

TECHNICAL MEMORANDUM

Date: April 27, 2026
To: Washington State Department of Ecology
From: Kevin Cook, PE; and Bita Nazyab, PE; BHC Consultants, LLC
Cc: Paul Richart, Don Ranger, Zach Putil; Alderwood Water and Wastewater District
Subject: Alderwood General Sewer Plan Amendment – Expanded Urban Growth Area



04/27/2026

Kevin Carl Cook, PE
BHC Consultants, LLC



04/27/2026

Bita Nazyab, PE
BHC Consultants, LLC

1. Executive Summary

This Amendment supplements the Alderwood Water and Wastewater District's (District) 2017 General Sewer Plan (GSP) to address the recently expanded Snohomish County Urban Growth Area (UGA) within the District's service area. The Amendment updates the service area, planning data and demand forecast, system analysis, capital improvement planning, and State Environmental Policy Act (SEPA) documentation for the added UGA only. The Amendment provides a planning level evaluation and focuses on service feasibility, conceptual local conveyance improvements, and a generalized assessment of downstream capacity.

The analysis indicates that wastewater flows generated by the expanded UGA can be accommodated through the construction of new lift stations and force mains, as well as the upsizing of gravity sewers to convey flows from the expanded UGA to the District's existing collection system. These facilities are assumed to be sized to accommodate projected buildout conditions. The timing and final configuration of these improvements should be informed by future data collection, flow monitoring, hydraulic modeling, and project-level design, consistent with the implementation approach identified in the 2017 GSP. All other portions of the adopted 2017 GSP remain unchanged and in effect.

2. Introduction

The District provides sanitary sewer service to a large portion of southwestern Snohomish County, including portions of the cities of Lynnwood, Bothell, Mukilteo, and Mill Creek, as well as surrounding areas of unincorporated Snohomish County. As development continues throughout the region, several areas within the District's existing service boundary remain unsewered. These areas present both near-term challenges and long-term opportunities for coordinated planning to ensure the efficient extension of sewer service, protection of public health and water quality, and consistency with regional growth management objectives.

This Technical Memorandum documents a proposed Amendment to the District's 2017 GSP to incorporate sewer planning for areas added to the UGA by Snohomish County in 2025. The purpose of this Amendment is to ensure consistency between land use planning and utility planning and to demonstrate that adequate sewer capacity can be provided to support planned urban development in accordance with the Growth Management Act (GMA) and Washington Administrative Code (WAC) 173-240-050.

2.1 Relationship to the 2017 General Sewer Plan

This Amendment focuses on the recently adopted Snohomish County UGA located in the southeastern portion of the District, which was not previously included in the adopted 2017 GSP and requires updated evaluation of service area boundaries, wastewater demand, system capacity, and capital improvement needs. This Amendment is intended to supplement the District's adopted 2017 GSP and does not replace or reissue the full GSP, addressing only those elements of the GSP that are affected by the recent expansion. This is also consistent with the 2017 GSP's Approach and Outcomes, under which planning assumptions and capital needs are refined over time using updated land use information, field observations, monitoring data, and subsequent system analyses. Wastewater generated from the expanded UGA will be conveyed through the District's collection system and ultimately treated by King County's regional wastewater treatment facilities, consistent with existing regional service arrangements.

The Sections of this Amendment correspond to the chapters of the 2017 GSP as summarized in Table 1.

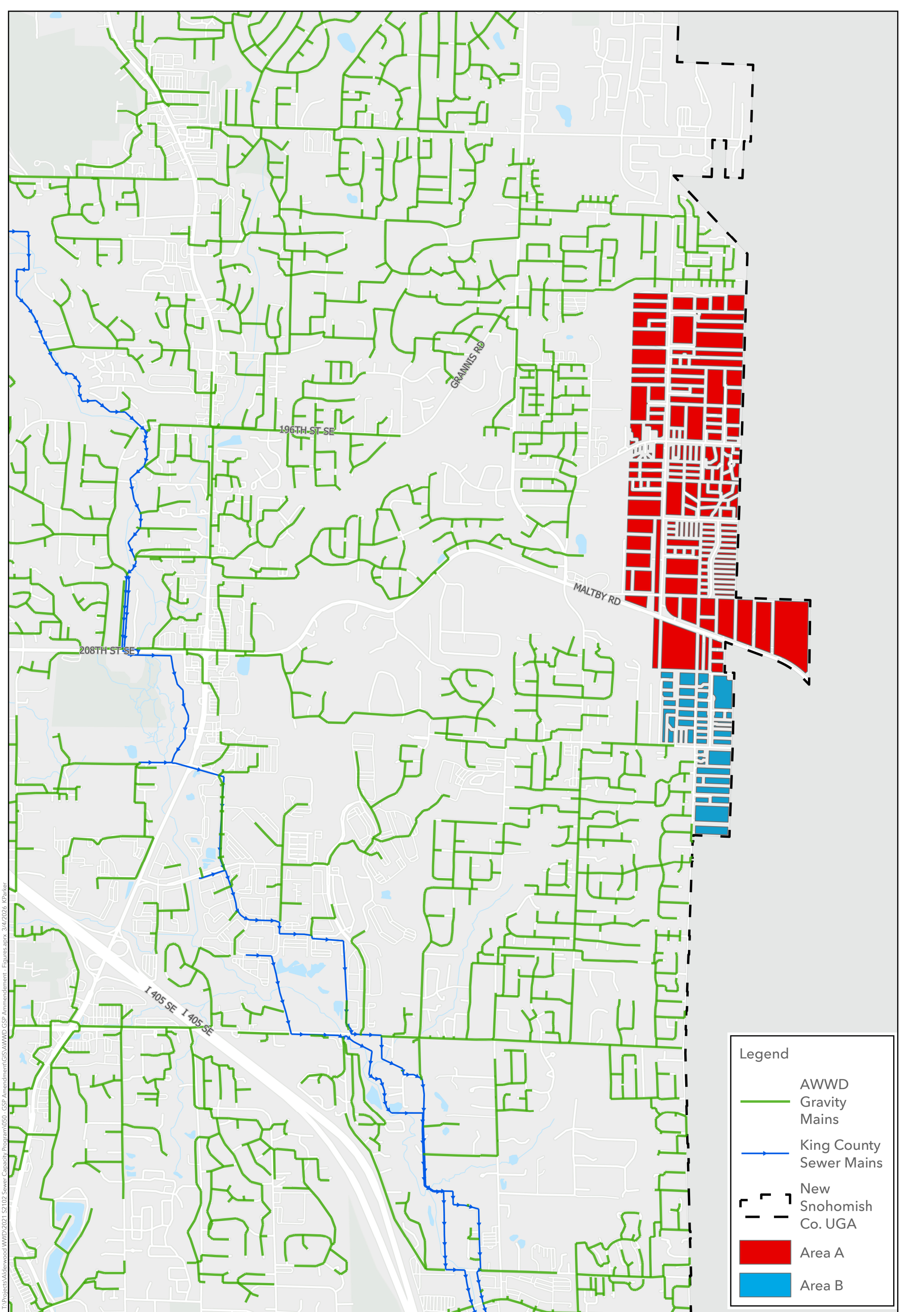
Table 1
GSP Amendment Sections and Corresponding 2017 GSP Chapters

Amendment Memo Section	Corresponding 2017 GSP Chapter	Nature of Update
Section 3 - New Service Area Added to UGA with Land Usage Summary	Chapter 1 - System Description	Supplements the wastewater service area mapping to reflect the expanded UGA.
Section 4 - Flow Projections and Corresponding Capacity	Chapter 3 - Planning Data and Demand Forecast	Provides planning-level wastewater flow projections for the expanded UGA.
Section 5 - Capacity Analysis	Chapter 4 - System Analysis	Planning-level review of how new areas may be served.
Section 6 - Capital Improvements Plan Updates	Chapter 10 - Capital Improvement Program	Adds incremental, conceptual CIP items associated with the expanded UGA; no changes to previously adopted CIP projects.
Section 7 - SEPA Updates	Appendix G - SEPA Checklist and Determination of Non-Significance	Updates SEPA documentation to reflect the expanded planning area.

3. New Service Area Added to UGA with Land Usage Summary

The expanded UGA introduces new areas into the District's long-range sewer planning area. These areas are currently unsewered and are characterized by low-density residential development, vacant land, and environmentally constrained areas. Future land use designations adopted by Snohomish County anticipate urban-level development densities within these areas. This Section summarizes the geographic extent of the added service area, existing land use conditions, and land use assumptions that form the basis for updated wastewater demand projections.

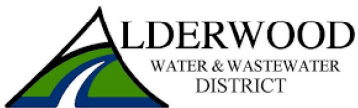
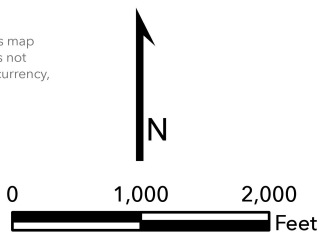
The expanded UGA includes approximately 373 acres and represents an approximately 2% increase in the District's service area. For purposes of this Amendment, the expanded UGA is divided into two planning areas, Area A and Area B, as shown in Figure 1. Area A consists of the portion of the expanded UGA north of 208th Street and was classified as Urban Medium Density Residential (UMDR), under the revised zoning associated with the expanded UGA, with an area of approximately 272 acres and a maximum of 18 dwelling units (DUs) per acre. Area B consists of the portion of the expanded UGA south of 208th Street and was classified as Urban Low Density Residential (ULDR), with an area of approximately 59 acres and a maximum of 6 DUs per acre. The remaining 42 acres, located in the southeast corner of Area A, will be classified as Institutional Parcels for the remainder of this Amendment. These parcels have been designated for school use, with flow projections derived from pre-existing septic permits.



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Expanded Urban Growth Area

General Sewer Plan Amendment
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Figure

4. Flow Projections and Corresponding Capacity

Wastewater flow projections for Areas A and B were developed using planning-level assumptions generally consistent with those applied in the 2017 GSP, including population projections, land use densities, and unit flow factors. Average daily and peak hour wet weather flows were estimated to evaluate the impact of the expanded service area on the District's collection and conveyance system. These projections provide the basis for assessing the impacts to existing downstream facilities and previously planned improvements, maintaining compliance with regulatory standards.

Projected DUs were estimated by applying the maximum assumed residential density for each planning area to the total planning area. Using methodology consistent with the 2017 GSP, those DU estimates were then used to calculate average dry weather flow and peak planning flow for collection system evaluation purposes.

Flow projections for the subset of Institutional Parcels within Area A were developed based on available information for the existing elementary school (Ruby Bridges) located within this subset. The school's permitted septic discharge was used as a baseline indicator of demand and was converted to an equivalent peak flow using planning-level assumptions for operating hours, wet weather conditions, and diurnal variation. This representative peak flow was then scaled to reflect the potential buildout of up to three similar institutional uses within the area.

These planning-level projections are intended to support a feasibility assessment for the expanded UGA and to identify improvements that may be required to serve the area. The projections are not intended to replace future project-specific analyses, which should incorporate updated land use data, flow monitoring, and hydraulic modeling as development proceeds. Estimated flow values are presented in Table 2.

Table 2
Projected Wastewater Flows

Facility / Basin	Acres	Dwelling Units Per Acre	Total Dwelling Units	Average Dry Weather Flow (gpm)	Peak Projected Flow (gpm)
Area A	272	18	4,896	493	1,972
Area B	59	6	354	36	143
Institutional Parcels	42	N/A	N/A	78	240

5. Capacity Analysis

This Section evaluates how wastewater flows from the expanded UGA can be conveyed through the District's sewer system and the impacts to existing and planned infrastructure identified in the 2017 GSP. The analysis considers projected flows described in Section 4, surrounding topography, and available conveyance capacity. Results identify conceptual conveyance improvements and proposed additions to the Capital Improvement Program (CIP). Cost estimates presented in this Section are for planning purposes only and will be refined through future hydraulic modeling and project-level design.

The 2017 GSP identified recommendations and plans to build off previous hydraulic analyses by improving data collection and analysis efforts with specific emphasis on flow monitoring data collection and hydraulic model construction and calibration. In the absence of detailed information for advanced capacity analysis, the focus of this effort emphasized feasibility of local collection and connection to existing conveyance facilities, as well as potential improvements needed to service the expanded District service areas. The analysis considered topography, basin boundaries, existing sewer infrastructure, and operational constraints, and does not include new hydraulic modeling.

Findings indicated that topographic conditions prevent wastewater from Area A from discharging to the existing gravity sewer system to the west via gravity conveyance alone. The land generally slopes to the east, requiring construction of a new lift station and force main to convey flows to the existing collection system to the west. Area A can be served via localized gravity conveyance, with all flows directed to a lift station (Area A lift station) that discharges through a force main to the existing downstream system. Based on the projected flows summarized in Section 4, Area A is expected to generate approximately 1,972 gpm of peak flows. While the Area A lift station will transport wastewater out of Area A, the existing gravity sewer does not currently have the capacity to convey these flows. As such, upsizing the gravity sewer from 8-inch and 15-inch, to 21-inch and 24-inch respectively, allows for the additional flow generated in Area A.

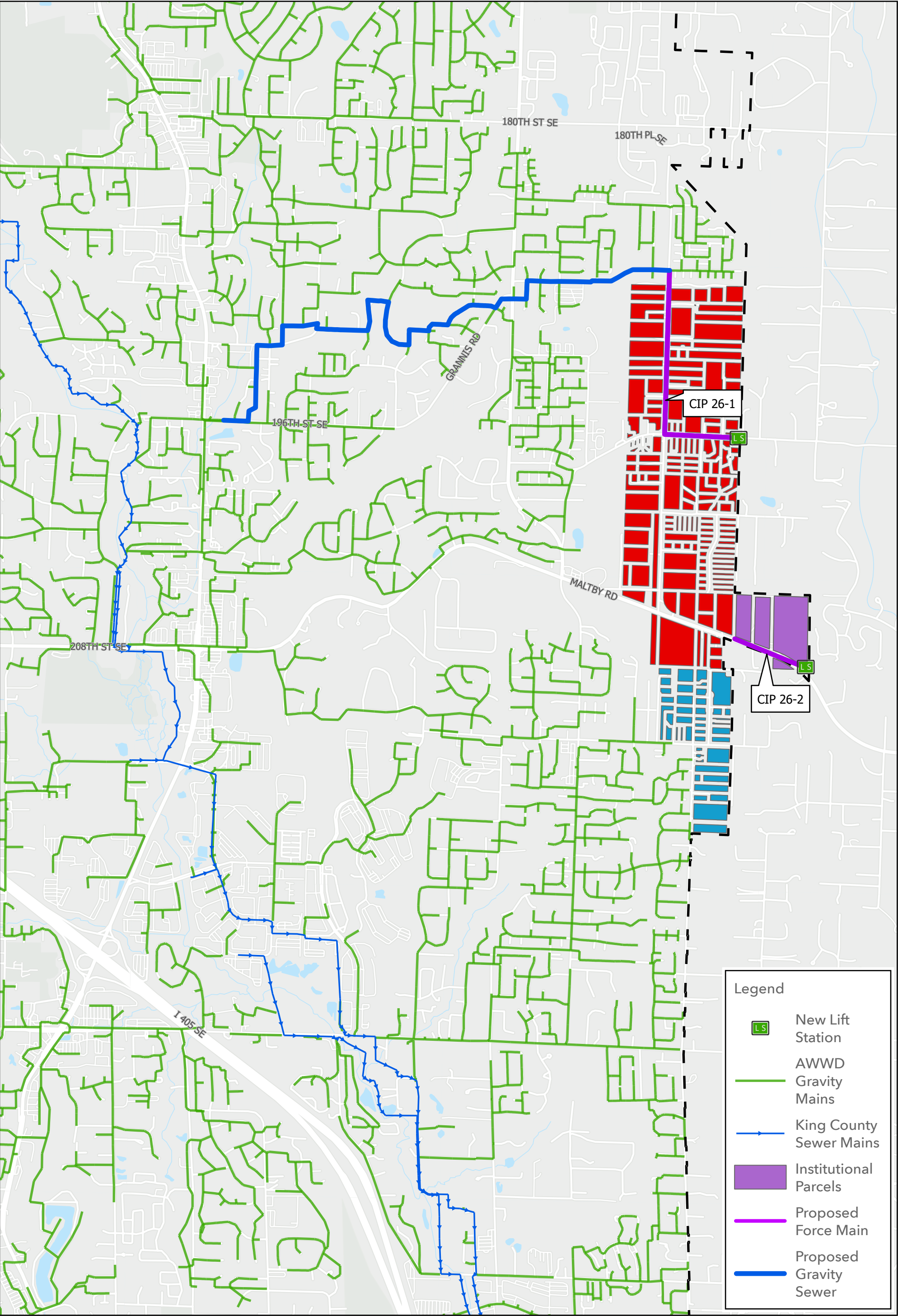
The Institutional Parcels within Area A are also constrained by topographic conditions, preventing wastewater from discharging via gravity alone. As such, a small lift station (Institutional Parcels lift station), conceptually sized at approximately 500 GPM will be required within this subarea to service up to three potential schools. A force main will be required to connect these parcels to the proposed localized gravity system within Area A. The localized gravity sewer within Area A will then convey flows from the Institutional Parcels to the Area A lift station, where they will be pumped to the existing system.

The preferred planning approach is to construct the upsized gravity sewer either as a single project or in phased segments, depending on funding availability. While construction of the Area A lift station and force main may occur in tandem with the gravity improvements, neither can become fully operational at peak demand until the downstream upsizing is complete. The Area A lift station and force main are assumed to be sized for full buildout of Area A and are critical to ultimate system operation.



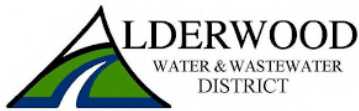
Flows from Area B can be conveyed directly to the existing gravity sewer network without additional downstream improvements. The projected peak flow of approximately 143 gpm is relatively small and can be distributed across multiple connection points to the west, resulting in minimal impacts to the existing collection system.

Based on the capacity analysis for localized collection and impacts to existing facilities, both Area A and Area B can be served via localized collection. Figure 2 illustrates the proposed conceptual lift station locations, the proposed force mains alignment, and the gravity sewer segments identified for upsizing. Localized collections within Area A and Area B are not shown and not evaluated for this planning-level analysis and are assumed to be a part of localized development. The location of the Area A lift station and the Institutional Parcels lift station may be adjusted based on final site constraints, including topography and property availability. If the stations are located outside of the UGA, the incoming gravity sewer and lift station shall not serve properties located outside of the UGA boundary.



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Preferred CIP Alignment

General Sewer Plan Amendment
Alderwood Water and Wastewater District
April 2026

Figure

6. Capital Improvement Plan Updates

Based on the flow projections and resultant capacity analysis, the following CIPs and updates to the 2017 GSP were identified. The planning-level cost estimates of the identified CIPs are provided to support near-term sewer availability planning for Area A and the Institutional Parcel subset. Inclusion of this project in the GSP Amendment does not constitute final project approval but establishes a framework for future capital planning and funding decisions. The project is additive to the District's adopted CIPs presented in the 2017 GSP and subsequent updates; no previously identified CIPs are modified by this Amendment. Capital improvement cost estimate was done in 2026 dollars, with cost of material, labor, engineering, and administration considered. The proposed CIP additions are provided in Table 3 below.

Project implementation and funding mechanisms will be determined through the District's development review and capital planning processes.

Table 3
Proposed CIP Addition

CIP Number	Project Description	Order of Magnitude Cost	Estimated Timeline
26-1	Area A - Install Area A lift station, force main, and upsize downstream gravity sewer	\$29.8 million	6 Year CIP (from 2026)
26-2	Institutional Parcels – Install Institutional Parcels lift station and force main	\$2.8 million	10 Year CIP (from 2026)
Note: 1) In order to be consistent with cost estimating approach utilized in the 2017 General Sewer Plan, the original cost per linear foot (lf) of new pipe was escalated to 2026 dollars. Cost is reflective of all work through final completion, encompassing internal staff time and associated costs at a planning level, and assumes construction of the full conveyance improvements to accommodate buildout conditions.			

7. SEPA Updates

Adoption of this GSP Amendment constitutes a non-project action under SEPA, Chapter 43.21C Revised Code of Washington (RCW). SEPA requires governmental agencies to consider the environmental impacts of a proposal before making decisions. A SEPA checklist is provided in Attachment A to reflect the expanded service area and evaluate the potential impacts of expanding the GSP service area to include the new UGA. Future sewer infrastructure projects identified in this Amendment will undergo separate, project-level SEPA review as required.

8. Conclusions

The planning-level analysis conducted in this Amendment indicates that wastewater flows generated by the expanded UGA can be conveyed through the District's system through the construction of new lift stations and force mains, as well as upsizing the gravity sewers connecting Area A to the existing trunk sewer system. These improvements are assumed to be sized to accommodate projected buildout conditions and have been identified as CIPs in this Amendment.

Depending on development timing and funding considerations, the improvements could be implemented incrementally; however, the primary planning assumption reflected in this Amendment is construction of the full conveyance improvements. Final configuration, timing, and design will be refined through future hydraulic modeling, data collection, and project-level engineering consistent with the implementation approach identified in the 2017 GSP.