

VII. WASTEWATER

A. Existing Wastewater System

1. Existing On-Site Wastewater Collection System

The existing wastewater collection system within Alameda Point is owned and maintained by the City of Alameda. The existing collection system consists of gravity pipelines ranging in size from 4-inch to 30-inch in diameter, 15 pump / lift stations, and force mains ranging from 4-inch to 8-inch in diameter. There is approximately 28 miles of existing wastewater pipelines within the Project Site comprised of the following:

- Gravity Mainlines = 14.2 Miles
- Force Mains = 2.3 Miles
- Building Laterals = 8.7 Miles
- Previously Abandoned Lines = 2.8 Miles

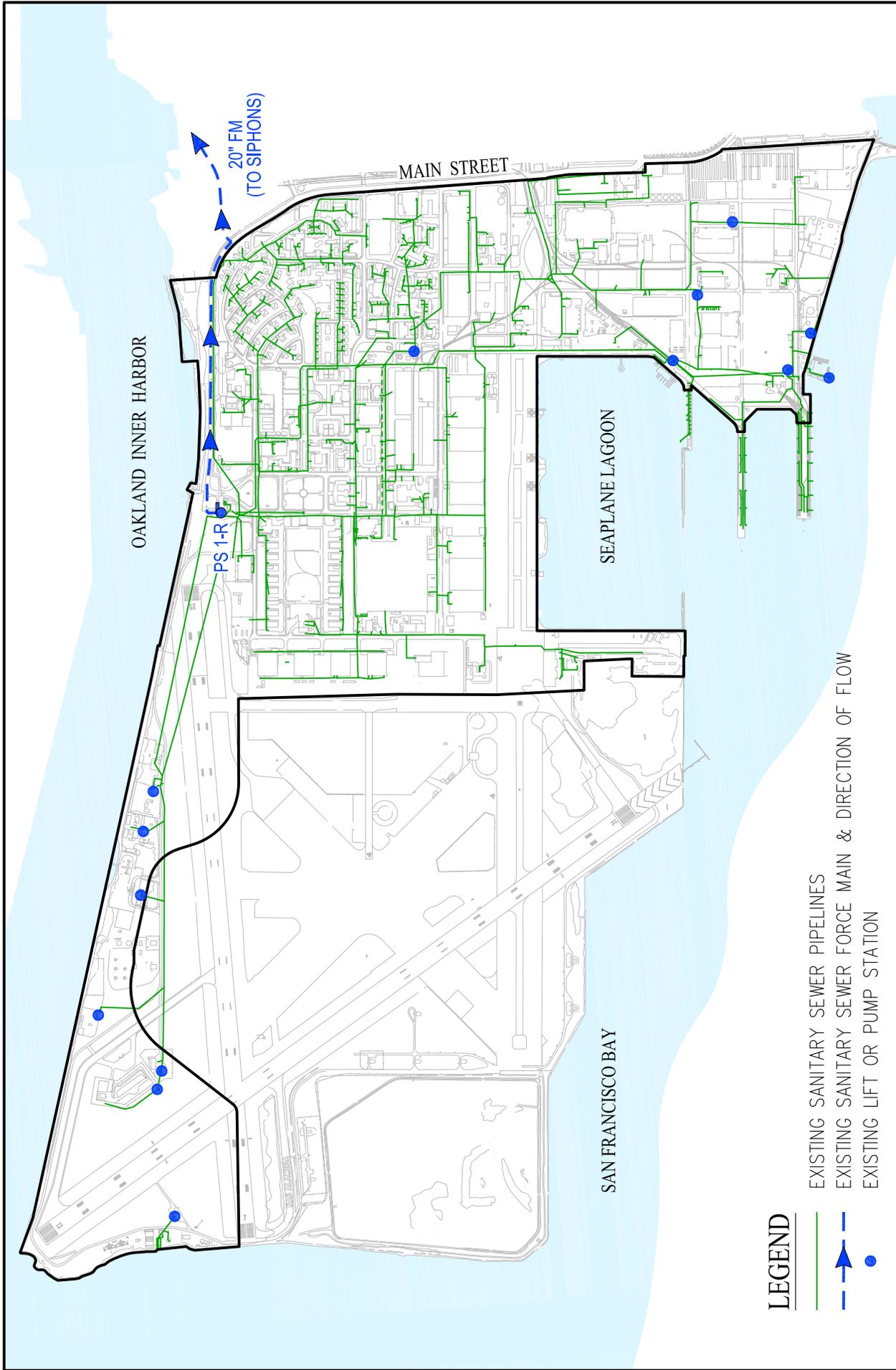
This system collects and conveys wastewater from the Project Site to the existing Pump Station, referred to as Pump Station R, located just west of the Main Gate at the northern edge of Alameda Point.

The Navy began the installation of this system approximately 70 years ago. The system is currently functional, however, the system is beyond its service life and has numerous deficiencies. Most notably, the majority of the system has deteriorated due to the age of the system and differential settlement has occurred over time at the Project Site. These effects of time have resulted in groundwater infiltration entering the on-site collection system and downstream transmission system. Additionally, portions of the existing system have adverse slopes causing wastewater build-up and stagnant conditions. There are portions of the collection pipelines that are located under existing buildings and outside of the existing and proposed backbone street rights of ways. The existing wastewater collection system does not meet the City's standards. See Figure 32 depicting the configuration of the existing wastewater collection system at Alameda Point.

Recent flow monitoring conducted by EMBUD just upstream of Pump Station R indicates the existing peak wet weather wastewater flow from Alameda Point is approximately 1.93 MGD.

2. Existing Off-Site Wastewater Transmission Facilities

The existing on-site wastewater collection system terminates at Pump Station R. Historically, the wastewater flows from Alameda Point were pumped from Pump Station R under the Oakland - Alameda Estuary and through the Port of Oakland site, eventually connecting to an EBMUD trunk main, "Interceptor", that conveyed the flows to the EBMUD Main Wastewater Treatment Plant (MWWTP). The location of the historical Estuary crossing was approximately 3,000-feet west of Pump Station R. In the early 2000's, the Port of Oakland dredged the Estuary to a depth that conflicted with the existing pipeline crossing. Accordingly, the City of Alameda, EBMUD and the Port of Oakland coordinated a project to reroute the wastewater from Alameda Point to the east and to cross the Estuary at the existing EBMUD siphon facility near the Webster / Posey Tubes. This project was completed in 2003 and included the installation of approximately 8,600 linear feet of a 20-inch force main from the Pump Station R to the siphon facility. This force main flows from west to east along the northern shoreline of western Alameda. Additionally, a third 48-inch diameter siphon was added to the two existing 30-inch and 48-inch diameter siphons. These siphons convey wastewater flows from the entire main island of the City of Alameda under the Oakland

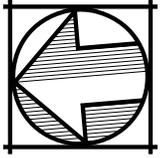


LEGEND

- EXISTING SANITARY SEWER PIPELINES
- - - EXISTING SANITARY SEWER FORCE MAIN & DIRECTION OF FLOW
- EXISTING LIFT OR PUMP STATION

**ALAMEDA POINT
MASTER INFRASTRUCTURE PLAN**
 CITY OF ALAMEDA ALAMEDA COUNTY CALIFORNIA
 DATE: MARCH, 2014 SCALE: 1" = 1,500'
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**FIGURE 32
EXISTING SANITARY SEWER (ON-SITE)**



/ Alameda Estuary. The siphons then connect into EBMUD's Interceptor, which convey wastewater from the City of Alameda and portions of the City of Oakland to EBMUD's MWWTP. EBMUD's MWWTP is located near the eastern landing of the Bay Bridge in West Oakland, approximately 2.5 miles from the Project Site. See Figure 33 depicting the existing off-site wastewater transmission and treatment facilities.

Pump Station R, the 20-inch force main, the siphon facility (Alameda Siphon) and the EBMUD Interceptor are owned and maintained by EBMUD. These facilities convey the wastewater generated at Alameda Point to the EBMUD MWWTP. EBMUD's design reports indicate that the existing capacity of Pump Station R is 7.5 MGD. The capacity of this pump station can be increased by increasing the size of the pumps and other equipment within the pump station. The existing 20-inch diameter force main has an existing capacity of 12.1 MGD. The third siphon that was constructed with the previously described project that rerouted the wastewater from Alameda Point is part of the Alameda Siphon. The existing peak wastewater flow within the Alameda Siphon is approximately 28 MGD.

3. Existing Wastewater Treatment

The EBMUD Main Wastewater Treatment Plant (MWWTP) currently has excess dry weather flow capacity. The current average dry weather flow to the MWWTP is approximately 54 MGD and the permitted dry weather flow of the MWWTP is 120 MGD.

In regards to wet weather flow capacity of EBMUD's treatment facilities, in January 2009, EBMUD entered into a Stipulated Order for Preliminary Relief from the U.S. Environmental Protection Agency, State of California Water Resources Control Board and the San Francisco Bay Regional Water Quality Control Board. This Stipulated Order outlines the measures EBMUD is required to implement in order to address inadequately treated sewage discharges to San Francisco Bay during wet weather conditions.

EBMUD's operates three wet weather facilities that handle excess sewage during storm events when flows exceed the capacity of the District's Main Wastewater Treatment Plant. The excess flows are largely caused by storm water and groundwater leaking into the region's aging sanitary sewer collection pipelines and through improper connections that allow storm water to flow into the sewer system. The intent of the Stipulated Order is to formulate long-term solutions to minimize the high level of infiltration to the East Bay collection systems and eliminate the discharge of the excess flows from the EBMUD's wet weather facilities.

The Stipulated Order requires EBMUD to conduct a flow monitoring study to identify the regions within the District's service area that generate the largest wet weather flows. This flow monitoring study is also intended to establish a range of scenarios of capacity flow limits for specific locations within the District's system that could eliminate the need for discharges from the wet weather facilities. This flow monitoring study was completed by EBMUD in March 2012 and approved by the EPA in December of 2012.

Large redevelopment sites such as Alameda Point are expected to reduce the amount of infiltration and inflow entering the wastewater collection system through the replacement/rehabilitation of the aging, deteriorated sewer infrastructure with new systems that are constructed to current standards. EBMUD has indicated that the conclusions of their efforts to address the Stipulated Order will not limit the future growth or redevelopment at Alameda Point. EBMUD recommends that the project incorporate the following measures to comply with the Stipulated Order and maintain capacity for the Project Site:



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**FIGURE 33
EXISTING SANITARY SEWER
(OFF-SITE TRANSMISSION)**

- Replace or rehabilitate any existing sanitary sewer collection system, including sewer lateral lines, to reduce infiltration/inflow, and
- Ensure any new wastewater collection systems for the project, including sewer laterals, are constructed to prevent infiltration/inflow to the maximum extent feasible.

B. Proposed Wastewater System

1. Proposed Wastewater Demand

The total estimate peak wastewater generated by the full build-out of the redevelopment of Alameda Point is approximately 2.16 MGD. The wastewater flow generation factors for the various proposed land uses are based on the current City of Alameda design criteria utilized in the City-Wide sewer model and outlined in Table 7. These wastewater generation factors do not account for the implementation of water conserving fixtures throughout the proposed buildings. The wastewater flow from the Project Site will be decreased with the implementation of sustainable strategies that achieve reductions in water consumption.

Table 7 - Wastewater Flow Generation Factors

Land Use	Flow Factor (Peak Dry Weather)
Residential	480 GPD / Unit
Commercial - Office/ Retail	0.20 GPD / SF
Commercial - Manufacturing / Warehouse	0.04 GPD / SF
Commercial - Service	1.00 GPD / SF
Park	3,000 GPD / Each
Park with Sports Complex	45,000 GPD / Each

Note: All areas additionally include a GWI and $1/3$ flow of 1,300 GPD / Net Acres (excluding Parks)

EBMUD has adequate dry weather capacity at the MWWTP for the projected wastewater flows from the redevelopment of Alameda Point. The project build out would increase the peak wet weather flow incrementally by approximately 0.23 MGD above the existing peak flows. This takes into consideration that replacement of existing infrastructure is expected to reduce peak infiltration / inflow and partially offset the projected increase in base wastewater flow. Based on the current peak wastewater flow from the City of Alameda of 28 MGD, the estimated maximum additional flow from Alameda Point represents an increase of less than 1 percent in current peak wastewater flow conveyed through the Alameda Siphon. It represents an even smaller percentage of the current peak wastewater flow of 107 MGD in EBMUD's south interceptor just downstream of the Alameda Siphon.

2. Proposed On-Site Wastewater Collection System

a. Development Areas

A new wastewater collection system will be installed within the Development Areas, where large-scale areas of new construction are anticipated. The proposed collection system will include gravity pipelines, ranging in size from 8-inch to 24-inch in diameter, and 5 lift stations. The proposed system

will connect to the existing Pump Station R located at the Main Gate. The existing wastewater system, pipelines and pump / lift stations, within the Development Areas will be replaced in phases consistent with the development build-out. The proposed wastewater collection facilities will be installed within all backbone streets within the Development Areas. See Figure 34 depicting the proposed on-site wastewater collection system schematic within the Development Areas.

The proposed on-site wastewater collection system will be owned and operated by the City of Alameda. The system shall be designed and constructed consistent with the City of Alameda's Standard Specifications and Design Criteria. All lift stations will include redundant pumps, alarm systems and emergency backup power supplies to ensure no disruption of service. The proposed wastewater collection system shall efficiently collect and convey the wastewater such that the amount of lift stations required is minimized. The gravity pipelines will be designed to accommodate settlement at locations where long term differential settlement is anticipated.

b. Reuse Areas

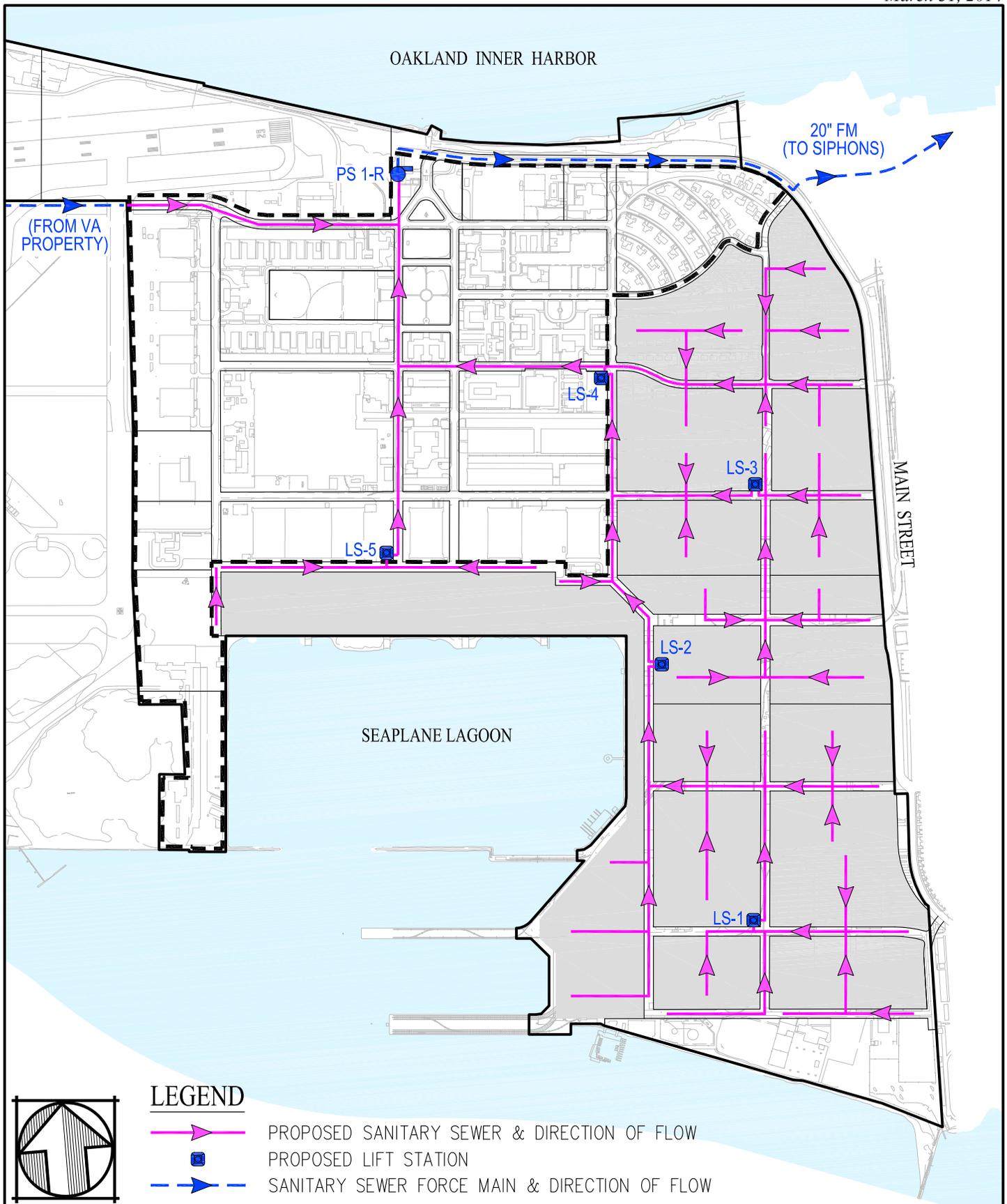
The existing wastewater collection system within the Reuse Areas will be incrementally replaced over time. Initially, the Reuse Areas will continue to utilize the existing wastewater collection system through an enhanced maintenance program. This program will rehabilitate the existing system to address deficiencies. Each proposed development within the Reuse Areas will be responsible for investigating and documenting the condition of the existing collection facilities that collect and convey the wastewater from that specific site. Any deficiencies identified shall be addressed at the time of that development to the satisfaction of the Public Works Director. The anticipated enhanced maintenance improvements include cleaning and lining of existing pipelines and manholes to address infiltration and inflow. Also, it is anticipated that portions of the existing pipelines will be required to be replaced to address adverse flow conditions and areas that have settled resulting in stagnant wastewater conditions.

Additionally, each development project within the Reuse Areas will replace the wastewater lateral and on-site pipelines serving that site, consistent with the City of Alameda's Private Sewer Lateral Replacement Ordinance. See Figure 35 depicting the existing on-site wastewater collection system schematic within the Reuse Areas to initially to be rehabilitated.

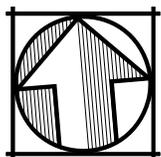
Ultimately, the wastewater collection system within the Reuse Areas will be replaced. The new system will be installed incrementally over time. As funds become available through a fee program, new backbone wastewater facilities will be installed. The City of Alameda will coordinate these improvements to ensure they are implemented orderly and with appropriate priorities. The proposed backbone collection system will be similar to the system proposed within the Development Areas, including new gravity pipelines and lift stations. The new collection pipes will connect to the adjacent on-site laterals and pipes. The system shall be designed and constructed consistent with the City of Alameda's Standard Specifications and Design Criteria. See Figure 36 depicting the ultimate on-site wastewater collection system schematic within the Reuse Areas.

3. Proposed Off-Site Wastewater Transmission System Improvements

The existing off-site wastewater transmission facilities, Pump Station R, 20-inch force main, Estuary siphon facility and the EBMUD Interceptor, have adequate capacity for the proposed wastewater flow generated by the full build-out of Alameda Point. There are no proposed improvements to these facilities as part of Alameda Point.



LEGEND



- ▶ PROPOSED SANITARY SEWER & DIRECTION OF FLOW
- PROPOSED LIFT STATION
- - -▶ SANITARY SEWER FORCE MAIN & DIRECTION OF FLOW

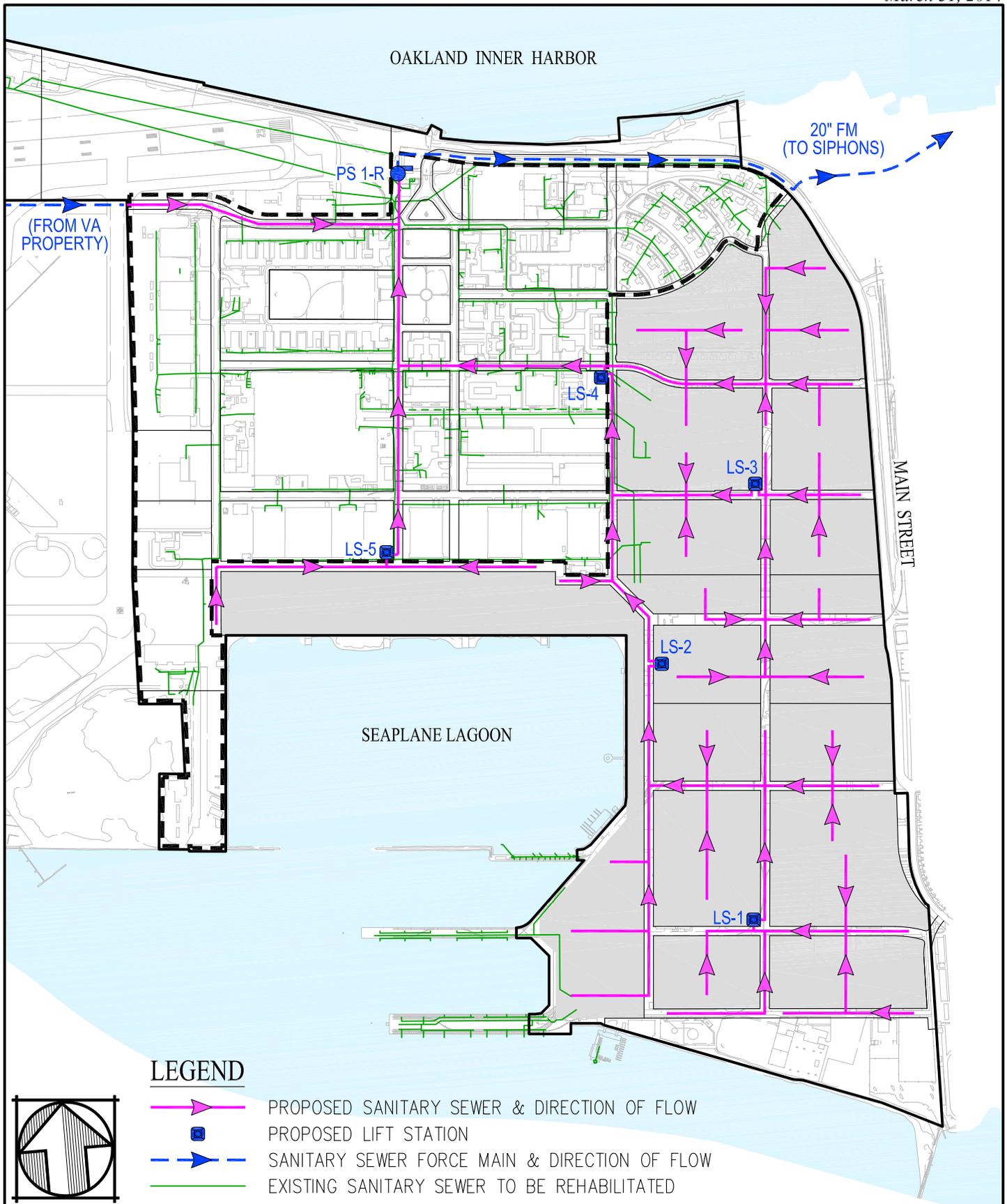
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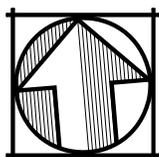
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**FIGURE 34
PROPOSED SANITARY SEWER
IN DEVELOPMENT AREAS**



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-  PROPOSED SANITARY SEWER & DIRECTION OF FLOW
-  PROPOSED LIFT STATION
-  SANITARY SEWER FORCE MAIN & DIRECTION OF FLOW
-  EXISTING SANITARY SEWER TO BE REHABILITATED

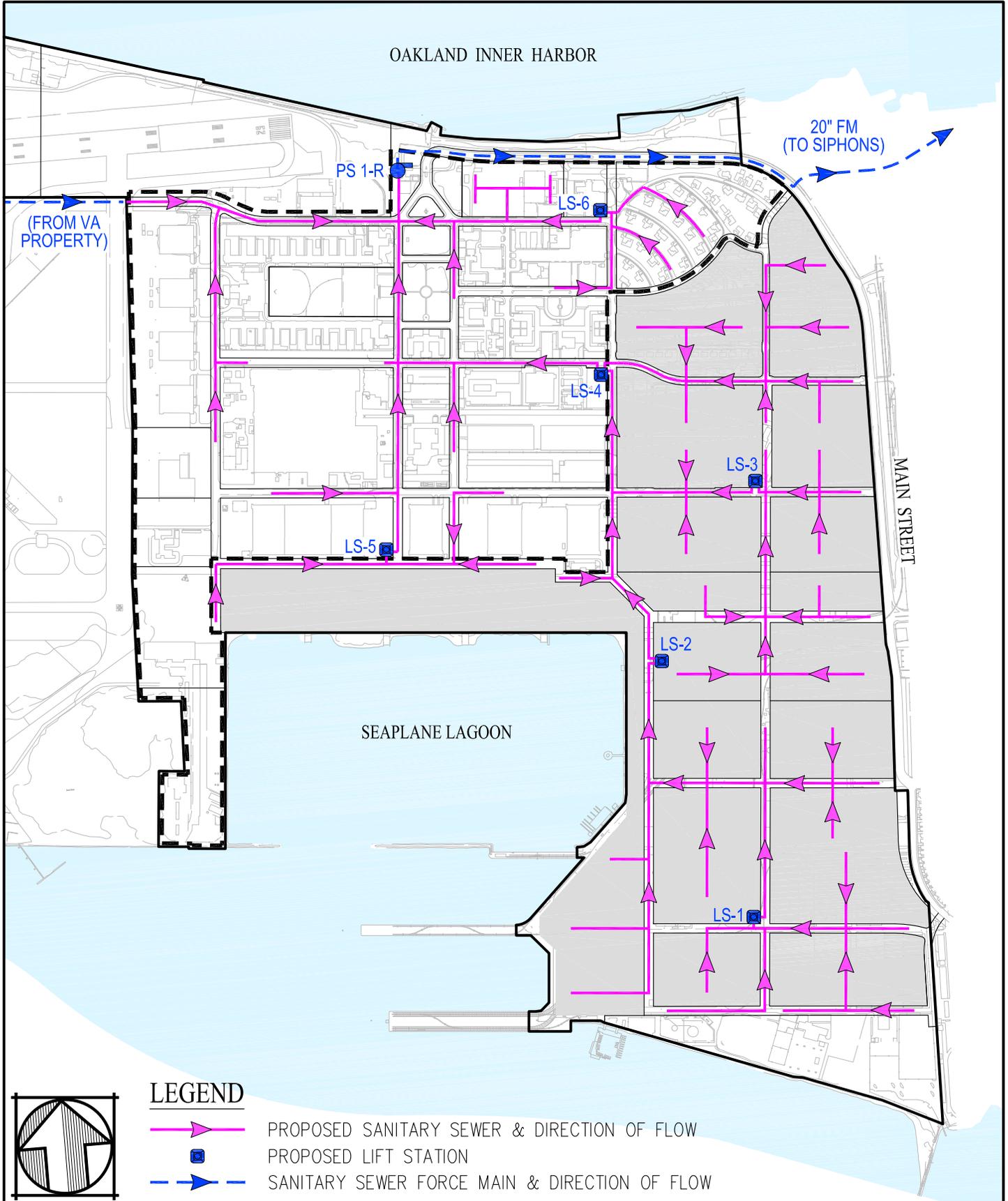
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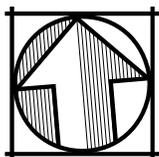
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**FIGURE 35
PROPOSED SANITARY SEWER
REUSE AREAS INITIAL CONSTRUCTION**



LEGEND



-  PROPOSED SANITARY SEWER & DIRECTION OF FLOW
-  PROPOSED LIFT STATION
-  SANITARY SEWER FORCE MAIN & DIRECTION OF FLOW

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**FIGURE 36
PROPOSED SANITARY SEWER
ULTIMATE SYSTEM**