Operations and Permitting Specialists

July 15, 2019

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Director of Public Works
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Ron:

March 24 and 25th, 2019 Operations and Permitting Specialists Principal Engineer William Lewis visited seven sewage lift stations with Director of Public Works Ronald R. Walker Jr.

Inspections consisted of:

- Visual inspection of each site
- Normal operation during the inspection
- Discussion of operational constraints
- General maintenance history
- Safety issues
- Access
- Spare parts for pumps and controls
- General issues

Inspection did not include:

- Review of drawings and other documentation
- Review of facility structural integrity other than visual inspection. Concrete testing such as surface hardness were not conducted. Coatings inspections were visual only - no tests were performed.

Conclusion: Prioritization of Live Oak Sewage Collection Lift Stations

Priority 1 - Complete Replacement

- P Street
- Pennington

Priority 2 Major Rehabilitation Project

- Peach Street

Priority 3 Intermediate Rehabilitation Project

- Ash

Priority 4 Minor Rehabilitation Project

- Kola
- Musgrave

Priority 5 Inspection prior to use

- Garden Glen

Below is a lift station condition summary table. The table outlines immediate and longer term improvements. Details for each lift station is included in the attached inspection notes and recommendations.

24250 SW Durdel Drive, Sherwood Oregon 97140 (530) 923 3862

Lift Station Condition Summary

Lift Station Name	General Condition	Immediate Improvements	Longer Term Improvements
P Street	Extremely Poor	• Complete replacement of the station - abandon existing station. • Hazardous conditions for employees. Stairwell has been blocked to prevent employees from access • Employees cannot access the pump discharge valves and check valves • Sewer gas and odors inside the main building have resulted in corrosion to the electrical system. • Electrical system is extremely poor condition • Current pumps cannot keep up with flow - sump rises above the inlet resulting in surcharged collection system. • Due to depth - as part of the pre-design consider dry well pumps	
Pennington	Poor	• Station requires a complete replacement due to location near school, sidewalk and street. • Maintenance results in raw sewage spillage on the sidewalk and other areas not behind a fence. • Consider relocation to an area to the south • Pre-design should evaluate a traditional sump and submersible pump installation	
Peach	Fair	• There is not a shelf spare pump - if a pump fails a smaller pump must be installed • Replace bubble controller with newer technology • Replace valve box lids	• Coat sump • Concrete repairs • Replace in sump piping
Ash	Good	• Replace bubble controller with newer technology	• Flow meter is out of service. Determine need for replacement or abandon in place • Relocate sump vent • Coat sump

Lift Station Name	**General Condition**	**Immediate Improvements**	**Longer Term Improvements**
Kola	Good	• Station layout can be used as a model for other future stations • Consider changing to Flyght pumps • Replace bubble controller with newer technology • Electrical wiring from MCC to pump needs evaluation and repair. Possible damage and corrosion where wiring enters the sump	• Coat piping • Evaluate roof condition • Flow meter is out of service. Determine need for replacement or abandon in place
Musgrave	Good	• Increase water service size	• Recoat sump • Replace pump rails
Garden Glen	Unknown	• Station is not currently in use except for I&I. • Limited inspection	• Additional asphalt

General Comments for all lift stations:

- All sump lids should have integral fall protection system installed
- All sump lids and vaults should be inspected for structural integrity
- Controls System are outdated. It was reported that original manufacturer parts are no longer available. All stations should be upgraded at the same time to allow consistent controls to be installed.
- Station radios should be considered for replacement
- Industrial rated UPS systems should be installed with Controls and SCADA monitoring project
- SCADA monitoring of more analog and digital inputs and outputs should be considered and evaluated.
- City should determine if flow metering is warranted at each lift station. If it is determined to have overall benefits then stations should be prioritized for flow metering installation. As an alternative the SCADA system could be programmed to estimate flow based on installed pump curves and measured pressure.
- All stations should include an onsite generator. The City should also consider the addition of a quick connection for portable generator. An electrician should not be required for temporary power connection. Stations should be standardized as to the type of plug connection for each voltage. If due to voltage and pump rotation considerations different connection cords are required clear signage and SOP with photographs should be posted at the connection location.
- As much as possible standardize pumps of similar size - manufacturer, rails, connection flange, voltage, etc. This will allow redundant shelf spare equipment for quick replacement.
- Electrical and instrumentation controls equipment location should be evaluated. Some lift stations include a control building while others utilize outdoor panels. Buildings provide longer life and improved operating conditions. Buildings can also be a multifunctional such as space for spare parts, maintenance equipment storage and are more resistant to vandalism. Panels are of a lower cost, but result in shorter equipment life and more difficult maintenance issues.

    - Stations that use a control building should use Kola Lift Station as a model to emulate.
    - Stations that use exterior control panels should use Musgrave Lift Station as a model.
- Arc-flash signage and protection protocols should be evaluated by an electrical or safety engineer
- Provide consistent level sensing in all stations. It is recommended that a pressure sensing technology become standard. Bubblers and radar type level sensing should be converted to pressure sensing.
- Exterior lighting at each lift station should be evaluated for security and emergency night work.
- All stations should have security fencing to prevent public access to all lift station components.
- City should evaluate installation of security cameras at all lift stations.
- Most of the Lift Stations do not have an adequate water supply for maintenance purposes. It is recommended that a 1.5 inch service be installed at all lift stations and at least one 1.5 inch hose bib be installed with camlock Type C quick disconnect. Other station hose bibs should be one inch.
- A typical design standard is that peak flow can be accomplished without surcharging the collections system with one pump in standby. Maximum level should be contained within the wetwell during peak operation - flow should not back-up into the collection piping. It was reported that most of the lift stations had all pumps operating for long periods of time this last winter in order to maintain sump level. P Street is not able to keep up with flow with all pumps operating - sump level rises and begins to surcharge the collection system. It is recommended that the collection system be evaluated for pump capacity. Some of the stations have provisions for a third pump installation, if so the pump, rails, electrical, controls, and piping should be added. Downstream piping should be evaluated for available and remaining capacity.
    - A complete inspection of the collection system should take place in order to reduce infiltration and inflow. TV inspection of piping should be conducted.
    - The City should consider preparation of a collection system model that could be used for lift station sizing.
- The newest lift station has a deep sump and collection system. Future lift stations should evaluate value and benefit of a more shallow collection system. Deep sumps and collection system are more difficult to maintain. Deep collection pipelines may be below the groundwater level resulting in increased opportunity for infiltration through pipe joints and manhole segments. A more shallow collection system may result in increased number of lift stations and operating cost. Increased lift station operations costs can then be compared to costs associated with treating at the wastewater facility and capacity of infiltration water. The wastewater treatment facility is designed for peak hour wet weather flow. The City should develop collection system maximum depth standards.

Attached are detailed site inspection reports for each lift station. Each report includes inspection notes and recommendations. If you have any questions or comments please contact me at 530 923 3862 or williamplewis@outlook.com.

Respectfully Submitted,

William P. Lewis

William P Lewis
Principal Engineer

Lift Station Name: P Street - Priority 1

Approximate date of construction	Late 1950's
Approximate date of last rehab	Updated approximately early 1980's
Monitoring System Issues	CPU outdated, original equipment manufacturer spare parts are not available. Radio does not have back-up. Repairs and maintenance requires vendor visits to the site.
Pumps controls method and reliability	Installed 9/2004. Panel needs updating. MCC, Control Panel and other electrical components have visible corrosion likely due to sewer gasses and wet conditions.
Pump horsepower	2 - 20 hp.
Are pump parts and rehab readily Available?	Yes
Number of pumps	Two pumps installed. It is common during the winter for both pumps to operate and not keep up with influent flow. Sump rises with both pumps operating.
Does LS pump into a line that is again repumped?	No
Approximate available downtime in event of a failure	Less than 20 in wet weather or high ground water conditions.
Ease and ability to connect emergency portable generator	Back-up generator onsite more than 30 years. Oldest generator in the City.
Is there an installed redundant pump during high flow events?	No: During storm events one pump runs continuously and often both pumps operate continuously. It was reported that it is not uncommon that the sump rises several feet and begins to surcharge the collection system with both pump running.
During recent storms how often were all of the pumps in the Lift Station required	Often
Does the City have a "shelf spare" in inventory	Spare pump in inventory - electrical and controls have limited spare parts.
Is there known direct infiltration into the Pump Sump	Yes - high ground water and storm events
Discharge issues - for example: 2 pumps cannot be operated at the same time due to piping constraints	2 pumps operate OK at same time. This is a common event during winter months.

Lift Station: P Street - Page 2	
Pump and valving constraints. For example: Discharge valves are not installed or not easily accessible or check valves cause maintenance issues	Discharge piping cannot be maintained. Check valves are on the lower level of the station. City staff are not allowed to enter the area due to confined space constraints.
Confined space entry issues for normal maintenance of pumps and valves	Yes. Deep wetwell. Internal stairway is blocked off to reduce sewer gases from entering the electrical/control room. There is significant corrosion of electrical equipment. Valving and piping are located on the lower blocked off level.
Pump rail condition	OK for 2 pumps. The wetwell is sized for 3 pumps. There are no provisions for third pump such as rails, electrical, or controls.
Sump Cover condition	Wet well cover in poor condition there are signs of corrosion and difficult to operate. Covers do not have fall prevention under main cover.
Sump and valve box condition	Located in the underground level of the building. Pipe gallery in poor condition. City staff are not allowed to enter area with valves and check valves.
Lighting for after hours activities	Poor - no exterior lights
Access issues for maintenance	Poor - Vacuum truck has poor access and difficult to remove solids and grease. Wetwell depth making cleaning difficult.
Odor complaints or desired odor control	There have been no known citizen odor complaints. Odors were present during observation of the station.
Unscheduled maintenance history on any LS equipment	Minor unscheduled repairs about every 60 days. Major unscheduled repair every 4 to 6 months.
Generator installation	Unknown more than 30 years old. Diesel fuel.
General Comments	1. Largest collection system pump station. 2. The Lift station is in such a condition that it is recommended to be abandoned and reconstructed, possibly to the west of existing location. 3. Due to the depth of the lift station the City may consider a dry well pump station. 4. Due to the lift station size and large flow variations the City should consider installation of pumps of different sizes and VFD controlled pumps.

Lift Station Name: Pennington - Priority 1

Approximate date of construction	Staff does not know date of construction
Approximate date of last rehab	No known significant improvements since original construction
Monitoring System Issues	CPU outdated, original equipment manufacturer spare parts are not available. Radio does not have back-up. Repairs and maintenance requires vendor visits to the site. Communication antenna height is impacted. Antenna should be evaluated for proper positioning including direction, height or relocated for improved line of sight communication.
Pumps controls method and reliability	Panel needs updating. Installed 9/2004.
Pump horsepower	Staff did not know pump rating - 2 above ground Gorman Rupp
Are pump parts and rehab readily Available?	Yes
Number of pumps	2
Does LS pump into a line that is again repumped?	No
Approximate available downtime in event of a failure	Unknown
Ease and ability to connect emergency portable generator	There is not an onsite generator. There is not a quick connection point or transfer switch for a portable generator. Emergency power connection requires an electrician vendor to be called to the site.
Is there an installed redundant pump during high flow events?	No. Both pumps are required to meet flows during storm and high groundwater events.
During recent storms how often were all of the pumps in the LS required	Often
Does the City have a "shelf spare" in inventory	Parts only. There is not a shelf spare pump. In the event of a pump failure during winter event an emergency pump around would likely be required.
Is there known direct infiltration into the Pump Sump	Yes
Discharge issues - for example: 2 pumps cannot be operated at the same time	2 pumps operate OK at same time

due to piping constraints	
Lift Station: Pennington - Page 2	
Pump and valving constraints. For example: Discharge valves are not installed or not easily accessible or check valves cause maintenance issues	Pipe gallery in poor condition. Repair would likely consist of a complete replacement.
Confined space entry issues for normal maintenance of pumps and valves	No
Pump rail condition	Not applicable. Pumps are above grade. Pump cover in poor condition
Sump Cover condition	Poor. Sump consists of a manhole.
Sump and valve box condition	Sump is an uncoated manhole.
Lighting for after hours activities	Poor. There is not any security or lights to assist during night work.
Access issues for maintenance	Poor. The station is located in front of LOMS just off the sidewalk. Public access to the pump cover is not limited. Pump sump is in the sidewalk.
Odor complaints or desired odor control	There have been no known citizen odor complaints. Odors were not present during observation of the station; however, staff did state that odors are at times present at the station.
Unscheduled maintenance history on any LS equipment	Staff stated there have been a limited number of unscheduled maintenance issues.
Generator installation	There is not an onsite generator. There is not a quick connection point or transfer switch for a portable generator. Emergency power connection requires an electrician vendor to be called to the site.
General Comments	1. Lift Station is in poor condition and is located in student walking path at LOMS. 2. Maintenance activities require blocking of the sidewalk near a LOMS 3. Pipes in the manhole sump have significant corrosion. Complete replacement of piping is likely required. 4. Water supply to the LS is limited. Maintenance activities can in raw sewage being spilled on the sidewalk and street. Clean-up is difficult 5. LS is located directly adjacent to a drainage canal. 6. A redundant pump cannot be installed in the sump. 7. The City should evaluate complete replacement of the LS. Options should include relocation, possibly to the south in a secure fenced area.

Lift Station Name: Peach - Priority 2

Approximate date of construction	Staff did not know date of original construction
Approximate date of last rehab	No known significant improvements since original construction
Monitoring System Issues	CPU outdated, original equipment manufacturer spare parts are not available. Radio does not have back-up. Repairs and maintenance requires vendor visits to the site. A bubbler is used for level control. City should consider replacing with a pressure sensor level monitoring system.
Pumps controls method and reliability	Panel needs updating. Installed 9/2004.
Pump horsepower	10 hp
Are pump parts and rehab readily Available?	Yes, however the in the event of a pump failure the City must install a smaller 7.5 hp pump. City does not have a spare 10 hp pump for this location
Number of pumps	2
Does LS pump into a line that is again repumped?	No
Approximate available downtime in event of a failure	Unknown
Ease and ability to connect emergency portable generator	Yes
Is there an installed redundant pump during high flow events?	No
During recent storms how often were all of the pumps in the LS required	Yes.
Does the City have a "shelf spare" in inventory	No. If a pump were to fail it is replaced with a smaller 7.5 hp pump while pump is repaired.
Is there known direct infiltration into the Pump Sump	Yes
Discharge issues - for example: 2 pumps cannot be operated at the same time due to piping constraints	2 pumps operate OK at same time

Lift Station: Peach - Page 2	
Pump and valving constraints. For example: Discharge valves are not installed or not easily accessible or check valves cause maintenance issues	Pipe gallery in poor condition and should be considered for replacement
Confined space entry issues for normal maintenance of pumps and valves	No
Pump rail condition	Recently updated
Sump Cover condition	Poor - top concrete cover has visible cracking. Cover should be evaluated for repair or replacement.
Sump and valve box condition	Average - It is recommended that the City further inspect the sump for corrosion to evaluate repairs and coating. The wetwell is not coated. Valve box lids are not functional. Covers should be replaced.
Lighting for after hours activities	Poor. LS would benefit with the addition of at least two more lights.
Access issues for maintenance	Adequate
Odor complaints or desired odor control	There have been no known citizen odor complaints. Odors were not present during observation of the station; however, staff did state that odors are at times present at the station.
Unscheduled maintenance history on any LS equipment	Staff stated there have been a limited number of unscheduled maintenance issues.
Generator installation	Diesel generator installed 10/95
General Comments	1. Lift station should be considered for a rehabilitation project including: a. Coating of sump, b. Valve box cover replacement, c. Piping repair including coating or replacement d. Sump cover evaluation for repair or replacement e. Installation of a third pump

Lift Station Name: Ash - Priority 3

Approximate date of construction	Staff did not know date of original construction
Approximate date of last rehab	No known significant improvements since original construction
Monitoring System Issues	CPU outdated, original equipment manufacturer spare parts are not available. Radio does not have back-up. Repairs and maintenance requires vendor visits to the site. A bubbler is used for level control. City should consider replacing with a pressure sensor level monitoring system. Installed flow meter is not functional. Evaluate need for replacement or abandonment.
Pumps controls method and reliability	Panel needs updating. Installed 9/2004. CPU outdated, original equipment manufacturer spare parts are not available. Radio does not have back-up. Repairs and maintenance requires vendor visits to the site.
Pump horsepower	20 hp - Flyght. One pump has a VFD installed.
Are pump parts and rehab readily Available?	Yes
Number of pumps	2 - LS sump was designed for three pumps. Staff stated a 3rd redundant pump would be beneficial during winter events and during lower summer flows.
Does LS pump into a line that is again repumped?	No
Approximate available downtime in event of a failure	Unknown
Ease and ability to connect emergency portable generator	Diesel generator - Installed 1988.
Is there an installed redundant pump during high flow events?	No
During recent storms how often were all of the pumps in the LS required	Most storms require both installed pumps to operate
Does the City have a "shelf spare" in inventory	Spare pump available.
Is there known direct infiltration into the Pump Sump	Yes

Lift Station: Ash - Page 2	
Discharge issues - for example: 2 pumps cannot be operated at the same time due to piping constraints	2 pumps operate OK at same time
Pump and valving constraints. For example: Discharge valves are not installed or not easily accessible or check valves cause maintenance issues	Valves and piping are accessible. Valve box in poor condition and should be replaced
Confined space entry issues for normal maintenance of pumps and valves	No
Pump rail condition	Needs updating. Rails for a third pump are not installed.
Sump Cover condition	Poor - Staff has installed rubber mats over the covers to reduce odor venting and cover protection due to poor condition. No fall protection under cover.
Sump and valve box condition	Poor - Sump should be evaluated for coating. Valve box should be repaired or replaced.
Lighting for after hours activities	Poor. There is currently not any functional security or work area lighting.
Access issues for maintenance	Adequate. Access is through a gas station. Vactor truck has to enter the business grounds. There is a vent on the front side of the sump that can impact access.
Odor complaints or desired odor control	There have been no known citizen odor complaints. Odors were not present during observation of the station; however, staff did state that odors are at times present at the station.
Unscheduled maintenance history on any LS equipment	Staff stated there have been a limited number of unscheduled maintenance issues.
Generator installation	Diesel installed - 7/1988
General Comments	1. Site does not have security fencing. Public access to the site is not restricted. 2. Rehabilitation of the sump and coating, piping and valve boxes should be considered. 3. Consider installation of third pump with all piping and electrical required improvements

Lift Station Name: Kola - Priority 4

Approximate date of construction	Staff did not know date of original construction
Approximate date of last rehab	No known significant improvements since original construction
Monitoring System Issues	CPU outdated, original equipment manufacturer spare parts are not available. Radio does not have back-up. Repairs and maintenance requires vendor visits to the site.
Pumps controls method and reliability	Panel needs updating. Installed 12/03. CPU outdated, original equipment manufacturer spare parts are not available. Radio does not have back-up. Repairs and maintenance requires vendor visits to the site. Currently using a Hydro-Ranger for level control. It is recommended that it be replaced with a pressure sensor.
Pump horsepower	20 hp KSB
Are pump parts and rehab readily Available?	Yes
Number of pumps	Two installed. There are provisions for a third pump. It is recommended that the City consider installation of a third pump for installed redundancy. Electrical and controls are required for a third pump.
Does LS pump into a line that is again repumped?	No
Approximate available downtime in event of a failure	Unknown
Ease and ability to connect emergency portable generator	2013 diesel generator installed inside the control building
Is there an installed redundant pump during high flow events?	No - Both pumps are required to meet winter and high groundwater demands
During recent storms how often were all of the pumps in the LS required	Most storms require both installed pumps to operate
Does the City have a "shelf spare" in inventory	No spare pump. City has a conversion kit to allow installation of a Flyght pump. It was not known if the controls and alarms are compatible if a Flyght pump were to be installed.
Is there known direct infiltration into the Pump Sump	Yes
Discharge issues - for example: 2 pumps cannot be operated at the same time due to piping constraints	2 pumps operate OK

Lift Station: Kola - Page 2	
Pump and valving constraints. For example: Discharge valves are not installed or not easily accessible or check valves cause maintenance issues	Discharge piping should be recoated
Confined space entry issues for normal maintenance of pumps and valves	No
Pump rail condition	Needs updating - rails are not stainless steel
Sump Cover condition	Good - Recommend the addition of fall protection
Sump and valve box condition	Average - It is recommended that the City further inspect the sump for corrosion to evaluate repairs and coating. The wetwell is not coated.
Lighting for after hours activities	Poor - the station would benefit with the addition of 2 to 3 lights.
Access issues for maintenance	OK
Odor complaints or desired odor control	There have been no known citizen odor complaints. Odors were not present during observation of the station; however, staff did state that odors are at times present at the station.
Unscheduled maintenance history on any LS equipment	Staff stated there have been a limited number of unscheduled maintenance issues.
Generator installation	Diesel installed December 2013
General Comments	1. This station has a block control building that also houses the standby generator. 2. If the City installs future lift stations that utilize a control building the layout could be used as an example. 3. Control building would benefit from additional lighting 4. A roof inspection was not conducted. It is recommended that a roofing contractor inspect the roof for remaining life and required maintenance or replacement. 5. For standardization purposes it is recommended that the KSB pumps be replace with Flyght pumps. 6. Electrical conduits are corroded resulting in difficulty in pump disconnect when pumps are removed. 7. Flow meter requires repair or replacement to return to normal operation

Lift Station Name: Musgrave - Priority 4

Approximate date of construction	2004
Approximate date of last rehab	No known significant improvements since original construction
Monitoring System Issues	CPU outdated, original equipment manufacturer spare parts are not available. Radio does not have back-up. Repairs and maintenance requires vendor visits to the site.
Pumps controls method and reliability	Installed 11/2004. Panel needs updating. CPU outdated, original equipment manufacturer spare parts are not available. Radio does not have back-up. Repairs and maintenance requires vendor visits to the site.
Pump horsepower	2 - 20 hp
Are pump parts and rehab readily Available?	Yes
Number of pumps	2
Does LS pump into a line that is again repumped?	No
Approximate available downtime in event of a failure	Unknown
Ease and ability to connect emergency portable generator	On site natural generator 12/04.
Is there an installed redundant pump during high flow events?	No - Both pumps required during storm events
During recent storms how often were all of the pumps in the LS required	Yes - historically for short periods of time
Does the City have a "shelf spare" in inventory	Spare pump in inventory - electrical and controls have limited spare parts.
Is there known direct infiltration into the Pump Sump	Yes
Discharge issues - for example: 2 pumps cannot be operated at the same time due to piping constraints	2 pumps operate OK at same time

Lift Station: Musgrave - Page 2	
Pump and valving constraints. For example: Discharge valves are not installed or not easily accessible or check valves cause maintenance issues	No noted deficiencies.
Confined space entry issues for normal maintenance of pumps and valves	No
Pump rail condition	Average - Note they are not stainless steel
Sump Cover condition	Average
Sump and valve box condition	Average
Lighting for after hours activities	Poor - One existing light. Additional lighting recommended.
Access issues for maintenance	Good - Vacuum truck has good access to the wetwell
Odor complaints or desired odor control	There have been no known citizen odor complaints. Odors were not present during observation of the station.
Unscheduled maintenance history on any LS equipment	Unknown
Generator installation	12/04
General Comments	1. The station does not have flow metering - City may consider adding flow meters downstream of the pumps. 2. There was noticeable wetwell corrosion. It is recommended that the wetwell be further evaluated for repair and/or coating to protect from further damage. 3. Electric pull boxes covers are damaged and should be replaced with higher load rated capacity 4. Water service size should be evaluated for ability to provide 1.5 inch service and hose bib 5. Lift Station is in a park setting. This layout would be a good example for station layout for facilities without a control building.

Lift Station Name: Garden Glen - Priority 5

Approximate date of construction	2011
Approximate date of last rehab	No known significant improvements since original construction. Note station has not been placed into service as of inspection date.
Monitoring System Issues	CPU outdated, original equipment manufacturer spare parts are not available. Radio does not have back-up. Repairs and maintenance requires vendor visits to the site.
Pumps controls method and reliability	Installed 1/2011. CPU outdated, original equipment manufacturer spare parts are not available. Radio does not have back-up. Repairs and maintenance requires vendor visits to the site.
Pump horsepower	2 - 7.5 hp
Are pump parts and rehab readily Available?	Yes
Number of pumps	2
Does LS pump into a line that is again repumped?	No
Approximate available downtime in event of a failure	Unknown
Ease and ability to connect emergency portable generator	On site natural gas generator installed in 2011
Is there an installed redundant pump during high flow events?	No - station was constructed but has not been used as of the inspection date
During recent storms how often were all of the pumps in the LS required	Unknown
Does the City have a "shelf spare" in inventory	Spare pump in inventory - electrical and controls have limited spare parts.
Is there known direct infiltration into the Pump Sump	Unknown
Discharge issues - for example: 2 pumps cannot be operated at the same time due to piping constraints	Unknown

Lift Station: Garden Glen - Page 2	
Pump and valving constraints. For example: Discharge valves are not installed or not easily accessible or check valves cause maintenance issues	No constraints noted by the City
Confined space entry issues for normal maintenance of pumps and valves	No
Pump rail condition	Good - Rails appear to be stainless steel
Sump Cover condition	Good - However there is no fall protection under the main cover lid
Sump and valve box condition	Good
Lighting for after hours activities	An addition of two lights would be beneficial
Access issues for maintenance	Vacuum truck has limited access. It is recommended that the City consider additional fenced space - potentially to the west
Odor complaints or desired odor control	Station is not yet in use
Unscheduled maintenance history on any LS equipment	Station is not yet in use
Generator installation	Natural gas installed in May 2011
General Comments	1. Sump is deep. City may consider for future developments that lift stations be installed such that the wetwell could be shallower. This likely will result in more required lift stations. The City should consider establishment of maximum depth for future lift stations. This may reduce infiltration, but will result in increased operations costs. 2. Sump was coated when installed. Prior to use it is recommended that coatings be inspected and repaired as required. 3. The City may consider addition of asphalt between the sidewalk and station entrance.