LITTLE HUNTING CREEK SEWER REPLACEMENT

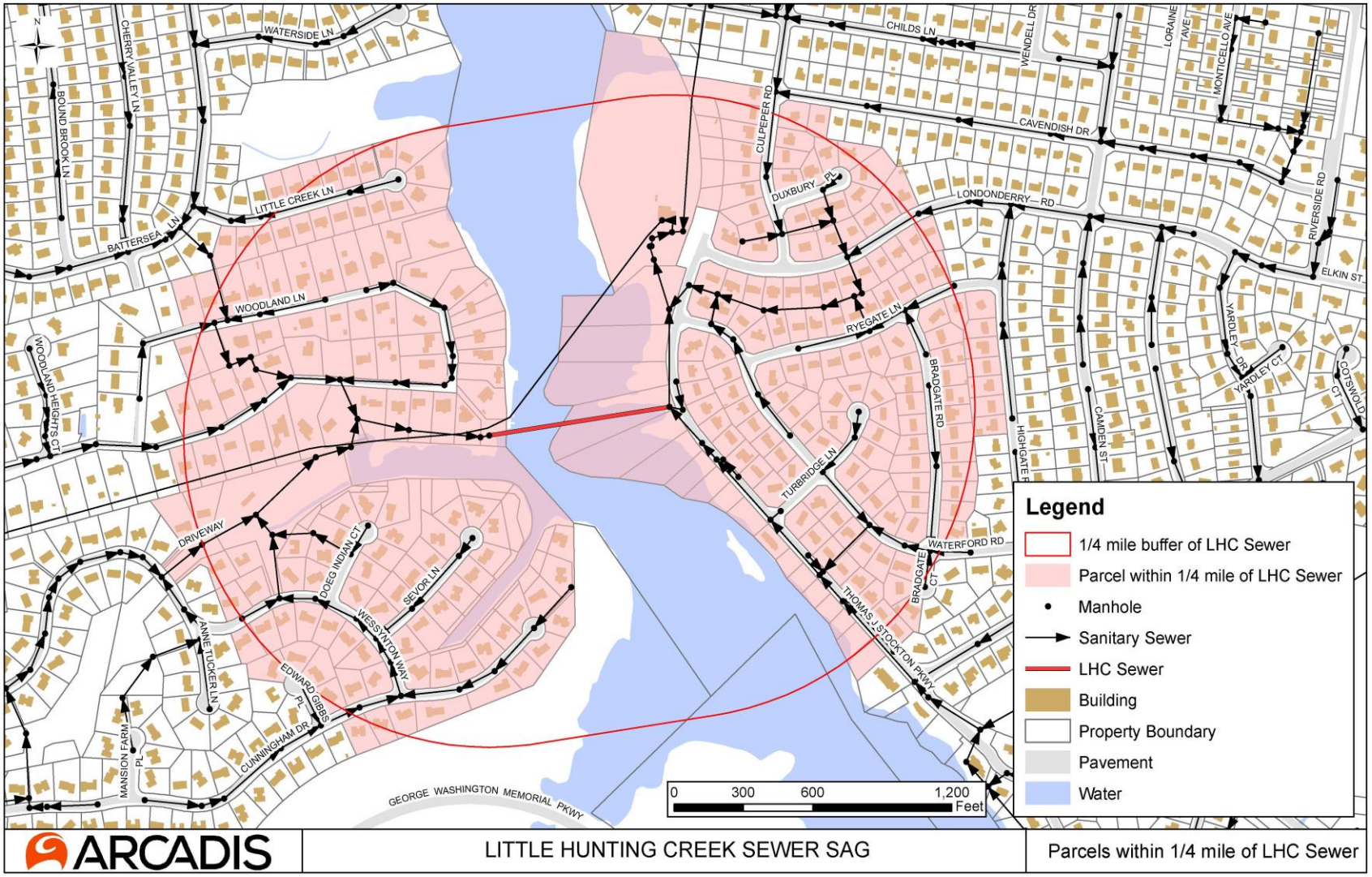
MVCCA
Environment & Recreation
Committee

September 4, 2019

Agenda

- Project Location and Background
- Site Study and Alternatives Analysis
- Design
- Construction

Project Location



Project Background

- Sanitary Sewer Crossing 800 LF of Little Hunting Creek
- 12” Cast Iron Pipe
- Constructed in 1961
- Extends from west end Woodland Lane to the east by Thomas J Stockton Parkway
- Serves approximately 480 residences

Little Hunting Creek Sewer Shed

Legend

Sanitary Sewer - Sewer Lines — County of Fairfax, Gravity Lines — Parcels — Vegetated

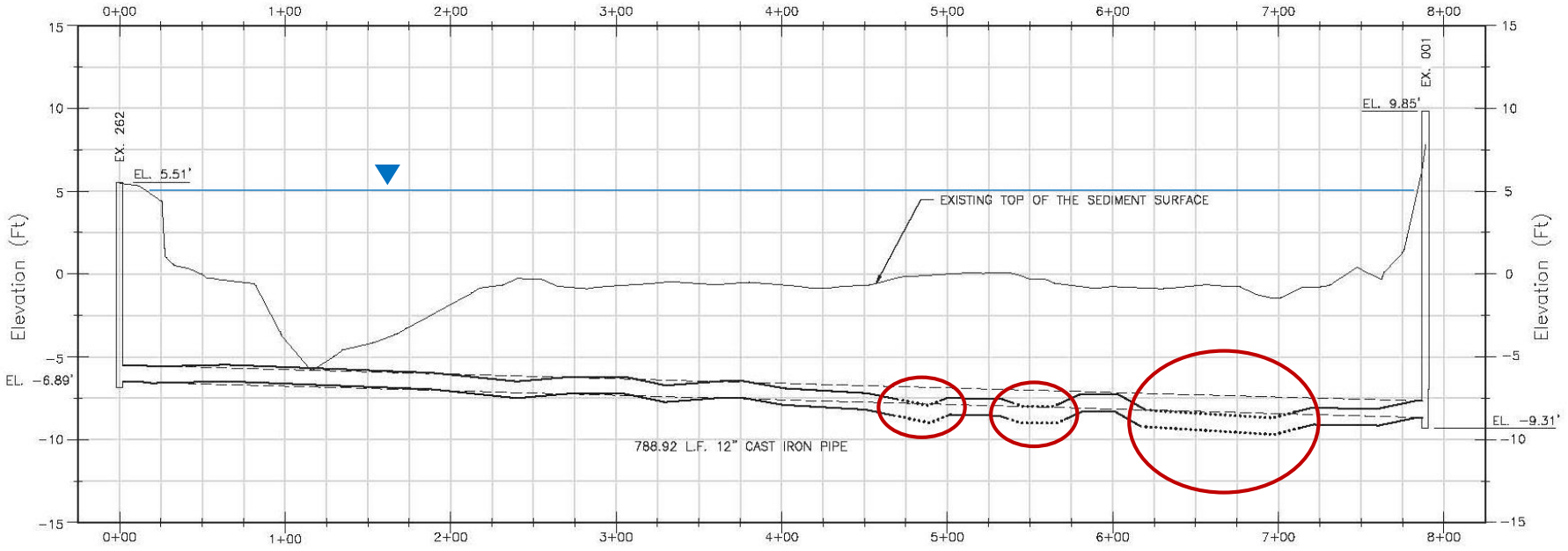
JURISDICTION, LINETYPE — Private, Force Main

County of Fairfax, Force Main — PS Sanitary Sewer - Pump Stations

Condition Assessment of Sewer

- Site visit
- Review of available information
  - Review maintenance history and records
  - Review of pipe video
- Plan and Profile Survey

Sewer Pipe Profile



PROFILE VIEW

SCALE: 1" = 50'−0" HORIZONTAL

SCALE: 1" = 5'−0" VERTICAL

LEGEND :

APPROXIMATE SEWER SAG PROFILE

PROBABLE ORIGINAL PIPE ALIGNMENT

Alternatives Analysis

Alternative	Pro's	Con's	Viable	Next Steps
Pipe Bursting	Utilizes the existing alignment along a known easement. Employs technology suitable for older cast iron pipe.	Does not allow for the pipe to be adequately corrected in profile – pipe could still have sags.	No	Recommend no further evaluation.
Cured in Place Pipe Lining	Utilizes the existing alignment along a known easement. Employs a rehabilitation method suitable for a pipe of this diameter and material.	Does not allow for the pipe to be adequately corrected in profile – pipe could still have sags.	No	Recommend no further evaluation.
New Pump Station	Eliminates need for work in the creek. Provides abandonment of the old line.	New pumping station will need to be maintained. Requires constructing a new small force main as described in sub-alternatives. Requires building pump station within HOA property.	Yes	May require flow metering to confirm flow and flow peaking quantities. Need to consider effects of flow to the downstream pump station.
New 6-inch Force Main Inside the Existing 12-inch Pipe	Minimizes extensive permitting. Uses existing easement. Eliminates creek crossing construction work	Requires cleaning existing pipe prior to pulling smaller pipe through. Need to determine if sag slopes are too steep to accommodate HDPE pipe.	Yes	Re-CCTV existing pipe with elevation readings to make sure pipe can act as a good conduit for a smaller pipe inside.
Tie-Into Existing 30-inch" DIP Force Main on West Side of Creek	Reduces length of force main construction. Eliminates creek crossing construction work.	Risk of 30" pipe integrity issues to accommodate pipe tapping.	Yes	Investigate pipe integrity. If early phase of construction finds pipe is not suitable, direct contractor to alternative options.
New Pump Station for a New Force Main on West Side of Street, Tie-In where Existing Force Main becomes a Gravity Sewer	Eliminates creek crossing construction work.	Requires community disruption along a significant distance.	No	Cost out linear footage of pipe and street repairs.
Jack and Bore	Minimizes any work in the creek Creates options for realignment and depth of alignment.	Too long of a reach for most contracting methods.	No	No further evaluation.
Horizontal Directional Drilling	Creates options for realignment and depth of alignment. Minimizes any work in the creek.	In order to achieve sufficient long-term bedding/stability, a deeper profile may be necessary that creates a siphon condition. Entire 789' has to be fused ahead of time. HDD permit is more stringent.	No	Will need to know more about the bed of the creek to determine depth of drilling Should be explored and costed out as a viable alternative for comparison.
Open Cut Pipe Replacement with Dam	Allows best assessment of bedding of pipe during construction. Reduces the amount of on-shore work in proximity of residences. Provides a long life expectancy.	Requires significant detailed permitting. Requires coffer-damming and related impacts in the creek. May require restoration of impacted wetlands.	Yes	Requires exploring permitting challenges Should be explored and costed-out as a viable alternative for comparison.
Do Nothing	Eliminates construction in the creek. No disruption to the community.	Continued maintenance for cleaning and inspection. Asset remains in poor condition and stays on the high-risk list.	No	Will be developed only as a baseline alternative for cost comparison.

Criteria Matrix: Open Cut with Pipe Replacement

Alternative 3: Open Cut Method with Coffer Dam				
Criteria	**Weight**	**Rating**	**Score**	**Comments**
Homeowner Disturbance	35%	4	1.40	Short term disruption. No long term disturbance to residence.
Maintenance	15%	4	0.60	Minimal to no maintenance for 30+ years.
Capital Cost	10%	2	0.20	Approximately $2.1 million.
Permits	25%	2	0.50	Extensive permitting could take between 6 - 18 months.
Easements	10%	3	0.30	One easement for relocation of new pipe, all other are temporary construction easements.
Schedule	5%	3	0.15	Expected project construction duration 8 months.
Summary	**100%**		**3.15**	

Weight x Rating = Score
Rating 1 (poor) - 5 (very good)
Weight percentage is relative importance to Fairfax County

Conceptual Replacement Design Layout

Key Design Investigations

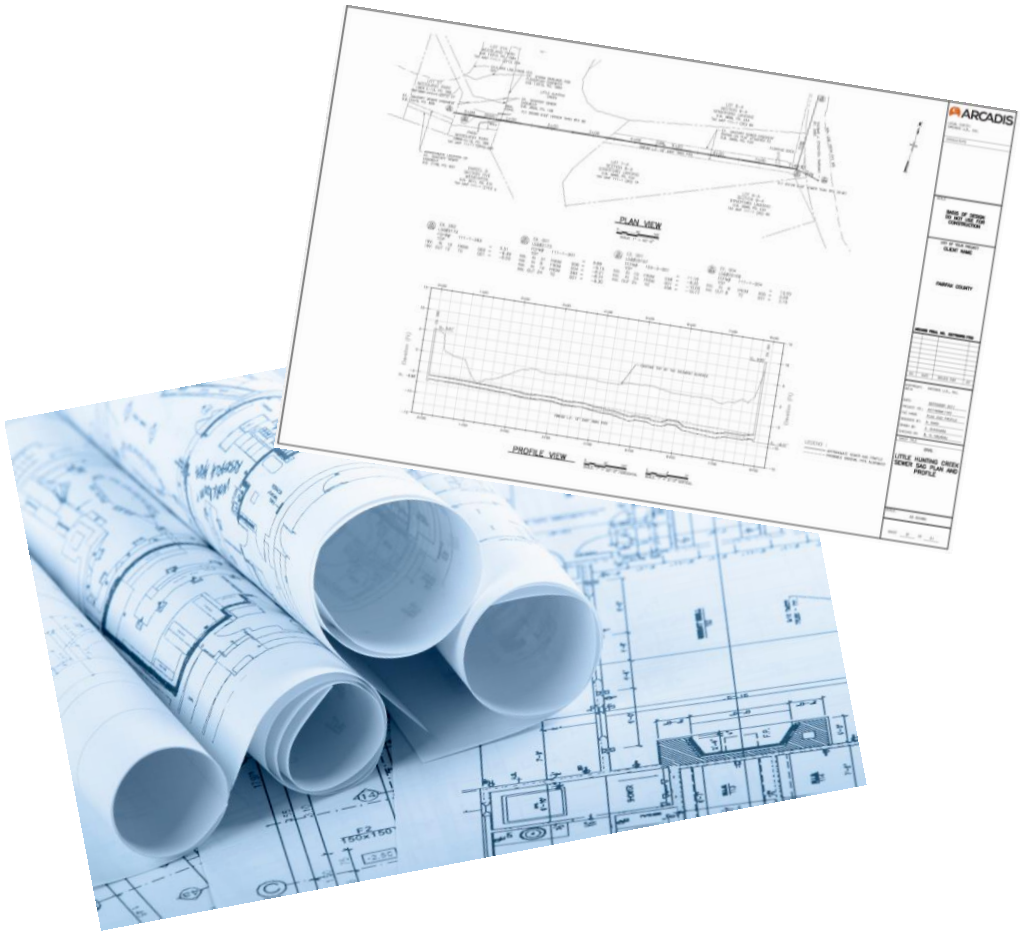
Wetlands Delineation

Vegetation Survey

Geotechnical Investigation

Field Survey

Development of Design Plans and Specification



- Alignment
- Pipe support
- Construction: dam, dewatering, trench support
  - Specialty contractor
- Contract documents

Permitting

- Goals
  - Provide appropriate solution and meet basic design criteria
  - Environmental stewardship
- Process
  - Early engagement
  - Permit development
  - Permit submissions
  - Review by agencies
  - Approval

Permitting

Regulatory Entity	Permit
Virginia Department of Environmental Quality (DEQ) Virginia Marine Resource Commission (VMRC)	Virginia Pollutant Discharge Elimination System (VPDES), CWA Sec. 404/401, VSMP-Stormwater Pollution Prevention Plan
United States Army Corps of Engineers (USACE)	CWA Sec. 404/401, Nationwide Permit #6
DEQ, VMRC, USACE	Tidal Water Joint Permit Application
VDOT	Various
Fairfax County	Compliance with Chesapeake Bay Preservation Ordinance DPWES Land Development Site and Building Permits
Virginia Department of Environmental Quality (DEQ)	Certificate to Construct (CTC)
United States Army Corps of Engineers	Nationwide Permit #12

Design Schedule

- Design: December 2017 – April 2019
- Easements
  - All easements recorded as of 8/2/19
- Permits
  - With easements recorded can JPA process is proceeding

Construction Considerations

- Creek construction
  - Cofferdam, pile supported pipe, underwater construction inside cofferdam
- Minimize impact to the park and boat ramp
- Schedule will minimize interference with recreational creek activities and consider time of year restrictions
  - Channel crossing to be completed “off season” to maximize recreational boating in creek
  - Time of year restriction February 15 – June 30

Pre-Qualified Contractors

- Due to specialized marine related work, contractors for the project have been pre-qualified.
- Pre-Qualified Marine Contractors
  - Corman Kokosing Construction Company
  - Garney Companies, Inc.
  - McLean Contracting Company

Construction Schedule

- Bid delayed by easements, permits
- Bid- February 2020
- Construction: April 2020 – March 2021
  - Creek construction July 2020-February 2021
- Construction Costs: $1.2 – 1.6 million dollars

Questions/Comments