LIFT STATION RESPONSE PLAN

Lift Station Response Plan

Introduction

The City of Corpus Christi (City) recognizes the importance of regular and proper operation of its wastewater lift stations to properly convey wastewater for the protection of the environment and to safeguard public health and safety. Failure of a lift station may result in customer service being disrupted and/or a Sanitary Sewer Overflow (SSO) if it takes an extended period of time to return the lift station to service. Failure may result from a variety of causes including, but not limited to, a power outage, mechanical failure, lift station control failure, pump blockage, vandalism, and severe storm damage. For these reasons, the City has developed a Lift Station Response Plan (LSRP, at times may be referred to as Lift Station Outage Response Plan or LSORP) to document lift station monitoring and response procedures to address such events and to minimize the impact on customers and the environment.

This LSRP provides a summary of the staffing and equipment available to continue the proper operation and maintenance of the City's lift stations. Additionally, it includes the specific details of the activities and procedures that personnel follow during an event that does not fall within the normal operation and maintenance of a lift station.

Responsibilities

The Wastewater Facility Manager oversees the dedicated crews responsible for operation and maintenance of the lift stations, including the response to failures. City crews routinely visit each lift station, many on a daily basis and others several times per week. The City's team of electricians and mechanical repair staff are responsible for troubleshooting any identified failure and performing the remedial measures necessary to resolve the failure event. Additional staff is engaged on an as-needed basis.

Alarms and Response Procedures

For every lift station, the City monitors the following four (4) basic events (via a City-wide wireless SCADA System):

- Main Power Failure
- Control Power Failure
- High Water Level in Wet well
- Water detected in Drywell (where applicable)

When any of these events are detected, a signal is transmitted to the City's Water Utilities Department SCADA Control Center, located at the O.N. Steven Water Treatment Plant (ONSWTP). The SCADA HMI (Human-Machine Interface) automatically sends alarm notices to maintenance personnel via cell phone texting and email. The HMI screen is checked periodically during the normal business day to insure proper operation. During non-business hours which includes evenings, weekends, and holidays, designated on-call staff receive cell phone texts and emails to indicate which lift station is experiencing which alarm(s).

The on-call electrician will respond to the alarm. The electrician, (first responder) proceeds to the lift station to confirm the situation and assesses the nature of the failure. If a mechanical crew is required, the on-call mechanical crew will be notified.

The SSO Response Plan details procedures used to address an SSO if it occurs as a result from a lift station failure.

Upon arrival at the lift station the first responder, often the on-call electrician, will initiate troubleshooting procedures (see Attachment A, Standard Operating Procedures for Flow Chart for Power Failure at Lift Stations) to identify the nature of the failure (electrical, mechanical or blockage).

For an observed lift station failure, the first responder will take the following actions as applicable to the situation:

1. If Power is Available:

- a. Perform a voltage test at the main service panel
- b. Check electrical panel to ensure main switch is engaged and system is in auto mode of operation
- c. If system does not operate in automatic mode, then test in manual mode
- d. Confirm circuit breakers have not tripped
- e. Confirm pumps are operating
- f. Check wet well to ensure level is moving
- g. Observe pump check valve to determine if it is opening normally
- h. Determine which, if any, pumps are operating

2. If Power is Not Available:

- a. Review Flow Chart for Power Failure at Lift Stations (See Attachment A)
- b. If applicable, start backup generator power system per manufacturer's procedures
- c. Obtain supplemental crews (electrical and mechanical) if needed
- d. Initiate delivery of appropriate backup portable generator, portable pumps, or vacuum/vactor vehicles based on specific lift station response plan

In the event of a force main leak or failure, the following actions will be taken, as applicable:

- 1. The leaking force main will be isolated or bypassed.
- 2. City personnel or outside contractor (depending on the damage, location, depth of pipeline, etc.) will complete repairs to the force main.
- 3. Containment of any SSO and cleanup will follow the procedures in the SSO Response Plan.

In the event of multiple, simultaneous alarms, the on-call electrician (first responder) will prioritize the lift stations based on estimated time to overflow and dispatch crews accordingly. The on-call electrician may engage his/her supervisor to assist in prioritizing the alarms. If necessary, additional crews will be engaged and dispatched to resolve the issues.

Response Equipment List and Location

Various equipment is available to the Wastewater Maintenance Manager and staff to respond to lift station alarms. The specific equipment to be used to resolve an event will depend on the cause, duration of outage, and existing lift station configuration. Equipment and other options available to respond to lift station outages may include, but are not limited to:

- 1. On-site backup generators (typical for major lift stations)
- 2. Portable backup generators for lift stations having electrical connection points to transfer loads
- 3. Portable engine driven pumps with readily accessible (quick) connection points to force main(s) or header
- 4. Dual power feeds
- 5. Vacuum/Vactor vehicles to pump and truck wastewater during outage
- 6. Engagement of local Equipment Vendors and Service Providers

Equipment is stored at the Water Utilities Building located at 2726 Holly Road. In the event equipment needs to be accessed, a warehouse representative can be reached by calling the on-call number: 361-774-4216. In addition to in-house equipment, Utilities presently has a contract in place for equipment services, including rental, and intends to maintain such a contract in the future.

Equipment Vendors available to the City to provide equipment and support services are included in the following table. This list is updated on a regular basis.

Contractor Name	Equipment/Services Provided
Godwin	Diesel Pumps - Repairs, Rental & Purchase
Odessa Pumps	New Pump Purchase & Drywell Pump Repairs
Smith Pumps	Drywell Pumps - Repair & Purchase
Universal Tool & Die	Various Pump Repairs
Xylem	Submersible Flygt Pumps - Repair & Purchase
C-D Electric	Motors - Repair & Purchase
Massengale Armature	Motors - Repair & Purchase
Holt	Generators - Rental & Purchase
Stewart & Stevenson	Generators - Rental & Purchase
ADK Environmental	Vactor Services - Tank & Pumping
Miller Environmental	Vactor Services - Tank & Pumping
Video Pipeline	Vactor Services - Tank & Pumping

The equipment that City staff will utilize depends on the nature and anticipated duration of the outage and the lift station configuration. The Lift Station Response Plan Maps (see Attachment B) provide necessary information for each lift station to facilitate restoring service. The requisite time for crews to implement alternative flow control measures or restore lift station service before the outage results in an SSO varies from lift station to lift station and is dependent upon one or more factors including, but not limited to, incoming flow volumes, storage volume within the system, upstream diversion(s) and control(s), and flow bypass capabilities. The estimated time needed for City crews to respond before an SSO would occur, assuming no action is taken to

bypass or relieve a blockage, is noted on each map of Attachment B (Lift Station Response Plan Maps) and is based on average daily flow. Crews are instructed to monitor the flow at the location where flow is most likely to escape the system. By observing flow elevations at the designated point, response crews can adjust their actions as necessary to prevent an SSO.

Training and Safety

Appropriate staff will participate in regularly scheduled training sessions to assist response crews in awareness of their responsibilities in executing their duties in a safe and effective manner. These training sessions will be organized based on the latest SSORP and LSRP, as well as other pertinent reference materials. Training sessions will also incorporate hands-on field demonstrations to ensure the preparedness of all response personnel. Field demonstrations will be performed to test equipment, response time, training effectiveness, and manpower capabilities.

Training and event participation will be documented and maintained by the City. Currently, City staff receives training through various vendors and participate in City-provided lift station and collection system training.

LSRP Availability and Updates

The City will routinely review (in accordance with the CMOM Plan and SSORP biennial review), evaluate and update the effectiveness of this LSRP as appropriate. The LSRP will be amended as necessary to reflect changes in facilities or changes in operations or maintenance procedures that may materially affect the potential for SSOs related to the lift stations. As policies change and response procedures are refined, the LSRP will be reviewed and modified to reflect all necessary changes. The City may also review and recommend modifications as appropriate after any SSO occurrence.

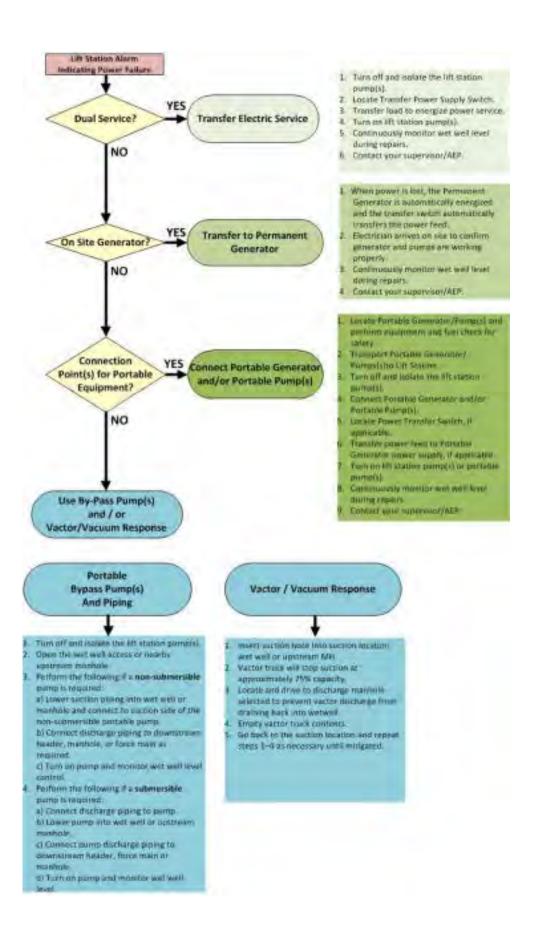
The City will maintain the master copy of this LSRP and amendments and, upon request, be made available to the public for review. Copies will be distributed to appropriate staff, City Departments and regulatory agencies as required. Copies of this document will be kept in response vehicles. A copy of the individual lift station response plan map(s) will be maintained at each lift station where possible.

ATTACHMENT A

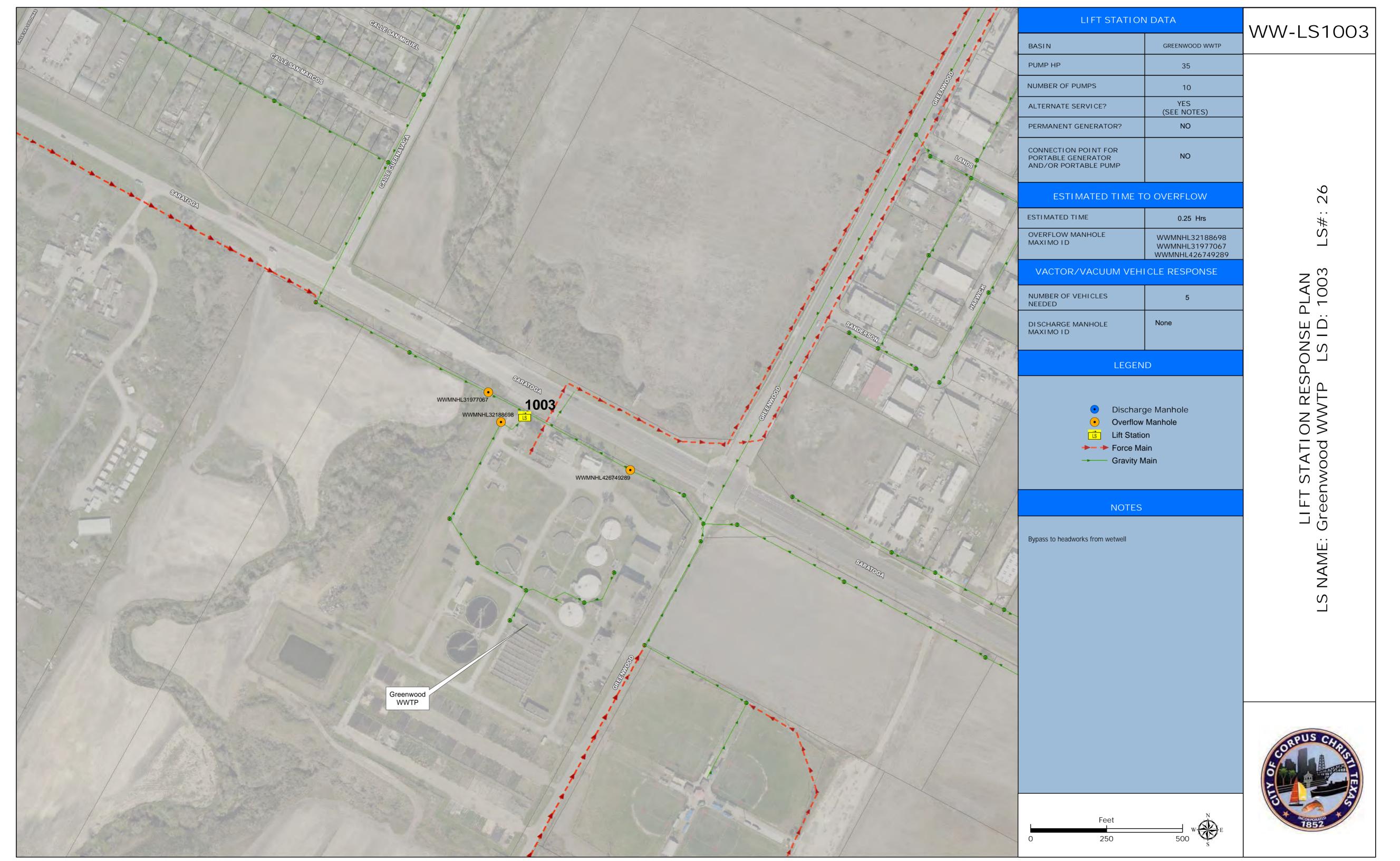
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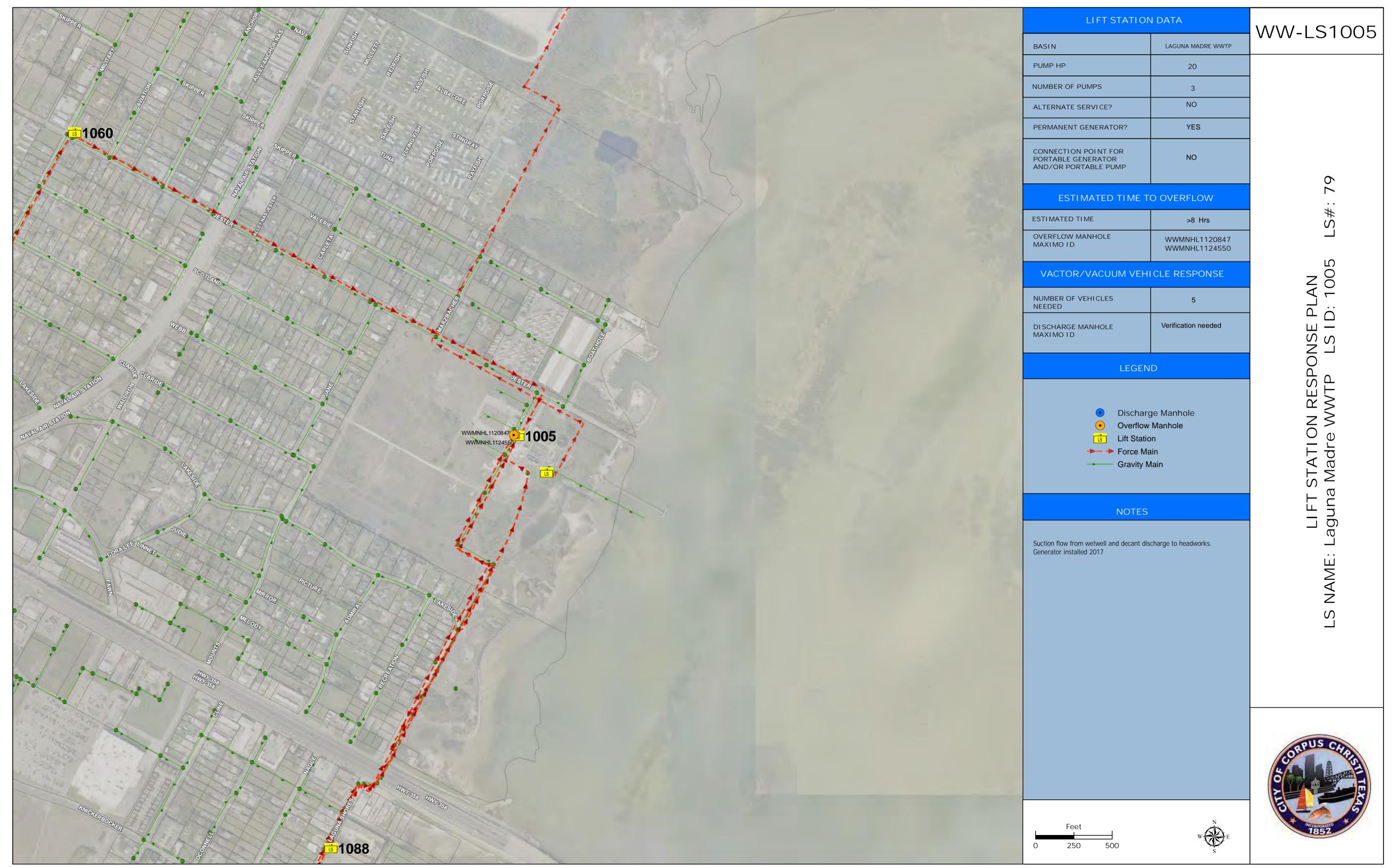
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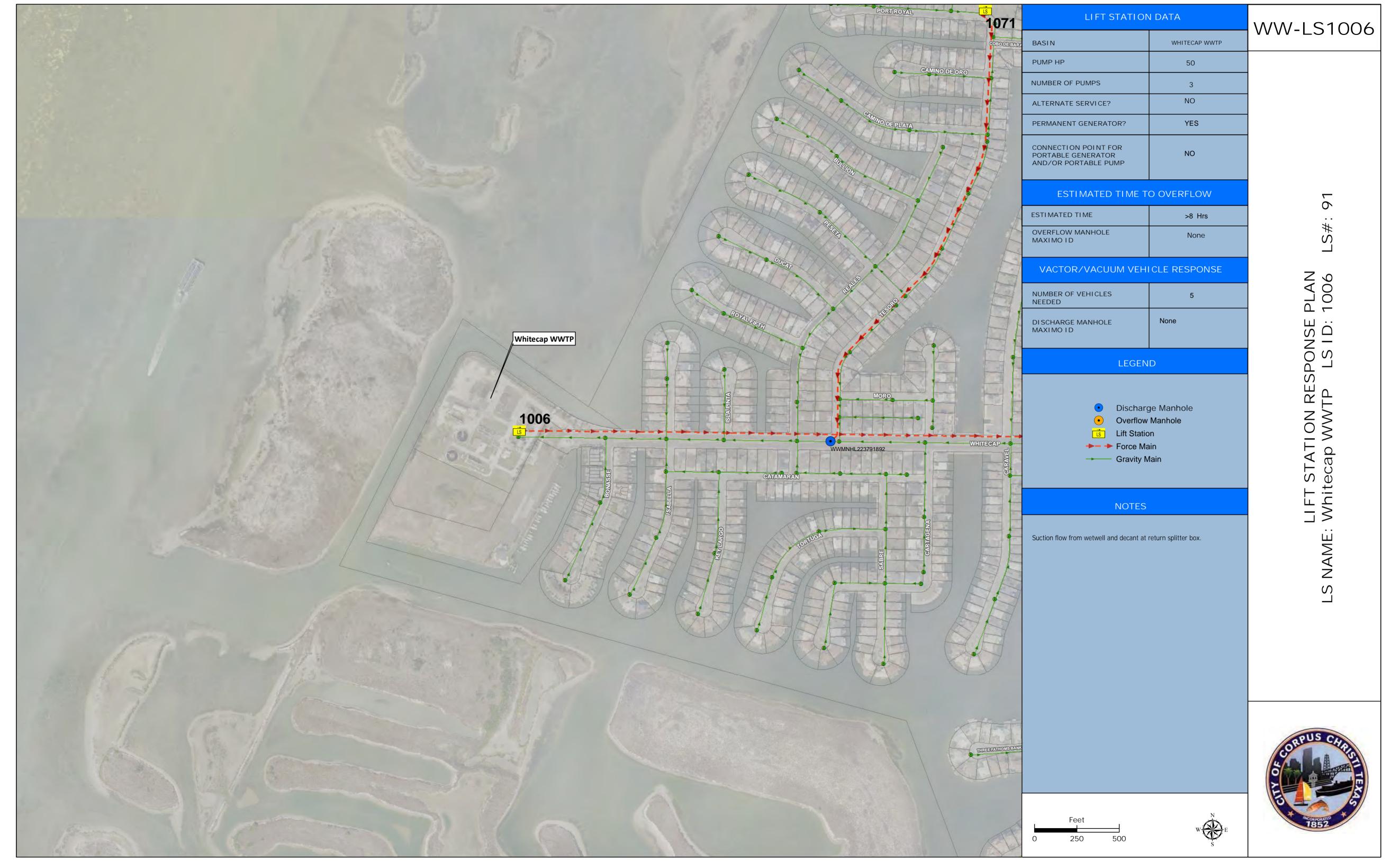
FLOW CHART FOR POWER FAILURE AT LIFT STATIONS

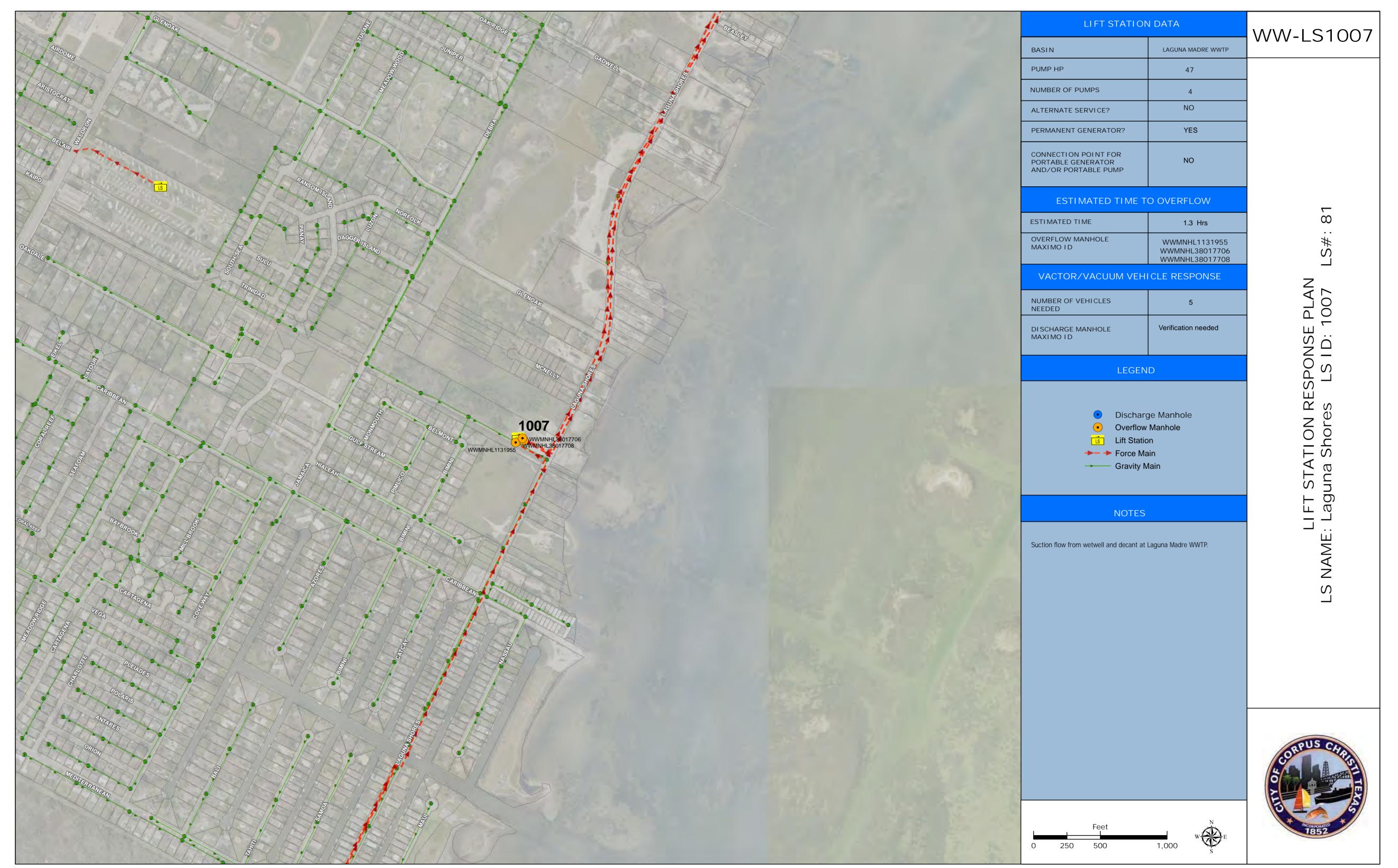


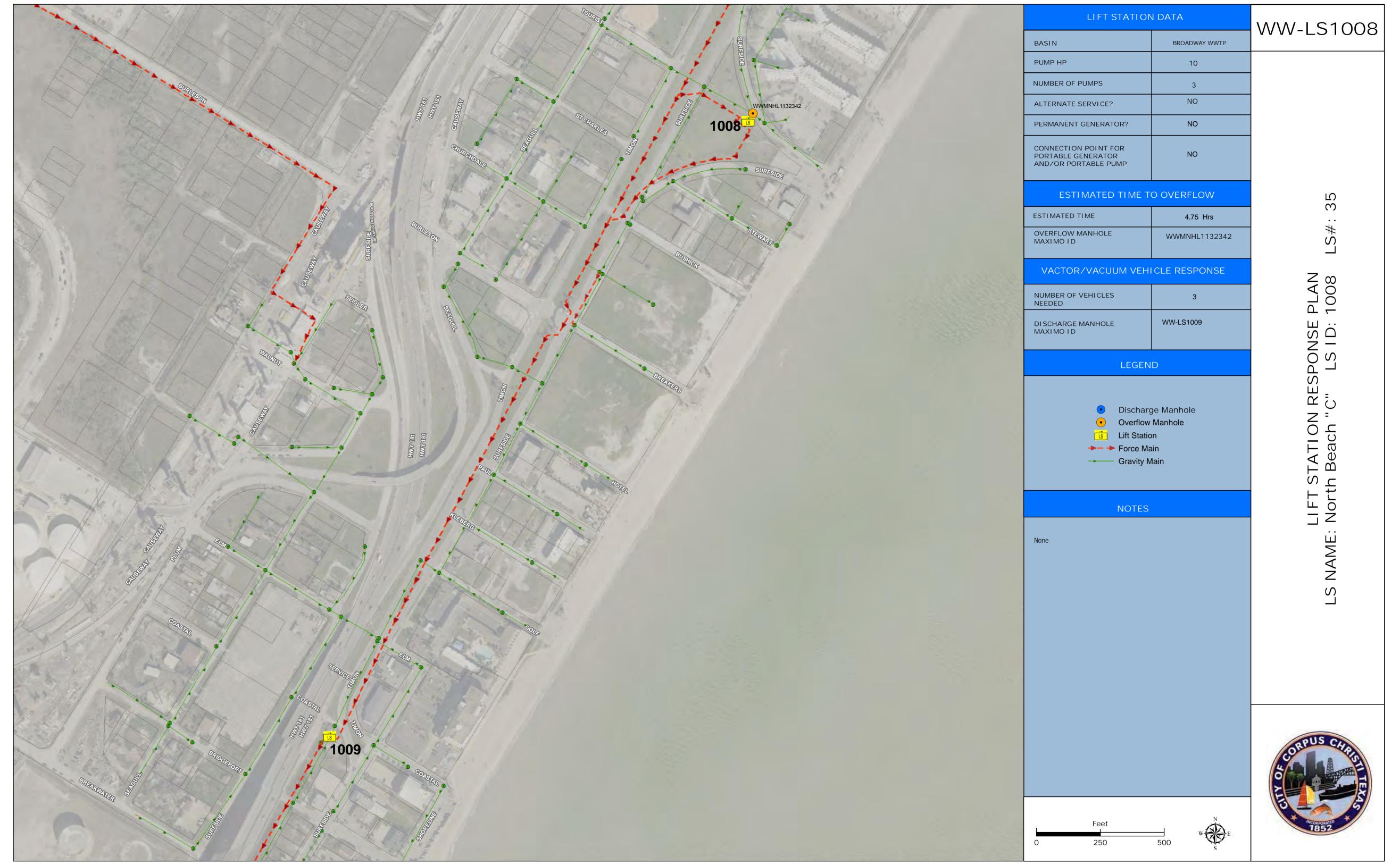
ATTACHMENT B LIFT STATION RESPONSE PLAN MAPS



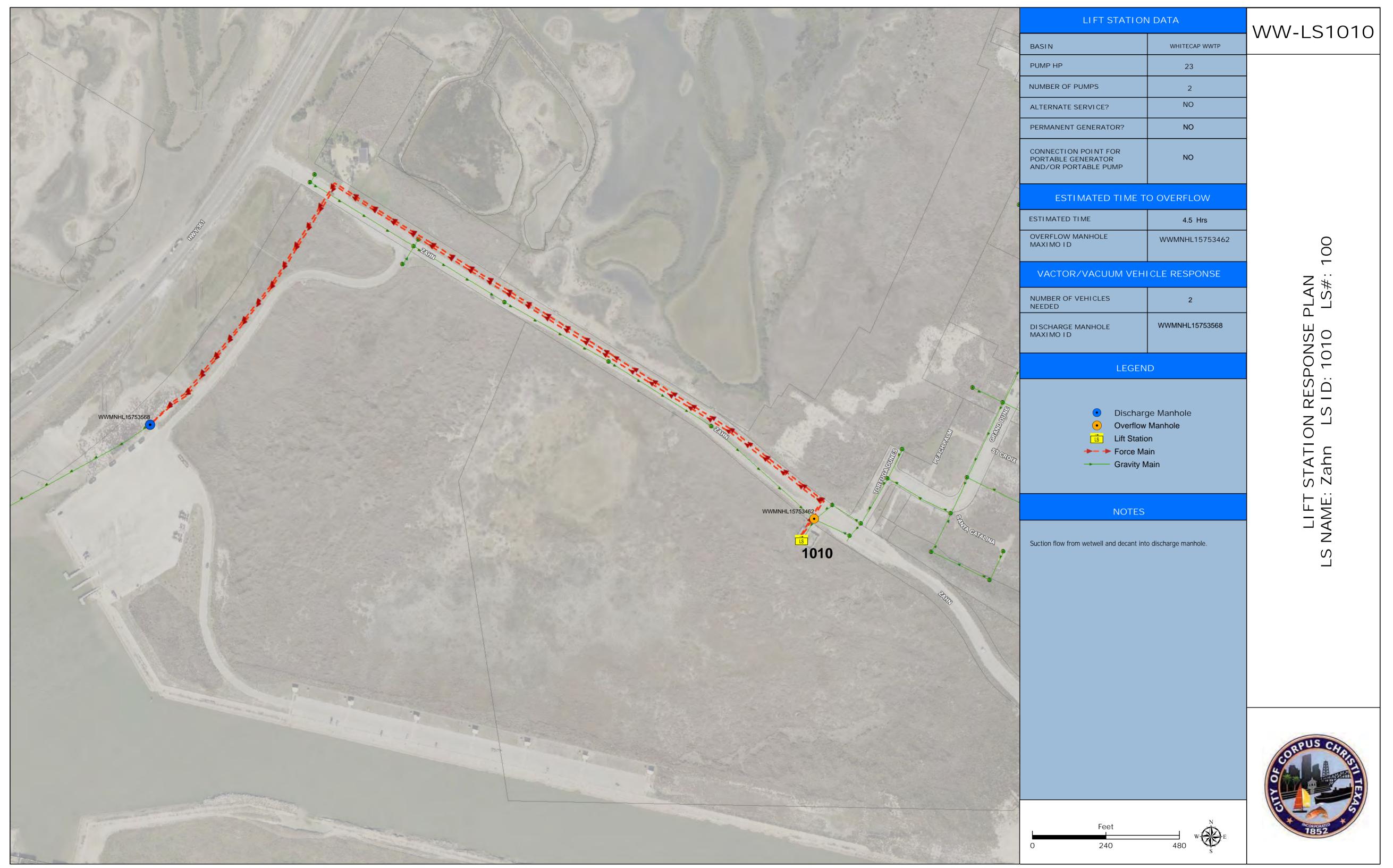


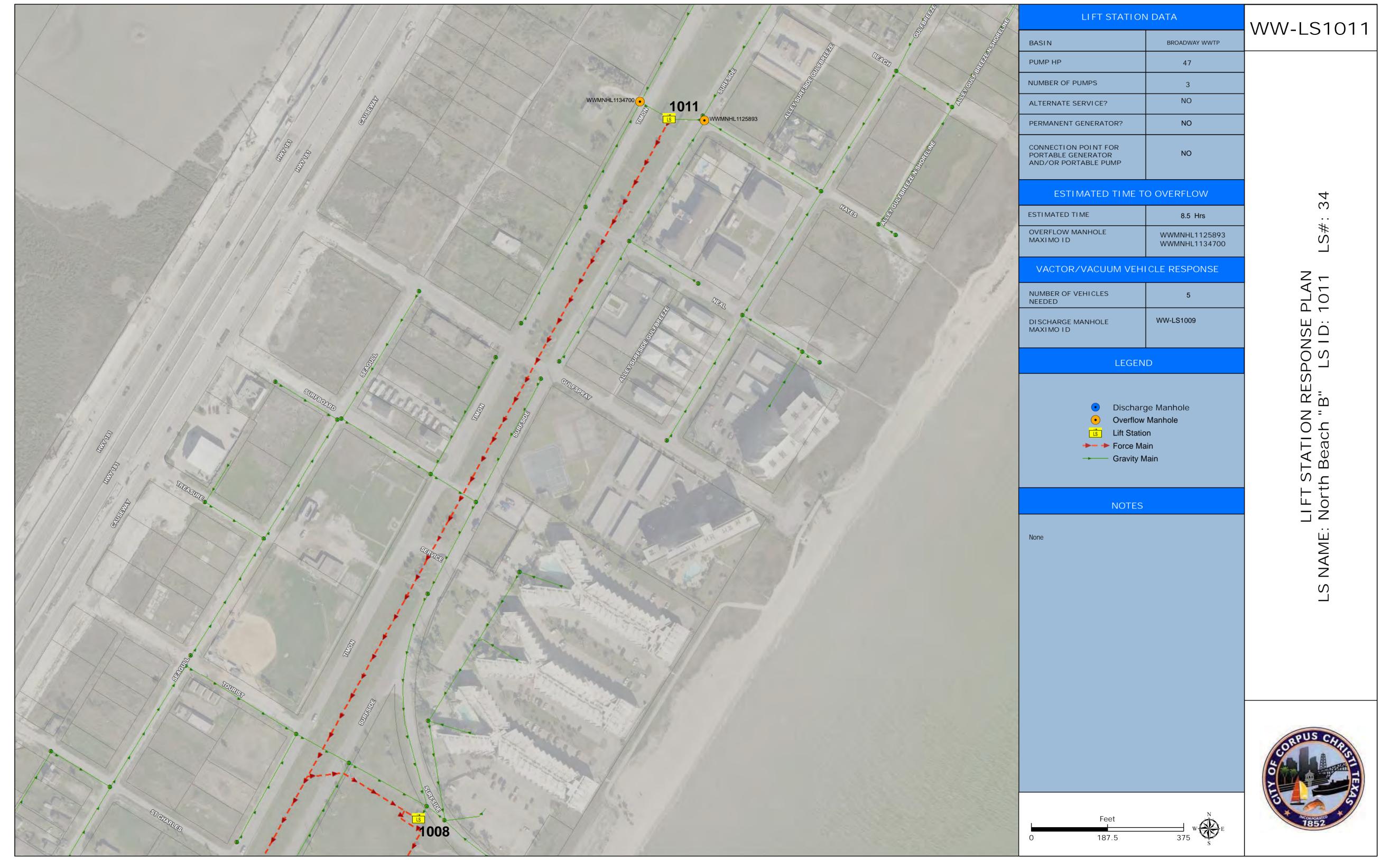


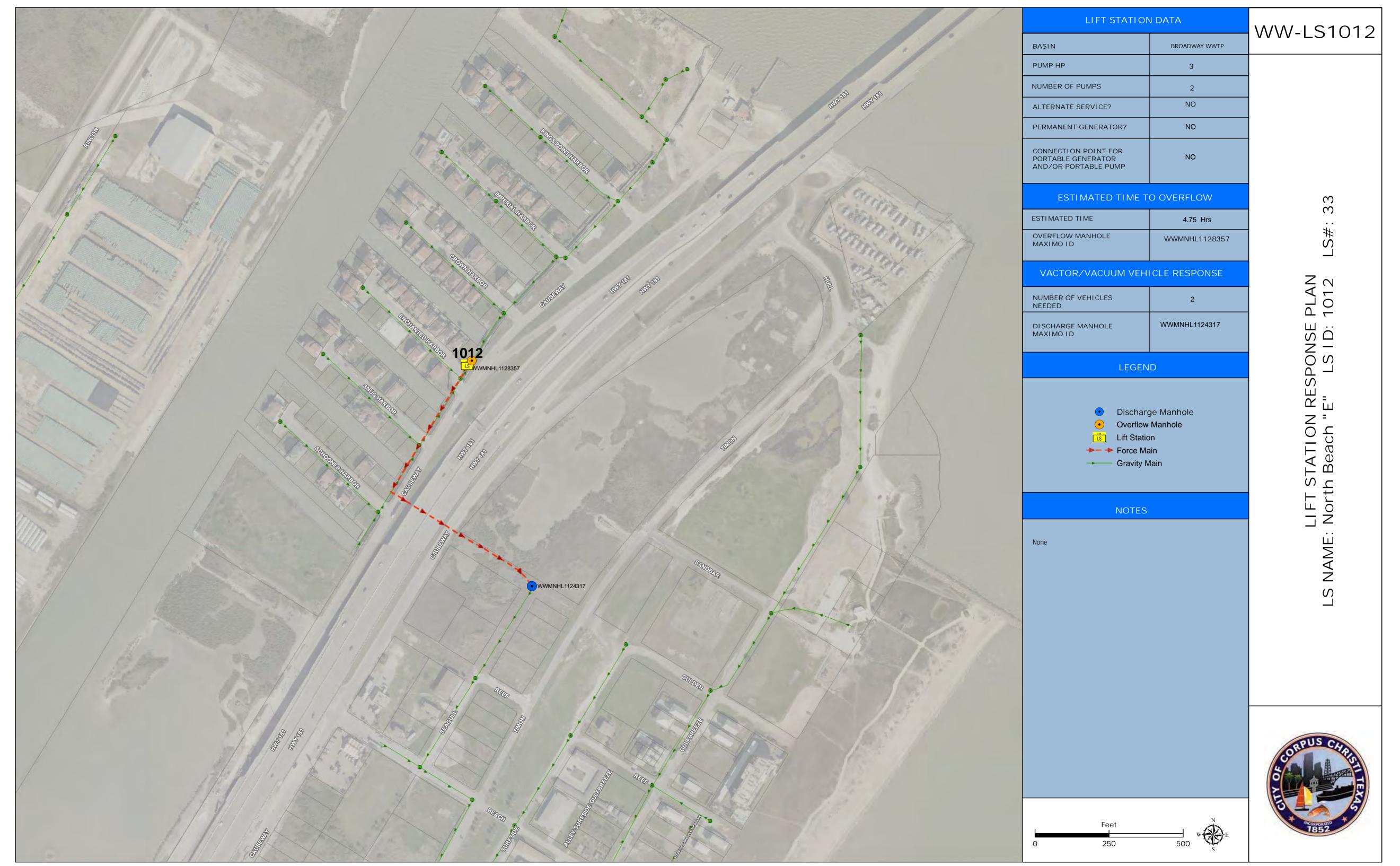


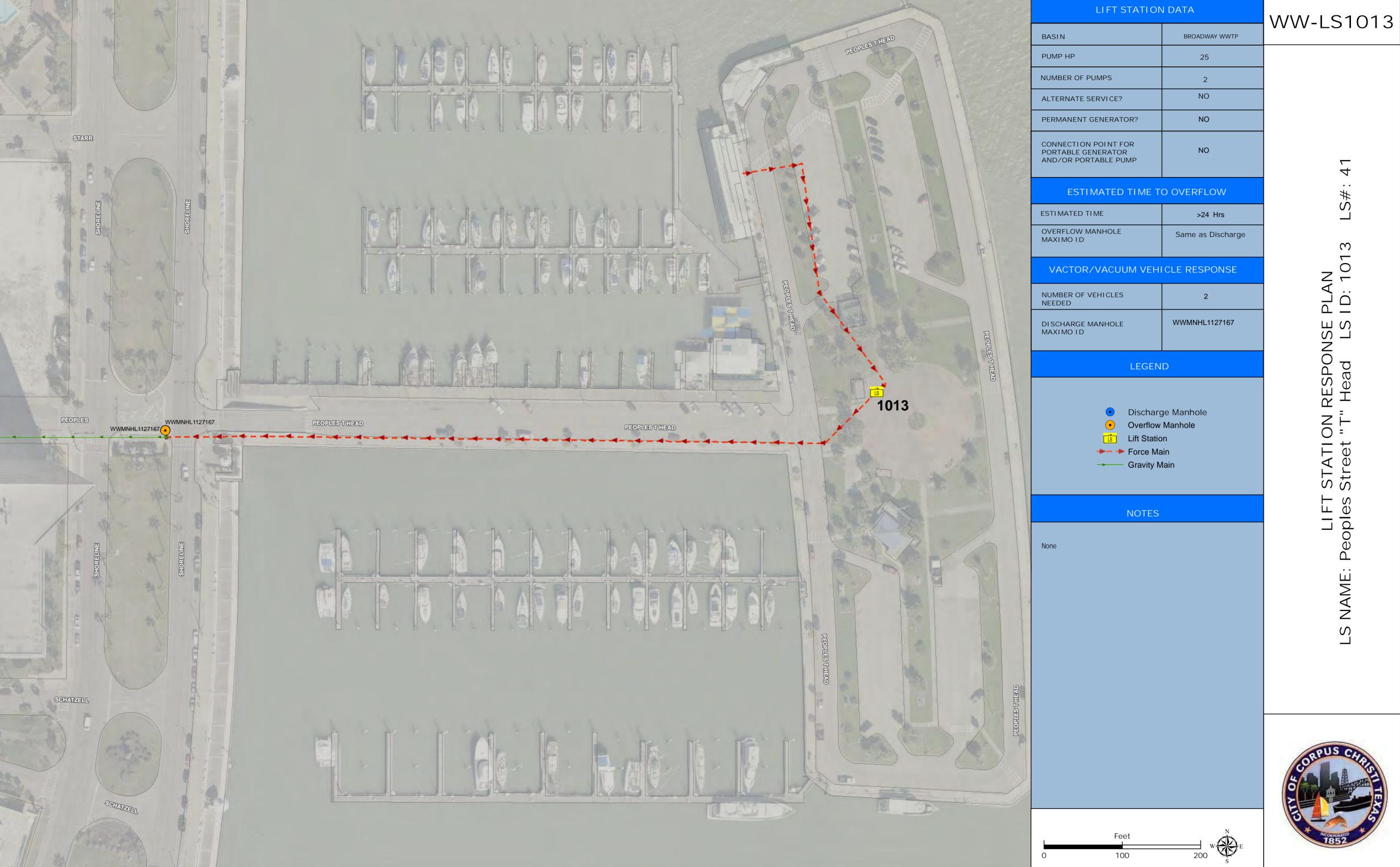




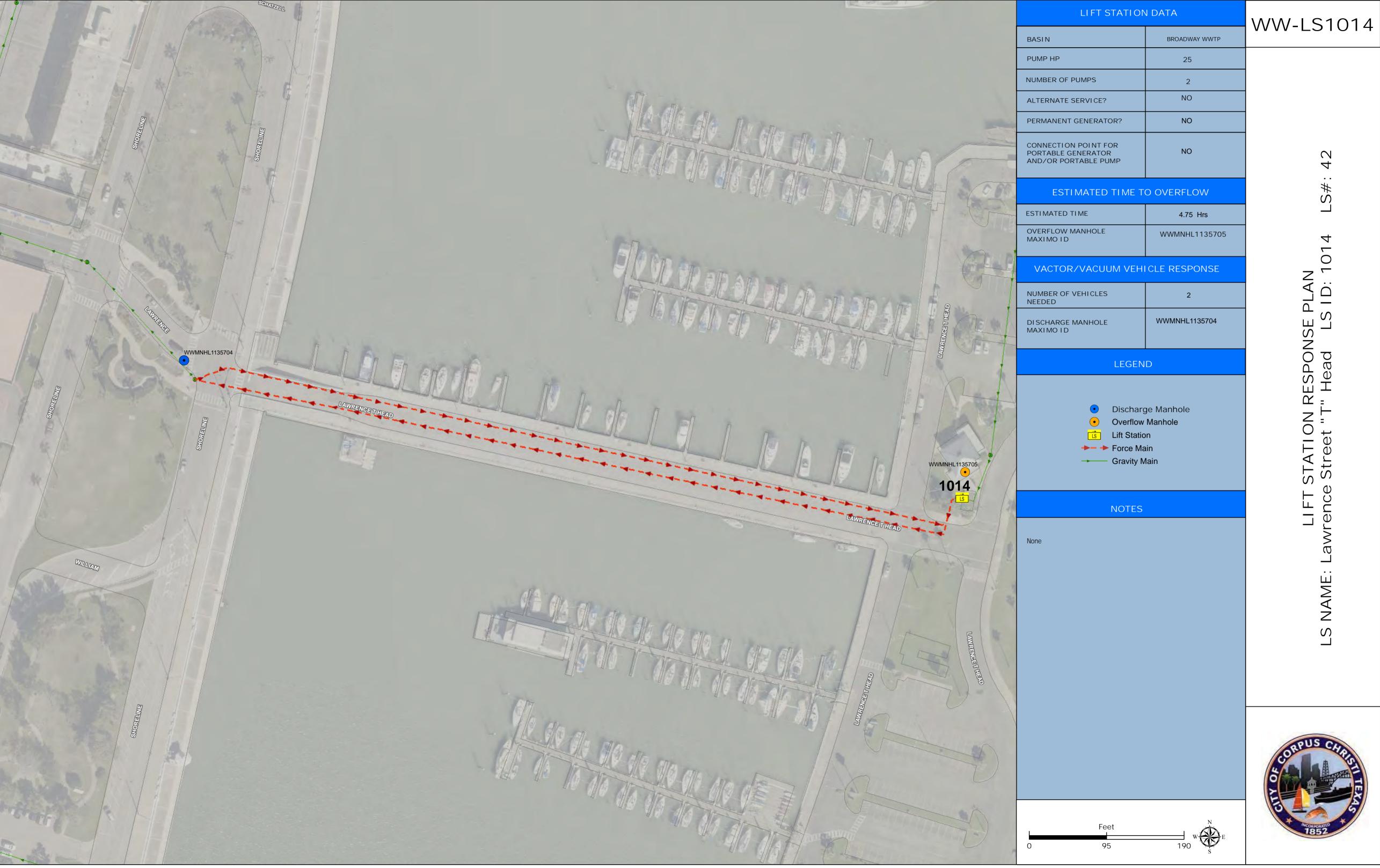








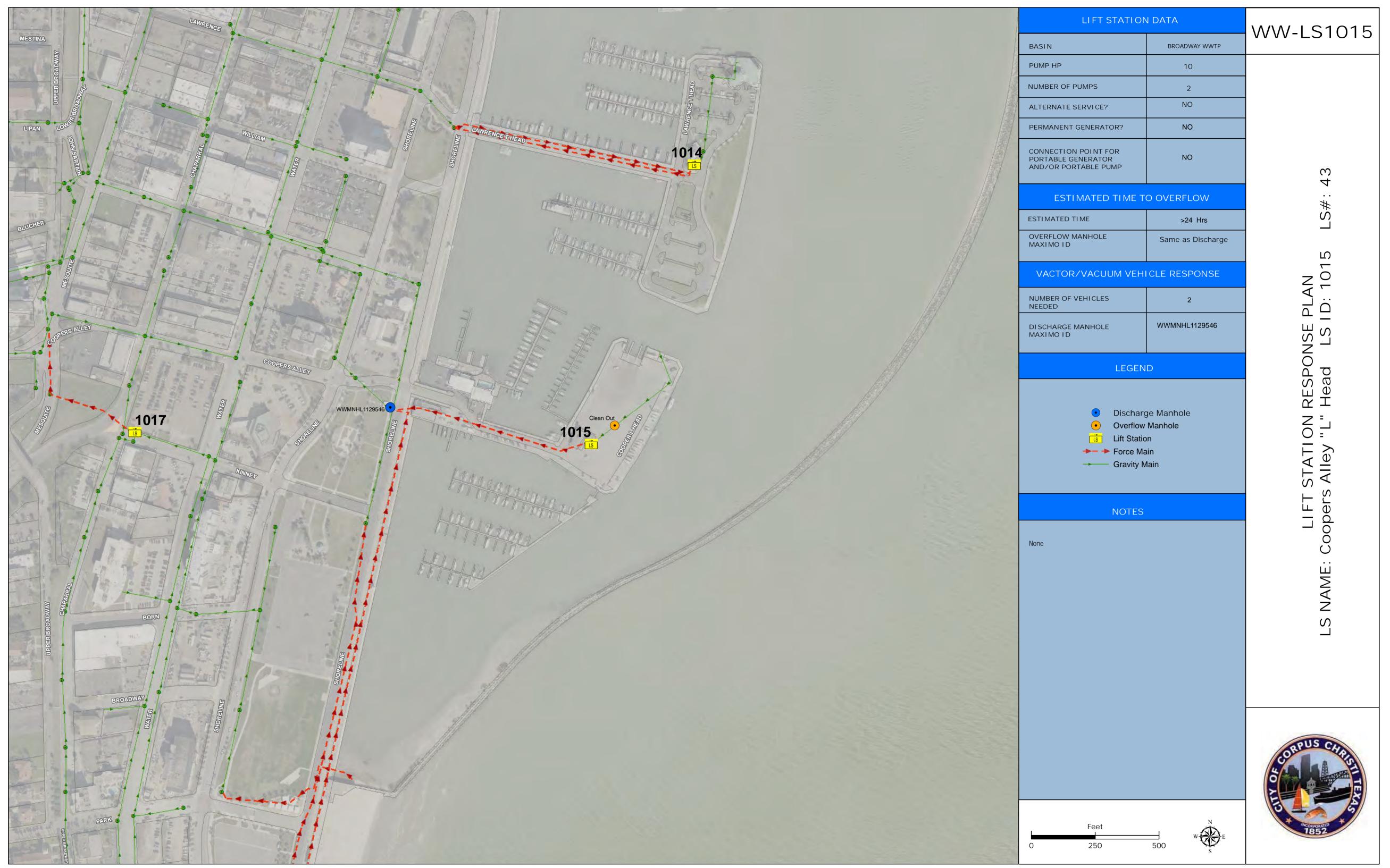
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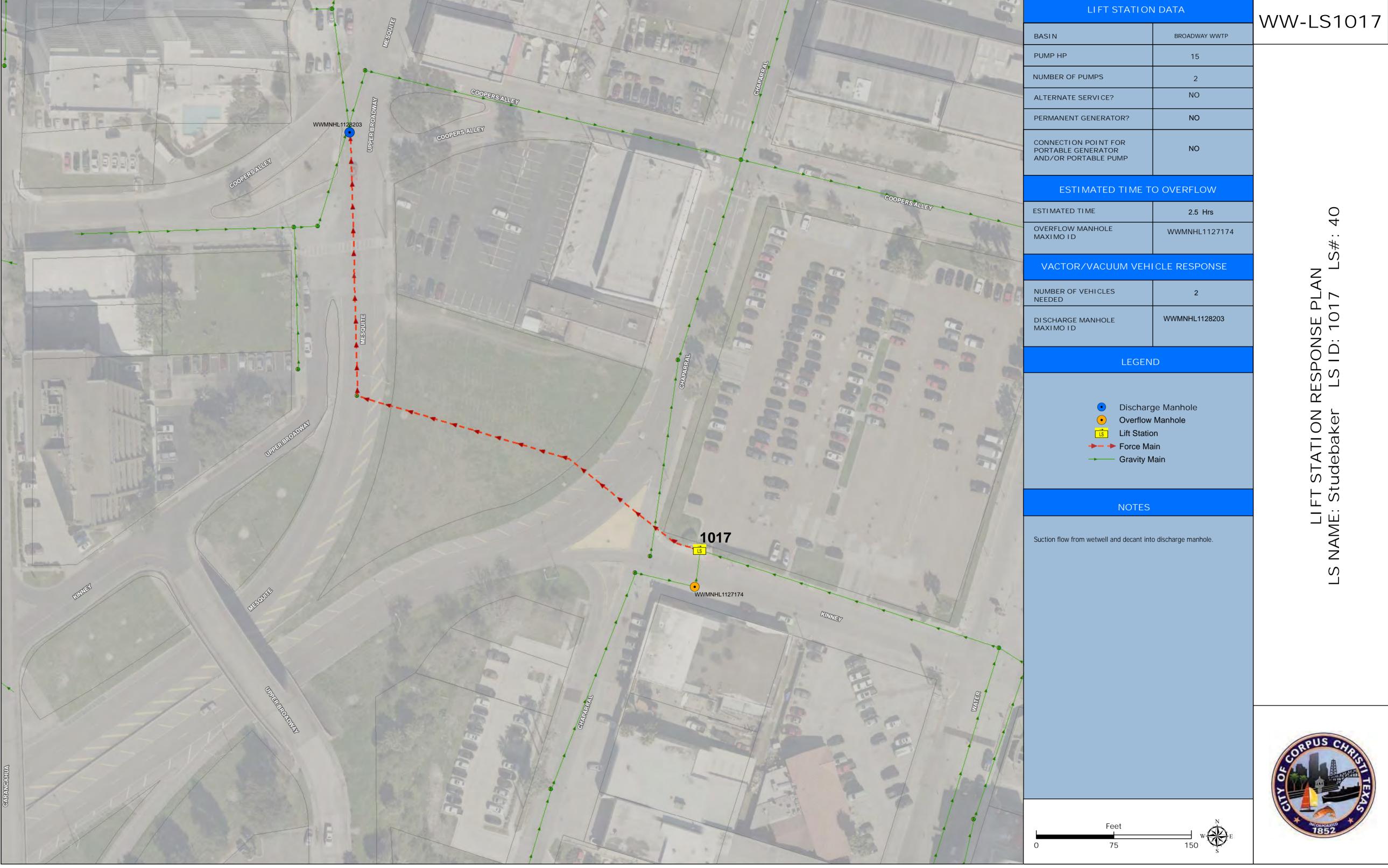


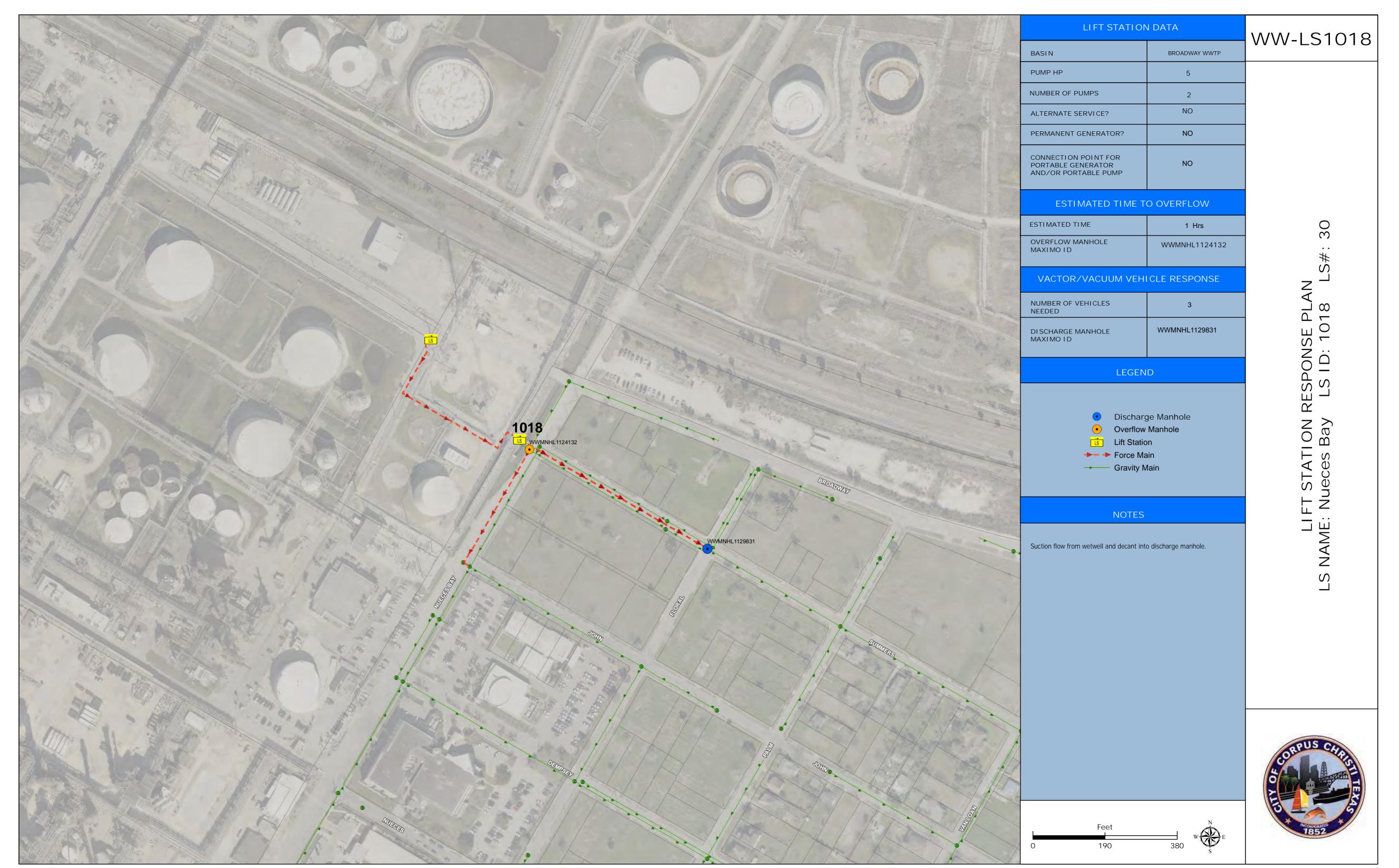
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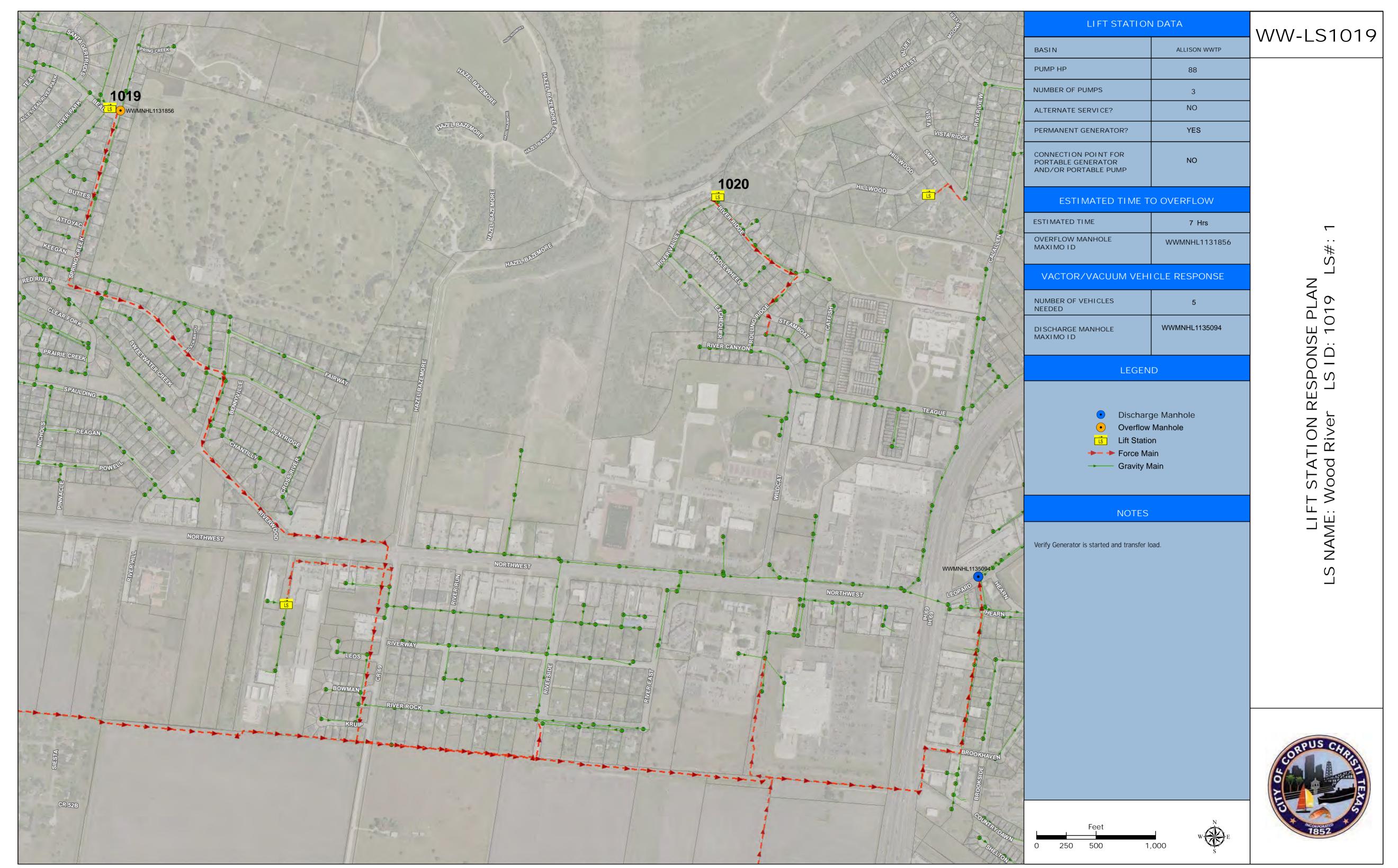
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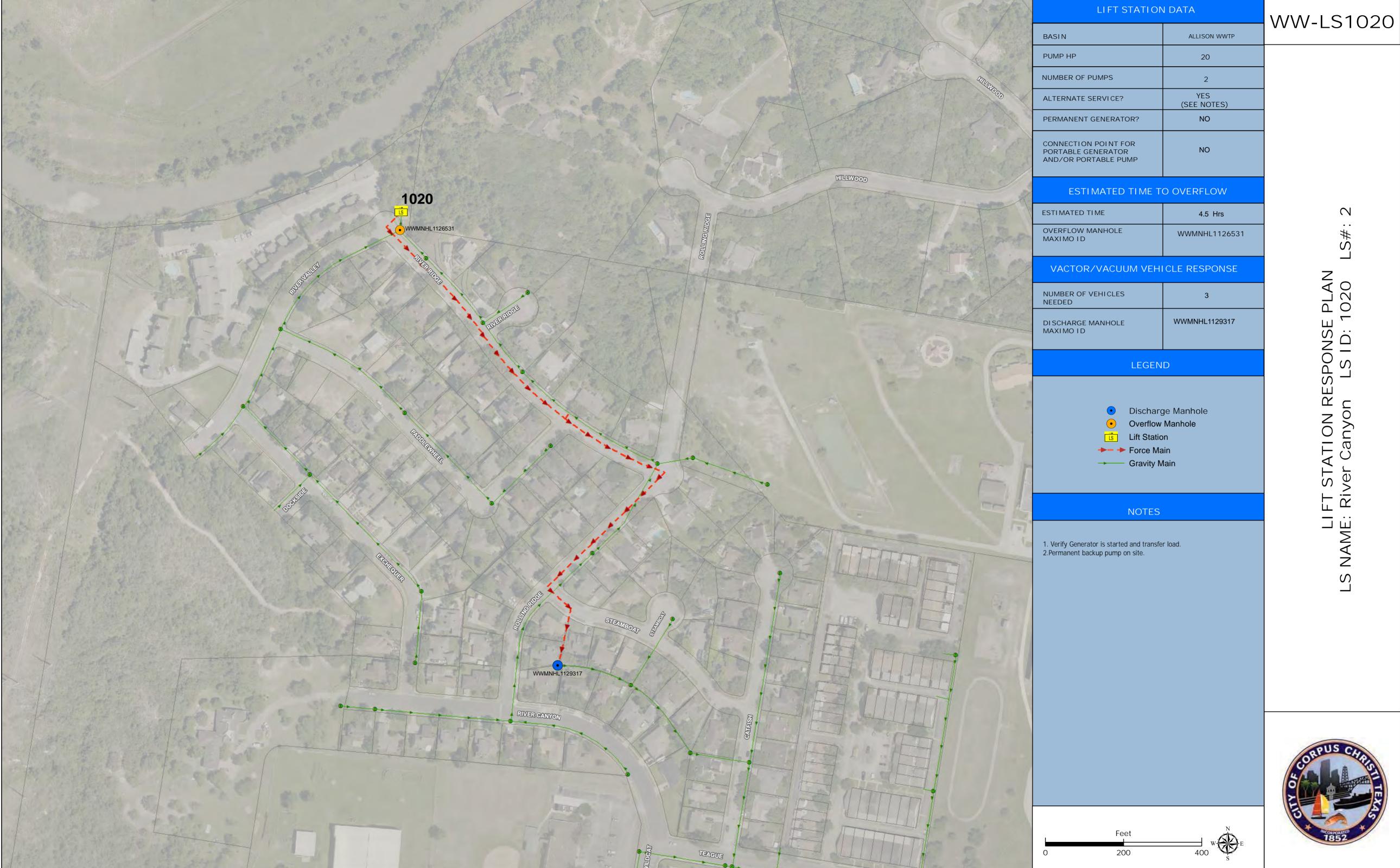
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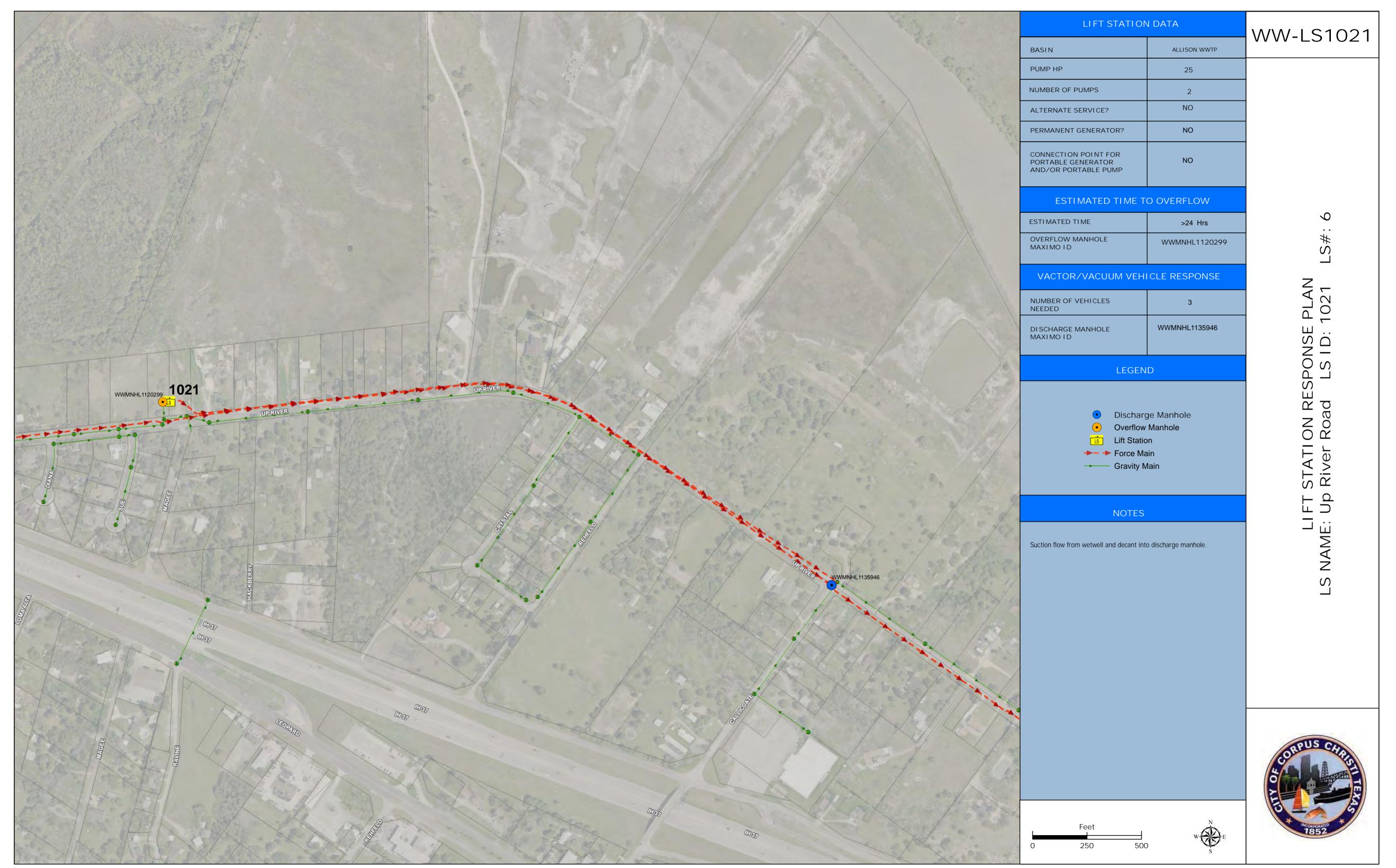


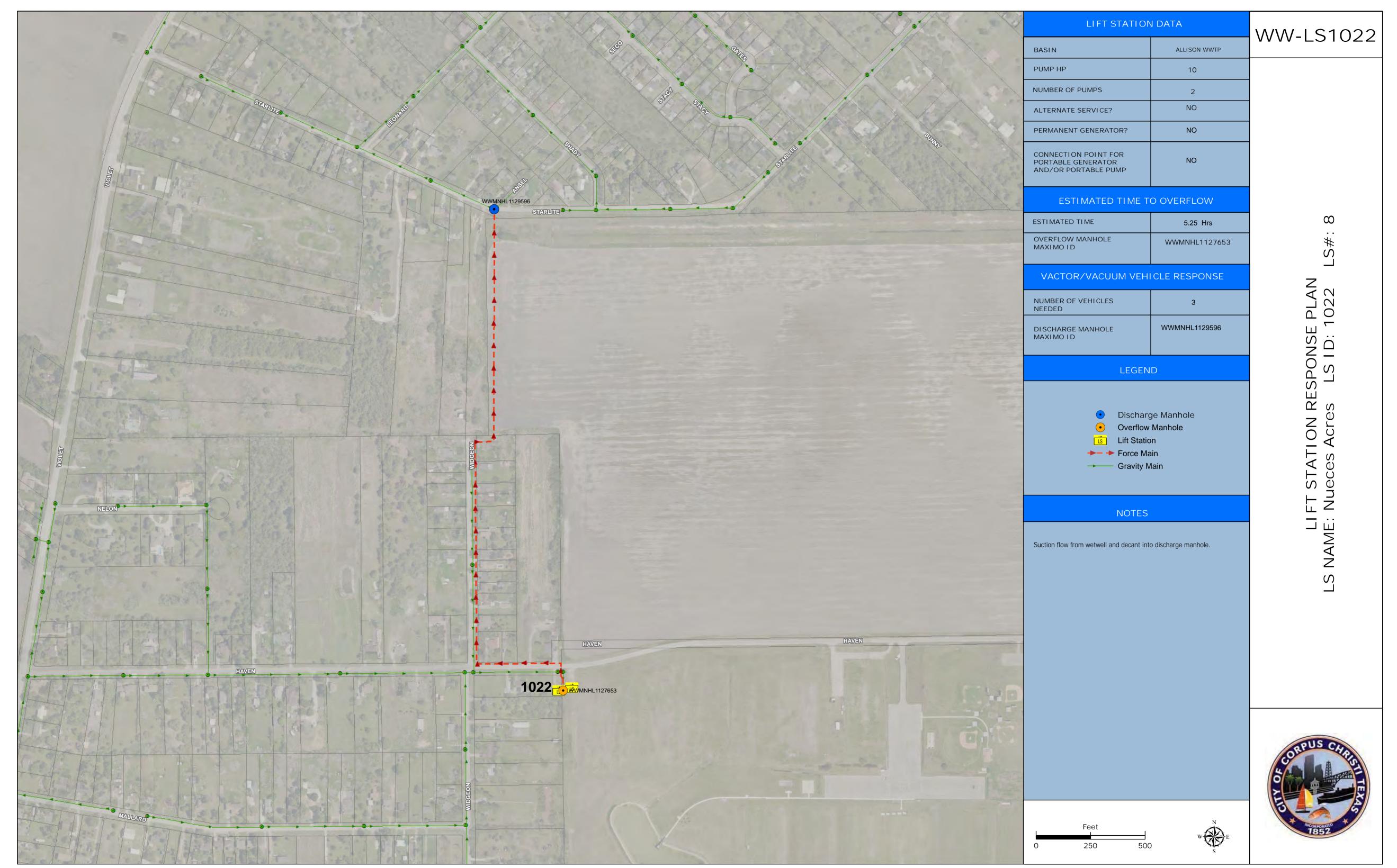


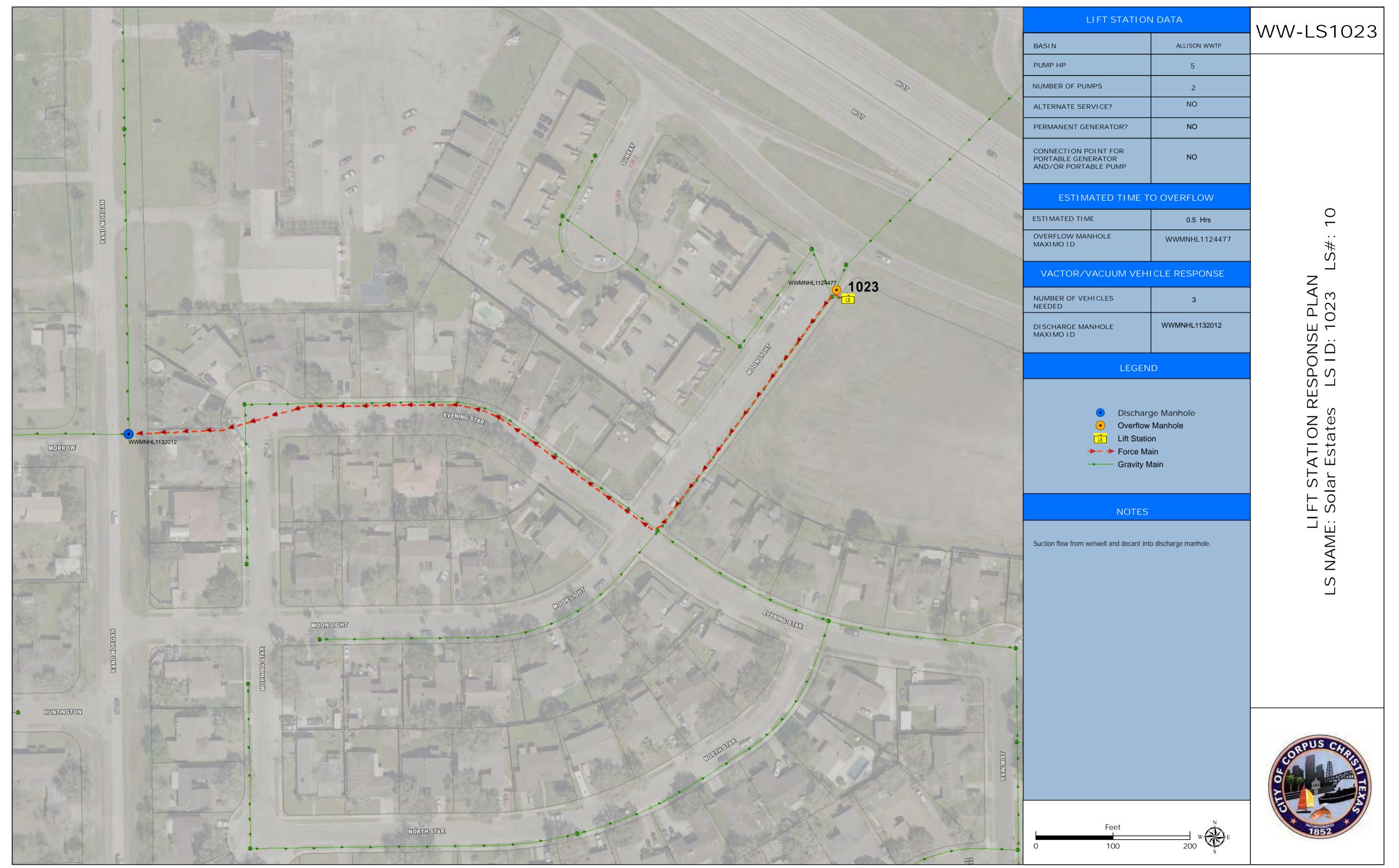


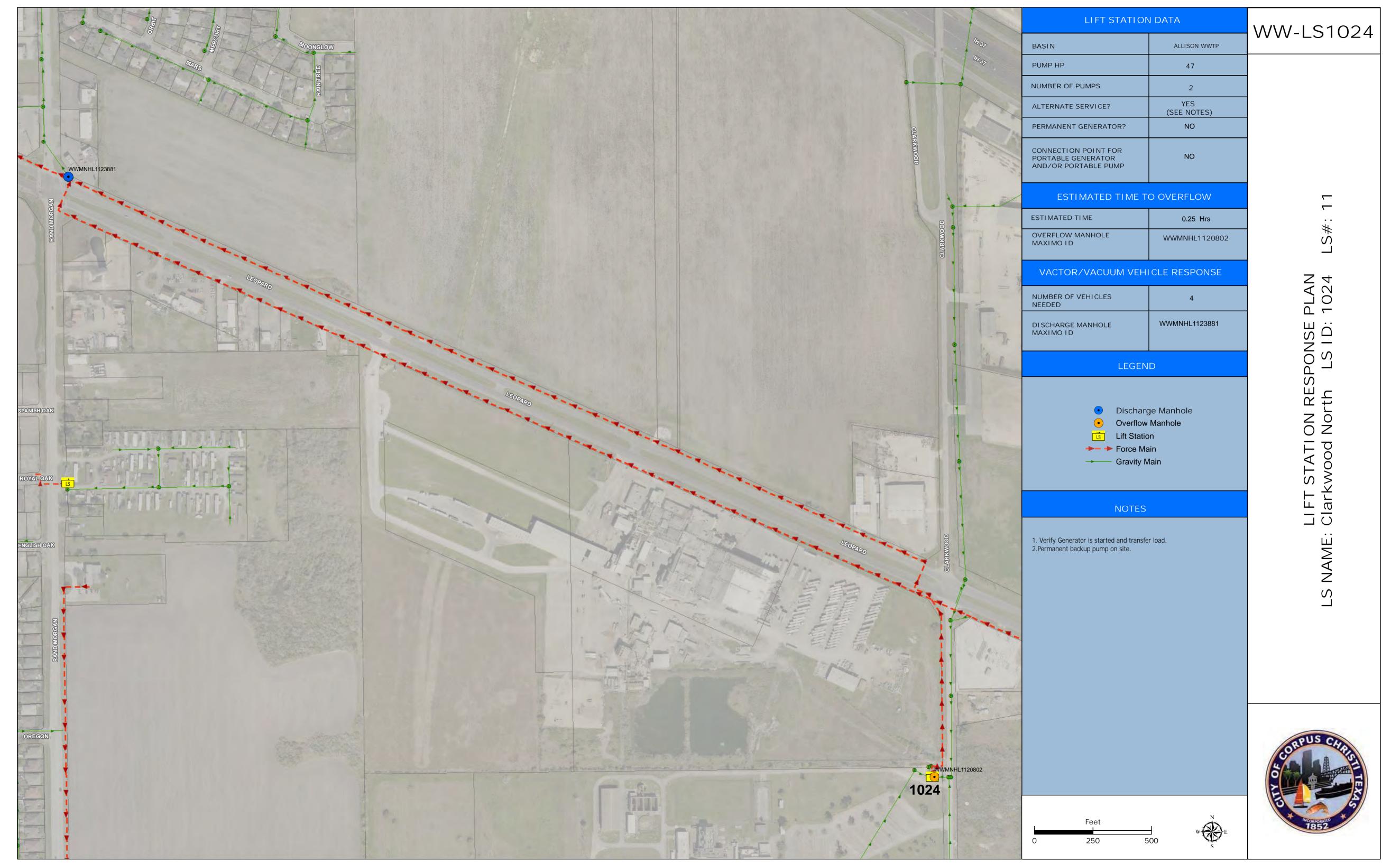


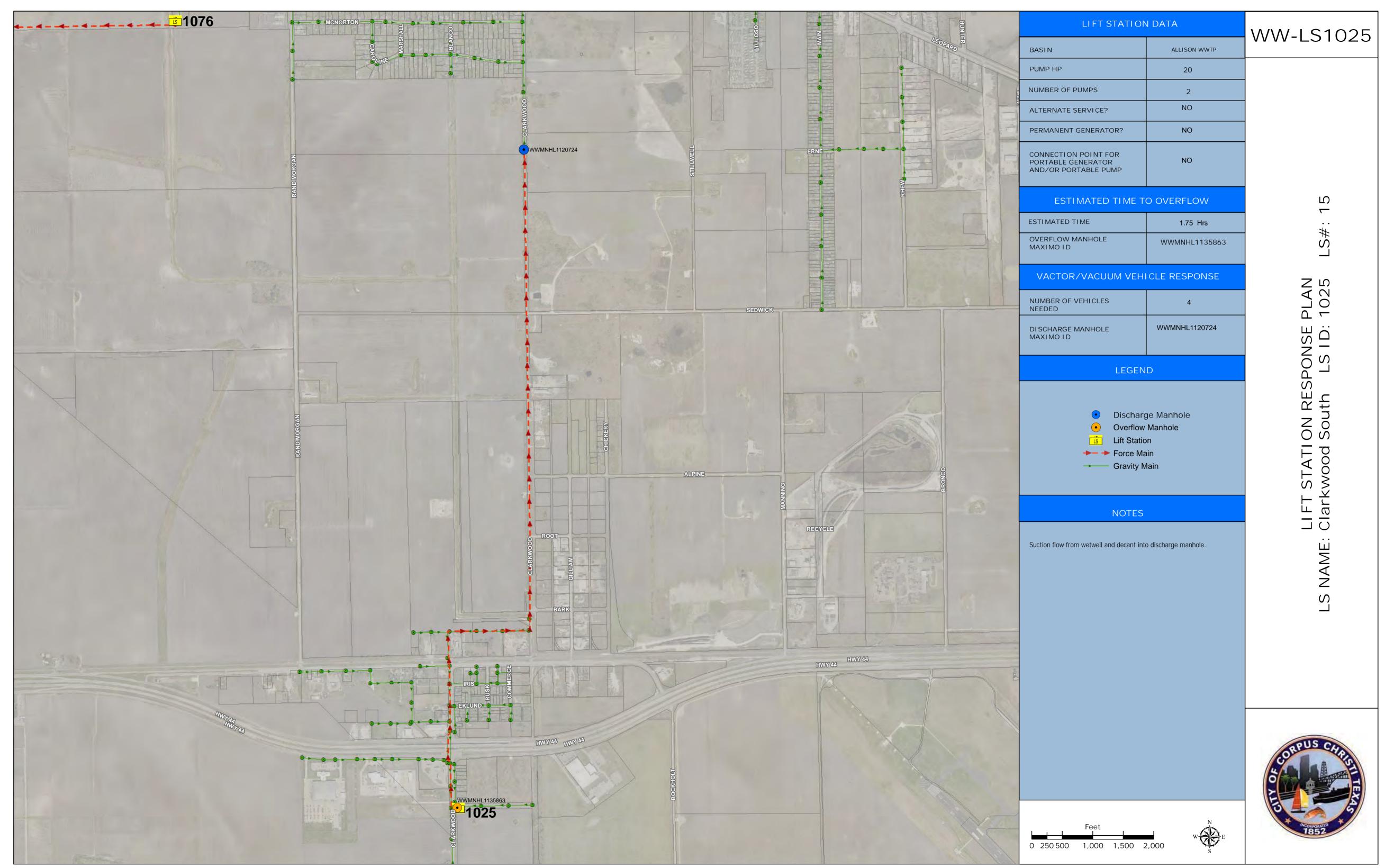


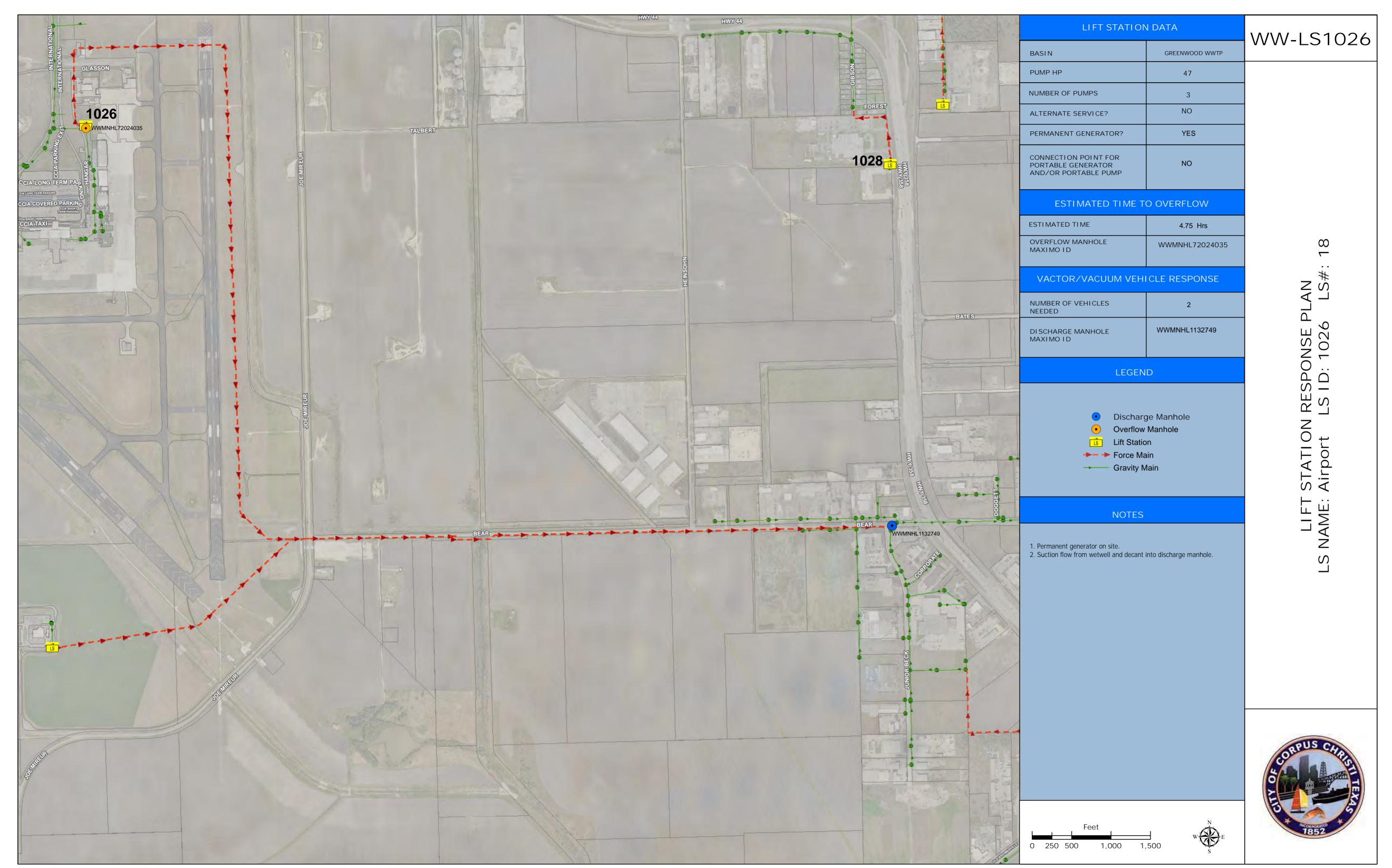


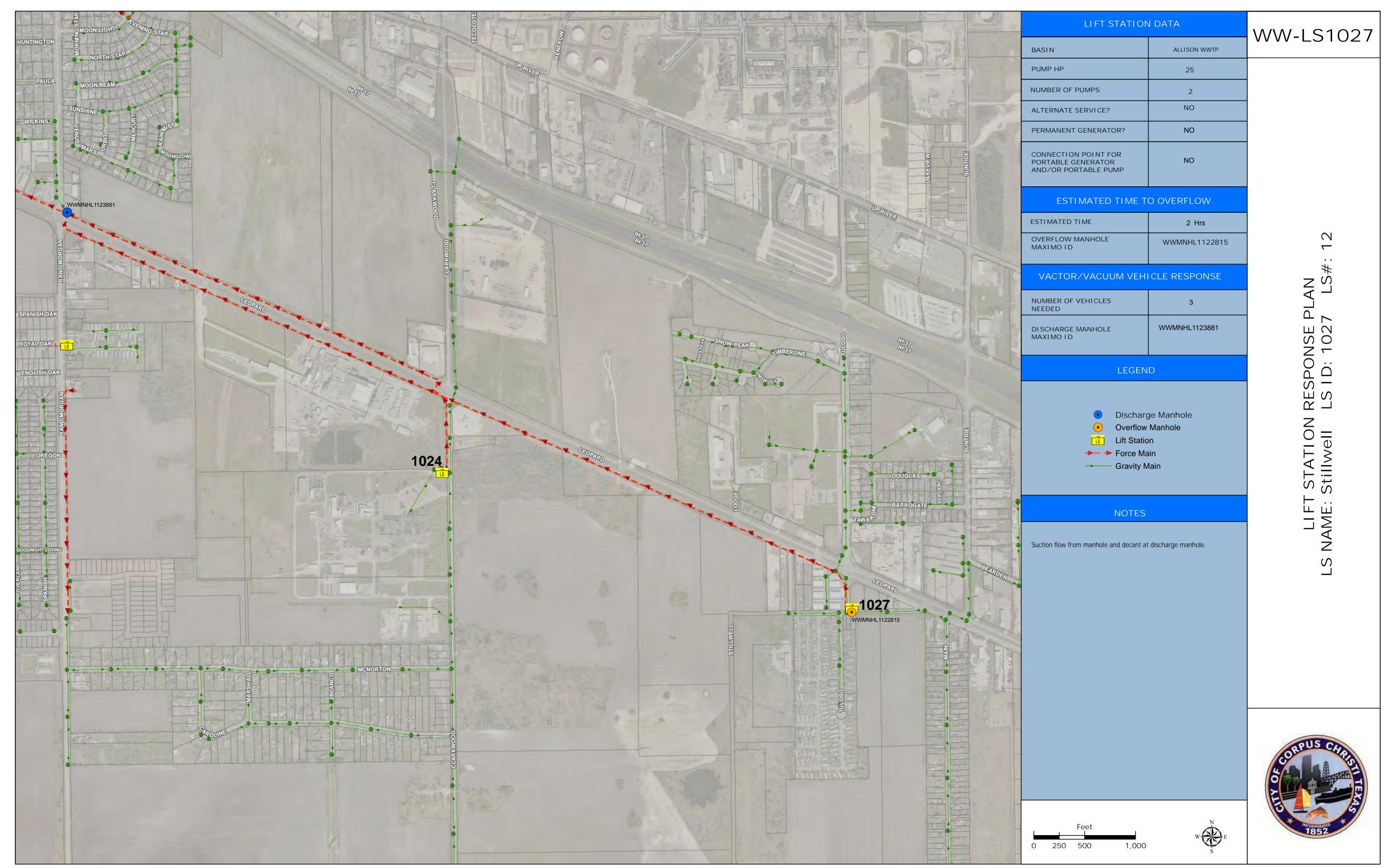


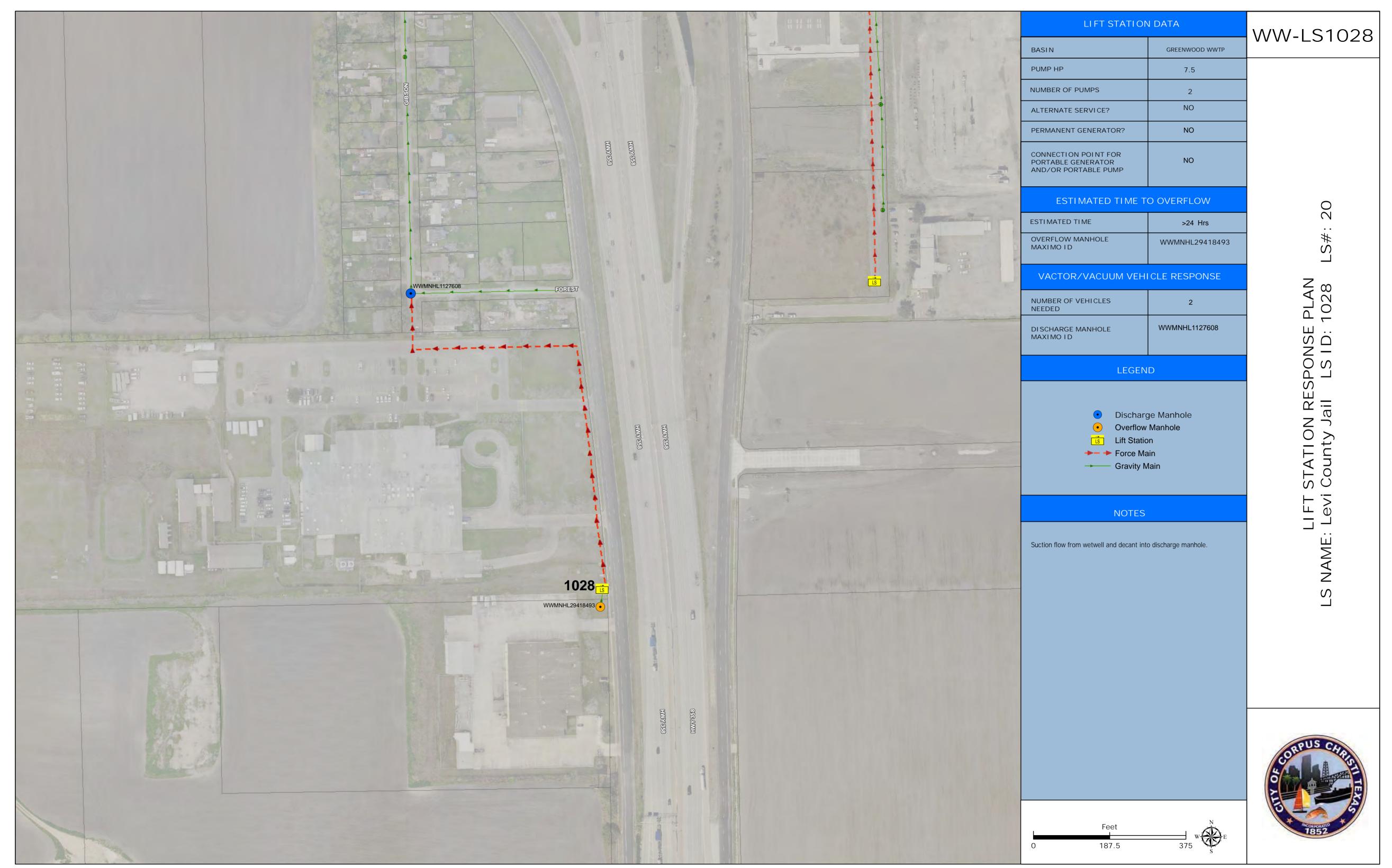


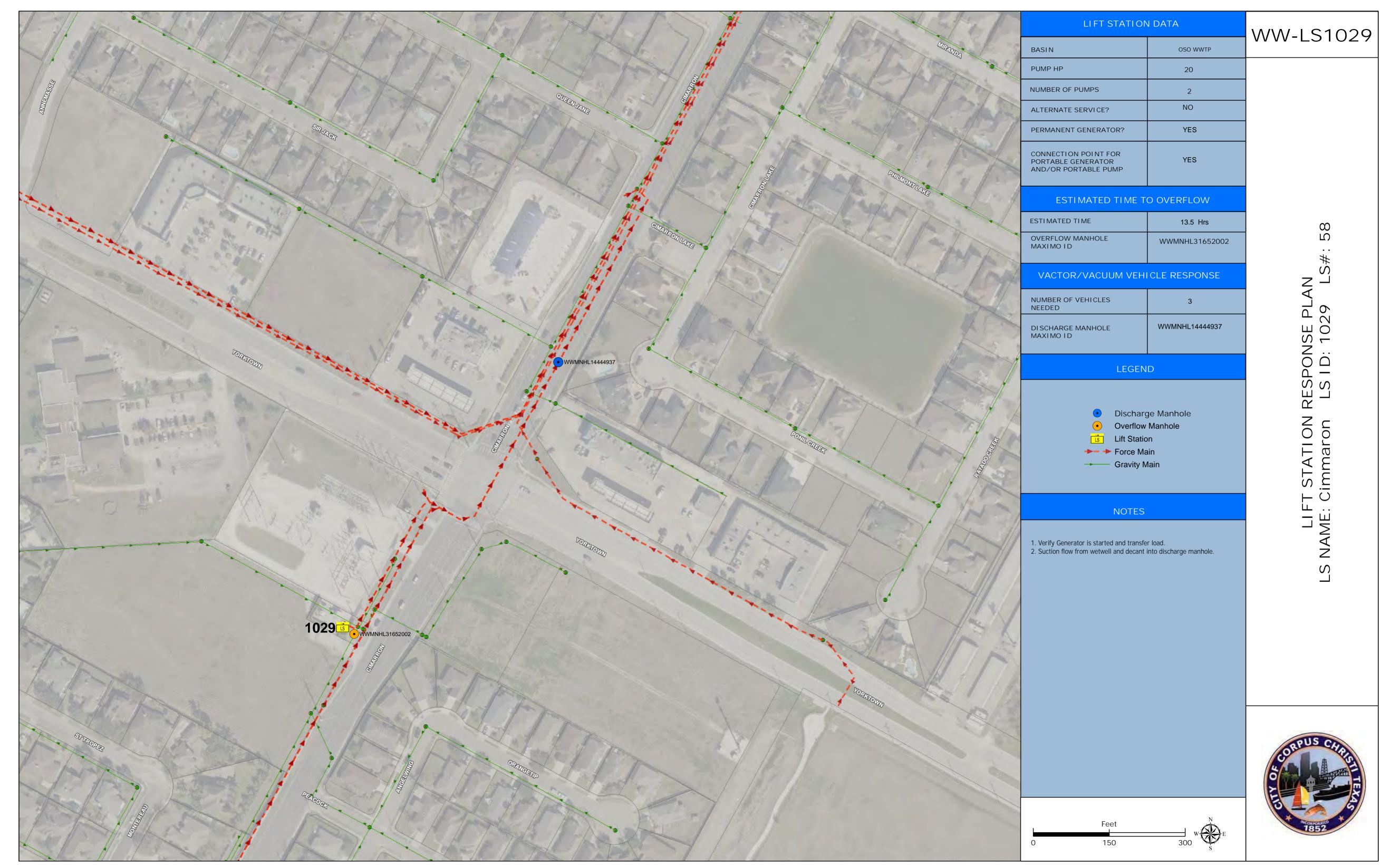


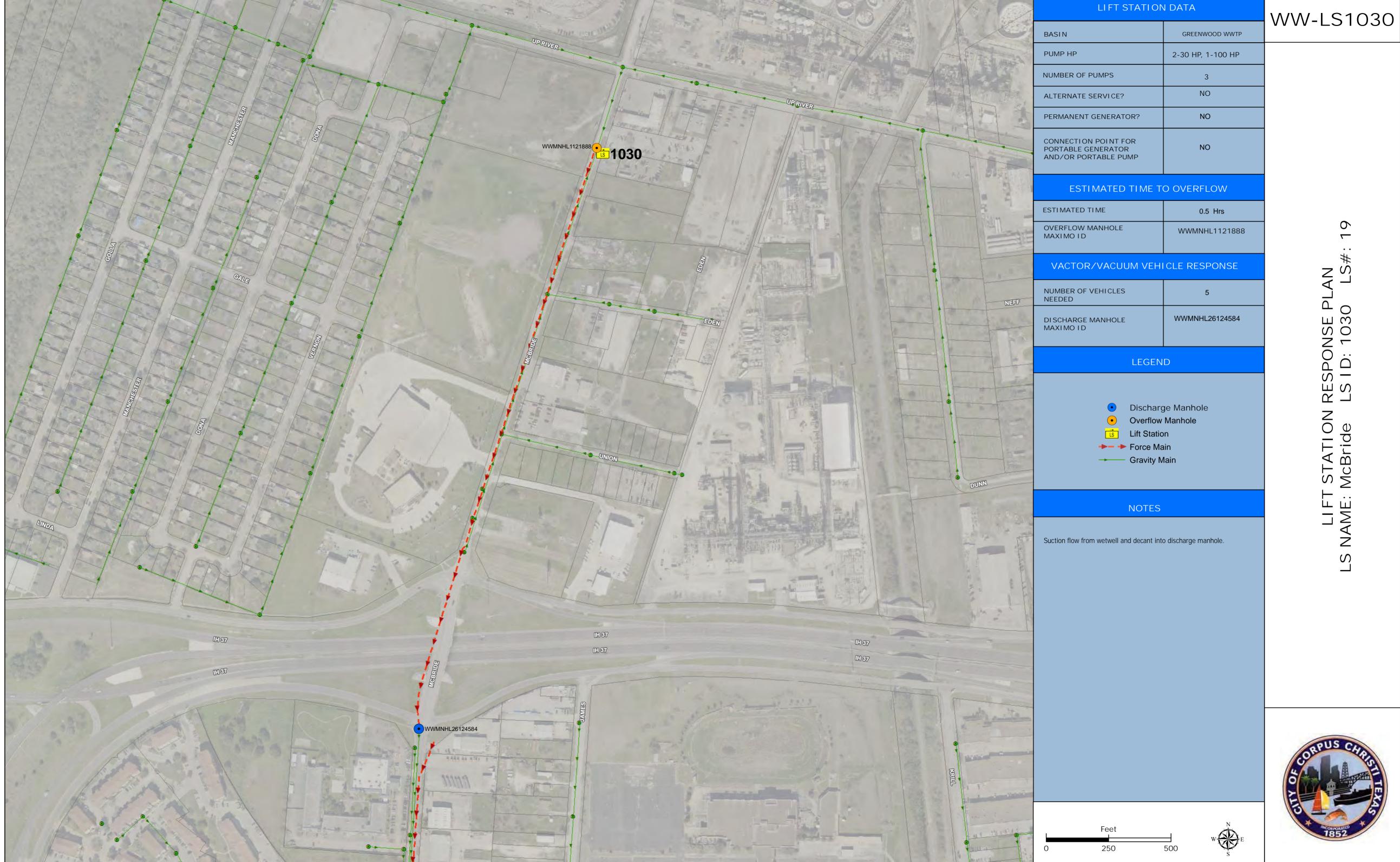




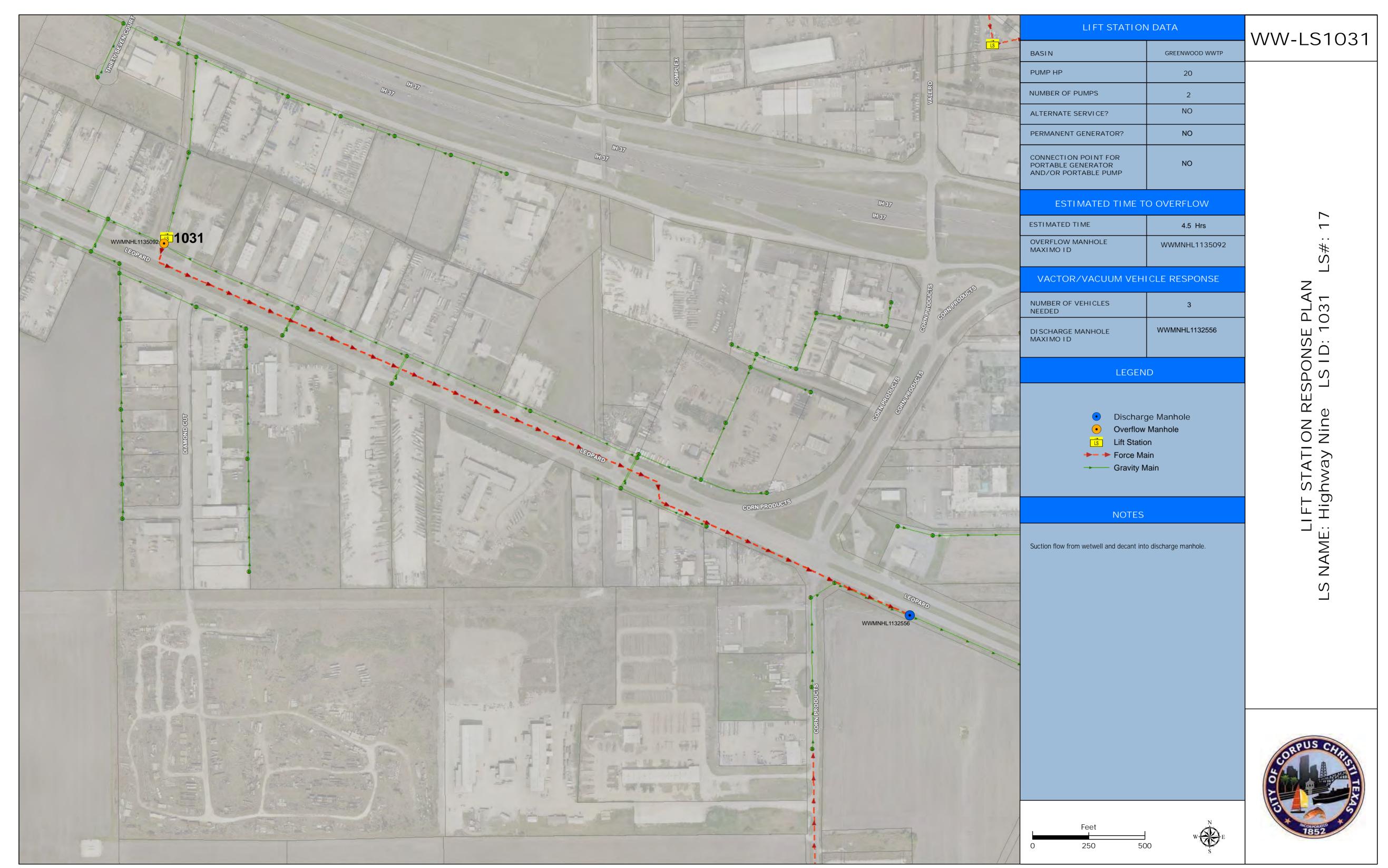


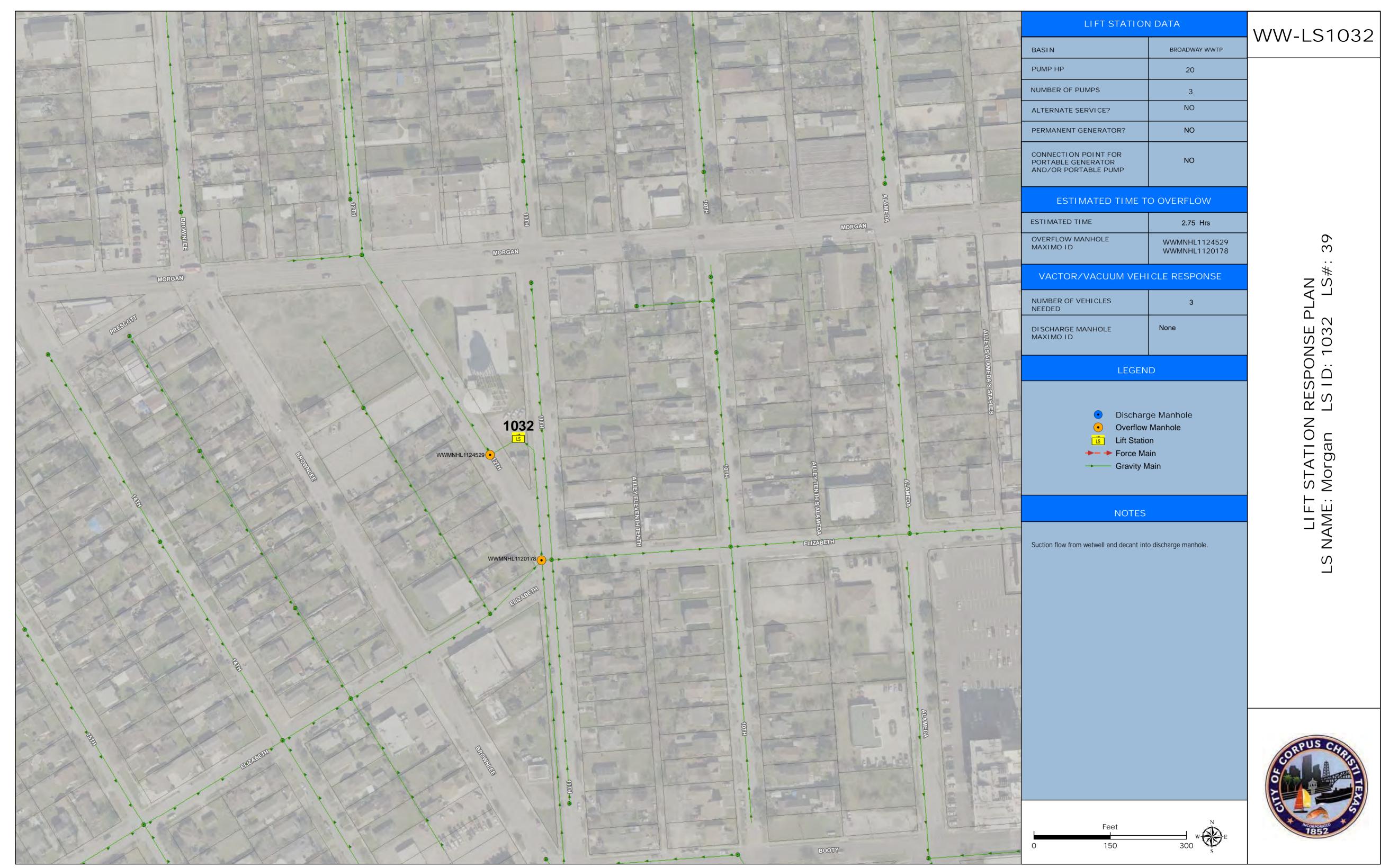


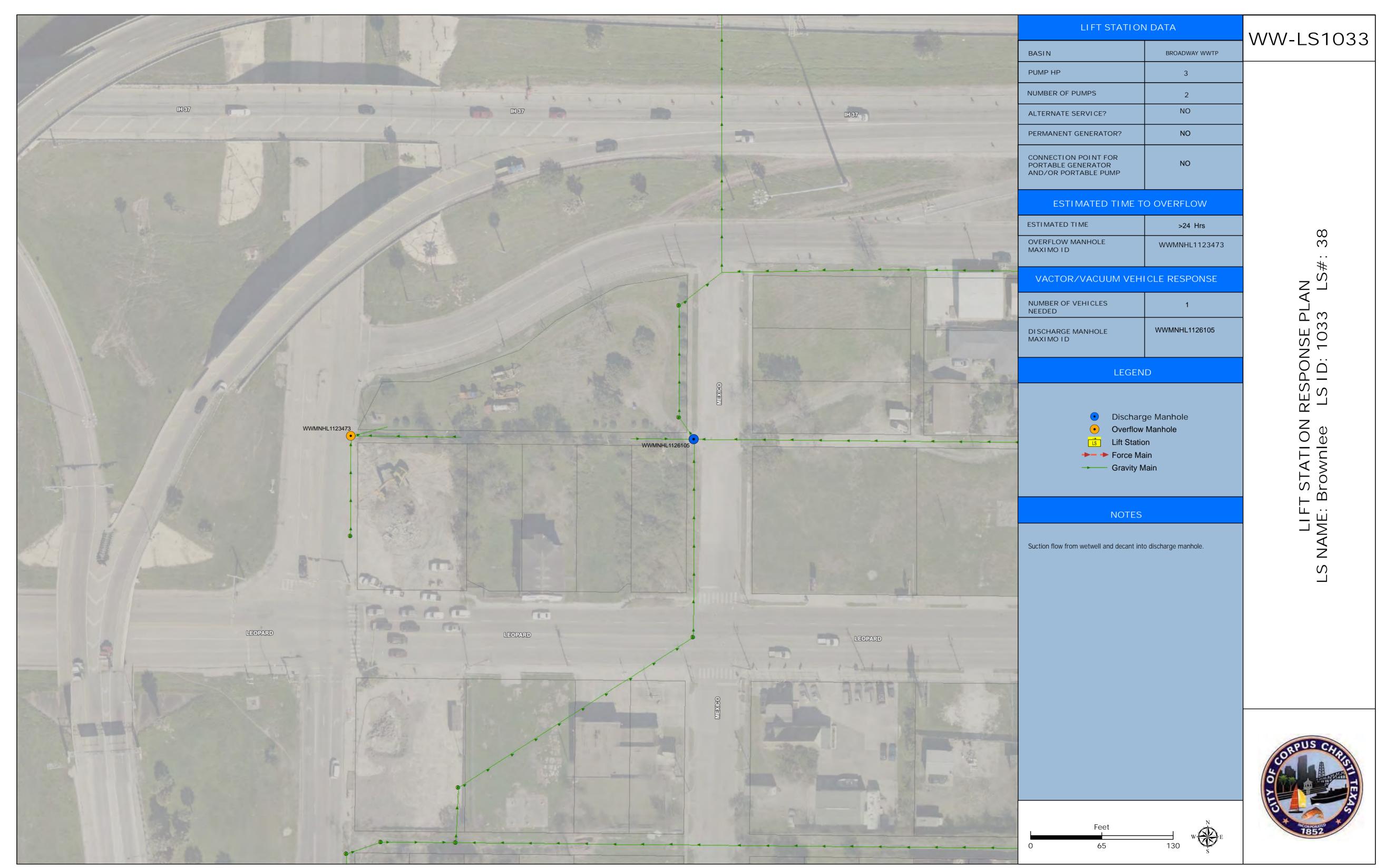




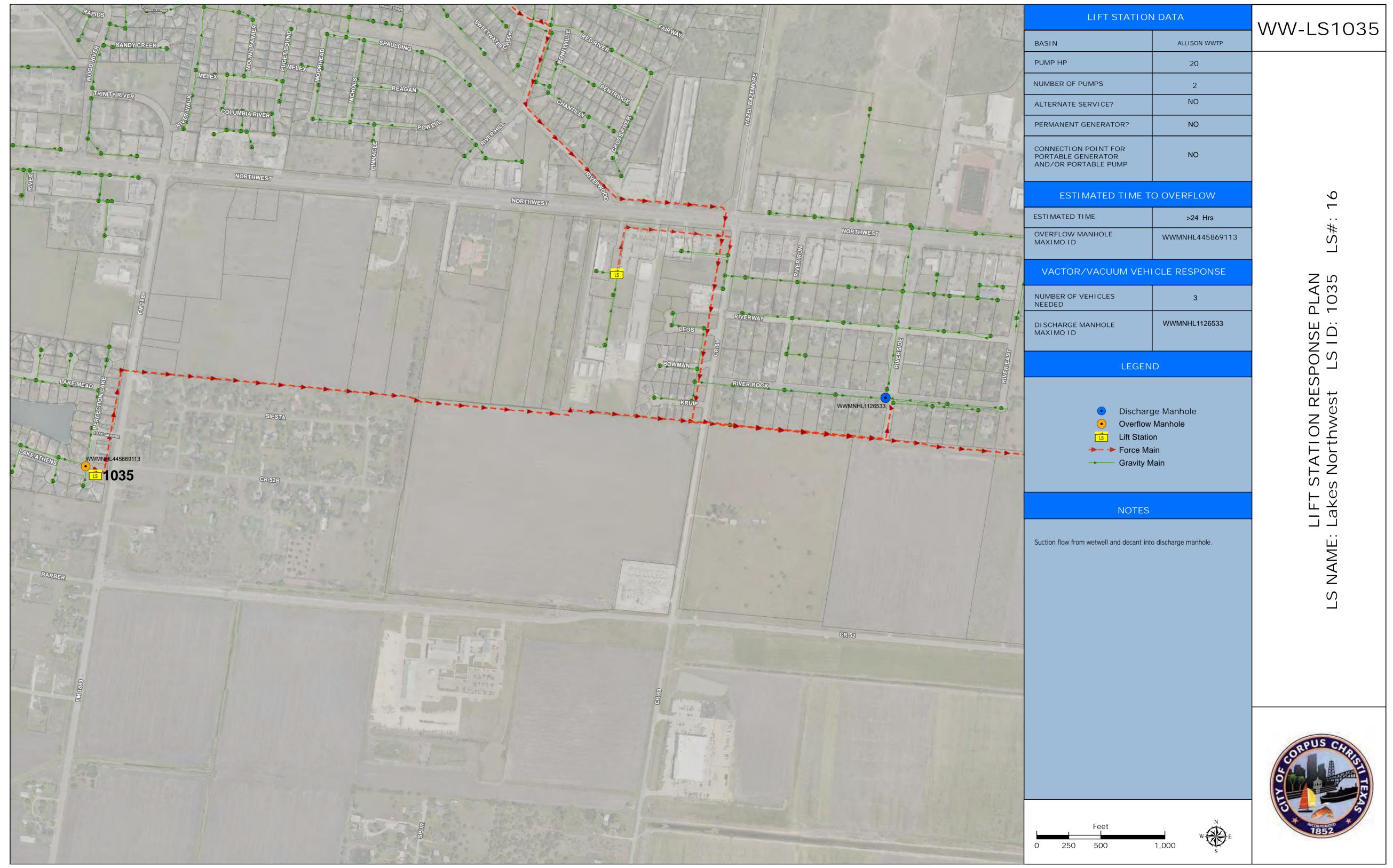
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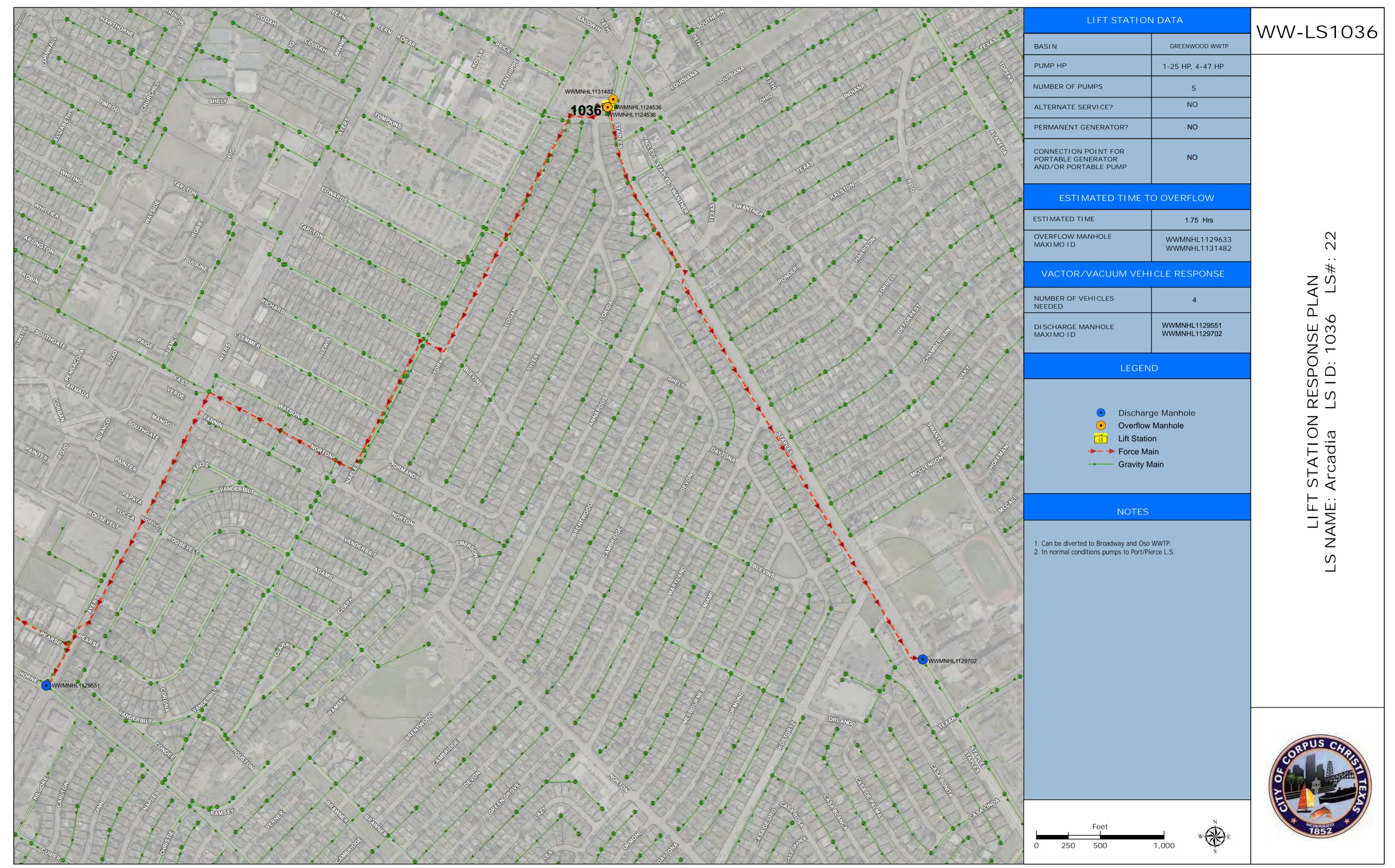


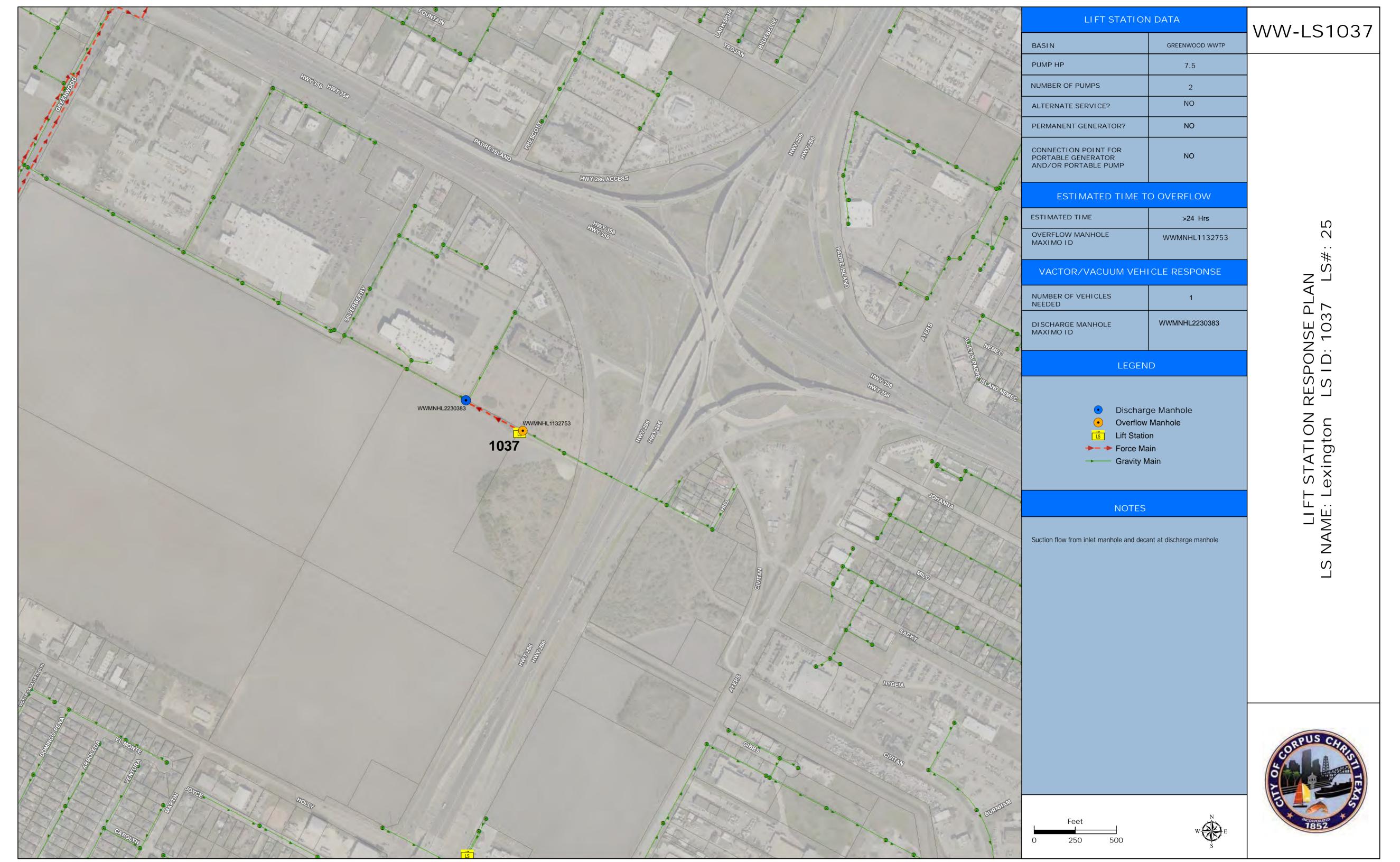


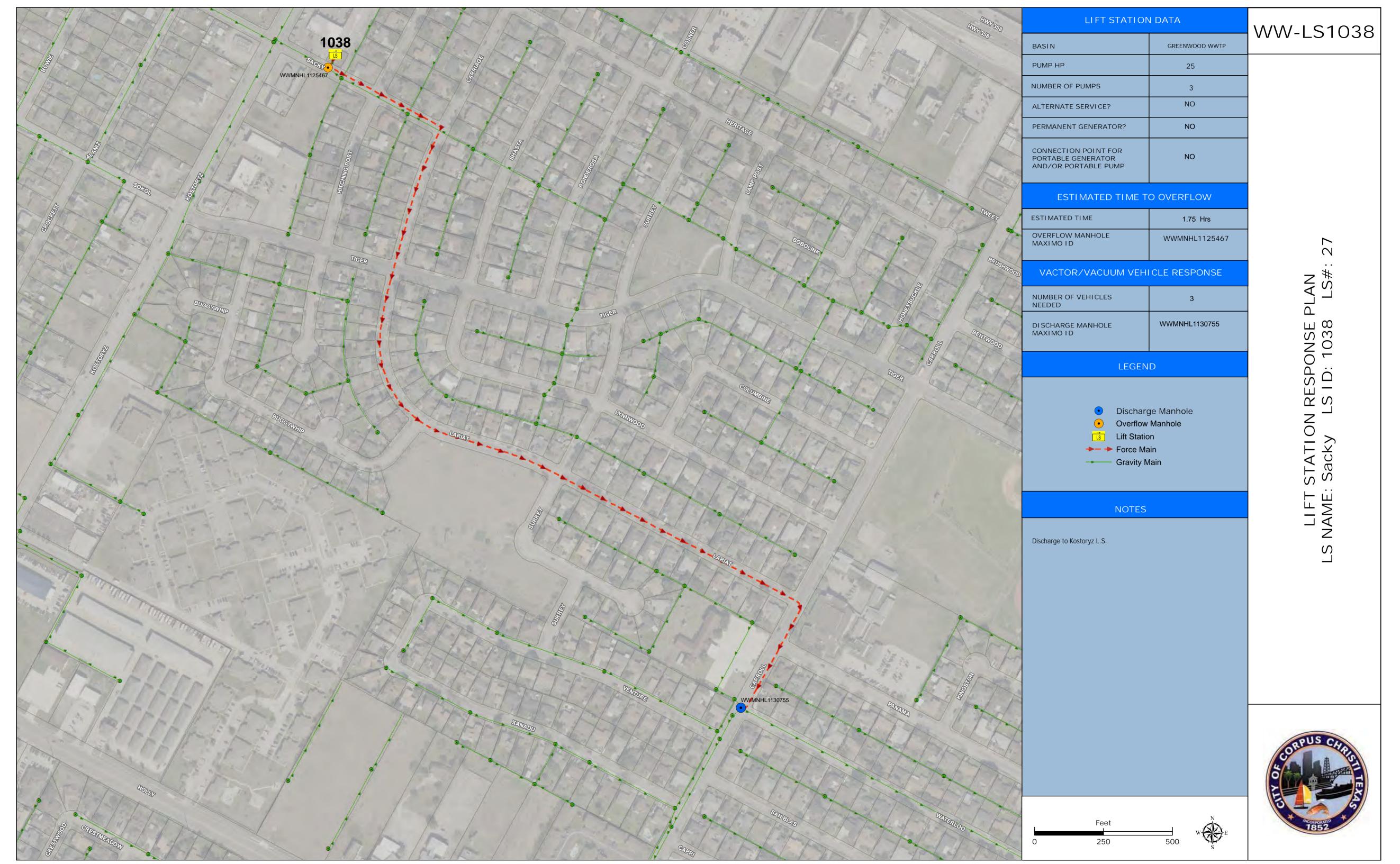


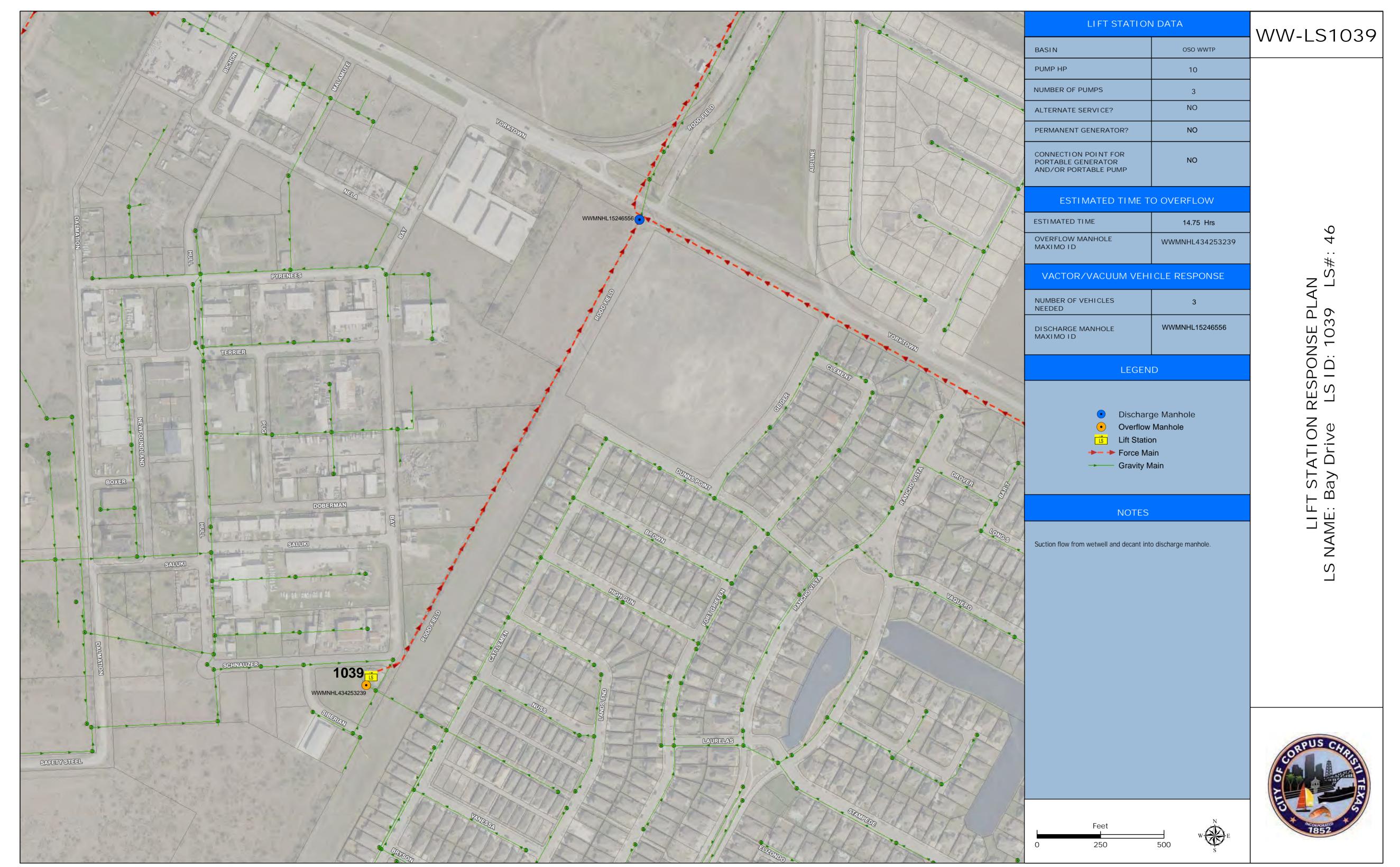


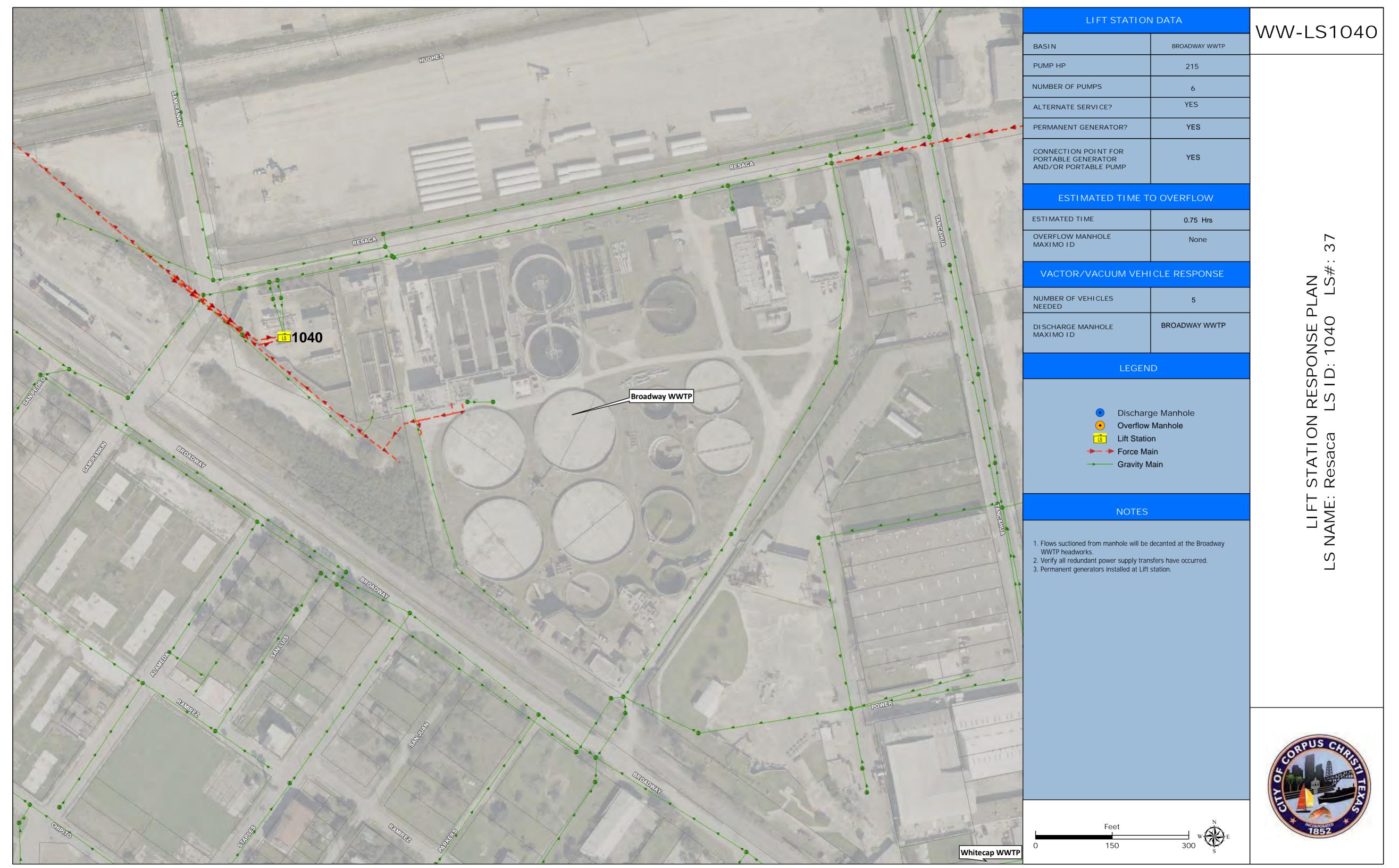


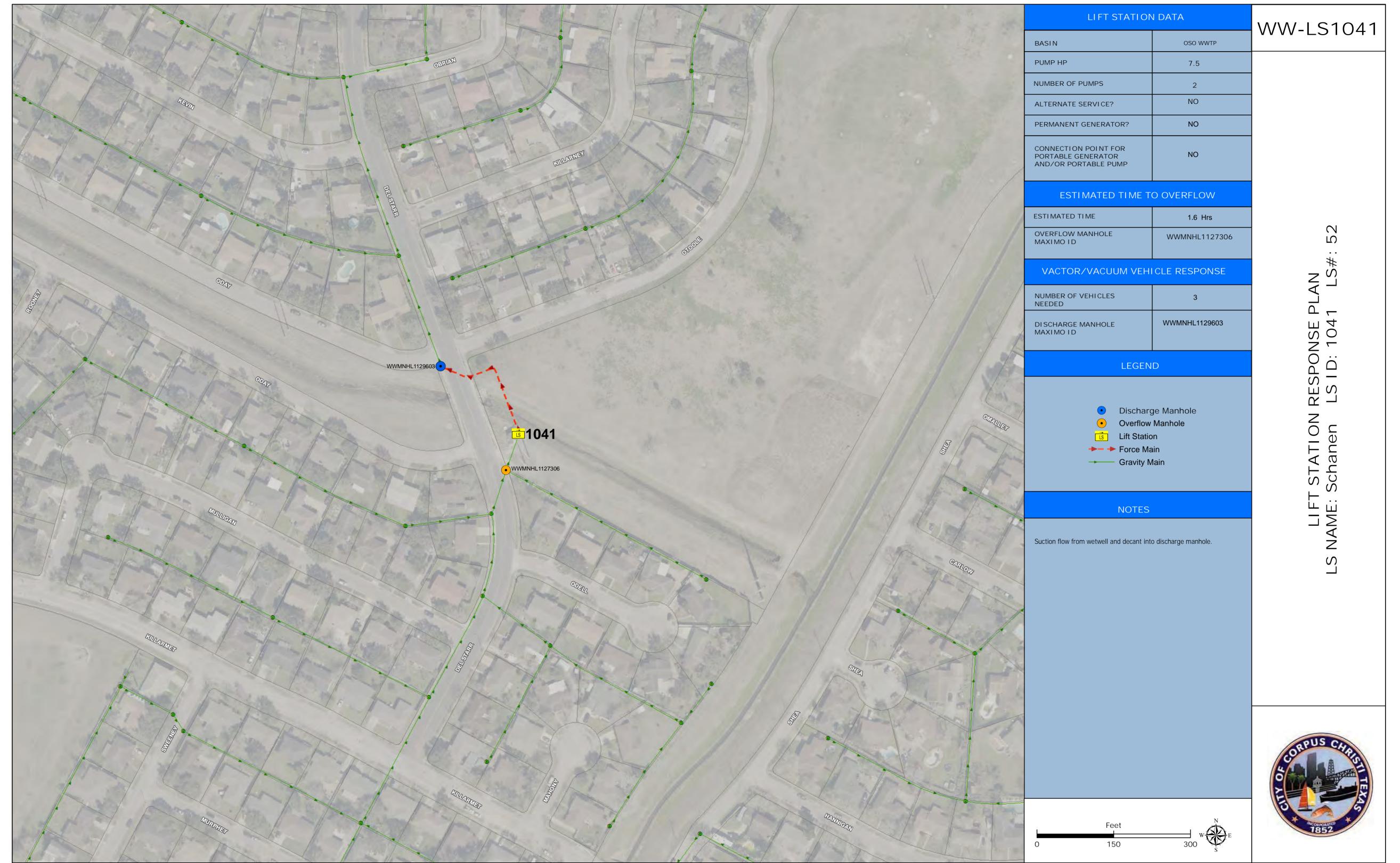


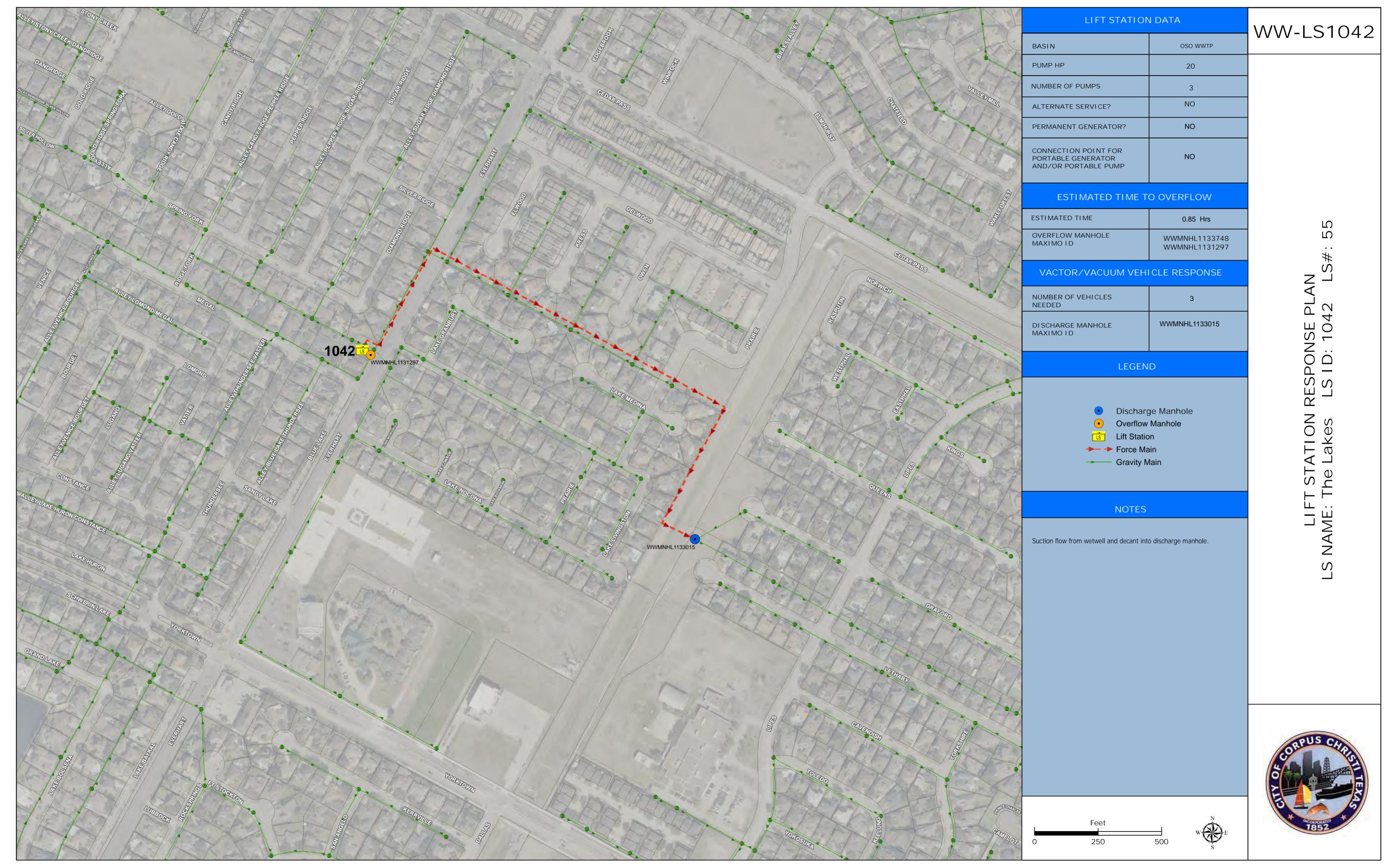


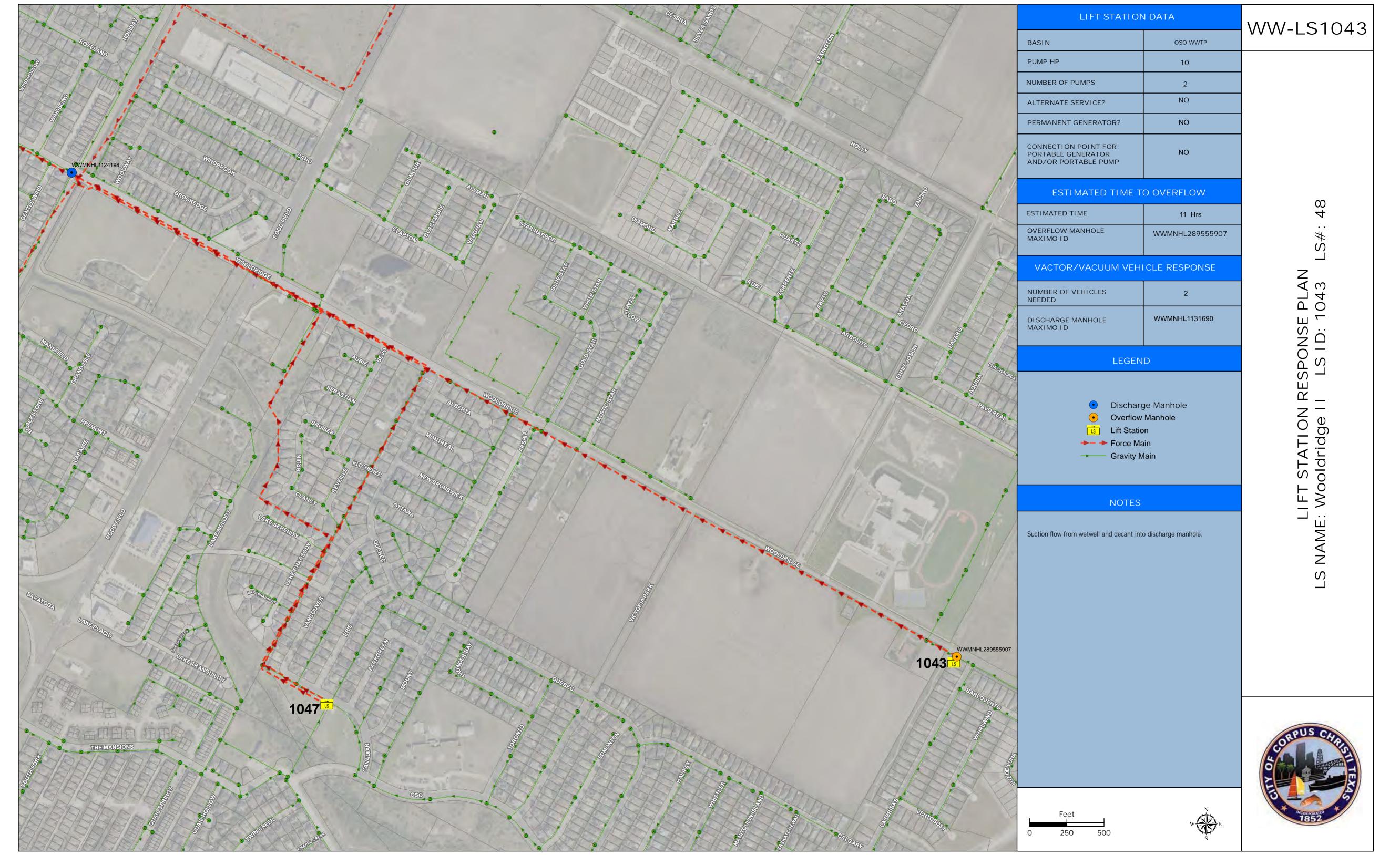


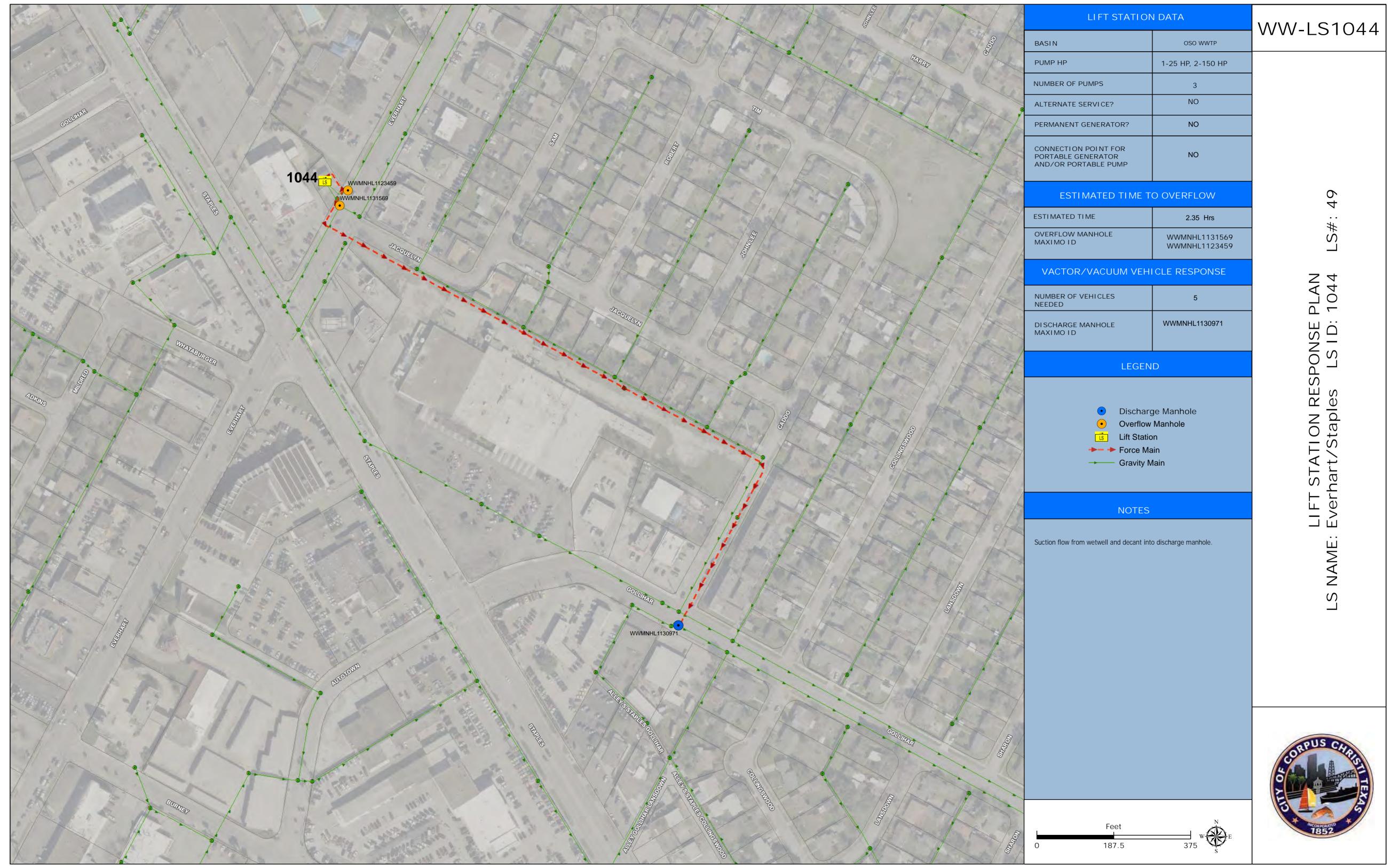


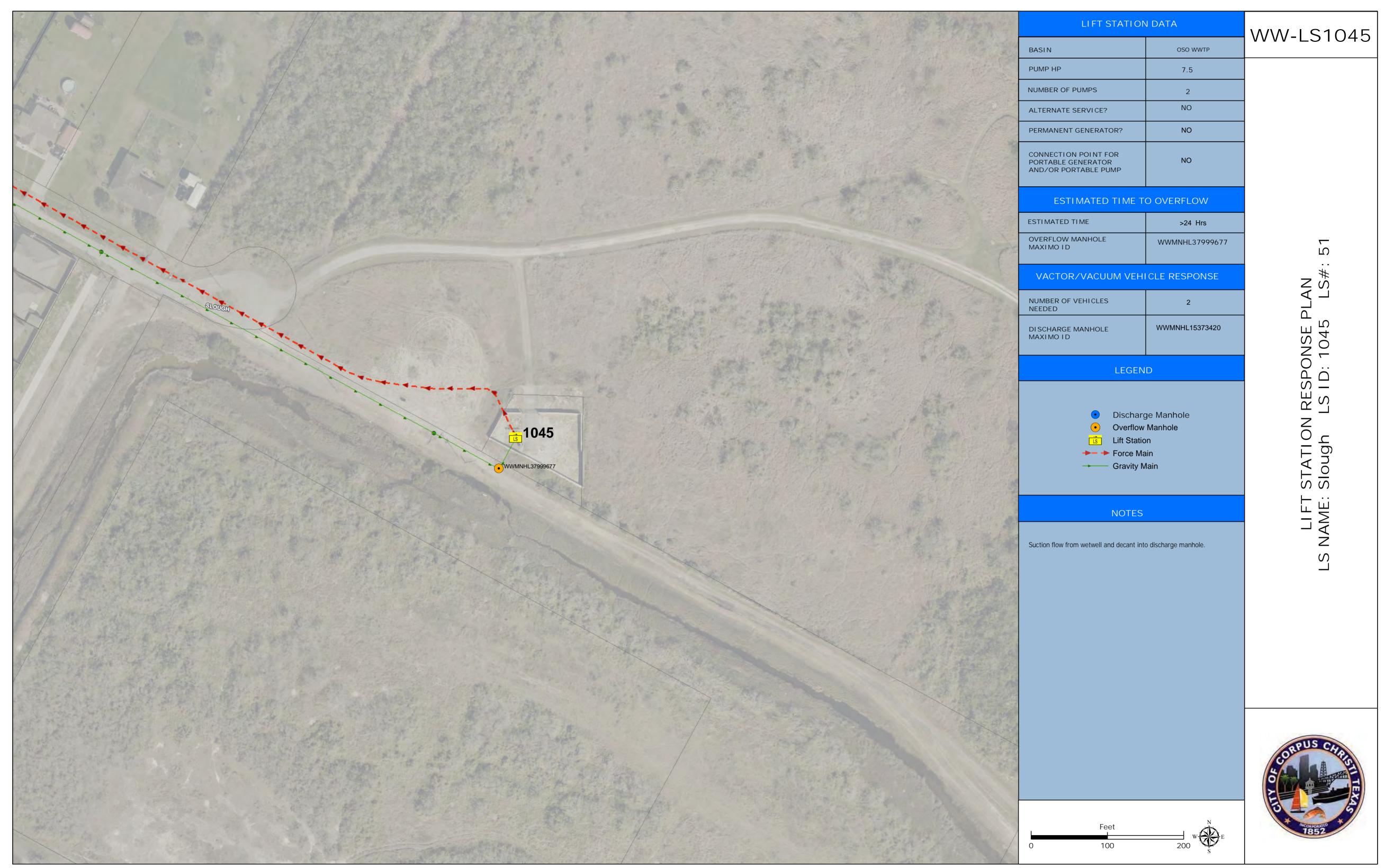


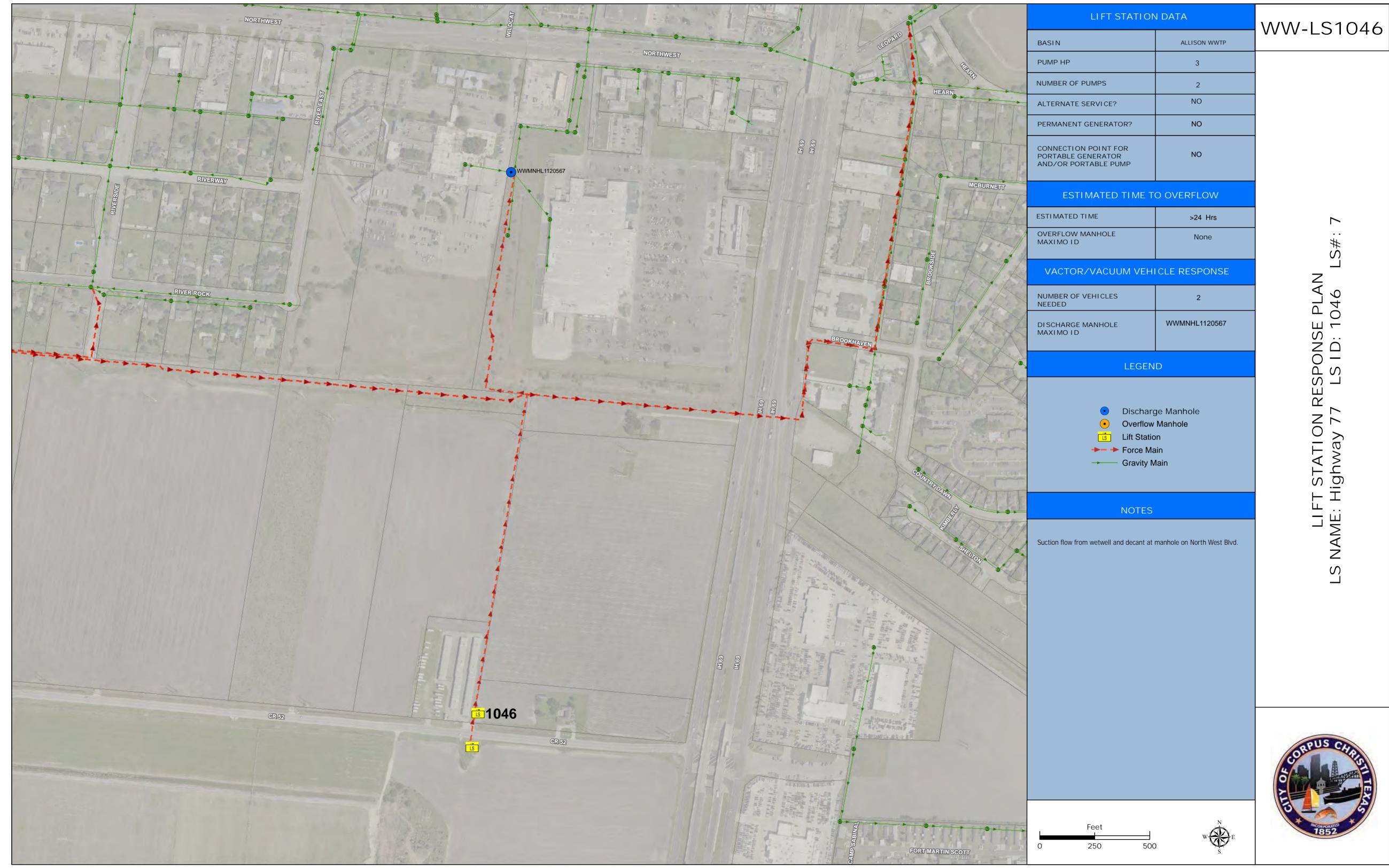




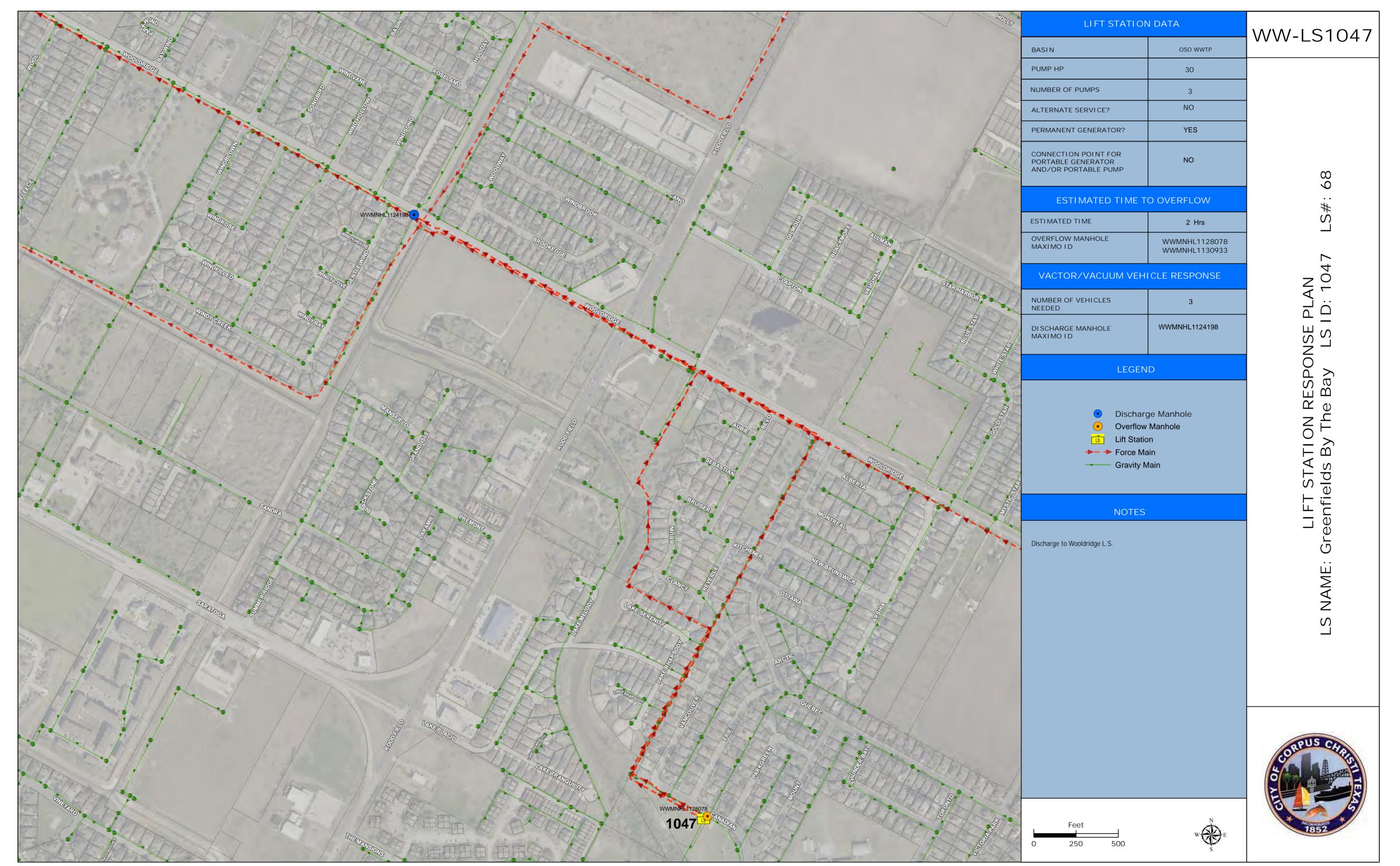


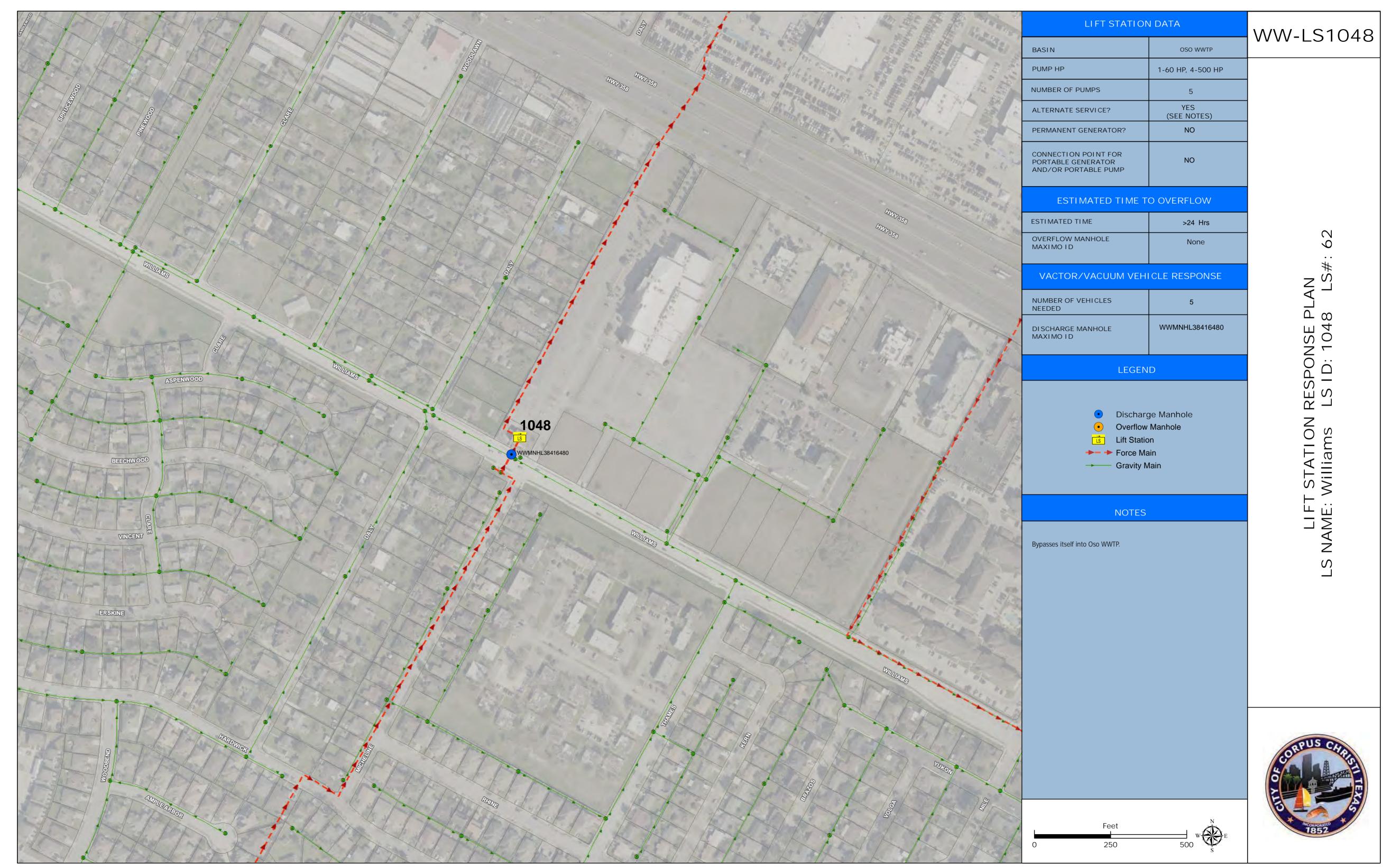


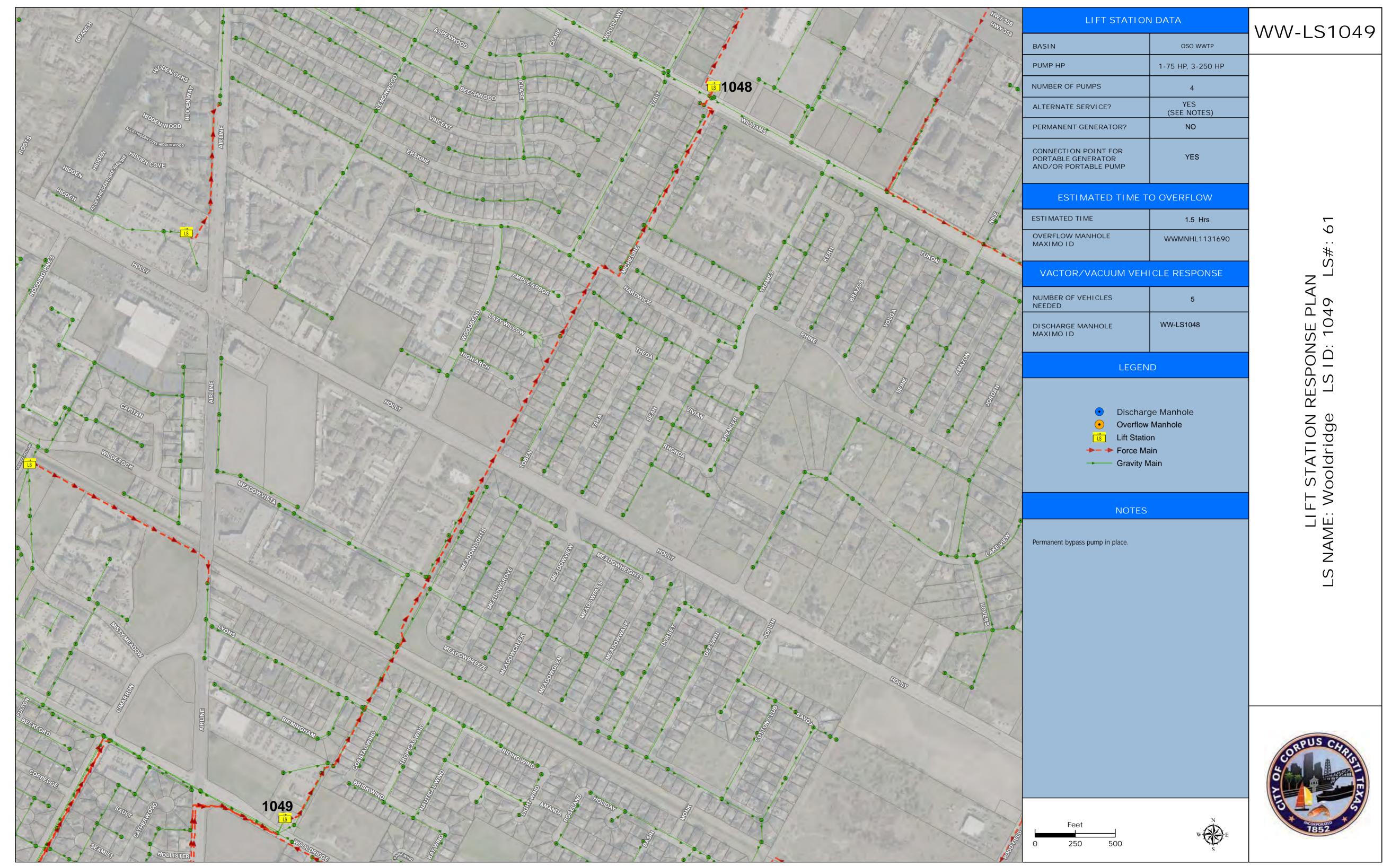


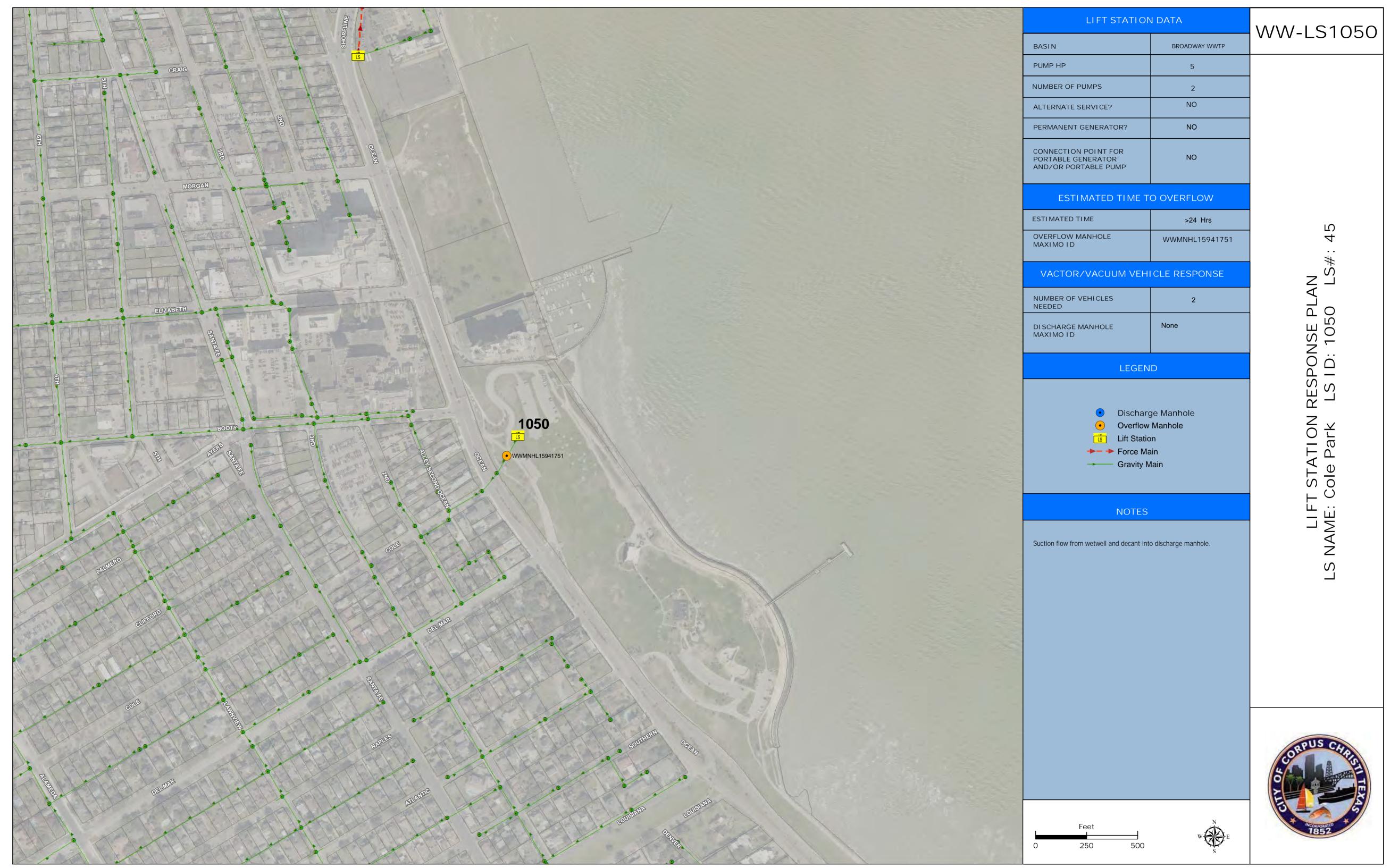


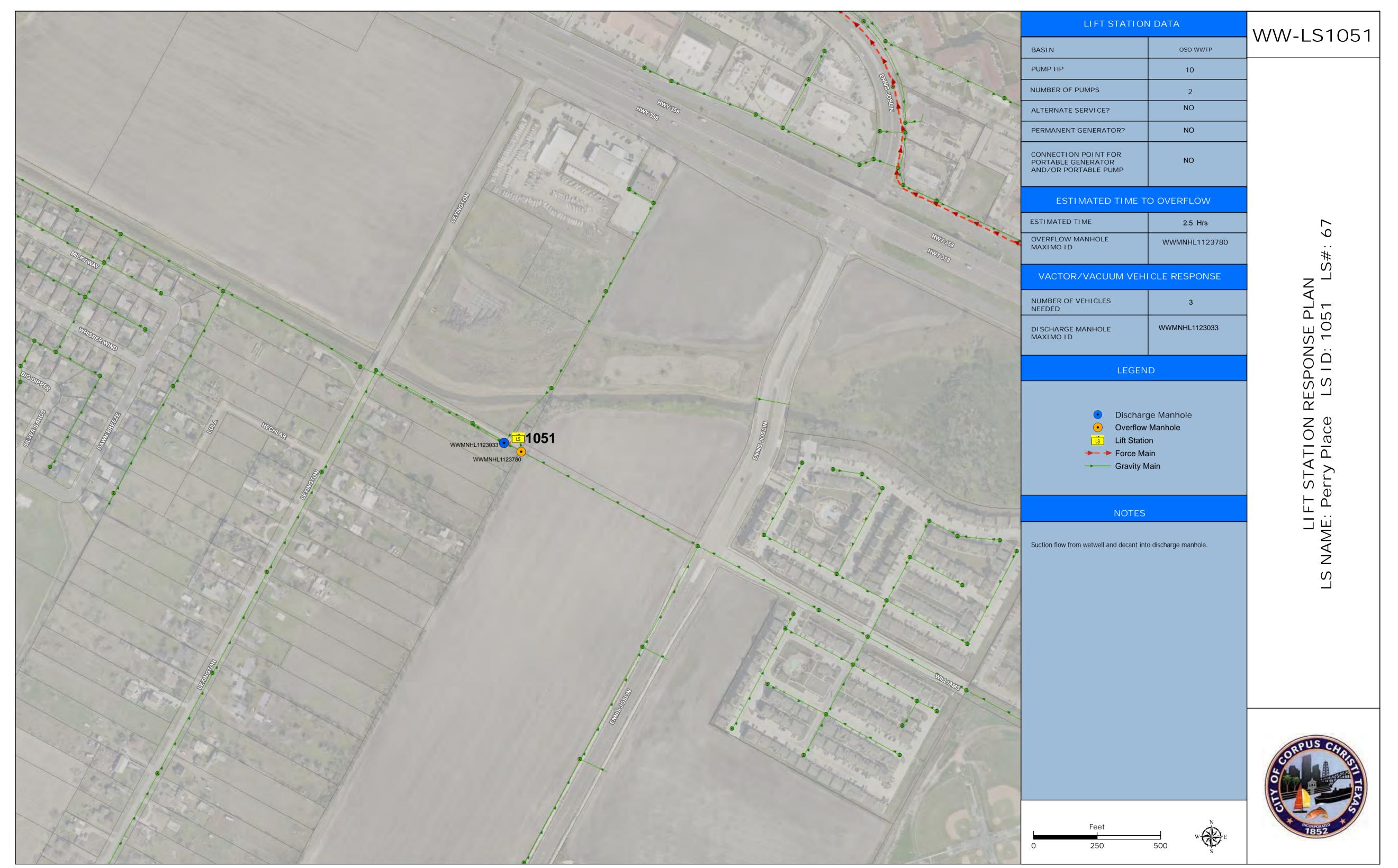
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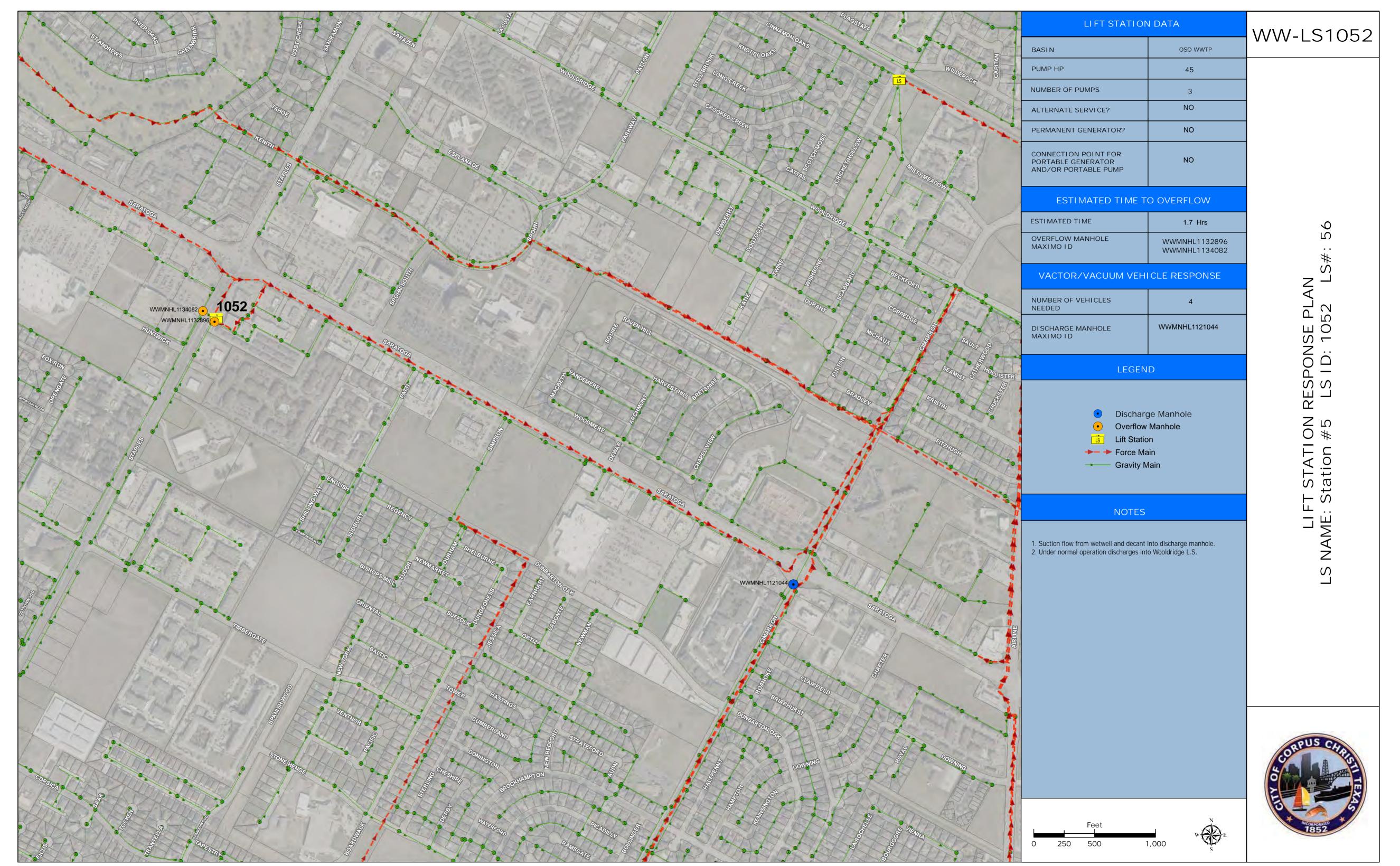


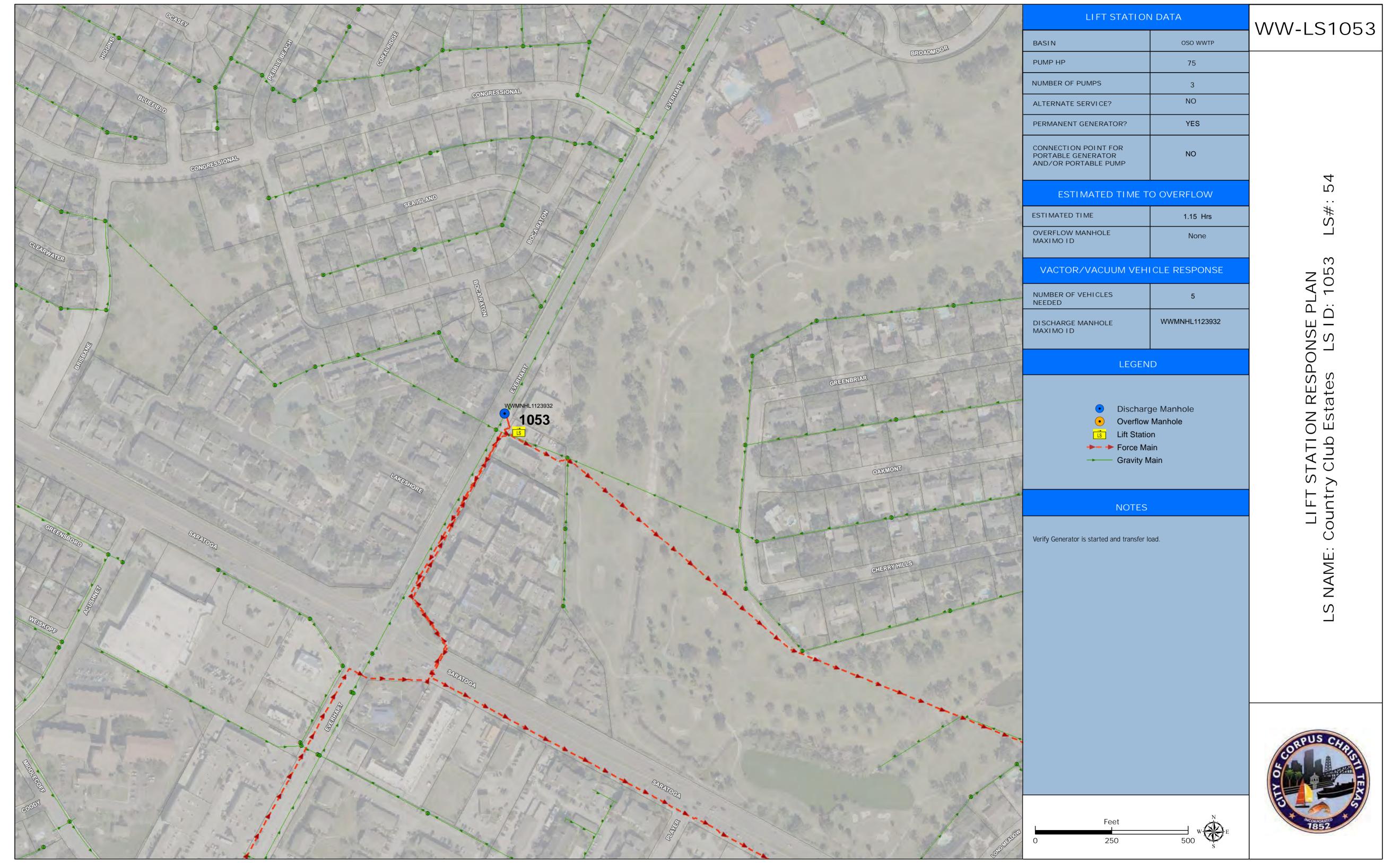


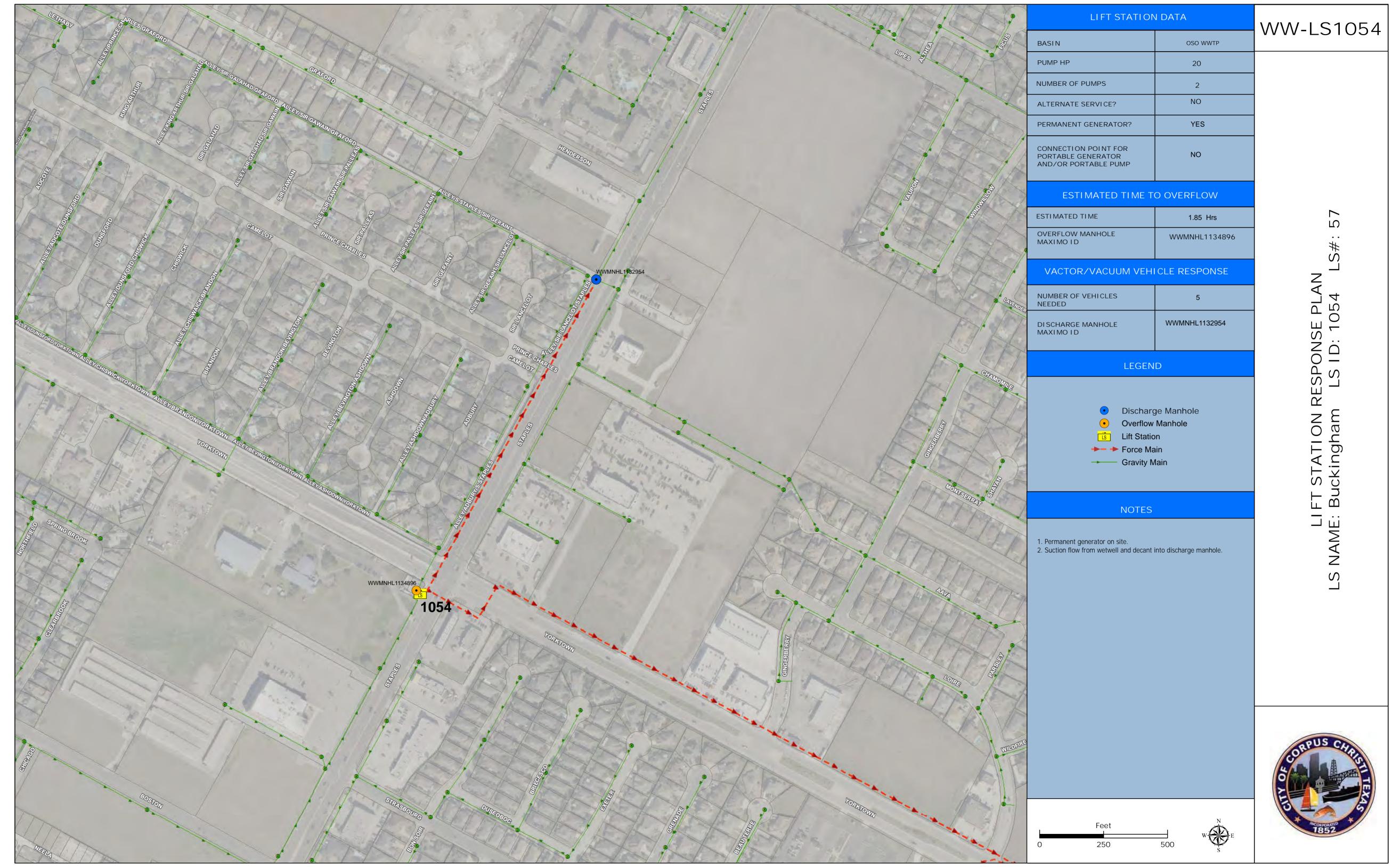


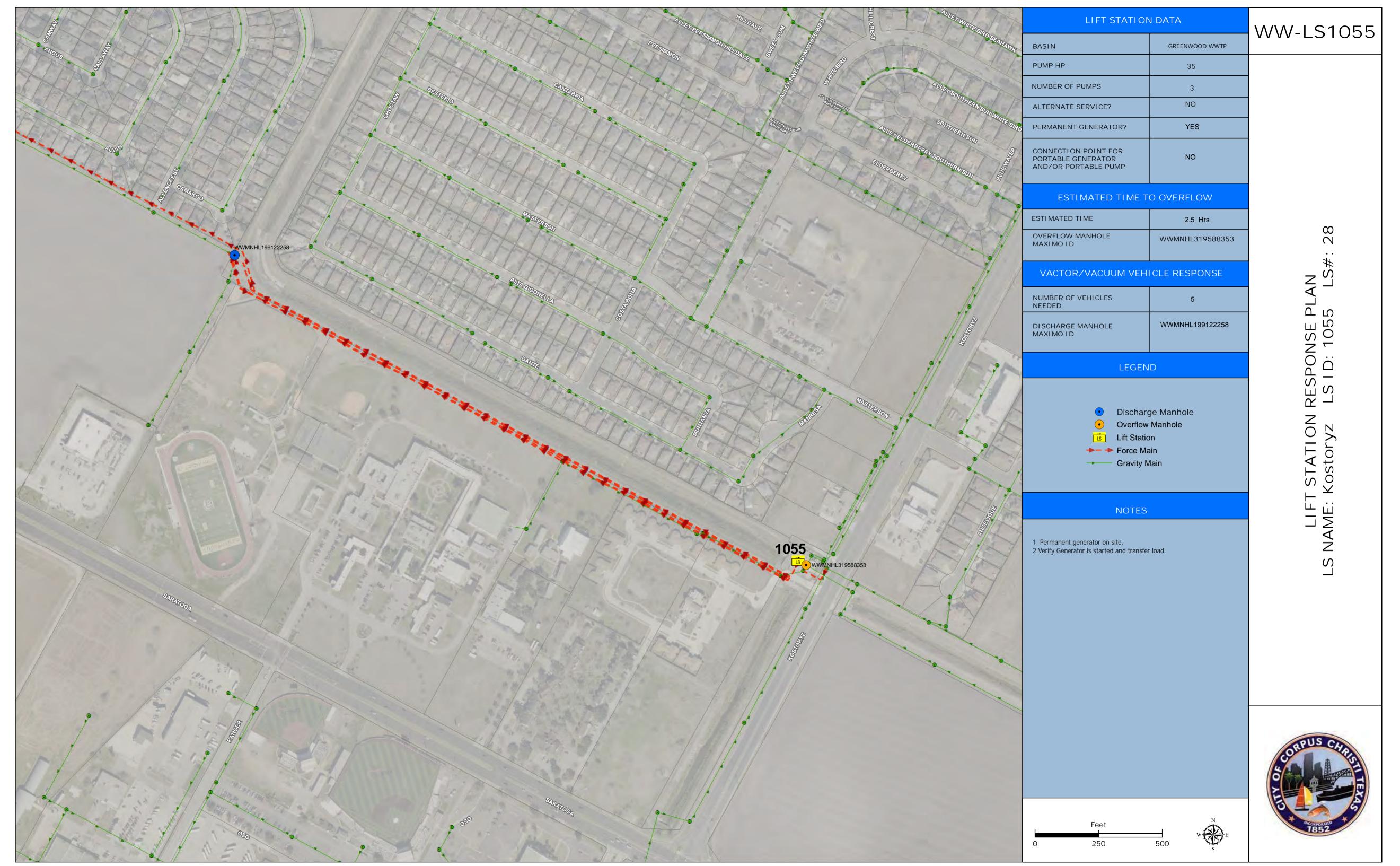


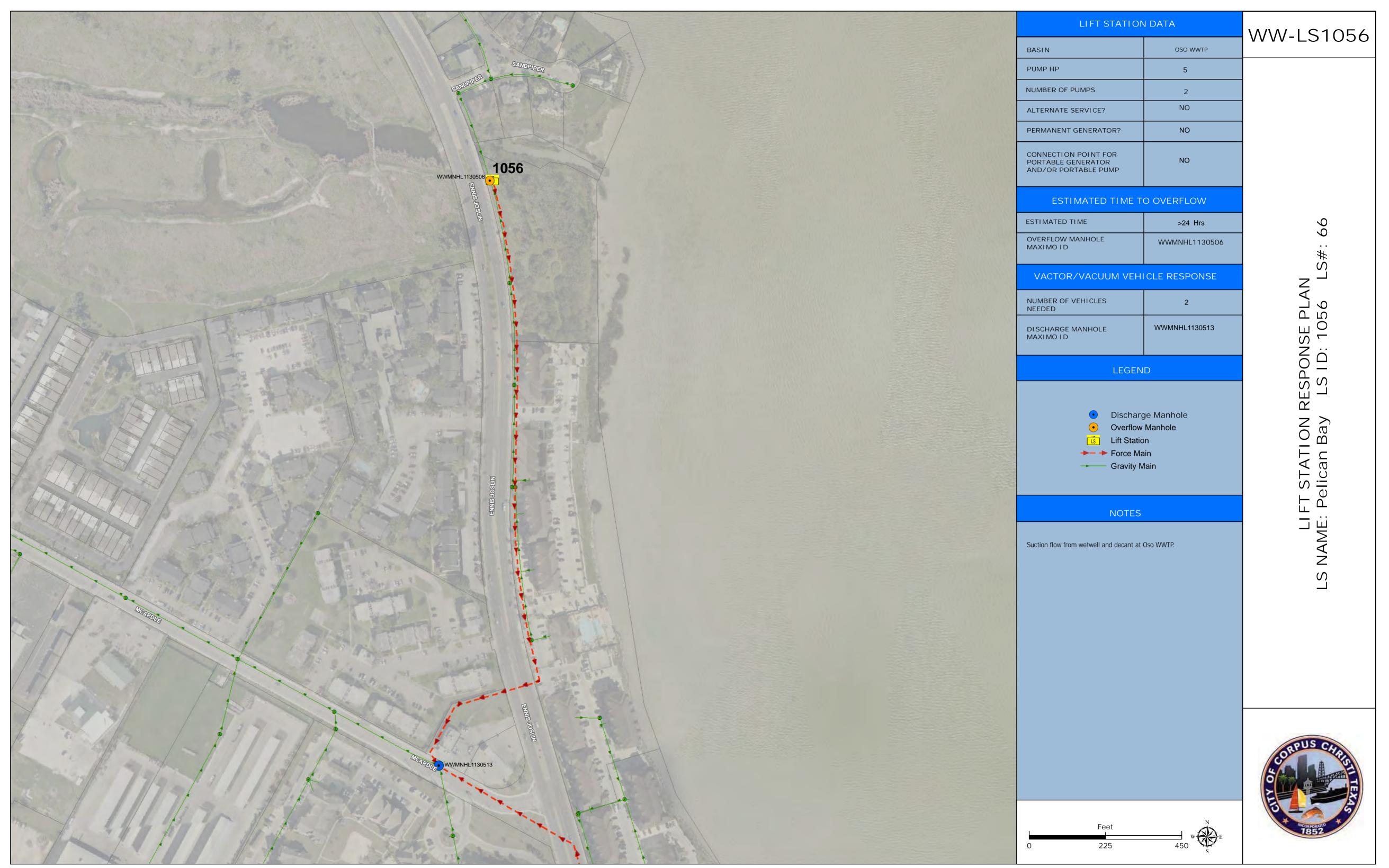


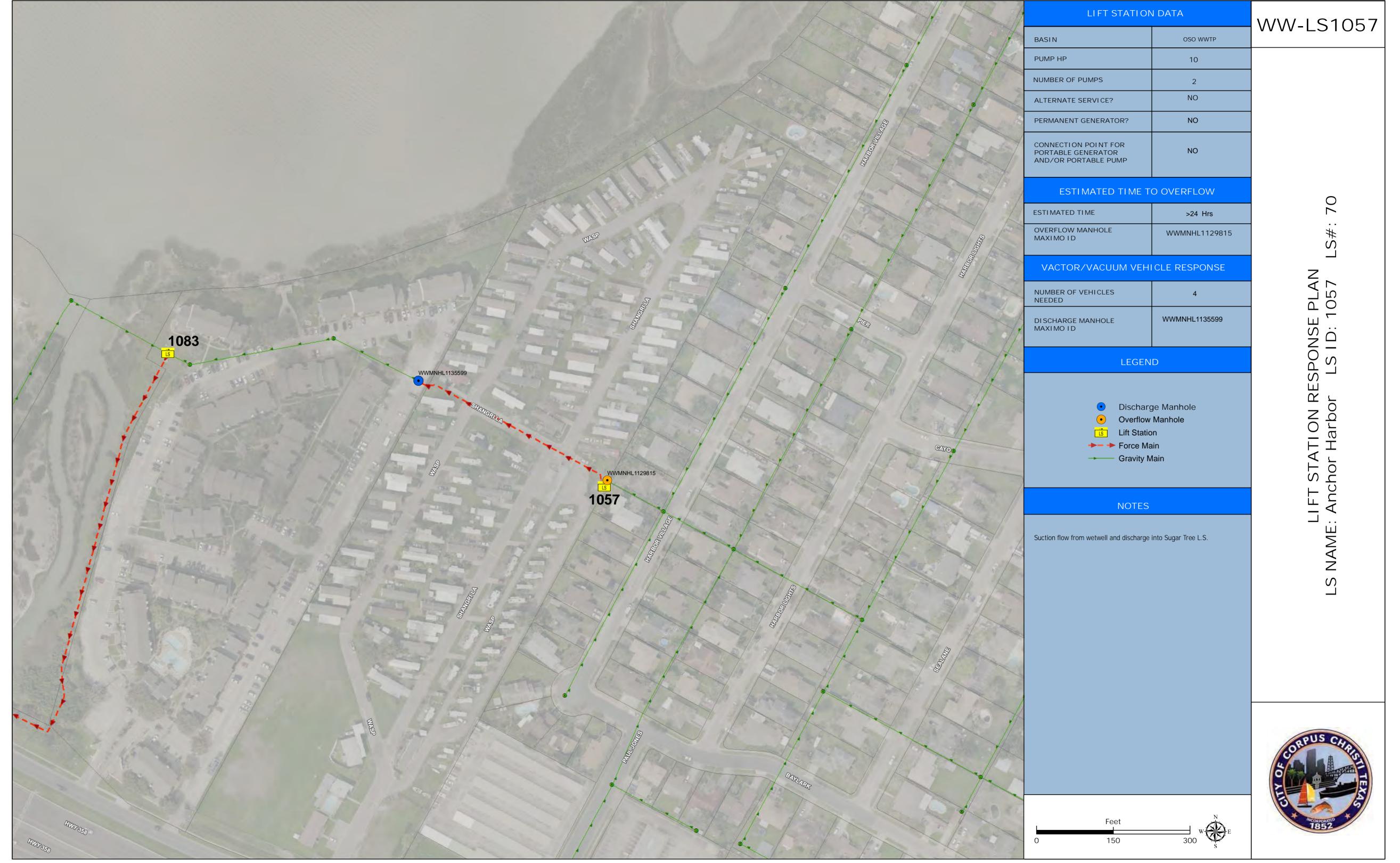


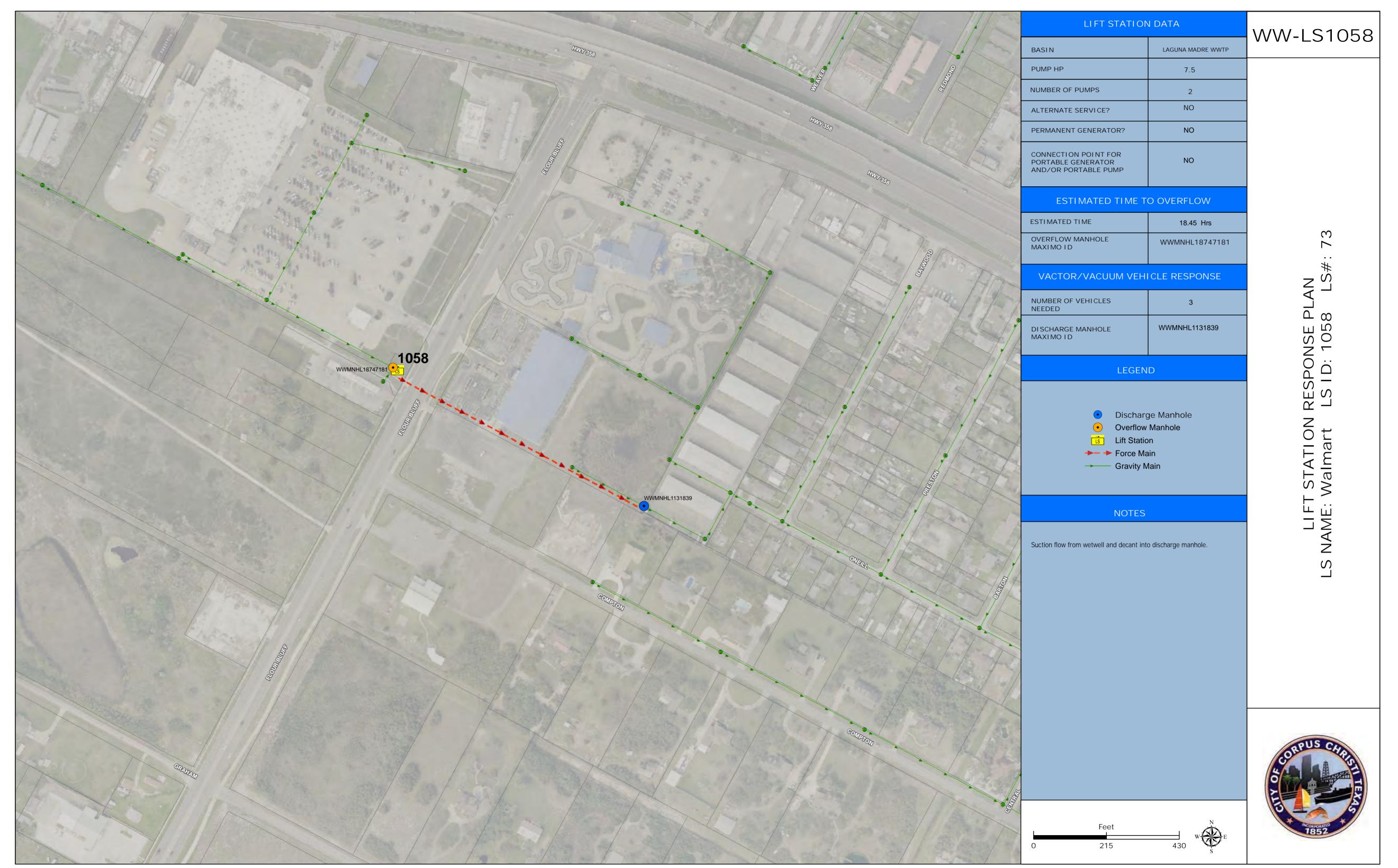


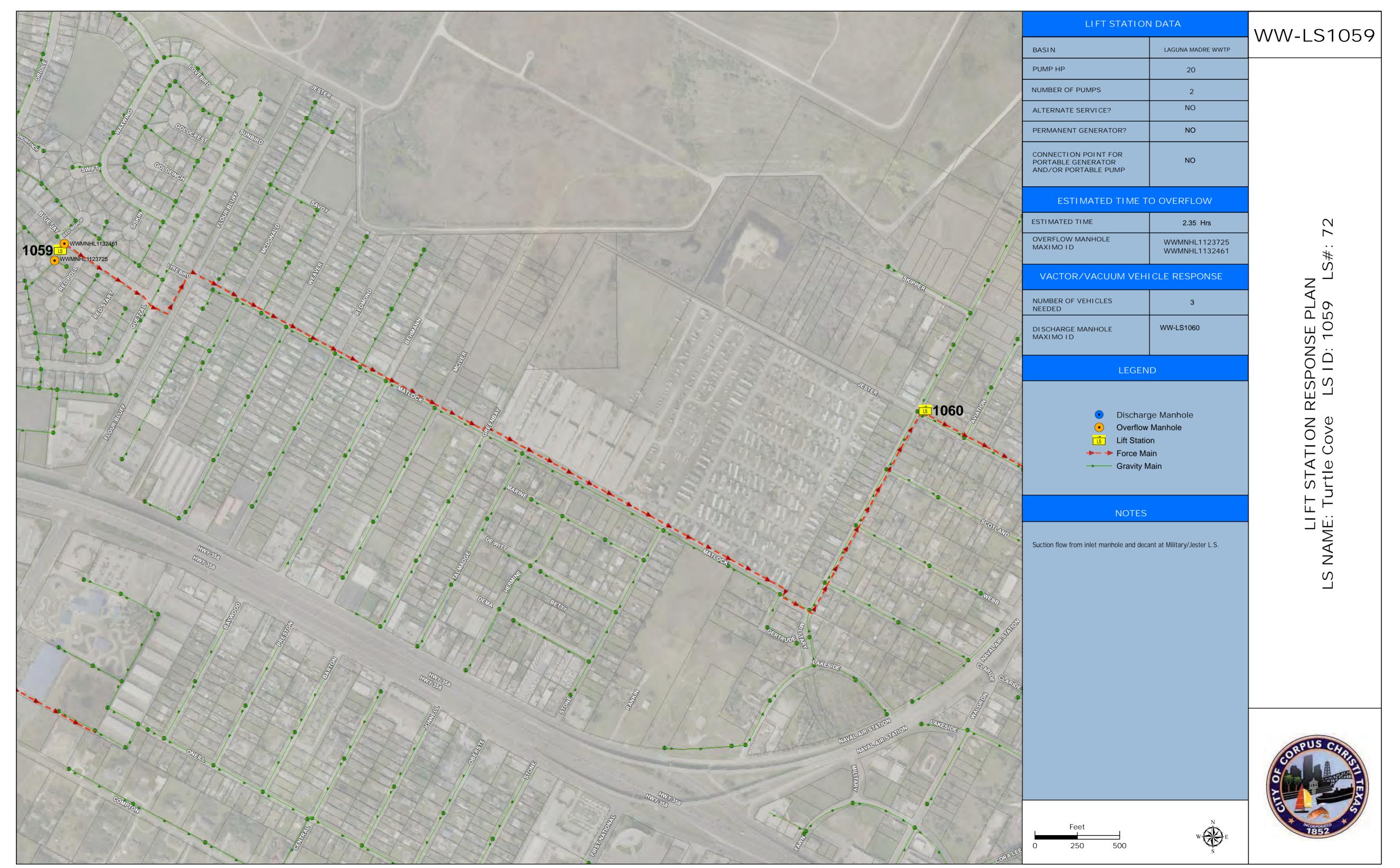


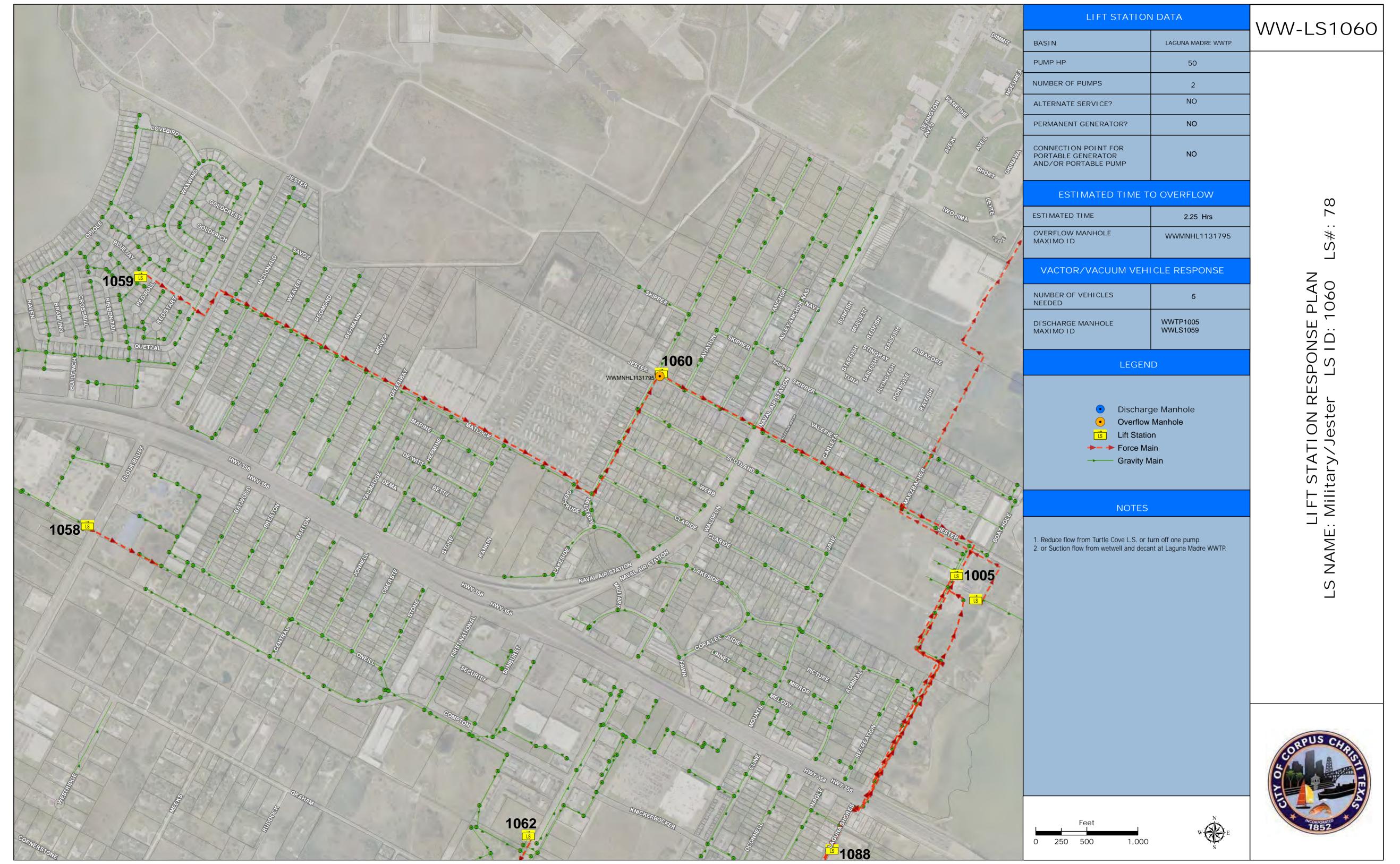


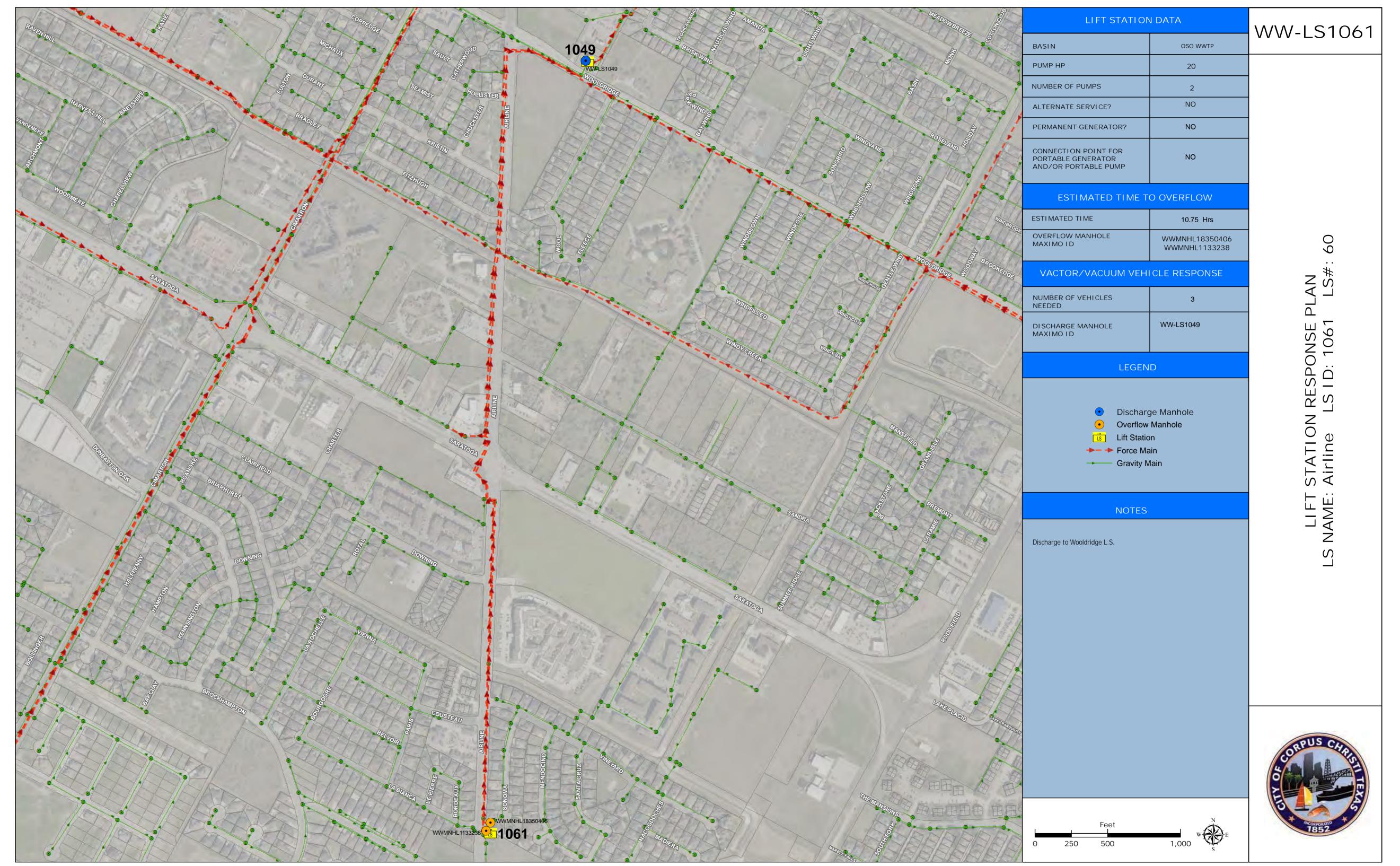


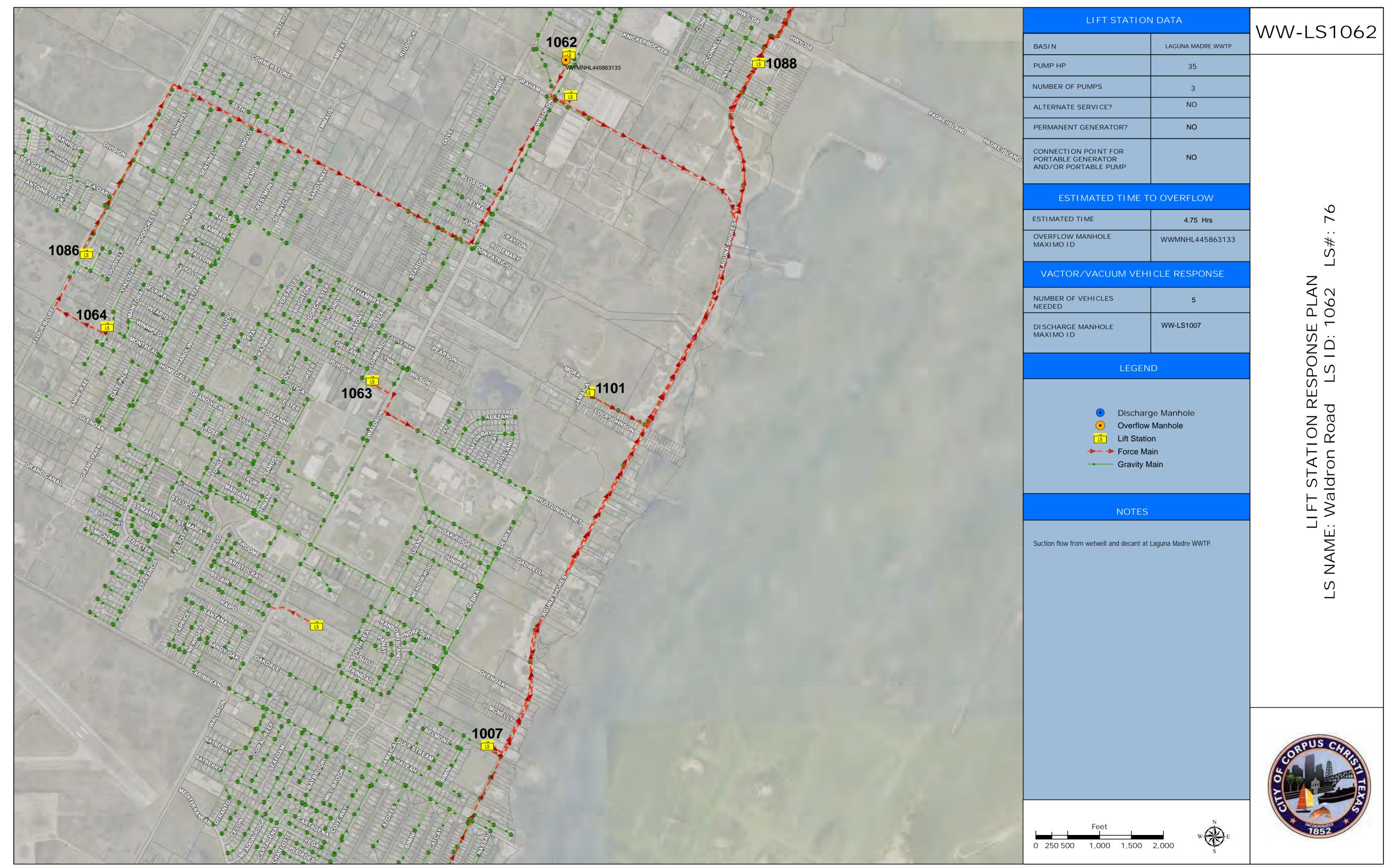


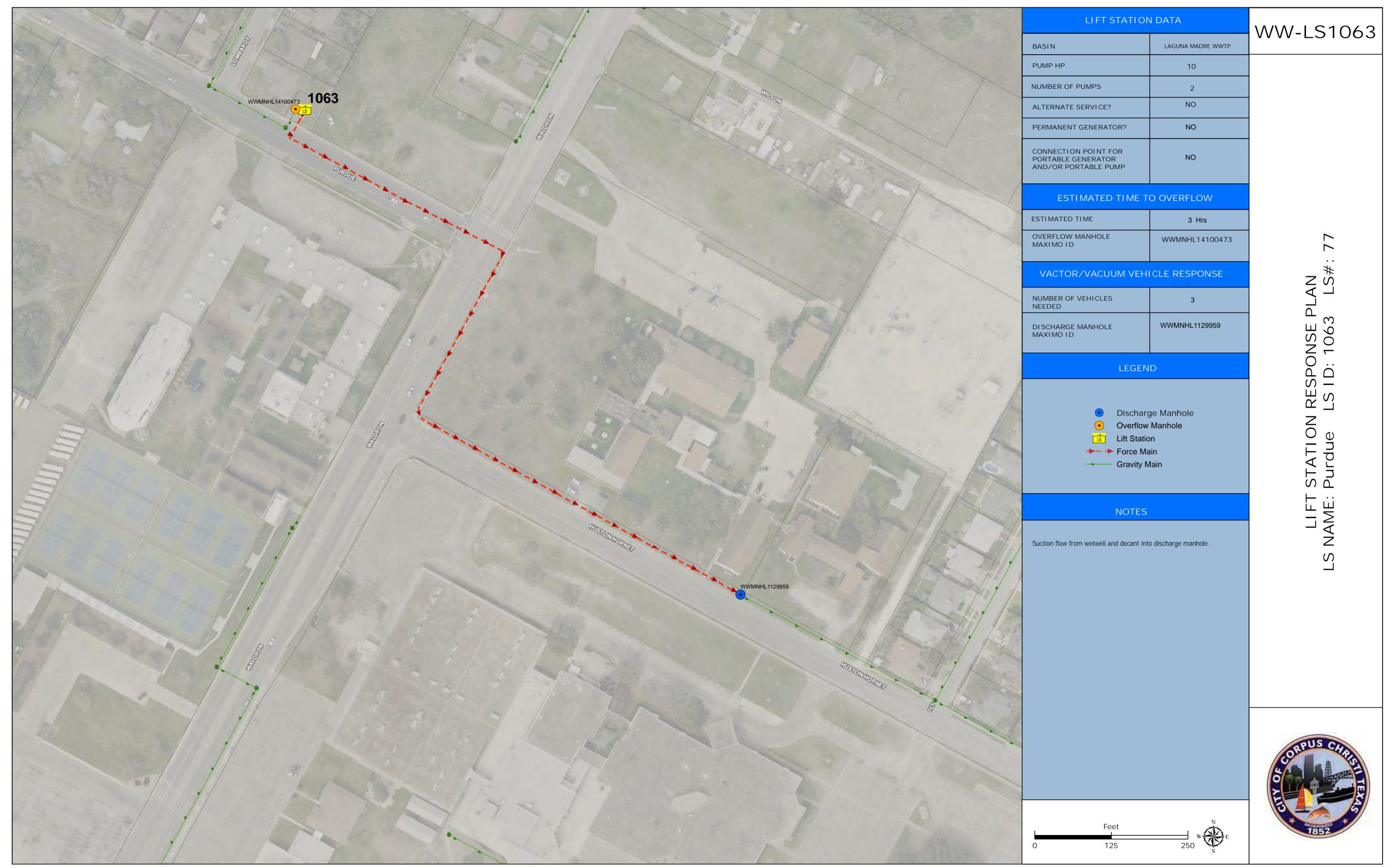


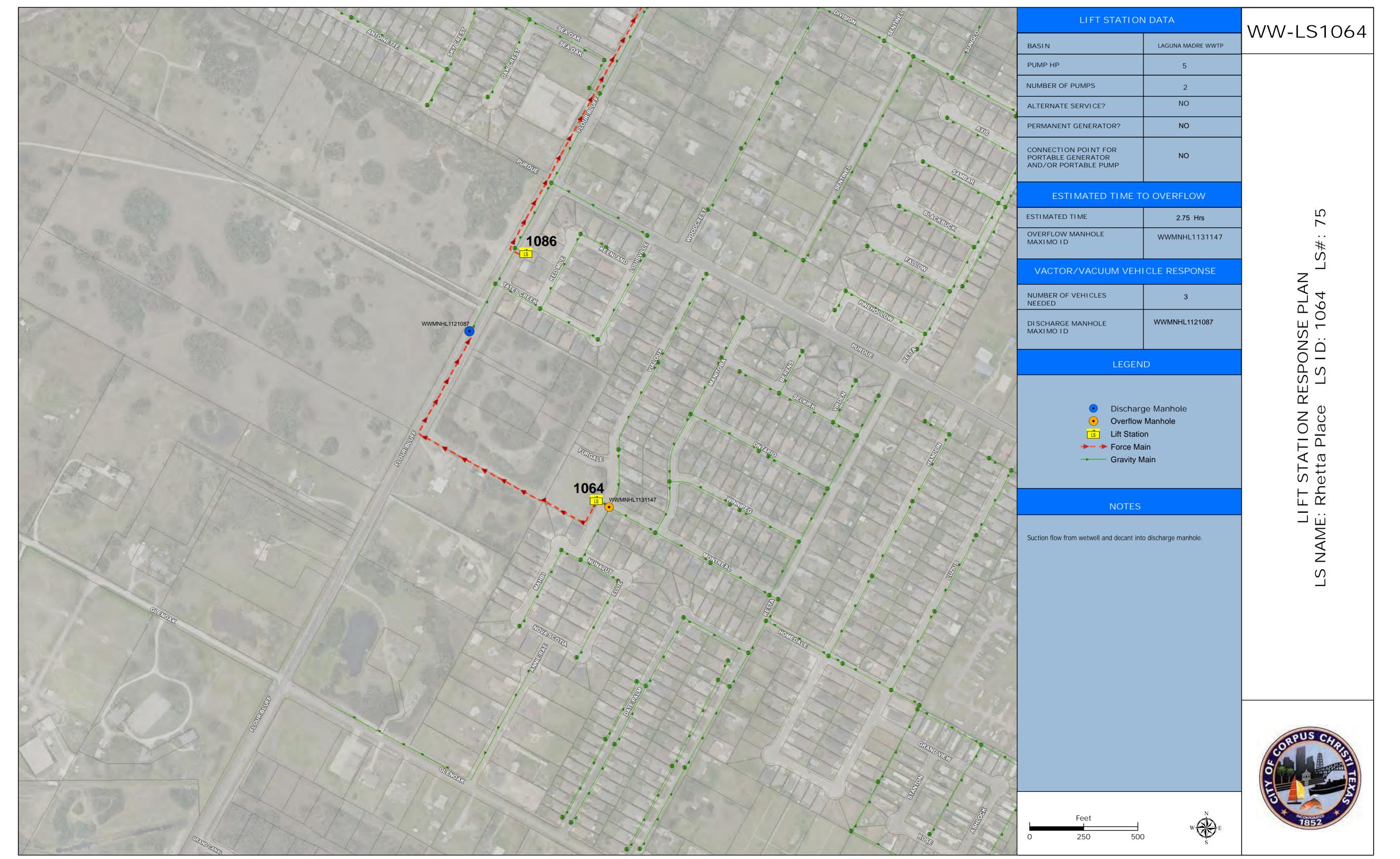


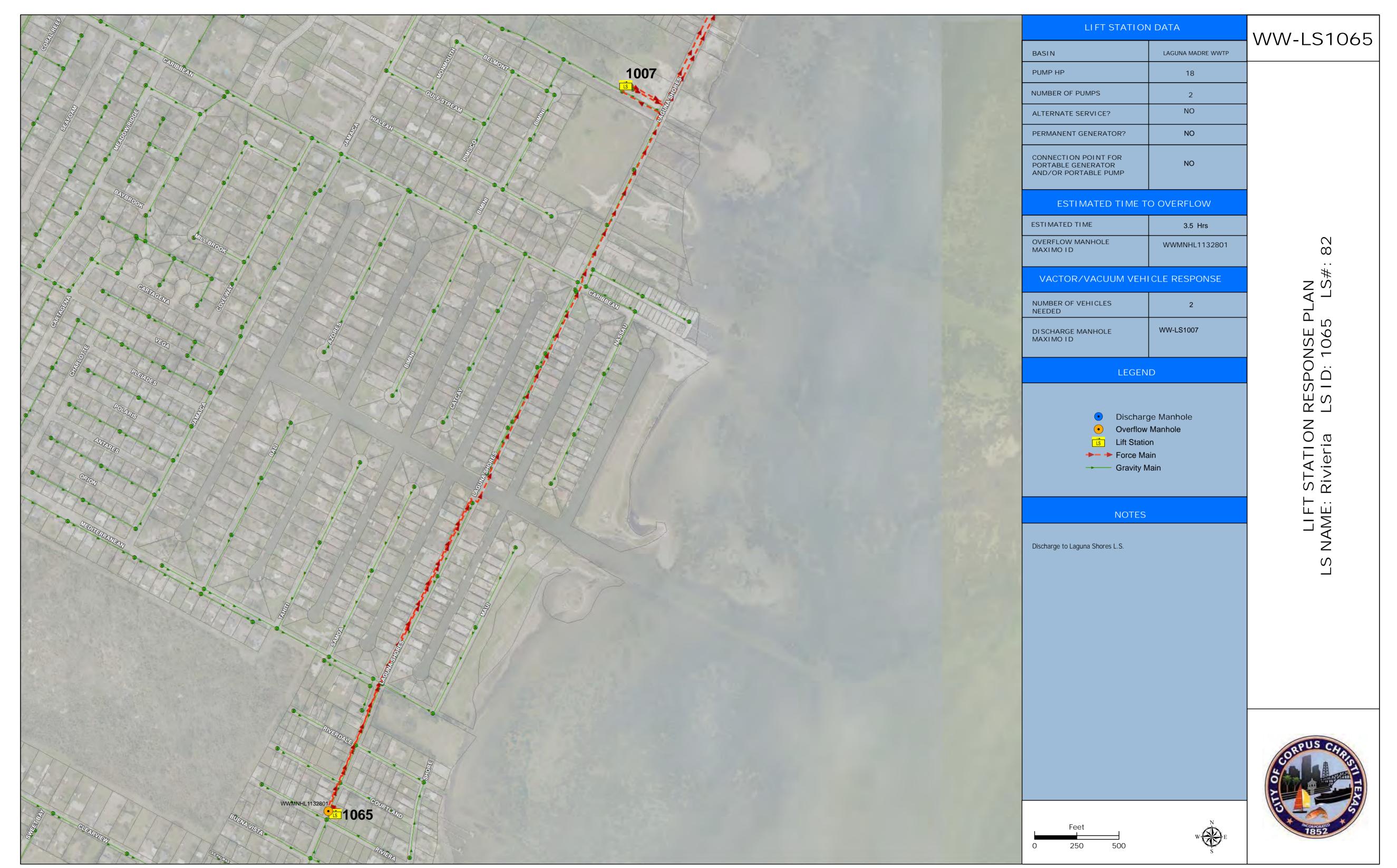


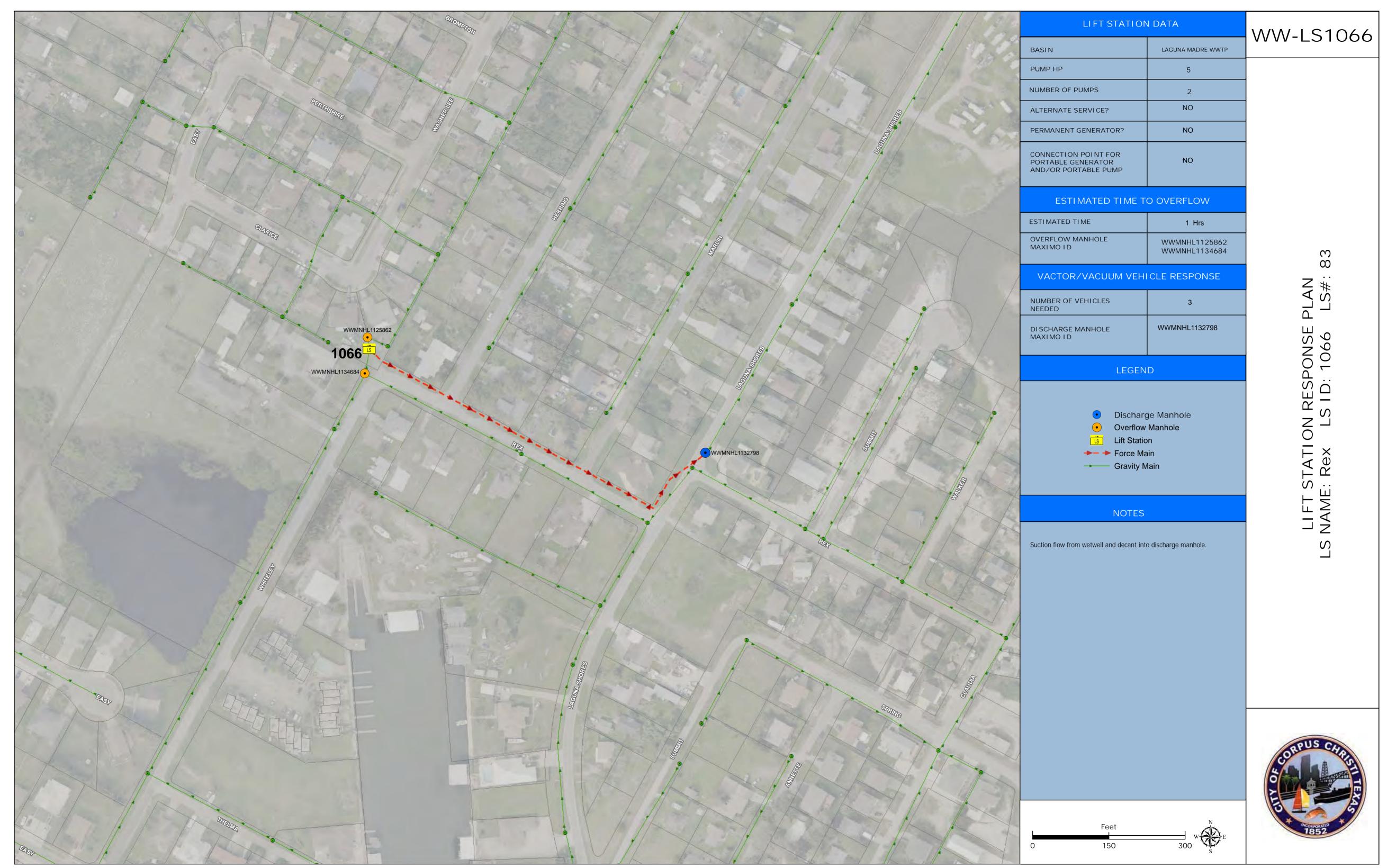


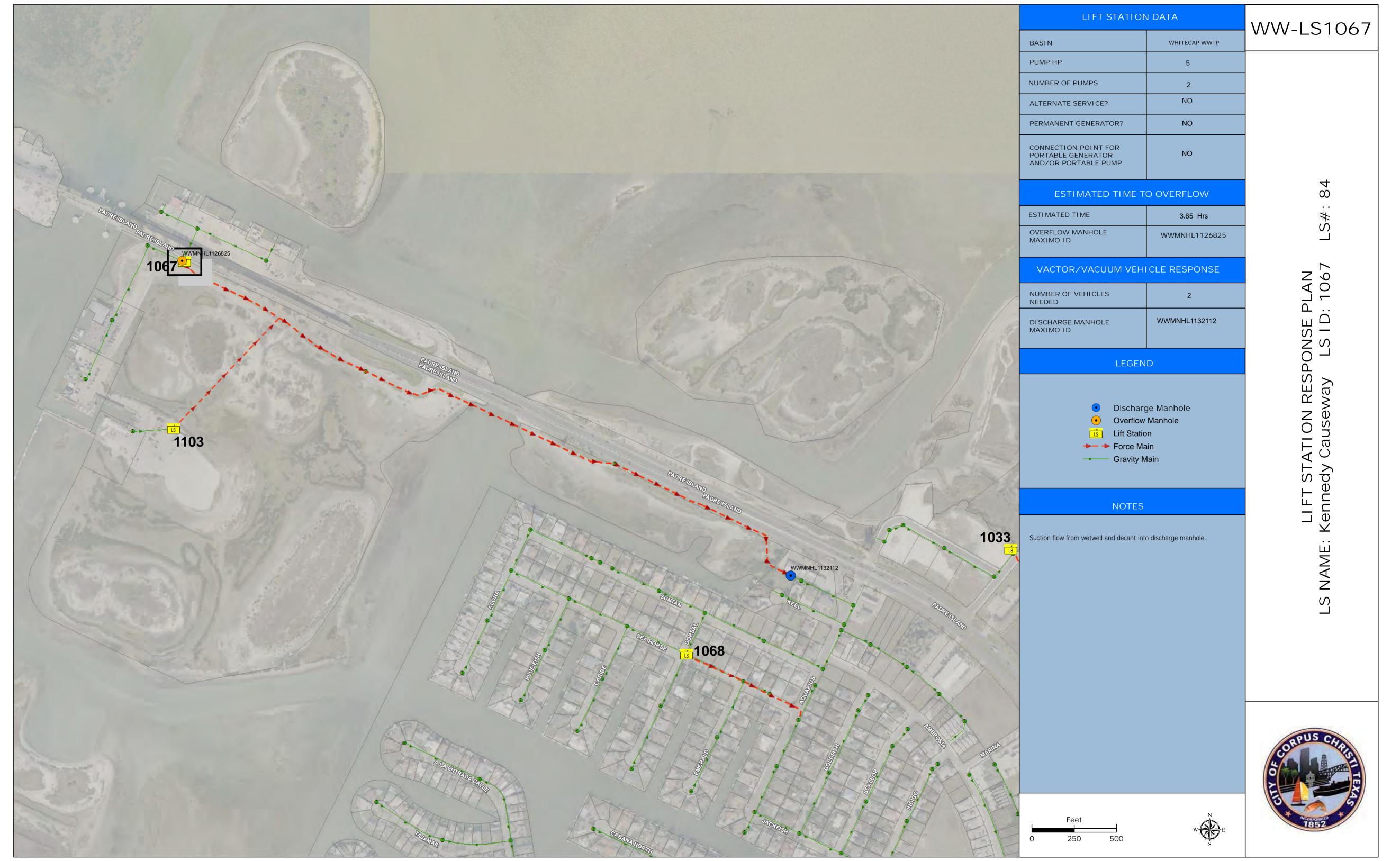


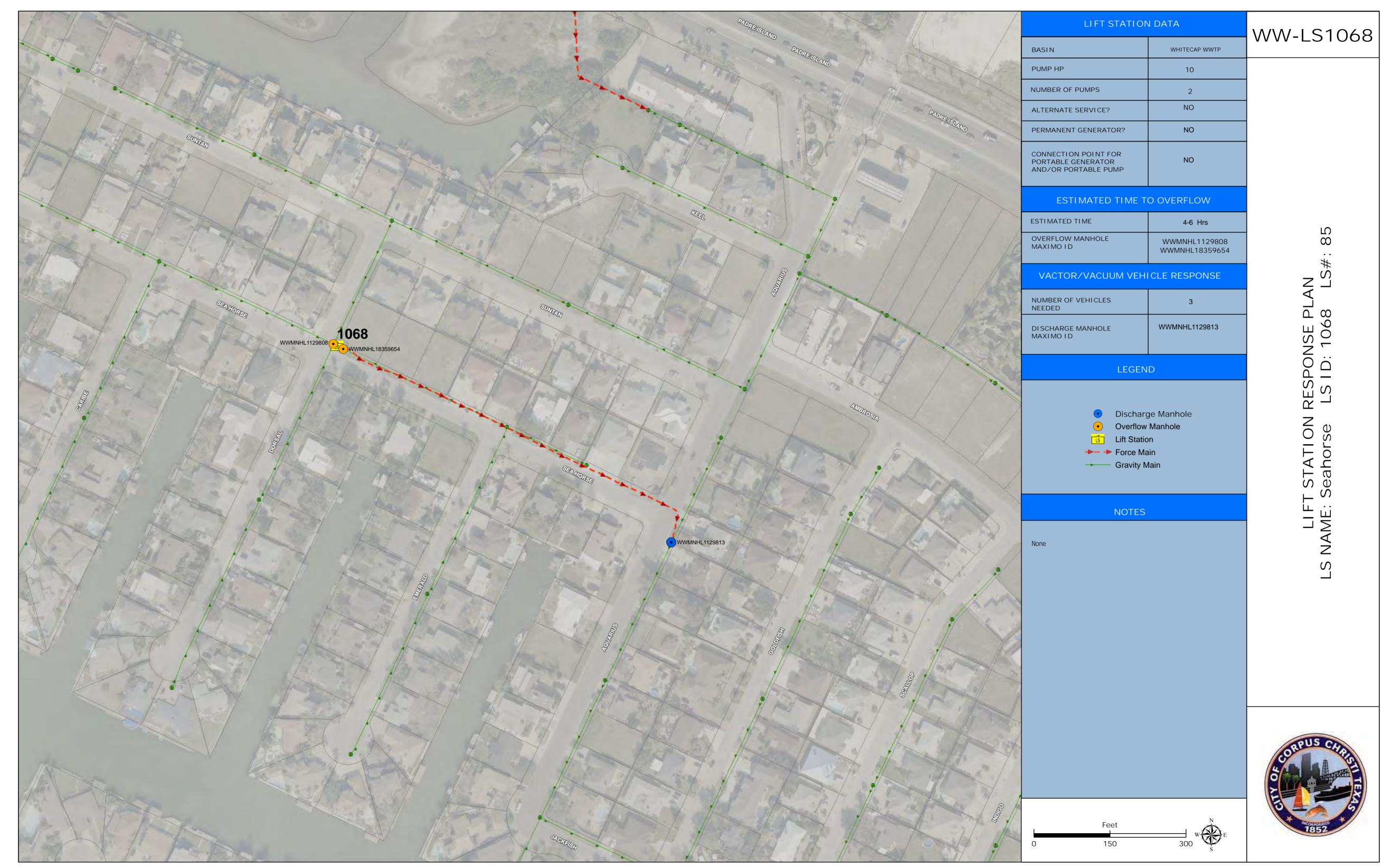


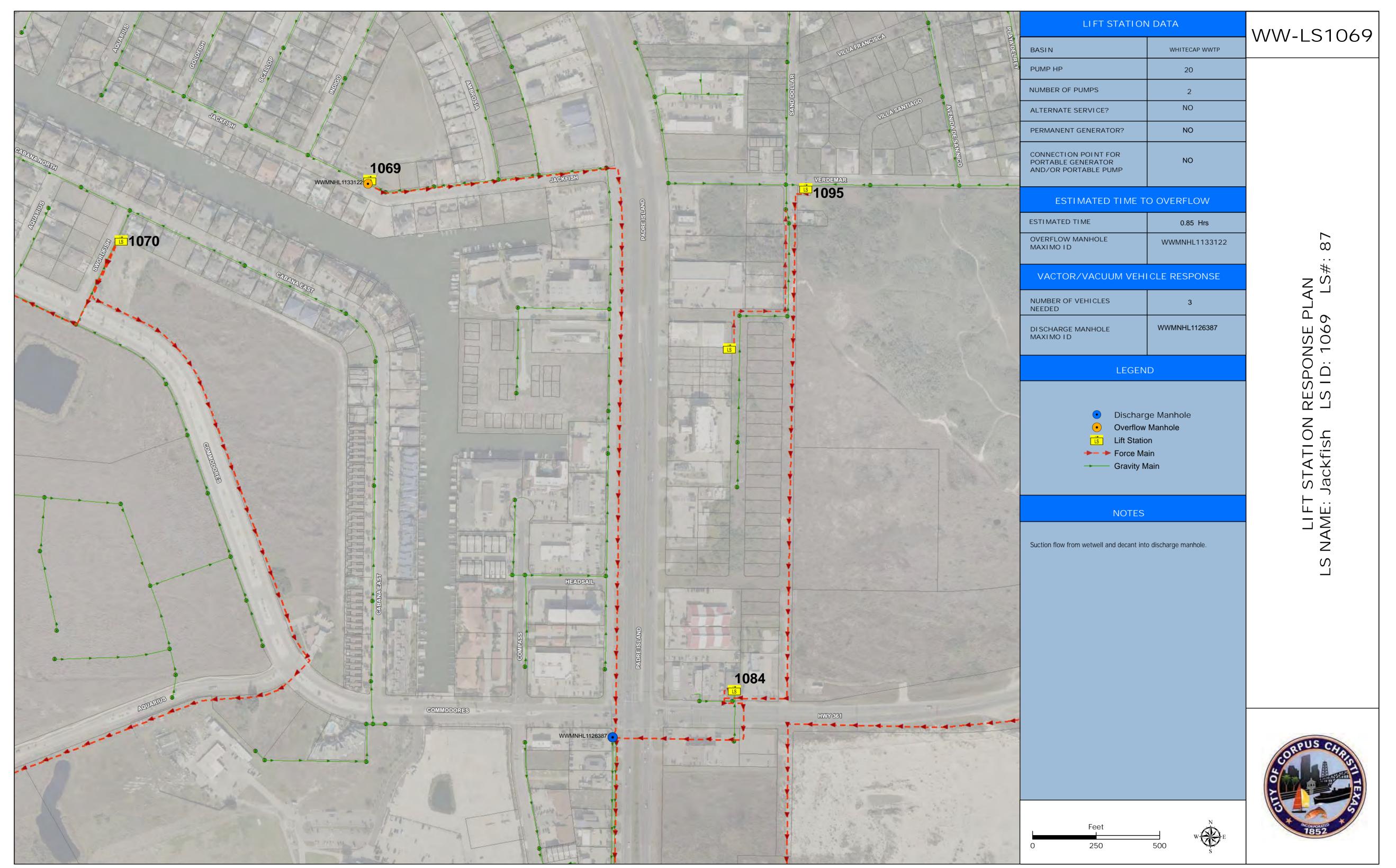


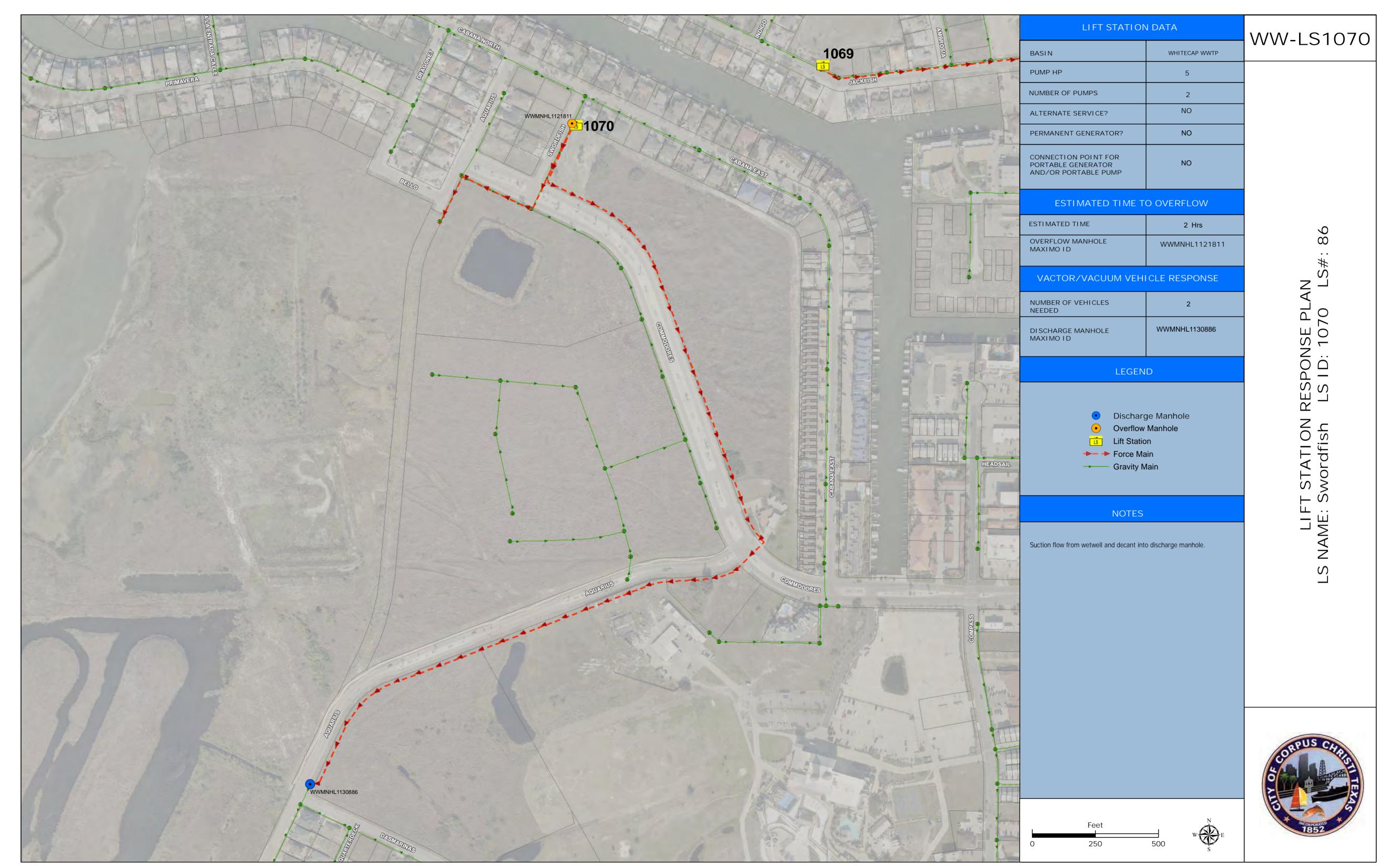


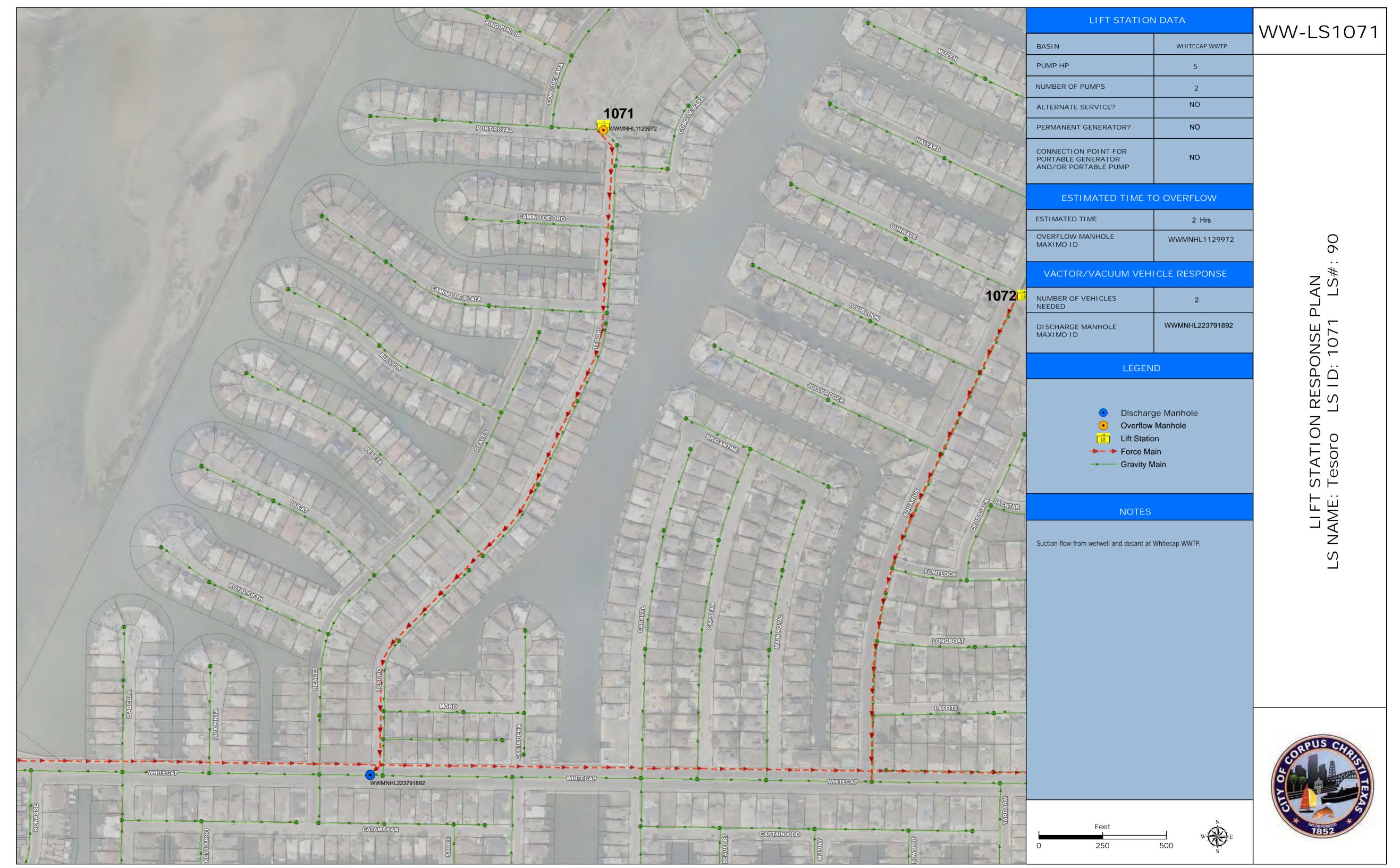


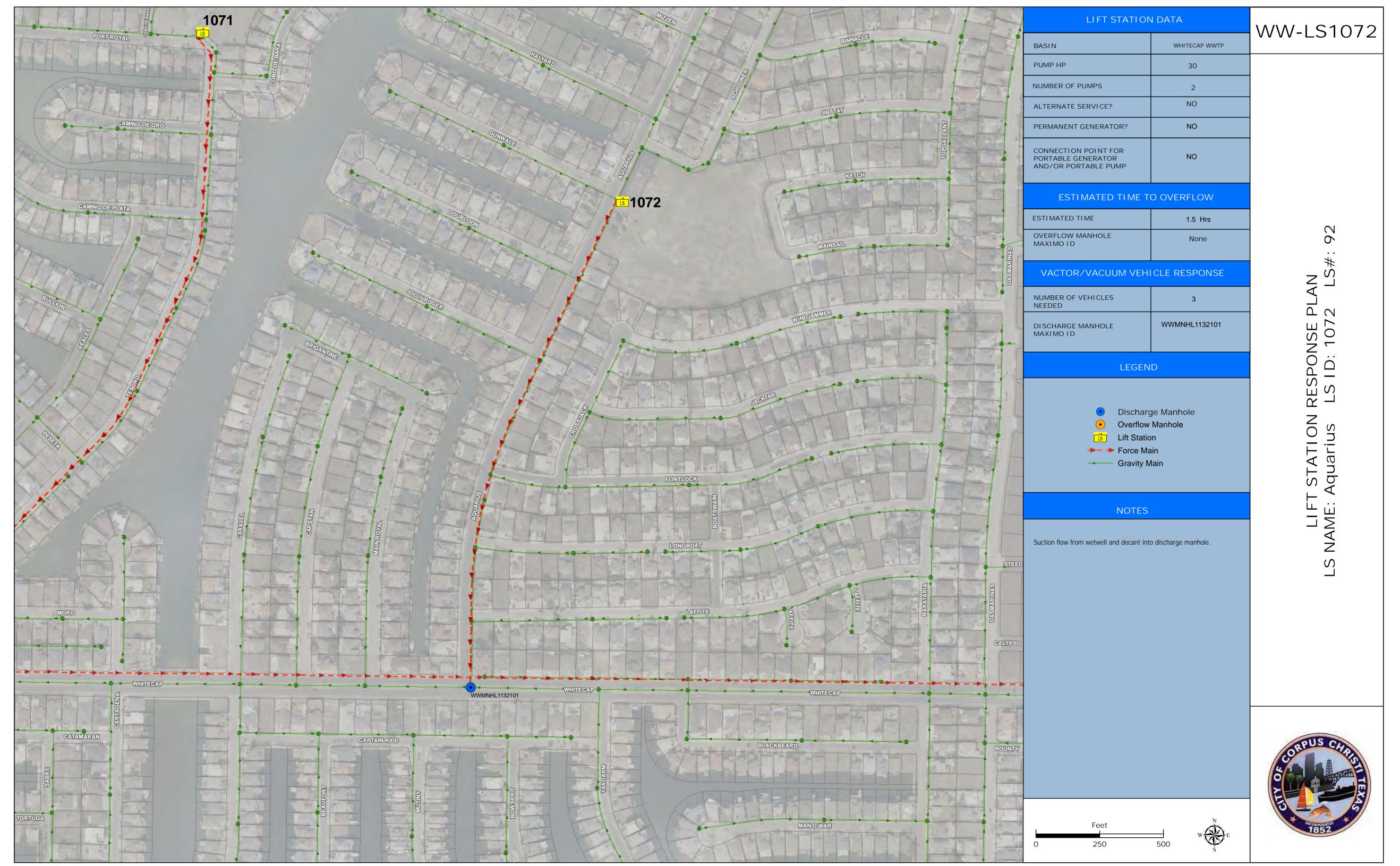


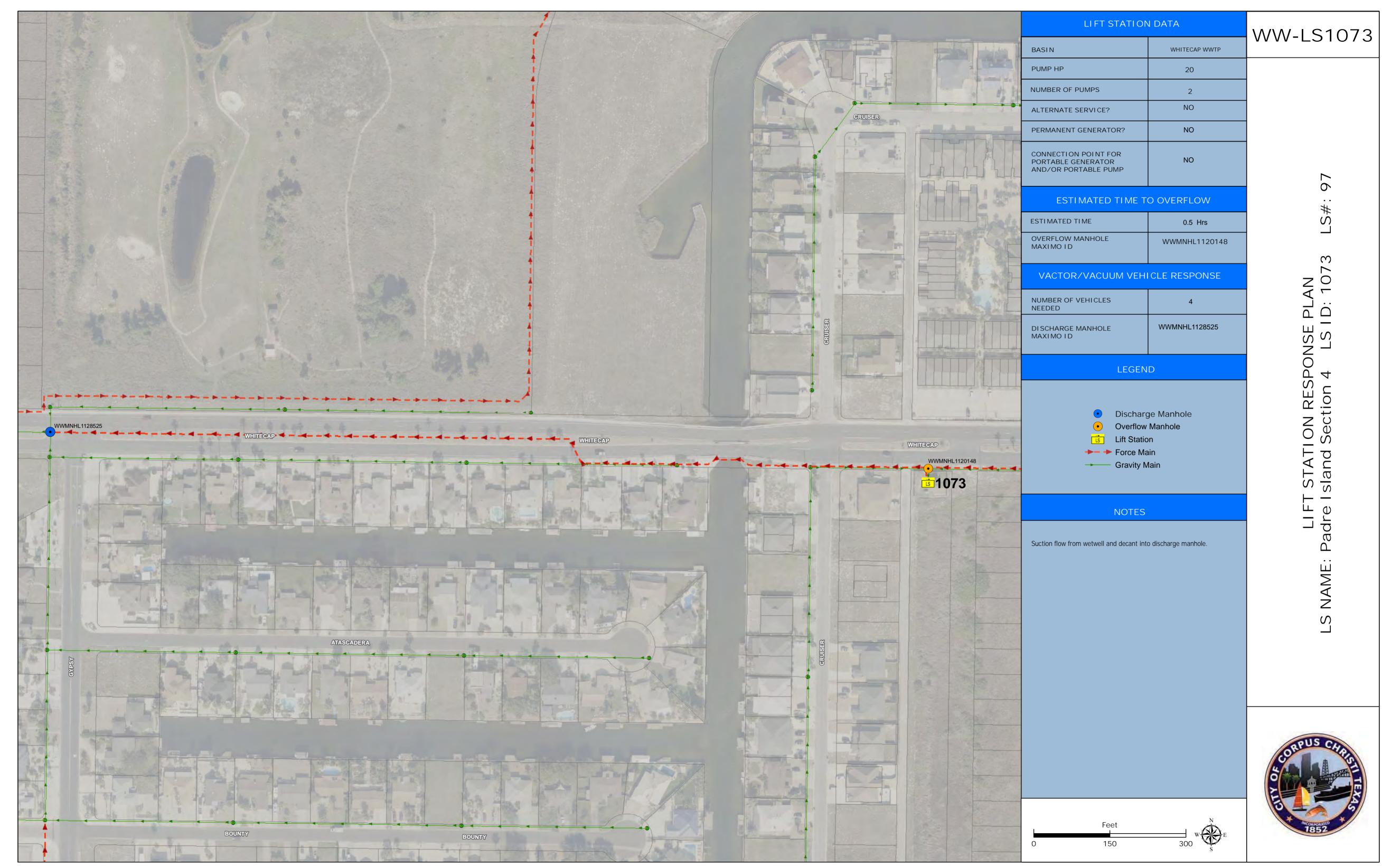


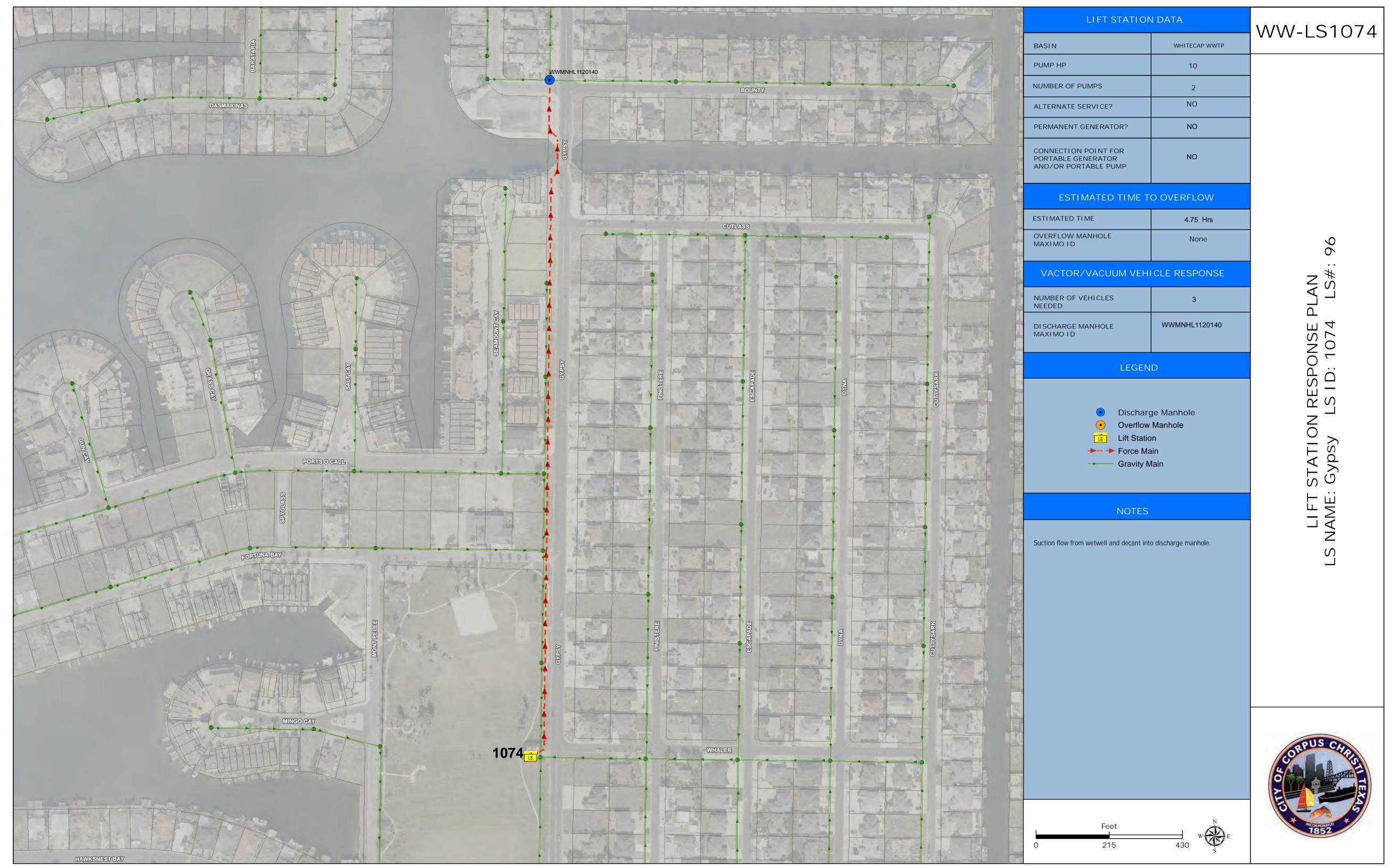


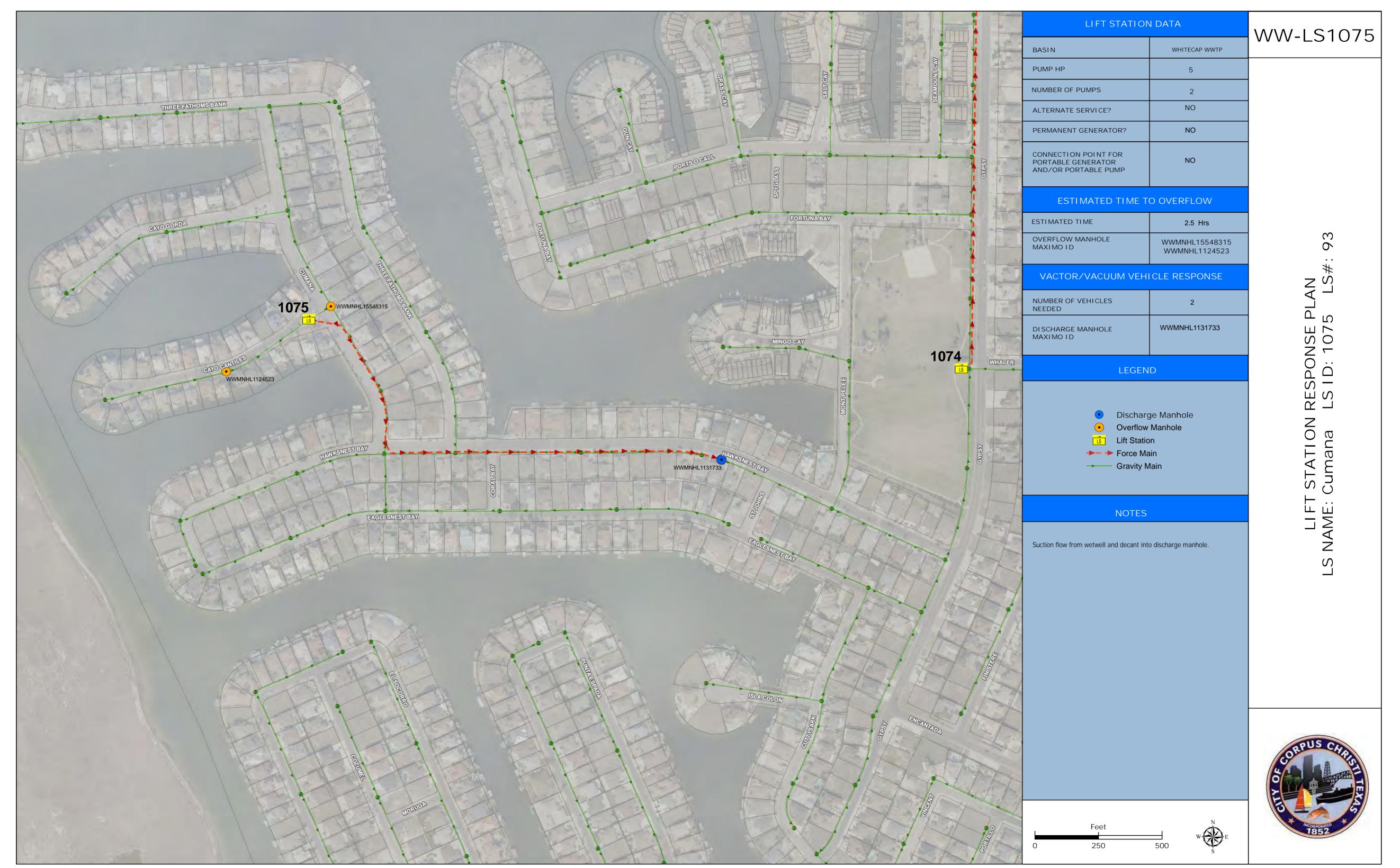


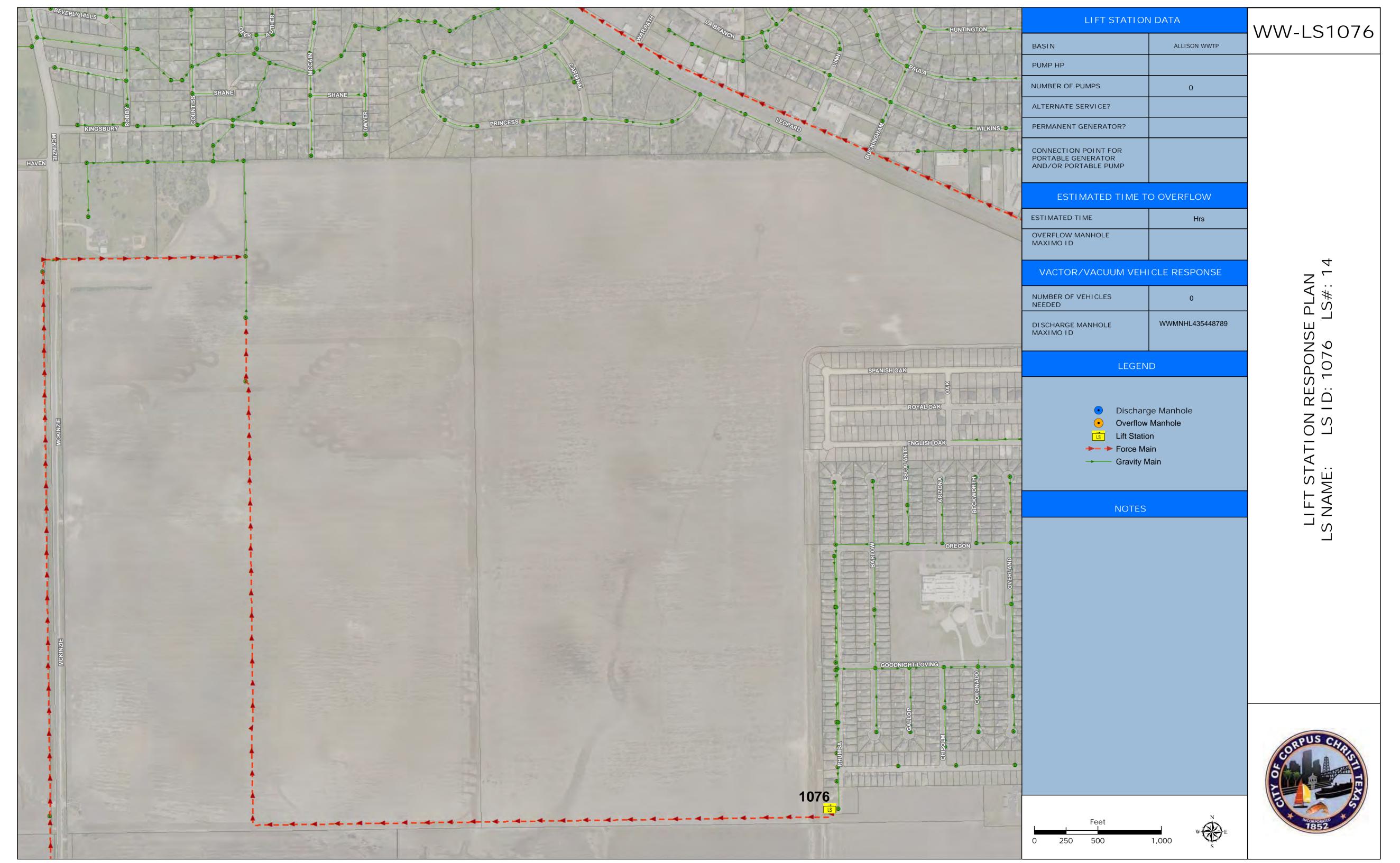


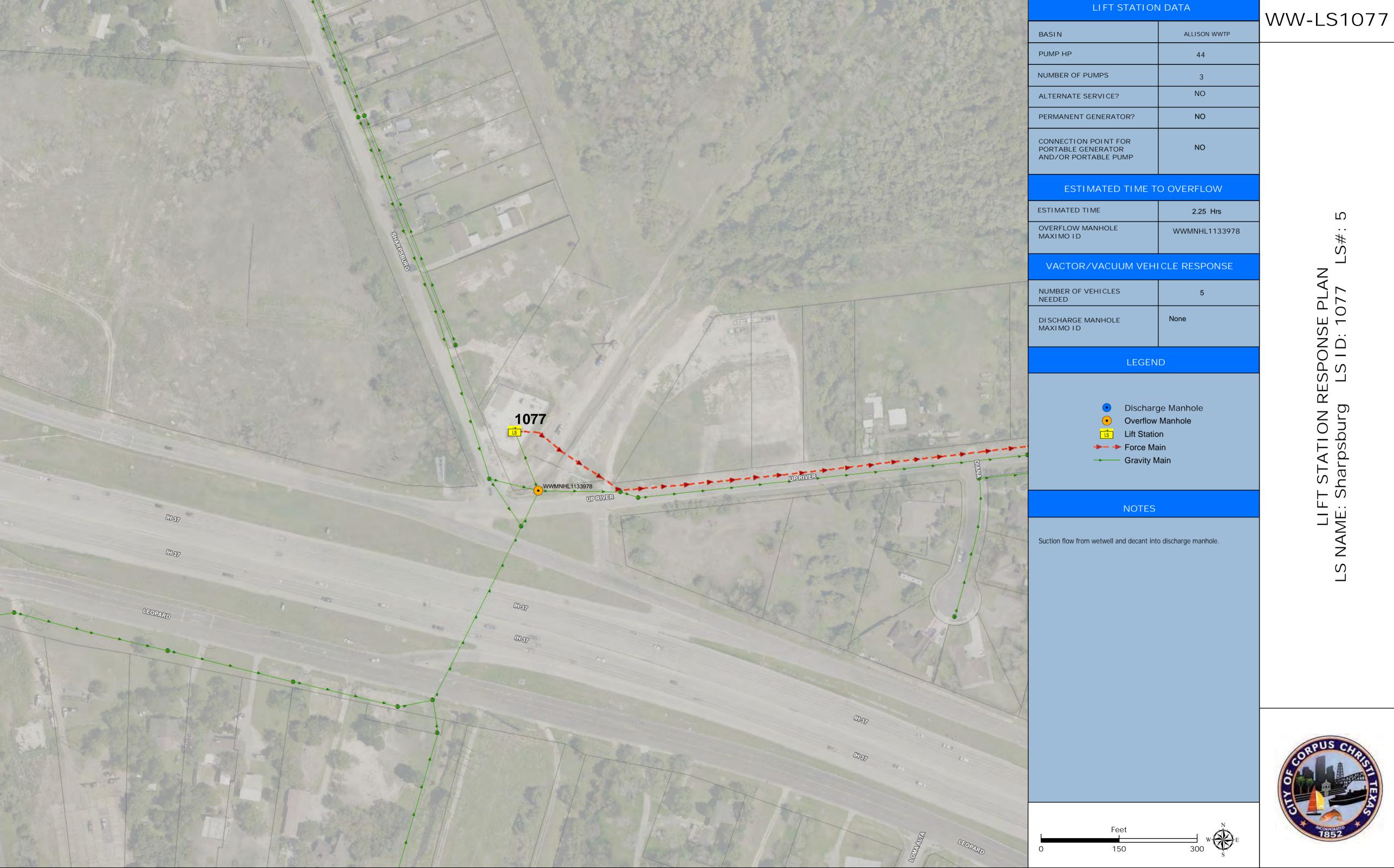


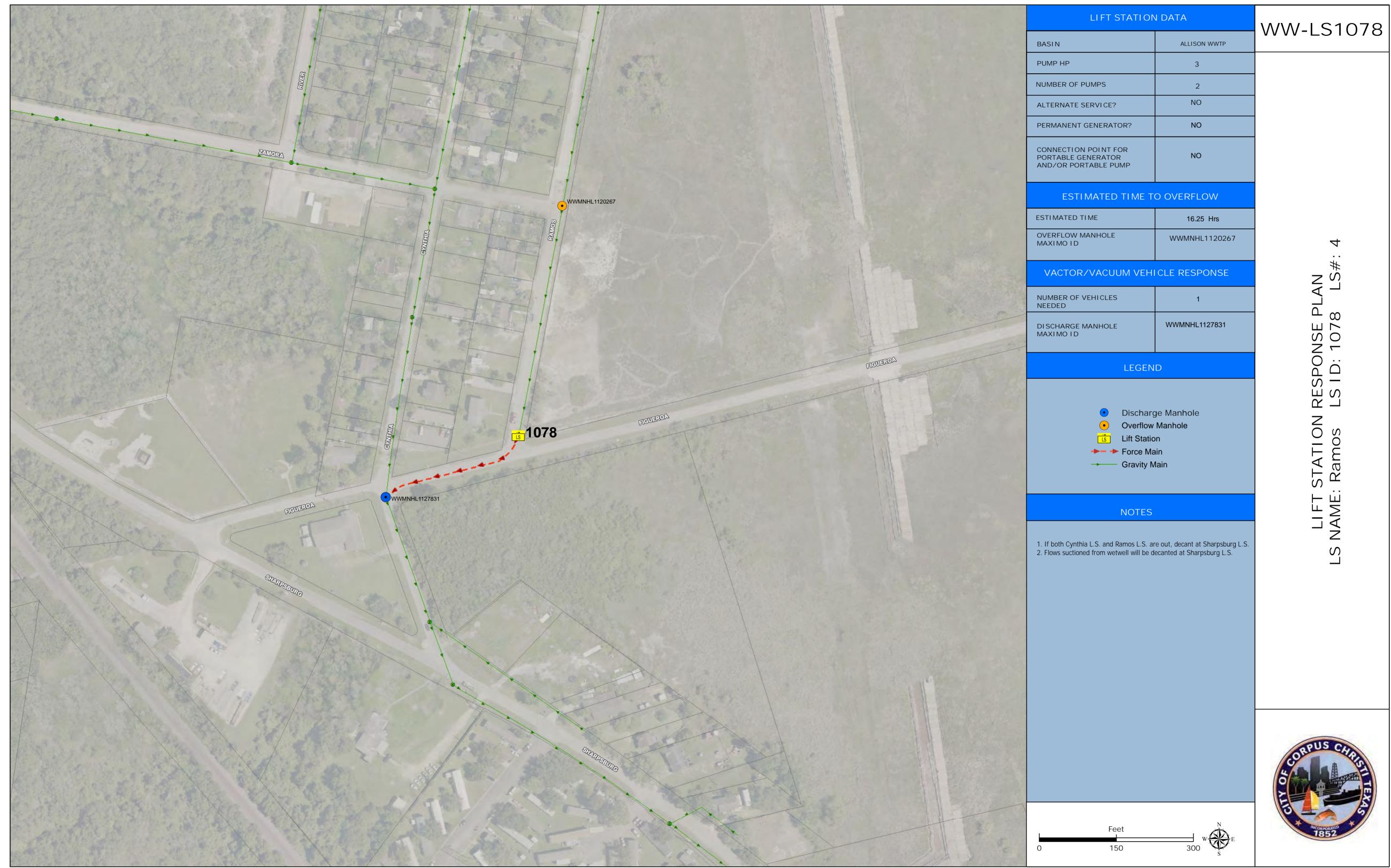


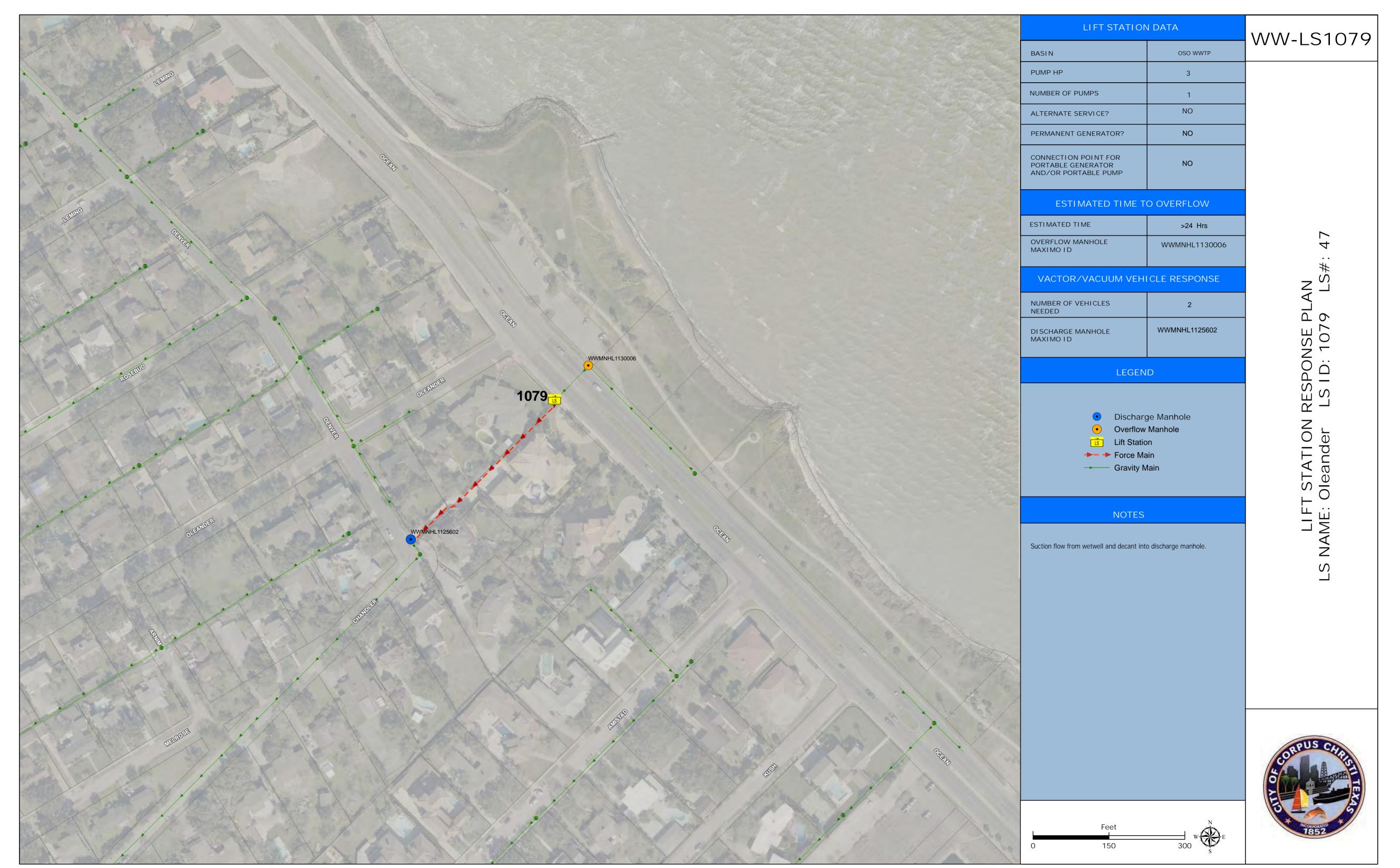


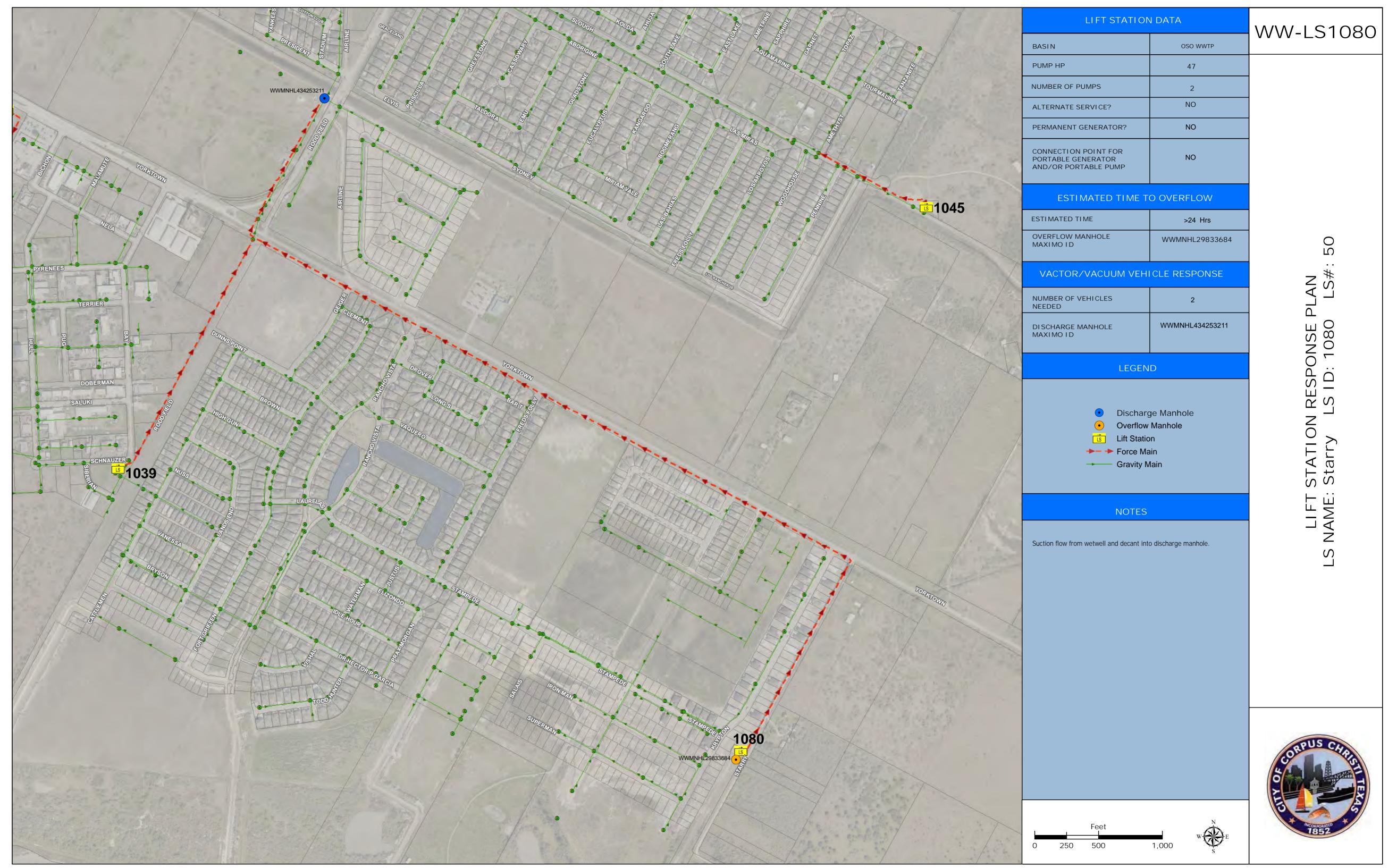


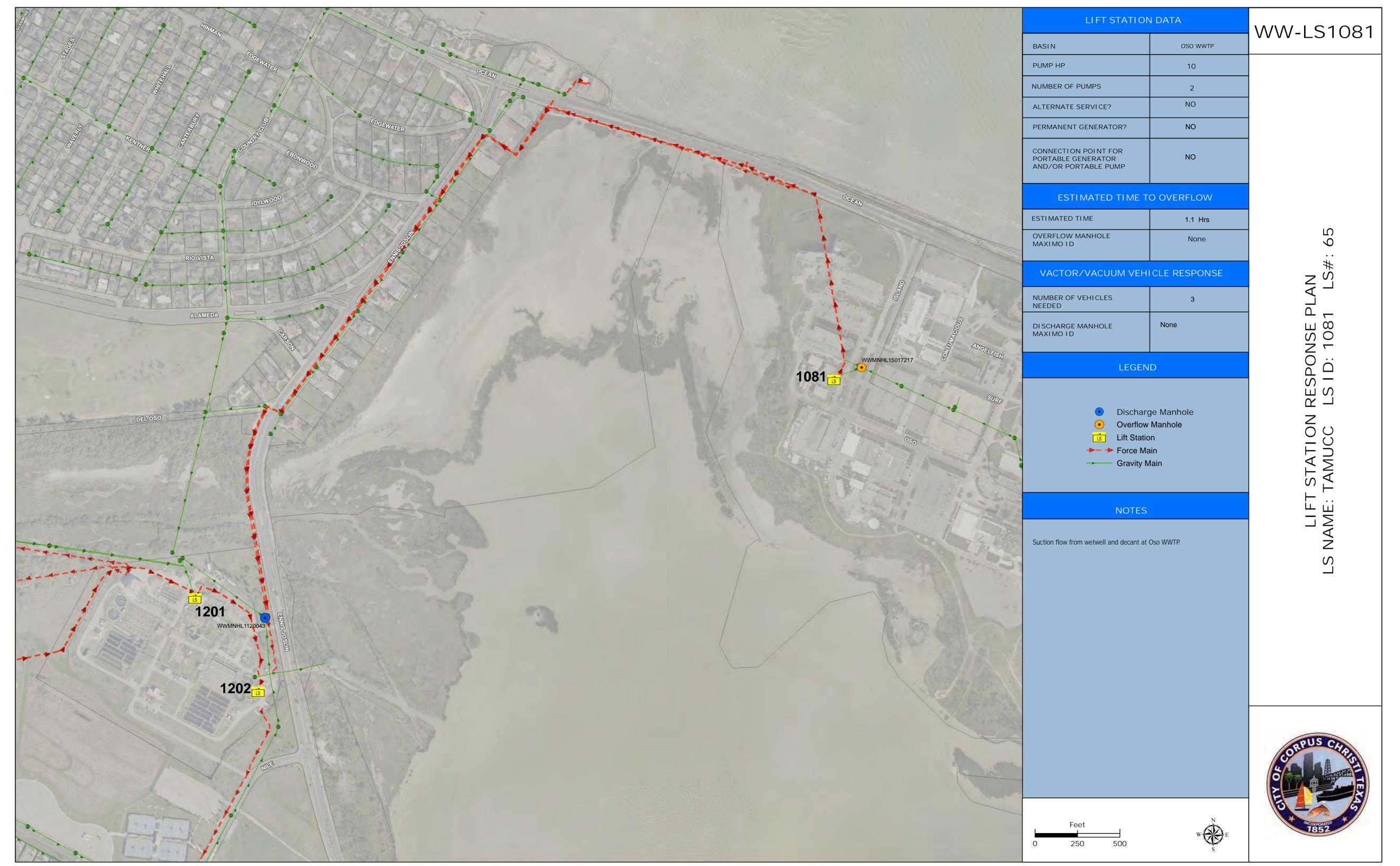


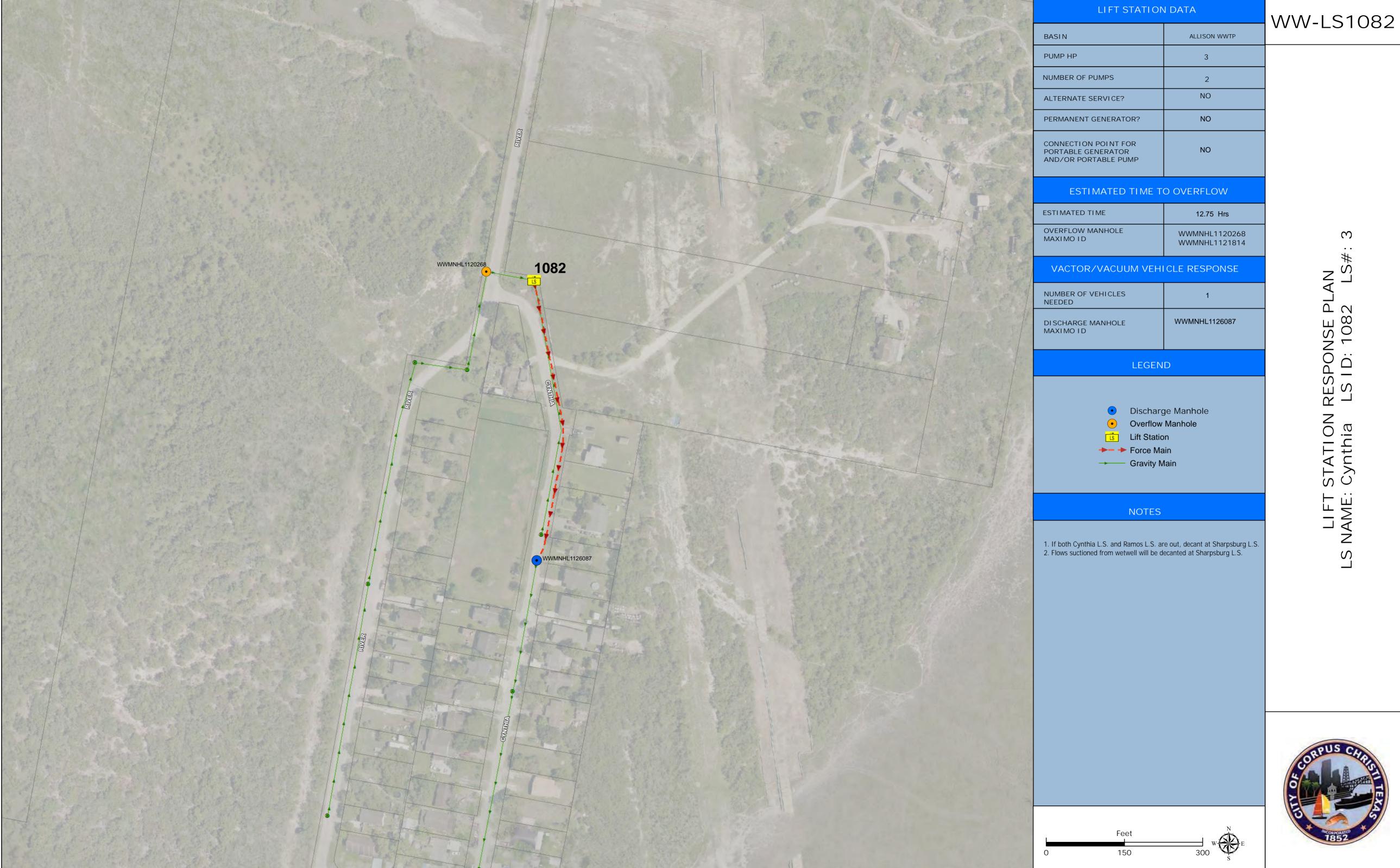




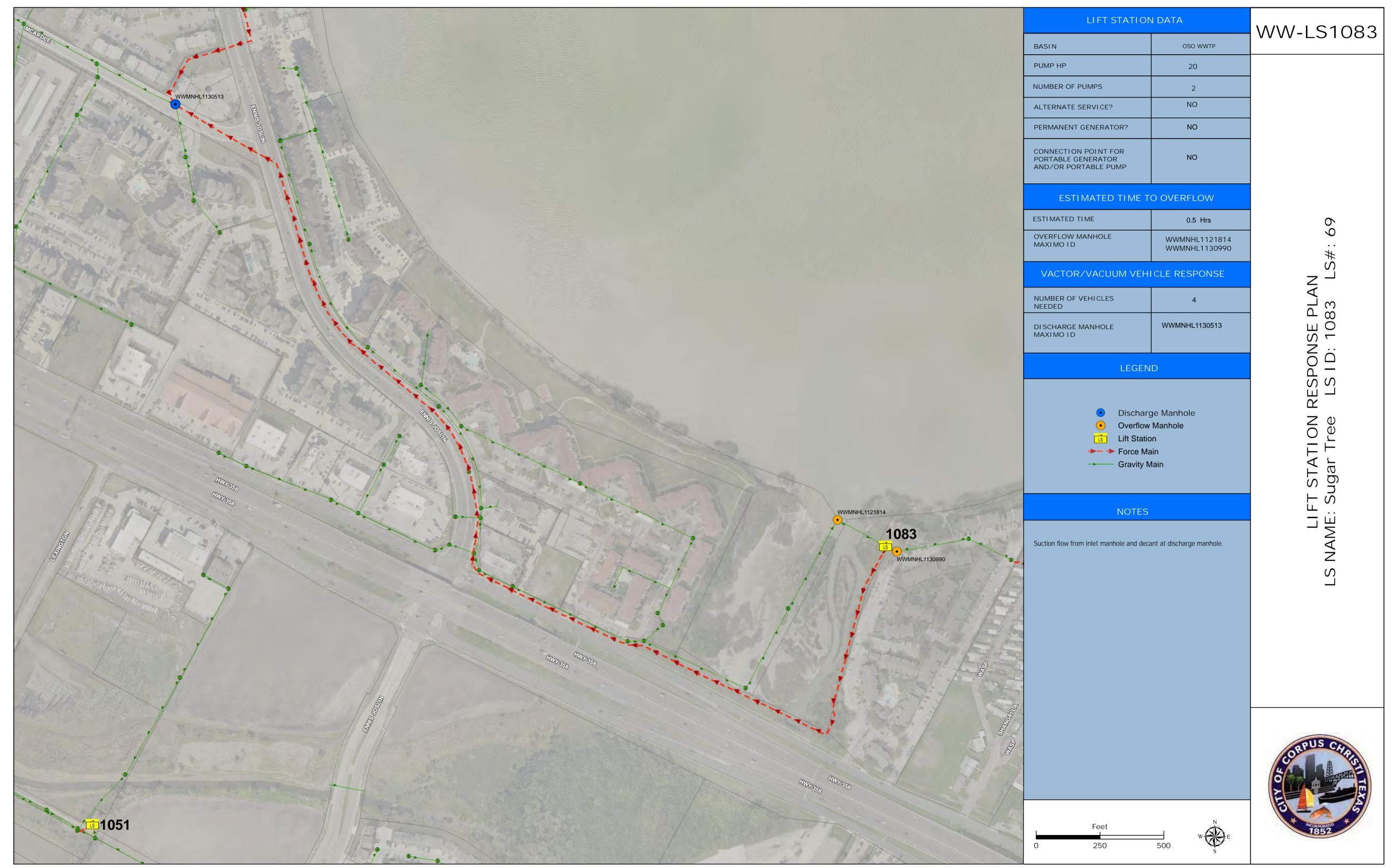


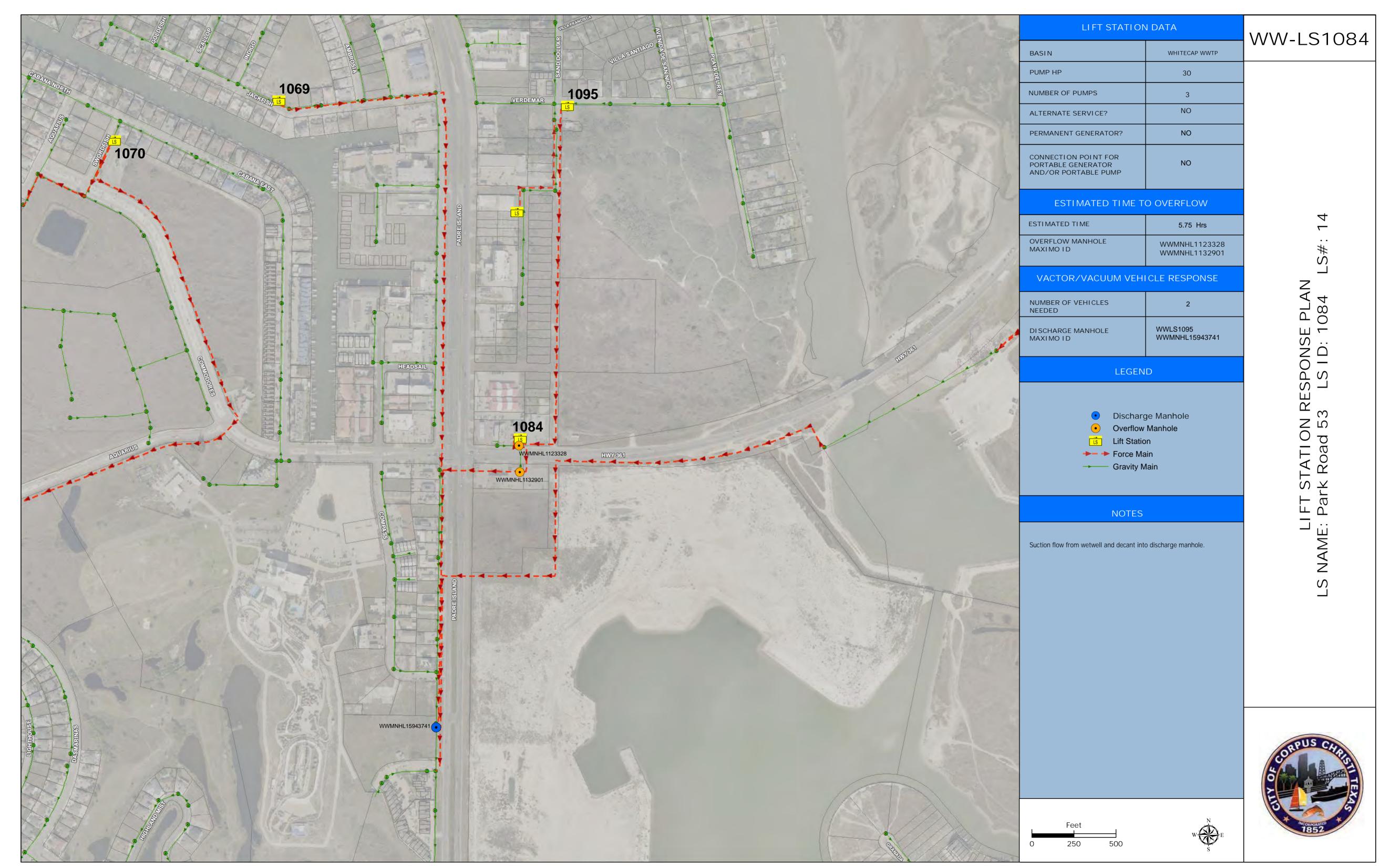




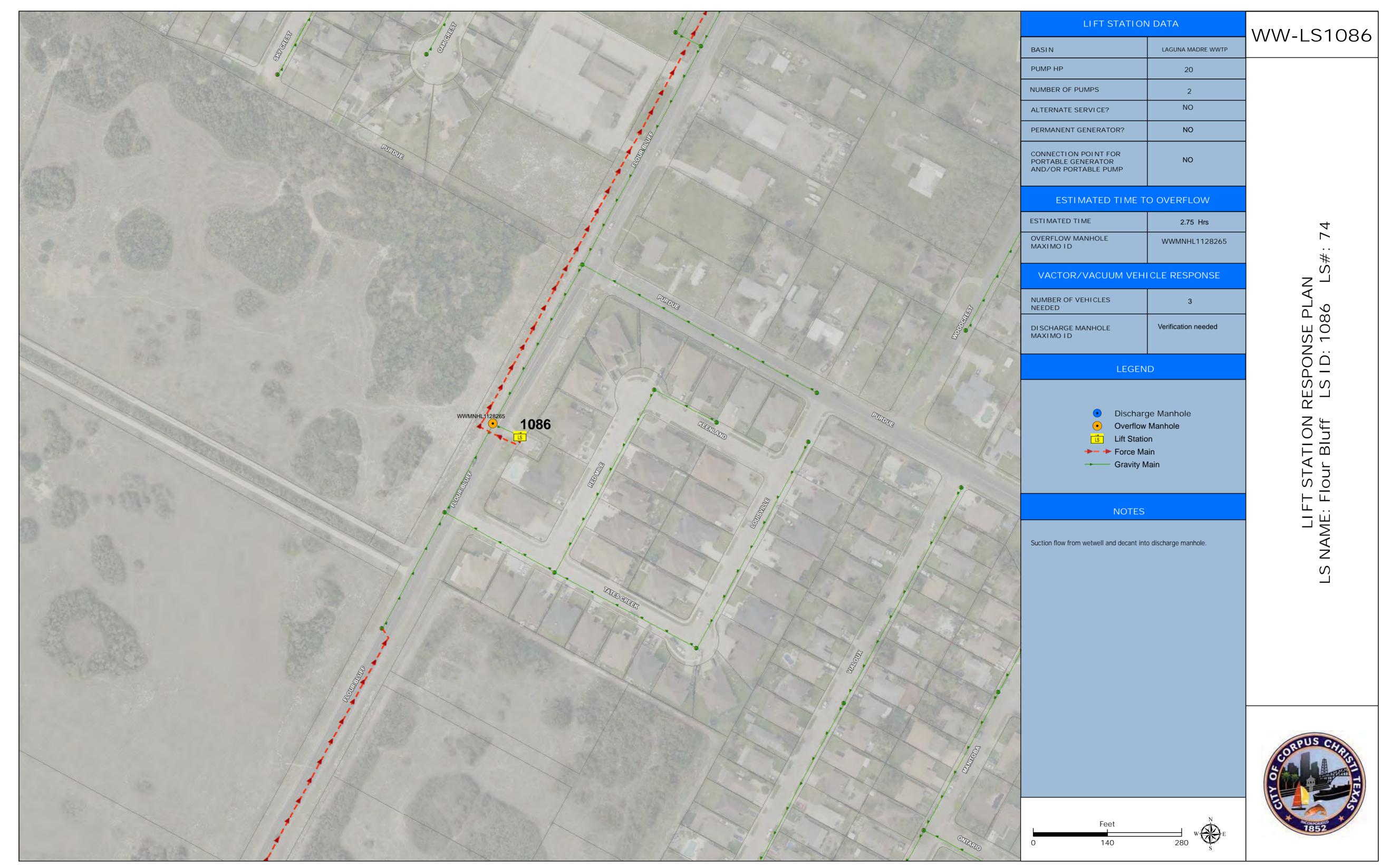


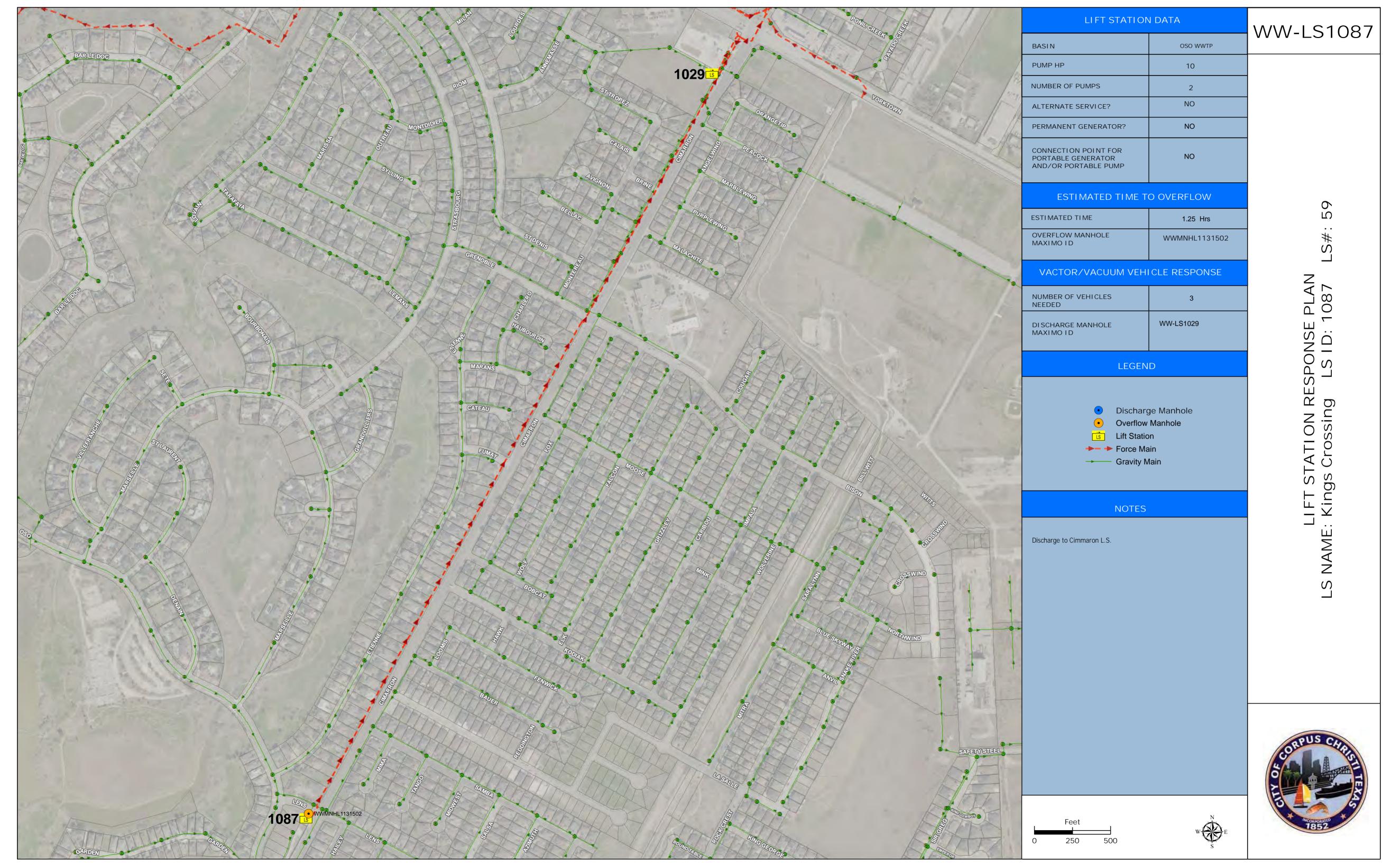
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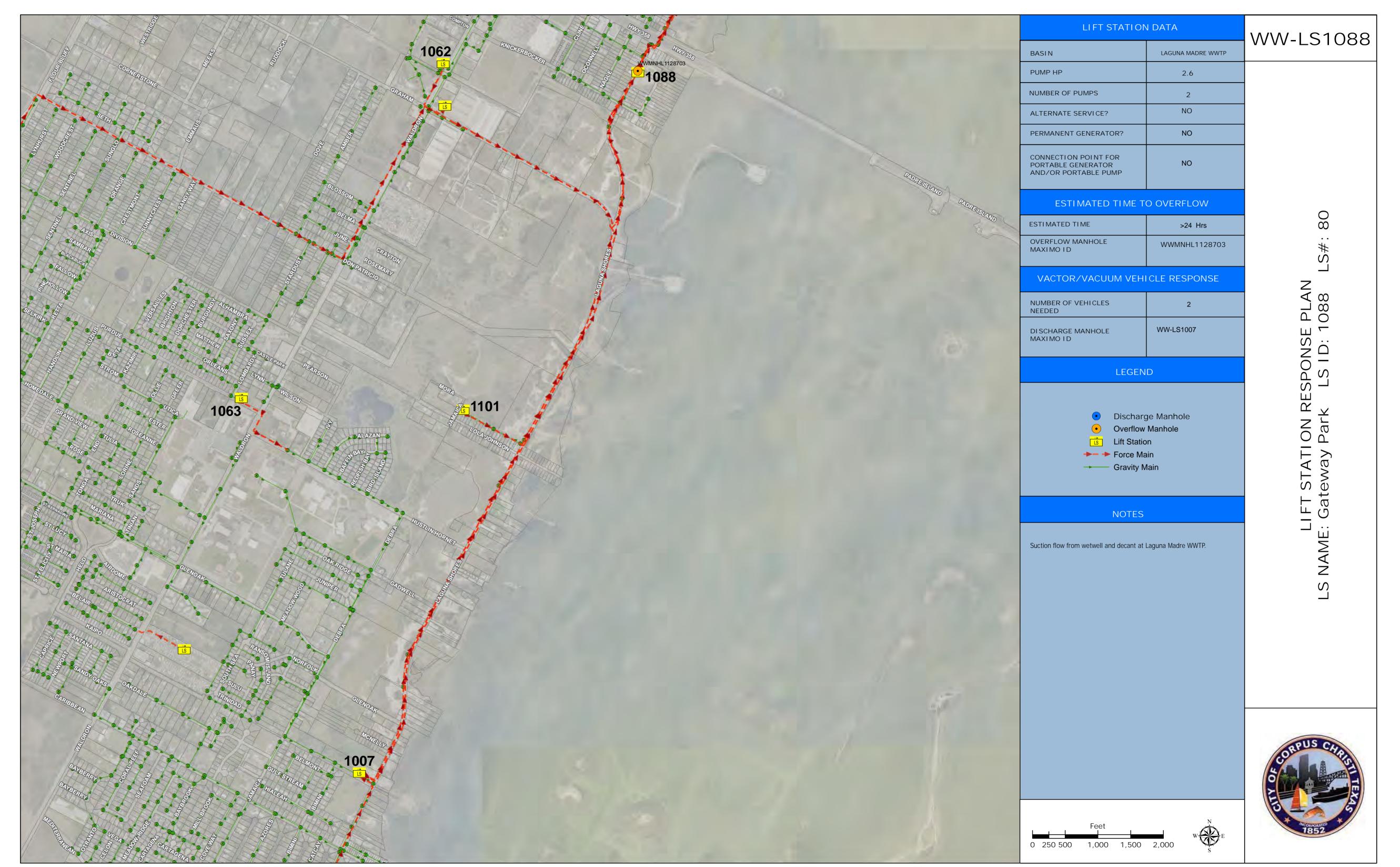


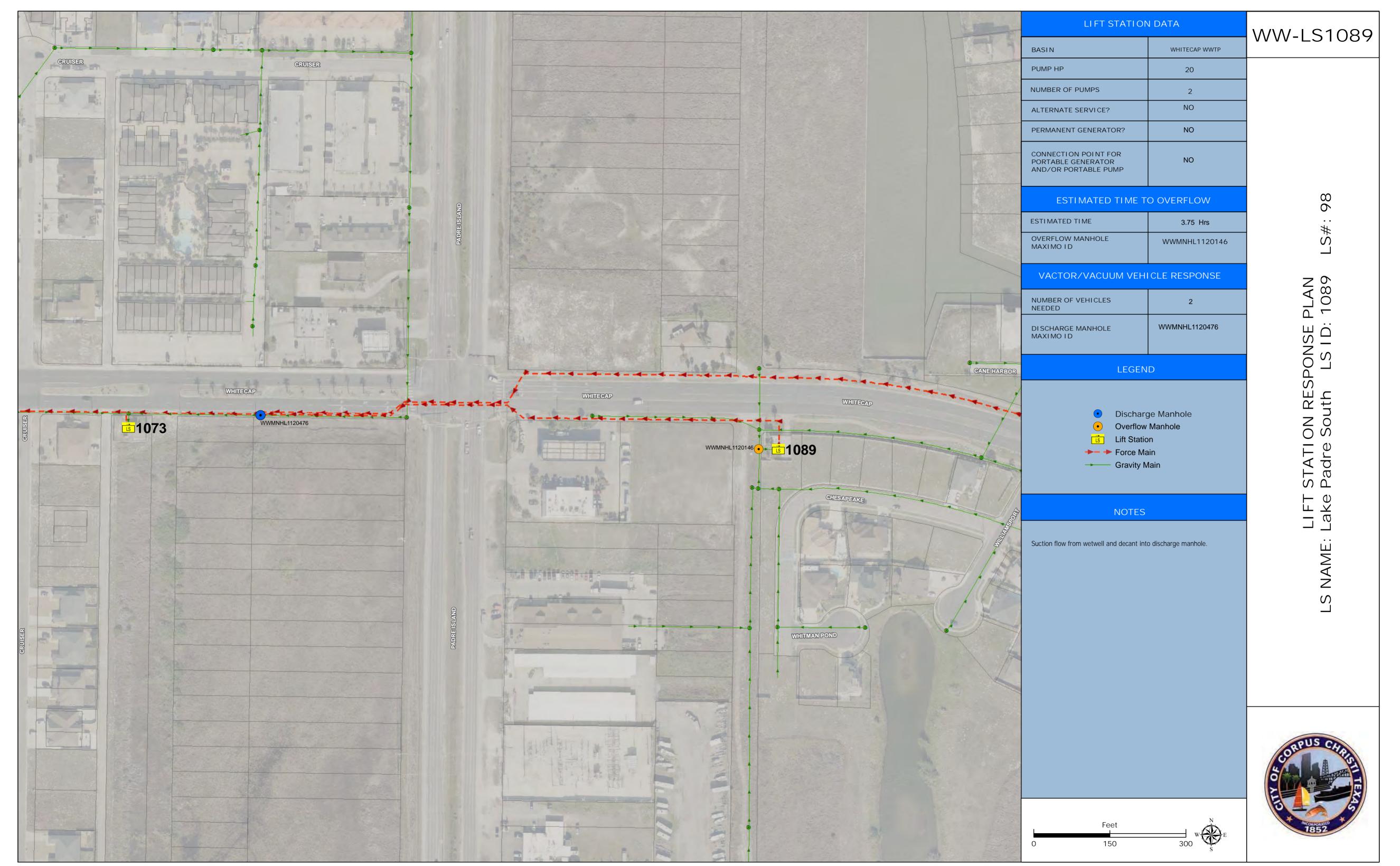


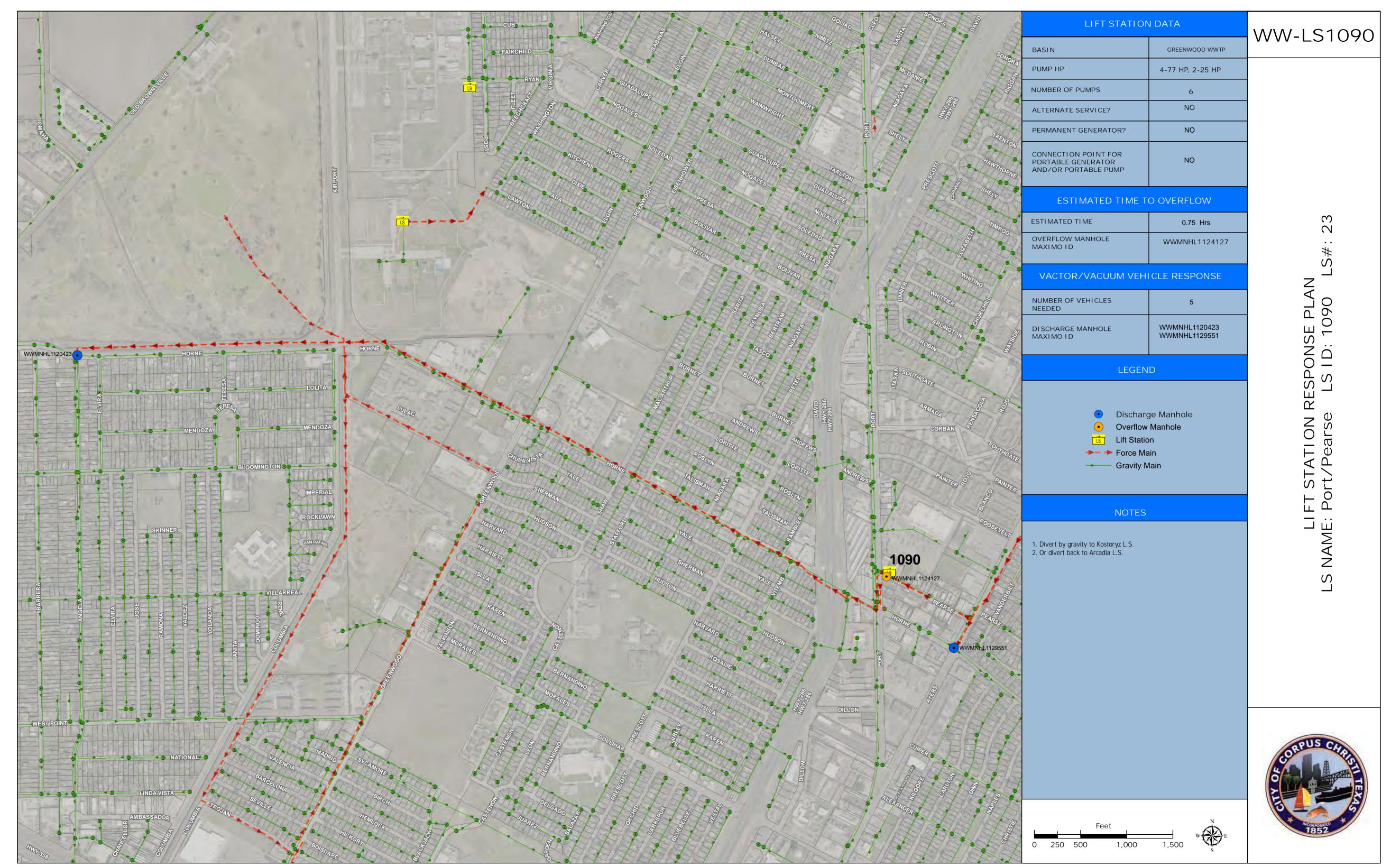


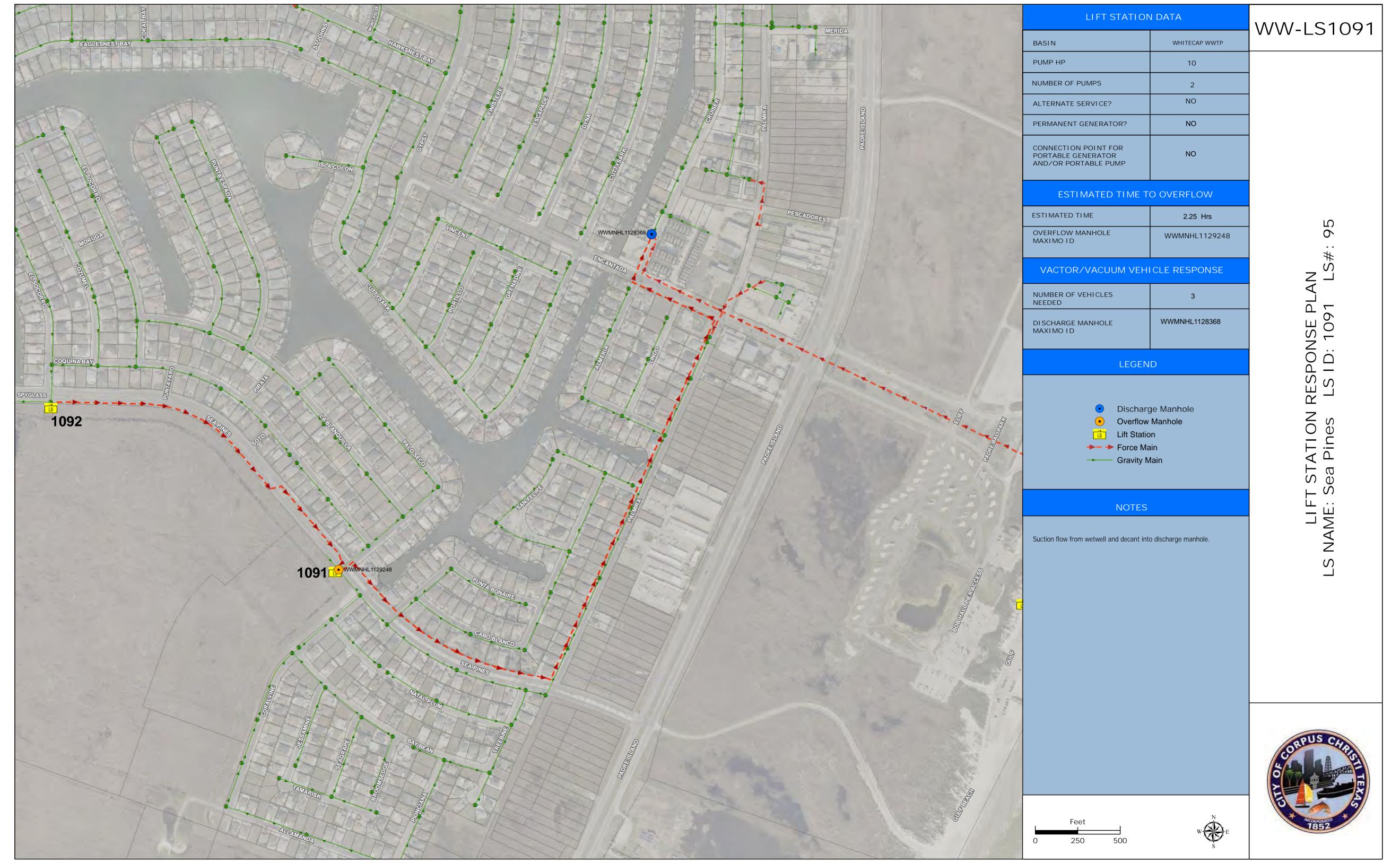


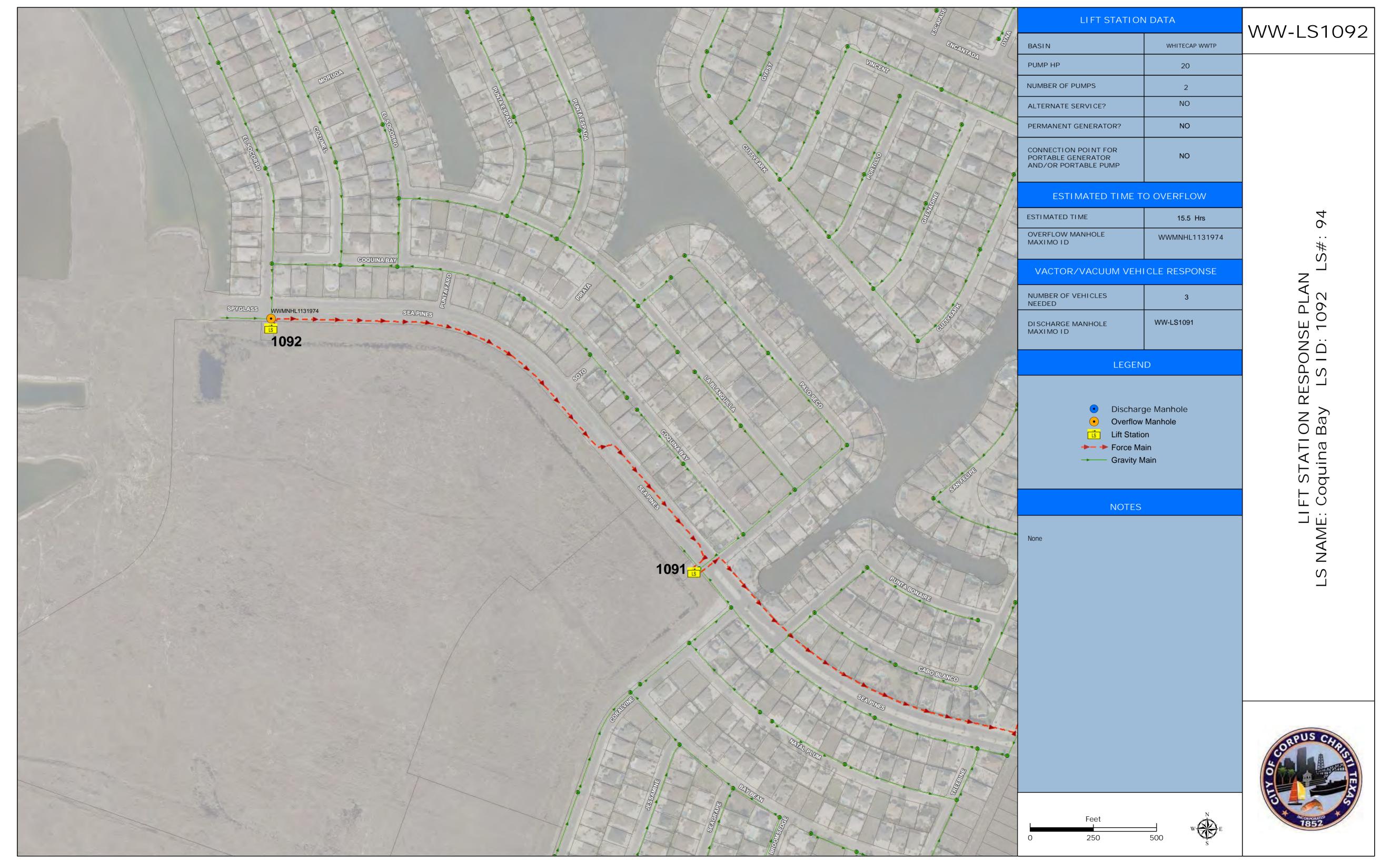


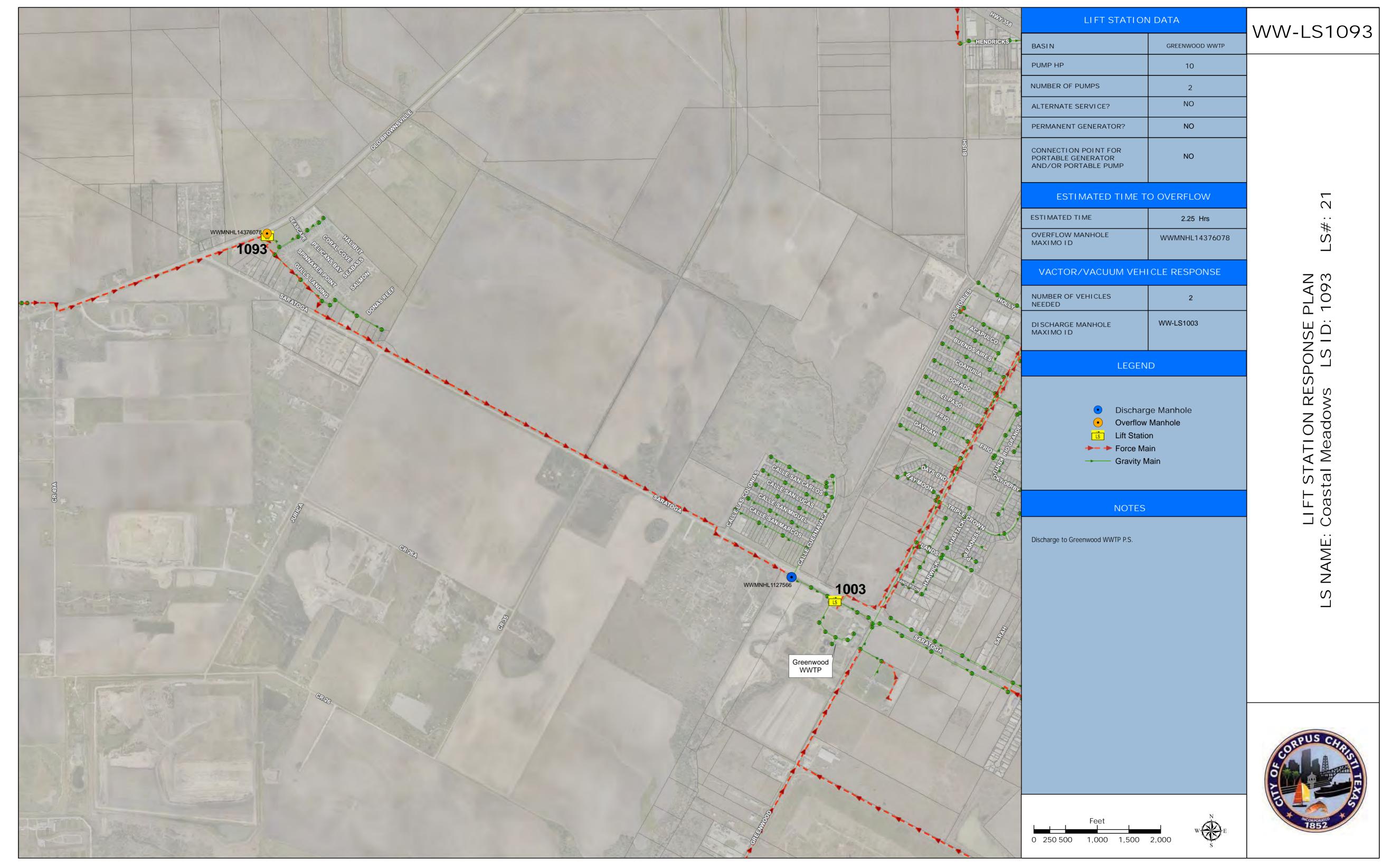


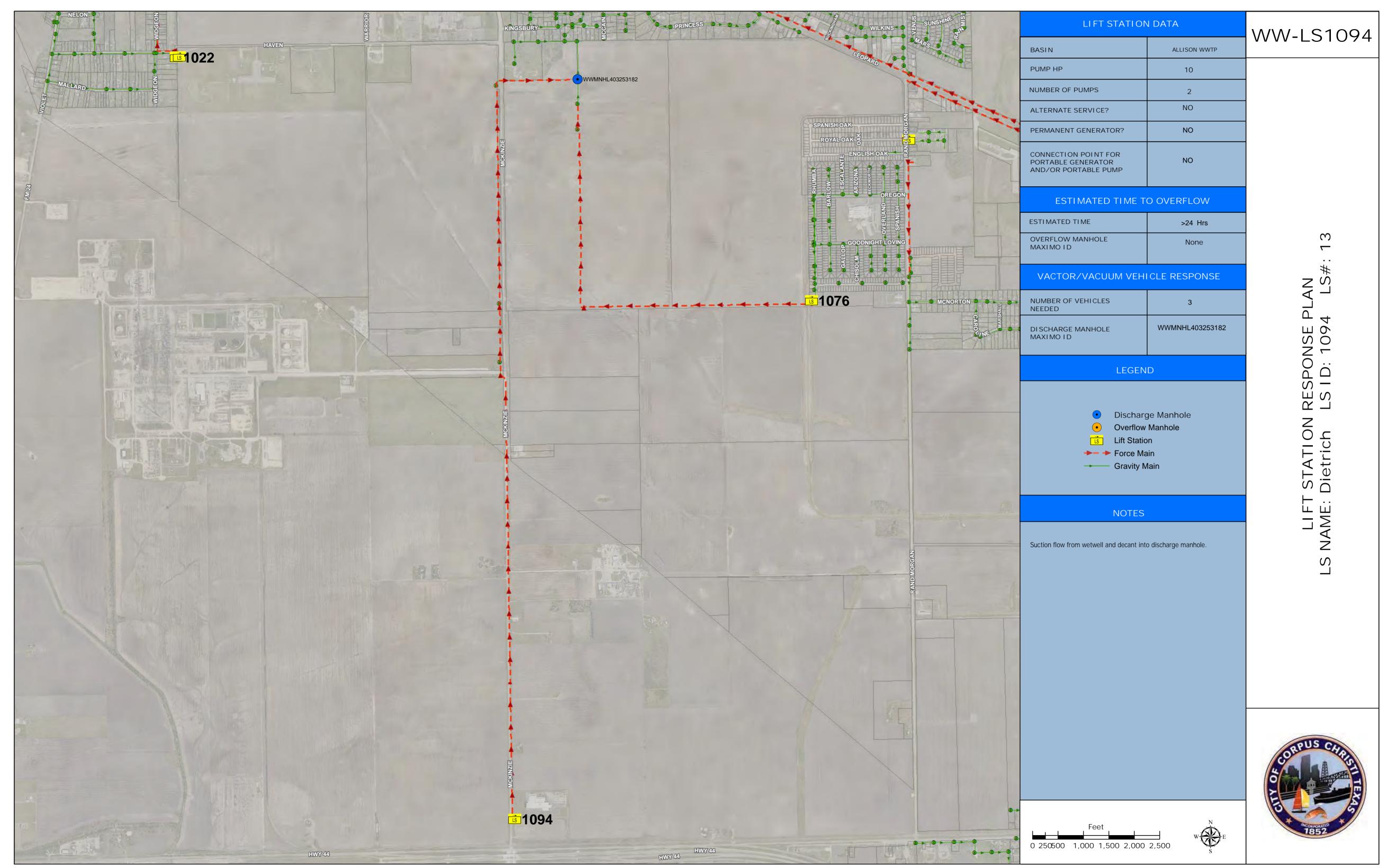


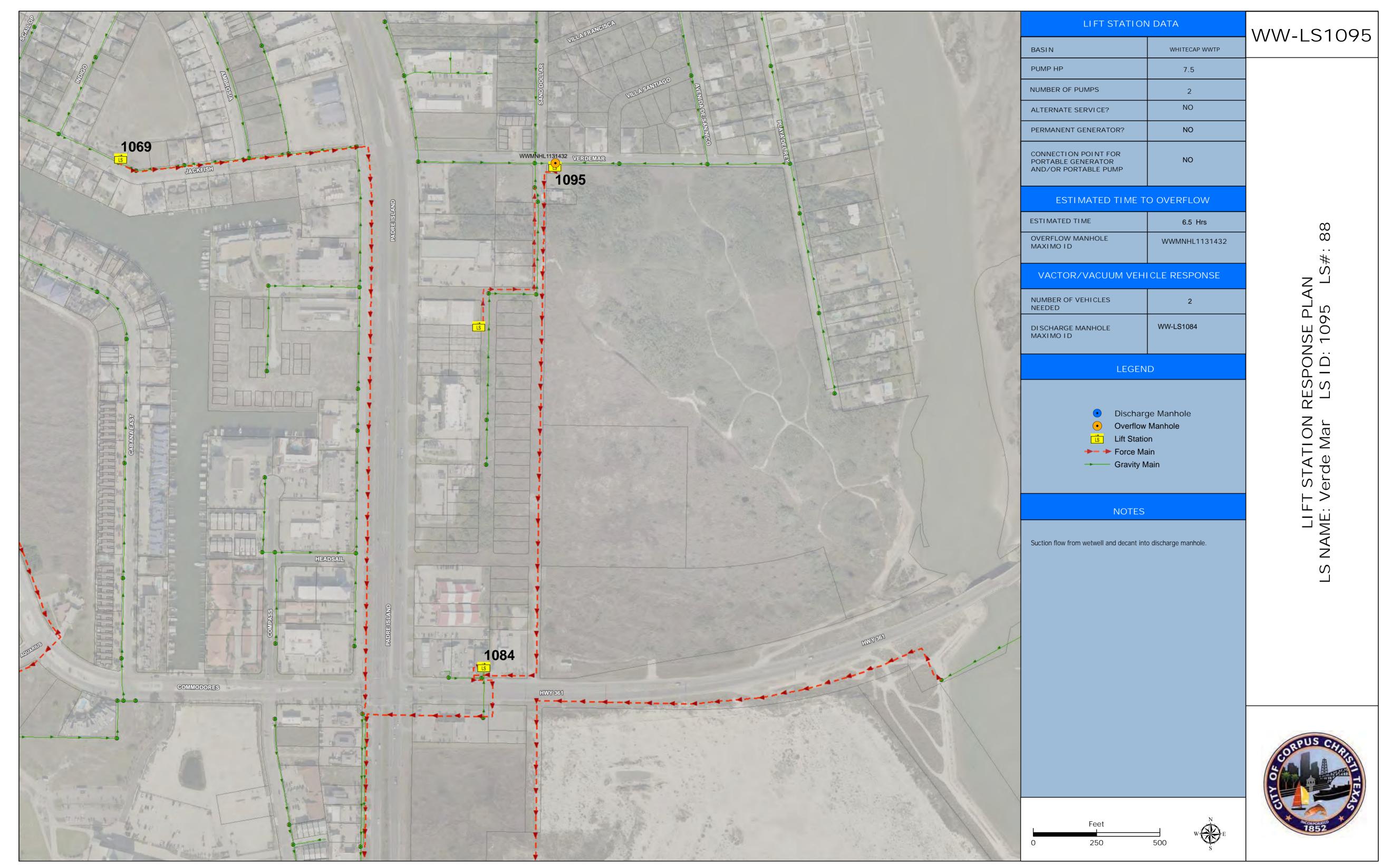


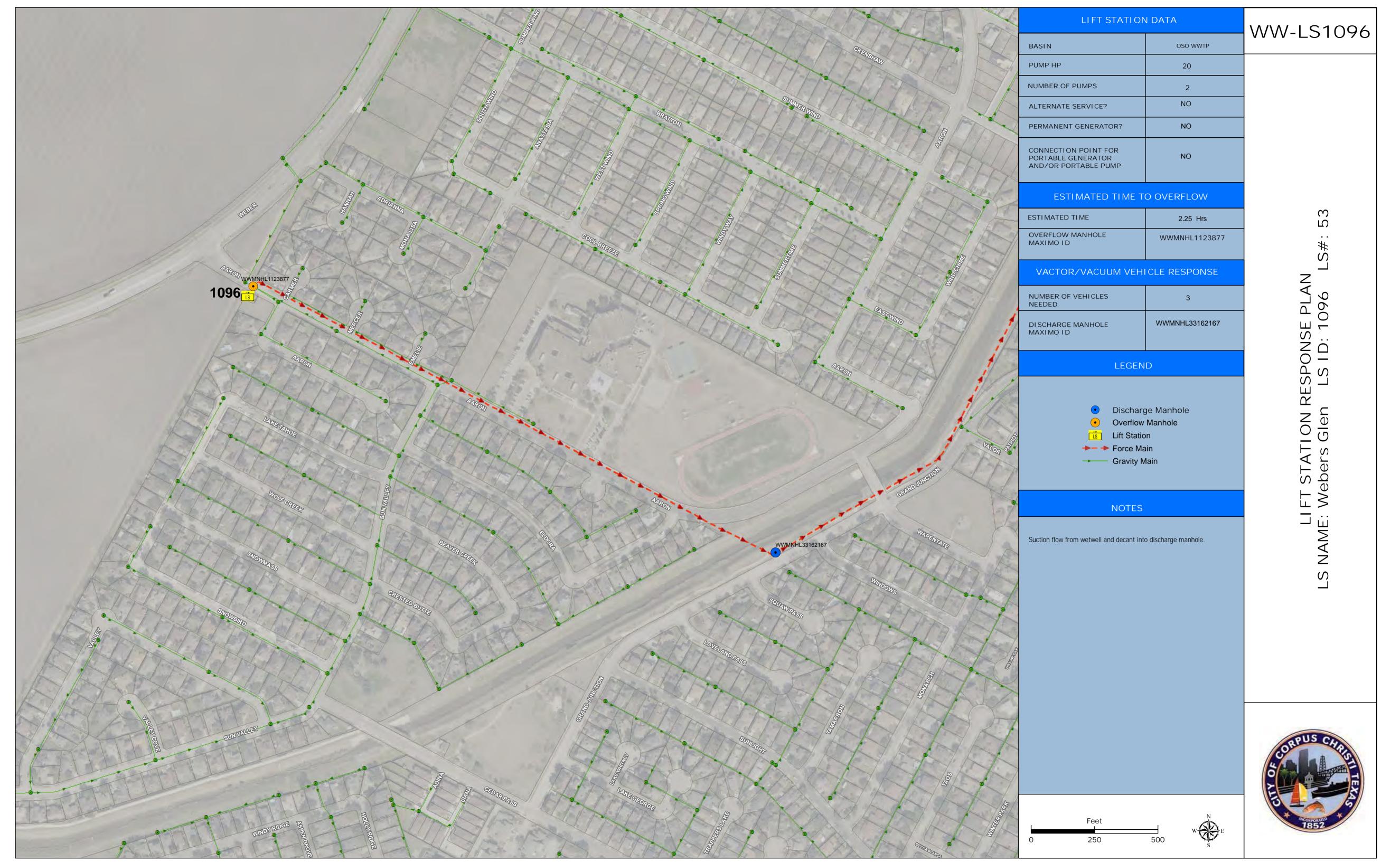


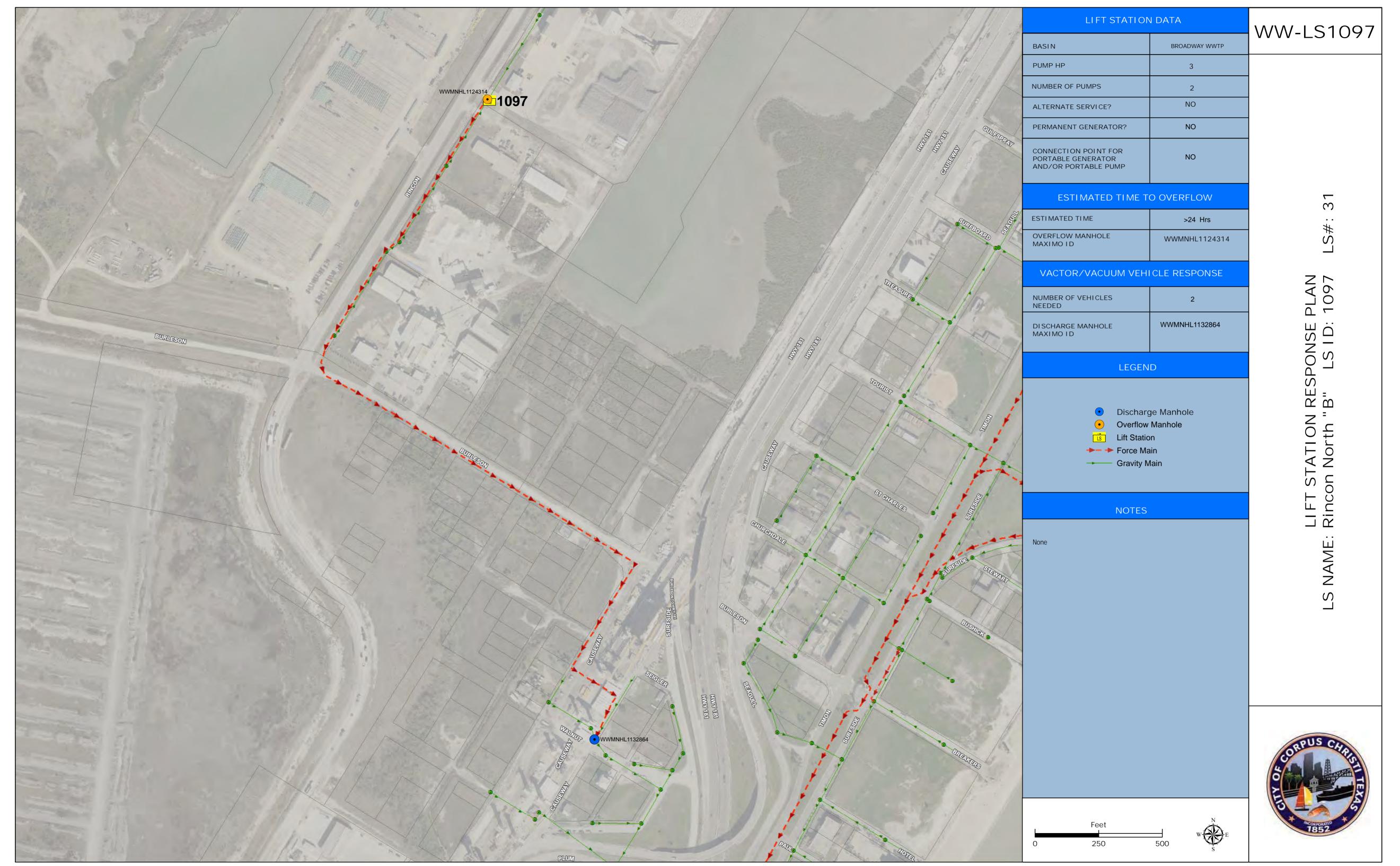


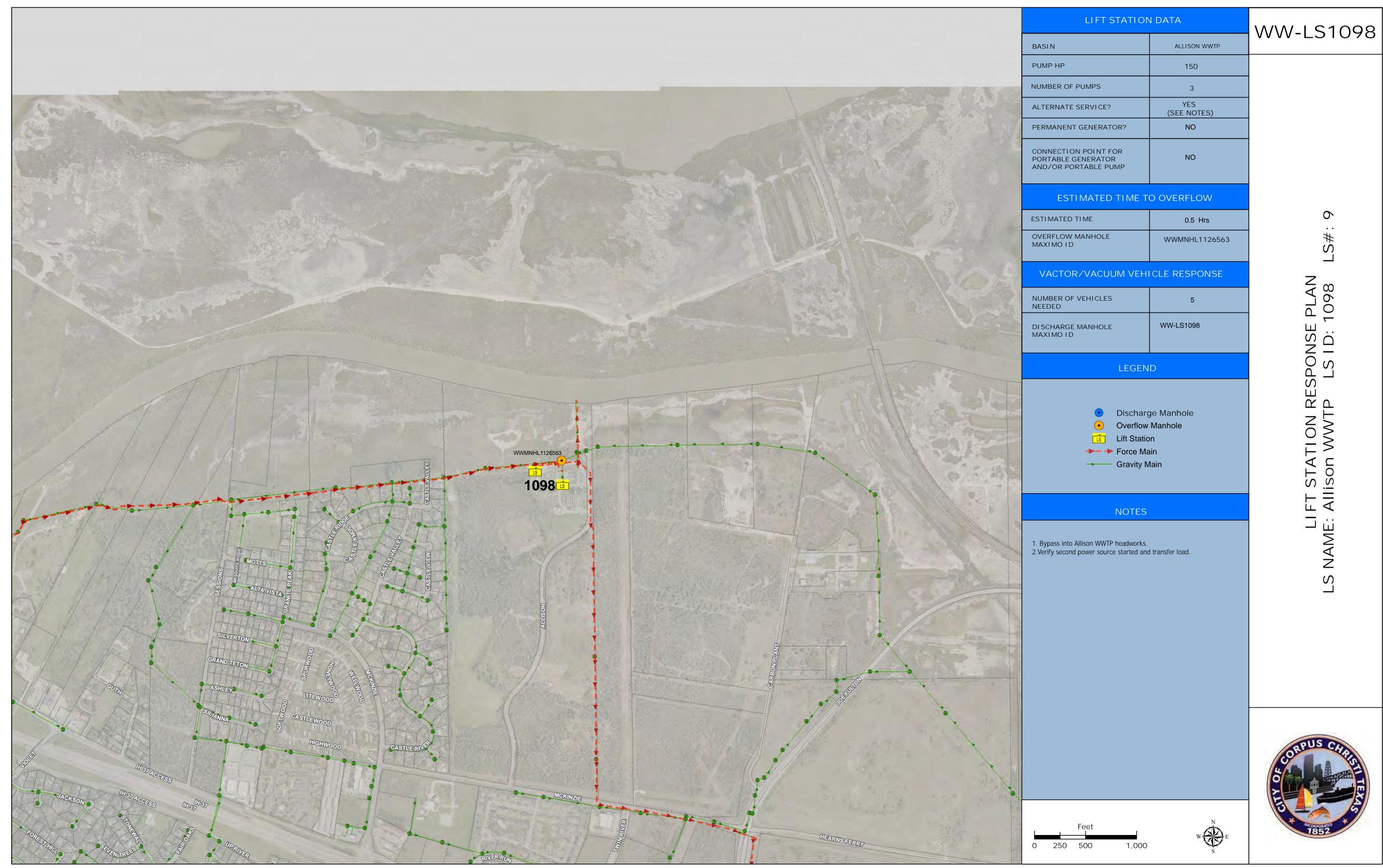












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