Forest Grove

Westside Planning Project

David Hill Area
Purdin Road UGB Area
Elm Street UGB Area

Infrastructure Overview

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Forest Grove Westside Planning Project
Infrastructure Overview

Project Information

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TABLE OF CONTENTS

Page

1. INTRODUCTION 2

2. FINDINGS 2

2.1 Sanitary Sewer Services 2

2.1.1 David Hill Area 3

2.1.2 Purdin Road UGB Area 4

2.1.3 Elm Street UGB Area 4

2.2 Stormwater Services 5

2.2.1 David Hill Area 5

2.2.2 Purdin Road UGB Area 5

2.2.3 Elm Street UGB Area 6

2.3 Water Services 6

2.3.1 David Hill Area 7

2.3.2 Purdin Road UGB Area 8

2.3.3 Elm Street UGB Area 8

LIST OF FIGURES

Figure 1. Westside Planning Area 9

Figure 2. Existing Sewer – David Hill Area 10

Figure 3. Existing Sewer – Purdin Road UGB 11

Figure 4. Existing Sewer – Elm Street UGB 12

Figure 5. Existing Storm – David Hill Area 13

Figure 6. Existing Storm – Purdin Road UGB 14

Figure 7. Existing Storm – Elm Street UGB 15

Figure 8. Existing Water – David Hill Area 16

Figure 9. Existing Water – Purdin Road UGB 17

Figure 10. Existing Water – Elm Street UGB 18

1. INTRODUCTION

This report provides a planning level assessment and description of existing sewer, stormwater and water utility infrastructure within and near the City of Forest Grove – but specifically targeting three areas proposed for future urban development: the David Hill / Gales Creek Road planning area (DH), the Purdin Road UGB (PR), and the Elm Street UGB (ES). The three planning areas are illustrated in Figure 1. These three areas are being assessed to address and resolve land use and infrastructure needs to guide future development.

The David Hill/Gales Creek planning area is located northwest of the City, and includes steep slopes, seasonal drainage ravines and landslide hazard areas that create unique challenges for road and utility infrastructure development. Most of DH is currently managed as agricultural land with scattered single-family homes. Generally south of Watercrest Road, the larger planning area includes densely developed neighborhoods. The northern end of the planning area is outside of the City, bounded to the east by NW Thatcher Road, but within the Urban Growth boundary. It should be noted that the primary focus in this planning area is on the area north of Watercrest Road. The Gales Creek area is included in Figure 1 primarily to address issues related to context and connectivity.

PR planning area is located north of the City (east of the DH planning area), on a relatively flat valley floor that is currently farmed and has fine-textured floodplain soils, potentially shallow groundwater, and is bordered by riparian areas to the north. Lands adjacent to the south (within the City) are agricultural; lands to the southwest are residential, including the Forest Grove High School complex, and the east side of the parcel is bounded by the Oregon Highway 47.

The ES planning area is located south of the City with regional access via Oregon Highway 47 to the north. It is currently farmed, but is directly adjacent to industrial lands and a bus barn, as well as one of the City's premiere Historic Landmarks (the Alvin T. Smith House), and is ¼ mile from the Fernhill Wetland Trail system.

2. FINDINGS

This report is intended to provide project planners with a baseline assessment of existing and planned water, sewer and stormwater utilities which will inform and support planning and development decisions in the Westside Planning areas. The information gathered is based on review of the following plans and documents:

- Sanitary Sewer Master Plan Update, Clean Services, March 2009
- Storm Drainage Master Plan, City of Forest Grove, November 2007
- City of Forest Grove Water Master Plan Update, HDR, August 2010.
- David Hill Urban Reserve Concept Plan, Vista Planning & Portland State University, June 2011
- West Basin Master Plan, 2013.
- Forest Grove Westside Plan Kick-off Meeting Minutes, October 30, 2014
- Forest Grove Comprehensive Pan, 2014

2.1 Sanitary Sewer Services

The City of Forest Grove operates a local sewer utility that feeds into the regional sanitary sewer system operated by Clean Water Services (District). The District provides wastewater collection and treatment to over a 122 square mile area in the Tualatin River watershed. The District operates four wastewater

treatment plants and 309 pump stations, working with twelve member cities. One wastewater treatment plant is located in southern Forest Grove east of Fern Hill Road and south of Highway 47. This facility serves the City of Forest Grove, the community of Gaston, and the City of Cornelius. Secondary treatment is provided using an activated sludge process followed by ultraviolet disinfection. This facility is connected to treatment facilities in Hillsboro and Rock Creek with all three being integrated in terms of operational requirements and responsibilities.

Clean Water Services updated the regional *Sanitary Sewer Master Plan* in 2009 (MP9), which is incorporated into the City of Forest Grove *Comprehensive Plan* by reference. The primary purpose of the MP9 was to assess the capacity of District's wastewater collection facilities, and to identify improvements that will extend service to areas anticipated to develop. The Purdin Road UGB area was included as a future growth area in the MP9. In 2013, the *West Basin Facilities Plan* (MP13) was prepared for the District to address specific improvement needs in Forest Grove, Hillsboro and other smaller communities in western Washington County. The Purdin Road UGB area was also included as a future growth area in the MP13 (and was assumed to develop with industrial uses), along with the David Hill Urban Reserve. The David Hill planning area under consideration as part of the Westside Planning Project was not included.

Existing sanitary sewer service facilities within the three planning areas and potential constraints that may affect future development are discussed in the sections below. See Figures 2, 3 and 4 for existing sewer line locations near the three areas.

2.1.1 David Hill Area

Existing Facilities

There is an existing 8 inch sewer line on the eastern side of the David Hill planning area (DH) on David Hill Road and an 8 inch line on Huntsman Street at the southwestern part of the hill and 8 inch lines all along the southern boundary. The area is currently being served by individual septic tank systems.

Planned Facilities

According to the *Forest Grove Sanitary Master Plan*, it is expected that two major trunk lines will ultimately serve development in the David Hill area. The first would be located on David Hill Road and the second would be located on Thatcher Road. The location where these two lines would meet is still under evaluation through the development process. The pipe on David Hill Road should be constructed deep enough so that the collection system can be extended to the south below a small ravine.

According to the Master Plan, a 15-inch pipe will be required between the existing collection system and the point of juncture of the two trunks with a required capacity of 1,100 gpm (gallons per minute).

The David Hill Road truck required pipe diameter is 12 inches, and the required capacity is 700 gpm. The Thatcher Road required pipe diameter is 12 inches, and the required capacity is 700 gpm.

Issues and Constraints

Based on review of the referenced plans and other documents, the following is a list of key issues that could affect future development in the David Hill area.

- The closest existing sewer line is located within the residential development along the southeastern border of DH. There is a stream corridor, Metro Title 3 water quality management areas, and a small ravine with steep slopes separating these lines from the majority of the planning area.

- Additional capacity may be needed depending on the nature of proposed development an anticipated water service demand. More research will need to be done as the refinement planning process continues.

2.1.2 Purdin Road UGB Area

Existing Facilities

There is an 8 inch sewer line that runs along Hartford Drive, both 8 and 12 inch lines running along 37th Avenue. Additional sewer lines to be considered as existing facilities are two proposed sewer mains at the intersections of Main Street/David Hill Road and A Street/David Hill Road. These are to be constructed as part of the Silverstone Subdivision. A second sewer main is to be constructed in David Hill Road from Highway 47 to existing development.

Issues and Constraints

Based on review of the referenced plans and other documents, the following is a list of key issues that could affect future development in the Purdin Road UGB area.

- It is anticipated that the Clean Water Services Council Creek sewer line has capacity to accommodate development in the planning area. Based on preferred land uses identified during the planning process, this conclusion will be confirmed. Review of the *West Basin Facility Plan* (2013) addresses issues with the alignment of the Council Creek trunk line (which is also intended to serve the community of Banks north of Forest Grove). This Plan does not show any further system improvements in the immediate area through 2035.
- CWS plans identify the need for a future North Forest Grove trunk line through the Purdin Road planning area. A specific alignment for this line will need to be discussed with CWS as site development concepts are developed. CWS plans also identify several proposed lateral lines within the Purdin Road planning area which have been revised through more recent planning and engineering design efforts associated with the Silverstone subdivision and the David Hill Road extension project.
- Consideration may need to be given to an optimal alignment of utilities through the Purdin Road planning area to accommodate physical and/or topographical constraints along Thatcher Road to establish connections with the David Hill planning area. An alignment could be located outside of the existing UGB, but then could not follow a street alignment.

2.1.3 Elm Street UGB Area

Existing Facilities

There is a 15 inch sewer line that runs along Taylor Road and an 8 inch line on Elm Street that dead ends about 275 feet short of the area.

Issues and Constraints

Based on review of the referenced plans and other documents, the following is a list of key issues that could affect future development in the Elm Street UGB area.

- Lack of depth of the sewer line serving the area. The property drops off heading south towards the Tualatin River. It is expected that this line will serve the northern half of the property but not the southern half. Options to service this area will need to be explored.

- Additional capacity may be needed depending on the nature of proposed development an anticipated water service demand. More research will need to be done as the refinement planning process continues.

2.2 Stormwater Services

The City of Forest Grove operates a local surface water management utility. They work together with Clean Water Service, (District). The District is the regional Stormwater Management utility for Urban Washington County. In cooperation with Washington County and the twelve cities in the District, they build maintain and enhance the public drainage system to meet quality regulations set for the Tualatin River drainage area by the Oregon Department of Environmental Quality. Prior to any subdivision approvals, the stormwater facilities for conveyance, detention and treatment must be installed. The operations and maintenance of the facilities are the responsibility of the City.

The City of Forest Grove has seven major stormwater basins. All three planning areas are located in the Tualatin River Watershed. David Hill Planning Area and Elm Street UGB area lie in the Gales Creek sub watershed and the Purdin Road area lies in the Dairy-McKay Creek sub watershed. The conveyance system in the city is composed of open drainage ways, ditch systems, gravity storm drainage pipelines, and 1 small pump station.

Based on the existing *Comprehensive Plan*, stormwater facilities should be designed to mitigate runoff conditions to accommodate future land development. These facilities should be co-located to complement other infrastructure facilities and to avoid conflict. The use of low impact design techniques to reduce stormwater runoff is encouraged. Collectively design and maintenance of an integrated water, stormwater and waste water system is encouraged to reduce pollution, minimize energy needs, maximize efficiency, and protect/restore ecological systems.

See Figures 5, 6, and 7 for existing stormwater line locations near the three planning areas.

2.2.1 David Hill Area

Existing Facilities

The David Hill Planning area contains no built stormwater management infrastructure. Typically stormwater flows downhill towards existing creeks. Stormwater from the southwestern portion of DH flows to the Gales Creek basin floodplain, and the northern portion of DH drains to the Council Creek system. Existing vegetation consists of forest, tree farms, and small agricultural and horticultural activities. The primary soil is Laurelwood silt which has very limited infiltration capabilities. Approximately 31 percent of the area contains steep slopes which could pose a risk for landslides and is not advisable for low impact development (LID) stormwater facilities. The David Hill area is not located within an existing floodplain.

Issues and Constraints

Primary issues and constraints to the establishment of stormwater management facilities in the David Hill planning area include:

- The presence of steep slopes throughout much of the planning area
- Low water infiltration soils

2.2.2 Purdin Road UGB Area

Existing Facilities

The Purdin Road planning area is located on relatively flat valley floor that is currently farmed and has fine-textures floodplain soils. The area is bordered by riparian habitat to the north and east and includes

the headwater tributaries of Council Creek. There is an existing housing subdivision located to the southwest that has an existing stormwater conveyance system. Along the south edge of the PR area, Silverstone Subdivision is proposing to install a stormwater conveyance system that will transfer stormwater from David Hill Road and Silverstone to the south. This stormwater system is also expected to convey a portion of the stormwater from the south PR area.

Issues and Constraints

There are issues for overland drainage of the area and some localized flooding occurs. Groundwater is potentially shallow. Flat topography does not promote positive flows.

2.2.3 Elm Street UGB Area

Existing Facilities

Existing stormwater facilities in the Elm Street area are limited with water generally flowing toward the Tualatin River. There is a stormwater manhole located about 620 feet away from the site on Elm Street. The site is relatively flat.

Issues and Constraints

Flat terrain does not promote positive flows. No other constraints to stormwater management related to development of this site are anticipated at this point.

2.3 Water Services

The City of Forest Grove belongs to the Joint Water Commission (JWC), a joint operation for the treatment, transmission, and storage of municipal and industrial water owned by the member agencies of the cities of Forest Grove, Hillsboro, and Beaverton, and the Tualatin Valley Water District.

JWC water is supplied to Forest Grove from the JWC Fern Hill Reservoirs through a 24” diameter transmission main (1/2 of the capacity is owned by City of Hillsboro). This water is controlled at a metering station located on 10th Ave near the Elm Street UGB.

Residents of Forest Grove also receive their water from a City-managed system. The City of Forest Grove has intake facilities within the Clear Creek watershed on Clear Creek, Roaring Creek, Thomas Creek, Deep Creek and Smith Creek. The City has a treatment plant that has a capacity of 3.7 million gallons per day (mgd). The filtered water is piped by gravity to the City’s 4.27 million gallon covered reservoir located adjacent to the water treatment plan. The city also has a 1.0 million gallon reservoir built in 1985, and located on David Hill Road within the DH planning area.

The City’s water distribution system has three pumping facilities:

- Raw water booster pump station along the transmission main to the City water treatment plan;
- David Hill pump station; and
- Watercrest pump station

The David Hill pump station was the primary means of moving water from the main (lower) pressure zone that encompasses much of the city, to the David Hill reservoir. The Watercrest pump station now feeds the David Hill reservoir and the Upper Pressure Zone that serves about 120 acres and nearly 600 connections in the northwestern portion of the City. The David Hill reservoir is now used as a back-up.

The City’s water distribution system includes pipes ranging in size up to 24-inches in diameter. Pipe types include cast iron, ductile iron, copper, steel, wrought iron, galvanized iron and polyvinyl chloride (PVC). Newer distribution pipes are largely ductile iron.

The City adopted a *Water Master Plan* in 2010 to evaluate water system facilities and to determine water supply requirements and system improvements needed to serve expected housing and employment growth in the city. This plan is based on population forecasts for the service area at the time the plan was prepared.
The City's *Water Master Plan* notes that the limiting supply factors for the City are the JWC transmission line's capacity of 6.1 mgd, and the 1.5 mgd reliable summertime capacity from the Clear Creek watershed. The City's current peak demand is approximately 6. 0 mgd with a forecasted demand expected to exceed the 7.6 mgd combined supply capacity by approximately 2023.

Existing water service facilities within the three planning areas and potential constraints that may affect future development are discussed in the sections below. See Figures 8, 9 and 10 for existing water line locations near and within the planning areas.

2.3.1 David Hill Area

Existing Facilities

While a 12-inch water line is currently provided along David Hill Road in the planning area, residents in the planning area typically rely on well water. The area is largely zoned/planned for single family residential with a mixed use area on the NW quadrant of David Hill Road and Thatcher Road established during the 2014 *Comprehensive Plan* update.

Issues and Constraints

Based on review of the referenced plans and other documents, the following is a list of key issues that could affect future development in the David Hill area.

- The City's existing water system can't supply water above an elevation of 440 feet above sea level with adequate pressure. DH has area that exceeds this elevation. At this time, the City is planning for the installation of a new reservoir that will be able to support service to this area.
- The City of Forest Grove *Water Master Plan Update* recommends building 1.0 million gallons of new storage at higher elevation to serve David Hill by 2045. This reservoir could also serve long-term (post 20-years) development in the Urban Reserve area to the west of the UGB. A reservoir elevation of 693 feet above sea level is identified. A pump station would be required to fill from Upper Pressure Zone (UPZ) and pressure reducing valves (PRV) would be needed to allow storage to serve UPZ.
- The *Water Master Plan* also includes the recommendation to add a new 10 inch pipe extending from the current pipe on David Hill Road, along this facility through the planning area. No water lines are currently planned to extend along Thatcher Road to the northern portion of the planning area or along Gales Creek Road to reach the southern edge of David Hill.
- There are water lines in the residential neighborhoods along the southeastern border of the David Hill planning area. There is a stream corridor, Metro Title 3 water quality management areas, and a small ravine with steep slopes separating the water main from the majority of the planning area.
- Prior to the 2014 update of the City's *Comprehensive Land Use Plan*, the David Hill area above the 440 foot contour assumed to develop at an average density of 1 dwelling unit per acre with well water service. The 2014 Comprehensive Land Use Plan continues the one unit

per acre density above the 440 foot contour. The 2014 Comprehensive Plan and underlying zoning calls for an average of 4 dwelling units per acre below the 440 foot contour. This added residential development may require new or expanded water serve facilities in the planning area. Additionally the urban reserve area to the west of David Hill has been identified for long-term development up to 20 dwelling units per acre.

2.3.2 Purdin Road UGB Area

Existing Facilities

According to the Forest Grove *Water Master Plan Update* existing water storage serving the Purdin Road UGB area includes 4.27 million gallons at the Forest Grove water treatment plant and 2.8 million gallons from the JWC Fern Hill Reservoir. Water demand for the future Purdin Road Area was modeled under a 2050 maximum day condition (including fire flow). An 8-inch diameter pipe extending from the intersection of B Street and Handford Drive was used in the model analysis. Demand at the end of the pipe was 229 gpm (0.33 mgd). There is also an 8-inch water pipe that runs along 37th Avenue immediately south of the planning area.

However, it should be noted that the *Water Master Plan* assumes the Purdin Road planning area would be much larger than the actual acreage recently admitted to the UGB. This area is largely agricultural with some residential and was brought into the UGB without preparation of a Concept Plan to identify appropriate land uses and infrastructure requirements.

Issues and Constraints

Based on review of the referenced plans and other documents, additional water service capacity may be needed in the Purdin Road UGB area, depending on the type of development envisioned and the level of demand anticipated. Land uses that may be considered could vary from residential to industrial which could have significantly different demand for water. More research will be needed as refinement plan options are developed.

2.3.3 Elm Street UGB Area

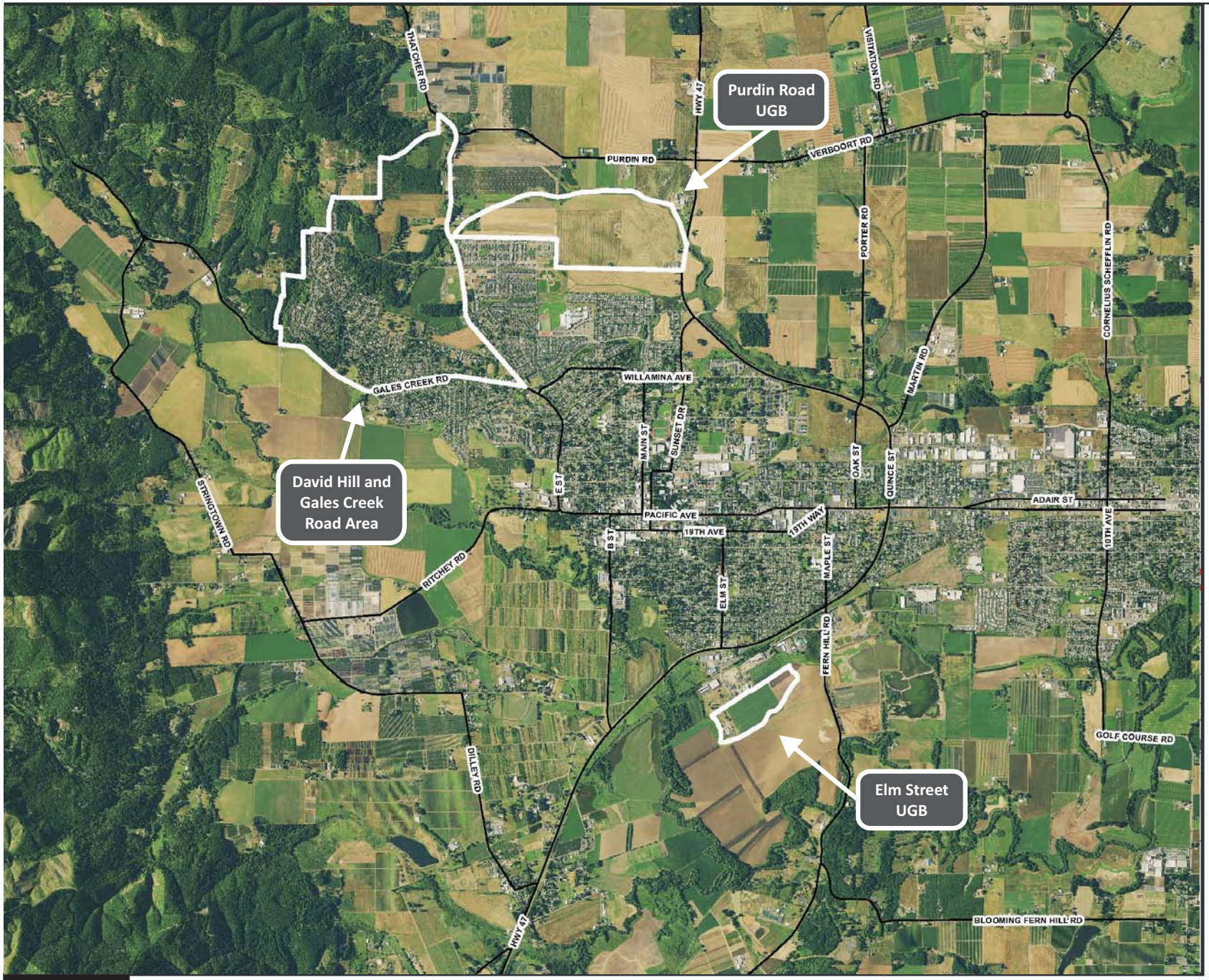
Existing Facilities

There is a 12 inch water pipe on Elm Street that dead ends about 275 feet short of the planning area.

Issues and Constraints

Based on review of the referenced plans and other documents, the following is a list of key issues that could affect future development in the Elm Street UGB area.

- There are questions about the best and least expensive means of connection to existing water services. Connections to the east to the Fern Hill Road vicinity may be difficult or circuitous due to existing development located to the north of the planning area.
- Additional capacity may be needed depending on the nature of proposed development an anticipated water service demand. More research will need to be done as the refinement planning process continues.



city of forest grove

Legend

- Arterial
- Westside Planning Areas

FIGURE 1

Westside Planning Area

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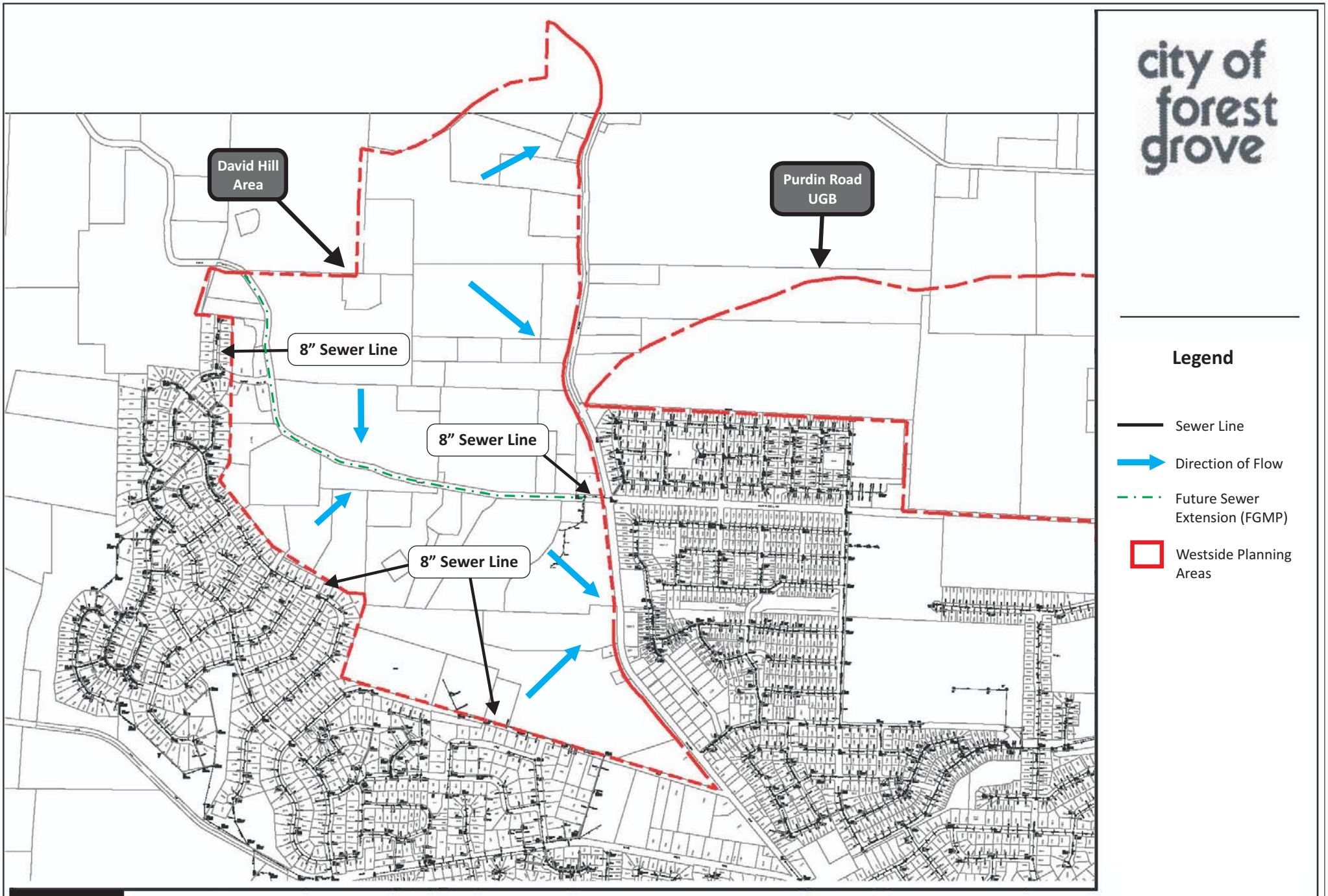
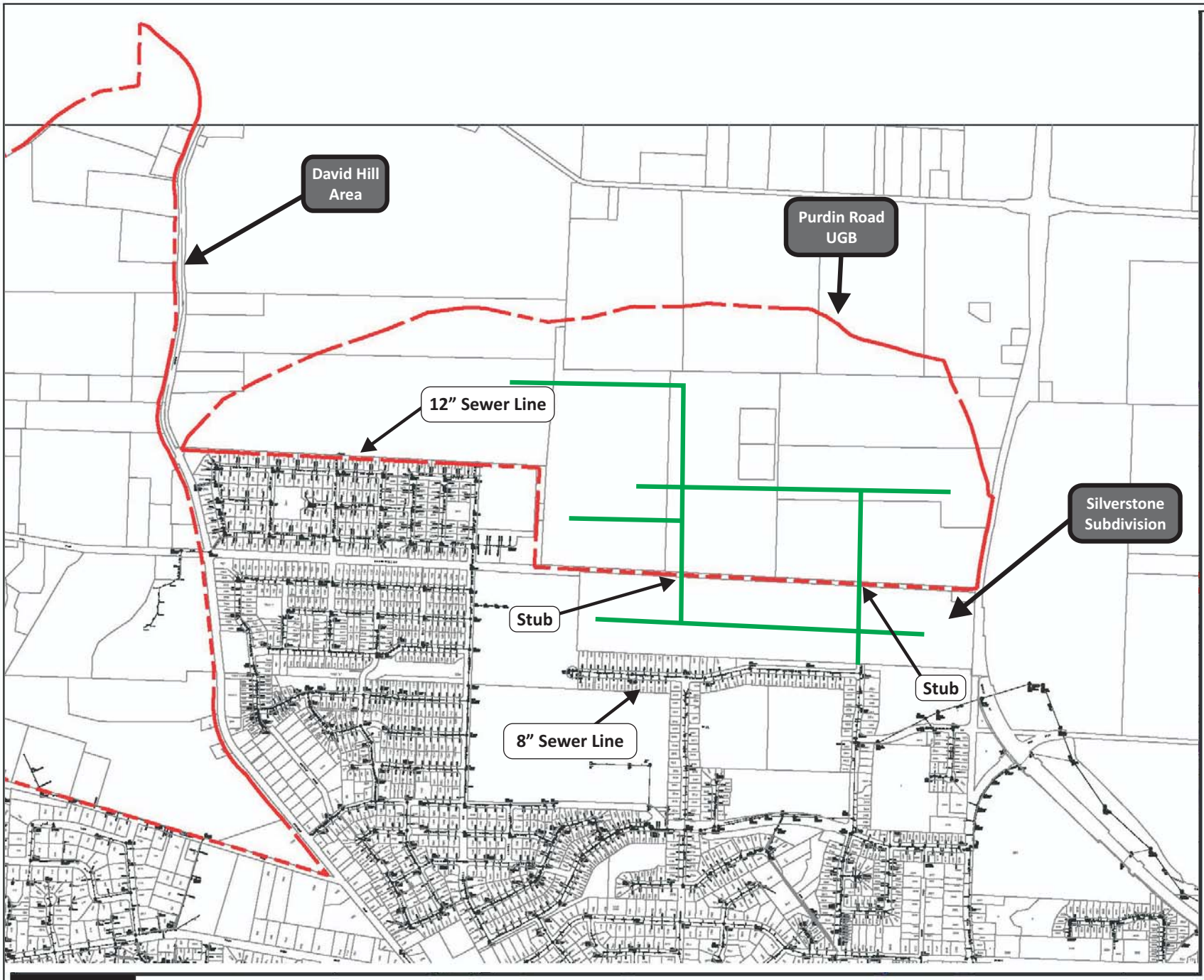


FIGURE 2

Existing Sewer - David Hill Area



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- Sewer Line
- Future System Expansion
- Westside Planning Areas

FIGURE 3

Existing Sewer - Purdin Road UGB

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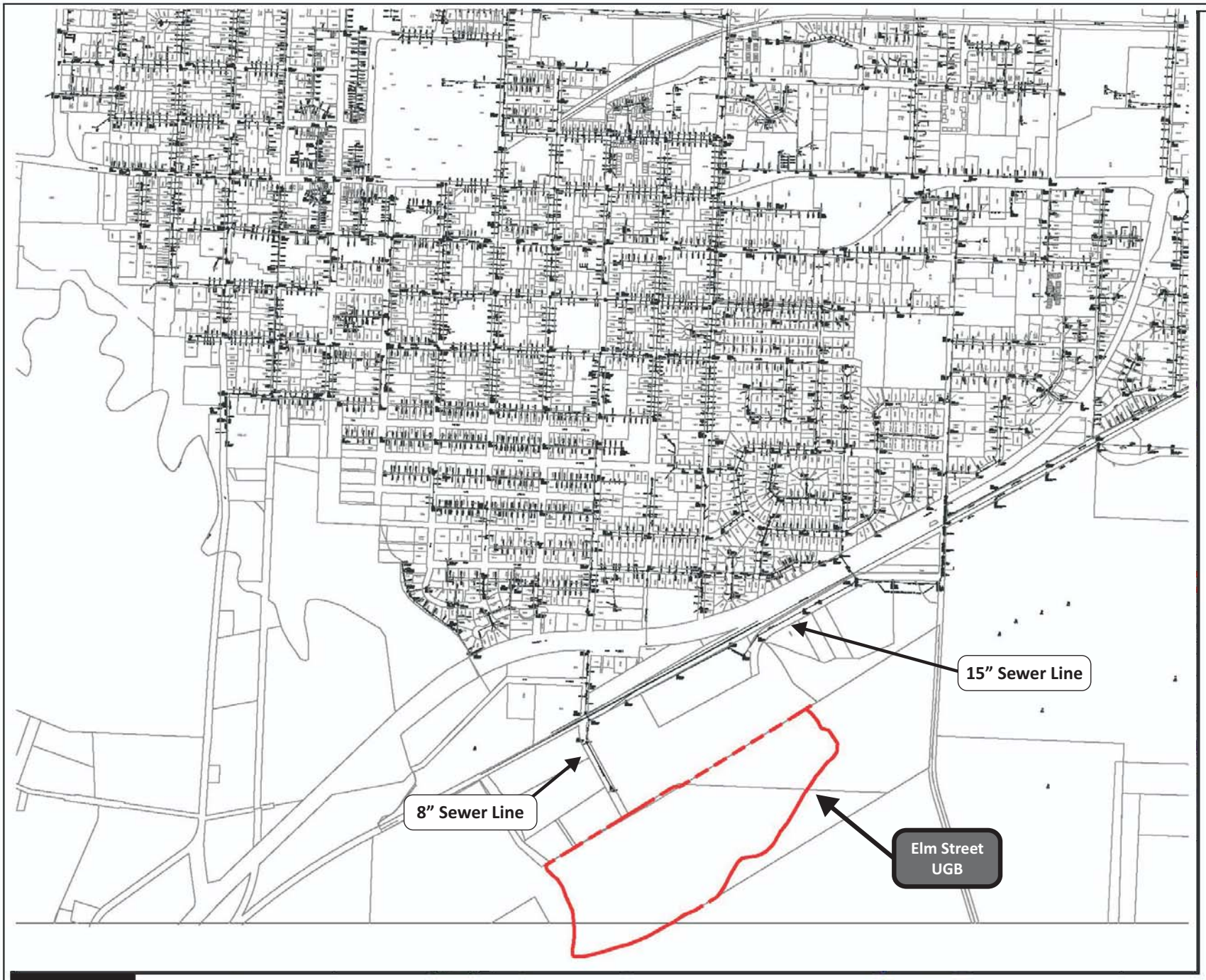

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Sewer Line

Westside Planning Areas

FIGURE 4

Existing Sewer - Elm Street UGB

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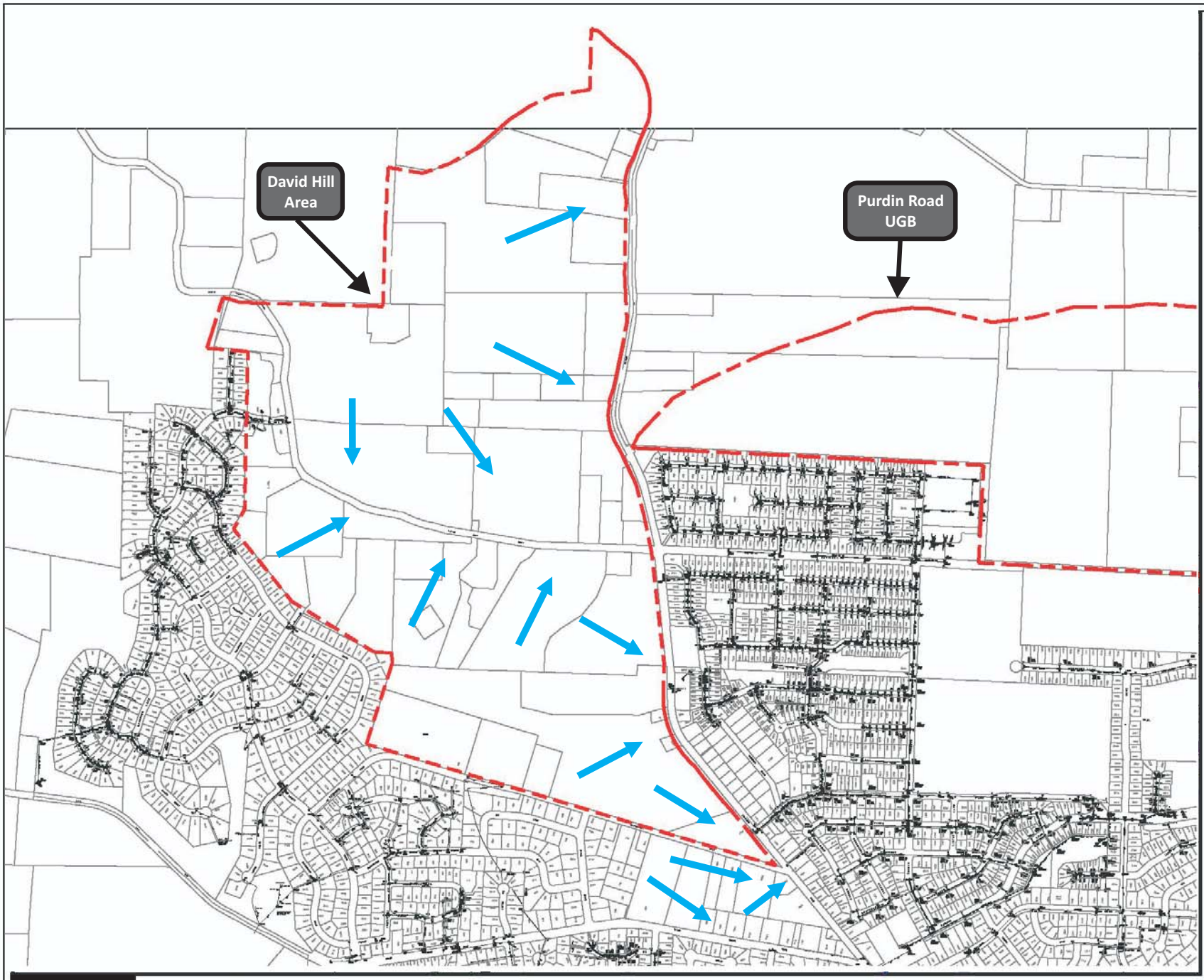

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- Storm Line
- Direction of Flow
- Westside Planning Areas

FIGURE 5

Existing Storm - David Hill Area

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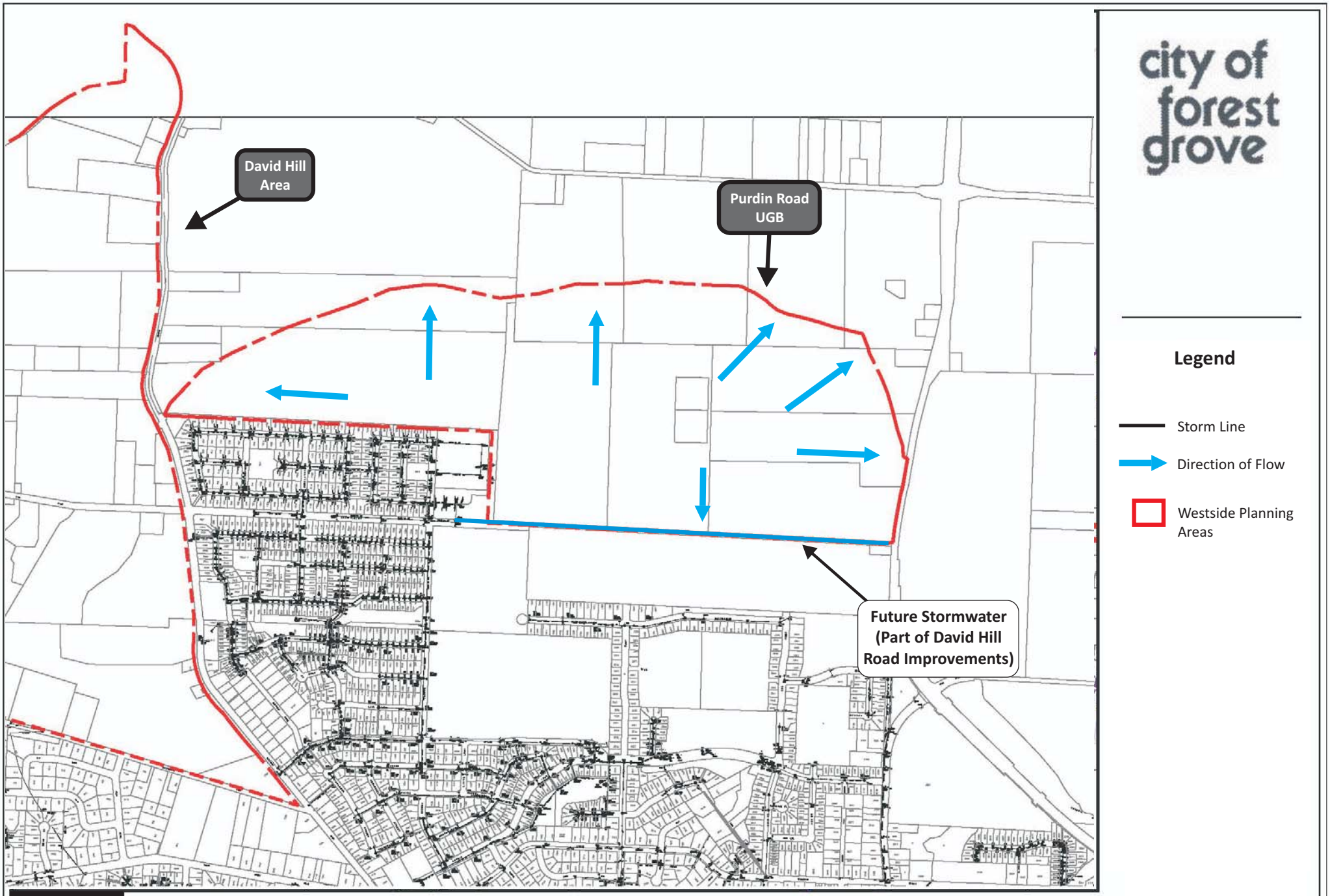
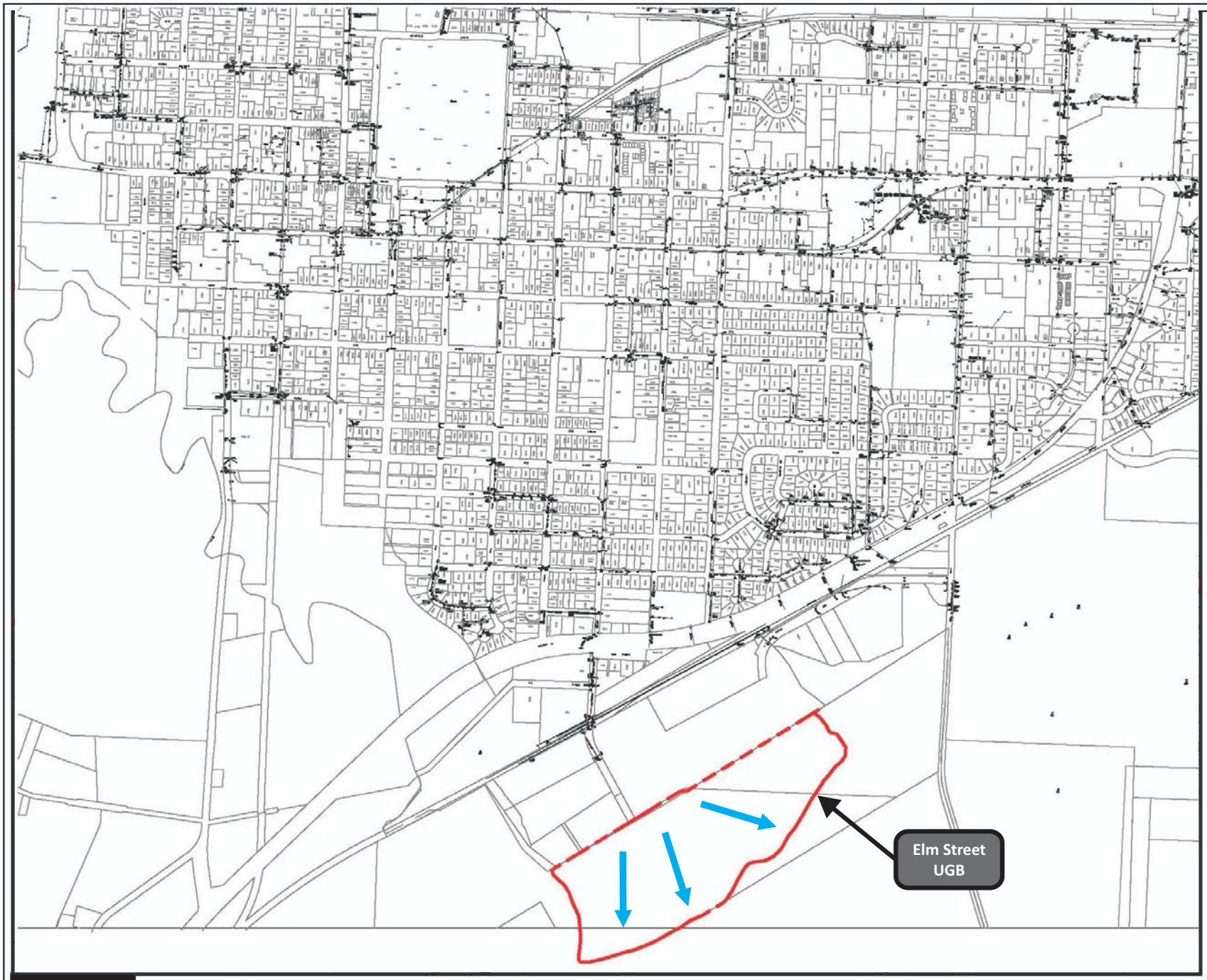


FIGURE 6

Existing Storm - Purdin Road UGB



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Legend

- Storm Line
- Direction of Flow
- Westside Planning Areas

FIGURE 7

Existing Storm - Elm Street UGB

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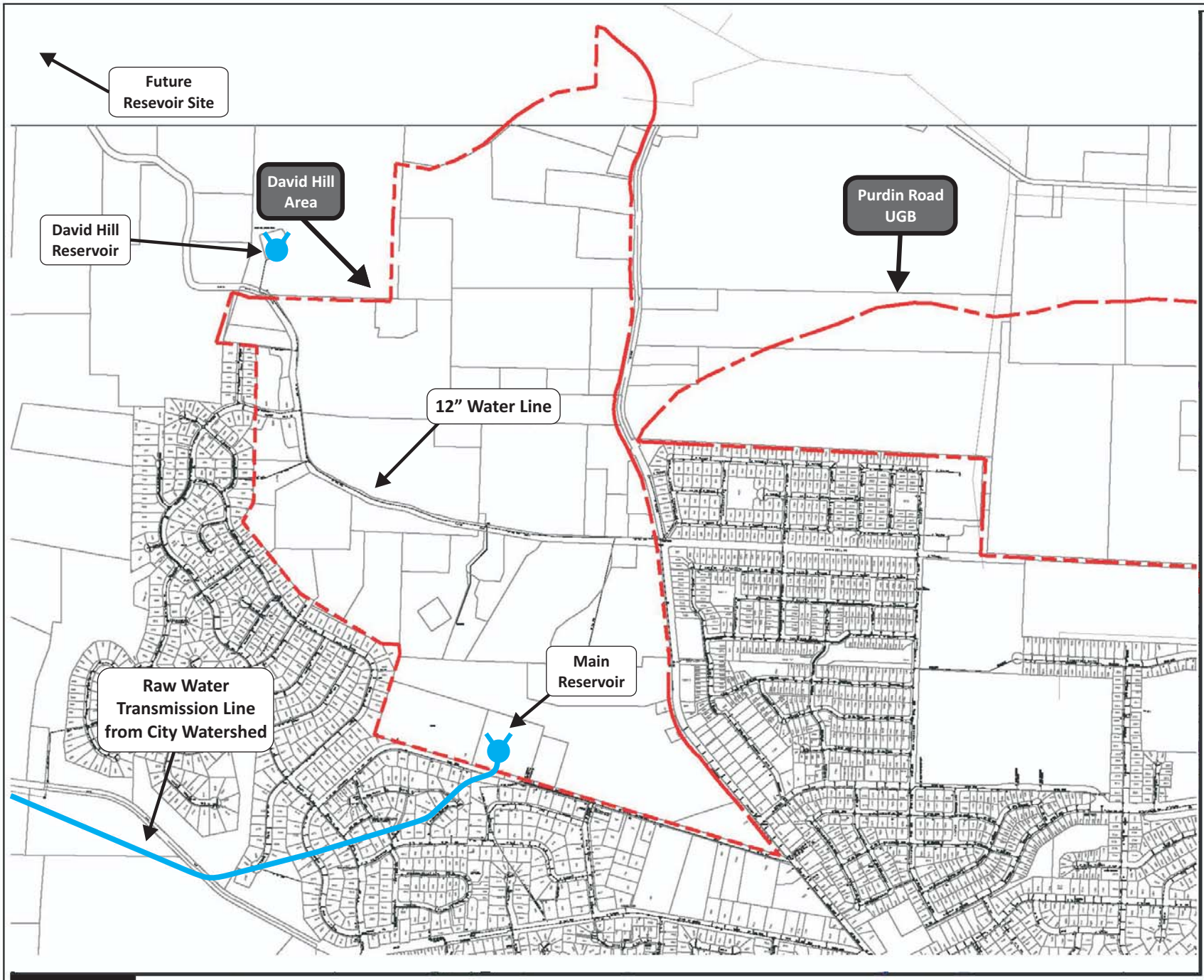

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- Water Line
- Westside Planning Areas
- Reservoir

FIGURE 8

Existing Water - David Hill Area

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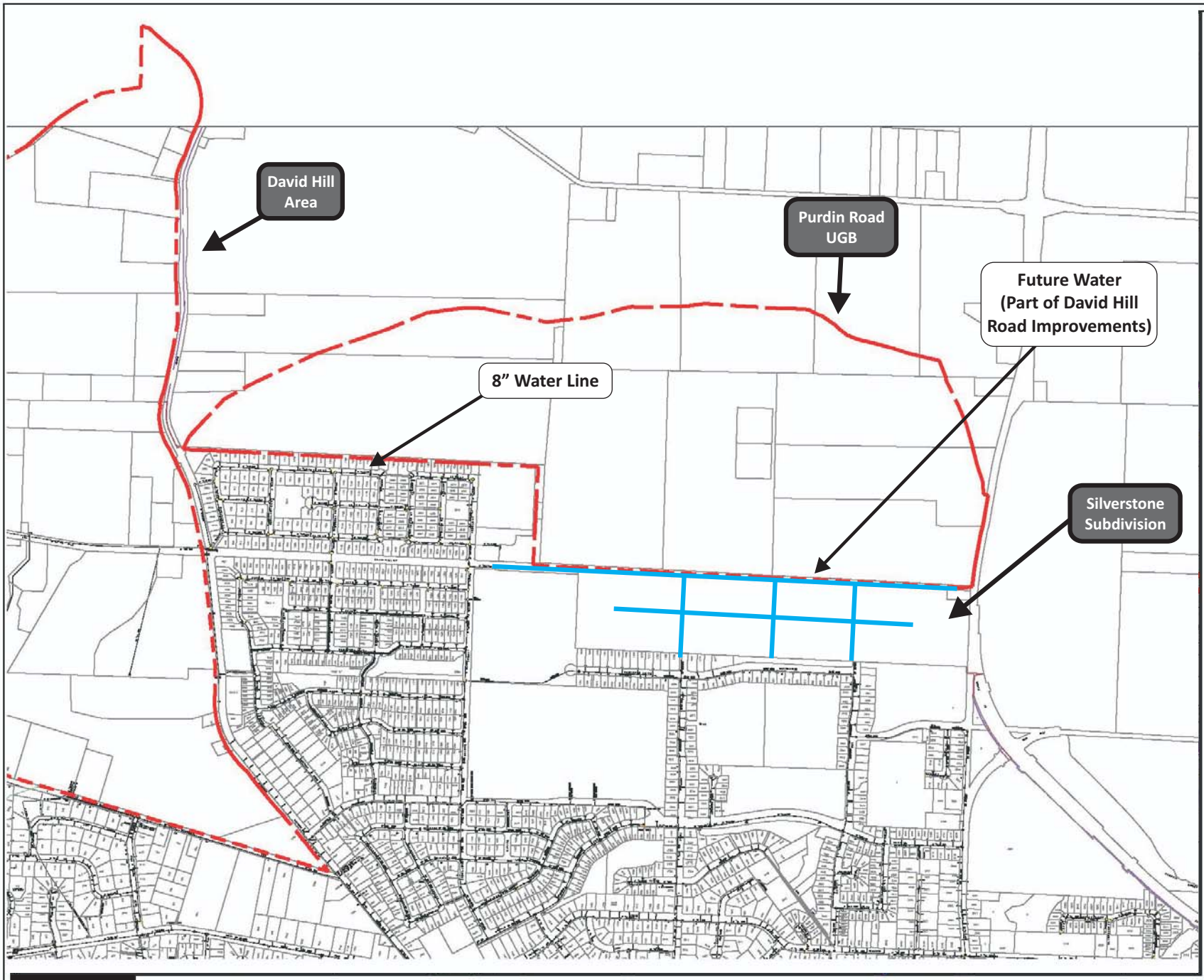

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- Water Line
- Westside Planning Areas

FIGURE 9

Existing Water - Purdin Road UGB

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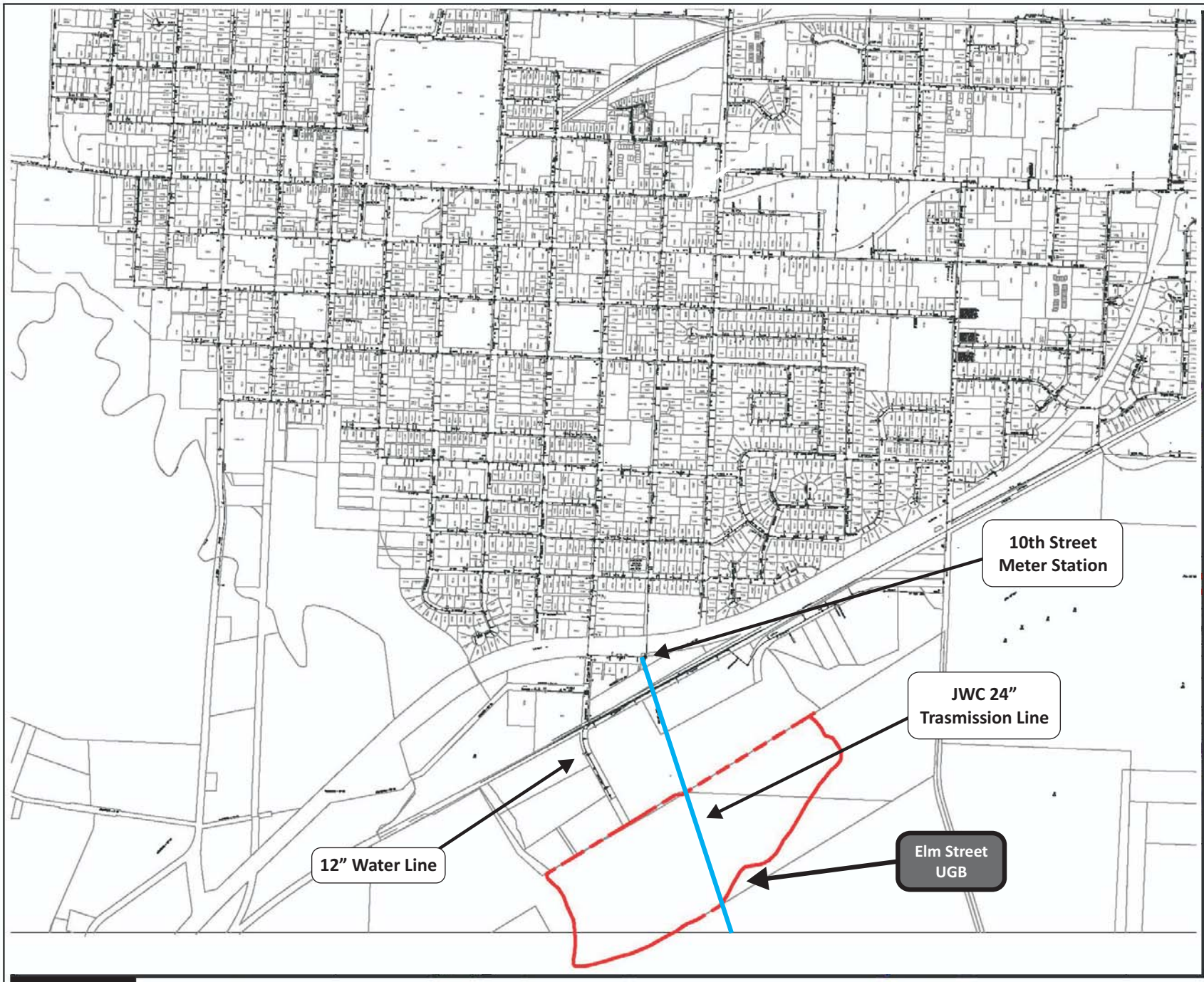

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Water Line

Westside Planning Areas

FIGURE 10

Existing Water - Elm Street UGB

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