CARollo engineers

Project Name:	Barton Murray, Magnolia, and North Beach CSO Facilities
Subject:	South Magnolia Basin: Summary of CSO Control Approach Alternatives for Workshop No. 2
Alternative 1A:	Store flow in a tank up basin from the CSO control point.

APPROACH: STORAGE

ALTERNATIVE DESCRIPTION

Following the recommendations of the 1997 CSO Plan, a storage tank would be constructed in the vicinity of W. Lynn Street and 32nd Avenue, approximately 2,200 feet north of the CSO control point. The storage tank could be located on a triangular parcel of land of an area of approximately 0.4 Ac. The tank would be connected to extant combined sewers for approximately 31% of the basin tributary to that area (approximately 235 Ac.) A pump station would be needed to empty the tank.

Existing gravity sewerage would continue to collect sewage from the remaining 69% of the basin. A pump station would be required at the CSO control point to transfer those flows to the storage tank. Further modeling is required to adequately determine the capacity of the pump station. A new gravity discharge pipeline would be required to convey flow from the tank to the existing S.Magnolia Interceptor.

ASSUMPTIONS

- Sufficient capacity in existing tributary SPU infrastructure, except as noted in the alternative description.
- Sufficient capacity in existing County conveyance infrastructure, except as noted in the alternative description.
- No outfall improvements needed.
- Land can be acquired through normal processes.
- No mitigation assumed at this level of alternative description.
- Geotechnical conditions are conducive to construction methods implied by the alternative description.

PROJECT ELEMENTS

Pump Stations

- One, at 10 mgd, 150-feet head
- One, at 4.3 mgd, 30-feet head

Conveyance Pipelines

- Forcemain from High Head Pump Station to storage tank.
  - +/- 2,200 feet, 12-inch diameter
- Gravity Pipeline from storage tank to existing S. Magnolia Interceptor
  - 4.3 mgd capacity
  - +/- 2,200 feet, 18-inch diameter.

Storage

- 2.6 MG, rectangular tank, 100 x 100 feet, 34-feet sidewater depth.

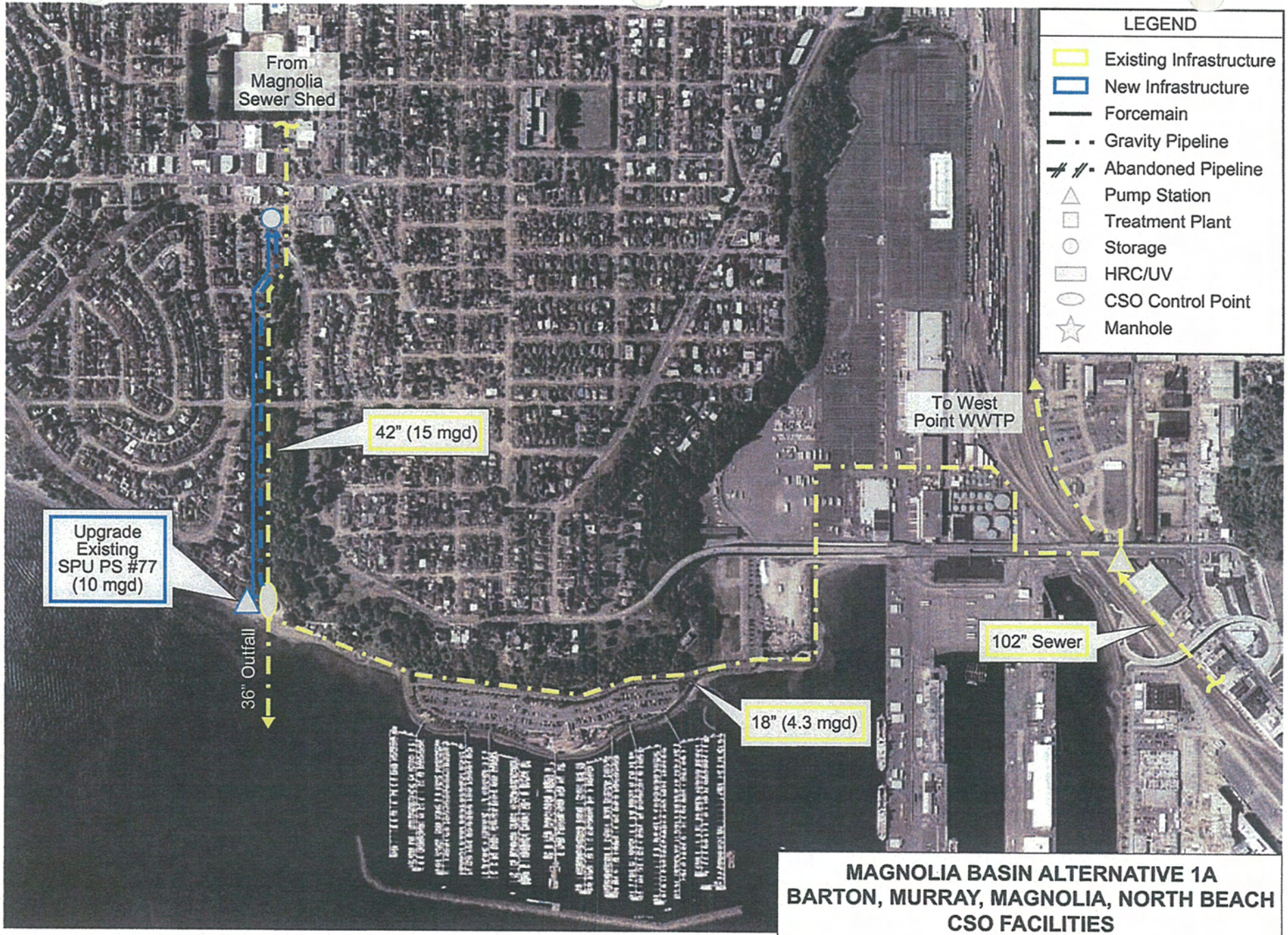
Treatment Processes

- NA

POLICY IMPLICATIONS

- ?

A schematic and map of the existing and proposed facilities are shown on the following page.



MAGNOLIA BASIN ALTERNATIVE 1A
BARTON, MURRAY, MAGNOLIA, NORTH BEACH CSO FACILITIES
KING COUNTY DNRP

kc507f1-7562.ai

CAROLLO engineers

Project Name:	Barton Murray, Magnolia, and North Beach CSO Facilities
Subject:	South Magnolia Basin: Summary of CSO Control Approach Alternatives for Workshop No. 2
Alternative 1B:	Store flow in a tank near the CSO control point.

APPROACH: STORAGE

ALTERNATIVE DESCRIPTION

A storage tank would be constructed on 32nd Ave. near the CSO control point. Adjacent property would be acquired for the tank. The SPU pump station #77 would be modified to increase pumping head sufficiently to lift flow into the tank. The discharge line for the pump station would be extended to the tank. Capacity of the SPU station is currently unknown.

Depending on location and footprint, a pump station may be needed to empty the tank into the S. Magnolia Interceptor upstream of the CSO control point.

ASSUMPTIONS

- Sufficient capacity in existing tributary SPU infrastructure, except as noted in the alternative description.
- Sufficient capacity in existing County conveyance infrastructure, except as noted in the alternative description.
- No outfall improvements needed.
- Land can be acquired through normal processes.
- No mitigation assumed at this level of alternative description.
- Geotechnical conditions are conducive to construction methods implied by the alternative description.

PROJECT ELEMENTS

Pump Stations

- Improve SPU pump station #77.

Conveyance Pipelines

- Local connector to and from tank, 200 feet, 18-inch diameter.
- Extend SPU pump station discharge line to tank, approximately 400 feet, 12-inch diameter.

Storage

- 2.6 MG rectangular tank, 50 x 200 feet, 34-feet sidewater depth.

Treatment Processes

- NA

POLICY IMPLICATIONS

- ?

A schematic and map of the existing and proposed facilities are shown on the following page.

MAGNOLIA BASIN ALTERNATIVE 1B
BARTON, MURRAY, MAGNOLIA, NORTH BEACH
CSO FACILITIES
KING COUNTY DNRP

kc507f2-7562.ai

CAROLLO engineers

Project Name:	Barton Murray, Magnolia, and North Beach CSO Facilities
Subject:	South Magnolia Basin: Summary of CSO Control Approach Alternatives for Workshop No. 2
Alternative 1C:	Store flow in a tank east of Marina.

APPROACH: STORAGE

ALTERNATIVE DESCRIPTION

A storage tank would be constructed north and east of the Marina on 23rd Ave. on a site currently owned by Seattle Parks, and currently used as a sports field. A pump station would be required to empty the tank.

A new gravity sewer would be constructed from the CSO control point to the tank, approximately 3,000 feet long, to convey flow from the basin. The SPU pump station and discharge line might be upgraded for higher head and distance needed to convey flows from approximately 20% of the basin to the new sewer.

The existing S. Magnolia Interceptor would remain in service for local connections between 32nd Ave. and the storage tank. It would be re-routed into the tank.

ASSUMPTIONS

- Sufficient capacity in existing tributary SPU infrastructure, except as noted in the alternative description.
- Sufficient capacity in existing County conveyance infrastructure, except as noted in the alternative description.
- No outfall improvements needed.
- Land can be acquired through normal processes.
- No mitigation assumed at this level of alternative description.
- Geotechnical conditions are conducive to construction methods implied by the alternative description.

PROJECT ELEMENTS

Pump Stations

- Upgrade SPU pump station #77.
- Tank discharge pump station, 4.3 mgd.

Conveyance Pipelines

- Gravity sewer, +/- 3,100 feet, 27 inch diameter, 15 mgd.
- Upgrade discharge line from SPU pump station #77 to new gravity sewer.

Storage

- 2.6 MG rectangular tank, 100 x 350 feet, 10-feet sidewater depth.

Treatment Processes

- NA

POLICY IMPLICATIONS

- ?

A schematic and map of the existing and proposed facilities are shown on the following page.

MAGNOLIA BASIN ALTERNATIVE 1C
BARTON, MURRAY, MAGNOLIA, NORTH BEACH CSO FACILITIES
KING COUNTY DNRP

kc507f3-7562.ai

CAROLLO engineers

Project Name:	Barton Murray, Magnolia, and North Beach CSO Facilities
Subject:	South Magnolia Basin: Summary of CSO Control Approach Alternatives for Workshop No. 2
Alternative 2A:	Replacement Sewer to Convey all flow to Interbay Pump Station.

APPROACH: CONVEY AND TREAT

ALTERNATIVE DESCRIPTION

A new gravity sewer would be constructed using a combination of open cut and trenchless methods to convey peak flows to the Interbay PS for conveyance to West Point. The sewer would begin near the CSO control point and end at the Interbay PS. SPU pump station #77 may require upgrade to enable pumping flow from approximately 20% of the basin to the new gravity sewer.

The existing S. Magnolia Interceptor would be interconnected at appropriate points to provide local service downstream of the CSO control point.

ASSUMPTIONS

- Sufficient capacity in existing tributary SPU infrastructure, except as noted in the alternative description.
- Sufficient capacity in existing County conveyance infrastructure, except as noted in the alternative description.
- No outfall improvements needed.
- Land can be acquired through normal processes.
- No mitigation assumed at this level of alternative description.
- Geotechnical conditions are conducive to construction methods implied by the alternative description.

PROJECT ELEMENTS

Pump Stations

- NA

Conveyance Pipelines

- Gravity sewer, +/- 6,000 feet, 27-inch diameter, 15 mgd.

Storage

- NA

Treatment Processes

- NA

POLICY IMPLICATIONS

- ?

A schematic and map of the existing and proposed facilities are shown on the following page.

MAGNOLIA BASIN ALTERNATIVE 2A
BARTON, MURRAY, MAGNOLIA, NORTH BEACH CSO FACILITIES
KING COUNTY DNRP

kc507f4-7562.ai

CAROLLO engineers

Project Name:	Barton Murray, Magnolia, and North Beach CSO Facilities
Subject:	South Magnolia Basin: Summary of CSO Control Approach Alternatives for Workshop No. 2
Alternative 2B:	Parallel Sewer to Convey all flow to Interbay Pump Station.

APPROACH: CONVEY AND TREAT

ALTERNATIVE DESCRIPTION

A new parallel gravity sewer would be constructed using a combination of open cut and trenchless methods to convey peak flows to the Interbay PS for conveyance to West Point. The sewer would begin near the CSO control point and end at the Interbay PS. A new control structure would be built to divert flows above 4.3mgd away from the S. Magnolia Interceptor. SPU pump station #77 may require upgrading to enable flow to be discharged to the new sewer.

The existing S. Magnolia Interceptor would be continue to carry flows up to 4.3 mgd.

ASSUMPTIONS

- Sufficient capacity in existing tributary SPU infrastructure, except as noted in the alternative description.
- Sufficient capacity in existing County conveyance infrastructure, except as noted in the alternative description.
- No outfall improvements needed.
- Land can be acquired through normal processes.
- No mitigation assumed at this level of alternative description.
- Geotechnical conditions are conducive to construction methods implied by the alternative description.

PROJECT ELEMENTS

Pump Stations

- NA

Conveyance Pipelines

- Gravity sewer, +/- 6,000 feet, 24-inch diameter, 10.7 mgd.

Storage

- NA

Treatment Processes

- NA

POLICY IMPLICATIONS

- ?

A schematic and map of the existing and proposed facilities are shown on the following page.

MAGNOLIA BASIN ALTERNATIVE 2B
BARTON, MURRAY, MAGNOLIA, NORTH BEACH CSO FACILITIES
KING COUNTY DNRP

kc507f5-7562.ai

Project Name:	Barton Murray, Magnolia, and North Beach CSO Facilities
Subject:	South Magnolia Basin: Summary of CSO Control Approach Alternatives for Workshop No. 2
Alternative 3A:	End of Pipe Treatment

APPROACH: END OF PIPE TREATMENT

ALTERNATIVE DESCRIPTION

A new HRC/UV wet weather treatment plant would be constructed near the CSO control point. New control structures would divert flows above 4.3 mgd to the treatment plant. Plant footprint is approximately 90 x 105 feet. A pump station would be needed to empty the plant after use.

SPU pump station #77 would require an upgrade to pump flow to the plant.

ASSUMPTIONS

- Sufficient capacity in existing tributary SPU infrastructure, except as noted in the alternative description.
- Sufficient capacity in existing County conveyance infrastructure, except as noted in the alternative description.
- No outfall improvements needed.
- Land can be acquired through normal processes.
- No mitigation assumed at this level of alternative description.
- Geotechnical conditions are conducive to construction methods implied by the alternative description.

PROJECT ELEMENTS

Pump Stations

- Upgrade SPU pump station #77.

Conveyance Pipelines

- Interconnecting sewers, 400 feet.

Storage

- NA

Treatment Processes

- HRC/UV treatment, 15 mgd.

POLICY IMPLICATIONS

- ?

A schematic and map of the existing and proposed facilities are shown on the following page.

MAGNOLIA BASIN ALTERNATIVE 3A
BARTON, MURRAY, MAGNOLIA, NORTH BEACH CSO FACILITIES
KING COUNTY DNRP

kc507f6-7562.ai

Project Name:	Barton Murray, Magnolia, and North Beach CSO Facilities
Subject:	South Magnolia Basin: Summary of CSO Control Approach Alternatives for Workshop No. 2
Alternative 4A:	Impervious Area Disconnection.

APPROACH: DEMAND MANAGEMENT

ALTERNATIVE DESCRIPTION

Approximately 50% of the connected impervious area in the basin would be separated.

A tunneled pipeline, located generally along the Galer St. right of way, east of the CSO control point would be used to store approximately 1.1 mgd of peak flow. The tunnel wouold end in the vicinity of 23rd Ave. Interconnecting sewers would connect the upstream and downstream ends of the tunnel to the existing S. Magnolia Interceptor.

ASSUMPTIONS

- Sufficient capacity in existing tributary SPU infrastructure, except as noted in the alternative description.
- Sufficient capacity in existing County conveyance infrastructure, except as noted in the alternative description.
- No outfall improvements needed.
- Land can be acquired through normal processes.
- No mitigation assumed at this level of alternative description.
- Geotechnical conditions are conducive to construction methods implied by the alternative description.

PROJECT ELEMENTS

Pump Stations

- NA

Conveyance Pipelines

- Interconnecting sewers.

Storage

- Tunnel, 3,000 feet, 96-inch diameter, 1.1 MG.

Treatment Processes

- NA

POLICY IMPLICATIONS

- ?

A schematic and map of the existing and proposed facilities are shown on the following page.

MAGNOLIA BASIN ALTERNATIVE 4A
BARTON, MURRAY, MAGNOLIA, NORTH BEACH CSO FACILITIES
KING COUNTY DNRP

kc507f7-7562.ai