29. BELMONT CORPORATION YARD

City of Belmont

VULNERABILITY SUMMARY

Belmont's Corporation Yard (Yard) is **moderately vulnerable** to sea level rise. It is moderately exposed to flooding from heavy rainfall events that coincide with high water levels on San Francisco Bay, causing water from Belmont Slough to back up on site. This condition is expected to increase with sea level rise. The Yard's many functions are moderately sensitive to flooding, although there are backup power supplies, and most functions could be performed at other locations during severe inundation. This would be a difficult and expensive shift as the city keeps all of its equipment here, and work done elsewhere would have to be done by other entities.

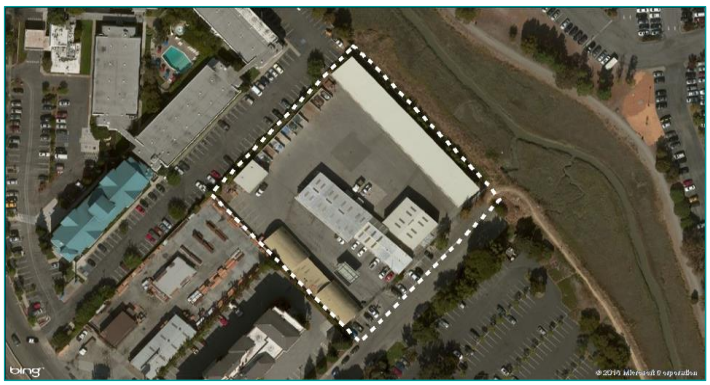
SENSITIVITY	*EXPOSURE*	*ADAPTIVE CAPACITY*	*CONSEQUENCES*
Moderate	*Moderate*	*Moderate*	*High*

ASSET CHARACTERISTICS

110 Sem Lane | Belmont

Asset Description and Function:

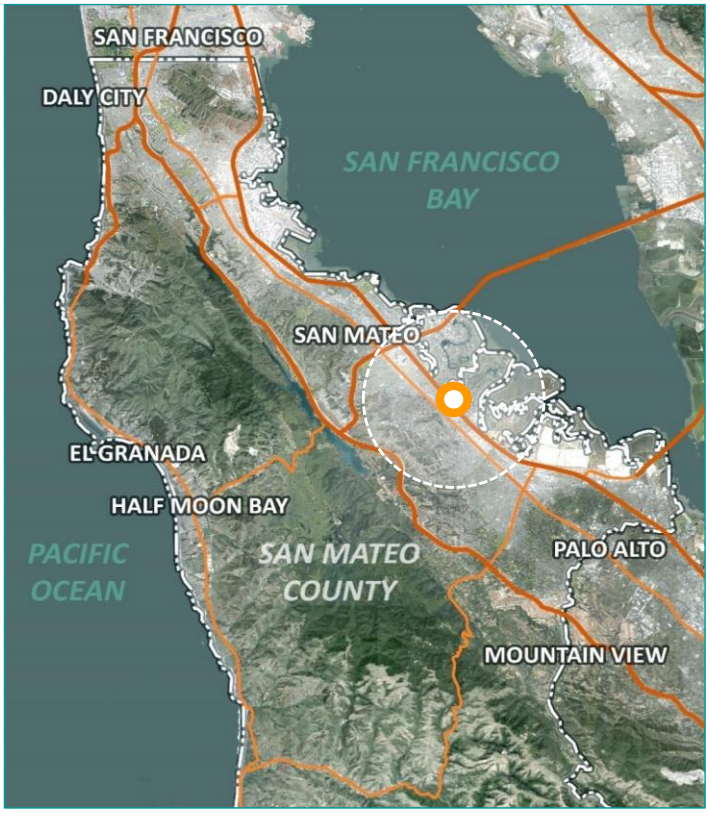
The Yard is the base of operations for the Belmont's Public Works and Parks Department operations, including street maintenance, traffic and electrical operations, sewer, drainage and pollution control, and vehicle fleet management. Vehicles, tools, and supplies for these operations are stored at the Yard. It also contains a sign shop, an auto repair shop, a vehicle canopy, a fuel tank and pump, and two oil-water separators. The Yard is the primary fueling location for Belmont's police and fire departments.



Asset Type	Corporation Yard
Asset Risk Class	4
Size	2.1 acres
Year of Construction	1950
Elevation	8 feet, MSL
Level of Use	Continuous, annual
Annual O&M Cost	$120,000
Special Flood Hazard Area	Asset is not in SFHA
Physical Condition	Fair
Landowner	City of Belmont

Underground Facilities

There is one underground fuel tank on site.



Environmental Considerations

Special status plants, animals, and natural communities may be present in the project area; a more detailed analysis will be needed before implementing adaptation strategies.

BELMONT CORPORATION YARD

ASSET SENSITIVITY

This asset is moderately sensitive to inundation, as all Public Works operation activities mentioned previously would be affected to some degree; the level of service, however, will be fully dependent on the depth, extent, and duration of floodwaters. When Sem Lane only is flooded, access to the yard is limited. In the near-term, the Yard itself could still operate internally if Sem Lane were flooded, despite the access challenges posed to fire, police, and other vehicles entering the Yard. Low clearance cars (such as police cars) would not be able to safely enter or exit the Yard, and so could not be fueled or repaired.

Any power loss could also cause the Yard to lose maintenance and fueling functionality after 2 to 3 days (limit of generator fuel). If the Yard itself were flooded, infrastructure subject to saltwater exposure would likely be non-functional and require replacement. It is likely that damaged equipment would include vehicles, such as the fire and police fleets, which could be unable to perform critical emergency services.

Stored fuel for the vehicle fleet could last roughly 3 weeks, maintaining this service provided that vehicles could still access the Yard. If water got into the oil-water separator, however, it could cause a hazardous spill.

Facilities at the Belmont Corporation Yard.

SHORELINE VULNERABILITY

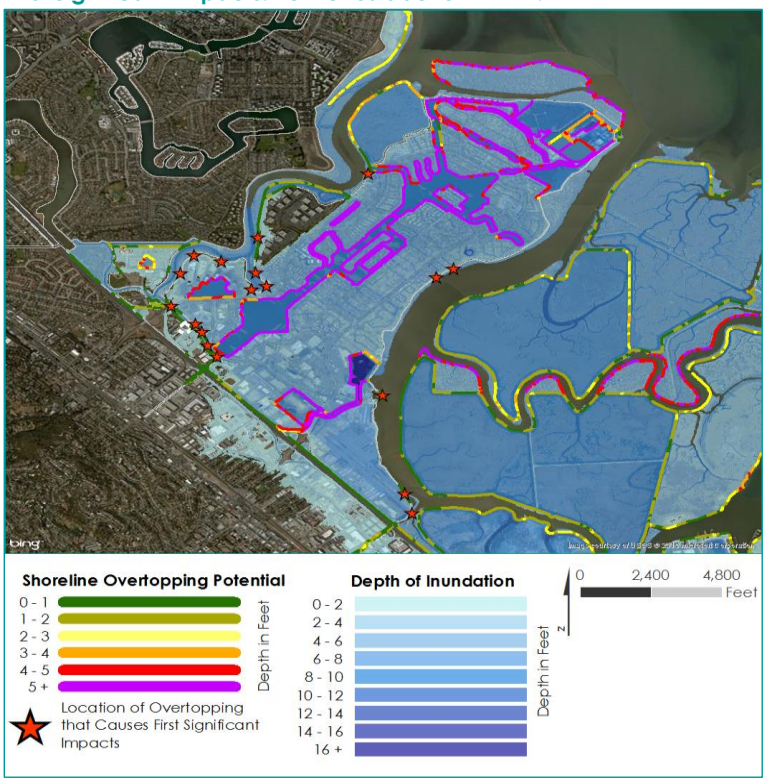
Shoreline Overtopping Analysis

The Yard will be below sea level with water levels 24-36 inches above the current mean higher high water (MHHW) level. With water 36-48 inches above MHHW, water from Belmont Slough (Northwest peninsula) and Steinberger Slough (Southeast peninsula) will overtop the Redwood Shores levee system (red stars on map) and could then reach the Yard.

Cross-Cutting Vulnerabilities

Belmont Slough has lost capacity to convey flood flows in part due to sediment; this increases the water levels in the slough and the frequency with which the slough could overtop and flood Sem Lane. Unlike Redwood Shores, the west side of Belmont Slough was not built with a well-designed levee or flood control system, which leaves it more exposed to overtopping during high tides and heavy rains. The levee protecting nearby Redwood Shores could also be a source of coastal flooding if not maintained or if overtopped, but it is managed by other jurisdictions.

First Significant Impacts: 48 inches above MHHW.



BELMONT CORPORATION YARD

SEA LEVEL RISE EXPOSURE ANALYSIS

Exposure Discussion

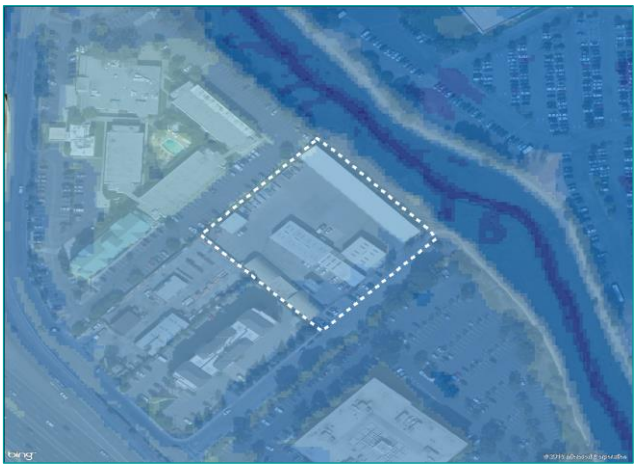
Exposure of the asset is moderate. The Yard is currently vulnerable to heavy rainfall events coinciding with high water levels in San Francisco Bay, whereby the Belmont Slough cannot drain to San Francisco Bay, and backs up onto Sem Lane. In 2010, 2011, and 2014, flooding from Belmont Slough inundated parts of Sem Lane roughly 18 inches and reaching as far as the door to the auto shop. Water will only drain naturally into Belmont Slough if the slough level drops, but if it is high, then standing water remains on site. Groundwater is present on site but has not yet caused any impacts to site facilities or functions.

Sea level rise will increase the frequency with which a high tide coincides with high water on Belmont Slough. In addition, the Yard could be vulnerable to coastal flooding with an increase of 48 inches of water level above MHHW. In this case, water could flood much of the site to a depth of 7.5 feet, including buildings through the doorways, any on-site vehicles, the fuel island, and the auto repair shop. Water could also enter the site through the manhole covers which are at grade. It may also be possible for the adjacent Redwood Shores Lagoon to overtop and cause flooding at the Yard.

Baseline Scenario: Asset not yet inundated.

Mid-Level Scenario: Asset under 0 to 5 feet of water.

High-End Scenario: Asset under 4 to 8 feet of water.



Exposure Analysis Results

Potential Inundation Depth (feet)		
Scenario	***Minimum***	***Maximum***
First Significant Impacts *(48 inches)*	***0***	***3***
Baseline *1% Flood*	***0***	***0***
Mid-Level *1% + 3.3 feet*	***0***	***5***
High-End *1% + 6.6 feet*	***4***	***8***

BELMONT CORPORATION YARD

ADAPTIVE CAPACITY, CONSEQUENCES, AND POTENTIAL ADAPTATION

Adaptive Capacity

The Yard has moderate near-term adaptive capacity relative to other assets in the project area. In the near-term, the Yard can use a pump to mitigate minor flooding of Sem Lane, given electrical power. There is also an elevated generator to support Yard function with fuel to last roughly 3 days. However, use of backup power depends upon the switch gear and power distribution system remaining dry. If these or the generator were flooded, all power would be lost, causing the loss of most services. Police and fire vehicles can fuel at other locations, and police cars could use alternative auto-mechanics if the Yard's auto repair were unavailable; however, the City of Belmont would need to hire others to perform these services, likely involving higher costs and delays. There is currently no other city-owned repair facility for unique fleets like fire engines. Over the long-term, water 48 inches over MHHW on San Francisco Bay would flood the Yard and render it inoperable.

Consequences

Flooding could cause direct damages to buildings and vehicles on site, valued at roughly $2 million each, for a total of approximately $4 million. It may also be possible for the underground fuel tanks or oil-water separators to spill, creating hazardous conditions and negative water quality impacts in Belmont Slough or for personnel on site. More importantly, loss of the Yard would affect all Public Works operations, including emergency services associated with the use and maintenance of police and fire vehicles, as well as traffic and electrical operations, street maintenance, sewer utility, drainage, and water pollution services. Loss of this facility could leave the City of Belmont unable to repair major thoroughfares if damaged. Loss of emergency services would have cascading impacts on the public health and safety of Belmont residents.

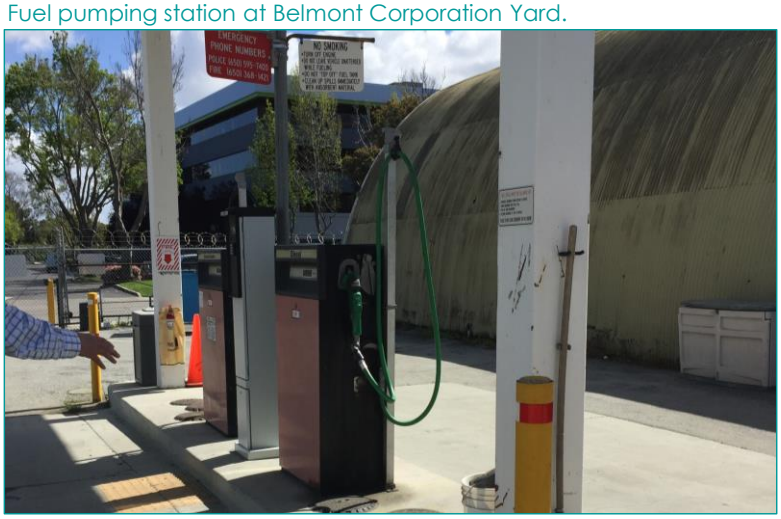
Additional Important Information

Because the Yard accommodates many operations and houses associated equipment and materials, it is subject to strict permitting guidelines for human health, air quality, building codes, and fire codes. That also makes temporary or permanent relocation difficult due to the lack of available space and the cost of doing so. This affects both near- and long-term adaptive capacity.

Finally, local drainage depends on discharge to Belmont Slough, which is impeded by high water levels, and a Caltrans stormwater pipe whose outfall is buried in sediment. This means that, like other assets in the project area, flood exposure of one asset can be affected inadvertently by management actions of other stakeholders.

Belmont Slough adjacent to Belmont Corporation Yard.

Fuel pumping station at Belmont Corporation Yard.



Asset-Specific Adaptation

In the near-term, pumping may be a practical nonstructural option to remove water from Sem Lane and other nearby components. Floodproofing the power supply or directing flow off Sem Lane could enable car access. It may also be possible to relocate the facility to higher ground west of Highway 101, or to enhance the shoreline protection in collaboration with other stakeholders.

Vulnerable Corporation Yards

There is another Asset Vulnerability Profile on vulnerable corporation yards: Foster City Corporation Yard (AVP #25). At the time of this assessment, an exhaustive dataset on corporation yards in San Mateo County is unavailable.