDD)	480	LFT	$ 100	$ 48,000
3	H-3 Hydrant Assembly	3	EA	$ 5,500	$ 16,500
4	8" Gate Valve & Box	2	EA	$ 2,500	$ 5,000
5	6" Connect to Existing Main	1	EA	$ 4,000	$ 4,000
6	8" Connect to Existing Main	1	EA	$ 5,500	$ 5,500
7	3/4" Water Service Reconnect	27	EA	$ 1,800	$ 48,600
8	Crushed Stone Drive Repair	100	LFT	$ 15	$ 1,500
9	Pavement Repair	160	LFT	$ 85	$ 13,600
10	Mob./Demob./Bonds/Insurance	1	LSUM	$ 11,000	$ 11,000
11	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 11,000	$ 11,000
				Subtotal	$ 236,000
				20% Contingency	$ 47,000
				Total Probable Construction Costs	**$ 283,000**

Total Probable Project Construction Costs	**$ 397,000**

III. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 100,000	**$ 100,000**

Total Probable ProjectCosts	**$ 497,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.

2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.

3.) Remaining valve placement based on location of existing valves.

4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.

5.) Number of services based on GIS parcel data.

WESSLER ENGINEERING

More than a Project

Engineer's Opinion of Probable Costs - Project D7

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **E 46th St (between Van Cleave St and Pendleton Pike)**

BRE 7.56 — **Lawrence Utilities**

I. Line D7A - Van Cleave St (between E 46th St and E 48th St)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	820	LFT	$ 55	$ 45,100
2	H-3 Hydrant Assembly	1	EA	$ 5,500	$ 5,500
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	6" Connect to Existing Main	4	EA	$ 4,000	$ 16,000
5	3/4" Water Service Reconnect	16	EA	$ 1,800	$ 28,800
6	Pavement Repair	135	LFT	$ 85	$ 11,475
7	Crushed Stone Drive Repair	300	LFT	$ 15	$ 4,500
8	Concrete Curb & Gutter Repair	15	LFT	$ 75	$ 1,125
9	Mob./Demob./Bonds/Insurance	1	LSUM	$ 6,000	$ 6,000
10	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 6,000	$ 6,000
				Subtotal	$ 127,000
				20% Contingency	$ 25,000
				Total Probable Construction Costs	**$ 152,000**

II. Line D7B - E 47th St (at Van Cleave St)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	60	LFT	$ 55	$ 3,300
2	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
3	6" Gate Valve & Box	1	EA	$ 4,000	$ 4,000
4	3/4" Water Service Reconnect	1	EA	$ 1,800	$ 1,800
5	Pavement Repair	15	LFT	$ 85	$ 1,275
6	Crushed Stone Drive Repair	20	LFT	$ 15	$ 300
9	Mob./Demob./Bonds/Insurance	1	LSUM	$ 1,000	$ 1,000
10	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 1,000	$ 1,000
				Subtotal	$ 15,000
				20% Contingency	$ 3,000
				Total Probable Construction Costs	**$ 18,000**

III. Line D7C - E 46th St (between Van Cleave St and Pendleton Pike)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	860	LFT	$ 55	$ 47,300
2	6" Connect to Existing Main	3	EA	$ 4,000	$ 12,000
3	3/4" Water Service Reconnect	10	EA	$ 1,800	$ 18,000
4	Pavement Repair	165	LFT	$ 85	$ 14,025
5	Crushed Stone Drive Repair	60	LFT	$ 15	$ 900
6	Concrete Sidewalk Repair	200	LFT	$ 35	$ 7,000
7	Concrete Curb & Gutter Repair	15	LFT	$ 75	$ 1,125
8	Mob./Demob./Bonds/Insurance	1	LSUM	$ 6,000	$ 6,000
9	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 6,000	$ 6,000
				Subtotal	$ 113,000
				20% Contingency	$ 23,000
				Total Probable Construction Costs	**$ 136,000**

IV. Line D7D - Mehaffey St (between E 46th St and E 47th St)

Item	Description	Quantity	Unit	Unit Price		Total Price	
1	6" C900 PVC Water Main (Open Cut)	410	LFT	$	55	$	22,550
2	H-3 Hydrant Assembly	1	EA	$	5,500	$	5,500
3	6" Gate Valve & Box	1	EA	$	1,700	$	1,700
4	6" Connect to Existing Main	1	EA	$	4,000	$	4,000
5	3/4" Water Service Reconnect	3	EA	$	1,800	$	5,400
6	Pavement Repair	60	EA	$	85	$	5,100
7	Crushed Stone Drive Repair	20	LFT	$	15	$	300
8	Concrete Curb & Gutter Repair	10	LFT	$	35	$	350
9	Mob./Demob./Bonds/Insurance	1	LSUM	$	3,000	$	3,000
10	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$	3,000	$	3,000
					Subtotal	$	51,000
					20% Contingency	$	10,000
					Total Probable Construction Costs	**$**	**61,000**

Total Probable Project Construction Costs	**$**	**367,000**

V. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price		Total Price	
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$	92,000	**$**	**92,000**

Total Probable ProjectCosts	**$**	**459,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.
2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.
3.) Remaining valve placement based on location of existing valves.
4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.
5.) Number of services based on GIS parcel data.

WESSLER ENGINEERING

More than a Project

Engineer's Opinion of Probable Costs - Project D8

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **Fall Creek Dr & Sumac Ln (south of Hermosa Dr)**

BRE 7.11 — **Lawrence Utilities**

I. Line D8A - Sumac Ln (between Hermosa Dr and Fall Creek Dr)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" DR-11 HDPE Water Main (HDD)	1,035	LFT	$ 45	$ 46,575
2	6" C900 PVC Water Main	60	LFT	$ 79	$ 4,740
3	H-3 Hydrant Assembly	1	EA	$ 7,478	$ 7,478
4	6"x6" Tapping Sleeve and Valve	1	EA	$ 5,188	$ 5,188
5	New 3/4" HDPE Water Service (short)	2	EA	$ 1,823	$ 3,646
6	New 3/4" HDPE Water Service (long)	3	EA	$ 2,255	$ 6,765
7	New 1" HDPE Water Service (short)	1	EA	$ 1,866	$ 1,866
8	Air Release Valve	2	EA	$ 2,940	$ 5,880
9	Transition Coupling	4	EA	$ 500	$ 2,000
10	Remove Existing Hydrant	1	EA	$ 830	$ 830
11	Remove Existing Valve	2	EA	$ 250	$ 500
12	Remove Existing Meter Pit	6	EA	$ 45	$ 270
13	Temporary Blowoff Assembly	1	EA	$ 300	$ 300
14	Cut and Cap Existing Water Main	2	EA	$ 2,035	$ 4,070
15	Granular Backfill	110	LFT	$ 20	$ 2,200
16	Asphalt Pavement Repair	100	LFT	$ 69	$ 6,900
17	Mob./Demob./Bonds/Insurance	1	LSUM	$ 9,542	$ 9,542
18	Final Cleanup & Restoration	1	LSUM	$ 6,350	$ 6,350
				Total Bid Costs	**$ 115,100**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 29,000	**$ 29,000**

Total Probable Project Costs	**$ 144,100**

Note:

All probable construction costs are based upon bid prices received by Finch Constructors, Inc.. Non-construction costs are estimated by Wessler Engineering.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.

2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.

3.) Remaining valve placement based on location of existing valves.

4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.

5.) Number of services based on GIS parcel data.

WESSLER ENGINEERING

More than a Project

Engineer's Opinion of Probable Costs - Project D9

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **N Franklin Rd (between Plummer St & Records St)**

BRE 6.48 — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" RJ C900 PVC Water Main (HDD)	540	LFT	$ 75	$ 40,500
2	H-3 Hydrant Assembly	1	EA	$ 5,500	$ 5,500
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	6" Connect to Existing Main	2	EA	$ 4,000	$ 8,000
5	3/4" Water Service Reconnect	15	EA	$ 1,800	$ 27,000
6	Pavement Repair	300	LFT	$ 85	$ 25,500
7	Concrete Sidewalk Repair	95	LFT	$ 35	$ 3,325
8	Concrete Curb & Gutter Repair	95	LFT	$ 75	$ 7,125
9	Mob./Demob./Bonds/Insurance	1	LSUM	$ 6,000	$ 6,000
10	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 6,000	$ 6,000
				Subtotal	$ 131,000
				20% Contingency	$ 26,000
				Total Probable Construction Costs	**$ 157,000**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 40,000	**$ 40,000**

Total Probable ProjectCosts	**$ 197,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.

2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.

3.) Remaining valve placement based on location of existing valves.

4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.

5.) Number of services based on GIS parcel data.

More than a Project™

Engineer's Opinion of Probable Costs - Project D10

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **E 49th St (between Elmhurst Dr and N Sadler Dr)**

BRE 6.21 — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	1,750	LFT	$ 55	$ 96,250
2	H-3 Hydrant Assembly	4	EA	$ 5,500	$ 22,000
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	8" Connect to Existing Main	2	EA	$ 5,500	$ 11,000
5	3/4" Water Service Reconnect	41	EA	$ 1,800	$ 73,800
6	Pavement Repair	545	LFT	$ 85	$ 46,325
7	Concrete Sidewalk Repair	100	LFT	$ 35	$ 3,500
8	Concrete Curb & Gutter Repair	25	LFT	$ 75	$ 1,875
9	Mob./Demob./Bonds/Insurance	1	LSUM	$ 13,000	$ 13,000
10	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 13,000	$ 13,000
				Subtotal	$ 283,000
				20% Contingency	$ 57,000
				Total Probable Construction Costs	**$ 340,000**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 85,000	**$ 85,000**

Total Probable ProjectCosts	**$ 425,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.

2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.

3.) Remaining valve placement based on location of existing valves.

4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.

5.) Number of services based on GIS parcel data.

WESSLER ENGINEERING

More than a Project

Engineer's Opinion of Probable Costs - Project D11

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **Pebblebrooke Dr & Stacie Cir (between E 75th St and Richie Cir)**

BRE 5.60 — **Lawrence Utilities**

I. Line D11A - Stacie Cir (west of Pebblebrooke Dr)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	450	LFT	$ 55	$ 24,750
2	H-3 Hydrant Assembly	1	EA	$ 5,500	$ 5,500
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	3/4" Water Service Reconnect	12	EA	$ 1,800	$ 21,600
5	Pavement Repair	160	LFT	$ 85	$ 13,600
6	Concrete Sidewalk Repair	10	LFT	$ 35	$ 350
7	Concrete Curb & Gutter Repair	10	LFT	$ 75	$ 750
8	Mob./Demob./Bonds/Insurance	1	LSUM	$ 4,000	$ 4,000
9	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 4,000	$ 4,000
				Subtotal	$ 77,000
				20% Contingency	$ 15,000
				Total Probable Construction Costs	**$ 92,000**

II. Line D11B - Pebblebrooke Dr (between E 75th St and Richie Cir)

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	1,500	LFT	$ 55	$ 82,500
2	H-3 Hydrant Assembly	2	EA	$ 5,500	$ 11,000
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	3/4" Water Service Reconnect	22	EA	$ 1,800	$ 39,600
4	6" Connect to Existing Main	2	EA	$ 4,000	$ 8,000
5	12" Connect to Existing Main	1	EA	$ 7,000	$ 7,000
6	Pavement Repair	390	LFT	$ 85	$ 33,150
7	Concrete Curb & Gutter Repair	30	LFT	$ 75	$ 2,250
7	Mob./Demob./Bonds/Insurance	1	LSUM	$ 10,000	$ 10,000
8	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 10,000	$ 10,000
				Subtotal	$ 206,000
				20% Contingency	$ 41,000
				Total Probable Construction Costs	**$ 247,000**

Total Probable Project Construction Costs	**$ 339,000**

III. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 85,000	**$ 85,000**

Total Probable ProjectCosts	**$ 424,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.

2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.

3.) Remaining valve placement based on location of existing valves.

4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.

5.) Number of services based on GIS parcel data.

More than a Project

Engineer's Opinion of Probable Costs - Project D12

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **E 52nd St (between N Kitley Ave and Katherine Dr)**

BRE 4.92 — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	340	LFT	$ 55	$ 18,700
2	H-3 Hydrant Assembly	1	EA	$ 5,500	$ 5,500
3	4" Connect to Existing Main	1	EA	$ 3,500	$ 3,500
4	6" Connect to Existing Main	2	EA	$ 4,000	$ 8,000
5	3/4" Water Service Reconnect	8	EA	$ 1,800	$ 14,400
6	Pavement Repair	130	LFT	$ 85	$ 11,050
7	Concrete Sidewalk Repair	15	LFT	$ 35	$ 525
8	Concrete Curb & Gutter Repair	10	LFT	$ 75	$ 750
9	Mob./Demob./Bonds/Insurance	1	LSUM	$ 4,000	$ 4,000
10	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 4,000	$ 4,000
				Subtotal	$ 70,000
				20% Contingency	$ 14,000
				Total Probable Construction Costs	**$ 84,000**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 21,000	**$ 21,000**

Total Probable ProjectCosts	**$ 105,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.
2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.
3.) Remaining valve placement based on location of existing valves.
4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.
5.) Number of services based on GIS parcel data.

More than a Project

Engineer's Opinion of Probable Costs - Project D13

Project No. 184616.03.002 | **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate | **E 50th St (between N Franklin Rd and Barlow Dr)**

BRE 4.92 | **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	530	LFT	$ 55	$ 29,150
2	4" Connect to Existing Main	1	EA	$ 3,500	$ 3,500
2	6" Connect to Existing Main	1	EA	$ 4,000	$ 4,000
3	3/4" Water Service Reconnect	13	EA	$ 1,800	$ 23,400
4	Pavement Repair	150	EA	$ 85	$ 12,750
5	Concrete Sidewalk Repair	20	EA	$ 35	$ 700
6	Concrete Curb & Gutter Repair	20	LFT	$ 75	$ 1,500
7	Mob./Demob./Bonds/Insurance	1	LSUM	$ 4,000	$ 4,000
8	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 4,000	$ 4,000
				Subtotal	$ 83,000
				20% Contingency	$ 17,000
				Total Probable Construction Costs	**$ 100,000**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 25,000	**$ 25,000**

Total Probable ProjectCosts	**$ 125,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.

2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.

3.) Remaining valve placement based on location of existing valves.

4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.

5.) Number of services based on GIS parcel data.

More than a Project™

Engineer's Opinion of Probable Costs - Project D14

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **Zoeller Ave (south of E 46th St)**

BRE 4.86 — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	910	LFT	$ 55	$ 50,050
2	H-3 Hydrant Assembly	3	EA	$ 5,500	$ 16,500
3	6" Connect to Existing Main	1	EA	$ 4,000	$ 4,000
4	3/4" Water Service Reconnect	20	EA	$ 1,800	$ 36,000
5	Pavement Repair	315	EA	$ 85	$ 26,775
6	Mob./Demob./Bonds/Insurance	1	LSUM	$ 7,000	$ 7,000
7	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 7,000	$ 7,000
				Subtotal	$ 148,000
				20% Contingency	$ 30,000
				Total Probable Construction Costs	**$ 178,000**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 45,000	**$ 45,000**

Total Probable ProjectCosts	**$ 223,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.

2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.

3.) Remaining valve placement based on location of existing valves.

4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.

5.) Number of services based on GIS parcel data.

More than a Project™

Engineer's Opinion of Probable Costs - Project D15

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **N Hartman Dr (between E 45th St and E 46th St)**

BRE 3.69 — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" RJ C900 PVC Water Main (HDD)	680	LFT	$ 75	$ 51,000
2	H-3 Hydrant Assembly	3	EA	$ 5,500	$ 16,500
3	6" Gate Valve & Box	1	EA	$ 1,700	$ 1,700
4	8" Connect to Existing Main	1	EA	$ 5,500	$ 5,500
5	3/4" Water Service Reconnect	22	EA	$ 1,800	$ 39,600
6	Concrete Sidewalk Repair	70	LFT	$ 35	$ 2,450
7	Mob./Demob./Bonds/Insurance	1	LSUM	$ 6,000	$ 6,000
8	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 6,000	$ 6,000
				Subtotal	$ 129,000
				20% Contingency	$ 26,000
				Total Probable Construction Costs	**$ 155,000**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 39,000	**$ 39,000**

Total Probable ProjectCosts	**$ 194,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.

2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.

3.) Remaining valve placement based on location of existing valves.

4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.

5.) Number of services based on GIS parcel data.

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Engineer's Opinion of Probable Costs - Project D16

Project No. 184616.03.002 — **Asset Management and Capital Improvements Plan**

Preliminary Cost Estimate — **Barbour Ct (north of E 51st St)**

BRE 2.87 — **Lawrence Utilities**

I. Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	6" C900 PVC Water Main (Open Cut)	300	LFT	$ 55	$ 16,500
2	H-3 Hydrant Assembly	1	EA	$ 5,500	$ 5,500
3	6" Connect to Existing Main	1	EA	$ 4,000	$ 4,000
4	3/4" Water Service Reconnect	8	EA	$ 1,800	$ 14,400
5	Pavement Repair	300	LFT	$ 85	$ 25,500
6	Mob./Demob./Bonds/Insurance	1	LSUM	$ 4,000	$ 4,000
7	Erosion Control, Final Cleanup, and Restoration	1	LSUM	$ 4,000	$ 4,000
				Subtotal	$ 74,000
				20% Contingency	$ 15,000
				Total Probable Construction Costs	**$ 89,000**

II. Non-Construction Costs

Item	Description	Quantity	Unit	Unit Price	Total Price
1	Survey, Design, Bid, Construction Administration, and Inspection	1	LSUM	$ 23,000	**$ 23,000**

Total Probable ProjectCosts	**$ 112,000**

Note:

All probable construction costs are based upon 2016 dollars. Construction materials and costs have been volatile in recent years. In providing these cost estimates, Wessler Engineering has no control over the costs of labor, equipment, materials, or contractors' methods of pricing. The cost estimates are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.

Assumptions:

1.) Hydrant spacing based on existing hydrant locations.

2.) Assumes all tie overs to existing mains will be done via tapping sleeves, reducing the number of valves needed.

3.) Remaining valve placement based on location of existing valves.

4.) Assumes that all 2-inch mains will be upsized to 4-inch mains.

5.) Number of services based on GIS parcel data.

APPENDIX C

Project BRE Summary Tables

Asset ID	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Filter E1	Richardt WTP	5.00	4.67	1.00	**23.33**
	Filter E2	Richardt WTP	5.00	4.67	1.00	**23.33**
	Filter W1	Richardt WTP	5.00	4.67	1.00	**23.33**
	Filter W2	Richardt WTP	5.00	4.67	1.00	**23.33**
	MCC - HSP1, HSP2 and Wells	Richardt WTP	4.24	4.42	1.00	**18.73**
	Filter Room Transformer	Richardt WTP	3.78	4.78	1.00	**18.06**
	Indian Lake WTP MCC	Indian Lake WTP	3.52	4.78	1.00	**16.82**
	High Service Pump 4	Richardt WTP	5.00	3.35	1.00	**16.75**
	East Reaction Tank	Richardt WTP	4.08	4.08	1.00	**16.66**
	Filter Building Transformer	Richardt WTP	3.32	4.78	1.00	**15.86**
	Main Service Disconnect Switch	Richardt WTP	3.32	4.78	1.00	**15.86**
	Fort Harrison Ground Storage Reservoir		3.68	4.31	1.00	**15.84**
	Chlorine Building	Richardt WTP	3.46	4.53	1.00	**15.67**
	West Reaction Tank	Richardt WTP	3.82	4.08	1.00	**15.60**
	Filter House MCC	Fort Harrison WTP	3.26	4.78	1.00	**15.58**
	Post-filtration Chlorination	Richardt WTP	3.50	4.39	1.00	**15.36**
	Well No. 15R	Indian Lake Well Field	3.98	3.72	1.00	**14.81**
	Motor Control Center	Richardt WTP	4.04	3.67	1.00	**14.81**
	Well No. 16	Indian Lake Well Field	3.78	3.78	1.00	**14.28**
	Oaklandon Elevated Storage Tank		3.48	3.94	1.00	**13.73**
	Motor Starter	Richardt WTP	2.8	4.78	1.00	**13.38**
	I&C	Richardt WTP	3.58	3.67	1.00	**13.13**
	I&C	Fort Harrison WTP	3.58	3.67	1.00	**13.13**
	I&C	Indian Lake WTP	3.58	3.67	1.00	**13.13**
	Well No. 4	Richardt WTP	4.26	3.00	1.00	**12.78**
	Chlorine Analyzer	Indian Lake WTP	3.52	3.58	1.00	**12.61**
	Backwash Holding Tank	Richardt WTP	3.28	3.81	1.00	**12.48**
	Filter Building	Richardt WTP	3	4.14	1.00	**12.42**
	Sodium Hypo Bulk Tank	Indian Lake WTP	2.54	4.81	1.00	**12.21**

Asset ID	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Well No. 14	Indian Lake Well Field	3.32	3.78	1.00	**12.18**
	Well No. 1	Richardt WTP	3.32	3.44	1.00	**11.95**
	Post-filtration Chlorination Pump	Indian Lake WTP	2.64	4.39	1.00	**11.59**
	Well Pump Control Panel	Fort Harrison WTP	3.12	3.67	1.00	**11.44**
	Safety switches x2 (Aerators)	Indian Lake WTP	3.06	3.72	1.00	**11.39**
	Well Set Points	Fort Harrison WTP	3.06	3.72	1.00	**11.39**
	HSP-MCC	Fort Harrison WTP	2.34	4.78	1.00	**11.18**
	Well No. 9	Fort Harrison Well Field	3.78	2.94	1.00	**11.13**
	52nd St. Elevated Storage Tank		2.8	3.94	1.00	**11.04**
	Filter Building	Fort Harrison WTP	2.74	3.97	1.00	**10.88**
	U.S. Filter Control	Richardt WTP	2.94	3.67	1.00	**10.78**
	RP Backflow Preventer	Richardt WTP	3.52	3.06	1.00	**10.75**
	Storage Resevoir	Fort Harrison WTP	2.44	4.39	1.00	**10.71**
	High Service Pump 3	Fort Harrison WTP	3.62	2.72	1.00	**10.56**
	Aerator #2 Building	Richardt WTP	3.62	2.89	1.00	**10.46**
	Chlorine Controls	Indian Lake WTP	3.06	3.42	1.00	**10.46**
	Chlorine Analyzer/PH	Fort Harrison WTP	2.6	4.00	1.00	**10.40**
	Chlorine Analyzer	Fort Harrison WTP	2.6	4.00	1.00	**10.40**
	Chlorine Controller	Fort Harrison WTP	2.6	4.00	1.00	**10.40**
	Chlorine Analyzer	Fort Harrison WTP	2.6	4.00	1.00	**10.40**
	Filter Control PLC	Fort Harrison WTP	2.80	3.67	1.00	**10.27**
	High Service Pump Control Panel	Indian Lake WTP	2.80	3.67	1.00	**10.27**
	Aerator #1 - HSP 1 and HSP 2 Building	Richardt WTP	3.46	2.89	1.00	**10.00**
	Well No. 10	Fort Harrison Well Field	3.32	2.94	1.00	**9.78**
	Lighting Panel	Fort Harrison Well Field - Well 10	3.32	2.94	1.00	**9.78**
	Well PLC	Fort Harrison Well Field	2.94	3.31	1.00	**9.72**
	Sodium Hypo Bulk Storage Tank bottom	Fort Harrison WTP	2.54	3.78	1.00	**9.60**
	Sodium Hypo Bulk Tank Top	Indian Lake WTP	2.54	3.69	1.00	**9.38**
	High Service Pump 1	Richardt WTP	2.68	3.50	1.00	**9.38**

Asset ID	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	High Service Pump 2	Richardt WTP	2.68	3.50	1.00	**9.38**
	Post-Filtration Chlorine Analyzer	Indian Lake WTP	2.6	3.58	1.00	**9.32**
	Post-filtration Chlorination	Fort Harrison WTP	1.86	4.39	1.00	**9.30**
	Well No. 8	Fort Harrison Well Field	2.96	3.22	1.00	**9.22**
	Filter 1	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	Filter 2	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	Filter 3	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	Filter 4	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	Filter 5	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	Filter 6	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	Filter 7	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	Filter 8	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	Filter 9	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	High Service Pump 1	Fort Harrison WTP	3.34	2.72	1.00	**9.09**
	HSP Building	Fort Harrison WTP	2.28	3.97	1.00	**9.06**
	Sodium Hypo Tank Base	Richardt WTP	2.38	3.78	1.00	**8.99**
	Automatic Transfer Switch	Fort Harrison WTP	1.88	4.78	1.00	**8.98**
	Flowtronex motor control panel	Winding Ridge	2.12	4.22	1.00	**8.95**
	Unit Heater	Fort Harrison Well Field - Well 9	4.24	2.11	1.00	**8.95**
	Unit Heater	Fort Harrison Well Field - Well 10	4.24	2.11	1.00	**8.95**
	Pre-filtration Chlorination Pump	Indian Lake WTP	2.8	3.19	1.00	**8.94**
	Well Pump Control Panel	Indian Lake WTP	2.80	3.14	1.00	**8.79**
	Air actuators	Fort Harrison WTP	2.34	3.67	1.00	**8.58**
	8" Butterfly Valve Backwash	Richardt WTP - Filter Building	3.98	2.14	1.00	**8.51**
	10" Gate Valve	Fort Harrison WTP	3.92	2.14	1.00	**8.38**
	Well No. 3	Richardt WTP	3.52	2.36	1.00	**8.31**
	Lighting Panel	Richardt WTP - Well No. 1	2.4	3.44	1.00	**8.27**
	Level Controller	Fort Harrison WTP	2.62	3.14	1.00	**8.22**
	Exhaust Fan	Fort Harrison Well Field - Wells 15/16	3.78	2.11	1.00	**7.98**

Asset ID	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Well No. 2	Richardt WTP	3.68	2.17	1.00	**7.97**
	8" Butterfly Valve - Raw	Fort Harrison WTP	3.62	2.14	1.00	**7.74**
	8" Butterfly Valve - Raw	Fort Harrison WTP	3.62	2.14	1.00	**7.74**
	Pre-filtration Chlorination Pump	Fort Harrison WTP	2.38	3.25	1.00	**7.73**
	Reaction Tank	Indian Lake WTP	2	3.81	1.00	**7.61**
	Bulk Chlorine Rate Meter	Richardt WTP	1.58	4.75	1.00	**7.51**
	Aerator 1	Richardt WTP	4.28	3.50	0.50	**7.49**
	Aerator 2	Richardt WTP	4.28	3.50	0.50	**7.49**
	Sodium Hypo Bulk Storage Tank Top	Fort Harrison WTP	2.54	2.94	1.00	**7.48**
	Filter Control Panel 1	Fort Harrison WTP	2.86	2.61	1.00	**7.47**
	Filter Control Panel 2	Fort Harrison WTP	2.86	2.61	1.00	**7.47**
	High Service Pump 2	Fort Harrison WTP	2.48	2.72	1.00	**7.46**
	Pre-filtration Chlorination	Richardt WTP	2.28	3.25	1.00	**7.41**
	12" Butterfly Valve - Raw	Fort Harrison WTP	3.46	2.14	1.00	**7.40**
	8" Butterfly Valve - Plant Finished	Fort Harrison WTP	3.46	2.14	1.00	**7.40**
	High Service Pump 3	Richardt WTP	3.76	1.94	1.00	**7.31**
	8" Butterfly - Filter E1 Raw	Richardt WTP - Filter Building	3.68	1.94	1.00	**7.16**
	8" Butterfly - Filter E1 Finished	Richardt WTP - Filter Building	3.68	1.94	1.00	**7.16**
	8" Butterfly - Filter E2 Finished	Richardt WTP - Filter Building	3.68	1.94	1.00	**7.16**
	8" Gate Valve Filter E1	Richardt WTP - Filter Building	3.68	1.94	1.00	**7.16**
	8" Butterfly Valve - Filter E1 Raw Right	Richardt WTP - Filter Building	3.68	1.94	1.00	**7.16**
	12" Globe Check Valve - Raw	Fort Harrison WTP	3.32	2.14	1.00	**7.10**
	6" Butterfly Valve - Filters 1-6 Backwash Rate	Fort Harrison WTP	3.62	1.94	1.00	**7.04**
	6" Valve Actuator - Filter 6 Finished	Fort Harrison WTP	3.62	1.94	1.00	**7.04**
	6" Butterfly Valve - Filter 5 Finished	Fort Harrison WTP	3.62	1.94	1.00	**7.04**
	6" Butterfly Valve - Filter 5 Finished	Fort Harrison WTP	3.62	1.94	1.00	**7.04**
	6" Valve Actuator - Filter 4 Finished	Fort Harrison WTP	3.62	1.94	1.00	**7.04**
	Sodium Hypo Tank Top	Richardt WTP	2.38	2.94	1.00	**7.01**
	Winding Ridge Ground Storage Tank		2.6	2.69	1.00	**7.00**

Asset ID	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	8" Gate Valve	Richardt WTP - Filter Building	3.22	2.14	1.00	**6.89**
	Chlorine Analyzer	Richardt WTP - Filter Building	1.88	3.58	1.00	**6.74**
	6" Valve Actuator - Filter 1 - Finished	Fort Harrison WTP	3.46	1.94	1.00	**6.73**
	6" Butterfly Valve - Filter 1 - Finished	Fort Harrison WTP	3.46	1.94	1.00	**6.73**
	6" Butterfly Valve - Finished	Fort Harrison WTP	3.46	1.94	1.00	**6.73**
	Well #2 Building	Richardt WTP	3	2.14	1.00	**6.42**
	Well #1 Building	Richardt WTP	3	2.14	1.00	**6.42**
	6" Butterfly Valve - Plant Finished	Fort Harrison WTP	3	2.14	1.00	**6.42**
	Utility Meter	Fort Harrison Well Field - Wells 15/16	2.4	2.67	1.00	**6.40**
	2-4" Butterfly Valves Filter E2 Drain Line	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	2- 8" Butterfly Valves Filter E2 Finished	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	2-4" Butterfly Valves Filter E1 Drain Line	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	2-8" Butterfly Valves Filter E1 Finished	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	8" Butterfly Valve Filter W1	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	8" Butterfly Valve Filter W1 Finished	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	8" Butterfly Valve Filter W2	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	8" Gate Valve Filter W2	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	8" Gate Valve Filter W1	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	8" Gate Valve Filter E2	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	6" Butterfly Valve - Filter W2 Raw Left	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	8" Butterfly Valve - Filter W1 Raw Right	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	8" Butterfly Valve - Filter E1 Raw Left	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	8" Butterfly Valve - Filter E1 Raw Left	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	8" Butterfly Valve - Filter E1 Raw Right	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	8" Butterfly Valve - Filter E2 Raw Right	Richardt WTP - Filter Building	3.22	1.94	1.00	**6.26**
	6" Butterfly Valve - Filter 8 - Finished	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Butterfly Valve - Filter 7 - Raw	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Butterfly Valve-Filter 1 - Raw	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Valve Actuator-Filter 1 - Raw	Fort Harrison WTP	3.16	1.94	1.00	**6.14**

Asset ID	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	6" Valve Actuator - Filter 1 - Raw	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Butterfly Valve - Filter 2 Raw	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Valve Actuator - Filter 2 Raw	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Valve Actuator - Filter 2 Raw	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Valve Actuator - Filter 2 Finished	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Valve Actuator - Filter 2 Finished	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Butterfly Valve - Filter 3 Raw	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Valve Actuator - Filter 3 Finished	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Valve Actuator - Filter 3 Finished	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Butterfly Valve - Filter 6 Raw	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Valve Actuator - Filter 6 Raw	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Valve Actuator - Filter 6 Finished	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Butterfly Valve - Filter 4 Raw	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Valve Actuator - Filter 4 Raw	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Valve Actuator - Filter 4 Finished	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	6" Butterfly Valve - Filter 4 Finished	Fort Harrison WTP	3.16	1.94	1.00	**6.14**
	Click PLC	Fort Harrison WTP	2.34	2.61	1.00	**6.11**
	PLC, Productivity	Fort Harrison WTP	2.34	2.61	1.00	**6.11**
	8" Butterfly Valve - Backwash	Fort Harrison WTP	2.84	2.14	1.00	**6.07**
	AC Drive	Fort Harrison WTP	2.08	2.89	1.00	**6.01**
	Generator Alternator	Fort Harrison WTP	1.88	3.19	1.00	**6.01**
	Generator Engine	Fort Harrison WTP	1.88	3.19	1.00	**6.01**
	6" Butterfly Valve - Filter W2 Raw Right	Richardt WTP - Filter Building	3.06	1.94	1.00	**5.95**
	6" Butterfly Valve - Filter W1 Raw Left	Richardt WTP - Filter Building	3.06	1.94	1.00	**5.95**
	6" Butterfly Valve - Filter W1 Raw Right	Richardt WTP - Filter Building	3.06	1.94	1.00	**5.95**
	8" Butterfly Valve - Filter E2 Raw Left	Richardt WTP - Filter Building	3.06	1.94	1.00	**5.95**
	8" Butterfly Valve - Filter E2 Raw Left	Richardt WTP - Filter Building	3.06	1.94	1.00	**5.95**
	8" Butterfly Valve - Filter E2 Raw Right	Richardt WTP - Filter Building	3.06	1.94	1.00	**5.95**
	Water Heater	Richardt WTP	3.82	1.56	1.00	**5.94**

Asset ID	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Vent	Indian Lake WTP	3.82	1.56	1.00	**5.94**
	High Service Pump 1	Indian Lake WTP	1.48	4.00	1.00	**5.92**
	High Service Pump 2	Indian Lake WTP	1.48	4.00	1.00	**5.92**
	High Service Pump 3	Indian Lake WTP	1.48	4.00	1.00	**5.92**
	Dual Port Throttling Device	Fort Harrison Well Field	3	1.94	1.00	**5.83**
	4" Plug Valve - Filter E1 Drain	Indian Lake WTP	3	1.94	1.00	**5.83**
	4" Plug Valve - Filter W2 Drain	Indian Lake WTP	3	1.94	1.00	**5.83**
	6" Butterfly Valve - Filter 9 - Finished	Fort Harrison WTP	3	1.94	1.00	**5.83**
	6" Butterfly Valve - Filter 9 - Raw	Fort Harrison WTP	3	1.94	1.00	**5.83**
	6" Valve Actuator - Filter 9 - Raw	Fort Harrison WTP	3	1.94	1.00	**5.83**
	6" Butterfly Valve - Filter 8 - Finished	Fort Harrison WTP	3	1.94	1.00	**5.83**
	6" Butterfly Valve - Filter 2 Finished	Fort Harrison WTP	3	1.94	1.00	**5.83**
	6" Valve Actuator - Filter 6 Raw	Fort Harrison WTP	3	1.94	1.00	**5.83**
	6" Butterfly Valve - Filter 6 Finished	Fort Harrison WTP	3	1.94	1.00	**5.83**
	6" Butterfly Valve - Filter 5 Raw	Fort Harrison WTP	3	1.94	1.00	**5.83**
	HMI	Fort Harrison WTP	2.80	2.08	1.00	**5.83**
	Safety Switch Gen Not Used	Indian Lake WTP	2.14	2.67	1.00	**5.71**
	Valve Air Compressor Motor	Fort Harrison WTP	3.26	1.75	1.00	**5.70**
	Garage and Office Building	Richardt WTP	2.38	2.39	1.00	**5.69**
	Overhead Pump Gantry	Fort Harrison WTP	2.38	2.39	1.00	**5.69**
	Valve Air Compressor	Fort Harrison WTP	3.22	1.75	1.00	**5.63**
	Abandoned Well Building	Richardt WTP	3.62	1.56	1.00	**5.63**
	MCC Transformer	Winding Ridge	1.6	3.47	1.00	**5.56**
	6" Butterfly Valve - Filter 8 - Raw	Fort Harrison WTP	2.86	1.94	1.00	**5.56**
	6" Valve Actuator - Filter 4 Raw	Fort Harrison WTP	2.86	1.94	1.00	**5.56**
	Air Valve	Fort Harrison Well Field	2.84	1.94	1.00	**5.52**
	4" Plug Valve - Filter W1 Drain	Indian Lake WTP	2.84	1.94	1.00	**5.52**
	Automation Direct	Fort Harrison WTP	2.08	2.61	1.00	**5.43**
	Chlorine Analyzer	Richardt WTP	2.1	2.58	1.00	**5.42**

Asset ID	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	6" Butterfly Valve - Filter 9 - Finished	Fort Harrison WTP	2.7	1.94	1.00	**5.25**
	6" Valve Actuator - Filter 8 - Raw	Fort Harrison WTP	2.7	1.94	1.00	**5.25**
	6" Butterfly Valve - Filter 7 - Finished	Fort Harrison WTP	2.7	1.94	1.00	**5.25**
	6" Butterfly Valve - Filter 7 - Finished	Fort Harrison WTP	2.7	1.94	1.00	**5.25**
	6" Butterfly Valve - Filter 7 - Raw	Fort Harrison WTP	2.7	1.94	1.00	**5.25**
	6" Valve Actuator - Filter 3 Raw	Fort Harrison WTP	2.7	1.94	1.00	**5.25**
	6" Valve Actuator- Filter 3 Raw	Fort Harrison WTP	2.7	1.94	1.00	**5.25**
	6" Butterfly Valve - Filter 3 Finished	Fort Harrison WTP	2.7	1.94	1.00	**5.25**
	6" Valve Actuator - Filter 5 Raw	Fort Harrison WTP	2.7	1.94	1.00	**5.25**
	6" Valve Actuator - Filter 5 Raw	Fort Harrison WTP	2.7	1.94	1.00	**5.25**
	Furnace	Richardt WTP - Filter Building	2.26	2.28	1.00	**5.15**
	Air Tank	Richardt WTP	2.9	1.75	1.00	**5.07**
	Air Gear Box	Richardt WTP	2.9	1.75	1.00	**5.07**
	Chlorine Transfer Pump 2	Fort Harrison WTP	2.18	2.11	1.00	**5.02**
	Phosphate Mixer	Fort Harrison WTP	2.84	1.75	1.00	**4.97**
	10" Butterfly Valve - Filters 7-9 Backwash Rate	Fort Harrison WTP	2.54	1.94	1.00	**4.94**
	4" Gate Valve - Drain	Indian Lake WTP	2.54	1.94	1.00	**4.94**
	4" Gate Valve - Drain	Indian Lake WTP	2.54	1.94	1.00	**4.94**
	8" Plug Valve - Filter E2	Indian Lake WTP	2.54	1.94	1.00	**4.94**
	4" Plug Valve - Filter E2 Drain	Indian Lake WTP	2.54	1.94	1.00	**4.94**
	8" Plug Valve - Filter E1	Indian Lake WTP	2.54	1.94	1.00	**4.94**
	8" Plug Valve - Filter W1	Indian Lake WTP	2.54	1.94	1.00	**4.94**
	8" Plug Valve - Filter W2	Indian Lake WTP	2.54	1.94	1.00	**4.94**
	Phosphate Feed System	Indian Lake WTP	2.54	1.75	1.00	**4.90**
	MCC Surge Arrester	Winding Ridge	2.06	2.36	1.00	**4.86**
	Splash Proof Switch	Winding Ridge	2.06	2.36	1.00	**4.86**
	Chlorine Room Unit Heater	Richardt WTP	2.76	1.75	1.00	**4.83**
	8" Butterfly Valve - Filter W2 Raw Left	Richardt WTP - Filter Building	2.46	1.94	1.00	**4.78**
	Chlorine Analyzer	Fort Harrison WTP	3.06	1.56	1.00	**4.76**

Asset ID	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Unit Heater	Fort Harrison WTP	3.06	1.56	1.00	**4.76**
	Unit Heater	Fort Harrison WTP	3.06	1.56	1.00	**4.76**
	Unit Heater	Fort Harrison WTP	3.06	1.56	1.00	**4.76**
	Mission System	Fort Harrison WTP	3.06	1.56	1.00	**4.76**
	Chlorine Scale	Fort Harrison WTP	2.54	1.86	1.00	**4.73**
	18" Shutter Mounted Exhaust Fan	Winding Ridge	2.4	1.94	1.00	**4.67**
	Spectrophotometer	Winding Ridge	3	1.56	1.00	**4.67**
	Portable Generator	Richardt WTP	1.62	2.83	1.00	**4.59**
	Water Level Meter	Richardt WTP	2.94	1.56	1.00	**4.57**
	Water Level Meter	Fort Harrison Well Field	2.94	1.56	1.00	**4.57**
	Water Level Meter	Indian Lake WTP	2.94	1.56	1.00	**4.57**
	Finished Water Meter	Indian Lake WTP	2.94	1.56	1.00	**4.57**
	Chart Recorder	Richardt WTP - Filter Building	2.94	1.56	1.00	**4.57**
	Booster Pump 1	Winding Ridge	1.96	2.31	1.00	**4.52**
	Booster Pump 2	Winding Ridge	1.96	2.31	1.00	**4.52**
	Chlorine Transfer Pump	Richardt WTP	2.12	2.11	1.00	**4.48**
	Chlorine Transfer Pump 1	Fort Harrison WTP	2.12	2.11	1.00	**4.48**
	Chlorine Transfer Pump	Indian Lake WTP	2.12	2.11	1.00	**4.48**
	HMI	Indian Lake WTP	2.08	2.14	1.00	**4.45**
	Chlorine Day Tank Scale	Indian Lake WTP	2.54	1.75	1.00	**4.44**
	Building - Winding Ridge	Winding Ridge	2.84	1.56	1.00	**4.42**
	Gen recept	Indian Lake WTP	1.62	2.67	1.00	**4.32**
	Chemical Analyzer	Indian Lake WTP	2.76	1.56	1.00	**4.29**
	Finished Water Meter	Indian Lake WTP	2.72	1.56	1.00	**4.23**
	Effluent Water Meter	Richardt WTP	2.42	1.75	1.00	**4.23**
	Wells 8, 9, 10 Flow Meter	Fort Harrison Well Field	2.42	1.75	1.00	**4.23**
	Backwash Meter	Indian Lake WTP	2.42	1.75	1.00	**4.23**
	Transformer	Winding Ridge	1.6	2.64	1.00	**4.22**
	8" Butterfly Valve - Filter W2 Raw Right	Richardt WTP - Filter Building	2.16	1.94	1.00	**4.20**

Asset ID	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	8" Butterfly Valve - Filter W1 Raw Left	Richardt WTP - Filter Building	2.16	1.94	1.00	**4.20**
	Furnace	Fort Harrison WTP	2.34	1.75	1.00	**4.09**
	Chlorine/Chem. Analyzer	Fort Harrison WTP	2.6	1.56	1.00	**4.04**
	Unit Heater	Indian Lake WTP	2.6	1.56	1.00	**4.04**
	Unit Heater	Indian Lake WTP	2.6	1.56	1.00	**4.04**
	Mission System	Fort Harrison WTP	2.60	1.56	1.00	**4.04**
	Mission Node	Fort Harrison WTP	2.60	1.56	1.00	**4.04**
	Mission	Indian Lake WTP	2.60	1.56	1.00	**4.04**
	Maintenance Building Meter	Richardt WTP	2.48	1.56	1.00	**3.86**
	Backwash Flow Meter	Richardt WTP - Filter Building	2.48	1.56	1.00	**3.86**
	PH Meter	Richardt WTP	2.46	1.56	1.00	**3.83**
	Mission System Node	Fort Harrison Well Field - Wells 15/16	2.4	1.56	1.00	**3.73**
	Chain Hoist	Fort Harrison WTP	2.38	1.56	1.00	**3.70**
	8" Check Valve	Winding Ridge	1.88	1.94	1.00	**3.66**
	8" Check Valve	Winding Ridge	1.88	1.94	1.00	**3.66**
	10" Globe Style Silent Check Valve	Winding Ridge	1.88	1.94	1.00	**3.66**
	4" Butterfly Valve - Discharge and Suction	Winding Ridge	1.88	1.94	1.00	**3.66**
	Air Tank	Indian Lake WTP	2.08	1.75	1.00	**3.64**
	Filter E1	Indian Lake WTP	2.32	3.08	0.50	**3.58**
	Filter E2	Indian Lake WTP	2.32	3.08	0.50	**3.58**
	Filter W1	Indian Lake WTP	2.32	3.08	0.50	**3.58**
	Filter W2	Indian Lake WTP	2.32	3.08	0.50	**3.58**
	Turbidity Meter	Richardt WTP	2.26	1.56	1.00	**3.52**
	PH Meter	Richardt WTP	2.26	1.56	1.00	**3.52**
	Chemical Meter	Richardt WTP	2.26	1.56	1.00	**3.52**
	Turbidity Meter	Indian Lake WTP	2.26	1.56	1.00	**3.52**
	PH Meter	Indian Lake WTP	2.26	1.56	1.00	**3.52**
	Water Heater	Richardt WTP	2.1	1.56	1.00	**3.27**
	Aerator 1	Indian Lake WTP	3.06	2.06	0.50	**3.14**

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	Aerator 2	Indian Lake WTP	3.06	2.06	0.50	**3.14**
	Mag Meter HSP 1 & 2	Richardt WTP	1.74	1.75	1.00	**3.04**
	Mag Meter	Richardt WTP	1.74	1.75	1.00	**3.04**
	Filter E2 Mag Meter	Indian Lake WTP	1.74	1.75	1.00	**3.04**
	Filter E1 Mag Meter	Indian Lake WTP	1.74	1.75	1.00	**3.04**
	Filter W1 Mag Meter	Indian Lake WTP	1.74	1.75	1.00	**3.04**
	Filter W2 Mag Meter	Indian Lake WTP	1.74	1.75	1.00	**3.04**
	Comcast Switch	Fort Harrison WTP	1.44	2.08	1.00	**3.00**
	Switch, ethernet	Fort Harrison WTP	1.44	2.08	1.00	**3.00**
	Sump Pump Basin	Richardt WTP	1.9	1.56	1.00	**2.96**
	8" Butterfly Valve - Filter W1 Raw Left	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	6" Butterfly Valve - Filter W1 Raw Left	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	6" Butterfly Valve - Filter W1 Raw Right	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	8" Butterfly Valve - Filter W1 Raw Right	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	8" Butterfly Valve - Filter E1 Raw Left	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	6" Butterfly Valve - Filter E1 Raw Left	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	6" Butterfly Valve - Filter E1 Raw Right	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	8" Butterfly Valve - Filter E1 Raw Right	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	8" Butterfly Valve - Filter E2 Raw Left	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	6" Butterfly Valve - Filter E2 Raw Left	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	6" Butterfly Valve - Filter E2 Raw Right	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	8" Butterfly Valve - Filter E2 Raw Right	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	8" Butterfly Valve - Filter W2-Left	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	6" Butterfly Valve - Filter W2-Left	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	6" Butterfly Valve - Filter W2-Right	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	8" Butterfly Valve - Filter W2-Right	Indian Lake WTP	1.52	1.94	1.00	**2.96**
	Bulk Tank, Day Tank level	Richardt WTP	1.58	1.75	1.00	**2.76**
	AC #1	Richardt WTP	2.6	1.56	0.67	**2.70**
	AC #2	Richardt WTP	2.6	1.56	0.67	**2.70**

Asset ID	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	AC #3	Richardt WTP	2.6	1.56	0.67	**2.70**
	Bulk Tank, Day Tank Pre & Post Levels	Indian Lake WTP	1.58	1.56	1.00	**2.46**
	Mag Meter	Winding Ridge	1.58	1.56	1.00	**2.46**
	8" Actuator - Filter E2 Right	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	6" Actuator - Filter E2-Right	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	6" Actuator - Filter E2-Left	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	8" Actuator - Filter E2-Left	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	8" Actuator - Filter E1-Right	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	6" Actuator - Filter E1-Right	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	6" Actuator - Filter E1-Left	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	8" Actuator - Filter E1-Left	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	8" Actuator - Filter W1-Right	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	6" Actuator - Filter W1-Right	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	6" Actuator - Filter W1-Left	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	8" Actuator - Filter W1-Left	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	8" Actuator - Filter W2-Right	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	6" Actuator - Filter W2-Right	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	6" Actuator - Filter W2-Left	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	8" Actuator - Filter W2-Left	Indian Lake WTP	1.26	1.94	1.00	**2.45**
	Furnace 2	Richardt WTP	1.84	1.56	0.67	**1.91**
	Furnace 1	Richardt WTP	1.58	1.56	0.67	**1.64**
	Furnace 3	Richardt WTP	1.58	1.56	0.67	**1.64**

Project No.	Project Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Average Asset Business Risk Exposure (1=low, 25=high)
P1	Richardt WTP Phase IA	5.00	4.67	**23.33**
P2	Richardt WTP Phase II	3.65	3.93	**14.23**
P3	Indian Lake Well Field Rehabilitation	3.69	3.76	**13.76**
P4	Oaklandon Rd. Tank Rehabilitation	3.48	3.94	**13.73**
P5	Indian Lake WTP Rehabilitation	3.09	4.00	**12.31**
P6	52nd St. Tank Rehabilitation	2.80	3.94	**11.04**
P7	Fort Harrison WTP Improvements	3.12	3.56	**10.60**
P8	Fort Harrison Well Field Rehabilitation	3.35	3.01	**9.97**
D1	Downtown (E 47th St, between N Sadler Dr and N Franklin Rd)	4.65	3.60	**16.74**
D2	N Kitley Ave, Leone Dr, Karen Dr Area	4.00	4.00	**16.00**
D3	Lee Rd Raw Water Main (at golf course)	2.70	5.00	**13.50**
D4	Downtown (E 46th St, between Payton Ave and N Franklin Rd)	3.35	3.20	**10.72**
D5	E 43rd St (between N Shadeland Ave and Elmhurst Dr)	2.70	2.80	**7.56**
D6	Elmhurst and Kingman Dr (between Picton Dr and Pendleton Pike)	2.70	2.80	**7.56**
D7	E 46th St (between Van Cleave St and Pendleton Pike)	2.70	2.80	**7.56**
D8	Fall Creek Dr and Sumac Ln (south of Hermosa Dr)	3.95	1.80	**7.11**
D9	N Franklin Rd (between Plummer St and Records St)	2.70	2.40	**6.48**
D10	E 49th St (between Elmhurst Dr and N Sadler Dr)	2.70	2.30	**6.21**
D11	Pebblebrooke Dr and Stacie Cir (between E 75th St and Richie Cir)	2.00	2.80	**5.60**
D12	E 52nd St (between N Kitley Ave and Katherine Dr)	2.05	2.40	**4.92**
D13	E 50th St (between N Franklin Rd and Barlow Dr)	2.05	2.40	**4.92**
D14	Zoeller Ave (south of E 46th St)	2.70	1.80	**4.86**
D15	N Hartman Dr (between E 45th St and E 46th St)	2.05	1.80	**3.69**
D16	Barbour Ct (north of E 51st St)	2.05	1.40	**2.87**

Asset ID	Project No.	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	P1	Filter E1	Richardt WTP	5.00	4.67	1.00	**23.33**
	P1	Filter E2	Richardt WTP	5.00	4.67	1.00	**23.33**
	P1	Filter W1	Richardt WTP	5.00	4.67	1.00	**23.33**
	P1	Filter W2	Richardt WTP	5.00	4.67	1.00	**23.33**

Asset ID	Project No.	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	P2	MCC - HSP1, HSP2 and Wells	Richardt WTP	4.24	4.42	1.00	**18.73**
	P2	Filter Room Transformer	Richardt WTP	3.78	4.78	1.00	**18.06**
	P2	**High Service Pump 4**	Richardt WTP	5.00	3.35	1.00	**16.75**
	P2	East Reaction Tank	Richardt WTP	4.08	4.08	1.00	**16.66**
	P2	Filter Building Transformer	Richardt WTP	3.32	4.78	1.00	**15.86**
	P2	Main Service Disconnect Switch	Richardt WTP	3.32	4.78	1.00	**15.86**
	P2	Chlorine Building	Richardt WTP	3.46	4.53	1.00	**15.67**
	P2	West Reaction Tank	Richardt WTP	3.82	4.08	1.00	**15.60**
	P2	**Post-filtration Chlorination**	Richardt WTP	3.50	4.39	1.00	**15.36**
	P2	Motor Control Center	Richardt WTP	4.04	3.67	1.00	**14.81**
	P2	I&C	Richardt WTP	3.58	3.67	1.00	**13.13**
	P2	**Well No. 4**	Richardt WTP	4.26	3.00	1.00	**12.78**
	P2	Backwash Holding Tank	Richardt WTP	3.28	3.81	1.00	**12.48**
	P2	Filter Building	Richardt WTP	3.52	4.14	1.00	**14.57**
	P2	Motor Starter	Richardt WTP	2.80	4.78	1.00	**13.38**
	P2	U.S. Filter Control	Richardt WTP	2.94	3.67	1.00	**10.78**
	P2	RP Backflow Preventer	Richardt WTP	3.52	3.06	1.00	**10.75**
	P2	Aerator #2 Building	Richardt WTP	3.62	2.89	1.00	**10.46**
	P2	Aerator #1 - HSP 1 and HSP 2 Building	Richardt WTP	3.46	2.89	1.00	**10.00**

Asset ID	Project No.	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	P3	Well No. 15R	Indian Lake Well Field	3.98	3.72	1.00	**14.81**
	P3	Well No. 16	Indian Lake Well Field	3.78	3.78	1.00	**14.28**
	P3	Well No. 14	Indian Lake Well Field	3.32	3.78	1.00	**12.18**

Asset ID	Project No.	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	P4	Oaklandon Elevated Storage Tank		3.48	3.94	1.00	**13.73**

Asset ID	Project No.	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	P5	Indian Lake WTP MCC	Indian Lake WTP	3.52	4.78	1.00	**16.82**
	P5	I&C	Indian Lake WTP	3.58	3.67	1.00	**13.13**
	P5	Chlorine Analyzer	Indian Lake WTP	3.52	3.58	1.00	**12.61**
	P5	Sodium Hypo Bulk Tank	Indian Lake WTP	2.54	4.81	1.00	**12.21**
	P5	Safety switches x2 (Aerators)	Indian Lake WTP	3.06	3.72	1.00	**11.39**
	P5	Chlorine Controls	Indian Lake WTP	3.06	3.42	1.00	**10.46**
	P5	Post-filtration Chlorination Pump	Indian Lake WTP	2.64	4.39	1.00	**11.59**
	P5	High Service Pump Control Panel	Indian Lake WTP	2.80	3.67	1.00	**10.27**

Asset ID	Project No.	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	P6	52nd St. Elevated Storage Tank		2.80	3.94	1.00	**11.04**

Asset ID	Project No.	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	P7	Filter House MCC	Fort Harrison WTP	3.26	4.78	1.00	**15.58**
	P7	Fort Harrison Ground Storage Reservoir	Fort Harrison WTP	3.68	4.31	1.00	**15.84**
	P7	I&C	Fort Harrison WTP	3.58	3.67	1.00	**13.13**
	P7	Filter Building	Fort Harrison WTP	3.26	3.97	1.00	**12.95**
	P7	Well Pump Control Panel	Fort Harrison WTP	3.12	3.67	1.00	**11.44**
	P7	Well Set Points	Fort Harrison WTP	3.06	3.72	1.00	**11.39**
	P7	HSP-MCC	Fort Harrison WTP	2.34	4.78	1.00	**11.18**
	P7	Chlorine Analyzer/PH	Fort Harrison WTP	2.60	4.00	1.00	**10.40**
	P7	Chlorine Analyzer	Fort Harrison WTP	2.60	4.00	1.00	**10.40**
	P7	Chlorine Controller	Fort Harrison WTP	2.60	4.00	1.00	**10.40**
	P7	Chlorine Analyzer	Fort Harrison WTP	2.60	4.00	1.00	**10.40**
	P7	**High Service Pump 3**	Fort Harrison WTP	3.62	2.72	1.00	**10.56**
	P7	Filter Control PLC	Fort Harrison WTP	2.80	3.67	1.00	**10.27**
	P7	Sodium Hypo Bulk Storage Tank bottom	Fort Harrison WTP	2.54	3.78	1.00	**9.60**
	P7	Filter 1	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	P7	Filter 2	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	P7	Filter 3	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	P7	Filter 4	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	P7	Filter 5	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	P7	Filter 6	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	P7	Filter 7	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	P7	Filter 8	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	P7	Filter 9	Fort Harrison WTP	3.32	3.08	0.89	**9.10**
	P7	**High Service Pump 1**	Fort Harrison WTP	3.34	2.72	1.00	**9.09**

Asset ID	Project No.	Asset Name	Location	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	P8	**Well No. 9**	Fort Harrison Well Field	3.78	2.94	1.00	**11.13**
	P8	**Well No. 10**	Fort Harrison Well Field	3.32	2.94	1.00	**9.78**
	P8	Lighting Panel	Fort Harrison Well Field - Well 10	3.32	2.94	1.00	**9.78**
	P8	**Well No. 8**	Fort Harrison Well Field	2.96	3.22	1.00	**9.22**

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D1	**Downtown (E 47th St, between N Sadler Dr and N Franklin Rd)**	**4.65**	**3.60**	**16.74**
	D1	Line D1D - N Richardt Ave (between E 47th St and E 48th St)	2.70	2.40	**6.48**
	D1	Line D1E - E 47th St (between N Richardt Ave and N Franklin Rd)	2.70	2.30	**6.21**
	D1	Line D1H - Payton Ave (between E 47th St and E 48th St)	2.05	2.80	**5.74**
	D1	Line D1A - N Sadler Dr (between W 46th St and E 47th St)	2.05	2.40	**4.92**
	D1	Line D1C - E 47th St (between N Sadler Dr and N Richardt Ave)	2.05	1.90	**3.90**
	D1	Line D1B - E 46th St (between N Sadler Dr and N Hartman Dr)	2.05	1.40	**2.87**
	D1	Line D1F - Longworth Ave (south of E 47th St)	2.05	1.40	**2.87**
	D1	Line D1G - Payton Ave (south of E 47th St)	2.05	1.40	**2.87**

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D2	**N Kitley Ave, Leone Dr, Karen Dr Area**	**4.00**	**4.00**	**16.00**
	D2	Line D2A - N Kitley Ave (between Brookhaven Dr and E 49th St)	2.70	2.80	**7.56**
	D2	Line D2C - N Kenyon Dr (between Leone Dr and Karen Dr)	2.05	2.80	**5.74**
	D2	Line D2D - Karen Dr (between Leone Dr and E 49th St)	2.05	2.80	**5.74**
	D2	Line D2E - Leone Dr (between N Kenyon Dr and E 49th St)	2.05	2.80	**5.74**
	D2	Line D2B - Katherine Dr (between N Kenyon Dr and Karen Dr)	2.05	2.30	**4.72**

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D3	Lee Rd Raw Water Main (at golf course)	2.70	5.00	13.50

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D4	**Downtown (E 46th St, between Payton Ave and N Franklin Rd)**	**3.35**	**3.20**	**10.72**
	D4	Line D4A - E 46th St (between Payton Ave and N Franklin Rd)	2.70	2.80	**7.56**
	D4	Line D4B - Payton Ave (between E 46th St and E 45th St)	2.05	2.80	**5.74**
	D4	Line D4C - Dunn St	2.05	1.40	**2.87**

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D5	**E 43rd St (between N Shadeland Ave and Elmhurst Dr)**	**2.70**	**2.80**	**7.56**
	D5	Line D5A - E 43rd St (between N Shadeland Ave and Elmhurst Dr)	2.70	2.80	**7.56**
	D5	Line D5C - Elmhurst Dr (between E 43rd St and E 42nd St)	2.05	1.90	**3.90**
	D5	Line D5B - Englewood Dr (south of E 43rd St)	2.05	1.40	**2.87**

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D6	**Elmhurst and Kingman Dr (between Picton Dr and Pendleton Pike)**	**2.70**	**2.80**	**7.56**
	D6	Line D6B - Elmhurst Dr & Pendleton Pike (between Kingman Dr and Picton Dr)	2.70	2.80	**7.56**
	D6	Line D6A - Kingman Dr (between Picton Dr and Pendleton Pike)	2.05	2.40	**4.92**

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D7	**E 46th St (between Van Cleave St and Pendleton Pike)**	**2.70**	**2.80**	**7.56**
	D7	Line D7A - Van Cleave St (between E 46th St and E 48th St)	2.05	2.40	**4.92**
	D7	Line D7D - Mehaffey St (between E 46th St and E 47th St)	2.05	2.40	**4.92**
	D7	Line D7B - E 47th St (at Van Cleave St)	2.05	1.90	**3.90**
	D7	Line D7C - E 46th St (between Van Cleave St and Pendleton Pike)	2.05	1.90	**3.90**

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D8	**Fall Creek Dr and Sumac Ln (south of Hermosa Dr)**	**3.95**	**1.80**	**7.11**
	D8	Line D8A - Sumac Ln (between Hermosa Dr and Fall Creek Dr)	3.30	1.90	**6.27**
	D8	Line D8B - Fall Creek Dr (south of Hermosa Dr)	1.35	1.40	**1.89**

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D9	N Franklin Rd (between Plummer St & Records St)	2.70	2.40	6.48

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D10	E 49th St (between Elmhurst Dr and N Sadler Dr)	2.70	2.30	6.21

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D11	**Pebblebrooke Dr and Stacie Cir (between E 75th St and Richie Cir)**	**2.00**	**2.80**	**5.60**
	D11	Line D11B - Pebblebrooke Dr (between E 75th St and Richie Cir)	2.00	2.80	**5.60**
	D11	Line D11A - Stacie Cir (west of Pebblebrooke Dr)	1.35	1.40	**1.89**

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D12	E 52nd St (between N Kitley Ave and Katherine Dr)	2.05	2.40	4.92

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D13	E 50th St (between N Franklin Rd and Barlow Dr)	2.05	2.40	4.92

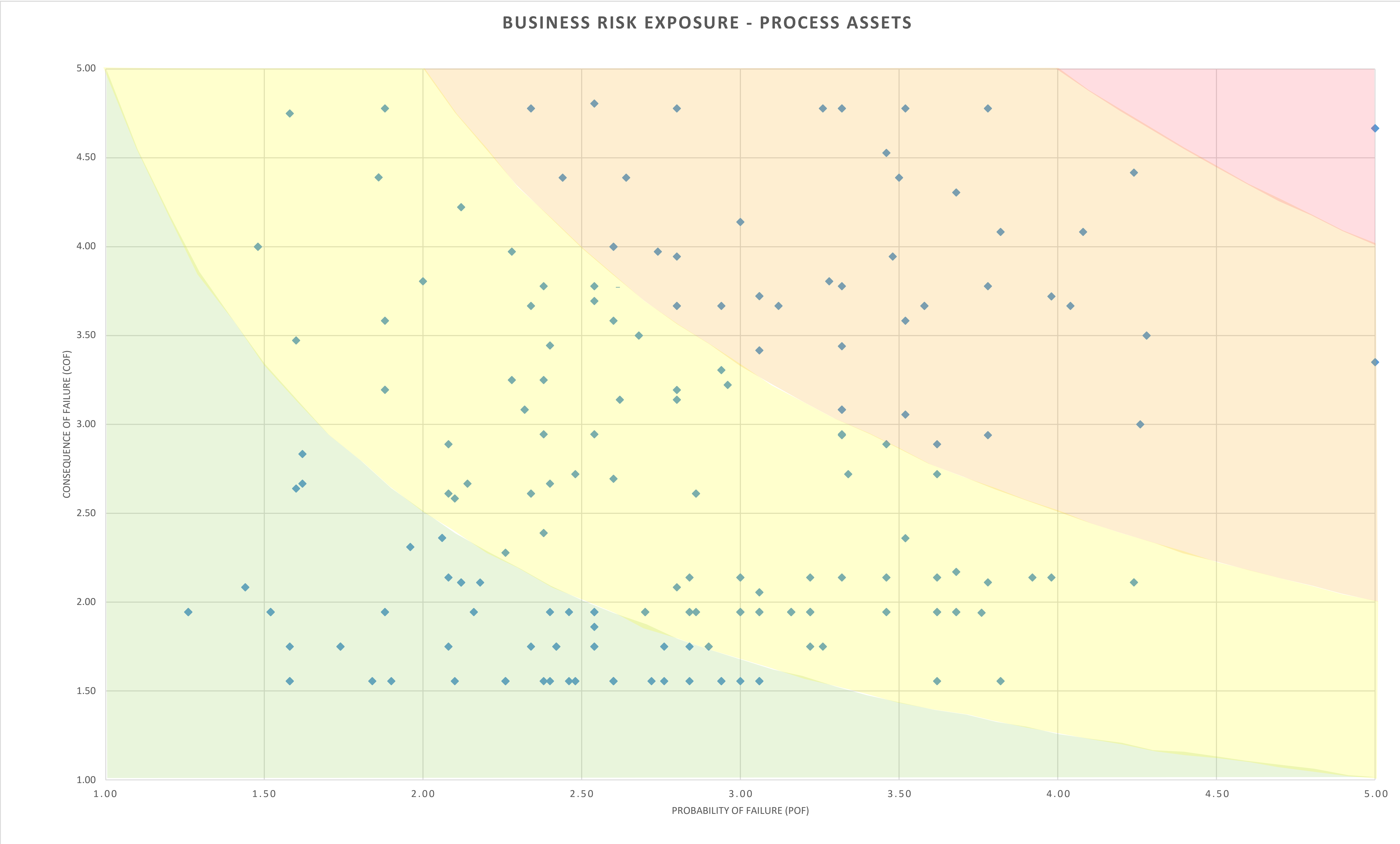
Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D14	Zoeller Ave (south of E 46th St)	2.70	1.80	4.86

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D15	N Hartman Dr (between E 45th St and E 46th St)	2.05	1.80	3.69

Asset ID	Project No.	Project/ Line Name	Probability of Failure (PoF) (1=low, 5=high)	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoF) (1=low, 25=high)
	D16	Barbour Ct (north of E 51st St)	2.05	1.40	2.87

APPENDIX D

Project BRE Summary Charts



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4.00
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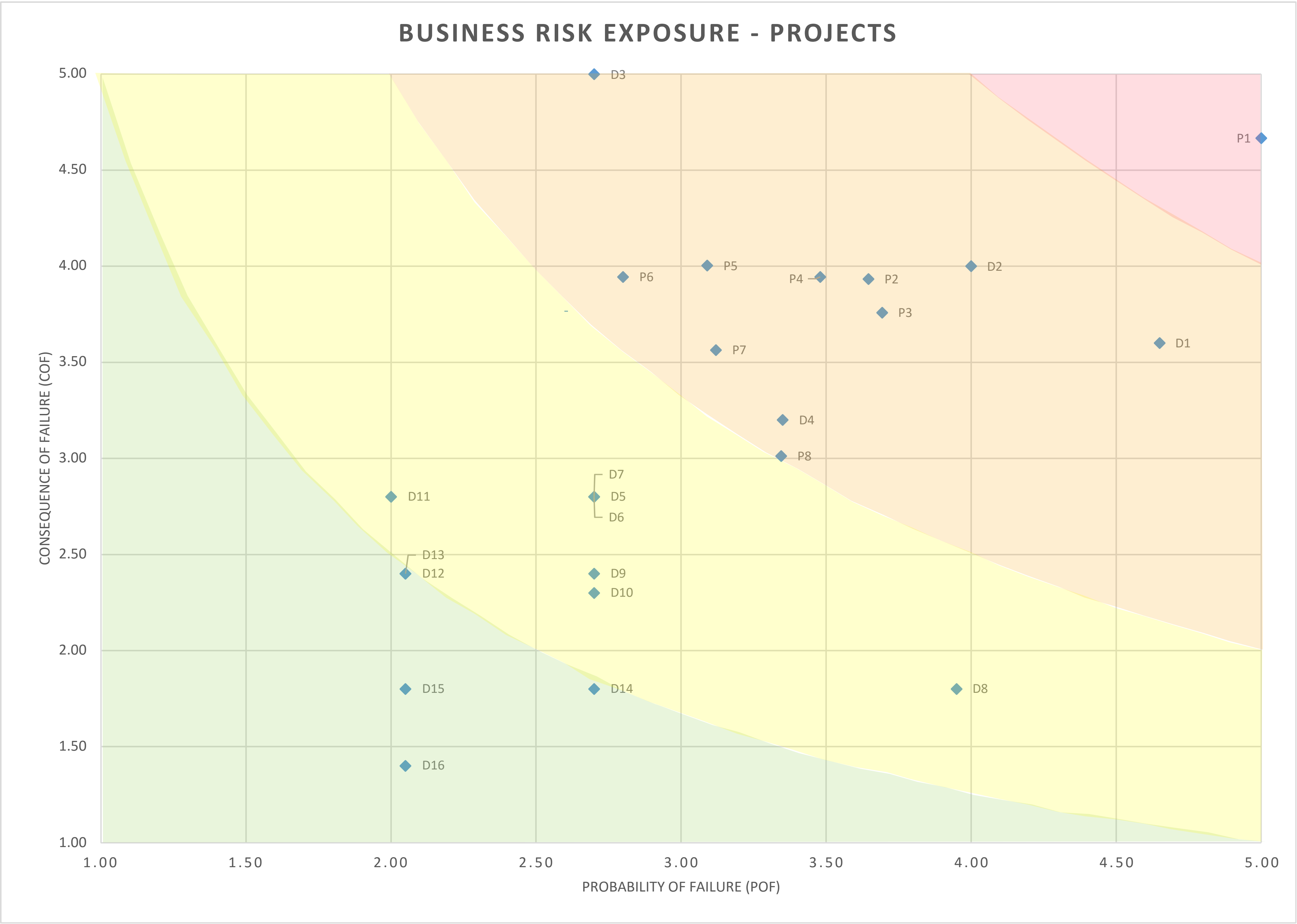
3.00
2.50
2.00
1.50
1.00
1.00
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
PROBABILITY OF FAILURE (POF)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4.00
3.50
3.00
2.50
2.00
1.50
1.00
CONSEQUENCE OF FAILURE (COF)
1.00
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
PROBABILITY OF FAILURE (POF)
D3
P1
P5
P6
P4
P2
D2
P3
D1
P7
D4
P8
D7
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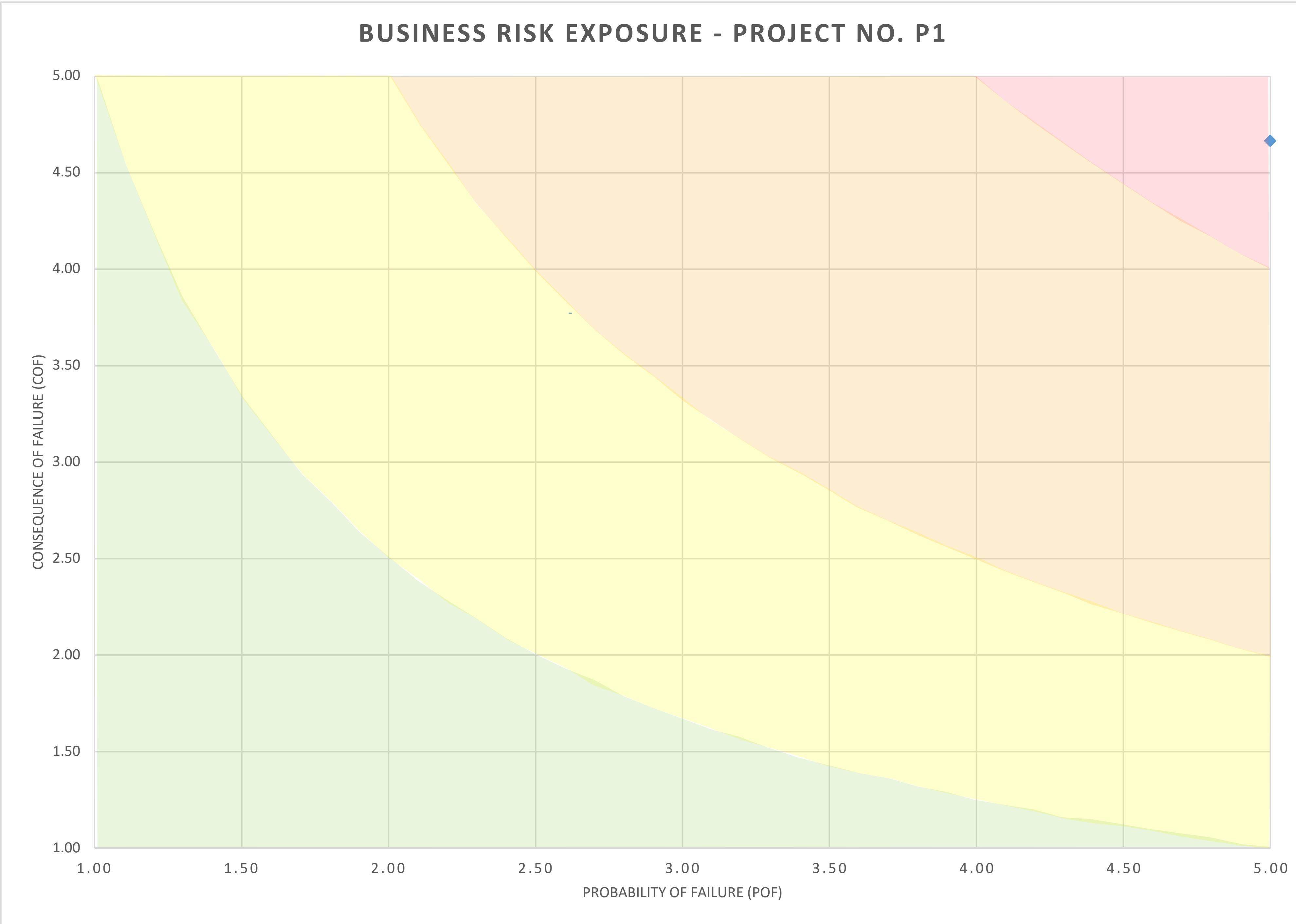
D15
D14
D8
D16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CONSEQUENCE OF FAILURE (COF)
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2.50
3.00
3.50
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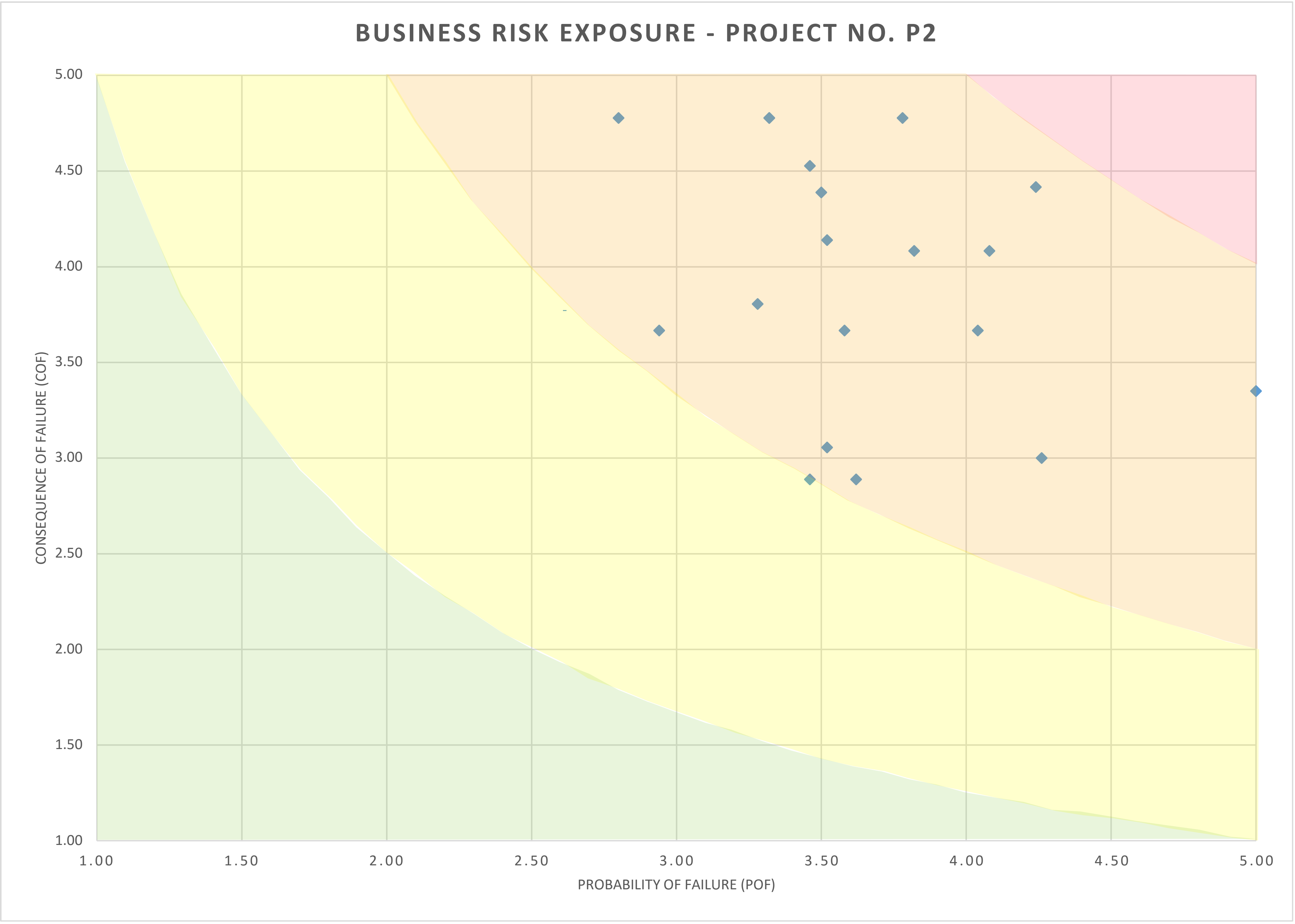
4.50
5.00
PROBABILITY OF FAILURE (POF)



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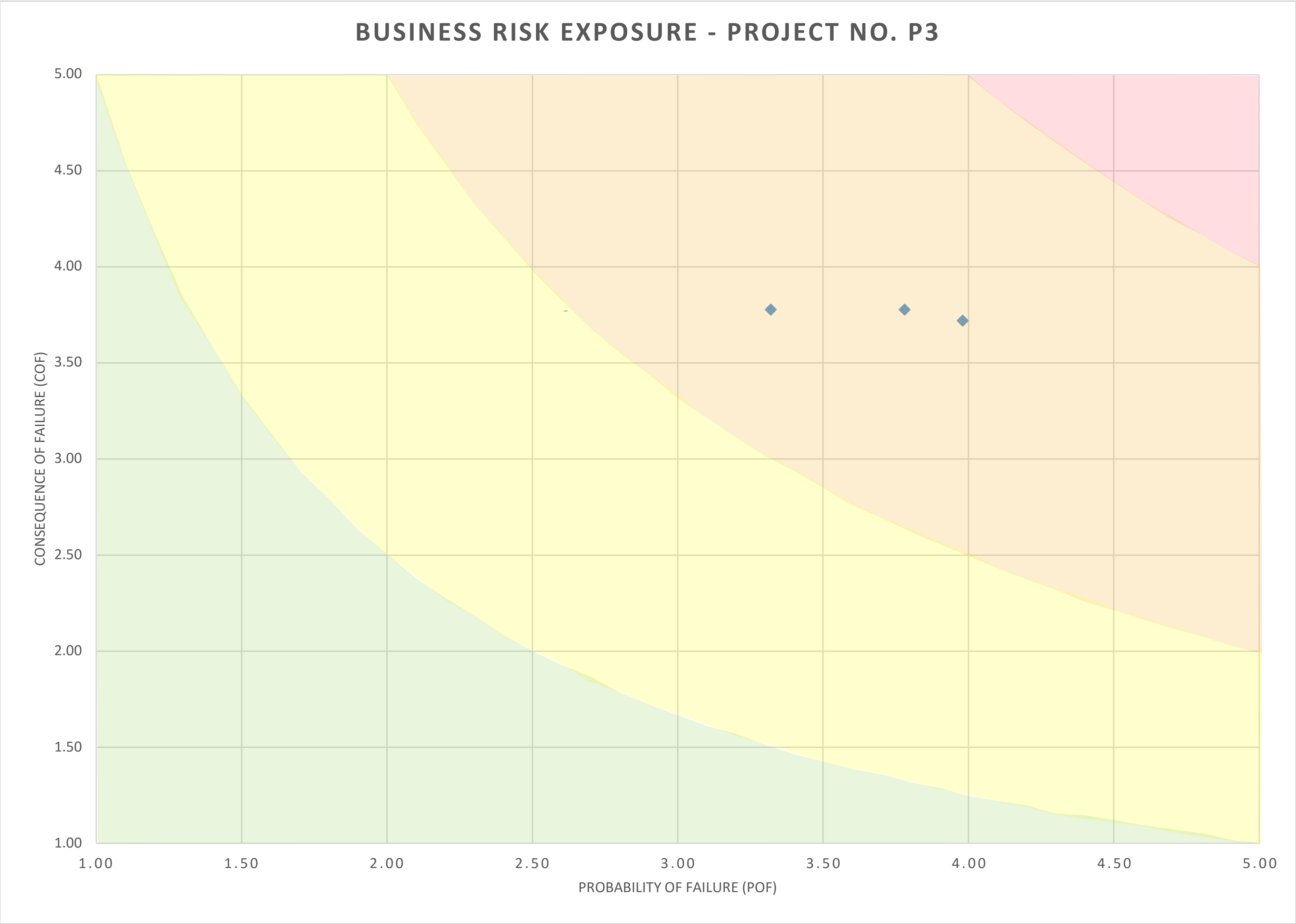
5.00
PROBABILITY OF FAILURE (POF)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3.00
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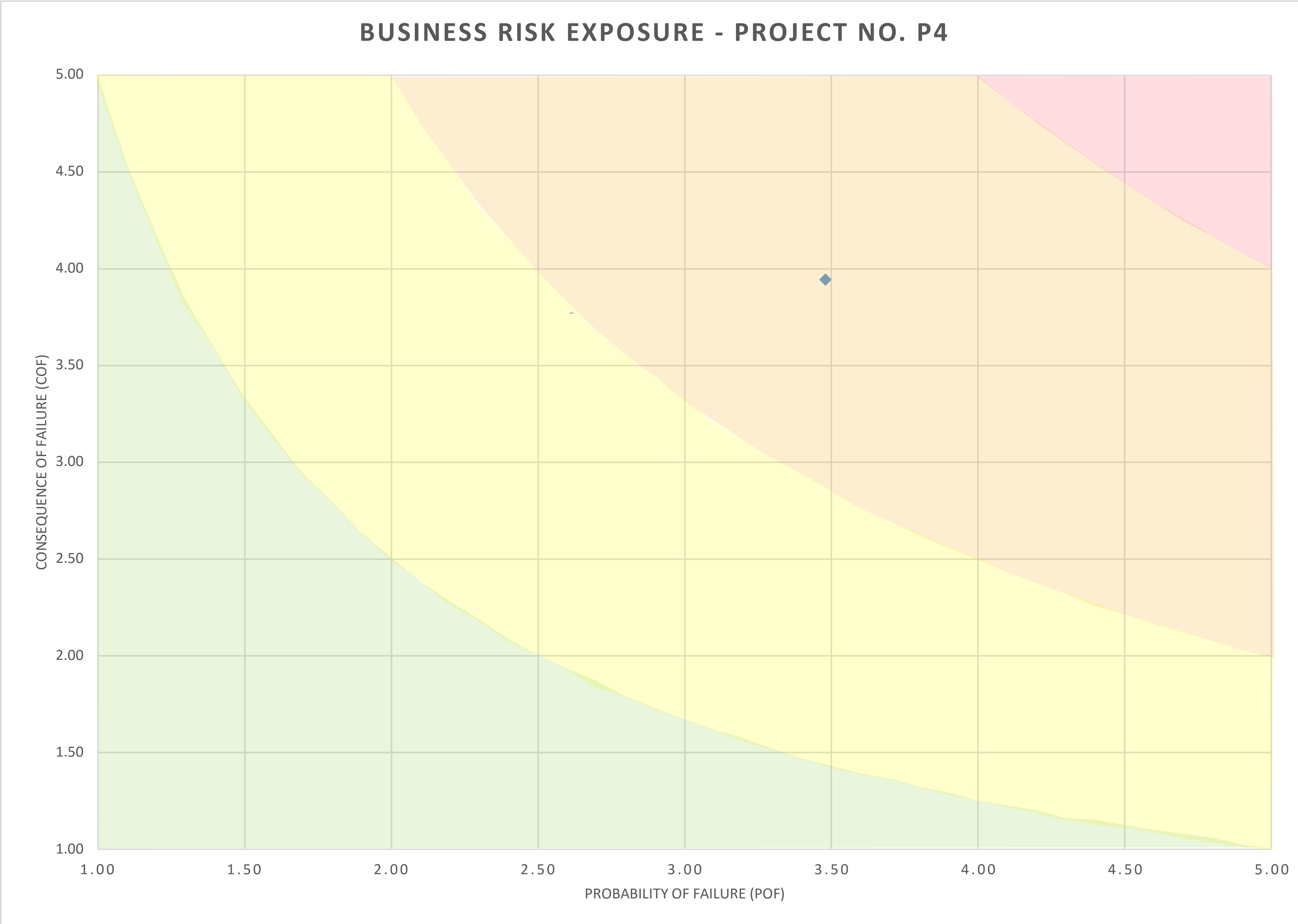
4.50
5.00
PROBABILITY OF FAILURE (POF)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2.00
1.50
1.00
CONSEQUENCE OF FAILURE (COF)
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2.00
2.50
3.00
3.50
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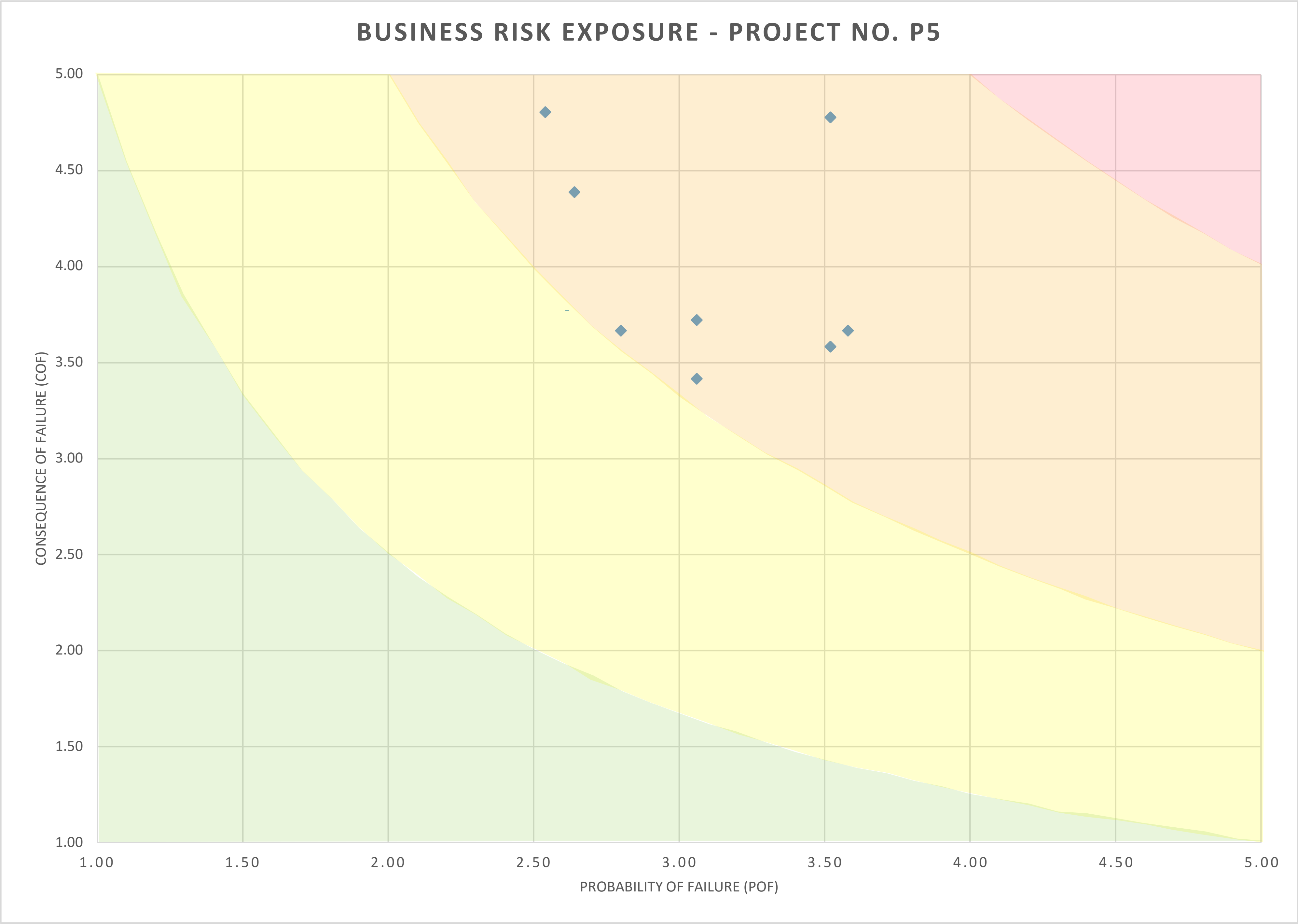
4.50
5.00
PROBABILITY OF FAILURE (POF)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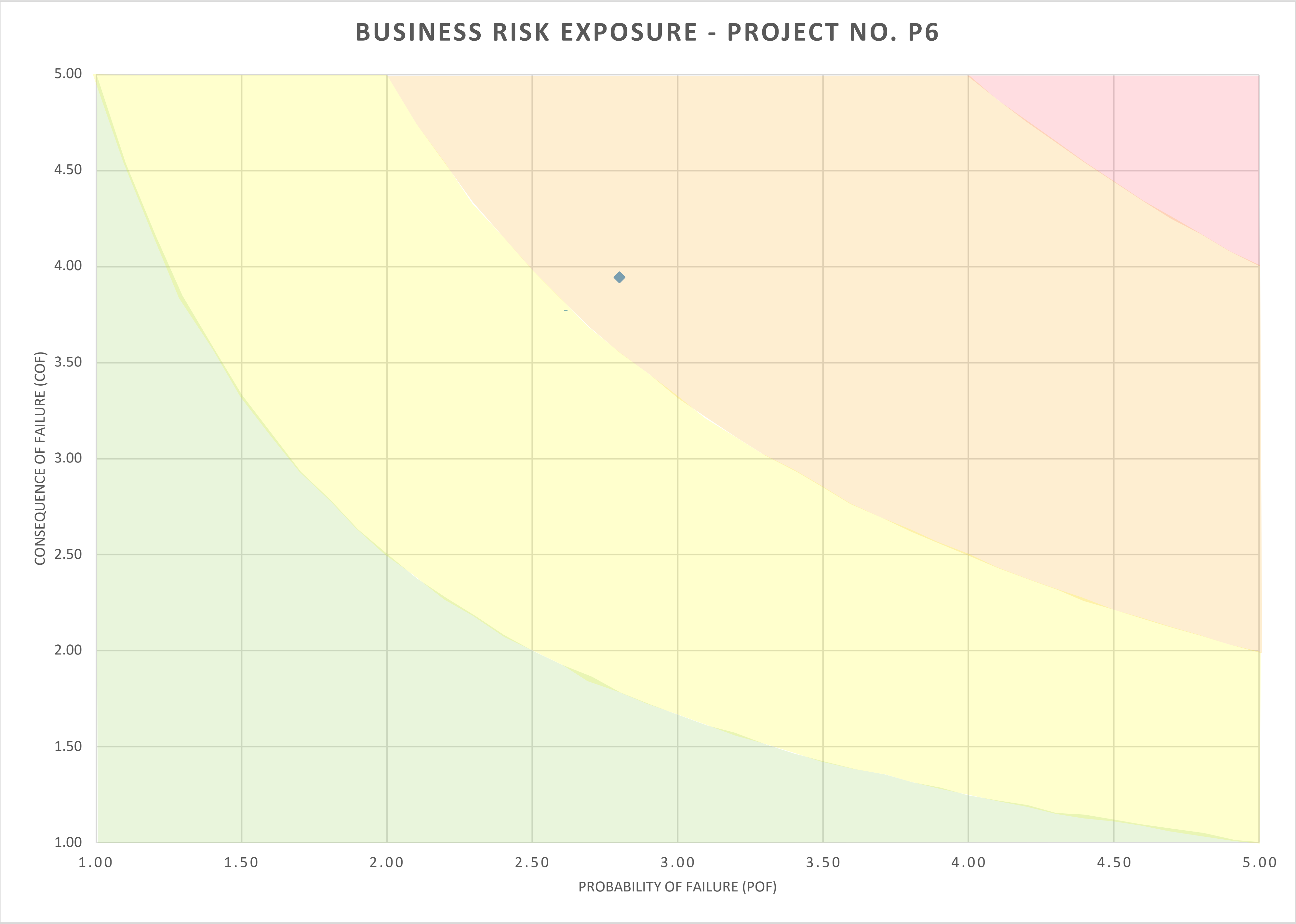
2.50
3.00
3.50
4.00
4.50
5.00
PROBABILITY OF FAILURE (POF)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1.00
CONSEQUENCE OF FAILURE (COF)
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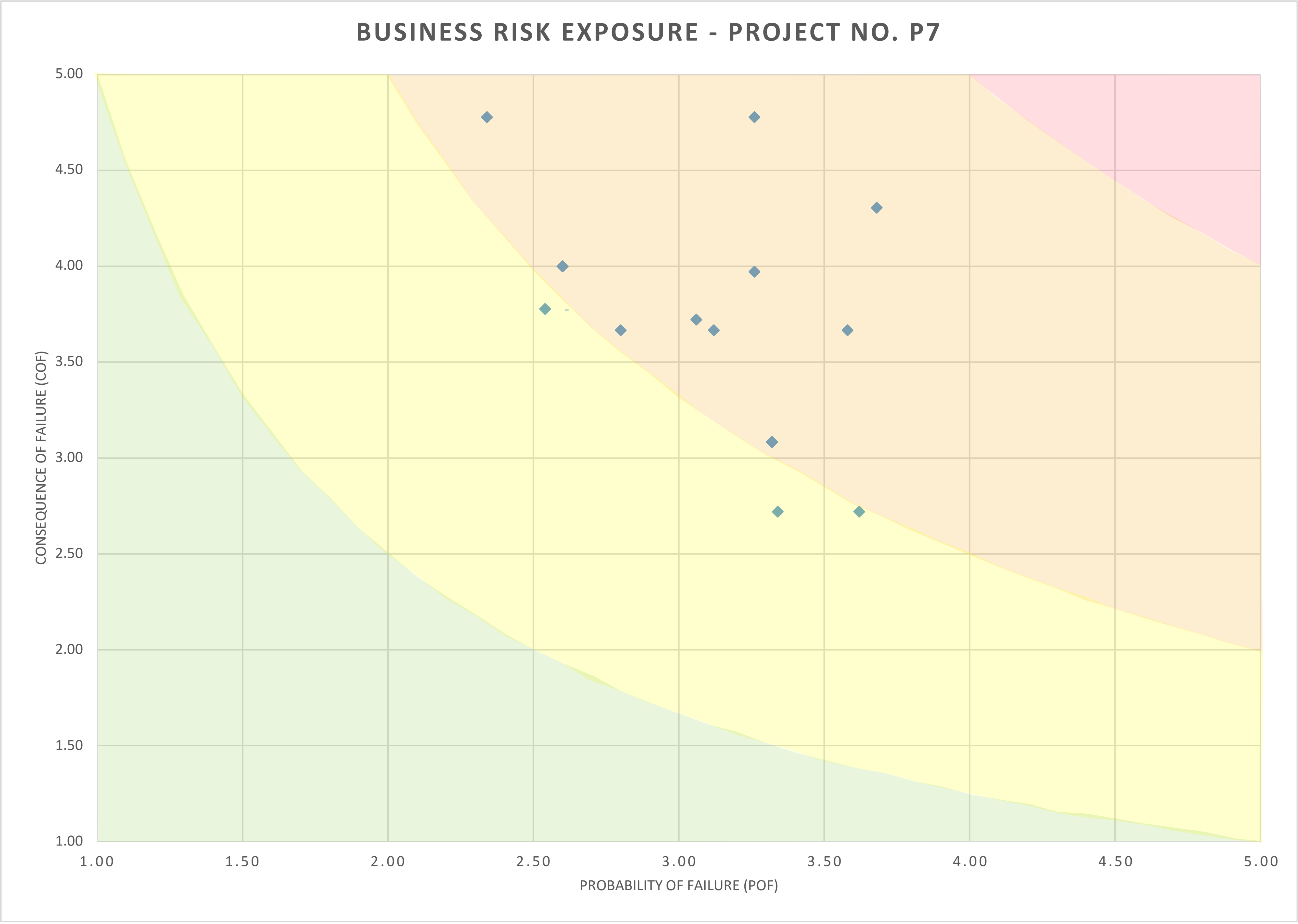
2.00
2.50
3.00
3.50
4.00
4.50
5.00
PROBABILITY OF FAILURE (POF)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1.50
1.00
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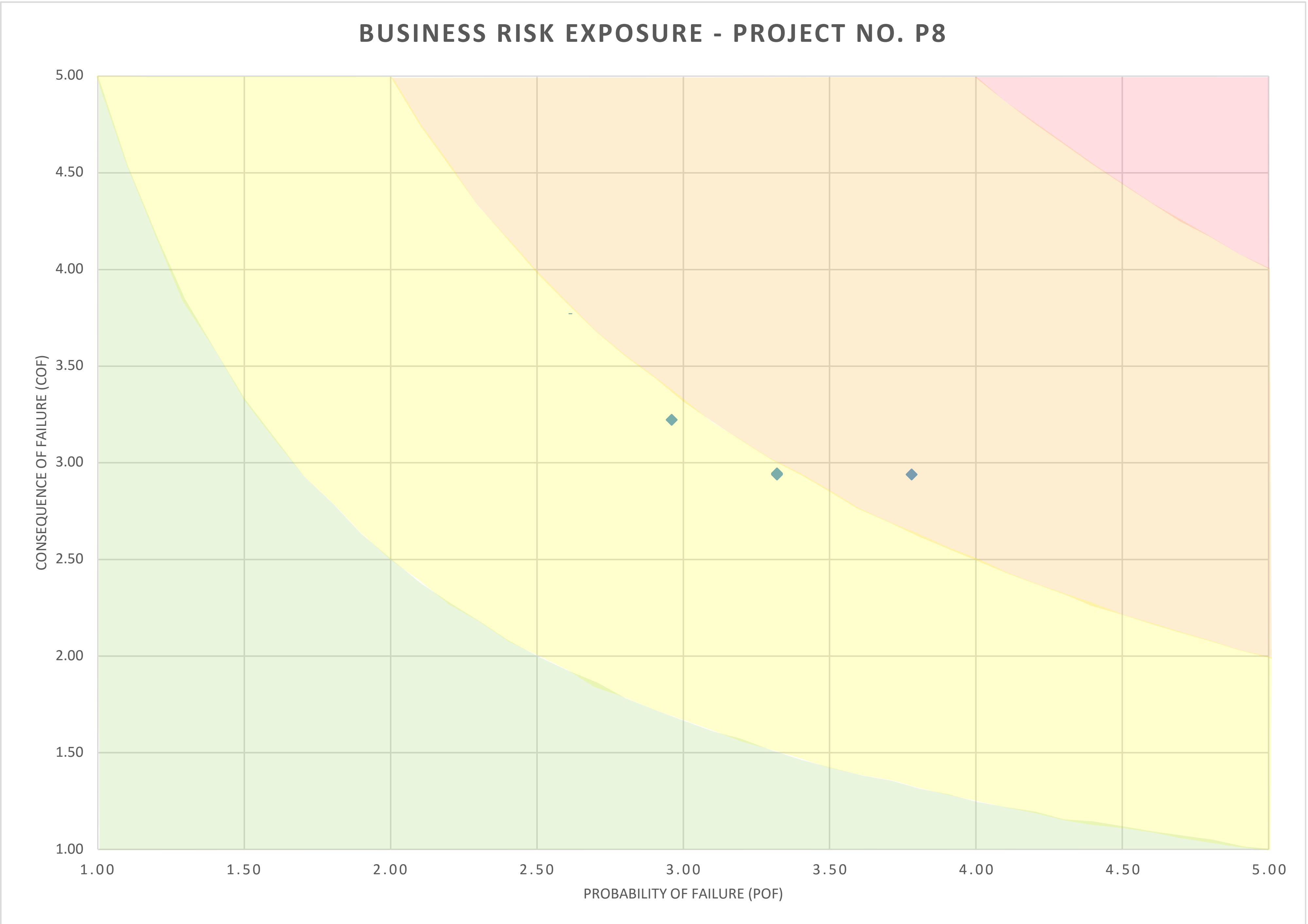
2.50
3.00
3.50
4.00
4.50
5.00
PROBABILITY OF FAILURE (POF)



BUSINESS RISK EXPOSURE - PROJECT NO. P8
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4.00
3.50
3.00
2.50
2.00
1.50
1.00
CONSEQUENCE OF FAILURE (COF)
1.00
1.50
2.00
2.50
3.00
3.50
4.00
4.50
5.00
PROBABILITY OF FAILURE (POF)

APPENDIX E

General Information and Asset Tables

NOTE: Asset data contained in this appendix is based upon the best available information at the time of compilation.

Last Inspec. Date	Asset ID	Pump Name	Location	Northing	Easting	Design Capacity (gpm)	Rated Capacity	Operating Capacity	Manufacturer	Model	Serial No.	Stages
		Well No. 1	Richardt WTP	4411885	582273	1,200			Layne		1091681	4
		Well No. 2	Richardt WTP	4411860	582373	1,100	1,200 @ 214'		Layne		70668	
		Well No. 3	Richardt WTP	4411735	582273	580			Layne	H10MC	1326552	6
		Well No. 4	Richardt WTP	4411730	582373	250			Layne		29040	
		Well No. 8	Fort Harrison Well Field	4415420	585268	1200	1,200 @ 275'		Simmons	SJ12M	227-04C	4
		Well No. 9	Fort Harrison Well Field	4415760	585673	500	700 @ 272'		Floway	JKH	60173	3
		Well No. 10	Fort Harrison Well Field	4415685	585573	1000	1,050 @260'		Layne , Peerless		74736, 298350A1	6
		Well No. 14	Indian Lake Well Field	4416235	585848	1000	1,400 @226'	700	Simmons/Floway		5189-01	4
		Well No. 15R	Indian Lake Well Field	4416435	585973	1000	1,000 @ 195'	860	Simmons		5684-90, 553532	3
		Well No. 16	Indian Lake Well Field	4416210	585798	1400	1,400 @ 230'	750	Floway	14JKL	60173, 1326923	
		High Service Pump 1	Richardt WTP			1200	1,000 @ 256'		Simmons	SL11H	1598-03B	4
		High Service Pump 2	Richardt WTP						Simmons	SL11H	1598-03B	
		High Service Pump 3	Richardt WTP			600			Layne			
		High Service Pump 4	Richardt WTP			1080	1,000 @ 256'		Simmons	SL11H		4
		High Service Pump 1	Fort Harrison WTP			700			Weinman	4 L 1-3	493967	
		High Service Pump 2	Fort Harrison WTP			1200			Peerless Midwest	6 AD 14 Type 5300	420276	
		High Service Pump 3	Fort Harrison WTP			1200			Weinman	5L1-2-Y2	T627782	
		High Service Pump 1	Indian Lake WTP			1042			Simmons/Floway	E12	404460A-1	3
		High Service Pump 2	Indian Lake WTP			1042			Simmons/Floway	E12XMC-3	14276742	3
		High Service Pump 3	Indian Lake WTP			1042			Simmons/Floway	XMC	1528263	3
		Chlorine Pump Pre-filtration	Richardt WTP			0.18-8.5 gph			Seepex	MD 0015-24	839949.2	
		Chlorine Pump Post-filtration	Richardt WTP			0.18-8.5 gph			Seepex	MD 0015-24	839952.1	
		Chlorine Post-filtration Gear Box	Richardt WTP						Browning	CBN3001BSCB52 115V CCL123	T12K 7567695-011	
		Chlorine Pre-filtration Gear Box	Richardt WTP						Browning	CBN3001BSCB52 115V CCL123	T12K 7567676-011	
		Chlorine Transfer Pump	Richardt WTP						Finish Thompson	SP10P-3-M218	129714G14	
		Temp. Pre-filtration Chlorine Pump	Richardt WTP						Pulsatron	LPH5MAVTC3U03	51011811	
		Chlorine Transfer Pump	Fort Harrison WTP						Finish Thompson	SP10P-3-M218	132430	
		Chlorine Feed Gear Box	Fort Harrison WTP						Nord Drive Systems	Type SK71L/4 CUS	32711502 19963788	
		Chlorine Feed Pump Post-filtration	Fort Harrison WTP						Seepex	MD005-24	843446.2	
		Chlorine Pre Pump	Fort Harrison WTP				190 gpd		Watson Marlow	0M0.244L.GLA	40513	
		Chlorine Transfer Pump	Fort Harrison WTP						Finish Thompson	SP10P-3-M218	123073A14	
		Phosphate Pump	Indian Lake WTP				44 gpd		Pulsatron	LPE4MA-VTT1-U03	02/12.344668	
		Pre Chlorine Pump	Indian Lake WTP				190 gpd		Watson Marlow	0M0.224L.GLA	N072269	
		Post Chlorine Pump	Indian Lake WTP				190 gpd		Watson Marlow	0M0.224L.GLA	O040516	
		Air Pump	Indian Lake WTP						Ingersoll Rand	SS3	S12064759	
		Chlorine Transfer Pump	Indian Lake WTP						FTI	128840F14	SP10P-3-M218	
		Booster Pump 1	Winding Ridge						Cornell	5HH-CC 100-4	133145	
		Booster Pump 2	Winding Ridge						Cornell	5HH-CC 100-4	133146 13.88	

Last Inspec. Date	Asset ID	Pump Name	General Information												Casing - Wells Only		Column Pipe	
			Bowl	Bowl Material	Impeller Size (in)	Impeller Type	Impeller Material	Screen Length (ft)	Screen Material	Type	Org. Designer	Org. Contractor	Year Cons.	Housing	Diameter (in)	Length (ft)	Diameter (in)	Length (ft)
		Well No. 1								Bedrock			2012	Well House	16	242	8	164.5
		Well No. 2								Bedrock			2012	Well House	16	250		
		Well No. 3	H10MC							Bedrock			2013	Well House	12	291	6	175.8
		Well No. 4								Bedrock			1954	Well House	8	289		
		Well No. 8	SJ12M	CI				23	Stainless Steel	Tubular		Dean Well Drilling, Inc.	2009	Elevated Platform	24	104	10	75.5
		Well No. 9	12JKM					20	Stainless Steel	Gravel Pack			2012	Well House	36 & 18	111.5	8	74.5
		Well No. 10	National J11	CI/BF				20	Stainless Steel	Gravel Pack		Layne Northern	2013	Well House	36 & 18	84	8	64
		Well No. 14	12JKH	CL		Enclosed		20	Stainless Steel	Tubular			2011	Well House	16 w/14" liner	86	8	70
		Well No. 15R	12JKM		(2) 8.375 & (1) 8.084	Enclosed				Gravel Pack		Peerless Midwest	2011	Elevated Platform	16	85	8	69
		Well No. 16	14JKL	CL						Gravel Pack		Bastin Logan	2013	Elevated Platform	20	87	10	80
		High Service Pump 1	SL11H	Stainless Steel				N/A	N/A	Vertical Turbine		Bastin Logan	2003	East Pump House	-	-	8	11
		High Service Pump 2								Vertical Turbine			2003	East Pump House	-	-		
		High Service Pump 3								Vertical Turbine			1971	West Pump House	-	-		
		High Service Pump 4	SL11H	Stainless Steel				N/A	N/A	Vertical Turbine		Bastin Logan	1971	West Pump House	-	-	8	11
		High Service Pump 1								Horizontal Centrifugal			1980	Filter Building	-	-		
		High Service Pump 2								Horizontal Centrifugal			2009	Filter Building	-	-		
		High Service Pump 3			13.63					Horizontal Centrifugal			2009	Filter Building	-	-		
		High Service Pump 1	National E12					2		Vertical Turbine			2012	HSP Building	-	-	8	11.7
		High Service Pump 2	E12XMC-3			Enclosed				Vertical Turbine			2012	HSP Building	-	-	8	11.7
		High Service Pump 3	National XMC					1		Vertical Turbine			2012	HSP Building	-	-	8	12.2
		Chlorine Pump Pre-filtration	-	-				-	-	Cavity Pump			2014	Chlorine Room	-	-	-	-
		Chlorine Pump Post-filtration	-	-				-	-	Cavity Pump			2014	Chlorine Room	-	-	-	-
		Chlorine Post-filtration Gear Box	-	-				-	-	Cavity Pump			2014	Chlorine Room	-	-	-	-
		Chlorine Pre-filtration Gear Box	-	-				-	-	Cavity Pump			2014	Chlorine Room	-	-	-	-
		Chlorine Transfer Pump	-	-	3.75			-	-				2014	Chlorine Room	-	-	-	-
		Temp. Pre-filtration Chlorine Pump	-	-	-	-	-	-	-	Peristaltic			2011	Chlorine Room	-	-	-	-
		Chlorine Transfer Pump	-	-	3.75			-	-				2014	Chlorine Room	-	-	-	-
		Chlorine Feed Gear Box	-	-				-	-				2015	Chlorine Room	-	-	-	-
		Chlorine Feed Pump Post-filtration	-	-				-	-				2015	Chlorine Room	-	-	-	-
		Chlorine Pre Pump	-	-	-	-	-	-	-	Peristaltic			2013	Filter Building	-	-	-	-
		Chlorine Transfer Pump	-	-	3.75			-	-				2013		-	-	-	-
		Phosphate Pump	-	-	-	-	-	-	-	Peristaltic			2012	Filter Building	-	-	-	-
		Pre Chlorine Pump	-	-				-	-	Peristaltic			2012		-	-	-	-
		Post Chlorine Pump	-	-				-	-	Peristaltic			2012		-	-	-	-
		Air Pump	-	-				-	-				2012		-	-	-	-
		Chlorine Transfer Pump	-	-	3.75			-	-				2014		-	-	-	-
		Booster Pump 1											2004		-	-	-	-
		Booster Pump 2											2004		-	-	-	-

Last Inspec. Date	Asset ID	Pump Name	Discharge Pipe Dia. (in)	Stand-by Power		Controls		Remote Monitoring		Check Valve?
				Type	Notes	Description	Notes	Type	Notes	
		Well No. 1	8	None	Permanent stand-by power required by 10 States Standards					Yes
		Well No. 2		None	Permanent stand-by power required by 10 States Standards					Yes
		Well No. 3	6	None	Permanent stand-by power required by 10 States Standards					Yes
		Well No. 4		None	Permanent stand-by power required by 10 States Standards					Yes
		Well No. 8	10	None	Permanent stand-by power required by 10 States Standards					Yes
		Well No. 9	8	None	Permanent stand-by power required by 10 States Standards					Yes
		Well No. 10	8	None	Permanent stand-by power required by 10 States Standards					Yes
		Well No. 14	8	None	Permanent stand-by power required by 10 States Standards			Direct read		
		Well No. 15R	8	Portable Connectio	Permanent stand-by power required by 10 States Standards			SCADA		
		Well No. 16	10	None	Permanent stand-by power required by 10 States Standards			Direct read		
		High Service Pump 1	8	None	Permanent stand-by power required by 10 States Standards	52nd St. Tank Level	Lead ON=22.9 ft, Lead OFF=27 ft, Lag ON=21.5ft, Lag OFF=25 ft			
		High Service Pump 2		None	Permanent stand-by power required by 10 States Standards	52nd St. Tank Level	Lead ON=22.9 ft, Lead OFF=27 ft, Lag ON=21.5ft, Lag OFF=25 ft			
		High Service Pump 3		None	Permanent stand-by power required by 10 States Standards	52nd St. Tank Level	Lead ON=22.9 ft, Lead OFF=27 ft, Lag ON=21.5ft, Lag OFF=25 ft			
		High Service Pump 4	8	None	Permanent stand-by power required by 10 States Standards	52nd St. Tank Level	Lead ON=22.9 ft, Lead OFF=27 ft, Lag ON=21.5ft, Lag OFF=25 ft			
		High Service Pump 1		Diesel Generator		52nd St. Tank Level				
		High Service Pump 2		Diesel Generator		52nd St. Tank Level				
		High Service Pump 3		Diesel Generator		52nd St. Tank Level				
		High Service Pump 1	8	None	Permanent stand-by power required by 10 States Standards	Oaklandon Tank Level				
		High Service Pump 2	8	None	Permanent stand-by power required by 10 States Standards	Oaklandon Tank Level				
		High Service Pump 3	8	None	Permanent stand-by power required by 10 States Standards	Oaklandon Tank Level				
		Chlorine Pump Pre-filtration	-	None	Permanent stand-by power required by 10 States Standards					
		Chlorine Pump Post-filtration	-	None	Permanent stand-by power required by 10 States Standards					
		Chlorine Post-filtration Gear Box	-	None	Permanent stand-by power required by 10 States Standards					
		Chlorine Pre-filtration Gear Box	-	None	Permanent stand-by power required by 10 States Standards					
		Chlorine Transfer Pump	-	None	Permanent stand-by power required by 10 States Standards					
		Temp. Pre-filtration Chlorine Pump	-	None	Permanent stand-by power required by 10 States Standards					
		Chlorine Transfer Pump	-	Diesel Generator						
		Chlorine Feed Gear Box	-	Diesel Generator						
		Chlorine Feed Pump Post-filtration	-	Diesel Generator						
		Chlorine Pre Pump	-							
		Chlorine Transfer Pump	-							
		Phosphate Pump	-							
		Pre Chlorine Pump	-							
		Post Chlorine Pump	-							
		Air Pump	-							
		Chlorine Transfer Pump	-							
		Booster Pump 1	-							
		Booster Pump 2	-							

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	Well No. 1	Richardt WTP	Layne		1091681	102-0019	2012		5	40	35	2052	13
	Well No. 2	Richardt WTP	Layne		70668	102-0521 - 102-0522	2012		5	40	35	2052	13
	Well No. 3	Richardt WTP	Layne	H10MC	1326552	101-0981	2013		4	40	36	2053	10
	Well No. 4	Richardt WTP	Layne		29040	101-0986	1954		63	40	-23	1994	158
	Well No. 8	Fort Harrison Well Field	Simmons	SJ12M	227-04C	102-0110 - 102-0111	2009		8	40	32	2049	20
	Well No. 9	Fort Harrison Well Field	Floway	JKH	60173		2012		5	40	35	2052	13
	Well No. 10	Fort Harrison Well Field	Layne , Peerless		74736, 298350A1	102-0102	2013		4	40	36	2053	10
	Well No. 14	Indian Lake Well Field	Simmons/Floway		5189-01	102-0164	2011		6	40	34	2051	15
	Well No. 15R	Indian Lake Well Field	Simmons		5684-90, 553532	102-0269- 102-0270	2011		6	40	34	2051	15
	Well No. 16	Indian Lake Well Field	Floway	14JKL	60173, 1326923	102-0144	2013		4	40	36	2053	10
	High Service Pump 1	Richardt WTP	Simmons	SL11H	1598-03B	102-0484 - 102-0486	2003		14	40	26	2043	35
	High Service Pump 2	Richardt WTP	Simmons	SL11H	1598-03B	102-0482 - 102-0483	2003		14	40	26	2043	35
	High Service Pump 3	Richardt WTP	Layne			102-0377	1971		46	40	-6	2011	115
	High Service Pump 4	Richardt WTP	Simmons	SL11H			1971		46	40	-6	2011	115
	High Service Pump 1	Fort Harrison WTP	Weinman	4 L 1-3	493967	102-0540 - 102-0542	1980		37	40	3	2020	93
	High Service Pump 2	Fort Harrison WTP	Peerless Midwest	6 AD 14 Type 5300	420276	102-0536 - 102-0538	2009		8	40	32	2049	20
	High Service Pump 3	Fort Harrison WTP	Weinman	5L1-2-Y2	T627782	102-0534 - 102-0535	2009		8	40	32	2049	20
	High Service Pump 1	Indian Lake WTP	Simmons/Floway	E12	404460A-1	102-0199	2012		5	40	35	2052	13
	High Service Pump 2	Indian Lake WTP	Simmons/Floway	E12XMC-3	14276742	102-0200 - 102-0201	2012		5	40	35	2052	13
	High Service Pump 3	Indian Lake WTP	Simmons/Floway	XMC	1528263	102-0202 - 102-0203	2012		5	40	35	2052	13
	Chlorine Pump Pre-filtration	Richardt WTP	Seepex	MD 0015-24	839949.2	101-0994 - 101-0998	2014		3	10	7	2024	30
	Chlorine Pump Post-filtration	Richardt WTP	Seepex	MD 0015-24	839952.1	101-0994 - 101-0998	2014		3	10	7	2024	30
	Chlorine Post-filtration Gear Box	Richardt WTP	Browning	CBN3001BSCB52 115V CCL123	T12K 7567695-011	101-0994 - 101-0998	2014		3	10	7	2024	30
	Chlorine Pre-filtration Gear Box	Richardt WTP	Browning	CBN3001BSCB52 115V CCL123	T12K 7567676-011	101-0994 - 101-0998	2014		3	10	7	2024	30
	Chlorine Transfer Pump	Richardt WTP	Finish Thompson	SP10P-3-M218	129714G14	102-0002 - 102-0003	2014		3	10	7	2024	30
	Temp. Pre-filtration Chlorine Pump	Richardt WTP	Pulsatron	LPH5MAVTC3U03	51011811	102-0014 - 102-0015	2011		6	7	1	2018	86
	Chlorine Transfer Pump	Fort Harrison WTP	Finish Thompson	SP10P-3-M218	132430	102-0059 - 102-0060	2014		3	10	7	2024	30
	Chlorine Feed Gear Box	Fort Harrison WTP	Nord Drive Systems	Type SK71L/4 CUS	32711502 19963788	102-0062 - 102-0063	2015		2	10	8	2025	20
	Chlorine Feed Pump Post-filtration	Fort Harrison WTP	Seepex	MD005-24	843446.2	102-0064 - 102-0065	2015		2	10	8	2025	20
	Chlorine Pre Pump	Fort Harrison WTP	Watson Marlow	0M0.244L.GLA	40513	102-0075 - 102-0076	2013		4	7	3	2020	57
	Chlorine Transfer Pump	Fort Harrison WTP	Finish Thompson	SP10P-3-M218	123073A14	102-0086 - 102-0087	2013		4	10	6	2023	40
	Phosphate Pump	Indian Lake WTP	Pulsatron	LPE4MA-VTT1-U03	02/12.344668	102-0208 - 102-0209	2012		5	7	2	2019	71
	Pre Chlorine Pump	Indian Lake WTP	Watson Marlow	0M0.224L.GLA	N072269	102-0169 - 102-0170	2012		5	7	2	2019	71
	Post Chlorine Pump	Indian Lake WTP	Watson Marlow	0M0.224L.GLA	O040516	102-0171, 102-0173	2012		5	7	2	2019	71
	Air Pump	Indian Lake WTP	Ingersoll Rand	SS3	S12064759	102-0224 - 102-0225	2012		5	10	5	2022	50
	Chlorine Transfer Pump	Indian Lake WTP	FTI	128840F14	SP10P-3-M218	102-0178-102-0180	2014		3	10	7	2024	30
	Booster Pump 1	Winding Ridge	Cornell	5HH-CC 100-4	133145	102-0131 - 102-0132	2004		13	40	27	2044	33
	Booster Pump 2	Winding Ridge	Cornell	5HH-CC 100-4	133146 13.88	102-0133 - 102-0134	2004		13	40	27	2044	33

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information		Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
					Coverage	Expiration Date								
	Well No. 1	Richardt WTP						--	40					
	Well No. 2	Richardt WTP						--	40					
	Well No. 3	Richardt WTP						--	40					
	Well No. 4	Richardt WTP						--	40					
	Well No. 8	Fort Harrison Well Field						--	40					
	Well No. 9	Fort Harrison Well Field						--	40					
	Well No. 10	Fort Harrison Well Field						--	40					
	Well No. 14	Indian Lake Well Field						--	40					
	Well No. 15R	Indian Lake Well Field						--	40					
	Well No. 16	Indian Lake Well Field						--	40					
	High Service Pump 1	Richardt WTP						--	40					
	High Service Pump 2	Richardt WTP						--	40					
	High Service Pump 3	Richardt WTP						--	40					
	High Service Pump 4	Richardt WTP						--	40					
	High Service Pump 1	Fort Harrison WTP						--	40					
	High Service Pump 2	Fort Harrison WTP						--	40					
	High Service Pump 3	Fort Harrison WTP						--	40					
	High Service Pump 1	Indian Lake WTP						--	40					
	High Service Pump 2	Indian Lake WTP						--	40					
	High Service Pump 3	Indian Lake WTP						--	40					
	Chlorine Pump Pre-filtration	Richardt WTP						--	10					
	Chlorine Pump Post-filtration	Richardt WTP						--	10					
	Chlorine Post-filtration Gear Box	Richardt WTP						--	10					
	Chlorine Pre-filtration Gear Box	Richardt WTP						--	10					
	Chlorine Transfer Pump	Richardt WTP						--	10					
	Temp. Pre-filtration Chlorine Pump	Richardt WTP						--	7					
	Chlorine Transfer Pump	Fort Harrison WTP						--	10					
	Chlorine Feed Gear Box	Fort Harrison WTP						--	10					
	Chlorine Feed Pump Post-filtration	Fort Harrison WTP						--	10					
	Chlorine Pre Pump	Fort Harrison WTP						--	7					
	Chlorine Transfer Pump	Fort Harrison WTP						--	10					
	Phosphate Pump	Indian Lake WTP						--	7					
	Pre Chlorine Pump	Indian Lake WTP						--	7					
	Post Chlorine Pump	Indian Lake WTP						--	7					
	Air Pump	Indian Lake WTP						--	10					
	Chlorine Transfer Pump	Indian Lake WTP						--	10					
	Booster Pump 1	Winding Ridge						--	40					
	Booster Pump 2	Winding Ridge						--	40					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Well No. 1	Richardt WTP	2	1	2	2	2	1.74	4	5	2	1	3	2	3.00	1.00	**5.22**
	Well No. 2	Richardt WTP	3	1	2	2	2	1.90	4	5	2	1	3	2	3.00	1.00	**5.70**
	Well No. 3	Richardt WTP	3	1	2	2	3	2.20	4	5	2	1	3	2	3.00	1.00	**6.60**
	Well No. 4	Richardt WTP	4	5	4	4	4	4.26	4	5	2	1	3	2	3.00	1.00	**12.78**
	Well No. 8	Fort Harrison Well Field	2	2	2	5	3	2.96	4	5	2	1	3	3	3.08	0.75	**6.85**
	Well No. 9	Fort Harrison Well Field	1	1	2	5	3	2.54	4	5	2	1	3	3	3.08	0.75	**5.87**
	Well No. 10	Fort Harrison Well Field	1	1	2	5	3	2.54	4	5	2	1	3	3	3.08	0.75	**5.87**
	Well No. 14	Indian Lake Well Field	1	1	2	5	3	2.54	4	5	2	1	3	3	3.08	0.75	**5.87**
	Well No. 15R	Indian Lake Well Field	4	1	2	5	3	3.02	4	5	2	1	3	3	3.08	0.75	**6.98**
	Well No. 16	Indian Lake Well Field	1	1	2	5	3	2.54	4	5	2	1	3	3	3.08	0.75	**5.87**
	High Service Pump 1	Richardt WTP	2	2	3	4	3	2.80	3	5	2	1	1	1	2.22	0.67	**4.15**
	High Service Pump 2	Richardt WTP	2	2	3	2	3	2.36	3	5	2	1	1	1	2.22	0.67	**3.50**
	High Service Pump 3	Richardt WTP	3	5	5	3	3	3.64	3	5	2	1	1	1	2.22	0.67	**5.39**
	High Service Pump 4	Richardt WTP	5	5	5	5	5	5.00	3	5	4	1	1	1	2.78	0.67	**9.26**
	High Service Pump 1	Fort Harrison WTP	3	5	5	3	2	3.34	3	5	2	1	3	1	2.72	1.00	**9.09**
	High Service Pump 2	Fort Harrison WTP	3	2	3	3	3	2.74	3	5	2	1	3	1	2.72	1.00	**7.46**
	High Service Pump 3	Fort Harrison WTP	5	2	3	4	5	3.88	3	5	2	1	3	1	2.72	1.00	**10.56**
	High Service Pump 1	Indian Lake WTP	3	1	2	2	2	1.90	3	5	2	1	3	1	2.72	0.67	**3.45**
	High Service Pump 2	Indian Lake WTP	3	1	2	2	2	1.90	3	5	2	1	3	1	2.72	0.67	**3.45**
	High Service Pump 3	Indian Lake WTP	3	1	2	2	2	1.90	3	5	2	1	3	1	2.72	0.67	**3.45**
	Chlorine Pump Pre-filtration	Richardt WTP	3	2	4	2	2	2.28	2	5	2	5	4	4	3.25	1.00	**7.41**
	Chlorine Pump Post-filtration	Richardt WTP	5	2	4	2	5	3.50	5	5	4	5	4	4	4.39	1.00	**15.36**
	Chlorine Post-filtration Gear Box	Richardt WTP	5	2	4	2	5	3.50	5	5	4	5	4	4	4.39	1.00	**15.36**
	Chlorine Pre-filtration Gear Box	Richardt WTP	3	2	4	2	2	2.28	2	5	2	5	4	4	3.25	1.00	**7.41**
	Chlorine Transfer Pump	Richardt WTP	2	2	4	2	2	2.12	2	5	2	1	1	2	2.11	1.00	**4.48**
	Temp. Pre-filtration Chlorine Pump	Richardt WTP	3	5	4	3	2	3.28	2	5	2	5	4	4	3.25	1.00	**10.66**
	Chlorine Transfer Pump	Fort Harrison WTP	2	2	4	2	2	2.12	2	5	2	1	1	2	2.11	1.00	**4.48**
	Chlorine Feed Gear Box	Fort Harrison WTP	2	2	4	2	2	2.12	5	5	4	5	4	4	4.39	1.00	**9.30**
	Chlorine Feed Pump Post-filtration	Fort Harrison WTP	2	2	4	2	2	2.12	5	5	4	5	4	4	4.39	1.00	**9.30**
	Chlorine Pre Pump	Fort Harrison WTP	2	3	4	2	2	2.38	2	5	2	5	4	4	3.25	1.00	**7.73**
	Chlorine Transfer Pump	Fort Harrison WTP	2	3	4	2	2	2.38	2	5	2	1	1	2	2.11	1.00	**5.02**
	Phosphate Pump	Indian Lake WTP	3	4	4	2	2	2.80	2	5	1	1	1	1	1.75	1.00	**4.90**
	Pre Chlorine Pump	Indian Lake WTP	3	4	4	2	2	2.80	2	5	2	4	4	4	3.19	1.00	**8.94**
	Post Chlorine Pump	Indian Lake WTP	2	4	4	2	2	2.64	5	5	4	5	4	4	4.39	1.00	**11.59**
	Air Pump	Indian Lake WTP	2	3	4	1	1	1.86	2	5	1	3	3	1	2.36	1.00	**4.39**
	Chlorine Transfer Pump	Indian Lake WTP	2	2	4	2	2	2.12	2	5	2	1	1	2	2.11	1.00	**4.48**
	Booster Pump 1	Winding Ridge	1	2	4	2	2	1.96	3	5	1	3	2	1	2.31	1.00	**4.52**
	Booster Pump 2	Winding Ridge	1	2	4	2	2	1.96	3	5	1	3	2	1	2.31	1.00	**4.52**

Last Inspec. Date	Asset ID	Asset Description	Motor Location			General Information										Stand-by Power	
			Location	Northing	Easting	Manufacturer	Model No.	Serial No.	HP	RPM	Voltage	Phase	VFD?	Starter Type	Year Cons.	Type	Notes
		Well No. 1	Richardt WTP	4411885	582273	U.S. Motors	RUE	B411/U02T3198025R-1	125	1,780	460	3	Yes		2012	None	Permanent stand-by power required by 10 States Standards
		Well No. 2	Richardt WTP	4411860	582373	Emerson	BF66	P 04 7352162-0011 R 00 07	100	1,785	460	3	Yes		2012	None	Permanent stand-by power required by 10 States Standards
		Well No. 3	Richardt WTP	4411735	582273	U.S. Motors	DT94	U 04 7557671-0031 M 0002							2013	None	Permanent stand-by power required by 10 States Standards
		Well No. 4	Richardt WTP	4411730	582373	U.S. Motors		2355470							1954	None	Permanent stand-by power required by 10 States Standards
		Well No. 8	Fort Harrison Well Field	4415420	585268	U.S. Motors	DT79	U 127579029-0001 R 00 02	100	1785	460	3	Yes		2004	None	Permanent stand-by power required by 10 States Standards
		Well No. 9	Fort Harrison Well Field	4415760	585673	U.S. Motors	BF56A	S 08 7499946-0046 M 0004	60	1765	230/460	3			2012	None	Permanent stand-by power required by 10 States Standards
		Well No. 10	Fort Harrison Well Field	4415685	585573	U.S. Motors	DT96	T 09 7539371-0003 M 0004	100	1780	460	3	Yes		2013	None	Permanent stand-by power required by 10 States Standards
		Well No. 14	Indian Lake Well Field	4416235	585848	U.S. Motors	H040V2BLF-C	S09-30722573-0001-6T-01	125	1785	460	3	Yes		2011	None	Permanent stand-by power required by 10 States Standards
		Well No. 15R	Indian Lake Well Field	4416435	585973	U.S. Motors	BF61A	N10-BF61A-M	75	1775	460	3			2011	Portable Connection	Permanent stand-by power required by 10 States Standards
		Well No. 16	Indian Lake Well Field	4416210	585798	Marathon Elec.	DT96	U 07 7565020-0062 M0013	100	1780	460	3	Yes		2013	None	Permanent stand-by power required by 10 States Standards
		HSP 1	Richardt WTP			U.S. Motors	BF66	601-BF66-M D3							2003	None	Permanent stand-by power required by 10 States Standards
		HSP 2	Richardt WTP			U.S. Motors	BF66	601-BF66-M D2							2003	None	Permanent stand-by power required by 10 States Standards
		HSP 3	Richardt WTP			U.S. Motors	R-8891-00-D-098	R2043535							1971	None	Permanent stand-by power required by 10 States Standards
		HSP 1	Fort Harrison WTP			Westinghouse	TBFC	8106M	50						1980	Diesel Generator	
		HSP 2	Fort Harrison WTP			Toshiba	0754DPSA31A-P	SA5363050	75						2009	Diesel Generator	
		HSP 3	Fort Harrison WTP			Toshiba	B0754VLF3USH	100806792	75						2009	Diesel Generator	
		HSP 1	Indian Lake WTP			U.S. Motors	BF50A	S 01 7473304-0045M 0005	50	1780	230/460	3			2012	None	Permanent stand-by power required by 10 States Standards
		HSP 2	Indian Lake WTP			U.S. Motors	RUSI/DT94	V 05 7591185-0006 M 0005	50		230/460	3			2012	None	Permanent stand-by power required by 10 States Standards
		HSP 3	Indian Lake WTP			U.S. Motors	RUSI/DT94	W 017612589-0017 M 0001	50	1780		3			2012	None	Permanent stand-by power required by 10 States Standards
		Air Compressor	Richardt WTP			WEG	97331136		5/3	3520/ 2940	230/460/1 90/380	3			2012	None	Permanent stand-by power required by 10 States Standards
		Chlorine Motor Post-filtration	Richardt WTP			Browning	NEMA MG1 PART 31	RD0313 T11K	0.5	1745	115/230	3	Yes		2014	None	Permanent stand-by power required by 10 States Standards
		Chlorine Motor Pre-filtration	Richardt WTP			Browning	NEMA MG1 PART 31	RD0513T11K	0.5	1745	115/230	3	Yes		2014	None	Permanent stand-by power required by 10 States Standards
		Chlorine Transfer Pump	Richardt WTP			WEG	00136ES1BD56C	10223659	1	3500	115/230	1			2014	None	Permanent stand-by power required by 10 States Standards
		Chlorine Transfer Pump	Fort Harrison WTP - Filter Building			WEG	00136ES1BD56C	10223659	1	3500	115/230	1			2014	Diesel Generator	
		Chlorine Transfer Pump	Fort Harrison WTP			WEG	00136ES1BD56C	10223659	1	3500	115/230	1			2013	Diesel Generator	
		Phosphate Mixer	Indian Lake WTP			Dayton	6K937BB	F10J230021	0.5	1725	115/230	1			2010	None	Permanent stand-by power required by 10 States Standards
		Air Compressor	Indian Lake WTP			Ingersoll Rand	T63BXCDT1254	56283138		3450	230	1			2012	None	Permanent stand-by power required by 10 States Standards
		Chlorine Transfer Pump	Indian Lake WTP			WEG	001136ES1BD56C	10223659	1	3500	115/230	1			2014	None	Permanent stand-by power required by 10 States Standards
		Booster Pump 1	Winding Ridge			Baldor	44F016W132H2	Z0402040161	100	1775	460	3			2004	Diesel Generator	
		Booster Pump 2	Winding Ridge			Baldor	44F016W132H2	Z0402040156	100	1775	460	3			2004	Diesel Generator	

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	Well No. 1	Richardt WTP	U.S. Motors	RUE	B411/U02T3198025R-1	102-0020 - 102-0021	2012		5	35	30	2047	14
	Well No. 2	Richardt WTP	U.S.	BF66	P 04 7352162-0011 R 00 07	102-0022 - 102-0023	2012		5	35	30	2047	14
	Well No. 3	Richardt WTP	U.S. Motors	DT94	U 04 7557671-0031 M 0002	101-0978 - 101-0980	2013		4	35	31	2048	11
	Well No. 4	Richardt WTP	U.S. Motors		2355470	101-0982 - 101-0985	1954		63	35	-28	1989	180
	Well No. 8	Fort Harrison Well Field	U.S. Motors	DT79	U 127579029-0001 R 00 02	102-0108 - 102-0109	2004		13	35	22	2039	37
	Well No. 9	Fort Harrison Well Field	U.S. Motors	BF56A	S 08 7499946-0046 M 0004	102-0095 - 102-0097	2012		5	35	30	2047	14
	Well No. 10	Fort Harrison Well Field	U.S. Motors	DT96	T 09 7539371-0003 M 0004	102-0100 - 102-0101	2013		4	35	31	2048	11
	Well No. 14	Indian Lake Well Field	U.S. Motors	H040V2BLF-C	S09-30722573-0001-6T-01	102-0162 - 102-0163	2011		6	35	29	2046	17
	Well No. 15R	Indian Lake Well Field	U.S. Motors	BF61A	N10-BF61A-M	102-0267 - 102-0268	2011		6	35	29	2046	17
	Well No. 16	Indian Lake Well Field	Marathon Elec.	DT96	U 07 7565020-0062 M0013	102-0142 - 102-0143	2013		4	35	31	2048	11
	HSP 1	Richardt WTP	U.S. Motors	BF66	601-BF66-M D3	102-0004 - 102-0005	2003		14	35	21	2038	40
	HSP 2	Richardt WTP	U.S. Motors	BF66	601-BF66-M D2	102-0008 - 102-0009	2003		14	35	21	2038	40
	HSP 3	Richardt WTP	U.S. Motors	R-8891-00-D-098	R2043535	102-0372 - 102-0374	1971		46	35	-11	2006	131
	HSP 1	Fort Harrison WTP	Westinghouse	TBFC	8106M	102-0034 - 102-0035	1980		37	35	-2	2015	106
	HSP 2	Fort Harrison WTP	Toshiba	0754DPSA31A-P	SA5363050	102-0032 - 102-0033	2009		8	35	27	2044	23
	HSP 3	Fort Harrison WTP	Toshiba	B0754VLF3USH	100806792	102-0029 - 102-0030	2009		8	35	27	2044	23
	HSP 1	Indian Lake WTP	U.S. Motors	BF50A	S 01 7473304-0045M 0005	102-0191 - 102-0192	2012		5	35	30	2047	14
	HSP 2	Indian Lake WTP	U.S. Motors	RUSI/DT94	V 05 7591185-0006 M 0005	102-0193 - 102-0195	2012		5	35	30	2047	14
	HSP 3	Indian Lake WTP	U.S. Motors	RUSI/DT94	W 017612589-0017 M 0001	102-0196 - 102-0198	2012		5	35	30	2047	14
	Air Compressor	Richardt WTP	WEG	97331136		102-0466	2012		5	35	30	2047	14
	Chlorine Motor Post-filtration	Richardt WTP	Browning	NEMA MG1 PART 31	RD0313 T11K	101-0994 - 101-0998	2014		3	35	32	2049	9
	Chlorine Motor Pre-filtration	Richardt WTP	Browning	NEMA MG1 PART 31	RD0513T11K	101-0994 - 101-0998	2014		3	35	32	2049	9
	Chlorine Transfer Pump	Richardt WTP	WEG	00136ES1BD56C	10223659	101-0999 - 102-0102	2014		3	35	32	2049	9
	Chlorine Transfer Pump	Fort Harrison WTP - Filter Building	WEG	00136ES1BD56C	10223659	102-0057 - 102-0058	2014		3	35	32	2049	9
	Chlorine Transfer Pump	Fort Harrison WTP	WEG	00136ES1BD56C	10223659	102-0084 - 102-0085	2013		4	35	31	2048	11
	Phosphate Mixer	Indian Lake WTP	Dayton	6K937BB	F10J230021	102-0204 - 102-0205	2010		7	35	28	2045	20
	Air Compressor	Indian Lake WTP	Ingersoll Rand	T63BXCDT1254	56283138	102-0222 - 102-2225	2012		5	35	30	2047	14
	Chlorine Transfer Pump	Indian Lake WTP	WEG	001136ES1BD56C	10223659	102-0176 - 102-0177	2014		3	35	32	2049	9
	Booster Pump 1	Winding Ridge	Baldor	44F016W132H2	Z0402040161	102-0127 - 102-0128	2004		13	35	22	2039	37
	Booster Pump 2	Winding Ridge	Baldor	44F016W132H2	Z0402040156	102-0129 - 102-0130	2004		13	35	22	2039	37

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information		Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes	Phys. Condition (1=exc., 5=poor)	Age factor
					Coverage	Expiration Date										
	Well No. 1	Richardt WTP						--	35						3	1
	Well No. 2	Richardt WTP						--	35						2	1
	Well No. 3	Richardt WTP						--	35						1	1
	Well No. 4	Richardt WTP						--	35						5	5
	Well No. 8	Fort Harrison Well Field						--	35						2	2
	Well No. 9	Fort Harrison Well Field						--	35						3	1
	Well No. 10	Fort Harrison Well Field						--	35						2	1
	Well No. 14	Indian Lake Well Field						--	35						3	1
	Well No. 15R	Indian Lake Well Field						--	35						4	1
	Well No. 16	Indian Lake Well Field						--	35						2	1
	HSP 1	Richardt WTP						--	35						2	3
	HSP 2	Richardt WTP						--	35						2	3
	HSP 3	Richardt WTP						--	35					Abandoned?	4	5
	HSP 1	Fort Harrison WTP						--	35						1	5
	HSP 2	Fort Harrison WTP						--	35						2	2
	HSP 3	Fort Harrison WTP						--	35						2	2
	HSP 1	Indian Lake WTP						--	35						2	1
	HSP 2	Indian Lake WTP						--	35						2	1
	HSP 3	Indian Lake WTP						--	35						2	1
	Air Compressor	Richardt WTP						--	35						1	1
	Chlorine Motor Post-filtration	Richardt WTP						--	35						3	1
	Chlorine Motor Pre-filtration	Richardt WTP						--	35						1	1
	Chlorine Transfer Pump	Richardt WTP						--	35						3	1
	Chlorine Transfer Pump	Fort Harrison WTP - Filter Building						--	35						1	1
	Chlorine Transfer Pump	Fort Harrison WTP						--	35						3	1
	Phosphate Mixer	Indian Lake WTP						--	35						3	2
	Air Compressor	Indian Lake WTP						--	35						2	1
	Chlorine Transfer Pump	Indian Lake WTP						--	35						2	1
	Booster Pump 1	Winding Ridge						--	35						1	2
	Booster Pump 2	Winding Ridge						--	35						1	2

Asset ID	Asset Description	Location	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Well No. 1	Richardt WTP	4	4	2	2.46	3	5	2	1	3	2	2.81	1.00	**6.90**
	Well No. 2	Richardt WTP	4	3	2	2.08	3	5	2	1	3	2	2.81	1.00	**5.84**
	Well No. 3	Richardt WTP	2	1	1	1.06	3	5	2	1	3	2	2.81	1.00	**2.97**
	Well No. 4	Richardt WTP	5	4	4	4.48	3	5	2	1	3	2	2.81	1.00	**12.57**
	Well No. 8	Fort Harrison Well Field	2	2	3	2.30	3	5	2	1	1	1	2.22	0.75	**3.83**
	Well No. 9	Fort Harrison Well Field	4	3	3	2.54	3	5	2	1	1	1	2.22	0.75	**4.23**
	Well No. 10	Fort Harrison Well Field	4	2	3	2.16	3	5	2	1	1	1	2.22	0.75	**3.60**
	Well No. 14	Indian Lake Well Field	4	3	3	2.54	3	5	2	1	1	1	2.22	0.75	**4.23**
	Well No. 15R	Indian Lake Well Field	4	3	3	2.70	3	5	2	1	1	1	2.22	0.75	**4.50**
	Well No. 16	Indian Lake Well Field	2	2	3	2.04	3	5	2	1	1	1	2.22	0.75	**3.40**
	HSP 1	Richardt WTP	4	3	2	2.60	3	5	2	1	1	1	2.22	0.67	**3.85**
	HSP 2	Richardt WTP	2	2	2	2.26	3	5	2	1	1	1	2.22	0.67	**3.35**
	HSP 3	Richardt WTP	4	4	4	4.26	3	5	2	1	1	1	2.22	0.67	**6.31**
	HSP 1	Fort Harrison WTP	2	2	2	2.62	3	5	2	1	3	1	2.72	1.00	**7.13**
	HSP 2	Fort Harrison WTP	2	3	2	2.22	3	5	2	1	3	1	2.72	1.00	**6.04**
	HSP 3	Fort Harrison WTP	2	2	2	2.00	3	5	2	1	3	1	2.72	1.00	**5.44**
	HSP 1	Indian Lake WTP	2	2	2	1.74	3	5	2	1	3	1	2.72	0.67	**3.16**
	HSP 2	Indian Lake WTP	2	2	2	1.74	3	5	2	1	3	1	2.72	0.67	**3.16**
	HSP 3	Indian Lake WTP	2	2	2	1.74	3	5	2	1	3	1	2.72	0.67	**3.16**
	Air Compressor	Richardt WTP	2	2	1	1.28	1	5	1	1	1	1	1.56	1.00	**1.99**
	Chlorine Motor Post-filtration	Richardt WTP	2	1	5	2.58	5	5	4	5	4	4	4.39	1.00	**11.32**
	Chlorine Motor Pre-filtration	Richardt WTP	2	1	1	1.06	2	5	2	5	4	4	3.25	1.00	**3.44**
	Chlorine Transfer Pump	Richardt WTP	3	2	2	1.96	2	5	2	1	1	2	2.11	1.00	**4.14**
	Chlorine Transfer Pump	Fort Harrison WTP - Filter Building	3	2	1	1.34	2	5	2	1	1	2	2.11	1.00	**2.83**
	Chlorine Transfer Pump	Fort Harrison WTP	3	3	2	2.18	2	5	2	1	1	2	2.11	1.00	**4.60**
	Phosphate Mixer	Indian Lake WTP	3	2	2	2.22	1	5	1	1	1	1	1.56	1.00	**3.45**
	Air Compressor	Indian Lake WTP	3	2	2	1.80	2	5	1	3	3	1	2.36	1.00	**4.25**
	Chlorine Transfer Pump	Indian Lake WTP	2	1	1	1.22	2	5	2	1	1	2	2.11	1.00	**2.58**
	Booster Pump 1	Winding Ridge	2	1	1	1.32	3	5	1	3	2	1	2.31	1.00	**3.04**
	Booster Pump 2	Winding Ridge	2	1	1	1.32	3	5	1	3	2	1	2.31	1.00	**3.04**

Last Inspec. Date	Asset ID	Asset Name	Location	General Information										Stand-by Power		Remote Monitoring	
				Year Placed into Service	Manufacturer	Model	Serial No.	Supplier	Voltage	Amps	Phase	Utility Feed Info.	NEMA Rating	Type	Notes	Type	Notes
		Well 1 VFD	Richardt St. WTP	2015	Toshiba	VT130P9U412K	150202853		480V		3						
		Well 2 VFD	Richardt St. WTP	2015	Toshiba	VT130P9U410K	140502678		480V		3						
		Well 8 VFD	Fort Harrison Well Field	2011	Toshiba	VT130P9U4750	110503833		480V		3		1				
		Well 10 VFD	Fort Harrison Well Field	2011	Toshiba	VT130P9U4750	120901217		480V		3		1				
		Well 14 VFD	Indian Lake Well Field	2011	Benshaw Vector	RSI100SX4D	05390075		480v		3		1				
		Well 16 VFD	Indian Lake Well Field	2011	Toshiba	VT130P9U410K	110300170		480V		3		1				
		HSP 1-VFD	Richardt St. WTP	2006	Toshiba	VT130H7U410KA	303D4307		480V		3						
		HSP 2-VFD	Richardt St. WTP	2006	Toshiba	VT130P9U410K	120100212										
		HSP 1-VFD	Fort Harrison WTP	2013	Toshiba	VT130H9U4500	A080501052		480V		3		1				
		HSP 2-VFD	Fort Harrison WTP	2013	Toshiba	VT130H9U4750	100500394		480V		3		1				
		HSP 3-VFD	Fort Harrison WTP	2013	Toshiba	VT130P9U4750	130400100		480V		3		1				
		HSP 1-VFD	Indian Lake WTP	2012	Toshiba	VT130P9U4750	110401487		480V		3		1				
		HSP 2-VFD	Indian Lake WTP	2012	Toshiba	VT130P9U410K	121100532		480V		3		1				
		HSP 3-VFD	Indian Lake WTP	2012	Toshiba	VT130P9U4500	141102062		480V		3		1				
		Chlorine Speed Control	Richardt WTP	2010	Leeson Speedmaster	174931.00	134312143136114-34						1				
		Chlorine Speed Control	Richardt WTP	2010	Leeson Speedmaster	174931.00	134312143136014-34						1				
		Motor Starter	Richardt WTP	2010	Furnas	11/71 Spec 041118	89S04898-1		480V		3						
		Sump Pump Basin	Richardt WTP	2015	Toshiba	VT130H7U4270	040603264				3						
		Filter Room Transformer	Richardt WTP	1994	Federal Pacific	FB	30013		480-120/240V		1						
		U.S. Filter Control	Richardt WTP	1995	U.S. Filter												
		Filter Building Transformer	Richardt WTP	1995	Square D	6T5F	31949-28445-002		480-120/240V		1						
		Portable Generator	Richardt WTP	2012	Baldor	IDLC250-JD	1B9BT182341692006		480V, 240V		3						
		MCC - HSP1, HSP2 and Wells	Richardt WTP	1990	Siemens-Allis				480V, 600A		3						
		Main Service Disconnect Switch	Richardt WTP	1990	Kinney Electric	VL 368-ST	32436		480V, RATED 600V, 3W	1200	3						
		HSP-MCC	Fort Harrison WTP	2005	Cutler Hammmer	2100	5A11003H02		480V		3		1				
		Automatic Transfer Switch	Fort Harrison WTP	2005	Emerson	856518	1065654		480V	260	3						
		Filter House MCC	Fort Harrison WTP	2005	Underwriters Labs	Model 4	A425257										
		Generator Alternator	Fort Harrison WTP	2005	Baldor	10.75200-G26	P0505230002		480/277V, 200KW, 301A		3						
		Generator Engine	Fort Harrison WTP	2005	John Deere		RG6081A170952										
		Well PLC	Fort Harrison Well Field	2005													
		MCC	Fort Harrison WTP	2005	Square D				480V	600	3						
		Safety switches x2 (Aerators)	Indian Lake WTP	1998	Eaton				RATED 600VAC	30	3						
		Safety Switch Gen Not Used	Indian Lake WTP	1998	Siemens												
		Gen recept	Indian Lake WTP	2013	Appleton Receptacle		AR20034		480V, 3W	200	3						
		Well 15 Power Center	Indian Lake Well Field	2000	Cutler Hammmer	P48G11S07SSCUB	J08L12026		480-120/240v		1		1				
		Indian Lake WTP MCC	Indian Lake WTP	1998	Cutler Hammmer		6AF1265784-C		480/277V	800	3		1				
		Flowtronex motor control panel	Winding Ridge	2008	Flowtronex	MVE-3000-2SL-74	12657M		480V		3						
		MCC Surge Arrester	Winding Ridge	2008	Surge & Lighting Advanced Protection	72-001-090											
		Transformer	Winding Ridge	2008	Acme	PT06-1150025-LS	A 5-701379		480-120/240v		1						
		Splash Proof Switch	Winding Ridge	2008		L96	OP-AR62 0307										
		MCC Transformer	Winding Ridge	2008	Acme	T-2-53010-S	B-111703		480-120/240v		1						
		Transformer	Well No. 1	1995	Acme				480-120/240V		1						
		Safety Switch	Well No. 1	1995	Siemens				RATED 600VAC	200	3						

				General Information										Stand-by Power		Remote Monitoring	
Last Inspec. Date	Asset ID	Asset Name	Location	Year Placed into Service	Manufacturer	Model	Serial No.	Supplier	Voltage	Amps	Phase	Utility Feed Info.	NEMA Rating	Type	Notes	Type	Notes
		Transformer	Richardt WTP - Filter Building	1995	Acme				480-120/240V								
		Transformer	Richardt WTP - Filter Building MCC	1995	Square D				480-120/240V								
		Power Panel	Well No. 1	1995	Siemens				480/277V	250	3						
		Lighting Panel	Well No. 1	1995	Siemens												
		Transformer	Richardt Admin Building	1995	Siemens		3F3Y045TP1		480-120/240V		1						
		Safety Switch	Well 8	1995	Siemens				RATED 600VAC	200	3						
		Utility Meter	Well 8	1995	Meter-Utility				480V/277V		3						
		Packaged Outdoor VFD	Well 8	2010	Toshiba						3						
		Unit Heater	Well 9	1995													
		Transformer	Well 9	1995	Westinghouse	EP	S20K11S10D		480-120/240V		1						
		Safety Switch	Well 9	1995	Siemens				480V	200	3						
		Building	Well 9	1995													
		Safety Switch x 2	Well 9	1995	Square D		B-40274-273-01		480V	250	3						
		Disconnect	Well 10	1995	Siemens	NR422			120/240V	60	1						
		Transformer	Well 10	1995	Acme	10S1F			480-120/240V		1						
		Lighting Panel	Well 10	1995	Siemens	SERIES 3			120/240V		1						
		Enclosed Circuit Breaker	Well 10	1995	Square D	KAL36200			480V	200	3						
		Unit Heater	Well 10	1995	The Hot One												
		Building	Well 10	1995													
		VFD running with pump off reads 60HZ	Well 14	2005													
		MCC	Well14	1995	Cutler Hammer	30-13980	6AF1235784-A		480/277V, 800A, 300A MAIN LUGS	800	3						
		Mini-Power Zone	Well 15	2000	Square D				480-120/240V		1						
		Safety Switch	Well 15	1995	Siemens				RATED 600VAC	200	3						
		Building	Well 15/16	1995													
		MCC	Well 15/16	1995	Cutler Hammer	30-13980	6AF1265784-B		480/277V, 800A, 300A MAIN LUGS	800	3						
			Well 15/16	1995	Mission												
		Utility Meter	Well 15/16	1995													
		Service Disconnect/MTS	Well 15/16	1995	Eaton				RATED: 600VAC	200	3						
		Exhaust Fan	Well 15/16	1995													
		Safety Switch	Well 16	1995	Siemens	B-40274-185-02			RATED 600VAC	200	3						

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Specific Description (Voltage, Amps, Phase, etc.)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date
	Well 1 VFD	Richardt St. WTP	Toshiba	VT130P9U412K	150202853	102-0017 - 102-0018	480V	2015		2	15	13	2030
	Well 2 VFD	Richardt St. WTP	Toshiba	VT130P9U410K	140502678	102-0024 - 102-0025	480V	2015		2	15	13	2030
	Well 8 VFD	Fort Harrison Well Field	Toshiba	VT130P9U4750	110503833	102-0112	480V	2011		6	15	9	2026
	Well 10 VFD	Fort Harrison Well Field	Toshiba	VT130P9U4750	120901217	102-0098 - 102-0099	480V	2011		6	15	9	2026
	Well 14 VFD	Indian Lake Well Field	Benshaw Vector	RSI100SX4D	05390075	102-0159 , 102-0161	480v	2011		6	15	9	2026
	Well 16 VFD	Indian Lake Well Field	Toshiba	VT130P9U410K	110300170	102-0149 - 102-0150	480V	2011		6	15	9	2026
	HSP 1-VFD	Richardt St. WTP	Toshiba	VT130H7U410KA	303D4307	102-0010 - 102-0011	480V	2006		11	15	4	2021
	HSP 2-VFD	Richardt St. WTP	Toshiba	VT130P9U410K	120100212	102-0006 - 102-0007	480V	2006		11	15	4	2021
	HSP 1-VFD	Fort Harrison WTP	Toshiba	VT130H9U4500	A080501052	102-0036 - 102-0037	480V	2013		4	15	11	2028
	HSP 2-VFD	Fort Harrison WTP	Toshiba	VT130H9U4750	100500394	102-0038 - 102-0039	480V	2013		4	15	11	2028
	HSP 3-VFD	Fort Harrison WTP	Toshiba	VT130P9U4750	130400100	102-0040 - 102-0041	480V	2013		4	15	11	2028
	HSP 1-VFD	Indian Lake WTP	Toshiba	VT130P9U4750	110401487	102-0185 - 102-0186	480V	2012		5	15	10	2027
	HSP 2-VFD	Indian Lake WTP	Toshiba	VT130P9U410K	121100532	102-0187 - 102-0188	480V	2012		5	15	10	2027
	HSP 3-VFD	Indian Lake WTP	Toshiba	VT130P9U4500	141102062	102-0189 - 102-0190	480V	2012		5	15	10	2027
	Chlorine Speed Control	Richardt WTP	Leeson Speedmaster	174931	134312143136114-34	101-0090 - 101-0093		2010		7	35	28	2045
	Chlorine Speed Control	Richardt WTP	Leeson Speedmaster	174931.00	134312143136014-34	101-0090 - 101-0093		2010		7	35	28	2045
	Motor Starter	Richardt WTP	Furnas	11/71 Spec 041118	89S04898-1	102-0382 - 102-0383	480V	2010		7	35	28	2045
	Sump Pump Basin	Richardt WTP	Toshiba	VT130H7U4270	040603264	102-0384 -102-0385		2015		2	35	33	2050
	Filter Room Transformer	Richardt WTP	Federal Pacific	FB	30013	102-0386 - 102-0388	480-120/240V	1994		23	35	12	2029
	U.S. Filter Control	Richardt WTP	U.S. Filter			102-0393		1995		22	15	-7	2010
	Filter Building Transformer	Richardt WTP	Square D	6T5F	31949-28445-002	102-0405 - 102-0407	480-120/240V	1995		22	35	13	2030
	Portable Generator	Richardt WTP	Baldor	IDLC250-JD	1B9BT182341692006	102-0461 - 102-0462	480V, 240V	2012		5	35	30	2047
	MCC - HSP1, HSP2 and Wells	Richardt WTP	Siemens-Allis			102-0497 - 102-0502	480V, 600A	1990		27	35	8	2025
	Main Service Disconnect Switch	Richardt WTP	Kinney Electric	VL 368-ST	32436	102-0503 - 102-0504	480V, 1200A, RATED 600V, 3W	1990		27	35	8	2025
	HSP-MCC	Fort Harrison WTP	Cutler Hammer	2100	5A11003H02	102-0045 - 102-0046, 102-0887	480V	2005		12	35	23	2040
	Automatic Transfer Switch	Fort Harrison WTP	Emerson	856518	1065654	102-0047 - 102-0048	480V, 260A	2005		12	35	23	2040
	Filter House MCC	Fort Harrison WTP	Square D	Model 4	A425257	102-0066 - 102-0067, 102-0581, 102-0584	480V	2005		12	35	23	2040
	Generator Alternator	Fort Harrison WTP	Baldor	10.75200-G26	P0505230002	102-0577 - 102-0578	480/277V, 200KW, 301A	2005		12	35	23	2040
	Generator Engine	Fort Harrison WTP	John Deere		RG6081A170952			2005		12	35	23	2040
	Well PLC	Fort Harrison Well Field				102-0585		2005		12	15	3	2020
	Safety switches x2 (Aerators)	Indian Lake WTP	Eaton			102-0863	RATED 600VAC, 200A	1998		19	35	16	2033
	Safety Switch Gen Not Used	Indian Lake WTP	Siemens			102-0864	RATED: 600VAC	1998		19	35	16	2033
	Gen recept	Indian Lake WTP	Appleton	Powertite Receptacle	AR20034	102-0865 - 102-0868	200A, 3W, 4Pole	2013		4	35	31	2048
	Well 15 Power Center	Indian Lake Well Field	Cutler Hammmer	P48G11S07SSCUB	J08L12026	102-0271 - 102-0272	480V	2000		17	35	18	2035
	Indian Lake WTP MCC	Indian Lake WTP	Cutler Hammmer		6AF1265784-C	102-0226 - 102-0228	480/277V, 800A	1998		19	35	16	2033
	Flowtronex motor control panel	Winding Ridge	Flowtronex	MVE-3000-2SL-74	12657M	102-0115 - 102-0116	480V	2008		9	15	6	2023
	MCC Surge Arrester	Winding Ridge	Surge & Lighting Advanced Protection	72-001-090		102-0126		2008		9	35	26	2043
	Transformer	Winding Ridge	Acme	PT06-1150025-LS	A 5-701379	102-0123 - 102-0122	480-120/240V	2008		9	35	26	2043
	Splash Proof Switch	Winding Ridge		L96	OP-AR62 0307	102-0141	480-120/240V	2008		9	35	26	2043
	MCC Transformer	Winding Ridge	Acme	T-2-53010-S	B-111703	102-0125	480-120/240v	2008		9	35	26	2043

Asset ID	Asset Description	Location	% Useful life used	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information Coverage	Warranty Information Expiration Date	Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes	Phys. Condition (1=exc., 5=poor)	Age factor
	Well 1 VFD	Richardt St. WTP	13						--	15						1	1
	Well 2 VFD	Richardt St. WTP	13						--	15						1	1
	Well 8 VFD	Fort Harrison Well Field	40						--	15						2	3
	Well 10 VFD	Fort Harrison Well Field	40						--	15						2	3
	Well 14 VFD	Indian Lake Well Field	40						--	15						4	3
	Well 16 VFD	Indian Lake Well Field	40						--	15						3	3
	HSP 1-VFD	Richardt St. WTP	73						--	15						2	4
	HSP 2-VFD	Richardt St. WTP	73						--	15						2	4
	HSP 1-VFD	Fort Harrison WTP	27						--	15						1	2
	HSP 2-VFD	Fort Harrison WTP	27						--	15						1	2
	HSP 3-VFD	Fort Harrison WTP	27						--	15						1	2
	HSP 1-VFD	Indian Lake WTP	33						--	15						1	2
	HSP 2-VFD	Indian Lake WTP	33						--	15						1	2
	HSP 3-VFD	Indian Lake WTP	33						--	15						1	2
	Chlorine Speed Control	Richardt WTP	20						--	35						2	2
	Chlorine Speed Control	Richardt WTP	20						--	35						2	2
	Motor Starter	Richardt WTP	20						--	35						3	2
	Sump Pump Basin	Richardt WTP	6						--	35						2	1
	Filter Room Transformer	Richardt WTP	66						--	35						4	4
	U.S. Filter Control	Richardt WTP	147						--	15						2	5
	Filter Building Transformer	Richardt WTP	63						--	35						3	4
	Portable Generator	Richardt WTP	14						--	35						1	1
	MCC - HSP1, HSP2 and Wells	Richardt WTP	77						--	35						5	4
	Main Service Disconnect Switch	Richardt WTP	77						--	35						3	4
	HSP-MCC	Fort Harrison WTP	34						--	35						2	2
	Automatic Transfer Switch	Fort Harrison WTP	34						--	35						1	2
	Filter House MCC	Fort Harrison WTP	34						--	35						4	2
	Generator Alternator	Fort Harrison WTP	34						--	35						1	2
	Generator Engine	Fort Harrison WTP	34						--	35						1	2
	Well PLC	Fort Harrison Well Field	80						--	15						2	5
	Safety switches x2 (Aerators)	Indian Lake WTP	54						--	35						3	3
	Safety Switch Gen Not Used	Indian Lake WTP	54						--	35						1	3
	Gen recept	Indian Lake WTP	11						--	35						1	1
	Well 15 Power Center	Indian Lake Well Field	49						--	35						5	3
	Indian Lake WTP MCC	Indian Lake WTP	54						--	35						4	3
	Flowtronex motor control panel	Winding Ridge	60						--	15						1	4
	MCC Surge Arrester	Winding Ridge	26						--	35						2	2
	Transformer	Winding Ridge	26						--	35						1	2
	Splash Proof Switch	Winding Ridge	26						--	35						2	2
	MCC Transformer	Winding Ridge	26						--	35						1	2

Asset ID	Asset Description	Location	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Well 1 VFD	Richardt St. WTP	1	2	1	1.22	3	5	5	1	3	3	3.72	1.00	4.54
	Well 2 VFD	Richardt St. WTP	1	2	1	1.22	3	5	5	1	3	3	3.72	1.00	4.54
	Well 8 VFD	Fort Harrison Well Field	1	2	3	2.50	3	5	5	1	1	3	3.22	1.00	8.06
	Well 10 VFD	Fort Harrison Well Field	1	2	2	2.20	3	5	5	1	1	3	3.22	1.00	7.09
	Well 14 VFD	Indian Lake Well Field	1	2	2	2.52	3	5	5	1	1	3	3.22	1.00	8.12
	Well 16 VFD	Indian Lake Well Field	1	2	2	2.36	3	5	5	1	1	3	3.22	1.00	7.60
	HSP 1-VFD	Richardt St. WTP	1	3	2	2.68	4	5	5	1	1	4	3.50	1.00	9.38
	HSP 2-VFD	Richardt St. WTP	1	3	2	2.68	4	5	5	1	1	4	3.50	1.00	9.38
	HSP 1-VFD	Fort Harrison WTP	1	2	1	1.48	4	5	5	1	3	4	4.00	1.00	5.92
	HSP 2-VFD	Fort Harrison WTP	1	2	1	1.48	4	5	5	1	3	4	4.00	1.00	5.92
	HSP 3-VFD	Fort Harrison WTP	1	2	1	1.48	4	5	5	1	3	4	4.00	1.00	5.92
	HSP 1-VFD	Indian Lake WTP	1	2	1	1.48	4	5	5	1	3	4	4.00	1.00	5.92
	HSP 2-VFD	Indian Lake WTP	1	2	1	1.48	4	5	5	1	3	4	4.00	1.00	5.92
	HSP 3-VFD	Indian Lake WTP	1	2	1	1.48	4	5	5	1	3	4	4.00	1.00	5.92
	Chlorine Speed Control	Richardt WTP	1	3	2	2.16	3	5	1	4	4	3	3.03	1.00	6.54
	Chlorine Speed Control	Richardt WTP	1	3	2	2.16	3	5	1	5	4	3	3.08	1.00	6.66
	Motor Starter	Richardt WTP	4	3	3	2.80	5	5	5	1	5	5	4.78	1.00	13.38
	Sump Pump Basin	Richardt WTP	1	3	2	1.90	1	5	1	1	1	1	1.56	1.00	2.96
	Filter Room Transformer	Richardt WTP	4	3	4	3.78	5	5	5	1	5	5	4.78	1.00	18.06
	U.S. Filter Control	Richardt WTP	1	3	2	2.94	5	5	1	1	5	5	3.67	1.00	10.78
	Filter Building Transformer	Richardt WTP	4	3	3	3.32	5	5	5	1	5	5	4.78	1.00	15.86
	Portable Generator	Richardt WTP	4	3	1	1.62	1	5	5	4	1	1	2.83	1.00	4.59
	MCC - HSP1, HSP2 and Wells	Richardt WTP	4	3	5	4.24	4	5	5	4	4	4	4.42	1.00	18.73
	Main Service Disconnect Switch	Richardt WTP	4	3	3	3.32	5	5	5	1	5	5	4.78	1.00	15.86
	HSP-MCC	Fort Harrison WTP	4	3	2	2.34	5	5	5	1	5	5	4.78	1.00	11.18
	Automatic Transfer Switch	Fort Harrison WTP	4	3	1	1.88	5	5	5	1	5	5	4.78	1.00	8.98
	Filter House MCC	Fort Harrison WTP	4	3	4	3.26	5	5	5	1	5	5	4.78	1.00	15.58
	Generator Alternator	Fort Harrison WTP	4	3	1	1.88	2	5	5	1	2	2	3.19	1.00	6.01
	Generator Engine	Fort Harrison WTP	4	3	1	1.88	2	5	5	1	2	2	3.19	1.00	6.01
	Well PLC	Fort Harrison Well Field	1	3	2	2.94	4	5	1	4	4	4	3.31	1.00	9.72
	Safety switches x2 (Aerators)	Indian Lake WTP	4	3	3	3.06	3	5	5	1	3	3	3.72	1.00	11.39
	Safety Switch Gen Not Used	Indian Lake WTP	4	3	1	2.14	1	5	5	1	1	1	2.67	1.00	5.71
	Gen recept	Indian Lake WTP	4	3	1	1.62	1	5	5	1	1	1	2.67	1.00	4.32
	Well 15 Power Center	Indian Lake Well Field	4	3	5	3.98	3	5	5	1	3	3	3.72	1.00	14.81
	Indian Lake WTP MCC	Indian Lake WTP	4	3	4	3.52	5	5	5	1	5	5	4.78	1.00	16.82
	Flowtronex motor control panel	Winding Ridge	3	2	1	2.12	5	5	3	1	5	5	4.22	1.00	8.95
	MCC Surge Arrester	Winding Ridge	3	2	2	2.06	1	5	3	1	2	1	2.36	1.00	4.86
	Transformer	Winding Ridge	3	2	1	1.60	2	5	3	1	2	2	2.64	1.00	4.22
	Splash Proof Switch	Winding Ridge	3	2	2	2.06	1	5	3	1	2	1	2.36	1.00	4.86
	MCC Transformer	Winding Ridge	3	2	1	1.60	5	5	3	1	2	5	3.47	1.00	5.56

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Specific Description (Voltage, Amps, Phase, etc.)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date
	Transformer	Well No. 1	Acme			102-0891	480-120/240V	1995		22	35	13	2030
	Safety Switch	Well No. 1	Siemens				RATED 600VAC, 200A	1995		22	35	13	2030
	Transformer	Richardt WTP - Filter Building	Acme			102-0897	480-120/240V	1995		22	35	13	2030
	Transformer	Richardt WTP - Filter Building MCC	Square D	31949-28445-002		102-0904	480-240V 3ph	1995		22	35	13	2030
	Power Panel	Well No. 1	Siemens	P1E42ML250CBS			480/277V, 250A	1995		22	35	13	2030
	Lighting Panel	Well No. 1	Siemens	P1C42QJ150CBS			120/208V	1995		22	35	13	2030
	Transformer	Richardt Admin Building	Siemens	3F3Y045TP1	3F3Y045TP1	102-0906 - 102-0907	480-120/240V	1995		22	35	13	2030
	Safety Switch	Well 8	Siemens			102-0803	RATED 600VAC, 200A	1995		22	35	13	2030
	Utility Meter	Well 8	Meter-Utility			102-0804	480/277V, 4W	1995		22	35	13	2030
	Unit Heater	Well 9				102-0778		1995		22	35	13	2030
	Transformer	Well 9	Westinghouse	EP	S20K11S10D	102-0779 - 102-0780	480-120/240V	1995		22	35	13	2030
	Safety Switch	Well 9	Siemens			102-0776	480V	1995		22	35	13	2030
	Building	Well 9				102-0781 - 102-0784		1995		22	35	13	2030
	Safety Switch x 2	Well 9	Square D		B-40274-273-01	102-0785 - 102-0786	480V, 250A	1995		22	35	13	2030
	Disconnect	Well 10	Siemens	NR422		102-0788 - 102-0789	240V, 60A	1995		22	35	13	2030
	Transformer	Well 10	Sorgel	10S1F		102-0790 - 102-0791	480-120/240V	1995		22	35	13	2030
	Lighting Panel	Well 10	Siemens	SERIES 3		102-0792 - 102-0793	120/240V	1995		22	35	13	2030
	Enclosed Circuit Breaker	Well 10	Square D	KAL36200		102-0794 - 102-0796	480V, 200A	1995		22	35	13	2030
	Unit Heater	Well 10	The Hot One			102-0802		1995		22	35	13	2030
	Building	Well 10				102-0797 - 102-0801		1995		22	35	13	2030
	Building	Well 14				102-0830-102-0833	480V	2005		12	35	23	2040
	MCC	Well14					480/277V, 800A, 300A MAIN LUGS	2016		1	35	34	2051
	Mini-Power Zone	Well 15	Square D				480-120/240V	2000		17	35	18	2035
	Safety Switch	Well 15	Siemens			102-0827	RATED 600VAC, 200A	1995		22	35	13	2030
	Building	Well 15/16				102-0809 - 102-0812		1995		22	35	13	2030
	MCC	Well 15/16	Cutler Hammer	30-13980	6AF1265784-B	102-0151 - 102-0152, 102-0813 - 102-0821	480/277V, 800A, 300A MAIN LUGS	1995		22	35	13	2030
	Mission System Node	Well 15/16	Mission			102-0822		1995		22	35	13	2030
	Utility Meter	Well 15/16				102-0842		1995		22	35	13	2030
	Service Disconnect/MTS	Well 15/16	Eaton			102-0823 - 102-0824	480V	1995		22	35	13	2030
	Exhaust Fan	Well 15/16				102-0826		1995		22	35	13	2030
	Safety Switch	Well 16	Siemens	B-40274-185-02		102-0807 - 102-0808	RATED 600VAC, 200A	1995		22	35	13	2030

Asset ID	Asset Description	Location	% Useful life used	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information Coverage	Warranty Information Expiration Date	Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes	Phys. Condition (1=exc., 5=poor)	Age factor
	Transformer	Well No. 1	63						--	35						3	4
	Safety Switch	Well No. 1	63						--	35						1	4
	Transformer	Richardt WTP - Filter Building	63						--	35						3	4
	Transformer	Richardt WTP - Filter Building MCC	63						--	35						3	4
	Power Panel	Well No. 1	63						--	35						1	4
	Lighting Panel	Well No. 1	63						--	35						1	4
	Transformer	Richardt Admin Building	63						--	35						1	4
	Safety Switch	Well 8	63						--	35						2	4
	Utility Meter	Well 8	63						--	35						1	4
	Unit Heater	Well 9	63						--	35						5	4
	Transformer	Well 9	63						--	35						4	4
	Safety Switch	Well 9	63						--	35						1	4
	Building	Well 9	63						--	35						4	4
	Safety Switch x 2	Well 9	63						--	35						3	4
	Disconnect	Well 10	63						--	35						1	4
	Transformer	Well 10	63						--	35						3	4
	Lighting Panel	Well 10	63						--	35						3	4
	Enclosed Circuit Breaker	Well 10	63						--	35						1	4
	Unit Heater	Well 10	63						--	35						5	4
	Building	Well 10	63						--	35						4	4
	Building	Well 14	34						--	15						5	2
	MCC	Well14	3						--	35						1	1
	Mini-Power Zone	Well 15	49						--	35						5	3
	Safety Switch	Well 15	63						--	35						5	4
	Building	Well 15/16	63						--	35						3	4
	MCC	Well 15/16	63						--	35						4	4
	Mission System Node	Well 15/16	63						--	35						1	4
	Utility Meter	Well 15/16	63						--	35						1	4
	Service Disconnect/MTS	Well 15/16	63						--	35						1	4
	Exhaust Fan	Well 15/16	63						--	35						4	4
	Safety Switch	Well 16	63						--	35						1	4

Asset ID	Asset Description	Location	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Transformer	Well No. 1	4	3	3	3.32	2	5	5	1	3	2	3.44	1.00	**11.44**
	Safety Switch	Well No. 1	4	3	1	2.40	3	5	5	1	3	3	3.72	1.00	**8.93**
	Transformer	Richardt WTP - Filter Building	4	3	3	3.32	2	5	5	1	3	2	3.44	1.00	**11.44**
	Transformer	Richardt WTP - Filter Building MCC	4	3	3	3.32	2	5	5	1	3	2	3.44	1.00	**11.44**
	Power Panel	Well No. 1	4	3	1	2.40	2	5	5	1	3	2	3.44	1.00	**8.27**
	Lighting Panel	Well No. 1	4	3	1	2.40	2	5	5	1	3	2	3.44	1.00	**8.27**
	Transformer	Richardt Admin Building	4	3	1	2.40	2	5	5	1	3	2	3.44	1.00	**8.27**
	Safety Switch	Well 8	4	3	2	2.86	3	5	5	1	1	3	3.22	1.00	**9.22**
	Utility Meter	Well 8	4	3	1	2.40	1	5	5	1	1	1	2.67	1.00	**6.40**
	Unit Heater	Well 9	4	3	5	4.24	1	5	3	1	1	1	2.11	1.00	**8.95**
	Transformer	Well 9	4	3	4	3.78	2	5	5	1	1	2	2.94	1.00	**11.13**
	Safety Switch	Well 9	4	3	1	2.40	3	5	5	1	1	3	3.22	1.00	**7.73**
	Building	Well 9	4	3	4	3.78	2	5	1	1	1	2	1.83	1.00	**6.93**
	Safety Switch x 2	Well 9	4	3	3	3.32	3	5	5	1	1	3	3.22	1.00	**10.70**
	Disconnect	Well 10	4	3	1	2.40	3	5	5	1	1	3	3.22	1.00	**7.73**
	Transformer	Well 10	4	3	3	3.32	2	5	5	1	1	2	2.94	1.00	**9.78**
	Lighting Panel	Well 10	4	3	3	3.32	2	5	5	1	1	2	2.94	1.00	**9.78**
	Enclosed Circuit Breaker	Well 10	4	3	1	2.40	2	5	5	1	1	2	2.94	1.00	**7.07**
	Unit Heater	Well 10	4	3	5	4.24	1	5	3	1	1	1	2.11	1.00	**8.95**
	Building	Well 10	4	3	4	3.78	2	5	1	1	1	2	1.83	1.00	**6.93**
	Building	Well 14	5	3	5	3.78	3	5	5	1	1	3	3.22	1.00	**12.18**
	MCC	Well14	1	1	1	1.00	5	5	5	1	1	5	3.78	1.00	**3.78**
	Mini-Power Zone	Well 15	4	3	5	3.98	2	5	5	1	1	2	2.94	1.00	**11.72**
	Safety Switch	Well 15	4	3	5	4.24	3	5	5	1	1	3	3.22	1.00	**13.66**
	Building	Well 15/16	4	3	3	3.32	2	5	1	1	1	2	1.83	1.00	**6.09**
	MCC	Well 15/16	4	3	4	3.78	5	5	5	1	1	5	3.78	1.00	**14.28**
	Mission System Node	Well 15/16	4	3	1	2.40	1	5	1	1	1	1	1.56	1.00	**3.73**
	Utility Meter	Well 15/16	4	3	1	2.40	1	5	5	1	1	1	2.67	1.00	**6.40**
	Service Disconnect/MTS	Well 15/16	4	3	1	2.40	4	5	5	1	1	4	3.50	1.00	**8.40**
	Exhaust Fan	Well 15/16	4	3	4	3.78	1	5	3	1	1	1	2.11	1.00	**7.98**
	Safety Switch	Well 16	4	3	1	2.40	3	5	5	1	1	3	3.22	1.00	**7.73**

Last Inspec. Date	Asset ID	Description	Location	General Information						Remote Monitoring		Control System	
				Org. Designer	Org. Contractor	Manufacturer	Year Placed into Service	Capacity	Notes	Type	Notes	Description	Notes
		Chlorine Analyzer	Richardt WTP			Hach	2013						
		Chlorine Analyzer	Richardt WTP - Filter Building			Hach	2013						
		Chart Recorder	Richardt WTP - Filter Building			Partlow	2005						
		Sodium Hypo Tank Top	Richardt WTP			Poly Processing	2000						
		Sodium Hypo Tank Base	Richardt WTP			Poly Processing	2000						
		Chlorine Analyzer	Fort Harrison WTP			Hach	2005						
		Chlorine Analyzer/PH	Fort Harrison WTP			Hach	2005						
		Chlorine/Chem. Analyzer	Fort Harrison WTP			Hach	2005						
		Chlorine Analyzer	Fort Harrison WTP			Hach	2005						
		Chlorine Controller	Fort Harrison WTP			Hach	2005						
		Chlorine Analyzer	Fort Harrison WTP			Hach	2005						
		Chlorine Scale	Fort Harrison WTP			Ohaus	2005						
		Phosphate Mixer	Fort Harrison WTP				2005						
		Sodium Hypo Bulk Storage Tank Top	Fort Harrison WTP			Poly Processing	2000						
		Sodium Hypo Bulk Storage Tank bottom	Fort Harrison WTP			Poly Processing	2000						
		Post-Filtration Chlorine Analyzer	Indian Lake WTP			Hach	2005						
		Chemical Analyzer	Indian Lake WTP			Hach	2005						
		Chlorine Analyzer	Indian Lake WTP			Hach	2005						
		Chlorine Day Tank Scale	Indian Lake WTP			Ohaus	2005						
		Sodium Hypo Bulk Tank	Indian Lake WTP			Poly Processing	2000						
		Sodium Hypo Bulk Tank Top	Indian Lake WTP			Poly Processing	2000						

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	Chlorine Analyzer	Richardt WTP	Hach	9180500	110345000559	101-0977	2013		4	7	3	2020	57
	Chlorine Analyzer	Richardt WTP - Filter Building	Hach	SC200	1105C0009305	102-0389 - 102-0390	2013		4	7	3	2020	57
	Chart Recorder	Richardt WTP - Filter Building	Partlow	51000011AA	1603019-002	102-0391, 102-0392	2005		12	20	8	2025	60
	Sodium Hypo Tank Top	Richardt WTP	Poly Processing		V-14-01588	102-0458	2000		17	30	13	2030	57
	Sodium Hypo Tank Base	Richardt WTP	Poly Processing		V-14-01589	102-0459 - 102-0460	2000		17	30	13	2030	57
	Chlorine Analyzer	Fort Harrison WTP	Hach	LPG440.99.00012	1423547	102-0026	2005		12	7	-5	2012	171
	Chlorine Analyzer/PH	Fort Harrison WTP	Hach	SC200	1107C0017263	102-0049 - 102-0050	2005		12	7	-5	2012	171
	Chlorine/Chem. Analyzer	Fort Harrison WTP	Hach	SL1000	150640100330	102-0053	2005		12	7	-5	2012	171
	Chlorine Analyzer	Fort Harrison WTP	Hach	9180500	110870006179	102-0051 - 102-0052	2005		12	7	-5	2012	171
	Chlorine Controller	Fort Harrison WTP	Hach	SC200	LXV404.99.00552	102-0071 - 102-0072	2005		12	10	-2	2015	120
	Chlorine Analyzer	Fort Harrison WTP	Hach	9180500	150545002956	102-0073 - 102-0074	2005		12	7	-5	2012	171
	Chlorine Scale	Fort Harrison WTP	Ohaus	T31P		102-0077 - 102-0079	2005		12	25	13	2030	48
	Phosphate Mixer	Fort Harrison WTP		6K937BB	F10J230024	102-0088	2005		12	25	13	2030	48
	Sodium Hypo Bulk Storage Tank Top	Fort Harrison WTP	Poly Processing	MBT-0007	V-14-01568	102-0671 - 102-0672	2000		17	30	13	2030	57
	Sodium Hypo Bulk Storage Tank bottom	Fort Harrison WTP	Poly Processing		V-14-01569	102-0671 - 102-0673	2000		17	30	13	2030	57
	Post-Filtration Chlorine Analyzer	Indian Lake WTP	Hach	SC200	1207C0044995	102-0212 - 102-0213	2005		12	7	-5	2012	171
	Chemical Analyzer	Indian Lake WTP	Hach	LPG440.99.00012	1499265	102-0214	2005		12	7	-5	2012	171
	Chlorine Analyzer	Indian Lake WTP	Hach	9180500	1.20845E+11	102-0231 - 102-0232	2005		12	7	-5	2012	171
	Chlorine Day Tank Scale	Indian Lake WTP	Ohaus	AM-5713C	B350083913	102-0181	2005		12	25	13	2030	48
	Sodium Hypo Bulk Tank	Indian Lake WTP	Poly Processing		V-14-00598	102-0184	2000		17	30	13	2030	57
	Sodium Hypo Bulk Tank Top	Indian Lake WTP	Poly Processing		V-14-00597	102-0183	2000		17	30	13	2030	57

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information: Coverage	Warranty Information: Expiration Date	Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes	Phys. Condition (1=exc., 5=poor)	Age factor
	Chlorine Analyzer	Richardt WTP						--	7						1	3
	Chlorine Analyzer	Richardt WTP - Filter Building						--	7						1	3
	Chart Recorder	Richardt WTP - Filter Building						--	20						2	4
	Sodium Hypo Tank Top	Richardt WTP						--	30						1	3
	Sodium Hypo Tank Base	Richardt WTP						--	30						1	3
	Chlorine Analyzer	Fort Harrison WTP						--	7						2	5
	Chlorine Analyzer/PH	Fort Harrison WTP						--	7						1	5
	Chlorine/Chem. Analyzer	Fort Harrison WTP						--	7						1	5
	Chlorine Analyzer	Fort Harrison WTP						--	7						1	5
	Chlorine Controller	Fort Harrison WTP						--	10						1	5
	Chlorine Analyzer	Fort Harrison WTP						--	7						1	5
	Chlorine Scale	Fort Harrison WTP						--	25						2	3
	Phosphate Mixer	Fort Harrison WTP							25						2	3
	Sodium Hypo Bulk Storage Tank Top	Fort Harrison WTP						--	30						2	3
	Sodium Hypo Bulk Storage Tank bottom	Fort Harrison WTP						--	30						2	3
	Post-Filtration Chlorine Analyzer	Indian Lake WTP						--	7						1	5
	Chemical Analyzer	Indian Lake WTP						--	7						2	5
	Chlorine Analyzer	Indian Lake WTP						--	7						3	5
	Chlorine Day Tank Scale	Indian Lake WTP						--	25						2	3
	Sodium Hypo Bulk Tank	Indian Lake WTP						--	30						2	3
	Sodium Hypo Bulk Tank Top	Indian Lake WTP						--	30						2	3

Asset ID	Asset Description	Location	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Chlorine Analyzer	Richardt WTP	2	2	2	2.10	2	5	3	3	1	3	2.58	1.00	**5.42**
	Chlorine Analyzer	Richardt WTP - Filter Building	2	1	2	1.88	4	5	5	4	1	3	3.58	1.00	**6.74**
	Chart Recorder	Richardt WTP - Filter Building	4	2	3	2.94	1	5	1	1	1	1	1.56	1.00	**4.57**
	Sodium Hypo Tank Top	Richardt WTP	3	3	2	2.38	4	5	1	5	2	5	2.94	1.00	**7.01**
	Sodium Hypo Tank Base	Richardt WTP	3	3	2	2.38	4	5	4	5	2	5	3.78	1.00	**8.99**
	Chlorine Analyzer	Fort Harrison WTP	3	3	2	3.06	1	5	1	1	1	1	1.56	1.00	**4.76**
	Chlorine Analyzer/PH	Fort Harrison WTP	3	3	1	2.60	4	5	5	4	2	5	4.00	1.00	**10.40**
	Chlorine/Chem. Analyzer	Fort Harrison WTP	3	3	1	2.60	1	5	1	1	1	1	1.56	1.00	**4.04**
	Chlorine Analyzer	Fort Harrison WTP	3	3	1	2.60	4	5	5	4	2	5	4.00	1.00	**10.40**
	Chlorine Controller	Fort Harrison WTP	3	3	1	2.60	4	5	5	4	2	5	4.00	1.00	**10.40**
	Chlorine Analyzer	Fort Harrison WTP	3	3	1	2.60	4	5	5	4	2	5	4.00	1.00	**10.40**
	Chlorine Scale	Fort Harrison WTP	3	3	2	2.54	2	5	1	3	1	1	1.86	1.00	**4.73**
	Phosphate Mixer	Fort Harrison WTP	3	3	3	2.84	2	5	1	1	1	1	1.75	1.00	**4.97**
	Sodium Hypo Bulk Storage Tank Top	Fort Harrison WTP	3	3	2	2.54	4	5	1	5	2	5	2.94	1.00	**7.48**
	Sodium Hypo Bulk Storage Tank bottom	Fort Harrison WTP	3	3	2	2.54	4	5	4	5	2	5	3.78	1.00	**9.60**
	Post-Filtration Chlorine Analyzer	Indian Lake WTP	3	3	1	2.60	4	5	5	4	1	3	3.58	1.00	**9.32**
	Chemical Analyzer	Indian Lake WTP	3	3	1	2.76	1	5	1	1	1	1	1.56	1.00	**4.29**
	Chlorine Analyzer	Indian Lake WTP	3	3	3	3.52	4	5	5	4	1	3	3.58	1.00	**12.61**
	Chlorine Day Tank Scale	Indian Lake WTP	3	3	2	2.54	2	5	1	1	1	1	1.75	1.00	**4.44**
	Sodium Hypo Bulk Tank	Indian Lake WTP	3	3	2	2.54	4	5	5	5	5	5	4.81	1.00	**12.21**
	Sodium Hypo Bulk Tank Top	Indian Lake WTP	3	3	2	2.54	4	5	1	5	5	5	3.69	1.00	**9.38**

Last Inspec. Date	Asset ID	Description	Location	General Information						Remote Monitoring		Control System	
				Org. Designer	Org. Contractor	Manufacturer	Year Placed into Service	Capacity	Notes	Type	Notes	Description	Notes
		Furnace	Richardt WTP - Filter Building			Lennox	2006						
		Chlorine Room Unit Heater	Richardt WTP			Dayton	1990						
		Air Tank	Richardt WTP			Ingersoll Rand	1990						
		Air Gear Box	Richardt WTP			Ingersoll Rand	1990						
		Water Heater	Richardt WTP			AO Smith	2013						
		Furnace 1	Richardt WTP			Bryant	2014						
		Furnace 2	Richardt WTP			Bryant	2013						
		Furnace 3	Richardt WTP			Bryant	2014						
		RP Backflow Preventer	Richardt WTP			Watts	1990						
		AC #1	Richardt WTP			Bryant	2010						
		AC #2	Richardt WTP			Bryant	2010						
		AC #3	Richardt WTP			Bryant	2010						
		Building - Winding Ridge	Richardt WTP			Dupont	2005						
		Garage and Office Building	Richardt WTP				2010						
		Well #2 Building	Richardt WTP				1963						
		Well #1 Building	Richardt WTP				1959						
		Aerator #1 - Building	Richardt WTP				1958						
		Chlorine Building	Richardt WTP				1958						
		Filter Building	Richardt WTP				1958						
		Abandoned Well Building	Richardt WTP				1954						
		Aerator #2 Building	Richardt WTP				1971						
		Water Heater	Richardt WTP			Water Furnace	1989						
		Valve Air Compressor	Fort Harrison WTP			Quincy	1990						
		Valve Air Compressor Motor	Fort Harrison WTP			Reliance Electric	1990						
		Unit Heater	Fort Harrison WTP			TPI Corp.	1990						
		Unit Heater	Fort Harrison WTP			TPI Corp.	1990						
		Overhead Pump Gantry	Fort Harrison WTP			Budgit	1990						
		Chain Hoist	Fort Harrison WTP			Budgit	1990						
		Unit Heater	Fort Harrison WTP			Modine	1990						
			Fort Harrison WTP			Trane	1990						
		Filter Building	Fort Harrison WTP			Kirby	1980						
		HSP Building	Fort Harrison WTP				1958						
		Unit Heater	Indian Lake WTP			Dayton	1990						
		Unit Heater	Indian Lake WTP			Dayton	1990						
		Vent	Indian Lake WTP			Cargocaire	1990						
		Air Tank	Indian Lake WTP			Ingersoll Rand	1990						
		18" Shutter Mounted Exhaust Fan	Winding Ridge			Dayton	2004						

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	Furnace	Richardt WTP - Filter Building	Lennox	LF24-100A-5	5609K01336	102-0394 - 102-0395	2006		11	20	9	2026	55
	Chlorine Room Unit Heater	Richardt WTP	Dayton			102-0457	1990		27	30	3	2020	90
	Air Tank	Richardt WTP	Ingersoll Rand	2340L5 Grainger	CBV230005	102-0463 - 102-0464	1990		27	30	3	2020	90
	Air Gear Box	Richardt WTP	Ingersoll Rand	2340	1209447	102-0465	1990		27	20	-7	2010	135
	Water Heater	Richardt WTP	AO Smith	BTH 120 100	1307M000925	102-0467 - 102-0468	2013		4	10	6	2023	40
	Furnace 1	Richardt WTP	Bryant	CNPVP4821ALAAAAA	0814X23618	102-0474 - 102-0475	2014		3	20	17	2034	15
	Furnace 2	Richardt WTP	Bryant	CNPVP6024ALAAAAA	0613X40791	102-0469 - 102-0471	2013		4	20	16	2033	20
	Furnace 3	Richardt WTP	Bryant	CNPVP2417ALAAAAA	0514X20942	102-0472 - 102-0473	2014		3	20	17	2034	15
	RP Backflow Preventer	Richardt WTP	Watts	909M1	448230	102-0476 - 102-0477	1990		27	20	-7	2010	135
	AC #1	Richardt WTP	Bryant	215BNA060-A	1912E16232	102-0528 - 102-0529	2010		7	15	8	2025	47
	AC #2	Richardt WTP	Bryant	215BNA018-A	0713E04197	102-0530 - 102-0531	2010		7	15	8	2025	47
	AC #3	Richardt WTP	Bryant	215BNA048-A	0213E22436	102-0532 - 102-0533	2010		7	15	8	2025	47
	Building - Winding Ridge	Winding Ridge	Dupont			102-0733 - 102-0748	2005		12	60	48	2065	20
	Garage and Office Building	Richardt WTP				102-0749 - 102-0753	2010		7	60	53	2070	12
	Well #2 Building	Richardt WTP				102-0754 - 102-0755	1963		54	60	6	2023	90
	Well #1 Building	Richardt WTP				102-0756 - 102-0757	1959		58	60	2	2019	97
	Aerator #1 - HSP 1 and HSP 2 Building	Richardt WTP				102-0758 - 102-0760, 102-0762	1958		59	60	1	2018	98
	Chlorine Building	Richardt WTP				102-0761, 102-0763 - 102-0764	1958		59	60	1	2018	98
	Filter Building	Richardt WTP				102-0765 - 102-0768	1958		59	60	1	2018	98
	Abandoned Well Building	Richardt WTP				102-0769 - 102-0770	1954		63	60	-3	2014	105
	Aerator #2 Building	Richardt WTP				102-0771 - 102-0774	1971		46	60	14	2031	77
	Water Heater	Richardt WTP	Water Furnace	WXH036A2309	DM4876	102-0396 - 102-0397	1989		28	10	-18	1999	280
	Valve Air Compressor	Fort Harrison WTP	Quincy	108	346245	102-0068	1990		27	15	-12	2005	180
	Valve Air Compressor Motor	Fort Harrison WTP	Reliance Electric	P.14G9244H	613308-74-MG	102-0069, 102-0070	1990		27	35	8	2025	77
	Unit Heater	Fort Harrison WTP	TPI Corp.	P3P5110CAIN		102-0569 - 102-0570	1990		27	10	-17	2000	270
	Unit Heater	Fort Harrison WTP	TPI Corp.	P3P5110CAIN		102-0571 - 102-0572	1990		27	10	-17	2000	270
	Overhead Pump Gantry	Fort Harrison WTP	Budgit			102-0573	1990		27	25	-2	2015	108
	Chain Hoist	Fort Harrison WTP	Budgit	5EH0116	296029	102-0574 - 102-0575	1990		27	25	-2	2015	108
	Unit Heater	Fort Harrison WTP	Modine	PAE100AC	30081010494	102-0604 - 102-0605	1990		27	10	-17	2000	270
	Furnace	Fort Harrison WTP	Trane	XR80		102-0613	1990		27	20	-7	2010	135
	Filter Building	Fort Harrison WTP	Kirby			102-0674 - 102-0698	1980		37	60	23	2040	62
	Storage Resevoir	Fort Harrison WTP				102-0667 - 102-0670	1990		27	50	23	2040	54
	HSP Building	Fort Harrison WTP				102-0699 - 102-0718	1958		59	60	1	2018	98
	Unit Heater	Indian Lake WTP	Dayton			102-0366 - 102-0367	1990		27	10	-17	2000	270
	Unit Heater	Indian Lake WTP	Dayton			102-0368 - 102-0369	1990		27	10	-17	2000	270
	Vent	Indian Lake WTP	Cargocaire	HC-300	239	102-370 - 102-0371	1990		27	10	-17	2000	270
	Air Tank	Indian Lake WTP	Ingersoll Rand	SS3660V	CBV217769	102-0219 - 102-0221	1990		27	30	3	2020	90
	18" Shutter Mounted Exhaust Fan	Winding Ridge	Dayton	2C708C	927318	102-0136 - 102-0138	2004		13	10	-3	2014	130

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information Coverage	Warranty Information Expiration Date	Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
	Furnace	Richardt WTP - Filter Building						--	20					
	Chlorine Room Unit Heater	Richardt WTP						--	30					
	Air Tank	Richardt WTP						--	30					
	Air Gear Box	Richardt WTP						--	20					
	Water Heater	Richardt WTP						--	10					
	Furnace 1	Richardt WTP						--	20					
	Furnace 2	Richardt WTP						--	20					
	Furnace 3	Richardt WTP						--	20					
	RP Backflow Preventer	Richardt WTP						--	20					
	AC #1	Richardt WTP						--	15					
	AC #2	Richardt WTP						--	15					
	AC #3	Richardt WTP						--	15					
	Building - Winding Ridge	Winding Ridge						--	60					
	Garage and Office Building	Richardt WTP						--	60					
	Well #2 Building	Richardt WTP						--	60					
	Well #1 Building	Richardt WTP						--	60					
	Aerator #1 - HSP 1 and HSP 2 Building	Richardt WTP						--	60					
	Chlorine Building	Richardt WTP						--	60					
	Filter Building	Richardt WTP						--	60					
	Abandoned Well Building	Richardt WTP						--	60					
	Aerator #2 Building	Richardt WTP						--	60					
	Water Heater	Richardt WTP						--	10					
	Valve Air Compressor	Fort Harrison WTP						--	15					
	Valve Air Compressor Motor	Fort Harrison WTP						--	35					
	Unit Heater	Fort Harrison WTP						--	10					
	Unit Heater	Fort Harrison WTP						--	10					
	Overhead Pump Gantry	Fort Harrison WTP						--	25					
	Chain Hoist	Fort Harrison WTP						--	25					
	Unit Heater	Fort Harrison WTP						--	10					
	Furnace	Fort Harrison WTP						--	20					
	Filter Building	Fort Harrison WTP						--	60					
	Storage Resevoir	Fort Harrison WTP						--	50					
	HSP Building	Fort Harrison WTP						--	60					
	Unit Heater	Indian Lake WTP						--	10					
	Unit Heater	Indian Lake WTP						--	10					
	Vent	Indian Lake WTP						--	10					
	Air Tank	Indian Lake WTP						--	30					
	18" Shutter Mounted Exhaust Fan	Winding Ridge						--	10					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Furnace	Richardt WTP - Filter Building	2	3	2	2	2	2.26	2	5	2	1	2	1	2.28	1.00	**5.15**
	Chlorine Room Unit Heater	Richardt WTP	2	5	3	3	1	2.76	2	5	1	1	1	1	1.75	1.00	**4.83**
	Air Tank	Richardt WTP	1	5	3	3	2	2.90	2	5	1	1	1	1	1.75	1.00	**5.07**
	Air Gear Box	Richardt WTP	1	5	3	3	2	2.90	2	5	1	1	1	1	1.75	1.00	**5.07**
	Water Heater	Richardt WTP	1	3	2	2	2	2.10	1	5	1	1	1	1	1.56	1.00	**3.27**
	Furnace 1	Richardt WTP	1	1	2	2	2	1.58	1	5	1	1	1	1	1.56	0.67	**1.64**
	Furnace 2	Richardt WTP	1	2	2	2	2	1.84	1	5	1	1	1	1	1.56	0.67	**1.91**
	Furnace 3	Richardt WTP	1	1	2	2	2	1.58	1	5	1	1	1	1	1.56	0.67	**1.64**
	RP Backflow Preventer	Richardt WTP	3	5	3	3	3	3.52	2	5	4	5	1	4	3.06	1.00	**10.75**
	AC #1	Richardt WTP	1	3	3	3	1	2.08	1	5	1	1	1	1	1.56	0.67	**2.16**
	AC #2	Richardt WTP	1	3	3	3	1	2.08	1	5	1	1	1	1	1.56	0.67	**2.16**
	AC #3	Richardt WTP	1	3	3	3	1	2.08	1	5	1	1	1	1	1.56	0.67	**2.16**
	Building - Winding Ridge	Winding Ridge	2	2	3	3	3	2.58	1	5	1	1	1	1	1.56	1.00	**4.01**
	Garage and Office Building	Richardt WTP	1	1	3	3	2	1.86	1	5	4	1	1	1	2.39	1.00	**4.44**
	Well #2 Building	Richardt WTP	3	5	3	3	3	3.52	4	5	1	1	1	1	2.14	1.00	**7.53**
	Well #1 Building	Richardt WTP	3	5	3	3	3	3.52	4	5	1	1	1	1	2.14	1.00	**7.53**
	Aerator #1 - HSP 1 and HSP 2 Building	Richardt WTP	4	5	3	3	4	3.98	4	5	1	1	4	1	2.89	1.00	**11.50**
	Chlorine Building	Richardt WTP	4	5	3	3	4	3.98	4	5	4	5	5	5	4.53	1.00	**18.02**
	Filter Building	Richardt WTP	3	5	3	3	3	3.52	4	5	4	1	5	3	4.14	1.00	**14.57**
	Abandoned Well Building	Richardt WTP	5	5	3	3	4	4.14	1	5	1	1	1	1	1.56	1.00	**6.44**
	Aerator #2 Building	Richardt WTP	5	4	3	3	4	3.88	4	5	1	1	4	1	2.89	1.00	**11.21**
	Water Heater	Richardt WTP	3	5	3	3	4	3.82	1	5	1	1	1	1	1.56	1.00	**5.94**
	Valve Air Compressor	Fort Harrison WTP	3	5	3	3	2	3.22	2	5	1	1	1	1	1.75	1.00	**5.63**
	Valve Air Compressor Motor	Fort Harrison WTP	3	4	3	3	3	3.26	2	5	1	1	1	1	1.75	1.00	**5.70**
	Unit Heater	Fort Harrison WTP	2	5	3	3	2	3.06	1	5	1	1	1	1	1.56	1.00	**4.76**
	Unit Heater	Fort Harrison WTP	2	5	3	3	2	3.06	1	5	1	1	1	1	1.56	1.00	**4.76**
	Overhead Pump Gantry	Fort Harrison WTP	1	5	3	3	2	2.90	1	5	4	1	1	1	2.39	1.00	**6.93**
	Chain Hoist	Fort Harrison WTP	1	5	3	3	2	2.90	1	5	1	1	1	1	1.56	1.00	**4.51**
	Unit Heater	Fort Harrison WTP	2	5	3	3	2	3.06	1	5	1	1	1	1	1.56	1.00	**4.76**
	Furnace	Fort Harrison WTP	1	5	3	3	1	2.60	2	5	1	1	1	1	1.75	1.00	**4.55**
	Filter Building	Fort Harrison WTP	3	4	3	3	3	3.26	4	5	4	1	5	1	3.97	1.00	**12.95**
	Storage Resevoir	Fort Harrison WTP	3	3	3	3	2	2.70	5	5	3	4	5	5	4.39	1.00	**11.85**
	HSP Building	Fort Harrison WTP	2	5	3	3	2	3.06	4	5	4	1	5	1	3.97	1.00	**12.16**
	Unit Heater	Indian Lake WTP	1	5	3	3	1	2.60	1	5	1	1	1	1	1.56	1.00	**4.04**
	Unit Heater	Indian Lake WTP	1	5	3	3	1	2.60	1	5	1	1	1	1	1.56	1.00	**4.04**
	Vent	Indian Lake WTP	3	5	3	3	4	3.82	1	5	1	1	1	1	1.56	1.00	**5.94**
	Air Tank	Indian Lake WTP	1	5	3	3	1	2.60	2	5	1	1	1	1	1.75	1.00	**4.55**
	18" Shutter Mounted Exhaust Fan	Winding Ridge	1	5	2	1	2	2.40	3	5	1	1	1	1	1.94	1.00	**4.67**

Last Inspec. Date	Asset ID	Description	Location	General Information						Remote Monitoring		Control System	
				Org. Designer	Org. Contractor	Manufacturer	Year Placed into Service	Capacity	Notes	Type	Notes	Description	Notes
		8" Silent Check Valve	Richardt WTP - HSP 3 Pump House			Val-Matic	1971						
		8" Butterfly Valve	Richardt WTP - HSP 3 Pump House			Dezurik	1971						
		8" Silent Check Valve	Richardt WTP - HSP 3 Pump House			Val-Matic	1971						
		8" Butterfly Valve	Richardt WTP - HSP 3 Pump House			Dezurik	1971						
		2-4" Butterfly Valves Filter E2 Drain Line	Richardt WTP - Filter Building			Dezurik?	1971						
		2- 8" Butterfly Valves Filter E2 Finished	Richardt WTP - Filter Building			Dezurik?	1971						
		2-4" Butterfly Valves Filter E1 Drain Line	Richardt WTP - Filter Building			Dezurik?	1971						
		2-8" Butterfly Valves Filter E1 Finished	Richardt WTP - Filter Building			Dezurik?	1971						
		8" Butterfly Valve Filter W1	Richardt WTP - Filter Building			Dezurik?	1958						
		8" Butterfly Valve Filter W1 Finished	Richardt WTP - Filter Building			Dezurik?	1958						
		8" Butterfly Valve Filter W2	Richardt WTP - Filter Building			Dezurik	1958						
		8" Gate Valve Filter W2	Richardt WTP - Filter Building			Mueller	1958						
		8" Gate Valve Filter W1	Richardt WTP - Filter Building			Mueller	1958						
		8" Gate Valve Filter E1	Richardt WTP - Filter Building			Mueller	1971						
		8" Gate Valve Filter E2	Richardt WTP - Filter Building			Mueller	1971						
		8" Butterfly Valve Backwash	Richardt WTP - Filter Building			Dezurik?	1971						
		8" Gate Valve	Richardt WTP - Filter Building			Iowa	1958						
		8" Butterfly Valve - Filter E1 Raw	Richardt WTP - Filter Building			Dezurik?	1971						
		8" Butterfly Valve - Filter E1 Finished	Richardt WTP - Filter Building			Dezurik?	1971						
		8" Butterfly Valve - Filter E2 Finished	Richardt WTP - Filter Building			Dezurik?	1971						
		8" Butterfly Valve - Filter W2 Raw Left	Richardt WTP - Filter Building			American	2008						
		6" Butterfly Valve - Filter W2 Raw Left	Richardt WTP - Filter Building			Dezurik?	1958						
		6" Butterfly Valve - Filter W2 Raw Right	Richardt WTP - Filter Building			Dezurik?	1958						
		8" Butterfly Valve - Filter W2 Raw Right	Richardt WTP - Filter Building			Val-Matic	2011						
		8" Butterfly Valve - Filter W1 Raw Left	Richardt WTP - Filter Building			Val-Matic	2011						
		6" Butterfly Valve - Filter W1 Raw Left	Richardt WTP - Filter Building			Dezurik?	1958						
		6" Butterfly Valve - Filter W1 Raw Right	Richardt WTP - Filter Building			Dezurik?	1958						
		8" Butterfly Valve - Filter W1 Raw Right	Richardt WTP - Filter Building			Dezurik?	1958						
		8" Butterfly Valve - Filter E1 Raw Left	Richardt WTP - Filter Building			Dezurik	1971						
		8" Butterfly Valve - Filter E1 Raw Left	Richardt WTP - Filter Building			Dezurik?	1971						
		8" Butterfly Valve - Filter E1 Raw Right	Richardt WTP - Filter Building			Dezurik	1971						
		8" Butterfly Valve - Filter E1 Raw Right	Richardt WTP - Filter Building			Dezurik	1971						
		8" Butterfly Valve - Filter E2 Raw Left	Richardt WTP - Filter Building			Dezurik	1971						
		8" Butterfly Valve - Filter E2 Raw Left	Richardt WTP - Filter Building			Dezurik?	1971						
		8" Butterfly Valve - Filter E2 Raw Right	Richardt WTP - Filter Building			Dezurik	1971						
		8" Butterfly Valve - Filter E2 Raw Right	Richardt WTP - Filter Building			Dezurik	1971						
		Air/Vacuum Valve	Richardt WTP			APCO	1990						
		6" Check Valve - Well 3	Richardt WTP			Mueller	1984						
		6" Gate Valve - Well 3	Richardt WTP			Mueller	1983						
		6" Gate Valve - Well 4	Richardt WTP			Mueller	1983						
		6" Check Valve - Well 4	Richardt WTP			Mueller	1984						
		Air/Vacuum Valve	Richardt WTP			Apco Co.	1990						
		8" Globe Check Valve - HSP 1	Richardt WTP			Val-Matic	1990						

Last Inspec. Date	Asset ID	Description	Location	General Information						Remote Monitoring		Control System	
				Org. Designer	Org. Contractor	Manufacturer	Year Placed into Service	Capacity	Notes	Type	Notes	Description	Notes
		8" Wafer Check Valve - HSP 2	Richardt WTP			Pratt	1990						
		8" Butterfly Valve - HSP 1	Richardt WTP			Dezurik	1990						
		8" Butterfly Valve - HSP 2	Richardt WTP			Dezurik	1990						
		Air/Vacuum Valve - Well 1	Richardt WTP			Val-Matic	1990						
		8" Check Valve - Well 1	Richardt WTP			Iowa	1982						
		8" Butterfly Valve - Well 1	Richardt WTP			Dezurik	1990						
		Air/Vacuum Valve	Richardt WTP			Val-Matic	1990						
		8" Check, Air Release - Well 2	Richardt WTP			Dezurik	1990						
		8" Butterfly Valve - HSP 3 Influent	Fort Harrison WTP			Dezurik	1980						
		10" Butterfly Valve - HSP 2 Influent	Fort Harrison WTP			Dezurik	1980						
		8" Butterfly Valve - HSP1 Influent '	Fort Harrison WTP			Dezurik	1980						
		8" Silent Check Valve - HSP 3	Fort Harrison WTP			APCO	1980						
		8" Singer Valve - HSP 3	Fort Harrison WTP			Singer	1980						
		8" Butterfly Valve - HSP 3 Flow Control	Fort Harrison WTP			Dezurik	1980						
		10" Silent Check Valve - HSP 2	Fort Harrison WTP			APCO	1980						
		10" Singer Valve - HSP 2	Fort Harrison WTP			Singer	1980						
		10" Butterfly Valve - HSP 2 Flow Control	Fort Harrison WTP			Dezurik	1997						
		8" Silent Check Valve - HSP 1	Fort Harrison WTP			APCO	1980						
		8" Singer Valve - HSP 1	Fort Harrison WTP			Singer	1980						
		8" Butterfly Valve - HSP 1 Flow Control	Fort Harrison WTP			Dezurik	1980						
		8" Butterfly Valve - Backwash	Fort Harrison WTP				1980						
		6" Butterfly Valve - Filter 9 - Finished	Fort Harrison WTP			Bray	1980						
		6" Butterfly Valve - Filter 9 - Finished	Fort Harrison WTP				1980						
		6" Butterfly Valve - Filter 9 - Raw	Fort Harrison WTP			Bray	1980						
		6" Valve Actuator - Filter 9 - Raw	Fort Harrison WTP			Bray	1980						
		6" Butterfly Valve - Filter 8 - Finished	Fort Harrison WTP			Bray	1980						
		6" Butterfly Valve - Filter 8 - Finished	Fort Harrison WTP				1980						
		6" Valve Actuator - Filter 8 - Raw	Fort Harrison WTP			Bray	1980						
		6" Butterfly Valve - Filter 8 - Raw	Fort Harrison WTP			Bray	1980						
		6" Butterfly Valve - Filter 7 - Finished	Fort Harrison WTP			Bray	1980						
		6" Butterfly Valve - Filter 7 - Finished	Fort Harrison WTP			Bray	1980						
		6" Butterfly Valve - Filter 7 - Raw	Fort Harrison WTP			Bray	1980						
		6" Butterfly Valve - Filter 7 - Raw	Fort Harrison WTP				1980						
		10" Gate Valve	Fort Harrison WTP				1980						
		12" Globe Check Valve - Raw	Fort Harrison WTP				1980						
		12" Butterfly Valve - Raw	Fort Harrison WTP				1980						
		8" Butterfly Valve - Raw	Fort Harrison WTP			Victaulic	1980						
		8" Butterfly Valve - Raw	Fort Harrison WTP			Victaulic	1980						
		6" Butterfly Valve-Filter 1 - Raw	Fort Harrison WTP			Victaulic	1980						
		6" Valve Actuator-Filter 1 - Raw	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 1 - Raw	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 1 - Finished	Fort Harrison WTP			Keystone	1980						
		6" Butterfly Valve - Filter 1 - Finished	Fort Harrison WTP			Keystone	1980						
		6" Butterfly Valve - Finished	Fort Harrison WTP			Victaulic	1980						

Last Inspec. Date	Asset ID	Description	Location	General Information						Remote Monitoring		Control System	
				Org. Designer	Org. Contractor	Manufacturer	Year Placed into Service	Capacity	Notes	Type	Notes	Description	Notes
		6" Butterfly Valve - Filter 2 Raw	Fort Harrison WTP			Victaulic	1980						
		6" Valve Actuator - Filter 2 Raw	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 2 Raw	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 2 Finished	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 2 Finished	Fort Harrison WTP			Keystone	1980						
		6" Butterfly Valve - Filter 2 Finished	Fort Harrison WTP			Victaulic	1980						
		6" Butterfly Valve - Filter 3 Raw	Fort Harrison WTP			Victaulic	1980						
		6" Valve Actuator - Filter 3 Raw	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator- Filter 3 Raw	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 3 Finished	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 3 Finished	Fort Harrison WTP			Keystone	1980						
		6" Butterfly Valve - Filter 3 Finished	Fort Harrison WTP			Victaulic	1980						
		6" Butterfly Valve - Filter 6 Raw	Fort Harrison WTP			Victaulic	1980						
		6" Valve Actuator - Filter 6 Raw	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 6 Raw	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 6 Finished	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 6 Finished	Fort Harrison WTP			Keystone	1980						
		6" Butterfly Valve - Filter 6 Finished	Fort Harrison WTP			Victaulic	1980						
		6" Butterfly Valve - Filter 5 Raw	Fort Harrison WTP			Victaulic	1980						
		6" Valve Actuator - Filter 5 Raw	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 5 Raw	Fort Harrison WTP			Keystone	1980						
		6" Butterfly Valve - Filter 5 Finished	Fort Harrison WTP			Keystone	1980						
		6" Butterfly Valve - Filter 5 Finished	Fort Harrison WTP			Keystone	1980						
		6" Butterfly Valve - Filter 4 Raw	Fort Harrison WTP			Victaulic	1980						
		6" Valve Actuator - Filter 4 Raw	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 4 Raw	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 4 Finished	Fort Harrison WTP			Keystone	1980						
		6" Valve Actuator - Filter 4 Finished	Fort Harrison WTP			Keystone	1980						
		6" Butterfly Valve - Filter 4 Finished	Fort Harrison WTP			Victaulic	1980						
		6" Butterfly Valve - Filters 1-6 Backwash Rate	Fort Harrison WTP			Dezurik	1980						
		10" Butterfly Valve - Filters 7-9 Backwash Rate	Fort Harrison WTP				1980						
		8" Butterfly Valve - Plant Finished	Fort Harrison WTP			Centerline	1980						
		6" Butterfly Valve - Plant Finished	Fort Harrison WTP			Centerline	1980						
		Air Valve	Well No. 8			Val-Matic	1990						
		Dual Port Throttling Device	Well No. 8			Val-Matic	1990						
		8" Butterfly Valve - Filter W1 Raw Left	Indian Lake WTP			Pratt	2015						
		6" Butterfly Valve - Filter W1 Raw Left	Indian Lake WTP			Pratt	2015						
		6" Butterfly Valve - Filter W1 Raw Right	Indian Lake WTP			Pratt	2015						
		8" Butterfly Valve - Filter W1 Raw Right	Indian Lake WTP			Pratt	2015						
		8" Butterfly Valve - Filter E1 Raw Left	Indian Lake WTP			Pratt	2015						
		6" Butterfly Valve - Filter E1 Raw Left	Indian Lake WTP			Pratt	2015						
		6" Butterfly Valve - Filter E1 Raw Right	Indian Lake WTP			Pratt	2015						
		8" Butterfly Valve - Filter E1 Raw Right	Indian Lake WTP			Pratt	2015						

Last Inspec. Date	Asset ID	Description	Location	General Information						Remote Monitoring		Control System	
				Org. Designer	Org. Contractor	Manufacturer	Year Placed into Service	Capacity	Notes	Type	Notes	Description	Notes
		8" Butterfly Valve - Filter E2 Raw Left	Indian Lake WTP			Pratt	2015						
		6" Butterfly Valve - Filter E2 Raw Left	Indian Lake WTP			Pratt	2015						
		6" Butterfly Valve - Filter E2 Raw Right	Indian Lake WTP			Pratt	2015						
		8" Butterfly Valve - Filter E2 Raw Right	Indian Lake WTP			Pratt	2015						
		8" Check Valve - HSP 1	Indian Lake WTP			Val-Matic	1989						
		8" Check Valve - HSP 2	Indian Lake WTP			Val-Matic	1989						
		8" Check Valve - HSP 3	Indian Lake WTP			Val-Matic	1989						
		8" Butterfly Valve - HSP 1	Indian Lake WTP			MH	1989						
		8" Butterfly Valve - HSP 2	Indian Lake WTP			MH	1989						
		8" Butterfly Valve - HSP 3	Indian Lake WTP			MH	1989						
		Dual Port Throttling Device - Well 16	Indian Lake Well Field			Val-Matic	1990						
		8" Silent Check Valve - Well 14	Indian Lake Well Field			Globe Style	1990						
		Dual Port Throttling Device - Well 15	Indian Lake Well Field			Val-Matic	1990						
		Air Release Valve - Well 15	Indian Lake Well Field			Val-Matic	1990						
		8" Actuator - Filter E2 Right	Indian Lake WTP			Kinetrol	2015						
		6" Actuator - Filter E2-Right	Indian Lake WTP			Kinetrol	2015						
		6" Actuator - Filter E2-Left	Indian Lake WTP			Kinetrol	2015						
		8" Actuator - Filter E2-Left	Indian Lake WTP			Kinetrol	2015						
		8" Actuator - Filter E1-Right	Indian Lake WTP			Kinetrol	2015						
		6" Actuator - Filter E1-Right	Indian Lake WTP			Kinetrol	2015						
		6" Actuator - Filter E1-Left	Indian Lake WTP			Kinetrol	2015						
		8" Actuator - Filter E1-Left	Indian Lake WTP			Kinetrol	2015						
		8" Actuator - Filter W1-Right	Indian Lake WTP			Kinetrol	2015						
		6" Actuator - Filter W1-Right	Indian Lake WTP			Kinetrol	2015						
		6" Actuator - Filter W1-Left	Indian Lake WTP			Kinetrol	2015						
		8" Actuator - Filter W1-Left	Indian Lake WTP			Kinetrol	2015						
		8" Actuator - Filter W2-Right	Indian Lake WTP			Kinetrol	2015						
		6" Actuator - Filter W2-Right	Indian Lake WTP			Kinetrol	2015						
		6" Actuator - Filter W2-Left	Indian Lake WTP			Kinetrol	2015						
		8" Actuator - Filter W2-Left	Indian Lake WTP			Kinetrol	2015						
		Well 15 Check Valve	Indian Lake Well Field				1990						
		Well 15 Valve Vault	Indian Lake Well Field				1990						
		4" Gate Valve - Drain	Indian Lake WTP			MI V&FI Co.	1989						
		4" Gate Valve - Drain	Indian Lake WTP			MI V&FI Co.	1989						
		8" Plug Valve - Filter E2	Indian Lake WTP			Val-Matic	1989						
		4" Plug Valve - Filter E2 Drain	Indian Lake WTP			Val-Matic	1989						
		8" Plug Valve - Filter E1	Indian Lake WTP			Val-Matic	1989						
		4" Plug Valve - Filter E1 Drain	Indian Lake WTP			Val-Matic	1989						
		8" Plug Valve - Filter W1	Indian Lake WTP			Val-Matic	1989						
		4" Plug Valve - Filter W1 Drain	Indian Lake WTP			Val-Matic	1989						
		8" Plug Valve - Filter W2	Indian Lake WTP			Val-Matic	1989						
		4" Plug Valve - Filter W2 Drain	Indian Lake WTP			Val-Matic	1989						
		8" Butterfly Valve - Filter W2-Left	Indian Lake WTP			Pratt	2015						
		6" Butterfly Valve - Filter W2-Left	Indian Lake WTP			Pratt	2015						
		6" Butterfly Valve - Filter W2-Right	Indian Lake WTP			Pratt	2015						

Last Inspec. Date	Asset ID	Description	Location	General Information						Remote Monitoring		Control System	
				Org. Designer	Org. Contractor	Manufacturer	Year Placed into Service	Capacity	Notes	Type	Notes	Description	Notes
		8" Butterfly Valve - Filter W2-Right	Indian Lake WTP			Pratt	2015						
		Globe Valve - Well 15 & 16 Well House	Indian Lake Well Field			Val-Matic	1990		8"				
		Air/Vaccum Valve - Well 14	Indian Lake Well Field			Val-Matic	1990		8"				
		Globe Valve - Well 14	Indian Lake Well Field			Val-Matic	1990		8"				
		8" Check Valve	Winding Ridge			Inlet Cla-Val Co.	2004						
		8" Check Valve	Winding Ridge			Inlet Cla-Val Co.	2004						
		10" Globe Style Silent Check Valve	Winding Ridge			Val-Matic	2004						
		10" Butterfly Valve - HSP 2 Discharge	Winding Ridge	BF		Watts	2004						
		10" Butterfly Valve - HSP 2 Suction	Winding Ridge	BF		Watts	2004						
		10" Butterfly Valve - HSP 1 Discharge	Winding Ridge	BF		Watts	2004						
		10" Butterfly Valve - HSP 1 Suction	Winding Ridge	BF		Watts	2004						
		4" Butterfly Valve - Discharge and Suction	Winding Ridge		MDLGA2-M4	Watts	2004						

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	8" Silent Check Valve	Richardt WTP - HSP 3 Pump House	Val-Matic			102-0375	1971		46	30	-16	2001	153
	8" Butterfly Valve	Richardt WTP - HSP 3 Pump House	Dezurik			102-0376	1971		46	30	-16	2001	153
	8" Silent Check Valve	Richardt WTP - HSP 3 Pump House	Val-Matic			102-0378	1971		46	30	-16	2001	153
	8" Butterfly Valve	Richardt WTP - HSP 3 Pump House	Dezurik			102-0379	1971		46	30	-16	2001	153
	2-4" Butterfly Valves Filter E2 Drain Line	Richardt WTP - Filter Building	Dezurik?			102-0408 , 102-0411	1971		46	30	-16	2001	153
	2- 8" Butterfly Valves Filter E2 Finished	Richardt WTP - Filter Building	Dezurik?			102-0409 - 102-0410	1971		46	30	-16	2001	153
	2-4" Butterfly Valves Filter E1 Drain Line	Richardt WTP - Filter Building	Dezurik?			102-0412, 102-0415	1971		46	30	-16	2001	153
	2-8" Butterfly Valves Filter E1 Finished	Richardt WTP - Filter Building	Dezurik?			102-0413 - 102-0414	1971		46	30	-16	2001	153
	8" Butterfly Valve Filter W1	Richardt WTP - Filter Building	Dezurik?			102-0416	1958		59	30	-29	1988	197
	8" Butterfly Valve Filter W1 Finished	Richardt WTP - Filter Building	Dezurik?			102-0417	1958		59	30	-29	1988	197
	8" Butterfly Valve Filter W2	Richardt WTP - Filter Building	Dezurik			102-0419	1958		59	30	-29	1988	197
	8" Gate Valve Filter W2	Richardt WTP - Filter Building	Mueller			102-0420	1958		59	30	-29	1988	197
	8" Gate Valve Filter W1	Richardt WTP - Filter Building	Mueller			102-0421	1958		59	30	-29	1988	197
	8" Gate Valve Filter E1	Richardt WTP - Filter Building	Mueller			102-0425	1971		46	30	-16	2001	153
	8" Gate Valve Filter E2	Richardt WTP - Filter Building	Mueller			102-0426	1971		46	30	-16	2001	153
	8" Butterfly Valve Backwash	Richardt WTP - Filter Building	Dezurik?			102-0422	1971		46	30	-16	2001	153
	8" Gate Valve	Richardt WTP - Filter Building	Iowa			102-0418	1958		59	30	-29	1988	197
	8" Butterfly Valve - Filter E1 Raw	Richardt WTP - Filter Building	Dezurik?			102-0423	1971		46	30	-16	2001	153
	8" Butterfly Valve - Filter E1 Finished	Richardt WTP - Filter Building	Dezurik?			102-0424	1971		46	30	-16	2001	153
	8" Butterfly Valve - Filter E2 Finished	Richardt WTP - Filter Building	Dezurik?			102-0427	1971		46	30	-16	2001	153
	8" Butterfly Valve - Filter W2 Raw Left	Richardt WTP - Filter Building	American			102-0429 - 102-0430	2008		9	30	21	2038	30
	6" Butterfly Valve - Filter W2 Raw Left	Richardt WTP - Filter Building	Dezurik?			102-0431	1958		59	30	-29	1988	197

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information Coverage	Warranty Information Expiration Date	Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
	8" Silent Check Valve	Richardt WTP - HSP 3 Pump House						--	30					
	8" Butterfly Valve	Richardt WTP - HSP 3 Pump House						--	30					
	8" Silent Check Valve	Richardt WTP - HSP 3 Pump House						--	30					
	8" Butterfly Valve	Richardt WTP - HSP 3 Pump House						--	30					
	2-4" Butterfly Valves Filter E2 Drain Line	Richardt WTP - Filter Building						--	30					
	2- 8" Butterfly Valves Filter E2 Finished	Richardt WTP - Filter Building						--	30					
	2-4" Butterfly Valves Filter E1 Drain Line	Richardt WTP - Filter Building						--	30					
	2-8" Butterfly Valves Filter E1 Finished	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve Filter W1	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve Filter W1 Finished	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve Filter W2	Richardt WTP - Filter Building						--	30					
	8" Gate Valve Filter W2	Richardt WTP - Filter Building						--	30					
	8" Gate Valve Filter W1	Richardt WTP - Filter Building						--	30					
	8" Gate Valve Filter E1	Richardt WTP - Filter Building						--	30					
	8" Gate Valve Filter E2	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve Backwash	Richardt WTP - Filter Building						--	30					
	8" Gate Valve	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter E1 Raw	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter E1 Finished	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter E2 Finished	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter W2 Raw Left	Richardt WTP - Filter Building						--	30					
	6" Butterfly Valve - Filter W2 Raw Left	Richardt WTP - Filter Building						--	30					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	8" Silent Check Valve	Richardt WTP - HSP 3 Pump House	4	5	3	2	4	3.76	3	5	1	1	1	1	1.94	1.00	**7.31**
	8" Butterfly Valve	Richardt WTP - HSP 3 Pump House	4	5	3	2	4	3.76	3	5	1	1	1	1	1.94	1.00	**7.31**
	8" Silent Check Valve	Richardt WTP - HSP 3 Pump House	5	5	3	2	5	4.22	3	5	1	1	1	1	1.94	1.00	**8.21**
	8" Butterfly Valve	Richardt WTP - HSP 3 Pump House	5	5	3	2	5	4.22	3	5	1	1	1	1	1.94	1.00	**8.21**
	2-4" Butterfly Valves Filter E2 Drain Line	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	2- 8" Butterfly Valves Filter E2 Finished	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	2-4" Butterfly Valves Filter E1 Drain Line	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	2-8" Butterfly Valves Filter E1 Finished	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	8" Butterfly Valve Filter W1	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	8" Butterfly Valve Filter W1 Finished	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	8" Butterfly Valve Filter W2	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	8" Gate Valve Filter W2	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	8" Gate Valve Filter W1	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	8" Gate Valve Filter E1	Richardt WTP - Filter Building	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	8" Gate Valve Filter E2	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	8" Butterfly Valve Backwash	Richardt WTP - Filter Building	4	5	3	3	4	3.98	4	5	1	1	1	1	2.14	1.00	**8.51**
	8" Gate Valve	Richardt WTP - Filter Building	3	5	3	3	2	3.22	4	5	1	1	1	1	2.14	1.00	**6.89**
	8" Butterfly Valve - Filter E1 Raw	Richardt WTP - Filter Building	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	8" Butterfly Valve - Filter E1 Finished	Richardt WTP - Filter Building	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	8" Butterfly Valve - Filter E2 Finished	Richardt WTP - Filter Building	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	8" Butterfly Valve - Filter W2 Raw Left	Richardt WTP - Filter Building	3	2	2	2	3	2.46	3	5	1	1	1	1	1.94	1.00	**4.78**
	6" Butterfly Valve - Filter W2 Raw Left	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	6" Butterfly Valve - Filter W2 Raw Right	Richardt WTP - Filter Building	Dezurik?			102-0432	1958		59	30	-29	1988	197
	8" Butterfly Valve - Filter W2 Raw Right	Richardt WTP - Filter Building	Val-Matic	2508/1B004	M697510	102-0433 - 102-0434	2011		6	30	24	2041	20
	8" Butterfly Valve - Filter W1 Raw Left	Richardt WTP - Filter Building	Val-Matic	2508/1B004	M697510	101-0435 - 102-0437	2011		6	30	24	2041	20
	6" Butterfly Valve - Filter W1 Raw Left	Richardt WTP - Filter Building	Dezurik?			102-0438	1958		59	30	-29	1988	197
	6" Butterfly Valve - Filter W1 Raw Right	Richardt WTP - Filter Building	Dezurik?			102-0439	1958		59	30	-29	1988	197
	8" Butterfly Valve - Filter W1 Raw Right	Richardt WTP - Filter Building	Dezurik?			102-0440	1958		59	30	-29	1988	197
	8" Butterfly Valve - Filter E1 Raw Left	Richardt WTP - Filter Building	Dezurik			102-0441	1971		46	30	-16	2001	153
	8" Butterfly Valve - Filter E1 Raw Left	Richardt WTP - Filter Building	Dezurik?			102-0442	1971		46	30	-16	2001	153
	8" Butterfly Valve - Filter E1 Raw Right	Richardt WTP - Filter Building	Dezurik			102-0443	1971		46	30	-16	2001	153
	8" Butterfly Valve - Filter E1 Raw Right	Richardt WTP - Filter Building	Dezurik			102-0444	1971		46	30	-16	2001	153
	8" Butterfly Valve - Filter E2 Raw Left	Richardt WTP - Filter Building	Dezurik			102-0445	1971		46	30	-16	2001	153
	8" Butterfly Valve - Filter E2 Raw Left	Richardt WTP - Filter Building	Dezurik?			102-0446	1971		46	30	-16	2001	153
	8" Butterfly Valve - Filter E2 Raw Right	Richardt WTP - Filter Building	Dezurik			102-0447	1971		46	30	-16	2001	153
	8" Butterfly Valve - Filter E2 Raw Right	Richardt WTP - Filter Building	Dezurik			102-0448	1971		46	30	-16	2001	153
	Air/Vacuum Valve	Richardt WTP	APCO	142		102-0449	1990		27	30	3	2020	90
	6" Check Valve - Well 3	Richardt WTP	Mueller			102-0451	1984		33	30	-3	2014	110
	6" Gate Valve - Well 3	Richardt WTP	Mueller			102-0452	1983		34	30	-4	2013	113
	6" Gate Valve - Well 4	Richardt WTP	Mueller			102-0453	1983		34	30	-4	2013	113
	6" Check Valve - Well 4	Richardt WTP	Mueller			102-0454	1984		33	30	-3	2014	110
	Air/Vacuum Valve	Richardt WTP	Apco Co.			102-0456	1990		27	30	3	2020	90
	8" Globe Check Valve - HSP 1	Richardt WTP	Val-Matic	1808H		102-0487 - 102-0488	1990		27	30	3	2020	90
	8" Wafer Check Valve - HSP 2	Richardt WTP	Pratt	A536-DI		102 -0489 - 102-0490	1990		27	30	3	2020	90
	8" Butterfly Valve - HSP 1	Richardt WTP	Dezurik	541056R007	1100001	102-0491 - 102-0494	1990		27	30	3	2020	90
	8" Butterfly Valve - HSP 2	Richardt WTP	Dezurik	541056R007	1100015	102-0495 - 102-0496	1990		27	30	3	2020	90
	Air/Vacuum Valve - Well 1	Richardt WTP	Val-Matic	202C		102-0514 - 102-0516	1990		27	30	3	2020	90
	8" Check Valve - Well 1	Richardt WTP	Iowa			102-0518	1982		35	30	-5	2012	117
	8" Butterfly Valve - Well 1	Richardt WTP	Dezurik			102-0519	1990		27	30	3	2020	90
	Air/Vacuum Valve	Richardt WTP	Val-Matic	202C		102-0520	1990		27	30	3	2020	90

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information Coverage	Warranty Information Expiration Date	Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
	6" Butterfly Valve - Filter W2 Raw Right	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter W2 Raw Right	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter W1 Raw Left	Richardt WTP - Filter Building						--	30					
	6" Butterfly Valve - Filter W1 Raw Left	Richardt WTP - Filter Building						--	30					
	6" Butterfly Valve - Filter W1 Raw Right	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter W1 Raw Right	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter E1 Raw Left	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter E1 Raw Left	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter E1 Raw Right	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter E1 Raw Right	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter E2 Raw Left	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter E2 Raw Left	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter E2 Raw Right	Richardt WTP - Filter Building						--	30					
	8" Butterfly Valve - Filter E2 Raw Right	Richardt WTP - Filter Building						--	30					
	Air/Vacuum Valve	Richardt WTP						--	30					
	6" Check Valve - Well 3	Richardt WTP						--	30					
	6" Gate Valve - Well 3	Richardt WTP						--	30					
	6" Gate Valve - Well 4	Richardt WTP						--	30					
	6" Check Valve - Well 4	Richardt WTP						--	30					
	Air/Vacuum Valve	Richardt WTP						--	30					
	8" Globe Check Valve - HSP 1	Richardt WTP						--	30					
	8" Wafer Check Valve - HSP 2	Richardt WTP						--	30					
	8" Butterfly Valve - HSP 1	Richardt WTP						--	30					
	8" Butterfly Valve - HSP 2	Richardt WTP						--	30					
	Air/Vacuum Valve - Well 1	Richardt WTP						--	30					
	8" Check Valve - Well 1	Richardt WTP						--	30					
	8" Butterfly Valve - Well 1	Richardt WTP						--	30					
	Air/Vacuum Valve	Richardt WTP						--	30					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	6" Butterfly Valve - Filter W2 Raw Right	Richardt WTP - Filter Building	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	5.95
	8" Butterfly Valve - Filter W2 Raw Right	Richardt WTP - Filter Building	3	2	2	2	2	2.16	3	5	1	1	1	1	1.94	1.00	4.20
	8" Butterfly Valve - Filter W1 Raw Left	Richardt WTP - Filter Building	3	2	2	2	2	2.16	3	5	1	1	1	1	1.94	1.00	4.20
	6" Butterfly Valve - Filter W1 Raw Left	Richardt WTP - Filter Building	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	5.95
	6" Butterfly Valve - Filter W1 Raw Right	Richardt WTP - Filter Building	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	5.95
	8" Butterfly Valve - Filter W1 Raw Right	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	6.26
	8" Butterfly Valve - Filter E1 Raw Left	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	6.26
	8" Butterfly Valve - Filter E1 Raw Left	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	6.26
	8" Butterfly Valve - Filter E1 Raw Right	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	6.26
	8" Butterfly Valve - Filter E1 Raw Right	Richardt WTP - Filter Building	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	7.16
	8" Butterfly Valve - Filter E2 Raw Left	Richardt WTP - Filter Building	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	5.95
	8" Butterfly Valve - Filter E2 Raw Left	Richardt WTP - Filter Building	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	5.95
	8" Butterfly Valve - Filter E2 Raw Right	Richardt WTP - Filter Building	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	6.26
	8" Butterfly Valve - Filter E2 Raw Right	Richardt WTP - Filter Building	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	5.95
	Air/Vacuum Valve	Richardt WTP	3	5	3	3	3	3.52	2	5	1	1	1	1	1.75	1.00	6.16
	6" Check Valve - Well 3	Richardt WTP	3	5	3	3	3	3.52	3	5	1	4	1	4	2.36	1.00	8.31
	6" Gate Valve - Well 3	Richardt WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	5.95
	6" Gate Valve - Well 4	Richardt WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	5.95
	6" Check Valve - Well 4	Richardt WTP	2	5	3	3	2	3.06	3	5	1	4	1	4	2.36	1.00	7.22
	Air/Vacuum Valve	Richardt WTP	2	5	3	3	2	3.06	2	5	1	1	1	1	1.75	1.00	5.35
	8" Globe Check Valve - HSP 1	Richardt WTP	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	6.84
	8" Wafer Check Valve - HSP 2	Richardt WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	5.95
	8" Butterfly Valve - HSP 1	Richardt WTP	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	6.84
	8" Butterfly Valve - HSP 2	Richardt WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	5.95
	Air/Vacuum Valve - Well 1	Richardt WTP	2	5	3	3	3	3.36	2	5	1	1	1	1	1.75	1.00	5.88
	8" Check Valve - Well 1	Richardt WTP	3	5	3	3	3	3.52	3	5	1	4	1	4	2.36	1.00	8.31
	8" Butterfly Valve - Well 1	Richardt WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	6.26
	Air/Vacuum Valve	Richardt WTP	3	5	3	3	2	3.22	2	5	1	1	1	1	1.75	1.00	5.63

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	8" Check, Air Release - Well 2	Richardt WTP	Dezurik			102-0525	1990		27	30	3	2020	90
	8" Butterfly Valve - HSP 3 Influent	Fort Harrison WTP	Dezurik	9353259		102-0543 - 102-0544	1980		37	30	-7	2010	123
	10" Butterfly Valve - HSP 2 Influent	Fort Harrison WTP	Dezurik	9354777		102-0545 - 102-0546	1980		37	30	-7	2010	123
	8" Butterfly Valve - HSP1 Influent '	Fort Harrison WTP	Dezurik	9353259		102-0547 - 102-0548	1980		37	30	-7	2010	123
	8" Silent Check Valve - HSP 3	Fort Harrison WTP	APCO			102-0549	1980		37	30	-7	2010	123
	8" Singer Valve - HSP 3	Fort Harrison WTP	Singer	106-BPC	1297-41-2	102-0550 - 102-0552	1980		37	30	-7	2010	123
	8" Butterfly Valve - HSP 3 Flow Control	Fort Harrison WTP	Dezurik	9353259		102-0553 - 102-0554	1980		37	30	-7	2010	123
	10" Silent Check Valve - HSP 2	Fort Harrison WTP	APCO			102-0555	1980		37	30	-7	2010	123
	10" Singer Valve - HSP 2	Fort Harrison WTP	Singer	106-BPC	1297-41-1	102-0558 - 102-0560	1980		37	30	-7	2010	123
	10" Butterfly Valve - HSP 2 Flow Control	Fort Harrison WTP	Dezurik	9354777		102-0561 - 102-0562	1997		20	30	10	2027	67
	8" Silent Check Valve - HSP 1	Fort Harrison WTP	APCO			102-0563	1980		37	30	-7	2010	123
	8" Singer Valve - HSP 1	Fort Harrison WTP	Singer	106-BPC	198-103	102-0564 - 102-0566	1980		37	30	-7	2010	123
	8" Butterfly Valve - HSP 1 Flow Control	Fort Harrison WTP	Dezurik	9353259		102-0567 - 102-0568	1980		37	30	-7	2010	123
	8" Butterfly Valve - Backwash	Fort Harrison WTP				102-0586	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 9 - Finished	Fort Harrison WTP	Bray			102-0587	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 9 - Finished	Fort Harrison WTP				102-0588	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 9 - Raw	Fort Harrison WTP	Bray	90-1000-21310532		102-0589	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 9 - Raw	Fort Harrison WTP	Bray	90-1000-21310532		102-0590	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 8 - Finished	Fort Harrison WTP	Bray			102-0591	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 8 - Finished	Fort Harrison WTP				102-0592	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 8 - Raw	Fort Harrison WTP	Bray	90-1000-21310532		102-0593 - 102-0594	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 8 - Raw	Fort Harrison WTP	Bray	90-1000-21310532		102-0595	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 7 - Finished	Fort Harrison WTP	Bray			102-0596	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 7 - Finished	Fort Harrison WTP	Bray			102-0597	1980		37	30	-7	2010	123

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information Coverage	Warranty Information Expiration Date	Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
	8" Check, Air Release - Well 2	Richardt WTP						--	30					
	8" Butterfly Valve - HSP 3 Influent	Fort Harrison WTP						--	30					
	10" Butterfly Valve - HSP 2 Influent	Fort Harrison WTP						--	30					
	8" Butterfly Valve - HSP1 Influent '	Fort Harrison WTP						--	30					
	8" Silent Check Valve - HSP 3	Fort Harrison WTP						--	30					
	8" Singer Valve - HSP 3	Fort Harrison WTP						--	30					
	8" Butterfly Valve - HSP 3 Flow Control	Fort Harrison WTP						--	30					
	10" Silent Check Valve - HSP 2	Fort Harrison WTP						--	30					
	10" Singer Valve - HSP 2	Fort Harrison WTP						--	30					
	10" Butterfly Valve - HSP 2 Flow Control	Fort Harrison WTP						--	30					
	8" Silent Check Valve - HSP 1	Fort Harrison WTP						--	30					
	8" Singer Valve - HSP 1	Fort Harrison WTP						--	30					
	8" Butterfly Valve - HSP 1 Flow Control	Fort Harrison WTP						--	30					
	8" Butterfly Valve - Backwash	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 9 - Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 9 - Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 9 - Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 9 - Raw	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 8 - Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 8 - Finished	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 8 - Raw	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 8 - Raw	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 7 - Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 7 - Finished	Fort Harrison WTP						--	30					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	8" Check, Air Release - Well 2	Richardt WTP	4	5	3	3	3	3.68	2	5	1	4	1	4	2.17	1.00	**7.97**
	8" Butterfly Valve - HSP 3 Influent	Fort Harrison WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	10" Butterfly Valve - HSP 2 Influent	Fort Harrison WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	8" Butterfly Valve - HSP1 Influent '	Fort Harrison WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	8" Silent Check Valve - HSP 3	Fort Harrison WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	8" Singer Valve - HSP 3	Fort Harrison WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	8" Butterfly Valve - HSP 3 Flow Control	Fort Harrison WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	10" Silent Check Valve - HSP 2	Fort Harrison WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	10" Singer Valve - HSP 2	Fort Harrison WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	10" Butterfly Valve - HSP 2 Flow Control	Fort Harrison WTP	2	4	3	3	2	2.8	3	5	1	1	1	1	1.94	1.00	**5.44**
	8" Silent Check Valve - HSP 1	Fort Harrison WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	8" Singer Valve - HSP 1	Fort Harrison WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	8" Butterfly Valve - HSP 1 Flow Control	Fort Harrison WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	8" Butterfly Valve - Backwash	Fort Harrison WTP	2	5	3	3	3	3.36	4	5	1	1	1	1	2.14	1.00	**7.19**
	6" Butterfly Valve - Filter 9 - Finished	Fort Harrison WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	6" Butterfly Valve - Filter 9 - Finished	Fort Harrison WTP	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	**6.84**
	6" Butterfly Valve - Filter 9 - Raw	Fort Harrison WTP	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	**6.84**
	6" Valve Actuator - Filter 9 - Raw	Fort Harrison WTP	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	**6.84**
	6" Butterfly Valve - Filter 8 - Finished	Fort Harrison WTP	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	**6.84**
	6" Butterfly Valve - Filter 8 - Finished	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 8 - Raw	Fort Harrison WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	6" Butterfly Valve - Filter 8 - Raw	Fort Harrison WTP	4	5	3	3	2	3.38	3	5	1	1	1	1	1.94	1.00	**6.57**
	6" Butterfly Valve - Filter 7 - Finished	Fort Harrison WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	6" Butterfly Valve - Filter 7 - Finished	Fort Harrison WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	6" Butterfly Valve - Filter 7 - Raw	Fort Harrison WTP	Bray	90-1000-21310532		102-0598	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 7 - Raw	Fort Harrison WTP		90-1000-21310532		102-0599	1980		37	30	-7	2010	123
	10" Gate Valve	Fort Harrison WTP				102-0603	1980		37	30	-7	2010	123
	12" Globe Check Valve - Raw	Fort Harrison WTP				102-0607	1980		37	30	-7	2010	123
	12" Butterfly Valve - Raw	Fort Harrison WTP				102-0606	1980		37	30	-7	2010	123
	8" Butterfly Valve - Raw	Fort Harrison WTP	Victaulic	FIG. 0030352211		102-0608	1980		37	30	-7	2010	123
	8" Butterfly Valve - Raw	Fort Harrison WTP	Victaulic			102-0609	1980		37	30	-7	2010	123
	6" Butterfly Valve-Filter 1 - Raw	Fort Harrison WTP	Victaulic			102-0610	1980		37	30	-7	2010	123
	6" Valve Actuator-Filter 1 - Raw	Fort Harrison WTP	Keystone	790-300		102-0611, 102-0614	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 1 - Raw	Fort Harrison WTP	Keystone	790-300		102-0612, 102-0615	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 1 - Finished	Fort Harrison WTP	Keystone	790-300		102-0616	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 1 - Finished	Fort Harrison WTP	Keystone			102-0617	1980		37	30	-7	2010	123
	6" Butterfly Valve - Finished	Fort Harrison WTP	Victaulic			102-0618	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 2 Raw	Fort Harrison WTP	Victaulic			102-0619	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 2 Raw	Fort Harrison WTP	Keystone	790-300		102-0620 - 102-0621	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 2 Raw	Fort Harrison WTP	Keystone	790-300		102-0622 - 102-0623	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 2 Finished	Fort Harrison WTP	Keystone	790-300		102-0624 - 102-0625	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 2 Finished	Fort Harrison WTP	Keystone	790-300		102-0626 - 102-0627	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 2 Finished	Fort Harrison WTP	Victaulic	V3522		102-0628 - 102-0629	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 3 Raw	Fort Harrison WTP	Victaulic			102-0630	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 3 Raw	Fort Harrison WTP	Keystone	790-300		102-0631	1980		37	30	-7	2010	123
	6" Valve Actuator- Filter 3 Raw	Fort Harrison WTP	Keystone	790-300		102-0632	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 3 Finished	Fort Harrison WTP	Keystone	790-300		102-0633	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 3 Finished	Fort Harrison WTP	Keystone	790-300		102-0634	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 3 Finished	Fort Harrison WTP	Victaulic	V3522		102-0635 - 102-0636	1980		37	30	-7	2010	123

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information		Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
					Coverage	Expiration Date								
	6" Butterfly Valve - Filter 7 - Raw	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 7 - Raw	Fort Harrison WTP						--	30					
	10" Gate Valve	Fort Harrison WTP						--	30					
	12" Globe Check Valve - Raw	Fort Harrison WTP						--	30					
	12" Butterfly Valve - Raw	Fort Harrison WTP						--	30					
	8" Butterfly Valve - Raw	Fort Harrison WTP						--	30					
	8" Butterfly Valve - Raw	Fort Harrison WTP						--	30					
	6" Butterfly Valve-Filter 1 - Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator-Filter 1 - Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 1 - Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 1 - Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 1 - Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 2 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 2 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 2 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 2 Finished	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 2 Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 2 Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 3 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 3 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator- Filter 3 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 3 Finished	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 3 Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 3 Finished	Fort Harrison WTP						--	30					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	6" Butterfly Valve - Filter 7 - Raw	Fort Harrison WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	6" Butterfly Valve - Filter 7 - Raw	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	10" Gate Valve	Fort Harrison WTP	5	5	3	3	5	4.44	4	5	1	1	1	1	2.14	1.00	**9.50**
	12" Globe Check Valve - Raw	Fort Harrison WTP	5	5	3	3	3	3.84	4	5	1	1	1	1	2.14	1.00	**8.21**
	12" Butterfly Valve - Raw	Fort Harrison WTP	4	5	3	3	4	3.98	4	5	1	1	1	1	2.14	1.00	**8.51**
	8" Butterfly Valve - Raw	Fort Harrison WTP	5	5	3	3	4	4.14	4	5	1	1	1	1	2.14	1.00	**8.85**
	8" Butterfly Valve - Raw	Fort Harrison WTP	5	5	3	3	4	4.14	4	5	1	1	1	1	2.14	1.00	**8.85**
	6" Butterfly Valve-Filter 1 - Raw	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator-Filter 1 - Raw	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 1 - Raw	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 1 - Finished	Fort Harrison WTP	4	5	3	3	4	3.98	3	5	1	1	1	1	1.94	1.00	**7.74**
	6" Butterfly Valve - Filter 1 - Finished	Fort Harrison WTP	4	5	3	3	4	3.98	3	5	1	1	1	1	1.94	1.00	**7.74**
	6" Butterfly Valve - Finished	Fort Harrison WTP	4	5	3	3	4	3.98	3	5	1	1	1	1	1.94	1.00	**7.74**
	6" Butterfly Valve - Filter 2 Raw	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 2 Raw	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 2 Raw	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 2 Finished	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 2 Finished	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Butterfly Valve - Filter 2 Finished	Fort Harrison WTP	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	**6.84**
	6" Butterfly Valve - Filter 3 Raw	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 3 Raw	Fort Harrison WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	6" Valve Actuator- Filter 3 Raw	Fort Harrison WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	6" Valve Actuator - Filter 3 Finished	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 3 Finished	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Butterfly Valve - Filter 3 Finished	Fort Harrison WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	6" Butterfly Valve - Filter 6 Raw	Fort Harrison WTP	Victaulic	V3522		102-0637	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 6 Raw	Fort Harrison WTP	Keystone	790-300		102-0638	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 6 Raw	Fort Harrison WTP	Keystone	790-300		102-0639	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 6 Finished	Fort Harrison WTP	Keystone	790-300		102-0640	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 6 Finished	Fort Harrison WTP	Keystone	790-300		102-0641	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 6 Finished	Fort Harrison WTP	Victaulic			102-0642	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 5 Raw	Fort Harrison WTP	Victaulic			102-0643	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 5 Raw	Fort Harrison WTP	Keystone	790-300		102-0644	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 5 Raw	Fort Harrison WTP	Keystone	790-300		102-0645	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 5 Finished	Fort Harrison WTP	Keystone	790-300		102-0646	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 5 Finished	Fort Harrison WTP	Keystone	790-300		102-0647	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 4 Raw	Fort Harrison WTP	Victaulic			102-0648	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 4 Raw	Fort Harrison WTP	Keystone	790-300		102-0649	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 4 Raw	Fort Harrison WTP	Keystone	790-300		102-0650	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 4 Finished	Fort Harrison WTP	Keystone	790-300		102-0651	1980		37	30	-7	2010	123
	6" Valve Actuator - Filter 4 Finished	Fort Harrison WTP	Keystone	790-300		102-0652	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filter 4 Finished	Fort Harrison WTP	Victaulic			102-0653	1980		37	30	-7	2010	123
	6" Butterfly Valve - Filters 1-6 Backwash Rate	Fort Harrison WTP	Dezurik			102-0660 - 102-0661	1980		37	30	-7	2010	123
	10" Butterfly Valve - Filters 7-9 Backwash Rate	Fort Harrison WTP				102-0662	1980		37	30	-7	2010	123
	8" Butterfly Valve - Plant Finished	Fort Harrison WTP	Centerline			102-0663 - 102-0664	1980		37	30	-7	2010	123
	6" Butterfly Valve - Plant Finished	Fort Harrison WTP	Centerline			102-0665	1980		37	30	-7	2010	123
	Air Valve	Fort Harrison Well Field	Val-Matic	102WS		102-0105 - 102-0106	1990		27	30	3	2020	90

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information: Coverage	Warranty Information: Expiration Date	Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
	6" Butterfly Valve - Filter 6 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 6 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 6 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 6 Finished	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 6 Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 6 Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 5 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 5 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 5 Raw	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 5 Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 5 Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 4 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 4 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 4 Raw	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 4 Finished	Fort Harrison WTP						--	30					
	6" Valve Actuator - Filter 4 Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filter 4 Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Filters 1-6 Backwash Rate	Fort Harrison WTP						--	30					
	10" Butterfly Valve - Filters 7-9 Backwash Rate	Fort Harrison WTP						--	30					
	8" Butterfly Valve - Plant Finished	Fort Harrison WTP						--	30					
	6" Butterfly Valve - Plant Finished	Fort Harrison WTP						--	30					
	Air Valve	Fort Harrison Well Field						--	30					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	6" Butterfly Valve - Filter 6 Raw	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 6 Raw	Fort Harrison WTP	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	**6.84**
	6" Valve Actuator - Filter 6 Raw	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 6 Finished	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 6 Finished	Fort Harrison WTP	5	5	3	3	4	4.14	3	5	1	1	1	1	1.94	1.00	**8.05**
	6" Butterfly Valve - Filter 6 Finished	Fort Harrison WTP	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	**6.84**
	6" Butterfly Valve - Filter 5 Raw	Fort Harrison WTP	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	**6.84**
	6" Valve Actuator - Filter 5 Raw	Fort Harrison WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	6" Valve Actuator - Filter 5 Raw	Fort Harrison WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	6" Butterfly Valve - Filter 5 Finished	Fort Harrison WTP	5	5	3	3	4	4.14	3	5	1	1	1	1	1.94	1.00	**8.05**
	6" Butterfly Valve - Filter 5 Finished	Fort Harrison WTP	5	5	3	3	4	4.14	3	5	1	1	1	1	1.94	1.00	**8.05**
	6" Butterfly Valve - Filter 4 Raw	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 4 Raw	Fort Harrison WTP	4	5	3	3	2	3.38	3	5	1	1	1	1	1.94	1.00	**6.57**
	6" Valve Actuator - Filter 4 Raw	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 4 Finished	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Valve Actuator - Filter 4 Finished	Fort Harrison WTP	5	5	3	3	4	4.14	3	5	1	1	1	1	1.94	1.00	**8.05**
	6" Butterfly Valve - Filter 4 Finished	Fort Harrison WTP	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	6" Butterfly Valve - Filters 1-6 Backwash Rate	Fort Harrison WTP	5	5	3	3	4	4.14	3	5	1	1	1	1	1.94	1.00	**8.05**
	10" Butterfly Valve - Filters 7-9 Backwash Rate	Fort Harrison WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	8" Butterfly Valve - Plant Finished	Fort Harrison WTP	4	5	3	3	4	3.98	4	5	1	1	1	1	2.14	1.00	**8.51**
	6" Butterfly Valve - Plant Finished	Fort Harrison WTP	3	5	3	3	3	3.52	4	5	1	1	1	1	2.14	1.00	**7.53**
	Air Valve	Fort Harrison Well Field	2	5	3	3	3	3.36	3	5	1	1	1	1	1.94	1.00	**6.53**

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	Dual Port Throttling Device	Fort Harrison Well Field	Val-Matic	2DPT	R5DPT-57	102-0107	1990		27	30	3	2020	90
	8" Butterfly Valve - Filter W1 Raw Left	Indian Lake WTP	Pratt			102-0310 - 102-0311	2015		2	30	28	2045	7
	6" Butterfly Valve - Filter W1 Raw Left	Indian Lake WTP	Pratt			102-0312 - 102-0314	2015		2	30	28	2045	7
	6" Butterfly Valve - Filter W1 Raw Right	Indian Lake WTP	Pratt			102-0315 - 102-0316	2015		2	30	28	2045	7
	8" Butterfly Valve - Filter W1 Raw Right	Indian Lake WTP	Pratt			102-0317 - 102-0319	2015		2	30	28	2045	7
	8" Butterfly Valve - Filter E1 Raw Left	Indian Lake WTP	Pratt			102-0320 - 102-0322	2015		2	30	28	2045	7
	6" Butterfly Valve - Filter E1 Raw Left	Indian Lake WTP	Pratt			102-0323 - 102-0325	2015		2	30	28	2045	7
	6" Butterfly Valve - Filter E1 Raw Right	Indian Lake WTP	Pratt			102-0326 - 102-0328	2015		2	30	28	2045	7
	8" Butterfly Valve - Filter E1 Raw Right	Indian Lake WTP	Pratt			102-0329 - 102-0331	2015		2	30	28	2045	7
	8" Butterfly Valve - Filter E2 Raw Left	Indian Lake WTP	Pratt			102-0332 - 102-0333	2015		2	30	28	2045	7
	6" Butterfly Valve - Filter E2 Raw Left	Indian Lake WTP	Pratt			102-0334 - 102-0340	2015		2	30	28	2045	7
	6" Butterfly Valve - Filter E2 Raw Right	Indian Lake WTP	Pratt			102-0341 - 102-0343	2015		2	30	28	2045	7
	8" Butterfly Valve - Filter E2 Raw Right	Indian Lake WTP	Pratt			102-0344 - 102-0345	2015		2	30	28	2045	7
	8" Check Valve - HSP 1	Indian Lake WTP	Val-Matic			102-0358	1989		28	30	2	2019	93
	8" Check Valve - HSP 2	Indian Lake WTP	Val-Matic			102-0359	1989		28	30	2	2019	93
	8" Check Valve - HSP 3	Indian Lake WTP	Val-Matic			102-0360	1989		28	30	2	2019	93
	8" Butterfly Valve - HSP 1	Indian Lake WTP	MH			102-0361	1989		28	30	2	2019	93
	8" Butterfly Valve - HSP 2	Indian Lake WTP	MH			102-0362	1989		28	30	2	2019	93
	8" Butterfly Valve - HSP 3	Indian Lake WTP	MH			102-0363	1989		28	30	2	2019	93
	Dual Port Throttling Device - Well 16	Indian Lake Well Field	Val-Matic	R5DPT-57	2DPT	102-0145 - 102-0146	1990		27	30	3	2020	90
	8" Silent Check Valve - Well 14	Indian Lake Well Field	Globe Style	1808		102-0165 - 102-0166	1990		27	30	3	2020	90
	Dual Port Throttling Device - Well 15	Indian Lake Well Field	Val-Matic	R5DPT-57	3DPT	102-0275	1990		27	30	3	2020	90
	Air Release Valve - Well 15	Indian Lake Well Field	Val-Matic	103-2	103W8	102-0276 - 102-0277	1990		27	30	3	2020	90
	8" Actuator - Filter E2 Right	Indian Lake WTP	Kinetrol	107-100	1615013	102-0235 - 102-0236	2015		2	35	33	2050	6
	6" Actuator - Filter E2-Right	Indian Lake WTP	Kinetrol	087-100	1509510	102-0237 - 102-0238	2015		2	35	33	2050	6
	6" Actuator - Filter E2-Left	Indian Lake WTP	Kinetrol	087-100	1509501	102-0239 - 102-0240	2015		2	35	33	2050	6
	8" Actuator - Filter E2-Left	Indian Lake WTP	Kinetrol	107-100	1615014	102-0241 - 102-0242	2015		2	35	33	2050	6
	8" Actuator - Filter E1-Right	Indian Lake WTP	Kinetrol	107-100	1615018	102-0243 - 102-0244	2015		2	35	33	2050	6
	6" Actuator - Filter E1-Right	Indian Lake WTP	Kinetrol	087-100	1643171	102-0245 - 102-0246	2015		2	35	33	2050	6

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information		Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
					Coverage	Expiration Date								
	Dual Port Throttling Device	Fort Harrison Well Field						--	30					
	8" Butterfly Valve - Filter W1 Raw Left	Indian Lake WTP						--	30					
	6" Butterfly Valve - Filter W1 Raw Left	Indian Lake WTP						--	30					
	6" Butterfly Valve - Filter W1 Raw Right	Indian Lake WTP						--	30					
	8" Butterfly Valve - Filter W1 Raw Right	Indian Lake WTP						--	30					
	8" Butterfly Valve - Filter E1 Raw Left	Indian Lake WTP						--	30					
	6" Butterfly Valve - Filter E1 Raw Left	Indian Lake WTP						--	30					
	6" Butterfly Valve - Filter E1 Raw Right	Indian Lake WTP						--	30					
	8" Butterfly Valve - Filter E1 Raw Right	Indian Lake WTP						--	30					
	8" Butterfly Valve - Filter E2 Raw Left	Indian Lake WTP						--	30					
	6" Butterfly Valve - Filter E2 Raw Left	Indian Lake WTP						--	30					
	6" Butterfly Valve - Filter E2 Raw Right	Indian Lake WTP						--	30					
	8" Butterfly Valve - Filter E2 Raw Right	Indian Lake WTP						--	30					
	8" Check Valve - HSP 1	Indian Lake WTP						--	30					
	8" Check Valve - HSP 2	Indian Lake WTP						--	30					
	8" Check Valve - HSP 3	Indian Lake WTP						--	30					
	8" Butterfly Valve - HSP 1	Indian Lake WTP						--	30					
	8" Butterfly Valve - HSP 2	Indian Lake WTP						--	30					
	8" Butterfly Valve - HSP 3	Indian Lake WTP						--	30					
	Dual Port Throttling Device - Well 16	Indian Lake Well Field						--	30					
	8" Silent Check Valve - Well 14	Indian Lake Well Field						--	30					
	Dual Port Throttling Device - Well 15	Indian Lake Well Field						--	30					
	Air Release Valve - Well 15	Indian Lake Well Field						--	30					
	8" Actuator - Filter E2 Right	Indian Lake WTP						--	35					
	6" Actuator - Filter E2-Right	Indian Lake WTP						--	35					
	6" Actuator - Filter E2-Left	Indian Lake WTP						--	35					
	8" Actuator - Filter E2-Left	Indian Lake WTP						--	35					
	8" Actuator - Filter E1-Right	Indian Lake WTP						--	35					
	6" Actuator - Filter E1-Right	Indian Lake WTP						--	35					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Dual Port Throttling Device	Fort Harrison Well Field	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	**6.84**
	8" Butterfly Valve - Filter W1 Raw Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Butterfly Valve - Filter W1 Raw Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Butterfly Valve - Filter W1 Raw Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Butterfly Valve - Filter W1 Raw Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Butterfly Valve - Filter E1 Raw Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Butterfly Valve - Filter E1 Raw Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Butterfly Valve - Filter E1 Raw Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Butterfly Valve - Filter E1 Raw Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Butterfly Valve - Filter E2 Raw Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Butterfly Valve - Filter E2 Raw Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Butterfly Valve - Filter E2 Raw Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Butterfly Valve - Filter E2 Raw Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Check Valve - HSP 1	Indian Lake WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	8" Check Valve - HSP 2	Indian Lake WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	8" Check Valve - HSP 3	Indian Lake WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	8" Butterfly Valve - HSP 1	Indian Lake WTP	3	5	3	3	2	3.22	3	5	1	1	1	1	1.94	1.00	**6.26**
	8" Butterfly Valve - HSP 2	Indian Lake WTP	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	**6.84**
	8" Butterfly Valve - HSP 3	Indian Lake WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	Dual Port Throttling Device - Well 16	Indian Lake Well Field	4	5	3	3	3	3.68	3	5	1	1	1	1	1.94	1.00	**7.16**
	8" Silent Check Valve - Well 14	Indian Lake Well Field	3	5	3	3	3	3.52	3	5	1	4	1	4	2.36	1.00	**8.31**
	Dual Port Throttling Device - Well 15	Indian Lake Well Field	2	5	3	3	2	3.06	2	5	1	1	1	1	1.75	1.00	**5.35**
	Air Release Valve - Well 15	Indian Lake Well Field	3	5	3	3	3	3.52	2	5	1	1	1	1	1.75	1.00	**6.16**
	8" Actuator - Filter E2 Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Actuator - Filter E2-Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Actuator - Filter E2-Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Actuator - Filter E2-Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Actuator - Filter E1-Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Actuator - Filter E1-Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	6" Actuator - Filter E1-Left	Indian Lake WTP	Kinetrol	087-100	1597726	102-0247 - 102-0248	2015		2	35	33	2050	6
	8" Actuator - Filter E1-Left	Indian Lake WTP	Kinetrol	107-100	1615017	102-0249 - 102-0250	2015		2	35	33	2050	6
	8" Actuator - Filter W1-Right	Indian Lake WTP	Kinetrol	107-100	1615010	102-0251 - 102-0252	2015		2	35	33	2050	6
	6" Actuator - Filter W1-Right	Indian Lake WTP	Kinetrol	087-100	1638919	102-0253 - 102-0254	2015		2	35	33	2050	6
	6" Actuator - Filter W1-Left	Indian Lake WTP	Kinetrol	087-100	1597714	102-0255 - 102-0256	2015		2	35	33	2050	6
	8" Actuator - Filter W1-Left	Indian Lake WTP	Kinetrol	107-100	1615105	102-0257 - 102-0258	2015		2	35	33	2050	6
	8" Actuator - Filter W2-Right	Indian Lake WTP	Kinetrol	107-100	1615022	102-0259 - 102-0260	2015		2	35	33	2050	6
	6" Actuator - Filter W2-Right	Indian Lake WTP	Kinetrol	087-100	1614737	102-0261 - 102-0262	2015		2	35	33	2050	6
	6" Actuator - Filter W2-Left	Indian Lake WTP	Kinetrol	087-100	1643170	102-0263 - 102-0264	2015		2	35	33	2050	6
	8" Actuator - Filter W2-Left	Indian Lake WTP	Kinetrol	107-100	1615019	102-0265 - 102-0266	2015		2	35	33	2050	6
	Well 15 Check Valve	Indian Lake Well Field				102-0278	1990		27	30	3	2020	90
	Well 15 Valve Vault	Indian Lake Well Field				102-0279 - 102-0282	1990		27	50	23	2040	54
	4" Gate Valve - Drain	Indian Lake WTP	MI V&FI Co.			102-0292	1989		28	30	2	2019	93
	4" Gate Valve - Drain	Indian Lake WTP	MI V&FI Co.			102-0293	1989		28	30	2	2019	93
	8" Plug Valve - Filter E2	Indian Lake WTP	Val-Matic			102-0294	1989		28	30	2	2019	93
	4" Plug Valve - Filter E2 Drain	Indian Lake WTP	Val-Matic			102-0295	1989		28	30	2	2019	93
	8" Plug Valve - Filter E1	Indian Lake WTP	Val-Matic			102-0296	1989		28	30	2	2019	93
	4" Plug Valve - Filter E1 Drain	Indian Lake WTP	Val-Matic			102-0297	1989		28	30	2	2019	93
	8" Plug Valve - Filter W1	Indian Lake WTP	Val-Matic			102-0298	1989		28	30	2	2019	93
	4" Plug Valve - Filter W1 Drain	Indian Lake WTP	Val-Matic			102-0299	1989		28	30	2	2019	93
	8" Plug Valve - Filter W2	Indian Lake WTP	Val-Matic			102-0300	1989		28	30	2	2019	93
	4" Plug Valve - Filter W2 Drain	Indian Lake WTP	Val-Matic			102-0301	1989		28	30	2	2019	93
	8" Butterfly Valve - Filter W2-Left	Indian Lake WTP	Pratt			102-0302 - 102-0303	2015		2	30	28	2045	7
	6" Butterfly Valve - Filter W2-Left	Indian Lake WTP	Pratt			102-0304 - 102-0305	2015		2	30	28	2045	7
	6" Butterfly Valve - Filter W2-Right	Indian Lake WTP	Pratt			102-0308 - 102-0309	2015		2	30	28	2045	7
	8" Butterfly Valve - Filter W2-Right	Indian Lake WTP	Pratt			102-0306 - 102-0307	2015		2	30	28	2045	7
	Globe Valve - Well 15 & 16 Well House	Indian Lake Well Field	Val-Matic	5808/5412		102-0156	1990		27	30	3	2020	90
	Air/Vaccum Valve - Well 14	Indian Lake Well Field	Val-Matic	200X		102-0167	1990		27	30	3	2020	90
	Globe Valve - Well 14	Indian Lake Well Field	Val-Matic			102-0168	1990		27	30	3	2020	90

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information		Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
					Coverage	Expiration Date								
	6" Actuator - Filter E1-Left	Indian Lake WTP						--	35					
	8" Actuator - Filter E1-Left	Indian Lake WTP						--	35					
	8" Actuator - Filter W1-Right	Indian Lake WTP						--	35					
	6" Actuator - Filter W1-Right	Indian Lake WTP						--	35					
	6" Actuator - Filter W1-Left	Indian Lake WTP						--	35					
	8" Actuator - Filter W1-Left	Indian Lake WTP						--	35					
	8" Actuator - Filter W2-Right	Indian Lake WTP						--	35					
	6" Actuator - Filter W2-Right	Indian Lake WTP						--	35					
	6" Actuator - Filter W2-Left	Indian Lake WTP						--	35					
	8" Actuator - Filter W2-Left	Indian Lake WTP						--	35					
	Well 15 Check Valve	Indian Lake Well Field						--	30					
	Well 15 Valve Vault	Indian Lake Well Field						--	50					
	4" Gate Valve - Drain	Indian Lake WTP						--	30					
	4" Gate Valve - Drain	Indian Lake WTP						--	30					
	8" Plug Valve - Filter E2	Indian Lake WTP						--	30					
	4" Plug Valve - Filter E2 Drain	Indian Lake WTP						--	30					
	8" Plug Valve - Filter E1	Indian Lake WTP						--	30					
	4" Plug Valve - Filter E1 Drain	Indian Lake WTP						--	30					
	8" Plug Valve - Filter W1	Indian Lake WTP						--	30					
	4" Plug Valve - Filter W1 Drain	Indian Lake WTP						--	30					
	8" Plug Valve - Filter W2	Indian Lake WTP						--	30					
	4" Plug Valve - Filter W2 Drain	Indian Lake WTP						--	30					
	8" Butterfly Valve - Filter W2-Left	Indian Lake WTP						--	30					
	6" Butterfly Valve - Filter W2-Left	Indian Lake WTP						--	30					
	6" Butterfly Valve - Filter W2-Right	Indian Lake WTP						--	30					
	8" Butterfly Valve - Filter W2-Right	Indian Lake WTP						--	30					
	Globe Valve - Well 15 & 16 Well House	Indian Lake Well Field						--	30					
	Air/Vaccum Valve - Well 14	Indian Lake Well Field						--	30					
	Globe Valve - Well 14	Indian Lake Well Field						--	30					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	6" Actuator - Filter E1-Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Actuator - Filter E1-Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Actuator - Filter W1-Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Actuator - Filter W1-Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Actuator - Filter W1-Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Actuator - Filter W1-Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Actuator - Filter W2-Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Actuator - Filter W2-Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Actuator - Filter W2-Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Actuator - Filter W2-Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	Well 15 Check Valve	Indian Lake Well Field	3	5	3	3	3	3.52	3	5	1	4	1	4	2.36	1.00	**8.31**
	Well 15 Valve Vault	Indian Lake Well Field	3	3	3	3	3	3	2	5	1	1	1	1	1.75	1.00	**5.25**
	4" Gate Valve - Drain	Indian Lake WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	4" Gate Valve - Drain	Indian Lake WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	8" Plug Valve - Filter E2	Indian Lake WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	4" Plug Valve - Filter E2 Drain	Indian Lake WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	8" Plug Valve - Filter E1	Indian Lake WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	4" Plug Valve - Filter E1 Drain	Indian Lake WTP	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	**6.84**
	8" Plug Valve - Filter W1	Indian Lake WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	4" Plug Valve - Filter W1 Drain	Indian Lake WTP	2	5	3	3	3	3.36	3	5	1	1	1	1	1.94	1.00	**6.53**
	8" Plug Valve - Filter W2	Indian Lake WTP	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	4" Plug Valve - Filter W2 Drain	Indian Lake WTP	3	5	3	3	3	3.52	3	5	1	1	1	1	1.94	1.00	**6.84**
	8" Butterfly Valve - Filter W2-Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Butterfly Valve - Filter W2-Left	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	6" Butterfly Valve - Filter W2-Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	8" Butterfly Valve - Filter W2-Right	Indian Lake WTP	1	1	1	1	1	1	3	5	1	1	1	1	1.94	1.00	**1.94**
	Globe Valve - Well 15 & 16 Well House	Indian Lake Well Field	2	5	3	3	2	3.06	3	5	1	1	1	1	1.94	1.00	**5.95**
	Air/Vaccum Valve - Well 14	Indian Lake Well Field	3	5	3	3	3	3.52	2	5	1	1	1	1	1.75	1.00	**6.16**
	Globe Valve - Well 14	Indian Lake Well Field	2	5	3	3	3	3.36	3	5	1	1	1	1	1.94	1.00	**6.53**

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life		Useful Life Replacement Date	% Useful life used
										Total (yrs)	Remaining Life (yrs)		
	8" Check Valve	Winding Ridge	Inlet Cla-Val Co.	63G03-187B	8 636-03BY	102-0119 - 102-0120	2004		13	30	17	2034	43
	8" Check Valve	Winding Ridge	Inlet Cla-Val Co.	658-01-89H	8 658-01-89N	102-0117 - 102-0118	2004		13	30	17	2034	43
	18" Shutter Mounted Exhaust Fan	Winding Ridge	Dayton	2C708C	927318	102-0136 - 102-0138	2004		13	10	-3	2014	130
	10" Globe Style Silent Check Valve	Winding Ridge	Val-Matic	1810		102-0135	2004		13	30	17	2034	43
	10" Butterfly Valve - HSP 2 Discharge	Winding Ridge	Watts			102-0719 - 102-0720	2004		13	30	17	2034	43
	10" Butterfly Valve - HSP 2 Suction	Winding Ridge	Watts			102-0721 - 102-0723	2004		13	30	17	2034	43
	10" Butterfly Valve - HSP 1 Discharge	Winding Ridge	Watts			102-0724 - 102-0725	2004		13	30	17	2034	43
	10" Butterfly Valve - HSP 1 Suction	Winding Ridge	Watts			102-0727 - 102-0730	2004		13	30	17	2034	43
	4" Butterfly Valve - Discharge and Suction	Winding Ridge	Watts			102-0731 - 102-0732	2004		13	30	17	2034	43

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information		Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
					Coverage	Expiration Date								
	8" Check Valve	Winding Ridge						--	30					
	8" Check Valve	Winding Ridge						--	30					
	18" Shutter Mounted Exhaust Fan	Winding Ridge						--	10					
	10" Globe Style Silent Check Valve	Winding Ridge						--	30					
	10" Butterfly Valve - HSP 2 Discharge	Winding Ridge							30					
	10" Butterfly Valve - HSP 2 Suction	Winding Ridge							30					
	10" Butterfly Valve - HSP 1 Discharge	Winding Ridge							30					
	10" Butterfly Valve - HSP 1 Suction	Winding Ridge							30					
	4" Butterfly Valve - Discharge and Suction	Winding Ridge							30					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	8" Check Valve	Winding Ridge	1	3	2	1	2	1.88	3	5	1	1	1	1	1.94	1.00	**3.66**
	8" Check Valve	Winding Ridge	1	3	2	1	2	1.88	3	5	1	1	1	1	1.94	1.00	**3.66**
	18" Shutter Mounted Exhaust Fan	Winding Ridge	1	5	2	1	2	2.4	3	5	1	1	1	1	1.94	1.00	**4.67**
	10" Globe Style Silent Check Valve	Winding Ridge	1	3	2	1	2	1.88	3	5	1	1	1	1	1.94	1.00	**3.66**
	10" Butterfly Valve - HSP 2 Discharge	Winding Ridge	1	3	2	1	2	1.88	3	5	1	1	1	1	1.94	1.00	**3.66**
	10" Butterfly Valve - HSP 2 Suction	Winding Ridge	1	3	2	1	2	1.88	3	5	1	1	1	1	1.94	1.00	**3.66**
	10" Butterfly Valve - HSP 1 Discharge	Winding Ridge	1	3	2	1	2	1.88	3	5	1	1	1	1	1.94	1.00	**3.66**
	10" Butterfly Valve - HSP 1 Suction	Winding Ridge	1	3	2	1	2	1.88	3	5	1	1	1	1	1.94	1.00	**3.66**
	4" Butterfly Valve - Discharge and Suction	Winding Ridge	1	3	2	1	2	1.88	3	5	1	1	1	1	1.94	1.00	**3.66**

Last Inspec. Date	Asset ID	Description	Location	General Information						Remote Monitoring		Control System	
				Org. Designer	Org. Contractor	Manufacturer	Year Cons.	Capacity	Notes	Type	Notes	Description	Notes
		I&C	Richardt WTP				1990						
		Motor Control Center	Richardt WTP			Furnas	1956						
		Filter Control Panel 1	Fort Harrison WTP			GE Series One	2000						
		Filter Control Panel 2	Fort Harrison WTP			Automation Direct	2000						
		Well Pump Control Panel	Fort Harrison WTP			Automation Direct	1980						
		I&C	Fort Harrison WTP				1980						
		Well Set Points	Fort Harrison WTP		HE800DIQ622C	HMI/PLC	2005						
		Filter Control PLC	Fort Harrison WTP	Direct Logic 06		Koyo	2012						
		HMI	Fort Harrison WTP		EZ-S6M-FS	Automation Direct	2012						
		Level Controller	Fort Harrison WTP			Precision Digital	2008						
		Mission System	Fort Harrison WTP			Mission	2006						
		Air actuators	Fort Harrison WTP			Parker	2008						
		Click PLC	Fort Harrison WTP		CO-O1AC	Koyo	2012						
		Mission System	Fort Harrison WTP			Mission	2006						
		Automation Direct	Fort Harrison WTP		EA1-T4CC	HMI	2015						
			Fort Harrison WTP		CO-O2DR	Koyo	1980						
		AC Drive	Fort Harrison WTP	GS1		Automation Direct	2015						
		PLC, Productivity	Fort Harrison WTP	P2550CPU		Automation Direct	2012						
		Mission Node	Fort Harrison WTP			Mission	2006						
		Comcast Switch	Fort Harrison WTP				2015						
		Switch, ethernet	Fort Harrison WTP			Adtran	2015						
		High Service Pump Control Panel	Indian Lake WTP			US Filter	2010						
		Well Pump Control Panel	Indian Lake WTP			Healy-Ruff	2010						
		I&C	Indian Lake WTP				1980						
		Chlorine Controls	Indian Lake WTP				2006						
		HMI	Indian Lake WTP			Automation Direct	2015						
		Mission	Indian Lake WTP			Mission	2005						
			Well No. 1		EAI-T4CC	HMI	1980						
		PLC, Koyo click	Well No. 1		CO-01AC	Automation Direct	2012						
		D620 Controller	Well No. 1			US Filter	2012						
		Mission System	Well No. 1			Mission System	2006						
		Mission System	Well No. 8			Mission	2006						
		Mission System	Well No. 9			Mission	2006						
		Mission System	Well No. 10			Mission	2006						
		3 Controllers Pressure, Flow, Level	Well No. 15/16			Precision Digital	2006						

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	I&C	Richardt WTP					1990		27	25	-2	2015	108
	Motor Control Center	Richardt WTP	Furnas				1956		60	25	-35	1981	240
	Filter Control Panel 1	Fort Harrison WTP	GE Series One				2000		17	25	8	2025	68
	Filter Control Panel 2	Fort Harrison WTP	Automation Direct				2000		17	25	8	2025	68
	Well Pump Control Panel	Fort Harrison WTP	Automation Direct				1980		37	25	-12	2005	148
	I&C	Fort Harrison WTP					1980		37	25	-12	2005	148
	Well Set Points	Fort Harrison WTP	HMI/PLC	HE800DIQ622C		102-0869 - 102-0871	2005		12	25	13	2030	48
	Filter Control PLC	Fort Harrison WTP	Koyo			102-0872	2012		5	25	20	2037	20
	HMI	Fort Harrison WTP	Automation Direct	42154099	EZ-S6M-FS	102-0875	2012		5	25	20	2037	20
	Level Controller	Fort Harrison WTP	Precision Digital			102-0876	2008		9	25	16	2033	36
	Mission System	Fort Harrison WTP	Mission				2006		11	25	14	2031	44
	Air actuators	Fort Harrison WTP	Parker		P2E-KV31F		2008		9	25	16	2033	36
	Click PLC	Fort Harrison WTP	Koyo			102-0879 - 102-0880	2012		5	25	20	2037	20
	Mission System	Fort Harrison WTP	Mission				2006		11	25	14	2031	44
	Automation Direct	Fort Harrison WTP	HMI		EA1-T4CL	102-0881 - 102-0884	2015		2	25	23	2040	8
		Fort Harrison WTP	Koyo		C0-02DR-D		1980		37	25	-12	2005	148
	AC Drive	Fort Harrison WTP	Automation Direct		GS1-10P5	102-0885	2015		2	25	23	2040	8
	PLC, Productivity	Fort Harrison WTP	Automation Direct			102-0886	2012		5	25	20	2037	20
	Mission Node	Fort Harrison WTP	Mission			102-0888	2006		11	25	14	2031	44
	Comcast Switch	Fort Harrison WTP				102-0889	2015		2	25	23	2040	8
	Switch, ethernet	Fort Harrison WTP	Adtran			102-0889	2015		2	25	23	2040	8
	High Service Pump Control Panel	Indian Lake WTP	US Filter				2010		7	25	18	2035	28
	Well Pump Control Panel	Indian Lake WTP	Healy-Ruff				2010		7	25	18	2035	28
	I&C	Indian Lake WTP					1980		37	25	-12	2005	148
	Chlorine Controls	Indian Lake WTP				102-0182	2006		11	25	14	2031	44
	HMI	Indian Lake WTP	Automation Direct			102-0858 - 102-0861	2015		2	25	23	2040	8
	Mission	Indian Lake WTP	Mission			102-0862	2005		12	25	13	2030	48
		Well No. 1	HMI				1980		37	25	-12	2005	148
	PLC, Koyo click	Well No. 1	Automation Direct		EA1-T4CL	102-0894 - 102-0896	2012		5	25	20	2037	20
	D620 Controller	Well No. 1	US Filter			102-0898 - 102-0902	2012		5	25	20	2037	20
	Mission System	Well No. 1	Mission System			102-0903	2006		11	25	14	2031	44
	Mission System	Well No. 8	Mission			102-0805	2006		11	25	14	2031	44
	Mission System	Well No. 9	Mission			102-0777	2006		11	25	14	2031	44
	Mission System	Well No. 10	Mission			102-0787	2006		11	25	14	2031	44
	3 Controllers Pressure, Flow, Level	Well No. 15/16	Precision Digital			102-0825	2006		11	25	14	2031	44

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information		Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
					Coverage	Expiration Date								
	I&C	Richardt WTP						--	25					
	Motor Control Center	Richardt WTP						--	25					
	Filter Control Panel 1	Fort Harrison WTP						--	25					
	Filter Control Panel 2	Fort Harrison WTP						--	25					
	Well Pump Control Panel	Fort Harrison WTP						--	25					
	I&C	Fort Harrison WTP						--	25					
	Well Set Points	Fort Harrison WTP						--	25					
	Filter Control PLC	Fort Harrison WTP						--	25					
	HMI	Fort Harrison WTP						--	25					
	Level Controller	Fort Harrison WTP						--	25					
	Mission System	Fort Harrison WTP						--	25					
	Air actuators	Fort Harrison WTP						--	25					
	Click PLC	Fort Harrison WTP						--	25					
	Mission System	Fort Harrison WTP						--	25					
	Automation Direct	Fort Harrison WTP						--	25					
		Fort Harrison WTP						--	25					
	AC Drive	Fort Harrison WTP						--	25					
	PLC, Productivity	Fort Harrison WTP						--	25					
	Mission Node	Fort Harrison WTP						--	25					
	Comcast Switch	Fort Harrison WTP						--	25					
	Switch, ethernet	Fort Harrison WTP						--	25					
	High Service Pump Control Panel	Indian Lake WTP						--	25					
	Well Pump Control Panel	Indian Lake WTP						--	25					
	I&C	Indian Lake WTP						--	25					
	Chlorine Controls	Indian Lake WTP						--	25					
	HMI	Indian Lake WTP						--	25					
	Mission	Indian Lake WTP						--	25					
		Well No. 1						--	25					
	PLC, Koyo click	Well No. 1						--	25					
	D620 Controller	Well No. 1						--	25					
	Mission System	Well No. 1						--	25					
	Mission System	Well No. 8						--	25					
	Mission System	Well No. 9						--	25					
	Mission System	Well No. 10						--	25					
	3 Controllers Pressure, Flow, Level	Well No. 15/16						--	25					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	I&C	Richardt WTP	3	5	4	3	3	3.58	5	5	1	1	5	5	3.67	1.00	**13.13**
	Motor Control Center	Richardt WTP	4	5	4	3	4	4.04	5	5	1	1	5	5	3.67	1.00	**14.81**
	Filter Control Panel 1	Fort Harrison WTP	2	4	4	3	2	2.86	3	5	1	1	3	3	2.61	1.00	**7.47**
	Filter Control Panel 2	Fort Harrison WTP	2	4	4	3	2	2.86	3	5	1	1	3	3	2.61	1.00	**7.47**
	Well Pump Control Panel	Fort Harrison WTP	2	5	4	3	2	3.12	5	5	1	1	5	5	3.67	1.00	**11.44**
	I&C	Fort Harrison WTP	3	5	4	3	3	3.58	5	5	1	1	5	5	3.67	1.00	**13.13**
	Well Set Points	Fort Harrison WTP	3	3	4	3	3	3.06	5	5	1	2	5	5	3.72	1.00	**11.39**
	Filter Control PLC	Fort Harrison WTP	3	2	4	3	3	2.80	5	5	1	1	5	5	3.67	1.00	**10.27**
	HMI	Fort Harrison WTP	3	2	4	3	3	2.80	2	5	1	1	2	2	2.08	1.00	**5.83**
	Level Controller	Fort Harrison WTP	3	2	1	3	3	2.62	4	5	1	1	4	4	3.14	1.00	**8.22**
	Mission System	Fort Harrison WTP	3	3	4	3	3	3.06	1	5	1	1	1	1	1.56	1.00	**4.76**
	Air actuators	Fort Harrison WTP	2	2	4	3	2	2.34	5	5	1	1	5	5	3.67	1.00	**8.58**
	Click PLC	Fort Harrison WTP	2	2	4	3	2	2.34	3	5	1	1	3	3	2.61	1.00	**6.11**
	Mission System	Fort Harrison WTP	2	3	4	3	2	2.60	1	5	1	1	1	1	1.56	1.00	**4.04**
	Automation Direct	Fort Harrison WTP	2	1	4	3	2	2.08	3	5	1	1	3	3	2.61	1.00	**5.43**
		Fort Harrison WTP	2	5	4	3	2	3.12	3	5	1	1	3	3	2.61	1.00	**8.15**
	AC Drive	Fort Harrison WTP	2	1	4	3	2	2.08	3	5	2	1	3	3	2.89	1.00	**6.01**
	PLC, Productivity	Fort Harrison WTP	2	2	4	3	2	2.34	3	5	1	1	3	3	2.61	1.00	**6.11**
	Mission Node	Fort Harrison WTP	2	3	4	3	2	2.60	1	5	1	1	1	1	1.56	1.00	**4.04**
	Comcast Switch	Fort Harrison WTP	1	1	1	3	1	1.44	2	5	1	1	2	2	2.08	1.00	**3.00**
	Switch, ethernet	Fort Harrison WTP	1	1	1	3	1	1.44	2	5	1	1	2	2	2.08	1.00	**3.00**
	High Service Pump Control Panel	Indian Lake WTP	3	2	4	3	3	2.80	5	5	1	1	5	5	3.67	1.00	**10.27**
	Well Pump Control Panel	Indian Lake WTP	3	2	4	3	3	2.80	4	5	1	1	4	4	3.14	1.00	**8.79**
	I&C	Indian Lake WTP	3	5	4	3	3	3.58	5	5	1	1	5	5	3.67	1.00	**13.13**
	Chlorine Controls	Indian Lake WTP	3	3	4	3	3	3.06	4	5	2	1	4	4	3.42	1.00	**10.46**
	HMI	Indian Lake WTP	2	1	4	3	2	2.08	2	5	1	2	2	2	2.14	1.00	**4.45**
	Mission	Indian Lake WTP	2	3	4	3	2	2.60	1	5	1	1	1	1	1.56	1.00	**4.04**
		Well No. 1	2	5	4	3	2	3.12	2	5	1	1	2	2	2.08	1.00	**6.50**
	PLC, Koyo click	Well No. 1	3	2	4	3	3	2.80	3	5	1	1	3	3	2.61	1.00	**7.31**
	D620 Controller	Well No. 1	4	2	4	3	4	3.26	5	5	1	1	5	5	3.67	1.00	**11.95**
	Mission System	Well No. 1	2	3	4	3	2	2.60	1	5	1	1	1	1	1.56	1.00	**4.04**
	Mission System	Well No. 8	2	3	4	3	2	2.60	1	5	1	1	1	1	1.56	1.00	**4.04**
	Mission System	Well No. 9	2	3	4	3	2	2.60	1	5	1	1	1	1	1.56	1.00	**4.04**
	Mission System	Well No. 10	2	3	4	3	2	2.60	1	5	1	1	1	1	1.56	1.00	**4.04**
	3 Controllers Pressure, Flow, Level	Well No. 15/16	2	3	4	3	2	2.60	1	5	1	1	1	1	1.56	1.00	**4.04**

Last Inspec. Date	Asset ID	Description	Location	General Information: Org. Designer	Org. Contractor	Manufacturer	Model No.	Serial No.	Year Cons.	Rated Capacity (gpm)	Aerator Material	Style	Slat Material	Bypass?	Blower HP	Fan Speed (cfm)	Voltage	Phase	Notes	Remote: Type	Notes	Control System: Description	Notes	Valve Types: Inlet	Outlet
		Aerator 1	Richardt WTP			Tonka		82147	1983	1,200		Forced air slat													
		Aerator 2	Richardt WTP			Tonka			1983	1,200		Forced air slat													
		Aerator 1	Indian Lake WTP			General Filter Co.			1989	1,300	Aluminum	Forced air slat													
		Aerator 2	Indian Lake WTP			General Filter Co.			1989	1,300	Aluminum	Forced air slat													

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life		Useful Life Replacement Date	% Useful life used
										Total (yrs)	Remaining Life (yrs)		
	Aerator 1	Richardt WTP	Tonka		82147	102-0480, 102-0481	1983		34	20	-14	2003	170
	Aerator 2	Richardt WTP	Tonka				1983		34	20	-14	2003	170
	Aerator 1	Indian Lake WTP	General Filter Co.			102-0356	1989		28	20	-8	2009	140
	Aerator 2	Indian Lake WTP	General Filter Co.			102-0357	1989		28	20	-8	2009	140

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information		Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
					Coverage	Expiration Date								
	Aerator 1	Richardt WTP						--	20					
	Aerator 2	Richardt WTP						--	20					
	Aerator 1	Indian Lake WTP						--	20					
	Aerator 2	Indian Lake WTP						--	20					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Aerator 1	Richardt WTP	4	5	3	3	5	4.28	4	5	2	4	4	3	3.50	0.50	**7.49**
	Aerator 2	Richardt WTP	4	5	3	3	5	4.28	4	5	2	4	4	3	3.50	0.50	**7.49**
	Aerator 1	Indian Lake WTP	2	5	3	3	2	3.06	3	5	1	3	1	1	2.06	0.50	**3.14**
	Aerator 2	Indian Lake WTP	2	5	3	3	2	3.06	3	5	1	3	1	1	2.06	0.50	**3.14**

Last Inspec. Date	Asset ID	Description	Location	General Information								Remote Monitoring		Valve Types	
				Org. Designer	Org. Contractor	Manufacturer	Year Cons.	Material	Above/Below Grade	Capacity (gal)	Notes	Type	Notes	Inlet	Outlet
		West Detention Tank	Richardt WTP				1971		Above	15,000	4' Deeper than east tank, hydraulically connected				
		East Detention Tank	Richardt WTP				1958		Above	15,000	Hydraulically connected to west tank				
		Backwash Holding Tank	Richardt WTP						Partially Above	40,000					
		Detention Tank	Indian Lake WTP							50,000					

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life		Useful Life Replacement Date	% Useful life used
										Total (yrs)	Remaining Life (yrs)		
	West Reaction Tank	Richardt WTP				102-0511 - 102-0512	1971		46	80	34	2051	58
	East Reaction Tank	Richardt WTP				102-0510, 102-0513	1958		59	80	21	2038	74
	Backwash Holding Tank	Richardt WTP				102-0505 - 102-0509	1958		59	80	21	2038	74
	Reaction Tank	Indian Lake WTP					1989		28	80	52	2069	35

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information		Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
					Coverage	Expiration Date								
	West Reaction Tank	Richardt WTP						--	80					
	East Reaction Tank	Richardt WTP						--	80					
	Backwash Holding Tank	Richardt WTP						--	80					
	Reaction Tank	Indian Lake WTP						--	80					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	West Reaction Tank	Richardt WTP	4	3	4	3	5	3.82	5	5	2	5	5	4	4.08	1.00	**15.60**
	East Reaction Tank	Richardt WTP	4	4	4	3	5	4.08	5	5	2	5	5	4	4.08	1.00	**16.66**
	Backwash Holding Tank	Richardt WTP	3	4	2	2	4	3.28	5	5	1	5	5	4	3.81	1.00	**12.48**
	Reaction Tank	Indian Lake WTP	2	2	2	2	2	2.00	5	5	1	5	5	4	3.81	1.00	**7.61**

Last Inspec. Date	Asset ID	Description	Location	General Information											Backwash Control System	
				Org. Designer	Org. Contractor	Manufacturer	Year Cons.	Type	No. of Cells	Media	Media Age (yrs)	BW Rate (gpm)	Filter Material	Rated Capacity (gpm)	Notes	Description	Notes
		Filter E1	Richardt WTP			Brown-Minneapolis	1971	Horizontal Pressure		Anthracite	15+		Steel	500			
		Filter E2	Richardt WTP			Brown-Minneapolis	1971	Horizontal Pressure		Anthracite	15+		Steel	500	ID/Serial # 1734		
		Filter W1	Richardt WTP			Brown-Minneapolis	1971	Horizontal Pressure		Anthracite	15+		Steel	500			
		Filter W2	Richardt WTP			Brown-Minneapolis	1971	Horizontal Pressure		Anthracite	15+		Steel	500	Part/Model WXH036A2309, ID/Serial # DM4876		
		Filter 1	Fort Harrison WTP			Culligan	1980	Vertical Pressure		Anthracite			Steel	174			
		Filter 2	Fort Harrison WTP			Culligan	1980	Vertical Pressure		Anthracite			Steel	174			
		Filter 3	Fort Harrison WTP			Culligan	1980	Vertical Pressure		Anthracite			Steel	174			
		Filter 4	Fort Harrison WTP			Culligan	1980	Vertical Pressure		Anthracite			Steel	174			
		Filter 5	Fort Harrison WTP			Culligan	1980	Vertical Pressure		Anthracite			Steel	174			
		Filter 6	Fort Harrison WTP			Culligan	1980	Vertical Pressure		Anthracite			Steel	174			
		Filter 7	Fort Harrison WTP			Culligan	1980	Vertical Pressure		Anthracite			Steel	174			
		Filter 8	Fort Harrison WTP			Culligan	1980	Vertical Pressure		Anthracite			Steel	174			
		Filter 9	Fort Harrison WTP			Culligan	1980	Vertical Pressure		Anthracite			Steel	174			
		Filter E1	Indian Lake WTP			General Filter	1989	Horizontal Pressure					Steel	486			
		Filter E2	Indian Lake WTP			General Filter	1989	Horizontal Pressure					Steel	486			
		Filter W1	Indian Lake WTP			General Filter	1989	Horizontal Pressure					Steel	486			
		Filter W2	Indian Lake WTP			General Filter	1989	Horizontal Pressure					Steel	486			

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Specific Description (Capacity, Dimensions, Media, etc.)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	Filter E1	Richardt WTP	Brown-Minneapolis			102-0402	500 gpm, two cell, 10' diameter x 22' long, horizontal pressure filter with antracite media	1971		46	50	4	2021	92
	Filter E2	Richardt WTP	Brown-Minneapolis			102-0398 - 102-0401	500 gpm, two cell, 10' diameter x 22' long, horizontal pressure filter with antracite media	1971		46	50	4	2021	92
	Filter W1	Richardt WTP	Brown-Minneapolis			102-0403	500 gpm, two cell, 10' diameter x 22' long, horizontal pressure filter with antracite media	1971		46	50	4	2021	92
	Filter W2	Richardt WTP	Brown-Minneapolis			102-0404	500 gpm, two cell, 10' diameter x 22' long, horizontal pressure filter with antracite media	1971		46	50	4	2021	92
	Filter 1	Fort Harrison WTP	Culligan			102-0654	174 gpm	1980		37	50	13	2030	74
	Filter 2	Fort Harrison WTP	Culligan			102-0655	174 gpm	1980		37	50	13	2030	74
	Filter 3	Fort Harrison WTP	Culligan			102-0656	174 gpm	1980		37	50	13	2030	74
	Filter 4	Fort Harrison WTP	Culligan			102-0657	174 gpm	1980		37	50	13	2030	74
	Filter 5	Fort Harrison WTP	Culligan			102-0658	174 gpm	1980		37	50	13	2030	74
	Filter 6	Fort Harrison WTP	Culligan			102-0659	174 gpm	1980		37	50	13	2030	74
	Filter 7	Fort Harrison WTP	Culligan			102-0600	174 gpm	1980		37	50	13	2030	74
	Filter 8	Fort Harrison WTP	Culligan			102-0601	174 gpm	1980		37	50	13	2030	74
	Filter 9	Fort Harrison WTP	Culligan			102-0602	174 gpm	1980		37	50	13	2030	74
	Filter E1	Indian Lake WTP	General Filter		1120-78-111	102-0284 - 102-0285	486 gpm	1989		28	50	22	2039	56
	Filter E2	Indian Lake WTP	General Filter			102-0286 - 102-0287	486 gpm	1989		28	50	22	2039	56
	Filter W1	Indian Lake WTP	General Filter			102-0288 - 102-0289	486 gpm	1989		28	50	22	2039	56
	Filter W2	Indian Lake WTP	General Filter			102-0290 - 102-0291	486 gpm	1989		28	50	22	2039	56

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information		Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
					Coverage	Expiration Date								
	Filter E1	Richardt WTP						--	50					
	Filter E2	Richardt WTP						--	50					
	Filter W1	Richardt WTP						--	50					
	Filter W2	Richardt WTP						--	50					
	Filter 1	Fort Harrison WTP						--	50					
	Filter 2	Fort Harrison WTP						--	50					
	Filter 3	Fort Harrison WTP						--	50					
	Filter 4	Fort Harrison WTP						--	50					
	Filter 5	Fort Harrison WTP						--	50					
	Filter 6	Fort Harrison WTP						--	50					
	Filter 7	Fort Harrison WTP						--	50					
	Filter 8	Fort Harrison WTP						--	50					
	Filter 9	Fort Harrison WTP						--	50					
	Filter E1	Indian Lake WTP						--	50					
	Filter E2	Indian Lake WTP						--	50					
	Filter W1	Indian Lake WTP						--	50					
	Filter W2	Indian Lake WTP						--	50					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Filter E1	Richardt WTP	5	5	5	5	5	5.00	5	5	4	4	5	5	4.67	1.00	**23.33**
	Filter E2	Richardt WTP	5	5	5	5	5	5.00	5	5	4	4	5	5	4.67	1.00	**23.33**
	Filter W1	Richardt WTP	5	5	5	5	5	5.00	5	5	4	4	5	5	4.67	1.00	**23.33**
	Filter W2	Richardt WTP	5	5	5	5	5	5.00	5	5	4	4	5	5	4.67	1.00	**23.33**
	Filter 1	Fort Harrison WTP	3	4	4	3	3	3.32	3	5	2	3	4	1	3.08	0.89	**9.10**
	Filter 2	Fort Harrison WTP	3	4	4	3	3	3.32	3	5	2	3	4	1	3.08	0.89	**9.10**
	Filter 3	Fort Harrison WTP	3	4	4	3	3	3.32	3	5	2	3	4	1	3.08	0.89	**9.10**
	Filter 4	Fort Harrison WTP	3	4	4	3	3	3.32	3	5	2	3	4	1	3.08	0.89	**9.10**
	Filter 5	Fort Harrison WTP	3	4	4	3	3	3.32	3	5	2	3	4	1	3.08	0.89	**9.10**
	Filter 6	Fort Harrison WTP	3	4	4	3	3	3.32	3	5	2	3	4	1	3.08	0.89	**9.10**
	Filter 7	Fort Harrison WTP	3	4	4	3	3	3.32	3	5	2	3	4	1	3.08	0.89	**9.10**
	Filter 8	Fort Harrison WTP	3	4	4	3	3	3.32	3	5	2	3	4	1	3.08	0.89	**9.10**
	Filter 9	Fort Harrison WTP	3	4	4	3	3	3.32	3	5	2	3	4	1	3.08	0.89	**9.10**
	Filter E1	Indian Lake WTP	2	3	3	2	2	2.32	3	5	2	3	4	1	3.08	0.50	**3.58**
	Filter E2	Indian Lake WTP	2	3	3	2	2	2.32	3	5	2	3	4	1	3.08	0.50	**3.58**
	Filter W1	Indian Lake WTP	2	3	3	2	2	2.32	3	5	2	3	4	1	3.08	0.50	**3.58**
	Filter W2	Indian Lake WTP	2	3	3	2	2	2.32	3	5	2	3	4	1	3.08	0.50	**3.58**

				General Information										Remote Monitoring	
Last Inspec. Date	Asset ID No.	Description	Location	Org. Designer	Org. Contractor	Manufacturer	Year Cons.	Type	Size (in)	Pipe Size (in)	Rated Accuracy	Last Calibrated	Notes	Type	Notes
		PH Meter	Richardt WTP			Hach	2012								
		Water Level Meter	Richardt WTP			Solinst	2005								
		Effluent Water Meter	Richardt WTP			Endress+Hauser	2005	Mag					NEMA 4X		
		Wells 8, 9, 10 Flow Meter	Fort Harrison Well Field			Endress+Hauser	2005	Mag					NEMA 4X		
		Bulk Tank, Day Tank level	Richardt WTP			Endress+Hauser	2005						NEMA 4X		
		Turbidity Meter	Richardt WTP			Hach	2005								
		PH Meter	Richardt WTP			Hach	2005								
		Chemical Meter	Richardt WTP			Hach	2005								
		Bulk Chlorine Rate Meter	Richardt WTP			Endress+Hauser	2005						NEMA 4X		
		Mag Meter HSP 1 & 2	Richardt WTP			Sparling	2004	Mag							
		Mag Meter	Richardt WTP			Sparling	2004	Mag							
		Well 3 Meter	Richardt WTP			Sensus	2005	Propeller							
		Well 4 Meter	Richardt WTP			Rockwell Industries	2005		8	8					
		Maintenance Building Meter	Richardt WTP			Badger Meter	2005								
		Well 1 Meter	Richardt WTP			Sensus/Rockwell	2005	Propeller							
		Well 2 Meter	Richardt WTP			Rockwell Industries	2005								
		Backwash Flow Meter	Richardt WTP - Filter Building			Water Specialties	2005								
		Well 10 Meter	Fort Harrison Well Field			Water Specialties	2005								
		Water Level Meter	Fort Harrison Well Field			Solinst	2005								
		Filter E2 Mag Meter	Indian Lake WTP			Sparling	2005	Mag	8	8					
		Filter E1 Mag Meter	Indian Lake WTP			Sparling	2005	Mag	8	8					
		Filter W1 Mag Meter	Indian Lake WTP			Sparling	2005	Mag	8	8					
		Filter W2 Mag Meter	Indian Lake WTP			Sparling	2005	Mag	8	8					
		Backwash Meter	Indian Lake WTP			Sparling	2005	Mag	8	8					
		Turbidity Meter	Indian Lake WTP			Hach	2005								
		Well 16 Mag Meter	Indian Lake Well Field			Endress+Hauser	2005	Mag					NEMA 4X		
		Water Level Meter	Indian Lake WTP			Solinst	2005								
		Finished Water Meter	Indian Lake WTP			Endress+Hauser	2005	Mag					NEMA 4X		
		Finished Water Meter	Indian Lake WTP			Endress+Hauser	2005	Mag					NEMA 4X		
		Bulk Tank, Day Tank Pre & Post Levels	Indian Lake WTP			Endress+Hauser	2005	Ultrasonic					NEMA 4X		
		PH Meter	Indian Lake WTP			Hach	2005	PH Meter							
		Spectrophotometer	Winding Ridge			Hach	2005	Spectrophotometer							
		Mag Meter	Winding Ridge			Krohne	2005	Mag	8	8					

Asset ID	Asset Description	Location	Manufacturer	Model No.	Serial No.	Picture No.(s)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life		Useful Life Replacement Date	% Useful life used
										Total (yrs)	Remaining Life (yrs)		
	PH Meter	Richardt WTP	Hach	Sension PH-3	426004	102-0027	2012		5	7	2	2019	71
	Water Level Meter	Richardt WTP	Solinst	Model 101	39267	102-0028	2005		12	10	-2	2015	120
	Effluent Water Meter	Richardt WTP	Endress+Hauser	50W4H-UL0A1RK2BAAA	7503FF19000	102-0043 - 102-0044	2005		12	30	18	2035	40
	Wells 8, 9, 10 Flow Meter	Fort Harrison Well Field	Endress+Hauser	50W4H-UL0A1RK2BAAA	FA086D16000	102-0080 - 102-0081	2005		12	30	18	2035	40
	Bulk Tank, Day Tank level	Richardt WTP	Endress+Hauser	FMU90-R11CA232AA1A	K30010150E6	102-0082 - 102-0083	2005		12	30	18	2035	40
	Turbidity Meter	Richardt WTP	Hach	2100Q01	11120C015066	101-0974	2005		12	7	-5	2012	171
	PH Meter	Richardt WTP	Hach	Sension PH-3	426002	101-0975	2005		12	7	-5	2012	171
	Chemical Meter	Richardt WTP	Hach	LPG440.99.00012	1491252	101-0976	2005		12	7	-5	2012	171
	Bulk Chlorine Rate Meter	Richardt WTP	Endress+Hauser	FMU90-R11CA232AA1A	J900E8150E6	101-0988 - 101-0989	2005		12	30	18	2035	40
	Mag Meter HSP 1 & 2	Richardt WTP	Sparling	73726	M07111404	102-0012 - 102-0013	2004		13	30	17	2034	43
	Mag Meter	Richardt WTP	Sparling	73726	M073121404	102-0380 - 102-0381	2004		13	30	17	2034	43
	Well 3 Meter	Richardt WTP	Sensus		38999	102-0450	2005		12	30	18	2035	40
	Well 4 Meter	Richardt WTP	Rockwell Industries			102-0455	2005		12	30	18	2035	40
	Maintenance Building Meter	Richardt WTP	Badger Meter	120	43210501	102-0478	2005		12	30	18	2035	40
	Well 1 Meter	Richardt WTP	Sensus/Rockwell	Propeller 300		102-0517	2005		12	30	18	2035	40
	Well 2 Meter	Richardt WTP	Rockwell Industries			102-0524	2005		12	30	18	2035	40
	Backwash Flow Meter	Richardt WTP - Filter Building	Water Specialties			102-0428	2005		12	30	18	2035	40
	Well 10 Meter	Fort Harrison Well Field	Water Specialties	944616-8"		102-0103	2005		12	30	18	2035	40
	Water Level Meter	Fort Harrison Well Field	Solinst	101 P2/M2/100FT	61390	102-0104	2005		12	10	-2	2015	120
	Filter E2 Mag Meter	Indian Lake WTP	Sparling	H34781790	FM655	102-0346 - 102-0347	2005		12	30	18	2035	40
	Filter E1 Mag Meter	Indian Lake WTP	Sparling	H34791790	FM655	102-0348 - 102-0349	2005		12	30	18	2035	40
	Filter W1 Mag Meter	Indian Lake WTP	Sparling	H34771690	FM655	102-0350 - 102-0353	2005		12	30	18	2035	40
	Filter W2 Mag Meter	Indian Lake WTP	Sparling	H34761690	FM655	102-0354 - 102-0355	2005		12	30	18	2035	40
	Backwash Meter	Indian Lake WTP	Sparling		G-03517	102-0364 - 102-0365	2005		12	30	18	2035	40
	Turbidity Meter	Indian Lake WTP	Hach	LPG439.01.00002	105040C040479	102-0215	2005		12	7	-5	2012	171
	Well 16 Mag Meter	Indian Lake Well Field	Endress+Hauser	50W2F-ULGA1RK5BAAD	AA02D316000	102-0273 - 102-0274	2005		12	30	18	2035	40
	Water Level Meter	Indian Lake WTP	Solinst	102	1024245		2005		12	10	-2	2015	120
	Finished Water Meter	Indian Lake WTP	Endress+Hauser	50W3H-UL0A1AC2BAAA	6100C416000	102-0229 - 102-0230	2005		12	30	18	2035	40
	Finished Water Meter	Indian Lake WTP	Endress+Hauser	50W3H-UL0A1AC2BAAA	6100C416000	102-0233 - 102-0234	2005		12	30	18	2035	40
	Bulk Tank, Day Tank Pre & Post Levels	Indian Lake WTP	Endress+Hauser	FMU90-R11CA232AA1A	J50072150E6	102-0174 - 102-0175	2005		12	30	18	2035	40
	PH Meter	Indian Lake WTP	Hach	Sension PH-3	426001	102-0217 - 102-0218	2005		12	7	-5	2012	171
	Spectrophotometer	Winding Ridge	Hach	44800-60	9507000358-64	102-0121 - 102-0122	2005		12	15	3	2020	80
	Mag Meter	Winding Ridge	Krohne	200MM/8INCH-H-HC-PN150 PSI	IFM4010/B/6	102-0139 - 102-0140	2005		12	30	18	2035	40

Asset ID	Asset Description	Location	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information		Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
					Coverage	Expiration Date								
	PH Meter	Richardt WTP						--	7					
	Water Level Meter	Richardt WTP						--	10					
	Effluent Water Meter	Richardt WTP						--	30					
	Wells 8, 9, 10 Flow Meter	Fort Harrison Well Field						--	30					
	Bulk Tank, Day Tank level	Richardt WTP						--	30					
	Turbidity Meter	Richardt WTP						--	7					
	PH Meter	Richardt WTP						--	7					
	Chemical Meter	Richardt WTP						--	7					
	Bulk Chlorine Rate Meter	Richardt WTP						--	30					
	Mag Meter HSP 1 & 2	Richardt WTP						--	30					
	Mag Meter	Richardt WTP						--	30					
	Well 3 Meter	Richardt WTP						--	30					
	Well 4 Meter	Richardt WTP						--	30					
	Maintenance Building Meter	Richardt WTP						--	30					
	Well 1 Meter	Richardt WTP						--	30					
	Well 2 Meter	Richardt WTP						--	30					
	Backwash Flow Meter	Richardt WTP - Filter Building						--	30					
	Well 10 Meter	Fort Harrison Well Field						--	30					
	Water Level Meter	Fort Harrison Well Field						--	10					
	Filter E2 Mag Meter	Indian Lake WTP						--	30					
	Filter E1 Mag Meter	Indian Lake WTP						--	30					
	Filter W1 Mag Meter	Indian Lake WTP						--	30					
	Filter W2 Mag Meter	Indian Lake WTP						--	30					
	Backwash Meter	Indian Lake WTP						--	30					
	Turbidity Meter	Indian Lake WTP						--	7					
	Well 16 Mag Meter	Indian Lake Well Field						--	30					
	Water Level Meter	Indian Lake WTP						--	10					
	Finished Water Meter	Indian Lake WTP						--	30					
	Finished Water Meter	Indian Lake WTP						--	30					
	Bulk Tank, Day Tank Pre & Post Levels	Indian Lake WTP						--	30					
	PH Meter	Indian Lake WTP						--	7					
	Spectrophotometer	Winding Ridge						--	15					
	Mag Meter	Winding Ridge						--	30					

Asset ID	Asset Description	Location	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	PH Meter	Richardt WTP	2	4	1	2	2	2.46	1	5	1	1	1	1	1.56	1.00	**3.83**
	Water Level Meter	Richardt WTP	3	5	2	2	2	2.94	1	5	1	1	1	1	1.56	1.00	**4.57**
	Effluent Water Meter	Richardt WTP	3	3	2	2	2	2.42	2	5	1	1	1	1	1.75	1.00	**4.23**
	Wells 8, 9, 10 Flow Meter	Fort Harrison Well Field	3	3	2	2	2	2.42	2	5	1	1	1	1	1.75	1.00	**4.23**
	Bulk Tank, Day Tank level	Richardt WTP	1	3	2	1	1	1.58	2	5	1	1	1	1	1.75	1.00	**2.76**
	Turbidity Meter	Richardt WTP	2	5	2	1	1	2.26	1	5	1	1	1	1	1.56	1.00	**3.52**
	PH Meter	Richardt WTP	2	5	2	1	1	2.26	1	5	1	1	1	1	1.56	1.00	**3.52**
	Chemical Meter	Richardt WTP	2	5	2	1	1	2.26	1	5	1	1	1	1	1.56	1.00	**3.52**
	Bulk Chlorine Rate Meter	Richardt WTP	1	3	2	1	1	1.58	4	5	5	4	5	5	4.75	1.00	**7.51**
	Mag Meter HSP 1 & 2	Richardt WTP	2	3	2	1	1	1.74	2	5	1	1	1	1	1.75	1.00	**3.04**
	Mag Meter	Richardt WTP	2	3	2	1	1	1.74	2	5	1	1	1	1	1.75	1.00	**3.04**
	Well 3 Meter	Richardt WTP	3	3	3	2	2	2.48	2	5	1	1	1	1	1.75	1.00	**4.34**
	Well 4 Meter	Richardt WTP	3	3	3	2	2	2.48	2	5	1	1	1	1	1.75	1.00	**4.34**
	Maintenance Building Meter	Richardt WTP	3	3	3	2	2	2.48	1	5	1	1	1	1	1.56	1.00	**3.86**
	Well 1 Meter	Richardt WTP	3	3	3	2	2	2.48	1	5	1	1	1	1	1.56	1.00	**3.86**
	Well 2 Meter	Richardt WTP	3	3	3	2	2	2.48	1	5	1	1	1	1	1.56	1.00	**3.86**
	Backwash Flow Meter	Richardt WTP - Filter Building	3	3	3	2	2	2.48	1	5	1	1	1	1	1.56	1.00	**3.86**
	Well 10 Meter	Fort Harrison Well Field	3	3	3	2	2	2.48	1	5	1	1	1	1	1.56	1.00	**3.86**
	Water Level Meter	Fort Harrison Well Field	3	5	2	2	2	2.94	1	5	1	1	1	1	1.56	1.00	**4.57**
	Filter E2 Mag Meter	Indian Lake WTP	2	3	2	1	1	1.74	2	5	1	1	1	1	1.75	1.00	**3.04**
	Filter E1 Mag Meter	Indian Lake WTP	2	3	2	1	1	1.74	2	5	1	1	1	1	1.75	1.00	**3.04**
	Filter W1 Mag Meter	Indian Lake WTP	2	3	2	1	1	1.74	2	5	1	1	1	1	1.75	1.00	**3.04**
	Filter W2 Mag Meter	Indian Lake WTP	2	3	2	1	1	1.74	2	5	1	1	1	1	1.75	1.00	**3.04**
	Backwash Meter	Indian Lake WTP	3	3	2	2	2	2.42	2	5	1	1	1	1	1.75	1.00	**4.23**
	Turbidity Meter	Indian Lake WTP	2	5	2	1	1	2.26	1	5	1	1	1	1	1.56	1.00	**3.52**
	Well 16 Mag Meter	Indian Lake Well Field	3	3	2	2	3	2.72	2	5	1	1	1	1	1.75	1.00	**4.76**
	Water Level Meter	Indian Lake WTP	3	5	2	2	2	2.94	1	5	1	1	1	1	1.56	1.00	**4.57**
	Finished Water Meter	Indian Lake WTP	3	3	2	2	3	2.72	1	5	1	1	1	1	1.56	1.00	**4.23**
	Finished Water Meter	Indian Lake WTP	4	3	3	2	3	2.94	1	5	1	1	1	1	1.56	1.00	**4.57**
	Bulk Tank, Day Tank Pre & Post Levels	Indian Lake WTP	1	3	2	1	1	1.58	1	5	1	1	1	1	1.56	1.00	**2.46**
	PH Meter	Indian Lake WTP	2	5	2	1	1	2.26	1	5	1	1	1	1	1.56	1.00	**3.52**
	Spectrophotometer	Winding Ridge	3	5	3	2	2	3.00	1	5	1	1	1	1	1.56	1.00	**4.67**
	Mag Meter	Winding Ridge	1	3	2	1	1	1.58	1	5	1	1	1	1	1.56	1.00	**2.46**

Last Inspec. Date	Asset ID	Description	Location	General Information									Remote Monitoring		Valve Types	
				Org. Designer	Org. Contractor	Year Cons.	Type	Material	Capacity (MG)	Head Range (ft)	Overflow Elevation	Notes	Type	Notes	Inlet	Discharge
2008		52nd St. Elevated Storage Tank	52nd St. and Briar Creek Lane		Universal Tank and Iron Works	1973	Elevated	Steel	0.5	30						
2008		Oaklandon Elevated Storage Tank	Oaklandon Road and Broadway St.		Universal Tank and Iron Works	1983	Elevated	Steel	0.5							
		Winding Ridge Ground Storage Tank	Winding Ridge Booster Station	Engineered Storage Products Co.		2004	Ground	Steel	1.1							
		Ground Storage Reservoir	Fort Harrison WTP			1980	Ground		3							

Asset ID	Asset Description	Contractor	Picture No.(s)	Specific Description (Overflow elevation, capacity, high alarm, low alarm, etc.)	Year placed into service	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used
	52nd St. Elevated Storage Tank	Universal Tank and Iron Works			1973		44	75	31	2048	59
	Oaklandon Elevated Storage Tank	Universal Tank and Iron Works			1983		34	75	41	2058	45
	Winding Ridge Ground Storage Tank	Engineered Storage Products Co.	102-0113 - 102-0114	1.1 MG, Model 7633 WT, Serial No. 8033380, 75.53' Nom. Dia., 33.01' Nom. Hgt.	2004		13	50	37	2054	26
	Fort Harrison Ground Storage Reservoir		102-0667 - 102-0670		1913		104	50	-54	1963	208

Asset ID	Asset Description	Estimated Maint Cost ($)	Salvage Value ($)	Warranty Information		Replacement Unit Cost ($)	Replacement Installed Cost ($)	Replacement Intervals (yrs)	Current Book Value	Source of Cost Information	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Notes
				Coverage	Expiration Date								
	52nd St. Elevated Storage Tank						--	75					
	Oaklandon Elevated Storage Tank						--	75					
	Winding Ridge Ground Storage Tank						--	50					
	Fort Harrison Ground Storage Reservoir						--	50					

Asset ID	Asset Description	Phys. Condition (1=exc., 5=poor)	Age factor	O&M protocols (1=exc., 5=poor)	Repair History (1=exc., 5=poor)	Operational Condition (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Process	Financial Impact	Safety	IDEM Compliance	Comm. Disruption	Required Response Time	Consequence of Failure (CoF) (1=low, 5=high)	Redundancy Score (R) (#req'd / # avail)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	52nd St. Elevated Storage Tank	4	3	2	3	2	2.80	4	5	3	4	5	2	3.94	1.00	**11.04**
	Oaklandon Elevated Storage Tank	5	3	2	4	3	3.48	4	5	3	4	5	2	3.94	1.00	**13.73**
	Winding Ridge Ground Storage Tank	2	2	2	2	4	2.60	3	5	1	4	3	2	2.69	1.00	**7.00**
	Fort Harrison Ground Storage Reservoir	4	5	3	3	3	3.68	5	5	3	4	5	4	4.31	1.00	**15.84**

Asset ID	Project Area	Length of Water Main (feet)	Pipe Type	Pipe Diameter	Number of Breaks within Project Area	Approx. Number of Customers within Project Area	Number of Customer Complaints	Year placed into service
	Downtown (E 46th St, between Payton Ave and N Franklin Rd)	**3090**	**Cast Iron**	**6-inch**	**9**	**75**	**0**	1950
	Line D4A - E 46th St (between Payton Ave and N Franklin Rd)	1800	Cast Iron	6-inch	6	40	0	1950
	Line D4B - Payton Ave (between E 46th St and E 45th St)	750	Cast Iron	6-inch	2	25	0	1950
	Line D4C - Dunn St	540	Cast Iron	6-inch	1	10	0	1950
	Downtown (E 47th St, between N Sadler Dr and N Franklin Rd)	**5685**	**Cast Iron**	**2 to 8-inch**	**15**	**109**	**1**	1950
	Line D1A - N Sadler Dr (between W 46th St and E 47th St)	655	Cast Iron	2-inch	1	16	0	1950
	Line D1B - E 46th St (between N Sadler Dr and N Hartman Dr)	180	Cast Iron	6-inch	1	6	0	1950
	Line D1C - E 47th St (between N Sadler Dr and N Richardt Ave)	300	Cast Iron	4-inch	1	1	0	1950
	Line D1D - N Richardt Ave (between E 47th St and E 48th St)	550	Cast Iron	8-inch	4	12	0	1950
	Line D1E - E 47th St (between N Richardt Ave and N Franklin Rd)	2650	Cast Iron	4-inch	3	30	0	1950
	Line D1F - Longworth Ave (south of E 47th St)	270	Cast Iron	2-inch	2	8	0	1950
	Line D1G - Payton Ave (south of E 47th St)	260	Cast Iron	4-inch	1	10	1	1950
	Line D1H - Payton Ave (between E 47th St and E 48th St)	820	Cast Iron	4-inch	2	26	0	1950
	N Hartman Dr (between E 45th St and E 46th St)	**680**	**Cast Iron**	**6-inch**	**2**	**22**	**1**	1950
	N Franklin Rd (between Plummer St & Records St)	**540**	**Cast Iron**	**6-inch**	**3**	**15**	**1**	1950
	E 43rd St (between N Shadeland Ave and Elmhurst Dr)	**1600**	**Cast Iron**	**6 to 8-inch**	**6**	**52**	**1**	1950
	Line D5A - E 43rd St (between N Shadeland Ave and Elmhurst Dr)	950	Cast Iron	8-inch	3	34	1	1950
	Line D5B - Englewood Dr (south of E 43rd St)	100	Cast Iron	6-inch	1	5	0	1950
	Line D5C - Elmhurst Dr (between E 43rd St and E 42nd St)	550	Cast Iron	6-inch	2	13	0	1950
	Elmhurst and Kingman Dr (between Picton Dr and Pendleton Pike)	**2080**	**Cast Iron**	**6 to 8-inch**	**5**	**41**	**1**	1950
	Line D6A - Kingman Dr (between Picton Dr and Pendleton Pike)	730	Cast Iron	6-inch	1	14	0	1950
	Line D6B - Elmhurst Dr & Pendleton Pike (between Kingman Dr and Picton Dr)	1350	Cast Iron	8-inch	4	27	1	1950
	Barbour Ct (north of E 51st St)	**300**	**Cast Iron**	**4-inch**	**2**	**8**	**0**	1950
	E 49th St (between Elmhurst Dr and N Sadler Dr)	**1750**	**Cast Iron**	**6-inch**	**4**	**41**	**4**	1950
	E 52nd St (between N Kitley Ave and Katherine Dr)	**300**	**Cast Iron**	**6-inch**	**2**	**8**	**0**	1950
	N Kitley Ave, Leone Dr, Karen Dr Area	**6950**	**Cast Iron**	**4 to 6-inch**	**11**	**202**	**1**	1950
	Line D2A - N Kitley Ave (between Brookhaven Dr and E 49th St)	1200	Cast Iron	6-inch	5	38	1	1950
	Line D2B - Katherine Dr (between N Kenyon Dr and Karen Dr)	1750	Cast Iron	4-inch	2	54	0	1950
	Line D2C - N Kenyon Dr (between Leone Dr and Karen Dr)	1480	Cast Iron	4-inch	1	46	0	1950
	Line D2D - Karen Dr (between Leone Dr and E 49th St)	1200	Cast Iron	4-inch	1	34	0	1950
	Line D2E - Leone Dr (between N Kenyon Dr and E 49th St)	1320	Cast Iron	6-inch	2	30	0	1950
	E 50th St (between N Franklin Rd and Barlow Dr)	**530**	**Cast Iron**	**6-inch**	**2**	**13**	**0**	1950

Asset ID	Project Area	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	Replacement Installed Cost ($)	Replacement Intervals (yrs)	% Useful life used	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Age factor
	Downtown (E 46th St, between Payton Ave and N Franklin Rd)	67	100	33	2050		100	67			4
	Line D4A - E 46th St (between Payton Ave and N Franklin Rd)	67	100	33	2050		100	67			4
	Line D4B - Payton Ave (between E 46th St and E 45th St)	67	100	33	2050		100	67			4
	Line D4C - Dunn St	67	100	33	2050		100	67			4
	Downtown (E 47th St, between N Sadler Dr and N Franklin Rd)	67	100	33	2050		100	67			4
	Line D1A - N Sadler Dr (between W 46th St and E 47th St)	67	100	33	2050		100	67			4
	Line D1B - E 46th St (between N Sadler Dr and N Hartman Dr)	67	100	33	2050		100	67			4
	Line D1C - E 47th St (between N Sadler Dr and N Richardt Ave)	67	100	33	2050		100	67			4
	Line D1D - N Richardt Ave (between E 47th St and E 48th St)	67	100	33	2050		100	67			4
	Line D1E - E 47th St (between N Richardt Ave and N Franklin Rd)	67	100	33	2050		100	67			4
	Line D1F - Longworth Ave (south of E 47th St)	67	100	33	2050		100	67			4
	Line D1G - Payton Ave (south of E 47th St)	67	100	33	2050		100	67			4
	Line D1H - Payton Ave (between E 47th St and E 48th St)	67	100	33	2050		100	67			4
	N Hartman Dr (between E 45th St and E 46th St)	67	100	33	2050		100	67			4
	N Franklin Rd (between Plummer St & Records St)	67	100	33	2050		100	67			4
	E 43rd St (between N Shadeland Ave and Elmhurst Dr)	67	100	33	2050		100	67			4
	Line D5A - E 43rd St (between N Shadeland Ave and Elmhurst Dr)	67	100	33	2050		100	67			4
	Line D5B - Englewood Dr (south of E 43rd St)	67	100	33	2050		100	67			4
	Line D5C - Elmhurst Dr (between E 43rd St and E 42nd St)	67	100	33	2050		100	67			4
	Elmhurst and Kingman Dr (between Picton Dr and Pendleton Pike)	67	100	33	2050		100	67			4
	Line D6A - Kingman Dr (between Picton Dr and Pendleton Pike)	67	100	33	2050		100	67			4
	Line D6B - Elmhurst Dr & Pendleton Pike (between Kingman Dr and Picton Dr)	67	100	33	2050		100	67			4
	Barbour Ct (north of E 51st St)	67	100	33	2050		100	67			4
	E 49th St (between Elmhurst Dr and N Sadler Dr)	67	100	33	2050		100	67			4
	E 52nd St (between N Kitley Ave and Katherine Dr)	67	100	33	2050		100	67			4
	N Kitley Ave, Leone Dr, Karen Dr Area	67	100	33	2050		100	67			4
	Line D2A - N Kitley Ave (between Brookhaven Dr and E 49th St)	67	100	33	2050		100	67			4
	Line D2B - Katherine Dr (between N Kenyon Dr and Karen Dr)	67	100	33	2050		100	67			4
	Line D2C - N Kenyon Dr (between Leone Dr and Karen Dr)	67	100	33	2050		100	67			4
	Line D2D - Karen Dr (between Leone Dr and E 49th St)	67	100	33	2050		100	67			4
	Line D2E - Leone Dr (between N Kenyon Dr and E 49th St)	67	100	33	2050		100	67			4
	E 50th St (between N Franklin Rd and Barlow Dr)	67	100	33	2050		100	67			4

Asset ID	Project Area	Repair History (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Main & Area Criticality (Impact on water mains adjacent to project area)	Financial Impact	Service Impact	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	Downtown (E 46th St, between Payton Ave and N Franklin Rd)	3	3.35	3	5	3	3.20	**10.72**
	Line D4A - E 46th St (between Payton Ave and N Franklin Rd)	2	2.70	3	5	2	2.80	**7.56**
	Line D4B - Payton Ave (between E 46th St and E 45th St)	1	2.05	3	5	2	2.80	**5.74**
	Line D4C - Dunn St	1	2.05	1	5	1	1.40	**2.87**
	Downtown (E 47th St, between N Sadler Dr and N Franklin Rd)	5	4.65	3	5	4	3.60	**16.74**
	Line D1A - N Sadler Dr (between W 46th St and E 47th St)	1	2.05	3	5	1	2.40	**4.92**
	Line D1B - E 46th St (between N Sadler Dr and N Hartman Dr)	1	2.05	1	5	1	1.40	**2.87**
	Line D1C - E 47th St (between N Sadler Dr and N Richardt Ave)	1	2.05	2	5	1	1.90	**3.90**
	Line D1D - N Richardt Ave (between E 47th St and E 48th St)	2	2.70	3	5	1	2.40	**6.48**
	Line D1E - E 47th St (between N Richardt Ave and N Franklin Rd)	2	2.70	2	5	2	2.30	**6.21**
	Line D1F - Longworth Ave (south of E 47th St)	1	2.05	1	5	1	1.40	**2.87**
	Line D1G - Payton Ave (south of E 47th St)	1	2.05	1	5	1	1.40	**2.87**
	Line D1H - Payton Ave (between E 47th St and E 48th St)	1	2.05	3	5	2	2.80	**5.74**
	N Hartman Dr (between E 45th St and E 46th St)	1	2.05	1	5	2	1.80	**3.69**
	N Franklin Rd (between Plummer St & Records St)	2	2.70	3	5	1	2.40	**6.48**
	E 43rd St (between N Shadeland Ave and Elmhurst Dr)	2	2.70	3	5	2	2.80	**7.56**
	Line D5A - E 43rd St (between N Shadeland Ave and Elmhurst Dr)	2	2.70	3	5	2	2.80	**7.56**
	Line D5B - Englewood Dr (south of E 43rd St)	1	2.05	1	5	1	1.40	**2.87**
	Line D5C - Elmhurst Dr (between E 43rd St and E 42nd St)	1	2.05	2	5	1	1.90	**3.90**
	Elmhurst and Kingman Dr (between Picton Dr and Pendleton Pike)	2	2.70	3	5	2	2.80	**7.56**
	Line D6A - Kingman Dr (between Picton Dr and Pendleton Pike)	1	2.05	3	5	1	2.40	**4.92**
	Line D6B - Elmhurst Dr & Pendleton Pike (between Kingman Dr and Picton Dr)	2	2.70	3	5	2	2.80	**7.56**
	Barbour Ct (north of E 51st St)	1	2.05	1	5	1	1.40	**2.87**
	E 49th St (between Elmhurst Dr and N Sadler Dr)	2	2.70	2	5	2	2.30	**6.21**
	E 52nd St (between N Kitley Ave and Katherine Dr)	1	2.05	3	5	1	2.40	**4.92**
	N Kitley Ave, Leone Dr, Karen Dr Area	4	4.00	3	5	5	4.00	**16.00**
	Line D2A - N Kitley Ave (between Brookhaven Dr and E 49th St)	2	2.70	3	5	2	2.80	**7.56**
	Line D2B - Katherine Dr (between N Kenyon Dr and Karen Dr)	1	2.05	2	5	2	2.30	**4.72**
	Line D2C - N Kenyon Dr (between Leone Dr and Karen Dr)	1	2.05	3	5	2	2.80	**5.74**
	Line D2D - Karen Dr (between Leone Dr and E 49th St)	1	2.05	3	5	2	2.80	**5.74**
	Line D2E - Leone Dr (between N Kenyon Dr and E 49th St)	1	2.05	3	5	2	2.80	**5.74**
	E 50th St (between N Franklin Rd and Barlow Dr)	1	2.05	3	5	1	2.40	**4.92**

Asset ID	Project Area	Length of Water Main (feet)	Pipe Type	Pipe Diameter	Number of Breaks within Project Area	Approx. Number of Customers within Project Area	Number of Customer Complaints	Year placed into service
	E 46th St (between Van Cleave St and Pendleton Pike)	**2040**	**Cast Iron**	**4 to 6-inch**	**6**	**30**	**0**	1950
	Line D7A - Van Cleave St (between E 46th St and E 48th St)	**820**	**Cast Iron**	**4-inch**	**2**	**16**	**0**	1950
	Line D7B - E 47th St (at Van Cleave St)	60	Cast Iron	6-inch	1	1	0	1950
	Line D7C - E 46th St (between Van Cleave St and Pendleton Pike)	750	Cast Iron	4-inch	2	10	0	1950
	Line D7D - Mehaffey St (between E 46th St and E 47th St)	410	Cast Iron	6-inch	1	3	0	1950
	Zoeller Ave (south of E 46th St)	**910**	**Cast Iron**	**4-inch**	**3**	**20**	**0**	1950
	Lee Rd Raw Water Main (at golf course)	**1500**	**Cast Iron**	**16-inch**	**4**	**0**	**0**	1950
	Fall Creek Dr and Sumac Ln (south of Hermosa Dr)	**2600**	**Ductile Iron**	**6 to 8-inch**	**14**	**21**	**0**	1985
	Line D8A - Sumac Ln (between Hermosa Dr and Fall Creek Dr)	1100	Ductile Iron	6-inch	12	7	0	1985
	Line D8B - Fall Creek Dr (south of Hermosa Dr)	1500	Ductile Iron	8-inch	2	14	0	1985
	Pebblebrooke Dr and Stacie Cir (between E 75th St and Richie Cir)	**1500**	**Ductile Iron**	**6-inch**	**5**	**34**	**0**	1985
	Line D11A - Stacie Cir (west of Pebblebrooke Dr)	450	Ductile Iron	6-inch	1	12	0	1985
	Line D11B - Pebblebrooke Dr (between E 75th St and Richie Cir)	1050	Ductile Iron	6-inch	4	22	0	1985

Asset ID	Project Area	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	Replacement Installed Cost ($)	Replacement Intervals (yrs)	% Useful life used	Recommended Replacement Date	Replacement Cost Budget (curr. $)	Age factor
	E 46th St (between Van Cleave St and Pendleton Pike)	67	100	33	2050		100	67			4
	Line D7A - Van Cleave St (between E 46th St and E 48th St)	67	100	33	2050		100	67			4
	Line D7B - E 47th St (at Van Cleave St)	67	100	33	2050		100	67			4
	Line D7C - E 46th St (between Van Cleave St and Pendleton Pike)	67	100	33	2050		100	67			4
	Line D7D - Mehaffey St (between E 46th St and E 47th St)	67	100	33	2050		100	67			4
	Zoeller Ave (south of E 46th St)	67	100	33	2050		100	67			4
	Lee Rd Raw Water Main (at golf course)	67	100	33	2050		100	67			4
	Fall Creek Dr and Sumac Ln (south of Hermosa Dr)	32	100	68	2085		100	32			2
	Line D8A - Sumac Ln (between Hermosa Dr and Fall Creek Dr)	32	100	68	2085		100	32			2
	Line D8B - Fall Creek Dr (south of Hermosa Dr)	32	100	68	2085		100	32			2
	Pebblebrooke Dr and Stacie Cir (between E 75th St and Richie Cir)	32	100	68	2085		100	32			2
	Line D11A - Stacie Cir (west of Pebblebrooke Dr)	32	100	68	2085		100	32			2
	Line D11B - Pebblebrooke Dr (between E 75th St and Richie Cir)	32	100	68	2085		100	32			2

Asset ID	Project Area	Repair History (1=exc., 5=poor)	Probability of Failure (PoF) (1=low, 5=high)	Main & Area Criticality (Impact on water mains adjacent to project area)	Financial Impact	Service Impact	Consequence of Failure (CoF) (1=low, 5=high)	Business Risk Exposure (BRE = PoFxCoFxR) (1=low, 25=high)
	E 46th St (between Van Cleave St and Pendleton Pike)	2	2.70	3	5	2	2.80	**7.56**
	Line D7A - Van Cleave St (between E 46th St and E 48th St)	1	2.05	3	5	1	2.40	**4.92**
	Line D7B - E 47th St (at Van Cleave St)	1	2.05	2	5	1	1.90	**3.90**
	Line D7C - E 46th St (between Van Cleave St and Pendleton Pike)	1	2.05	2	5	1	1.90	**3.90**
	Line D7D - Mehaffey St (between E 46th St and E 47th St)	1	2.05	3	5	1	2.40	**4.92**
	Zoeller Ave (south of E 46th St)	2	2.70	1	5	2	1.80	**4.86**
	Lee Rd Raw Water Main (at golf course)	2	2.70	5	5	5	5.00	**13.50**
	Fall Creek Dr and Sumac Ln (south of Hermosa Dr)	5	3.95	1	5	2	1.80	**7.11**
	Line D8A - Sumac Ln (between Hermosa Dr and Fall Creek Dr)	4	3.30	2	5	1	1.90	**6.27**
	Line D8B - Fall Creek Dr (south of Hermosa Dr)	1	1.35	1	5	1	1.40	**1.89**
	Pebblebrooke Dr and Stacie Cir (between E 75th St and Richie Cir)	2	2.00	3	5	2	2.80	**5.60**
	Line D11A - Stacie Cir (west of Pebblebrooke Dr)	1	1.35	1	5	1	1.40	**1.89**
	Line D11B - Pebblebrooke Dr (between E 75th St and Richie Cir)	2	2.00	3	5	2	2.80	**5.60**

Asset Description	Department	Utility Fleet ID	VIN No.	Year	Acquisition Cost ($)	Asset Age (yrs)	Effective Life Total (yrs)	Effective Life Remaining Life (yrs)	Useful Life Replacement Date	% Useful life used	Estimated Maint Cost ($)	Salvage Value ($)	Depreciated Cost ($)
Chevrolet Truck KC34	Water & Sewer	LU00-03	1GBKC34J5YF422623	2000		17	10	-7	2010	170			$ -
CAT Backhoe	Water & Sewer	LU01-05	FDP03264	2001	$68,473.43	16	15	-1	2016	107			$ -
Freightliner Dump Truck	Water & Sewer	LU01-12	1FV6GJBC71HH02202	2001	$45,000.00	16	10	-6	2011	160			$ -
Ford Ranger	Water & Sewer	LU01-13	1FTYR10U21TB02854	2001	$15,484.00	16	10	-6	2011	160			$ -
Elgin Street Sweeper	Water & Sewer	LU01-15	1FVABTBV52HK05072	2001		16	10	-6	2011	160			$ -
Dodge 1500 Quad Cab	Water	LU03-02	1D7HU18N13S318222	2003	$23,927.60	14	10	-4	2013	140			$ -
Trailerman Trailer T-81	Water & Sewer	LU03-11	5L3CX20254L001006	2003	$3,350.00	14	15	1	2018	93			$ 170
Ford F-150	Water	LU04-06	2FTRF18214CA77847	2004	$22,453.00	13	10	-3	2014	130			$ -
Express Van EC	Water & Sewer	LU05-01	1GCGG25V851124271	2005		12	10	-2	2015	120			$ -
Ja-Mar Trailer	Water	LU05-02	4AJTL09145J039908	2005	$725.00	12	15	3	2020	80			$ 1,000
Dodge Dakota	Water & Sewer	LU05-04	1D7HE42K65S138797	2005	$23,386.00	12	10	-2	2015	120			$ -
Carry-On Trailer	Water	LU05-05	4YMUL10165M015557	2005	$943.99	12	15	3	2020	80			$ 1,000
Ford F250 Pickup	Water	LU05-06	1FTSX21PX5EC56295	2005		12	10	-2	2015	120			$ -
Jeep Liberty	Water & Sewer	LU05-07	1J4GL48K96W117532	2005		12	10	-2	2015	120			$ -
Chevrolet Express Van EC	Water	LU06-07	1GCGG29V161119490	2006	$17,500.00	11	10	-1	2016	110			$ -
Ford Focus Wagon	Water & Sewer	LU06-10	1FAFP36N96W110907	2006	$14,766.01	11	10	-1	2016	110			$ -
Chevrolet 1500 EC	Water & Sewer	LU06-12	2GCEC19V561127793	2006	$11,750.00	11	10	-1	2016	110			$ -
Chevrolet 1500 RC	Water	LU06-17	1GCEC14X86Z118845	2006	$14,150.00	11	10	-1	2016	110			$ -
Chevrolet 1500 RC	Water & Sewer	LU06-18	1GCEC14X46Z118941	2006	$10,950.00	11	10	-1	2016	110			$ -
Solar Tech Arrow Board Trailer	Water & Sewer	LU09-03	4GM1A091691623327	2009		8	15	7	2024	53			$ 1,200
Ford F250 Pickup	Water	LU11-01	1FT7X2BT1BEC56652	2011	$36,289.00	6	10	4	2021	60			$ -
Ford F250 Pickup	Water	LU11-02	1FT7X2BTXBEC39770	2011	$36,289.00	6	10	4	2021	60			$ 10,000
Ford F150 XLT Pickup	Water	LU11-03	1FTFX1EFXBFB40792	2011	$29,530.00	6	10	4	2021	60			$ 10,000
Ford F150 XLT Pickup	Water & Sewer	LU11-04	1FTFX1EF2BFB53214	2011	$29,530.00	6	10	4	2021	60			$ 5,000
Ford E250	Water & Sewer	LU12-01	1FTNE2EW1CDA04720	2012	$19,486.24	5	10	5	2022	50			$ 6,300
Ford F150	Water	LU12-02	1FTFX1EF6CFC82221	2012	$22,115.68	5	10	5	2022	50			$ 12,500
Ford F150	Water	LU12-03	1FTFX1EF3CFC82225	2012	$22,115.68	5	10	5	2022	50			$ 12,500
Ford F150	Water	LU12-04	1FTFX1EF4CFC82220	2012	$22,115.68	5	10	5	2022	50			$ 12,500
Ford F150	Water	LU12-05	1FTFX1EF2CFC82233	2012	$22,115.68	5	10	5	2022	50			$ 12,500
Ford F150	Water & Sewer	LU12-07	1FTFX1EF3CFC82211	2012	$22,115.68	5	10	5	2022	50			$ 6,300
Ford F150	Water & Sewer	LU12-08	1FTFX1EF7CFC82227	2012	$22,115.68	5	10	5	2022	50			$ 6,300
Ford Focus	Water & Sewer	LU13-01	1FADP3K26DL219133	2013	$17,429.09	4	10	6	2023	40			$ 4,500
Ford Edge	Water & Sewer	LU13-02	2FMDK3JC0DBB01108	2013	$31,739.50	4	10	6	2023	40			$ 9,000
EH Wachs Valve Maint. Trailer	Water	LU13-03	1E9PT1511DC297894	2013		4	15	11	2028	27			$ 3,700
Mayes HM-P7K Trailer	Water & Sewer	LU13-05	1H9FP2029DR612307	2013	$4,995.00	4	10	6	2023	40			$ 1,500
Ford F250 Pickup	Water & Sewer	LU14-01	1FTBF2B61EEB08934	2014	$31,021.57	3	10	7	2024	30			$ 8,800
Ford F250 Pickup	Water & Sewer	LU14-02	1FTBF2B6XEEB08933	2014	$31,021.57	3	10	7	2024	30			$ 8,800
Caterpillar Hydraulic Excavator	Water & Sewer	LU14-03	XFA02365	2014	$55,717.83	3	15	12	2029	20			$ 24,000
Vactor 2112Plus	Water & Sewer	LU14-04	1FVHG5CY5FHGF1148	2014	$369,858.00	3	10	7	2024	30			$ 122,500
Ford F250 Pickup	Water & Sewer	LU15-02	1FT7X2B67FEA09376	2015	$36,065.00	2	10	8	2025	20			$ 14,000

Asset Description	Department	Utility Fleet ID	Water Utility Replacement Cost ($)
Chevrolet Truck KC34	Water & Sewer	LU00-03	$ 12,500
CAT Backhoe	Water & Sewer	LU01-05	$ 50,000
Freightliner Dump Truck	Water & Sewer	LU01-12	$ 20,000
Ford Ranger	Water & Sewer	LU01-13	$ 7,500
Elgin Street Sweeper	Water & Sewer	LU01-15	$ 50,000
Dodge 1500 Quad Cab	Water	LU03-02	$ 25,000
Trailerman Trailer T-81	Water & Sewer	LU03-11	$ 2,500
Ford F-150	Water	LU04-06	$ 25,000
Express Van EC	Water & Sewer	LU05-01	$ 10,000
Ja-Mar Trailer	Water	LU05-02	$ 5,000
Dodge Dakota	Water & Sewer	LU05-04	$ 12,500
Carry-On Trailer	Water	LU05-05	$ 5,000
Ford F250 Pickup	Water	LU05-06	$ 25,000
Jeep Liberty	Water & Sewer	LU05-07	$ 12,500
Chevrolet Express Van EC	Water	LU06-07	$ 30,000
Ford Focus Wagon	Water & Sewer	LU06-10	$ 10,000
Chevrolet 1500 EC	Water & Sewer	LU06-12	$ 7,500
Chevrolet 1500 RC	Water	LU06-17	$ 15,000
Chevrolet 1500 RC	Water & Sewer	LU06-18	$ 7,500
Solar Tech Arrow Board Trailer	Water & Sewer	LU09-03	$ 2,500
Ford F250 Pickup	Water	LU11-01	$ 25,000
Ford F250 Pickup	Water	LU11-02	$ 25,000
Ford F150 XLT Pickup	Water	LU11-03	$ 25,000
Ford F150 XLT Pickup	Water & Sewer	LU11-04	$ 12,500
Ford E250	Water & Sewer	LU12-01	$ 12,500
Ford F150	Water	LU12-02	$ 25,000
Ford F150	Water	LU12-03	$ 25,000
Ford F150	Water	LU12-04	$ 25,000
Ford F150	Water	LU12-05	$ 25,000
Ford F150	Water & Sewer	LU12-07	$ 12,500
Ford F150	Water & Sewer	LU12-08	$ 12,500
Ford Focus	Water & Sewer	LU13-01	$ 7,500
Ford Edge	Water & Sewer	LU13-02	$ 15,000
EH Wachs Valve Maint. Trailer	Water	LU13-03	$ 5,000
Mayes HM-P7K Trailer	Water & Sewer	LU13-05	$ 2,500
Ford F250 Pickup	Water & Sewer	LU14-01	$ 12,500
Ford F250 Pickup	Water & Sewer	LU14-02	$ 12,500
Caterpillar Hydraulic Excavator	Water & Sewer	LU14-03	$ 30,000
Vactor 2112Plus	Water & Sewer	LU14-04	$ 175,000
Ford F250 Pickup	Water & Sewer	LU15-02	$ 17,500

Probability of Failure (PoF) Grading Criteria

Weighting Factor

	↓		5	4	3	2	1
			Very High	High	Moderate	Low	Very Low
	0.8	Physical Condition (Based on visual inspection)	Very Poor (Condition Grade 5)	Poor (Condition Grade 4)	Fair (Condition Grade 3)	Good (Condition Grade 2)	Very Good (Condition Grade 1)
	1.3	Age Factor	Greater than 80% of useful life	Age between 60% and 80% of useful life	Age between 40% and 60% of useful life	Age between 20% and 40% of useful life	Age less than 20% of useful life
	0.3	O&M Protocols	None	Written/online, but not complete, not current or location unknown	Written/online, but not complete, not current or not easily accessible	Complete, written/online, current, but not easily accessible	Complete, written/online, current, and easily accessible
	1.1	Repair history	Very Poor (Repaired more than 15 times in the last 10 years)	Poor (Repaired 10 to 15 times in the last 10 years)	Moderate (Repaired 5 to 10 times in the last 10 years)	Good (Repaired 1 to 5 times in the last 10 years)	Very Good (Not repaired in the last 10 years)
	1.5	Operational Condition	Not operational and not repairable	Operational but needs to be rebuilt or upgraded	Operational but needs some restoration	Operational with minimal problems	No operational problems

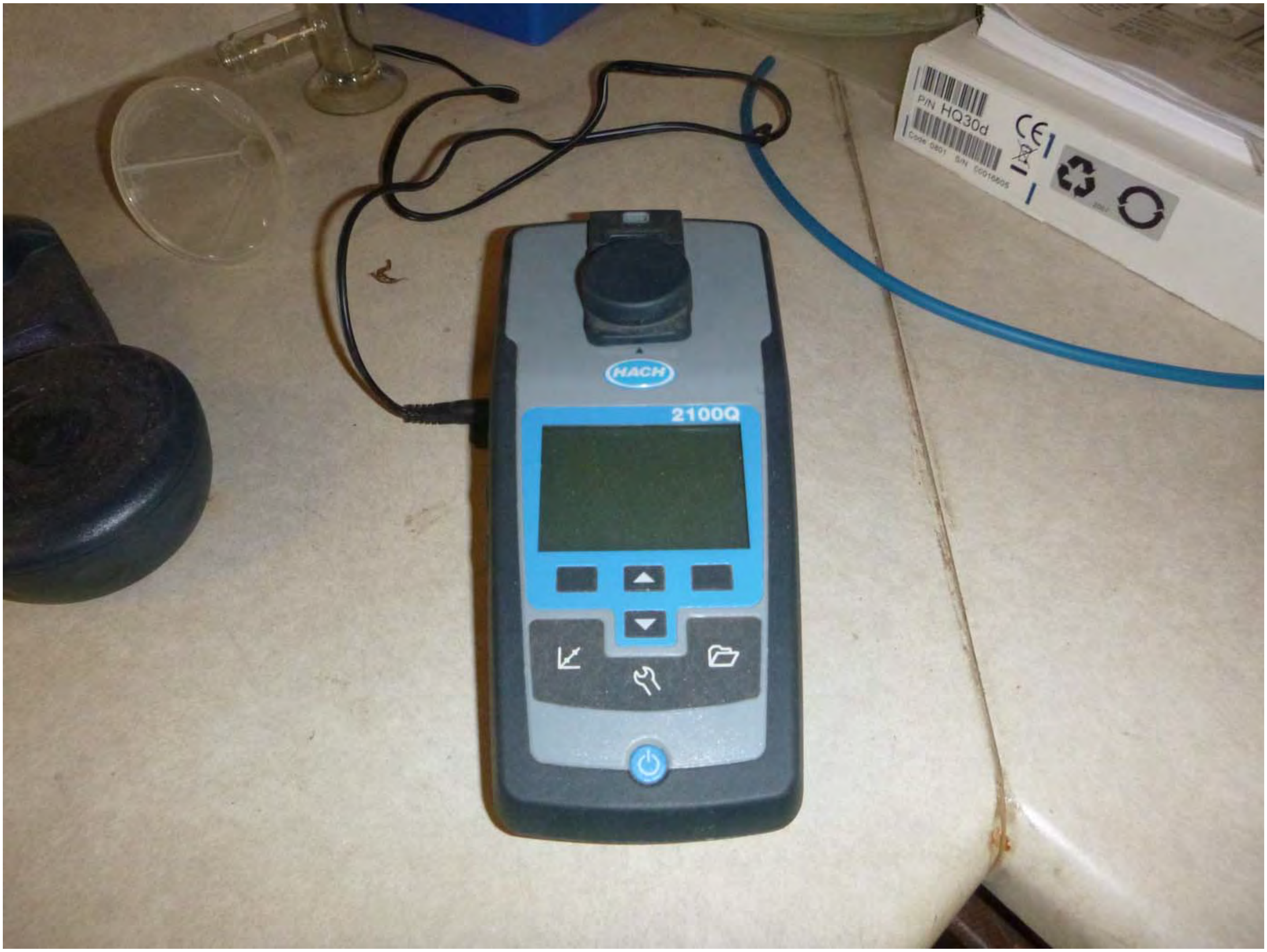
Consequence of Failure (CoF) Grading Criteria

Weighting Factor

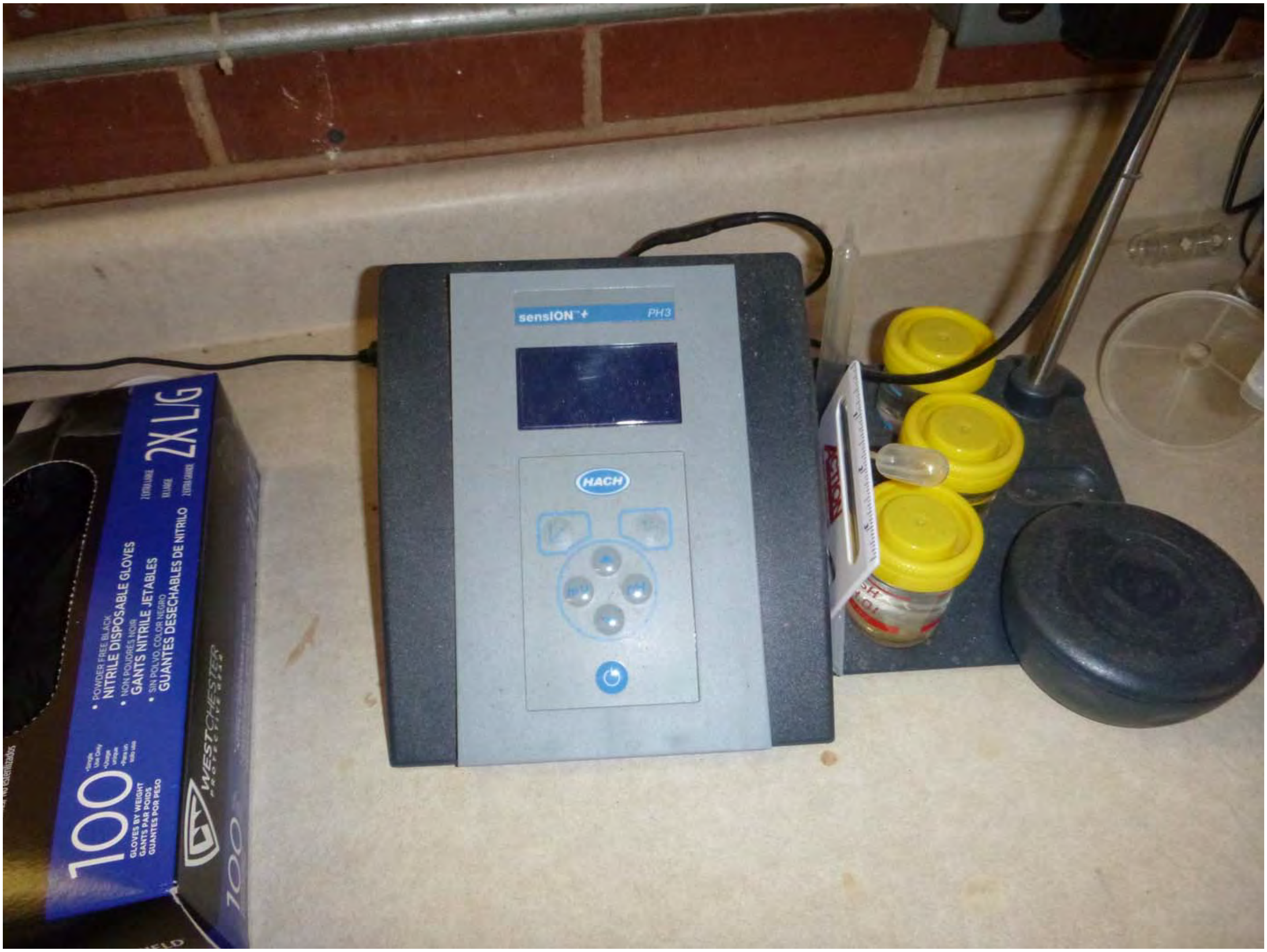
	↓		5	4	3	2	1
			Very High	High	Moderate	Low	Very Low
	1.167	Process	Mission Critical - Unable to accomplish Mission	Process shut-down	Loss of Redundancy	Potential process upset	No impact on process
	0.833	Financial Impact	May require new borrowing or impact rates	May require transfer from reserves	Absorbed within current budget	Absorbed within applicable line item	Budgeted expense
	1.667	Safety	Loss of life	Severe Injury to employees or public	Minor injury requiring treatment off-site or lost time	Minor injury requiring No medical treatment with no lost time	No injury
	0.333	IDEM Compliance	Enforcement action by IDEM	Major issue but no enforcement action	Localized issue	Minimal Issue	100% compliance
	1.5	Disruption to the community	Long term impact; area wide disruption	Short term impact but substantial disruption	Sporadic service disruptions	Minor disruption	No disruption
	0.5	Required response time	1/2 hour	1/2 to 2 hours	2 to 4 hours	4 to 8 hours	> 8 hours

APPENDIX F

Photos



P1010974


sensION+
PH3
HACH
100
NITRILE DISPOSABLE GLOVES
GANTS NITRILE JETABLES
GUANTES DESECHABLES DE NITRILO
2X L/G
WESTCHESTER

P1010975

P1010976

P1010977


CATALOG # H050V2BLG
LOWER END BRG 6211-J
UPPER END BRG
FR 326TP TYPE RUSI ENCL WPI
PH 3 MAX AMB 40 °C
INSUL CLASS F DUTY CONT WT 675 LB BAL 0.08 IN/SEC
HP 50.00 RPM 1780 SF 1.15 HZ 60
VOLTS 230/460 MAX KVAR NEMA NOM EFFICIENCY 94.5
AMPS 113.0/57.0 PF 87.7 CODE G DES B
OIL CAPACITY LOWER END BRG GREASE QTS. UPPER END BRG 2.8L/ 3 QTS
NEMA MG1 PART 31
INVERTER DUTY
AMPS
TORQUE HZ RANGE MAX RPM
147.5 LB-FT 6-60 180-1800
SF 1.0 INV. TYPE
MADE IN MEXICO OF IMPORTED AND DOMESTIC COMPONENTS
NIDEC MOTOR CORPORATION
422707-005
www.usmotors.com
SPECIAL FEATURES
B533050
SHAFT GROUNDING
RING INSTALLED
INTERNALLY
SPECIAL FEATURES

P1010978


CATALOG #
LOWER END BRG 6211-J
UPPER END BRG
FR TYPE ENCL
PH 3 MAX AMB 40 °C ID#
INSUL CLASS F DUTY CONT WT 675 LB BAL 0.08 IN/SEC
HP 50.00 RPM 1780 SF 1.15 HZ 60
VOLTS 230/460 MAX KVAR NEMA NOM EFFICIENCY 94.5
AMPS 113.0/57.0 PF 87.7 CODE G DES B
OIL CAPACITY LOWER END BRG GREASE QTS. UPPER END BRG QTS.
NEMA MG1 PART 31
INVERTER DUTY
AMPS
TORQUE 147.5 LB-FT
HZ RANGE 6-60
MAX RPM
SF 1.0
INV. TYPE
MADE IN MEXICO OF IMPORTED AND DOMESTIC COMPONENTS
422707-005
NIDEC MOTOR CORPORATION
www.usmotors.com
US MOTORS
SPECIAL FEATURES B533059
SHAFT GROUNDING
RING INSTALLED
INTERNALLY
SPECIAL FEATURES B533059
NEMA Premium
Southaven, MS 04/16/13 Nidec
Item Number
DT94

P1010979

P1010980


INSTALLED BY
PEERLESS-MIDWEST, INC.
MISHAWAKA, INDIANA
PHONE 574-254-9050
PUMP SERIAL NUMBER
13 26 552

P1010981


MOTOR
2355470
220/440
CFU
1800
N.R.R.
THIS MOTOR IS EQUIPPED
WITH THE FOLLOWING BEARINGS
UPPER
LOWER
365P
F
CODE
RATING
DESIGN
MOTORS Inc.

P1010982

P1010983


U.S. ELECTRICAL MOTORS Inc.
MILFORD, CONN.
CODE
RATING
LUBRICATION INSTRUCTIONS

P1010984

P1010985

P1010986


#3
WESTINGHOUSE
Life-Linestarter
WELL #3
PUMP SETTING 176'3.5"
CRITICAL LEVEL 171'
LAST TESTED 10/5/78
WELL #4
PUMP SETTING 176'10"
CRITICAL LEVEL 171'
LAST TESTED 5/20/78
ELECTRICAL CONTROLS
HYPOCHLORITE SYSTEM 480V 3ø, 3W
SIEMENS
ON
OFF
DANGER

P1010987

P1010988


Assembled in USA
Greenwood, In.
Endress+Hauser
Prosonic S
Order code FMU90-R11CA232AA1A
Ser. no. J900E8150E8
90...253 V AC
50/60 Hz 23 VA
4...20 mA HART

P1010989


PRE & Post T Drives
Post
LEESON SPEEDMASTER
Digital
ADJUSTABLE SPEED AC MOTOR CONTROL
START
STOP
LEESON SPEEDMASTER
Digital
ADJUSTABLE SPEED AC MOTOR CONTROL
START
STOP

P1010990


Type: 174931.00
SN: 13431214313611434
Enclosure: IP31/Type 1
Manual: M106
1 HP
0.75 kW
See manual for detailed data and alternate ratings
Input:
Output:
Volts: 120/240 V
0-230 V
Hz: 50-60 Hz
0-120 Hz
Phase: 1
3
Amps: 16.2/8.1 A
4.0 A
LEESON
SPEEDMASTER
Made in USA
CE
LISTED
IND. CONT. EQ.

P1010993

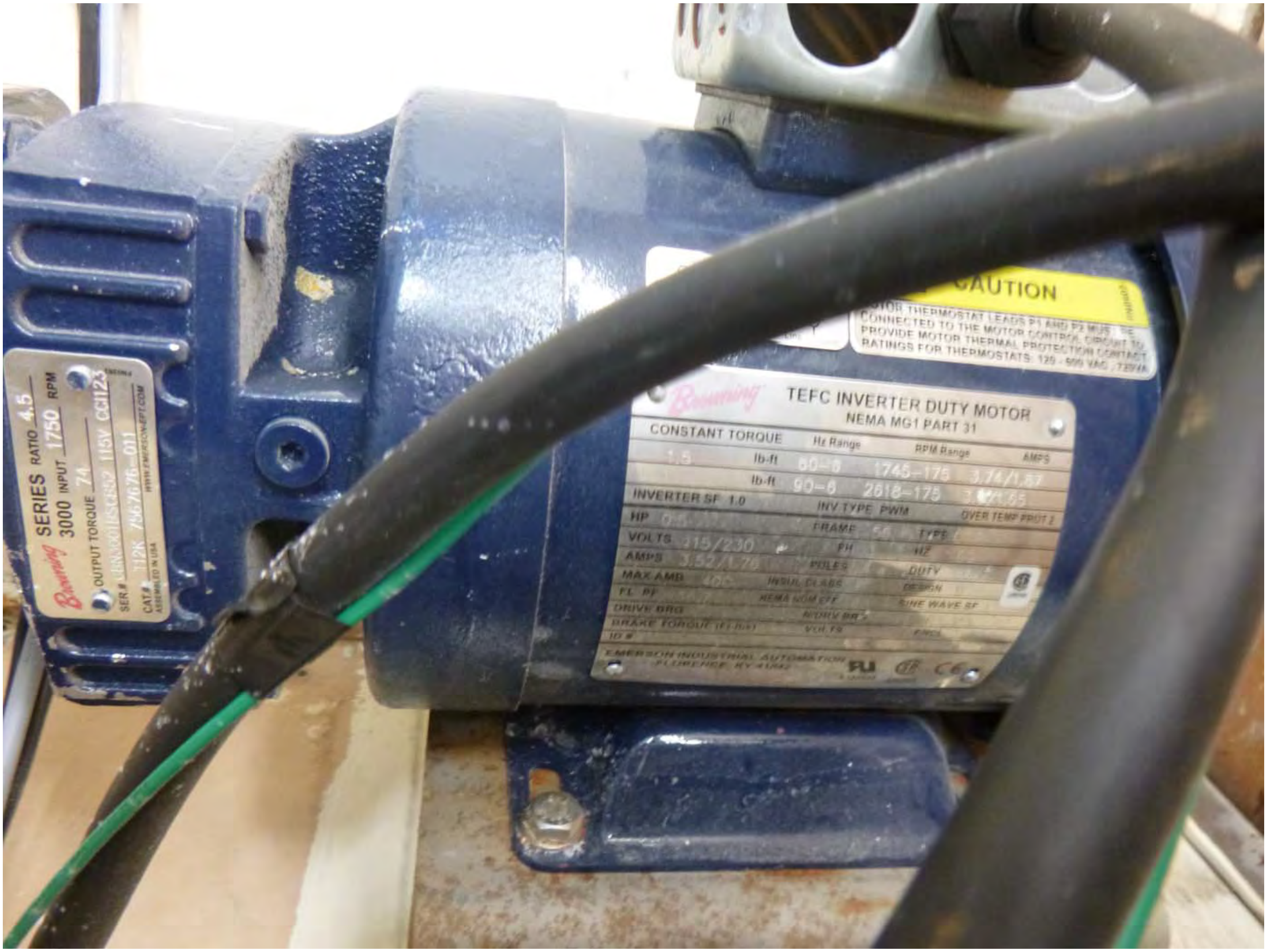
P1010994


Lo-Volts
Y
Hi-Volts
CONN
Line
Line
CAUTION
MOTOR THERMOSTAT LEADS P1 AND P2 MUST BE CONNECTED TO THE MOTOR CONTROL CIRCUIT TO PROVIDE MOTOR THERMAL PROTECTION CONTACT RATINGS FOR THERMOSTATS: 120 - 600 VAC , 720VA
Browning
TEFC INVERTER DUTY MOTOR
NEMA MG1 PART 31
CONSTANT TORQUE
Hz Range
RPM Range
AMPS
1.5
lb-ft
lb-ft
INVERTER SF 1.0
INV TYPE PWM
OVER TEMP PROT 2
HP 0.5
FRAME 56
TYPE
VOLTS
PH
HZ 60
AMPS
POLES
DUTY
MAX AMB 40C
INSUL CLASS
DESIGN
FL PF 66.7
NEMA NOM EFF
SINE WAVE SF
DRIVE BRG
N/DRV BRG
BRAKE TORQUE (Ft-lbs)
VOLTS
ENCL
ID #
EMERSON INDUSTRIAL AUTOMATION
FLORENCE, KY 41042

P1010995

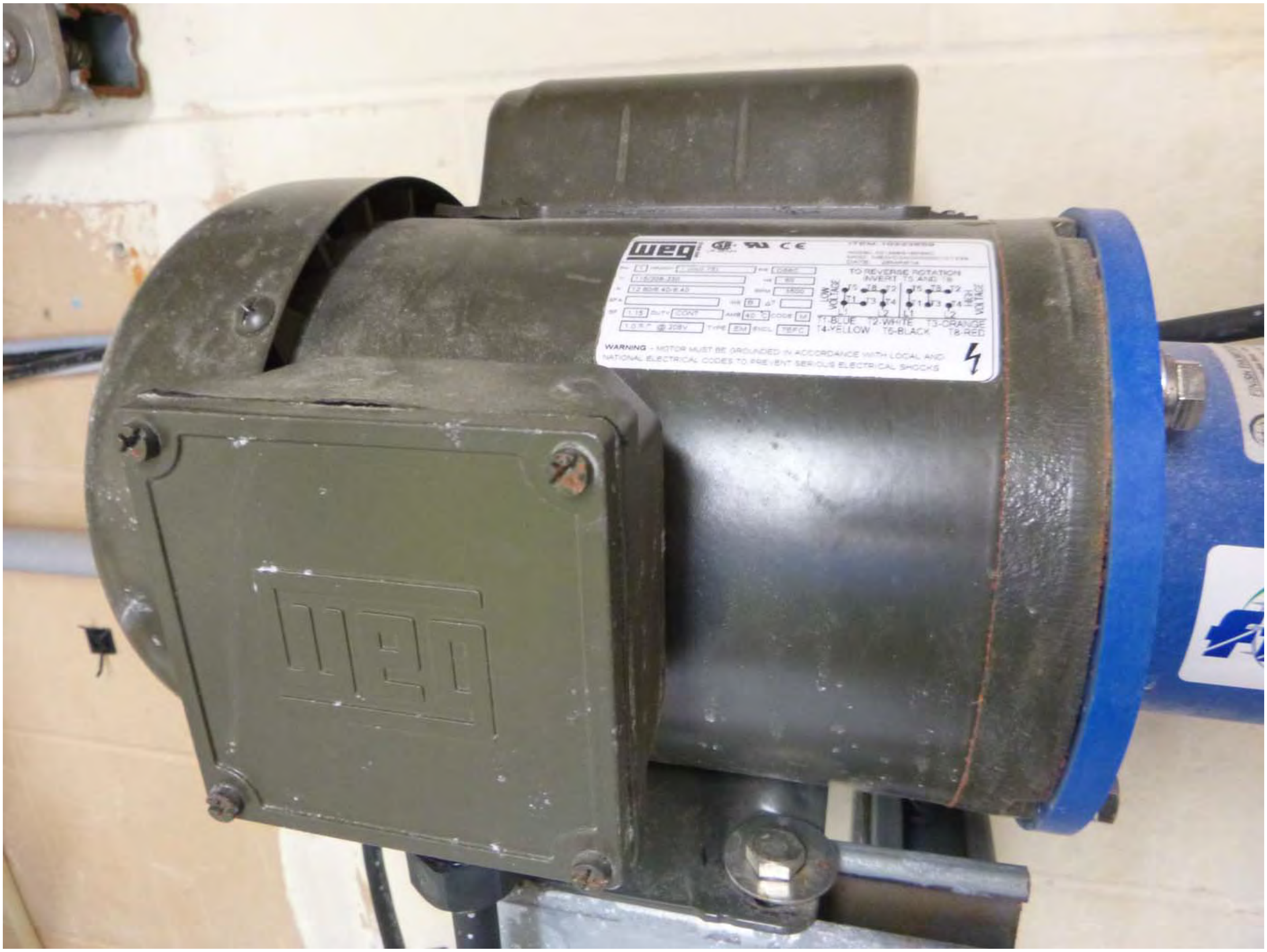

seepex.com
+1 (937) 864-7150
seepex.com
Direction of rotation
seepex Inc.
511 Speedway Drive
Enon, Ohio 45323
USA
Phone +1(937)8647150
Fax +1(937)8647157
sales@seepex.net
24h Helpline: www. eepex.com
Commission no. 839951.2
Type MD 0015-24
Year of construction 2014

P1010996


CAUTION
Browning
TEFC INVERTER DUTY MOTOR
NEMA MG1 PART 31
CONSTANT TORQUE
Hz Range
RPM Range
AMPS
INVERTER SF 1.0
INV TYPE PWM
HP
FRAME
VOLTS 115/230
AMPS
MAX AMB
INSUL CLASS
DUTY
DESIGN
DRIVE BRG
SINE WAVE SF
EMERSON INDUSTRIAL AUTOMATION
Browning
SERIES
RATIO 4.5
3000
INPUT 1750
RPM
OUTPUT TORQUE
SER #
CAT #
ASSEMBLED IN USA

P1010997

P1010998


TO REVERSE ROTATION
INVERT T5 AND T8
LOW VOLTAGE
HIGH VOLTAGE
T1-BLUE T2-WHITE T3-ORANGE
T4-YELLOW T5-BLACK T8-RED
WARNING - MOTOR MUST BE GROUNDED IN ACCORDANCE WITH LOCAL AND NATIONAL ELECTRICAL CODES TO PREVENT SERIOUS ELECTRICAL SHOCKS

P1010999


weg
LR 38324
ITEM: 10223659
MODEL 00136ES1BD56C
MOD. ME0IC0X0X0000101334
DATE 26MAR14
PH 1
HP(KW) 1.00(0.75)
FR D56C
V 115/208-230
Hz 60
A 12.80/6.40-6.40
RPM 3500
SFA
INS B
ΔT
SF 1.15
DUTY CONT
AMB 40 °C
CODE M
1.0 S.F. @ 208V
TYPE EM
ENCL TEFC
TO REVERSE ROTATION INVERT T5 AND T8
LOW VOLTAGE
HIGH VOLTAGE
T5 T8 T2 T1 T3 T4 L1 L2
T1-BLUE T2-WHITE T3-ORANGE
T4-YELLOW T5-BLACK T8-RED
WARNING - MOTOR MUST BE ROUNDED IN ACCORDANCE WITH LOCAL AND
NATIONAL ELECTRICAL CODES O PREVENT SERIOUS ELECTRICAL SHOCKS.

P1020001


FINISH THOMPSON, INC.
921 Greengarden Road * Erie, PA
Ph 814-455-4478 * Fax
Model: SP10P-3-M218
IMP DIA: 3.75
S/N: 129714 G14

P1020002

P1020003


CATALOG #
MODEL #
LOWER END BRG
UPPER END BRG
FR
TYPE
ENC
PH
MAX AMB
°C
ID#
INSUL CLASS
DUTY
WT
BAL
HP
RPM
SF 1.15
HZ 60
VOLTS
AMPS
OIL CAPACITY
PF
CODE
DES
QTS
INVERTER DUTY
TORQUE
HZ RANGE
RPM
AMPS
120
U.S. ELECTRICAL MOTORS
SPECIAL FEATURES

P1020004

P1020005


PASSED
QC
TOSHIBA
TRANSISTOR INVERTER
VT130P9U410K (8)
100kVA-100HP
INPUT
OUTPUT
U (V~)
3PH 380/480
3PH 380/480
F (Hz)
50/60
0 / 299
I (A)
128
124
(CF 4kHz)
Cu AWG 2/0
75°C
275/360 lb-in
31/41 Nm
Suitable for use on a circuit capable of delivering not more than 200000 rms symmetrical Amperes, 480 V maximum
Serial No. 120100212
Manufactured in USA
from foreign and domestic components
UL Type 1 Enclosure
LISTED
POW.CONV.EQ.
HOU
TOSHIBA INTERNATIONAL CORPORATION
HOUSTON, TEXAS

P1020006

P1020007


CATALOG #
MODEL #
FR 404TP
TYPE
ENCL
PH 3
°C ID#
DUTY CONT
WT
HP 100
RPM 1785
BAL
VOLTS 460
SF
HZ
AMPS
OIL CAPACITY
PF
CODE
DES
GREASE QTS.
QTS.
INVERTER DUTY
TORQUE
HZ RANGE
RPM
AMPS
U.S. ELECTRICAL MOTORS
DIVISION OF EMERSON ELECTRIC CO.
ST. LOUIS, MO
EMERSON
422707-008
SPECIAL FEATURES
Premium Efficient
422689

P1020008

P1020009


TOSHIBA
RUN
STOP RESET
ENTER
ESC
H7
TRUE TORQUE CONTROL
ADJUSTABLE SPEED DRIVE
USFilter
Control Systems
DANGER

P1020010


PASSED QC
SUITABLE FOR USE ON A CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN: 200000 RMS SYMMETRICAL AMPERES 480 VOLTS MAXIMUM
PN 48613
THIS EQUIPMENT PROVIDES ADJUSTABLE INTERNAL OVERLOAD PROTECTION FOR THE MOTOR LOAD. REFER TO OPERATION MANUAL FOR ADJUSTMENT INSTRUCTIONS.
PN 44085
TRANSISTOR INVERTER
TYPE FORM:VT130H7U410KA
CAPACITY:100 -KVA 100 HP
INPUT: 460 V 136 A 3φ
50/60HZ
OUTPUT: 460 V 124 A 3φ
.1-80/400 HZ
SERIAL NO: 030304307
ENCLOSURE:TYPE 1
LISTED INDUSTRIAL CONTROL EQUIPMENT
35U5
TOSHIBA INTERNATIONAL CORPORATION
MANUFACTURED IN U.S.A.
FROM FOREIGN AND DOMESTIC COMPONENTS
HOUSTON, TEXAS

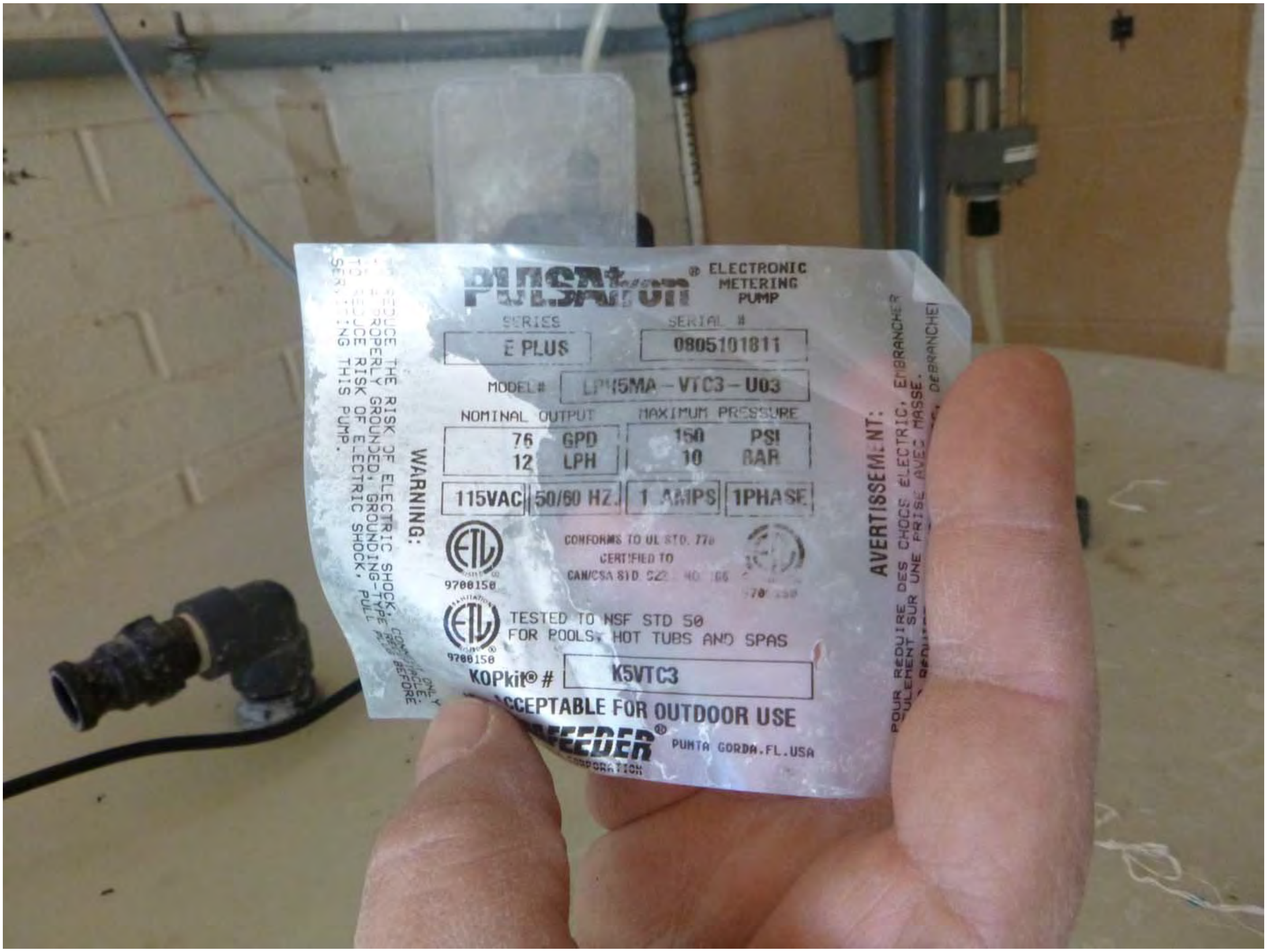
P1020011


CAUTION - Disconnect From Supply Before Opening.
Keep Cover Tight While Circuits Are Alive.
SPARLING
TIGERMAG EP
967. GPM
YES
NO

P1020012


SPARLING
S/N M073111404
S.O. NO. 73726
ACCPT. QA 3
DATE 4/5/04
FORM 932

P1020013


PULSAtron ELECTRONIC METERING PUMP
SERIES
E PLUS
SERIAL #
0805101811
MODEL #
NOMINAL OUTPUT
MAXIMUM PRESSURE
76 GPD
12 LPH
PSI
10 BAR
115VAC
50/60 HZ.
1PHASE
TESTED TO NSF STD 50
FOR POOLS, HOT TUBS AND SPAS
KOPkit® #
K5VTC3
ACCEPTABLE FOR OUTDOOR USE
PUNTA GORDA.FL.USA
WARNING:
AVERTISSEMENT:

P1020014

P1020015


PASSED QC
TOSHIBA
TRANSISTOR INVERTER
VT130P9U412K
125kVA-125HP
(16)
INPUT
OUTPUT
U (V~)
3PH 380/480
3PH 380/480
F (Hz)
50/60
0 / 299
I (A)
163
156 (CF 2.5kHz)
Cu AWG 4/0
75°C
275/360 lb-in
31/41 Nm
Suitable for use on a circuit capable of delivering not more than 200000 rms symmetrical Amperes, 480 V maximum
Serial No. 150202853
Manufactured in USA from foreign and domestic components
UL Type 1 Enclosure
c UL US
LISTED 35U5
POW.CONV.EQ.
HOU
TOSHIBA INTERNATIONAL CORPORATION
HOUSTON, TEXAS

P1020017


P9
ADJUSTABLE SPEED DRIVE
TOSHIBA
TOSHIBA
DANGER
Risk of injury, electric shock or fire
DANGER

P1020018


INSTALLED BY
PEERLESS-MIDWEST, INC.
MISHAWAKA, INDIANA
PHONE 574-254-9050
PUMP SERIAL NUMBER

P1020019


60
HZ
1780
RPM
6212-J
PREMIUM EFFICIENCY HIGH THRUST MOTOR
U.S. ELECTRICAL MOTORS
DIVISION OF EMERSON ELECTRIC
ST. LOUIS, MO.

P1020020

P1020021


HORNER
INDUSTRIAL GROUP
www.HornerIndustrial.com
877.467.6372
PE
OPE
BRG. MFG.
NTN
BRG. TYPE
THRUST
BALL
BRG. NO.
7222
DATE
JOB NO.
89100
LOWER BRG
GREASE TYPE POLYREX
Premium Efficient
Inverter Suitable VT & 4:1 CT
422689
CATALOG#
MODEL#
BF66
LOWER END BRG
6212-J
UPPER END BRG
7222-BEM
FR
TYPE
ENCL
PH
MAX AMB
°C
ID#
INSUL CLASS
DUTY
WT
1110 LBS
BAL
HP
100
RPM
1785
SF
1.15
HZ
60
VOLTS
460
AMPS
MAX KVAR
NEMA NOM EFFICIENCY
95.4
OIL CAPACITY
LOWER END BRG
GREASE
PF
86.3
CODE
DES
QTS.
UPPER END BRG
QTS.
INVERTER DUTY
TORQUE
LB-FT
HZ RANGE
MAX RPM
AMPS
SF 1.0
INV. TYPE
460
V
MADE IN
USA
422707-005
EMERSON
EMERSON MOTOR COMPANY
ST. LOUIS, MO
US MOTORS

P1020022

P1020023

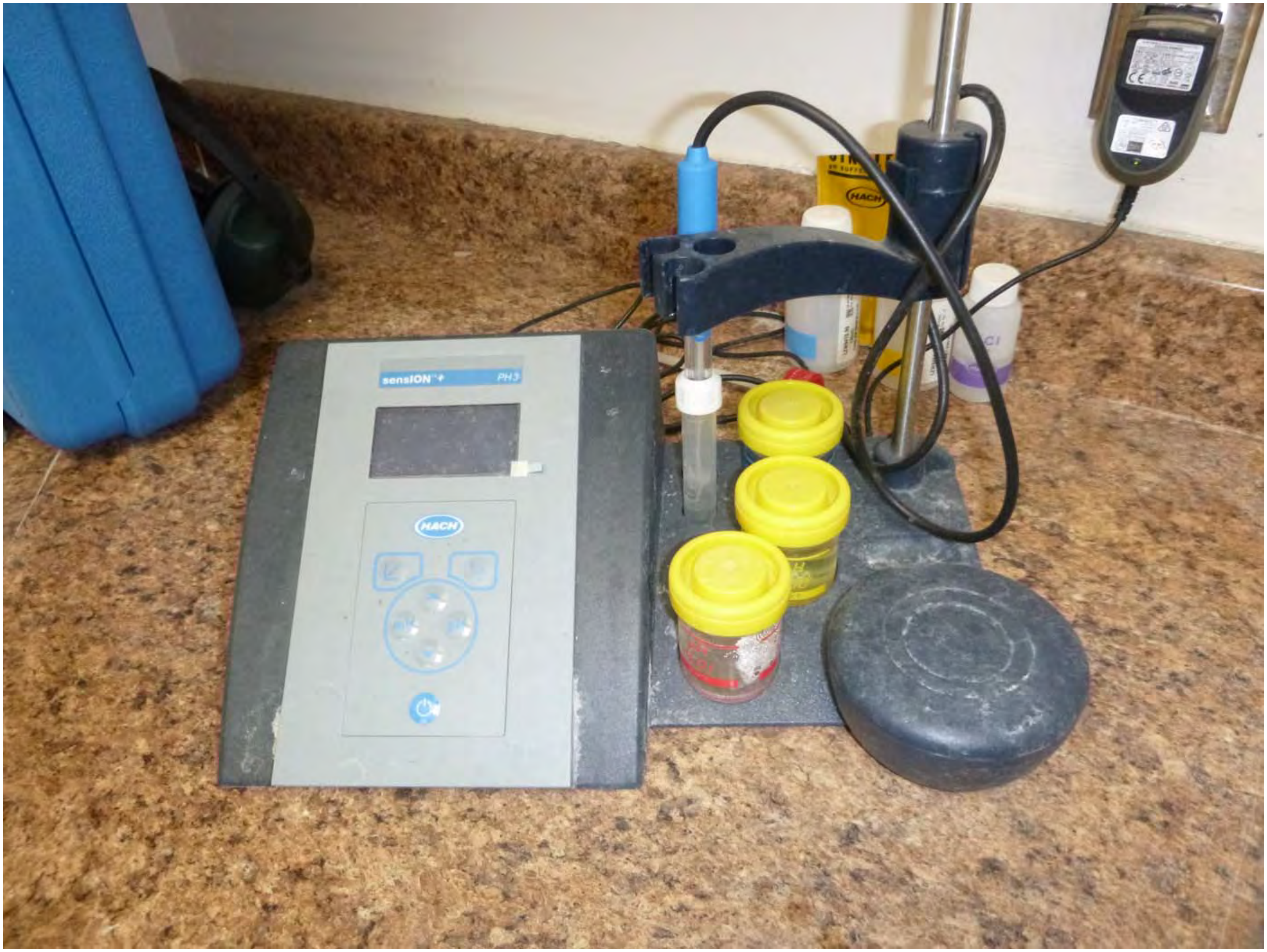

P9
ADJUSTABLE SPEED DRIVE
TOSHIBA
TOSHIBA
HAND/ AUTO
ESC
RUN
MODE
STOP RESET
DANGER
Risk of injury, electric shock or fire.
Read the instruction manual.
Do not open the cover while power is applied or within 5 minutes after removal of power.
Ensure proper earth connection.
DANGER
Risque de blessure, de choc électrique ou d'incendie.

P1020024


PASSED QC
TOSHIBA
TRANSISTOR INVERTER
VT130P9U410K
100kVA-100HP
(R15)
INPUT
OUTPUT
U (V~)
3PH 380/480
3PH 380/480
F (Hz)
50/60
I (A)
128
Cu AWG 2/0
75°C
275/360 lb-in
31/41 Nm
Suitable for use on a circuit capable of delivering not more than 200000 rms symmetrical Amperes, 480 V maximum
Serial No. 140502678
Manufactured in USA from foreign and domestic components
UL Type 1 Enclosure
HOU
TOSHIBA INTERNATIONAL CORPORATION
HOUSTON, TEXAS

P1020025

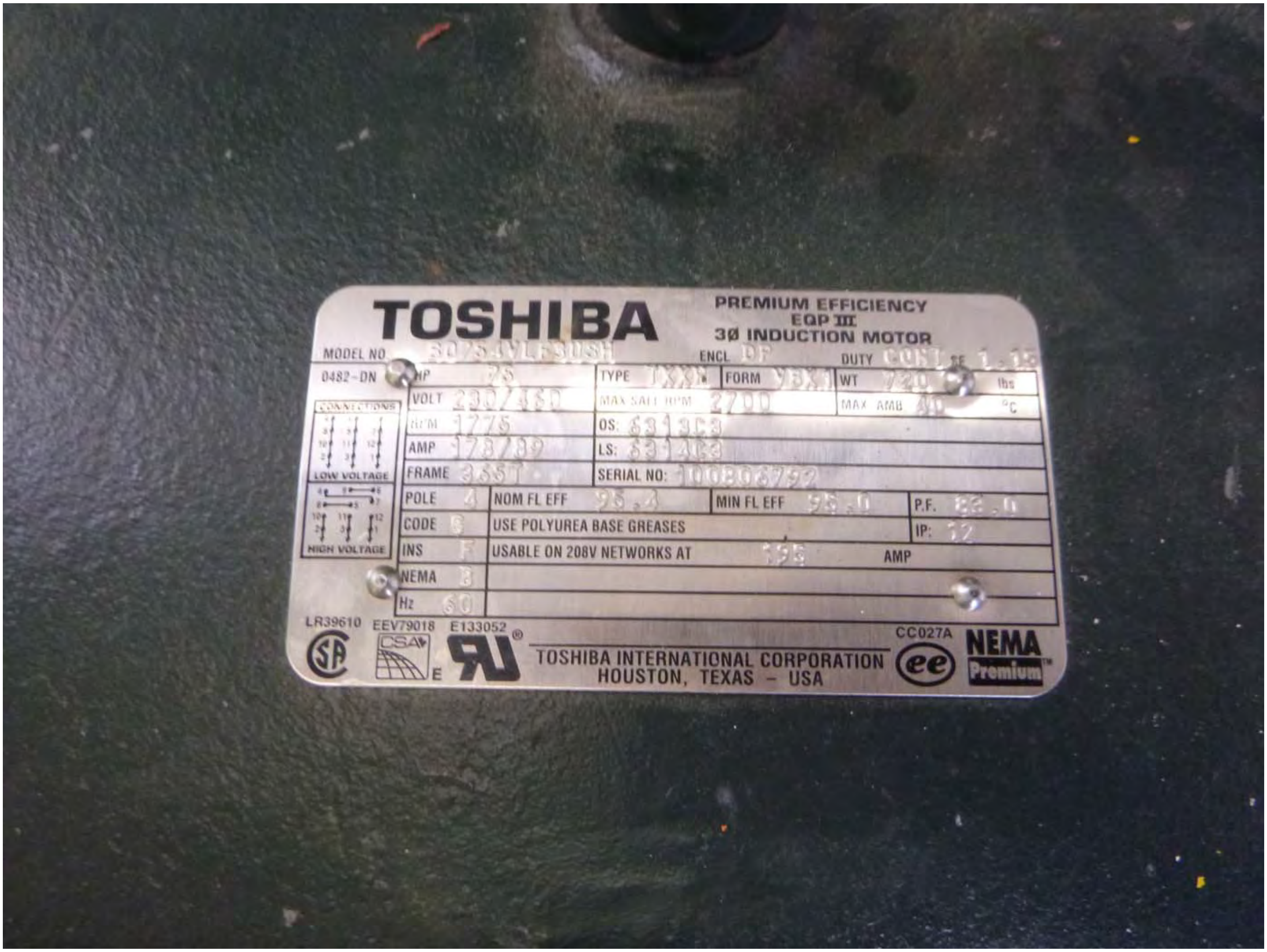
P1020026



P1020027

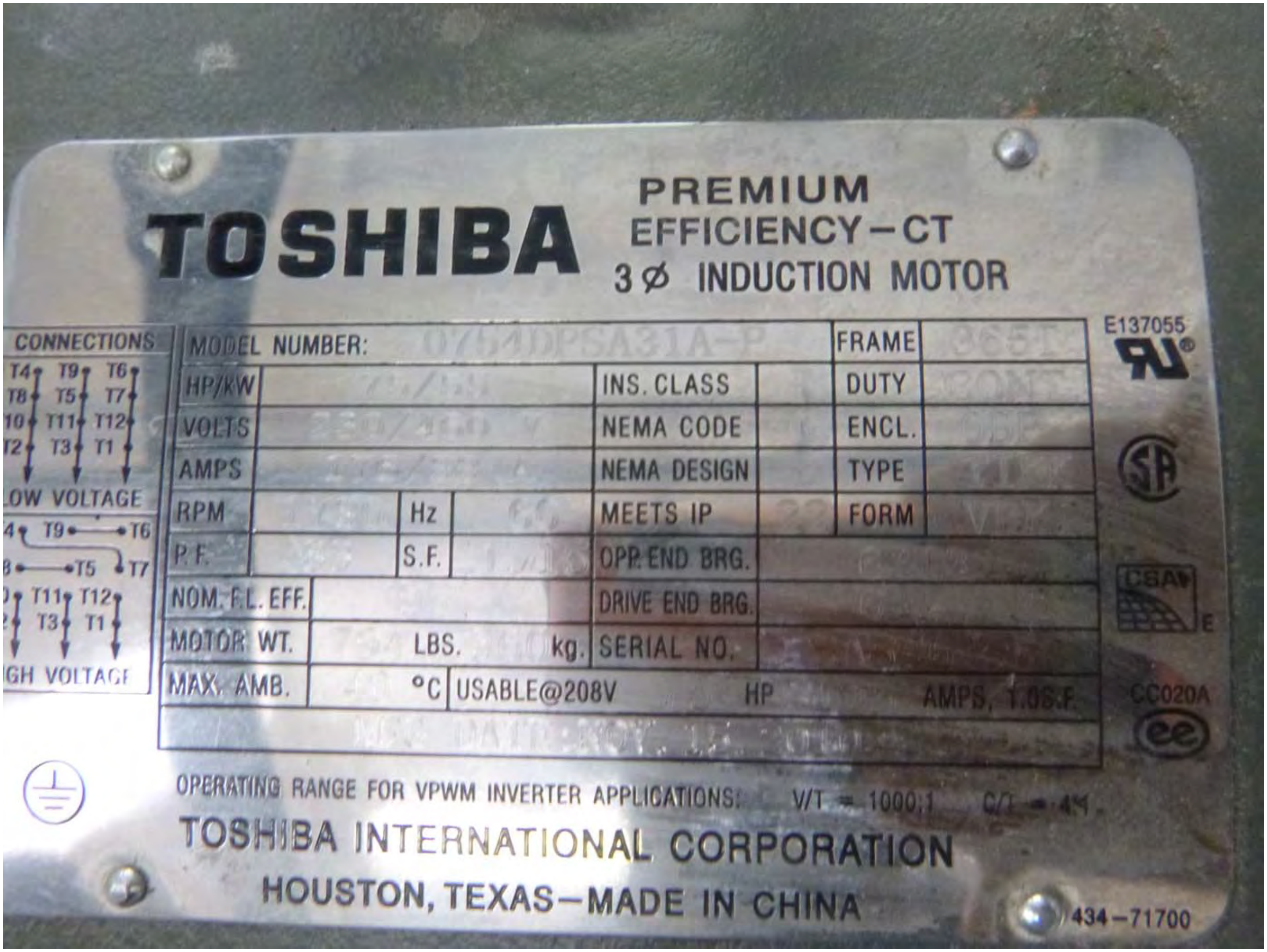

CLAMPS
for plastic pipe
and rubber hose
Solinst
Water Level Meter
Model 101
Battery
Test
Sensitivity
Off
CE
39267
Made in Canada
Georgetown, ON
BlueBook

P1020028


TOSHIBA
PREMIUM EFFICIENCY
EQP III
3Ø INDUCTION MOTOR
MODEL NO
ENCL
DUTY
0482-DN
HP
TYPE
FORM
WT
lbs
VOLT
MAX SAFE RPM
MAX AMB
°C
CONNECTIONS
LOW VOLTAGE
HIGH VOLTAGE
RPM
OS:
AMP
LS:
FRAME
SERIAL NO:
POLE
NOM FL EFF
MIN FL EFF
P.F.
CODE
USE POLYUREA BASE GREASES
IP:
INS
USABLE ON 208V NETWORKS AT
AMP
NEMA
Hz
LR39610
EEV79018
E133052
CC027A
TOSHIBA INTERNATIONAL CORPORATION
HOUSTON, TEXAS - USA
NEMA Premium

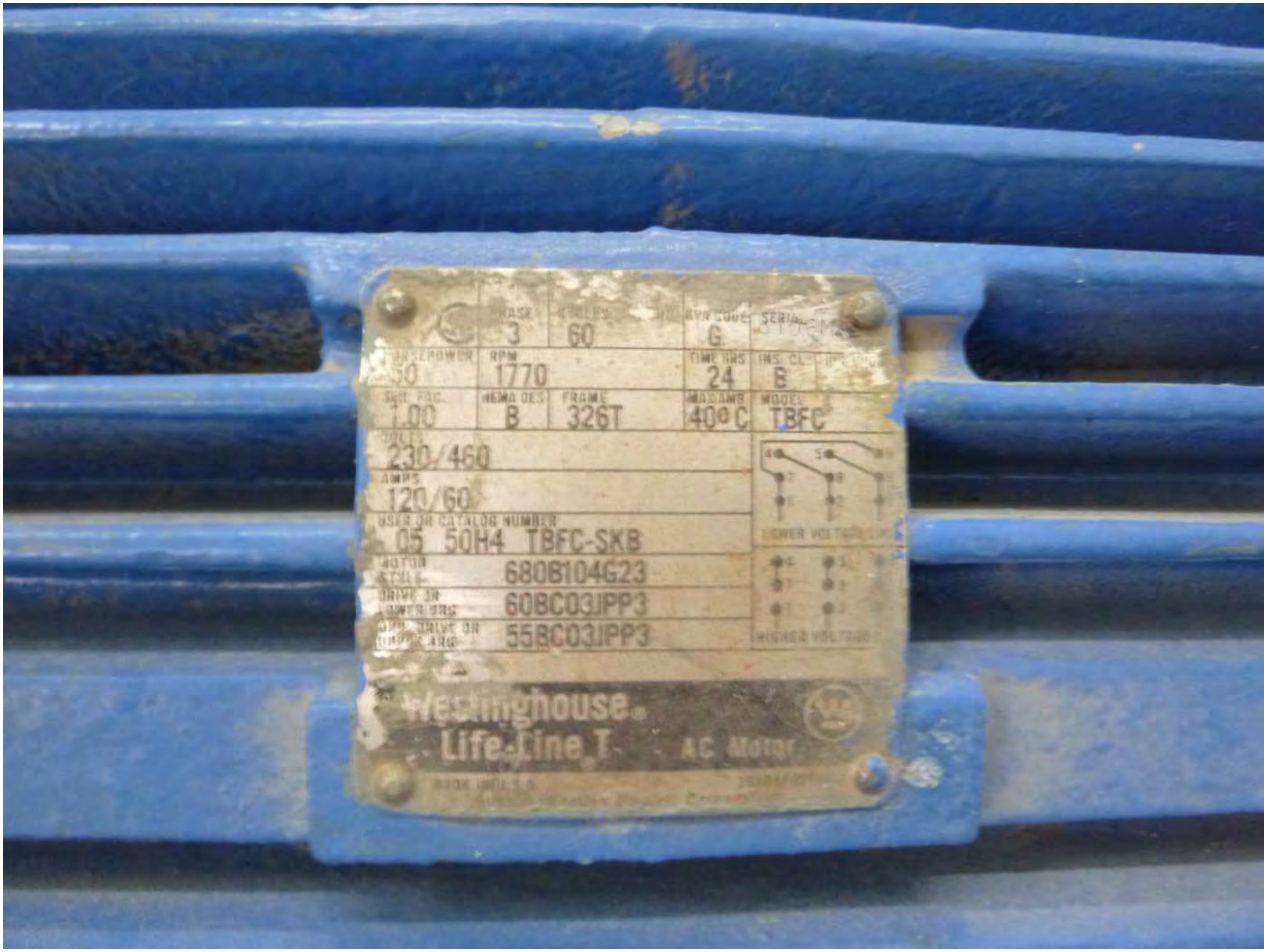
P1020029

P1020030


TOSHIBA
PREMIUM
EFFICIENCY-CT
3 Ø INDUCTION MOTOR
CONNECTIONS
LOW VOLTAGE
HIGH VOLTAGE
MODEL NUMBER:
0754DPSA31A-P
FRAME
HP/KW
INS. CLASS
DUTY
VOLTS
NEMA CODE
ENCL.
AMPS
NEMA DESIGN
TYPE
RPM
Hz
MEETS IP
FORM
P.F.
S.F.
OPP. END BRG.
NOM. F.L. EFF.
DRIVE END BRG.
MOTOR WT.
LBS.
kg.
SERIAL NO.
MAX. AMB.
°C
USABLE@208V
HP
AMPS, 1.0S.F.
E137055
CC020A
OPERATING RANGE FOR VPWM INVERTER APPLICATIONS:
V/T = 1000:1
TOSHIBA INTERNATIONAL CORPORATION
HOUSTON, TEXAS-MADE IN CHINA
434-71700

P1020032

P1020033


PHASE
3
CYCLES
60
CODE
G
SERIAL
HORSEPOWER
50
RPM
1770
TIME HRS
24
INS. CL.
B
SERV. FAC.
1.00
NEMA DES
B
FRAME
326T
MAX AMB
40°C
MODEL
TBFC
VOLTS
230/460
AMPS
120/60
USER OR CATALOG NUMBER
05 50H4 TBFC-SKB
MOTOR STYLE
680B104G23
608C03JPP3
558C03JPP3
LOWER VOLTAGE
HIGHER VOLTAGE
Westinghouse
Life-Line T
AC Motor

P1020034

P1020035


TOSHIBA
TRANSISTOR INVERTER
INPUT
OUTPUT
U (V~)
3PH 380/480
3PH 380/480
F (Hz)
50/60
I (A)
65
Suitable for use on a circuit capable of
symmetrical Amperes, 480 V maximum
Manufactured in USA
from foreign and domestic components
UL Type 1 Enclosure
c UL US
TOSHIBA INTERNATIONAL CORPORATION
HOUSTON, TEXAS

P1020036


H9 ADJUSTABLE SPEED DRIVE
TOSHIBA
TOSHIBA
CAUTION
DO NOT REACH INTO RUNNING EQUIPMENT

P1020037


PASSED
QC
TOSHIBA
TRANSISTOR INVERTER
VT130H9U4750 (14)
75KVA-75HP
INPUT
OUTPUT
F (Hz)
50/60
106
Suitable for use on a circuit capable of
delivering not more than 200000 rms
symmetrical Amperes, 480 V maximum
Serial No. 100500394
Manufactured in USA
from foreign and domestic components
UL Type 1 Enclosure
HOU
TOSHIBA INTERNATIONAL CORPORATION
HOUSTON, TEXAS

P1020038

P1020039

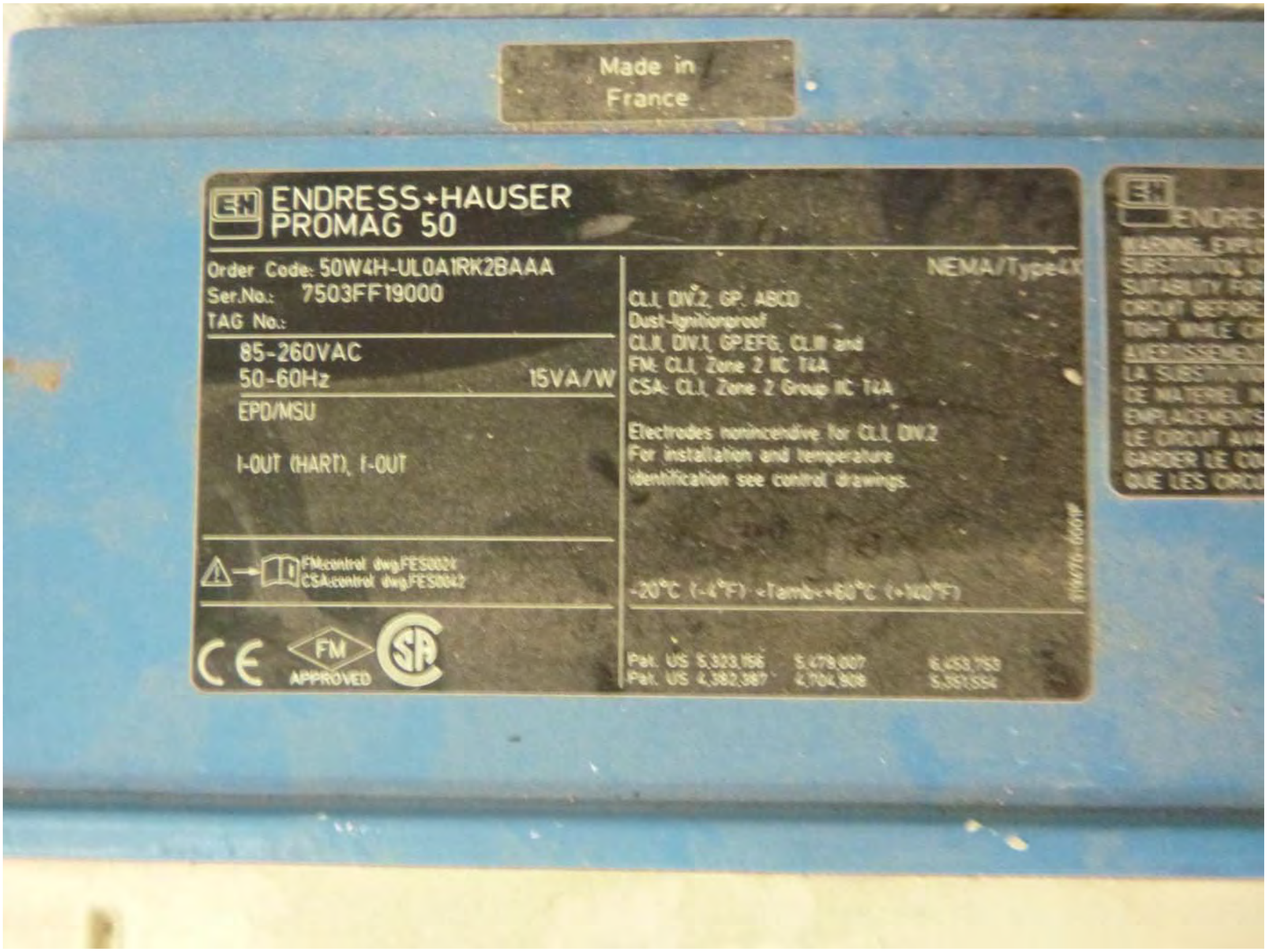

PASSED QC
TOSHIBA
TRANSISTOR INVERTER
VT130P9U4750
75kVA-75HP
(R14)
INPUT
OUTPUT
U (V~)
3PH 380/480
3PH 380/480
F (Hz)
50/60
0 / 299
I (A)
106
96 (CF 4kHz)
Cu AWG 1/0
75°C
275/360 lb-in
31/41 Nm
Suitable for use on a circuit capable of delivering not more than 200000 rms symmetrical Amperes, 480 V maximum
Serial No. 130400100
Manufactured in USA from foreign and domestic components
UL Type 1 Enclosure
c UL us
LISTED 35U5
POW.CONV.EQ.
HOU
TOSHIBA INTERNATIONAL CORPORATION
HOUSTON, TEXAS

P1020040

P1020041


7503FF19000
1358761
Certificate(s):
Protection: NEMA/Type6P
Esc
E

P1020043


Made in
France
ENDRESS+HAUSER
PROMAG 50
Order Code: 50W4H-UL0A1RK2BAAA
Ser.No.: 7503FF19000
TAG No.:
85-260VAC
50-60Hz
15VA/W
EPD/MSU
I-OUT (HART), f-OUT
FM:control dwg.FES0024
CSA:control dwg.FES0042
CE
FM
APPROVED
NEMA/Type4X
CL.I, DIV.2, GP. ABCD
Dust-Ignitionproof
CL.II, DIV.1, GP.EFG, CL.III and
FM: CL.I, Zone 2 IIC T4A
CSA: CL.I, Zone 2 Group IIC T4A
Electrodes nonincendive for CL.I, DIV.2
For installation and temperature
identification see control drawings.
-20°C (-4°F) <Tamb<+60°C (+140°F)
Pat. US 5,323,156 5,479,007 6,453,753
Pat. US 4,382,387 4,704,908 5,351,554

P1020044

P1020045

P1020046


Factory Trained
EGSA Certified
Technicians
Generators
Paralleling Systems
Transfer Switches
Engine Controls
Battery Systems
800-338-1989
W.W.Williams
onsite energy
EMERSON
ASCO 7000
PELIGRO
DANGER

P1020047


ASCO Services 24-Hour Support
Site / Location ID
Model / Catalog No.
CATALOG NO. J7ADTSA30260N5XC
ITEM 856518
AMPS 260 A
VOLTS 480V 50 – 60HZ
Tag No. / Instance No.
Serial / Job No.
SERIAL NO. 1065654 RE
SALES ORDER 1421177
For Service / Support / Maintenance Programs:
1-800-800-ASCO (2726)
For outside the U.S. +1-973-360-3600
www.ascoservices.com
EMERSON
Network Power
PELIGRO
DANGER

P1020048


HACH
sc200
CL2 GATEWAY
2.539
CL2
mg/l
11:05:45 AM
11-20-2015
TEMP 61.4°F
menu
home
back
enter
SD
EXIT

P1020049


Rated Class 1 Division 2 Groups A,B,C,D,T4
Class1 Zone 2, Group IIC,T4
HACH
Model SC200
LXV404.99.00552
Hach Co.
5600 Lindbergh Dr
Loveland, CO
80538
General Purpose Analyzer
Enclosure Type NEMA 4X
Electrical Ratings
Supply 100-240 VAC +/- 10%, 50/60 Hz
50 VA with 7 W Probe Load, 60°C Max Ambient
100 VA with 28 W Probe Load, 50°C Max Ambient
Relay Output Ratings
100-240 VAC, 5 A Max
29/07/11
Serial Number 1107C0017263
MADE IN CHINA

P1020050

P1020051


9180500
AMPEROMETRIC GATEWAY
HACH
MADE IN USA
S/N 1108700006179
A N'UTILISER
LE CAPTEUR

P1020052

P1020053

P1020054

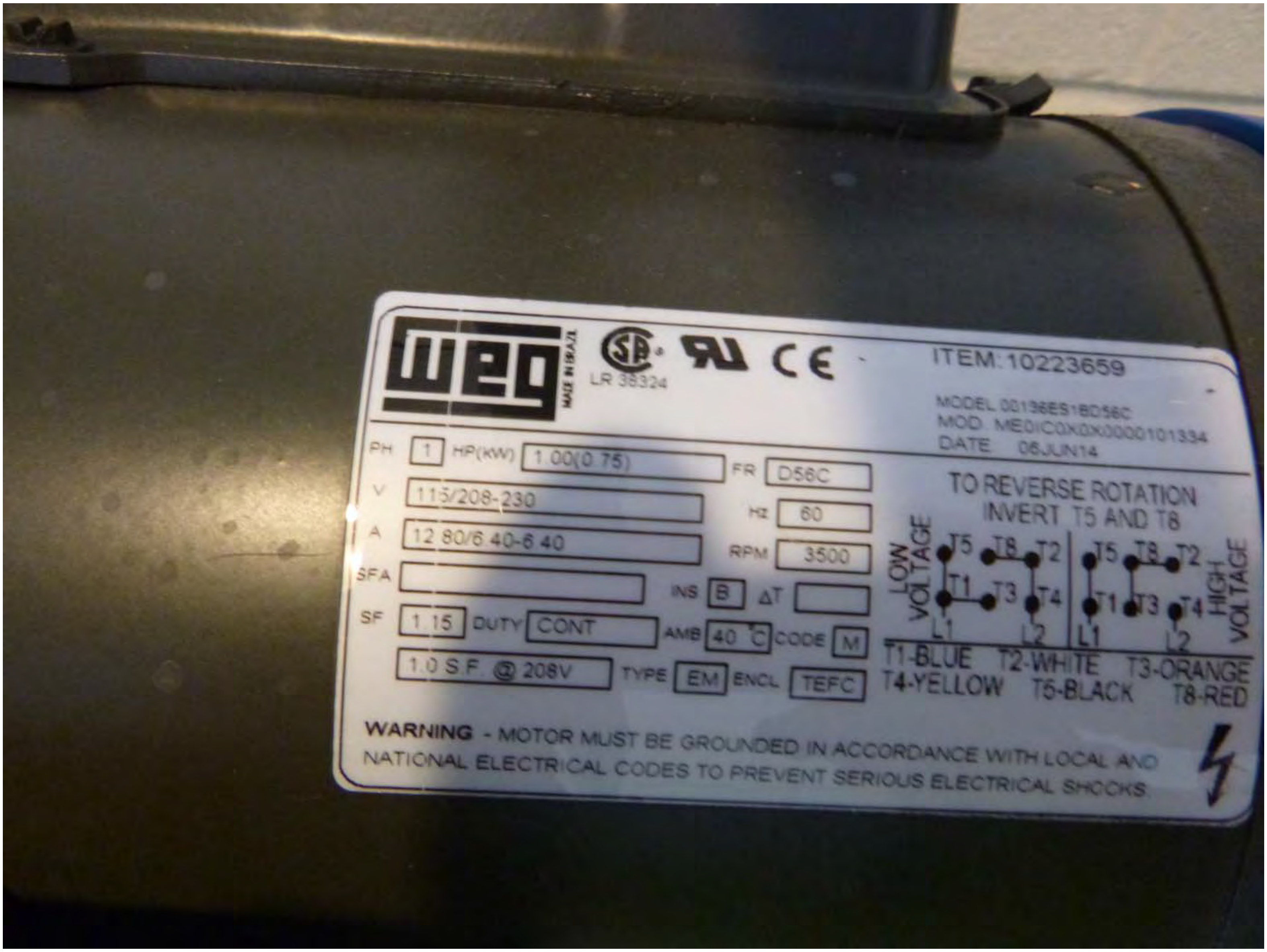

100-240V 50/60Hz
190VA
Intertek
IP66
WATSON
MARLOW
Pumps
Watson-Marlow Limited
Falmouth, Cornwall
TR11 4RU, UK
Tel +44 (0)1326 370370
www.wmpg.com
A Spirax-Sarco Engineering Company
0M0.224L.GLA
QDOS UNIV 30L/HR 7BAR
180GPD 100PSI SANT SILCC
0072393

P1020055


NEPTUNE
CHEMICAL PUMP CO.
TYPE 63
115 V
60 Hz
1.62 A
1550 RPM
Cust P/N 100783
Motor Must Be Grounded
LR6319
Assembled in Mexico

P1020056

P1020057



MADE IN BRAZIL
LR 38324
ITEM: 10223659
MODEL 00136ES1BD56C
MOD. ME0IC0X0X0000101334
DATE 06JUN14
PH 1 HP(kW) 1.00(0.75) FR D56C
V 115/208-230 Hz 60
A 12.80/6.40-6.40 RPM 3500
SFA INS B ΔT
SF 1.15 DUTY CONT AMB 40 °C CODE M
1.0 S.F. @ 208V TYPE EM ENCL TEFC
TO REVERSE ROTATION INVERT T5 AND T8
LOW VOLTAGE
HIGH VOLTAGE
T1-BLUE T2-WHITE T3-ORANGE
T4-YELLOW T5-BLACK T8-RED
WARNING - MOTOR MUST BE GROUNDED IN ACCORDANCE WITH LOCAL AND NATIONAL ELECTRICAL CODES TO PREVENT SERIOUS ELECTRICAL SHOCKS

P1020058

P1020059


FINISH THOMPSON, INC.
fti
921 Greengarden Road * Erie, PA 16501-1591 U.S.A.
Ph 814-455-4478 * Fax 814-455-8518
Model: SP10P-3-M218
S/N: 132430 J14
IMP DIA: 3.75

P1020060


NORD
E 191510
189340
Type SK 71L/4 CUS
3~Mot.
No. 32711502
19963788
INS F
NEMA
IP55
S1
AMB+40
C°
TEFC
DP
60 Hz
230/460
V YY/Y
Hz
V
1,90/0,95
A
0,50
HP
A
0,37
kW
PF 0,69
1720
rpm
PF
rpm
EFF 61,4%
CODE F
EFF
CODE
SF 1,15
ISF
A
SF
ISF
A
V YY/Y
V
A
SF
A
SF
nord.com

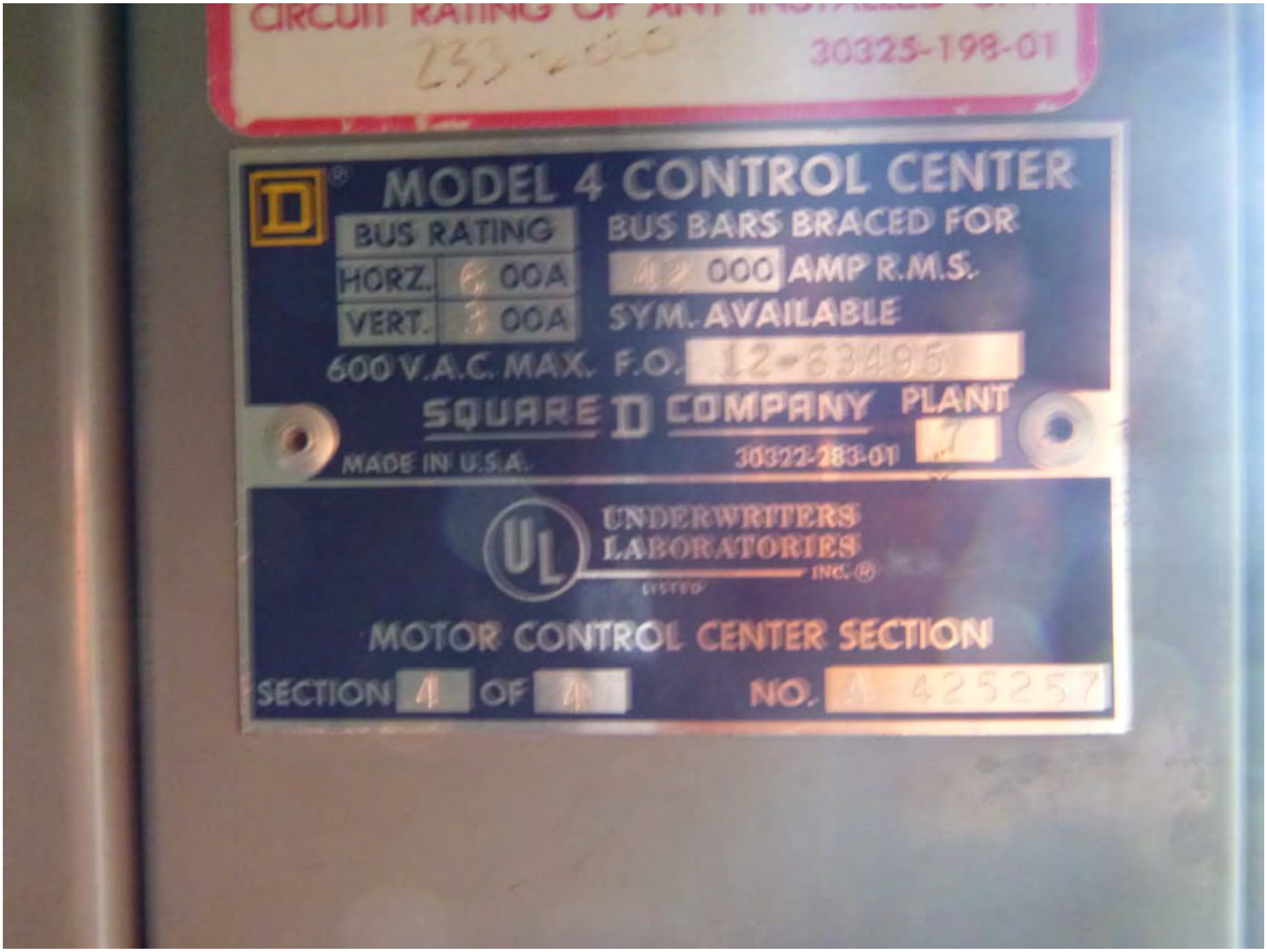
P1020062


NORD DRIVESYSTEMS
Type SK 02XF-71L/4 CUS
S1
No.201524477-100
21102341
102
lb-in
5.57
Pos M1
0.50
hp
309
rpm
33
MOBIL 600 XP220 0.21 qt
www.nord.com

P1020063

P1020064

P1020065



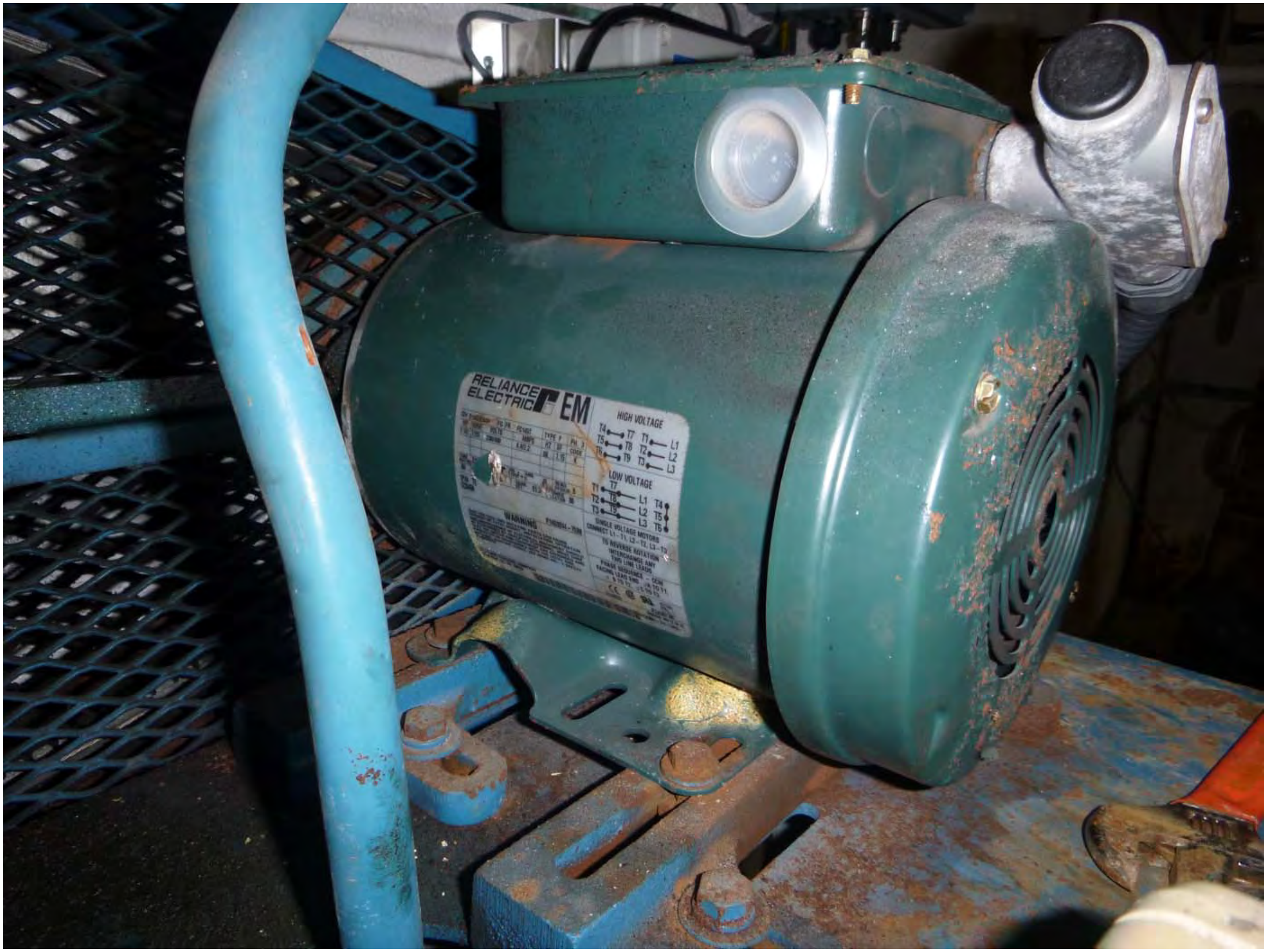
CIRCUIT RATING OF ANY INSTALLED
233-2000
30325-198-01
MODEL 4 CONTROL CENTER
BUS RATING
HORZ. 600A
VERT. 300A
BUS BARS BRACED FOR
42 000 AMP R.M.S.
SYM. AVAILABLE
600 V.A.C. MAX. F.O. 12-63495
SQUARE D COMPANY
PLANT 7
MADE IN U.S.A.
30322-283-01
UNDERWRITERS LABORATORIES INC.
LISTED
MOTOR CONTROL CENTER SECTION
SECTION 4 OF 4
NO. A 425257

P1020066

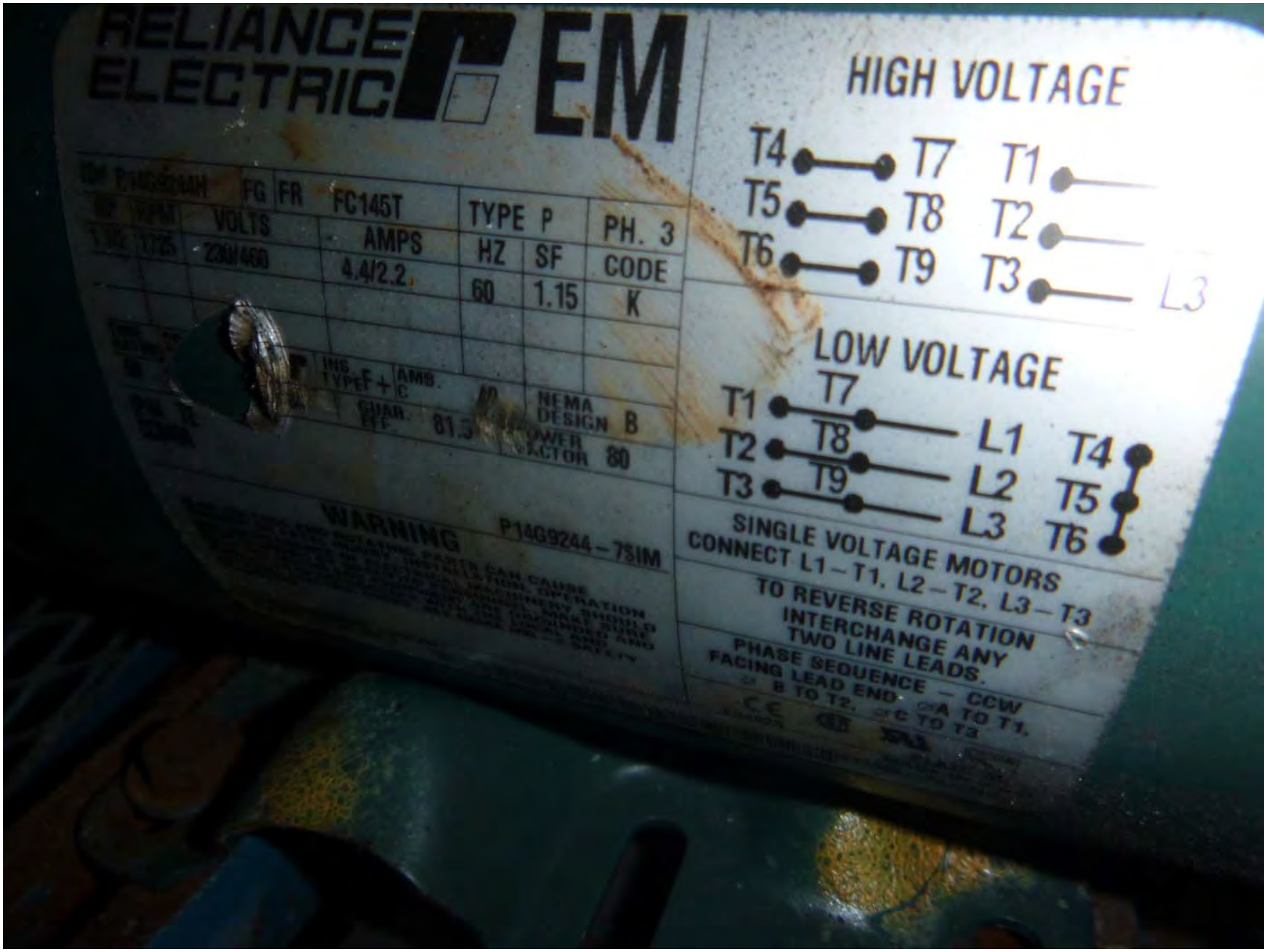
P1020067


JINCY COMPRESSOR DI
COLT INDUSTRIES
FILTER NO 110377F075
ELEMENT NO 110377E075
DANGER
MODEL
SERIAL NO
SIZE
Quincy

P1020068



P1020069


RELIANCE ELECTRIC
EM
HIGH VOLTAGE
T4 T7 T1
T5 T8 T2
T6 T9 T3 L3
FC145T
TYPE P
PH. 3
VOLTS
230/460
AMPS
4.4/2.2
HZ
SF
CODE
60
1.15
K
INS TYPE F+
NEMA DESIGN B
81.5
POWER FACTOR 80
WARNING
P14G9244-7SIM
LOW VOLTAGE
T1 T7 L1 T4
T2 T8 L2 T5
T3 T9 L3 T6
SINGLE VOLTAGE MOTORS
CONNECT L1-T1, L2-T2, L3-T3
TO REVERSE ROTATION
INTERCHANGE ANY
TWO LINE LEADS.
PHASE SEQUENCE - CCW
FACING LEAD END

P1020070


HACH
sc200
CL2 GATEWAY
CL2
2.19ppm
02:20:48 PM
20-11-2015
OUT1: 7.50mA;OUT2: 4.00mA
menu
home
back
enter
9180600
AMPEROMETRIC PANEL - ENGLISH
MADE IN USA
S/N 150545002956

P1020071


Conforms to:
UL STD 61010-1
FM STD's 3600 & 3611
Certified to:
CAN/CSA STD 22.2
No.61010-1 & No.213M1987
Intertek
3054010
Rated: Class 1 Division 2 Groups A,B,C,D,T4
Class 1 Zone 2, Group IIC,T4
HACH
Model sc200
LXV404.99.00552
Loveland, CO
80538
General Purpose Analyzer
NEMA 4X
ELECTRICAL RATINGS:
SUPPLY 100-240 VAC +/- 10%, 50/60 Hz
50VA with 7W Probe Load, 60°C Max Ambient
100VA with 28W Probe Load, 50°C Max Ambient
Relay Output Ratings: 100-240 VAC, 5A Max
MSIP-REM
-HAH-
SC200
30/04/15
Serial Number 1504C0145688
Country of Origin CHINA

P1020072

P1020073


9180500
AMPEROMETRIC GATEWAY
HACH
MADE IN USA
S/N 1505450002956
INSPECTED
NT
A N'UTILISER QU'AVEC
LE CAPTEUR CHLORE

P1020074


WATSON-MARLOW
59.0
MENU
INFO
MAX
MODE
WATSON MARLOW
qdos30
UNIVERSAL

P1020075


100-240V 50/60Hz
190VA
N27364
IP66
Intertek
Warranty void if serial number label removed
WATSON MARLOW Pumps
Watson-Marlow Limited
Falmouth, Cornwall
TR11 4RU, UK
www.wmpg.com
0M0.224L.GLA Iss: 4
QDOS UNIV 30L/HR 7BAR
190GPD 100PSI SANT SILICO
0040513

P1020076

Model: T31P
OHAUS CORPORATION, USA
www.ohaus.com
Assembled in China
Power Supply: 9 - 12 V ⎓ 0.5A
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.
N13123
LISTED
Weighing Indicator I.T.E. E2940
Factory ID:A

P1020077


DEFENDER 3000
1050.5
lb
OHAUS
CALIBRATION MODE
PCS
NET
TARE
On/Zero
Off
Yes
Print
Units
No
Function
Mode
Back
Tare
Menu
Exit

P1020078

P1020079


PROMAG 50
Endress+Hauser
Order Code: 50W4H-ULGA1RK5BAAA
Ser.No.: FA086D16000
TAG No.:
85-260VAC
15VA/W 50-60Hz
I-OUT (HART), f-OUT
NEMA/Type4X
CL.I, DIV.2, GP. ABCD
Dust-Ignitionproof
CL.II, DIV.1, GP.EFG, CL.III and
FM: CL.I, Zone 2 IIC T4A
CSA: CL.I, Zone 2 Group IIC T4A
-20°C (-4°F) <Tamb<+60°C (+140°F)
Pat. US 5,323,156 5,479,007 6,453,753
Pat. US 4,382,387 4,704,908 5,351,554
FM APPROVED
WARNING: EXPLOSION HAZARD.
SUBSTITUTION OF COMPONENTS MAY
IMPAIR SUITABILITY FOR CLASS I,
DIVISION 2. OPEN CIRCUIT BEFORE REMOVING COVER. LR 82598
KEEP COVER TIGHT WHILE CIRCUITS ARE ALIVE.
AVERTISSEMENT: RISQUE D'EXPLOSION.
LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE
CE MATERIEL INACCEPTABLE POUR LES
EMPLACEMENTS DE CLASSE I, DIVISION 2. OUVRIR
LE CIRCUIT AVANT D'ENLEVER LE COUVERCLE.
GARDER LE COUVERCLE BIEN FERME TANT
QUE LES CIRCUITS SONT SOUS TENSION.

P1020080

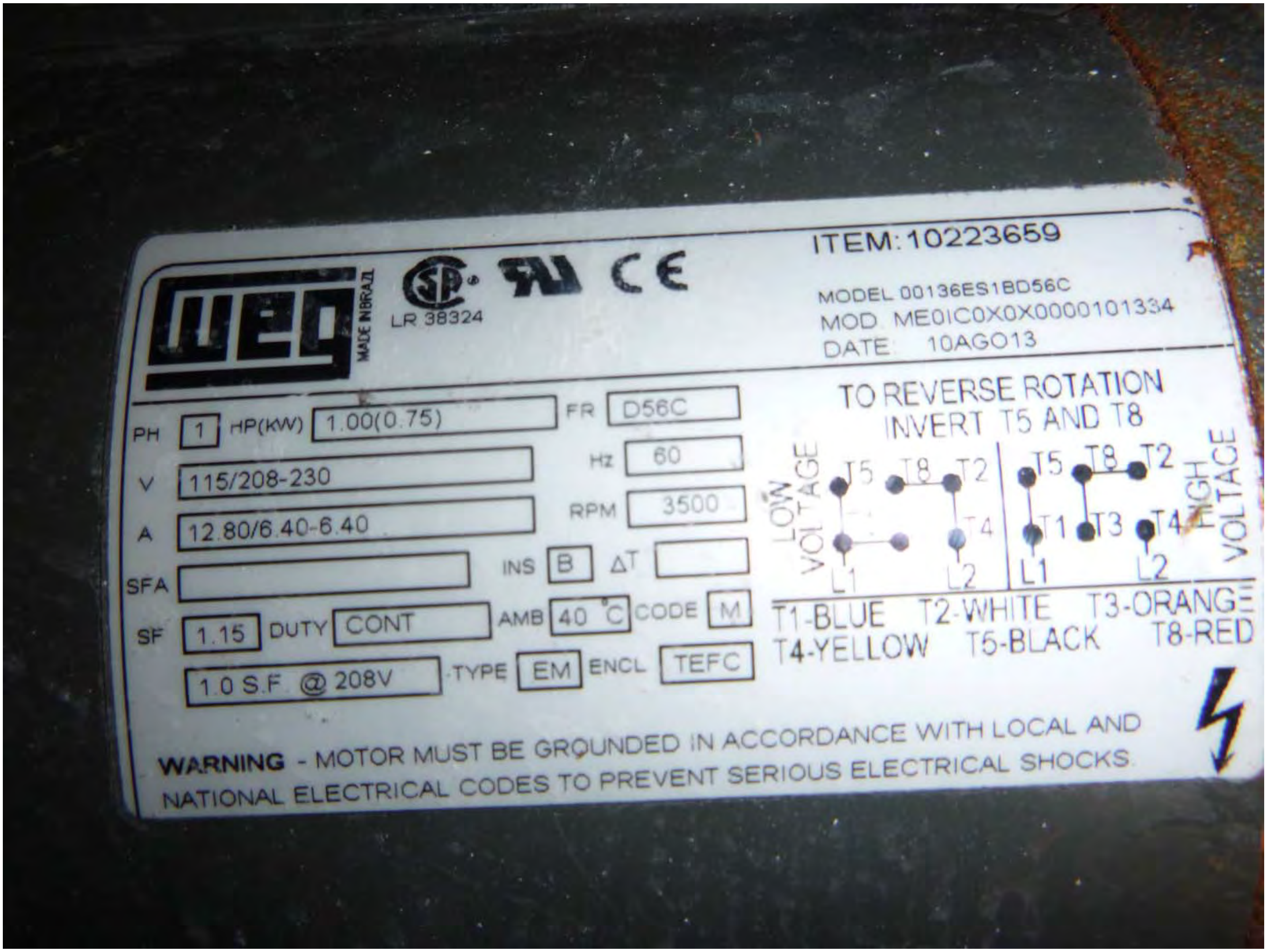
P1020081


Assembled in USA.
Greenwood, In.
Endress+Hauser
Prosonic S
Order code: FMU90-R11CA232AA1A
Ser. no.: K30010150E6
90...253 V AC
50/60 Hz 23 VA
4...20 mA HART
IP66 / NEMA4X
Patents
X = if modification see sep. label
N12895

P1020082

P1020083

P1020084


ITEM: 10223659
WEG MADE IN BRAZIL
LR 38324
MODEL 00136ES1BD56C
MOD. ME0IC0X0X0000101334
DATE 10AGO13
PH 1 HP(KW) 1.00(0.75) FR D56C
V 115/208-230 Hz 60
A 12.80/6.40-6.40 RPM 3500
SFA INS B ΔT
SF 1.15 DUTY CONT AMB 40 °C CODE M
1.0 S.F. @ 208V TYPE EM ENCL TEFC
TO REVERSE ROTATION INVERT T5 AND T8
LOW VOLTAGE
T5 T8 T2 T4 L1 L2
HIGH VOLTAGE
T5 T8 T2 T1 T3 T4 L1 L2
T1-BLUE T2-WHITE T3-ORANGE
T4-YELLOW T5-BLACK T8-RED
WARNING - MOTOR MUST BE GROUNDED IN ACCORDANCE WITH LOCAL AND NATIONAL ELECTRICAL CODES TO PREVENT SERIOUS ELECTRICAL SHOCKS.

P1020085

P1020086


fti
FINISH THOMPSON, INC.
921 Greengarden Road · Erie, PA
Ph 814-455-4478 · Fax
Model: SP10P-3-M218
S/N: 123073 A14
IMP DIA: 3.75

P1020087


Dayton
INDUSTRIAL MOTOR
E47479
247903
HP 1/2
HZ 60
PH 1
CODE M
SF 1.15
FR 56
ENCL TEFC
OSE BALL
GROUND
J10 BLACK
T4 YELLOW
T8 RED
T2 WHITE
T3 ORANGE
T1 BLUE
PERMANENTLY LUBRICATED BALL BEARINGS,
RELUBRICATION NOT REQUIRED

P1020088

P1020095


MODEL #
TYPE
ENCL
BAL
HZ
RPM
SF
NEMA NOM EFFICIENCY
CODE
DES
QTS.
AMPS
INVERTER DUTY
TORQUE
HZ RANGE
MAX RPM
INV TYPE
EMERSON MOTOR COMPANY
ST. LOUIS, MO.
EMERSON
Premium Efficient

P1020096

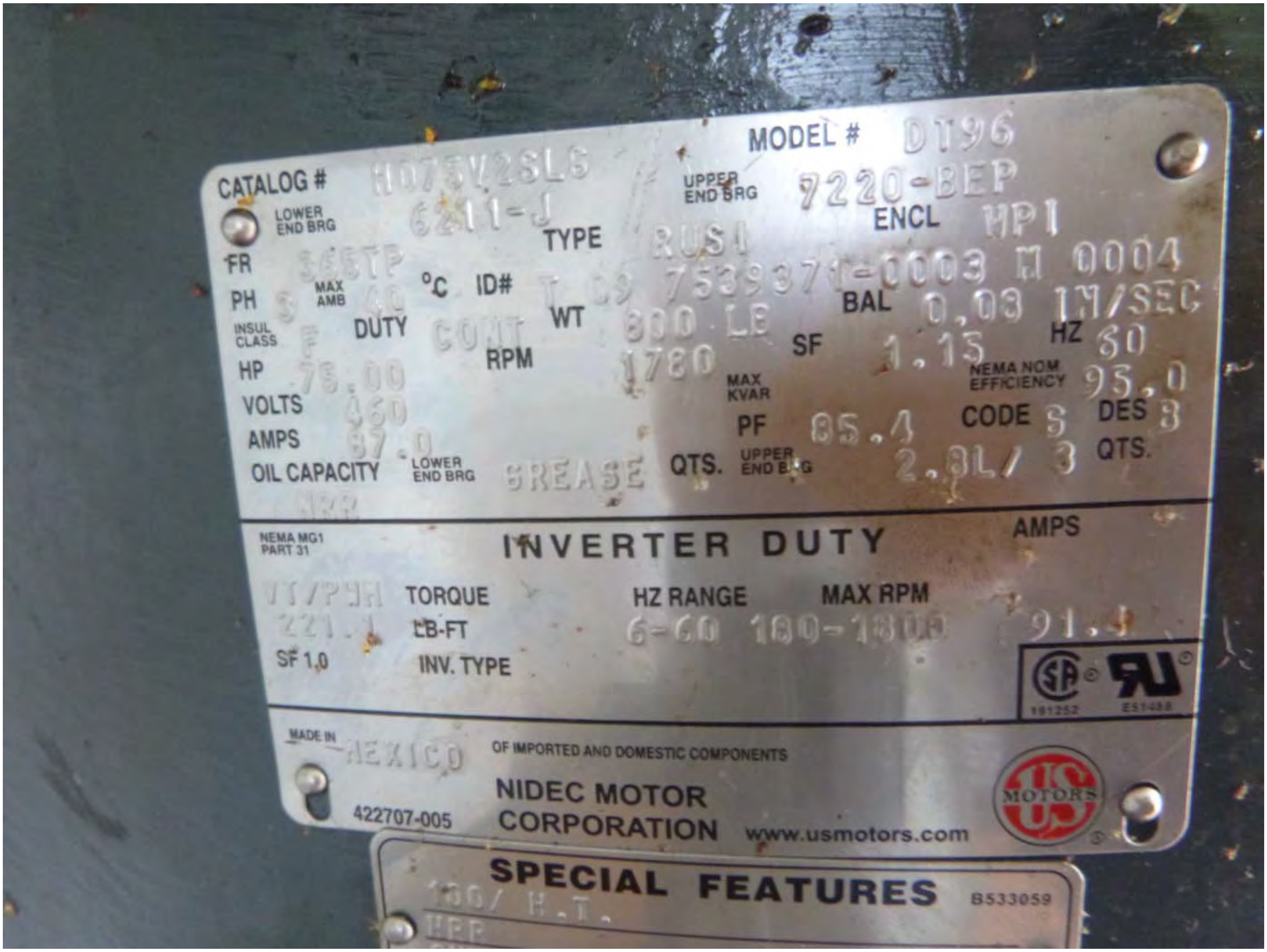

CATALOG #
MODEL #
FR
TYPE
ENCL
PH
°C
ID#
DUTY
WT
BAL
HP
RPM
SF
HZ
VOLTS
CODE
DES
AMPS
PF
OIL CAPACITY
QTS.
INVERTER DUTY
NEMA MG1 PART 31
TORQUE
LB-FT
HZ RANGE
MAX RPM
SF 1.0
INV. TYPE
MADE IN
EMERSON MOTOR COMPANY
ST. LOUIS, MO.
422707-005
EMERSON
Premium Efficient
Inverter Suitable VT & 4:1 CT

P1020097

P1020098


PASSED
QC
TOSHIBA
TRANSISTOR INVERTER
VT130P9U4750
75kVA-75HP
(9)
INPUT
OUTPUT
U (V~)
3PH 380/480
3PH 380/480
F (Hz)
50/60
0 / 299
I (A)
106
96
(CF 4kHz)
Cu AWG 1/0
75°C
275/360 lb-in
31/41 Nm
Suitable for use on a circuit capable of
delivering not more than 200000 rms
symmetrical Amperes, 480 V maximum
Serial No. 120901217
Manufactured in USA
from foreign and domestic components
UL Type 1 Enclosure
LISTED 35U5
POW.CONV.EQ.
HOU
TOSHIBA INTERNATIONAL CORPORATION
HOUSTON, TEXAS

P1020099



P1020100

P1020101


INSTALLED BY
PEERLESS-MIDWEST, INC.
MISHAWAKA, INDIANA
PHONE 574-254-9050
PUMP SERIAL NUMBER
298350A1

P1020102

P1020103


Solinst
Water Level Meter
Model 101
Sensitivity
Off
Battery Test
Solinst Canada Ltd.
http://www.solinst.com
Made in Canada
Georgetown, ON

P1020104

P1020105


WELL SERVICE AIR VALVE 102WS
SIZE IN. CWP P.S.I. YR. 04
VAL-MATIC®
U.S. PATENT 5,769,429
ELMHURST, IL
UL
LISTED 28WL

P1020106


VAL-MATIC® CORP.
ELMHURST, IL.
DUAL PORT THROTTLING DEVICE
R5DPT-57
U.S. PAT. 5,765,595

P1020107


SPECIAL FEATURES
SHAFT GROUNDING
RING INSTALLED
INTERNALLY
B533059
CATALOG # H0100V2SLG
MODEL # DT79
LOWER END BRG 6212-J
UPPER END BRG 7222-BEM
FR 404TP
TYPE RUSI
ENCL WPI
PH 3
MAX AMB 40 °C
ID# U 12 7579029-0001 R 00 02
INSUL CLASS F
DUTY CONT
WT 1110 LBS
BAL 0.08 IPS
HP 100
RPM 1785
SF 1.15
HZ 60
VOLTS 460
MAX KVAR
NEMA NOM EFFICIENCY 95.4
AMPS 114
PF 86.3
CODE G
DES B
OIL CAPACITY
LOWER END BRG GREASE
QTS.
UPPER END BRG
QTS.
NEMA MG1 PART 31
INVERTER DUTY
AMPS
460V
VT
TORQUE
HZ RANGE
MAX RPM
LB-FT
6-60
SF 1.0
INV. TYPE
MADE IN
OF IMPORTED AND DOMESTIC COMPONENTS
NIDEC MOTOR CORPORATION
www.usmotors.com
422707-005
MOTORS

P1020108

P1020109

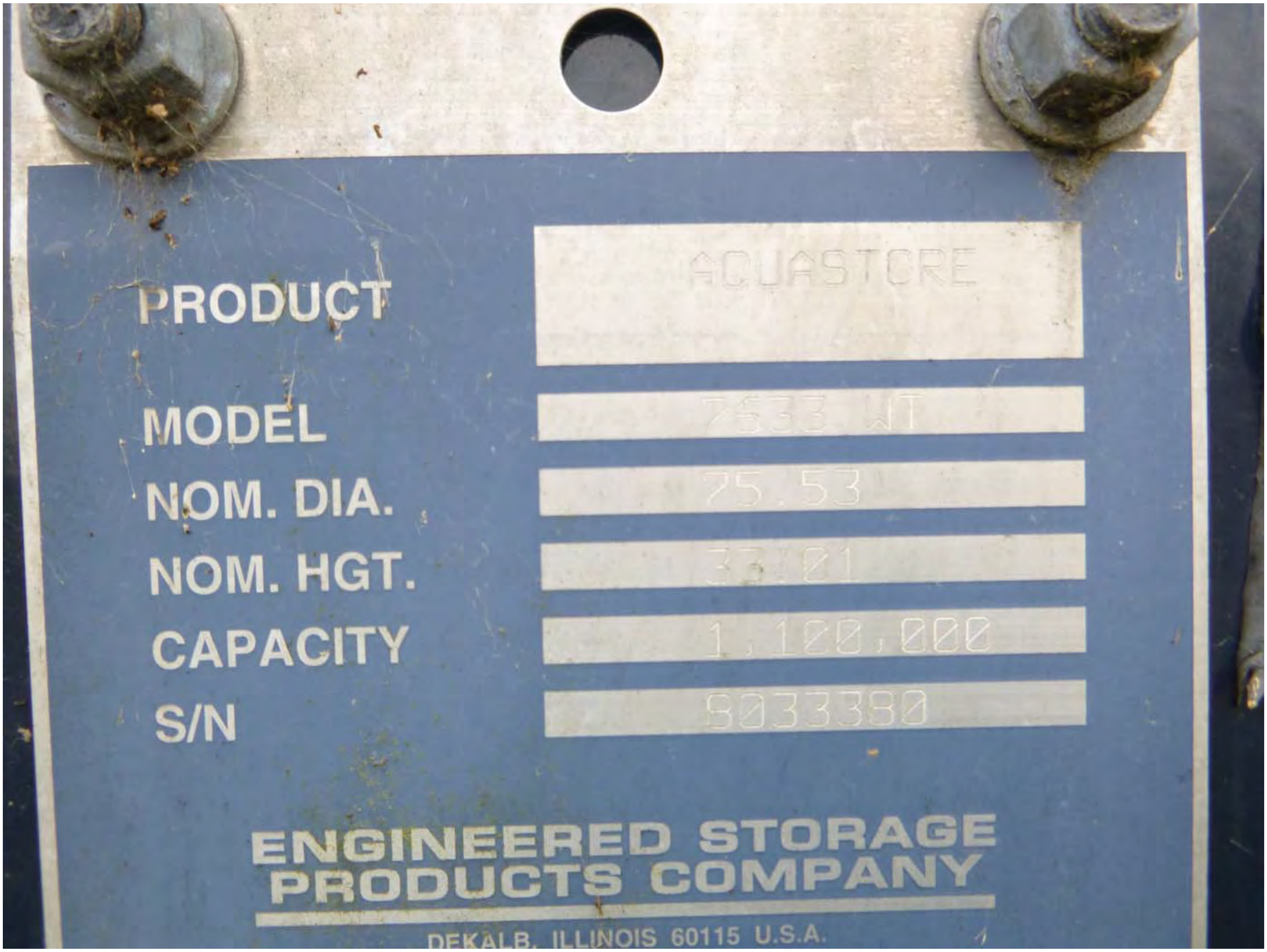
P1020110


MANUFACTURED BY
SIMMONS
PUMP CORPORATION
LUBBOCK, TEXAS
ROTATION
BOWL MODEL
SERIAL NUMBER

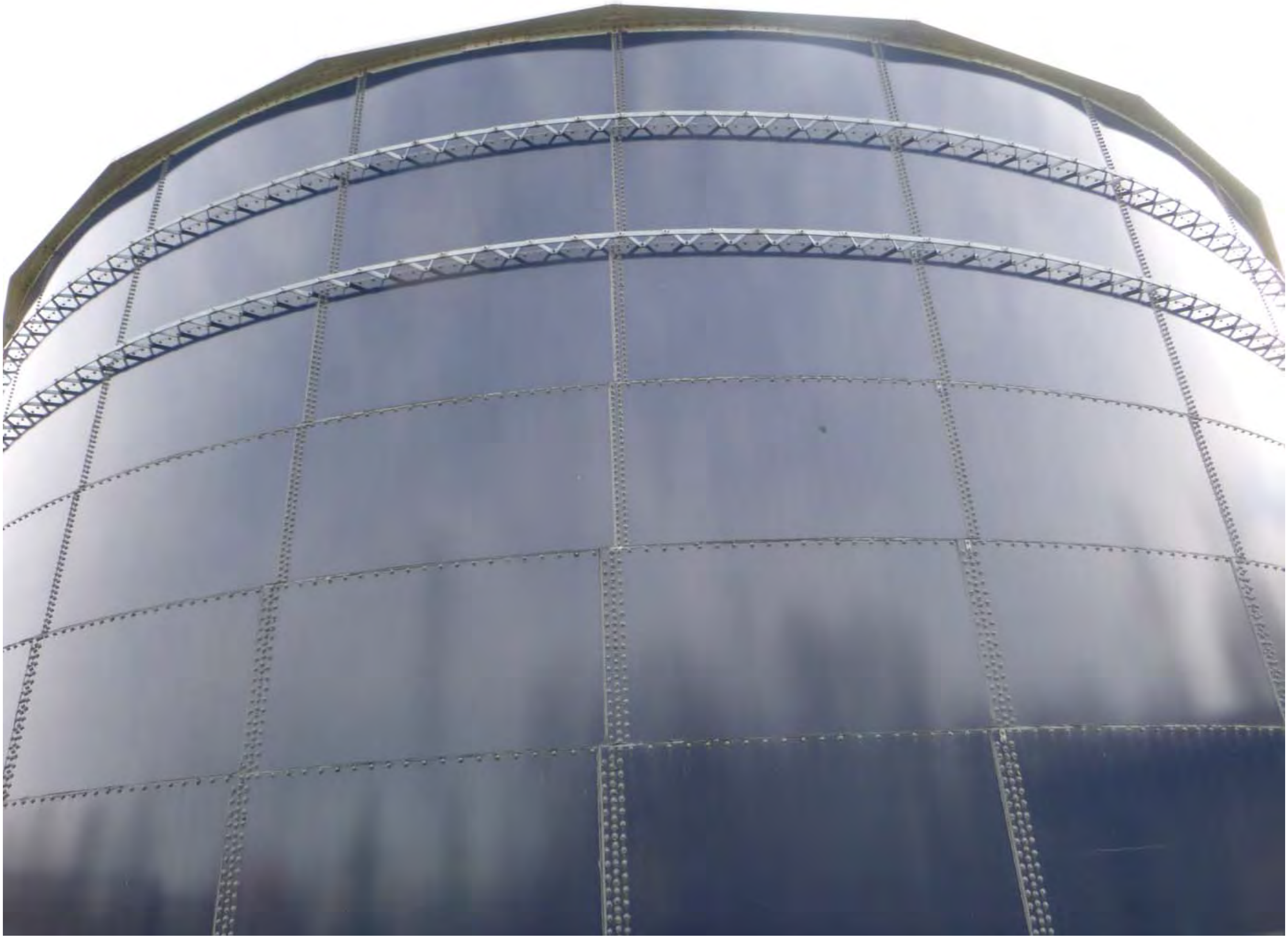
P1020111


TOSHIBA
TOSHIBA INTERNATIONAL CORPORATION
WARNING
Arc Flash And Shock Hazard
Appropriate PPE Required
DANGER

P1020112


PRODUCT
AQUASTORE
MODEL
7533 WT
NOM. DIA.
75.53
NOM. HGT.
33.01
CAPACITY
1,100,000
S/N
8033380
ENGINEERED STORAGE
PRODUCTS COMPANY
DEKALB, ILLINOIS 60115 U.S.A.

P1020113



P1020114


FLOWTRONEX™
SERIAL NO.
1265TM
VOLTAGE
460
PHASE
3
FULL LOAD AMPS
262
FREQUENCY
60
MAXIMUM H.P.
MODEL NO.
MVE-3000-2SL-74
FLOW
3000 GPM
PRESSURE
75 PSI
Flowtronex
ITT Industries

P1020115

P1020116


INLET
EINTRITT
ENTRADA
SIZE & CAT NO.
STOCK NO.
658-01-8
CODE
CLA - VAL CO.
BEACH, CALIF. U.S.A.

P1020117

P1020118


INLET
EINTRITT
ENTR'EE
ENTRADA
SIZE &
CAT NO.
STOCK
NO.
CODE
MFD. BY CLA-VAL CO.
NEWPORT BEACH, CALIF. U.S.A.

P1020119

P1020120


DR/2000
DIRECT READING
SPECTROPHOTOMETER
HACH
POWER
SHIFT
METH
ZERO
READ
ENTER
nm

P1020121


HACH
HACH COMPANY
BOX 389, LOVELAND, COLO. U.S.A.
DR/2000 Spectrophotometer
P/N 44800-60
VOLTS 7-8 V @ 700 mA
S/N 950700035864
CE

P1020122


ACME TRANSFORMER
Panel=Tran
ZONE POWER CENTER
Shielded for cleaner power

P1020123


CATALOG NO. PT06 – 1150025 – LS
PRIMARY: 480 VOLTS AC WITH 2 – 5% TAPS
MAXIMUM FULL LOAD 58 AMPS
SECONDARY: 240/120 VOLTS AC
MAXIMUM FULL LOAD 105 AMPS
25 KVA 1 PHASE 60 HZ
2.80 % IMPEDANCE AT 135 DEG C
INSULATION CLASS 180 DEG C
WINDING RISE 115 DEG C
FOR PROPER COOLING INSTALL IN UPRIGHT POSITION WITH THE FOLLOWING CLEARANCES:
SIDE – – 8 INCHES
VERTICAL – – 10 INCHES
COMPLETE WIRING DIAGRAM AND SPECIFICATIONS INSIDE COVER
UL TYPE 3R ENCLOSURE
WEIGHT 330 LBS
INSTRUCTIONS I – 40
UNIT SUBSTATION
IN THE UNITED STATES ONLY, SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT.
LR 7357
A 5 – 701379 –
ACME TRANSFORMER
Shielded for cleaner power

P1020124


ACME
TRANSFORMER™
LUMBERTON, NORTH CAROLINA
LISTED 5000
GENERAL PURPOSE TRANSFORMER
CATALOG NO T-2-53010-S
STYLE SR
PRIMARY VOLTS 240X480
SECONDARY VOLTS 120/240
WT 24 LBS
1.0 KVA 60 HZ 1 PHASE WINDING RISE 115 DEG C
% IMPEDANCE AT DEG C INSTRUCTIONS A1
MINIMUM FIELD INSTALLED CLEARANCES:
SIDE 4 INCHES, VERTICAL 4 INCHES
ENCLOSURE TYPE 3R OUTDOOR
INSULATION SYSTEM H-3180-M
CLASS 180
FOR AUTOTRANSFORMER CONNECTIONS SEE DRAWING
DRAWING B-111703
WIRING INFORMATION ON INSIDE COVER
ACME ELECTRIC CORPORATION
POWER DISTRIBUTION PRODUCTS DIVISION
LUMBERTON, NC
MADE IN MEXICO
A-5-700967-M

P1020125

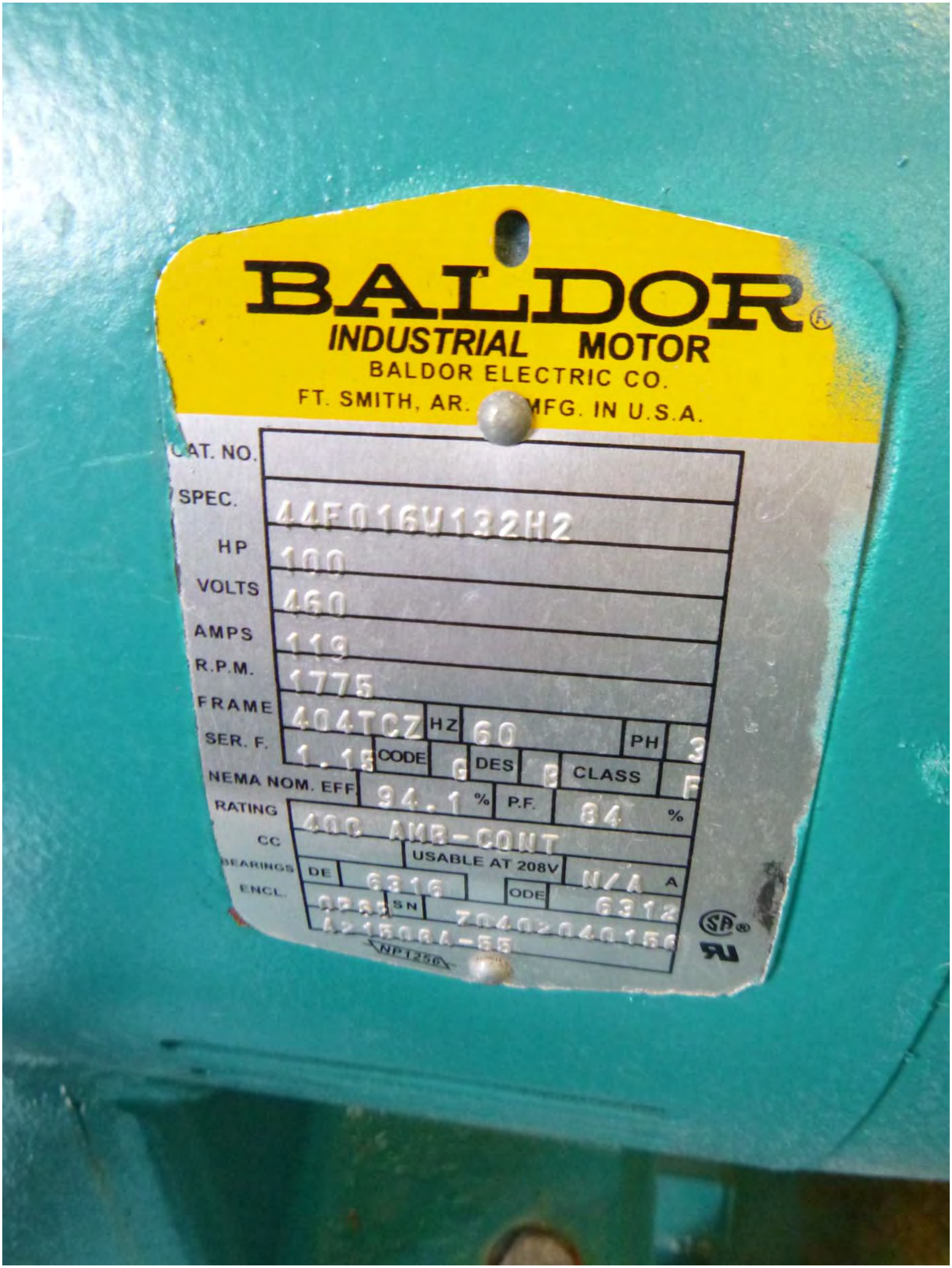

THREE-PHASE SURGE ARRESTER
UL Category "B" & "C"
SLAP
Surge & Lightning Advanced Protection
277/380/400/415/460/480 VAC
TOTAL POWER DISSIPATION - 82,500 kVA
MAXIMUM CLAMPING VOLTAGE - 1,500 VOLTS
(200A Pulse, 8*20μsec)
REORDER: FPSI PART #72-001-090

P1020126


BALDOR®
INDUSTRIAL MOTOR
BALDOR ELECTRIC CO.
FT. SMITH, AR. MFG. IN U.S.A.
CAT. NO.
SPEC. 44F016W132H2
HP 100
VOLTS 460
AMPS 119
R.P.M. 1775
FRAME 404TCZ HZ 60 PH 3
SER. F. 1.15 CODE G DES B CLASS F
NEMA NOM. EFF 94.1 % P.F. 84 %
RATING 40C AMB-CONT
CC USABLE AT 208V N/A A
BEARINGS DE 6316 ODE 6312
ENCL. OPSB SN Z0402040161
NP1256

P1020127

P1020128


BALDOR
INDUSTRIAL MOTOR
BALDOR ELECTRIC CO.
FT. SMITH, AR. MFG. IN U.S.A.
CAT. NO.
SPEC. 44F016W132H2
HP 100
VOLTS 460
AMPS 119
R.P.M. 1775
FRAME 404TCZ HZ 60 PH 3
SER. F. 1.15 CODE G DES B CLASS F
NEMA NOM. EFF 94.1 % P.F. 84 %
RATING 40C AMB-CONT
CC
USABLE AT 208V N/A A
BEARINGS DE 6316 ODE 6312
ENCL. OPSS SN Z0402040156
NP1256

P1020129

P1020130

P1020131

P1020132

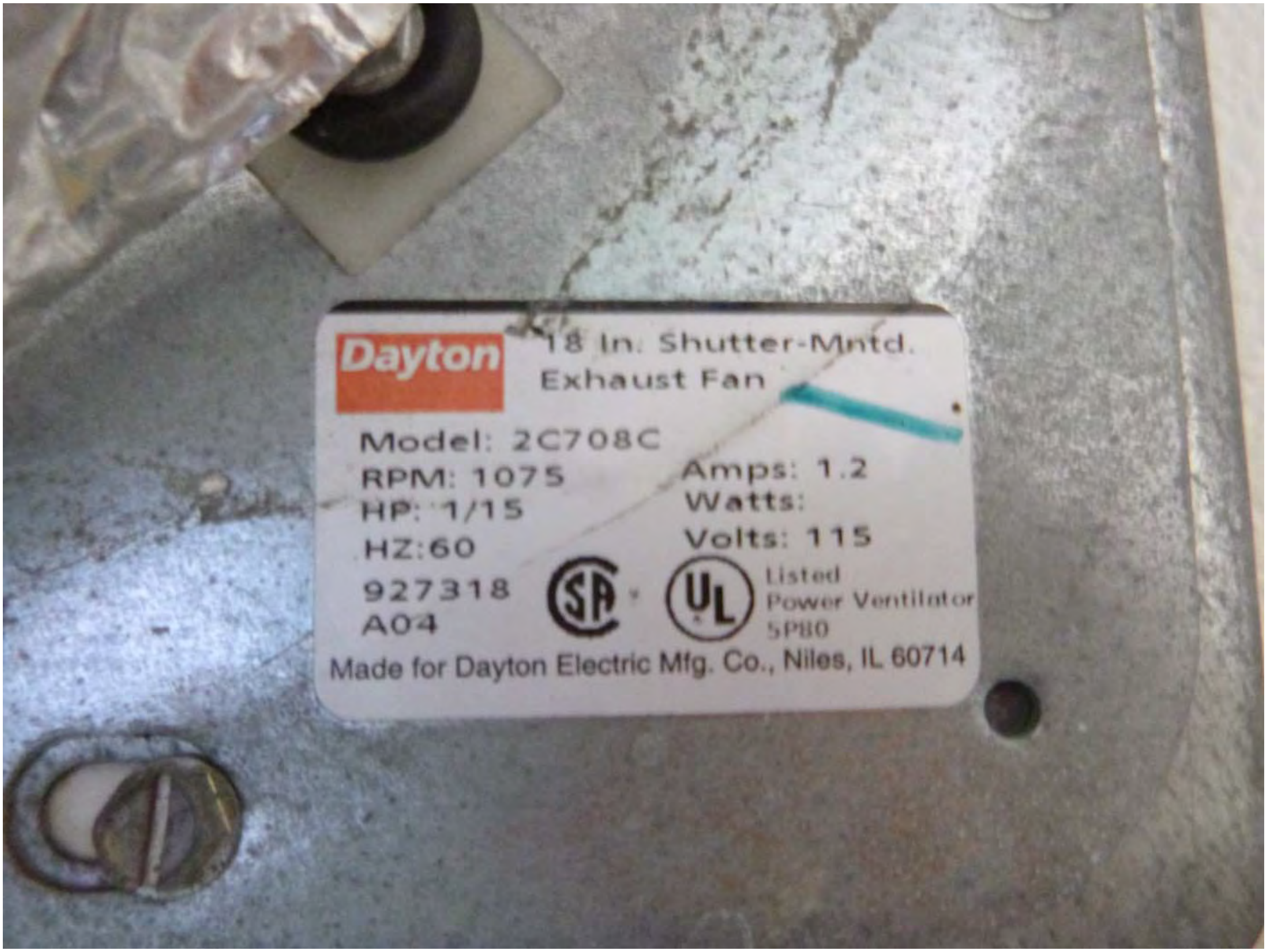

CORNELL PUMP CO.
PORTLAND, OREGON, USA
MODEL 5HH-CC 100-4
SERIAL T33146 13.88
TB06881

P1020133

P1020134


GLOBE STYLE
SILENT CHECK VALVE
MODEL NO. 1810
SIZE 10
BODY CI
ANSI 125
TRIM BRZ
Approved
COLD WORKING PRESSURE 200 P.S.I.
VAL-MATIC®
ELMHURST
ILLINOIS
R1806-57

P1020135


Dayton
18 In. Shutter-Mntd.
Exhaust Fan
Model: 2C708C
RPM: 1075
HP: 1/15
HZ:60
927318
A04
Amps: 1.2
Watts:
Volts: 115
Listed
Power Ventilator
5P80
Made for Dayton Electric Mfg. Co., Niles, IL 60714

P1020136


Dayton
HP 1/15
VOLTS 115
HZ 60
Thermally Protected
MTR REF
Line 1 Purple
Line 2 Black
Capacitor Brown

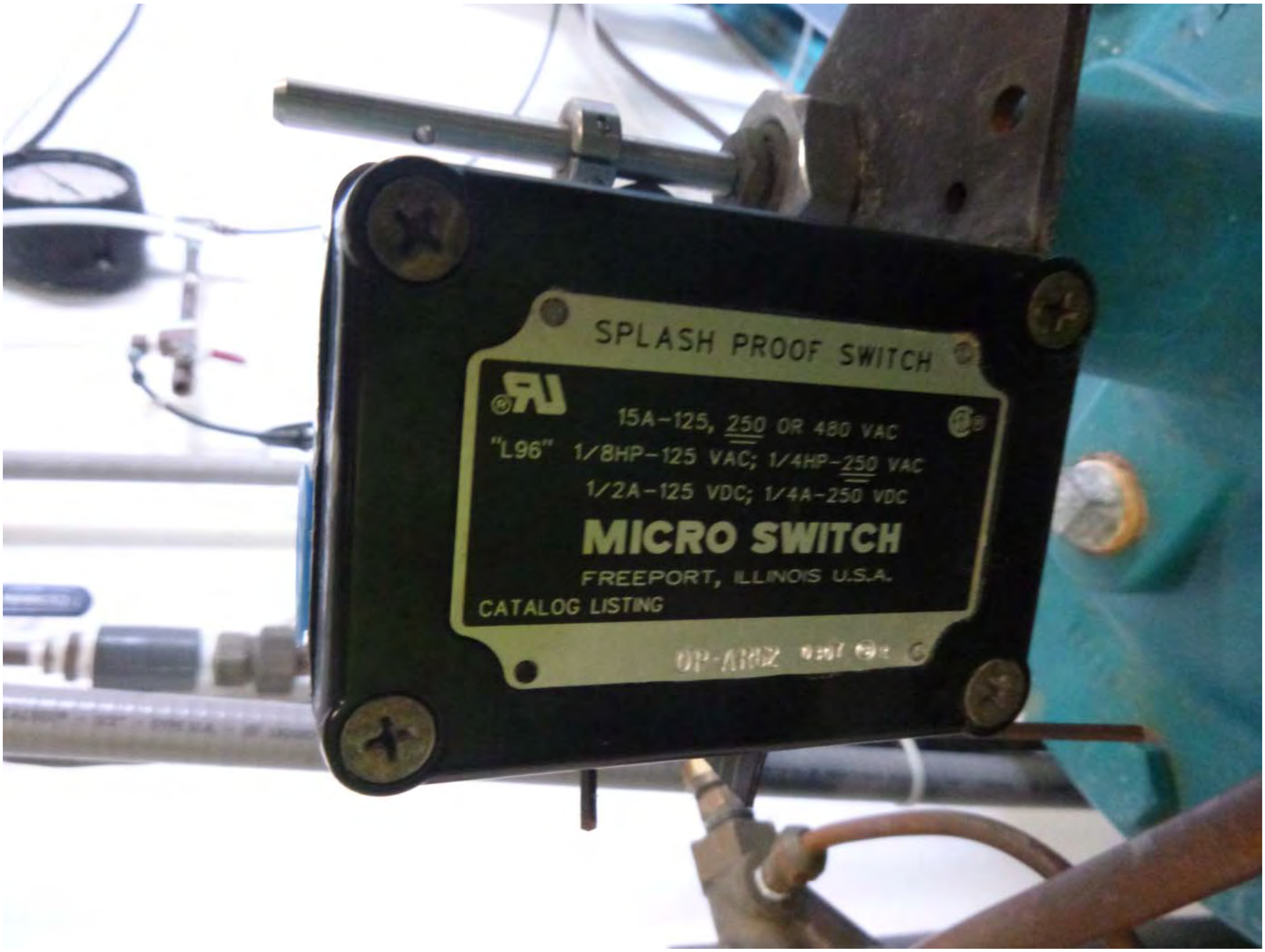
P1020137

P1020138

P1020139


KROHNE
Holland
Altometer
IFM4010/B/6
0896/04 ISO KL.H IP 67
Q: 0-3900 USGal/ min GKL:8.0791
I: 4 – 20Ma RI<=0.5 kOhm P: 1000 HZ
DN 200mm/ 8 Inch-H-HC-PN150 PSI
TAG:
100-130 V AC
5 VA
48-63 Hz

P1020140


SPLASH PROOF SWITCH
15A-125, 250 OR 480 VAC
"L96" 1/8HP-125 VAC; 1/4HP-250 VAC
1/2A-125 VDC; 1/4A-250 VDC
MICRO SWITCH
FREEPORT, ILLINOIS U.S.A.
CATALOG LISTING

P1020141

P1020142

P1020143


INSTALLED BY
PEERLESS-MIDWEST, INC.
MISHAWAKA, INDIANA
PHONE 574-254-9050
PUMP SERIAL NUMBER
1528923

P1020144

P1020145


VAL-MATIC®
CORP.
ELMHURST, IL.
DUAL PORT THROTTLING DEVICE
U.S. PAT. 5,765,595
2DPT
R5DPT-57

P1020146

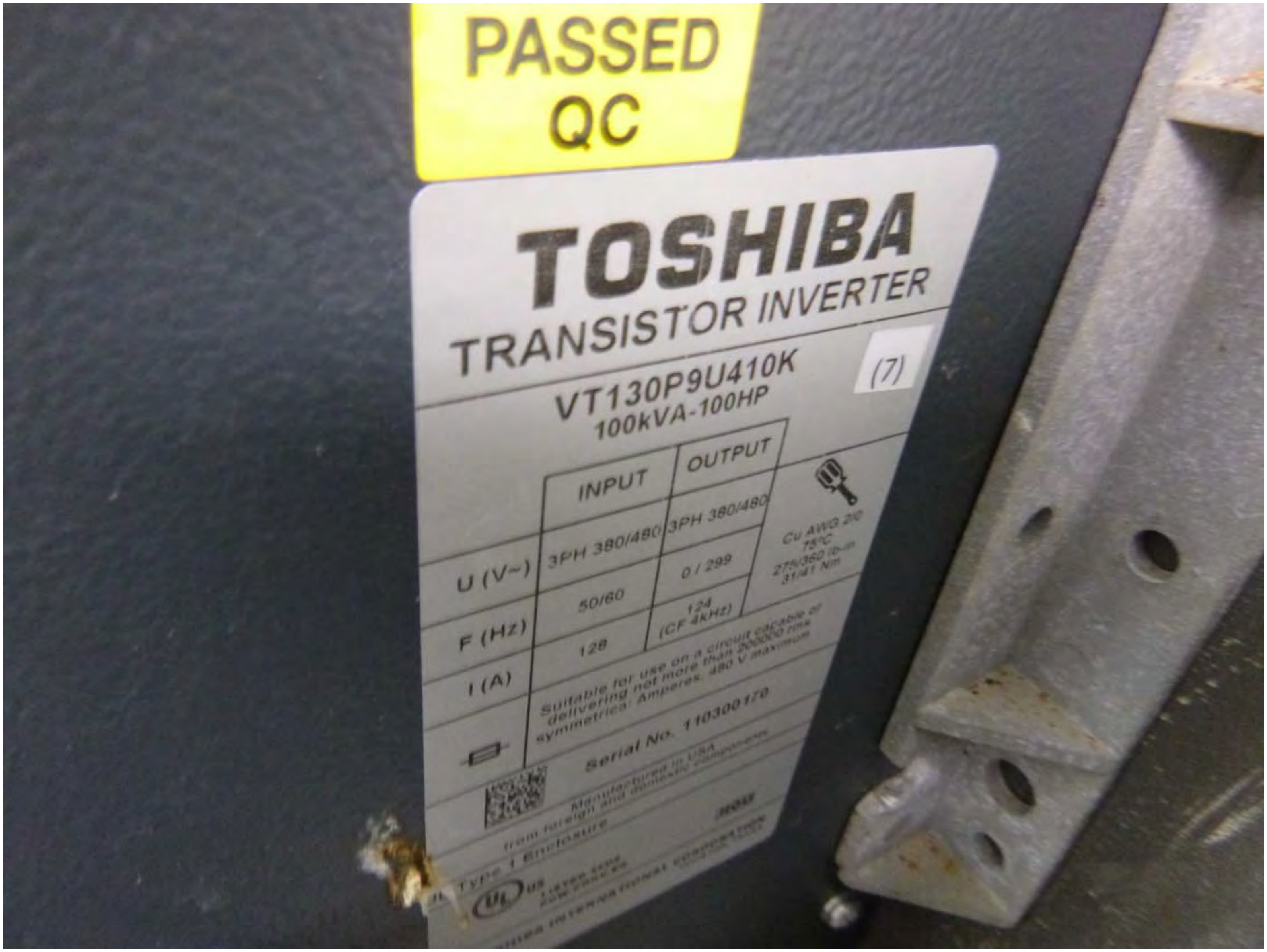
P1020147


SQUARE D
HEAVY DUTY
SAFETY SWITCH
200 AMP. 600 V.AC
150 H.P. MAX. RATING 3PH.
DANGER
HAZARD OF ELECTRICAL SHOCK
OR BURN. SEE INSTRUCTIONS
INSIDE DOOR.
B-40274-185-02

P1020148


P9 ADJUSTABLE SPEED DRIVE
TOSHIBA
TOSHIBA
DANGER
Risk of injury, electric shock or fire.
Read the instruction manual.
Do not open the cover while power is applied or within 5 minutes after removal of power.
Ensure proper earth connection.
Monitored By

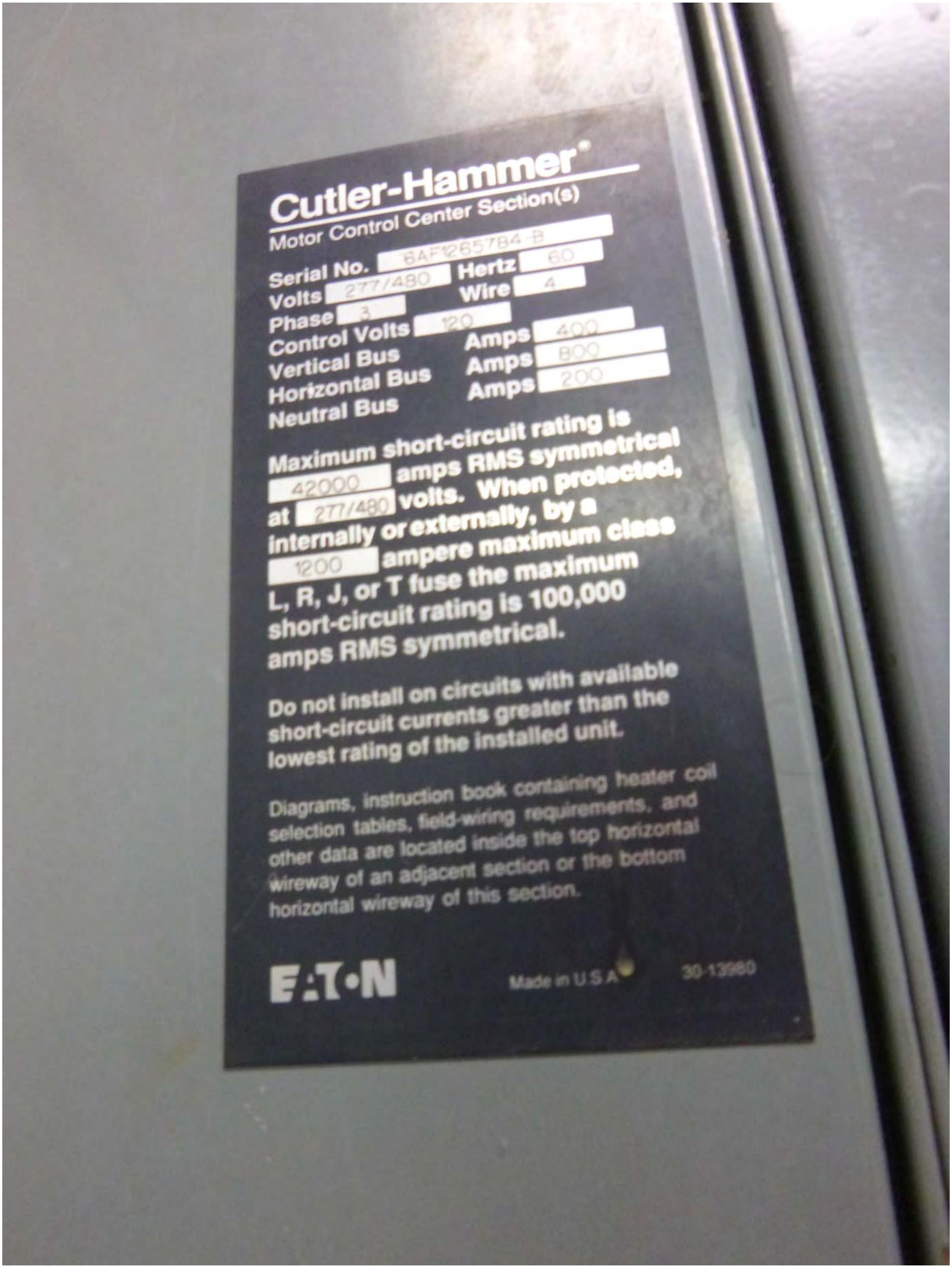
P1020149


PASSED
QC
TOSHIBA
TRANSISTOR INVERTER
VT130P9U410K
(7)
100kVA-100HP
INPUT
OUTPUT
U (V~)
3PH 380/480
3PH 380/480
0 / 299
F (Hz)
50/60
124
(CF 4kHz)
I (A)
128
Suitable for use on a circuit capable of
delivering not more than 200000 rms
symmetrical Amperes, 480 V maximum
Serial No. 110300170
Manufactured in USA
from foreign and domestic components
Type 1 Enclosure

P1020150


Cutler-Hammer
EATON
UNITROL Motor Control Center
HEALY-RUFF

P1020151


Cutler-Hammer
Motor Control Center Section(s)
Serial No. 6AF1265784-B
Hertz 60
Volts 277/480
Wire 4
Phase 3
Control Volts 120
Vertical Bus Amps 400
Horizontal Bus Amps 800
Neutral Bus Amps 200
Maximum short-circuit rating is 42000 amps RMS symmetrical at 277/480 volts. When protected, internally or externally, by a 1200 ampere maximum class L, R, J, or T fuse the maximum short-circuit rating is 100,000 amps RMS symmetrical.
Do not install on circuits with available short-circuit currents greater than the lowest rating of the installed unit.
Diagrams, instruction book containing heater coil selection tables, field-wiring requirements, and other data are located inside the top horizontal wireway of an adjacent section or the bottom horizontal wireway of this section.
EATON
Made in U.S.A.
30-13980

P1020152


SERVICE
DISCONNECT
UTILITY
SERVICE
ON
OFF
ON
GENERATOR
SERVICE

P1020153


EATON | Cutler-Hammer
Double Throw Safety Switch
Interrupteur de sécurité bidirectionnel
Interruptor de seguridad de doble tiro
200 A, 600 V~, 60 Hz, 250 V ⎓
Complete Ratings Inside. Further instructions inside.
Valeurs nominales complètes à l'intérieur. Autres instructions à l'intérieur.
Información completa de capacidades en el interior. Instrucciones adicionales en el interior.
DANGER
HAZARDOUS VOLTAGE. WILL CAUSE SEVERE INJURY OR DEATH.
• Never operate switch with cover open.
• Turn OFF power ahead of switch before doing any work inside. Replace all parts. Close cover before turning power ON.
TENSION DANGEREUSE. PEUT CAUSER DES BLESSURES GRAVES OU LA MORT.
• Ne jamais manœuvrer l'interrupteur lorsque le couvercle est ouvert.
• Couper l'alimentation en amont de l'interrupteur avant toute intervention. Remplacer les pièces. Fermer le couvercle avant de remettre sous tension.
PELIGRO
VOLTAJE PELIGROSO. PUEDE CAUSAR HERIDAS SEVERAS O LA MUERTE.
• Nunca opere el interruptor con la cubierta abierta.
• Desconectar la alimentación del interruptor antes de trabajar dentro del mismo. Reemplazar todas las partes. Cerrar la cubierta antes de energizar el interruptor.
Made in U.S.A./Fabriqué aux É.U./Hecho en E.U.A.
30-43072-8

P1020154

P1020155

P1020156

P1020157


Cutler-Hammer
Motor Control Center Section(s)
Serial No.
Volts 277/480
Hertz 60
Wire 4
Phase 3
Control Volts 120
Vertical Bus Amps 400
Horizontal Bus Amps 800
Neutral Bus Amps 200
Maximum short-circuit rating is 42000 amps RMS symmetrical at 277/480 volts. When protected, internally or externally, by a 1200 ampere maximum class L, R, J, or T fuse the maximum short-circuit rating is 100,000 amps RMS symmetrical.
Do not install on circuits with available short-circuit currents greater than the lowest rating of the installed unit.
Diagrams, instruction book containing heater coil selection tables, field-wiring requirements, and other data are located inside the top horizontal wireway of an adjacent section or the bottom horizontal wireway of this section.
Made in U.S.A.

P1020158

P1020159


BENSHAW
RSi100SX4D
IP55 / TYPE 12
CT
VT
HP
100
125
Input Volts
380-460V ± 15% 3PH, 50/60HZ
Input Amps
140.0/124.0
168.0/156.0
Output Volts
0-380/460 3PH
Output Amps
140.0/124.0
168.0/156.0
INSTRUCTION MANUAL 890020-0
www.benshaw.com
Made in U.S.A.
C UL US
LISTED Ind. Cont. Eq.
66D8
CE
05390075

P1020161

P1020162


CATALOG#
MODEL#
LOWER END BRG
UPPER END BRG
FR
TYPE
ENCL
PH
ID#
DUTY
WT
BAL
HP
RPM
SF
HZ
VOLTS
NEMA NOM EFFICIENCY
AMPS
MAX KVAR
OIL CAPACITY
PF
CODE
DES
QTS.
INVERTER DUTY
AMPS
TORQUE
HZ RANGE
MAX RPM
LB-FT
INV. TYPE
QC INSP
EMERSON
EMERSON MOTOR COMPANY
ST. LOUIS, MO
Premium Efficient

P1020163

P1020164


GLOBE STYLE
SILENT CHECK VALVE
MODEL NO.
SIZE
BODY
FM
Approved
TRIM
COLD WORKING PRESSURE
P.S.I.
VAL-MATIC
ELMHURST
ILLINOIS

P1020165


GLOBE STYLE
SILENT CHECK VALVE
MODEL NO. 1808
SIZE 8
BODY CI
NSI 125
TRIM BRZ
FM
Approved
COLD WORKING PRESSURE 200 P.S.I.
VAL-MATIC®
ELMHURST
ILLINOIS
R1806-57

P1020166

P1020167


P1020168

P1020169


IP66
Intertek
Warranty void if serial number label removed
0M0.224L.GLA Iss: 2
QDOS UNIV 30L/HR 7BAR
190GPD 100PSI SANT GLYC
N072269

P1020170

P1020171

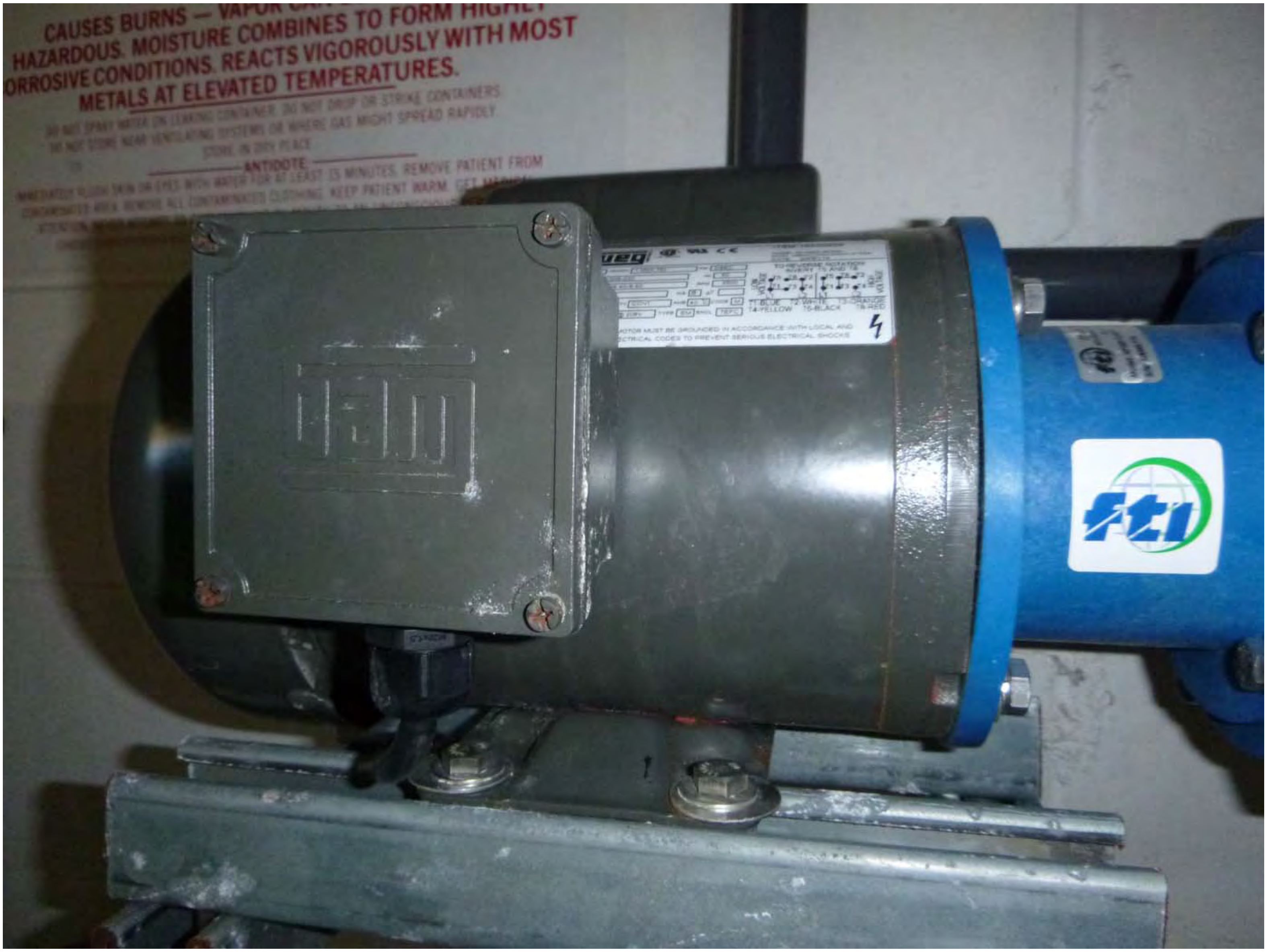

N27364
Warranty void if serial number label removed
0M0.224L.GLA
Marlow Limited
Cornwall
mpg.com
Engineering Company

P1020173

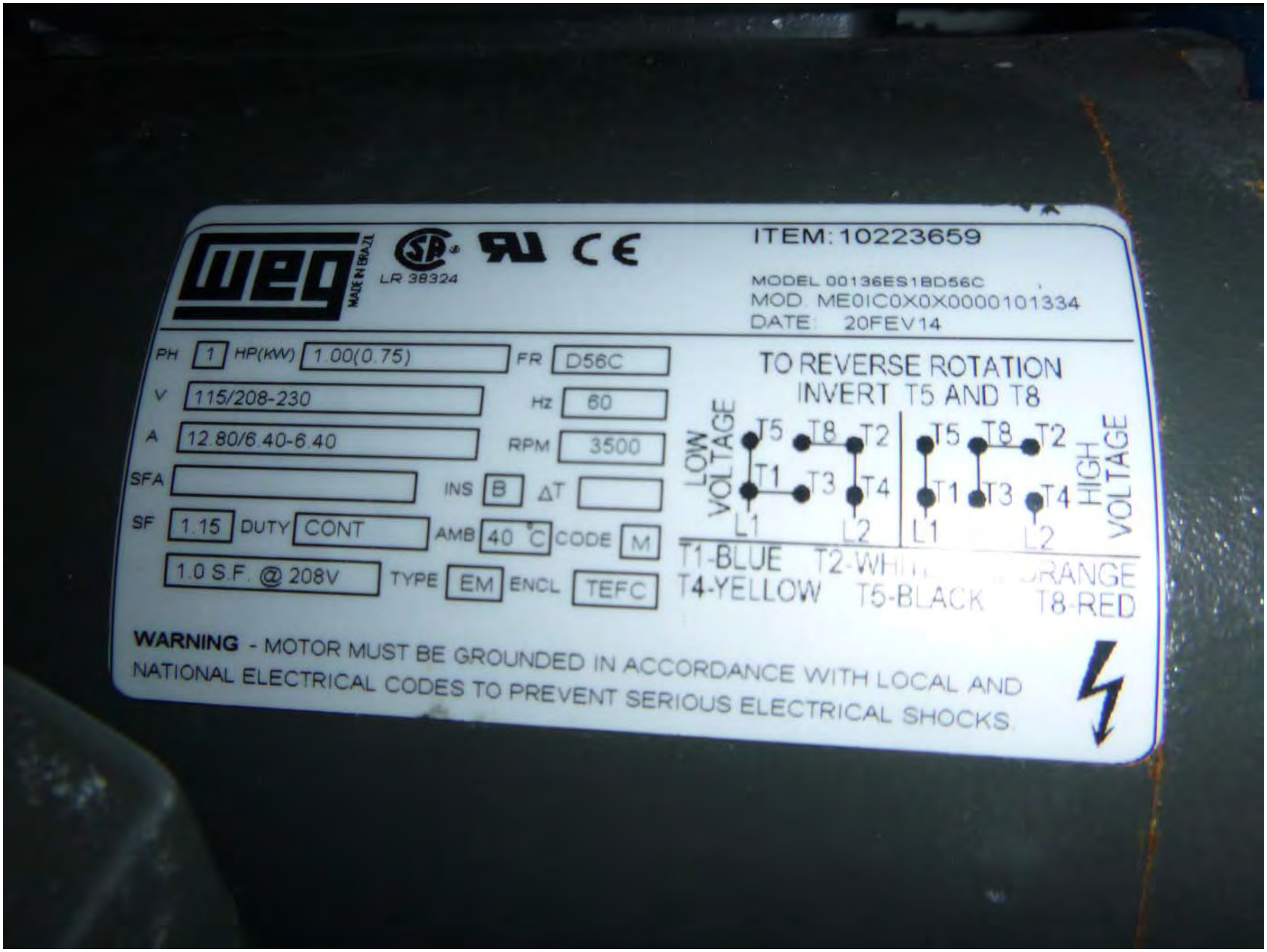
P1020174


Assembled in USA.
Greenwood. In.
Endress+Hauser
Prosonic S
Order code: FMU90-R11CA232AA1A
Ser. no.: J50072150E6
90...253 V AC
50/60 Hz 23 VA
4...20 mA HART
IP66 / NEMA4X
Patents
x = if modification see sep. label
N12895

P1020175


CAUSES BURNS — VAPOR
HAZARDOUS. MOISTURE COMBINES TO FORM HIGHLY
ORROSIVE CONDITIONS. REACTS VIGOROUSLY WITH MOST
METALS AT ELEVATED TEMPERATURES.
ANTIDOTE
fti

P1020176


WEG
MADE IN BRAZIL
LR 38324
CE
ITEM: 10223659
MODEL 00136ES1BD56C
MOD. ME0IC0X0X0000101334
DATE: 20FEV14
PH 1 HP(KW) 1.00(0.75) FR D56C
V 115/208-230 Hz 60
A 12.80/6.40-6.40 RPM 3500
SFA
INS B ΔT
SF 1.15 DUTY CONT AMB 40 °C CODE M
1.0 S.F. @ 208V TYPE EM ENCL TEFC
TO REVERSE ROTATION
INVERT T5 AND T8
LOW VOLTAGE
HIGH VOLTAGE
T5 T8 T2
T1 T3 T4
L1 L2
T1-BLUE T2-WHITE T3-ORANGE
T4-YELLOW T5-BLACK T8-RED
WARNING - MOTOR MUST BE GROUNDED IN ACCORDANCE WITH LOCAL AND NATIONAL ELECTRICAL CODES TO PREVENT SERIOUS ELECTRICAL SHOCKS.

P1020177


TREMELY
ORM HIGHLY
LY WITH MOST
RES.
CONTAINERS.
EAD RAPIDLY
fti

P1020178


FINISH THOMPSON, INC.
921 Greengarden Road • Erie, PA
Ph 814-455-4478 • Fax
Model: SP10P-3-M218
IMP DIA: 3.75

P1020179


921 Greengarden Road
Ph 814-455-4478
Model: SP10P-3-M218
S/N: 128840 F14

P1020180

P1020181

P1020182

P1020183

P1020184


P9 ADJUSTABLE SPEED DRIVE
TOSHIBA
TOSHIBA
HAND/AUTO
ESC
RUN
MODE
STOP RESET
Read the instruction manual
Do not open the cover while power is applied or within 5 minutes after removal of power.
Ensure proper earth connection.

P1020185


PASSED
QC
TOSHIBA
TRANSISTOR INVERTER
VT130P9U4750
75kVA-75HP
(9)
INPUT
OUTPUT
U (V~)
3PH 380/480
3PH 380/480
F (Hz)
50/60
0 / 299
I (A)
106
96
(CF 4kHz)
Cu AWG 1/0
75°C
275/360 lb-in
31/41 Nm
Suitable for use on a circuit capable of
delivering not more than 200000 rms
symmetrical Amperes, 480 V maximum
Serial No. 110401487
Manufactured in USA
from foreign and domestic components
UL Type 1 Enclosure
HOU
LISTED 35US
POW.CONV.EQ.
TOSHIBA INTERNATIONAL CORPORATION
HOUSTON, TEXAS
REFURBISHED

P1020186


P9
ADJUSTABLE SPEED DRIVE
TOSHIBA
DANGER
Risk of injury, electric shock or fire
Read the instruction manual
Do not open the cover while power is applied or within 5 minutes after removal of power
Ensure proper earth connection

P1020187


PASSED QC
TOSHIBA
TRANSISTOR INVERTER
VT130P9U410K
100kVA-100HP
(9)
INPUT
OUTPUT
U (V~)
3PH 380/480
3PH 380/480
F (Hz)
50/60
0 / 299
I (A)
128
124 (CF 4kHz)
Cu AWG 2/0
75°C
275/360 lb-in
31/41 Nm
Suitable for use on a circuit capable of delivering not more than 200000 rms symmetrical Amperes, 480 V maximum
Serial No. 121100532
Manufactured in USA from foreign and domestic components
UL Type 1 Enclosure
HOU
LISTED 35US
POW.CONV.EQ.
TOSHIBA INTERNATIONAL CORPORATION
HOUSTON, TEXAS

P1020188


P9 ADJUSTABLE SPEED DRIVE
TOSHIBA
TRANSPARENT FILM MUST BE REMOVED AFTER INSTALLATION
HAND/AUTO
ESC
MODE
STOP RESET
TOSHIBA
Read the instruction manual
Do not open the cover while power is applied or within 5 minutes after removal of power
Ensure proper earth connection
DANGER
Risque de blessure, de choc électrique ou d'incendie

P1020189


PASSED QC
TOSHIBA
TRANSISTOR INVERTER
VT130P9U4500
50kVA-50HP
(15)
INPUT
OUTPUT
U (V~)
3PH 380/480
3PH 380/480
F (Hz)
50/60
0 / 299
I (A)
65
65 (CF 4kHz)
Cu AWG 3
75°C
50/212 lb-in
5.7/24 Nm
Suitable for use on a circuit capable of delivering not more than 200000 rms symmetrical Amperes, 480 V maximum
Serial No. 141102062
Manufactured in USA from foreign and domestic components
UL Type 1 Enclosure
c UL us
LISTED 35U5
POW.CONV.EQ.
HOU
TOSHIBA INTERNATIONAL CORPORATION
HOUSTON, TEXAS

P1020190

P1020191


CATALOG # H050V2BLG
MODEL # BF50A
LOWER END BRG 6211-J
UPPER END BRG 7220-BEP
FR 326TP
TYPE RUSI
ENCL WP-1
PH 3
MAX AMB 40 °C
ID# S 01 7473304-0045 M 0005
INSUL CLASS F
DUTY CONT
WT 675 LB
BAL
HP 50.00
RPM 1780
SF 1.15
HZ 60
NEMA NOM EFFICIENCY 94.5
VOLTS 230/460
MAX KVAR
CODE G
DES B
AMPS 114.0/57.0
PF
OIL CAPACITY
LOWER END BRG GREASE QTS.
UPPER END BRG 3 QTS.
INVERTER DUTY
NEMA MG1 PART 31
TORQUE LB-FT
HZ RANGE 6-60
MAX RPM 180-1800
AMPS 118/59
SF 1.0
INV. TYPE
MADE IN MEXICO
EMERSON MOTOR COMPANY
ST. LOUIS, MO
422707-005
EMERSON
Premium Efficient
Southaven, MS 01/27/11
ITEM NUMBER
BF50

P1020192


WARNING
MOTOR MAY START.
POWER BEFORE REMOVING
COVER MUST BE IN PLACE
STARTING, RUNNING OR
TO STOP.

P1020193


CATALOG #
MODEL # DT94
LOWER END BRG
UPPER END BRG
FR
TYPE
ENCL
PH 3
MAX AMB 40 °C
ID#
INSUL CLASS F
DUTY
WT 675 LB
BAL
HP 50.00
RPM 1780
SF
HZ
VOLTS 230/460
AMPS 113.00/57.00
MAX KVAR
NEMA NOM EFFICIENCY
PF
CODE
DES
OIL CAPACITY
LOWER END BRG GREASE QTS.
UPPER END BRG
QTS.
NEMA MG1 PART 31
INVERTER DUTY
AMPS
TORQUE
HZ RANGE
MAX RPM
SF1.0
INV. TYPE
MADE IN MEXICO
OF IMPORTED AND DOMESTIC COMPONENTS
NIDEC MOTOR CORPORATION
422707-005
SPECIAL FEATURES
SHAFT GROUNDING
RING INSTALLED
INTERNALLY
SPECIAL FEATURES
NEMA
Premium
ITEM NUMBER
05/12/14
DT94

P1020194


CATALOG #
MODEL #
LOWER END BRG
6211-J
UPPER END BRG
FR
326TP
TYPE
ENCL
PH
3
MAX AMB
40 °C
ID#
INSUL CLASS
DUTY
WT
BAL
HP
50.00
RPM
SF
HZ
VOLTS
230/460
MAX KVAR
CODE
DES
AMPS
PF
OIL CAPACITY
LOWER END BRG
QTS.
UPPER END BRG
QTS.
INVERTER DUTY
NEMA MG1 PART 31
HZ RANGE
MAX RPM
TORQUE
INV. TYPE
SF 1.0
OF IMPORTED AND DOMESTIC COMPONENTS
MADE IN
NIDEC MOTOR CORPORATION
422707-005
SPECIAL FEATURES
SHAFT GROUNDING
RING INSTALLED
INTERNALLY
SPECIAL FEATURES
NEMA Premium
ITEM NUMBER
DT94

P1020195

P1020196


CATALOG #
MODEL #
LOWER END BRG
6211-J
UPPER END BRG
FR
326TP
TYPE
ENCL
PH
3
MAX AMB
40 °C
ID#
INSUL CLASS
F
DUTY
CONT
WT
BAL
HP
50.00
RPM
SF
VOLTS
230/460
MAX KVAR
CODE
DES
PF
AMPS
QTS.
OIL CAPACITY
LOWER END BRG
GREASE
INVERTER DUTY
NEMA MG1 PART 31
HZ RANGE
MAX RPM
TORQUE
LB-FT
INV. TYPE
SF 1.0
OF IMPORTED AND DOMESTIC COMPONENTS
MADE IN MEXICO
NIDEC MOTOR CORPORATION
422707-005
SPECIAL FEATURES
SHAFT GROUNDING
RING INSTALLED
INTERNALLY
SPECIAL FEATURES
OVER TEMP PROT 2
NEMA Premium
ITEM NUMBER
DT94

P1020197


CATALOG #
MODEL #
LOWER END BRG
UPPER END BRG
FR
TYPE
ENCL
PH 3
MAX AMB
ID#
BAL
INSUL CLASS F
DUTY
WT 675
SF
HZ
HP 50.00
RPM 1780
NEMA NOM EFFICIENCY
VOLTS 230/ 460
MAX KVAR
PF
CODE
DES
AMPS 113.00/ 57.00
QTS.
OIL CAPACITY
LOWER END BRG GREASE QTS.
UPPER END BRG
AMPS
INVERTER DUTY
NEMA MG1 PART 31
VT/PWM
TORQUE
HZ RANGE
MAX RPM
147.5
LB-FT
INV. TYPE
SF 1.0
MADE IN MEXICO
OF IMPORTED AND DOMESTIC COMPONENTS
NIDEC MOTOR CORPORATION
www.usmotors.com
422707-005
SPECIAL FEATURES
SHAFT GROUNDING
RING INSTALLED
INTERNALLY
SPECIAL FEATURES
OVER TEMP PROT 2
NEMA Premium
ITEM NUMBER

P1020198

P1020199

P1020200


INSTALLED BY
PEERLESS-MIDWEST, INC.
MISHAWAKA, INDIANA
PHONE 574-254-9050
PUMP SERIAL NUMBER

P1020201

P1020202


INSTALLED BY
PEERLESS-MIDWEST, INC.
MISHAWAKA, INDIANA
PHONE 574-254-9050
PUMP SERIAL NUMBER

P1020203

P1020204


FIRE EXTINGUISHER
Dayton
INDUSTRIAL MOTOR
E47479
247903
MOD 6K937BB
HP 1/2
HZ 60
V 115/208-230
PH 1
RPM 1725
CODE M
A 8.0/4.0-4.0
SF 1.15
SFA 8.5/4.3-4.3
FR 56
AMB 40 C
INSUL CLASS B
NEMA DESIGN
DUTY CONT
ENCL TEFC
BRG SE BALL
OSE BALL
PROT
GROUND IN ACCORDANCE WITH LOCAL & NATIONAL ELECTRICAL CODE
KEEP FINGERS & OBJECTS AWAY FROM OPENINGS & ROTATING PARTS.
DISCONNECT POWER SOURCES BEFORE TOUCHING INTERNAL PARTS.
PERMANENTLY LUBRICATED BALL BEARINGS.
RELUBRICATION NOT REQUIRED

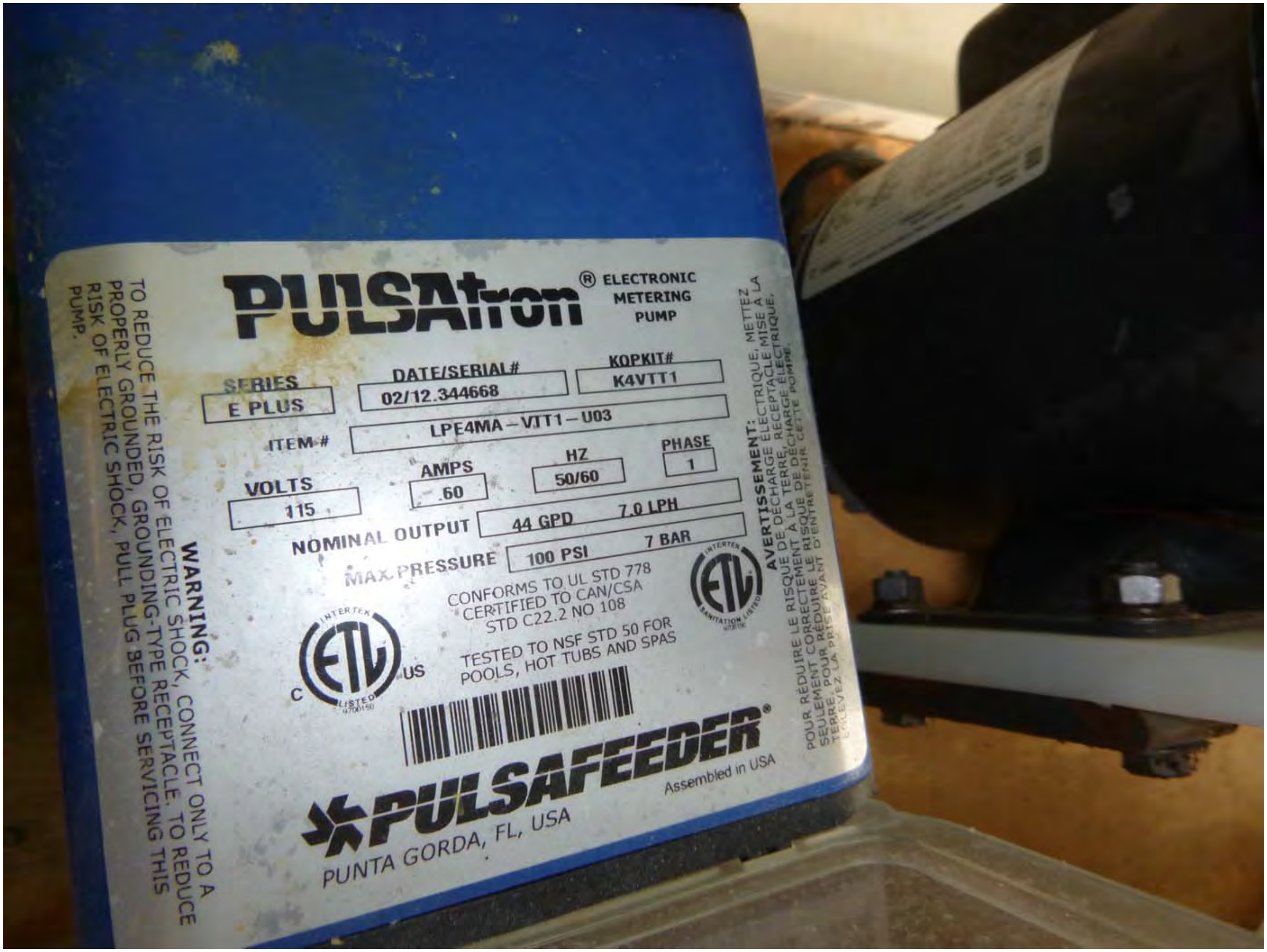
P1020205

P1020206


NEPTUNE
CHEMICAL PUMP CO.
LANSDALE, PA 19446
No. 71636819
TYPE 63
60 Hz
115 V
1.62 A
1550 RPM
Cust P/N 100783
Motor Must Be Grounded
LR6319
Assembled In Mexico
1/20 HP
Oil with SAE 20
E46205
M3710

P1020207

P1020208


PULSAtron® ELECTRONIC METERING PUMP
SERIES
E PLUS
DATE/SERIAL#
02/12.344668
KOPKIT#
K4VTT1
ITEM #
LPE4MA – VTT1 – U03
VOLTS
115
AMPS
.60
HZ
50/60
PHASE
1
NOMINAL OUTPUT
44 GPD
7.0 LPH
MAX PRESSURE
100 PSI
7 BAR
CONFORMS TO UL STD 778
CERTIFIED TO CAN/CSA
STD C22.2 NO 108
TESTED TO NSF STD 50 FOR
POOLS, HOT TUBS AND SPAS
PULSAFEEDER®
Assembled in USA
PULSAFEEDER
PUNTA GORDA, FL, USA
WARNING:
TO REDUCE THE RISK OF ELECTRIC SHOCK, CONNECT ONLY TO A PROPERLY GROUNDED, GROUNDING-TYPE RECEPTACLE. TO REDUCE RISK OF ELECTRIC SHOCK, PULL PLUG BEFORE SERVICING THIS PUMP.

P1020209


USABlueBook
Everything for Water & Wastewater
Fax 24 hours: 847-689-3030
Phone: 800-548-1234

P1020210


PULSAtron®
ELECTRONIC METERING PUMP
ITEM #
LPH5MA-VTC3-U03
KOPKIT#
K5VTC3
DATE/SERIAL#
01/13.432741
AMPS
1
PHASE
1
HZ
50/60
VOLTS
115
FLOW RATE
76 GPD
11.9 LPH
MAX PRESS
150 PSI
10 BAR
CONFORMS TO UL STD 778
CERTIFIED TO CAN/CSA
STD C22.2 NO 108
TESTED TO NSF STD 50 FOR
POOLS, HOT TUBS AND SPAS
Intertek
9700150
Intertek
9700150
PULSAFEEDER®
Assembled in USA
PULSAFEEDER
PUNTA GORDA, FL, USA
800-333-6677 - www.pulsafeeder.com
WARNING:
TO REDUCE THE RISK OF ELECTRIC SHOCK, CONNECT ONLY TO A PROPERLY GROUNDED, GROUNDING-TYPE RECEPTACLE. TO REDUCE RISK OF ELECTRIC SHOCK, PULL PLUG BEFORE SERVICING THIS PUMP.
Max Liquid Temp: 40 Degrees Celsius
AVERTISSEMENT:

P1020211


Conforms to:
UL STD 61010-1
FM STD's 3600 & 3611
Certified to:
CAN/CSA STD 22.2
No.61010-1 & No.213M1987
INTERTEK
3054010
Rated:Class 1 Division 2 Groups A,B,C,D,T4
Class 1 Zone 2. Group IIC,T4
HACH
Model SC200
LXV404.99.00552
Hach Co.
5600 Lindbergh Dr
Loveland, CO
80538
General Purpose Analyzer
Enclosure Type NEMA 4X
Electrical Ratings
Supply 100-240 VAC +/- 10%, 50/60 Hz
50 VA with 7 W Probe Load, 60°C Max Ambie
100 VA with 28 W Probe Load, 50°C Max Amb
Relay Output Ratings
100-240 VAC, 5 A Max
09/07/12
Serial Number 1207C0044995
MADE IN CHINA

P1020212


HACH
sc200
CL2 GATEWAY
2.508
CL2
ppm
11:23:59 AM
11-24-2015
pH 7.65pH
menu
home
back
enter
SD

P1020213

P1020214

P1020215

P1020217


PH 3 PH-Meter
Serial Number: 426001
Voltage 12 VDC,50/60 Hz,Power 3.3W
STIRRER
pH / mV
ELECTRODE
REFERENCE
ELECTRODE
Pt 1000
PROBE
Pt 1000
PROBE

P1020218

P1020219

P1020220


Ingersoll Rand
Industrial Technologies
Serial No.
No. de serie
No. de série
CBV217769
Model
Modelo
Modèle
GRAINGER SS3660V
PSIG CFM
40 13.2
90 11.3
Max 10.3
Rating
Capacidad nominal
Calibre
3
Hertz
Hertzios
Hertz
60
Phases
Fases
Phases
1
Maximum pressure
Presión màxima
Pression maximum
135
Volts
Voltios
Volt
230
Amps
Amperios
Ampère
*
Tank capacity
Capacidad del tanque
Capacité de réservoir
60
Pump speed
Velocidad de bombeo
Vitesse de pompe
1200

P1020221

P1020222


E22922
156060
THERMALLY PROTECTED MANUAL
MOTORS
MOD I/R# 56283138 HP SPL RPM 3450
V 230
FR 56 HZ 60 FLA 15.0
PH 1 CODE
INS B MAX AMB 40 °C
SF 1.0 SFA DUTY CONT
MTR REF T63BXCDT1254
BRG BALL
DATE CODE L12C
I/R#56283138
4 LINE
1
LINE TO UNGROUNDED SIDE OF SUPPLY - WHEN GROUNDED SUPPLY IS AVAILABLE.
PRELUBRICATED BALL BEARINGS-
NO FURTHER LUBRICATION REQUIRED
NIDEC MOTOR CORPORATION
www.usmotors.com
Made in Mexico
WARNING
GROUNDING-FAILURE TO CONNECT THE MOTOR FRAME TO EQUIPMENT GROUNDING CONDUCTOR BY USING THE GROUNDING CORD, GREEN SCREW OR GREEN WIRE PROVIDED, MAY RESULT IN SERIOUS ELECTRICAL SHOCK.
Z417397930001
TYPE

P1020223


Ingersoll Rand
MODEL
SERIAL NO.
Made in China
WARNING/ADVERTENCIA/AVERTISSEMENT
HOT SURFACES. CAN CAUSE SERIOUS INJURY.
DO NOT TOUCH. ALLOW TO COOL BEFORE SERVICING.
SUPERFICIE CALIENTE. PUEDE CAUSAR LESIONES GRAVES.
NO TOCAR. DEJE QUE SE ENFRIE ANTES DE DAR SERVICIO.

P1020224


Ingersoll Rand
Industrial Technologies
MODEL
SS3
SERIAL NO.
S12064759
Made in China

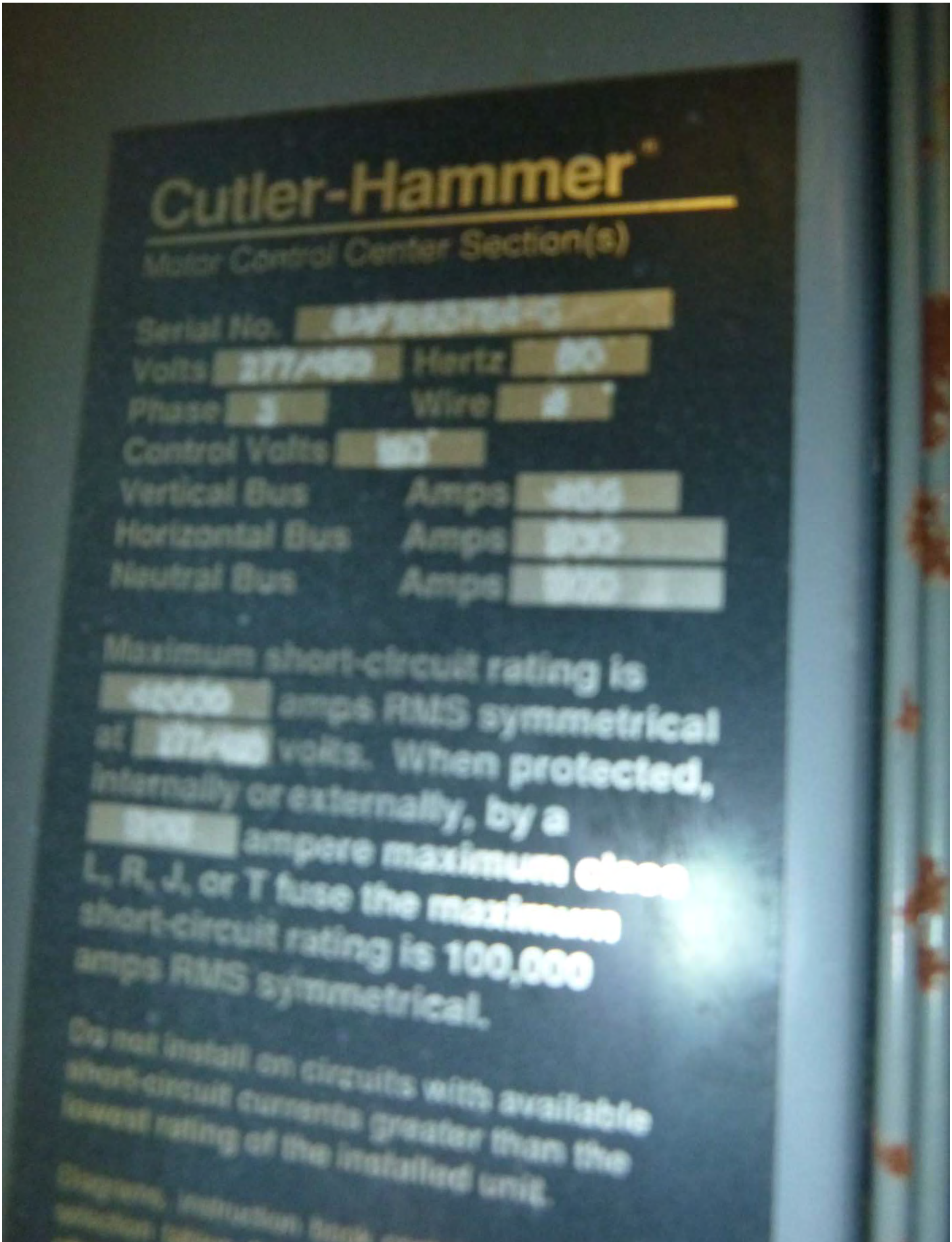
P1020225


EATON
or Control Center
BUS SPLICE KIT AND
HARDWARE LOCATED
BEHIND THIS COV

P1020226

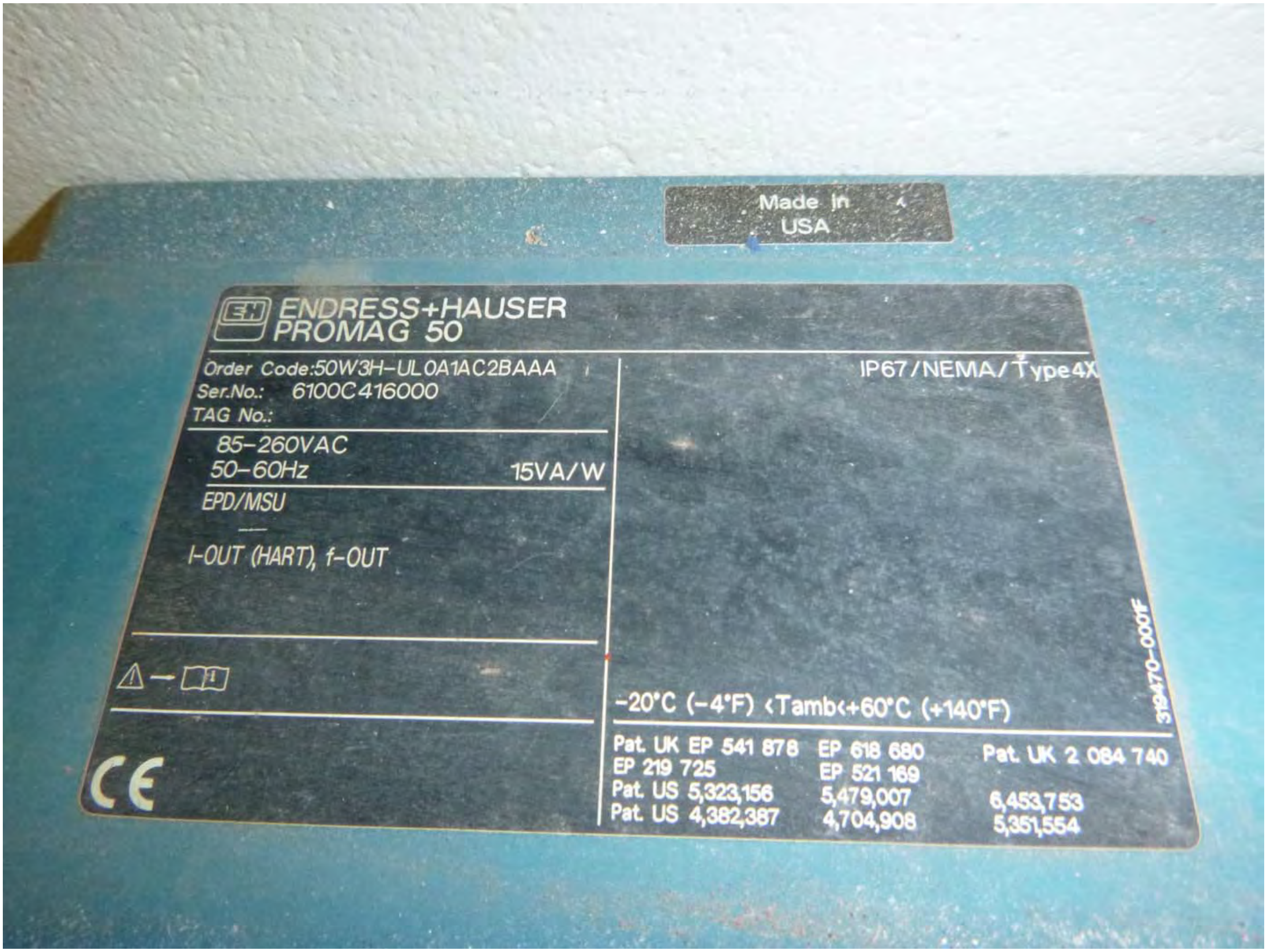

Cutler-Hammer
Motor Control Center Section(s)
Serial No.
Volts
Hertz
Phase
Wire
Control Volts
Vertical Bus
Amps
Horizontal Bus
Amps
Neutral Bus
Amps
Maximum short-circuit rating is
amps RMS symmetrical
at
volts. When protected,
internally or externally, by a
ampere maximum class
L, R, J, or T fuse the maximum
short-circuit rating is 100,000
amps RMS symmetrical.
Do not install on circuits with available
short-circuit currents greater than the
lowest rating of the installed unit.
Diagrams, instruction book containing heater coil
selection tables, field-wiring requirements, and
other data are located inside the top horizontal
wireway of an adjacent section or the bottom
horizontal wireway of this section.
EATON
Made in U.S.A.
30-13980

P1020227


Cutler-Hammer
Motor Control Center Section(s)
Serial No.
Volts
Hertz
Phase
Wire
Control Volts
Vertical Bus
Amps
Horizontal Bus
Amps
Neutral Bus
Amps
Maximum short-circuit rating is
amps RMS symmetrical
at
volts. When protected,
internally or externally, by a
ampere maximum class
L, R, J, or T fuse the maximum
short-circuit rating is 100,000
amps RMS symmetrical.
Do not install on circuits with available
short-circuit currents greater than the
lowest rating of the installed unit.

P1020228

P1020229


Made in
USA
ENDRESS+HAUSER
PROMAG 50
Order Code:50W3H-UL0A1AC2BAAA
Ser.No.: 6100C416000
TAG No.:
IP67/NEMA/Type4X
85-260VAC
50-60Hz
15VA/W
EPD/MSU
I-OUT (HART), f-OUT
-20°C (-4°F) <Tamb<+60°C (+140°F)
319470-000F
Pat. UK EP 541 878 EP 618 680 Pat. UK 2 084 740
EP 219 725 EP 521 169
Pat. US 5,323,156 5,479,007 6,453,753
Pat. US 4,382,387 4,704,908 5,351,554
CE

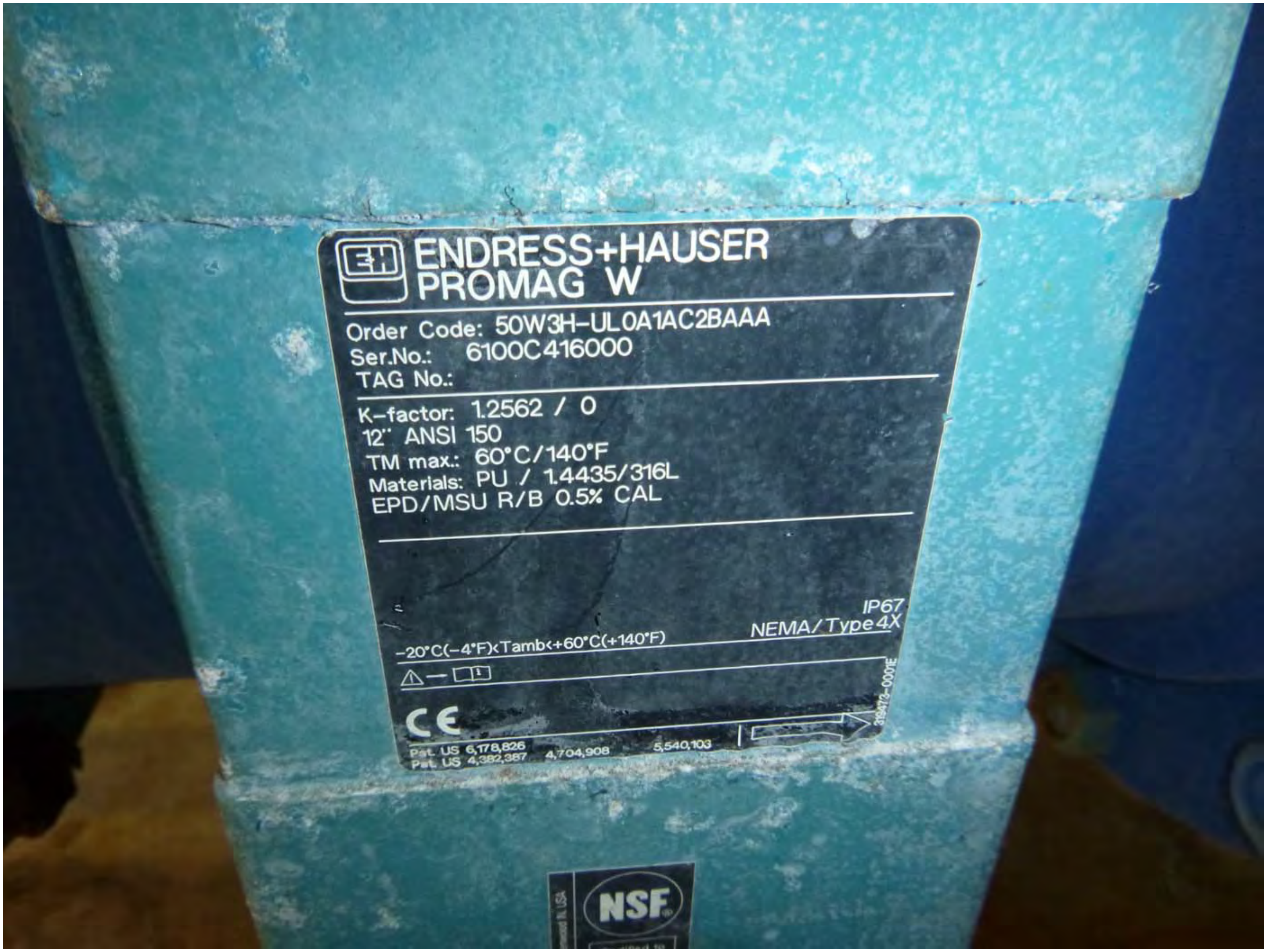
P1020230

P1020231


9180500
AMPEROMETRIC GATEWAY
HACH
MADE IN USA
S/N 1208450000347
CHLORE

P1020232

P1020233


ENDRESS+HAUSER
PROMAG W
Order Code: 50W3H-UL0A1AC2BAAA
Ser.No.: 6100C416000
TAG No.:
K-factor: 1.2562 / 0
12" ANSI 150
TM max.: 60°C/140°F
Materials: PU / 1.4435/316L
EPD/MSU R/B 0.5% CAL
IP67
NEMA/Type 4X
-20°C(-4°F)<Tamb<+60°C(+140°F)
Pat. US 6,178,826
Pat. US 4,382,387 4,704,908 5,540,103
NSF

P1020234


TYPE: 107-100
Serial No. 1615013
Tech.File KTR1118ATEX
II 2GDc 90°C-20°C Ta80°C

P1020235

P1020236

P1020237


TYPE: 087-100
Serial No. 1509510
Tech.File KTR118ATEX
II 2GDc 90°C-20°CTa80°C
L

P1020238

P1020239


TYPE: 087-100
Serial No. 1509501
Tech.File KTR118ATEX
II 2GDc 90°C-20°CTa80°C

P1020240


TYPE: 107-100
Serial No. 1615014
Tech.File KTR118ATEX
II 2GDc 90°C-20°CTa80°C

P1020241

P1020242

P1020243


MODEL
10
TYPE: 107-100
Serial No. 1615018
Tech.File KTR118ATEX
II 2GDc 90°C-20°CTa80°C

P1020244

P1020245

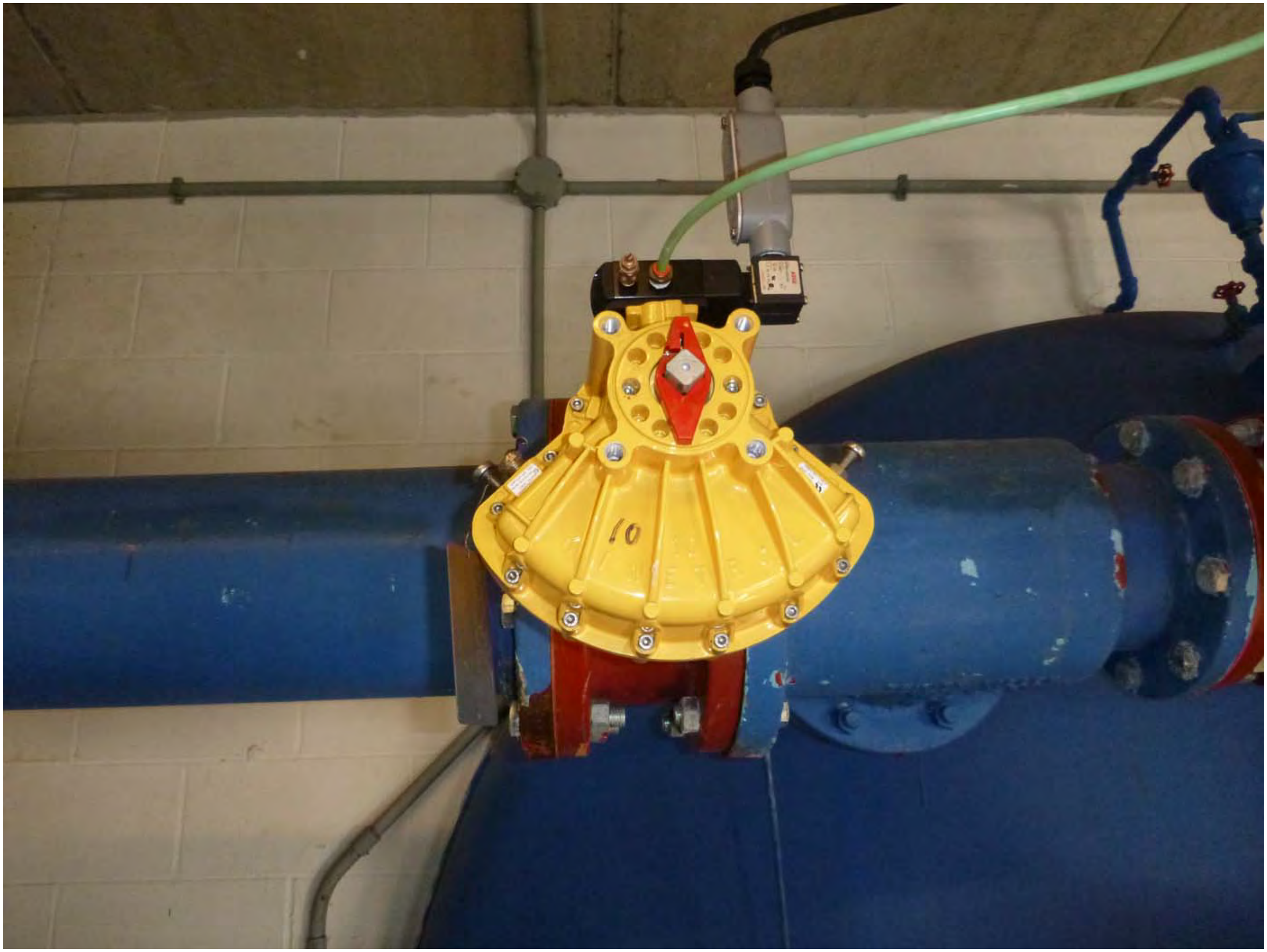
P1020246

P1020247


TYPE: 087-100
Serial No. 1597726
Tech.File KTR118ATEX
II 2GDc 90°C-20°CTa80°C

P1020248

P1020249



P1020250

P1020251

P1020252

P1020253


TYPE: 087-100
Serial No. 1638919
Tech.File KTR118ATEX
II 2GDc 90°C-20°CTa80°C

P1020254

P1020255


5
TYPE: 087-100
Serial No. 1597714
Tech.File KTR118ATEX
II 2GDc 90°C-20°C Ta80°C

P1020256

P1020257

P1020258

P1020259


TYPE: 107.100
Serial No. 1615022
Tech.File KTR118ATEX
II 2GDc 90°C-20°CTa80°C

P1020260


TYPE: 087-100
Serial No. 16147737
Tech File KTR118ATEX
II 2GDc 90°C-20°CTa80°C

P1020261

P1020262

P1020263

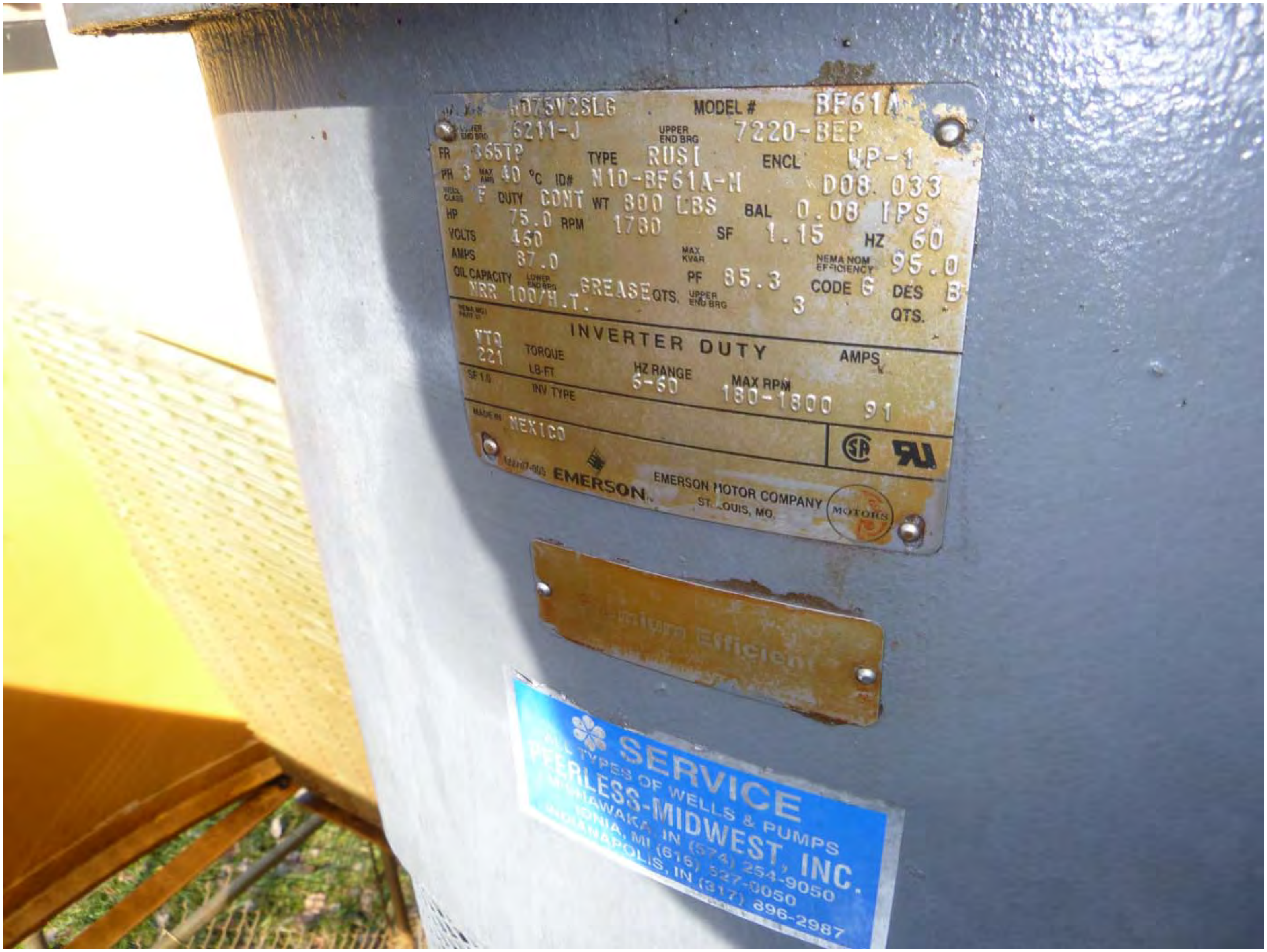

TYPE: 087-100
Serial No. 1643170
Tech.File KTR118ATEX
II 2GDc 90°C-20°CTa80°C

P1020264

P1020265

P1020266

P1020267



MODEL # BF61A
HD75V2SLG
6211-J
UPPER END BRG 7220-BEP
FR 365TP TYPE RUSI ENCL WP-1
PH 3 MAX AMB 40 °C ID# N10-BF61A-M D08 033
F DUTY CONT WT 800 LBS BAL 0.08 IPS
HP 75.0 RPM 1780
VOLTS 460 SF 1.15 HZ 60
AMPS 87.0
NEMA NOM EFFICIENCY 95.0
OIL CAPACITY GREASE QTS. PF 85.3 CODE G DES B
NRR 100/H.T.
3 QTS.
INVERTER DUTY
VTQ 221 TORQUE LB-FT
HZ RANGE 6-60
MAX RPM 180-1800
AMPS 91
INV TYPE
MADE IN MEXICO
EMERSON
EMERSON MOTOR COMPANY ST. LOUIS, MO.
MOTORS
SERVICE
ALL TYPES OF WELLS & PUMPS
PEERLESS-MIDWEST, INC.
MISHAWAKA, IN (574) 254-9050
IONIA, MI (616) 527-0050
INDIANAPOLIS, IN (317) 896-2987

P1020268

P1020269


— WARNING —
DISCONNECT POWER SUPP Y
DO NOT SER ICE WHILE
INSTALLED BY
PEERLESS-MIDWEST INC.
MISHAWAKA, INDIANA
PHONE 574-254-9050
PUMP SERIAL NUMBER

P1020270

P1020271


Cutler-Hammer
SINGLE PHASE TRANSFORMER
TRANSFORMADOR MONOFASICO
TRANSFORMATEUR MONOPHASÉ
60 HZ
SERIAL No.
MPC 1 PH
FRAME:
GABINETE: 307
BÂTI:
2.27 % IMP
SEC.: 120/240
WEIGHT/ PESO /POIDS:
SUITABLE FOR SERVICE EQUIPMENT
DANGER
PELIGRO

P1020272

P1020273


PROMAG 50
Endress+Hauser
Order Code:50W2F--ULGA1RK5BAAD
Ser.No.: AA02D316000
TAG No.:
NEMA/Type4X
CL.I, DIV.2, GP. ABCD
Dust-ignitionproof
CL.II, DIV.1, GP.EFG, CL.III and
FM: CL.I, Zone 2 IIC T4A
CSA: CL.I, Zone 2 Group IIC T4A
85-260VAC
15VA/W 50-60Hz
EPD/MSU
I-OUT (HART), f-OUT
STATUS-OUT, STATUS-IN
FM:control dwg.FES0024
CSA:control dwg.FES0042
control drawings.
-20°C (-4°F) <Tamb<+60°C (+140°F)
N12895
APPROVED
Pat. US
Pat. US

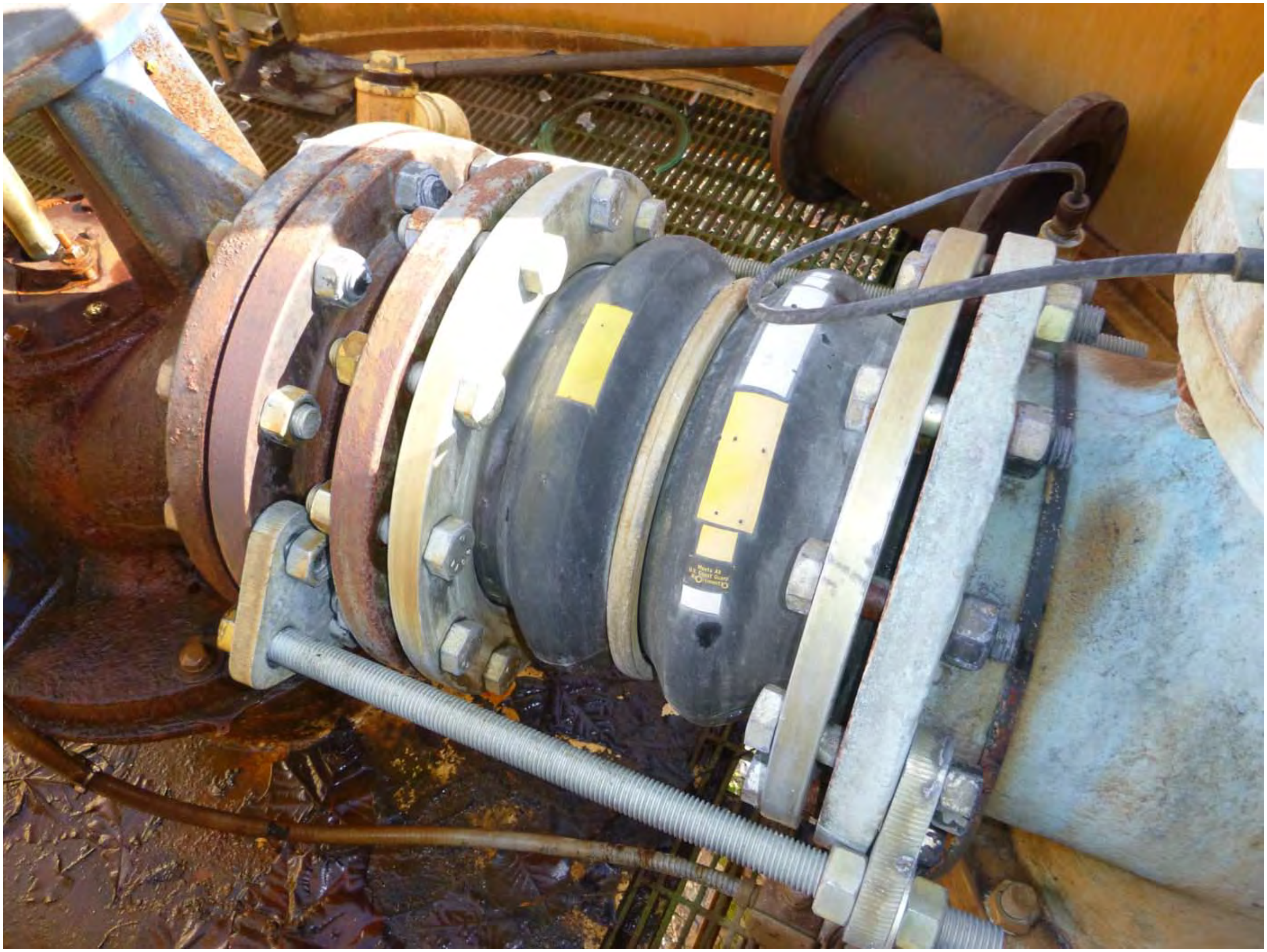
P1020274


VAL-MATIC CORP.
ELMHURST, IL.
PORT THROTTLING DEVICE
3DPT
U.S. PAT. 5,765,595

P1020275

P1020276

P1020277



P1020278

P1020279

P1020280

P1020281

P1020282


CITY OF LAWRENCE
WATER PROJECT
1989
BOARD OF PUBLIC WORKS AND SAFETY
THOMAS D. SCHNEIDER MAYOR
H. DONALD INSKEEP PRESIDENT
R. DOUGLAS REESER MEMBER
COMMON COUNCIL
R. DOUGLAS REESER PRESIDENT
GEORGE F. CALLAHAN MEMBER
JEANNE JOHNSON MEMBER
GEORGE KELLER MEMBER
MICHAEL R. SNOW MEMBER
JAMES M. SOLENBERG MEMBER
PAUL WHITEHEAD MEMBER
ENGINEER
CLYDE E. WILLIAMS & ASSOCIATES, INC.
CONTRACTOR
BOWEN ENGINEERING CORPORATION

P1020283

P1020284


FILTER
Company
GF
Ames,
GF
COMPANY
DESIGN PRESSURE
TEST PRESSURE
P.S.I.
DO NOT EXCEED
E2

P1020285

P1020286


GENERAL FILTER COMPANY
AMES, IOWA
PROD. ORDER NO.
DESIGN PRESSURE
P.S.I.
TEST PRESSURE
P.S.I.
CAUTION-DO NOT EXCEED
DESIGN P.S.I.
E1

P1020287

P1020288

GF
Ames, Iowa
SINCE 1935
GENERAL FILTER COMPANY
AMES, IOWA
PROD. ORDER NO.
DESIGN PRESSURE P.S.I.
TEST PRESSURE P.S.I.
GF
CAUTION-DO NOT EXCEED DESIGN P.S.I.
W1

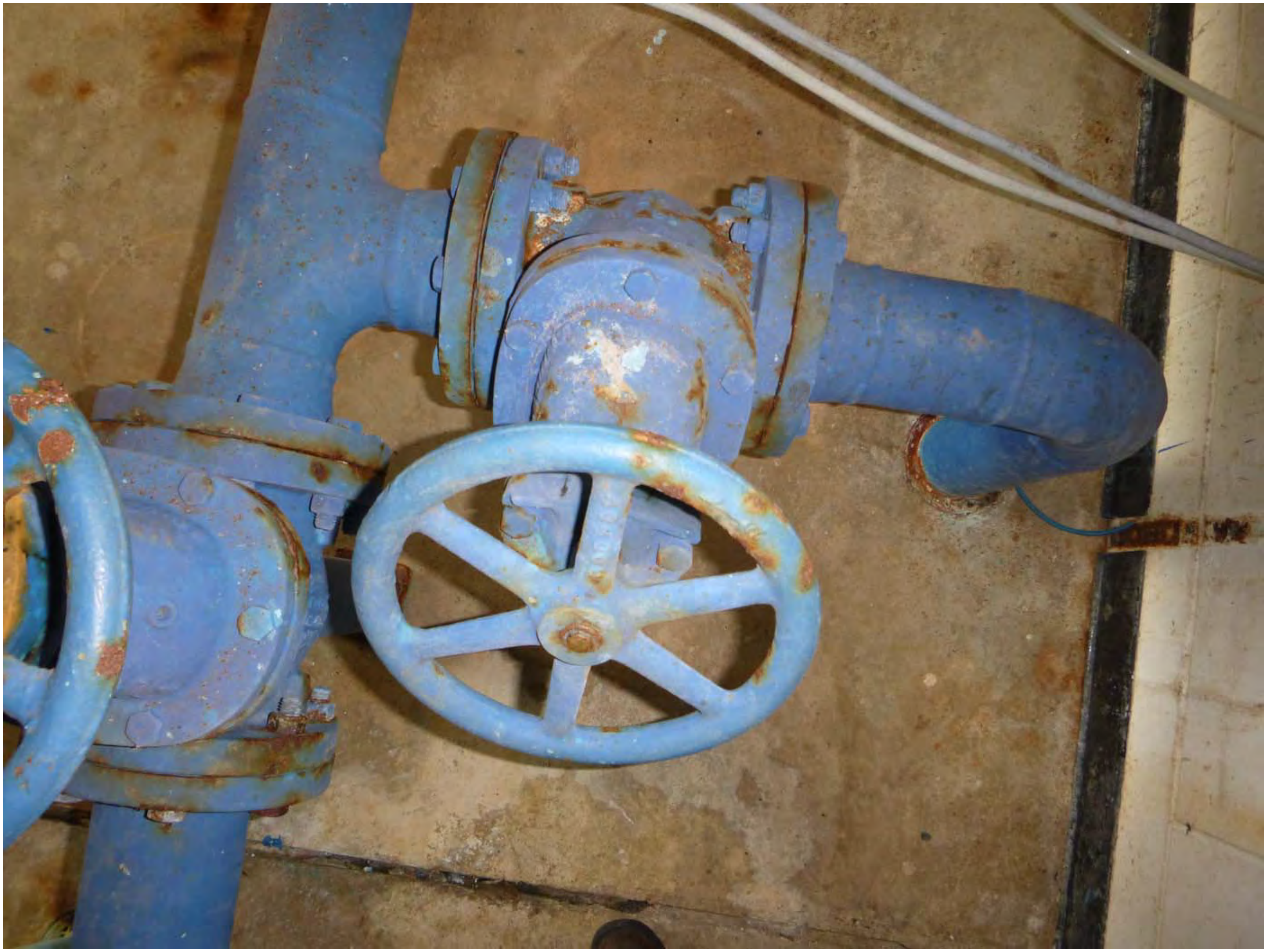
P1020289

P1020290


GF
GENERAL FILTER COMPANY
AMES, IOWA
PROD. ORDER NO.
DESIGN PRESSURE P.S.I.
TEST PRESSURE P.S.I.
GF
CAUTION-DO NOT EXCEED
DESIGN P.S.I.
W2

P1020291

P1020292

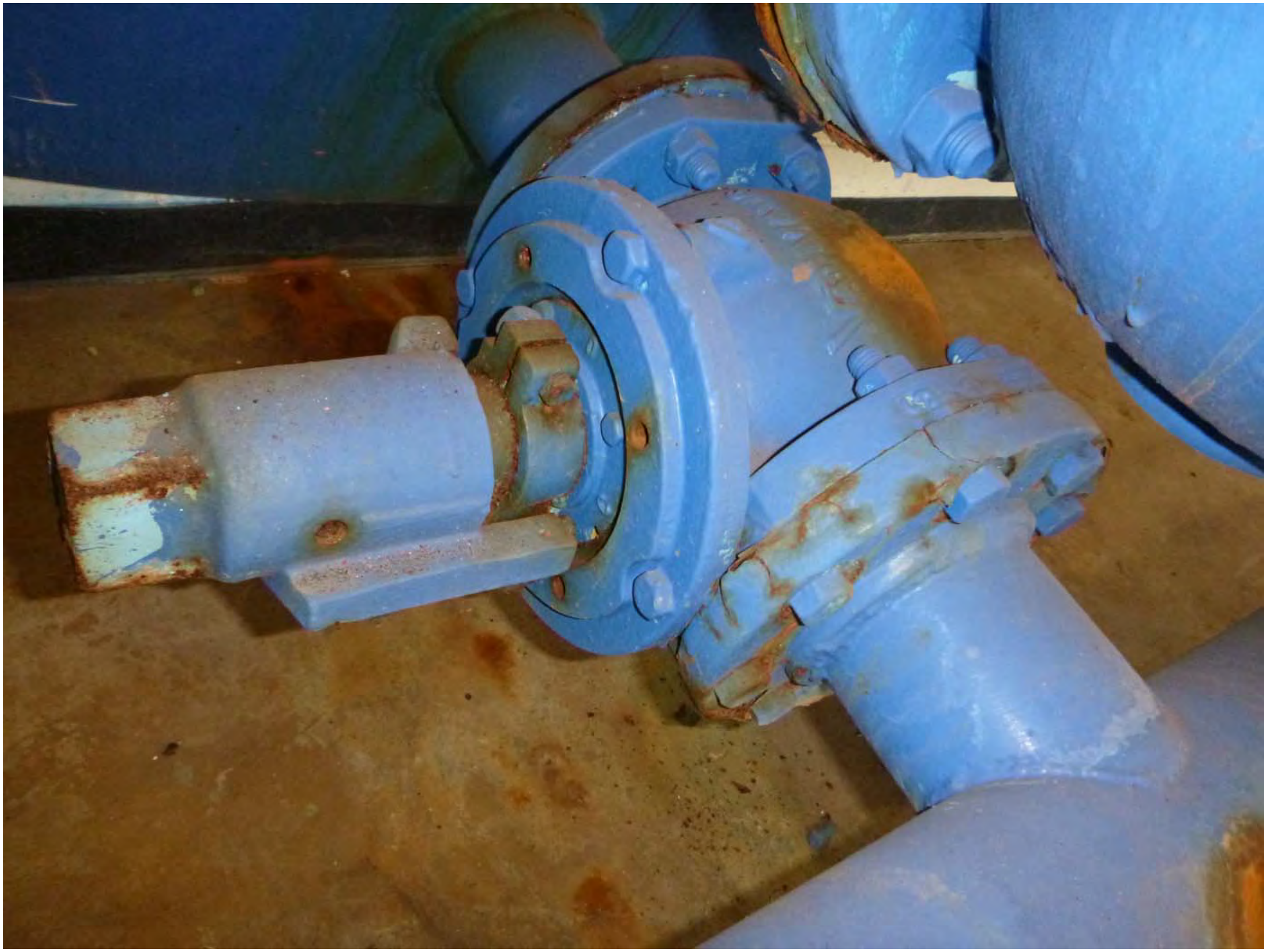


P1020293

P1020294

P1020295

P1020296



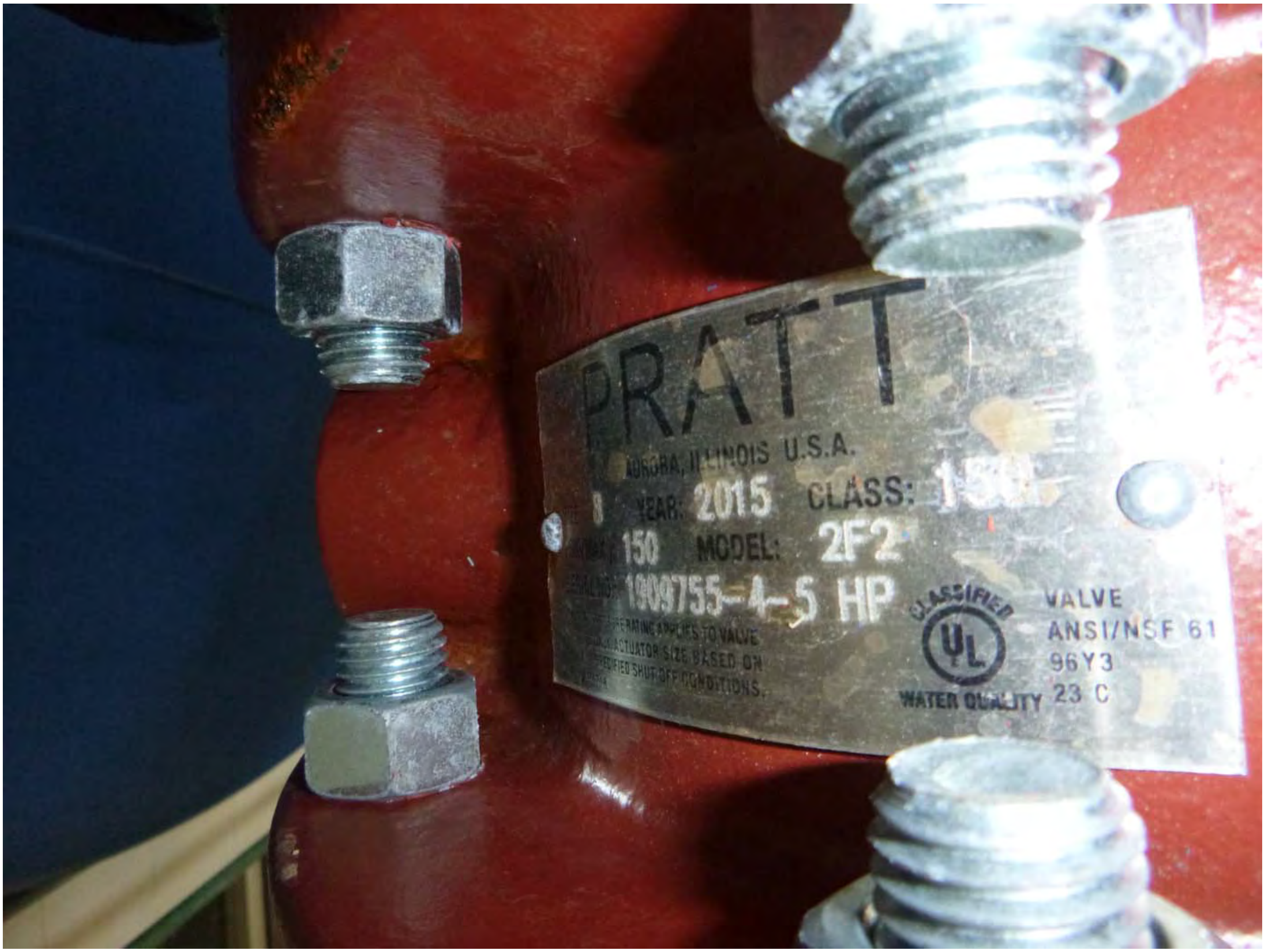
P1020297

P1020298

P1020299

P1020300

P1020301


PRATT
AURORA, ILLINOIS U.S.A.
YEAR: 2015 CLASS:
150 MODEL: 2F2
1909755-4-5 HP
CLASSIFIED
UL
WATER QUALITY
VALVE
ANSI/NSF 61
96Y3
23 C

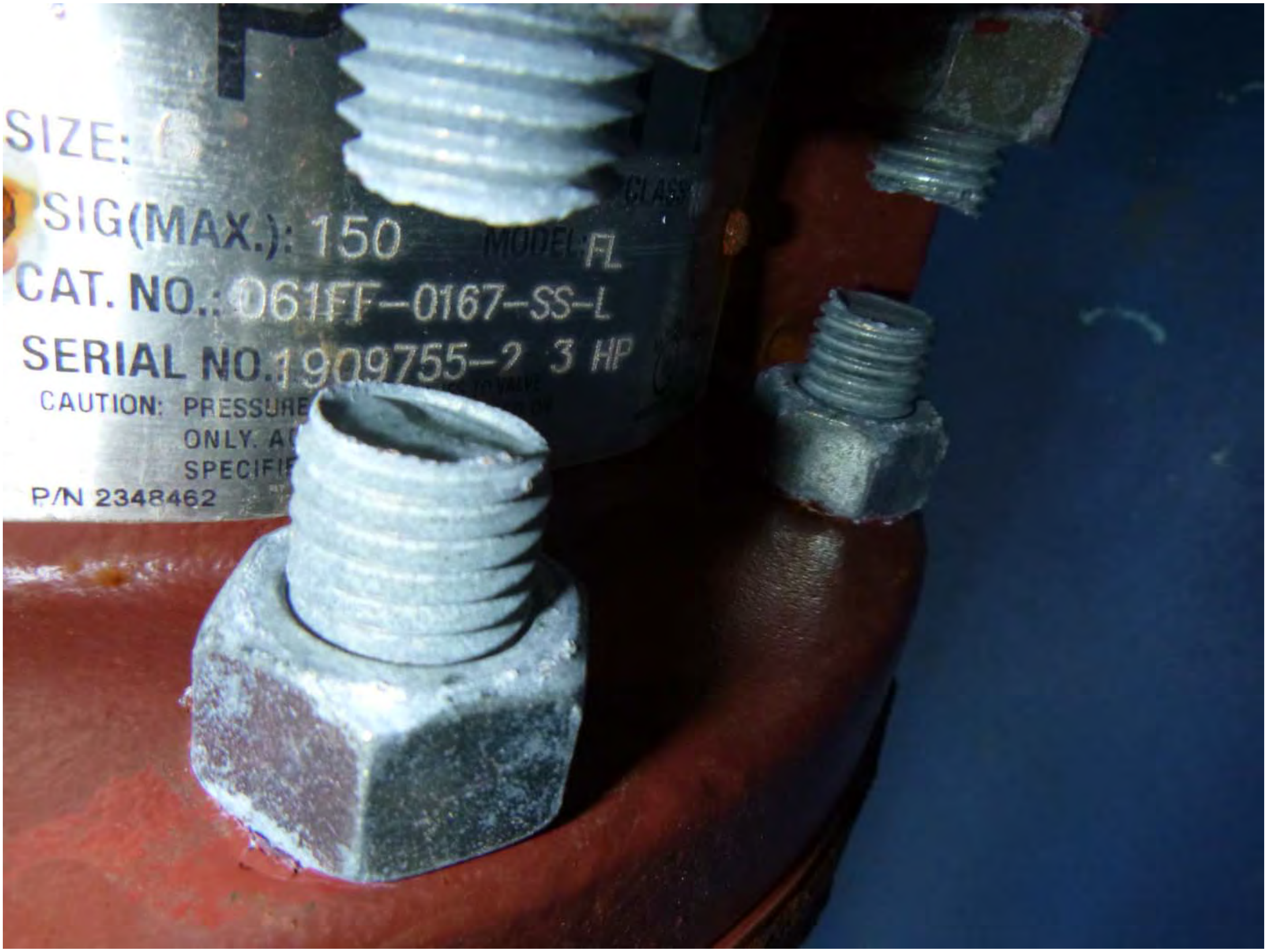
P1020302


PRATT
AURORA, ILLINOIS
SIZE: 8
YEAR:
PSIG(MAX.): 150
MODEL
SERIAL NO.: 1909755
CAUTION: PRESSURE RATING APPLIES TO VALVE ONLY. ACTUATOR SIZE BASED ON SPECIFIED SHUT OFF CONDITIONS.
P/N 2271718

P1020303


ATT
CLASS:150
MODEL:
-SS-L
3 HP
APPLIES TO VALVE
FOR SIZED BASED ON
OFF CONDITIONS.
CLASSIFIED
UL
WATER QUALITY
VALVE
ANSI/NSF61
96Y3
23 C
CHINA

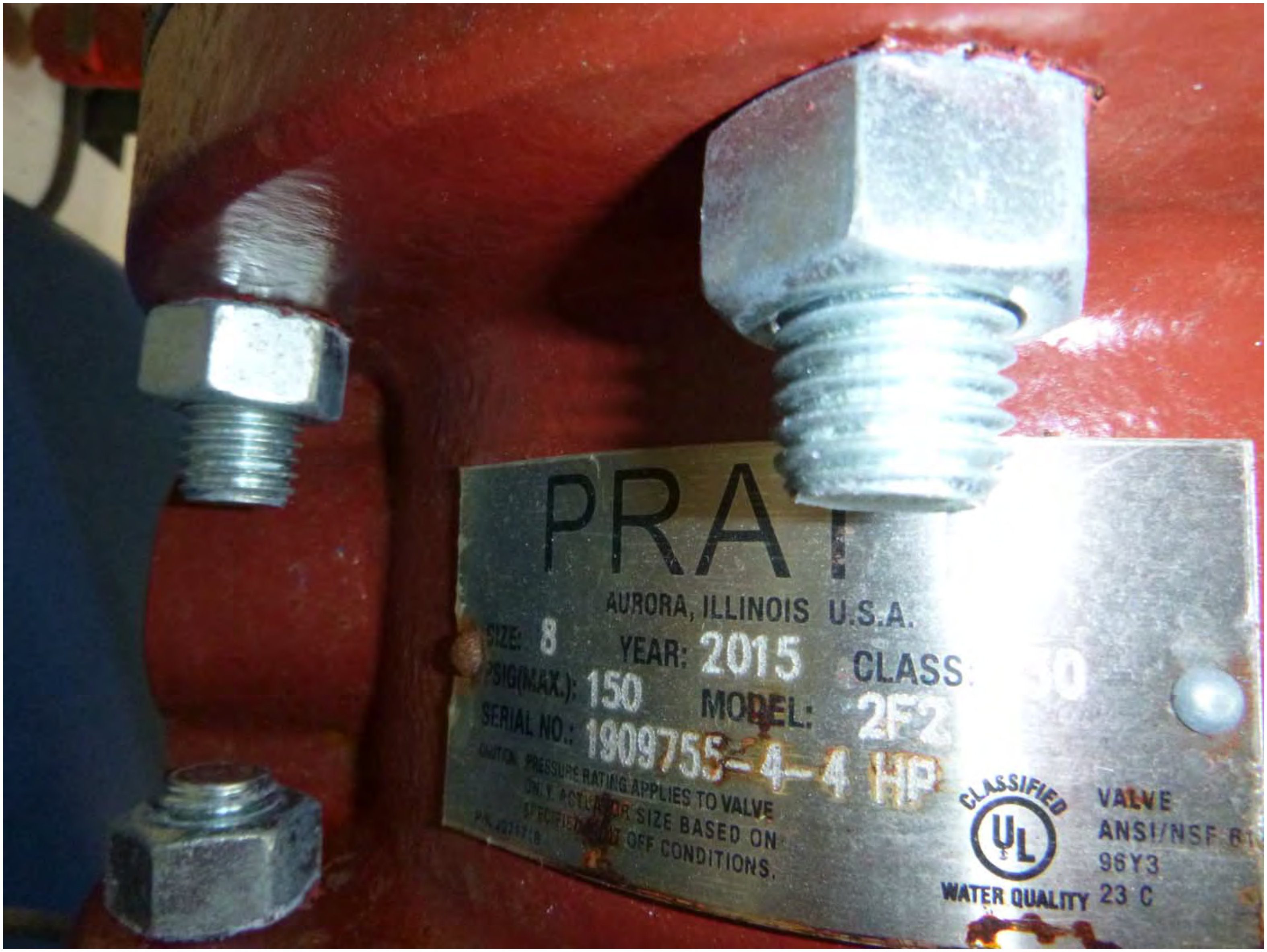
P1020304


SIZE: 6
PSIG(MAX.): 150
MODEL: FL
CAT. NO.: 061FF-0167-SS-L
SERIAL NO. 1909755-2 3 HP
CAUTION:
P/N 2348462

P1020305


PRATT
AURORA, ILL U.S.A.
SIZE: 8
YEAR:
CLASS: 150
PSIG(MAX.): 150
MODEL: 2F2
SERIAL NO.:
HP
CAUTION: PRESSURE RATING APPLIES TO VALVE ONLY. ACTUATOR SIZE BASED ON SPECIFIED SHUT OFF CONDITIONS.
P/N 2271718
CLASSIFIED
WATER QUALITY

P1020306

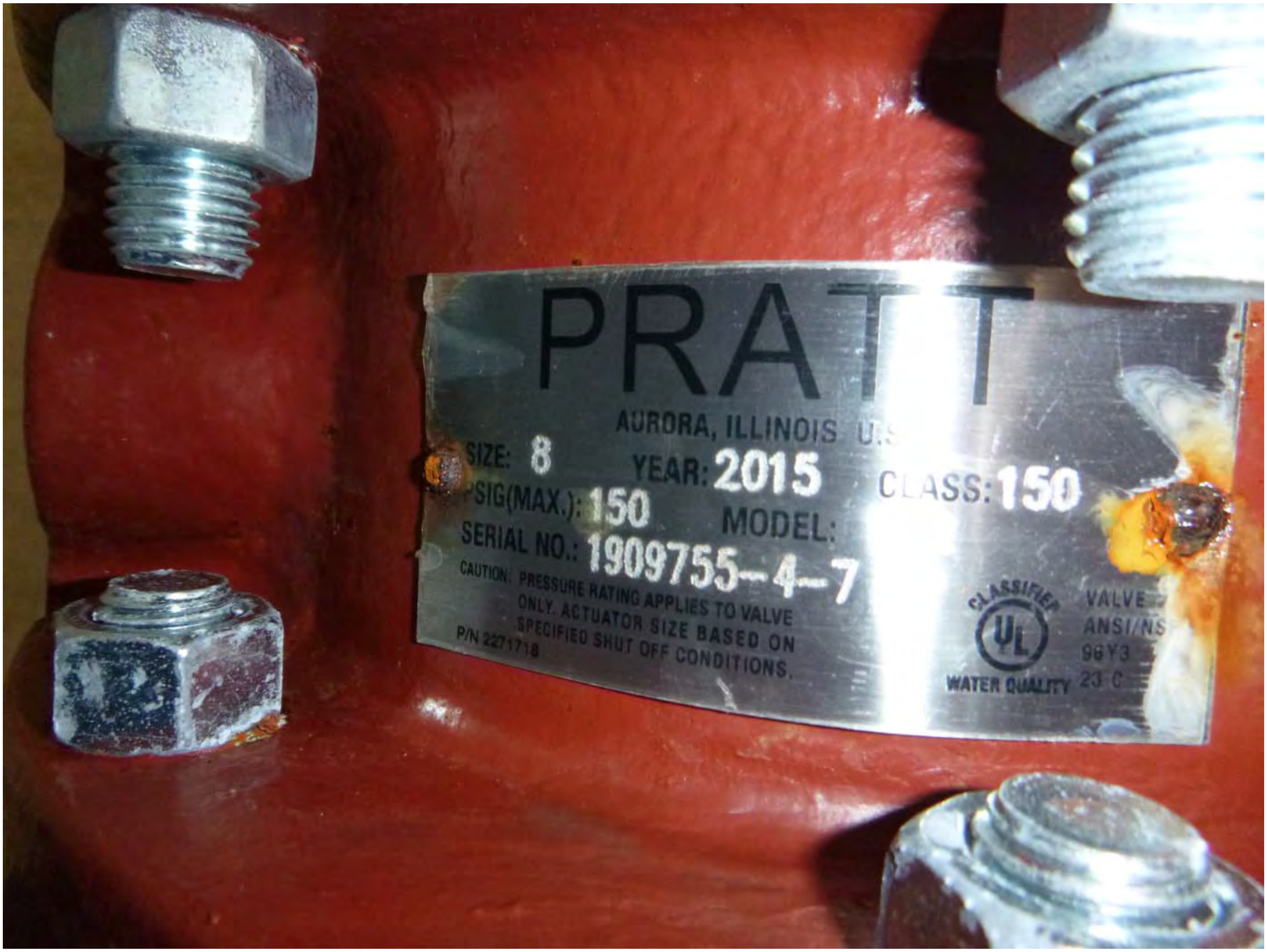

PRAT
AURORA, ILLINOIS U.S.A.
SIZE: 8
YEAR: 2015
CLASS:
PSIG(MAX.): 150
MODEL:
SERIAL NO.:
PRESSURE RATING APPLIES TO VALVE
SIZE BASED ON
OFF CONDITIONS.
CLASSIFIED
WATER QUALITY
VALVE
96Y3
23 C

P1020307

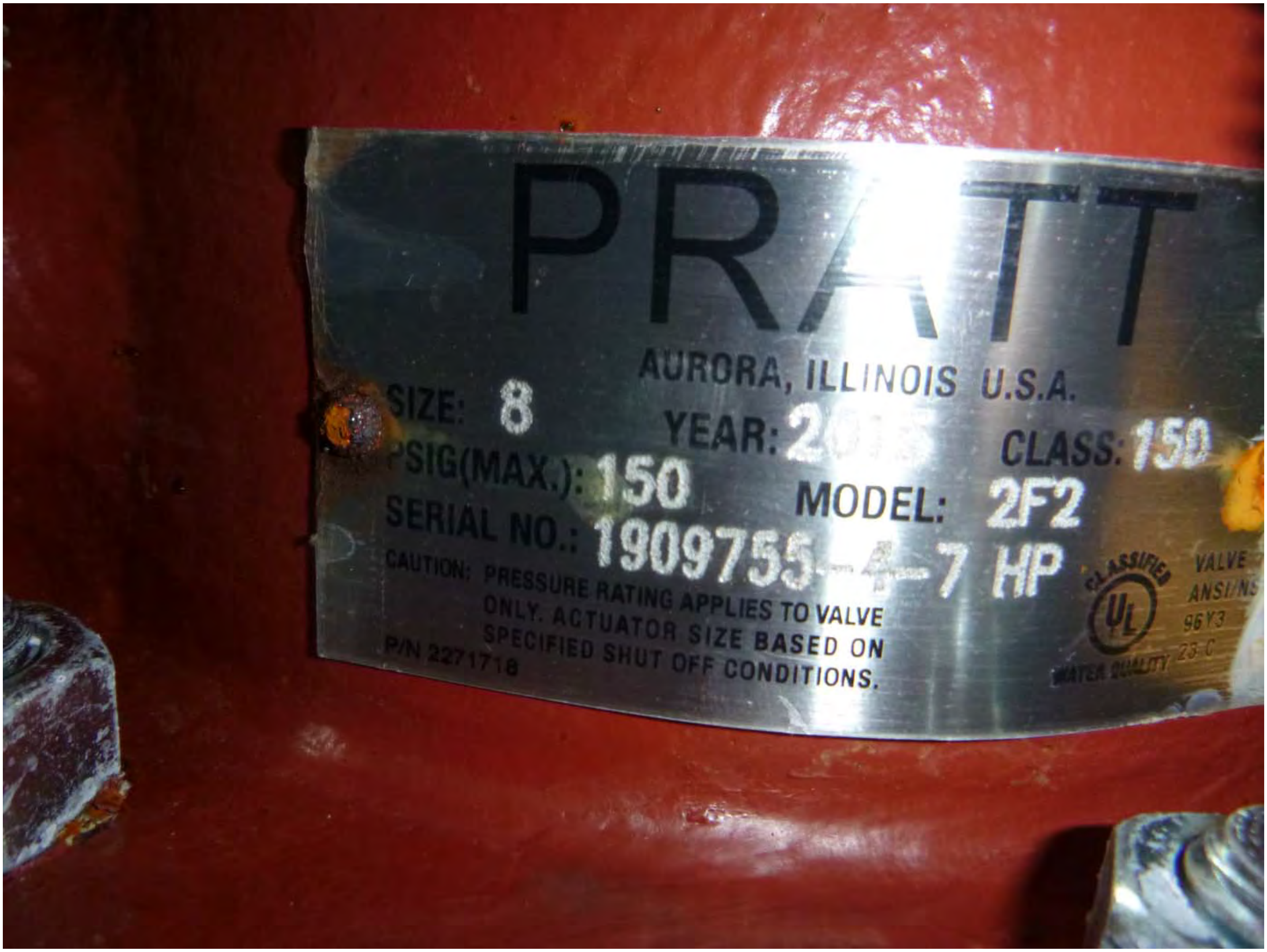
P1020308


RATT
YEAR:2015 CLASS:150
150 MODEL:
061FF-0167-SS-L
755-2 7 HP
PRESSURE RATING APPLIES TO VALVE
ACTUATOR SIZED BASED ON
SHUT OFF CONDITIONS.
CLASSIFIED
UL
WATER QUALITY
VALVE
ANSI/NSF61
96Y3
23 C
CHINA

P1020309


PRATT
AURORA, ILLINOIS U.S
SIZE: 8
YEAR: 2015
CLASS: 150
PSIG(MAX.): 150
MODEL:
SERIAL NO.: 1909755-4-7
CAUTION: PRESSURE RATING APPLIES TO VALVE ONLY. ACTUATOR SIZE BASED ON SPECIFIED SHUT OFF CONDITIONS.
P/N 2271718
CLASSIFIED
UL
WATER QUALITY
VALVE
ANSI/NS
96Y3
23 C

P1020310


PRATT
AURORA, ILLINOIS U.S.A.
SIZE: 8
YEAR:
CLASS: 150
PSIG(MAX.): 150
MODEL: 2F2
SERIAL NO.: 1909755-4-7 HP
CAUTION: PRESSURE RATING APPLIES TO VALVE ONLY. ACTUATOR SIZE BASED ON SPECIFIED SHUT OFF CONDITIONS.
P/N 2271718
CLASSIFIED
WATER QUALITY
VALVE

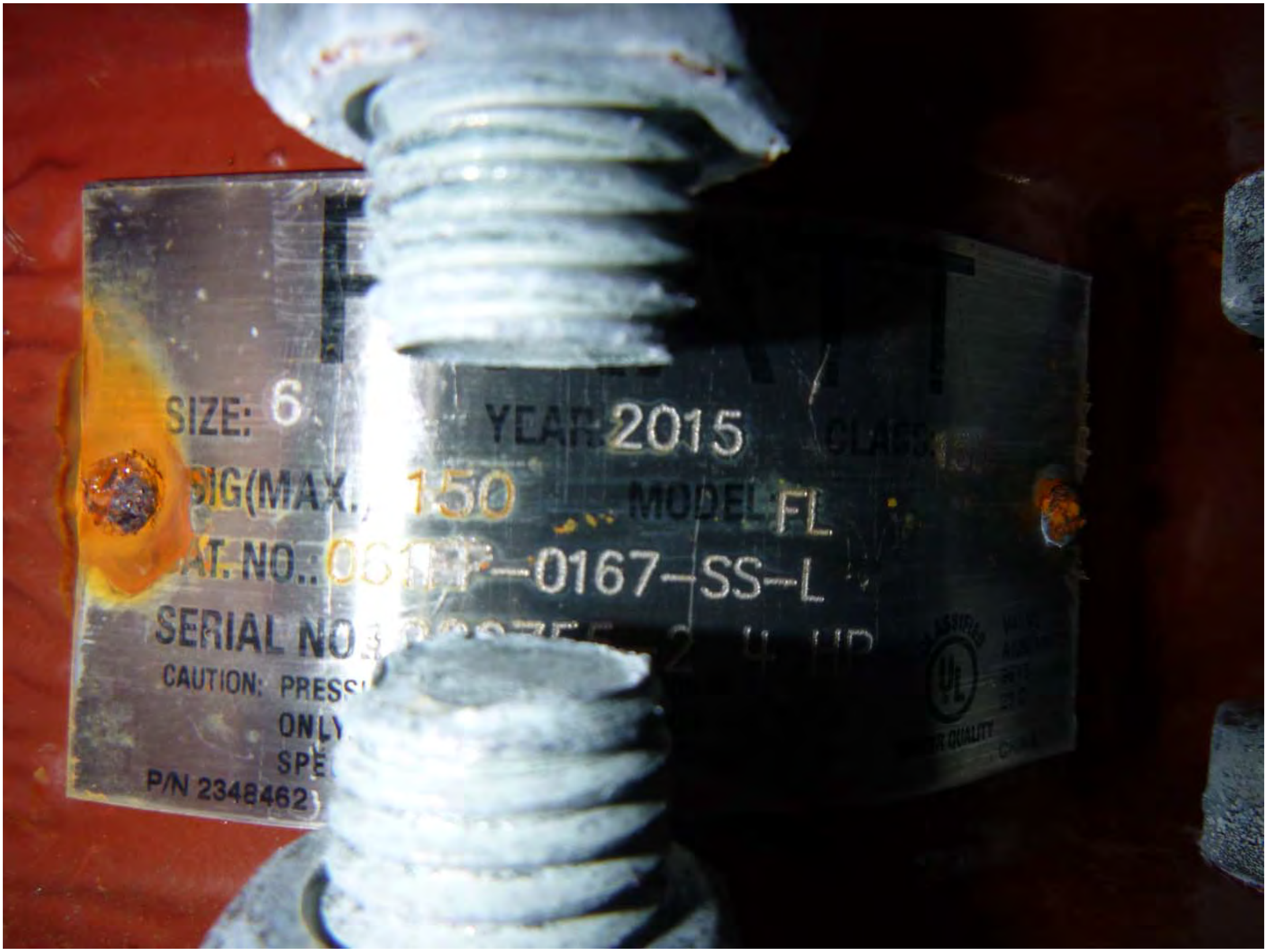
P1020311


YEAR 2015
MAX.): 150
MODEL FL
NO.: 061FF-0167-SS-L
SERIAL NO.: 909755-2 4 HP
CAUTION: PRESSURE RATING
ONLY. ACTUATO
SPECIFIED SHUT
P/N 2348462

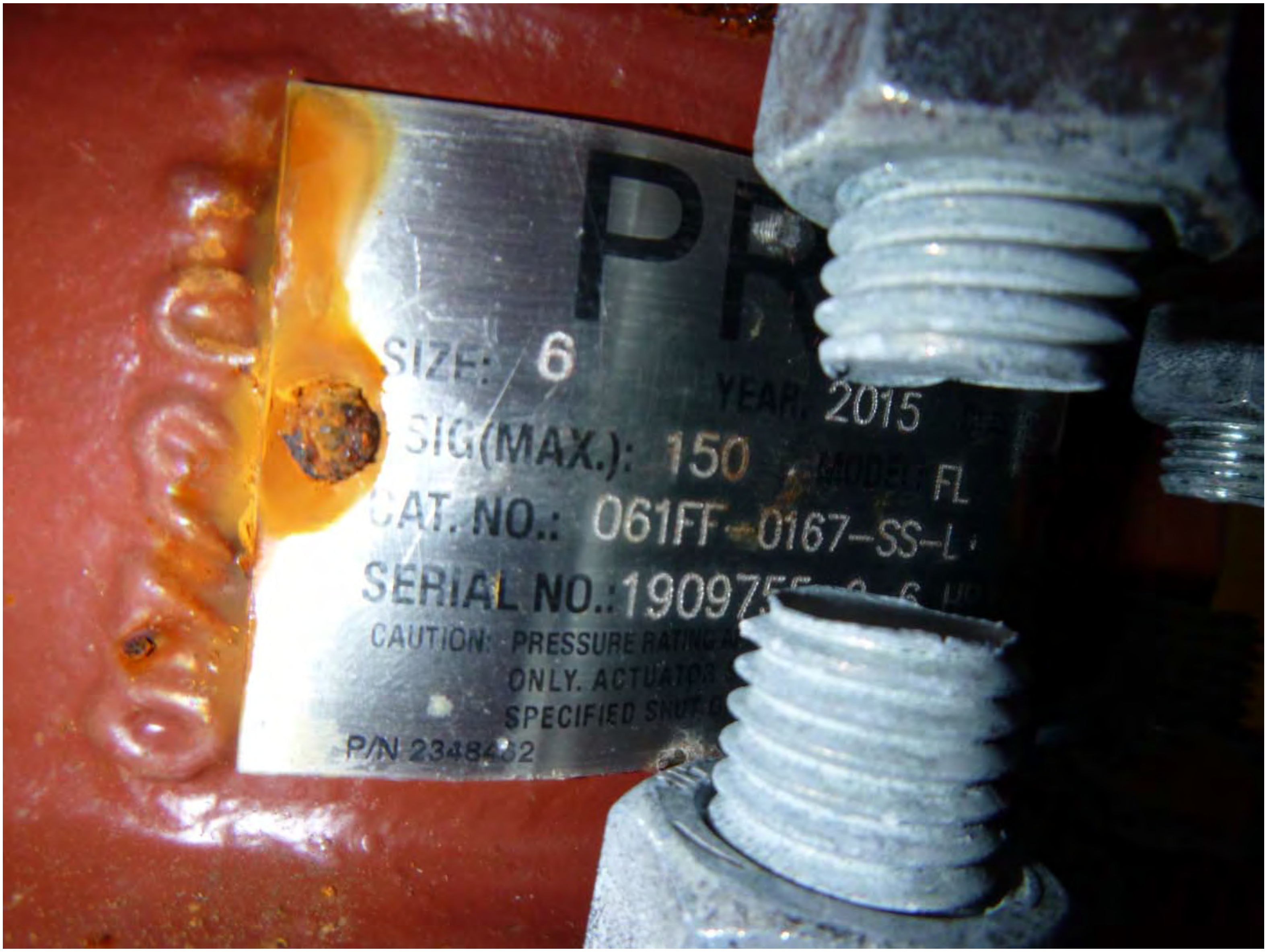
P1020312


RATT
YEAR:2015
CLASS 150
150
MODEL:
RATING APPLIES TO VALVE
TUATOR SIZED BASED ON
SHUT OFF CONDITIONS.
VALVE
ANSI/NSF61
23 C
WATER QUALITY
CHINA

P1020313


SIZE: 6
YEAR 2015
MODEL FL
0167-SS-L
SERIAL NO
CAUTION:
P/N 2348462

P1020314


SIZE: 6
YEAR: 2015
SIG(MAX.): 150
CAT. NO.: 061FF-0167-SS-L
CAUTION: PRESSURE RATING
ONLY. ACTU
SPECIFIED SHUT

P1020315


YEAR: 2015
CLASS: 150
SIZE: 6
MODEL: FL
PSIG(MAX.): 150
CAT. NO.:
0167-SS-L
SERIAL NO
2 6 HP
CAUTION:
CHINA

P1020316


PRATT
ILLINOIS U.S.A.
2015 CLASS: 150
150 MODEL: 2F2
1909755-4-8 HP
CLASSIFIED
WATER
VALVE
ANSI/NSF
96Y3
23 C

P1020317


PRATT
AURORA, ILLINOIS U.S.A.
SIZE: 8 YEAR: 2016 CLASS: 150
PSIG(MAX.): 150 MODEL: 2F2
SERIAL NO.: 1909755-4-8 HP
CAUTION: PRESSURE RATING APPLIES TO VALVE
ONLY. ACTUATOR SIZE BASED ON
SPECIFIED SHUT OFF CONDITIONS.
P/N 2271718
WATER QUALITY

P1020318


PRATT
AURORA, ILLINOIS U.S.A.
YEAR:
CLASS: 150
MODEL: 2F2
SERIAL NO.:
WATER QUALITY

P1020319


PRATT
AURORA
LINOIS U.S.A.
SIZE: 8
YEAR
015
CLASS: 150
PSIG(MAX.): 150
MODEL: 2F2
SERIAL NO.: 1909
-4-7 HP
CAUTION: PRESSURE RATING APPLIES TO VALVE ONLY. ACTUATOR SIZE BASED ON SPECIFIED SHUT OFF CONDITIONS.
271718
CLASSIFIED
UL
WATER QUALITY

P1020320


PRATT
AURORA, ILLINOIS U.S.A.
YEAR: 2015
8
150
MODEL:
SERIAL NO.:
CAUTION PRESSURE RATING APPLIES TO VALVE
ONLY, ACTUATOR SIZE BASED ON
SPECIFIED SHUT OFF CONDITIONS.
P/N 2271718
VALVE
ANSI/NSF 61
96Y3
23 C
UL
WATER QUALITY

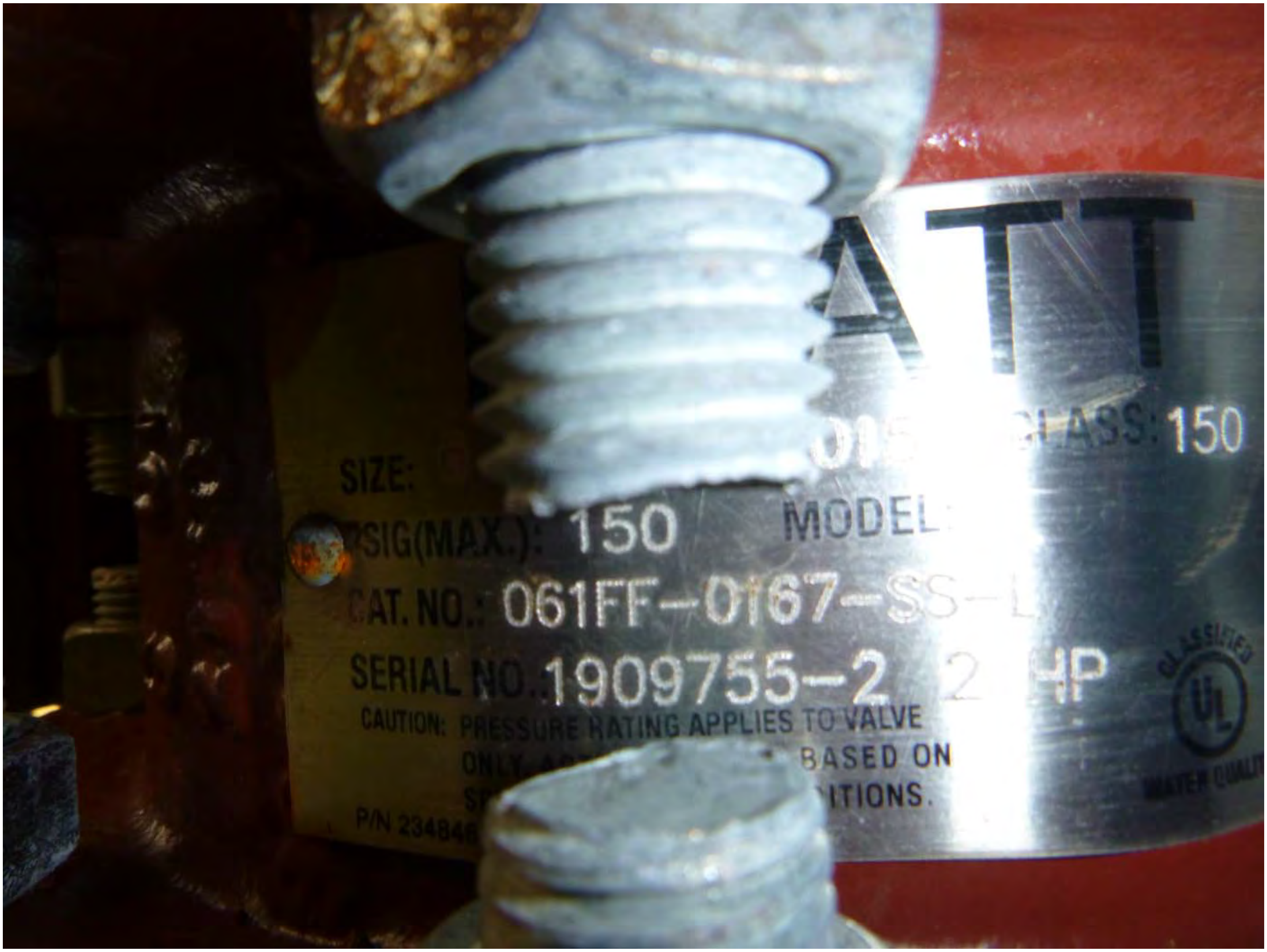
P1020321


PRATT
AURORA, ILLINOIS U.S.A.
SIZE: 8 YEAR: 2015 CLASS: 150
PSIG(MAX.): 150 MODEL: 2F2
SERIAL NO.: 1909755-4-
HP
CLASSIFIED
UL
WATER QUALITY
VALVE
ANSI/NSF
96Y3
23 C
CAUTION: PRESSURE RATING APPLIES TO VALVE ONLY. ACTUATOR SIZE BASED ON SPECIFIED SHUT OFF CONDITIONS.
P/N 2271718

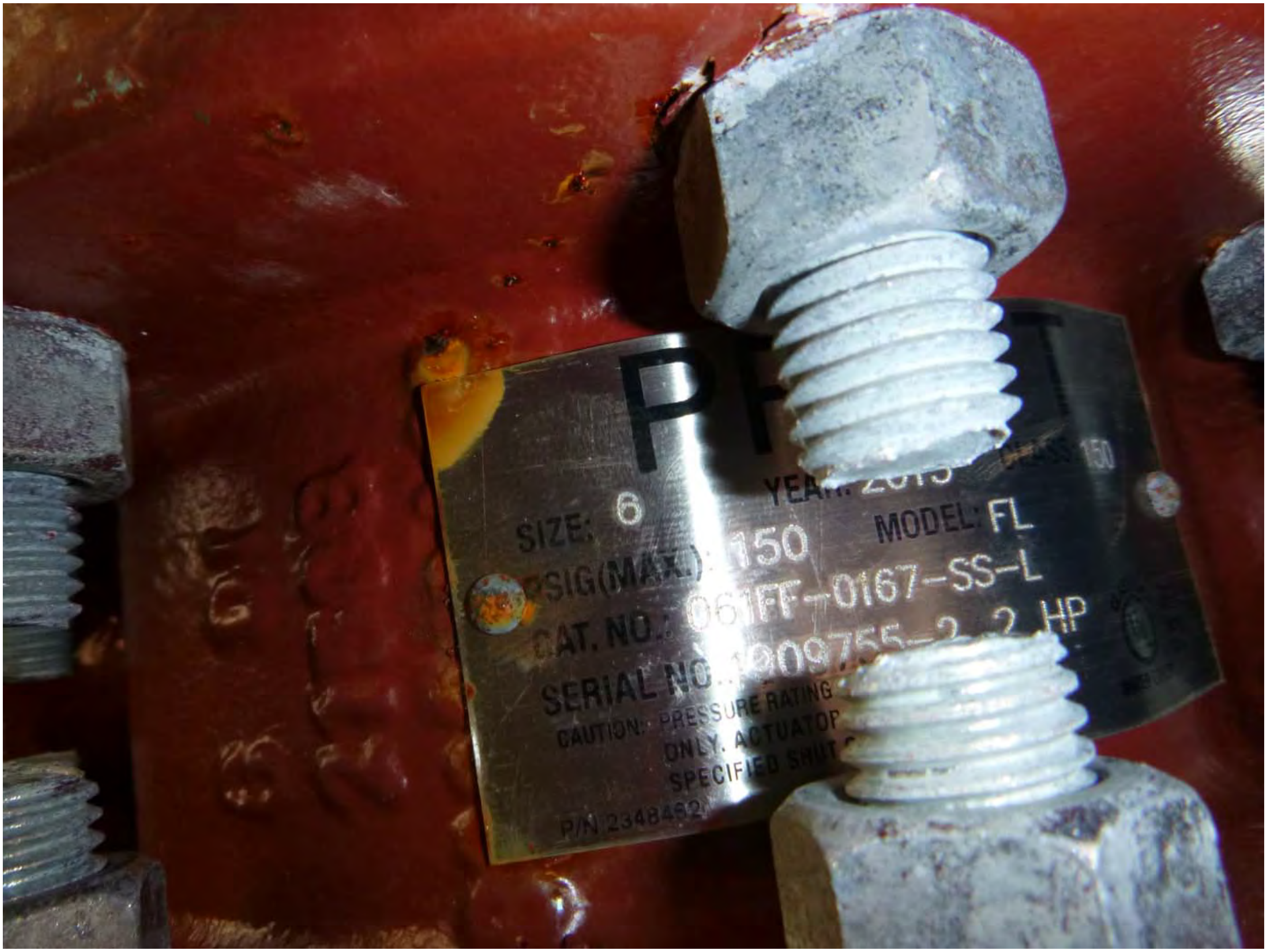
P1020322


PR
SIZE: 6
YEAR: 2
PSIG(MAX.): 150
MODEL:
CAT. NO.:
1FF-0167-SS
SERIAL NO.:1909755-2
CAUTION: PRESSURE RATING APPLIES TO VALVE
ONLY. ACTUATOR SIZED BASED
SPECIFIED SHUT OFF
P/N 2348462

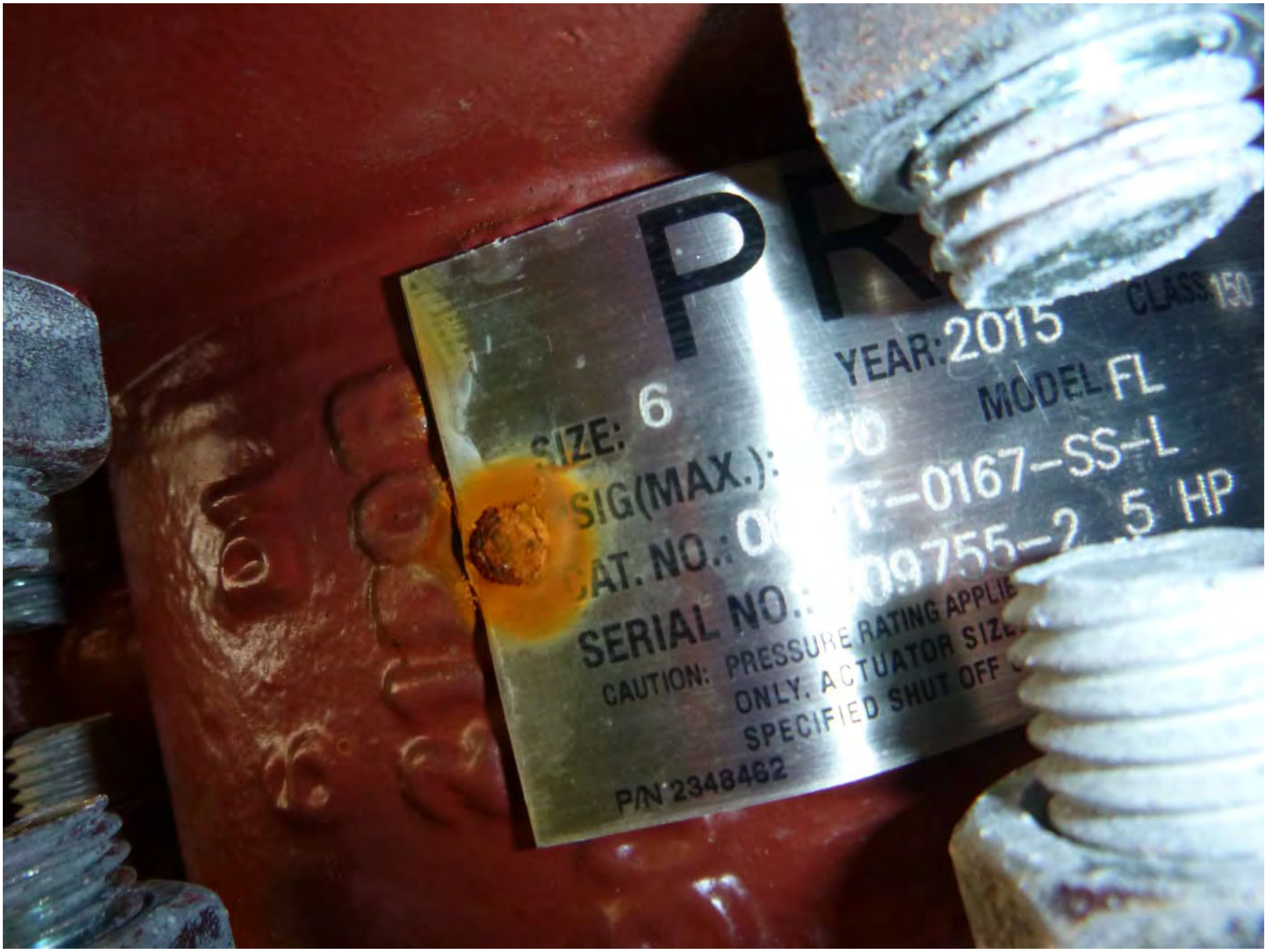
P1020323


ATT
CLASS: 150
SIZE:
PSIG(MAX.): 150
MODEL
CAT. NO.: 061FF-0167-SS-L
SERIAL NO.1909755-2
HP
CAUTION: PRESSURE RATING APPLIES TO VALVE
BASED ON
ITIONS.
P/N 23484
CLASSIFIED
UL
WATER QUALITY

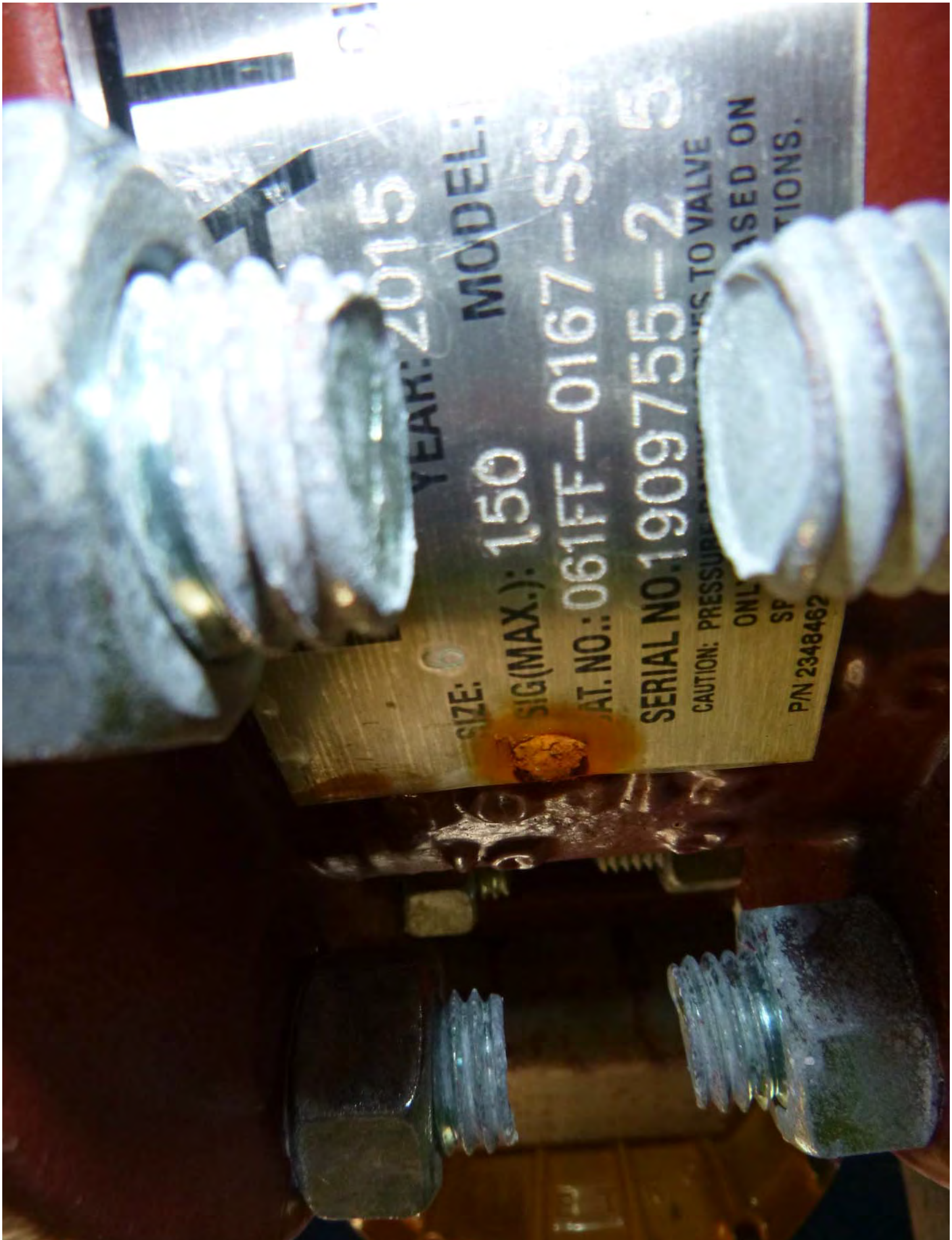
P1020324


SIZE: 6
YEAR: 2015
CLASS: 150
MODEL: FL
PSIG(MAX.): 150
CAT. NO.: 061FF-0167-SS-L
P/N 2348462

P1020325


PR
CLASS 150
YEAR:2015
SIZE: 6
MODEL FL
SIG(MAX.):
CAT. NO.:
F-0167-SS-L
5 HP
SERIAL NO.:
CAUTION: PRESSURE RATING APPLIE
ONLY. ACTUATOR SIZE
SPECIFIED SHUT OFF
P/N 2348462

P1020326


YEAR: 2015
MODEL:
SIZE:
150
061FF-0167-
SERIAL NO.1909755-2
CAUTION:
TO VALVE

P1020327


ATT
YEAR:2015
CLASS:150
SIZE: 6
MODEL:FL
SIG(MAX.): 150
AT. NO.: 061FF-0167-SS-L
SERIAL NO.1909755-2 5 HP
CAUTION:
PLIES TO VALVE
ZED BASED ON
CONDITIONS.
CLASSIFIED
UL
WATER QUALITY
VALVE
ANSI/NSF61
96Y3
23 C
CHINA

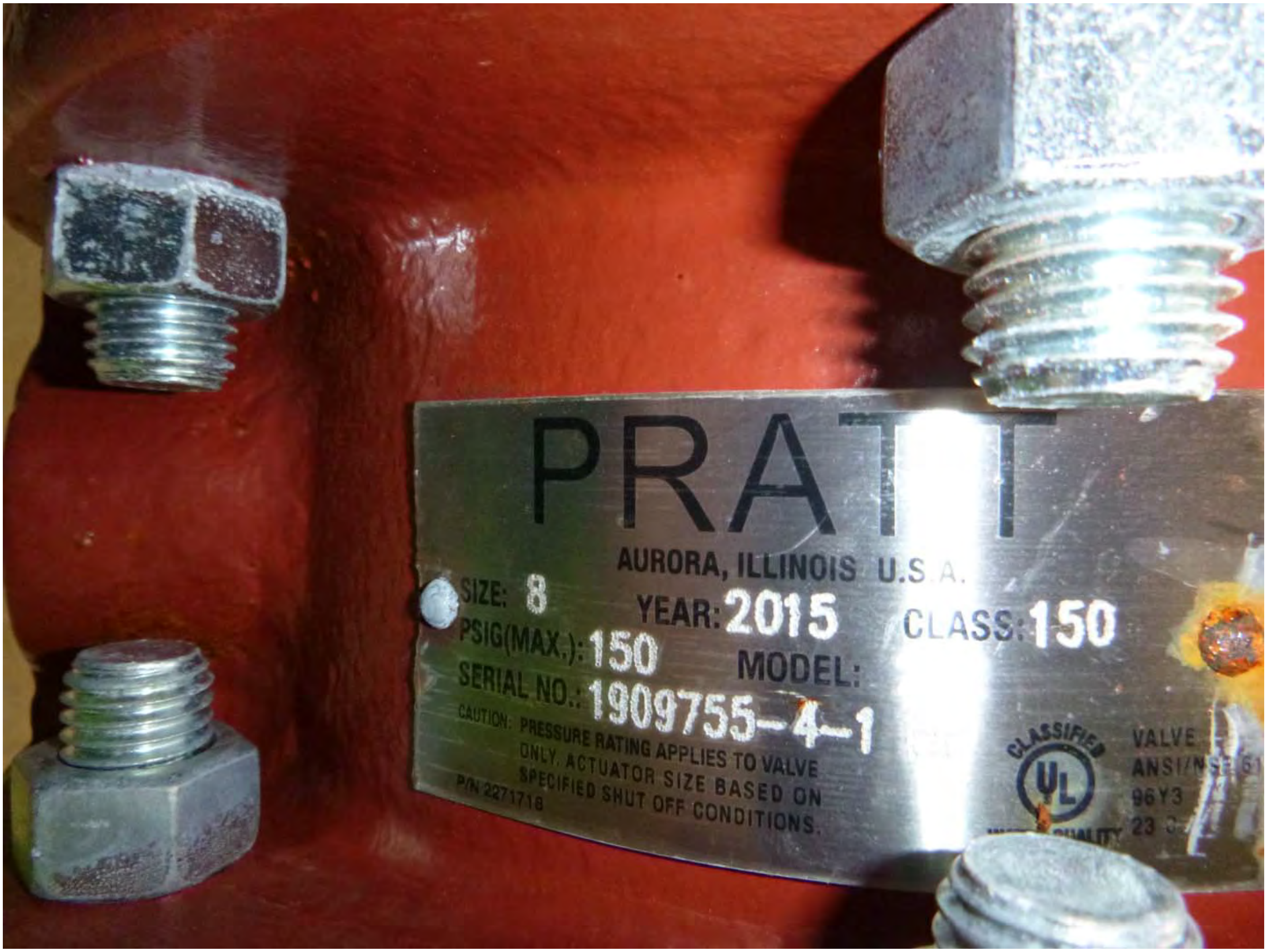
P1020328


PRATT
AURORA, ILLINOIS U.S.A.
SIZE: 8 YEAR: 2015 CLASS 150
PSIG(MAX.): 150 MODEL: 2F2
SERIAL NO.: 1909755-4-1 HP
CAUTION: PRESSURE RATING APPLIES TO VALVE
ONLY. ACTUATOR SIZE BASED ON
SPECIFIED SHUT OFF CONDITIONS.
P/N 2271718

P1020329


PRATT
AURORA, ILLINOIS U.S.A.
SIZE: 8
YEAR: 2015
CLASS: 150
PSIG(MAX.): 150
MODEL:
SERIAL NO.:
CAUTION: PRESSURE RATING APPLIES TO VALVE ONLY. ACTUATOR SIZE BASED ON SPECIFIED SHUT OFF CONDITIONS.

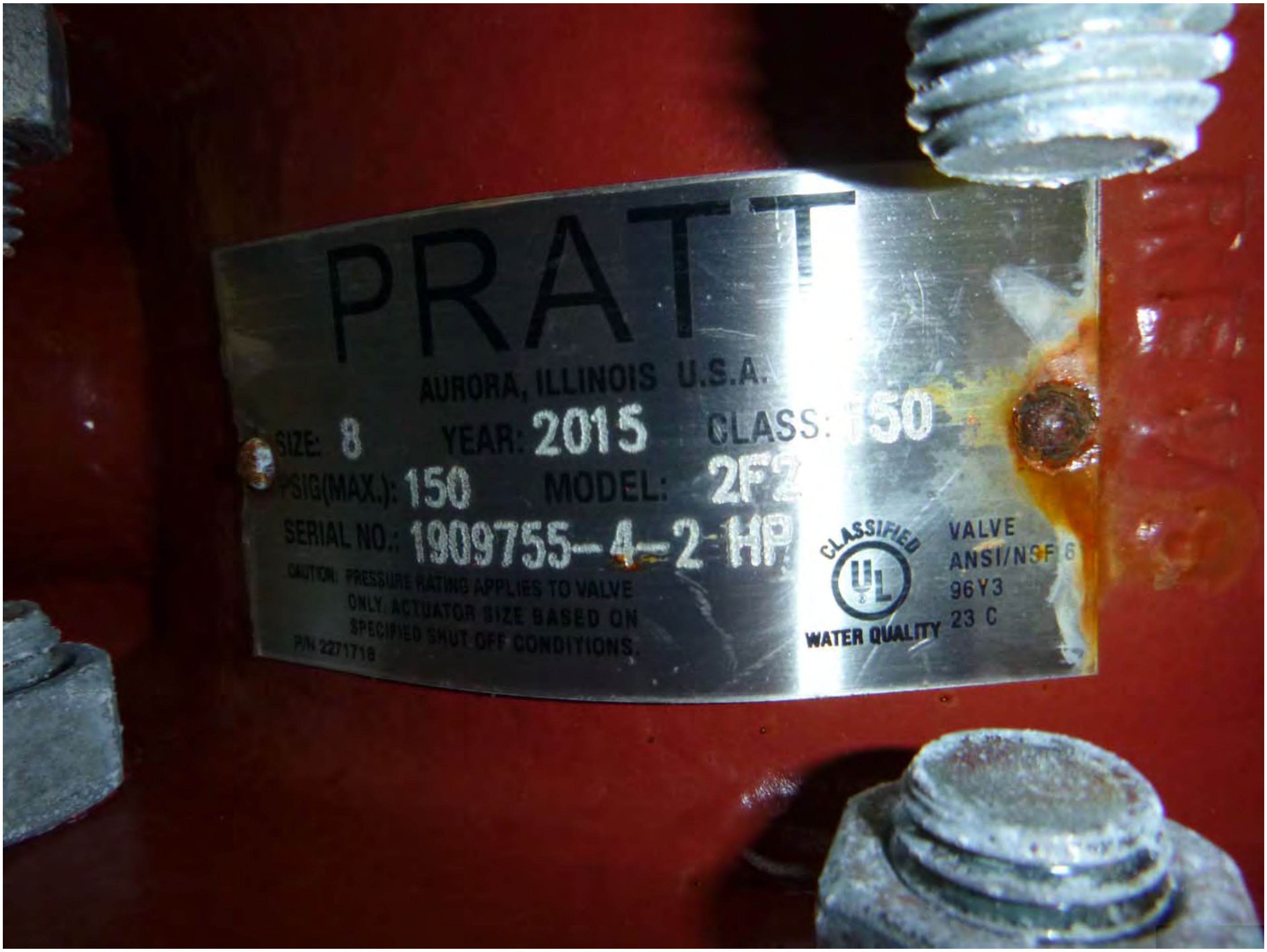
P1020330


PRATT
AURORA, ILLINOIS U.S.A.
SIZE: 8
YEAR: 2015
CLASS: 150
PSIG(MAX.): 150
MODEL:
SERIAL NO.: 1909755-4-1
CAUTION: PRESSURE RATING APPLIES TO VALVE ONLY. ACTUATOR SIZE BASED ON SPECIFIED SHUT OFF CONDITIONS.
P/N 2271718
CLASSIFIED
UL
VALVE
96Y3

P1020331


PRATT
AURORA, ILLIN U.S.A.
SIZE: 8
YEAR: 201
CLASS: 150
PSIG(MAX.): 150
MODEL: 2F2
SERIAL NO.: 1909755- 2 HP
CAUTION: PRESSURE RATING APPLIES TO VALVE ONLY. ACTUATOR SIZE BASED ON SPECIFIED SHUT OFF CONDITIONS.
P/N 2271718
CLASSIFIED
UL
WATER QUALITY
VALVE

P1020332


PRATT
AURORA, ILLINOIS U.S.A.
SIZE: 8 YEAR: 2015 CLASS: 150
PSIG(MAX.): 150 MODEL: 2F2
SERIAL NO.: 1909755-4-2-HP
CAUTION: PRESSURE RATING APPLIES TO VALVE ONLY. ACTUATOR SIZE BASED ON SPECIFIED SHUT OFF CONDITIONS.
P/N 2271718
CLASSIFIED
UL
WATER QUALITY
VALVE
ANSI/NSF 6
96Y3
23 C

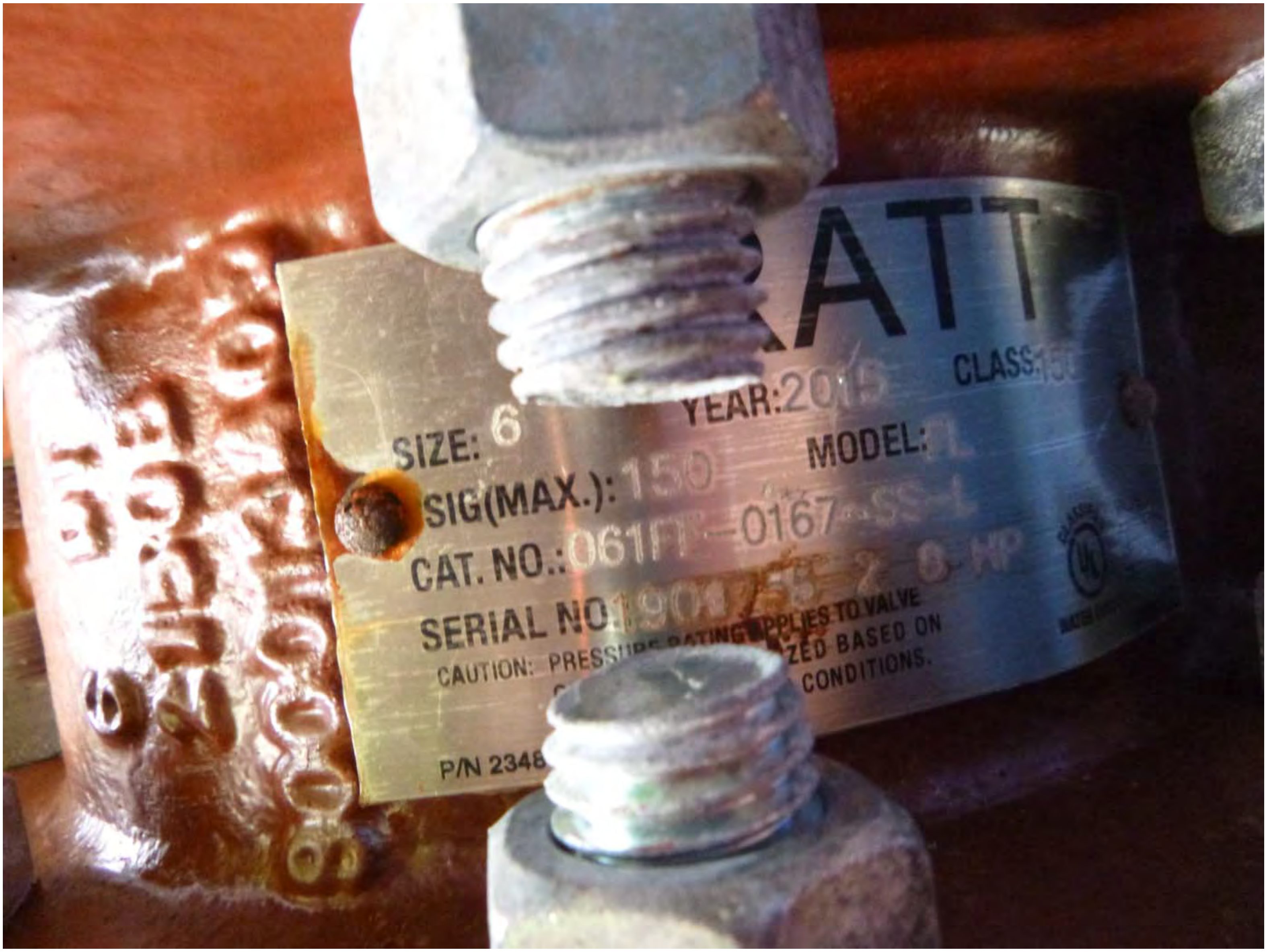
P1020333

ATT
SIZE: 6
YEAR:2015
CLASS:150
MODEL FL
CAT. NO.:
-0167-SS-L
8 HP
SERIAL NO.
CAUTION: PRESSURE RATING

P1020334


SIZE: 6
CLASS 150
MODEL FL
CAT. NO.:
SERIAL NO.
8 HP
CAUTION: PRESSURE RATING

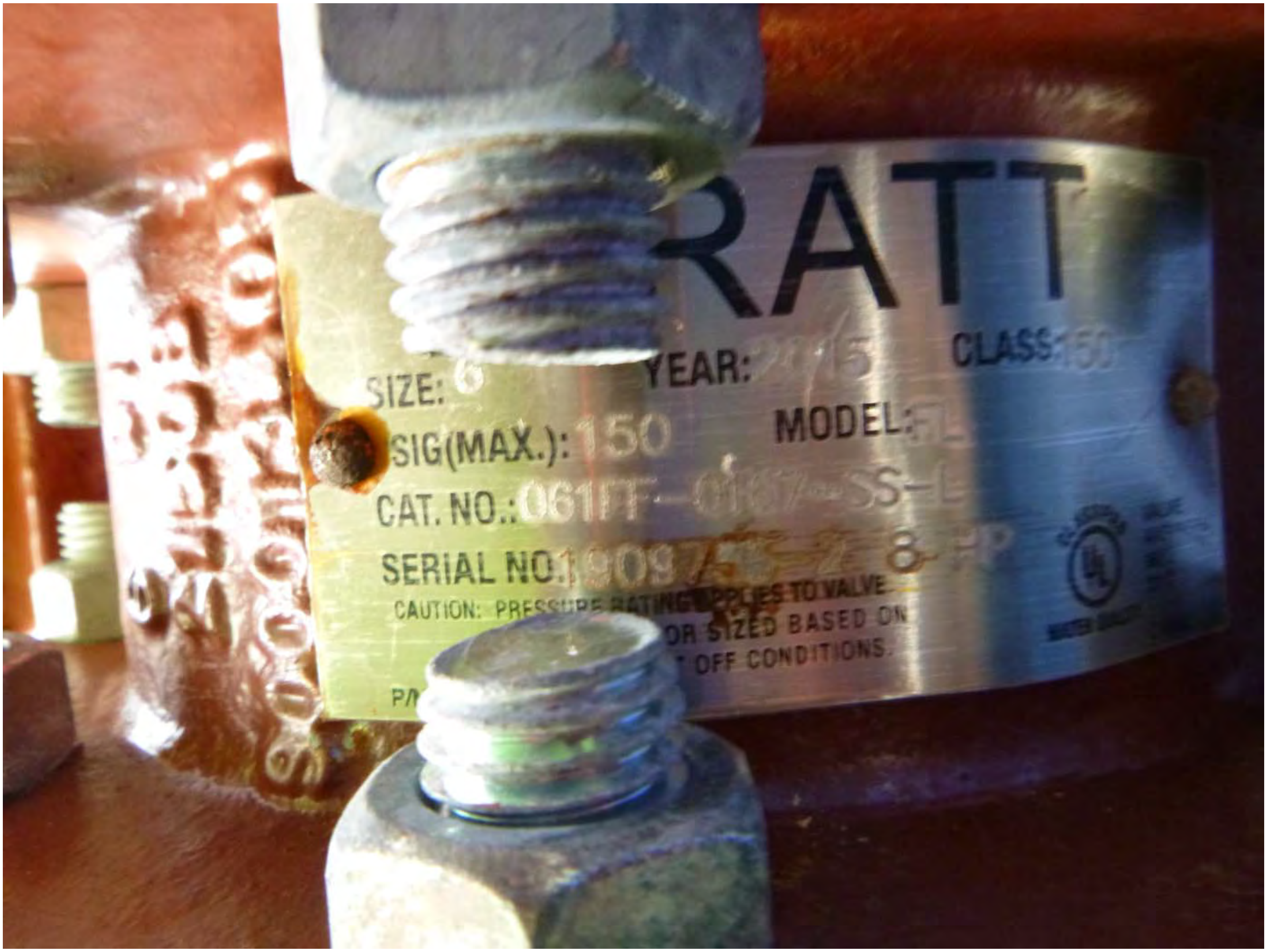
P1020335


ATT
YEAR:
CLASS
SIZE: 6
MODEL:
SIG(MAX.): 150
CAT. NO.:
SERIAL NO
APPLIES TO VALVE
CAUTION: PRES
BASED ON
CONDITIONS.
P/N 2348

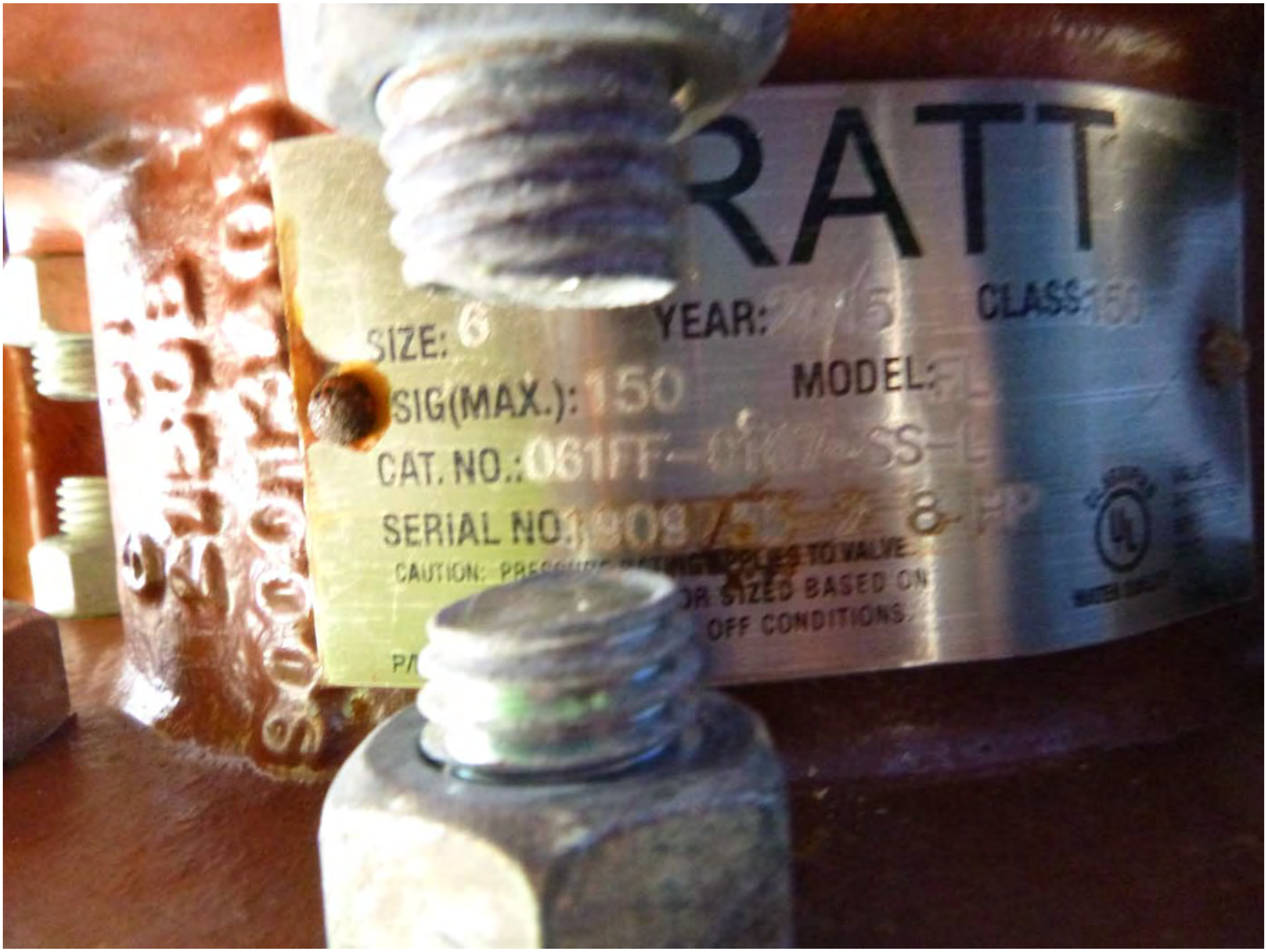
P1020336


RATT
YEAR:
CLASS:
MODEL:
PRESSURE RATING APPLIES TO VALVE
ACTUATOR SIZED BASED ON
SHUT OFF CONDITIONS.

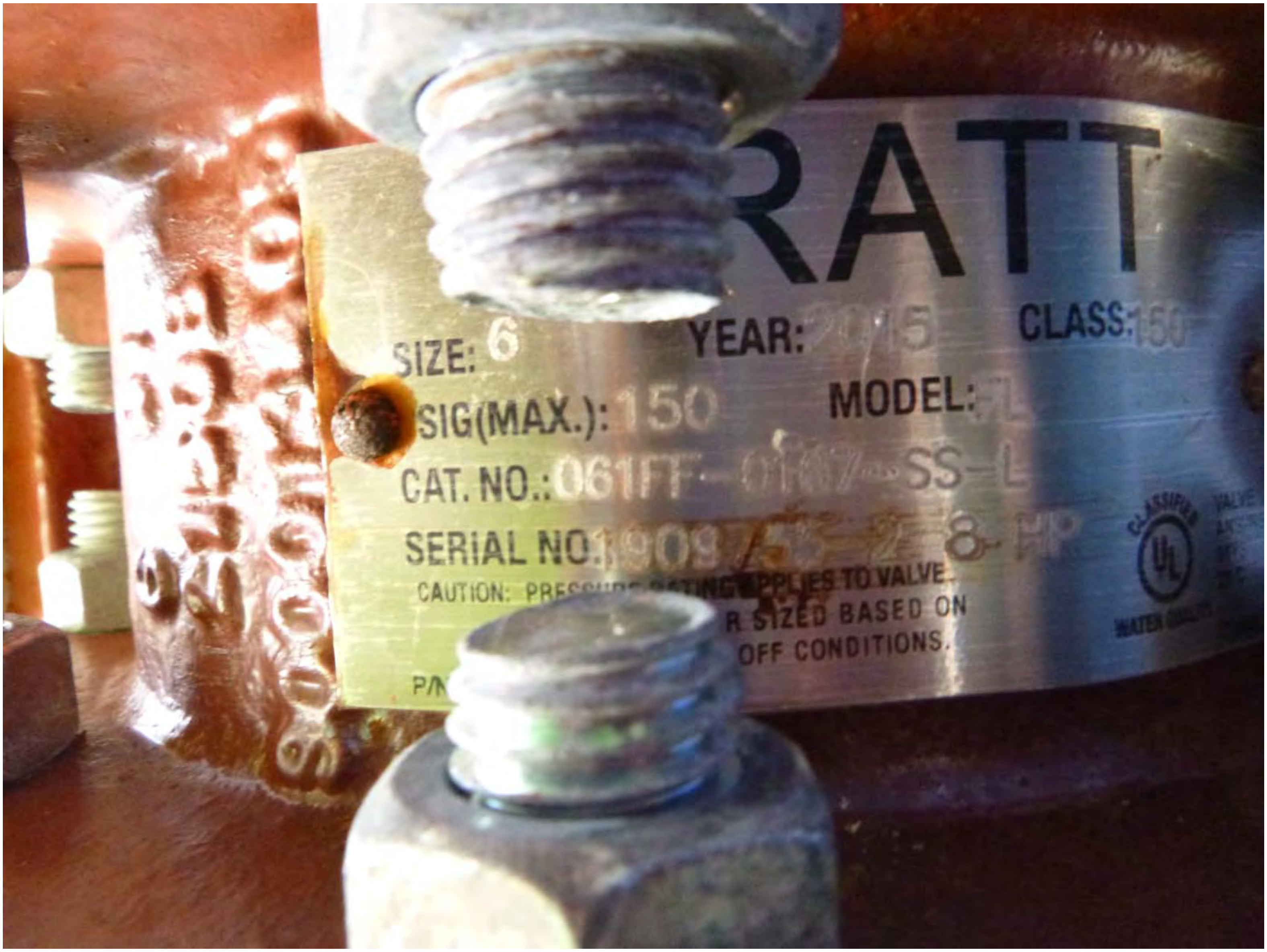
P1020337


RATT
SIZE: 6
YEAR:
CLASS:
PSIG(MAX.): 150
MODEL:
CAT. NO.:
SERIAL NO.
CAUTION: PRESSURE RATING APPLIES TO VALVE
OR SIZED BASED ON
OFF CONDITIONS.

P1020338


RATT
SIZE: 6
YEAR:
CLASS:
SIG(MAX.): 150
MODEL:
CAT. NO.:
SERIAL NO.
CAUTION:
OFF CONDITIONS

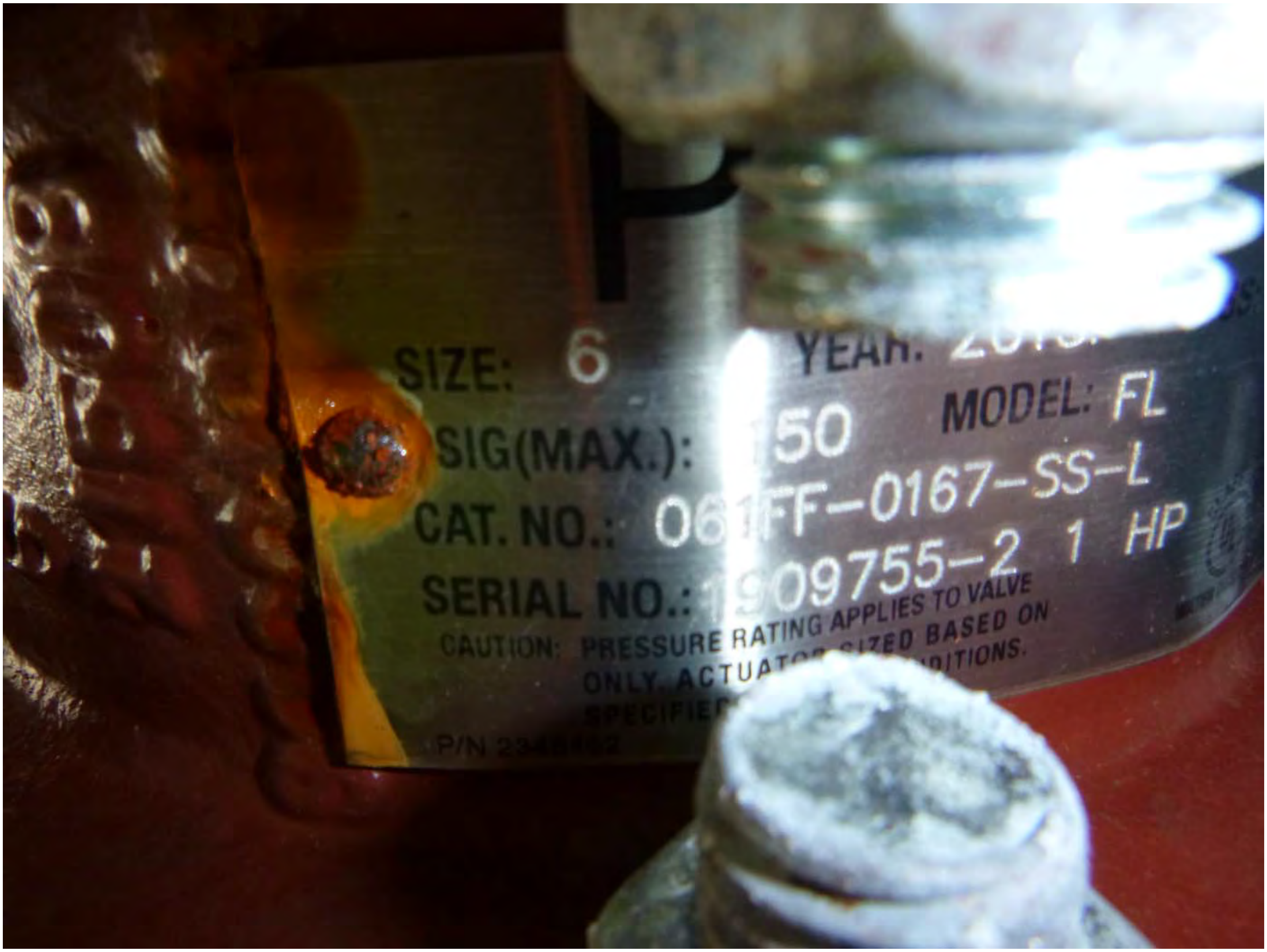
P1020339


RATT
SIZE: 6
YEAR:
CLASS:
SIG(MAX.): 150
MODEL:
CAT. NO.:
SERIAL NO.:
CAUTION:
R SIZED BASED ON
OFF CONDITIONS.

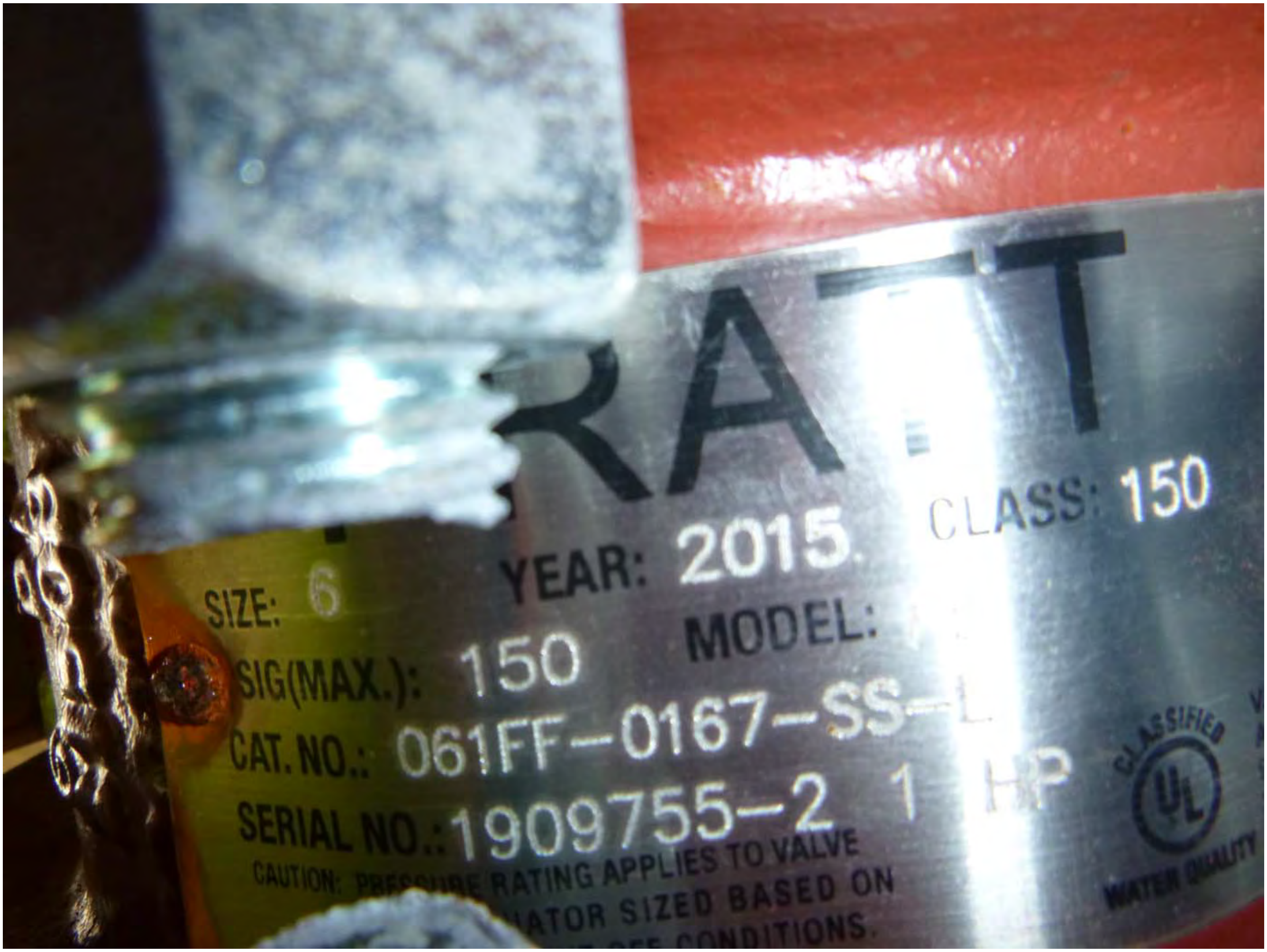
P1020340


PRATT
R: 2015
CLA
SIZE: 6
MODEL: FL
SIG(MAX.):
0167-SS-
CAT. NO.: 061
55-2 1
SERIAL NO
TO VALVE
BASED ON
ITIONS.
CAUTION: PR
P/N 234845

P1020341


SIZE: 6
YEAR:
SIG(MAX.): 150
MODEL: FL
CAT. NO.:
FF-0167-SS-L
SERIAL NO.:
09755-2 1 HP
CAUTION: PRESSURE RATING APPLIES TO VALVE
ONLY.
BASED ON

P1020342


RATT
YEAR: 2015
CLASS: 150
SIZE: 6
MODEL:
SIG(MAX.): 150
CAT. NO.: 061FF-0167-SS-L
SERIAL NO.: 1909755-2
CLASSIFIED
UL
WATER QUALITY

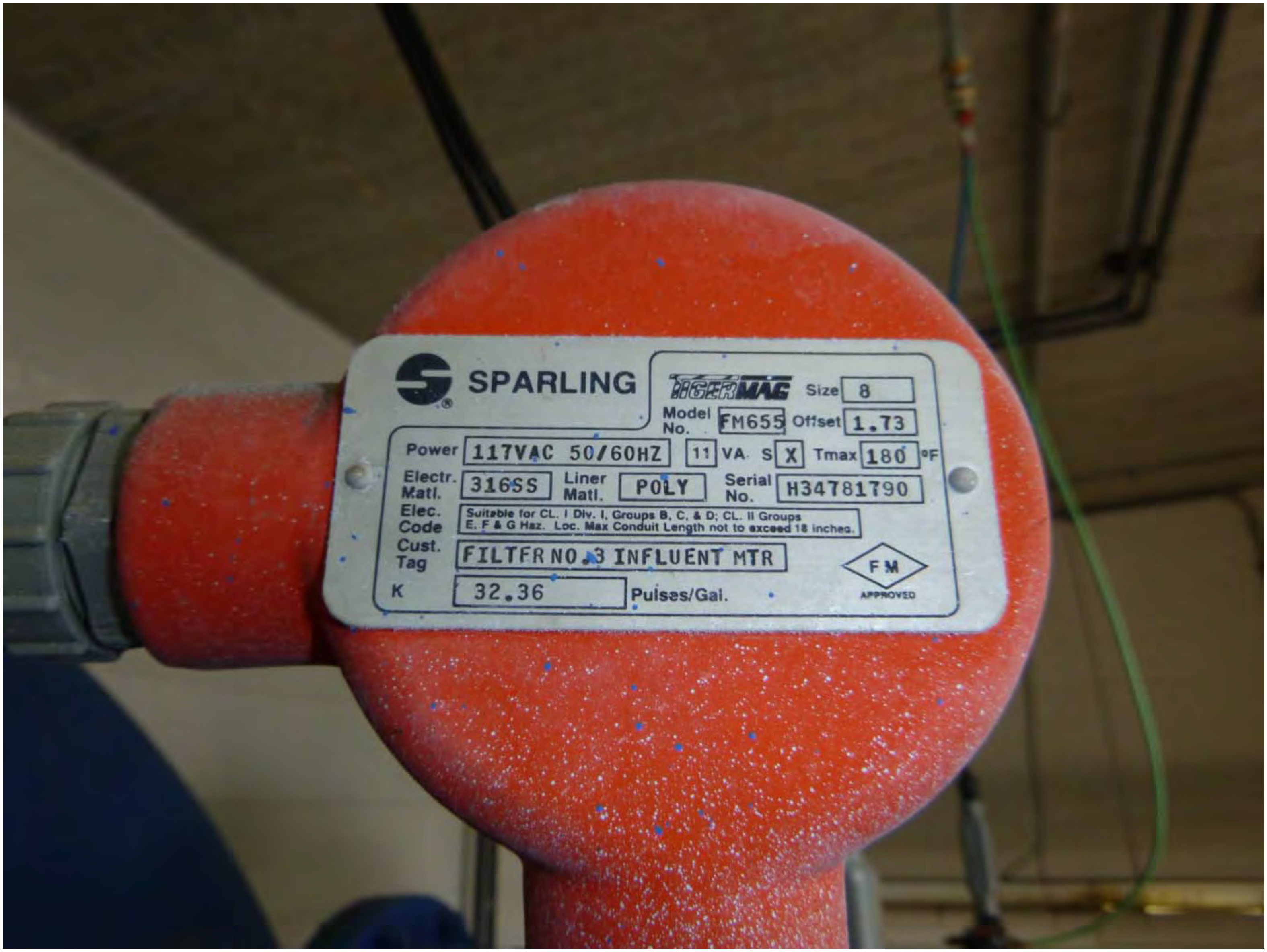
P1020343

PRATT
AURORA, ILLINOIS U.S.A.
YEAR: 2015 CLASS: 150
MODEL: 2F2
CLASSIFIED
WATER QUALITY
VALVE
ANSI/NSF 61
96Y3
23 C

P1020344


PRATT
AURORA, ILLINOIS U.S.A.
SIZE: 8
YEAR:
CLASS:
PSIG(MAX.): 150
MODEL:
SERIAL NO.:
CAUTION: PRESSURE RATING APPLIES TO VALVE ONLY ACTUATOR SIZE BASED ON SPECIFIED SHUT OFF CONDITIONS.
P/N 2271718
VALVE
ANSI/NSF 61
96Y3
23 C

P1020345


SPARLING
TIGERMAG
Size 8
Model No. FM655
Offset 1.73
Power 117VAC 50/60HZ
11 VA
S X
Tmax 180 °F
Electr. Matl. 316SS
Liner Matl. POLY
Serial No. H34781790
Elec. Code
Suitable for CL. I Div. I, Groups B, C, & D; CL. II Groups E, F & G Haz. Loc. Max Conduit Length not to exceed 18 inches.
Cust. Tag FILTFR NO. 3 INFLUENT MTR
K 32.36 Pulses/Gal.
FM
APPROVED

P1020346


SPARLING
TIGERMAG
Size 8
Model No. FM655
Offset 1.73
Power 117VAC 50/60HZ
11 VA. S X
Tmax 180 °F
Electr. Matl. 316SS
Liner Matl. POLY
Serial No. H34781790
Elec. Code
Suitable for CL. I Div. I, Groups B, C, & D; CL. II Groups
E. F & G Haz. Loc. Max Conduit Length not to exceed 18 inches.
Cust. Tag FILTFR NO. 3 INFLUENT MTR
K 32.36 Pulses/Gal.
FM
APPROVED

P1020347


SPARLING
TIGERMAG
Size 8
Model No. FM655
Offset 1.39
Power 117VAC 50/60HZ
11 VA
S X
Tmax 180 °F
Electr. Matl. 316SS
Liner Matl. POLY
Serial No. H34791790
Elec. Code
Suitable for CL. I Div. I, Groups B, C, & D; CL. II Groups E, F & G Haz. Loc. Max Conduit Length not to exceed 18 inches.
Cust. Tag FILTER NO.4 INFLUENT MTR
K 31.65 Pulses/Gal.
FM
APPROVED

P1020348


SPARLING
TIGERMAG
Size 8
Model No. FM655
Offset 1.39
Power 117VAC 50/60HZ
11 VA
S X
Tmax 180 °F
Electr. Matl. 316SS
Liner Matl. POLY
Serial No. H34791790
Elec. Code
Suitable for CL. ; Div. I, Groups B, C, & D; CL. II Groups
E, F & G Haz. Loc. Max Conduit Length not to exceed 18 inches.
Cust. Tag FILTER NO.4 INFLUENT MTR
K 31.65 Pulses/Gal.
FM
APPROVED

P1020349


SPARLING
Size 8
Model No. FM655
Offset 2.37
VA 11
S X
Tmax 180 °F
Serial No. H34771690
Liner Matl. POLY
Cust. Tag FILTER NO.2 INFLUENT MTR
Pulses/Gal.
FM
APPROVED

P1020350


SPARLING
TIGERMAG
Size 8
Model No. FM655
Offset 2.37
50/60HZ
11 VA
S X
Tmax 180 °F
Liner Matl. POLY
Serial No. H34771690
Elec. Code
Max Conduit Length not to exceed 18 inches.
Cust. Tag FILTER NO.2 INFLUENT MTR
K
Pulses/Gal.
FM
APPROVED

P1020351


SPARLING
Size
8
Model No.
FM655
Offset
2.37
Trnsr
180
°F
Serial No.
Liner Matl
POLY
Pulses/Gal
FM
APPROVED

P1020352


SPARLING
Size 8
Model No. FM655
Offset 2.37
Power
VAC 50/60HZ
11 VA
X
°F
Electr. Matl.
Liner Matl. POLY
Serial No.
Elec. Code
Cust. Tag FILTER NO.2
K
.46
Pulses/Gal
FM

P1020353


SPARLING
TIGERMAG
Size 8
Model No. FM655
Offset 1.17
Power 117VAC 50/60HZ
11 VA
S X
Tmax 180 °F
Electr. Matl. 316SS
Liner Matl. POLY
Serial No. H34761690
Elec. Code
Suitable for CL. I Div. I, Groups B, C, & D; CL. II Groups E, F & G Haz. Loc. Max Conduit Length not to exceed 18 inches.
Cust. Tag FILTER NO.1 INFLUENT MTR
K 31.56 Pulses/Gal.
FM
APPROVED

P1020354


SPARLING
TIGERMAG
Size 8
Model No. FM655
Offset 1.17
Power 117VAC 50/60HZ
11 VA
S X
Tmax 180 °F
Electr. Matl. 316SS
Liner Matl. POLY
Serial No. H34761690
Elec. Code
Suitable for CL. I Div. I, Groups B, C, & D; CL. II Groups E, F & G Haz. Loc. Max Conduit Length not to exceed 18 inches.
Cust. Tag FILTER NO.1 INFLUENT MTR
K 31.56 Pulses/Gal.
FM
APPROVED

P1020355

P1020356

P1020357

P1020358

P1020359


INVERTER DUTY
NIDEC MOTOR CORPORATION
SPECIAL FEATURES
SPECIAL FEATURES
ITEM NUMBER
DT94
NEMA
Premium

P1020360

P1020361

P1020362

P1020363

P1020364

P1020365

P1020366


Dayton
Unit Heater
Calefactor Unitario
Appareil de Chauffage
c UL us
Model: Modelo: Modèle: 2YU73
KW: KW: KW: 15
Volts: Volts: Volts: 480
Control Volts: Voltaje Control: Tension Com m ande: 24
Phase: Fase: Phase: 3
60HZ
Motor Volts: Voltaje Motor: Tension Motor: 480
Amps: Amperes: Ampères: 0.34
Minimum Mounting Clearance
Separacion minima de Montaje
Dégagement Minimal
Air Flow Flujo de Aire Débit d'Air
SIDE LADO Côte
BACK POSTERIOR Arriere
CEILING TECHO Plafond
FLOOR PISO Plancher
Horiz. Horiz. Horiz. 9 IN 13 IN 6 IN 7 FT
Vert. Vert. Vert. 24 IN 24 IN 6 IN 7 FT
WARNING: Do not turn louvers above level of unit. Disconnect power source before servicing.
ADVERTENCIA: No voltear las refillas por encima del nivel del calefactor. Desconectar la corriente antes de darle ser vicio.
AVERTISSEMENT: Ne pas tourner les évents à lama au-dessus du niveau de l'appareil. Couper l'alimentation anvant de procéder à l'entretien.
MADE IN CHINA – MEPS/HECHO EN CHINA – MEPS/FAB AUX CHINE – MEPS
Manufactured for / Fab. para / Fab. pour
Dayton Electric Mfg. Co., Niles, Illinois 60714 U.S.A.
4104-2538-015
1307075624
Warning: Do not install less than 6 feet (or 1.8 meters) from the floor.
Ne pas installer la partie inferieure du radiateur à moins de 183 cm au-dessus du planche.
4104-11088-000

P1020367


Dayton
CAUTION
EYE PROTECTION
REQUIRED
WHEN
HANDLING CHEMICALS
P1020368


Dayton
Unit Heater
Calefactor Unitario
Appareil de Chauffage
2YU73
480
3
480
60HZ
15
24
0.34
9 IN
24 IN
13 IN
24 IN
6 IN
6 IN
7 FT
7 FT
Dayton Electric Mfg. Co., Niles, Illinois 60714 U.S.A.

P1020369

P1020370


MODEL HC-300
PART # 30500-01
SERIAL # 229
WIRING DIA. 50124-01
VOLTS 230
PHASE 3 HZ 50/60
FLA 17
AUTO
POWER ON
CARGOCAIRE ENGINEERING CORPORATION
79 MONROE STREET AMESBURY, MA 01913
FOR SERVICE AND PARTS CALL (508) 388-0600
AT TIMES OTHER THAN 8am TO 5pm EST CALL (508) 372-9782

P1020371

P1020372


HIGH THRUST
H.P. 60 PH. 3 60 CYCLES
FRAME V 230 119
TYPE RU 460 59.6
DESIGN B CODE G INSUL CLASS B
1765 R.P.M.
CONT RATING 60°C S.F. 1.15
BRG SIZES UPPER THRUST AFBMA LOWER GUIDE AFBMA
OIL CAPACITY UPPER BEARING 8 1/4 QTS. LOWER BEARING QTS.
NOMINAL POWER SYSTEM VOLTAGE 240/480
U.S. ELECTRICAL MOTORS
DIVISION OF EMERSON ELECTRIC
MILFORD, CONN.

P1020373


PUMP MOTOR
HIGH THRUST
H.P. 60
PH. 3
FRAME 326TP
TYPE RU
DESIGN B CODE
CONT. RATING
BRG. SIZES
OIL CAPACITY
MODEL
NOMINAL POWER SYSTEM VOLTAGE 240/480
U.S. ELECTRICAL MOTORS
DIVISION OF EMERSON ELECTRIC
MILFORD, CONN.

P1020374


GLOBE STYLE
SILENT CHECK VALVE
MODEL NO.
SIZE
BODY
TRIM
COLD WORKING PRESSURE
PSI
VAL MATIC
ELMHURST
ILLINOIS

P1020375

P1020376

P1020377

P1020378

P1020379

P1020380


SPARLING
TIGERMAG EP
OUTPUT INHIBITED
COUNT=0000467941
YES
NO
CAUTION - Disconnect From Supply Before Opening.
Keep Cover Tight While Circuits Are Alive.
Un Scellement Doit Etre Installe A
Moins De 450mm Du Boitier.
Conduit Seals Must Be Installed Within
18 Inches Of The Enclosure

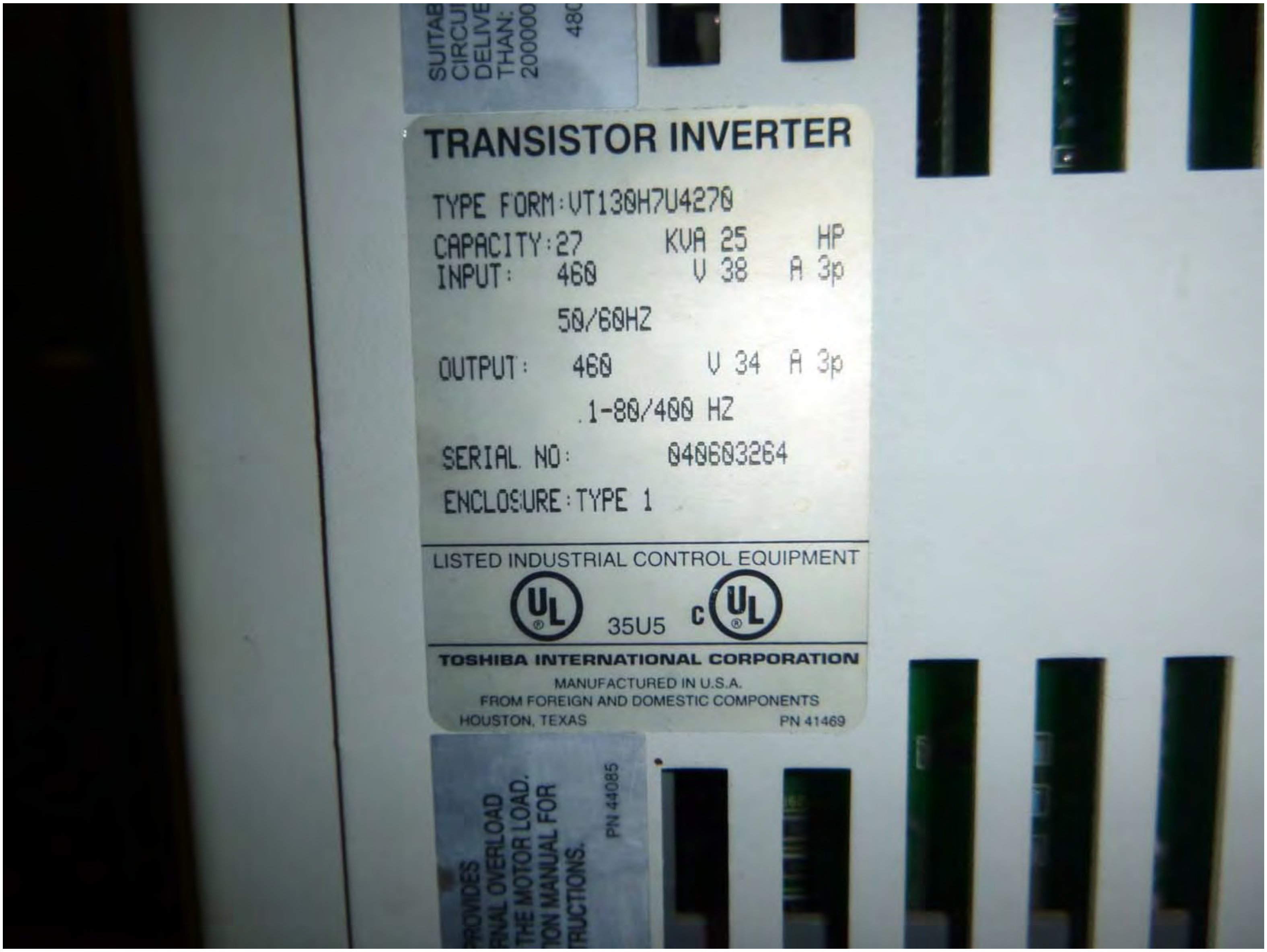
P1020381

P1020382

P1020383

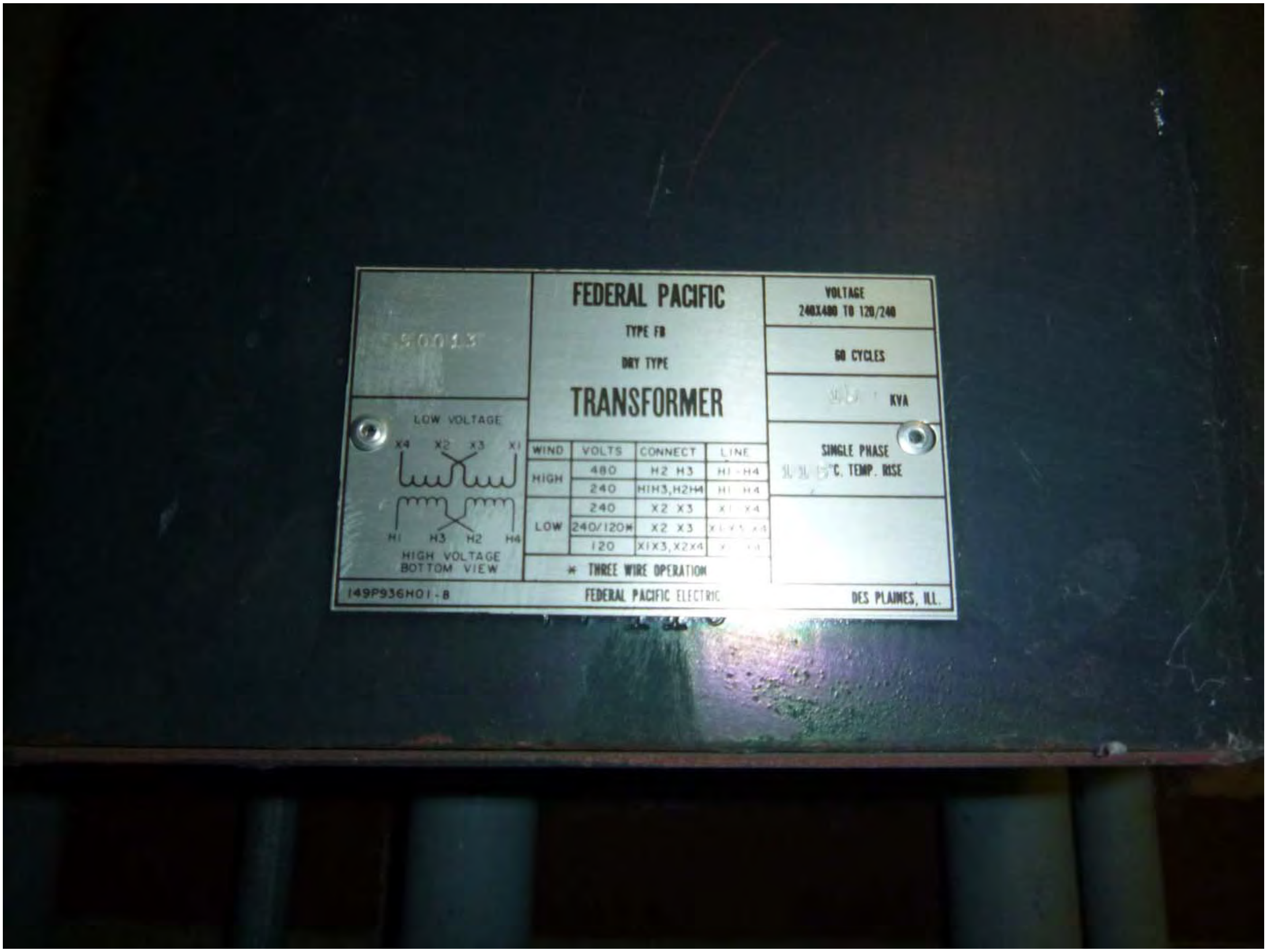

TOSHIBA
ENTER
ESC
RUN
STOP
RESET
H7
TRUE TORQUE CONTROL2
ADJUSTABLE SPEED DRIVE

P1020384


TRANSISTOR INVERTER
TYPE FORM:VT130H7U4270
CAPACITY:27 KVA 25 HP
INPUT: 460 V 38 A 3p
50/60HZ
OUTPUT: 460 V 34 A 3p
.1-80/400 HZ
SERIAL NO: 040603264
ENCLOSURE:TYPE 1
LISTED INDUSTRIAL CONTROL EQUIPMENT
35U5
TOSHIBA INTERNATIONAL CORPORATION
MANUFACTURED IN U.S.A.
FROM FOREIGN AND DOMESTIC COMPONENTS
HOUSTON, TEXAS
PN 41469

P1020385

P1020386


FEDERAL PACIFIC
TYPE FB
DRY TYPE
TRANSFORMER
VOLTAGE
240X480 TO 120/240
60 CYCLES
KVA
SINGLE PHASE
°C. TEMP. RISE
LOW VOLTAGE
X4 X2 X3 X1
H1 H3 H2 H4
HIGH VOLTAGE
BOTTOM VIEW
WIND
VOLTS
CONNECT
LINE
HIGH
480
H2 H3
H1-H4
240
H1H3, H2H4
H1-H4
LOW
240
X2 X3
X1-X4
240/120*
X2 X3
120
X1X3, X2X4
* THREE WIRE OPERATION
149P936H01-B
FEDERAL PACIFIC ELECTRIC
DES PLAINES, ILL.

P1020387


FEDERAL PACIFIC
TYPE FB
DRY TYPE
TRANSFORMER
VOLTAGE
60 CYCLES
KVA
SINGLE PHASE
°C. TEMP. RISE
LOW VOLTAGE
X4 X2 X3 X1
H1 H3 H2 H4
HIGH VOLTAGE
BOTTOM VIEW
WIND VOLTS CONNECT LINE
HIGH 480 H2 H3 H1-H4
240 H1H3,H2H4 H1-H4
LOW 240 X2 X3 X1-X4
240/120* X2 X3 X1-X3-X4
120 X1X3,X2X4 X1-X4
* THREE WIRE OPERATION
149P936H01-8
FEDERAL PACIFIC ELECTRIC

P1020388


HACH
sc200
CL2 GATEWAY
2.742
CL2
ppm
08:48:41
2015-11-25
pH 7.62pH
menu
home
back
enter
SD

P1020389

Conforms to:
UL STD 61010-1
FM STD's 3600 & 3611
Certified to:
CAN/CSA STD 22.2
No.61010-1 & No.213M1987
INTERTEK
3054010
Rated: Class 1 Division 2 Groups A,B,C,D,T4
Class1 Zone 2, Group IIC,T4
HACH
Model SC200
LXV404.99.00552
Hach Co.
5600 Lindbergh Dr
Loveland, CO
80538
General Purpose Analyzer
Enclosure Type NEMA 4X
Electrical Ratings
Supply 100-240 VAC +/- 10%, 50/60 Hz
50 VA with 7 W Probe Load, 60°C Max Ambient
100 VA with 28 W Probe Load, 50°C Max Ambient
Relay Output Ratings
100-240 VAC, 5 A Max
03/05/11
Serial Number 1105C0009305
MADE IN CHINA

P1020390

P1020391

THE PARTLOW-WEST CORPORATION
NEW HARTFORD, NEW YORK 13413
MRC 5000 SERIES
PROCESS CONTROL EQUIPMENT
MODEL
51000011AA
INPUT RATINGS:
100-240VAC
20-50VAC
47/63 HZ 18VA MAX
MAXIMUM AMBIENT:55ºC
SERIAL NO.
1603019-0
RELAY OUTPUT RATINGS:
115 VAC:5.0A RESISTIVE
1/8 HP, OR 250VA
230 VAC: 2.5A RESISTIVE
1/8 HP, OR 250VA
DAT CD:1103
62528501
MADE IN U.S.A.
REV. B
LISTED
8880
E67237

P1020392


U.S. FILTER
CONSOLIDATED ELECTRIC
D620 Controller
52ND STREET TANK
OVERFLOW 30 FT.
HIGH ALARM 29.5 FT.
LOW ALARM 14.5 FT.
EAST CL2 BOOSTER
EAST AERATOR
WEST AERATOR
MISSION
DANGER

P1020393

P1020394

-CAUTION-
DISCONNECT ELECTRIC POWER SUPPLY BEFORE SERVICING
-WARNING-
IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE INJURY, OR DEATH. READ THE INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS BEFORE INSTALLING OR SERVICING THIS EQUIPMENT
-ATTENTION-
DECONNECTER DU CIRCUIT D'ALIMENTATION ELECTRIQUE AVANT L'ENTRETIEN.
-DANGER-
CERTIFIED FOR USE WITH B-1 VENT.
CERTIFIER POUR UTILIZATION AVEC CHEMINEE B-1
IN UNITED STATES OF AMERICA:
THIS APPLIANCE MUST BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND LOCAL CODES. IN THE ABSENCE OF LOCAL CODES, FOLLOW THE NATIONAL FUEL GAS CODE, ANSI Z223.1
FACTORY RUN TESTED BY
CKBY 04920
65272700
WARNING
WARNING
FOR YOUR SAFETY
DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPOURS AND LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.
POUR VOTRE SECURITE
NE PAS EMMAGASINER OU UTILISER DE L'ESSENCE OU D'AUTRES VAPEURS ET LIQUIDES INFLAMMABLES AUX ENVIRONS DE CET APPAREIL OU D'AUTRES APPAREILS SEMBLABLES.
65220800
LENNOX
DALLAS, TEXAS
M/N LF24-100A-5 S/N 5609K01336
HEATING DATA
CHAUFFAGE
ALTITUDE 0-2000 FT 2001-4500 FT
INPUT (BTUH) (W) 100,000 (29,307) 100,000 (29,307)
OUTPUT (BTUH) (W) 80,500 (23,592) 80,500 (23,592)
MANIFOLD PRESSURE (IN. WC.) (kPa) 3.5 (0.872) 3.50 (0.872)
ELECTRICAL RATING / CARACTERISTIQUE ELECTRIQUE
VOLTS 120
HERTZ 60
PHASE 1
MAX AMPS / AMP MAX 6
ANS Z83.8*CSA-2.6-2006
UNIT HEATER/AEROTHERME
CATEGORY / CATEGORIE 1*
THERMAL EFF. 80.5%
5609K01336
16J70

P1020395


Water Furnace
THE LEADER IN LIQUID SOURCE HEAT PUMPS
1-5-98
DANGER

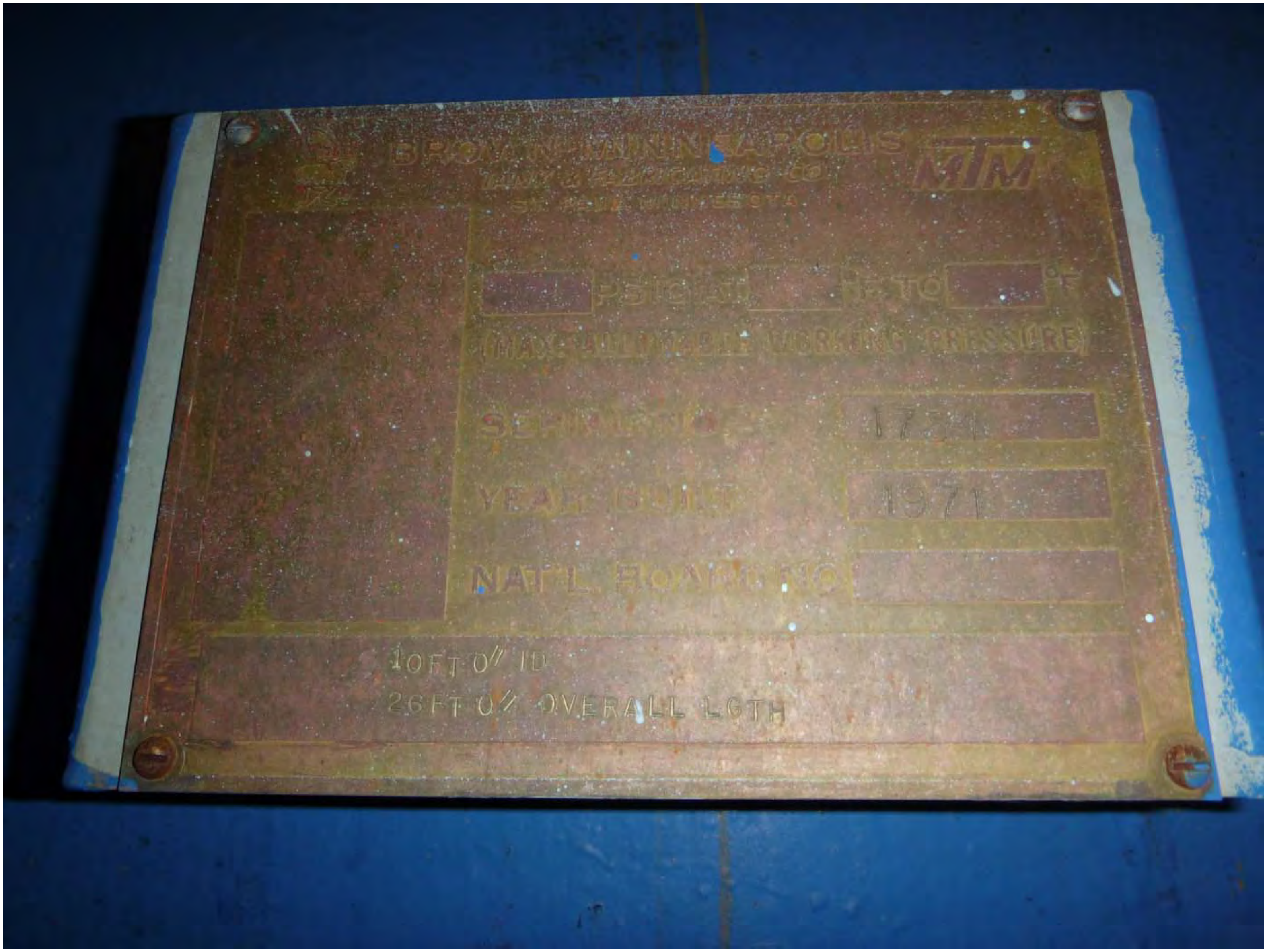
P1020396

WATER OUT
Water Furnace
LEADER IN LIQUID SOURCE HEAT PUMPS
Water Furnace
Liquid Source Heat Pump
Model Number
Serial Number
Options
Min Volts
Hertz
Time-Delay Type 'D' Fuse
Circuit Breaker
Capacity (MBTUH)
Htg
Clg
ARI 320

P1020397

P1020398

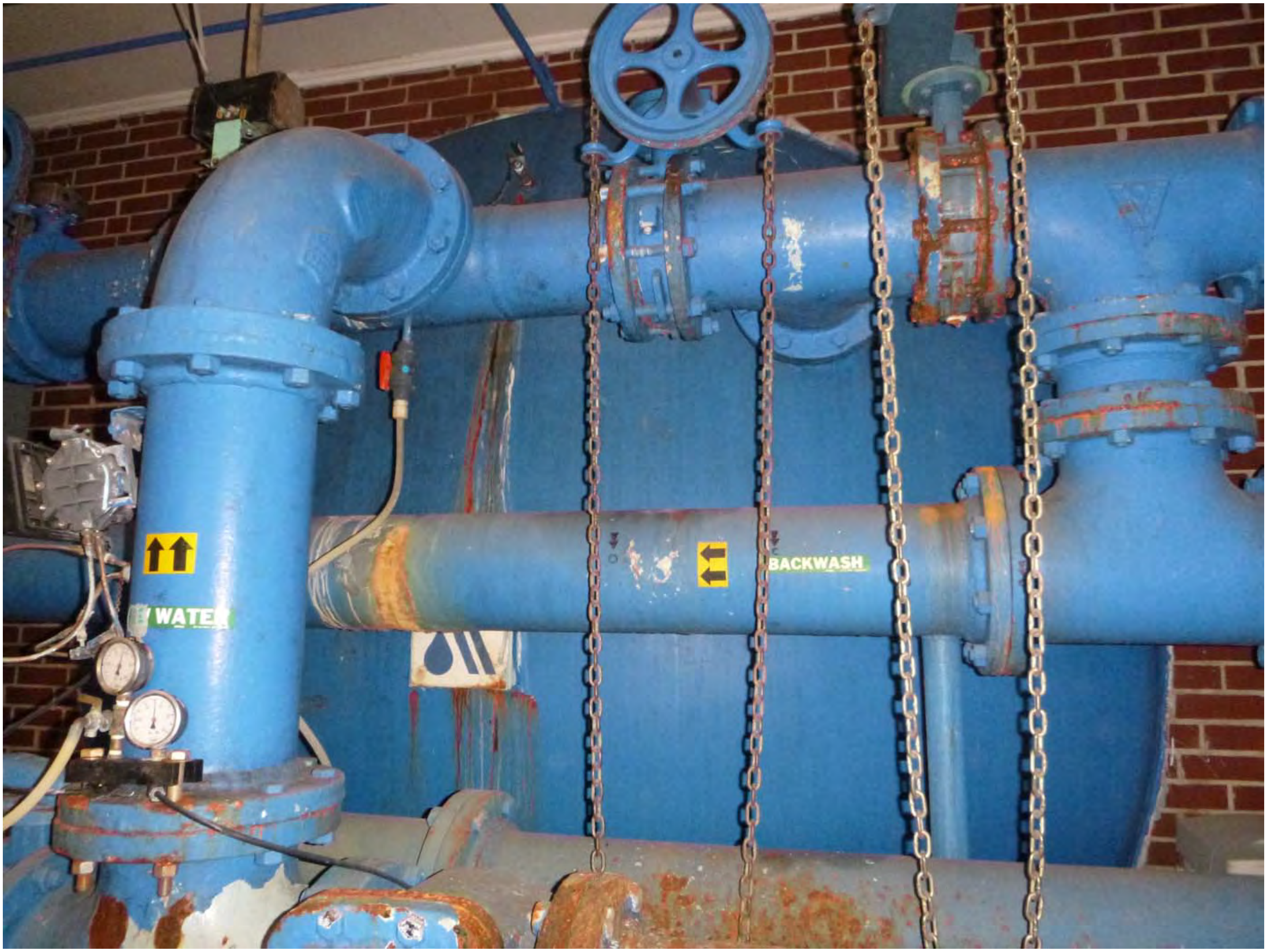
P1020399



P1020400


SERIAL NO.
1734
YEAR BUILT
1971
NAT'L. BOARD NO.
10FT 0" ID
26FT 0" OVERALL LGTH

P1020401



P1020402

P1020403

P1020404

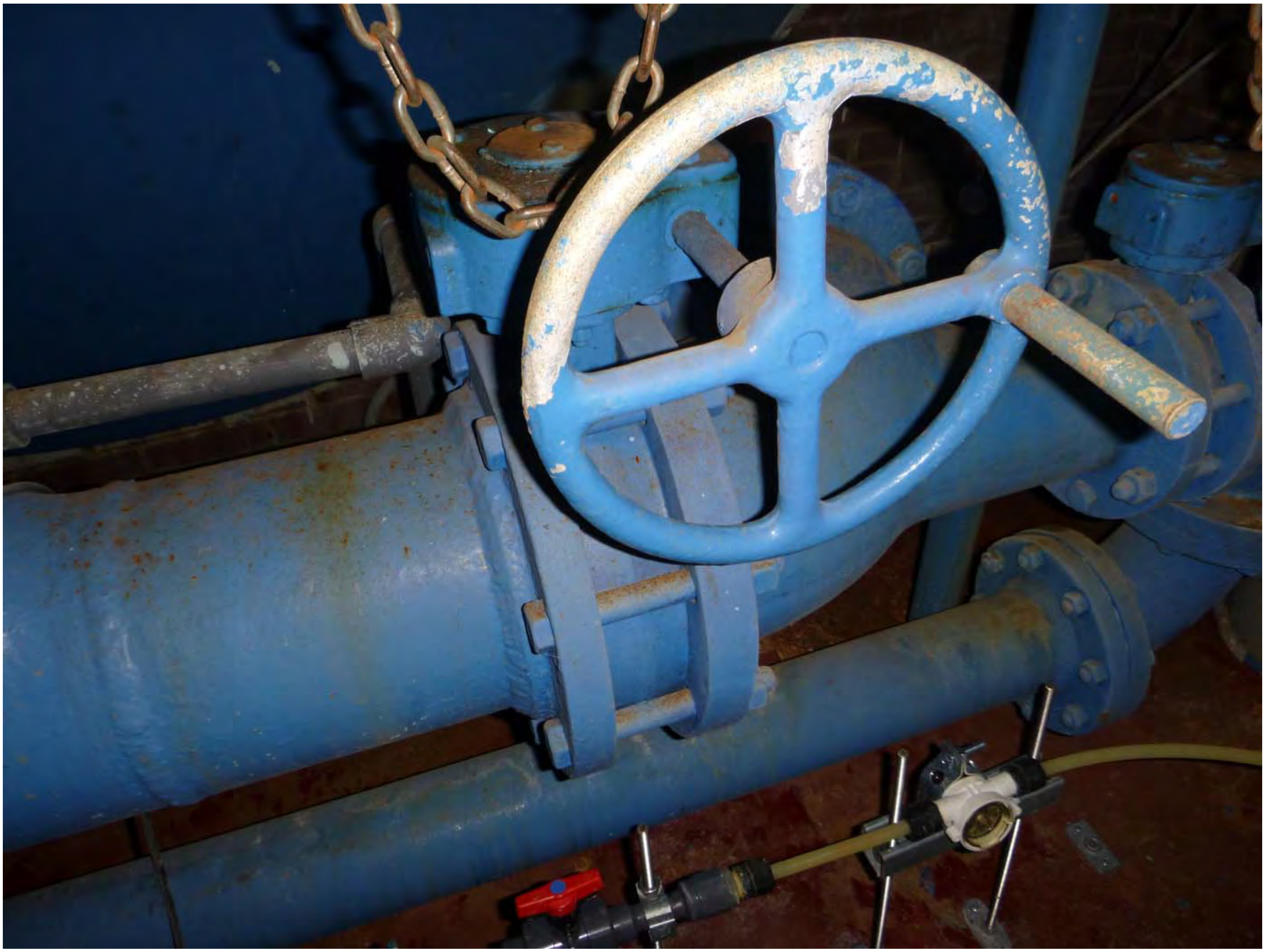
P1020405

P1020406


DANGER
LISTED
SORGEL TRANSFORMERS
SQUARE D COMPANY
MILWAUKEE WISCONSIN
THREE PHASE INSULATED TRANSFORMER
STYLE NO. 31949-28445-002
CAT. NO. 6T5F
KVA 6
% IZ
180°C INS. SYSTEM FOR 115 °C
CLASS AA
WT. 145
HZ 60
TYPE OD
H.V. 480
H.V. AMPS 7.2
L.V. 240
L.V. AMPS
CONNECT TAPS H1-H2-H3 H4-H2-H5 H6-H2-H7
HIGH VOLTAGE 480 456 432
DE-ENERGIZE TRANSFORMER BEFORE CHANGING TAPS

P1020407

P1020408

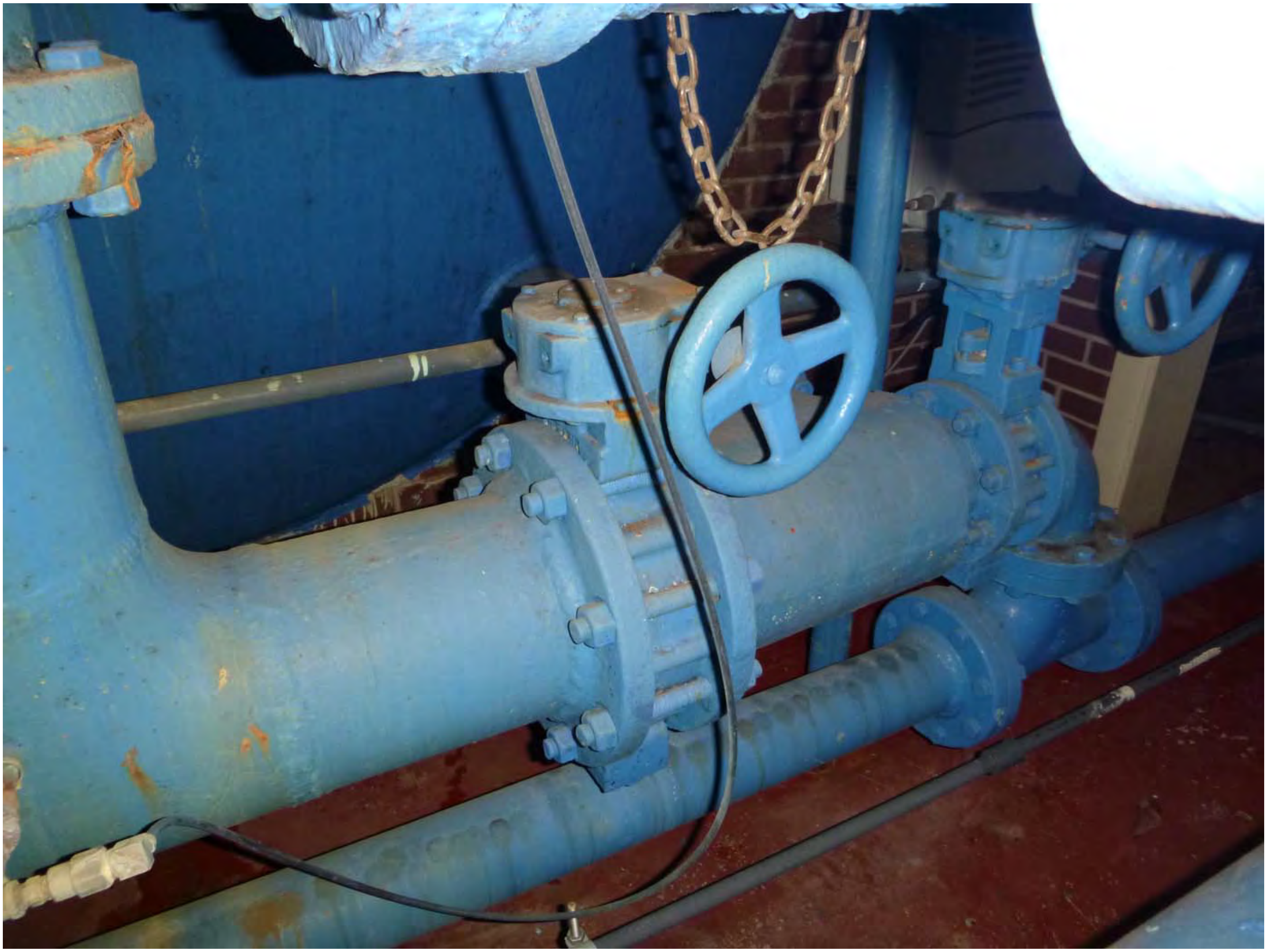


P1020409

P1020410

P1020411

P1020412



P1020413

P1020414

P1020415

P1020416

P1020417

P1020418

P1020419

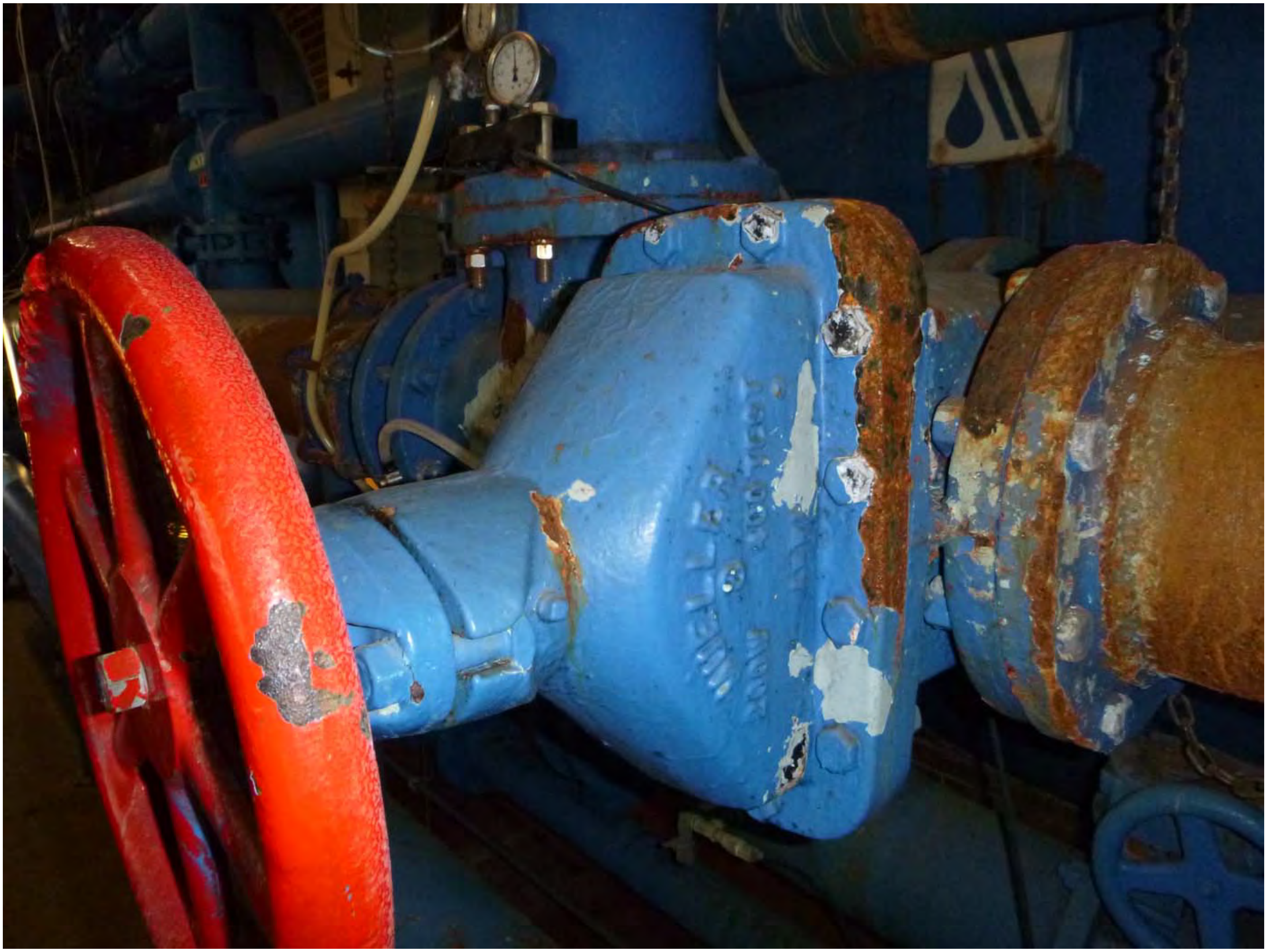
P1020420

P1020421

P1020422

P1020423

P1020424



P1020425

P1020426

P1020427

P1020428

P1020429


AMERICAN BFV® BUTTERFLY VALVE
SIZE IN. AWWA CLASS ANSI FLG
MODEL NO.
CWP PSI YEAR
SERIAL NO.
VAL-MATIC®
ELMHURST,
SEAT END

P1020430

P1020431

P1020432

P1020433


"WAFER BUTTERFLY VALVE
IN. AWWA CLASS 150B
YEAR 2011
CWP
ANSI CLASS 125 ISO PN10/16 ACT
VAL-MATIC®
ELMHURST, ILLINOIS US PATENT NO.

P1020434

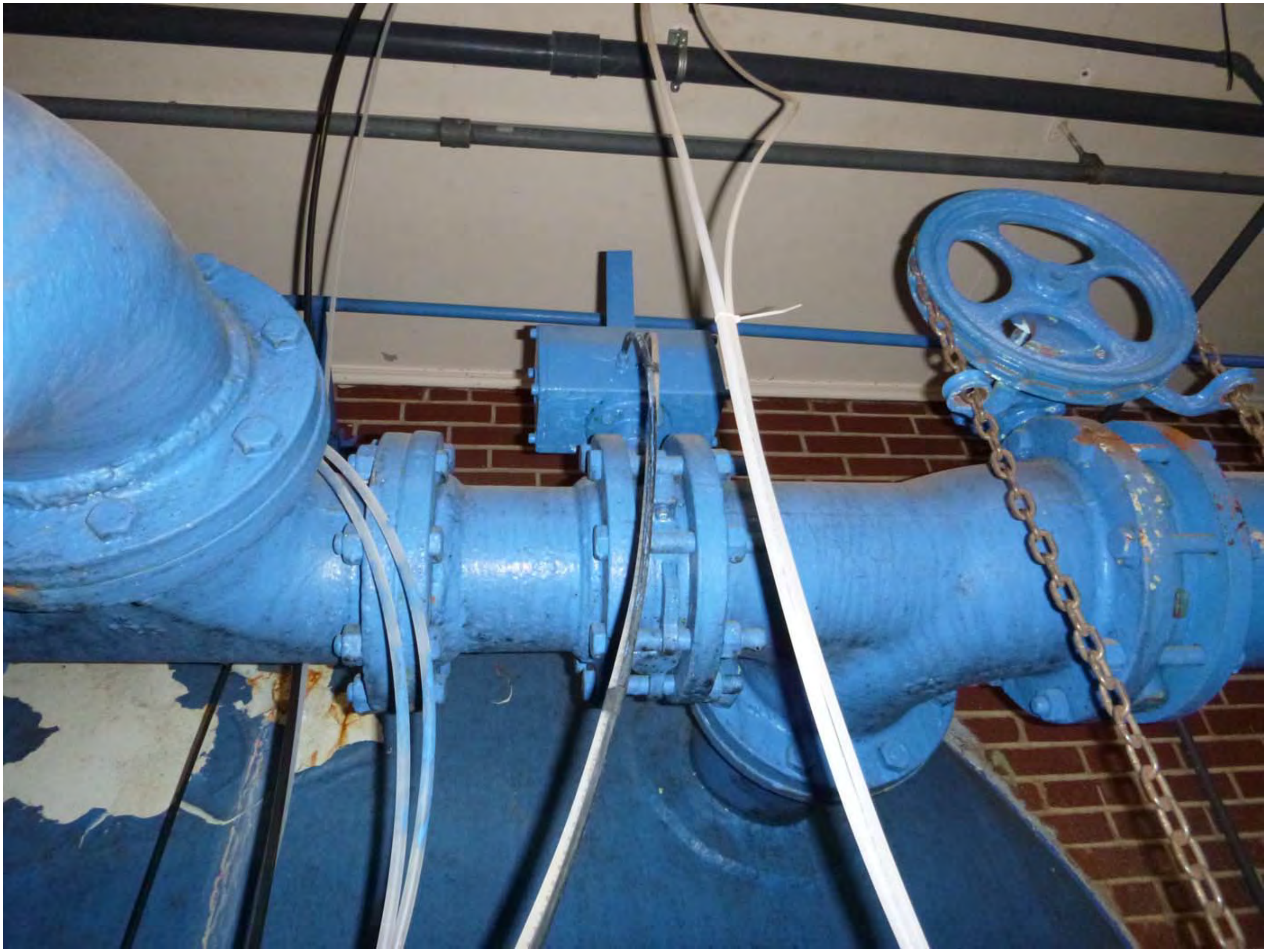
P1020435

P1020436


AMERICAN-BFV "WAFER BUTTERFLY VALVE
IN. AWWA CLASS 150B YEAR 2011
ODEL NO. 2508/1BOOA ANSI CLASS 125 ISO PN10/16
RIAL NO. M69750
VAL-MATIC
ELMHURST, ILLINOIS US PATENT

P1020437

P1020438



P1020439

P1020440

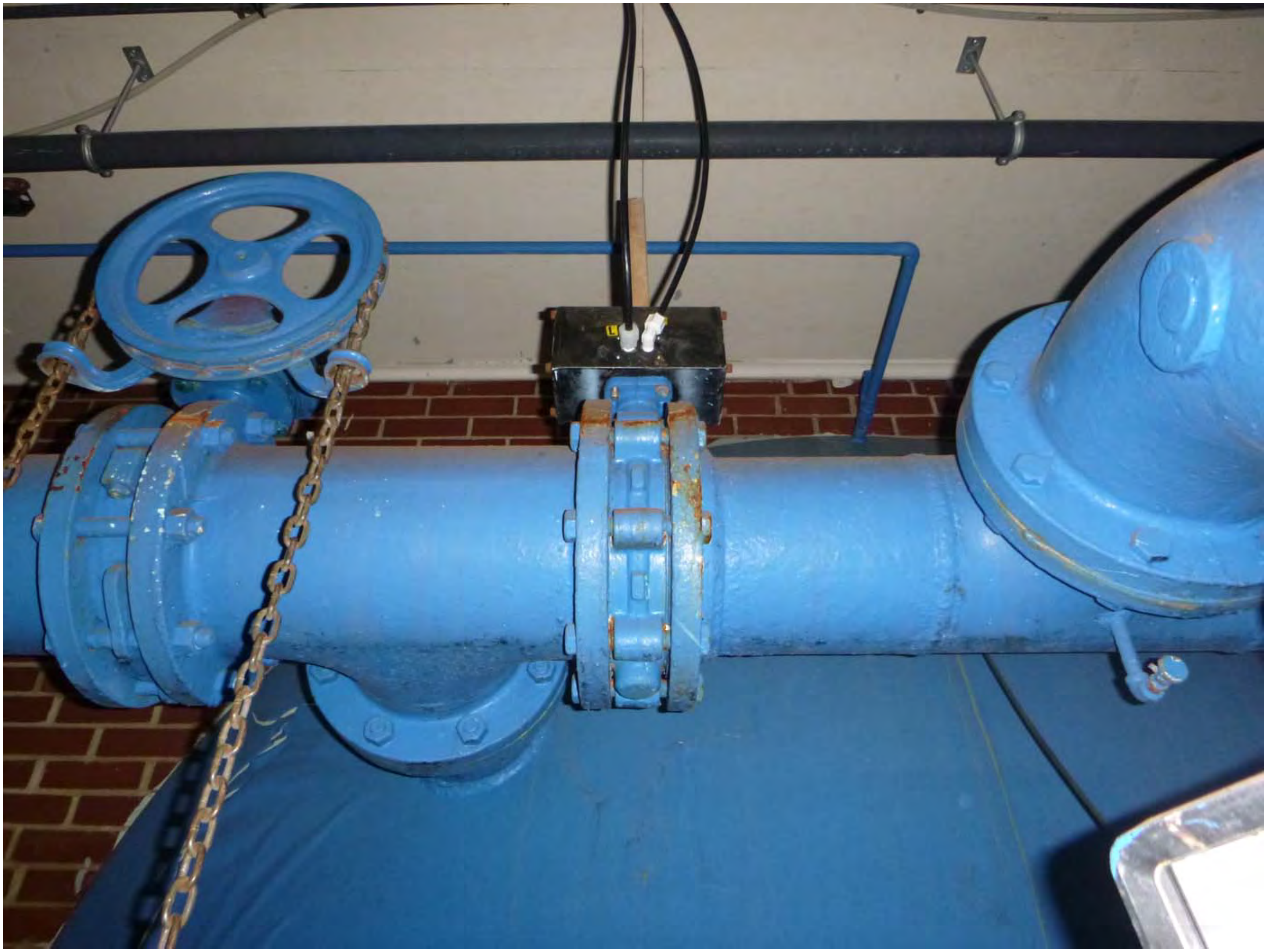
P1020441

P1020442

P1020443

P1020444

P1020445



P1020446


P1020447

P1020448

P1020449

P1020450

P1020451

P1020452

P1020453

P1020454

P1020455

P1020456

P1020457

P1020458

P1020459

P1020460

P1020461


MANUFACTURED BY
BALDOR
GENERATORS
Mukwonago, WI 53149 ■ 262-363-1555
JOB #:
DATE/MFD: FEBRUARY 2004
MODEL #: IDLC250-JD
TYPE: Trailer, Generator
GVWR: 10,674#
GAWR: 16,000#
(All Axles)
VIN #: 1B9BT182341692006
This vehicle conforms to all applicable Federal Motor Vehicle Safety
Standards in effect on the date of the manufacture shown above

P1020462

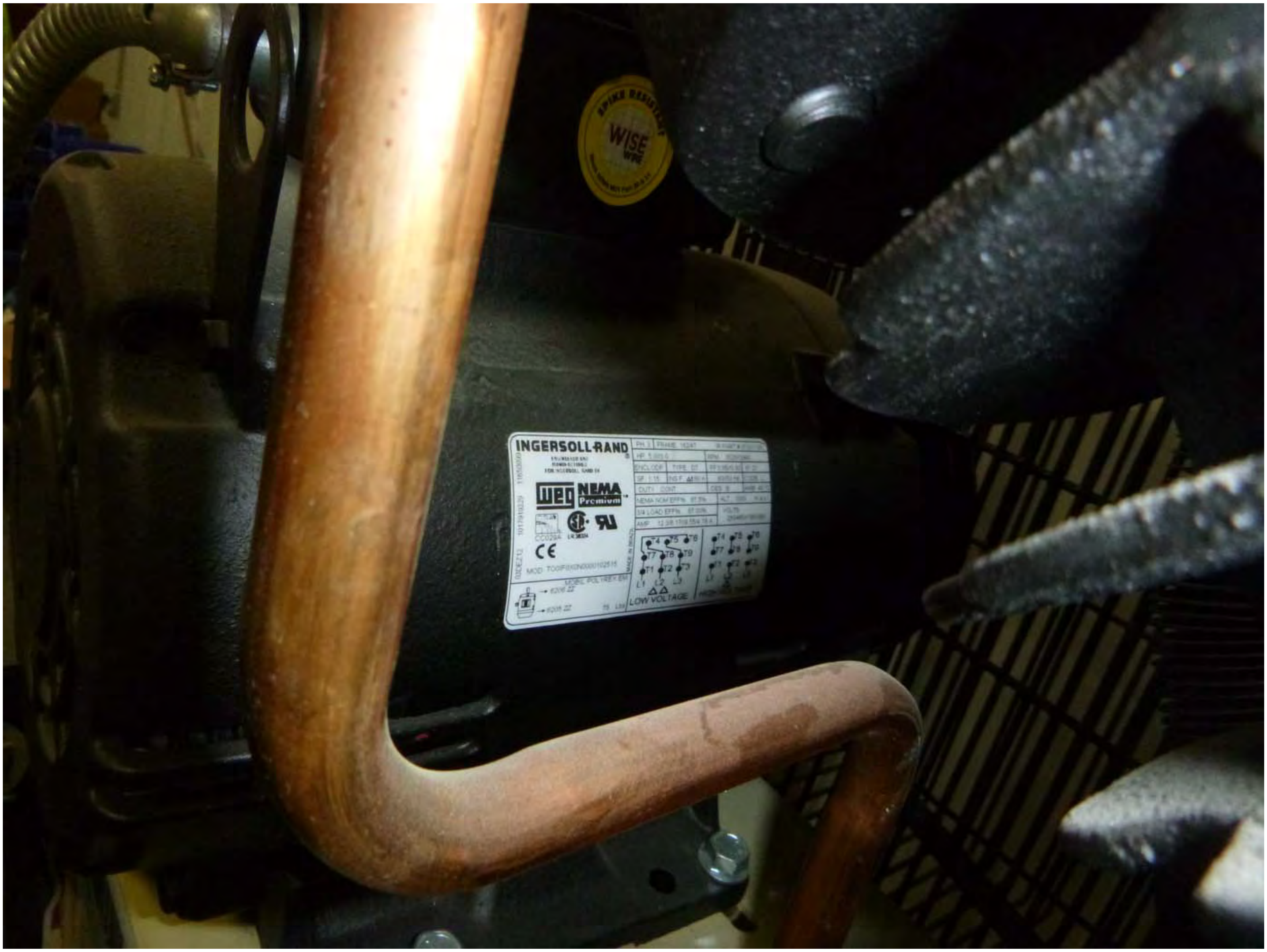
P1020463


Ingersoll Rand
Industrial Technologies
Serial No.
No. de serie
No. de série
CBV230005
Model
Modelo
Modèle
2340L5GRAINGER
PSIG CFM
40 14.4
90
Max 14
Rating
Capacidad nominal
Calibre
5
Maximum pressure
Presión máxima
Pression maximum
175
Volts
Voltios
Volt
460
Hertz
Hertzios
Hertz
60
Phases
Fases
Phases
3
Pump speed
Velocidad de bombeo
Vitesse de pompe
1575
Tank capacity
Capacidad del tanque
Capacité de réservoir
60
If connected to a circuit protected by fuses, use time delay fuses marked 'D' with this product.
Si está conectado a un circuito protegido por fusibles, use fusibles de tiempo diferido marcados 'D' con este producto.
Dans le cas d'une connexion à un circuit protégé par des fusibles, utiliser des fusibles à fusion temporisée marqués d'un 'D' avec ce produit.
This unit conforms to California safety order 462(L)(2).
Esta unidad se ajusta a las normas de Seguridad de California 462(L)(2).
Cette unité répond à l'ordonnance relative à la sécurité 462(L)(2)de la Californie, Estas-Unis.
*See motor/tank nameplate.
*Vea la placa de identificación del motor/tanque.
*Voir la plaque signalétique du moteur/réservoir.
DANGER / PELIGRO / DANGER
INTAKE AIR. CAN CONTAIN CARBON MONOXIDE OR OTHER CONTAMINANTS. WILL CAUSE SERIOUS INJURY OR DEATH. INGERSOLL-RAND AIR COMPRESSORS ARE NOT DESIGNED, INTENDED OR APPROVED FOR BREATHING AIR. COMPRESSED AIR SHOULD NOT BE USED FOR BREATHING AIR APPLICATIONS UNLESS TREATED IN ACCORDANCE WITH ALL APPLICABLE CODES AND REGULATIONS.

P1020464


Ingers
Industrial Te
MODEL NO.
2340
SERIAL NO.
1209447
Made in India
54398730-D

P1020465


SPIKE RESISTANT
WISE
INGERSOLL-RAND
NEMA
Premium
DUTY CONT
NEMA NOM EFF%
3/4 LOAD EFF%
AMP
CC029A
CE
T4 T5 T6
T7 T8 T9
T1 T2 T3
L1 L2 L3
LOW VOLTAGE

P1020466

P1020467


Hours: 7am - 7pm Central Time, M-F
Email: help@hotwater.com
321103-000 REV. 00
AHRI CERTIFIED®
www.ahridirectory.org
AUTOMATIC
CIRCULATING TANK OR
AUTOMATIC STORAGE
WATER HEATER
LLC
ANSI Z21.10.3 – CSA 4.3 – 2011
WATER QUALITY
ANSI/NSF-5
MODEL NUMBER
BTH 120 100
GAS TYPE
NATURAL
9281052000
INPUT BTU/HR
120000
RECOVERY GAL/HR
136.72
SERIAL NUMBER
1307M000925
CITY OF NEW YORK DEPT OF BUILDING MEA
116 – 96 – E VOL II
GAS PRESSURES IN. W.C.
MANIFOLD
4.00
MAX INLET
10.50
MIN INLET
4.90
MAX WORKING PRESSURE P.S.I.
160
ELECTRICAL RATINGS
VOLTS
120
60
AMPS
5
CAPACITY
RATED
60.0
MEASURED
58
STANDBY LOSS
1.84
Btu/hr
613
THERM. EFF.
94
MADE IN USA
A.O. SMITH WATER PRODUCTS CO.
MCBEE, SC. USA
Model Number: BTH 120 100
5. This appliance is equipped with a device which automatically lights the burner.
DO NOT TRY TO LIGHT THE BURNER BY HAND.
6. Wait five (5) minutes to clear out any gas. If you then smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
7. Turn on all electrical power to the appliance.
8. Set the ON/OFF switch on the control box to the "ON" position.
9. Set the thermostat to the desired setting.
CAUTION: Hotter water increases the risk of scald injury. Consult the instruction manual before changing temperature.
WARNING: TURN OFF ALL ELECTRIC POWER BEFORE SERVICING.
2. Set the ON/OFF switch on the control panel to the "OFF" position.
3. Turn off all electrical power to the appliance if service is to be performed.
TIME TO PRODUCE 2nd & 3rd DEGREE BURNS ON ADULT SKIN
Nearly instantaneous
About 1/2 Second
About 1 1/2 Seconds
Less than 5 seconds
More Than 30 Seconds
More Than 5 Minutes
LOW GAS PRESSURE SWITCH
24 VAC GAS VALVE
UIM

P1020468

P1020469


CAC/BDP
7310 West Morris Street, Indianapolis, IN 46231 U.S.A.
INDOOR SECTION
SECTION INTÉRIEUR
MODEL NO.
MODÉLE N°
CNPVP6024ALAAAAA
SERIAL NO.
SERIE N°
0613X40791
DESIGN PRESSURE
PRESSION DESIGNÉE
450 PSIG
3102 kPa
REFRIGERANT:
RÉFRIGÉRANT:
R-410A
FACTORY INSTALLED
METERING DEVICE
DISPOSITIF DE MÉSURE INSTALLÉ EN USINE
TXV
DATE OF MANUFACTURE
DATE DE FABRICATION
Feb-2013
Listed 3R39 Indoor Section of
Heat Pump or Air Conditioner.
Section intérieur listé 3R39 de
thermopompe ou air climatiseur.
MADE IN MEXICO
FABRIQUE AU MEXIQUE
c UL US
LISTED
Section of Heat Pumps
or Air Conditioners
3R39
338462-7016
RISQUE DE FEU
NOTICE
BEFORE REPLACING TXV COMPLETE
THESE STEPS:
1. Verify airflow is correct.
2. Check Subcooling at Outdoor unit to verify correct charge.
3. Confirm TXV bulb is properly attached and insulated.
Puron

P1020471


bryant
perdue
HEATING • COOLING
(317) 545-6577
(765) 529-1910
FURN #3

P1020472


CAC/BDP
7310 West Morris Street, Indianapolis, IN 46231 U.S.A.
INDOOR SECTION
SECTION INTÉRIEUR
MODEL NO.
MODÉLE N°
CNPVP2417ALAAAAA
SERIAL NO.
SERIE N°
0514X20942
DESIGN PRESSURE
PRESSION DESIGNÉE
450 PSIG
3102 kPa
REFRIGERANT:
RÉFRIGÉRANT:
R – 410A
FACTORY INSTALLED
METERING DEVICE
DISPOSITIF DE MÉSURE INSTALLÉ EN USINE
TXV
DATE OF MANUFACTURE
DATE DE FABRICATION
Jan – 2014
Section of Heat Pump or Air Conditioner.
Section de la thermopompe ou de l'air conditionné.
MADE IN MEXICO
FABRIQUE AU MEXIQUE
C UL US
LISTED
Evaporator Coil
338462 – 4004
NOTICE

P1020473


WELL-CASING ASTM
bryant
perdue
HEATING • COOLING
(317) 545-6577
(765) 529-1910

P1020474

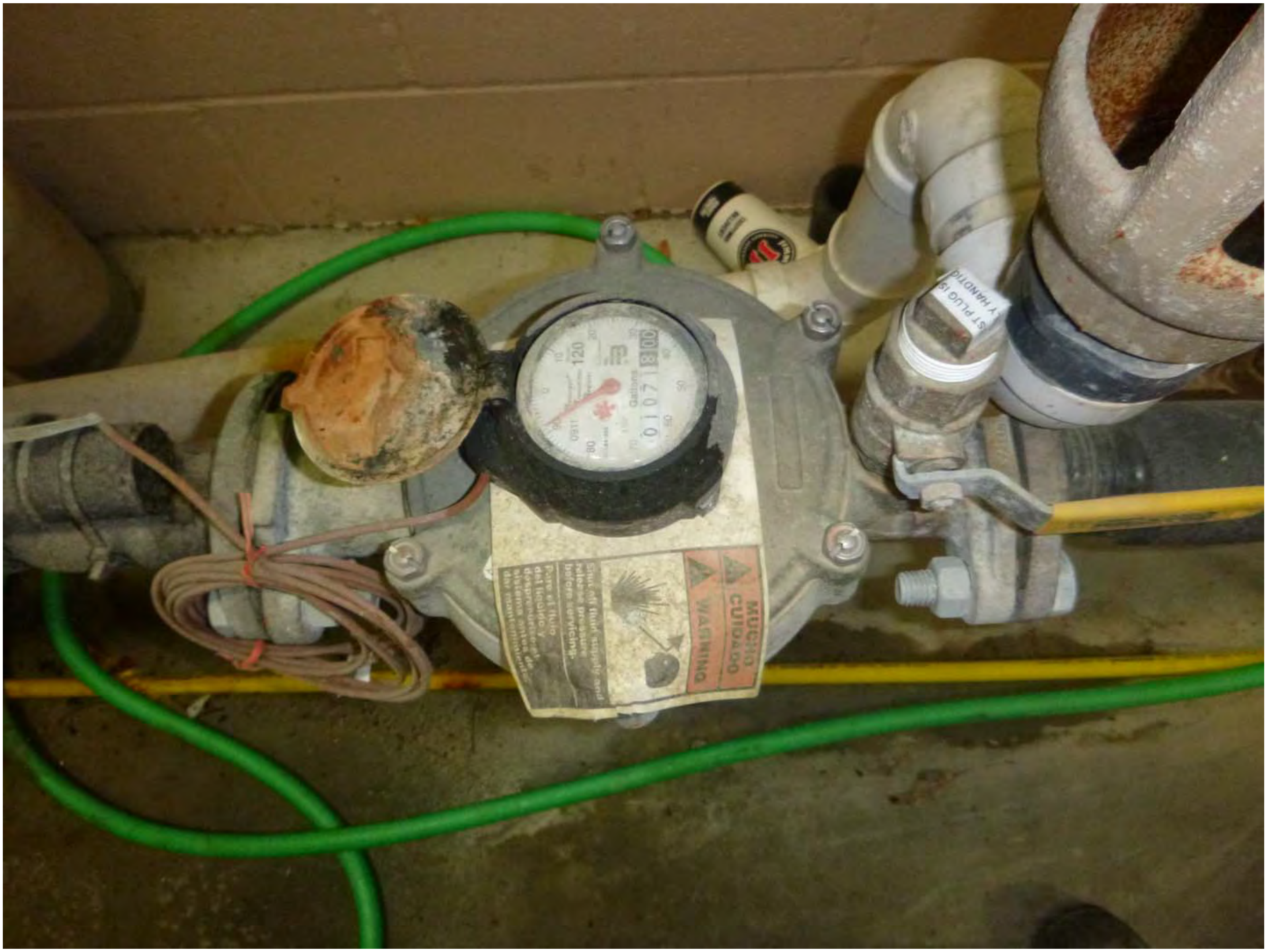

CAC/BDP
7310 West Morris Street, Indianapolis, IN 46231 U.S.A.
INDOOR SECTION
SECTION INTÉRIEUR
MODEL NO.
MODÈLE N°
CNPVP4821ALAAAAA
SERIAL NO.
SERIE N°
0814X23618
DESIGN PRESSURE
PRESSION DESIGNÉE
450 PSIG
3102 kPa
REFRIGERANT:
RÉFRIGÉRANT:
R – 410A
FACTORY INSTALLED
METERING DEVICE
TXV
DISPOSITIF DE MÉSURE INSTALLÉ EN USINE
DATE OF MANUFACTURE
DATE DE FABRICATION
Feb – 2014
Section of Heat Pump or Air Conditioner.
Section de la thermopompe ou de l'air conditionné.
MADE IN MEXICO
FABRIQUE AU MEXIQUE
C UL US
LISTED
Evaporator Coil
338462 – 4014
RISQUE DE FEU
NOTICE
BEFORE REPLACING TXV COMPLETE
THESE STEPS:
1. Verify airflow is correct.

P1020475

P1020476


1½" 909M1 QT RP
WATTS
1013
B64.4
448230
140°F 175 PSI
CITY OF N.Y. - MEA-144-83M

P1020477

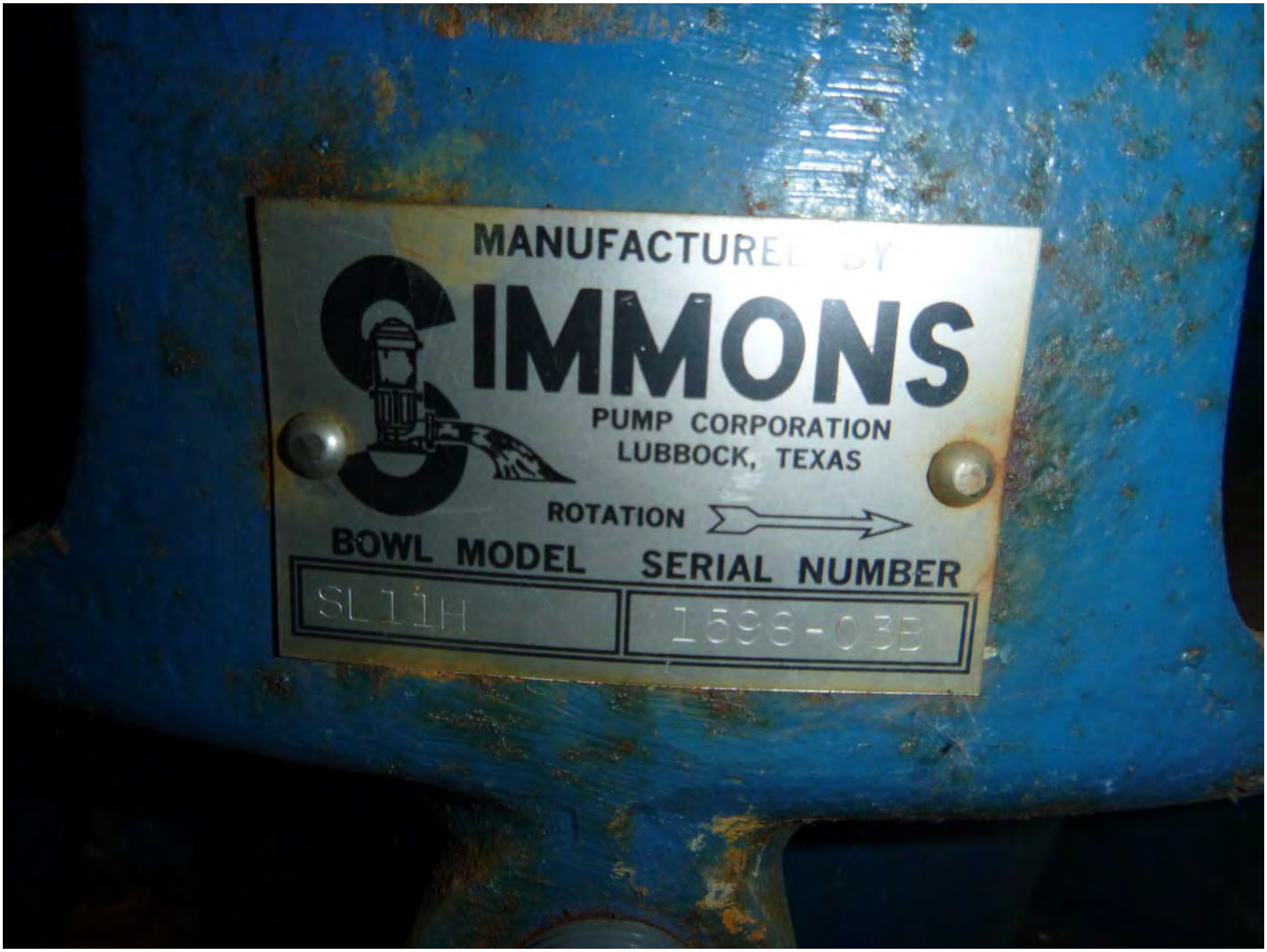


P1020478

P1020480


TREATMENT SYSTEM
TEC
TONKA EQUIPMENT CO.
INDUCED DRAFT
AERATOR
CAP. 1200 GPM.

P1020481


MANUFACTURED BY
SIMMONS
PUMP CORPORATION
LUBBOCK, TEXAS
ROTATION
BOWL MODEL
SERIAL NUMBER
SL11H
1698-03B

P1020482

P1020483

P1020484


MANUFACTURED
IMMO
PUMP CORP
LUBBOCK
ROTATION
BOWL MODEL
SERIAL NUMBER

P1020485


MANUFACTURED BY
SIMMONS
PUMP CORPORATION
LUBBOCK, TEXAS
ROTATION
BOWL MODEL
SERIAL NUMBER

P1020486

P1020487


GLOBE STYLE
SILENT CHECK VALVE
MODEL NO. 1808H
SIZE 8
BODY CI
ANSI 125
TRIM BRZ
Factory Mutual System Approved
COLD WORKING PRESSURE 200 P.S.I.
VAL-MATIC®
ELMHURST ILLINOIS
R1806-57

P1020488

P1020489


WAFER CHECK VALVE
SIZE
8
BODY
A536-DI
DISC
SEAT
EPDM
PRESS
125/250
FIGURE NO
720

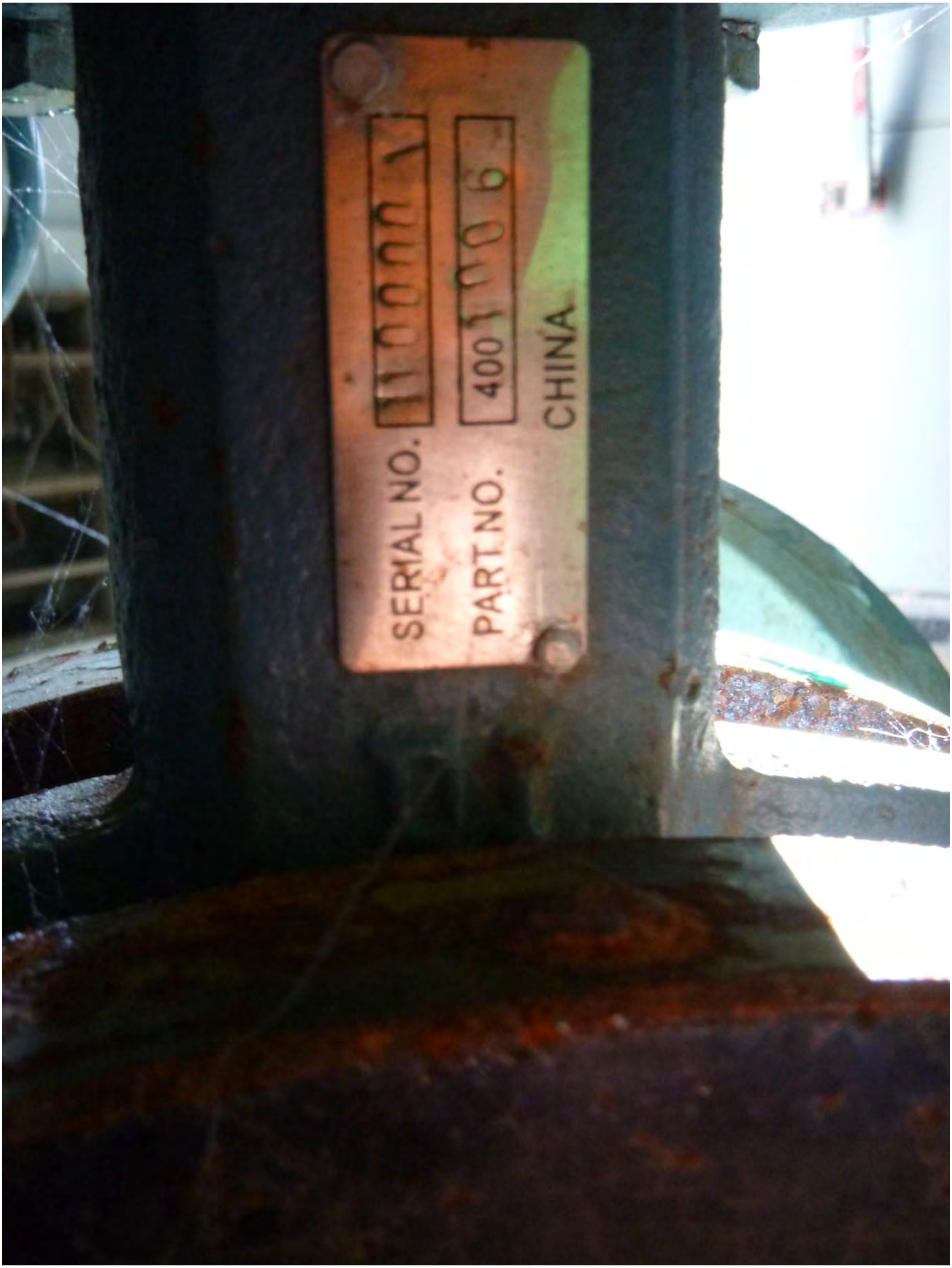
P1020490

P1020491


DeZURIK
PART NUMBER
SALES ORDER
SIZE
STYLE
A
BODY
CWP
DISC/BALL
SHAFT
SEAT
MAX TEMP

P1020492

P1020493



P1020494

P1020495

P1020496

P1020497


SIEMENS-ALLIS
MOTOR CONTROL CENTER
WICHITA FALLS, TEXAS • MADE IN USA
480 VOLTS 3 PHASE 60 HERTZ
HORIZ. & VERT. BUS BRACED FOR SHORT CIRCUIT
CURRENT RATING OF AMPS R.M.S. SYM.
HORIZ. BUS CONTINUOUS RATING 600 AMPS
MCC SHORT-CIRCUIT CURRENT RATING
22KA RMS SYMMETRICAL AMPERES.
DO NOT INSTALL ON CIRCUITS WITH AVAILABLE
SHORT-CIRCUIT CURRENTS GREATER THAN THE
MCC RATING.
MCC SERIAL NO. 01-1466-50215-02
MCC PART NO. 25-307-974-502
25-120-865-003

P1020498


SIEMENS-ALLIS
MOTOR CONTROL CENTER
WICHITA FALLS, TEXAS • MADE IN USA
VOLTS PHASE 60 HERTZ
HORIZ. & VERT. BUS BRACED FOR SHORT CIRCUIT
CURRENT RATING OF AMPS R.M.S. SYM.
HORIZ. BUS CONTINUOUS RATING AMPS
MCC SHORT-CIRCUIT CURRENT RATING
RMS SYMMETRICAL AMPERES.
DO NOT INSTALL ON CIRCUITS WITH AVAILABLE
SHORT-CIRCUIT CURRENTS GREATER THAN THE
MCC RATING.
MCC SERIAL NO.
MCC PART NO.
25-120-865-003

P1020499

SIEMENS-ALLIS
SIEMENS-ALLIS
MARQ
ON
ON
ON
DANGER
DANGER
DANGER
DANGER
Shock Hazard

P1020500


MENS-AL
SIEMENS-ALLIS
MOTOR CONTROL CENTER
WICHITA FALLS, TEXAS • MADE IN USA
480 VOLTS 3 PHASE 60 HERTZ
HORIZ. & VERT. BUS BRACED FOR SHORT CIRCUIT
CURRENT RATING OF 22KA AMPS R.M.S. SYM.
HORIZ. BUS CONTINUOUS RATING 600 AMPS
MCC SHORT-CIRCUIT CURRENT RATING
22KA RMS SYMMETRICAL AMPERES.
DO NOT INSTALL ON CIRCUITS WITH AVAILABLE
SHORT-CIRCUIT CURRENTS GREATER THAN THE
MCC RATING.
MCC SERIAL NO. 01-1466-50215-02
MCC PART NO. 25-307-974-502
25-120-865-003

P1020501


SIEMENS-ALLIS
MOTOR CONTROL CENTER
WICHITA FALLS, TEXAS • MADE IN USA
VOLTS PHASE HERTZ
HORIZ. & VERT. BUS BRACED FOR SHORT CIRCUIT
CURRENT RATING OF AMPS R.M.S. SYM.
HORIZ. BUS CONTINUOUS RATING AMPS
MCC SHORT-CIRCUIT CURRENT RATING
RMS SYMMETRICAL AMPERES.
DO NOT INSTALL ON CIRCUITS WITH AVAILABLE
SHORT-CIRCUIT CURRENTS GREATER THAN THE
MCC RATING.
MCC SERIAL NO.
MCC PART NO.
25-120-865-003

P1020502


Kinney
ELECTRICAL MFG. CO. ELGIN, ILLINOIS
ON
OFF
HI-Z
SIEM
MARQ

P1020503


BOLTED PRESSURE
CONTACT SWITCH
KINNEY ELECTRICAL MFG. CO.
ELGIN, ILLINOIS
SERIAL NO. 32436
CAT. NO. VL 368-ST
1200 AMP
600AC VOLT
3 POLE
3 WIRE

P1020504

P1020505

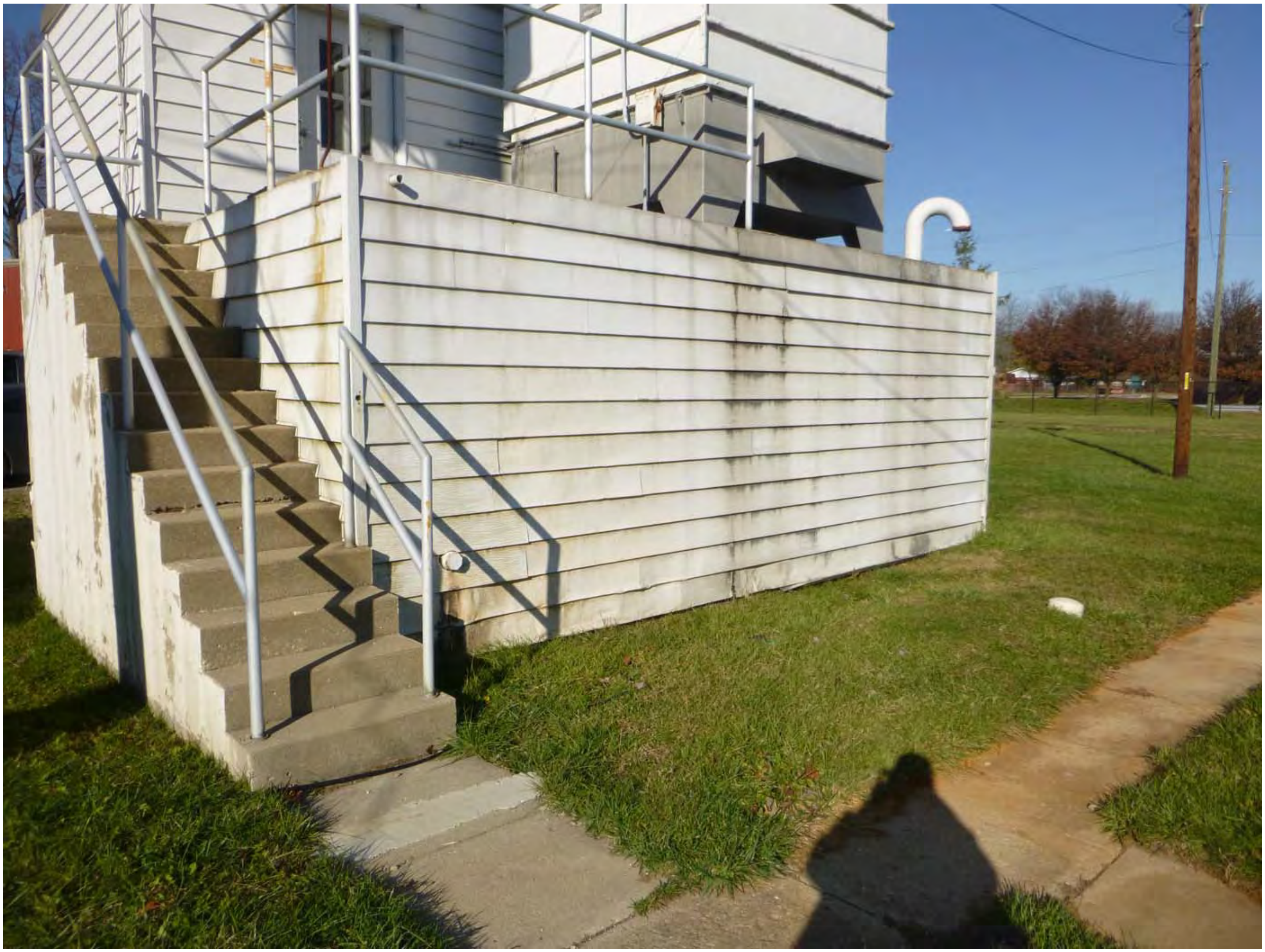
P1020506

P1020507

P1020508

P1020509

P1020510



P1020511

P1020512

P1020513

P1020514

P1020515

P1020516

P1020517

P1020518

P1020519

P1020520

P1020521


INSTALLED BY
PEERLESS-MIDWEST, INC.
MISHAWAKA, INDIANA
PHONE 574-254-9050
PUMP SERIAL NUMBER
70668

P1020522

P1020524

P1020525

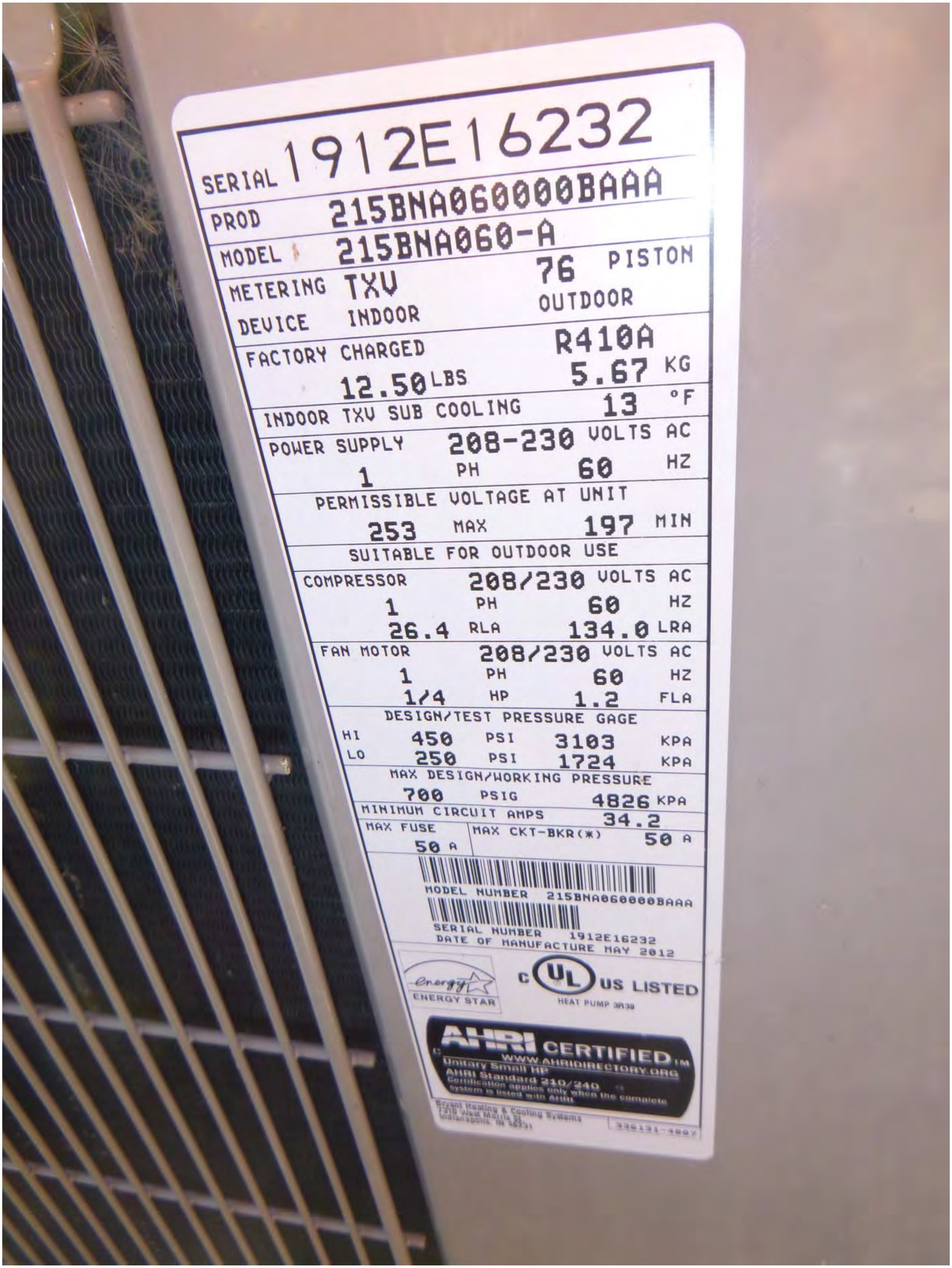

5450
LAWRENCE
WATER WORKS
1971
BOARD OF PUBLIC WORKS
AND SAFETY
MORRIS SETTLES MAYOR
JAMES H. HARDIN COUNCIL MEMBER
LLOYD L. DE WESTER CITY ATTORNEY
WILLIAM D. HALL CLERK-TREASURER
CONTRACTORS
WELL NO. 5 AND PUMPHOUSE LAYNE NORTHERN CO.
IRON REMOVAL PLANT ADDITIONS - INTERSTATE PIPING INC.
ENGINEER
CLYDE E. WILLIAMS & ASSOC., INC.
SOUTH BEND INDIANAPOLIS

P1020526


LAWRENCE WATER
TREATMENT PLANT
1958
TOWN OFFICIALS
PRESIDENT
TRUSTEE
TRUSTEE
TRUSTEE
TRUSTEE
CLERK-TREASURER
ATTORNEY
SUPERINTENDENT
CONTRACTORS
ENGINEER
NO SMOKING

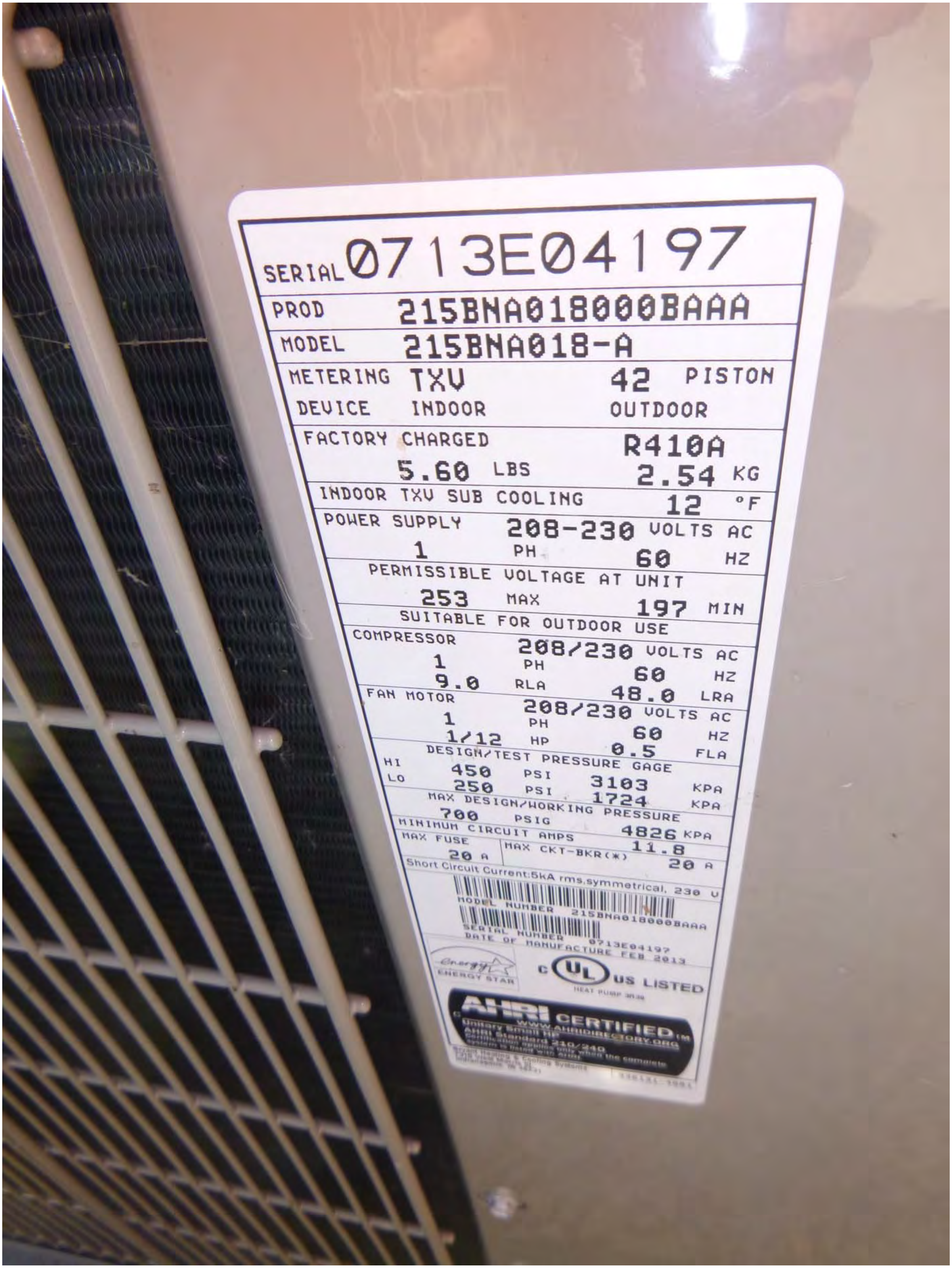
P1020527

P1020528


SERIAL 1912E16232
PROD 215BNA060000BAAA
MODEL 215BNA060-A
METERING TXV
DEVICE INDOOR
76 PISTON
OUTDOOR
FACTORY CHARGED
R410A
12.50 LBS
5.67 KG
INDOOR TXV SUB COOLING 13 °F
POWER SUPPLY 208-230 VOLTS AC
1 PH 60 HZ
PERMISSIBLE VOLTAGE AT UNIT
253 MAX 197 MIN
SUITABLE FOR OUTDOOR USE
COMPRESSOR 208/230 VOLTS AC
1 PH 60 HZ
26.4 RLA 134.0 LRA
FAN MOTOR 208/230 VOLTS AC
1 PH 60 HZ
1/4 HP 1.2 FLA
DESIGN/TEST PRESSURE GAGE
HI 450 PSI 3103 KPA
LO 250 PSI 1724 KPA
MAX DESIGN/WORKING PRESSURE
700 PSIG 4826 KPA
MINIMUM CIRCUIT AMPS 34.2
MAX FUSE 50 A
MAX CKT-BKR(*) 50 A
MODEL NUMBER 215BNA060000BAAA
SERIAL NUMBER 1912E16232
DATE OF MANUFACTURE MAY 2012
energy ENERGY STAR
c UL US LISTED
HEAT PUMP 3R39
AHRI CERTIFIED TM
WWW.AHRIDIRECTORY.ORG
Unitary Small HP
AHRI Standard 210/240
Certification applies only when the complete system is listed with AHRI

P1020529

P1020530


SERIAL 0713E04197
PROD 215BNA018000BAAA
MODEL 215BNA018-A
METERING TXV 42 PISTON
DEVICE INDOOR OUTDOOR
FACTORY CHARGED R410A
5.60 LBS 2.54 KG
INDOOR TXV SUB COOLING 12 °F
POWER SUPPLY 208-230 VOLTS AC
1 PH 60 HZ
PERMISSIBLE VOLTAGE AT UNIT
253 MAX 197 MIN
SUITABLE FOR OUTDOOR USE
COMPRESSOR 208/230 VOLTS AC
1 PH 60 HZ
9.0 RLA 48.0 LRA
FAN MOTOR 208/230 VOLTS AC
1 PH 60 HZ
1/12 HP 0.5 FLA
DESIGN/TEST PRESSURE GAGE
HI 450 PSI 3103 KPA
LO 250 PSI 1724 KPA
MAX DESIGN/WORKING PRESSURE
700 PSIG 4826 KPA
MINIMUM CIRCUIT AMPS 11.8
MAX FUSE 20 A
MAX CKT-BKR(*) 20 A
Short Circuit Current:5kA rms,symmetrical, 230 V
MODEL NUMBER 215BNA018000BAAA
SERIAL NUMBER 0713E04197
DATE OF MANUFACTURE FEB 2013
ENERGY STAR
C UL US LISTED
AHRI CERTIFIED
WWW.AHRIDIRECTORY.ORG
AHRI Standard 210/240

P1020531

P1020532


SERIAL 0213E22436
PROD 215BNA048000BAAA
MODEL 215BNA048-A
METERING DEVICE TXV INDOOR
67 PISTON OUTDOOR
FACTORY CHARGED R410A
9.60 LBS 4.35 KG
INDOOR TXV SUB COOLING 13 °F
POWER SUPPLY 208-230 VOLTS AC
1 PH 60 HZ
PERMISSIBLE VOLTAGE AT UNIT
253 MAX 197 MIN
SUITABLE FOR OUTDOOR USE
COMPRESSOR 208/230 VOLTS AC
1 PH 60 HZ
21.8 RLA 117.0 LRA
FAN MOTOR 208/230 VOLTS AC
1 PH 60 HZ
1/4 HP 1.2 FLA
DESIGN/TEST PRESSURE GAGE
HI 450 PSI 3103 KPA
LO 250 PSI 1724 KPA
MAX DESIGN/WORKING PRESSURE
700 PSIG 4826 KPA
MINIMUM CIRCUIT AMPS 28.5
MAX FUSE 40 A
MAX CKT-BKR(*) 40 A
Short Circuit Current:5kA rms.symmetrical, 230 V
MODEL NUMBER 215BNA048000BAAA
SERIAL NUMBER 0213E22436
DATE OF MANUFACTURE JAN 2013
ENERGY STAR
C UL US LISTED
AHRI CERTIFIED
WWW.AHRIDIRECTORY.ORG
AHRI Standard 210/240

P1020533

P1020534


WEINMAN
T627782
-0499
175
106046
S.P.M.
FT.HD.
IMP.DIA.
13.63
5L1-2-Y2

P1020535

P1020536

P1020537

P1020538

P1020540

P1020541


WEINMAN®
Pumps Inc. Company. - Made in USA
493967
0994
G.P.M.
PSI
FT.HD.

P1020542

P1020543


DeZURIK
STOCK
8
PART NUMBER
WORK ORDER
SIZE
STYLE
A
304
NBR
BODY
CWP
DISC/BALL
SEAT

P1020544

P1020545


A UNIT OF GENERAL SIGNAL
DeZURIK
PART NUMBER
STOCK
WORK ORDER
10
SIZE
BAW
STYLE
150B
CWP
304
SHAFT
CT
DISC/BALL
NBR
SEAT
200F
MAX TEMP

P1020546

P1020547

P1020548

P1020549

P1020550

P1020551

P1020552

P1020553


9353259
STOCK
8
BAW
A
PART NUMBER
WORK ORDER
SIZE
STYLE
A
NBR
200F

P1020554

P1020555

P1020558

P1020559

P1020560

P1020561

P1020562

P1020563

P1020564

P1020565


SINGER VALVE INC.
REV.
MODEL
106-RPC
BB
SIZE
8
IN.
MAX INLET
250
PSI
SER. No.
198-103

P1020566

P1020567

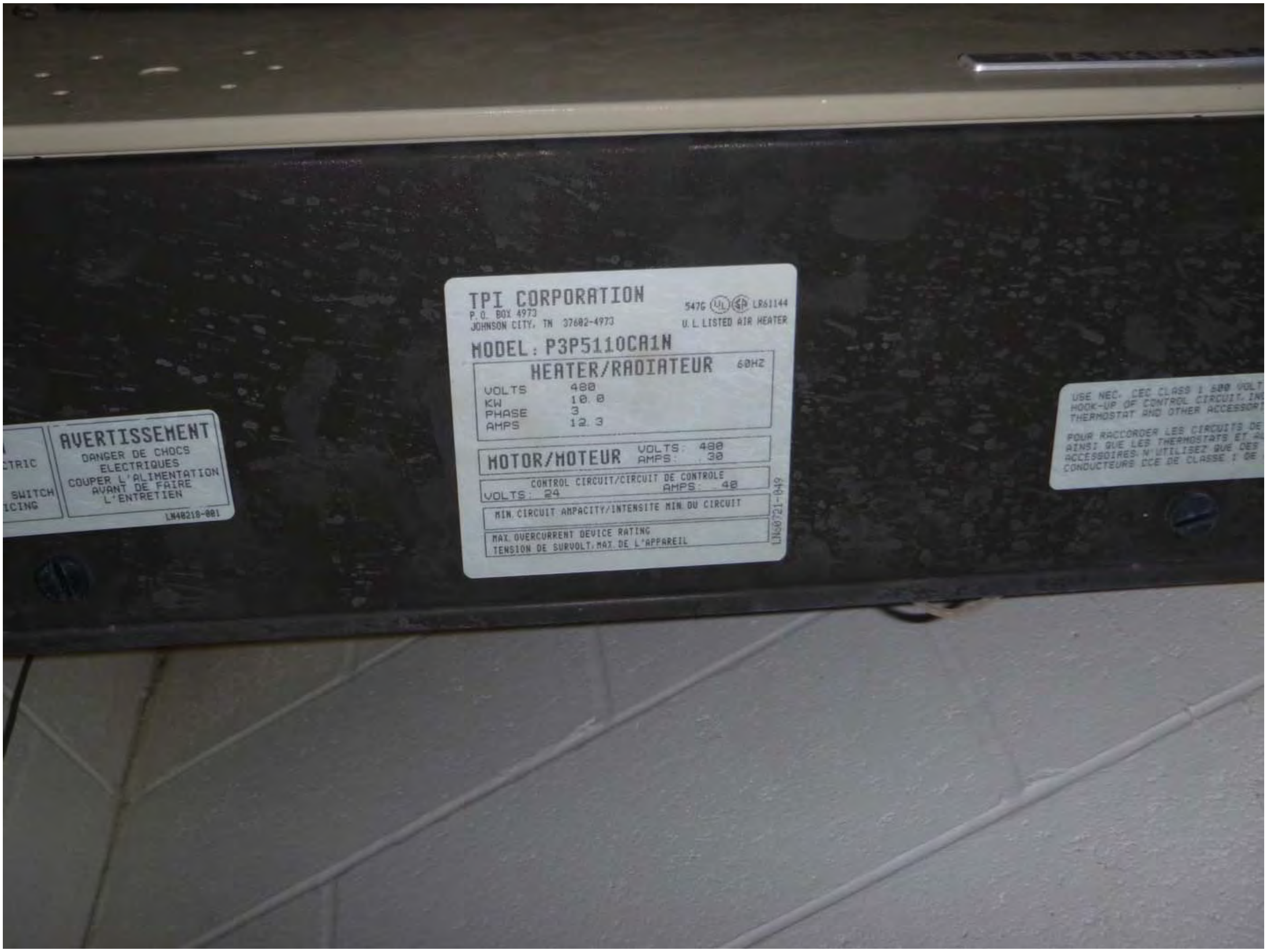
P1020568

P1020569


TPI CORPORATION
P.O. BOX 4973
JOHNSON CITY, TN 37602-4973
547G LR61144
U.L. LISTED AIR HEATER
MODEL: P3P5110CA1N
HEATER/RADIATEUR 60HZ
VOLTS 480
KW 10.0
PHASE 3
AMPS 12.3
MOTOR/MOTEUR VOLTS: 480 AMPS: .30
CONTROL CIRCUIT/CIRCUIT DE CONTROLE
VOLTS: 24 AMPS: 40
MIN. CIRCUIT AMPACITY/INTENSITE MIN. DU CIRCUIT
MAX. OVERCURRENT DEVICE RATING
TENSION DE SURVOLT. MAX. DE L'APPAREIL
LN60721-049
ISSEMENT
ER DE CHOCS
ECTRIQUES
L'ALIMENTATION
NT DE FAIRE
ENTRETIEN
LN40218-001

P1020570

P1020571

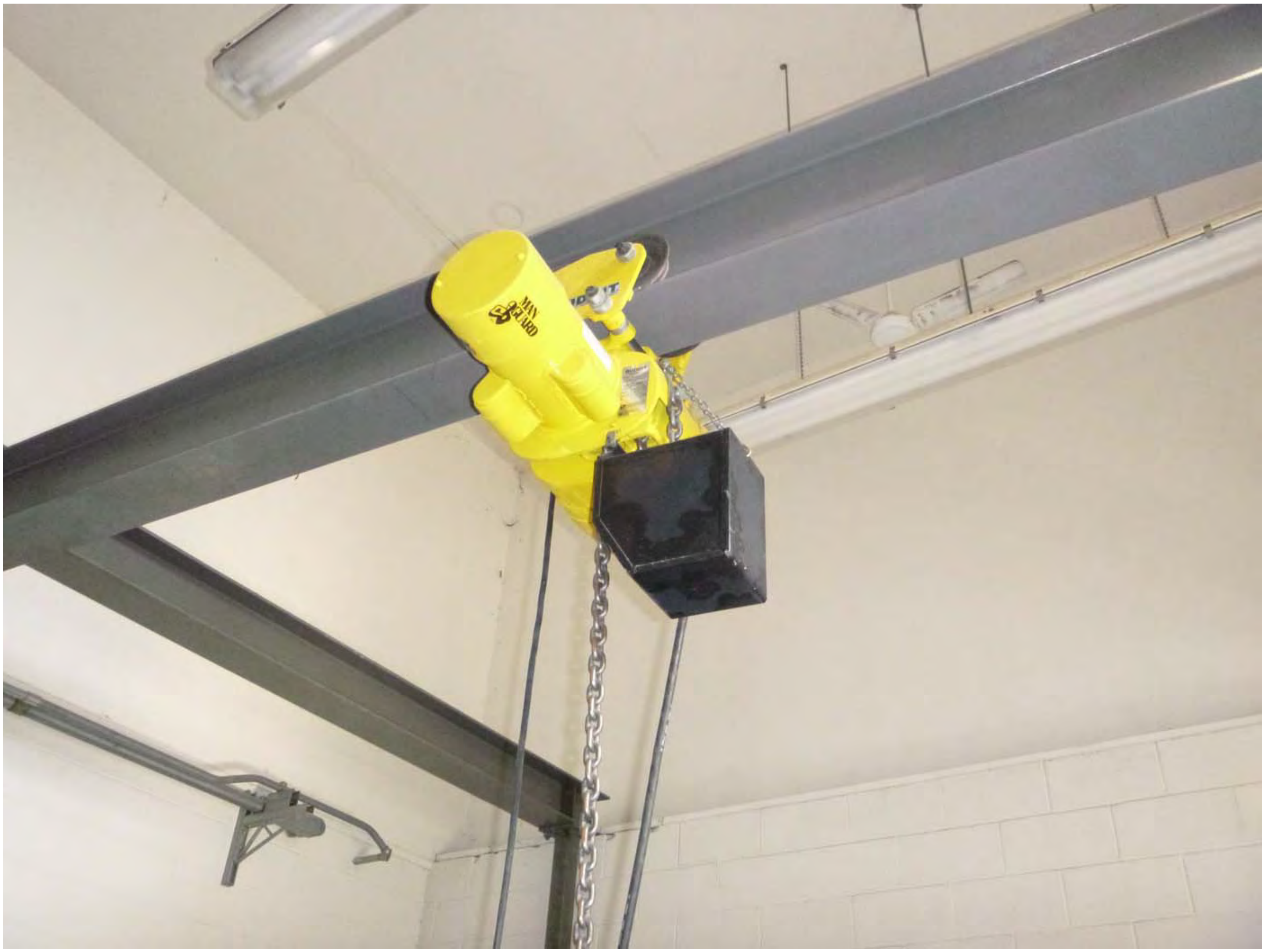

TPI CORPORATION
P.O. BOX 4973
JOHNSON CITY, TN 37602-4973
547G LR61144
U.L. LISTED AIR HEATER
MODEL: P3P5110CA1N
HEATER/RADIATEUR 60HZ
VOLTS 480
KW 10.0
PHASE 3
AMPS 12.3
MOTOR/MOTEUR VOLTS: 480 AMPS: .30
CONTROL CIRCUIT/CIRCUIT DE CONTROLE
VOLTS: 24 AMPS: 40
MIN. CIRCUIT AMPACITY/INTENSITE MIN DU CIRCUIT
MAX. OVERCURRENT DEVICE RATING
TENSION DE SURVOLT. MAX DE L'APPAREIL
LN60721-049
AVERTISSEMENT
DANGER DE CHOCS ELECTRIQUES
COUPER L'ALIMENTATION AVANT DE FAIRE L'ENTRETIEN
LN40218-001

P1020572

P1020573


BUDGIT
CHAIN HOIST
MODEL
CATALOG
236029
SERIAL
CODE
LB
CAPACITY
2000
FPM
16
PEED
115
LTAGE
30 MIN
1
LIFT-TECH INTERNATIONAL, division of
COLUMBUS MCKINNON CORPORATION
MUSKEGON, MICHIGAN 49443-0765
U.S. PATENT 4,749,067
FOREIGN PAT. PENDING

P1020574



P1020575

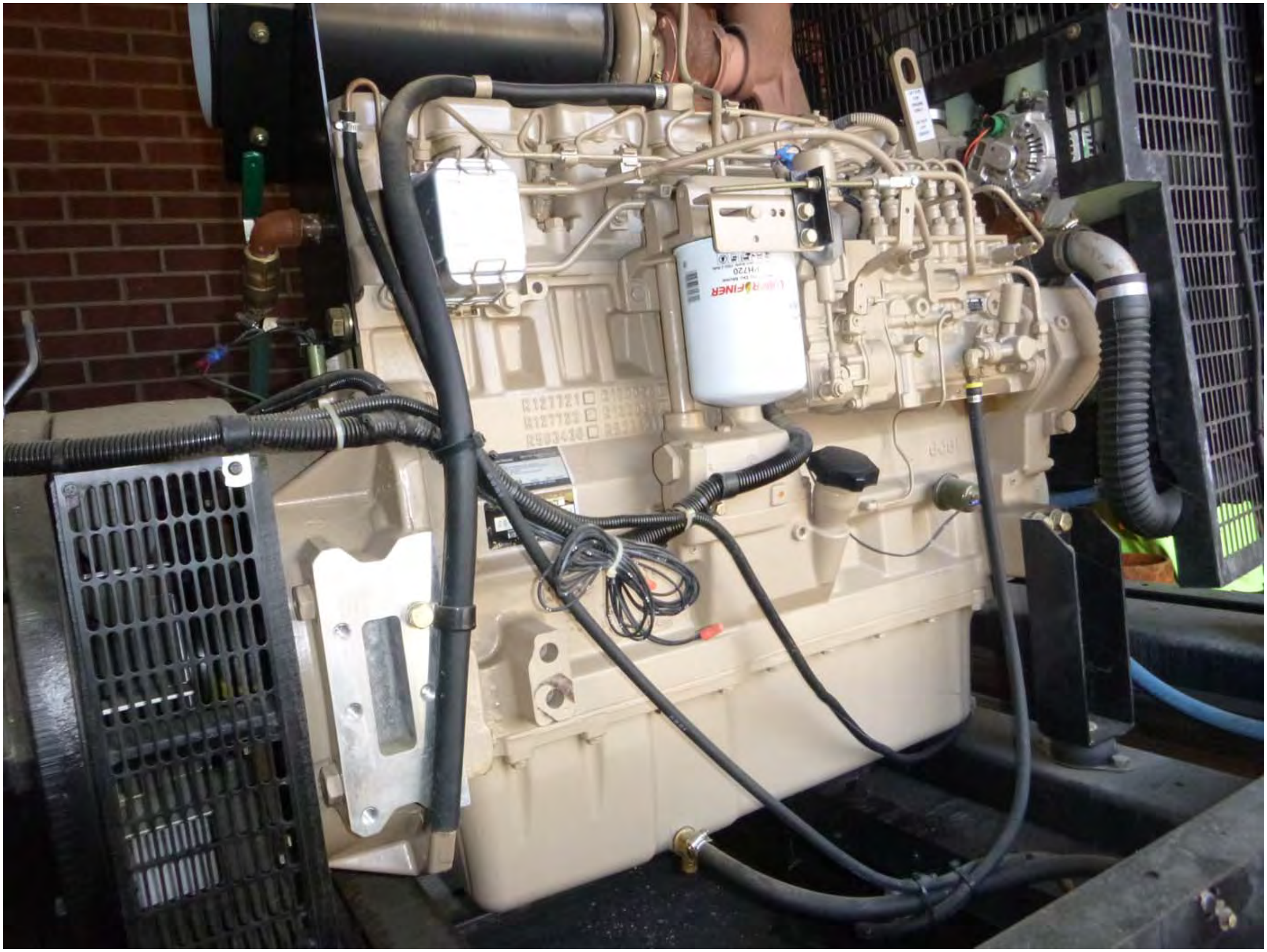
P1020576


DANGER
STARTS AUTOMATICALLY
W.W.Williams
Factory Trained
EGSA Certified
Technicians
800-238-1989
BALDOR
GENERATORS

P1020577


BALDOR
GENERATORS
MODEL
P/N 10.75200-G26
WT 3965
KW 200
PH 3
KVA 250
PF 0.8
AMPS 301
VOLTS 277/480
RPM 1800
HZ 60
S/N P0505230002
INSULATION CLASS F/H
MAX. RATING @ 20 DEG C - SEA LEVEL
FOR USE IN WELL VENTILATED AREA
FOR ELECTRICAL EQUIPMENT ONLY
MADE IN THE USA
BALDOR GENERATORS
OSHKOSH, WISCONSIN, USA
920-236-4200
7 12150 01768 4
S-MFG-014-1

P1020578



P1020579


R127723
R503430
JOHN DEERE
IMPORTANT ENGINE INFORMATION
DEERE & COMPANY
·This engine may be used:
· In the US for stationary and non-regulated marine applications
and other applications that are not subject to EPA emissions regulations.
· In the EU for generator-set applications.
· For export to countries that do not have emissions regulations.
R517821
ISO9001 Registered
For Engine Service and Parts Call 1-800-JD ENGINE
JOHN DEERE
Number RG6081A170952
6081AF001
8.1L
1685F
Customer No. EA0009A88
OPTION CODES

P1020580

P1020581


GREATER THA
CIRCUIT RATING OF AN
MODEL 4 CONTROL CENTER
BUS RATING
HORZ. 6 00A
VERT. 3 00A
BUS BARS BRACED FOR
42 000 AMP R.M.S.
SYM. AVAILABLE
600 V.A.C. MAX. F.O. 12-63495
SQUARE D COMPANY PLANT 7
MADE IN U.S.A.
30322-283-01
UNDERWRITERS LABORATORIES INC.
MOTOR CONTROL CENTER SECTION
SECTION 4 OF 4
NO. A-425257

P1020584

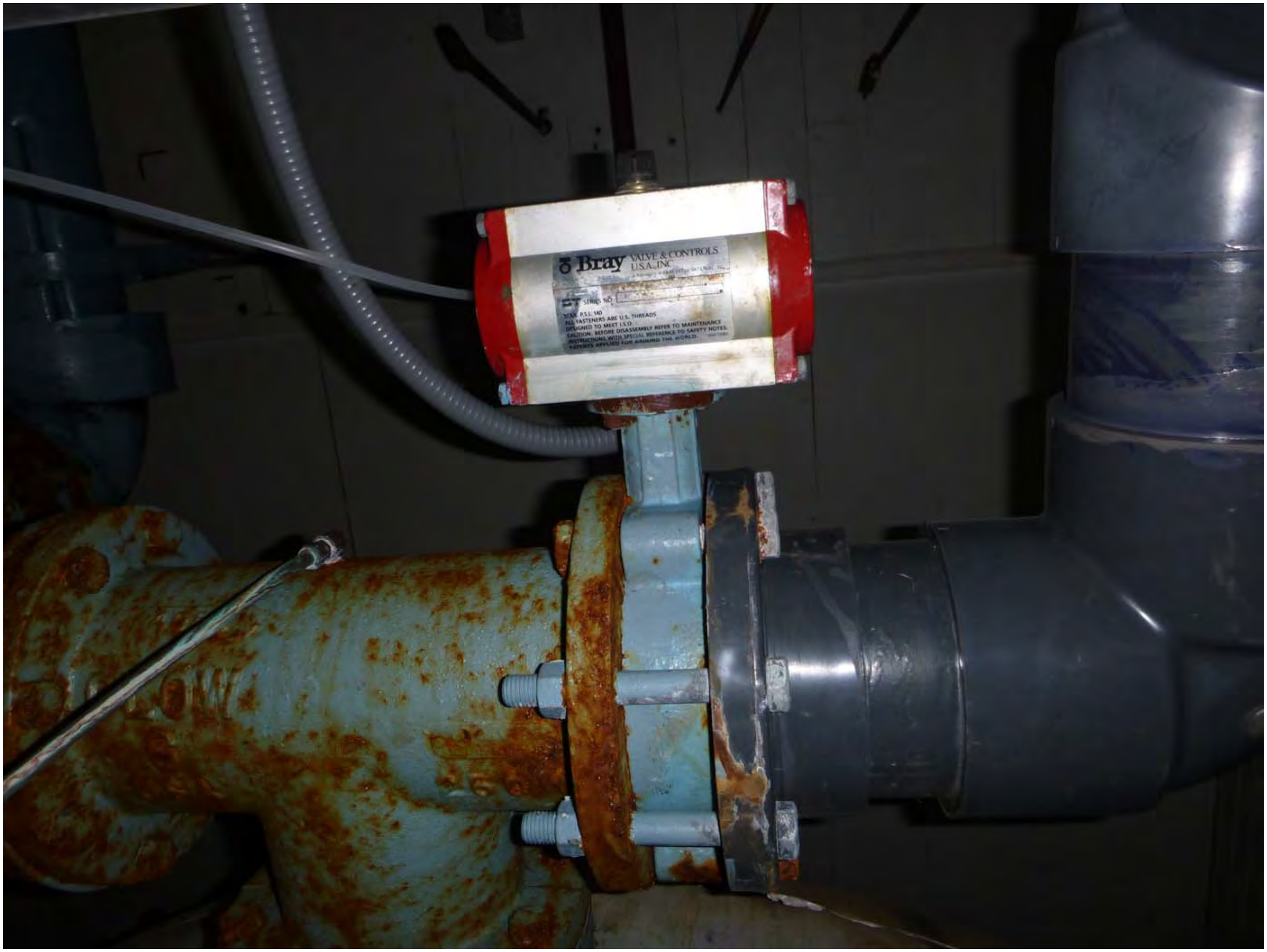

Well 10
WELL 7 ON
WELL 7 OFF
WELL 8 ON
WELL 8 OFF
WELL 9 ON
WELL 9 OFF
Level Alarm FAULT
F12 Clear Alarm
F11 Acknowledge
F10 Hide Fault Scrn
WELL 10 ON
WELL 10 OFF
7
8
9
10

P1020585

P1020586

P1020587

P1020588


Bray
VALVE & CONTROLS
U.S.A. INC
SERIES NO.
MAX. P.S.I. 140
ALL FASTENERS ARE U.S. THREADS
DESIGNED TO MEET I.S.O.
CAUTION: BEFORE DISASSEMBLY REFER TO MAINTENANCE
INSTRUCTIONS WITH SPECIAL REFERENCE TO SAFETY NOTES.
PATENTS APPLIED FOR AROUND THE WORLD.

P1020589


Bray
VALVE & CONTROLS
U.S.A., INC.
SERIES NO.
MAX. P.S.I. 140
ALL FASTENERS ARE U.S. THREADS

P1020590

P1020591

P1020592


Bray
VALVE & CONTROLS
U.S.A., INC.
A Subsidiary of BRAY INTERNATIONAL, Inc
SERIES NO.
MAX. P.S.I. 140
ALL FASTENERS ARE U.S. THREADS
DESIGNED TO MEET I.S.O.
CAUTION: BEFORE DISASSEMBLY REFER TO MAINTENANCE
INSTRUCTIONS WITH SPECIAL REFERENCE TO SAFETY NOTES
PATENTS APPLIED FOR AROUND THE WORLD.

P1020593


Bray VALVE & CONTROLS U.S.A., INC.
A Subsidiary of BRAY INTERNATIONAL, Inc.
SERIES NO.
MAX. P.S.I. 140
ALL FASTENERS ARE U.S. THREADS
DESIGNED TO MEET I.S.O.
CAUTION: BEFORE DISASSEMBLY REFER TO MAINTENANCE
INSTRUCTIONS WITH SPECIAL REFERENCE TO SAFETY NOTES.
PATENTS APPLIED FOR AROUND THE WORLD.
1250-73301

P1020594

P1020595

P1020596

P1020597

P1020598

P1020599

P1020600

P1020601

P1020602

P1020603

P1020604

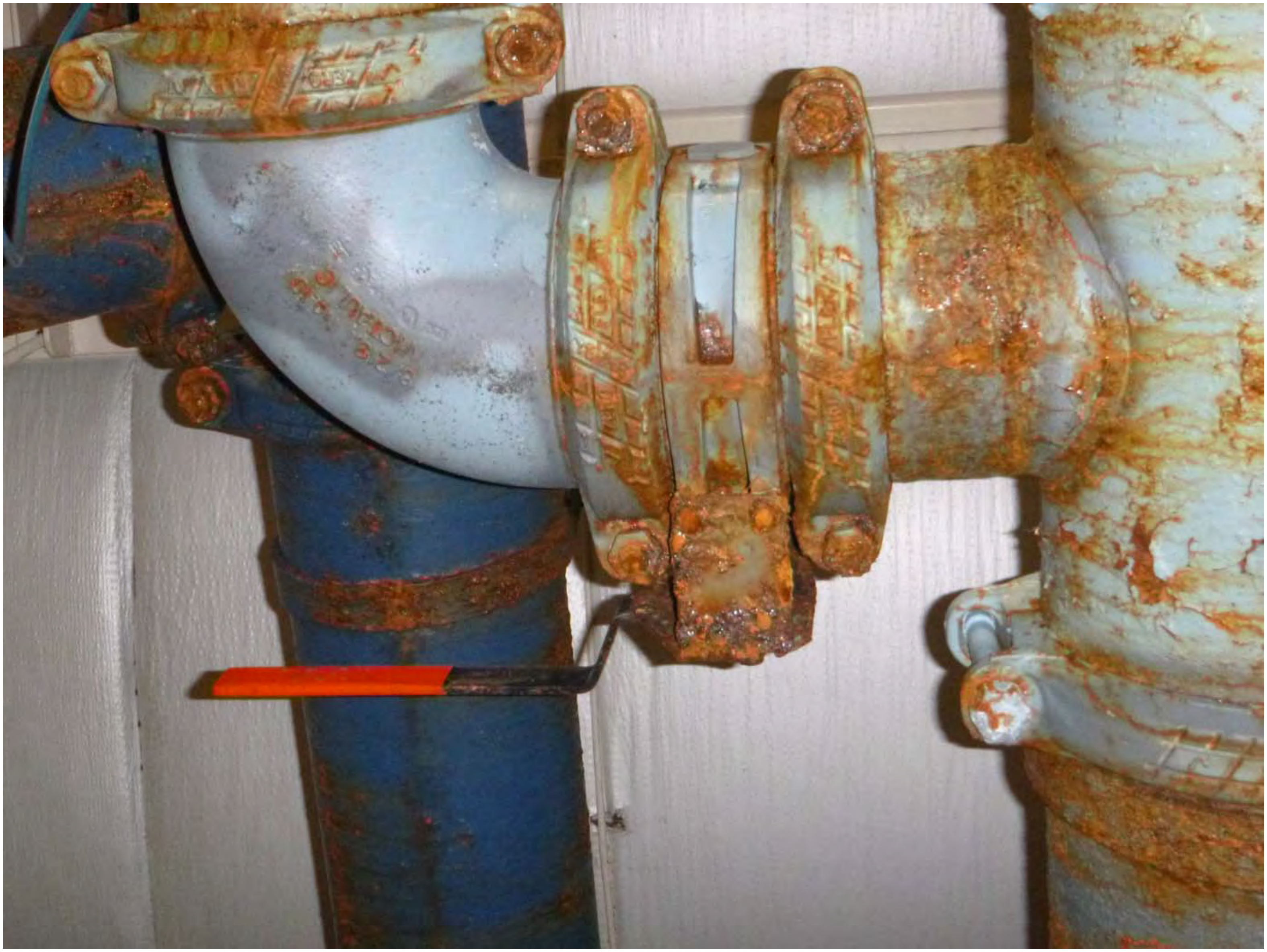

UNIT HEATER FOR INDUSTRIAL / COMMERCIAL USE
AEROTHERME POUR USAGE INDUSTRIEL / COMMERCIAL
MODINE®
MODINE MANUFACTURING COMPANY
1500 DE KOVEN AVENUE
RACINE, WISCONSIN 53403
MADE IN U.S.A.
SERIAL NUMBER
NUMERO DE SERIE
MODEL NUMBER
NUMERO DE MODELE
VOLTS
AMPS
INPUT BTU/HR
TYPE OF GAS
TYPE DE GAZ
NATURAL
CATEGORY
ORIFICE SIZE
DESIGN
GAS
CERTIFIED
LIGHTING INSTRUCTIONS
SHUT DOWN INSTRUCTIONS
TURN OFF POWER & CLOSE ALL GAS VALVES
INSTRUCTIONS D' ALLUMAGE
APPROVED
SH72428C
4 3/4
6 5/8
WARNING
Improper installation, adjustment, alter-
ation, service or maintenance can cause
property damage, injury or death, and
could cause exposure to substances

P1020605

P1020606

P1020607

P1020608



P1020609

P1020610

P1020611

P1020612


WARNING
Electrical shock hazard.
Rotating fan blade!
CAUTION-FOR YOUR SAFETY
Flammable vapors!
AVERTISSEMENT
Risque de choc électrique.
Pale de ventilateur tournante!
ATTENTION-POUR VOTRE SÉCURITÉ
Vapeurs inflammables!
ENERGYGUIDE
80.0
TRANE
XR80

P1020613

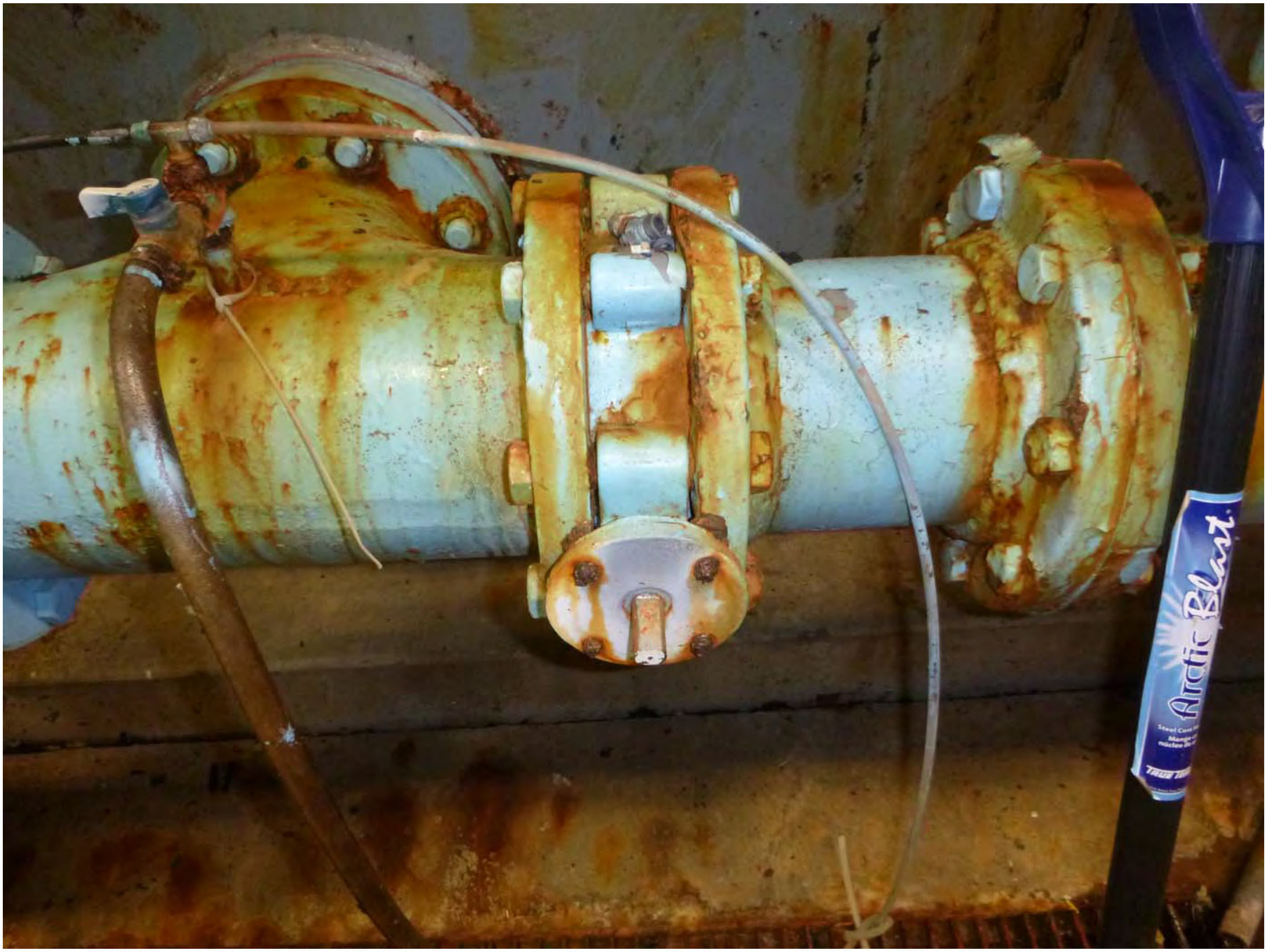

KEYSTONE
PNEUMATIC ACTUATOR
MODEL NO.
SERIAL NO.
WORLD WIDE PATENTS APPLIED FOR
ALL FASTENERS IN
AMERICAN STD.

P1020614


KEYSTONE
PNEUMATIC ACTUATOR
MODEL NO.
SERIAL NO.
WORLD WIDE PATENTS APPLIED FOR U.S. PATENT NO.
ALL FASTENERS IN THIS
UNIT ARE AMERICAN

P1020615

P1020616



P1020617

P1020618

P1020619

P1020620

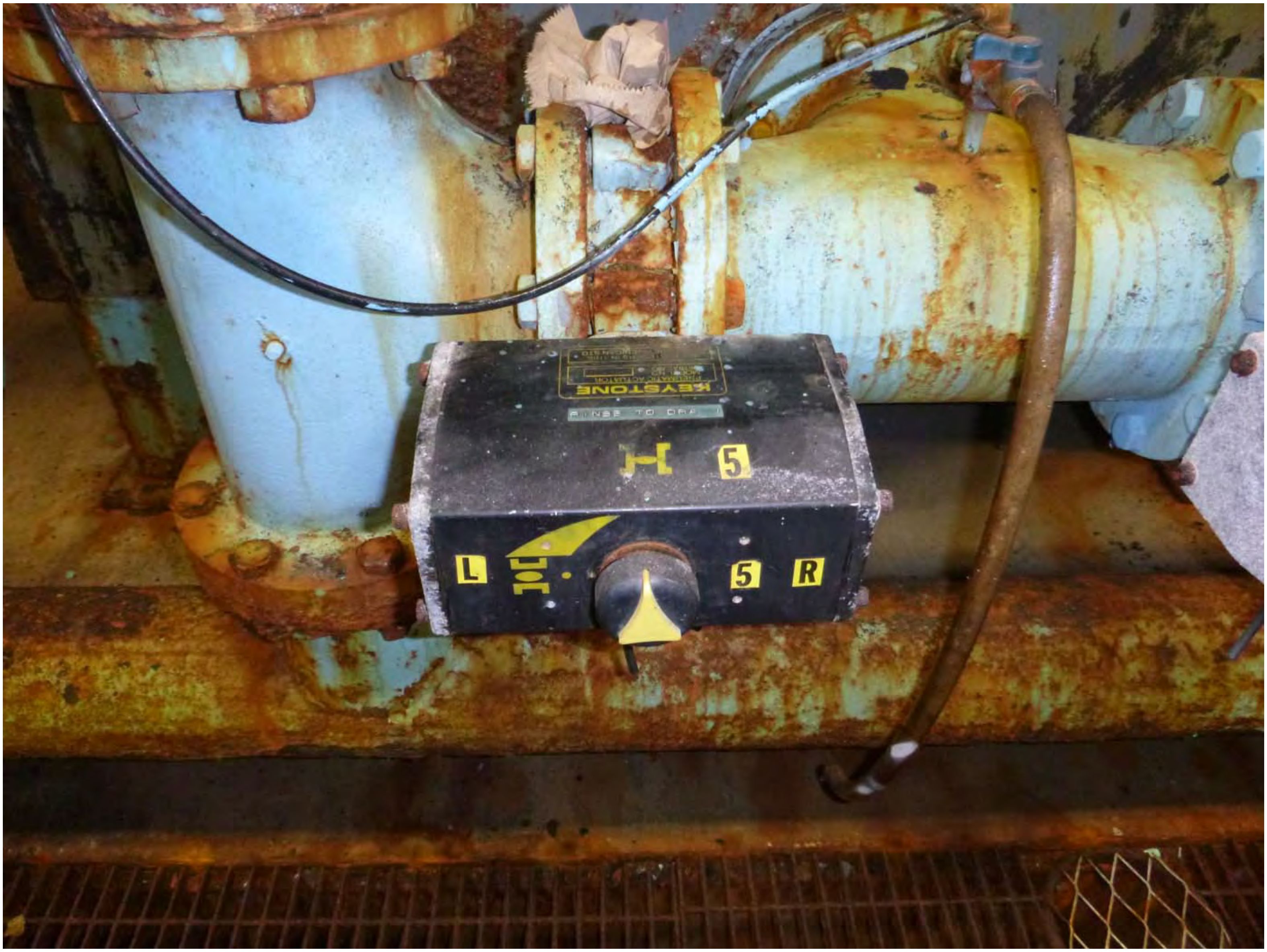

KEYSTONE
PNEUMATIC ACTUATOR
MODEL NO.
SERIAL NO.
790-300
WORLD WIDE PATENTS APPLIED FOR U.S. PATENT NO. 3982725
ALL FASTENERS IN THIS
UNIT ARE AMERICAN STD.

P1020621

P1020622


KEYSTONE
PNEUMATIC ACTUATOR
MODEL NO
SERIAL NO.
790-300
WORLD WIDE PATENTS APPLIED FOR U.S. PATENT NO. 3982725
ALL FASTENERS IN THIS
UNIT ARE AMERICAN STD.

P1020623



P1020624


KEYSTONE
PNEUMATIC ACTUATOR
MODEL NO
SERIAL NO
RINSE TO DRAIN

P1020625

P1020626


KEYSTONE
PNEUMATIC ACTUATOR
MODEL NO.
SERIAL NO.
ALL FASTENERS IN THIS
UNIT ARE AMERICAN STD
SERVICE OUT

P1020627

P1020628

P1020629

P1020630

P1020631

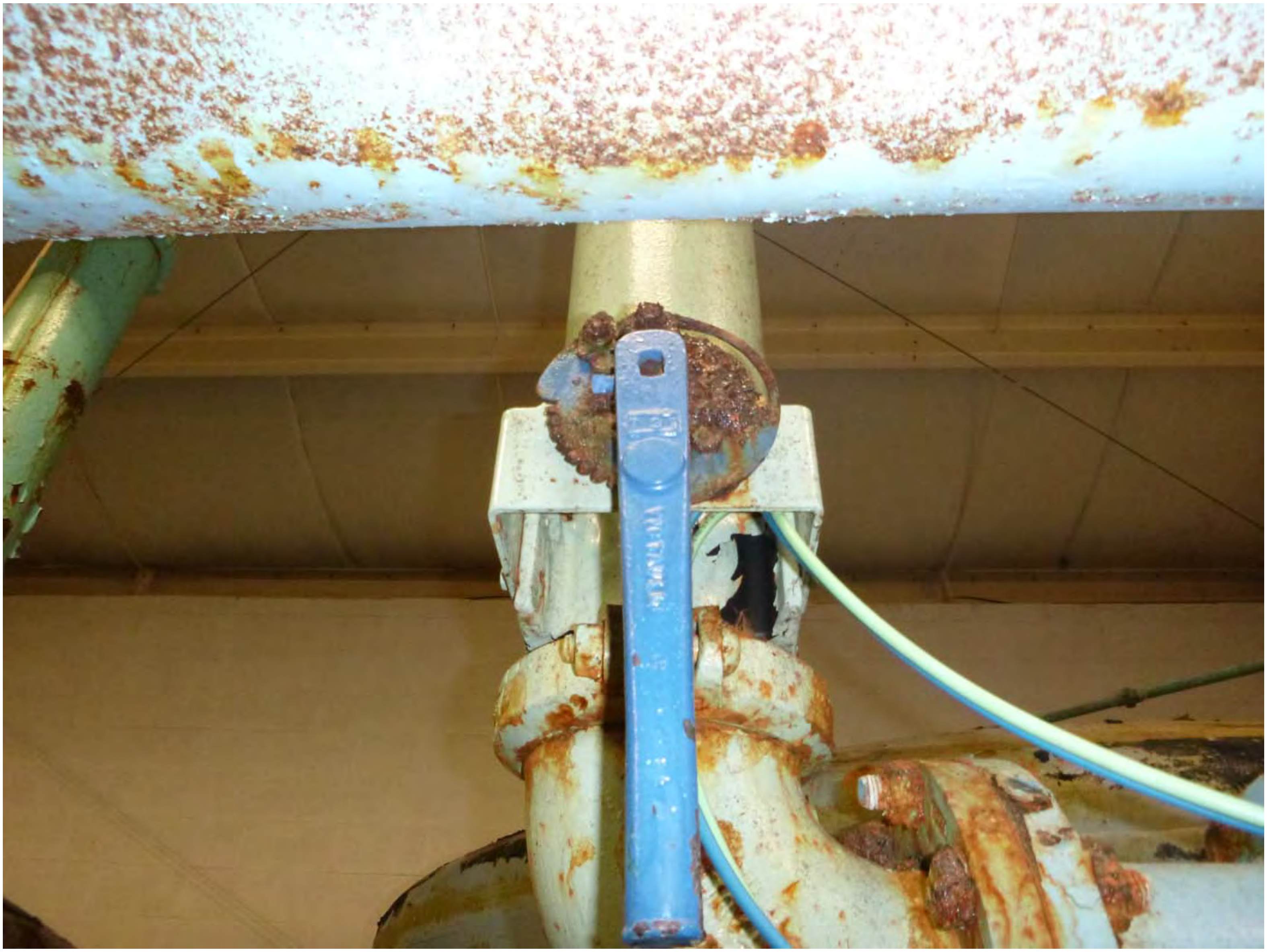
P1020632

P1020633

P1020634

P1020635

P1020636



P1020637

P1020638

P1020639

P1020640

P1020641

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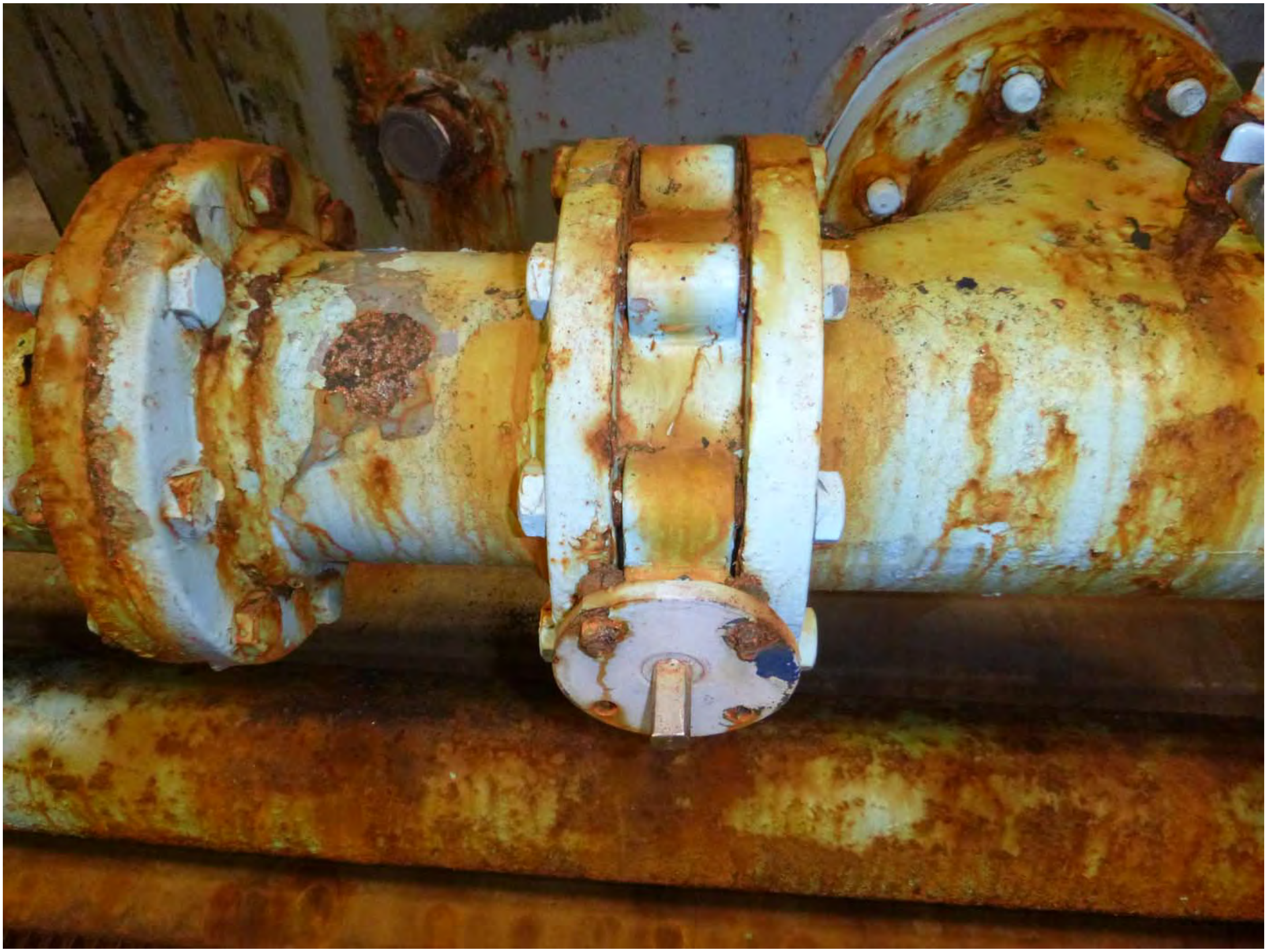
P1020643

P1020644

P1020645



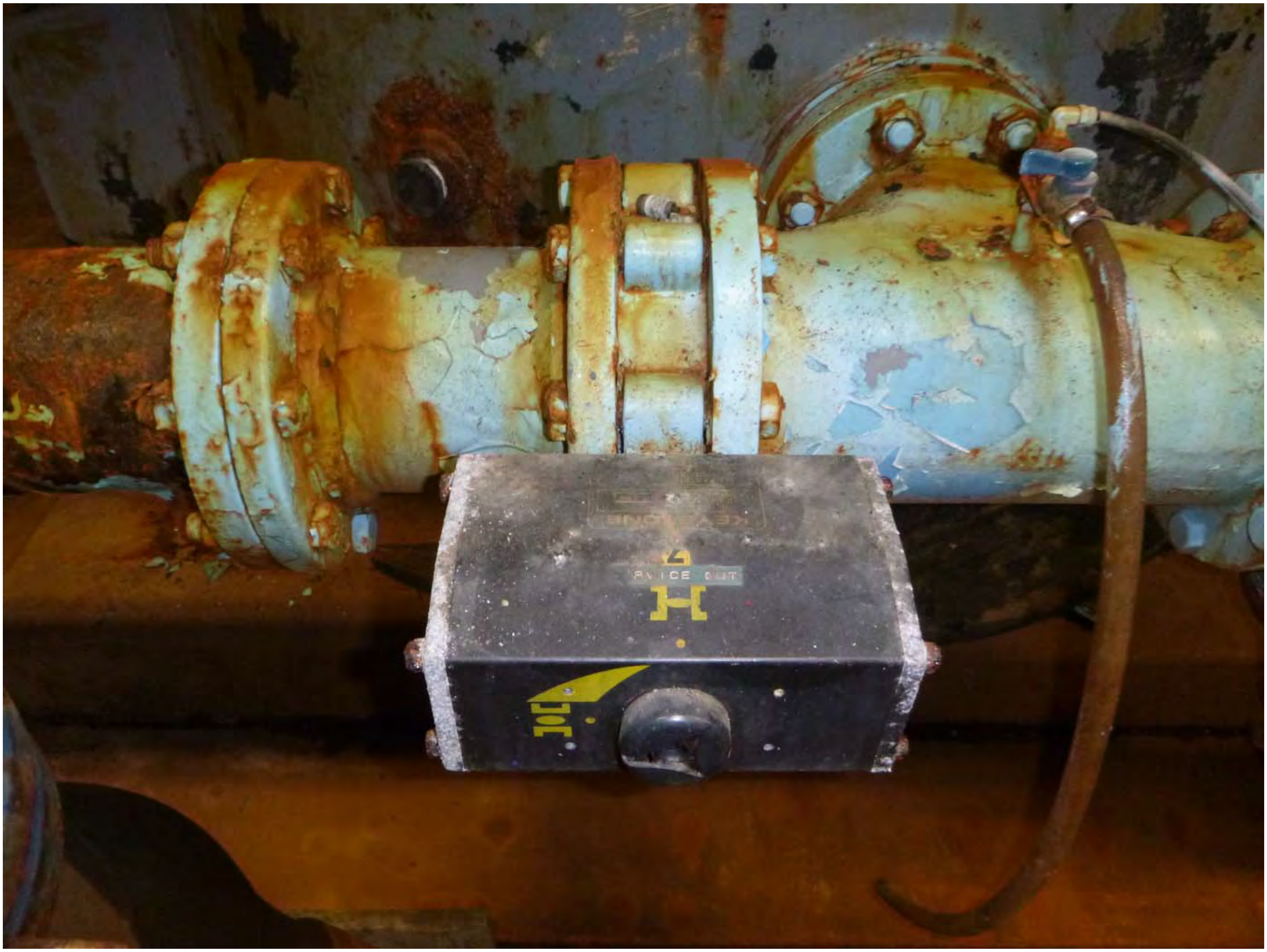
P1020646

P1020647

P1020648

P1020649

P1020650



P1020651

P1020652

P1020653

P1020654

P1020655

P1020656

P1020657

P1020658

P1020659

P1020660


DeZURIK
A UNIT OF GENERAL SIGNAL
9078316
PART NUMBER
WORK ORDER
CI
175
CWP
416
CI

P1020661

P1020662

P1020663

P1020664

P1020665

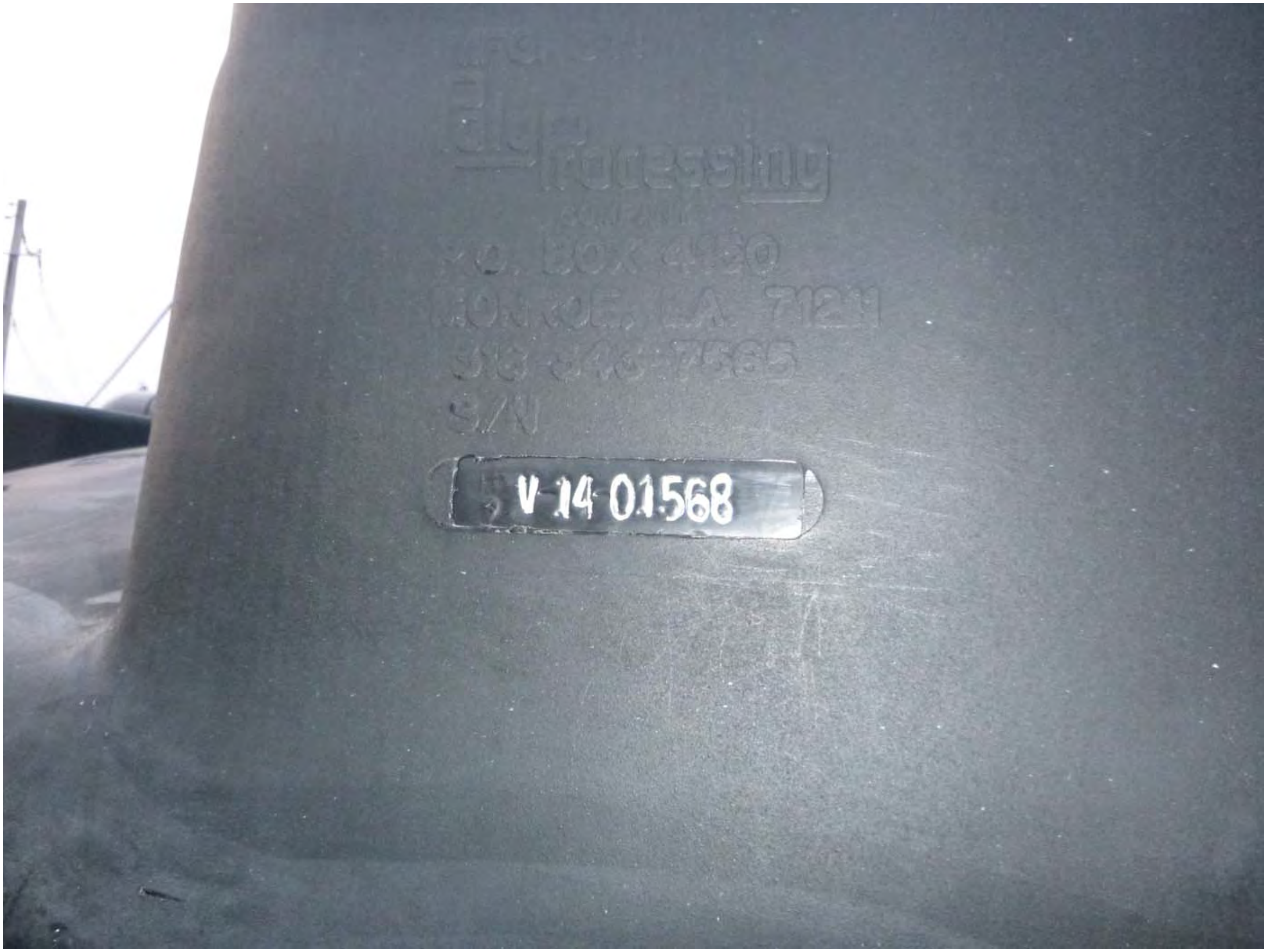
P1020667

P1020668

P1020669

P1020670

P1020671



P1020672

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P1020674

P1020675

P1020676

P1020677

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P1020679

P1020680

P1020681

P1020682

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P1020685

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P1020688

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P1020700

P1020701

P1020702

P1020703

P1020704

P1020705

P1020706

P1020707

P1020708

P1020709

P1020710

P1020711

P1020712

P1020713

P1020714

P1020715

P1020716

P1020717

P1020718

P1020719


BF
SERIES
BODY
CI
DISC
C954
SEAT
EPDM
STEM
416SS
MADE IN CHINA
BY WATTS

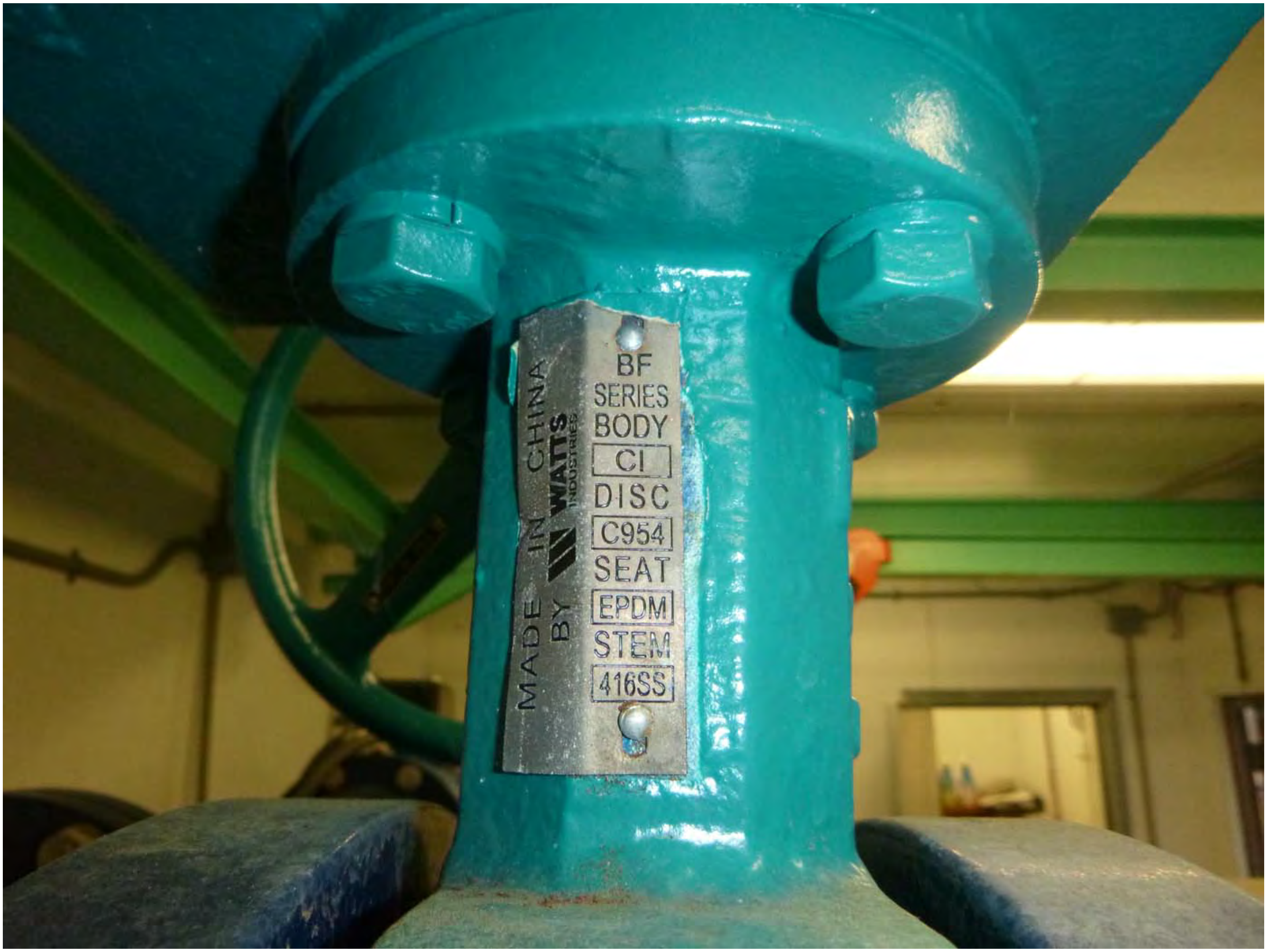
P1020720

P1020721

MADE IN CHINA
BY WATTS
BF
SERIES
BODY
CI
DISC
C954
SEAT
EPDM
STEM
416SS

P1020723

P1020724

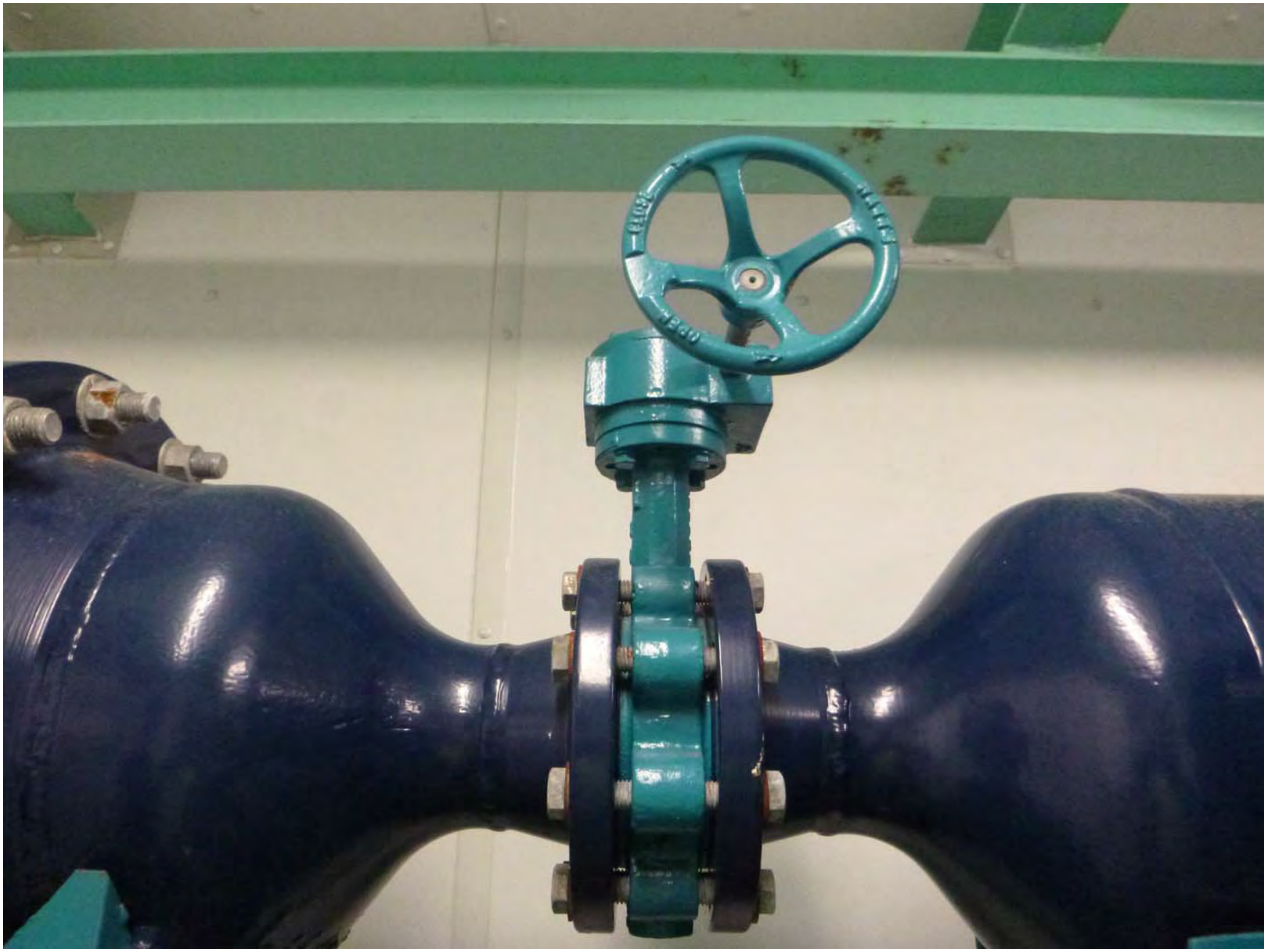

MADE IN CHINA
BY WATTS INDUSTRIES
BF
SERIES
BODY
CI
DISC
C954
SEAT
EPDM
STEM
416SS

P1020726

P1020727

MADE IN CHINA
BY WATTS
INDUSTRIES
BF
SERIES
BODY
CI
DISC
C954
SEAT
EPDM
STEM
416SS

P1020730



P1020731

P1020732

P1020733

P1020734

P1020735

P1020736

P1020737

P1020738

P1020739

P1020740

ABB
DANGER
HIGH VOLTAGE
UNAUTHORIZED PERSONNEL
KEEP OUT
FLOWTRONEX
Panel Tran

P1020741

P1020742

P1020743

P1020744

P1020745

P1020746

P1020747

P1020748

P1020749

P1020750

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P1020758

P1020759

P1020760

P1020761

P1020762

P1020763

P1020764

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P1020766

P1020767

P1020768

P1020769

P1020770

P1020771

P1020772

P1020773

P1020774

P1020775


SIEMENS
ON
Heavy Duty
Safety Switch
100A 600VAC, 600VDC
Horsepower Rated
DANGER
Hazardous Voltage
Will cause death or
serious injury.
OFF
H9 Adjustable Speed Drive
Quick Start Guide
Monitored

P1020776


H9 Adjustable Speed Drive
Monitored By
MISSION
CONTROL
Let Us Know You Are Here.
Use Electronic Key
To Place RTU In Service Mode
Prior to Maintaining Equipment.

P1020777

P1020778

P1020779


S20K11S10D
Westinghouse
STYLE
323B701A
TYPE EP
TRANSFORMER
SINGLE PHASE
80°C TEMP. RISE
VOLTAGE
240 X 480 TO 120/240
60 CYCLES
KVA
%
IMPEDANCE AT 75°C.
FRAME NO.
INST. CARD
10806
LOW VOLTAGE
X4 X2 X3 X1
H1 H4 H5 H2 H3 H6
HIGH VOLTAGE BOTTOM VIEW
WIND.
VOLTS
CONN.
LINE
HIGH
480
H3 - H4
H1 - H6
H3 - H5
H2 - H5
240
H1H4,H3H6
216
H2H6
LOW
X2 - X3
X1 - X4
240/120
X1-X3-X4
120
X1X3,X2X4
THREE WIRE OPERATION
WESTINGHOUSE ELECTRIC CORPORATION
MADE IN U. S. A.
11P976H01A

P1020780

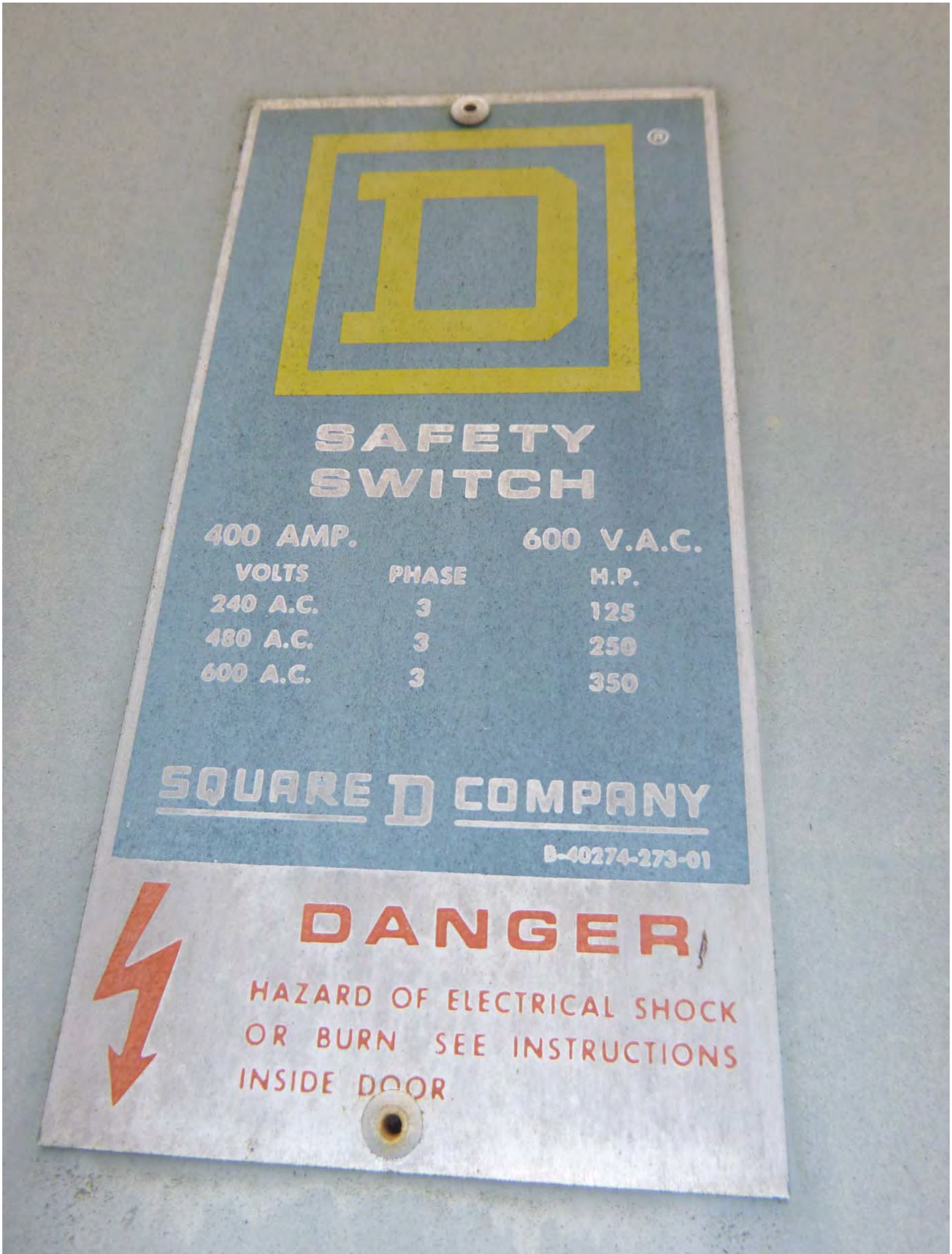
P1020781

P1020782

P1020783

P1020784

P1020785


SAFETY
SWITCH
400 AMP.
600 V.A.C.
VOLTS PHASE H.P.
240 A.C. 3 125
480 A.C. 3 250
600 A.C. 3 350
SQUARE D COMPANY
B-40274-273-01
DANGER
HAZARD OF ELECTRICAL SHOCK
OR BURN SEE INSTRUCTIONS
INSIDE DOOR.

P1020786


PASSED QC
TOSHIBA
TRANSISTOR INVERTER
Monitored By
MISSION
CONTROL
Let Us Know You Are Here.
Use Electronic Key
To Place RTU In Service Mode
Prior to Maintaining Equipment.

P1020787

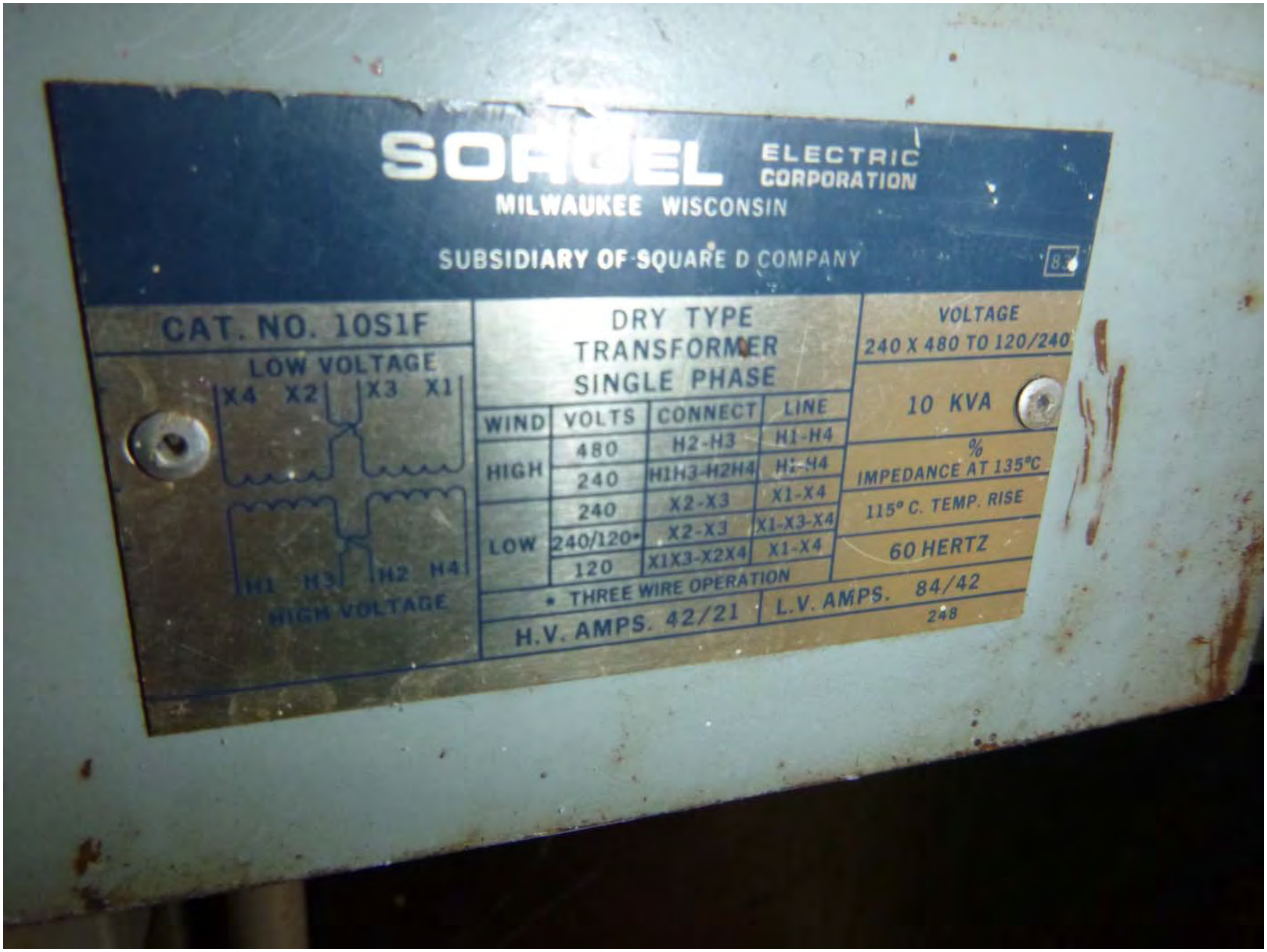

UP
ON
I-T-E
Enclosed
Switch
General Duty
Vacu-Break® Switch with
Clampmatic® Contacts
CAT. NO.
NR422
ENCLOSURE
Type 3R
Indoor/Outdoor
AMPS.
60
VOLTS A.C.
240
3 Phase
240 V. H.P.
std.
7½
max.
15
See notes and additional rating information inside.
DANGER
HAZARDOUS VOLTAGE. WILL CAUSE SEVERE SHOCK OR BURN.
DOWN
OFF

P1020788


I-T-E
Enclosed
Switch
General Duty
Vacu-Break ® Switch with
Clampmatic ® Contacts
CAT. NO.
NR422
ENCLOSURE
Type 3R
Indoor/Outdoor
AMPS.
60
VOLTS A.C.
240
3 Phase
240 V. H.P.
std.
7½
max.
15
See notes and additional rating information inside.
Suitable for use as service equipment.
DANGER
VOLTAGE WILL
CAUSE SEVERE SHOCK OR BURN.
Turn off switch before removing or
installing fuse. Turn off power ahead
of switch before doing other work
inside. Close cover before turning
power on.
DOWN
OFF

P1020789

P1020790


SORGEL ELECTRIC CORPORATION
MILWAUKEE WISCONSIN
SUBSIDIARY OF SQUARE D COMPANY
CAT. NO. 10S1F
LOW VOLTAGE
X4 X2 X3 X1
H1 H3 H2 H4
HIGH VOLTAGE
DRY TYPE TRANSFORMER SINGLE PHASE
WIND VOLTS CONNECT LINE
HIGH 480 H2-H3 H1-H4
240 H1H3-H2H4 H1-H4
LOW 240 X2-X3 X1-X4
240/120• X2-X3 X1-X3-X4
120 X1X3-X2X4 X1-X4
• THREE WIRE OPERATION
H.V. AMPS. 42/21
L.V. AMPS. 84/42
248
VOLTAGE
240 X 480 TO 120/240
10 KVA
% IMPEDANCE AT 135°C
115° C. TEMP. RISE
60 HERTZ

P1020791

P1020792


SQUARE D COMPANY
PANELBOARD BOX
FOR NQO/NQOB PANELBOARD
WT. LBS.
SERIES 3
MADE IN U.S.A.
40288-029-01
5901
NQ-20

P1020793


Monitored By
MISSION
CONTROL
Let Us Know You Are Here.
ENCLOSED
CIRCUIT
BREAKER
ON
TRIPPED
OFF
DANGER
ON

P1020794


DANGER
CIRCUIT BREAKER ENCLOSURE
Circuit Breaker
Interruptor Automático
Disjoncteur
200 A
KAL36200
HACR TYPE
tipo CAAR
SQUARE D COMPANY

P1020795


Circuit Breaker
Interruptor Automático
Disjoncteur
200 A
Type/Tipo KAL
S2
KAL36200
600 V ~ 250 V ⎓
40°C
HACR TYPE
tipo CAAR
Interrupting Rating
AIR / A nom. I
UL/CSA/NEMA 60 Hz
240 V ~ 42 kA
480 V ~ 25 kA
600 V ~ 22 kA
250 V ⎓ 10 kA
IEC 947-2 50/60 Hz
BS EN 60 947-2
AL250KA
Cu/Al
#4 AWG-350 kcmil
lb-in/pulg/po 250
25-185 mm² Cu/Al 29 N·m
Min. 1000 A
Max. 2000 A
LISTED C.B.
Issue No. 116
Made in Ireland
Hecho en Irlanda
Fabriqué en Irlande
CAT.NO. SN225KA
225 AMP.
SQUARE D COMPANY
MADE IN U.S.A.

P1020796

P1020797

P1020798

P1020799

P1020800

P1020801

P1020802


SIEMENS
ON
Heavy Duty
Safety Switch
200A 600VAC, 600VDC
Horsepower Rated
DANGER
Hazardous Voltage.
Will cause death or
serious injury.
OFF

P1020803

I/O
kV2c
Enhanced Power Supply FITZALL™
Silver Spring Networks
0013500101141CB0
Contains:
MODEL No: NIC314k
FCC ID: OWS-NIC514
IC: 5975A-NIC514
9S
IPL-0018380
0606
USA
0411
KZD000018380002
50 479 911
Mult by_____VTR_____:1 CTR_____:5 PK_h_____
CL 20 120-480V 4W FM9S Kt 1.8
787X980055 50/60Hz CA 0.2 TA 2.5 Kh 1.8 TV 120

P1020804

P1020805


TOSHIBA
53.5
Hz
Forward
LOCAL
REMOTE
ENTER
MON/
PRG
ESC
RUN
STOP
RESET

P1020806


ON
SQUARE D
HEAVY DUTY
SAFETY SWITCH
200 AMP. 600 V.AC
150 H.P. MAX. RATING 3PH.
DANGER
HAZARD OF ELECTRICAL SHOCK
OR BURN. SEE INSTRUCTIONS
INSIDE DOOR.

P1020807


SQUARE D
HEAVY DUTY
SAFETY SWITCH
200 AMP. 600 V.AC
150 H.P. MAX. RATING 3PH.
DANGER
HAZARD OF ELECTRICAL SHOCK
OR BURN. SEE INSTRUCTIONS
INSIDE DOOR.
B-40274-185-02

P1020808

P1020809

P1020810

P1020811

P1020812

P1020813

P1020814


WELL #15
-Hammer
Center Section(s)
Hertz
Wire
Amps
Amps
Amps
rcuit rating is
MS symmetrical
When protected,
lly, by a
ximum class
maximum
100,000
al.
h available
than the
unit.

P1020815

P1020816

P1020817

P1020818

P1020819

P1020820


Cutler-Hammer®
Motor Control Center Section(s)
Serial No. 6AF1265784-B
Hertz 60
Volts 277/480
Wire 4
Phase 3
Control Volts 120
Vertical Bus Amps 400
Horizontal Bus Amps 800
Neutral Bus Amps 200
Maximum short-circuit rating is 42000 amps RMS symmetrical at 277/480 volts. When protected, internally or externally, by a 1200 ampere maximum class L, R, J, or T fuse the maximum short-circuit rating is 100,000 amps RMS symmetrical.
Do not install on circuits with available
short-circuit currents grea than the
lowest rating of the insta
Diagrams, instruction book containing heater coil selection tables, field-wiring requirements, and other data are located inside the top horizontal wireway of an adjacent section or the bottom horizontal wireway of this section.
EATON
Made in U.S.A.
30-13980

P1020821


Monitored By
MISSION
CONTROL
Let Us Know You Are Here.
Use Electronic Key
To Place RTU In Service Mode
Prior to Maintaining Equipment.

P1020822


SERVICE
DISCONNECT
UTILITY
SERVICE
ON
OFF
ON
GENERATOR
SERVICE

P1020823


EATON | Cutler-Hammer
Double Throw Safety Switch
Interrupteur de sécurité bidirectionnel
Interruptor de seguridad de doble tiro
200 A, 600 V~, 60 Hz, 250 V ⎓
Complete Ratings Inside. Further instructions inside.
Valeurs nominales complètes à l'intérieur. Autres instructions à l'intérieur.
Información completa de capacidades en el interior. Instrucciones adicionales en el interior.
DANGER
HAZARDOUS VOLTAGE. WILL CAUSE SEVERE INJURY OR DEATH.
• Never operate switch with cover open.
• Turn OFF power ahead of switch before doing any work inside. Replace all parts. Close cover before turning power ON.
TENSION DANGEREUSE. PEUT CAUSER DES BLESSURES GRAVES OU LA MORT.
• Ne jamais manœuvrer l'interrupteur lorsque le couvercle est ouvert.
• Couper l'alimentation en amont de l'interrupteur avant toute intervention. Remplacer les pièces. Fermer le couvercle avant de remettre sous tension.
PELIGRO
VOLTAJE PELIGROSO. PUEDE CAUSAR HERIDAS SEVERAS O LA MUERTE.
• Nunca opere el interruptor con la cubierta abierta.
• Desconectar la alimentación del interruptor antes de trabajar dentro del mismo. Reemplazar todas las partes. Cerrar la cubierta antes de energizar el interruptor.
Made in U.S.A./Fabriqué aux É.U./Hecho en E.U.A.
30-43072-8

P1020824


CONTROL
JUNCTION BOX
LEVEL
FLOW
PRESSURE
CANTEX RIGID PVC CONDUIT

P1020825

P1020826

P1020827

P1020830

P1020831

P1020832

P1020833


Cutler-Hammer
E·T·N
BUS SPLICE KIT AND
HARDWARE LOCATED
BEHIND THIS COVER
WELL #9
PUMP SETTING 69'8.5'
CRITICAL LEVEL 65'
LAST TESTED 4/28/00

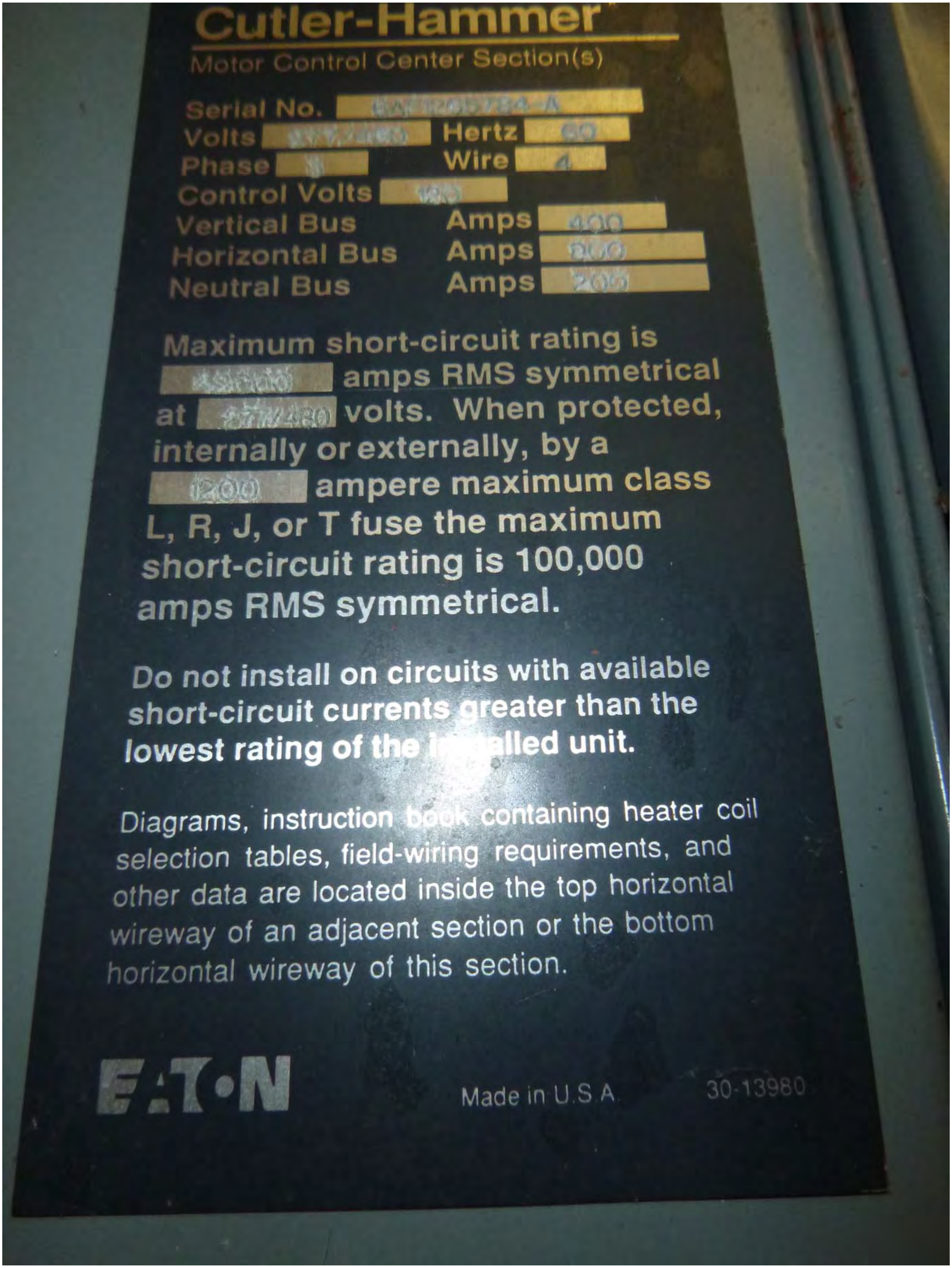
P1020834

P1020835

P1020836

P1020837

P1020838



Cutler-Hammer
Motor Control Center Section(s)
Serial No.
Volts
Hertz 60
Phase
Wire 4
Control Volts
Vertical Bus Amps 400
Horizontal Bus Amps
Neutral Bus Amps
Maximum short-circuit rating is
amps RMS symmetrical
at 277/480 volts. When protected,
internally or externally, by a
1200 ampere maximum class
L, R, J, or T fuse the maximum
short-circuit rating is 100,000
amps RMS symmetrical.
Do not install on circuits with available
short-circuit currents greater than the
lowest rating of the installed unit.
Diagrams, instruction book containing heater coil
selection tables, field-wiring requirements, and
other data are located inside the top horizontal
wireway of an adjacent section or the bottom
horizontal wireway of this section.
EATON
Made in U.S.A.
30-13980

P1020839

P1020840


kV2c
Enhanced Power Supply FITZALL™
IPL-0015792
KZD000015792002
50 133 041
0606
USA
0311
03
Mult by_____VTR_____:1 CTR_____:5 PK_____
CL 20 120-480V 4W FM9S Kt 1.8
50/60Hz CA 0.2 TA 2.5 Kh 1.8 TV 120

P1020841

P1020842


Cutler-Hammer
Motor Control Center Section(s)
Serial No.
Hertz
Volts
Wire
Phase 3
Control Volts
Vertical Bus
Amps
Horizontal Bus
Amps
Neutral Bus
Amps
Maximum short-circuit rating is
amps RMS symmetrical
at
volts. When protected,
internally or externally, by a
ampere maximum class
L, R, J, or T fuse the maximum
short-circuit rating is 100,000
amps RMS symmetrical.
Do not install on circuits with available short-circuit currents greater than the lowest rating of the installed unit.
Diagrams, instruction book containing heater coil selection tables, field-wiring requirements, and other data are located inside the top horizontal wireway of an adjacent section or the bottom horizontal wireway of this section.
Made in U.S.A.
30-13980

P1020843

P1020844


BEHIND
REMOVE THIS LABEL AFTER INSTALLATI
Cutler-Hammer
LIGHTING ARRESTOR
& SURGE CAPACITOR
LIGHTING PANEL
LP

P1020845

P1020846

P1020847

P1020848

P1020849

P1020850

P1020851

P1020852

P1020853

P1020854

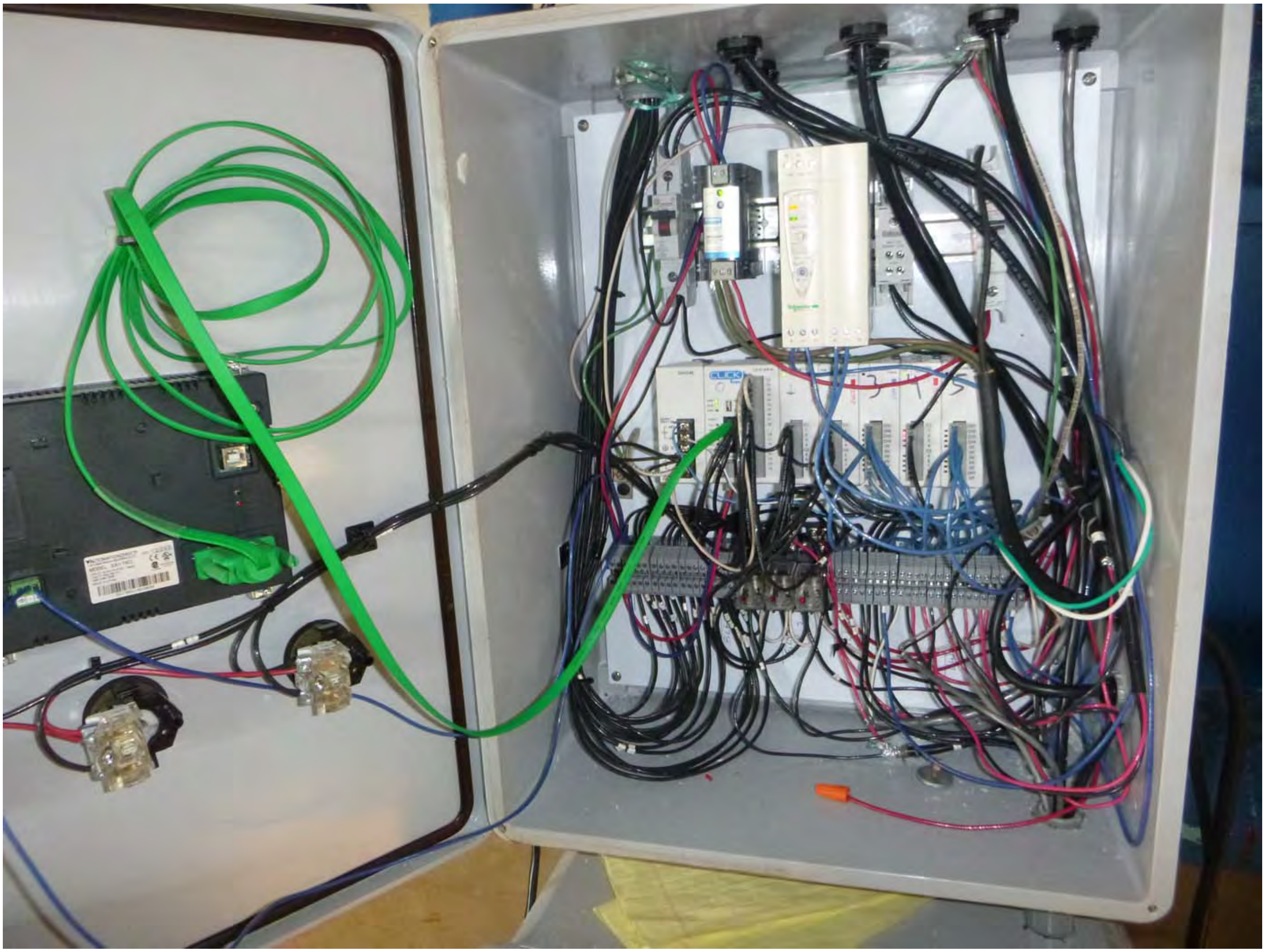
P1020855

P1020856

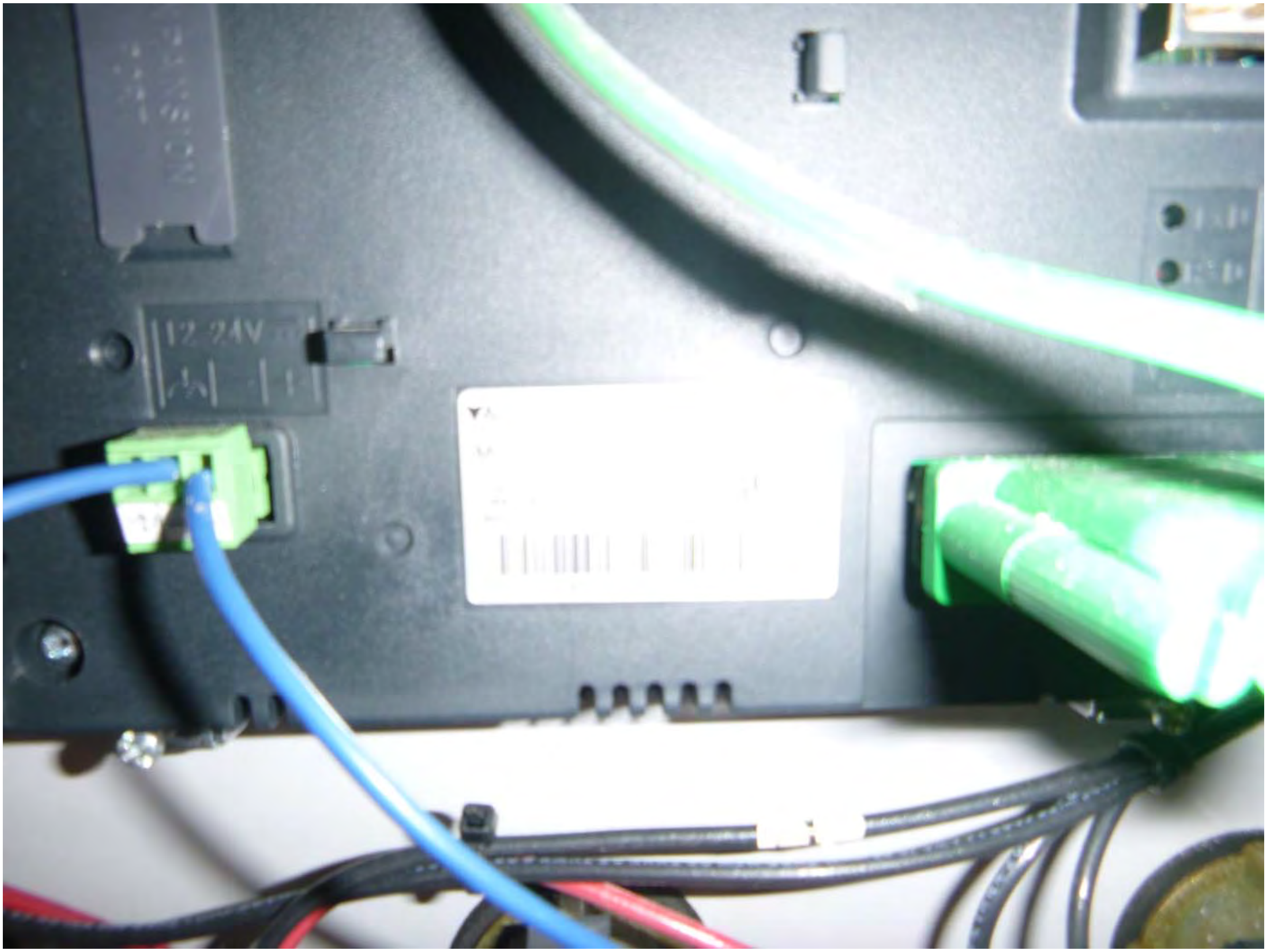
P1020857


Plant Effluent
857 gpm
HS 1
Off
HS 2
Off
On
Tower Lvl
Setup
Pump
Setup
Backwash
F1
F2
F3
F4
F5
1
OFF
ON
2
OFF
ON
3
OFF
ON

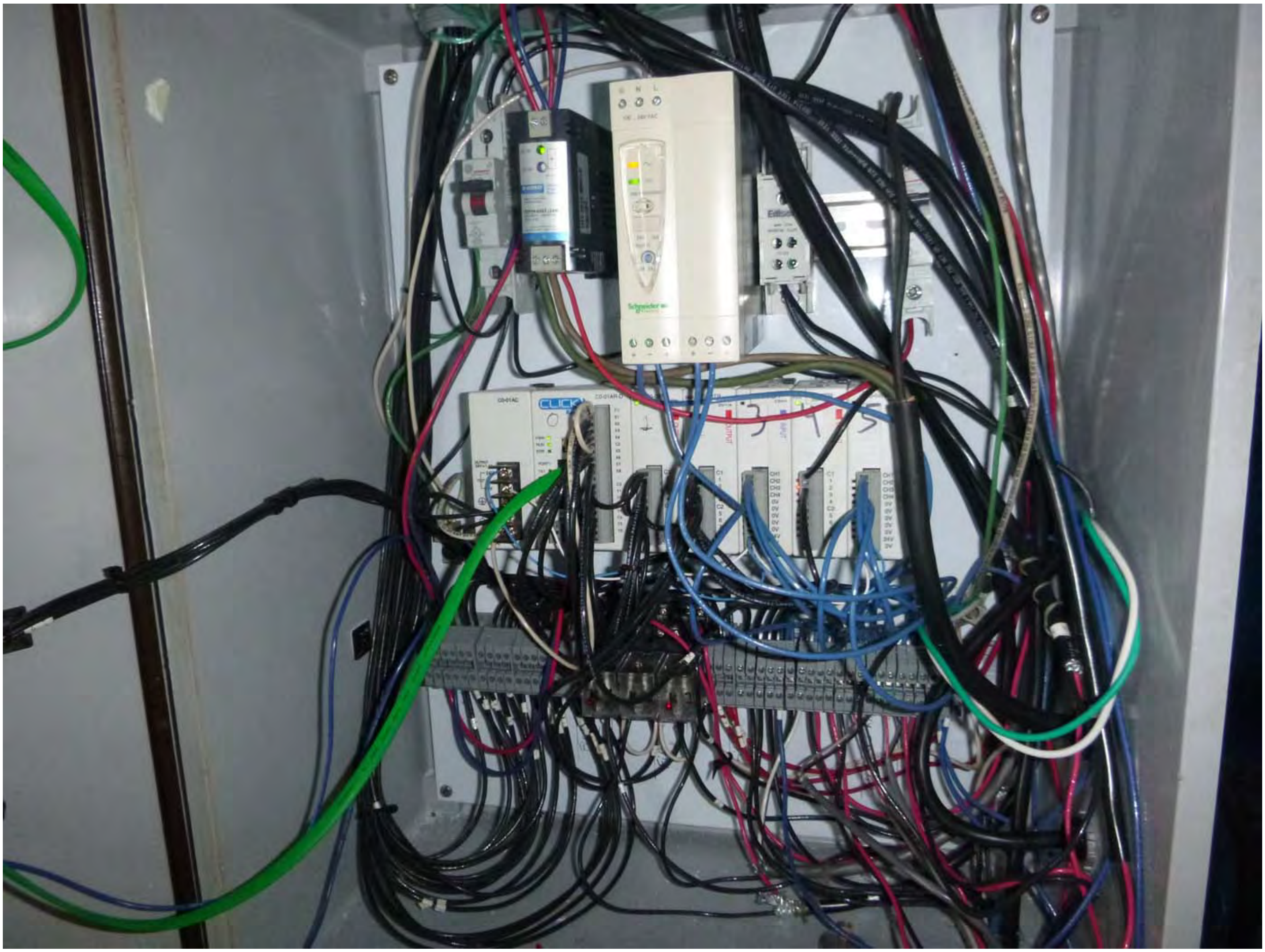
P1020858



P1020859



P1020860



P1020861

P1020862

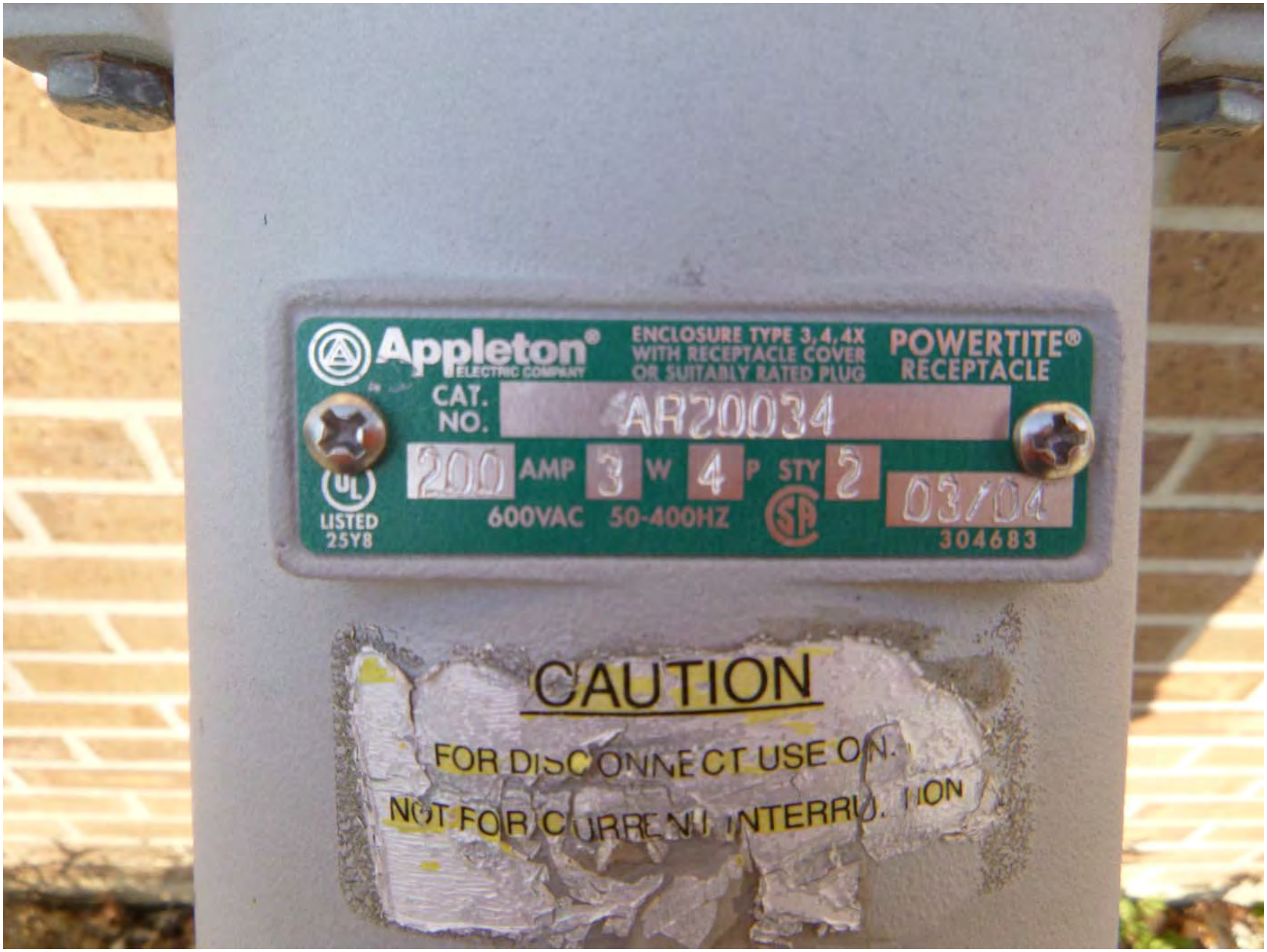

Cutler-Hammer®
Heavy Duty Safety Switch
30 Amp, 600 Volts A-c
Horsepower Rated
Complete Ratings Inside
EATON
ON
OFF
DANGER
Hazard of electrical shock or burn
TURN OFF SWITCH BEFORE OPENING COVER
Further instructions inside

P1020863


SIEMENS
ON
Heavy Duty
Safety Switch
200A 600VAC, 600VDC
Horsepower Rated
DANGER
Hazardous Voltage.
Will cause death or
serious injury.
OFF

P1020864

P1020865


Appleton®
ELECTRIC COMPANY
ENCLOSURE TYPE 3,4,4X
WITH RECEPTACLE COVER
OR SUITABLY RATED PLUG
POWERTITE®
RECEPTACLE
CAT.
NO.
AR20034
200
AMP
3
W
4
P
STY
2
03/04
LISTED
25Y8
600VAC
50-400HZ
304683
CAUTION
FOR DISCONNECT USE ON.
NOT FOR CURRENT INTERRU. ION

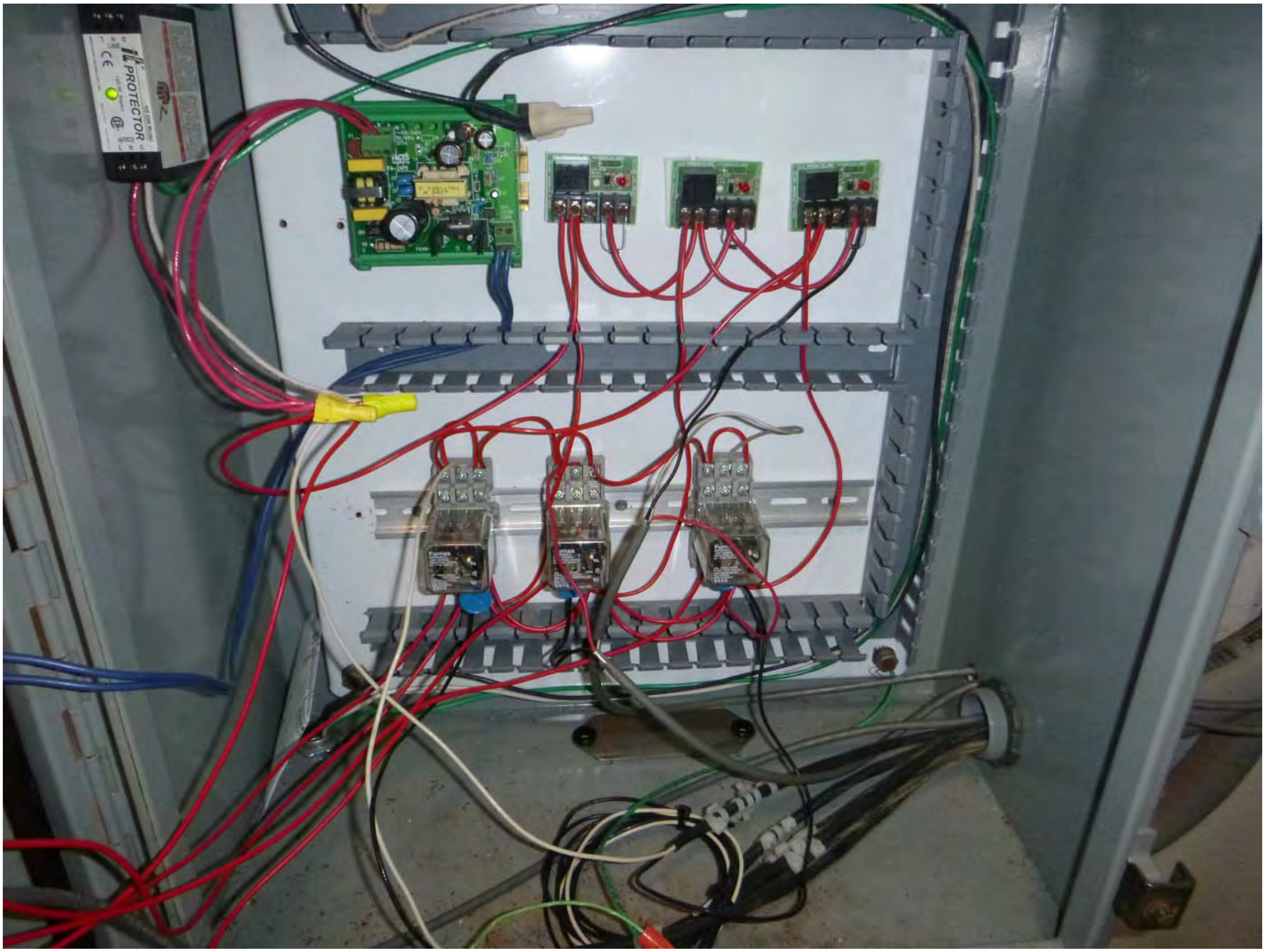
P1020868


This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference that may cause undersired operation.
HE800DIQ622C
CE S/N: 1371
Warning: Hazardous voltage may be present.

P1020869


HE5000CS210J
Listed: 2P79
E180220
IND. CONT. EQ. FOR HAZ.
LOC. CLASS I, DIV 2,
GROUPS ABCD
CE
N15136
S/N:
2286
Electrical Ratings
24VDC typical, 180mA
Max. Amb. Temp=60 DEGREES C

P1020870



P1020871


Direct LOGIC 06
Koyo
D0-06AR
PWR
RUN
CPU
TX1
RX1
TX2
RX2
PORT1
TERM
STOP
RHINO
Industrial Power Supply
PSM24-180S (180W)
24VDC / 7.5A
DC OK
DC ON
24 - 28V
PROTECTOR

P1020872


FLASH
RAM
GREEN = OK
Manufactured in USA by:
AUTOMATION DIRECT.com
Autotech / Viktron Group
PN: EZ-S6M-FS
SN: 042154099
20-30 VDC 13W
LISTED 26UN
IND CONT EQ
TYPE 1
RECOMMENDED
DEDICATED
1.2 AMP
PWR SUPPLY
(MINIMUM)
24V
+ -
PLC
RS422/485
RS232
J1
COM1
RS422/485
RS232
J2

P1020873


Sold by: Automationdirect.com
Manufactured in USA by:
AUTOMATION DIRECT.com™
avG
Autotech / Viktron Group
PN: EZ-S6M-FS
SN: 042154099
CE 20-30 VDC 13W
c UL us
LISTED 26UN
IND CONT EQ
TYPE 1

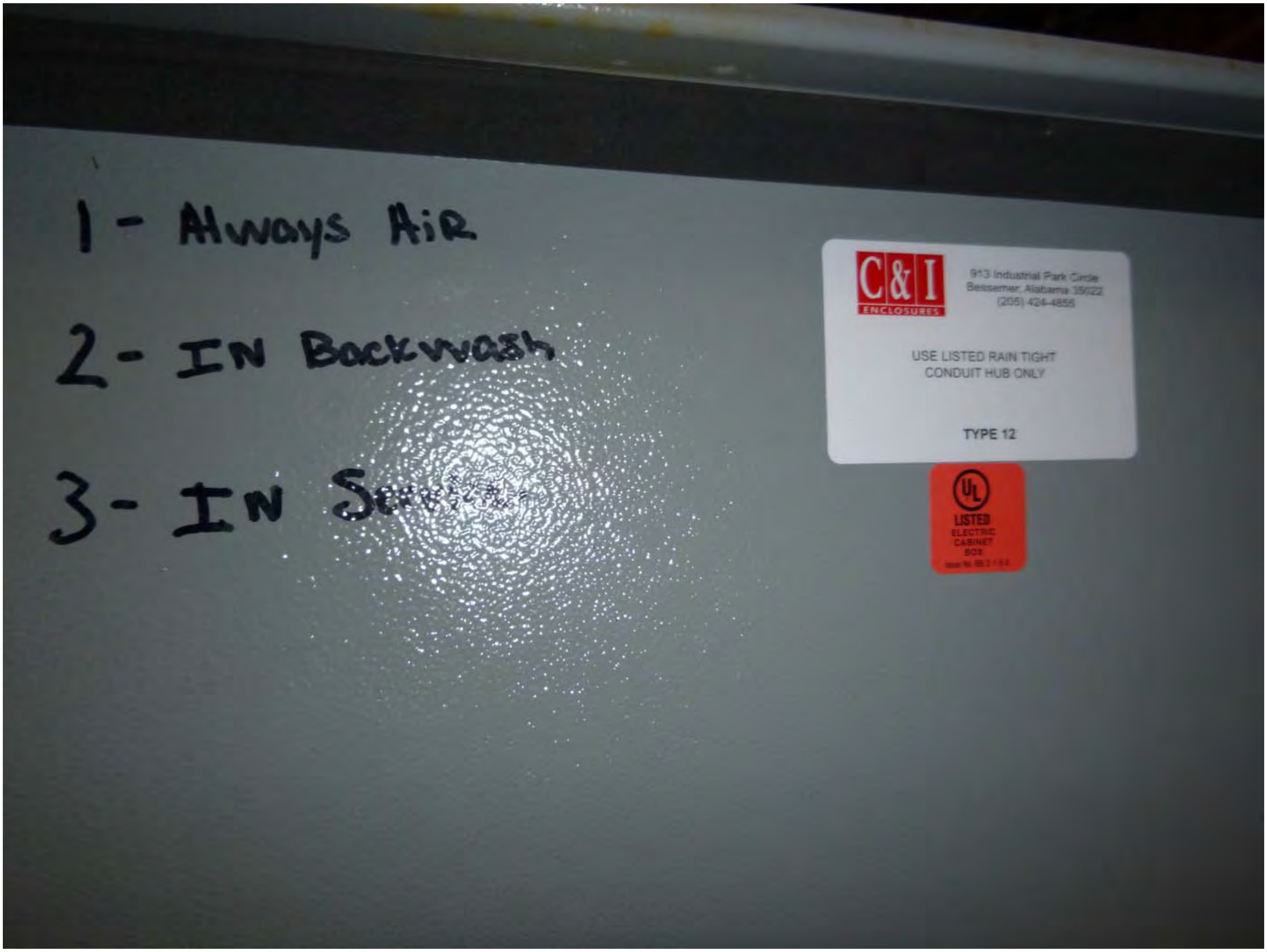
P1020874


DATE
TIME
SAMPLE ADDRESS
PUSH AUTO
SAMPLER'S NAME
BUTTON
TOWNSEND RESEARCH
ONLY
7
8
9

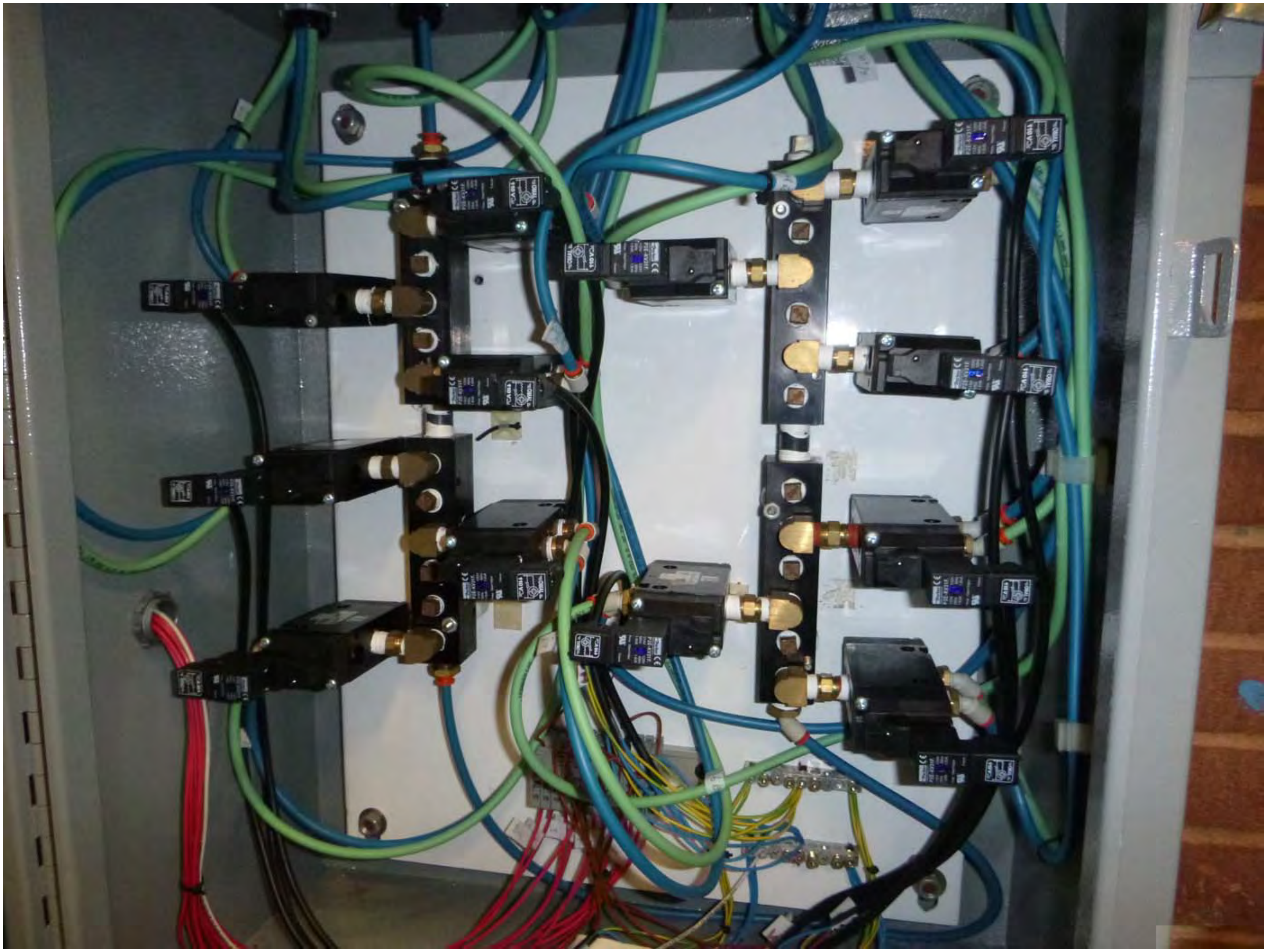
P1020875


8
9
10
PLC CONNECTIONS
Monitored by
MISSION
Use Electronic Key
To Place RTU In Service Mode
Prior to Maintaining Equipment.

P1020876


1- Always Air
2- IN Backwash
3- IN
C&I
ENCLOSURES
USE LISTED RAIN TIGHT
CONDUIT HUB ONLY
TYPE 12
LISTED
ELECTRIC
CABINET
BOX

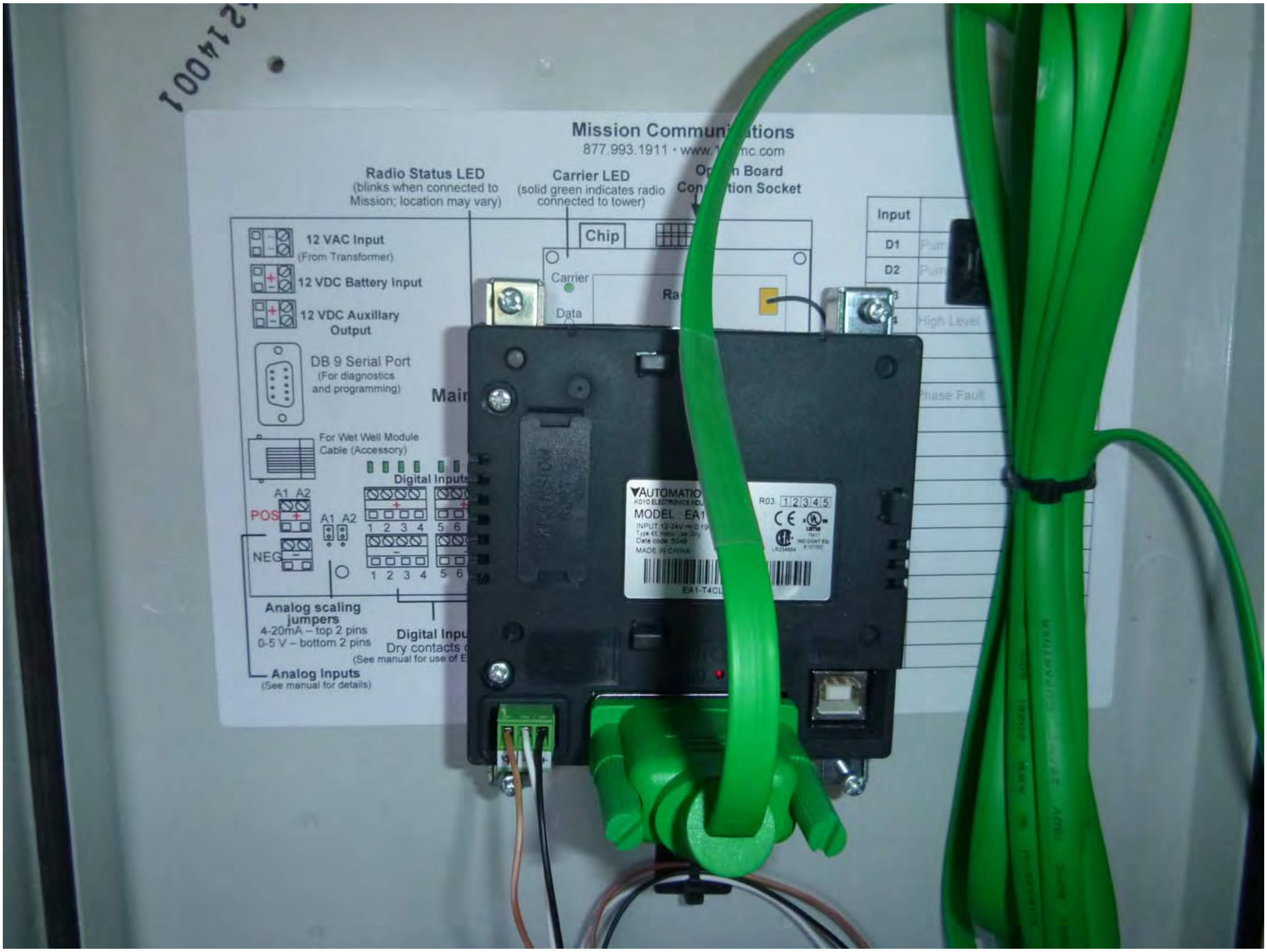
P1020877



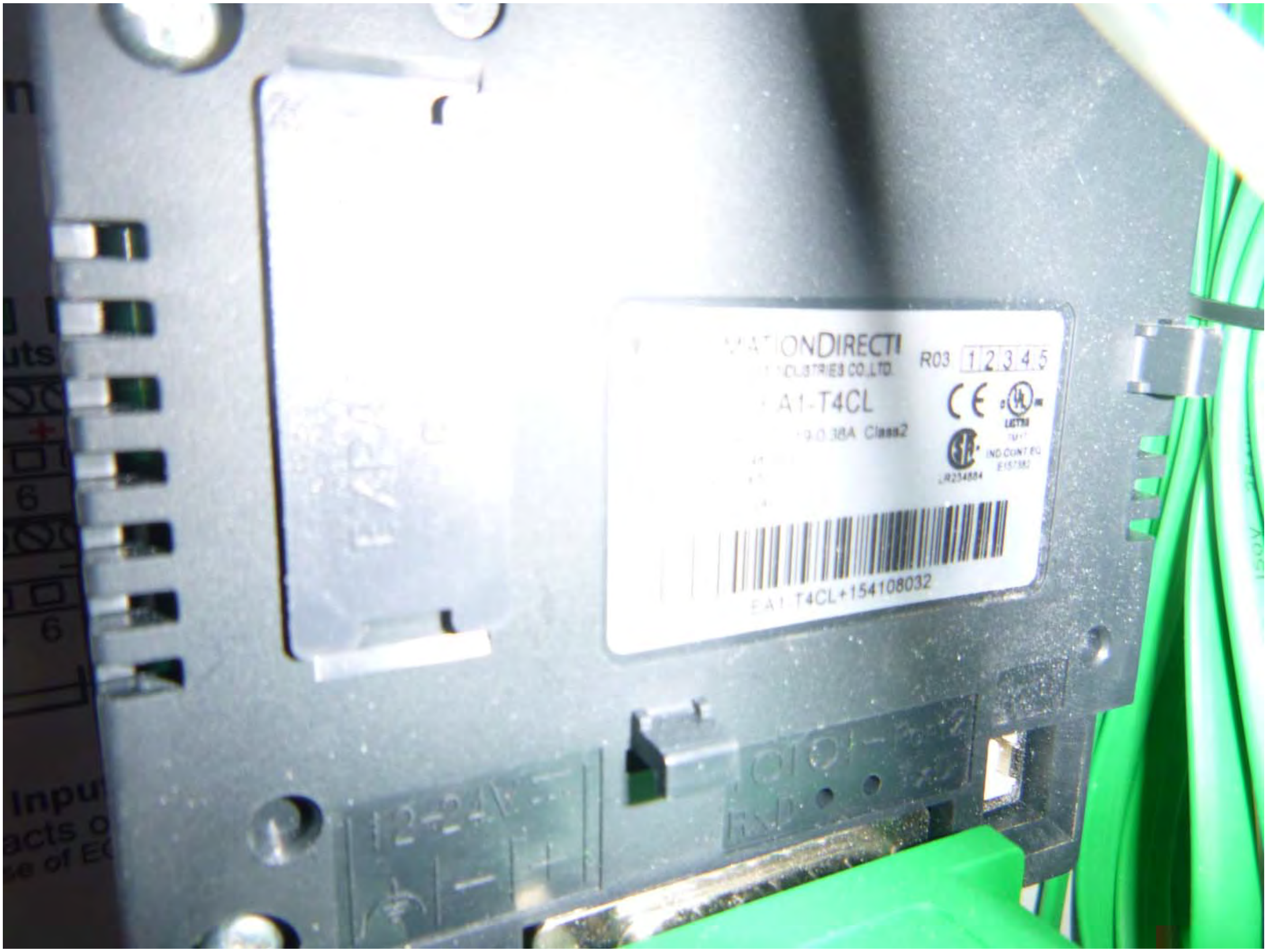
P1020878

P1020879

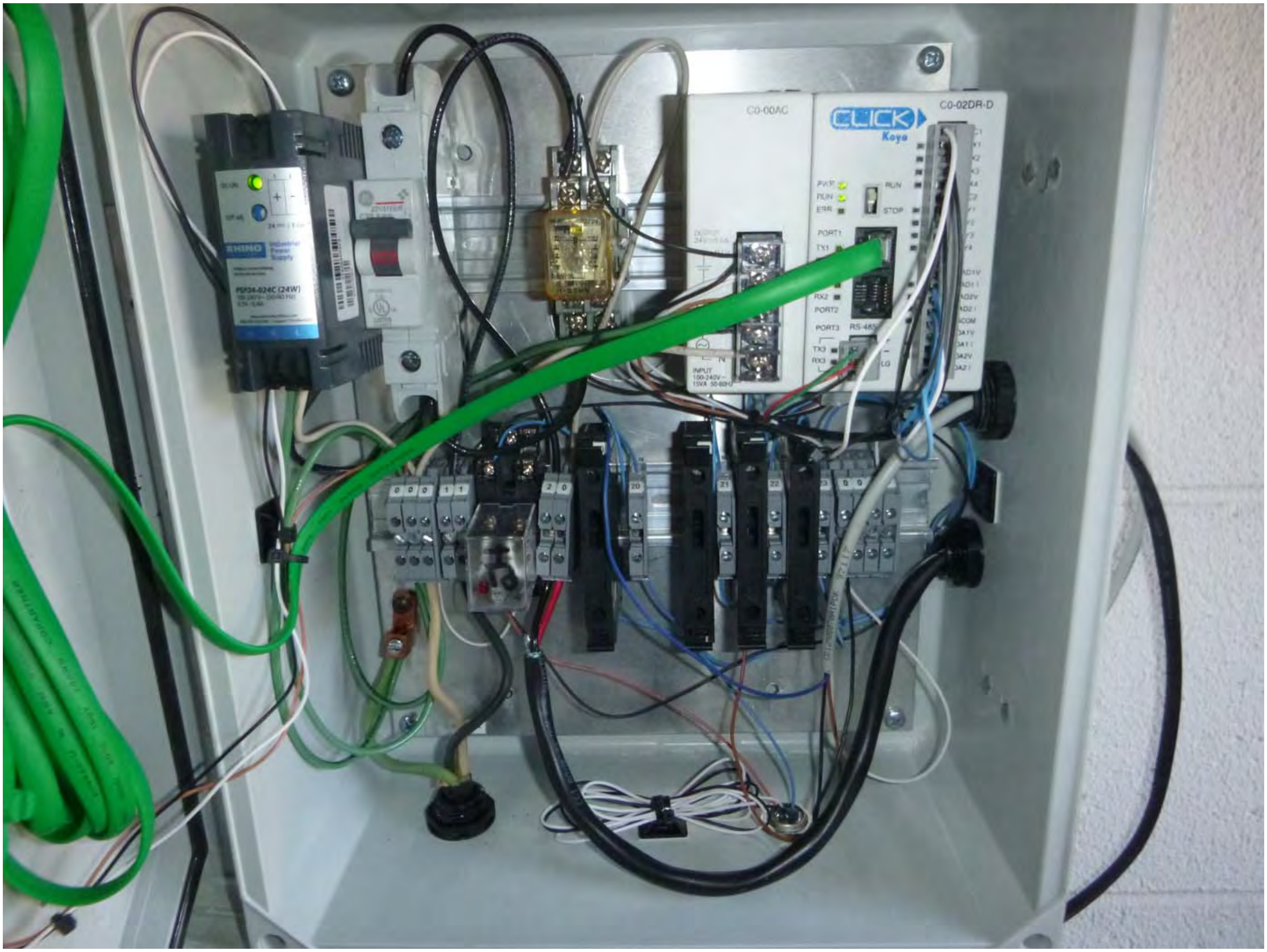
P1020880


Radio Status LED
(blinks when connected to Mission; location may vary)
Carrier LED
(solid green indicates radio connected to tower)
Chip
Carrier
Data
12 VAC Input
(From Transformer)
12 VDC Battery Input
12 VDC Auxiliary Output
DB 9 Serial Port
(For diagnostics and programming)
For Wet Well Module Cable (Accessory)
A1 A2
POS
NEG
Analog scaling jumpers
4-20mA – top 2 pins
0-5 V – bottom 2 pins
Analog Inputs
(See manual for details)
Input
D1
D2
High Level
Phase Fault
MADE IN CHINA

P1020881



P1020882



P1020883

P1020884


STOP
WARNING
• Do not connect AC power to outpu
terminals (T1,T2,T3).
• Do not inspect components until LED
are turned off for at least 1min.
MODEL: GS1-10P5
INPUT:100~120V 50/60Hz 1PH 9.0Amps
OUTPUT:0~240V 0.5HP 2.5Amps 1.0KVA 3PH
FREQUENCY RANGE: 1~400Hz
GS1-10P5+W15140111
Automationdirect.com,Inc.
0.5HP
120V 1PH
GS1

P1020885


Productivity
16-BIT
0-20mA
8 CH
ENABLED
16-BIT
4-20mA
Power
SE-SW5U
5-Port Industrial Ethernet Switch
Stride
DC ON
DC OK
RHINO

P1020886


Freedom 2100
Motor Control
STAND RATING
IRCUIT, CAPABLE
E THAN 65,000
TS MAXIMUM.
CUITS WITH
CURRENTS
ST SHORT-
ALLED UNIT.
5A11003H02
HIN54796 IT.001 -FVC
FEB.98 H.BUS 600A
480Y 3PH 3W 60HZ
SECT. 1-600A
SECT. 2-NONE
SECT. 3-5-300A
MAIN HND 600A

P1020887


Monitored By
MISSION
CONTROL
Let Us Know You Are Here.
Use Electronic Key
To Place RTU In Service Mode
Prior to Maintaining Equipment.

P1020888


For 24/7 Ethernet Technical
Support, please call the Ethernet
Support Team at 800-741-4141 and
reference the Device CLLI below.

P1020889


ACME TRANSFORMER
LUMBERTON, NORTH CAROLINA
GENERAL PURPOSE TRANSFORMER
CATALOG NO T-2-53013-4S
PRIMARY VOLTS 240 X 480 W/2-2.5% FC TAPS STYLE SK
SECONDARY VOLTS 120/240
3 KVA 60 HZ 1 PHASE WT 55 LBS
% IMPEDANCE AT WINDING RISE 115 DEG C
DEG C INSTRUCTIONS AT
MINIMUM FIELD INSTALLED CLEARANCES:
SIDE 4 INCHES. VERTICAL 4 INCHES
ENCLOSURE TYPE 3R OUTDOOR
INSULATION SYSTEM H-3180-L CLASS 180
WIRING INFORMATION ON INSIDE COVER
ACME ELECTRIC CORPORATION
POWER DISTRIBUTION PRODUCTS DIVISION
LUMBERTON, NC
MADE IN U.S.A.
A-2-700967
ACME® TRANSFORMER™
Shielded for cleaner power™
EIA-413-9651

P1020891

SQUARE D COMPANY
UL
9647 H-1
PLANT 65
MADE IN U.S.A.
LISTED
933R
DRY TYPE TRANSFORMER SINGLE PHASE
3.0KVA 115C TEMPERATURE RISE
CAT.NO. 351F
TYPE S
60 HZ
HIGH VOLTAGE (HV)
H1 H3 H2 H4
X4 X2 X3 X1
LOW VOLTAGE (LV)
VOLTS
CONNECT
LINE
480(HV) H2-H3 H1-H4
240(HV) H1H3-H2H4 H1-H4
240(LV) X2-X3 X1-X4
120(LV) X1X3-X2X4 X1-X4
FOR FIELD CONNECTIONS USE WIRES INSULATED FOR A MINIMUM OF 90°C AND SIZED ON THE BASIS OF 60°C AMPACITY
RAINPROOF TYPE 3R ENCLOSURE
WARNING - HAZARD OF ELECTRIC SHOCK OR BURN. TURN OFF POWER SUPPLY BEFORE WORKING INSIDE

P1020892


SIEMENS
ON
Heavy Duty
Safety Switch
200A 600VAC, 600VDC
Horsepower Rated
DANGER
Hazardous Voltage.
Will cause death or
serious injury.
Turn off before replacing
any fuse. Disconnect
power before working on
this switch. Close cover
before turning power on.
OFF

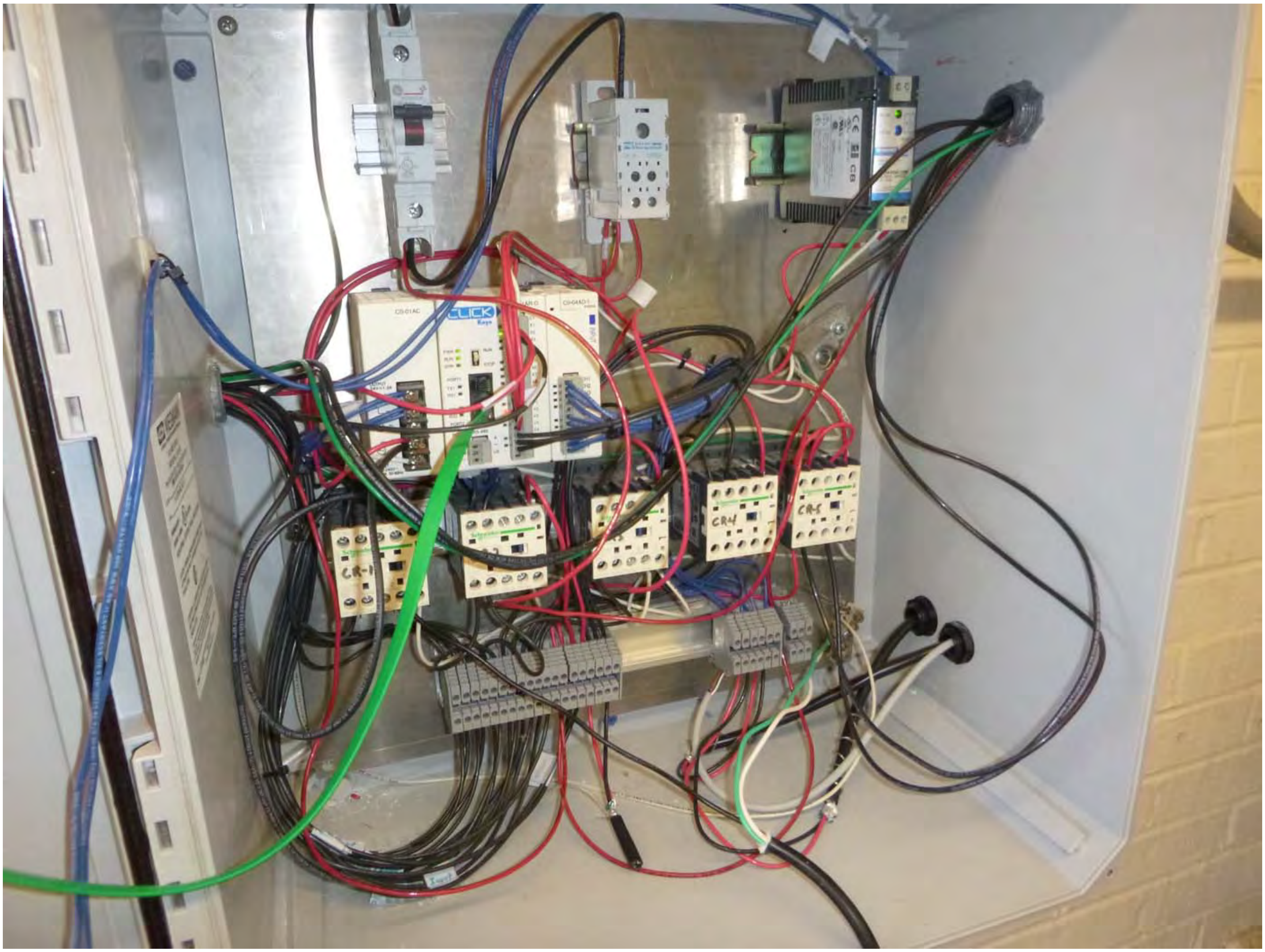
P1020893


Post PSI
0
ILBS USED
23
DAY TANK
116.1
PRE-RUN
POST-RUN
MAIN
F1
F2
F3
F4
F5

P1020894


EXPANSION
PORT
AUTOMATIONDIRECT!
R03. 1 2 3 4 5
MODEL : EA1-T4CL
INPUT 12-24V 0.19-0.38A Class2
Type 4X Indoor Use Only
Date code 4068
MADE IN CHINA
LR234884
7M17
IND.CONT.EQ.
EA1-T4CL+146168030
12-24V

P1020895



P1020896


Acme Transformer
LUMBERTON NC • A DIVISION OF ACME ELECTRIC CORPORATION
GENERAL PURPOSE TRANSFORMER
CATALOG NO T-2-53516-3S STYLE
PRIMARY VOLTS 240X480 WITH FC TAPS
SECONDARY VOLTS 120/240 WT 125
10 kVA 60 HZ 1 PHASE WINDING RISE 115 °C
2.00 % IMPEDANCE AT 135 °C INSTRUCTIONS
MINIMUM FIELD INSTALLED CLEARANCES: SIDE 8 INCHES, VERTICAL 10
UL LISTED 50BB
ENCLOSURE TYPE 3R . OUTDOOR .
INSULATION SYSTEM X-3221-L CLASS 155
WIRING INFORMATION ON INSIDE COVER

P1020897


CONSOLIDATED ELECTRIC
D620 Controller
MENU
FUNC
HELP
CLEAR
ENTER
ACK
U.S. FILTER
52ND STREET TANK
OVERFLOW 30 FT.
HIGH ALARM 29.5 FT.
LOW ALARM 14.5 FT.
EAST CL2 BOOSTER
EAST AERATOR
WEST AERATOR
HIGH SERVICE NO. 2
STAGE SELECTOR
1 2 3 OFF
DANGER

P1020898


52ND STREET TANK
OVERFLOW 30 FT.
HIGH ALARM 29.5 FT.
LOW ALARM 14.5 FT.
CALL
RUN
FAIL
OFF/RESET
HAND
AUTO
PUMP CONTROL SELECTOR
U.S.FILTER
EAST CL2 BOOSTER
WEST CL2 BOOSTER
EAST AERATOR
WEST AERATOR

P1020899


CALL
RUN
FAIL
OFF/RESET
HAND
AUTO
PUMP CONTROL SELECTOR
U.S.FILTER
HIGH SERVICE NO. 2
STAGE SELECTOR
1 2 3 OFF
HIGH SERVICE NO. 3
STAGE SELECTOR
1 2 3 OFF
HIGH SERVICE NO. 4
STAGE SELECTOR
1 2 3 OFF
WELL NO. 1
STAGE SELECTOR
1 2 3 OFF
WELL NO. 3
STAGE SELECTOR
1 2 3 OFF
WELL NO. 4
STAGE SELECTOR
1 2 3 OFF
DANGER

P1020900


CALL
RUN
FAIL
OFF/RESET
HAND
AUTO
U.S.FILTER
WELL NO. 1
STAGE SELECTOR
1 2 3 OFF
PUMP CONTROL SELECTOR
U.S.FILTER
WELL NO. 3
STAGE SELECTOR
1 2 3 OFF
PUMP CONTROL SELECTOR
U.S.FILTER
WELL NO. 4
STAGE SELECTOR
1 2 3 OFF
DANGER
Disconnect all sources of power before opening door. (Multiple and/or remote sources of power may be present.)
Hazardous voltages cause severe injury or death.

P1020901


CALL
RUN
FAIL
OFF/RESET
HAND
AUTO
PUMP CONTROL SELECTOR
U.S.FILTER
HIGH SERVICE NO. 1
STAGE SELECTOR
1 2 3 OFF
CALL
RUN
FAIL
OFF/RESET
HAND
AUTO
PUMP CONTROL SELECTOR
U.S.FILTER
HIGH SERVICE NO. 2
STAGE SELECTOR
1 2 3 OFF
WELL NO. 2
STAGE SELECTOR
1 2 3 OFF
WELL NO. 1
STAGE SELECTOR
1 2 3 OFF

P1020902


Monitored by
MISSION
Use Electronic Key
To Place RTU In Service Mode
Prior to Maintaining Equipment.
Monitored By
MISSION
CONTROL
Let Us Know You Are Here.
Use Electronic Key
To Place RTU In Service Mode
Prior to Maintaining Equipment.

P1020903

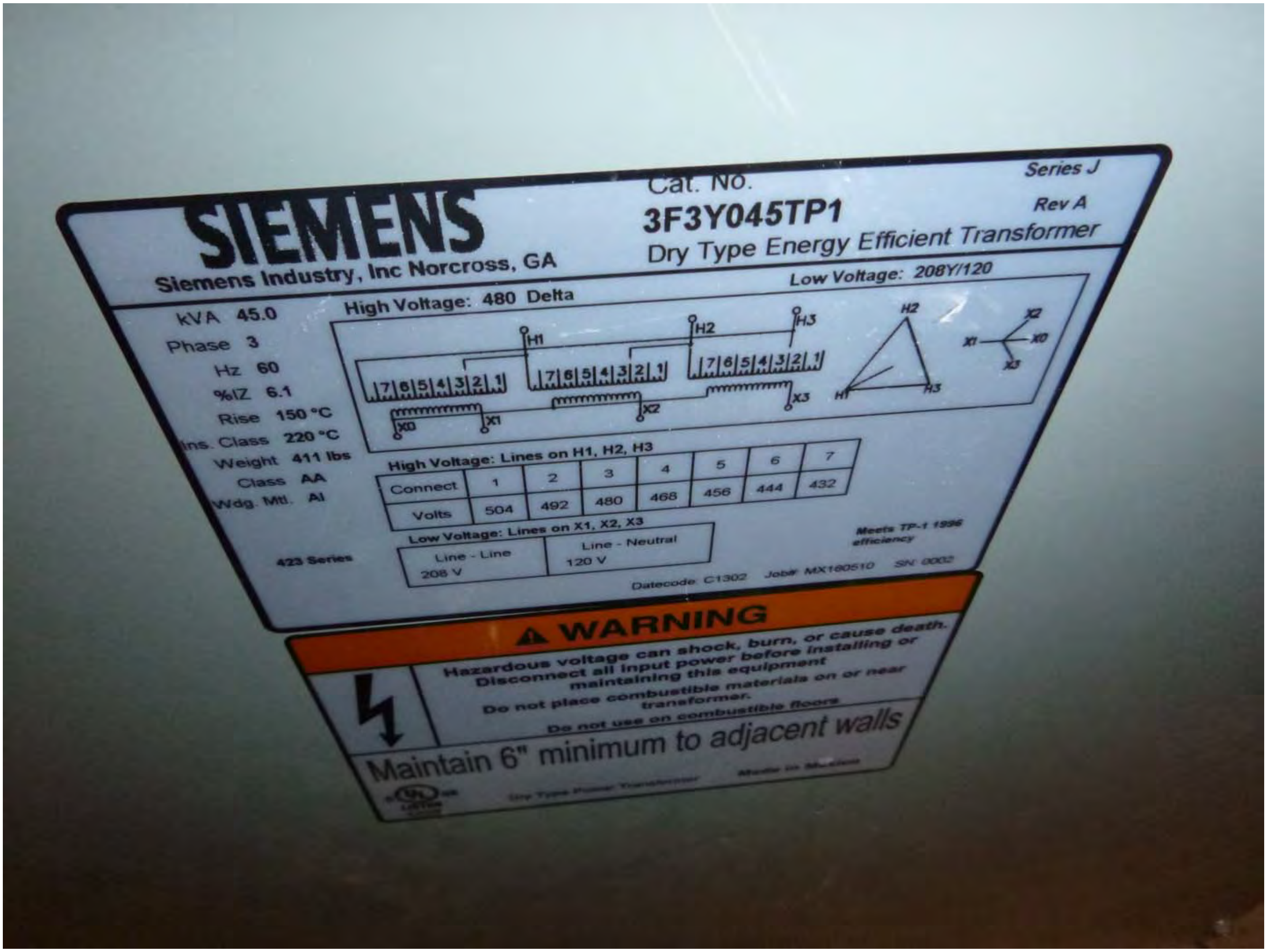

SORGEL
SQUARE D COM
THREE PHASE INSULATED
STYLE NO 31949-28445-002
CAT. NO.
KVA 6
% IZ
180°C INS SYSTEM
WT 145
HZ 60
CLASS AA
L.V. 240
H.V. 480
H.V. AMPS. 7.2
CONNECT TAPS H1-H2-H3 H4-H2-H5
HIGH VOLTAGE 480 456
H1 H4 H6
L.V.
X1
DE-ENERGIZE TRANSFORMER BEFORE

P1020904


edgewater
4550 Series
PROPERTY
OF
Comcast
For Initial Service Activation
For Technical Support
Call: 800-741-4141
Comcast
ciena
RICHARDT 1
RICHARDT1-SWITCH 10.2.10.2
BOTTOM

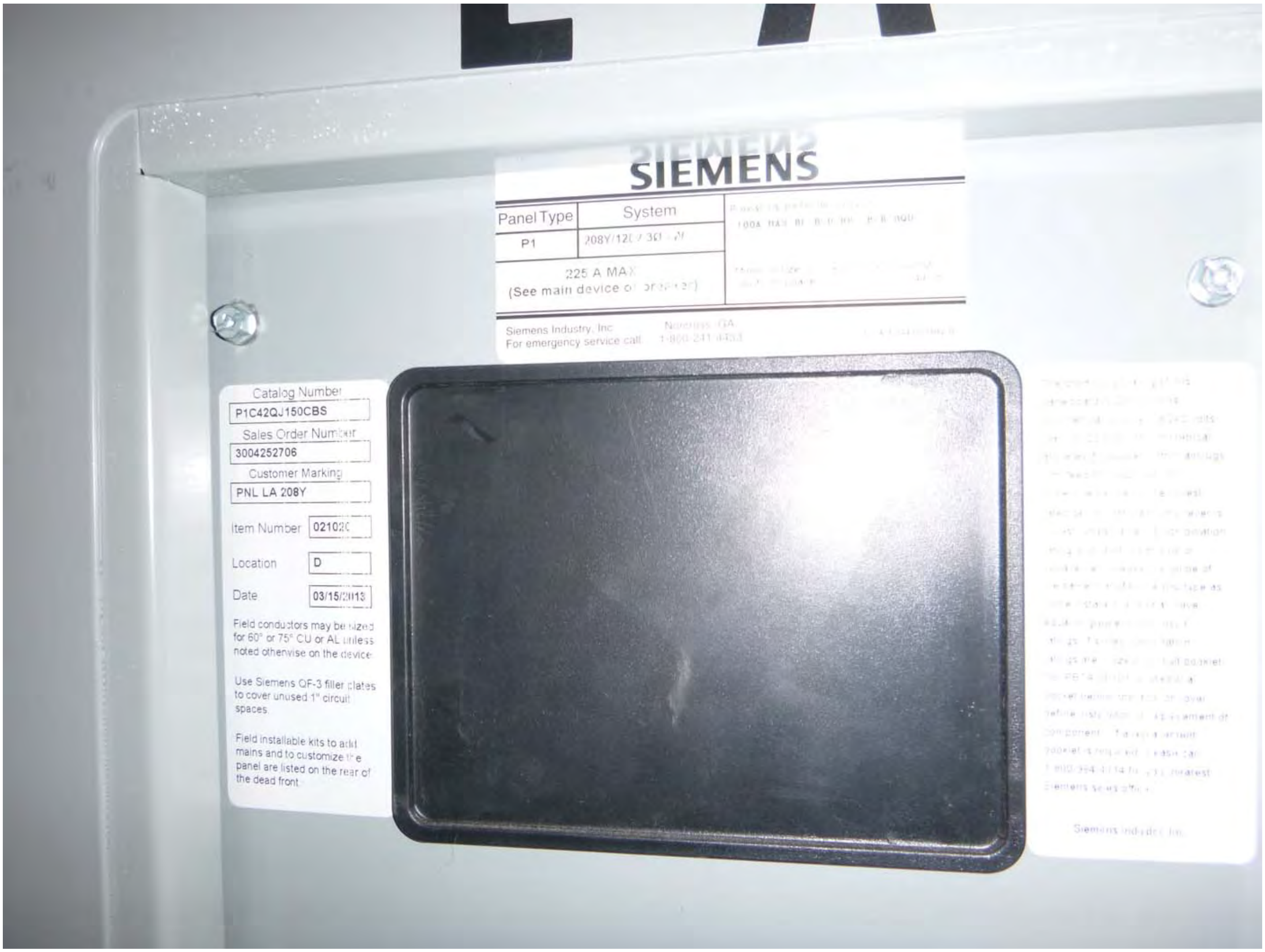
P1020905

P1020906


SIEMENS
Siemens Industry, Inc Norcross, GA
Cat. No.
3F3Y045TP1
Series J
Rev A
Dry Type Energy Efficient Transformer
Low Voltage: 208Y/120
High Voltage: 480 Delta
KVA 45.0
Phase 3
Hz 60
%IZ 6.1
Rise 150 °C
Ins. Class 220 °C
Weight 411 lbs
Class AA
Wdg. Mtl. Al
423 Series
High Voltage: Lines on H1, H2, H3
Connect 1 2 3 4 5 6 7
Volts 504 492 480 468 456 444 432
Low Voltage: Lines on X1, X2, X3
Line - Line 208 V
Line - Neutral 120 V
Meets TP-1 1996 efficiency
Datecode C1302
WARNING
Hazardous voltage can shock, burn, or cause death.
Disconnect all input power before installing or maintaining this equipment
Do not place combustible materials on or near transformer.
Do not use on combustible floors
Maintain 6" minimum to adjacent walls

P1020907

P1020908


SIEMENS
Panel Type
System
P1
225 A MAX
Siemens Industry, Inc.
For emergency service call
Catalog Number
P1C42QJ150CBS
Sales Order Number
3004252706
Customer Marking
PNL LA 208Y
Item Number
Location
D
Date
Use Siemens QF-3 filler plates to cover unused 1" circuit spaces.
Field installable kits to add mains and to customize the panel are listed on the rear of the dead front.
Siemens Industry, Inc.

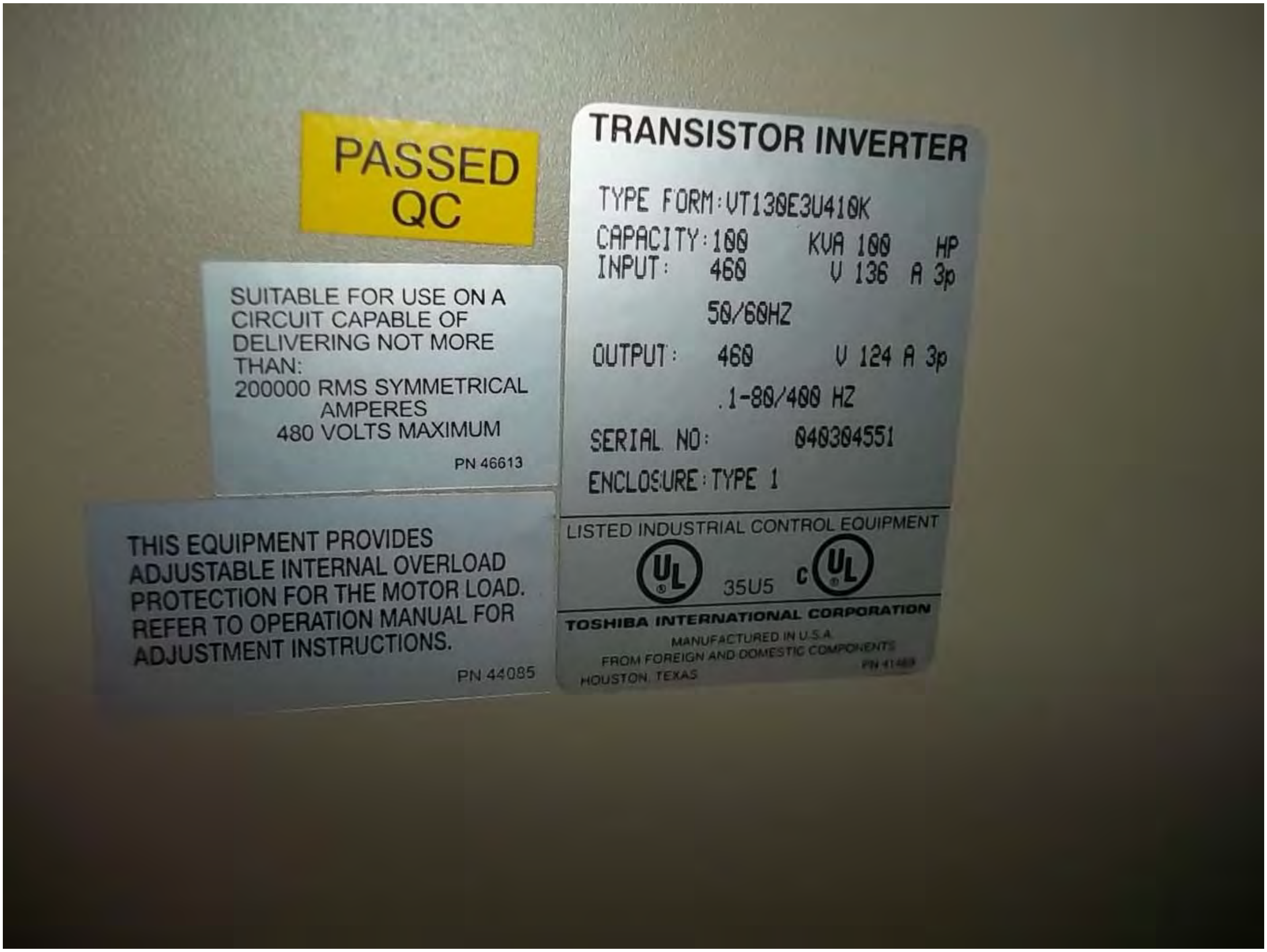
P1020909

P1020910


SIEMENS
Panel Type
System
P1
Catalog Number
P1E42ML250CBS
3004252706
PNL HA 480Y
Item Number
Location
D
Date
spaces

P1020911

100_5660



PASSED
QC
SUITABLE FOR USE ON A CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN:
200000 RMS SYMMETRICAL AMPERES
480 VOLTS MAXIMUM
PN 46613
THIS EQUIPMENT PROVIDES ADJUSTABLE INTERNAL OVERLOAD PROTECTION FOR THE MOTOR LOAD. REFER TO OPERATION MANUAL FOR ADJUSTMENT INSTRUCTIONS.
PN 44085
TRANSISTOR INVERTER
TYPE FORM: VT130E3U410K
CAPACITY: 100 KVA 100 HP
INPUT: 460 V 136 A 3p
50/60HZ
OUTPUT: 460 V 124 A 3p
.1-80/400 HZ
SERIAL NO: 040304551
ENCLOSURE: TYPE 1
LISTED INDUSTRIAL CONTROL EQUIPMENT
35U5
TOSHIBA INTERNATIONAL CORPORATION
MANUFACTURED IN U.S.A.
FROM FOREIGN AND DOMESTIC COMPONENTS
HOUSTON, TEXAS

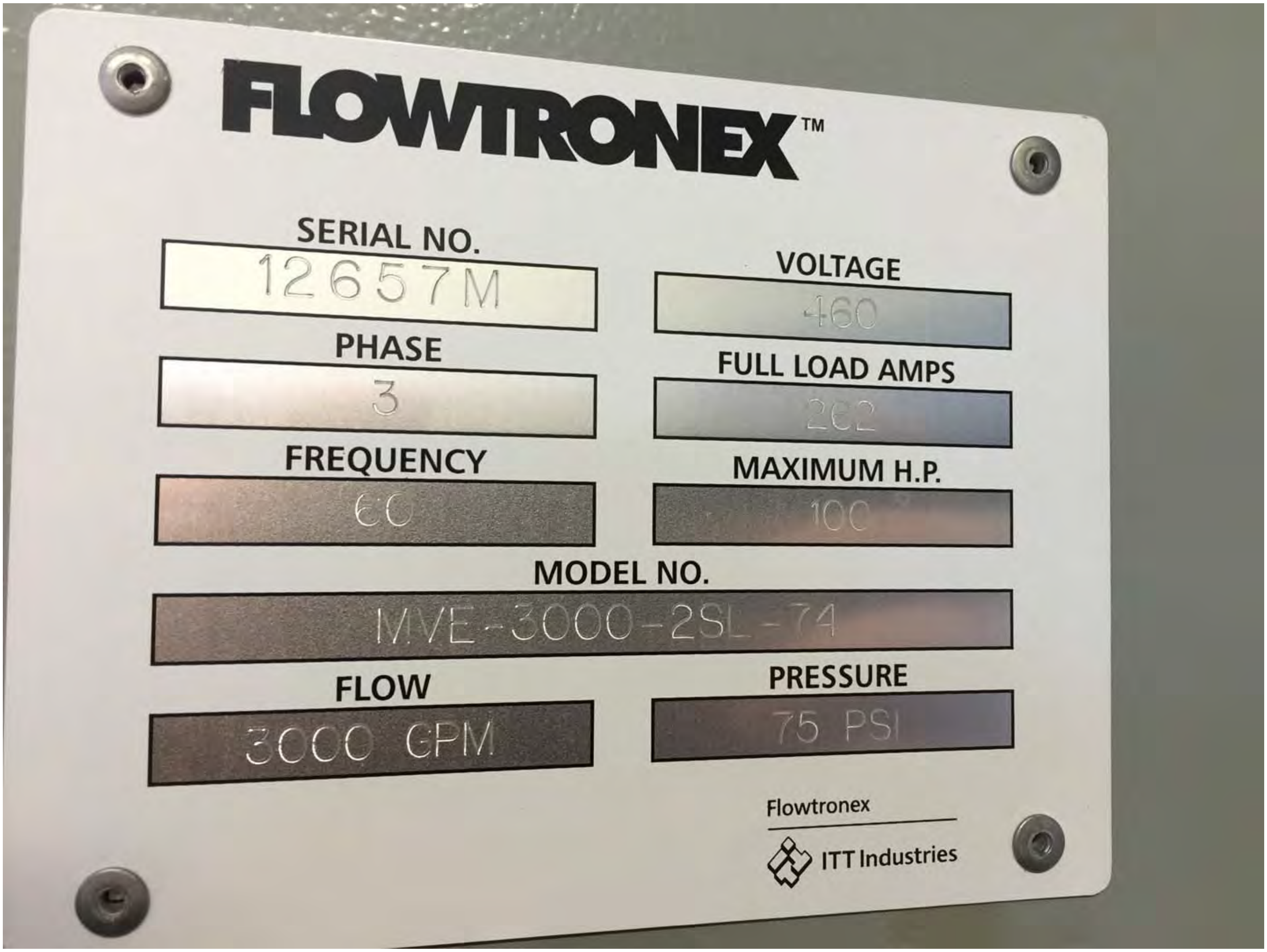
100_5662


SYSTEM FAULT
REMOTE MODE REQUESTED
FLOWTRONEX
RUN
ALARM
COM
FAULT
FLOW, PRESSURE & SYSTEM STATUS
CURRENT CONDITION OF ALL ALARMS
PUMP RUN-TIME AND STARTS RECORD
MAIN MENU
F1 F2 F3 F4 F5 F6 F7 F8
ACCESS PREV DATA
STOP DATA SCROLL
ACCESS NEXT DATA
HOME MONITOR
F9 F10 F11 F12 F13 F14 F15 F16
DATA ACCESS CONTROL KEYS FOR EVENTS AND ALARM HISTORY
HELP
CLEAR
ENTER
ITT Industries
SPEED
PUMP 1 HOUR METER
PUMP 2 HOUR METER

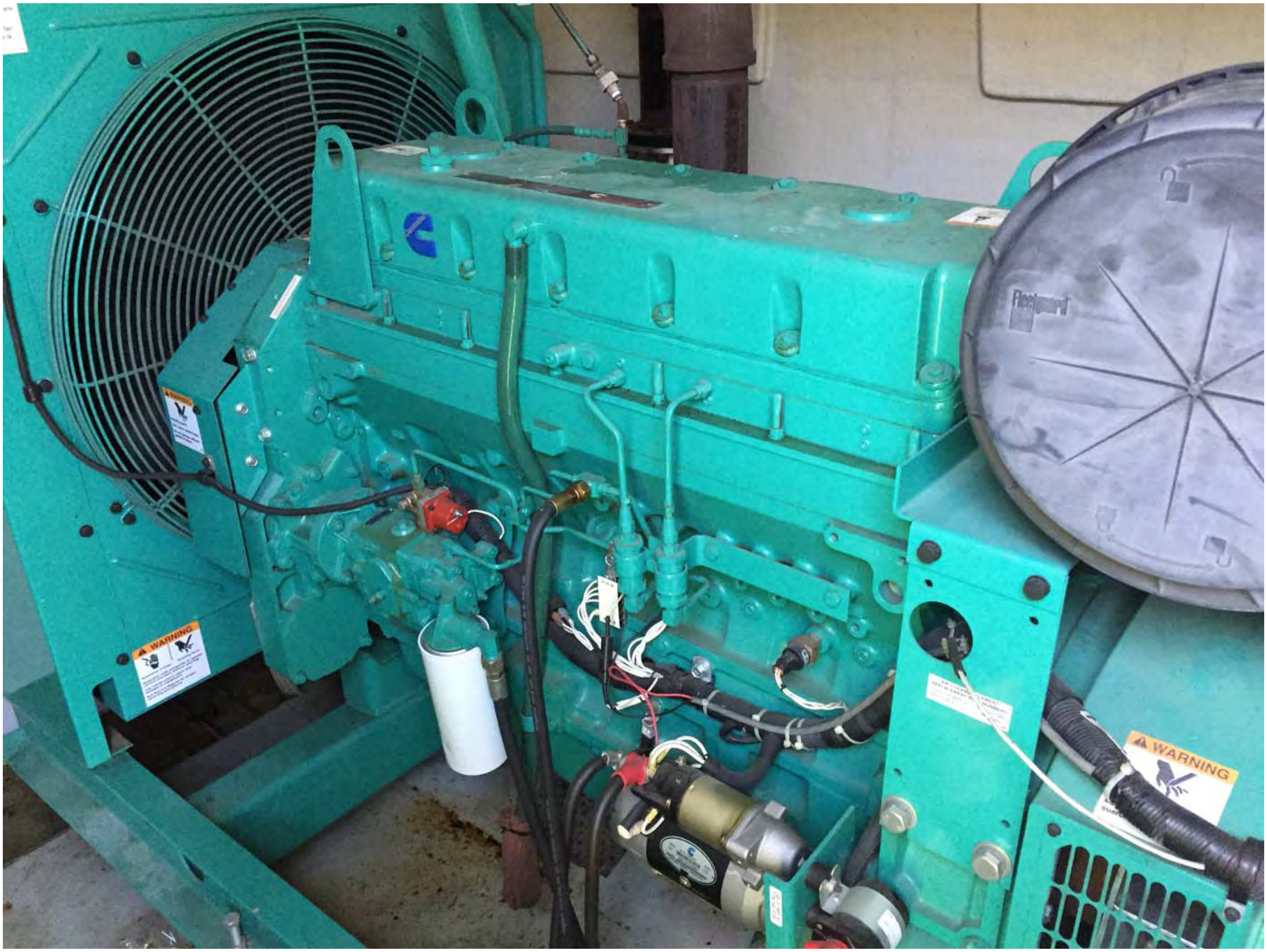
IMG_0758


PUMP 1
OFF
HAND
AUTO
PUMP 2
OFF
HAND
AUTO
SPEED
MIN
MAX
AUDIBLE ALARM
SYSTEM CONTROL
OFF
TEST
AUTO
LOW DISCHARGE
PRESSURE
OVERRIDE
ACTIVE
RESET
ALARM SILENCE
VFD SELECT
1
2
VFD 1 MODE
VFD
BYPASS
PUMP 1
HOUR METER
PUMP 2
HOUR METER

IMG_0759


FLOWTRONEX™
SERIAL NO.
12657M
VOLTAGE
460
PHASE
3
FULL LOAD AMPS
262
FREQUENCY
60
MAXIMUM H.P.
100
MODEL NO.
MVE-3000-2SL-74
FLOW
3000 GPM
PRESSURE
75 PSI
Flowtronex
ITT Industries

IMG_0760



IMG_0761


Model No.
Modele
DFAB-5671525
Serial No.
Serie
E040646161
Spec. M
IMPORTANT!
Model & Serial No. Required When Ordering Parts.
Modele & No. Serie Requis Pour Commander Des Pieces.
99-2433
CUMMINS POWER GENERATION
1400 73RD AVE. N.E.
MINNEAPOLIS, MN 55432 U.S.A.
MADE IN U.S.A.
60 HZ
STANDBY
PRIME
FREQUENCY
SERVICE RATING
PHASE
RATED KW
POWER FACTOR
RATED KVA
I2 CAPABILITY
CONNECTION
1PH 3PH 1PH 3PH
154.1 230.0 0.0 0.0
1.0 0.8 0.0 0.0
154.1 287.5 0.0 0.0
0.0 0.0
WYE
AMPS
VOLTS
AMPS
BATTERY
24 VDC
ROTATING
SPEED
1800RPM
NOMINAL
RATED
110/ 190
110/ 220
115/ 200
115/ 230
120/ 208
120/ 240
127/ 220
139/ 240
220/ 380
230/ 400
240/ 416
255/ 440
266/ 460
277/ 480
700.5
670
642.1
873.6
754.5
830
721.7
798
691.6
754.5
691.6
436.8
415
399
377.3
360.9
345.8
FUEL:
Diesel
WIRING DIAGRAM 0612-6764
For Electrical Equipment Only
Pour Material Electrique Seulement
Model N
Modele
Serial No
Serie
IMPORTAN
Model & Seria
Modele & No.
Onan
5/26/2004 MML
326-5716
326-5482
326-5484
326-5488
326-5490
326-5566
326-5579
326-5583
326-5597
326-5653
326-5683
326-5694
326-5719
326-5721
326-5722
326-5835
XE3E4
IMG_0762


Model No
Modele
DFAB-5671525
Serial No
Serie
E040646161
Spec.
M
IMPORTANT!
Model & Serial No. Required When Ordering Parts.
Modele & No. Serie Requis Pour Commander Des Pieces.
1400 73rd Avenue N.E.
Minneapolis, MN 55432 U.S.A.
Cummins
Onan
Made in U.S.A
99-2433
5/26/2004 MMDDYYYY
326-5716
326-5482
326-5484
326-5488
326-5490
326-5566
326-5579
326-5583
326-5597
326-5653
326-5683
326-5694
326-5719
326-5721
326-5722
326-5835
XE3E4
Build Date
Calibration P/N
Feature P/N
Feature P/N
Feature P/N
Feature P/N
Feature P/N
Feature P/N
Feature P/N
Feature P/N
Feature P/N
Feature P/N
Feature P/N
Feature P/N
Feature P/N
Feature P/N
Feature P/N
Checksum
99-2433
PRIME
1PH
3PH
0.0
0.0
0.0
0.0
0.0
0.0
AMPS
415
399
377.3
360.9
345.8

IMG_0763


Model No
Modele
DFAB-5671525
Spec.
M
Serial No
Serie
E040646161
IMPORTANT!
Model & Serial No. Required When Ordering Parts.
Modele & No. Serie Requis Pour Commander Des Pieces.
1400 73rd Avenue N.E.
Minneapolis, MN 55432 U.S.A.
99-2433
Made in U.S.A
Onan
5/26/2004 MMDDYYYY
Build Date
326-5716
Calibration P/N
326-5482
Feature P/N
326-5484
Feature P/N
326-5488
Feature P/N
326-5490
Feature P/N
326-5566
Feature P/N
326-5579
Feature P/N
326-5583
Feature P/N
326-5597
Feature P/N
326-5653
Feature P/N
326-5683
Feature P/N
326-5694
Feature P/N
326-5719
Feature P/N
326-5721
Feature P/N
326-5722
Feature P/N
326-5835
Feature P/N
XE3E4
Checksum
99-2433
60 HZ
PRIME
1PH
3PH
0.0
0.0
AMPS
73.6
54.5
830
721.7
798
691.6
754.5
691.6
436.8
415
399
377.3
360.9
345.8

IMG_0764

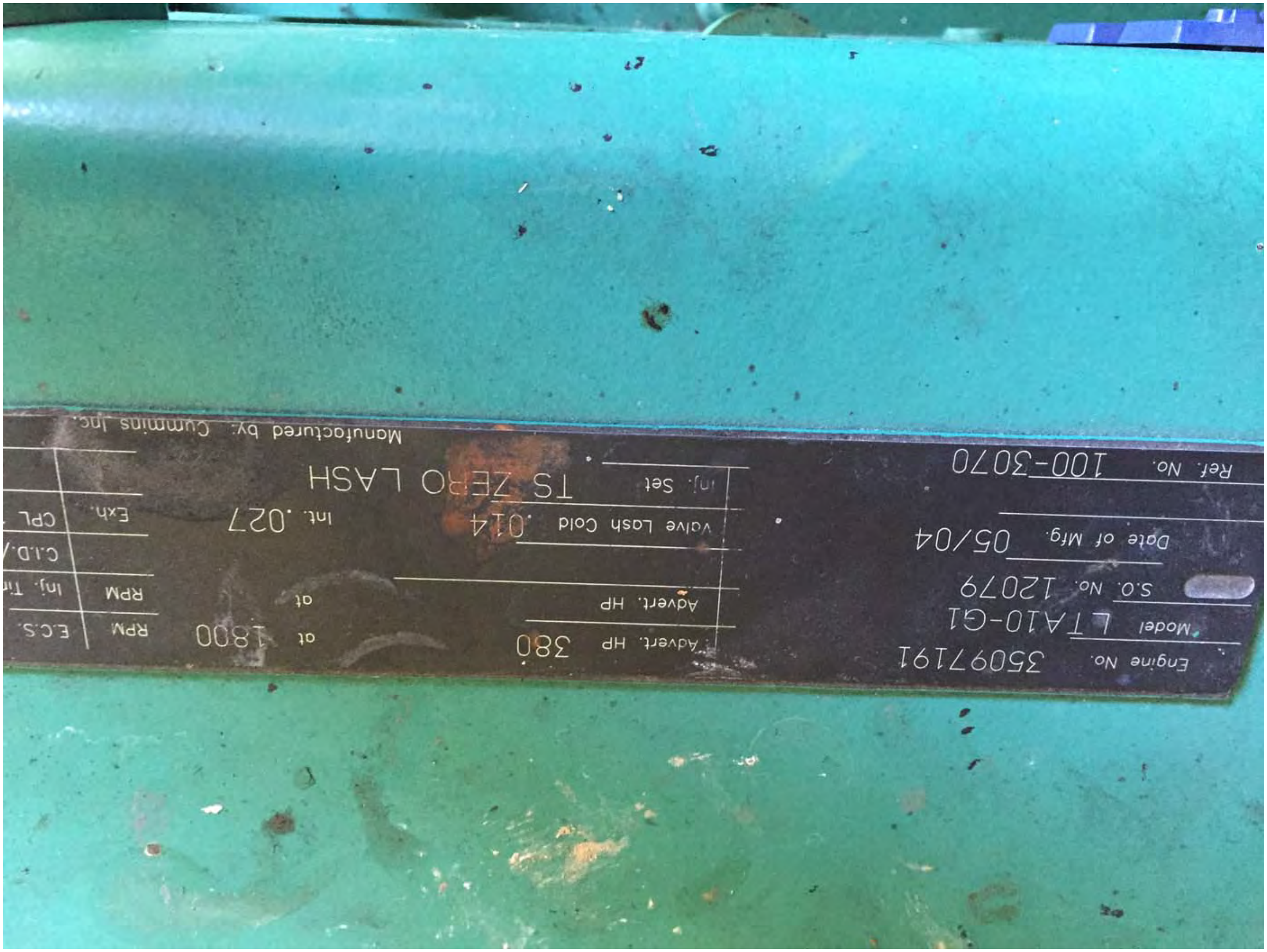

Cummins
Power Generation
PowerCommand
Transfer Switch
Source 1
Source 2
Connected
Available
Not In Auto
Test/Exercise Active
Test
Override
Reset/
Lamp Test
Home
Previous
Menu
7 day 24 hour service
Factory Trained
EGSA Certified
Technicians
Generators
Paralleling Systems
Transfer Switches
Engine Controls
Battery Systems
800-338-1989
W.W.Williams
onsite energy
W.W.Williams
Consider It Done.
Service
800-338-1989
DANGER
IMG_0765


Power Generation
PowerCommand
Transfer Switch
Source 1
Source 2
Connected
Available
Not In Auto
Test/Exercise Active
Test
Override
Reset/
Lamp Test
Home
Previous
Menu
Factory Trained
EGSA Certified
Technicians
Generators
Paralleling Systems
Transfer Switches
Engine Controls
Battery Systems
7 day
24 hour
service
800-338-1989
W.W.Williams
onsite energy
W.W.Williams
Consider It Done.
Service
800-338-1989
DANGER

IMG_0766


ACME TRANSFORMER
LISTED 5088
LUMBERTON, NORTH CAROLINA
GENERAL PURPOSE TRANSFORMER
CATALOG NO T-2-53516-3S
STYLE SR
PRIMARY VOLTS 240X480 W/FC TAPS
SECONDARY VOLTS 120/240
WT 125 LBS
10 KVA 60 HZ 1 PHASE WINDING RISE 115 DEG C
2.00% IMPEDANCE AT 135 DEG C INSTRUCTIONS A1
MINIMUM FIELD INSTALLED CLEARANCES:
SIDE 8 INCHES, VERTICAL 10 INCHES
ENCLOSURE TYPE 3R OUTDOOR
INSULATION SYSTEM X-3221-L CLASS 155
FOR AUTOTRANSFORMER CONNECTIONS SEE
DRAWING B-111705.
WIRING INFORMATION ON INSIDE COVER
ACME ELECTRIC CORPORATION
POWER DISTRIBUTION PRODUCTS DIVISION
LUMBERTON, NC MADE IN U.S.A.
A-3-700958
ACME TRANSFORMER
Shielded for cleaner power

IMG_0767


Engine No. 35097191
Model LTA10-G1
S.O. No. 12079
Date of Mfg. 05/04
Ref. No. 100-3070
Advert. HP 380 at 1800 RPM
Advert. HP at RPM
Valve Lash Cold .014
Int. .027
Exh.
Inj. Set TS ZERO LASH
E.C.S.
CPL
Manufactured by: Cummins Inc.

IMG_0768


Advert. HP 380 at 1800 RPM
E.C.S.
Advert. HP at RPM
Inj. Timing Code 1B
C.I.D./L 611/10
Valve Lash Cold .014 Int. .027 Exh.
CPL 1429
Inj. Set TS ZERO LASH
Manufactured by: Cummins Inc.
Assembled in the U.S.A
3077273
Cummins
WARNING:

IMG_0769


WARNING: Injury may result and warranty is voided if fuel rate, RPM, or altitudes exceed published maximum values for this model and application.
Warranty St. Date
Cummins
3077273
Assembled in the U.S.A
Cummins Inc.
E.C.S.
RPM
Inj. Timing Code 1B
C.I.D./L 611/10
CPL 1429
Exh.
at 1800 RPM
.027

IMG_0770

BARD MANUFACTURING COMPANY. 1914 RANDOLPH DRIVE. BRYAN. OHIO 43506 U S A

	MODEL	(1) APPROVED HEATER PACKAGE	VAC	HZ	PH	(2) SINGLE CIRCUIT MINIMUM CIRCUIT AMPACITY	(2) SINGLE CIRCUIT MAX. FUSE OR CKT. BREAKER	(2) DUAL CIRCUIT MINIMUM CIRCUIT AMPACITY CKT.A/CKT.B	(2) DUAL CIRCUIT MAX. FUSE OR CKT. BREAKER CKT.A/CKT.B
( )	WA302-A00XP5XXJ	NONE	230/208	60	1	24	35	N/A	N/A
( )	WA302-A0ZXP5XXJ	WMCB-05A	230/208	60	1	24	35	N/A	N/A
(X)	WA302-A05XP5XXJ	EHWA03-A05	230/208	60	1	31	35	N/A	N/A
( )	WA302-A08XP5XXJ	EHWA03-A08	230/208	60	1	47	50	N/A	N/A
( )	WA302-A10XP5XXJ	EHWA03-A10	230/208	60	1	57	60	N/A	N/A
( )	WA302-A15XP5XXJ	EHWA03-A15	230/208	60	1	83	90	57/26	60/30
( )	WA302-AXHXP5XXJ	EHWA03-AXH	230/208	60	1	57	60	N/A	N/A
( )	WA302-AXKXP5XXJ	EHWA03-AXK	230/208	60	1	83	90	57/26	60/30

BRANCH CIRCUIT SELECT CURRENT 14.1 OPERATING VOLTAGE RANGE: 197 VAC MIN 253 VAC MAX

SERIAL NUMBER 255F041914424-02 UL FILE NO. SA9951

SUITABLE FOR OUTDOOR USE ALL MOTORS ARE THERMALLY PROTECTED

-- ELECTRICAL RATINGS --

	VAC	HZ	PH	HP	FLA	LRA	RLA
COMPRESSOR	230/208	60	1			73/73	12.2/12.9
OUTDOOR MOTOR	230/208	60	1	1/5	1.5		
INDOOR MOTOR	230/208	60	1	1/3	2.2		
WERV-A3A	230/208	60	1		2.2	(OPTIONAL)	

HEATER PACKAGE	VAC	HZ	PH	KW	FLA
EHWA03-A05	240/208	60	1	5/3.75	20.8/18.1
EHWA03-A08	240/208	60	1	8/6	33.3/28.8
EHWA03-A10, -AXH	240/208	60	1	10/7.5	41.6/36.2
EHWA03-A15, -AXK	240/208	60	1	15/11.25	62.5/54.1

c UL us LISTED

CENTRAL COOLING AIR CONDITIONER 5N73

-- FACTORY REFRIGERANT --

FACTORY CHARGED R22: 77 OZ. DESIGN PRESSURE PSIG 300 HIGH 150 LOW

-- CLEARANCES --

UNIT CASING SUITABLE FOR 0 INCH CLEARANCE.
OUTLET DUCT CLEARANCE 1/4 INCH MINIMUM FOR AT LEAST FIRST 3 FEET OF DUCT. REFER TO INSTALLATION INSTRUCTIONS FOR ADDITIONAL CLEARANCE INFORMATION. MAXIMUM OUTLET AIR TEMPERATURE: 200 DEG. F
THIS MODEL HAS BEEN TESTED AT STATIC PRESSURES FROM 0 TO .5 IN. WATER COLUMN. CONSULT INSTALLATION INSTRUCTIONS FOR MAXIMUM PERMITTED STATIC PRESSURE FOR SPECIFIC EQUIPMENT APPLICATION.

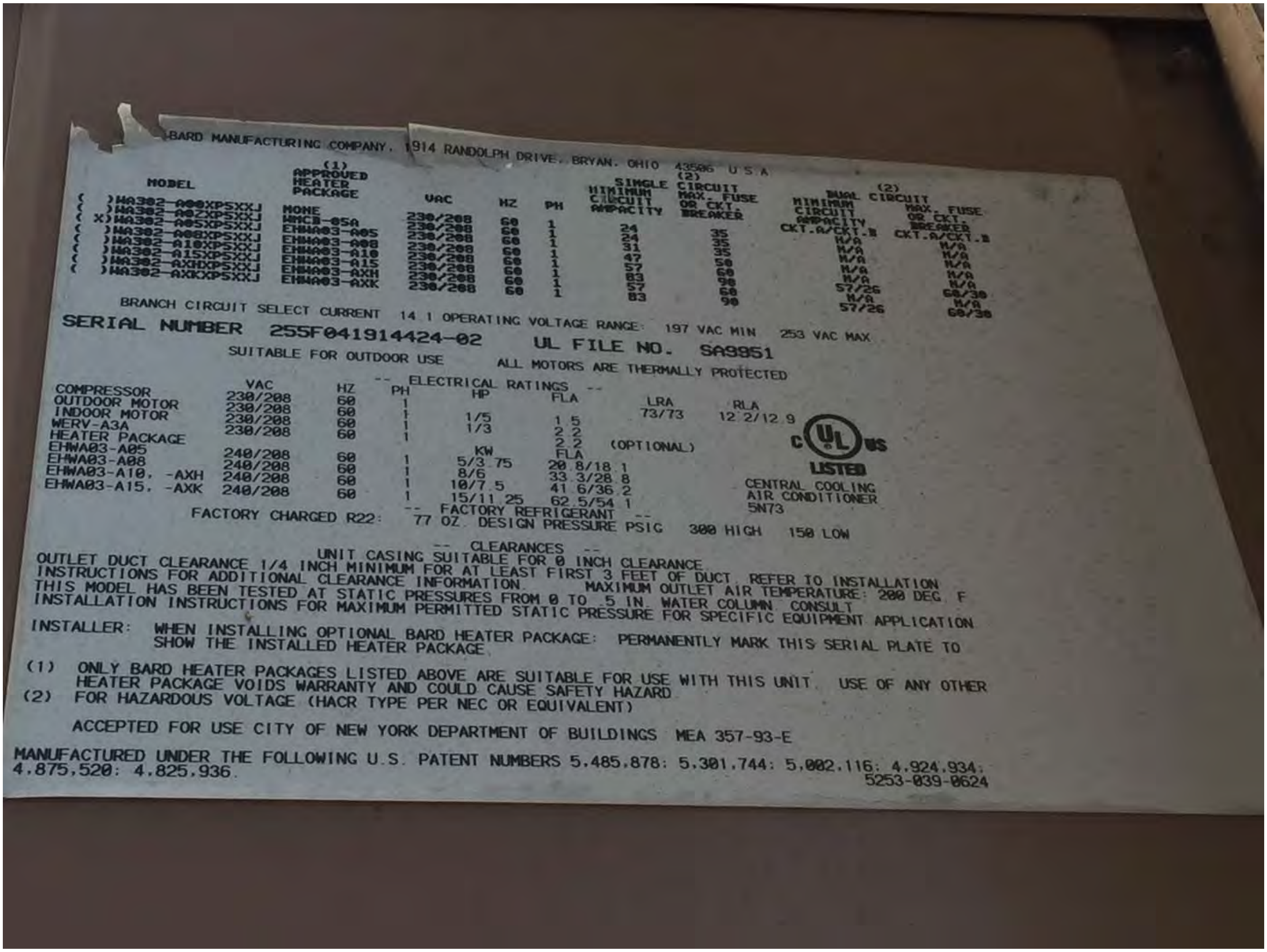
INSTALLER: WHEN INSTALLING OPTIONAL BARD HEATER PACKAGE: PERMANENTLY MARK THIS SERIAL PLATE TO SHOW THE INSTALLED HEATER PACKAGE.

(1) ONLY BARD HEATER PACKAGES LISTED ABOVE ARE SUITABLE FOR USE WITH THIS UNIT. USE OF ANY OTHER HEATER PACKAGE VOIDS WARRANTY AND COULD CAUSE SAFETY HAZARD.
(2) FOR HAZARDOUS VOLTAGE (HACR TYPE PER NEC OR EQUIVALENT)

ACCEPTED FOR USE CITY OF NEW YORK DEPARTMENT OF BUILDINGS MEA 357-93-E

MANUFACTURED UNDER THE FOLLOWING U.S. PATENT NUMBERS 5,485,878; 5,301,744; 5,002,116; 4,924,934; 4,875,520; 4,825,936.

5253-039-0624



BARD MANUFACTURING COMPANY, 1914 RANDOLPH DRIVE, BRYAN, OHIO 43506 U.S.A.

MODEL	(1) APPROVED HEATER PACKAGE	VAC	HZ	PH	(2) SINGLE CIRCUIT MINIMUM CIRCUIT AMPACITY	(2) SINGLE CIRCUIT MAX. FUSE OR CKT. BREAKER	(2) DUAL CIRCUIT MINIMUM CIRCUIT AMPACITY CKT.A/CKT.B	(2) DUAL CIRCUIT MAX. FUSE OR CKT. BREAKER CKT.A/CKT.B
( )WA302-A00XP5XXJ	NONE	230/208	60	1	24	35	N/A	N/A
( )WA302-A0ZXP5XXJ	WMCB-05A	230/208	60	1	24	35	N/A	N/A
(X)WA302-A05XP5XXJ	EHWA03-A05	230/208	60	1	31	35	N/A	N/A
( )WA302-A08XP5XXJ	EHWA03-A08	230/208	60	1	47	50	N/A	N/A
( )WA302-A10XP5XXJ	EHWA03-A10	230/208	60	1	57	60	N/A	N/A
( )WA302-A15XP5XXJ	EHWA03-A15	230/208	60	1	83	90	57/26	60/30
( )WA302-AXHXP5XXJ	EHWA03-AXH	230/208	60	1	57	60	N/A	N/A
( )WA302-AXKXP5XXJ	EHWA03-AXK	230/208	60	1	83	90	57/26	60/30

BRANCH CIRCUIT SELECT CURRENT 14.1 OPERATING VOLTAGE RANGE: 197 VAC MIN 253 VAC MAX

SERIAL NUMBER 255F041914424-02 UL FILE NO. SA9951

SUITABLE FOR OUTDOOR USE ALL MOTORS ARE THERMALLY PROTECTED

-- ELECTRICAL RATINGS --

	VAC	HZ	PH	HP	FLA	LRA	RLA
COMPRESSOR	230/208	60	1			73/73	12.2/12.9
OUTDOOR MOTOR	230/208	60	1	1/5	1.5		
INDOOR MOTOR	230/208	60	1	1/3	2.2		
WERV-A3A	230/208	60	1		2.2 (OPTIONAL)		
HEATER PACKAGE				KW	FLA		
EHWA03-A05	240/208	60	1	5/3.75	20.8/18.1		
EHWA03-A08	240/208	60	1	8/6	33.3/28.8		
EHWA03-A10, -AXH	240/208	60	1	10/7.5	41.6/36.2		
EHWA03-A15, -AXK	240/208	60	1	15/11.25	62.5/54.1		

c UL us LISTED
CENTRAL COOLING AIR CONDITIONER
5N73

-- FACTORY REFRIGERANT --

FACTORY CHARGED R22: 77 OZ. DESIGN PRESSURE PSIG 300 HIGH 150 LOW

-- CLEARANCES --

UNIT CASING SUITABLE FOR 0 INCH CLEARANCE.

OUTLET DUCT CLEARANCE 1/4 INCH MINIMUM FOR AT LEAST FIRST 3 FEET OF DUCT. REFER TO INSTALLATION INSTRUCTIONS FOR ADDITIONAL CLEARANCE INFORMATION. MAXIMUM OUTLET AIR TEMPERATURE: 200 DEG. F

THIS MODEL HAS BEEN TESTED AT STATIC PRESSURES FROM 0 TO .5 IN. WATER COLUMN. CONSULT INSTALLATION INSTRUCTIONS FOR MAXIMUM PERMITTED STATIC PRESSURE FOR SPECIFIC EQUIPMENT APPLICATION.

INSTALLER: WHEN INSTALLING OPTIONAL BARD HEATER PACKAGE: PERMANENTLY MARK THIS SERIAL PLATE TO SHOW THE INSTALLED HEATER PACKAGE.

(1) ONLY BARD HEATER PACKAGES LISTED ABOVE ARE SUITABLE FOR USE WITH THIS UNIT. USE OF ANY OTHER HEATER PACKAGE VOIDS WARRANTY AND COULD CAUSE SAFETY HAZARD.

(2) FOR HAZARDOUS VOLTAGE (HACR TYPE PER NEC OR EQUIVALENT)

ACCEPTED FOR USE CITY OF NEW YORK DEPARTMENT OF BUILDINGS MEA 357-93-E

MANUFACTURED UNDER THE FOLLOWING U.S. PATENT NUMBERS 5,485,878; 5,301,744; 5,002,116; 4,924,934; 4,875,520; 4,825,936.

5253-039-0624

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