January 31, 2011

City of Hot Springs
Utilities Department

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Arkansas Department of Environmental Quality
Water Division
ATTN: Cindy Garner
5301 Northshore Drive
North Little Rock, AR 72118

Re: City of Hot Springs
CAO LIS No. 08-099
Annual Report

Dear Cindy,

This letter is submitted to the Arkansas Department of Environmental Quality (ADEQ) to comply with CAO LIS No. 08-099, Attachment A: Schedule of Compliance Activities, Condition II. 1. The City of Hot Springs (CHS) has continued the efforts presented in the document "City of Hot Springs – Response to Consent Administrative Order" dated November 14, 2008 (Response to CAO) with respect to the sanitary sewer collection system. This report is generally submitted in the same format as the two previous annual reports which specifically address the Major Goals presented in the aforementioned November 14th response from the city. However, this report is submitted prior to the February 28 deadline as it also includes specific information relating to the efforts related to addressing the deadline of January 1, 2011 as it relates to dry weather overflows. A large portion of this report is directly related to providing information related to this requirement of the CAO. **We ask that this report be considered as the annual report due by February 28 as well as a status report with regards to the efforts to meet the January 1, 2011 deadline related to dry weather overflows.**

To date, the city has spent and/or encumbered over $11.7 million on projects related to achieving compliance since the CAO was issued in August, 2008. This was primarily made possible through the issuance of bonds in December, 2009 that yielded over $26 million in funds that are dedicated to this effort. The city fully understands that these funds that will be largely expended on projects by 2013, as required by the bond language, and that achieving compliance with the wet weather overflow deadline of January 1, 2018 may likely involve another bond issue for a second round of projects.

On a positive note, the project to replace all of our existing water meters with new, remote read meters that was mentioned in the previous annual report is nearing completion. Early indications are that the installation of new meters will resulted in a notable increase in water

consumption. As our wastewater rates are based on actual water consumption and not a flat rate charge, this could produce an increase in revenues of up to 10% based on numbers seen in November and December of 2010. We will continue to monitor the success of this project and fully expect to continue to increase the health of our Wastewater Fund, which now has a positive cash balance of over $500,000 versus the zero balance that we hovered around at the time the CAO was issued.

We trust that the efforts presented herein illustrate the city's commitment to addressing all of the issues outlined in the CAO. We appreciate the continued cooperation from ADEQ and EPA in working with us as we move forward.

Please feel free to contact me at (501) 321-6860 if you have any questions or need additional information.

Sincerely,

CITY OF HOT SPRINGS, ARKANSAS

Steve Mallett, Jr., P.E.
Deputy City Manager for Public Works and Utilities

cc: City of Hot Springs Board of Directors
Lance Hudnell, City Manager
Larry Merriman, Utilities Operations Director
Aaron Stallmann, Garver, LLC
CAO File

SPECIAL SECTION DEDICATED TO CAO MANDATE TO ACHIEVE COMPLIANCE WITH REGARDS TO DRY WEATHER OVERFLOWS BY JANUARY 1, 2011.

INTRODUCTION:

As this is our first deadline to meet with regards to specific requirements, the first section of this report will be dedicated to describe our efforts related to addressing dry weather overflows to date as well as outlining continued efforts in this regard. Staff feels that it is important to note that of the two years and four months allowed to comply with this requirement, the City of Hot Springs was not able to acquire funding for infrastructure improvements until December, 2009. Based on that fact, the City of Hot Springs basically had only twelve (12) full months in which to begin addressing those items that required funding, which included engineering design, construction, etc. for the major projects. With that in mind, we are extremely pleased with the amount of progress we have made in a short period of time and feel that we have complied with the intent of the requirement. We were able to leverage what little funding we had so that we could hit the ground running once funding became available, which we did. We thoroughly appreciate our Board of Directors, city staff, consultants, contractors and members of the state and federal agencies for their willingness to work together to achieve so much in so little time, relatively speaking.

As stated in previous reports and conversations, city staff has defined certain projects and/or practices that will directly impact current issues related to dry weather overflows and allow us to achieve compliance with the order. As these types of overflows in the Hot Springs Wastewater System are almost entirely related to pump station issues (power outage, lack of and/or failing SCADA units, mechanical pump failure, etc.), our efforts are focused on addressing these shortcomings. The only non-pump station related item identified to address dry weather overflows is the development of an effective pipeline flushing/cleaning program. Therefore, this report related to efforts addressing dry weather overflows will include the following sections:

1. Introduction
2. Pump Station Rehabilitation and Backup Power
3. Major Pump Station SCADA System
4. Minor (Grinder Station) SCADA System
5. Preventive Maintenance Program
6. Pipeline Cleaning Program
7. Summary

Staff feels that these five (5) components represent all of the issues that lead to dry weather overflows. The City of Hot Springs is currently addressing each item listed and our efforts, both to-date and planned, are described herein.

PUMP STATION REHABILITATION AND BACKUP POWER GENERATORS:

The City of Hot Springs has identified that the primary cause for dry weather overflows include equipment failure/malfunction and the loss of power at a pump station. The City retained Garver, LLC to begin evaluating pump stations that were considered to be critical to the collection system. An initial list of 76 pump stations for evaluation was developed by the City based on the condition of the station, frequency of overflows and station capacity. Garver conducted meetings with City personnel to gather any available information for the pump stations on this list. Garver then began performing field investigations of the listed pump stations. Pump operating performance, influent flowrate, power usage, run hours, site measurements, equipment information, general site notes, and pictures were recorded at each station. Collection information in the field regarding pump characteristics and overall site layout was necessary to progress further with the collection system evaluation.
Once the field investigations were completed, the data collected was compiled and developed into a report for each station. The reports included the field information, wet well drawdown calculations, photographs, and recommendations for improvements. An example of these reports is included with this report as Appendix A. A map of the 27 stations included in Project 10A is included as Appendix B.

Based on the recommendations in the reports, Garver developed plans and specifications for Project 10A which included mechanical and safety improvements at 27 pump stations, including lighting upgrades, replacement of power supplies and control panels, general site improvements, installation of 4 - 100KW natural gas generators, installation of 1 - 200KW diesel generator, and installation of 5 manual transfer switches with receptacles to facilitate the use of portable generators. Project 10A was awarded to H&H Electrical for the contract amount of approximately $923,000 and is scheduled to be completed in February, 2011.

Another issue identified by Hot Springs personnel included replacing discharge piping and valve vault components in 6 large pump stations. During inspection of these 6 stations, it was noted that discharge piping was in poor conditions and valves were malfunctioning due to severe corrosion. To address these issues, the City of Hot Springs asked Garver to provide plan and specifications to replace all existing ductile iron discharge piping and guide rails with stainless steel, and to either rehabilitate or replace all valves in the affected pump stations. Plans and specifications are currently being prepared for this task, referred to as Project 10C. The project is expected to ready to advertise in February, 2011.

Three of the major pump stations in the Hot Springs collection system have been identified for replacement. Two of the stations will be converted from drywell/wetwell can type stations to submersible, and the third will be a rebuild of an existing submersible pump station. Currently, Garver is conducting a hydraulic evaluation of the collection system and force main associated with each station. Once the hydraulic analysis is complete,

construction plans and specifications will be developed for this project. Garver anticipates this project to advertise and bid in the first quarter of 2011.

The approach for evaluating the pump stations has evolved over time and evaluations are now being performed based on drainage basins. This approach allows for measuring the capacity of a particular pump station and determining if the pumps and force mains are adequate. The City of Hot Springs and Garver have delineated the city into major drainage basins. Evaluation and design are currently being completed on the Mazarn and Fairwood drainage basins. Field evaluations have been completed for 83 pump stations and reports have been compiled for 49 pump stations.

Design phase estimates on household wastewater contributions, inflow and infiltration, and peaking factor are being used to calculate the total peak flow for each pump station rated above 5 Hp in the Mazarn basin, starting with pump station furthest "upstream" from the basin collection point and working "downstream". Total peak flow has been calculated for 59 pump stations in the Mazarn basin. System curves and hydraulic grade lines have been developed for 7 major pump stations. After completing system curves for every pump station, analysis and design can begin on upgrading pump stations and force mains to eliminate wet weather SSO. Other design approaches are being considered in this phase such as consolidating several smaller pump stations into one new pump station or into an upgraded existing station. This approach could reduce operational costs by having fewer pump stations and reducing staffing cost needed for maintenance and inspection.

The city has also completed a project which involved upgrading and rehabilitation of the Molly Creek Pump station, one of the systems largest, has been completed and is in service.

Currently, we are addressing issues at a number of our wastewater pumping stations related to backup power, mechanical dependability and SCADA monitoring. While the preceding information describes our current efforts, we do realize that it does not address all of our pump stations. In addition to the pump stations detailed above, there are a number of duplex grinder stations used for small subdivisions and commercial businesses that will also be evaluated with regards to mechanical dependability, back-up power and SCADA. These evaluations will be performed once all major stations and individual grinder stations are addressed.

A detailed listing of the improvements listed above is included in Appendix C of this report. If any agency would like to have copies of any or all of the aforementioned pump station reports, design calculations, construction plans, etc., please contact us and we will provide them as requested.

MAJOR PUMP STATION SCADA:

Obviously, one of the most critical shortcomings within our wastewater collection system is the remote monitoring of our 3,000+ wastewater pump stations. Currently, only a small portion of these stations have remote monitoring and of those that do, many of the units are obsolete and/or are no longer supported by the company that supplied them. This lack of remote monitoring is primarily responsible for the inability for staff to respond until after an overflow occurs. For this reason, the City of Hot Springs entered into contract to develop a SCADA Master Plan to provide a comprehensive, standardized remote monitoring system utilizing equipment that incorporates an open architecture that is not proprietary. This would allow us to continue to build upon a stable, standardized system with compatible equipment that can be operated and programmed by anyone who understands basic PLC programming. This plan was completed in 2008.

With regards to implementation of the SCADA Master Plan, the SCADA Radio System was installed in December 2010 and is now operational. This consists of a new Master Radio at the Ouachita Water Treatment Plant with connections to the new computer based Wonderware System Platform Human Machine Interface (HMI) system. A new radio repeater is installed at the West Mountain Tower which will provide coverage for the water distribution system and sewer collection system. The first radio based Remote Telemetry Unit (RTU) is installed at Music Mountain Pump Station. This completes the installation of the basic communications backbone and we can now begin installation of Contracts for design of the first 80 Remote Telemetry Units will be approved in February, 2011 to begin installation shortly thereafter.

Once the contract for the first 80 stations is underway, Brown Engineers will begin working on installation of SCADA on the next phase of stations. It is our intention that all of our pumping stations have monitoring, whether it be the simple power/high level alarm that we are installing on our grinder stations at $800 per station or the more complex device that is being installed at our major stations capable of providing much more information regarding the station estimated at $10,000 each. We plan to perform all of this work within the current program developed to comply with the CAO.

A detailed listing of the improvements listed above is included in Appendix C of this report.

GRINDER STATION SCADA:

One new major positive development that has occurred during the past year that will make a huge impact on the number of wet and dry weather overflows is the development of a device that will cost-effectively provide alarm status of the 2845 individual wastewater grinder stations that we have in our system. Currently, none of these stations are equipped with remote monitoring devices, however, they are equipped with visual and audible alarms.

Therefore, we are dependent on area residents to notify us of problems with these stations, hopefully, before an overflow event occurs. Many of these stations, however, are located at homes that are not full-time residents and alarms may go un-noticed for some time if the property owners are not home. Also, the alarm system may be inoperable and we have no way of knowing without individually checking each station.

This system, which utilizes our newly installed automated water meter reading system, will include a modified electrical metering device that will deliver a high level or power fail alarm to our central SCADA system via the new remote communications network. This will allow us to respond independently without relying on homeowner notification and greatly enhance our ability to prevent overflows on grinder stations. This project was bid on November 15, 2010 and a reputable local electrical contractor was awarded the bid in the amount of $772,115.50 on December 7, 2010. Including the cost of engineering design, application development, programming and system integration, the cost for each installation is approximately $458 per site. This cost is substantially lower than any traditional RTU and will provide the critical data to our staff real-time. The contractor is expected to begin this work in early February, 2011 with a completion time of 270 calendar days. Again, we did not propose this work in the original scope presented in our response to the CAO as we were not aware of any practical way to effectively monitor these stations at a reasonable cost. We are grateful to our consulting engineer, Brown Engineers, and SENSUS metering company who worked together to craft a solution to this historical issue.

A detailed listing of the improvements listed above is included in Appendix C of this report.

PREVENTIVE MAINTENANCE PROGRAM:

Staff fully understands that a comprehensive and effective preventive maintenance program is key to pump station and pipeline reliability. This is a major component of our long term effort to address both dry and wet weather overflows and is a major focus of ours in 2011. Currently, the majority of our in-house staff of 19 positions that are dedicated to pump station maintenance and repair spend the large majority of their time making repairs to our stations, thus making it difficult to find the time and personnel to perform routine maintenance. We have purchased the Cityworks asset management software and are currently using it for work order purposes. However, we have not fully utilized it for scheduling preventive maintenance, but are in the process of gathering information on our extensive inventory of pump station equipment so that it can be entered into the software and begin generating scheduled maintenance tasks related to this equipment. We understand that we must dedicate personnel to perform these tasks independently of our current repair efforts in order for the program to work effectively.

We have recently hired an outside applicant for the position of Lift Station Manager. This person has an extensive background in equipment repair and maintenance. He will be

charged with overseeing the development and implementation of a comprehensive preventive maintenance program, either by re-assigning existing personnel and/or utilizing outside contracts in a long or short term capacity as needed. We expect to have this system in place by end of year 2011.

PIPELINE CLEANING PROGRAM:

Staff continues to evaluate and revise our pipeline cleaning program and are currently formulizing our list of trouble areas. We are reviewing our overflow reports that are a result of grease, etc. and making sure any of these that appear to be repeat offenders are on the list to be periodically cleaned as a preventive measure.

In July of 2002, the City of Hot Springs Board of Directors amended the City's Pretreatment Ordinance to include regulation related to the design and construction of grease waste producing businesses' grease interceptors, oil separators and grease recovery device (GRD) units. The City's pretreatment division developed a networking relationship with the local health department and the City's code enforcement division to effectively enforce the grease interceptor ordinance. New businesses were required to comply with the conditions outlined in the ordinance prior to the opening of their business. Existing businesses were given six (6) months to bring their facilities in compliance.

The pretreatment division instituted a door to door policy in which every grease waste producing business connected to the utilities collection system were notified of the criteria and required to come in compliance with the ordinance standards. Also, routine follow up assessments are conducted and cleaning schedules are set for each grease waste producing business by the pretreatment division in order to assure compliance with the ordinance standards. An assessment of commercial businesses and/or residential dwellings is conducted anytime a complaint is received from code compliance, utilities collection, sewer lift station divisions and the health department.

The City's SSO's and sewer line blockages have reduced as a result of regulating the design, installation, cleaning schedule and maintenance of the businesses' grease interceptors, oil separators and grease recovery device (GRD) units. Educating the general public about the hazards associated with the disposal of cooking grease has had an impact in reducing SSO's.

As we reduce the flows and velocities in our pipes over time through our system repair and improvements, the conditions will lend themselves to an increase in blockages due to grease. With this said, we must continue to keep our fats, oils and grease program a top priority for our Pretreatment Division.

SUMMARY

The City of Hot Springs is proud of the accomplishments to date and encouraged by the trends we are beginning to see related to plant flows, overflow volumes, etc. While we have not eliminated dry weather overflows, we have seen a reduction in overflow volumes due to our in-house efforts targeted at reducing response times, improving notification methods, etc. Our substantial investment to-date and projects that are in progress and/or in the design phase is a clear indication of the City of Hot Springs' commitment to compliance related to the reduction and/or elimination of dry and wet weather overflows. We feel strongly that the plan we currently have in place along with the cooperation of state and federal agencies, which we have enjoyed to date, will result in achieving compliance within the timeframe stated.

The City of Hot Springs also realizes that the work cannot stop once compliance is achieved, which is why the city feels that the preventive maintenance, pipeline cleaning and pre-treatment programs much continue to be developed, implemented and/or improved. Addressing these components, as well as continuing to hire, keep and train qualified staff, is imperative to continually improve on and preserve the work now being performed.

ANNUAL STATUS REPORT

1. ACHIEVE COMPLIANCE WITH REGARDS TO DRY WEATHER OVERFLOWS BY JANUARY 1, 2011.

See special report section above.

2. ACHIEVE COMPLIANCE WITH REGARDS TO WET WEATHER OVERFLOWS BY JANUARY 1, 2018.

On August 27, 2010, the City of Hot Springs submitted the original System Evaluation and Capacity Assurance Plan (SECAP), along with an update that was current at the time of that correspondence. As the update submitted at that time is only 4 months old, there would be very little change of consequence in an update presented at this time. Therefore, we ask that the documents submitted on that date be considered as current. If you are in need of additional copies of either document, please let us know and we will provide them immediately. The next update will be developed at the time the hydraulic model is complete and system capacities can be determined. We expect to have this information in the latter part of 2011.

With respect to our efforts related to wet weather overflows, all items mentioned in the special report related to dry weather overflows contained herein will obviously contribute to satisfying the wet weather overflow issues as well. In addition to those efforts, CHS has retained RJN Group, Inc. to perform a Sanitary Sewer Evaluation Study to evaluate the collection system and identify potential deficiencies that may require attention. This study includes a system wide flow monitoring program which has been completed. The results, which have been presented to ADEQ and EPA, have provided information that has allowed us to prioritize our efforts related to the physical inspection of the collection system. To date, all of the 12,000+ manholes within the system have been physically inspected and any deficiencies found have been recorded. Of the over 12,000 manholes inspected, 5,500 will require some type of corrective action, ranging from sealing of the ring to total replacement. RJN is currently developing the first phase of manhole repairs which is expected to bid in February with a target completion date of January, 2012. Subsequent phases of manhole repair will follow over the next 12 months with the goal of having all phases of manhole repairs complete by the end of 2012.

In addition to the manhole repairs, RJN has completed smoke testing of all the system's gravity pipelines and are nearing completion of CCTV on the lines that indicated the possibility of problems during the smoke testing efforts. The first phase of pipeline replacement will target the worst areas found to date and is expected to be ready to bid in May, 2012 with a target completion of mid 2013. Future phases of pipeline replacement

projects will be developed and bid in order to comply with the January 1, 2018 deadline related to wet weather overflows and may require that the city obtain additional funding through future bond issues.

Several major projects that will have a direct impact on our efforts to address wet weather overflows are updated below:

Fairwood Force Main/Pump Station Improvements - This project, with a total cost of approximately $1.9 million, is currently in progress. This project consists of upgrading the Fairwood pump station, one of our largest, and installing a new large diameter force main that will provide additional capacity within our collection system and help prevent capacity related overflows. This project was originally bid in 2009, but due to lack of sufficient funding was placed on hold. It was re-bid in 2010 and is expected to be complete by end of 2012.

Molly Creek Pump Station - This project which involved upgrading and rehabilitation of the Molly Creek Pump station, one of the systems largest, has been completed and is in service.

Manhole Rehabilitation Using Uretek Repair Method – The city has entered into contract directly with Uretek ICR for sealing of manholes utilizing their patented expanded polymer material. The city has completed to contracts with Uretek ICR totaling $150,000 which provided for repair of approximately 150 manholes and one pump station.

Hot Springs Creek Pump Installation – City staff has installed a new replacement pump at the Hot Springs Creek Pump station, which is our largest station within our system. This improves the reliability of this pump station in wet and dry conditions.

Annual Wastewater Pipeline Replacements – The city currently develops plans and specifications for pipeline replacements based on trouble reports and known deficiencies. Based on our limited funding in the past, we have spent a little more than $200,000 over each of the past 2 years.

All of these projects, as well as money others listed within this report, are included in a comprehensive wastewater project summary report attached to this report as Appendix C.

3. DEVELOPMENT OF A COMPREHENSIVE MAINTENANCE PROGRAM FOR ALL WASTEWATER COLLECTION SYSTEM ELEMENTS AND DETERMINE PROPER STAFFING LEVELS TO COMPLETE THE WORK ORDERS ISSUED BY THE SYSTEM.

Garver, LLC continues to work with staff to locate and/or obtain operations manuals for existing and newly installed pump station equipment. As this data is collected, the operations

manuals will be the basis for development of a routine preventive maintenance program utilizing the city's existing Cityworks software. The data for all of the stations that have been and continue to be evaluated by Garver is currently in a form that can be entered into the maintenance software. This data entry process will continue throughout the evaluation process as it progresses over the next few years. Again, this is perhaps the most vital component of the city's long-term efforts to minimize dry weather overflows due to mechanical problems.

4. OBTAIN ADEQUATE FUNDING REQUIRED TO COMPLETE PROJECTS REQUIRED FOR COMPLIANCE.

As mentioned in this and previous reports, the City of Hot Springs Wastewater Fund was basically at a zero fund balance at the time the CAO was issued and struggled to include substantial capital improvements in the annual budgets. It was obvious that in order to correct the issues included in the CAO, the city would need to obtain funding that was initially estimated at over $37 million over the next ten years. The city was successful at securing funding in excess of $26 million to address the first round of capital improvements. We are approximately one third of the way through the initial phase of projects to be funded by this money. Additional funding will be obtained as necessary upon evaluation and analysis of the first phase of projects. The city is committed to obtain adequate funding and perform the work necessary to fully achieve compliance with the CAO.

5. IMPLEMENT AN INCREASE IN WASTEWATER RATES IN EARLY 2009 TO SUPPORT PAYBACK OF FUNDING MECHANISM.

As mentioned in the 2010 annual report, the city was successful in increasing wastewater rates to a level that will support a $26 million bond issue in 2009. In addition, we are currently in the final stages of a $10.5 million water project that replaces all of our old, manual read water meters with new, automated meters. As our wastewater revenues are based off of actual water consumption and not a flat rate, any increase in water consumption as a result of new, more accurate meters will result in a corresponding increase in wastewater revenues. We are optimistic that we will begin to realize the full impact of these newer meters in 2011, however, any projections and/or commitments related to wastewater are not based on any extra revenues being generated from this source. We also have secured a contract with Economists.com, our rate consultant based in Dallas, Texas, who is currently conducting a review of our current water and wastewater rates to ensure that we are progressing as projected. We remain confident that the financial position of the city's wastewater system is now sufficient to facilitate the needed improvements that will satisfy the CAO requirements within the timeframe set.

6. IMPLEMENT THE RECOMMENDATIONS OUTLINED IN THE RECENTLY DEVELOPED SCADA MASTER PLAN.

The city continues to include funding in the annual wastewater capital budget to implement general system wide SCADA improvements that will accommodate the large SCADA projects that are specifically mentioned in the special report included herein. The special section of this report specifically outlines the status of the major efforts related to implementation of the Master Plan. These improvements are vital in addressing both dry and wet weather overflows as reporting problems is imperative, regardless of the conditions that create them.

7. DEVELOP CRITICAL INVENTORY LIST AND ENSURE THOSE PARTS ARE IN STOCK.

As stated in previous annual reports, this item has been completed. We are currently improving the inventory and parts warehouse operations to further insure that our records are accurate and all materials are properly stocked and tracked.

8. EVALUATE EXISTING PERSONNEL WITH REGARDS TO EFFICIENCY, WORKLOAD, JOB DUTIES, ETC. AND IMPLEMENT NECESSARY CHANGES

In the 2011 Utilities Budget, funding was included to hire a Utilities Director and re-establish the position of Projects Manager. Over the past two years, we have basically combined these two positions into a single position, Utilities Operations Manager. Based on the increasing number of projects that are being undertaken as described within this report and otherwise, city administration feels it is prudent to dedicate someone to monitor the many engineering and construction contracts associated with this effort. Larry Merriman, who was originally hired as the Project Manager due to his extensive knowledge and experience related to the inspection and administration of large construction contracts, has spent the last two years as the Utilities Operations Director and has concentrated on operational issues related to our personnel, including overflow response time, pipeline cleaning, material inventory, training, etc. Mr. Merriman will now return to his original position as Project Manager and a Utilities Director position is expected to be filled in February, 2011.

We will also be filling the vacant position of City Engineer who will provide valuable input and technical engineering advice related to the design and construction of the various wastewater projects. We feel that these proposed changes in 2011 will best position us to move forward and maximize our funding as well as continue to improve our internal operations.

We have also recently hired a new Lift Stations Manager as our previous manager, Craig Stevens, has retired. The new manager is Bobby Harris and he has extensive experience in machinery repair and maintenance and had developed work order systems for that repair and maintenance. These talents, we feel are critical in the manager's position as he will be

instrumental in the task of developing a preventive maintenance work order system as well as refining our current emergency work order system. We will expect Mr. Harris to develop and/or continue to evaluate and benchmark our Lift Station Division's efforts and strive to improve in areas of critical importance.

9. PROPERLY TRAIN ALL PERSONNEL IN ACCORDANCE WITH EXISTING AND FUTURE POLICIES IN REGARD TO APPLICABLE PROCEDURES IN THE WASTEWATER SYSTEM.

The city has, once again, sent appropriate personnel to the annual CMOM conference in Austin, Texas. We continue to utilize this training opportunity to educate new staff attendees and network with others in our situation. We have realized a notable benefit by developing a relationship with administrative staff with the City of Fayetteville, Arkansas, as they have been very successful in addressing the same overflow issues in their city. We have taken key staff members to Fayetteville in 2010 to further visit with staff and see firsthand the improvements made in their system. We very much appreciate the assistance and insight provided by David Jergens and his staff in Fayetteville. We also continue to use this opportunity to meet with EPA officials and keep up with the rules and regulations that affect our system.

The city continues to evaluate and attend appropriate training which is applicable to our effort as we must ensure personnel are adequately equipped and trained to perform required duties. Several staff members attended a pump station operations and maintenance class in October, 2010 to further increase their knowledge of the industry and keep up with new technology.

The city's wastewater collection division continues to work closely with RJN, our contractor responsible for conducting our collection system survey, and is receiving valuable on the job training as it relates to our investigative efforts.

10. UTILIZE THE EXISTING GIS DATABASE TO INTEGRATE THE WORK ORDER SYSTEM WITH THE MAP FEATURE TO IMPROVE MANAGER'S ABILITY TO ANALYZE WORKLOAD AND IDENTIFY TROUBLE AREAS.

The city continues to rectify and update our water and wastewater GIS maps including ordering revised aerial base maps to be delivered in early 2011. These maps can and will be utilized in the development of a graphically based work order system that provides an ease of analysis and reporting that we currently do not have. We currently utilize the Cityworks work order system but have not fully utilized the graphic capabilities, but have initiated this process internally.

ADDITIONAL INFORMATION:

Schedule of Projects as Provided in Previous Correspondence

The following table lists the proposed projects intended to address the goals described above. Dates have been revised as necessary based on the latest information. A much more detailed listing of these generalized projects is included in this report as Appendix C.

Description	Estimated Percentage Complete	Current Estimated Completion Date
Collection System Survey Phase I – Flow Metering	100%	COMPLETE
Collection System Survey Phase II – MH Inspection	100%	Summer 2010
Collection System Survey Phase III – Smoke Testing	100%	Fall 2010
Treatment Plant Expansion Study	100%	Fall 2009
Fairwood Force Main	10%	January 2011
Pump Station SCADA, Phase I	0%	Fall 2011
Pump Station Mechanical Upgrades and Standby Power, Phase I	95%	February 2011
Pump Station SCADA, Phase II	0%	Summer 2013
Development of Wastewater System Model	80%	Spring 2011
Collection System Manhole Repairs, Phase I	0%	January 2012
Pump Station Mechanical Upgrades and Standby Power, Phase II	0%	January 2013
Collection System Pipeline Repairs, Phase I	0%	June 2013
Pump Station Mechanical Upgrades and Standby Power, Phase III	0%	January 2018
Collection System Manhole Repairs, Phases II-IV	0%	January 2018
Collection System Pipeline Repairs, Phase II-IV	0%	January 2018

Wastewater Plant Flows

We have seen a very promising trend as a result of the work performed to date related to dry weather plant flows. Due to manhole sealing, pipeline repairs, etc., we have noted that minimum dry weather flows indicate that the efforts made to date are already having a positive impact on reducing inflow and infiltration.

We are encouraged by the trends presented below and feel confident that that efforts of the past year, while relatively small when compared to the overall scope, have made a noticeable impact on dry weather flows. While it is still too early to provide much history on wet weather flows, we are also very encouraged by similar trends.

Closing Remarks

In closing, the City of Hot Springs wastewater division continues to improve both its operational and financial status. The City of Hot Springs Board of Directors is dedicated to insuring that staff is fully equipped with the means to meet the requirements of the CAO, and we again hope that this is evidenced by the major accomplishments over the past 12 months.

CITY OF HOT SPRINGS
WASTEWATER PUMP STATIONS

HOUSLEY ROAD EVALUATION

GARVER | ENGINEERS
WATER

PROJECT NO.: 08059030

OCTOBER 1, 2008

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Note: Additional photographs are also included in Appendix B.

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SUMMARY

Housley Road is a small submersible station located in the low part of the drainage area and during dry weather it seems that one pump operated with a back-up pump is adequate to handle the incoming flow. The station is showing its age of 24 years, obtained from the inspection date of November 1984 provided by City of Hot Springs personnel. The 4 to 6-inch discharge piping in the valve vault needs to be sand blasted and painted. The top guide rail mounting brackets need replacement. During the pump station site inspection, Pump #1 and Pump #2 were tested. Debris was present in the wet well and may have interfered with the draw-down test for Pump #1.

The electrical panels are functioning properly but, based on the data recently collected, may need to be updated. There is no provision for standby power on location, and phase monitoring is not currently utilized. Relocation of the water service from the front of the electrical panels, or relocation of the electrical panels, is recommended to address safety concerns and trip hazards.

Air samples collected from the wet well vent indicated small amounts of hydrogen sulfide (0.1 ppm) and trace amounts of mercaptans (detection level of 0.2 ppm). Considering the low concentration and the current remote location of this station, installation of odor control equipment is not currently recommended. (See Air Sample report in Appendix E)

The concrete wet well and valve vault appear to be structurally sound and adequate to handle the existing station flow requirements.

CONDITION OF EXISTING STATION

The pump station is located adjacent to Amity Road in a fenced area following the local drainage. The fencing appears to be in adequate condition, but some security and work-lighting should to be installed on a switch or a night watcher to provide operations personnel light for night-time service and increase security.

Housley Road sewage pump station is a duplex submersible station with a concrete wet well and concrete valve vault built into the station wet well. Wastewater from the Housley Road Station is pumped into a 12-inch force main which also collects flow from the Mt. Carmel, Carolyn Acres, Hwy 290, Quail House, and Tanglewood stations, all of which flow into the Hot Springs #3 Pump Station. The pump installed at the Housley Road Station are Peabody Barnes Model No. 6SEH2504, 30 HP, 1,750 RPM, 60 Hz, 460 volt 3-phase, oil filled motor/pump combination submersible non-clog pump.

Pump #1 and pump #2 are both operational, providing the station back up and high flow capabilities. Pumps alternate with each cycle.

An additional safety concern that was noted at each pump station evaluated was the presence of used hypodermic needles in the wet wells. Extreme caution should be exercised by all personnel

working in the wet wells or on the pumps to avoid potential exposure to infectious diseases as a result of accidental contact with the discarded needles.

The operational status of the power factor capacitors could not be determined, however, due to the size of this station and the relatively small power usage, renovation of these components may not be economically feasible. At this time, it does not appear that Entergy meters kVA demand at this location, and for this reason, an improved power factor would not provide associated electricity cost savings. It should be stated, however, that Entergy reserves the right to monitor kVA usage at any time, in which case the energy bill would reflect a kW demand charge of 90 percent of metered kVA demand.

The station is also fitted with a 4-inch suction and 4-inch discharge piping in the valve vault for emergency pumping by a portable pump. No standby power provision was observed.

The SCADA equipment at Housley Road is a SCADA Pack with an antenna system and appears to working intermittently from the SCADA run time reports provided. A history of data is not available so a long-term evaluation of the SCADA functionality is not possible at this time.

Refer to Appendix A for the pump station inspection, Appendix C for pump curves, and Appendix E for Air Sampling results.

PERFORMANCE OF EXISTING STATION

Housley Road Station is supplied power from an open-delta transformer connection at 480 volts line-to-line. The phase voltages measured at the time of the site visit varied from 507 to 497 volts, approximately 2% variation. Electrical amperage imbalances were observed when checking the current during the operation of Pump #1 and Pump #2. The measured amperage draws on the 3 phases was as follows: A- 23, B - 22, C - 24 for Pump #1 and A- 34, B - 32, C – 33 for Pump #2. This amount of phase imbalance is unusual, and continued observation of this pump is suggested. These measurements do not match the catalog expected current draw of about 36 amps for the 30 HP motor with 6-inch discharge, but this may be attributable to pump wear.

The wet well draw-down test for Pump #1 measured 67.32 gpm, and pump #2 measured 90 gpm. Pumps 1 & 2 together pumped 202 gpm. The inspection team was unable to collect readings, therefore the system head is unavailable.

The wet well draw-down tests indicated that dry weather inflow is approximately 22 gpm, while Pump #1 was capable of pumping approximately 67 gpm and Pump #2 approximately 90 gpm. The SCADA run hours indicate a dry weather run time of 7.0 hours per day. During a period of heavy rain, the pump run time increased to 14 and 16 hours per day. A calculated run time based on the wet well draw-down test indicated that if the dry weather influent flow was approximately 22 gpm, resulting in approximately 32,256 gallons per day or 410 minutes (6.83 hours) per day of pumping time per day. These results are similar to the Healy-Ruff SCADA system reports.

Energy summaries obtained from Entergy for the Housley Road Station indicate that power usage increases during times corresponding to above average rainfall. Figure 1 shows a comparison

between the monthly kilowatt hours billed and the measured rainfall for that month. (Note that the electric bill is not issued until a period of time after the energy has been used.) There seems to be a correlation between the actual month's rainfall and the energy used by the pump(s). Due to lack of run times and historical data, more detailed assessment cannot be performed at this time. However, the similar peak times on the graphs suggest system inflow and infiltration.

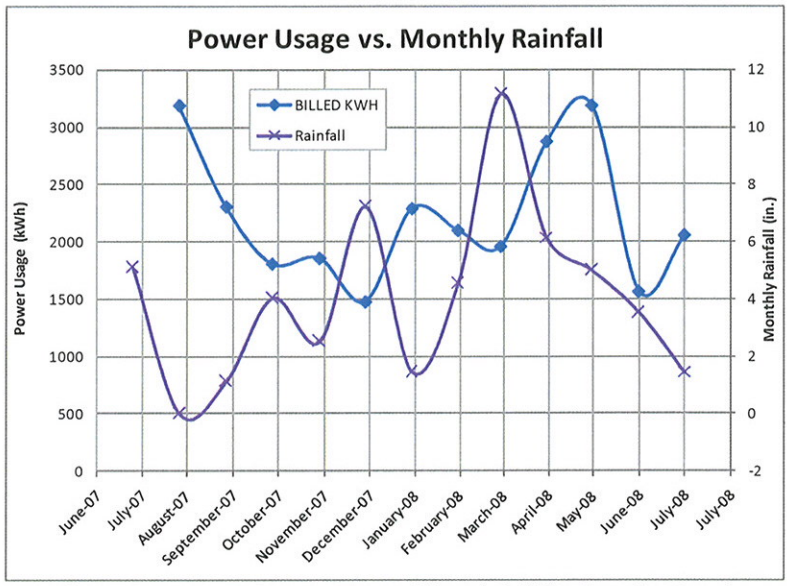


Figure 1. Power Usage vs. Monthly Rainfall for Housley Road

Figure 2 shows trend lines of both the billed kilowatt hours and the billed kilowatt demand over the course of a year.

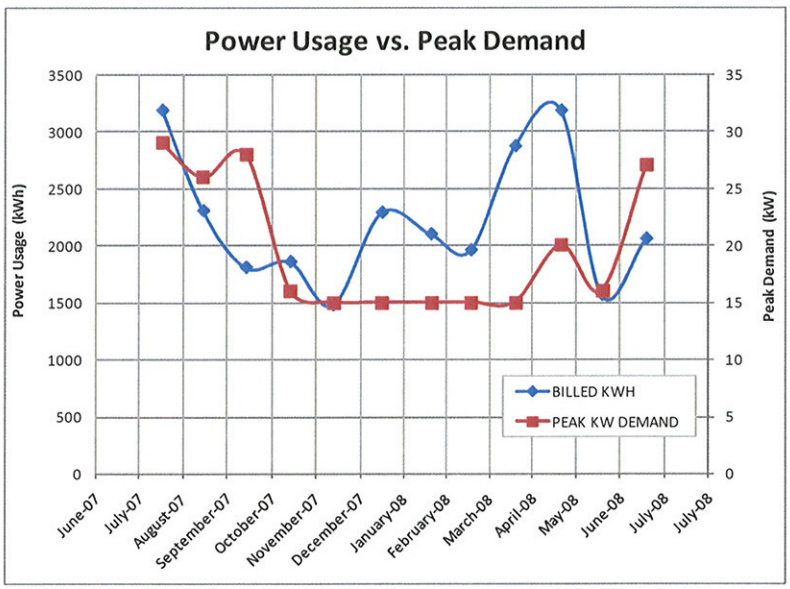


Figure 2. Power Usage vs. Peak Demand for Housley Road

There was no provision observed for standby power, and it is recommended that a stationary standby power source is located on site. The recommended generator is natural gas powered, 100kW, Aluminum Sound-Attenuating enclosure, with separate 200A NEMA 4X analog Automatic Transfer Switch (ATS). The aluminum housing for the generator and stainless steel (NEMA 4X) for the ATS are the preferred housing options for corrosion resistance. This unit has been priced by the local Kohler supplier at around a total price of $27,300. If preferred, a diesel unit can be obtained in a comparable price range. The unit can be provided without the added cost of the ATS, but a separately purchased Manual Transfer Switch of this size will cost a similar amount. Since the ATS includes phase monitoring and is relatively similar in cost to a manual switch, it is the recommended option. For an approximate cost breakdown for this unit, see Appendix G. Modern phase monitoring equipment should be installed at the control panel to protect the pumps in the event of phase failure, phase imbalance, or other damaging circumstances. Refer to Appendix F for the typical configuration of this provision and general discussion of this and other electrical issues.

SPECIFIC LIMITATIONS

Historical data for this station was not available from the City of Hot Springs or from the supposed pump manufacturer representative. Additional factors have limited the engineers' evaluation of the pump stations, including the following:

- Limited run time data,
- No trending of pump run times,
- No record drawings or "As Built,"

WORK ORDERS

A maintenance work order plan for the pump stations has been developed in two different formats for use by the City. The first format is a checklist that highlights the items that should be inspected during a given time period. The second format is a detailed document listing all items that should be inspected.

RECOMMENDATIONS

A complete upgrade of the electrical panel and power factor capacitors would increase the reliability of the electrical controls. However, as the existing panel appears to be fully functional, it would also be difficult to justify the $10,000 to $15,000 expenditure for electrical panel replacement. Entergy's kW demand charge does not currently appear to account for power factor, so costs for power factor improvements would also be difficult to justify.

- Install a night watcher or pole lighting on a switch to provide working light,

- Install 100kW generator with Automatic Transfer Switch,
- Install phase monitoring equipment before starters,
- Sandblast and paint piping and valves in valve vault,
- Relocate water hydrant,
- Replace guide rail brackets and top guide rail mountings,
- Additional inspection of the pumps to determine of repair or replacement is necessary,
- Keep a station log book in the electrical panel and record station visits, pump run hours maintenance performed, alarms and pump trips (power losses, seal failures, over temps, pump clearings, odor complaints, grease removal), and
- System analysis of the pump stations from Mt. Carmel to Hot Springs #3.

COST ESTIMATE

To complete the items listed above, the total estimated cost is $54,028. For additional details, Appendix G contains a line item unit cost schedule.

APPENDIX A

Field Notes

PUMP STATION INSPECTIONS
08059030 Hot Springs WW - Project Pump Station

Date:	7/23/2008	Garver Personnel:	SJG,AJK,SFF	Station #:	
Name of Station:		HOUSLEY ROAD			
Nearest Main Roadway(s)/Intersection		Amity Road			
Latitude/Longitude:		N 34 25.598'	W 93 6.356'	EL: 421 FT	
INSPECTION ITEMS					
Type of Station:		Submersible			
Number of pumps:		2			
Pump No. 1 Information					
Manufacturer:	Peabody Barnes	Type:		ID #:	Serial#: 68027IR
RPM:	1775	Impeller:		Suction Size:	5 inch
Discharge size: 6 inch					
Other Notes:		Model 6SEH2504 or Barnes Series 6SE-L Model 6SE36044L			
Existing Pump rated capacity					
Estimated capacity:					
Hour Run Meter:		07519.0			
Pressure Gauge Reading:					
Motor No. 1 Information:					
Name:		I.D.		HP:	30
Volts:	480	Amps:		Hz.	
Phase:	3	RPM:		Frame:	
Motor kva code		Fuse/Breaker	70A BRK	Starter Size:	
Heater		Temp Rise:		Service Factor:	
Other Notes:					
Nameplate EFF		PF Cap. kVAR rating	?? 216F, UL Listed	PFC Fuses	
Motor Feeder Size		Motor Feeder Length		Conduit size	
Amps A:	15	Amps B:	16	Amps C:	15

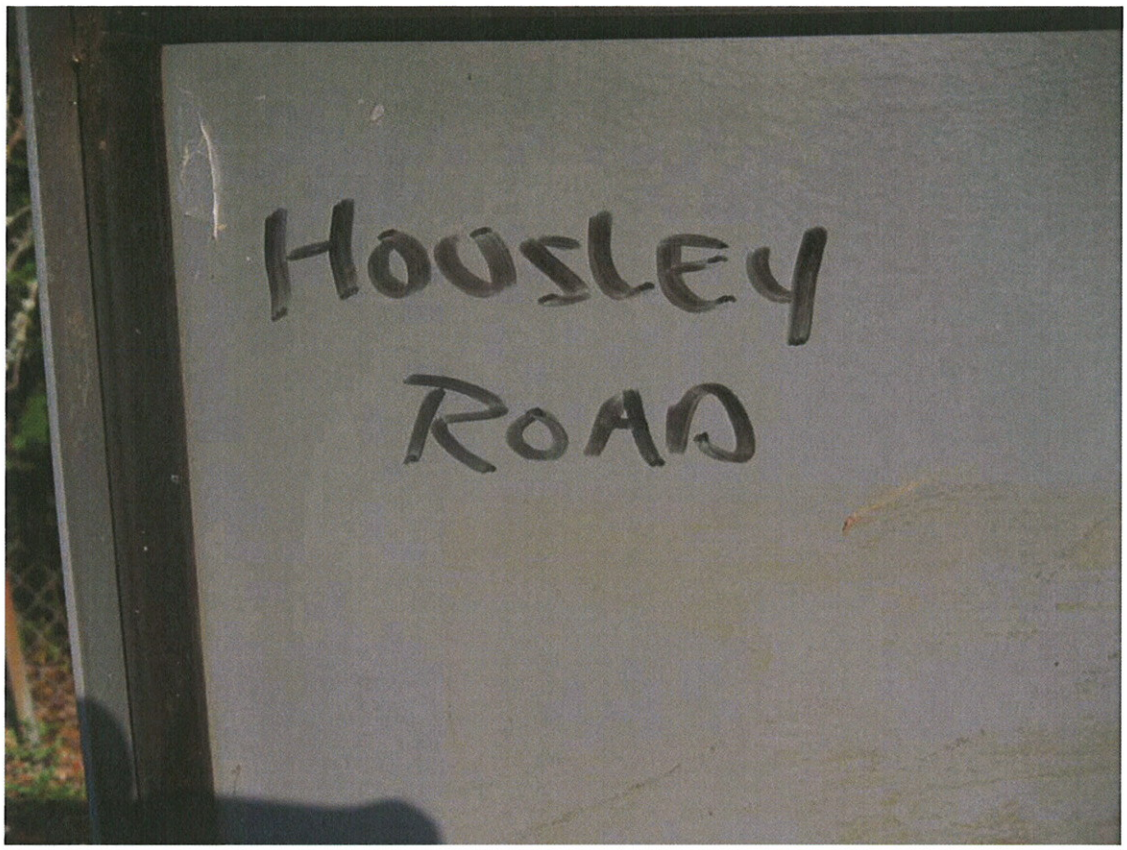
Pump No. 2 Information					
Manufacturer:	Peabody Barnes	Type:		ID #:	
RPM:	1775	Impeller:		Suction Size:	5 inch
Discharge size: 6 inch					
Other Notes:		Model 6SEH2504 or Barnes Series 6SE-L Model 6SE36044L			
Existing Pump rated capacity					
Estimated capacity:					
Hour Run Meter:		12926.0			
Pressure Gauge Reading:		33 PSI from Hot Springs			
Motor No. 2 Information:					
Name:		I.D.		HP:	30
Volts:	480	Amps:	45	Hz.	60
Phase:		RPM:		Frame:	
Motor kva code		Fuse/Breaker		Starter Size:	
Heater		Temp Rise:		Service Factor:	
Other Notes:					
Nameplate EFF		PF Cap. kVAR rating	?? 216F, UL Listed	PFC Fuses	
Motor Feeder Size		Motor Feeder Length		Conduit size	
Amps A:	24	Amps B:	25.5	Amps C:	24

Pump #1 Wet Well Draw Down Test					
Start Time:	0				
Wet Well Start Level:	220"				
Stop Time:	1min				
Wet Well Stop Level:	220 1/2"				
Flow Rate:					
Pressure:					
Pump #2 Wet Well Draw Down Test					
Start Time:	0				
Wet Well Start Level:	219 1/2"				
Stop Time:	1min				
Wet Well Stop Level:	220 1/4"				
Flow Rate:					
Pressure:					
Pump #1 + #2 Wet Well Draw Down Test					
Start Time:	0				
Wet Well Start Level:	219 1/2"				
Stop Time:	1min				
Wet Well Stop Level:	221 1/2"				
Flow Rate:					
Pressure:					
Wet Well Influent Test (No Pumps ON)					
Start Time:	0				
Wet Well Start Level:	223"				
Stop Time:	4min 15sec	8min	10min		
Wet Well Stop Level:	222"	221 1/2"	220 1/2"		
Check or Control valves:					
Wet Well Dimensions:	14'x14'x282" **LxW dimen. Include ~12" wall thickness. Subtract ~6" from D.				
Inlet Size:		Num. of Inlet Lines			
Other Notes:					
At vent do H_2S test if pungent odor is present?					
H_2S conc.:		Organics:		Other odors:	
Other Testing:					
(Note Air Sampling Sheet)					

Any Scrubbers? If so what type:					
Name of Equipment:					
Last Checked:					
Other Pump Station Comments:					
Electrical Power Utility		ENTERGY			
Electrical Meter Acct Number		3190350			
Meter Multiplier			KW Demand (read)	15.14	
Electrical Service Notes:					
OH or UG:	OH	kVA Rating:	25 & ?	Phase	3
Voltage	480	Connection:	OPEN-DELTA (Vphase=480/0/480; Vline=480)		
MCB:		AIC:		Fuse:	100A
Incoming Wire/Conduit Size/Length		[3#2+1#6?N]	Past Disconnect: 2 SETS-[3#6+1#6N]		
Main Gear Mfg		Catalog/Model/Shop Order No.			
Date of Install		General Condition			
Space Heater KW			Thermostat?		
Vent Fan HP			Volts		
Lighting					
Functional?			Source		
Num. of fixtures			Watts/Fixture		
Control System:					
SCADA SCADA-Pack					
Radio Data		Freq.			
Phone line		Acct			
Antenna Height	25-30 ft	Omni/Yagi	YAGI	Azimuth	340°
Structural Comments:					
Type of structure					
Age (If Known)		Condition			
Other Notes:	Rusty piping and valves in all submersible valve vaults. All pressure gauges rusty and not working so far.				

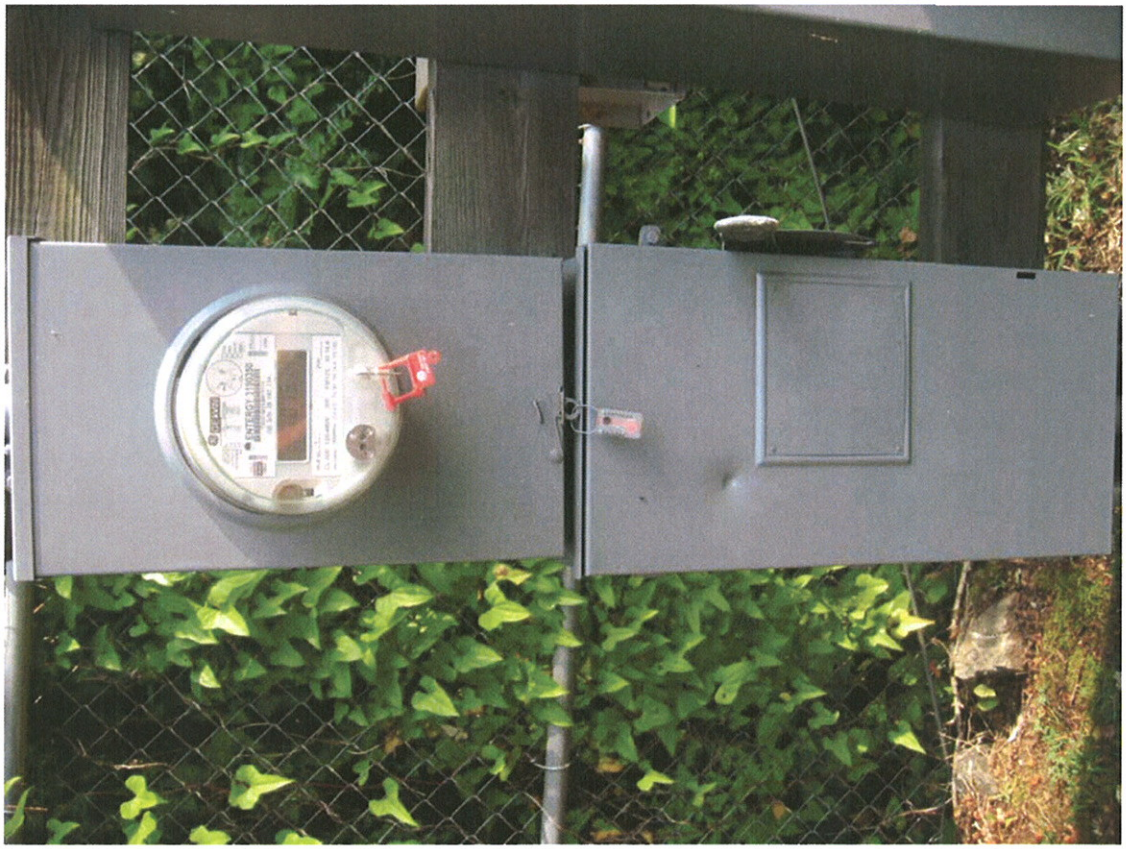
APPENDIX B

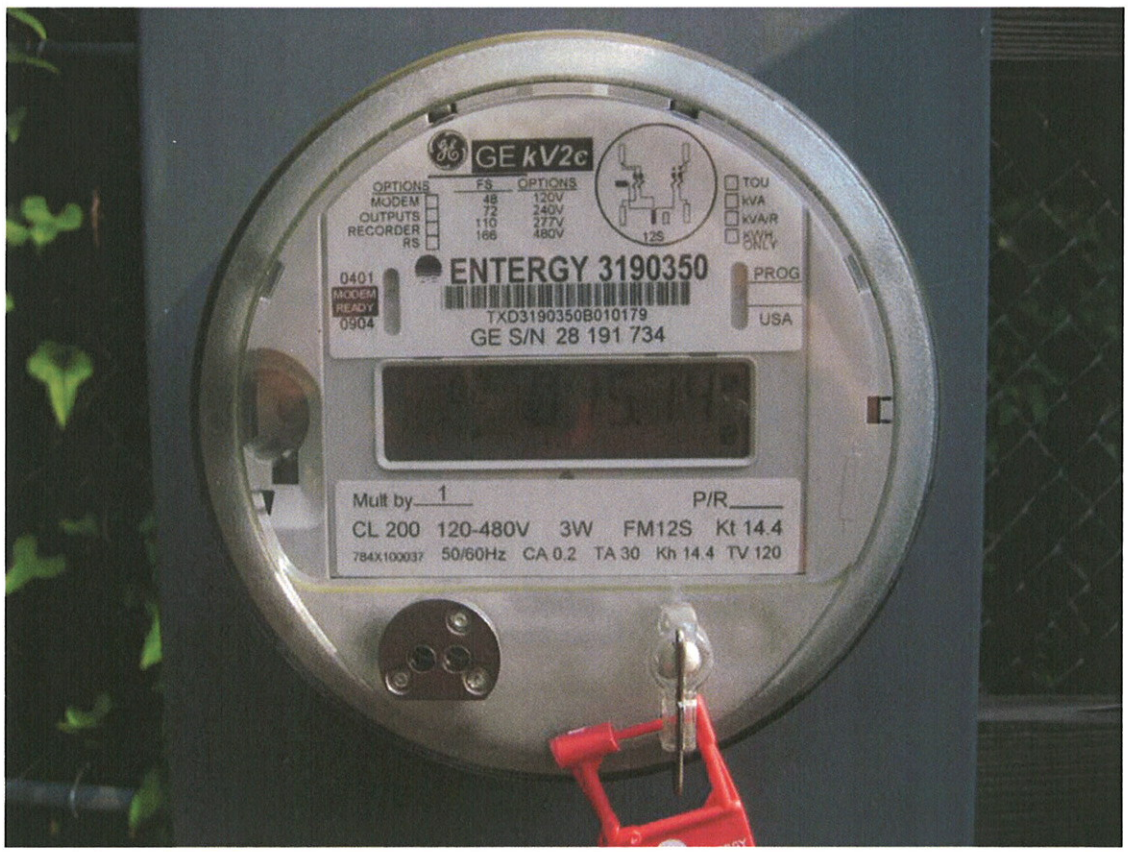
Photographs



Housley Road—July 2008 (SFF)

Housley Road—July 2008 (SFF)





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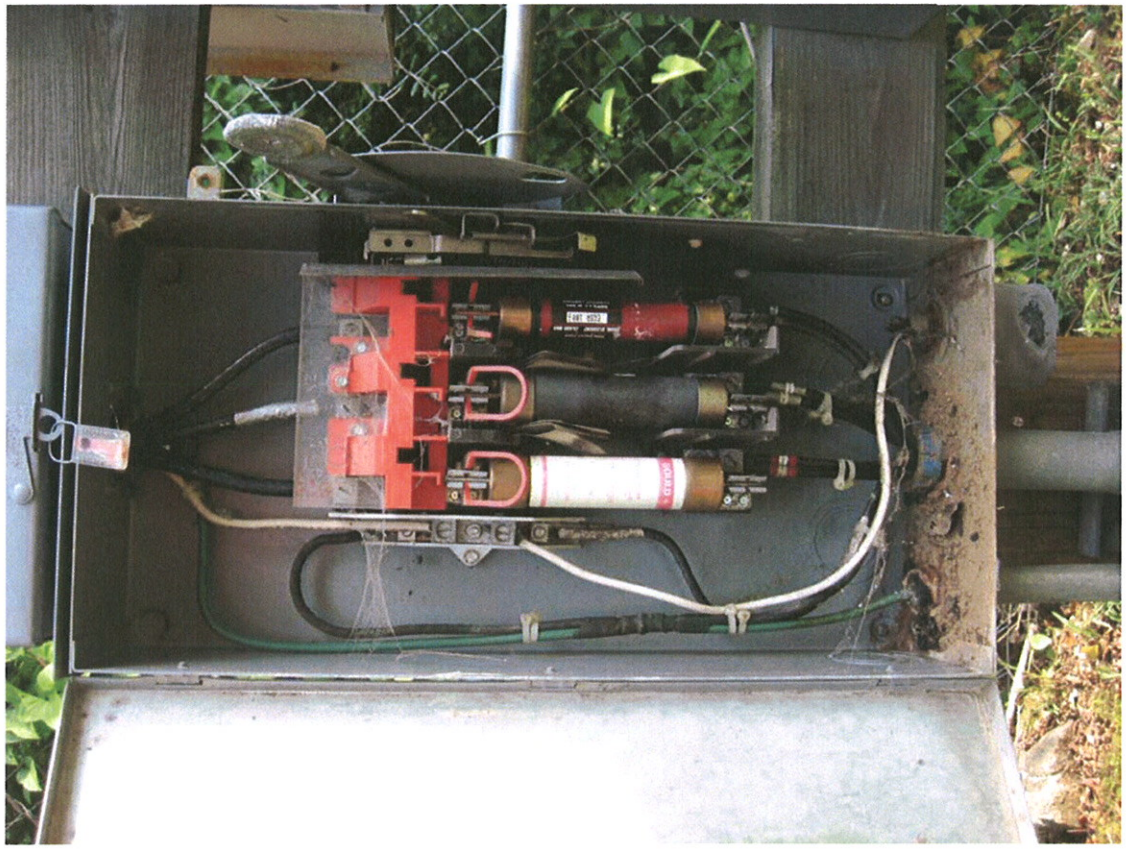

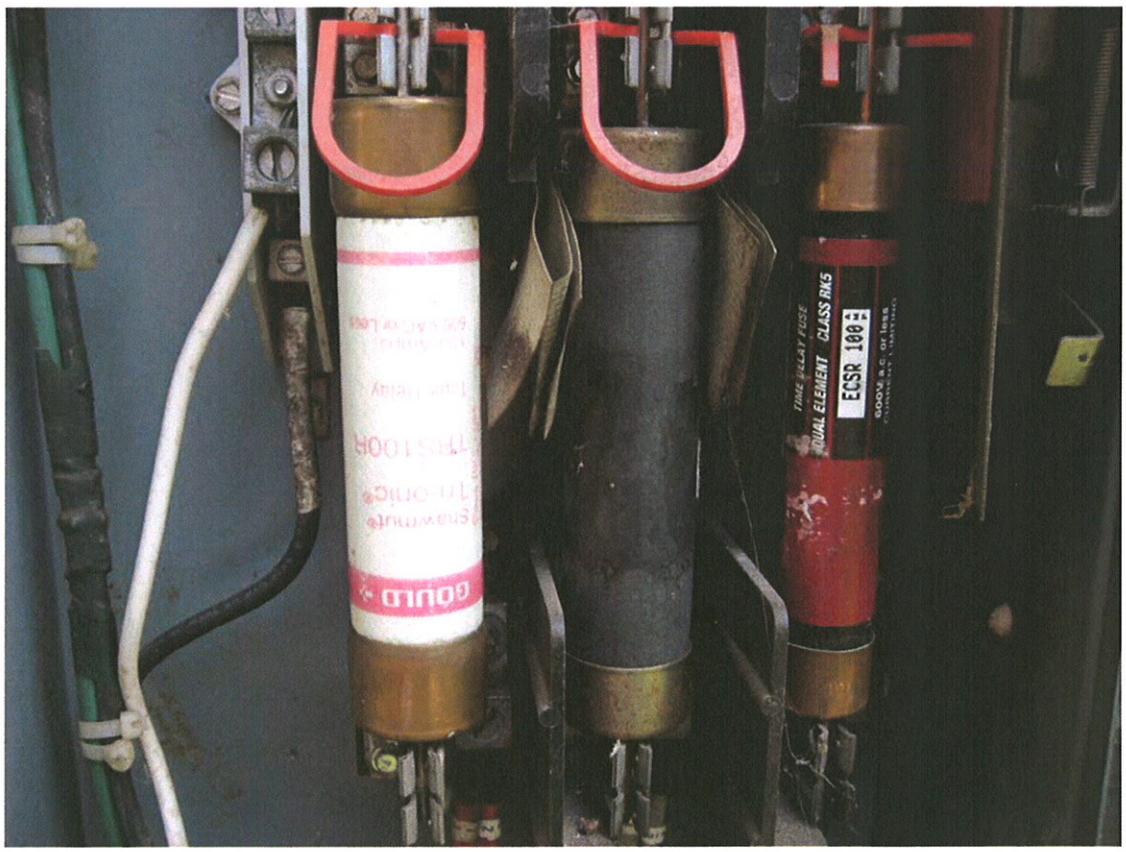

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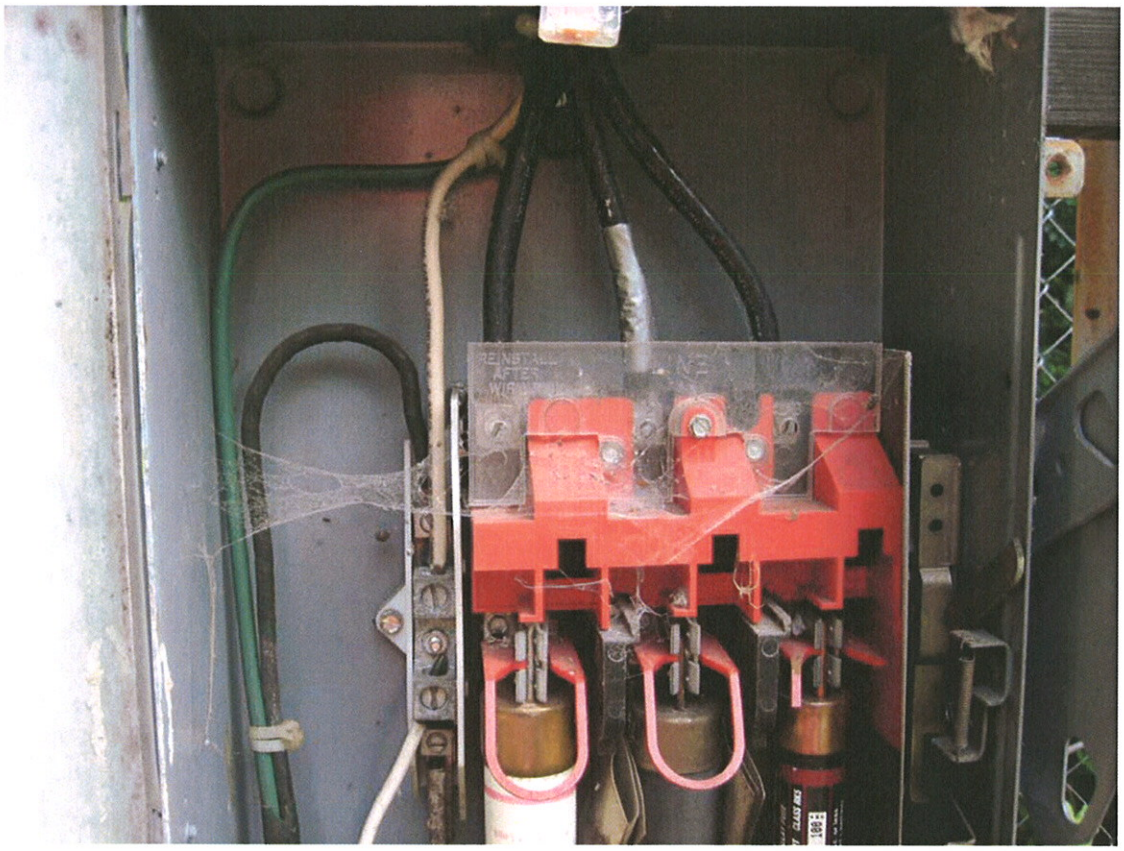

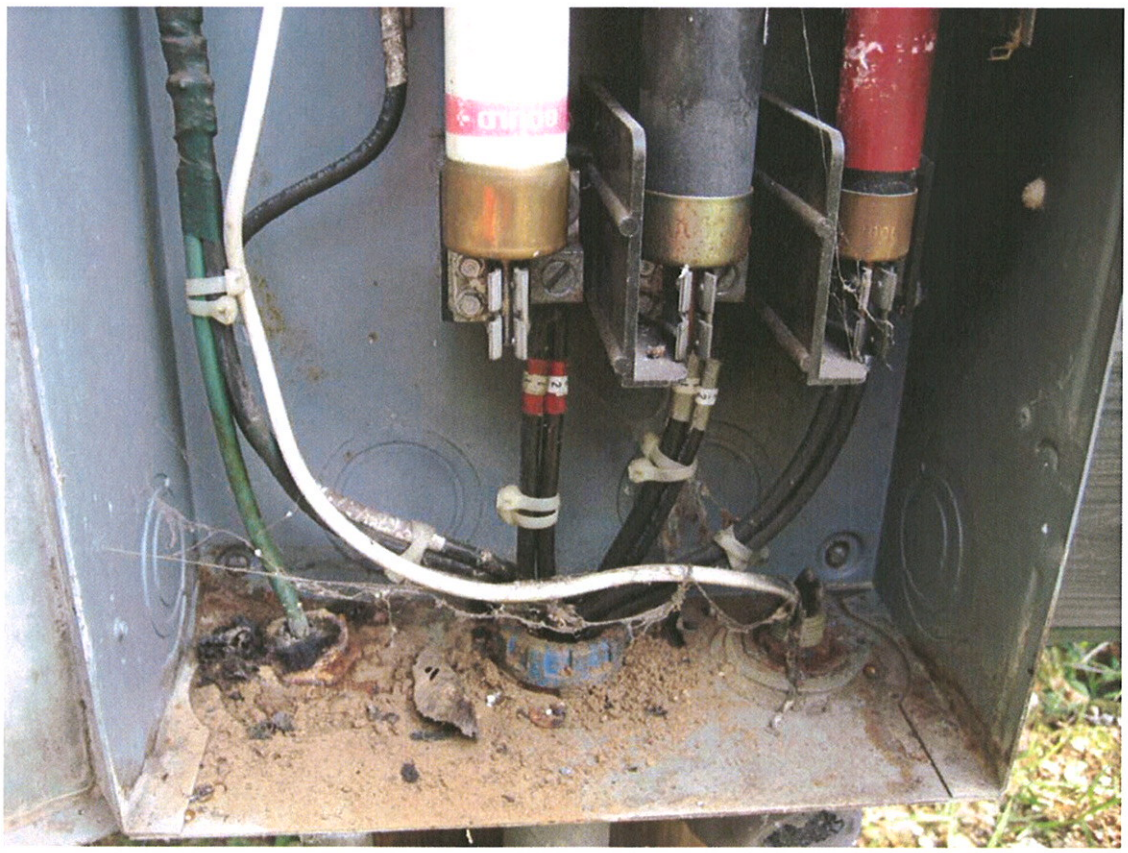

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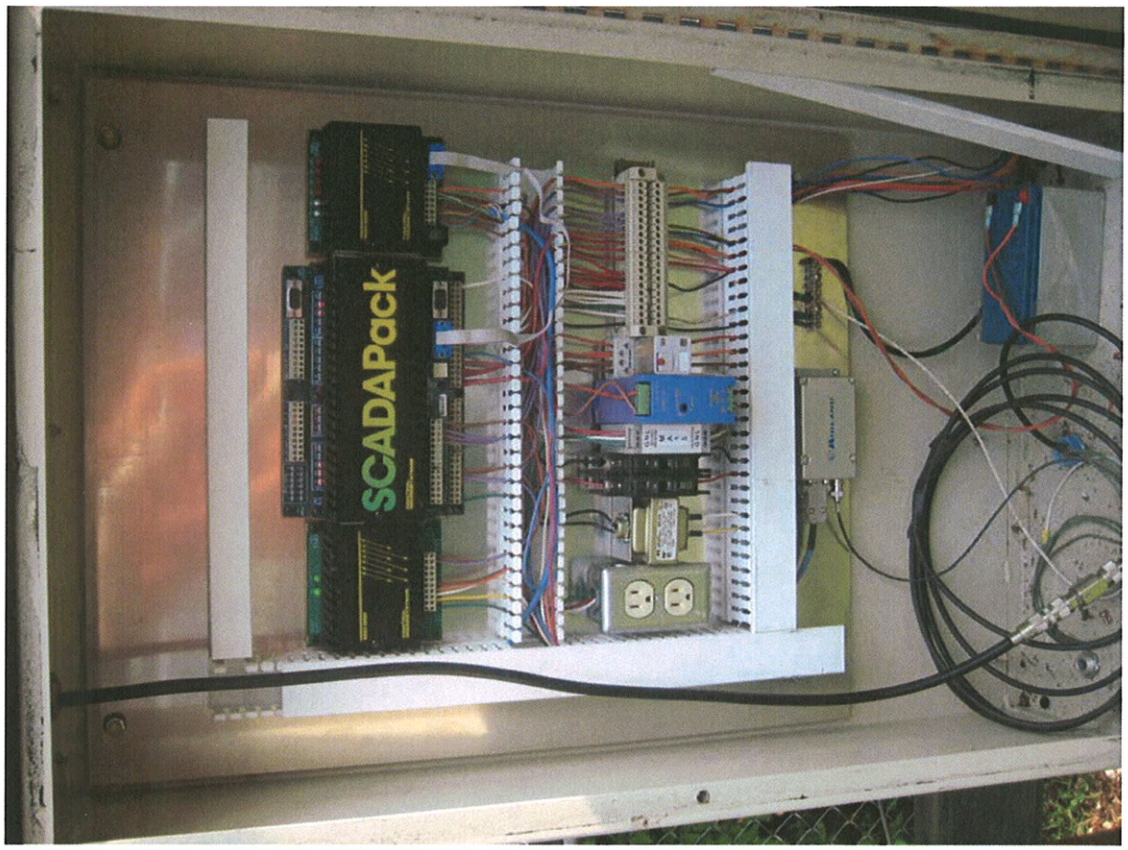

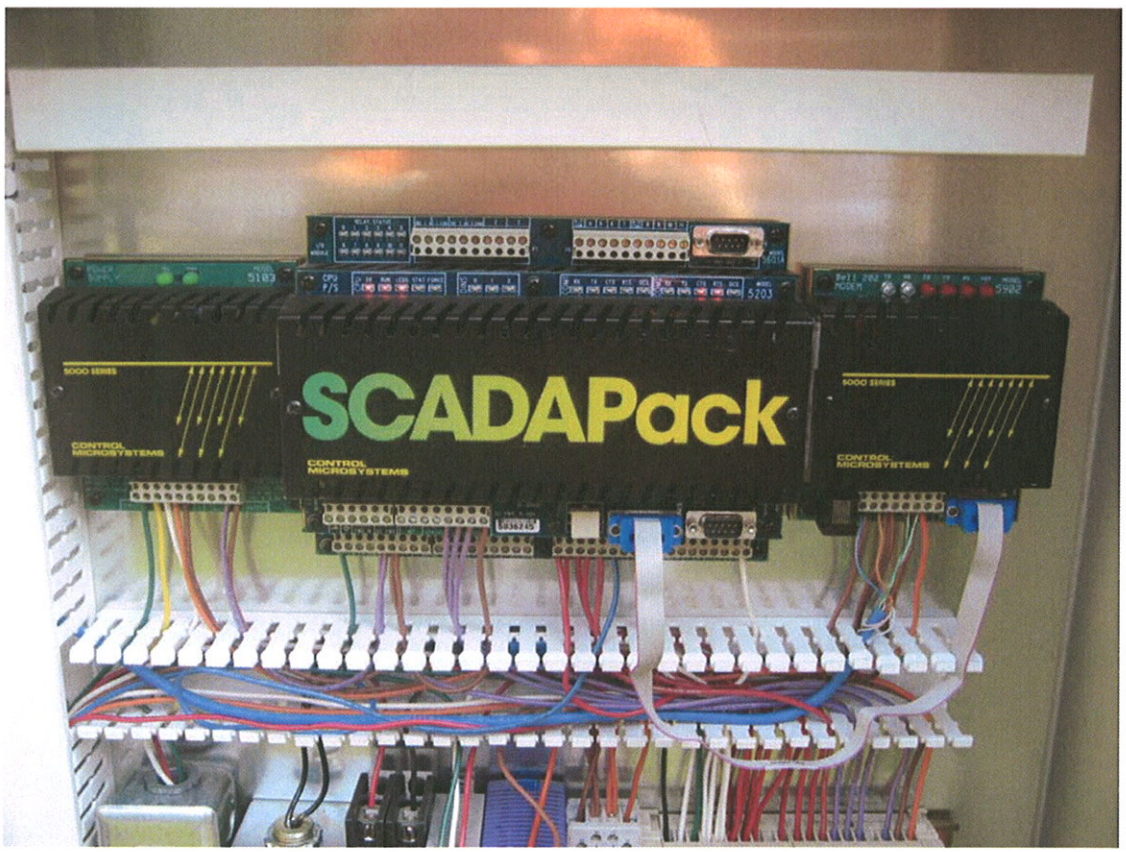

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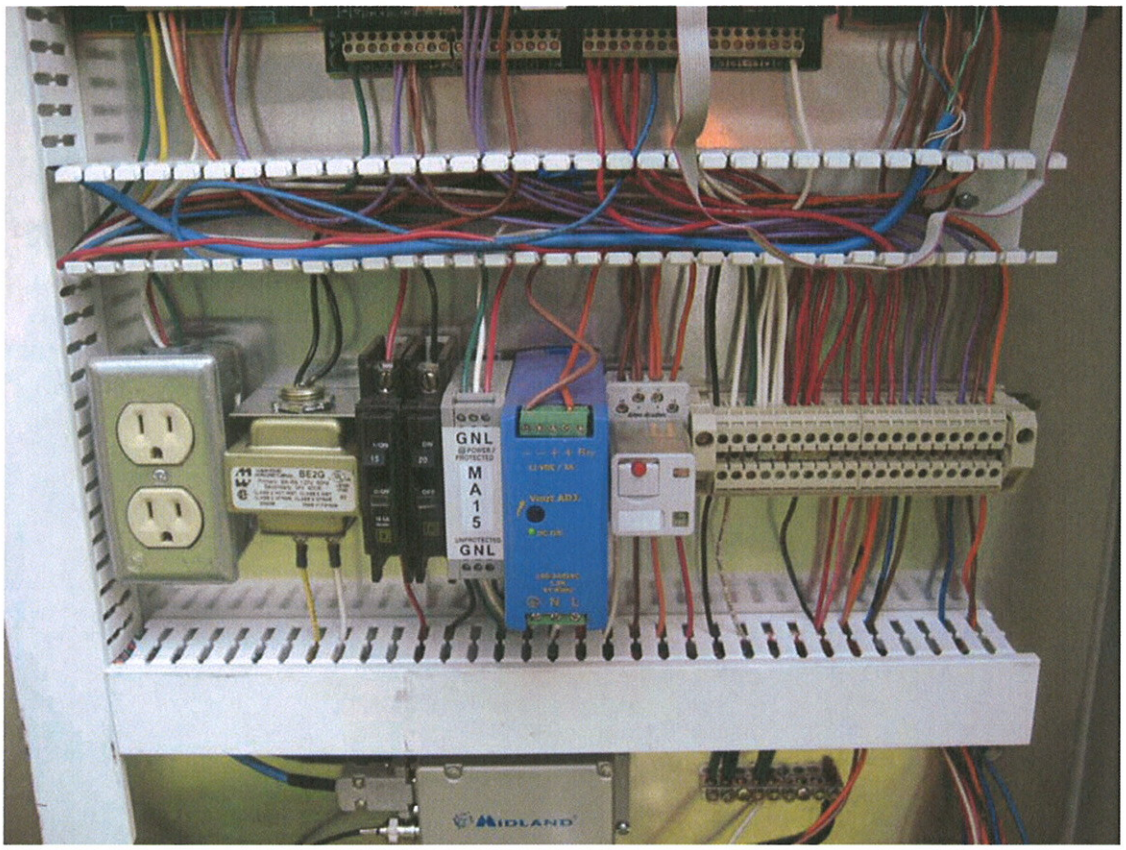

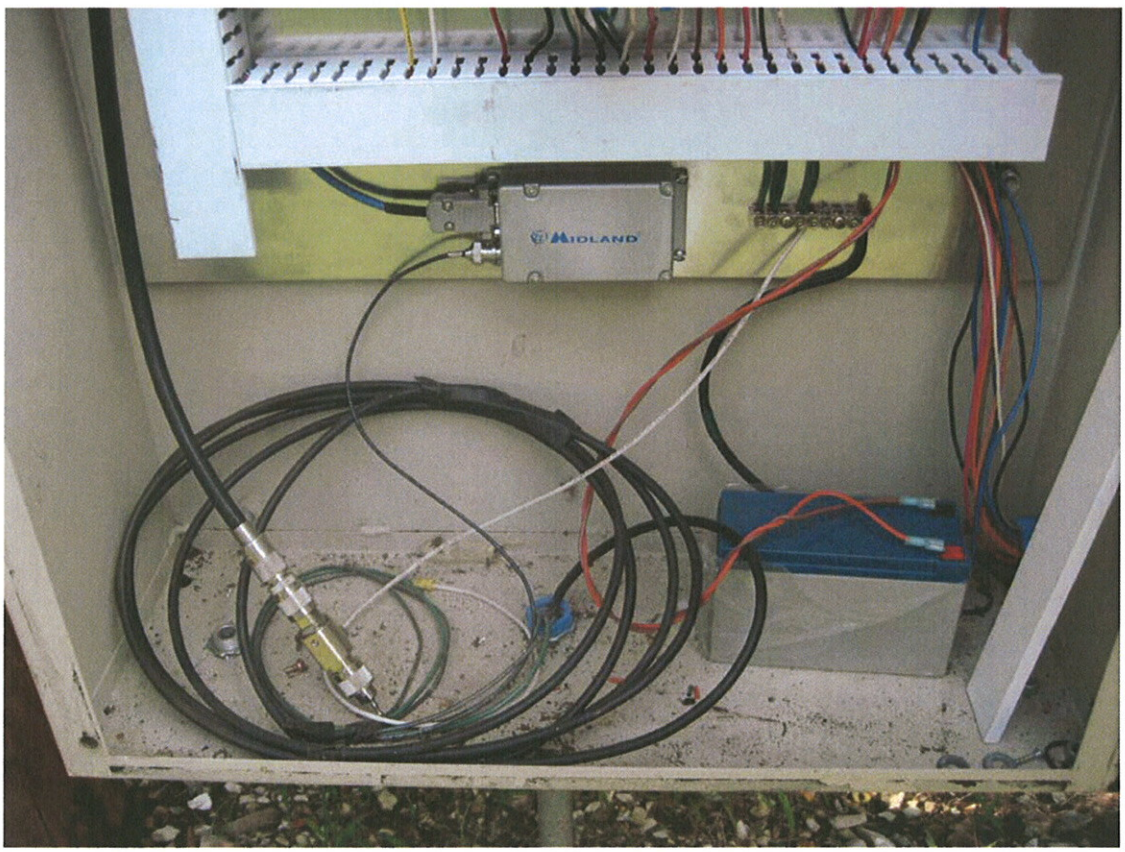

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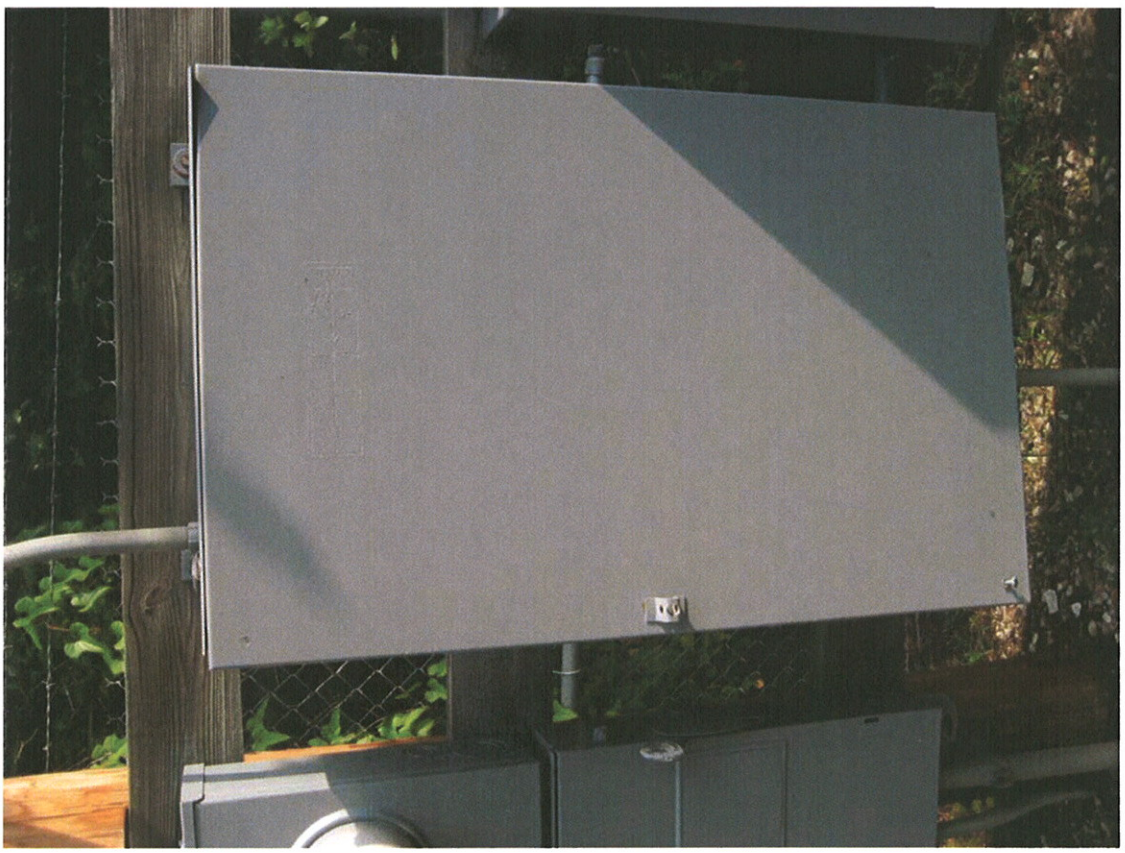

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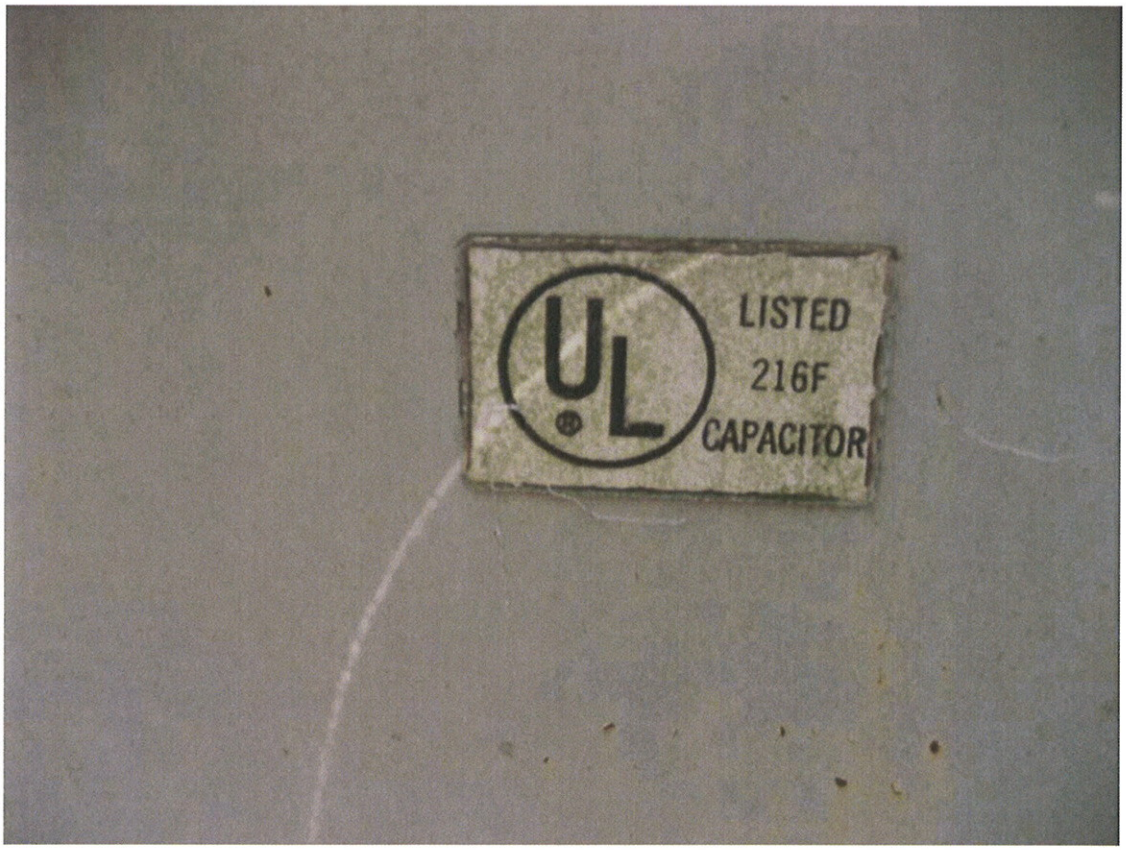

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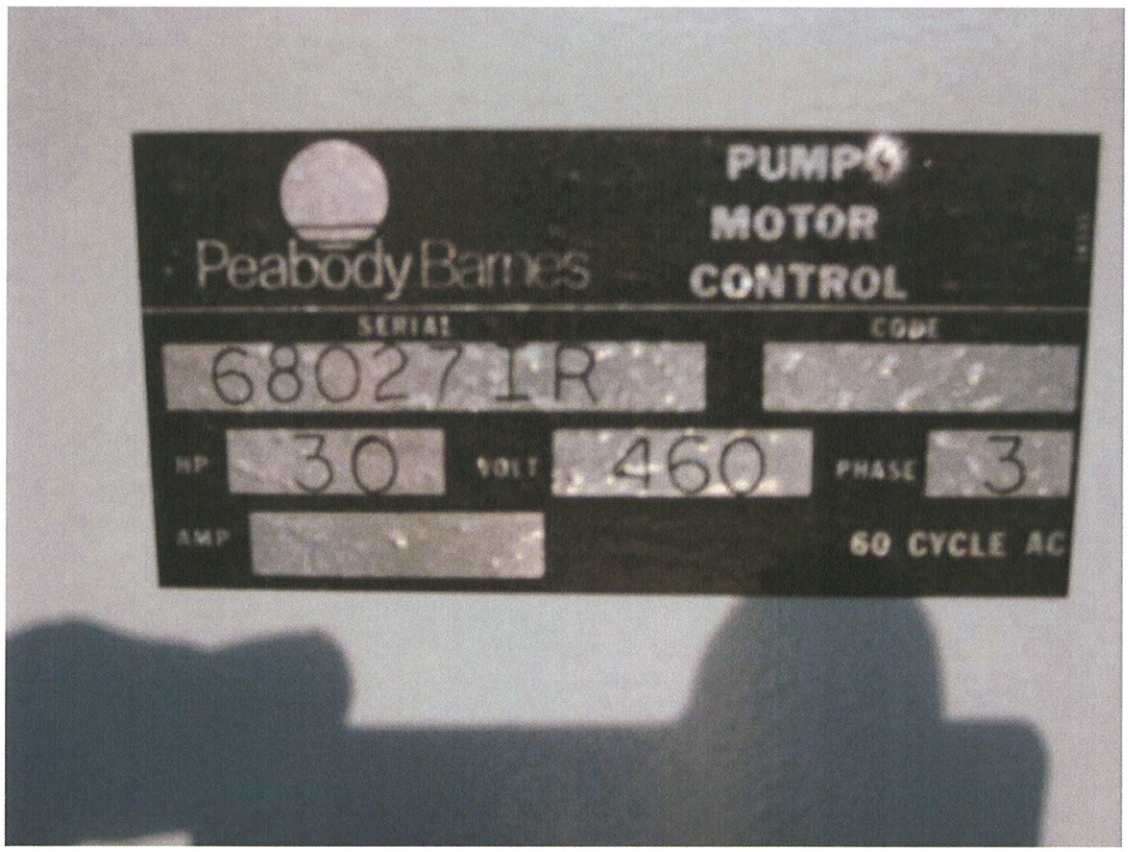

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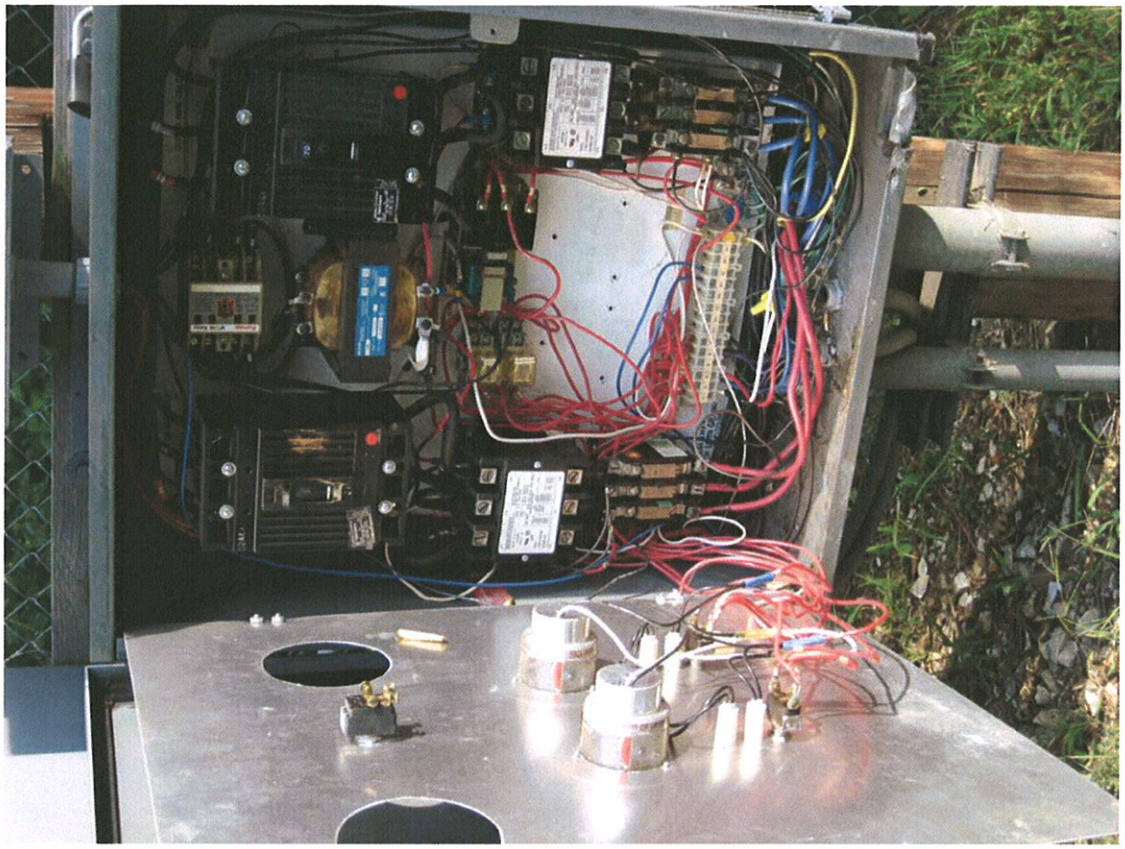

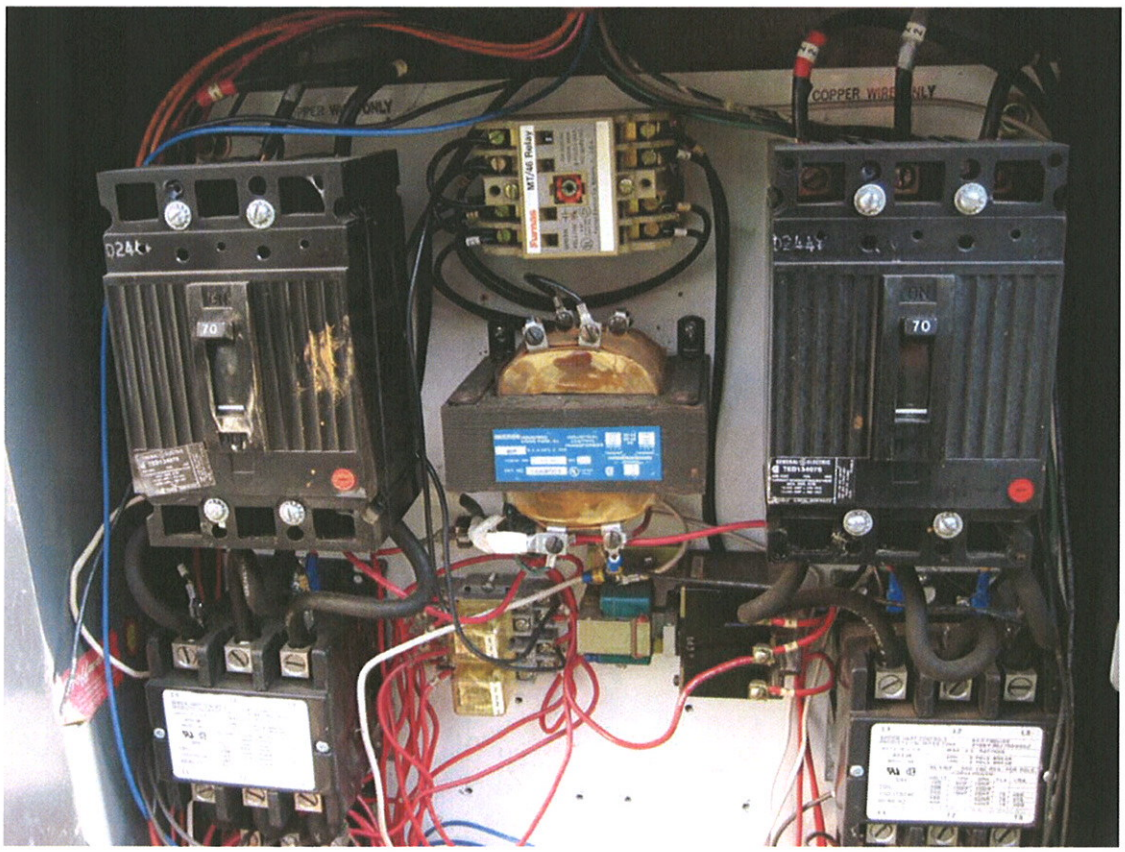

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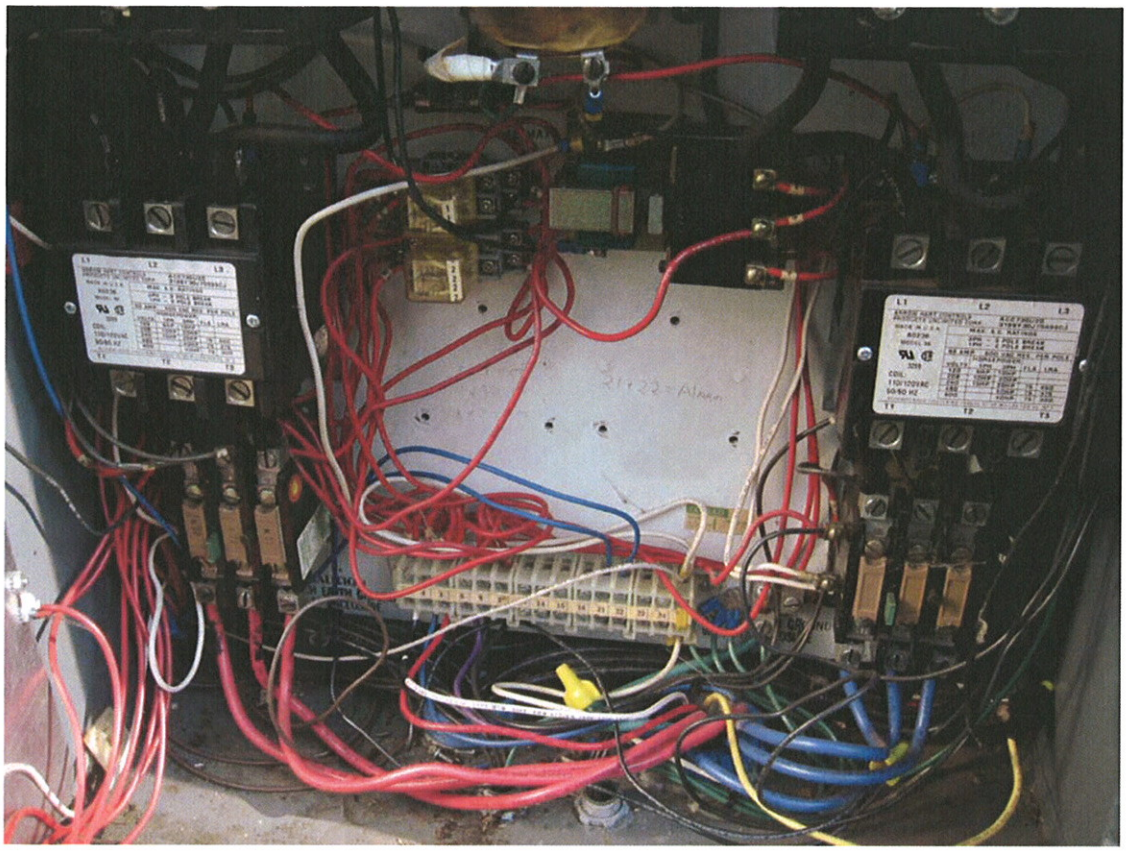
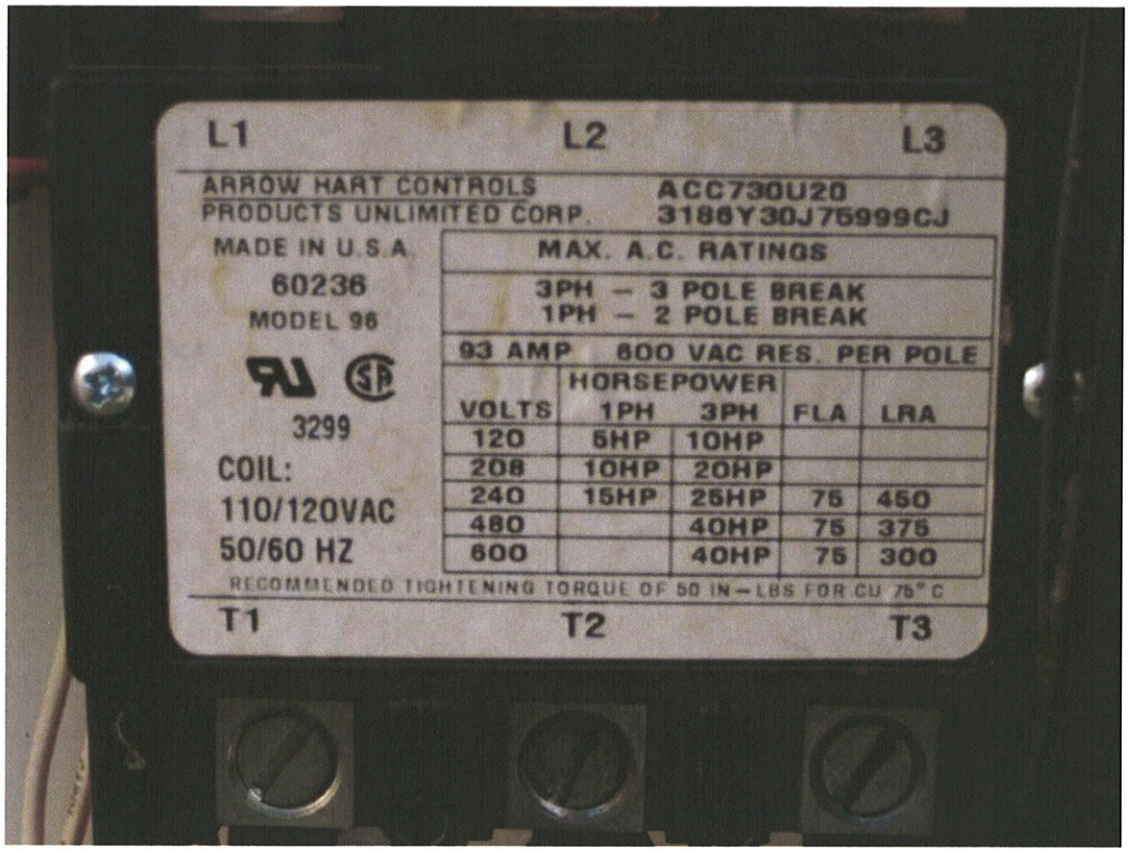


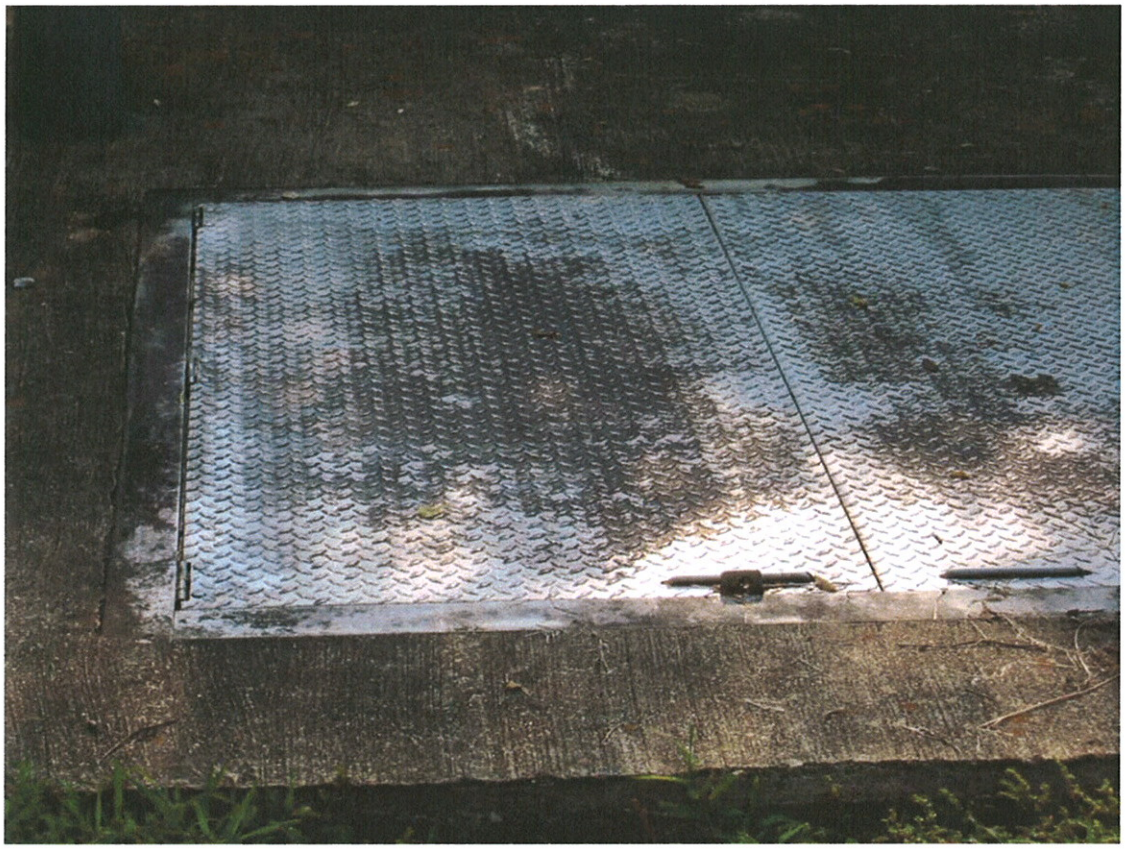

L1
L2
L3
ARROW HART CONTROLS
PRODUCTS UNLIMITED CORP.
ACC730U20
3186Y30J75999CJ
MADE IN U.S.A.
60236
MODEL 96
3299
COIL:
110/120VAC
50/60 HZ
MAX. A.C. RATINGS
3PH – 3 POLE BREAK
1PH – 2 POLE BREAK
93 AMP 600 VAC RES. PER POLE
VOLTS
HORSEPOWER 1PH
HORSEPOWER 3PH
FLA
LRA
120 5HP 10HP
208 10HP 20HP
240 15HP 25HP 75 450
480 40HP 75 375
600 40HP 75 300
RECOMMENDED TIGHTENING TORQUE OF 50 IN-LBS FOR CU 75° C
T1
T2
T3

Housley Road—July 2008 (SJG)

Housley Road—July 2008 (SJG)

Housley Road—July 2008 (SJG)

Housley Road—July 2008 (SJG)



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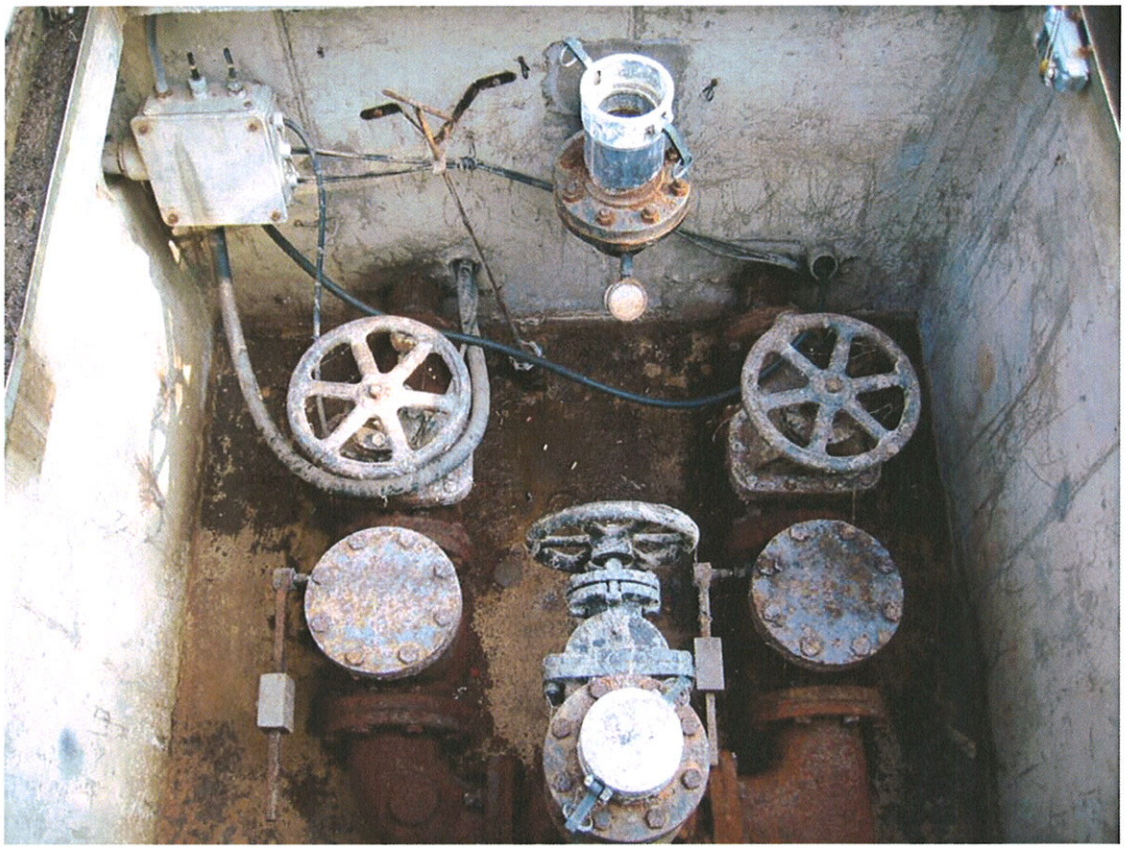

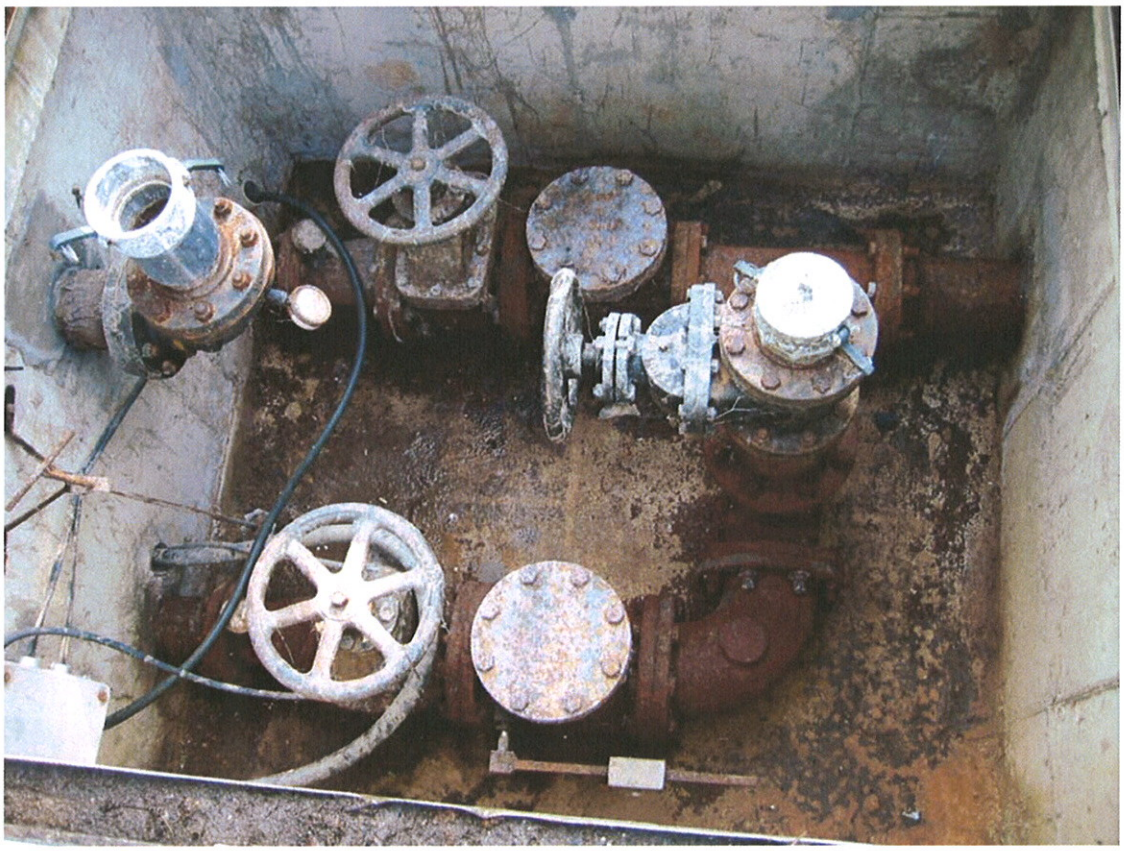

Housley Road—July 2008 (SJG)

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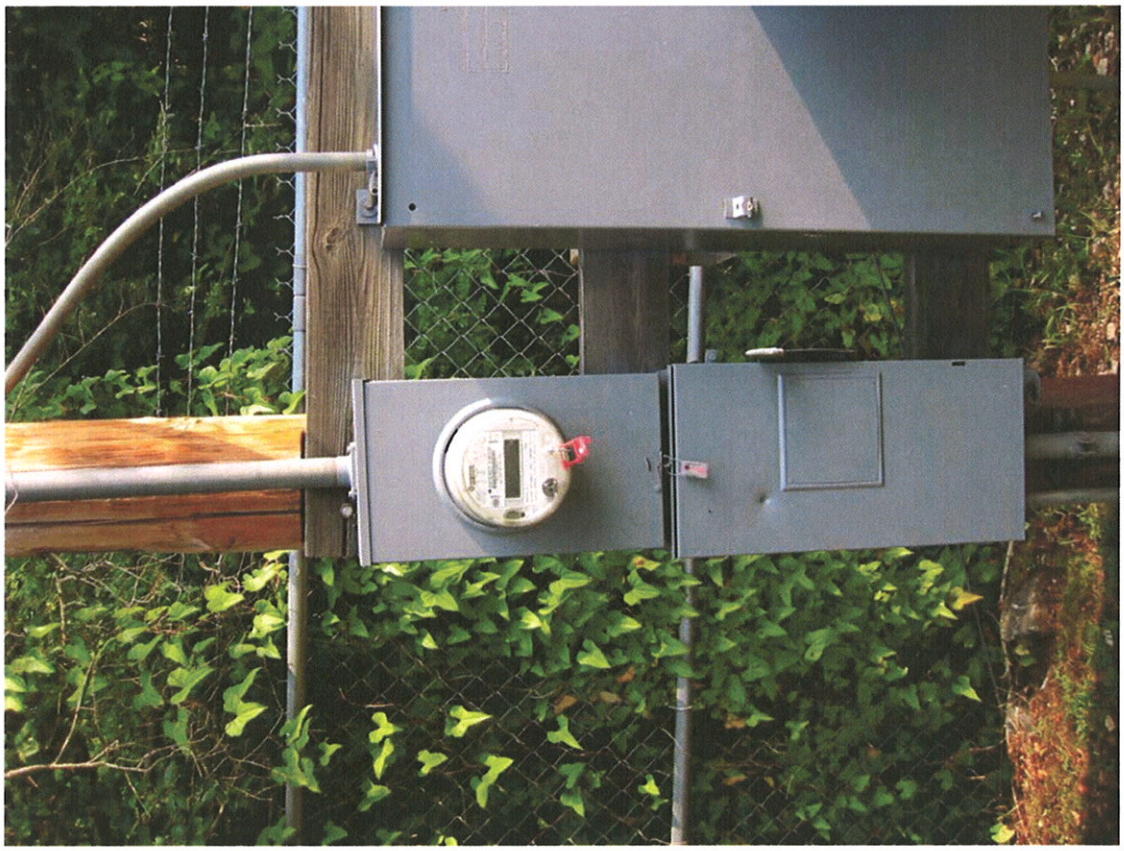

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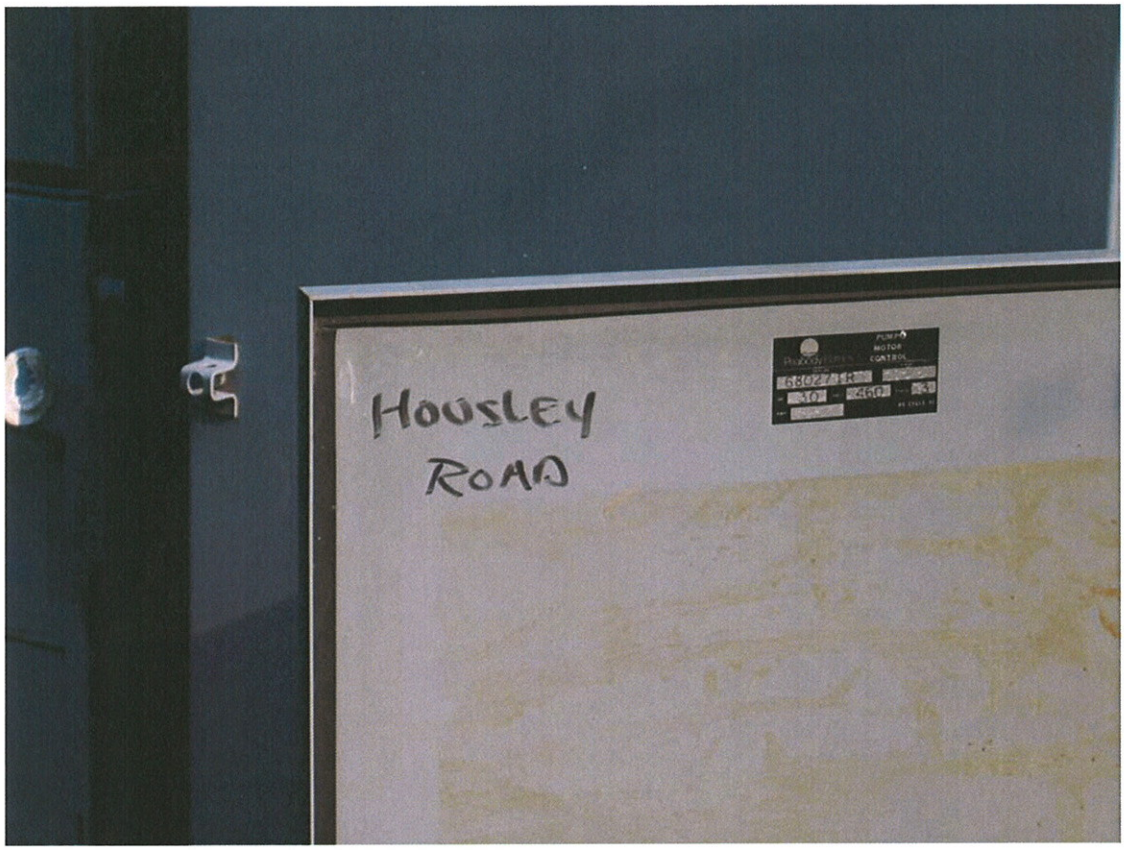

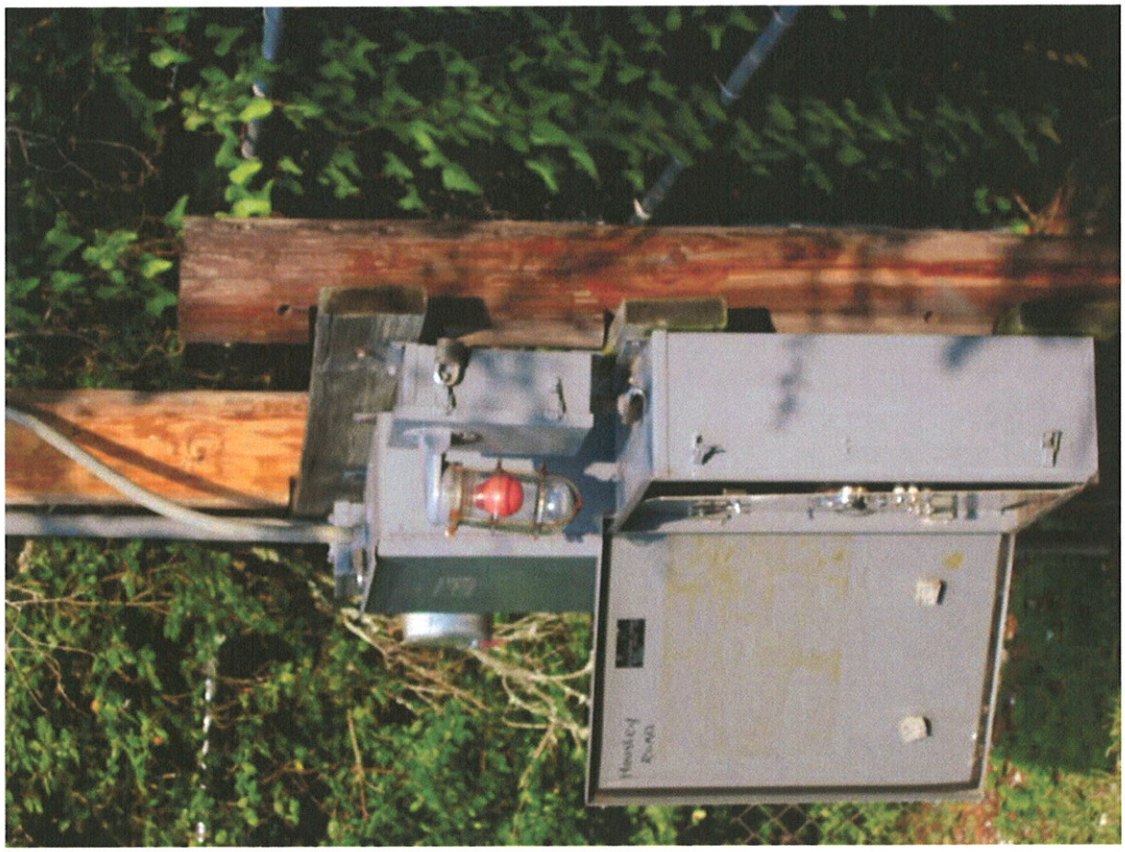

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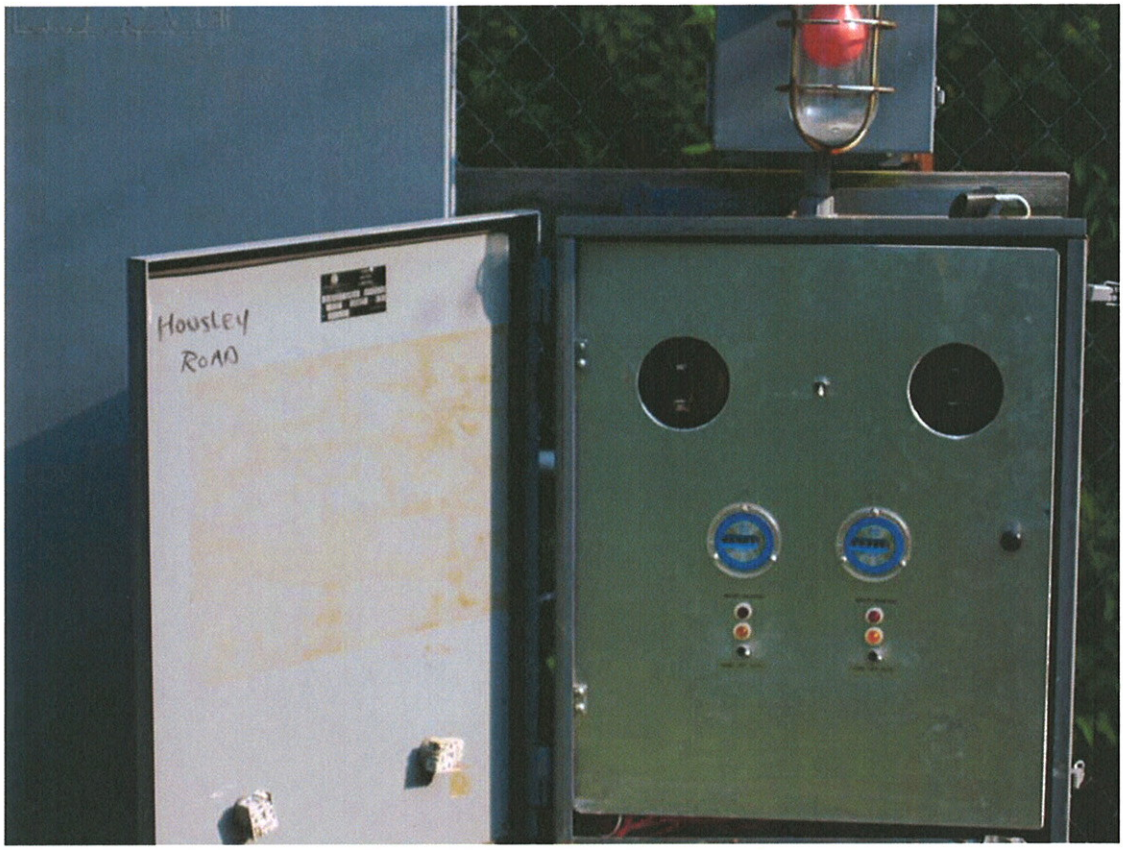

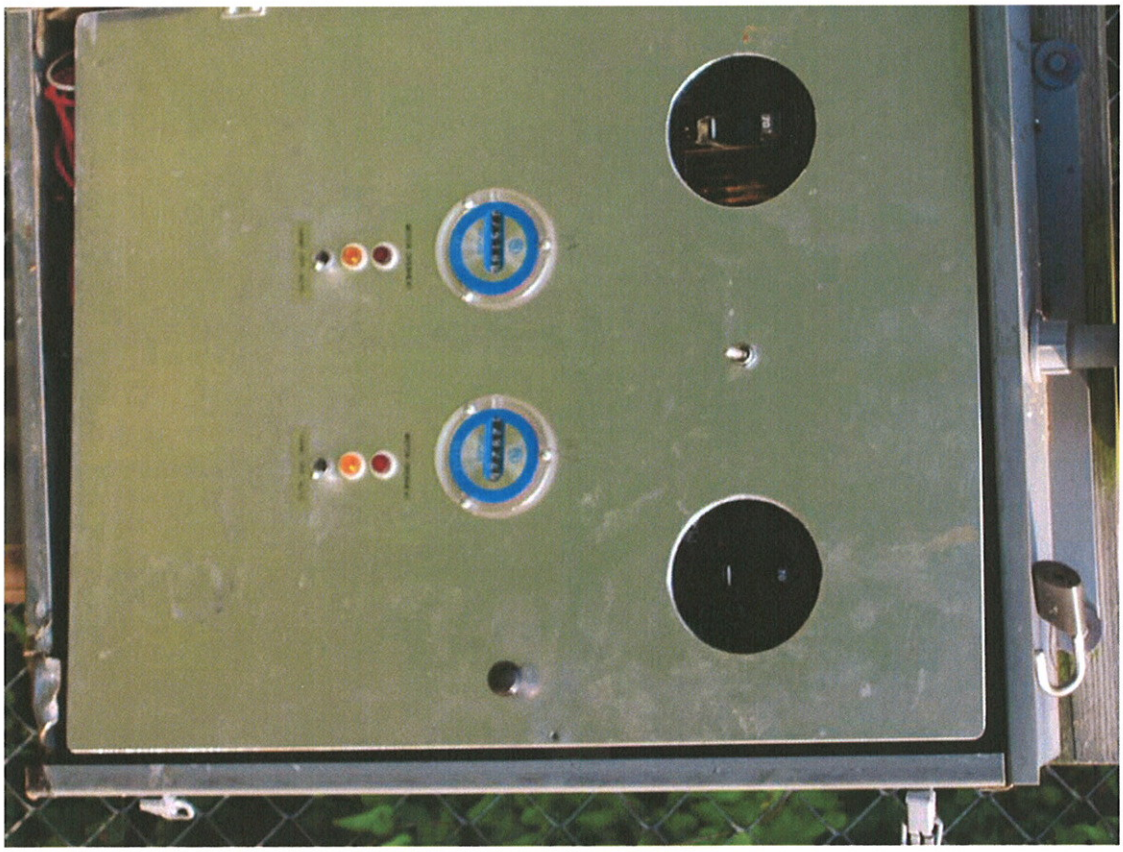

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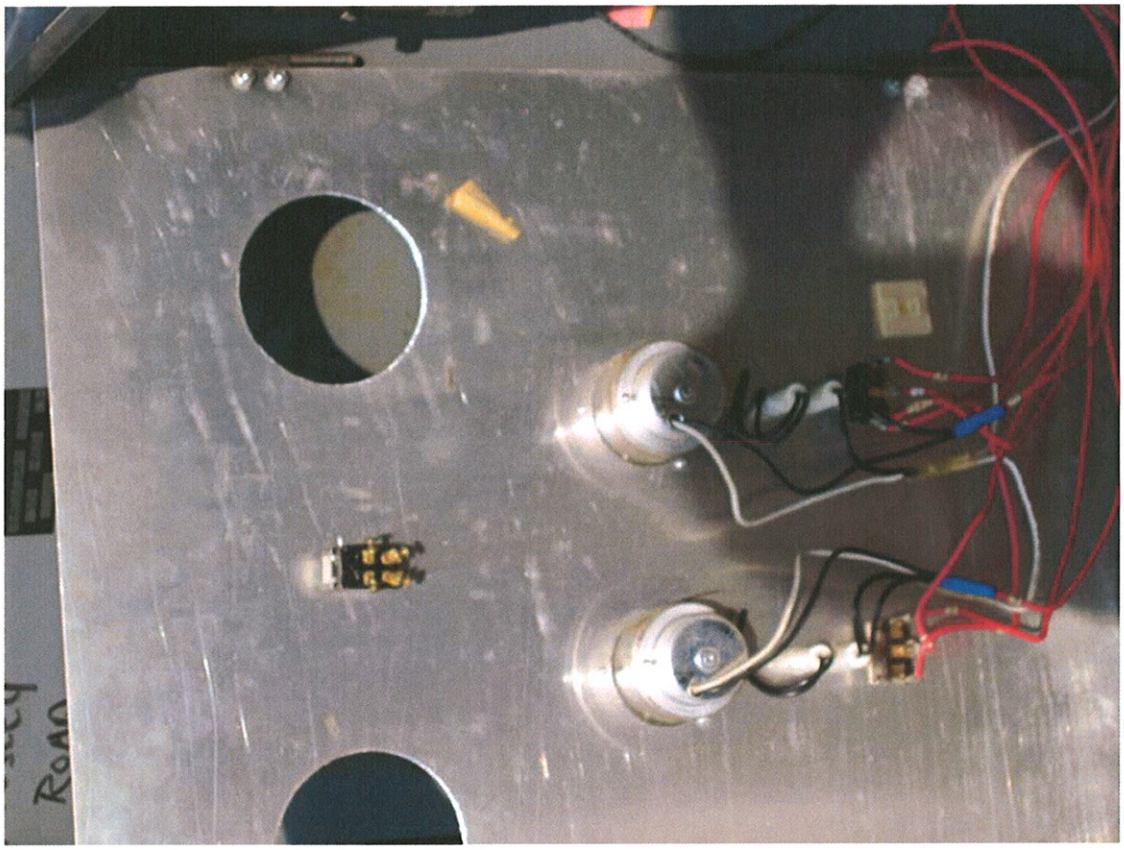

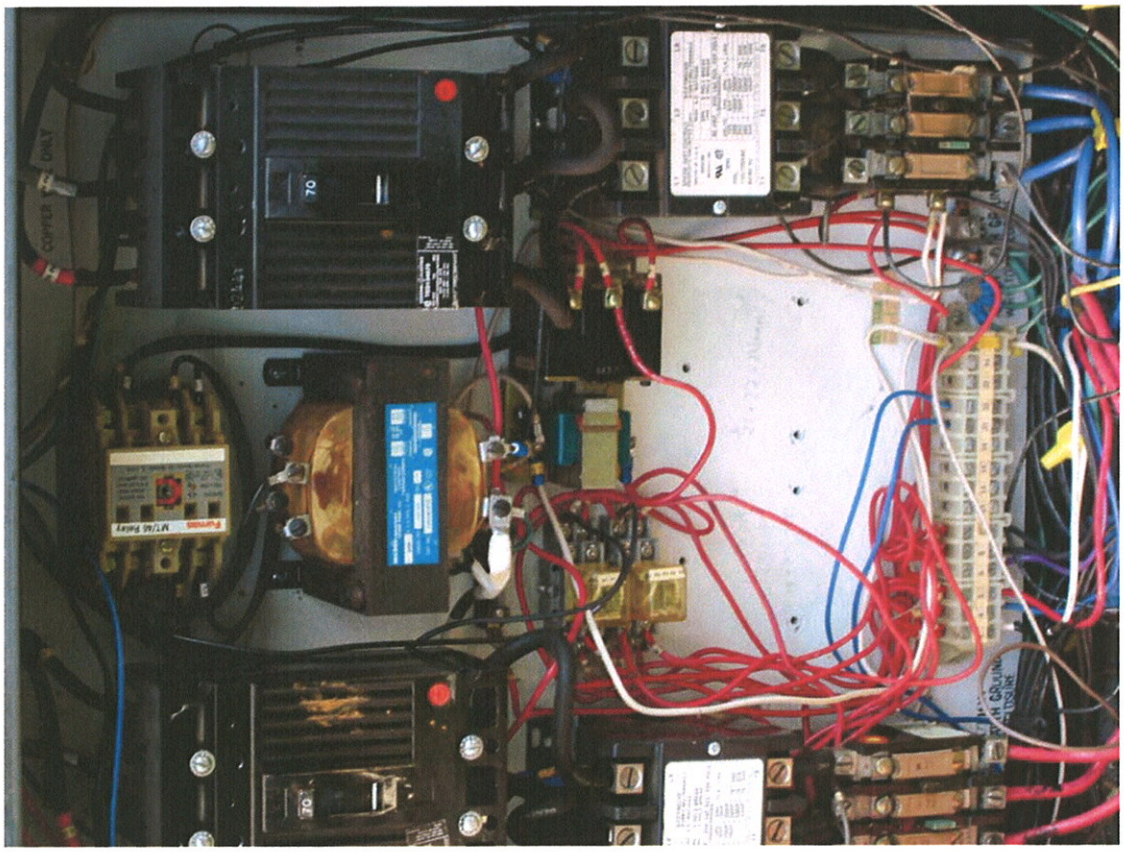

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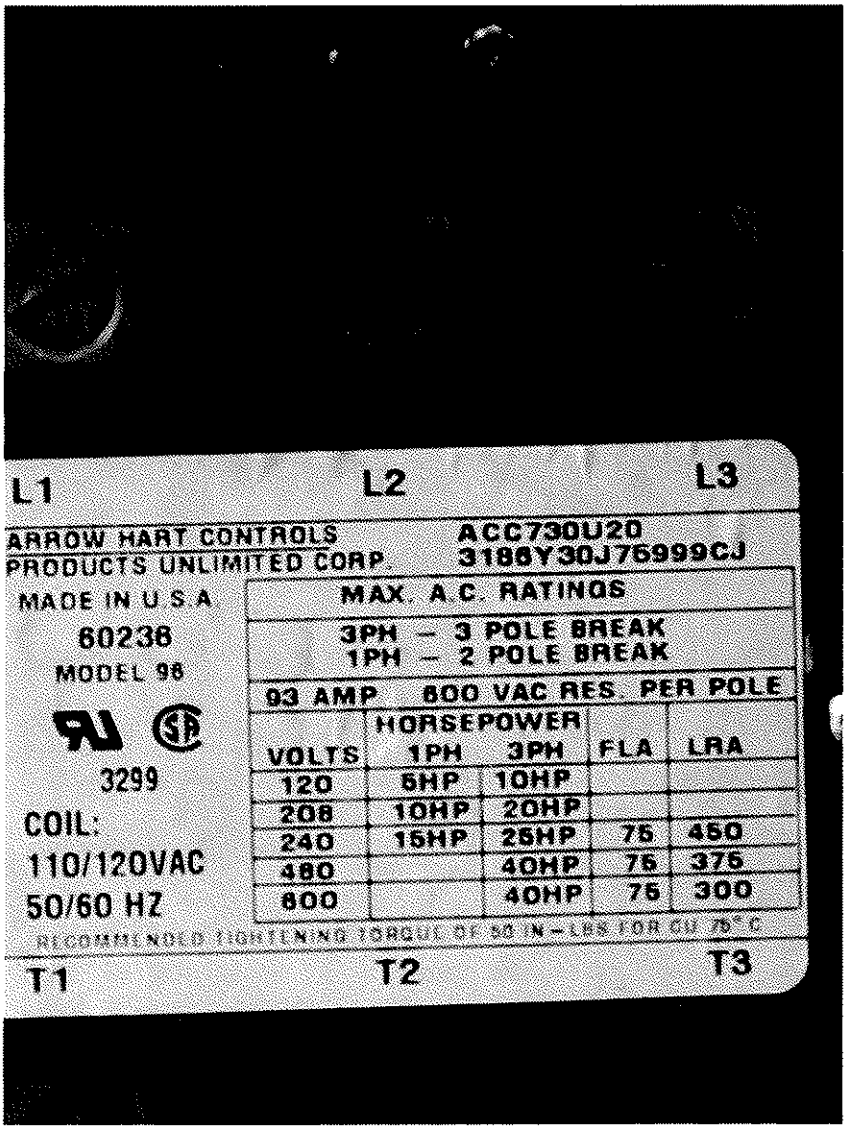

L1
L2
L3
ARROW HART CONTROLS
PRODUCTS UNLIMITED CORP.
ACC730U20
3186Y30J76999CJ
MADE IN U.S.A.
60236
MODEL 98
3299
COIL:
110/120VAC
50/60 HZ
MAX. A.C. RATINGS
3PH – 3 POLE BREAK
1PH – 2 POLE BREAK
93 AMP 600 VAC RES. PER POLE
HORSEPOWER
VOLTS 1PH 3PH FLA LRA
120 5HP 10HP
208 10HP 20HP
240 15HP 25HP 75 450
480 40HP 75 375
600 40HP 75 300
RECOMMENDED TIGHTENING TORQUE OF 50 IN-LBS FOR CU 75°C
T1
T2
T3

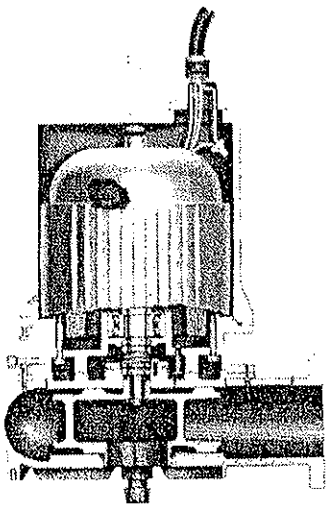
APPENDIX C

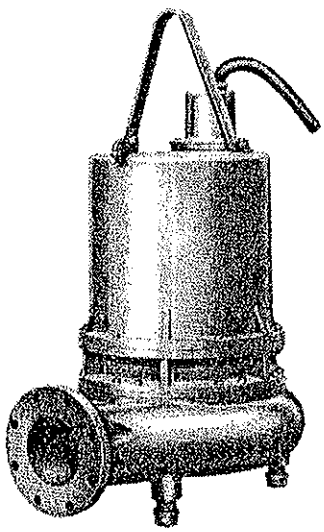
Pump Curves

Heavy Duty Submersible Wastewater Pumps

6" Discharge High Head

Peabody Barnes





Models

6SEH1502
6SEH1504
6SEH2002
6SEH2004
6SEH2502
6SEH2504
6SEH3002
6SEH3004
6SEH4004
6SEH5004

Size

6" Discharge

4" Spherical Solids Handling

NOTE: Pump can operate dry for extended periods without damage to motor and/or seals.

Pump Specifications

Size: 6" Discharge, 5" Suction opening
Impeller: Single Vane Enclosed, Cast Iron with Pressure Vanes on Back Side and Spiral Seal System
Seal: Double Mechanical Type in Patented Oil-Filled, Pressure Equalized Chamber. Motor End of Seal, Ceramic and Carbon, Pump End of Seal, Carbon and Ceramic
Pump Body: Cast Iron
Motor Housing: Cast Iron
Hardware: 300 Series Stainless Steel
Suitable for: 160° F Liquids
Power Cord: 30' of 6/4 G Cable on Models 6SEH1502, 1504, 2002 and 2004. 30' of 2/4 G Cable on Models 6SEH2502, 2504, 3002, 3004, 4004 and 5004
Standard Equipment: All Models Equipped with Legs and Lifting Bail , Moisture and Temperature Sensors
Optional Equipment: Additional Cable, Carbide Seal Faces

Motor Specifications

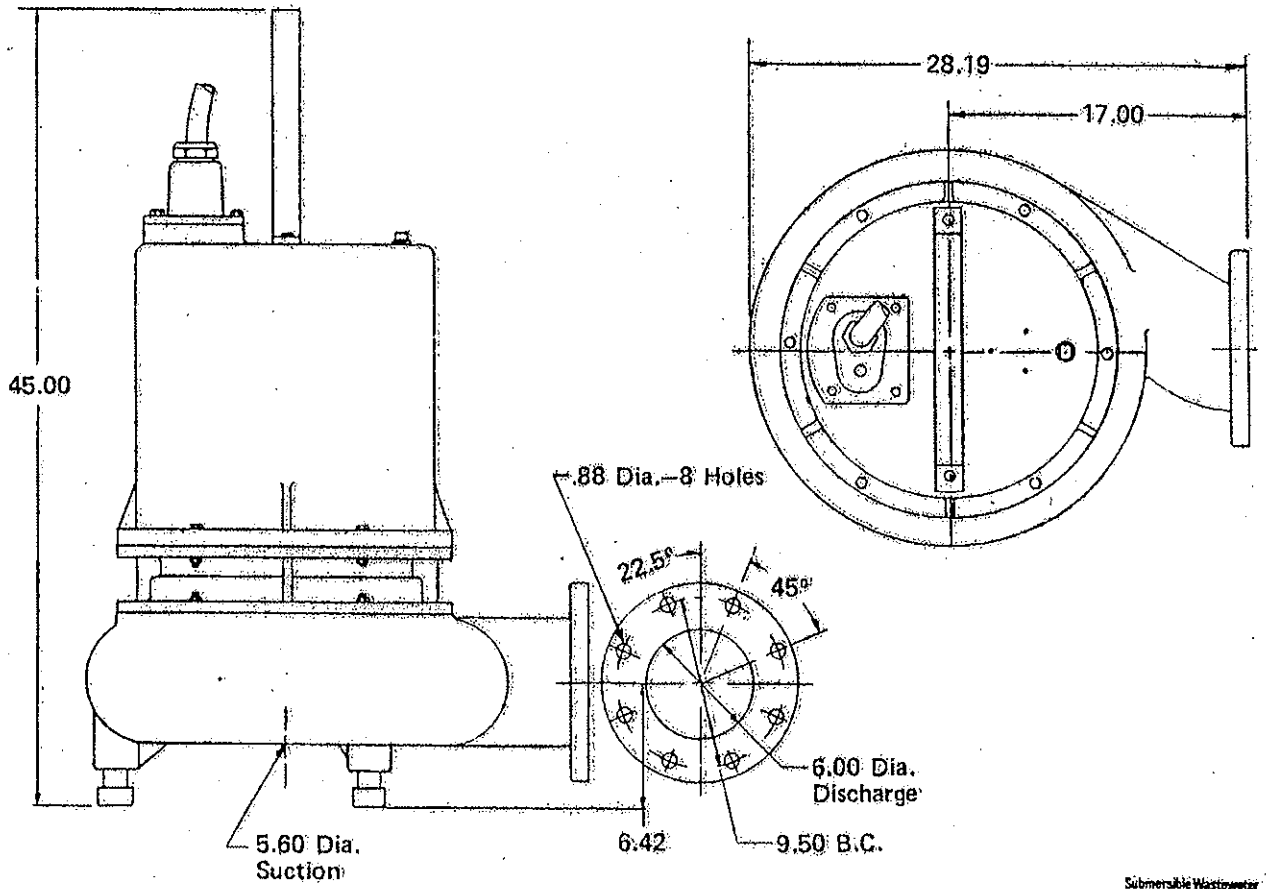
Model 6SEH1502: 18 HP, 230 Volt, Three Phase
Model 6SEH1504: 18 HP, 460 Volt, Three Phase
Model 6SEH2002: 24 HP, 230 Volt, Three Phase
Model 6SEH2004: 24 HP, 460 Volt, Three Phase
Model 6SEH2502: 30 HP, 230 Volt, Three Phase
Model 6SEH2504: 30 HP, 460 Volt, Three Phase
Model 6SEH3002: 36 HP, 230 Volt, Three Phase
Model 6SEH3004: 36 HP, 460 Volt, Three Phase
Model 6SEH4004: 48 HP, 460 Volt, Three Phase
Model 6SEH5004: 60 HP, 460 Volt, Three Phase

Three Phase: Completely Oil-Filled, Overload Protection provided in Control Box
Motor Speed: 1750 RPM
Shaft: 416 Stainless Steel
Thrust Bearing: Ball
Radial Bearing: Ball

Models

6SEH1502
6SEH1504
6SEH2002
6SEH2004
6SEH2502
6SEH2504
6SEH3002
6SEH3004
6SEH4004
6SEH5004

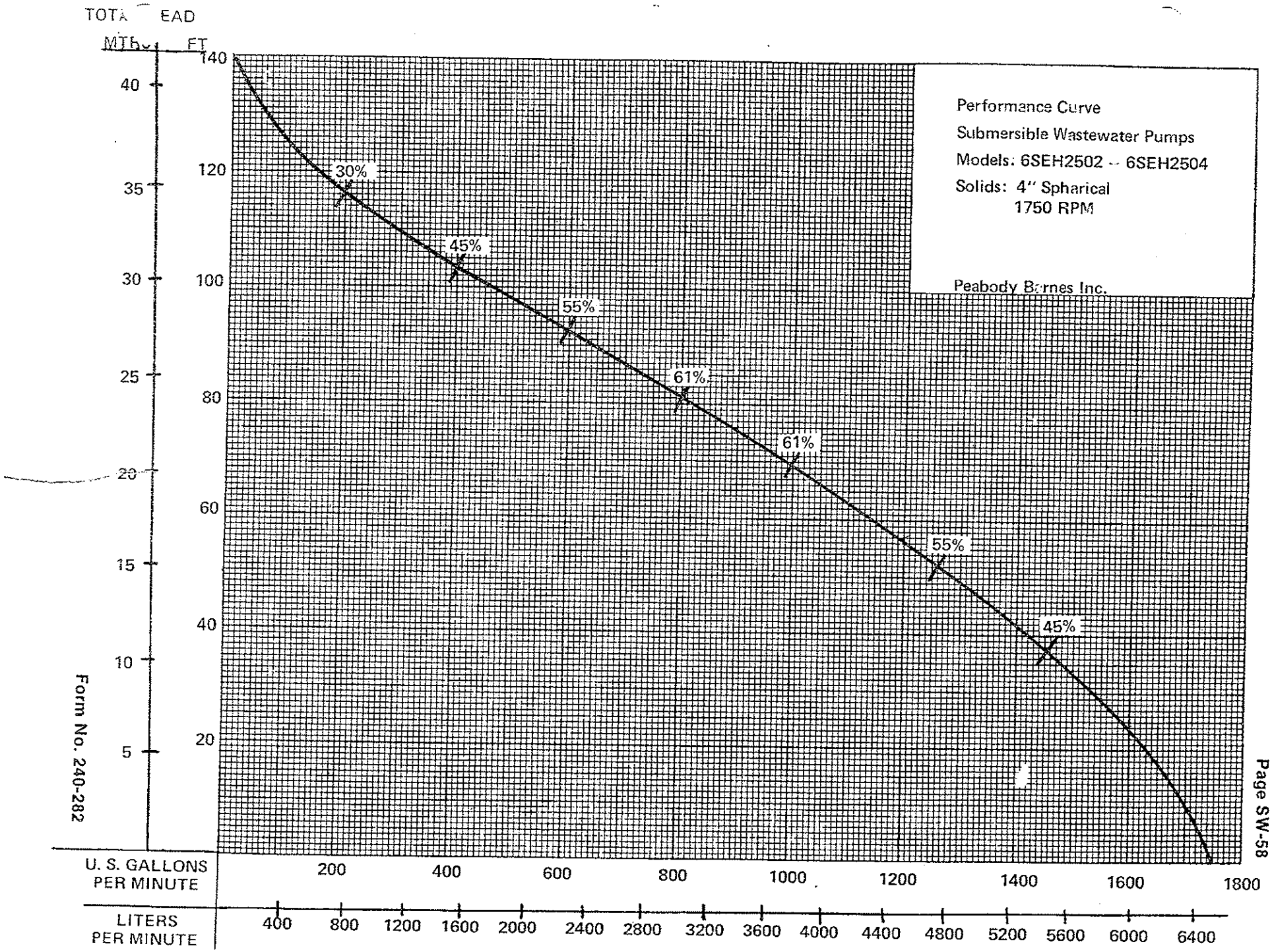
AMPERAGE		
MODEL NO.	MAX. RUN. AMPS	LOCKED ROTOR AMPS
6SEH1502	52.0	232.0
6SEH1504	26.0	116.0
6SEH2002	64.0	290.00
6SEH2004	32.0	145.0
6SEH2502	90.0	364.0
6SEH2504	45.0	182.0
6SEH3002	102.0	434.0
6SEH3004	51.0	217.0
6SEH4004	61.0	290.0
6SEH5004	74.0	363.0



Submersible Wastewater Pump Association
SWPA MEMBER

Peabody Barnes

651 North Main Street, Mansfield, Ohio 44902
Phone: 419/522-1511



Form No. 240-282

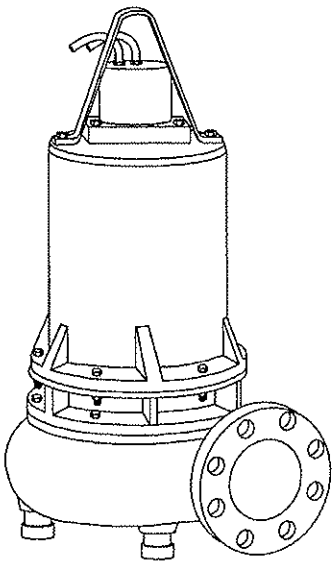
Series 6SE-L

3" Spherical Solids Handling

BARNES®

www.cranepumps.com

6" Horizontal Discharge - Submersible Non-Clog Pumps



Series: 6SE-L
18 thru 75HP,
1750RPM, 60Hz

Submersible Wastewater Pump Association SWPA MEMBER

CSA® Canadian Standards Association
File No. LR16567-25

Sample Specifications: Section 1 Page 16.

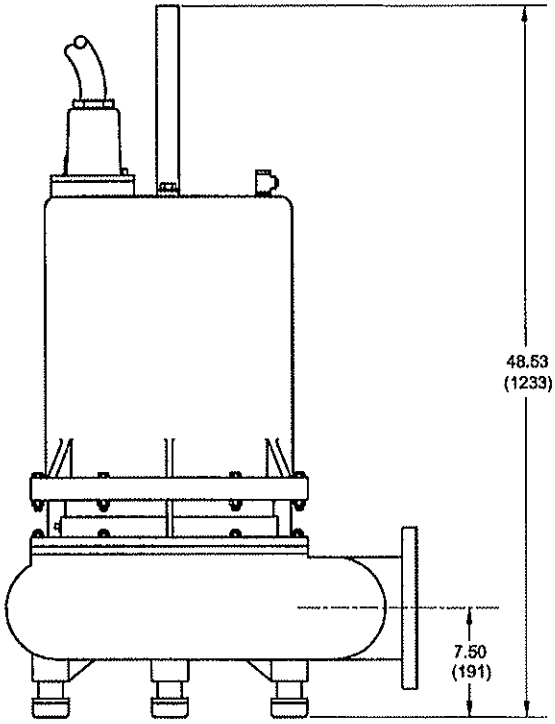
DESCRIPTION:

SUBMERSIBLE NON-CLOG SEWAGE PUMP DESIGNED FOR TYPICAL RAW SEWAGE APPLICATIONS.

Specifications:

DISCHARGE		6" NPT, 125 lb. Flange Horizontal
LIQUID TEMPERATURE		104°F (40°C) Continuous
VOLUTE		Cast Iron ASTM A-48, Class 30, with Bronze wear ring
MOTOR HOUSING		Cast Iron ASTM A-48, Class 30
SEAL PLATE		Cast Iron ASTM A-48, Class 30
IMPELLER:	*Design*	Single Vane on 18 thru 36HP , Two Vane on 48 thru 75HP, Enclosed, With Pump OutVanes on Back Side. Dynamically Balanced ISO G6.3
	Material	Cast Iron ASTM A-48, Class 30
SHAFT		416 Stainless Steel
SQUARE RINGS		Buna-N
DIAPHRAGM		Buna-N
HARDWARE		300 Series Stainless Steel
PAINT		Air Dry Enamel.
SEAL:	*Design*	Double Mechanical, Oil Filled Pressure Equalized Reservoir
	Material	Rotating Faces - Carbon Stationary Faces - Ceramic Elastomer - Buna-N Hardware -300 Series Stainless
CORD ENTRY		40 ft. (12.1 m) Std. Cord. Epoxy Sealed Housing with Secondary Pressure Grommet for Sealing and Strain Relief
SPEED		1750 RPM (Nominal)
UPPER BEARING:		
	Design	Single Row, Ball, Oil Lubricated
	Load	Radial
LOWER BEARING:		
	Design	Double Row, Ball, Oil Lubricated
	Load	Radial & Thrust
MOTOR:	*Design*	NEMA B - Three Phase Torque Curve. Oil-Filled, Squirrel Cage Induction
	Insulation	Class F.
THREE PHASE		Dual Voltage 230/460; Requires Overload Protection to be Included in control panel.
MOISTURE SENSOR		Normally Open (N/O), Requires Relay in Control Panel
TEMPERATURE SENSOR		Normally Closed (N/C), Requires Relay in Control Panel
OPTIONAL EQUIPMENT		Seal Material, Impeller Trims, Cord Length

6" Horizontal Discharge - Submersible Non-Clog Pumps



MODEL NO	PART NO	HP	VOLT/Ph	Hz	RPM (Nom)	NEMA START CODE	FULL LOAD AMPS	LOCKED ROTOR AMPS	CORD SIZE	CORD TYPE	CORD O.D. ± .02 (.5) in (mm)
6SE18034L	084663	18	230/3	60	1750	F	50.6	232.0	6/3-3G	G	1.010 (26)
6SE18044L	084664	18	460/3	60	1750	F	25.3	116.0	6/3-3G	G	1.010 (26)
6SE18054L	089187	18	575/3	60	1750	F	20.0	92.8	6/3-3G	G	1.010 (26)
6SE24034L	084665	24	230/3	60	1750	E	62.8	290.0	6/3-3G	G	1.010 (26)
6SE24044L	084666	24	460/3	60	1750	E	31.4	145.0	6/3-3G	G	1.010 (26)
6SE24054L	089188	24	575/3	60	1750	E	25.6	116.0	6/3-3G	G	1.010 (26)
6SE30034L	084667	30	230/3	60	1750	E	75.8	364.0	2/3-3G	G	1.340 (34)
6SE30044L	084668	30	460/3	60	1750	E	37.9	182.0	2/3-3G	G	1.340 (34)
6SE30054L	089189	30	575/3	60	1750	E	30.3	145.6	2/3-3G	G	1.340 (34)
6SE36034L	084669	36	230/3	60	1750	E	90.0	434.0	2/3-3G	G	1.340 (34)
6SE36044L	084670	36	460/3	60	1750	E	45.0	217.0	2/3-3G	G	1.340 (34)
6SE36054L	089190	36	575/3	60	1750	E	36.0	173.0	2/3-3G	G	1.340 (34)
6SE48044L	084671	48	460/3	60	1750	E	65.0	290.0	2/3-3G	G	1.340 (34)
6SE48054L	089191	48	575/3	60	1750	E	52.0	232.0	2/3-3G	G	1.340 (34)
6SE60044L	084672	60	460/3	60	1750	E	78.0	363.0	2/3-3G	G	1.340 (34)
6SE60054L	089192	60	575/3	60	1750	E	62.4	290.4	2/3-3G	G	1.340 (34)
6SE75044L	084673	75	460/3	60	1750	G	96.0	576.0	2/3-3G	G	1.340 (34)
6SE75054L	089193	75	575/3	60	1750	G	76.8	460.8	2/3-3G	G	1.340 (34)

Moisture and Temperature sensor cord for all models is 18/5 SOW, 0.476 (12.1mm) ± .02 (.51mm) O.D.

IMPORTANT !

1.) PUMP MAY BE OPERATED "DRY" FOR EXTENDED PERIODS WITHOUT DAMAGE TO MOTOR AND/OR SEALS.
2.) THIS PUMP IS APPROPRIATE FOR THOSE APPLICATIONS SPECIFIED AS CLASS I DIVISION II HAZARDOUS LOCATIONS.
3.) THIS PUMP IS NOT APPROPRIATE FOR THOSE APPLICATIONS SPECIFIED AS CLASS I DIVISION I HAZARDOUS LOCATIONS.
4.) INSTALLATIONS SUCH AS DECORATIVE FOUNTAINS OR WATER FEATURES PROVIDED FOR VISUAL ENJOYMENT MUST BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE ANSI/NFPA 70 AND/OR THE AUTHORITY HAVING JURISDICTION. THIS PUMP IS NOT INTENDED FOR USE IN SWIMMING POOLS, RECREATIONAL WATER PARKS, OR INSTALLATIONS IN WHICH HUMAN CONTACT WITH PUMPED MEDIA IS A COMMON OCCURRENCE.

Series 6SE-L

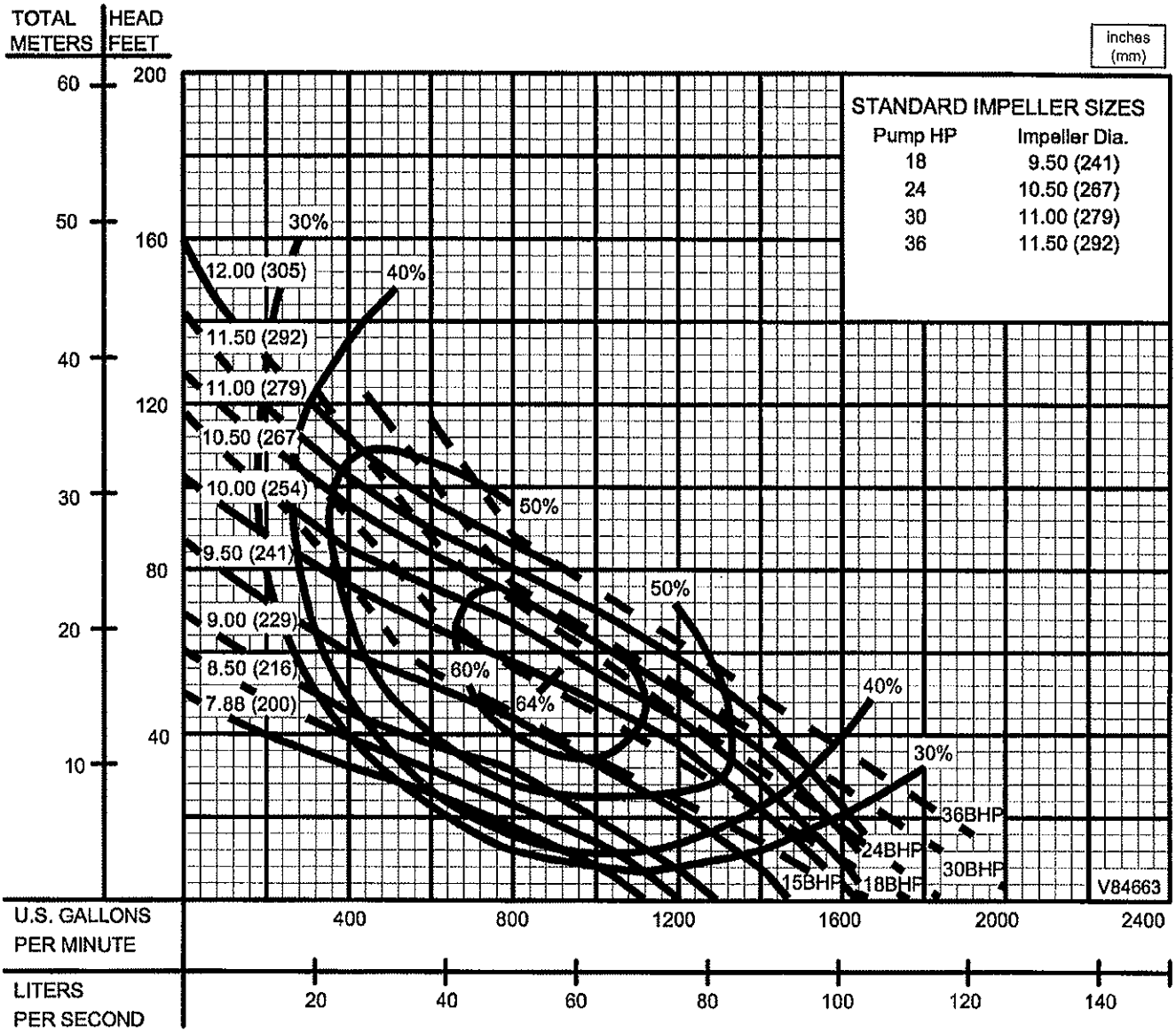
Performance Curve

18, 24, 30 & 36HP, 1750RPM, 60Hz

BARNES®

www.cranepumps.com

6" Horizontal Discharge - Submersible Non-Clog Pumps



Testing is performed with water, specific gravity 1.0 @ 68° F @ (20°C), other fluids may vary performance

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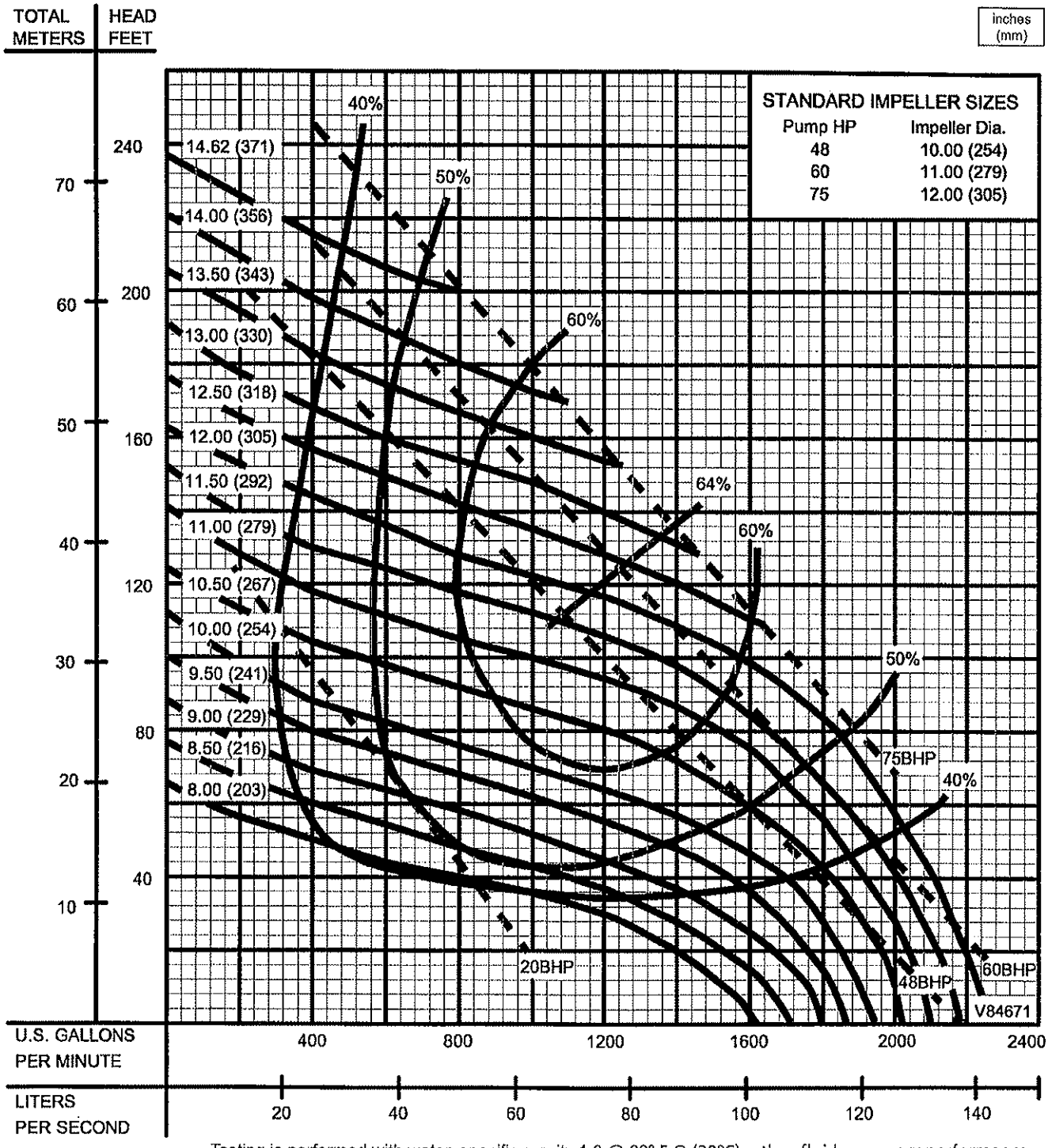
Series 6SE-L

Performance Curve

48, 60 & 75HP, 1750RPM, 60Hz

6" Horizontal Discharge - Submersible Non-Clog Pumps



Testing is performed with water, specific gravity 1.0 @ 68° F @ (20°C), other fluids may vary performance

APPENDIX D

Air Sampling Data

AIR SAMPLE

Air Sampling Data

Hot Springs PS Examination Job #: 08059030

SITE: HOUSLEY RD.

DATE: July 23rd, 2008 SAMPLE TAKEN BY: ____ SJG TIME: 9:00 AM

Note! Performed leak test on gas sampler. Tested OK

	Tube #	Exp. Date	Temp °F	Volume (mL)	Concentration Range	Concentration C (ppm)	Correction for Temp. and/or Vol. = C_{corr}	Comments
HYDROGEN SULFIDE	120SF	JUL 2010		100	25-2000 ppm			
(High Range)					(DL = 0.3 ppm)			
HYDROGEN SULFIDE	120U	JUL 2009	76.0	100	0.2-3 ppm	0.1		
(Low Range)								
MERCAPTANS	130U	JUL 2009	76.0	100	0.5 - 10 ppm	TRACE		
					(DL = 0.2 ppm)			
METHYL AMINE	227S	JUL 2010	76.0	100	1 - 20 ppm	ND		
					(DL = 0.2 ppm)			
GENERAL HYDROCARBONS	187S	JUL 2010	76.0	100	50 - 1400 ppm	ND		
					(DL = 5 ppm)			

na - not applicable **nn** - applicable, but not needed because no odor detected at that range **ND** - no detection

APPENDIX E

Draw-Down Calculations

Project Hot Springs Pump Station Evaluations Job No. 0805 9030 Made By AJK Date 7-31-08

Subject Housley Road Hydraulic Calcs. Chkd. By _____ Date _____

WET WELL DIMENSIONS:

14' x 14' x 282" *

* L x W Include 12" Wall Thickness.

AREA = (12 FT)(12 FT)
= 144 FT²

INFLUENT CALCS.

TEST # 1

Δh = 223" - 220½"
= 2½" = 0.208'

VOL = (144 FT²)(0.208 FT)
= 30 FT³ | 7.48 GAL / FT³ = 224.4 GAL

Δt = 10 MIN

Q = 22.44 GPM

PUMP # 1 CALCS.

TEST # 1

Δh = 220½" - 220"
= ½" = 0.0417'

VOL = (144 FT²)(0.0417 FT)
= 6 FT³ | 7.48 GAL / FT³ = 44.88 GAL

Δt = 1 MIN

TOTAL VOL = 44.88 GAL + (22.44 GPM)(1 MIN)
= 67.32

PUMP # 1 MEASURED FLOW RATE

Q_{PUMP} = 67 GPM

Pump #2 Calcs.

Test #1

$\Delta h = 220\frac{1}{4}" - 219\frac{1}{2}"$
$= 3/4" = 0.0625'$

Vol = $9\ Ft^3 = 67.32$ GAL

$\Delta t = 1$ MIN

Total Vol = 89.76 GAL

Pump #2 Measured Flow Rate

$Q_{PUMP} = 90$ GPM

Pump #1 + Pump #2 Calcs

Test #1

$\Delta h = 221\frac{1}{2}" - 219\frac{1}{2}"$
$= 2" = 0.1667'$

Vol = $24\ Ft^3 = 179.52$ GAL

$\Delta t = 1$ MIN

Total Vol = 201.96 GAL

Pump #1 + Pump #2 Measured Flow Rate

$Q_{PUMPS} = 202$ GPM

APPENDIX F

Electrical Power and Control Issues

Standby Power and Related Issues

It should be noted that at the time of the site visit, the electrical configurations were not necessarily identical at each station. For portable generator installation, it is required that the phase rotations at each station be consistent. This may require "rolling" conductors to existing connections to achieve code and proper rotation of existing motors. It is also important to note that some services have "high leg" 120/240 volt-three phase- four wire services. Others have 480 volt-three phase services.

Generators can be provided with accessories to allow voltage selection for 240 or 480 volt operation, but this is not a standard feature to allow tools free operation. Personnel will have to be knowledgeable in the use of the portable generators. Each station should have a sign stating voltage and phase rotation.

During the pump station inspections, we found instances where the "high leg" was not positioned in middle phase location as required by code causing concerns about consistency for sites sharing portable generators.

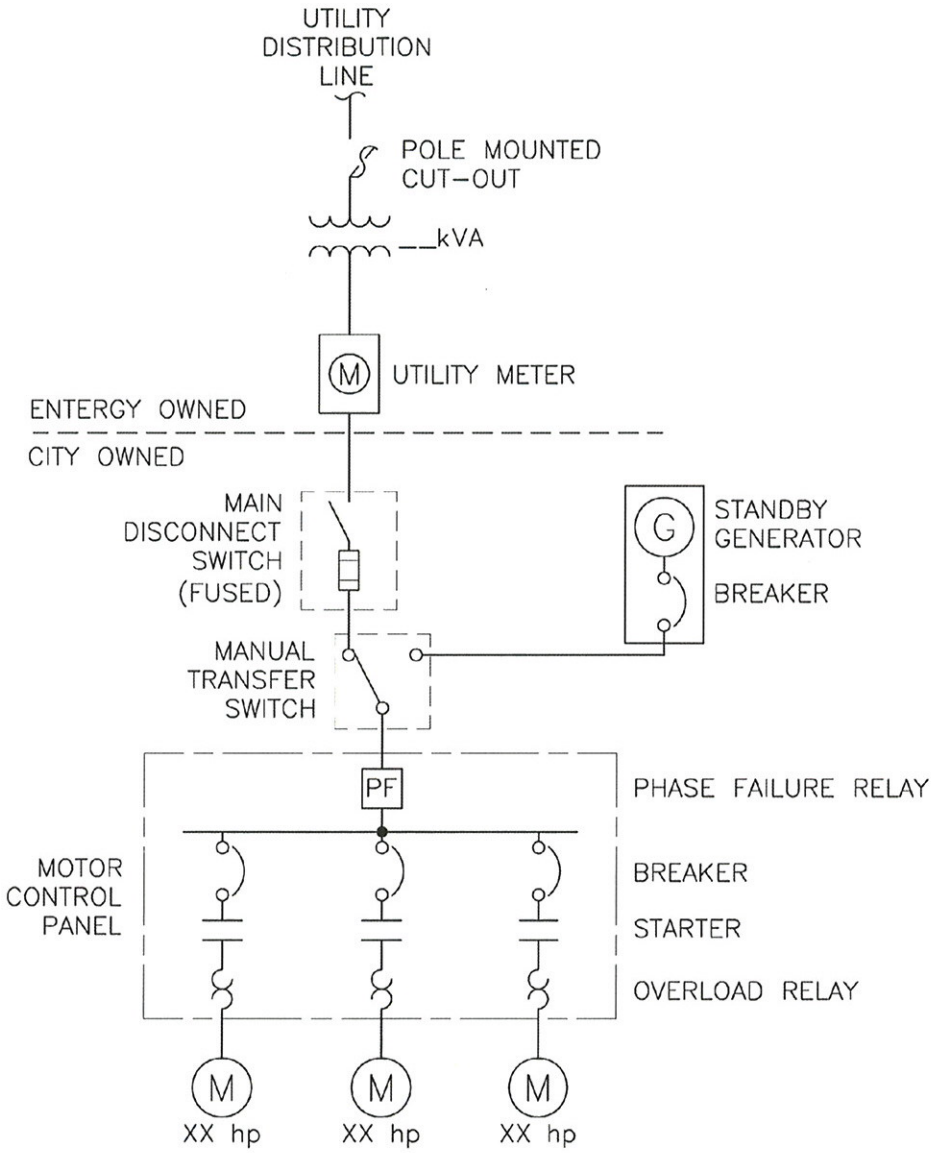
To make provision for portable generators, there will need to be added manual transfer switches (MTS) which select either the utility or the generator power supply and prohibit the interconnection of two sources.

We have shown installation of receptacles for the generator lead delivery of standby power. Particular care will be required by a knowledgeable and responsible electrician to get this installed correctly and consistently.

Related to this issue is our recommendation to install loss of phase and phase reversal protection relay for all three phase pump motors. An economical method is to install a Timemark or equal relay on each motor. On power degradation the pumps will stop, whether from utility voltage problems or from a generator power connection issue.

The pump stations should report loss of power to the SCADA central monitoring location and also display when the pump station is on generator power. This would be a management tool to allow dispatch of generators as well as knowing the source of power to each station in transition periods.

The selection of the receptacle requires some analysis was well since one size should fit most or all of the stations using portable generators. The considerations of arc flash protection are included in the manufacture in some receptacle plug combinations.



NOTE: FOR MOTORS 25HP AND LARGER

2 PERMANENT STATIONARY STANDBY GENERATOR
SCALE: NONE

QuickSize
Generator Set Sizing

Project WW Pump Stations
Customer City of Hot Springs

Generator Set

Model No. 100RZG **Gensets** 1
Engine Vortec 8.1 (Nat. Gas)
Alternator 4S13

Performance Summary

LN / LL Voltage	277/480	volts	**Altitude**	500	feet
Frequency	60	hertz	**Ambient Temp.**	104	F
Phase(s)	3	phase			

Genset Rating @ 130C Rise	100.00 kW	
Genset Derated Rating	95.50 kW	
Total Running Power	55.00 kW	
Percent of Available kW Used	57.59 %	
Alternator Starting kVA	294.29 kVA @ 20% dip	
Peak Starting kVA	184.96 kVA	
Maximum Voltage Dip	14.34 %	
Maximum Frequency Dip	8.50 %	(no restriction)
Voltage THD	0.00 %	(no restriction)

Informational

Program Version	8.6.0
Database Version	1.32
Project Created	September 25, 2008; 09:22:01 AM
Project Last Saved	September 25, 2008; 09:22:01 AM
Report Created	September 25, 2008; 09:30:34 AM

Project Created By

QuickSize
Generator Load Profile

Project WW Pump Stations
Customer City of Hot Springs

Generator Set

Model No. 100RZG **Gensets** 1
Engine Vortec 8.1 (Nat. Gas)
Alternator 4S13

Load Profile

	Qty	Run kW	Run kVA	Run pF	Start kW	Start kVA	Volt Dip	Freq Dip	Volt (L-N) THD
Step #1	**Load Step #3**								
<Misc. Load> (3.00 kW misc. load)									
	1	3.00	3.00	1.00	3.00	3.00			
Step Totals		3.00	3.00	1.00	3.00	3.00	0.92	1.80	0.0%/0.0%/0.0%
Cum. Totals		3.00	3.00	1.00					
Step #2	**Load Step #1**								
<Motor> (30.00 HP, 3 phase, code F, loaded motor, w/ A.T.L. starting)									
Rated motor torque from full voltage starting = 73.6%									
	1	26.00	29.50	0.88	66.78	159.00			
Step Totals		26.00	29.50	0.88	66.78	159.00	14.22	8.50	0.0%/0.0%/0.0%
Cum. Totals		29.00	32.50	0.89					
Step #3	**Load Step #2**								
<Motor> (30.00 HP, 3 phase, code F, loaded motor, w/ A.T.L. starting)									
Rated motor torque from full voltage starting = 73.4%									
	1	26.00	29.50	0.88	66.78	159.00			
Step Totals		26.00	29.50	0.88	66.78	159.00	14.34	8.50	0.0%/0.0%/0.0%
Cum. Totals		55.00	62.00	0.89					
Grand Totals		55.00	62.00	0.89					0.0%/0.0%/0.0%

*Frequency dip calculation based on estimated data.

Informational

Program Version 8.6.0
Database Version 1.32

Project Created September 25, 2008; 09:22:01 AM
Project Last Saved September 25, 2008; 09:22:01 AM
Report Created September 25, 2008; 09:28:19 AM

Project Created By

APPENDIX G

Cost Estimate

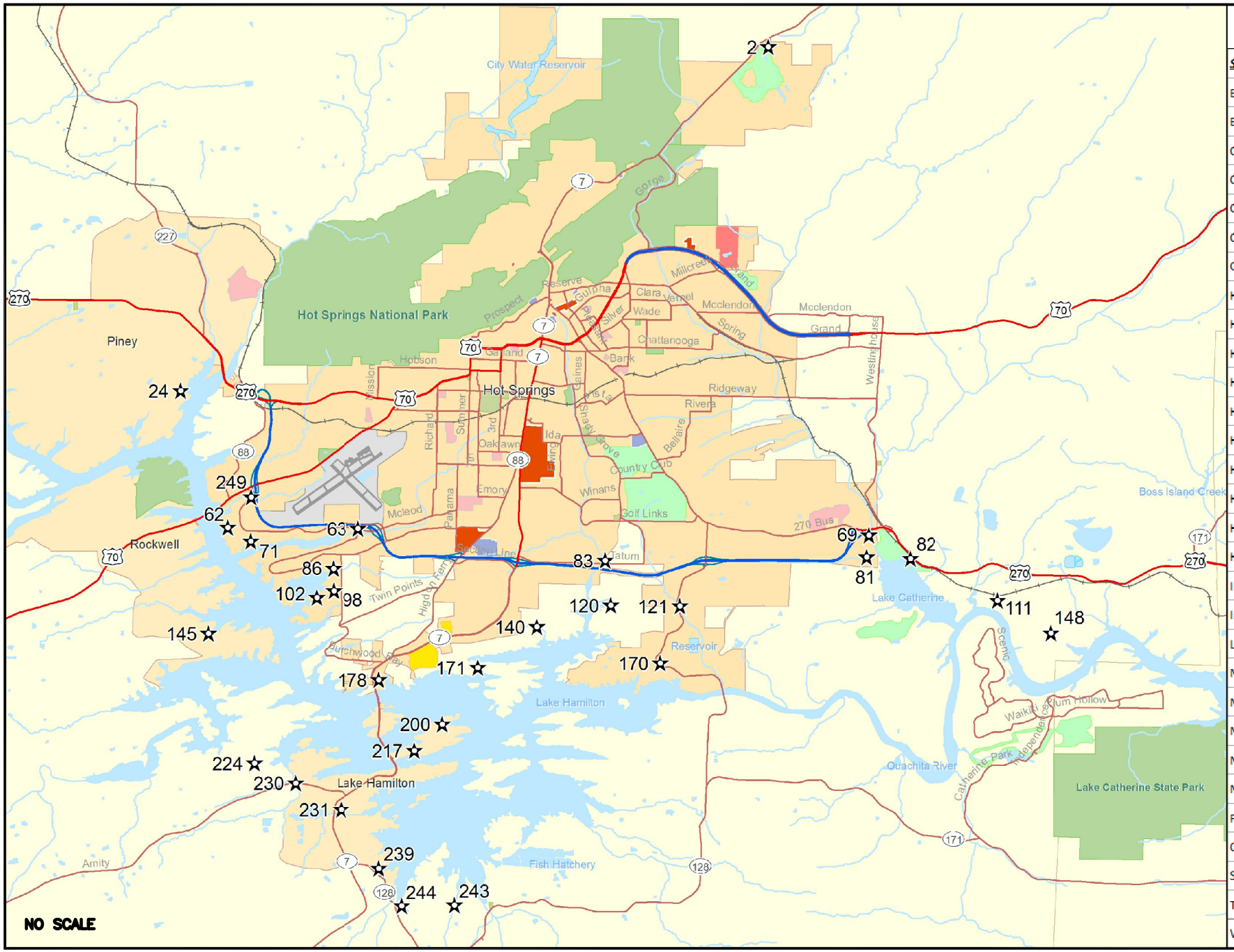
PROJECT COST ESTIMATE			SHEET 1	OF 1	
DESCRIPTION: Housley Road Estimated Pump Station Repair Costs					
PROJECT NUMBER: 0805-9030	DESCRIPTION: Hot Springs Pump Station and Collection System Examination				
NAME OF PERSON PREPARING COST ESTIMATE: AJK, SFF	ORGANIZATION: Garver Engineers, Inc.			DATE (Day, Month, Year): 30-Sep-08	
NAME OF PERSON CHECKING COST ESTIMATE: AAS	ORGANIZATION: Garver Engineers, Inc.			DATE (Day, Month, Year): 9/30/08 5:36 PM	

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	LABOR COST	TOTAL ITEM COST
1	Pump Guide Rails	4	EA	$ 480.00	$ 190.00	$ 2,680.00
2	Guide Rail Brackets	2	EA	$ 369.00	$ 150.00	$ 1,038.00
3	Sand Blasting/ Painting Pipe	100%	LS	$ 5,000.00	$ -	$ 5,000.00
4	Security Lighting	1	MO	$ 10.00	$ -	$ 10.00
5	Relocate Water Service	100%	LS	$ 300.00	$ -	$ 300.00
	Standby Power					
6	100kW Kohler Natural Gas Generator (480V)*	1	EA	$ 23,500.00	$ 3,200.00	$ 26,700.00
7	*Add-on*: Sound-Attenuating Enclosure	1	EA	$ 1,400.00	$ -	$ 1,400.00
8	200A Automatic Transfer Switch (Analog)	1	EA	$ 4,000.00	$ 400.00	$ 4,400.00
9	*Add-on*: Digital ATS		EA	$ 1,200.00	$ -	$ -
	Probable Construction Cost					$ 41,528.00
	Contingency & Engineering (30%)					$ 12,500.00
	Opinion of Probable Total Cost**					**$ 54,028.00**

* Please note that the pumps in this station have NOT been evaluated based on required capacity. Recommended pump capacity and generator size for this station may change pending a thorough hydraulic evaluation of the station.

** Total cost does NOT include any applicable sales tax or site delivery costs for materials.

APPENDIX "B"



ALPHABETICAL CROSS-REFERENCE

Station Name:	ID Number:
Bayside Road	24
Belvedere	2
Caroline Acres	244
Carpenter Dam	170
Catherine Heights	81
Chad Drive	148
Gulpha	69
Halteria	62
Harold Drive	98
Hogan Creek	249
Hot Springs #1	140
Hot Springs #2	171
Hot Springs #3	178
Hot Springs #4	86
Hot Springs Creek	83
Housley Road	230
HWY 290	239
Island #5	217
Island #6	200
Lakeside	121
Malvern Highway	82
Matthews Lane	120
Mazarn #1	145
Moonlight Bay	102
Mt. Carmel	243
Port-au-Prince	71
Quail House	231
Stokes	63
Tanglewood	224
Wilson Mill	111

APPENDIX "C" - WASTEWATER PROJECT STATUS REPORT

	PROJECT DESCRIPTION	FIRM CONTRACTOR	CONTRACT COST	COMPLETION TARGET	STATUS
	SCADA MASTER PLAN PROJECTS				
	Scada Master Plan Development				
1	Engineering Study, Plan Development & Computer Radio Modeling	Brown Engineers	$ 48,543.00	Jan 1, 2009	Complete
2	Radio Path Study	Brown Engineers		2009	Complete
3	Ouachita Water Plant HMI Upgrade	Brown Engineers	$ 149,400.00	Mar 1, 2009	Complete
4	SCADA RTU Program Development	Brown Engineers	$ 196,700.00	2010	Complete
5	SCADA Radio Repeater	Brown Engineers	$ 134,540.00	Feb 1, 2011	95% Complete
	Grinder Station Alarm System				
6	Engineering Design, Bidding, etc	Brown Engineers	$ 196,700.00	December, 2010	Complete
7	Construction Contract for 2845 Stations	All Service Electric	$ 772,115.50	October, 2011	Contractor to begin in February
8	Engineering Integration, Programming, etc	Brown Engineers	$ 335,000.00	October, 2011	Pending Board Approval 2/1/11
				$ 1,832,998.50	**Project Subtotal - To Date**
9	Regional Wastewater Plant HMI Upgrade	Brown Engineers	$ 228,447.00		Awaiting Notice To Proceed
	RTU Installation Project - 80 Wastewater Sites				
10	Design	Brown Engineers	$ 125,000.00		Future
11	Construction Contract	TBD by Bid Process	$ 1,600,000.00		Future
12	System Integration	Brown Engineers	$ 160,000.00		Future
13	Operations View Clients (Wonderware Information Server)	Brown Engineers	$ 45,000.00		Future
14	IT and Database Monitoring, Backups and Disaster Recovery	Brown Engineers	$ 25,000.00		Future
15	Annual SCADA Software Support (Invensys Wonderware & BE)		$ 30,000.00		Future
		SCADA Subtotal	**$ 4,046,445.50**		**Estimated (Actuals + Projected)**
	PUMP STATION EVALUATION AND REHABILITATION				
1	Wastewater Pump Station Evaluation and Collection System Examination	Garver, LLC	$ 1,200,000.00	December, 2011	50% Complete
2	Pump Station Rehabilitation and Upgrade - Project 10A	H&H Electric	$ 923,080.00	February, 2011	90% Complete
				$ 2,123,080.00	**Project Subtotal - To Date**
3	Pump Station Piping Replacement - Project 10C	To be determined	$ 350,000.00	September, 2011	80% Design Complete
4	Pump Station Rehabilitation and Upgrade - Project 10D	To be determined	$ 1,000,000.00	Summer, 2012	Surveying Complete. Design 50%
		Pumps Subtotal	**$ 3,473,080.00**		**Estimated (Actuals + Projected)**
	COLLECTION SYSTEM EVALUATION AND REHABILITATION				

APPENDIX "C" - WASTEWATER PROJECT STATUS REPORT

1	Phase 1 - Flow Monitoring	RJN Group	$ 412,302.35	Spring, 2009	Complete
2	Phase 2 - Field Investigation	RJN Group	$ 3,360,383.00	February, 2011	95% Complete
3	Phase 3 - Hydraulic Modeling	RJN Group	$ 359,530.00	Spring, 2011	80% Complete
4	Phase 4 - Construction Design and Bidding Services	RJN Group	$ 629,505.00		Design of Phase I MH/Pipelines
				$ 4,761,720.35	**Project Subtotal - To Date**
5	Phase 1 of Manhole and Pipeline Repair/Rehab/Replacement	To Be Determined	$ 8,000,000.00		Bidding in Spring, 2011
		Collections Subtotal	**$ 12,761,720.35**		**Estimated (Actuals + Projected)**
	WASTEWATER PLANT EXPANSION DESIGN AND SPECS				
1	Regional Wastewater Plant Expansion from 12 MGD to 16 MGD - Engr. Design	Garver, LLC	$ 228,000.00	Fall, 2009	Complete - Pending ADEQ Appr.
2	Regional Wastewater Plant Phosphorous Removal Study and Design	Garver, LLC	$ 334,000.00	2011	Study Complete - Design Pending
		Plants Subtotal	**$ 562,000.00**		**Estimated (Actuals + Projected)**
	IN-HOUSE EFFORTS				
1	South Patterson Wastewater Line Replacement	City Crews	$ 243,000.00	2008	Complete
2	Molly Creek Pump Station Rebuild	Heller Co./City	$ 363,000.00	2009	Complete
3	Tom Ellsworth Street Wastewater Line Replacement	Heller Co./City	$ 220,000.00	2010	Complete
4	Manhole Rehabilitation Using Uretek	Uretek/City	$ 150,000.00	2011	Complete
5	2010 Wastewater System Improvements - Line Replacements	Cobar Construction	$ 211,000.00	2010	Complete
6	Fairwood Forcemain/Pump Station Improvements	Coakley Co.	$ 1,840,000.00	2012	Project Underway
				$ 3,027,000.00	**Project Subtotal - To Date**
7	2011 Wastewater System Improvements - Line Replacements	To Be Determined	$ 200,000.00	2011	Design Phase
		Collections Subtotal	**$ 3,227,000.00**		**Estimated (Actuals + Projected)**
	Total Amount Spend and/or Encumbered To-Date	**$ 11,744,798.85**			
	Estimated Amount of Known Projects (Actuals Plus Projected)	**$ 24,070,245.85**			