UTILITIES TECHNICAL REPORT:

MULTICARE GOOD SAMARITAN HOSPITAL MASTER PLAN

DRAFT EIS

March 2024

Prepared for:

City of Puyallup

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1.0 INTRODUCTION

This report describes existing utilities (sanitary sewer, water and stormwater/drainage) and water resources on and in the vicinity of MultiCare Good Samaritan Hospital (MGSH) site, evaluates potential impacts, and identifies measures to mitigate impacts to these utilities and water resources from implementation of the proposed MGSH *Master Plan Update* and Draft Environmental Impact Statement (EIS) alternatives for the MGSH *Master Plan*.

1.1 PROJECT DESCRIPTION

MultiCare is proposing to redevelop a portion of its hospital campus of approximately 34.86 acres as described in the proposed MGSH *Master Plan* update that was initially submitted to the City of Puyallup in 2022 and then updated and resubmitted in 2023 to address City comments (MGSH 2023 *Master Plan*).

The MSGH campus is in the City of Puyallup at the southwest corner of 15th Avenue SE and 3rd Street SE. The campus is bound to the north by Highway 512 and to the east by existing residential properties. To the south the campus is largely bounded by 15th Avenue SE; however, four parcels south of 15th Ave SE, between 3rd Street SE and 5th Street SE, are included in the campus. To the west, the campus is largely bound by 3rd Street SE, apart from six parcels located at the northwest corner of the campus. See Chapter 2 in the EIS for figures and tables regarding existing campus characteristics and location.

The proposed MGSH 2023 *Master Plan* provides a long-term phased development plan that is intended to achieve the following development goals:

- **Patient Care Tower.** Construct a new Patient Care Tower on a timeline that will support MGSH's Certificate of Need approval, which anticipates beginning site construction in 2025 and licensing and opening of the new facility in 2029. The Tower would accommodate an additional 200 licensed inpatient beds and 30 replacement Observation (non-licensed) beds on campus. The Patient Care Tower must include sufficient space for diagnostic and treatment, ancillary, support, utility, public and administrative activities appropriate to inpatient bed growth of this magnitude.
- **Clinical Space.** Construct sufficient outpatient clinical space through the development of one or more medical office buildings to support new patient and clinical service demand generated by hospital and regional growth.
- **Parking.** Provide adequate vehicular parking for employees, patients, and visitors through a combination of structured and surface parking facilities to support the new campus facilities.
- **Invest in Current Facilities.** Strategically renew, expand, and modernize existing facilities on the MGSH campus, to support both clinical and nonclinical functions.
- **Futureproof.** Thoughtfully locate facility and infrastructure development on the MGSH campus in such a way that it maximizes future site flexibility and efficiency to respond to evolving campus and healthcare needs and priorities. This pertains to construction of buildings, roads and driveways, utilities, landscaping, public amenities, etc.

The full build-out of the MGSH *Master Plan* would create 1,012,000 ground square feet (gsf) of space at full build-out of all development phases. Full buildout of the *Master Plan* is expected to take 20 years to complete, with occupancy in 2043, depending on economic and market conditions. See Chapter 2 of the DEIS for more information on the *Master Plan* and of the EIS process.

1.2 DESCRIPTION OF ALTERNATIVES

This EIS is intended to address the probable significant adverse impacts that could occur as a result of city approval of the proposed *Master Plan Update*. A range of alternatives are analyzed in this EIS (See DEIS Chapter 2) that are intended, in part, to: 1) encompass a range of campus development that can reasonably accommodate the projected building space needs; and 2) meet the identified *Master Plan* goals and objectives.

To conduct a comprehensive environmental review, three alternatives are included in the EIS:

- *Proposed Action* – Proposed *Master Plan*
- *Alternative 1 – Reduced Medical Office Building Size*
- *No Action Alternative*

The *Proposed Action* would fully meet the MGSH's goals for the *Master Plan* as described in Section 1.1. *Alternative 1* would be similar to the *Proposed Action Master Plan*, except that Medical Office Building B (MOB B) would not be included. All other development proposed as part of the *Master Plan* would be built as described for the *Proposed Action*. Modifications and connections to existing public utilities would be required to accomplish the proposed projects in all phases of development, including to water services, sanitary sewer services, and storm drain services. Implementation of stormwater management best management practices (BMPs) for flow control, on-site stormwater management and water quality treatment systems would also be required prior to discharging into the storm drain mains to protect water resources downstream. Further descriptions of utility service are provided herein.

For the *Proposed Action* and *Alternative 1*, redevelopment of the site is assumed to be built out by the year 2043, based on 20 years for construction. The actual buildout period would depend on specific economic and market conditions.

Under the *No Action Alternative,* this EIS assumes that future development of hospital uses outlined under the *Proposed Action* and *Alternative 1* would not occur on campus, and that any future new projects (e.g., ancillary medical clinic/office uses) would apply for individual permits under PMC 20.43 on a site-by-site basis, adhering to development standards in the City's code (parking, height, lot coverage, FAR, setbacks, landscaping, etc.). No changes to the building height overlays and setbacks, or the physical improvements that are included under the *Proposed Action* or *Alternative 1* would occur.

See DEIS Chapter 2 for more descriptions of the three EIS Alternatives.

1.2.1 Proposed Action Master Plan

The proposed *Master Plan* is being formulated to achieve the objectives listed in Section 1.1. The development contemplated under the proposed *Master Plan* includes both the expansion of existing facilities and construction of new buildings to respond to immediate and projected needs. The *Proposed Action* assumes adoption and implementation of the proposed *Master Plan*.

The proposed *Master Plan* features are described below.

Campus Boundary

The current campus boundary and size (approximately 34.86 acres) would not change under the proposed *Master Plan*. The campus boundary under the proposed Master Plan would remain the same as illustrated in the figures in Chapter 2 of the EIS.

Proposed Building Space

To help meet the health care needs of the region, the proposed *Master Plan* includes growth in overall building space from the existing approximately 1.24 million sq. ft. of building space to up to 2.25 million sq. ft. of building space (reflecting a net increase of approximately 1,012,000 sq. ft.) at build-out in approximately 20 years.

Proposed Building Uses

The mix of uses proposed for the MGSH campus are consistent with the current campus and the City of Puyallup's definition of a medical facility, as they will relate to and support inpatient bed demand, emergency department needs, and ancillary growth resulting from the hospital capacity expansion.

The new campus development would largely be in the east campus sector, in an area that is currently in grass field and surface parking. Most of the new development would occur on the surface parking lot that is bound by 5th Street SE, 15th Avenue SE, and 14th Avenue SE.

Full build out of the proposed MGSH *Master Plan* would occur over four major phases:

- **Phase One** would entail five projects including a new patient care tower directly connected to the Dally Tower, a new parking garage supporting new patient beds and staff, a small expansion to the existing emergency department, an expansion to the existing central utility plant, and the Patient Care Tower Shell (see EIS Chapter 2, Figure 2-8).

- **Phases Two to Four:** Remaining phases could include two medical office buildings, a second new parking garage, and an eventual central tower expansion connected to the north of Dally Tower and the new Patient Care Tower (see DEIS Chapter 2, Figure 2-9). The proposed location for the two medical office buildings and parking structure is north of 15th Street.

All future phases of development beyond the initial Patient Care Tower are speculative and would be developed on an as-needed basis as determined by MGSH.

A summary of the proposed elements for the *Proposed Action* for full buildout of the *Master Plan* include:

- Up to 1,012,000 square feet of new building floor surface area over a building footprint of 185,000 sf for new patient beds, nursing and surgical units, medical offices, hospital support, ancillary services, retail, and parking.
- Up to 250 new hospital beds (with existing 625 beds to remain)
- Up to 1,046 new parking spaces and up to 448 replaced parking spaces
- New sanitary sewer services for the new buildings along with connections to the existing public sanitary sewer main in the adjacent streets.
- New domestic and fire water services to serve the new buildings along with new fire hydrants to ensure adequate hydrant coverage for new buildings.
- New storm drain conveyance and collection for new facilities and surfaces.
- New flow control (detention) and water quality treatment facilities for the new and replaced surfaces prior to discharge into the existing downstream storm systems in accordance with City of Puyallup stormwater management requirements.
- Protection of existing landscaping to the extent possible under the *Proposed Action* and provisions of new landscaping for site redeveloped areas. It is expected that the new landscaping would be reduced from existing to accommodate the hospital campus facilities.

Projects proposed at full build-out of the MGSH *Master Plan* are detailed in Table 1.2-1. See Chapter 2 of the DEIS for further description of the *Proposed Action*.

Table 1.2-1: Proposed Action - Proposed Campus Build-Out to 2043

Facility	Phase	Proposed Floor Space	Proposed Footprint	Proposed Building Height
Patient Care Tower (PCT)	**1A**	230,000 gsf	40,000 sf	141'-6"
Parking Structure (PS) 1	**1A**	190,000 gsf	28,000 sf	50'
Central Utility Plant Expansion	**1A**	10,000 gsf	10,000 sf	44'
Patient Care Tower Shell Buildout[1]	**1B**	Shell buildout	See PCT	141'-6"
Dally Tower Emergency Department Expansion	**1C**	2,000 gsf	2,000 sf	15'
Medical Office Building (MOB) A	**2**	100,000 gsf	20,000 sf	85'
Parking Structure (PS) 2	**2**	260,000 gsf	35,000 sf	68'
Medical Office Building (MOB) B	**3**	100,000 gsf	20,000 sf	85'
Central Supply Tower	**4**	90,000 gsf	15,000 sf	90'
Dally Tower Expansion towards 3rd Street	**4**	30,000 gsf	15,000 sf	50'
Subtotal		**1,012,000 gsf**	**185,000 sf**	

Source: Table 2-4 in EIS Chapter 2 that was based on MGSH 2023 Master Plan.

sf=square feet gsf=ground surface square feet

[1]The Master Plan proposes to include a shell floor in the Patient Care Tower, which would allow the future build out of 40 additional licensed beds, bringing the new building's total bed count to 200 in-patients plus 30 observation beds.

1.2.2 Alternative 1 – Reduced Medical Office Building Size

Alternative 1 would be like the *Proposed Action Master Plan*, except that the second Medical Office Building (MOB B) proposed to be constructed in Phase 3 of the *Proposed Action* would not be included in *Alternative 1*. See Table 1.2-2 for list of facilities included in *Alternative 1*. All other development proposed as part of the *Master Plan* would be built as described for the *Proposed Action*. See Chapter 2 of the DEIS for further description of this alternative. A summary of the proposed elements for *Alternative 1* at full buildout of the *Master Plan* include:

- Up to 912,000 square feet of new building floor surface area over a building footprint of 165,000 sf for new patient beds, nursing and surgical units, medical offices, hospital support, ancillary services, retail, and parking.
- Up to 250 new hospital beds.
- Parking and access would be like the *Proposed Action*, except it would include 723 new parking spaces onsite, which is approximately 323 fewer spaces than *Proposed Action*.
- New sanitary sewer services for the new buildings along with connections to the existing public sanitary sewer main in the adjacent streets.
- New domestic and fire water services to serve the new buildings along with new fire hydrants to ensure adequate hydrant coverage for new buildings.
- New storm drain conveyance and collection for new facilities and surfaces.
- New flow control (detention) and water quality treatment facilities for the new and replaced surfaces prior to discharge into the existing downstream storm systems in accordance with City of Puyallup stormwater management requirements.
- Protection of existing landscaping to the extent possible under *Alternative 1*, and provision of new landscaping for site redeveloped areas. It is expected that the new landscaping would be reduced from existing to accommodate the hospital facilities.

Table 1.2-2: Alternative 1 – Proposed Campus Build-out to 2043

Facility	Phase	Proposed Floor Space	Proposed Footprint	Proposed Building Height
Patient Care Tower	**1A**	230,000 gsf	40,000 sf	141’-6”
Parking Structure (PS) 1	**1A**	190,000 gsf	28,000 sf	50’
Central Utility Plant Expansion	**1A**	10,000 gsf	10,000 sf	44’
Patient Care Tower Shell Buildout[1]	**1B**	Shell Buildout	See PCT	141’-6”
Dally Tower Emergency Dept. Expansion	**1C**	2,000 gsf	2,000 sf	15’
Medical Office Building (MOB) A	**2**	100,000 gsf	20,000 sf	85’
Parking Structure (PS) 2	**2**	260,000 gsf	35,000 sf	68’
Central Supply Tower	**3**	90,000 gsf	15,000 sf	90’
Dally Tower Expansion towards 3rd Street	**3**	30,000 gsf	15,000 sf	50’
Subtotal		**912,000 gsf**	**165,000 sf**	

Source: Table 2-6 in DEIS Chapter 2 that was based on MGSH 2023 Master Plan.

sf=square feet gsf=ground surface square feet

[1]Description of shell buildout is the same as Proposed Action. See footnote 1 in Table 1.2-1.

1.2.3 No Action Alternative

Under the *No Action Alternative*, it is assumed that the demand for increases in health care services in the region would continue and that additional development would need to occur on the MGSH campus. However, under Puyallup's Municipal Code (PMC), hospital uses can only be developed under an existing *Master Plan* (see DEIS Chapter 2). Therefore, this EIS alternative assumes that future development of hospital uses outlined under the *Proposed Action* and *Alternative 1* would not occur on campus, and that any future new projects (e.g., ancillary medical clinic/office uses) would apply for individual permits under PMC 20.43 on a site-by-site basis, adhering to development standards in the City's code (parking, height, lot coverage, FAR, setbacks, landscaping, etc.). Development standards associated with the expired, 2007 *Master Plan* would not be applicable. No changes to the buildings' height overlays and setbacks, or the physical improvements that are included under the *Proposed Action* or *Alternative 1* would occur. Existing campus characteristics include:

- Campus area of 34.86 acres
- Eleven buildings, including two parking structures, providing and supporting inpatient and outpatient healthcare services and facilities.
- Existing buildings space capacity approximately 1.245 million gross square feet
- Inpatient hospital beds: 375
- Impervious Area: 22.1 acres
- Pervious Area (landscape, lawn): 12.8 acres
- Existing parking spaces (garages and surface lots): 1,858

Table 1.2-3 summarizes the Existing Building Characteristics. See Chapter 2 of the DEIS for further description of this alternative.

Table 1.2-3: Existing Building Characteristics for No Action Alternative

Existing Building	Floor Space	Building Height
Puyallup Valley Medical Clinic	22,482 gsf	38'
Central Utility Plant	15,401 gsf	44'
Cancer Care Center	35,537 gsf	32'
Children's Therapy Unit	47,541 gsf	44'
Pavilions (Meadow, Forest River)	359,057 gsf	86', 76' and 37'
Daily Tower	375,800 gsf	157'-6"
Medical Office Building	83,736 gsf	65'
Facilities Building	12,471 gsf	24'
622-623 14th (Marketing)	3,784 gsf	15'
P2 Parking Garage (1990)	138,484 gsf	40'
P1 Parking Garage (2010)	150,103 gsf	37'
TOTAL BUILDING SPACE	1,244,396 gsf	

Source: MGSH 2023 Master Plan.
sf=square feet gsf=ground surface square feet

1.2.4 7th Street Roadway Connection Option

A portion of the eastern half of the MGSH campus property was dedicated to the City of Puyallup to achieve a 60' public right-of-way for a potential future city street connecting the northern extent of 7th Street SE to the southern extent of 7th Street SE between 13th Avenue SE and 15th Avenue SE through the MGSH campus. The purpose of this dedication was to facilitate city transportation planning for the 7th Street link between 13th Ave SE and 15th Ave SE and to facilitate future planning for the MGSH campus. The 7th Street SE Roadway Connection is currently shown under the *Transportation Element* within the City of Puyallup's Comprehensive Plan.

Impact on utilities (water, sanitary sewer, stormwater conveyance and water resources) with the development of the street right-of-way was not analyzed nor included in this utilities report. The potential development of the City ROW for 7th Street SE extension is dependent upon the results of a traffic analysis for traffic mitigation improvements. See Chapter 2 of the DEIS for more information.

1.2.5 EIS Alternative Summary

The proposed *Master Plan* and *Alternative 1* reflect implementation of improvements to meet anticipated increased demands for healthcare services in the region. The *No Action Alternative* reflects current conditions with no update to the *2007 Master Plan* for the campus. The overall development assumptions under the EIS Alternatives are summarized in DEIS Chapter 2. Select elements from DEIS Chapter 2 are included Table 1.2-4 for ease of reference in this Utility Report.

Table 1.2-4: Comparison of EIS Alternatives

	Proposed Action Master Plan*	Alternative 1 – Reduced MOB*	No Action Alternative*
Campus Acreage	34.86 acres	34.86 acres	34.86 acres
New Building Space	1,012,000 gsf	912,000 gsf	0
Total Building Space	2,258,396 gsf	2,158,396 gsf	1,246,396 gsf
Building Height Limits	165'	165'	165'
New Hospital Beds	250	250	0
Total Hospital Beds	625	625	375
Impervious Area[1]	23.4 acres (67%)	22.9 acres (66%)	22.1 acres (63%)[3]
Pervious Area[2]	11.5 acres (33%)	12.0 acres (34%)	12.8 acres (37%)[3]
Net New Parking Spaces	1,046 spaces	723 spaces	0 spaces
Total Parking Supply	2,904 spaces	2,581 spaces	1,858 spaces

Source: MGSH 2023 Master Plan and Table 2-7 in Chapter 2 of the DEIS

[1]*Includes new, replaced, and existing to remain impervious areas for building footprint, roadways, parking, and hardscape.*

[2]*Includes new, replaced and existing pervious areas in landscaping and other natural open space*.

[3]Existing areas to remain. No increase assumed.

** 7th Street Extension not accounted for in this table*.

2.0 AFFECTED ENVIRONMENT

Information provided in the MGSH *Master Plan* by MGSH's civil engineering consultant, AHBL, and by City of Puyallup Public Works, along available public records from City of Puyallup for its comprehensive plans including from Gray & Osborne (water), BHC consultants (sanitary sewer) and Brown and Caldwell (stormwater sewer / drainage), were reviewed. Based on this information, the MGSH campus is served by a full complement of utility services for water, sanitary sewer, and stormwater sewer/drainage systems.

2.1 EXISTING WATER

2.1.1 Water Source

Water for domestic, fire and irrigation use for the site is provided by the city of Puyallup (City). The City of Puyallup's Comprehensive Plan, Chapter 8 Utilities, indicates that the City's water system supplies water to over 36,000 people within the city and its Urban Growth Area (UGA) (current plan posted on City website as of March 2024). Sources of water supply for the city include two natural springs, six production deep wells and an inter-tie with the city of Tacoma. The City chlorinates all water sources before the water enters the distribution system. See Figure 2.1-1 for the city of Puyallup water service area.

The City's water distribution system consists of 190 miles of water pipes from 2-inch to 24-inch in diameter. The distribution system conveys water to thirteen zones which maintain pressure for specific areas within the city. Water storage is provided in nine sealed reservoirs with 19.3 million gallons of capacity prior to distribution throughout the city. Water is drawn from the reservoirs as needed to meet demand, which varies throughout the year. The City's water system can produce over 13.7 million gallons of drinking water daily according to City's webpage for the History of Puyallup Water, posted in December 2023.

According to City of Puyallup's reporting of Water Use Efficiency, in 2022, approximately 1.245 billion gallons of water was authorized for consumption from the City's system (average 3.4 million gallons/day). The estimated consumption rate for an equivalent residential unit (ERU) was 194.5 gallons per day/ERU in 2022.

2.1.2 Water Distribution

The MGSH site is located within the City's pressure Zone 2 with a hydraulic grade line of 359 feet according to Gray & Osborne, Inc.'s review of City system. The pressure of the existing 8-inch to 12-inch distribution ductile iron (DI) water pipes along the site perimeter and within the site ranges from 62 psi to 117 psi based on modeling in the City's Water System Comprehensive Plan for the projected 20-year (City water system analysis was based on projections to year 2038) peak hour demand scenario. See Gray & Osborne, Inc. Technical Memorandum, March 2024 in Appendix. See Figure 2.1-2 for the existing water system at the MGSH site.

The City's water distributions mains (unless noted otherwise as a private distribution main) adjacent and within the MGSH campus are as follows:

- 3rd Street SE – 12" DI

- 4th Street SE – 12" DI
- 5th Street SE – 8" DI (private, maintained by MGSH)
- 13th Avenue SE – 12" DI
- 14th Avenue SE – 8" DI (private, maintained by MGSH)
- 15th Avenue SE – 12" DI

The private 8-inch water distribution main in 5th Street SE and 14th Avenue SE were previously public mains that were converted to private mains when the MGSH campus was developed. These private mains connect to the existing public water mains in 13th Ave SE and 15th Ave SE. Modeled pressure was assessed based on the public and private system being looped (as opposed to dead end line in 13th) system. See Figure 2.1-2 for mapping of the existing private and public water distribution mains.

There are 15 fire hydrants currently located in the vicinity and within the existing site.

Existing domestic water, irrigation and fire service protection to the various buildings and facilities on campus are from the adjacent water mains as shown in Figure 2.1-2.

2.1.3 Existing MGSH Water Consumption

Based on City's utility accounting of water consumption in 2022, it is estimated the MGSH campus currently uses approximately 35 million gallons per year with the majority of this from domestic water use for the hospital facilities. The total water consumption in 2022 for the full MGSH campus was reported as follows (with rounding):

Domestic Water:	31,400,000 gallons
Irrigation Water:	3,560,000 gallons
Fire Service:	None
Total (rounded):	~35,000,000 gallons

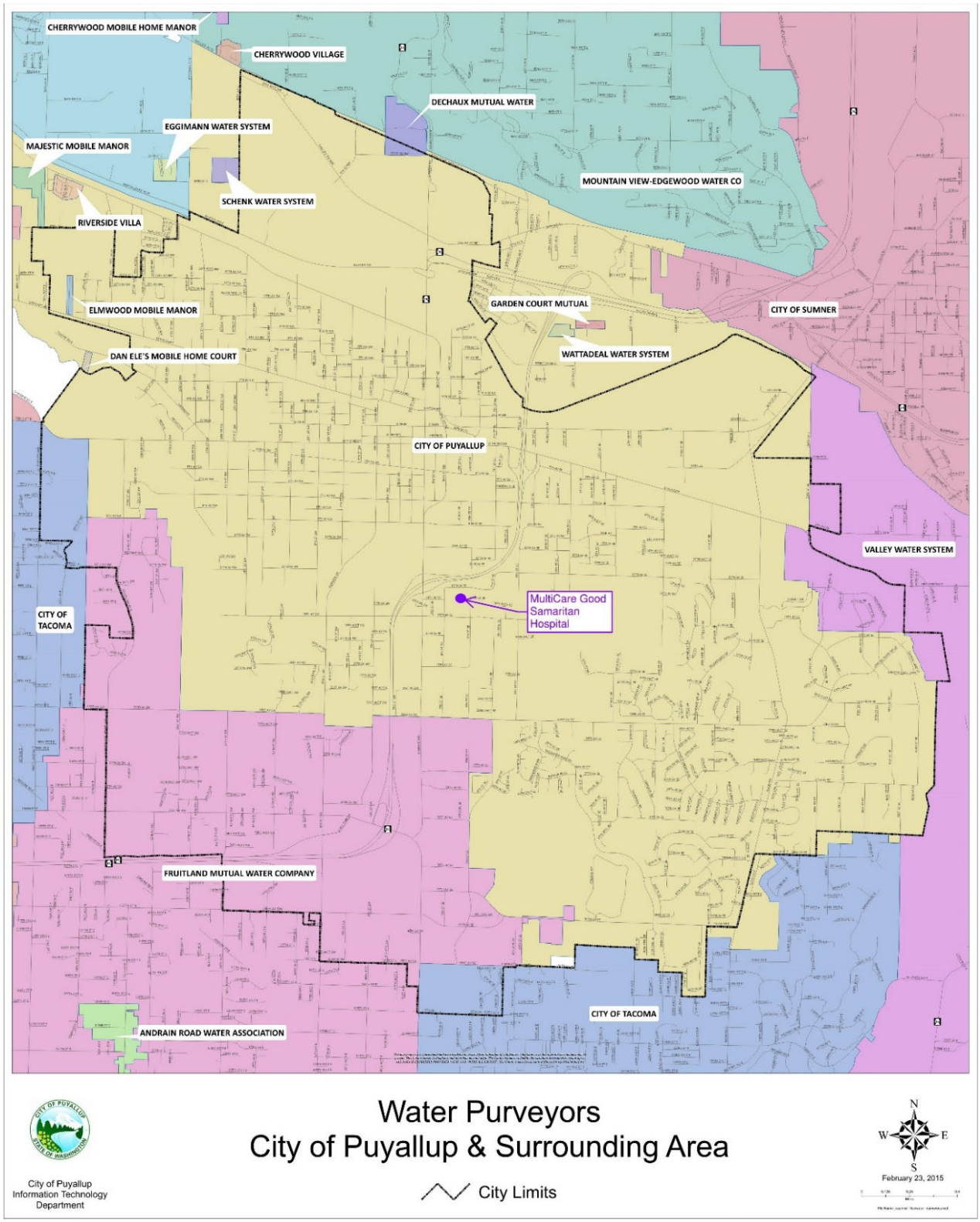
For the area of the proposed improvements of the 2023 *Master Plan* (hospital facilities located between 13th Ave SE and 15th Ave SE and 3rd St SE and 5th Street SE including: Dally Tower, Medical Offices, Central Utility Plant, Hospital Tower/Pavilions, a parking garage), approximately 29,700,000 gallons of domestic water was provided to the campus by City of Puyallup water. See Figure 2.1-3.

2.1.4 Fire Service

Existing fire services to various buildings on campus are provided from the 12-inch public water mains. There are also over 15 fire hydrants currently located in the vicinity and within the existing site from the existing 12-inch public water mains and 8-inch private water mains.

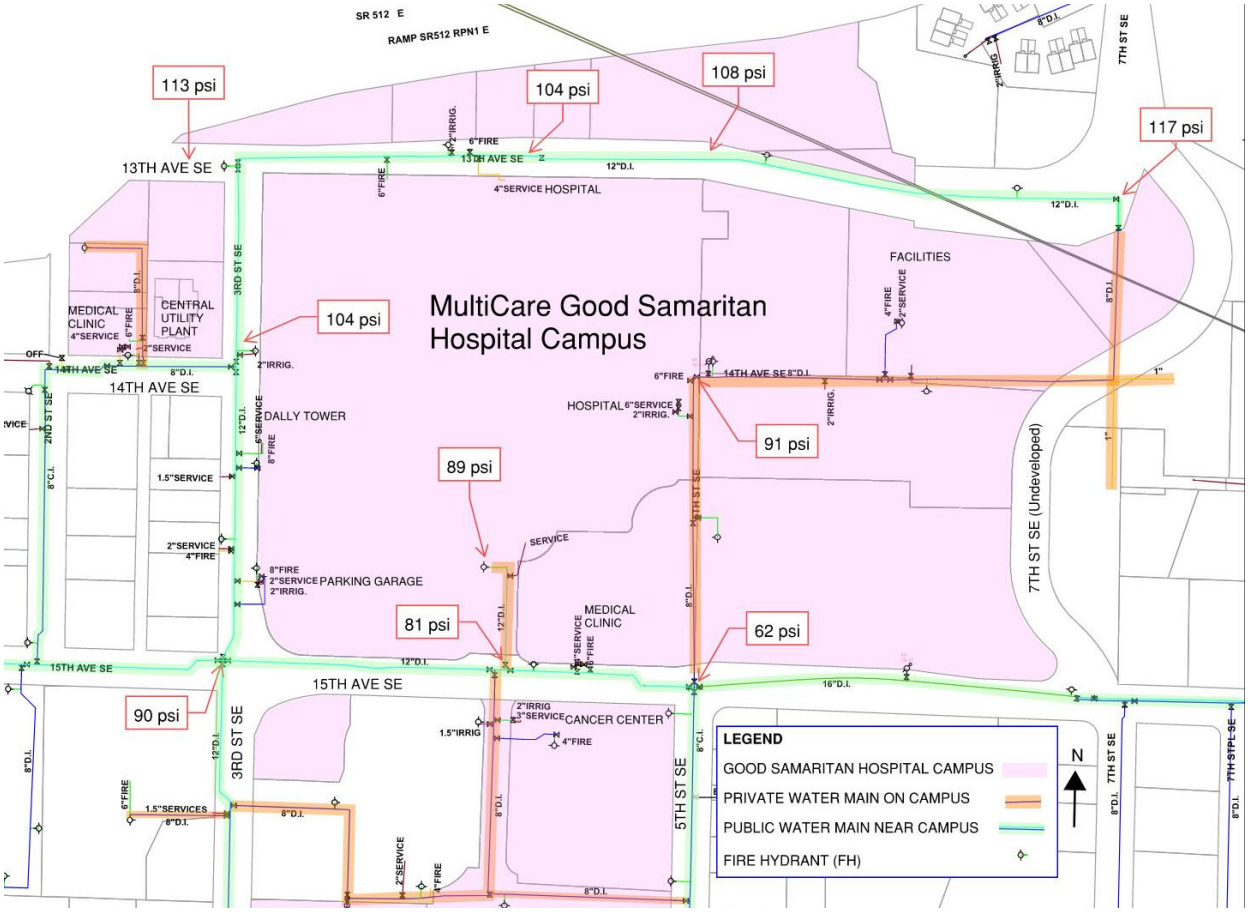
Based on Gray & Osborne Inc.'s review of the existing system and the City of Puyallup's 2019 Water System Plan (WSP), the current fire flow requirement for the hospital campus and existing buildings noted in Table 1.2-3 is 4,000 gpm for 4 hours, which is available from the 12-inch pipes surrounding and within the hospital campus. See Appendix for Gray & Osborne Inc.'s hydraulic modeling of the existing water system.

Figure 2.1-1 City of Puyallup Water Service Area



Source: City of Puyallup

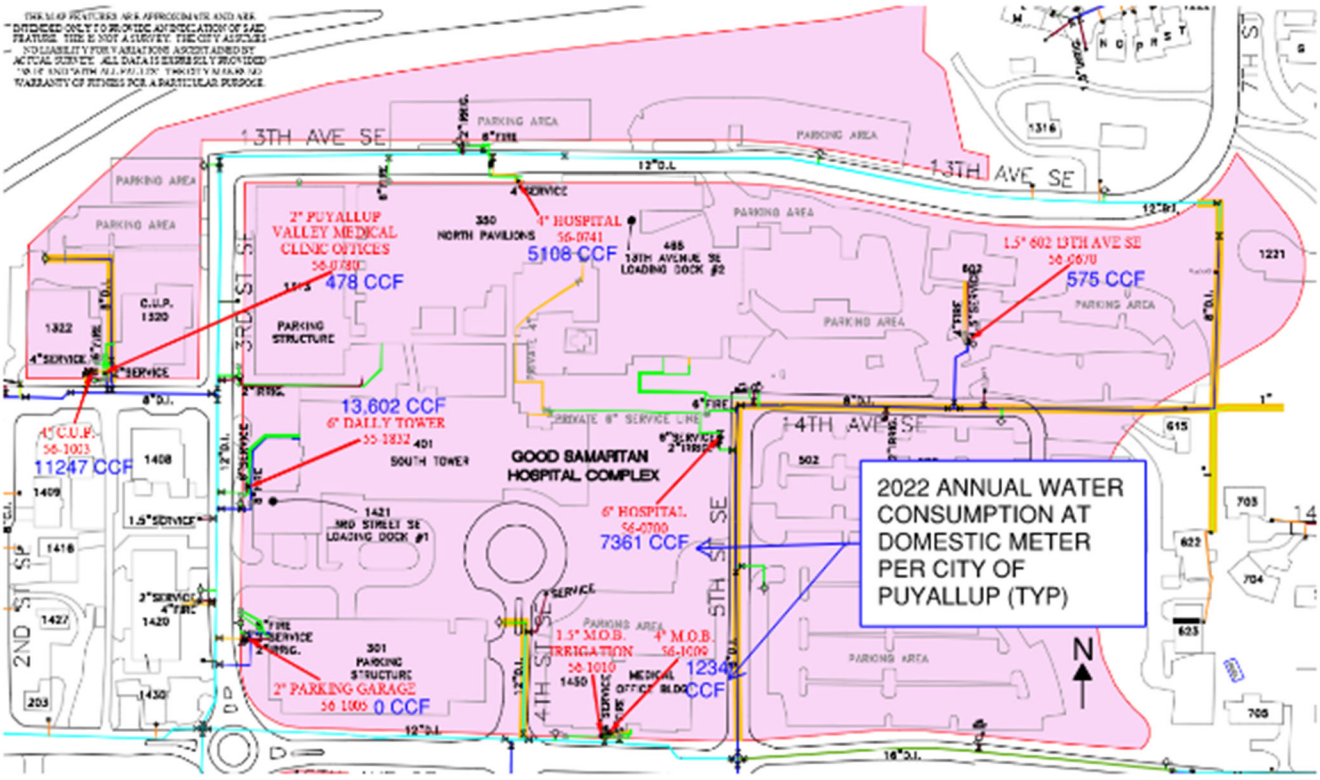
Figure 2.1-2 Existing Public and Private Water System



Source: Figure and water pressure data provided by Gray & Osborne, Inc. (11/23/2023). Public and private water main information provided by City of Puyallup.

psi = water pressure pounds per square inch

Figure 2.1-3 Domestic Water Use in 2022



Source: Figure with 2022 water consumption (CCF) of select domestic meters provided by City of Puyallup

CCF=centum cubic feet for water consumed, 1 CCF = 748 US gallons

2.2 EXISTING SANITARY SEWER

2.2.1 Sanitary Sewer System

The city of Puyallup's Public Works department provides wastewater collection and treatment for sites within the city limits including the MGSH campus. The City of Puyallup service area includes all the properties within the city limits as well as additional areas within the urban growth area and unincorporated Pierce County. See Figure 2.2-1.

According to the 2015 *Puyallup Comprehensive Plan*, Chapter 8 Utilities, the City's existing sanitary sewer conveyance system includes over 225 miles of gravity sewer pipe, 8 miles of force main and 20 sewage pump stations. Wastewater flows are treated at the City's Water Pollution Control Plant (WPCP). Once treated, the wastewater is discharged into the Puyallup River. Regulations for treatment prior to discharge is in accordance with United States Environmental Protection Agency and Washington State Department of Ecology. The treatment capacity of the WPCP was noted as 27.4 million gallons per day (MGD) with an annual average influent flow of 9.5 MGD.

Information regarding the existing public sanitary sewer system along with existing side sewer connections from the MGSH site was gathered from documents provided by MGSH, including the MultiCare Good Samaritan Hospital 2023 *Master Plan*, and the City's Public Data Viewer mapping and analysis provided by BHC Consultants for the City.

Sanitary sewer flows from the MGSH campus discharge into a public sanitary sewer piped conveyance system that was built in 1950s with upgrades through 2011 according to review of City of Puyallup Public Data Viewer mapping. Sanitary sewer mains are in the various streets surrounding the site with side sewer connections to the existing campus buildings and facilities. The public sewer mains adjacent to the campus in the street right-of-way include:

- 3rd Street SE – 8" PVC
- 5th Street SE – 8" PVC (south of 15th Ave SE)
- 7th Street SE – 8" PVC (south of 15th Ave SE)
- 13th Avenue SE – 8" PVC and 8" RCP
- 15th Avenue SE – 8" PVC

PVC=polyvinylchloride pipe RCP= reinforced concrete pipe

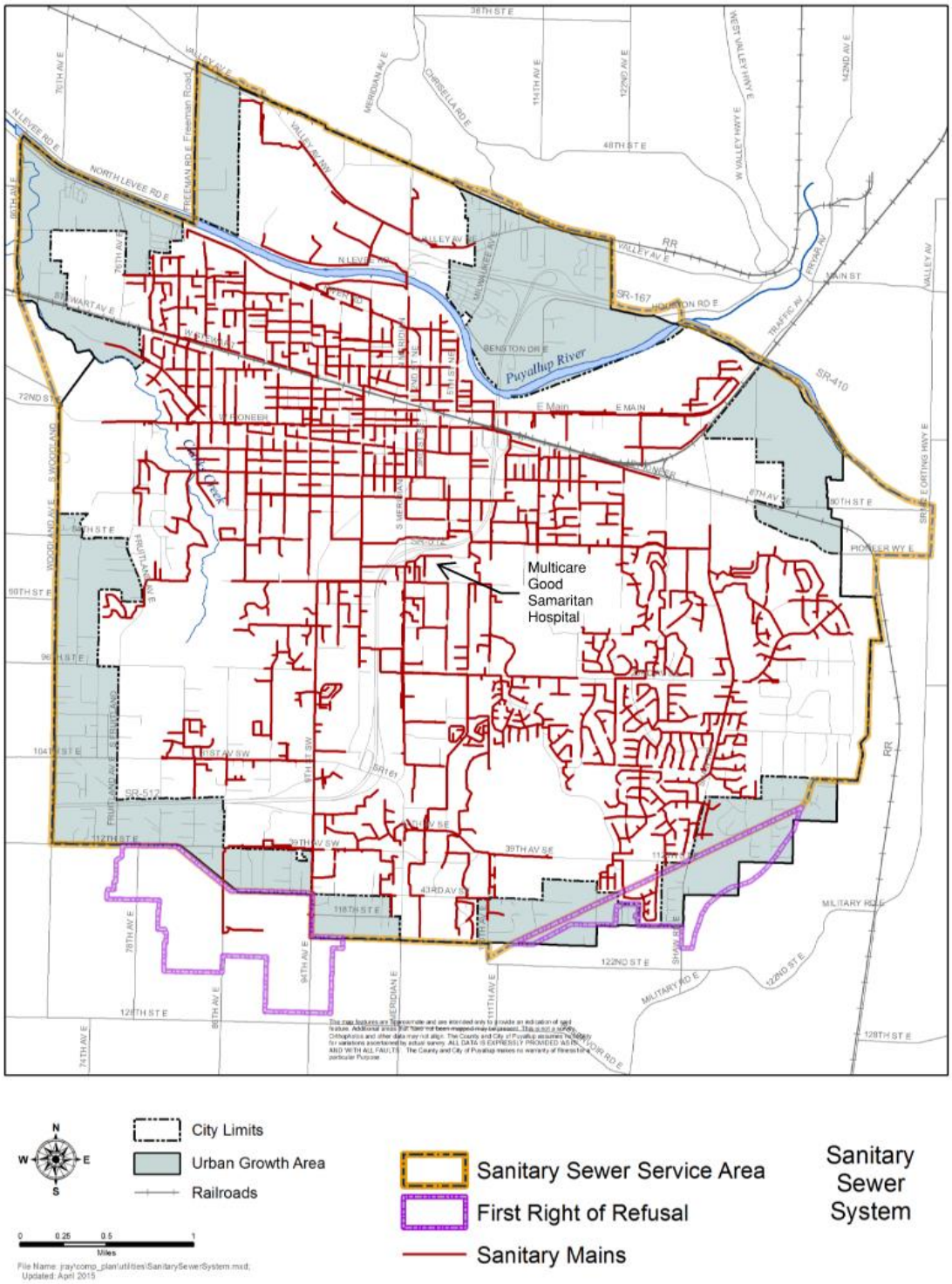
The northern buildings of the existing hospital have side sewer connections to the sewer main in 13th Avenue SE which conveys flows westward towards S. Meridian Street. The Dally tower and main hospital building have side sewer connections to sewer main in 3rd Street SE which conveys flows to the north into the 13th Avenue SE sewer main. The sewer main in 15th Avenue SE conveys flow westward to the sewer main in S. Meridian Street. See Figure 2.2-2 for mapping of existing sanitary sewer within and adjacent to the site.

From discussions with BHC consultants, there are no known existing pipe conveyance capacity issues for the public sanitary sewer main in 13th Ave SE east of Meridian that receives wastewater flows from much of the campus. However, further downstream from the MGSH

campus, there are sewer capacity deficiencies predicted for future demand and/or identified in the City's 2015 Comprehensive Sewer Plan. Some of these existing deficiencies are expected to be addressed with future City capital improvements as described in the City's Comprehensive Sewer Plan. See BHC Consultants Memorandum in the Appendix of this report for more information.

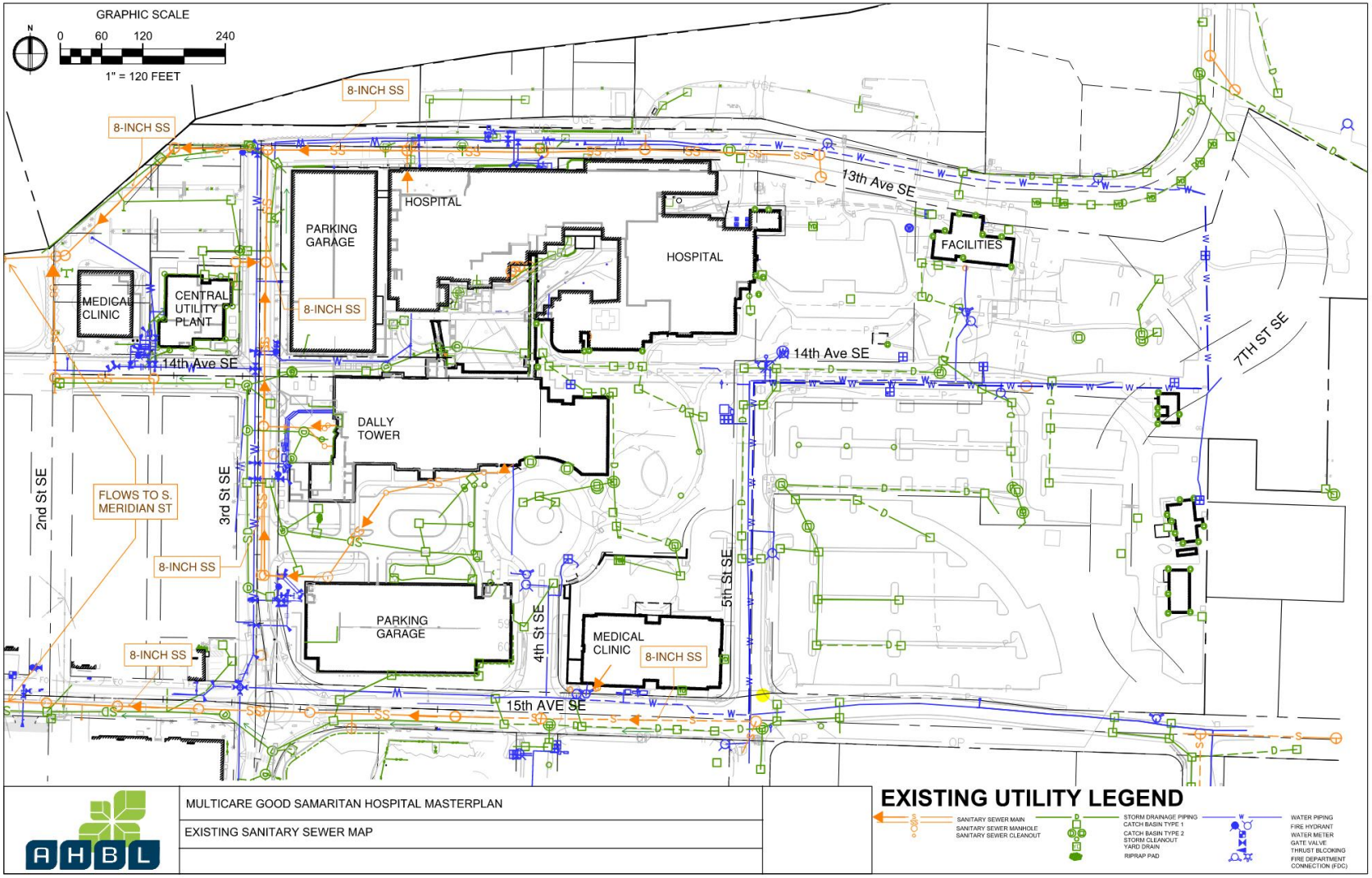
Existing sanitary sewer utility bills were not available for review; thus, estimates of existing annual wastewater discharge were based on domestic water consumption in 2022 as described in Section 2.1.3. As a result, it is estimated that the MGSH campus currently has an annual wastewater discharge of 31,400,000 gallons (which averages to 86,100 gallons/day) from the campus into the City's sanitary sewer system. For the area of the campus where the proposed improvements shown in the 2023 *Master Plan* (hospital facilities located between 13th Ave SE and 15th Ave SE and 3rd St SE and 5th Street SE), it is estimated the facilities in this area have an annual wastewater discharge of approximately 29,700,000 gallons per year, which is the majority of the wastewater discharges generated on campus.

Figure 2.2-1 City of Puyallup Sanitary Sewer System



Source: City of Puyallup Comprehensive Plan, Chapter 8- Utilities Element, Map 8-3.

Figure 2.2-2 Existing Sanitary Sewer System



Source: Figure based off Figure II-N by AHBL in MGSH 2023 Master Plan with additional notes added by MIG regarding existing site features and sanitary sewer system.

2.3 EXISTING STORMWATER AND WATER RESOURCES

2.3.1 Stormwater System

Stormwater runoff from the MGSH campus is collected within the on-site stormwater systems and then conveyed to the City's storm drainage conveyance system that discharges into two separate drainage basins/water resources, including Clarks Creek basin to the west and State Highway basin (along SR 512) to the northeast. See Figure 2.3-1 for watershed basins map and Figure 2.3-2 for stormwater conveyance systems near MGSH campus.

Based on review of City of Puyallup Public Data Viewer mapping, available MGSH records, and information provided by AHBL on behalf of MGHS, existing on-site stormwater management systems for water quality treatment, conveyance and/or flow attenuation include catch basins, inlets, pipes, detention ponds, storm filter vaults, oil-water separators, rain gardens and/or porous asphalt parking lot (See Figure 2.3-2). Once the stormwater runoff from buildings and parking lots is collected it is then conveyed to existing stormwater mains located in streets adjacent to the MGSH campus at various service drainpipe connection points surrounding the site. The public stormwater conveyance system adjacent to the campus is typically 12-inch PVC pipes, except for the 42-inch reinforced concrete pipe in 7th Street SE.

2.3.2 Hydrology and Drainage Basin

The existing land use characteristics for the areas of the MGSH *Master Plan* are described in Table 2.3-1 and depicted in Figure 2.3-3. Portions of the stormwater runoff from these areas are mitigated through the existing on-site stormwater facilities on the campus described herein and shown in Figure 2.3-2.

Table 2.3-1: Existing MGSH Campus Characteristics

Campus Acreage	34.86 acres
Impervious Area (Buildings, Parking Lots, sidewalks etc.)	22.1 acres (63%)
Pervious Area (landscape, lawn)	12.8 acres (37%)

Source: MGSH 2023 Master Plan.

Stormwater runoff from the MGSH campus drains into two separate drainage basins including Clarks Creek basin to the west and State Highway basin (along SR 512) to the northeast. City of Puyallup's Public Works department's Maintenance and Operations division maintains the City's public storm drain mains and drainage systems downstream and adjacent to MGSH campus.

Drainage to Clarks Creek: The majority of the MGSH campus north of 15th Avenue SE and west of 5th Street SE discharges into the City's 12-inch storm main in 13th Ave SE and 3rd Street SE. The storm main in 3rd Street SE conveys flows to the north to 13th Ave SE then flows west in the storm main in 13th Ave SE. The City's piped conveyance system then crosses under State Route 512 at 14th Ave SE (30-inch pipe) and eventually discharges into Meeker Creek that is a tributary to Clarks Creek Basin.

Drainage to State highway basin: Stormwater runoff from the remainder of the campus east of 5th Street SE flows into the City's 12-inch storm main in 13th Avenue SE and to the northeast into 42-inch storm main in 7th Street SE. At 7th St SE and 12th Ave SE, the City's storm main discharges into an open conveyance swale along State Route (SR) 512 (referred to as State Highway Basin). The joint City-State-owned conveyance system along SR 512 eventually outfalls into White River/Puyallup River to the north.

2.3.3 Downstream Conveyance

For information regarding the downstream conveyance system, MIG reviewed City of Puyallup GIS mapping, MGSH 2023 *Master Plan*, data provided by MGSH civil engineering consultant, AHBL, and information provided Brown and Caldwell in a letter dated January 15, 2024.

Based on Brown and Caldwell's review, there are no known flooding or downstream conveyance capacity problems in the existing storm piped systems in 13th Ave SE, 14th Ave SE and 15th Ave SE adjacent to the campus that eventually drains to Meeker/Clarks Creek Basin.

For the City's piped conveyance system in 13th Ave SE and 7th Street SE to where it discharges into the conveyance system in SR 512, there are no known conveyance capacity problems. However, several sources indicated there may be issues with the joint city-state owned conveyance system in SR 512 or other areas within the State Highway basin. Excerpt from MGSH 2023 *Master Plan*, "*Discussed on August 30th, 2022, during a meeting with the City of Puyallup engineering staff to discuss the civil engineering scope of the masterplan, the conveyance system along Highway 512 was identified as undersized by the City.*"

In a letter provided by Brown and Caldwell (BC) dated January 30, 2024 (see Appendix for letter), they reviewed existing conditions and known drainage problems downstream of the MGSH campus and summarized their findings as follows:

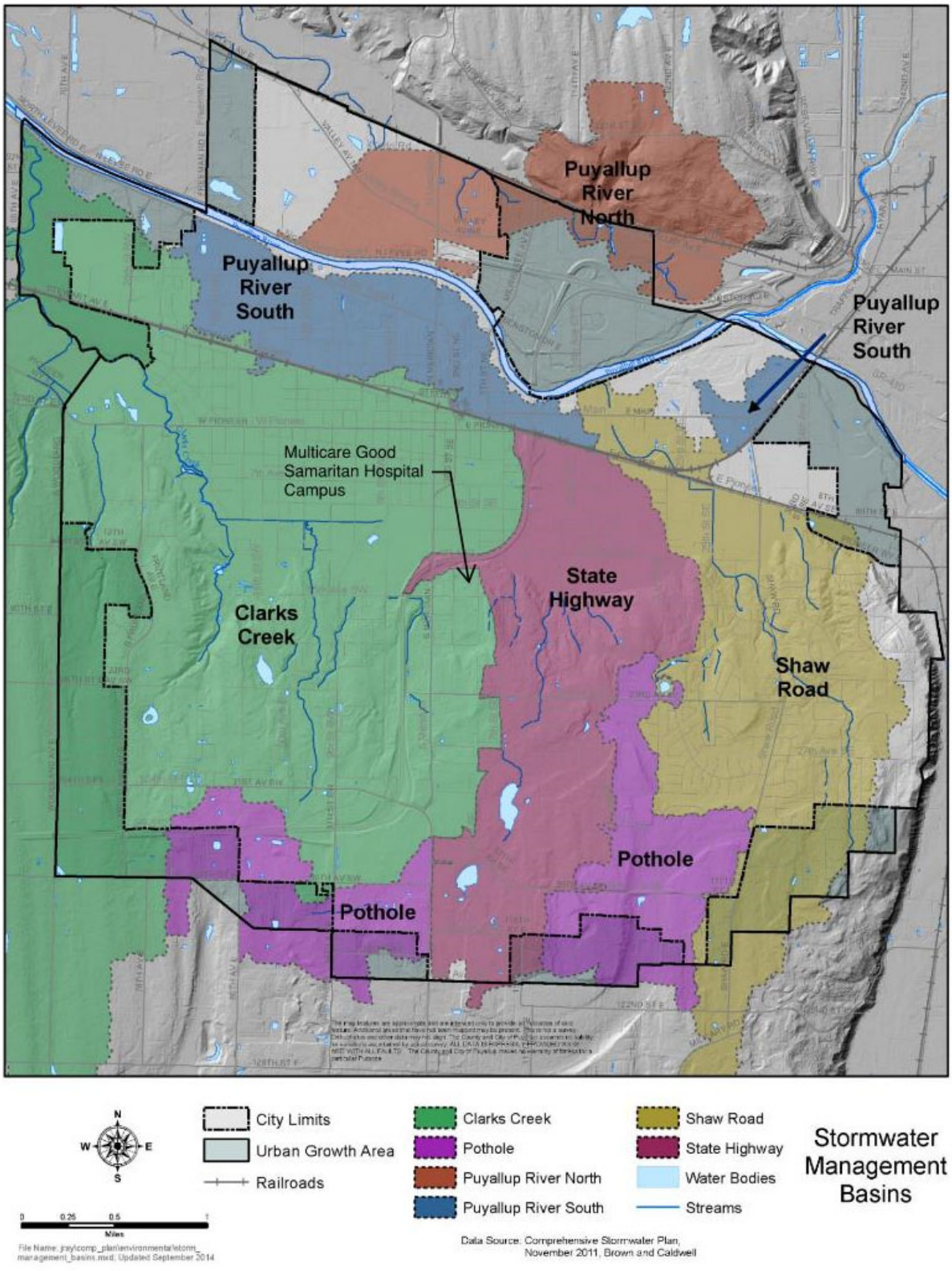
> "*During most storms, each portion of the Site [MGSH campus] drains to their respective basins. During very large storms, some flow in SR 512 storm pipe is diverted to the Meeker/Clarks system (Tetra Tech 2012) where 15th Ave intersects with SR 512. The diversion occurs upstream from where drainage from Good Samaritan Hospital campus discharges into the SR 512 system.*"
>
> *"Stormwater from the State Highway basin discharges to the SR 512 storm pipe that discharges to the Puyallup River, which meets the requirements for a TDA exemption. However, the City believes the SR 512 storm pipe is at capacity and intends to verify the capacity in the future with a calibrated model (Personal communication with Paul Marrinan 2023). Therefore, stormwater from any new improvements in portions of the Site discharging to the State Highway basin would not qualify for direct discharge to the Puyallup River but would need to meet all applicable MRs including MR#7 Flow Control."*
>
> "*BC reviewed flooding locations at the City's request in support of the 2024 Stormwater Comprehensive Plan (SWCP). There is one known flooding location located within the State Highway basin in proximity to the Site as shown in Figure 1* [see Figure 2.3-4

herein], *the 12th Avenue SE and 13th Street SE Flooding location. Identified in the 2007 State Highway Basin Plan, the 12th Avenue SE and 13th Street SE flooding occurs in an area with high groundwater and a general lack of stormwater infrastructure. However, the flooding is relatively minor, and is not anticipated to be addressed as a capital project in the capital improvement program update in the 2024 SWCP (personal communication with Kelton Parker 2023)*."

BC further notes in email correspondence with MIG that "minor" flooding is defined as "Road flooding during major events only," from 2012 Comprehensive Storm Drainage Plan Appendix A, Table 1, City of Puyallup Drainage Problems. BC estimates that the flow at the intersection of 12th Avenue SE and 13th Avenue SE are not impacted by runoff from the campus (MIG email correspondence with Margaret Ales of BC on 2/15/2024).

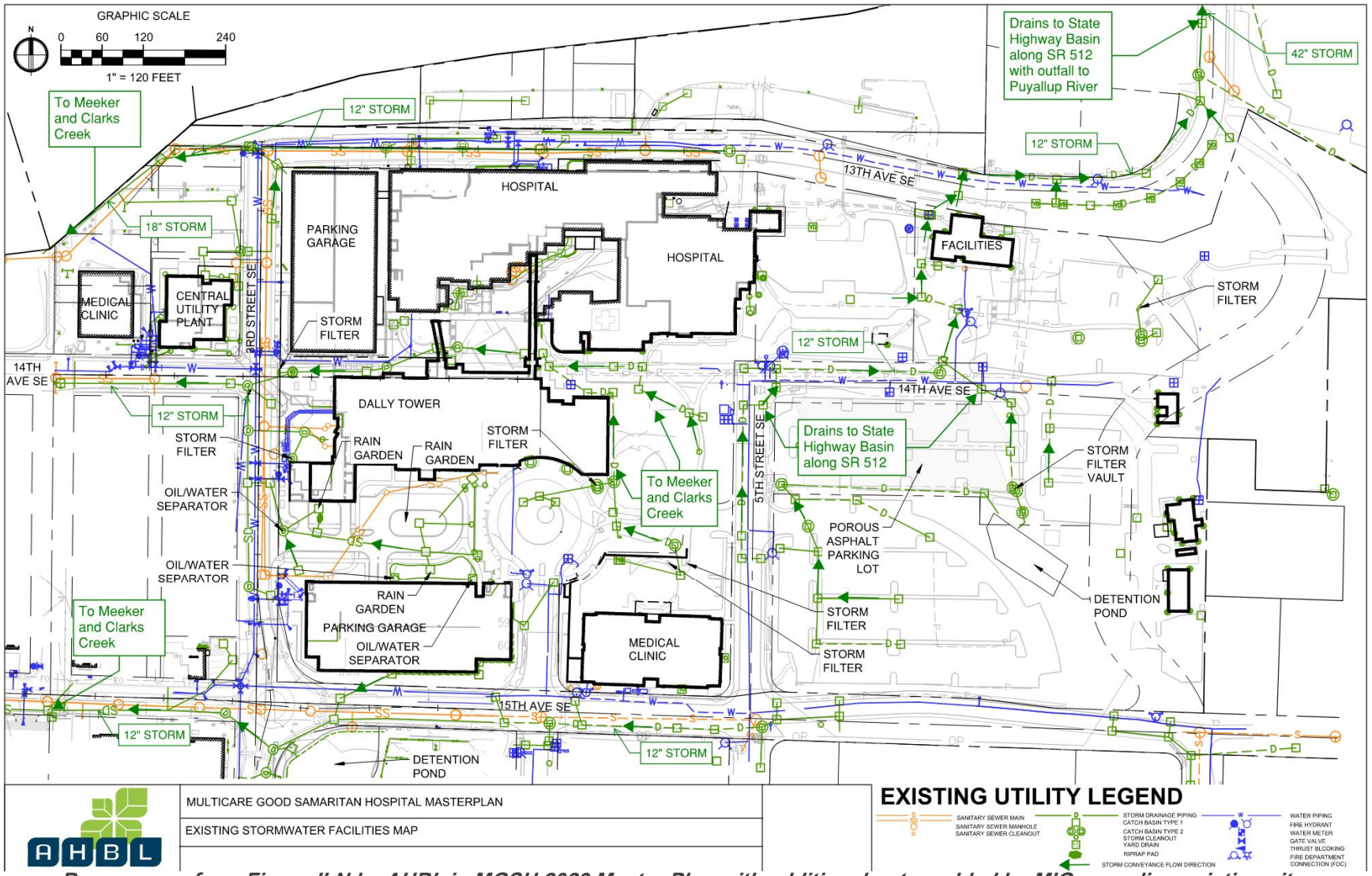
Based on MIG's review of storm water utility mapping from City of Puyallup Public Data Viewer webpage and information provided by Brown and Caldwell, drainage from the MGSH campus is not conveyed to the intersection of 12th Avenue SE and 13th Street SE. Thus, the campus does the contribute to the flooding at this intersection and the "minor flooding" is localized due to lack of drainage collection infrastructure.

Figure 2.3-1 Existing Stormwater Management Basins



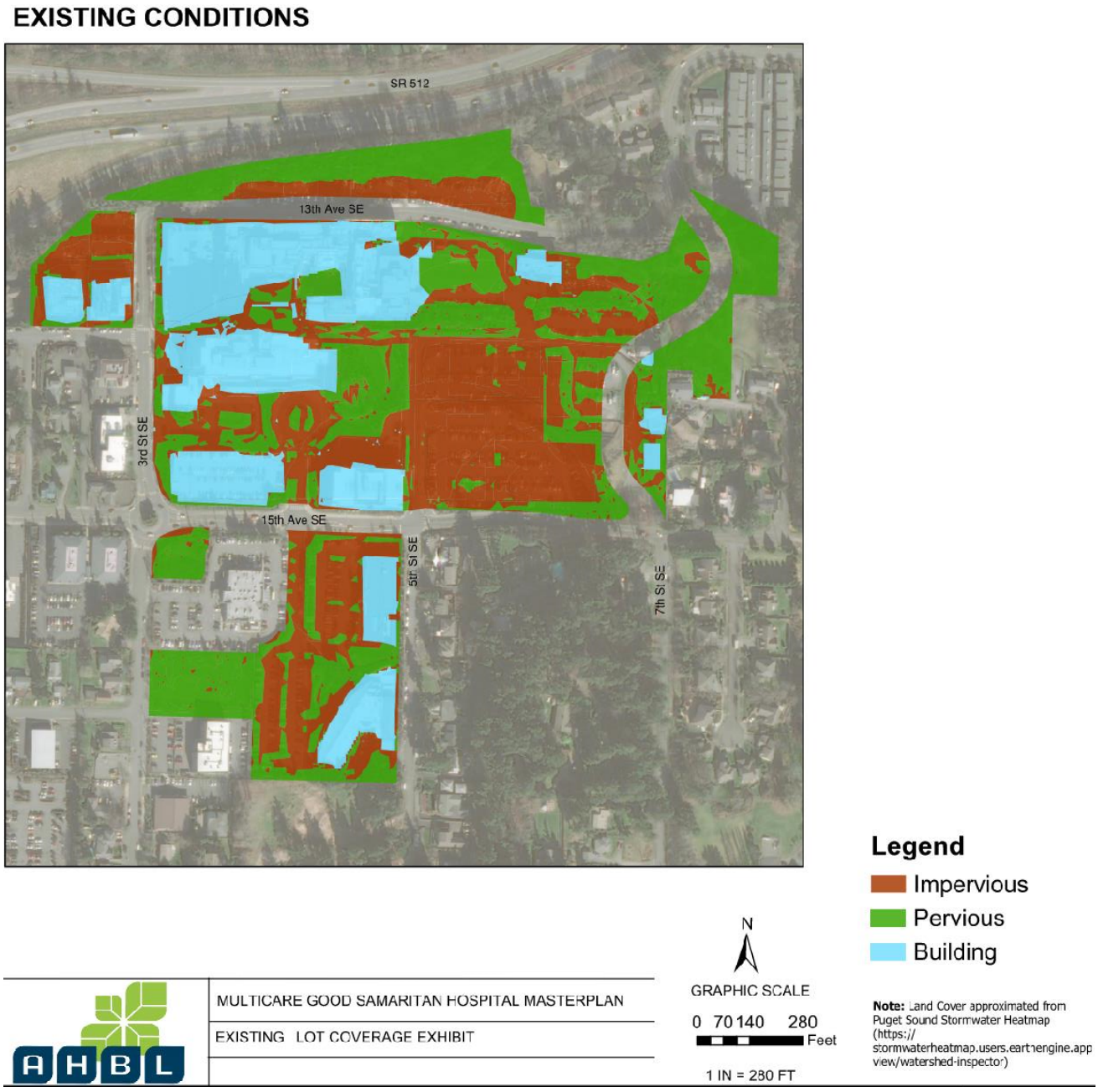
Source: City of Puyallup Comprehensive Plan, Chapter 8

Figure 2.3-2 Existing Stormwater Conveyance System



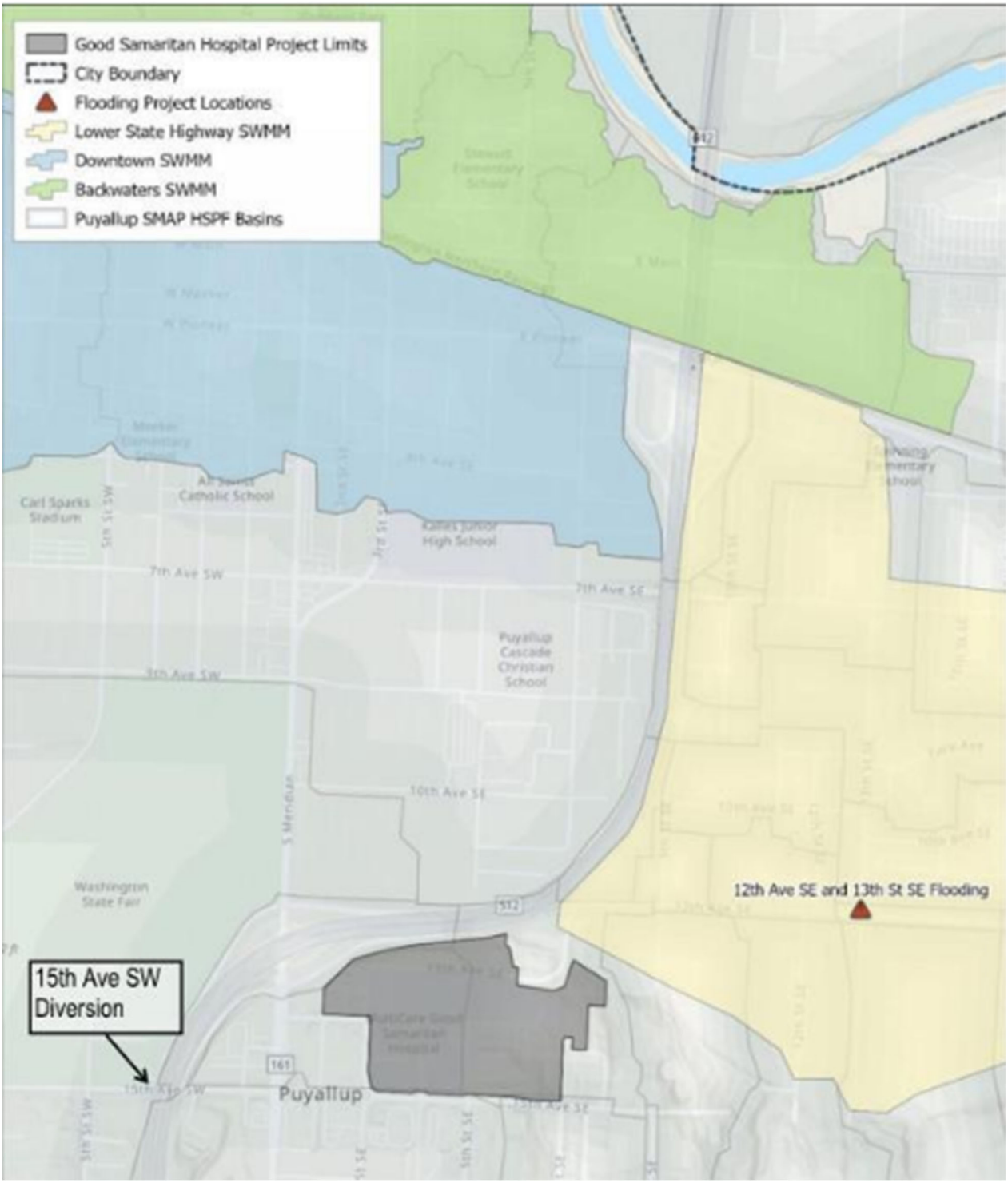
Source: Base source from Figure II-N by AHBL in MGSH 2023 Master Plan with additional notes added by MIG regarding existing site features and storm system information provided by MGSH and City.

Figure 2.3-3 Existing Impervious Pervious Lot Coverage



Source: Original figure provided by AHBL from Figure II-M in MGSH 2023 Master Plan.

Figure 2.3-4 Known Flooding Location in SR 512 Highway Basin



Source: Figure from Brown and Caldwell letter dated January 30, 2024. In letter, figure is labeled: "Figure 1 Flooding project location near the Site."

3.0 IMPACTS OF EIS ALTERNATIVES

3.1 WATER

For each of the EIS Alternatives, the City of Puyallup would continue to provide water service to the site for the proposed development. For estimating the increase in water consumption for the *Proposed Action*, MIG reviewed data provided by the City of Puyallup Public Works Water division and the design team for MultiCare's Good Samaritan Hospital Master plan. We then estimated drinking water consumption based on the different building uses on site and tabulated them for the *Proposed Action and Alternative 1*. Finaly, MIG coordinated with Gray & Osborne, Inc. who conducted an analysis of the potential impacts to the city water main distribution system. This section summarizes the results for the water demand impacts at full buildout of the *Proposed Action* and *Alternative 1* for the EIS.

3.1.1 Average Day, Maximum Day, and Peak Demands

A water demand analysis was conducted by MIG to assess the new water demand for the EIS Alternatives. Assumptions for water demand use were based on:

- information provided by MGSH's civil engineering consultant, AHBL, and other consultants for the MultiCare's Good Samaritan Hospital 2023 *Master Plan*.
- review of City provided Domestic Water Use (water bills) from 2022 for similar facilities on campus.
- Washington State Department of Health (DOH) guidelines outlined in the Water System Design Manual, June 2020 edition, DOH Pub 331-123; and
- Washington State Department of Ecology's Criteria for Sewage Works Design, August 2008, Publication 98-37 WQ.

The estimate of increase in annual domestic water consumption (gallons per year) for the new facilities in the *Master Plan* was based on review of existing domestic water utility bills provided by the city for 2022 and estimates provided by AHBL.

To estimate the increase in Maximum Daily Demand (MDD) (domestic water gallons/day) for the new facilities in the *Master Plan*, MIG referenced Table 3-2 in DOH Pub 331-123 and supplemented with information provided by AHBL. Table 3.1-1 summarizes the assumptions used for calculating MDD.

To calculate domestic water peak flow demand (gallons per minute = gpm) MIG applied a factor of 1.62 to MDD with a unit conversion to gpm. The value of 1.62 was provided by Gray and Osborne based on what they have used in their water distribution modeling. For other facilities not listed in Table 3-2 in DOH Pub 331-123, MIG used the peak demand estimate provided by MGSH's civil engineering consultant, AHBL.

Table 3.1-2 shows a summary of the increase in annual domestic water consumption, MDD and Peak Flow demands for domestic water for the *Proposed Action and Alternative 1*.

Table 3.1-1: Basis of Design for Estimating Water Used

Facilities	Unit	Water Used per Unit (MDD or Peak)[1]	Flow Duration
Hospital (per bed)	Per bed	400 gpd[2]	24 hours[3]
Medical Office Area	Per 1,000 gsf	500 gpd[3]	12 hours[3]
Parking Structure (PS) 1	Per Building[4]	30 gpm[4]	12 hours
Central Utility Plant	Per Expansion[4]	100 gpm[4]	10 min/day[4]
Parking Structure (PS) 2	Per Building[4]	100 gpm[4]	12 hours
Central Supply Tower	Per Building[4]	60 gpm[4]	4 hours[4]
Dally Tower Expansion	Per Building[4]	100 gpm[4]	4 hours[4]

GSF = floor space in square feet

[1]MDD = Maximum Daily Demand in gallons per day (gpd) or Peak Demand in gallons per minute (gpm)
[2] Assumptions from Table 3-2: Guide for Maximum Daily Nonresidential Water Demand in DOH 331-123, June 2020 Water System Design Manual
[3] Assumptions from Table G2-2 Design Basis for New Sewage Works in Washington State Department of Ecology Criteria for Sewage Works Design, August 2008, Publication #98-37 WQ.
[4]Provided by MGSH 2023 Master Plan's civil engineering consultant AHBL.

Table 3.1-2: Summary of Estimated Increase in New Domestic Water Demand

Development Type	Increase in Water Demand (Gallons/year)[1]	Increase in MDD[5] (gpd)	Increase in Peak Demand[3,5] (gpm)
Proposed Action	24,810,000	300,000	773
Alternative 1 – Reduction in MOB B [2]	22,990,000	250,000	661
Phase 1 Only Proposed Action/ Alternative 1[4]	7,140,000	116,000	288
No Action Alternative	None[6]	None[6]	None[6]

MDD = maximum daily demand (domestic water use) gpd = gallons per day gpm = gallons per minute
[1]Patient Care Tower, Emergency Department Expansion, parking structures and medical office buildings were based on actual domestic water consumption for 2022 provided by City of Puyallup. All other buildings/facilities were based on information provided by MGSH 2023 Master Plan's engineering consultant AHBL.
[2]Does not include Medical Office Building B
[3]Peak Demand is a sum for all the facilities and with peak demand occurring simultaneously (including maintenance testing for supply tower). Actual peak demand for the campus would be less since peak demand for facilities would occur at different times during the day. For example, flow testing of the central utility plant would be done outside of peak flow demands for campus medical facilities.
[4]Phase 1 improvements would be the same for the Proposed Action and Alternative 1 as described in Section 1.2 of this report.
[5]Estimates for maximum daily demand and peak demand are based on assumptions in Table 3.1-1.
[6]Existing annual consumption is noted in Table 3.1-3 for the No Action Alternative. Per Gray-Osborne March 2024 Memorandum, based on the City's Water System Plan last updated in 2017 it is assumed the existing MDD is 206,000 gpd and Peak Demand is 233 gpm.

Table 3.1-3 compares the estimated total annual water demand for the campus for each of the EIS Alternatives. The existing annual water used is based on utility bills from 2022 as described in Section 2.1.

Table 3.1-3: Comparison of Annual Water Demand Use for EIS Alternatives

Development Type	Annual Water Demand (Gallons)[1]	Percent Increase from Existing	Average Daily Demand (gallons/day)[1]
Proposed Action Master Plan	59,770,000	71%	164,000
Alternative 1 – Reduction in MOB B[2]	57,950,000	66%	159,000
Phase 1 Only Proposed Action/ Alternative 1[3]	42,100,000	20%	116,000
No Action Alternative	34,960,000	None	96,000

[1] Includes Increase in annual water consumption for the EIS Alternative as noted in Table 3.1-2 plus existing annual consumption for entire campus as estimated from 2022 water utility bills. Average daily demand = Annual Water Demand/365 days.

[2]Does not include Medical Office Building B

[3]Phase 1 improvements would be the same for the Proposed Action and Alternative 1 as described in Section 1.2 of this report.

3.1.2 Minimum System Pressure

Based on information provided by Gray and Osborne, Inc. regarding the City of Puyallup's water system, the MGSH "campus is located within the City's pressure Zone 2, which has a hydraulic grade line of 359 feet. The pressure along the 8-inch to 12-inch pipes along the site perimeter ranges from 62 psi to 117 psi. The pressures are based on the modeling in the [City of Puyallup 2019] Water System Plan for the projected 20-year peak hour demand scenario. Average day pressures may be slightly higher than this."

3.1.3 Required Fire Flow

When MGSH implements the *Master Plan*, they will be required to design and construct fire system to provide the required fire flow to the new facilities and buildings of MGSH *Master Plan*. The required fire flow is a function of the size of a building and the type of construction as referenced in Appendix B of the Fire Code of the City of Puyallup (Chapter 16.04 of the City Municipal Code). Requirements for fire flow are described in Chapter 16.08 of the City Municipal Code.

Requirements for fire hydrants are described in Chapter 16.08 of the City Municipal Code. Where existing fire hydrants are impacted by improvements, new fire hydrants would be installed on site in accordance with City standards and the Fire Marshal requirements to maintain fire protection coverage.

The required fire flow for each of the EIS Alternatives is estimated to remain the same as existing conditions at 4,000 gpm for 4 hours, as noted in City's Water System Plan that was last

updated in 2017, assuming the new buildings will be designed similar to the existing buildings in material, height, fire sprinkler system and construction. Designers for the MGSH *Master Plan* will coordinate with City Fire Marshall and architect to determine required fire flow for the improvements under each of the EIS Alternative given the assumed building types and for installation of new fire hydrants on the campus.

Gray & Osborne (G-O) analyzed the adequacy of the City's existing water system to provide water and fire service for the full buildout of the *Proposed Action Master Plan* with projected 2038 demands described in the City's Water System Plan. Factoring in the increase in domestic water demands for the *Proposed Action* and assumptions for the hydraulic model, their analysis showed that the current fire flow requirement of 4,000 gpm, would still be available from the existing 12-inch water mains. However, the existing private 8-inch water main on east side of campus would not have capacity to provide a fire flow requirement if it was to provide 4,000 gpm for 4 hours.

The fire flow demands to the site will need to be confirmed once the buildings in the *Proposed Action* are designed by the fire sprinkler designer for MGSH's new buildings. If the fire flow demand requirements for the campus increases from existing fire flow requirements, then further analysis will be required by MGSH's designers and the city to determine whether the existing City water system is adequate to supply the needed fire flow. See Appendix for Gray & Osborne Inc.'s technical memorandum summarizing the analysis.

3.1.4 Irrigation Demand

Typically, irrigation takes place during off-peak water demand hours. In addition, there would be a reduction in pervious landscape areas on site for the *Proposed Action* and *Alternative 1*. Thus, the water demand for irrigation is not included in the analysis and the water demand for irrigation is expected to be similar to or less than existing conditions demand. See Section 2.1 for assumptions for existing irrigation consumption.

3.1.5 Proposed Water System Improvements

For all the EIS Alternatives, new water service connections, fire service connections, and fire hydrants would be provided to the new buildings and facilities on site. The city of Puyallup has adequate water supply and treatment of their existing water system to meet the estimated increase in water consumption for the *Proposed Action*. All new water services to the campus would be sized by MGSH design engineers based on respective domestic and fire service demand, as well as available pressure and flow from the City's water distribution system. Appropriate backflow devices and appurtenances would be provided on domestic water and fire water services in conformance with the City's water standards. New fire hydrants will be installed for adequate hydrant coverage for proposed buildings. Refer to Figure 3.1-1 for conceptual water and fire service exhibit.

The existing public 12-inch water mains to the site have adequate capacity to provide 4,000 gpm fire flow to the campus. However, the existing private 8-inch water main on the eastern side of the campus will need to be replaced and relocated with a 12-inch water main if it is required to provide 4,000 gpm of fire flow for the new improvements (see Gray & Osborne, Inc.'s analysis in

Appendix). The existing private 8-inch water main also encroaches into the 7th Ave right-of-way and if this right-of-way is developed into a streetscape (e.g., road, sidewalks etc) to city standards, then the private line will need to be relocated. Furthermore, to maintain adequate pressure in the system, the replaced private water main on the eastern side of the campus will be required to be looped by connecting to the existing public 12-inch mains in 13th Ave SE and 15th Ave SE.

As referenced in Section 2.1.1, the City's water system can produce over 13.7 million gallons of drinking water daily. The city reported that 1.245 billion gallons was consumed within the City's water supply system in 2022, which converts to a daily average of 3.4 million gallons/day. The City has ample water supply and treatment capacity to meet the increased daily water demands for all the EIS alternatives as shown in Table 3.1-2 for maximum daily demand (up to 0.3 million gallons/day) and Table 3.1-3 for average daily demand (up to 0.164 million gallons/day).

3.1.5.a Proposed Action Master Plan

The City of Puyallup would continue to provide water service to the campus for development under the proposed *Master Plan*. New water service connections would be installed for each new building. Connections would be sized depending on respective domestic and fire service demand, as well as available pressure and flow from the City's water distribution system. New fire hydrants would be installed to ensure adequate hydrant coverage for all proposed new buildings.

Per City of Puyallup, MGSH will be required to continue to provide a north south water main on east side of the campus to ensure adequate pressure is maintained for the existing system. Currently, the existing private 8" water main in 5th Street SE and 14th Avenue SE provides a looped water system between the public water mains in 13th Avenue SE and 15th Avenue SE. This private water main is also considered by the city as an encroachment since it is in the newly dedicated undeveloped 7th Street SE right-of-way. Furthermore, based on hydraulic modeling conducted by Gray & Osborne, Inc., this existing 8-inch water main would need to be upsized to 12-inch to provide a 4,000 gpm fire flow off this main. As a result, the private water main will need to be upsized and relocated to install proposed improvements of the *Master Plan* to maintain the looped water system. See Figure 3.1-1 for the proposed public water main distribution plan.

3.1.5.b Alternative 1 – Reduced Medical Office Building Size

The proposed water system for *Alternative 1* would be same as described in 3.1.5a for the *Proposed Action Master Plan*, except that the second, 100,000 gsf Medical Office Building (MOB B) would not be included; thus, reducing the number of water, fire, and irrigation services to the site by one. All other development proposed in the *Master Plan* would be built. The water infrastructure improvements would be same as *Proposed Action Master Plan* including replacing and relocating the private 8" water main to a 12" water main as described above.

3.1.5.c No Action Alternative

With the *No Action Alternative*, there would be no new services or modifications made to the

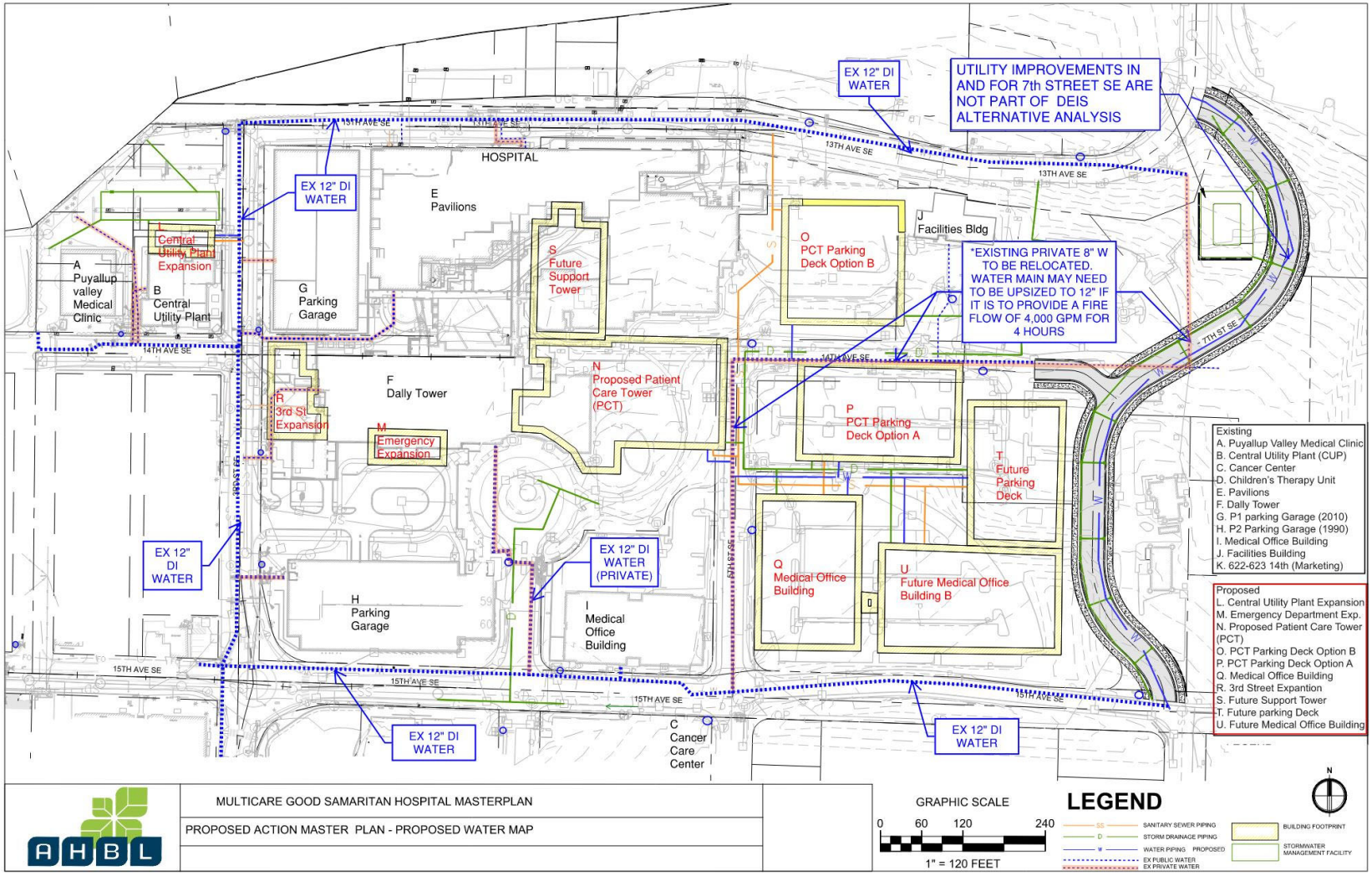
existing water system except as required to address future maintenance issues for the private system. From correspondence with City of Puyallup, if 7th Ave SE is developed, the existing private 8-inch water main and services that encroach in 7th Ave SE public right-of-way (ROW) would need to be relocated out of the City ROW and onto MGSH parcel. This main would also need to be upsized to a 12-inch if it is intended to provide a required fire flow of 4,000 gpm for 4 hours as described previously.

3.1.6 Construction Impacts

Construction of proposed water improvements for the *Proposed Action* and *Alternative 1* would be scheduled with other infrastructure improvements, including sewer, stormwater control, site work, and other utilities. The existing water system would continue to provide domestic and fire service to existing buildings to remain. To maintain coverage and minimize disruptions during construction, temporary service connections/bypass may be needed in accordance with City of Puyallup and Fire Marshall requirements.

In general, during grading and excavations for underground pipes, Temporary Erosion and Sediment Control (TESC) Best Management Practices (BMPs), per City of Puyallup regulations would be used to address the potential for erosion/sedimentation with clearing, grading, and trenching for utilities.

Figure 3.1-1 Proposed Action and Alternative 1 Water System



Source: Based on Figure III-K prepared by AHBL in MGHS 2023 Master Plan. Additional notes added for reference.

3.2 SANITARY SEWER

For all the EIS Alternatives, the City of Puyallup would continue to manage the treatment of wastewater discharge flows received from the MGSH site via existing and new side sewer connections to the City's sanitary sewer conveyance system. MIG reviewed information provided by the City of Puyallup Public Works and the design team for MultiCare's Good Samaritan Hospital *Master Plan* for estimating the increase in wastewater discharges for the *Proposed Action* and *Alternative 1*. BHC Consultants then conducted a review of existing municipal sanitary sewer conveyance system models for evaluating increase in wastewater discharges from implementation of the *Proposed Action* and *Alternative 1*. This section evaluates the increase in wastewater discharge and estimates the increase in peak sanitary sewer flows at full buildout of the *Proposed Action* and *Alternative 1*.

3.2.1 Estimated Wastewater Discharge and Flows

MIG estimated the increase in wastewater discharge into the City's sanitary sewer system with implementation of the *Proposed Action* based on the following:

- information provided by MGSH's design team of engineering consultants (including civil engineering consultant, AHBL) for Good Samaritan Hospital's 2023 *Master Plan*.
- review of City provided Domestic Water Use from 2022 for similar facilities on campus.
- guidance in Washington State Department of Ecology Criteria for Sewage Works Design, August 2008, Publication 98-37 WQ.
- guidance in Washington State Department of Health (DOH) guidelines outlined in the Water System Design Manual, June 2020 edition, DOH Pub 331-123.

For the wastewater discharge estimates, MIG identified the discharge facility type (such as medical office building, hospital beds, etc.) and the design units (as described in Ecology Publication 98-37 WQ Table G2-2) for the discharge facility. MGSH's design team for the *Master Plan* provided the number of unit counts for each building/discharge facility (such as number of hospital beds, gross floor building area) as described in Section 1 and Table 1-1 and Table 1-2.

Annual Wastewater Discharge: Estimate of increase in annual wastewater discharge (gallons per year) for the new facilities in the *Master Plan* was based on review of existing annual domestic water consumption (from utility bills) provided by the city of Puyallup for 2022 and estimates provided by MGSH's design engineers (AHBL). Sanitary sewer utility bills were not available for the analysis, as such, the annual wastewater discharge is considered conservative since it assumes 100 percent of the water consumed is converted to wastewater discharge.

Maximum Daily Discharge: To estimate the increase in Maximum Daily Discharge (MDD) (wastewater discharge gallons/day) for the new facilities in the *Master Plan*, MIG applied a flow per design unit count based on assumptions in Table G2-2 in Ecology's Publication 98-37 WQ and supplemented with estimates provided by MGSH's design engineers (e.g. AHBL) for discharge facilities not included in the Ecology publication. Table 3.2-1 summarizes the assumptions used for calculating MDD.

Discharge Peak Flow: To calculate wastewater peak flow (gallons per minute=gpm) a peak factor was applied to the MDD value along with assumptions for the flow duration then converted to gallons per minute. In lieu of not having flow data for the existing sewer system, to estimate the peak flow, MIG assumed that the peak factor for wastewater discharge would be like the domestic water peak flow demand factor of 1.62 as described in Section 3.1. For other facilities not listed in Table G2-2 of Ecology's Publication 98-37WQ, peak flow estimate assumptions were provided by MGSH's design engineer consultants for the *Master Plan* (e.g., AHBL).

Table 3.2-2 shows a summary of the increase annual wastewater discharge, MDD and Peak Flow for the *Proposed Action* and *Alternative 1*.

Table 3.2-1: Summary of Sewer Design Assumptions based on Building Use

Discharge Facility	Design Unit	Flow (MDD or Peak[1]) per Design Unit	Flow Duration
Hospital (per bed)	Per bed[2]	300 gpd[2]	24 hours[2]
Medical Office Area	Per 1,000 gsf[2]	500 gpd[2]	12 hours[2]
Parking Structure (PS) 1	Per Building[2]	30 gpm[3]	12 hours
Central Utility Plant	Per Building Expansion[3]	150 gpm[3]	10 min/day[3]
Parking Structure (PS) 2	Per Building[3]	100 gpm[3]	12 hours
Central Supply Tower	Per Building[3]	60 gpm[3]	4 hours[3]
Dally Tower Expansion	Per Building[3]	100 gpm[3]	4 hours[3]

GSF = floor space in square feet

[1]Flow noted in MDD = Maximum Daily Demand in gallons per day (gpd) or Peak Flow in gallons per minute (gpm)
[2] Assumptions from Table G2-2 Design Basis for New Sewage Works in Washington State Department of Ecology Criteria for Sewage Works Design, August 2008, Publication #98-37 WQ.
[3]Provided by MGSH Master Plan's engineering consultant AHBL

Table 3.2-2: Summary of Increase in Estimated Wastewater Flows

Development Type	Annual Wastewater Discharge (gallons/year)[1,4]	Increase in MDD[5] (gpd)	Increase in Peak Flow[3, 4] (gpm)
Proposed Action Master Plan	24,540,400	273,330	750
Alternative 1 – Reduction in MOB B[2]	22,715,400	223,330	638
Phase 1 of Proposed Action or Alternative 1[5]	6,874,400	90,500	265
No Action Alternative	No change	No change	No change

MDD = Maximum Daily Demand gpd = gallons per day gpm = gallons per minute

[1]Patient Care Tower, Emergency Department Expansion, parking structures and medical office buildings were based on data provided by City of Puyallup for existing domestic water consumption in 2022 for similar facilities. Wastewater discharge estimates for all other facilities were provided by MGSH Master Plan's civil engineering consultant AHBL. See Table 3.2-1 for assumptions.

[2]Does not include Medical Office Building B that is in the Proposed Action.

[3]Peak Flow was calculated by summing up all peak flow rates for each facility. This assumes all peak flows happen at the same time in a day simultaneously, a very unusual / unlikely event of occurrence, and therefore conservative. Typically, peak sewer flow for campus facilities will vary based on building use and occupancy. For example, if it is assumed that the Central Utility Plant (peak flow of 150 gpm for 10 minutes in a day for maintenance) and the parking garages' peak flow does not occur at the same time as the hospital or medical office building then the cumulative Peak Flow would be reduced from 750 gpm to 470 gpm.

[4]Does not include existing wastewater discharges for campus facilities to remain.

[5]Phase 1 improvements are the same for Proposed Action and Alternative 1 as described in Section 1.2 of this report.

Table 3.2-3 compares the estimated total annual wastewater discharge for the campus for each of the EIS Alternatives. The existing annual wastewater discharge is based on assumptions noted in Section 2.2.

Table 3.2-3: Comparison of Estimated Annual Wastewater Discharge for EIS Alternatives

Development Type	Annual Wastewater Discharge (gallons/year)[1]	Percent Increase from Existing	Daily Average Wastewater Discharge (gallons/day)[1]
Proposed Action Master Plan	55,940,400	78%	153,300
Alternative 1 – Reduction in MOB B[2]	54,115,400	72%	148,300
Phase 1 of Proposed Action or Alternative 1[3]	38,274,400	22%	104,900
No Action Alternative	31,400,000	0	86,100

[1] Includes increase in annual water consumption for the EIS Alternatives as noted in Table 3.2-2 plus existing annual consumption for entire campus as estimated from 2022 water utility bills. Daily Average = Year discharge/365 day.

[2]Does not include Medical Office Building B

[3]Phase 1 improvements are the same for Proposed Action and Alternative 1 as described in Section 1.2 of this report.

As referenced in Section 2.2.1, from the City's Comprehensive Plan, the treatment capacity of the City's WPCP is 27.4 MGD with a current average influent flow of 9.5 MGD. The WPCP has plenty of treatment capacity to meet the increased maximum daily sewer influent flows for all the EIS alternatives for MGSH campus. As shown in Table 3.2-3, the average daily flow for the current campus of the *No Action Alternative* is estimated at 0.086 MGD. With full buildout of the *Proposed Action,* the average daily flow estimated for the full campus would increase to 0.153 MGD, which results in less than 1% increase from current average influent flow to WPCP. *Alternative 1* would be less of an increase with 0.148 MGD would have an lesser increase from current average influent flow to WPCP.

3.2.2 Proposed Sanitary Sewer Improvement

The City of Puyallup would continue to provide sewer service to the site for the proposed development. New sanitary side sewers would be installed and then convey flow to the existing City sanitary sewer mains in 13th Avenue SE and 3rd Street SE. Existing side sewers impacted by the improvements would be relocated. Design for the sanitary side sewers would be in accordance with City of Puyallup Public Works standards along with other requirements referenced in Washington State Department of Ecology Criteria for Sewage Works Design, August 2008.

3.2.2.a Proposed Action Master Plan

Proposed sanitary sewer service connections would be required for each of the buildings and building expansions for implementation of the MGSH *Master Plan*. Where existing sanitary side sewers are impacted by the new facilities or building expansion, the existing side sewers would be relocated. A private sanitary sewer main would be installed on the campus in alignment with 5th Street SE. A new side sewer connection would connect the Patient Care Tower, Parking Garages and Medical Office Buildings to the sewer main extension. An oil-water separator would be installed when required for certain building use on campus to treat effluent water prior to discharge into the side sewer that connects to the public sanitary sewer per City requirements. A new side sewer connection and oil water separator would be installed for the Central Utility Plant expansion and connect to the public sanitary sewer main in 3rd Street SE. See Figure 3.2-1 for a conceptual sanitary sewer main for improvements for the *Proposed Action*.

The increase in wastewater discharge from all the new facilities for the *Proposed Action* will all converge and drain into the existing public 8-inch sanitary sewer main in 13th Ave SE and 3rd St SE. There also may be a possibility to direct some of the sanitary sewer flows into an extension of the public sewer main to the northeast in 13th Ave SE if the existing sanitary sewer system that flows to the northwest does not have capacity.

A review of the conveyance capacity of the downstream sanitary sewer system was conducted by BHC consultants (see Appendix for Memorandum) using the City's hydraulic model from the City's 2015 Comprehensive Sewer Plan. Based on their review, there were no current capacity issues identified for the existing sanitary sewer main in 13th Ave SE upstream from Meridian Avenue. However, implementation of Phase 1 or full buildout of the *Proposed Action* will create added sewer demand on the city's sanitary sewer system. BHC notes that "new and previously unidentified capacity issues are predicted" with full buildout of the *Proposed Action*. The potential impact could be exacerbation of the existing capacity issues. Based on BHC's analysis it is estimated that approximately 310 LF of 8-inch sewer main would need to be upsized to 10-inch sewer main just west of the campus between 2nd St SE and 14th Ave SE (City's Sewer Maintenance Hole ID# MH S5-01777 and MH S5-01828) if all the increase in sewer flows from the *Proposed Action* discharge into this sewer system.

If the first Phase 1 of the *Proposed Action* and *Alternative 1* is constructed, then BHC's analysis estimated that flows generated from Phase 1 would result in deficiencies in the 310 LF of 8-inch sewer main that would require it to be upsized to 10-inch; however, BHC noted that if the City installs capital improvements that are planned for the sewer main under Highway 512 at 14th Ave SE (City Sewer ID PUY-19A CIP) then these deficiencies in the 310 LF of 8-inch sewer main are not predicted and the 8-inch sewer main would not need to be upsized.

3.2.2.b Alternative 1 – Reduced Medical Office Building (MOB) Size

Under *Alternative 1*, proposed redevelopment of the site would be like the *Proposed Action* except Medical Office Building B (see Figure 3.2-1) would not be constructed; thus, there would be small reduction in sanitary sewer flows compared to the *Proposed Action* as noted in Table 3.2-2.

Sanitary side sewer connections and extensions and analysis for capacity of the downstream system for *Alternative 1* are the same as the *Proposed Action* minus the connection for Medical Office Building B. See Figure 3.2-1.

While not modeled in BHC's analysis, it is predicted that the conveyance capacity issues noted in the *Proposed Action* would be similar for *Alternative 1* since the reduction in peak flow from MOB B is small. Further sensitivity analysis would be required to assess at what level of peak flows does the downstream system becomes deficient with and without improvements and in the City's Comprehensive Sewer Plan.

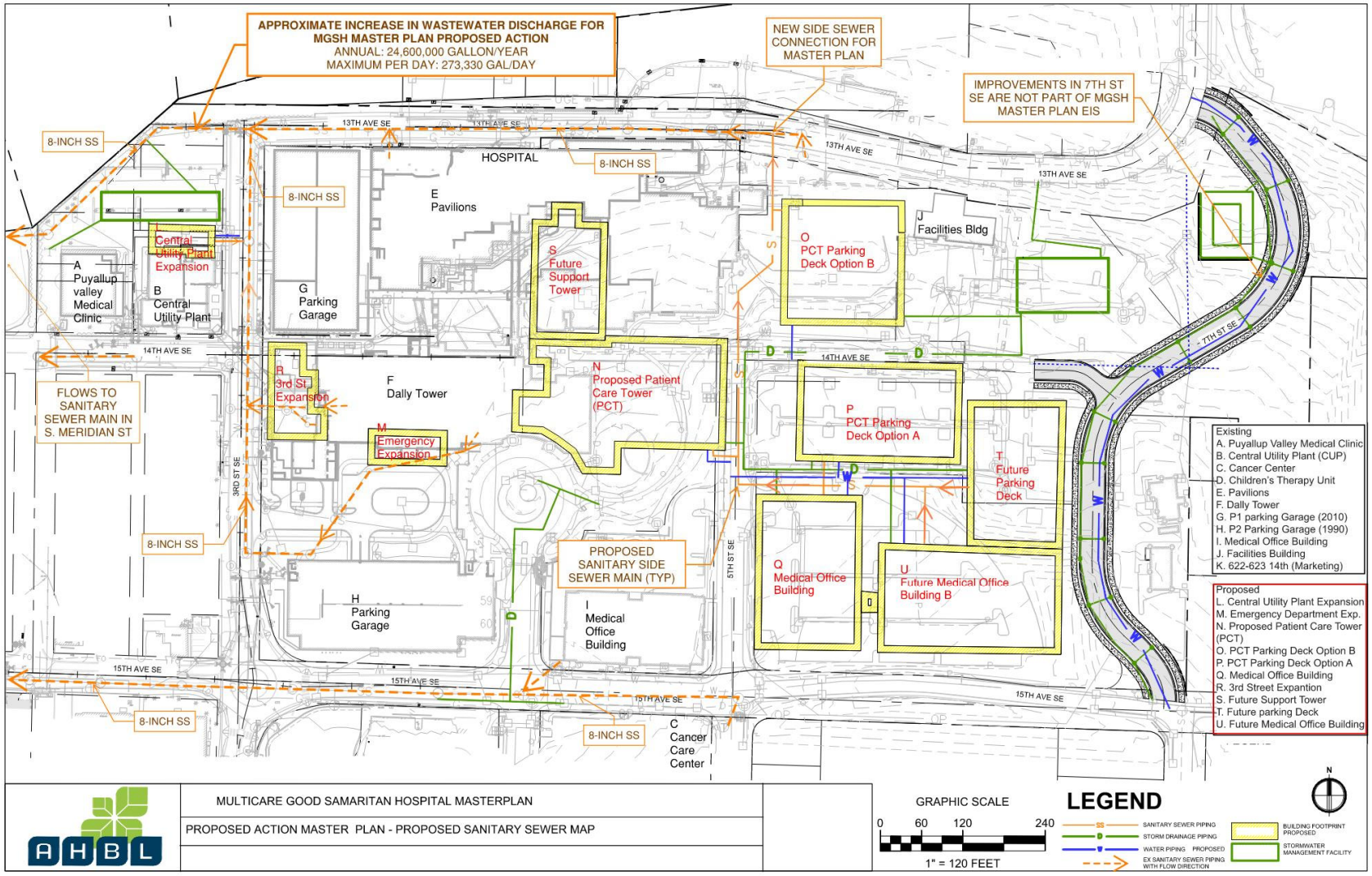
3.2.2.c No Action Alternative

The City of Puyallup would continue to provide sanitary sewer service to the site for the existing facilities on site. Wastewater discharge and flows would remain the same since there would be no change to existing conditions. The existing capacity deficiencies referenced in the City's Comprehensive Sewer Plan and BHC's analysis would remain the same unless they are resolved by planned capital improvements in the City's Comprehensive Sewer Plan CIP.

3.2.3 Construction Impacts

Construction of proposed sanitary side sewer improvements for the *Proposed Action* and *Alternative 1* would be scheduled with other infrastructure improvements including water, stormwater control, site work, and other utilities. Interruptions of sewer services to current users adjacent to the site would be minimized. A temporary bypass when connecting to existing sewer mains would occur to continue to service to adjacent properties. In general, during grading and excavations for underground pipes, Temporary Erosion and Sediment Control (TESC) Best Management Practices (BMPs), per City of Puyallup regulations would be used.

Figure 3.2-1 Proposed Sanitary Sewer for Proposed Action and Alternative 1



Source: Based on Figure III-K prepared by AHBL in MGHS 2023 Master Plan. Additional notes added for reference.

3.3 STORMWATER

For all the EIS Alternatives, the City of Puyallup would continue to manage the stormwater discharge flows from the MGSH site via existing and new storm drainage connections to the public storm sewer mains. The area draining to the two Threshold Discharge Areas, Clarks Creek and State Highway Basin, would remain the same and stormwater management facilities would be installed to mitigate impacts to the downstream system.

For the proposed on-site stormwater system for the *Proposed Action* and *Alternative 1*, MIG reviewed information provided by the City of Puyallup Public Works department, the 2023 MGSH *Master Plan*, information provided by AHBL for the proposed drainage concept for the *Master Plan*, Washington State Department of Ecology's Stormwater Management Manual for Western Washington, 2019 edition, as adopted by the City of Puyallup (SWMMWW) and information provided by Brown and Caldwell in a letter dated January 14, 2024 (BC 2024 Memo).

This section reviews the potential stormwater impacts that would occur with full buildout of the *Proposed Action* and *Alternative 1* and then identifies mitigation measure to address potential impacts. For the *No Action Alternative* there would be no changes to the existing stormwater systems and any stormwater system issues would persist.

3.3.1 Proposed Site Characteristics

Table 3.3-1 summarizes the land cover and surfaces for the EIS Alternatives and Figure 3.3-1 provides an overview of the land cover for the *Proposed Action* and *Alternative 1*. Land cover for the *No Action Alternative* would remain the same as shown in Figure 2.3-3.

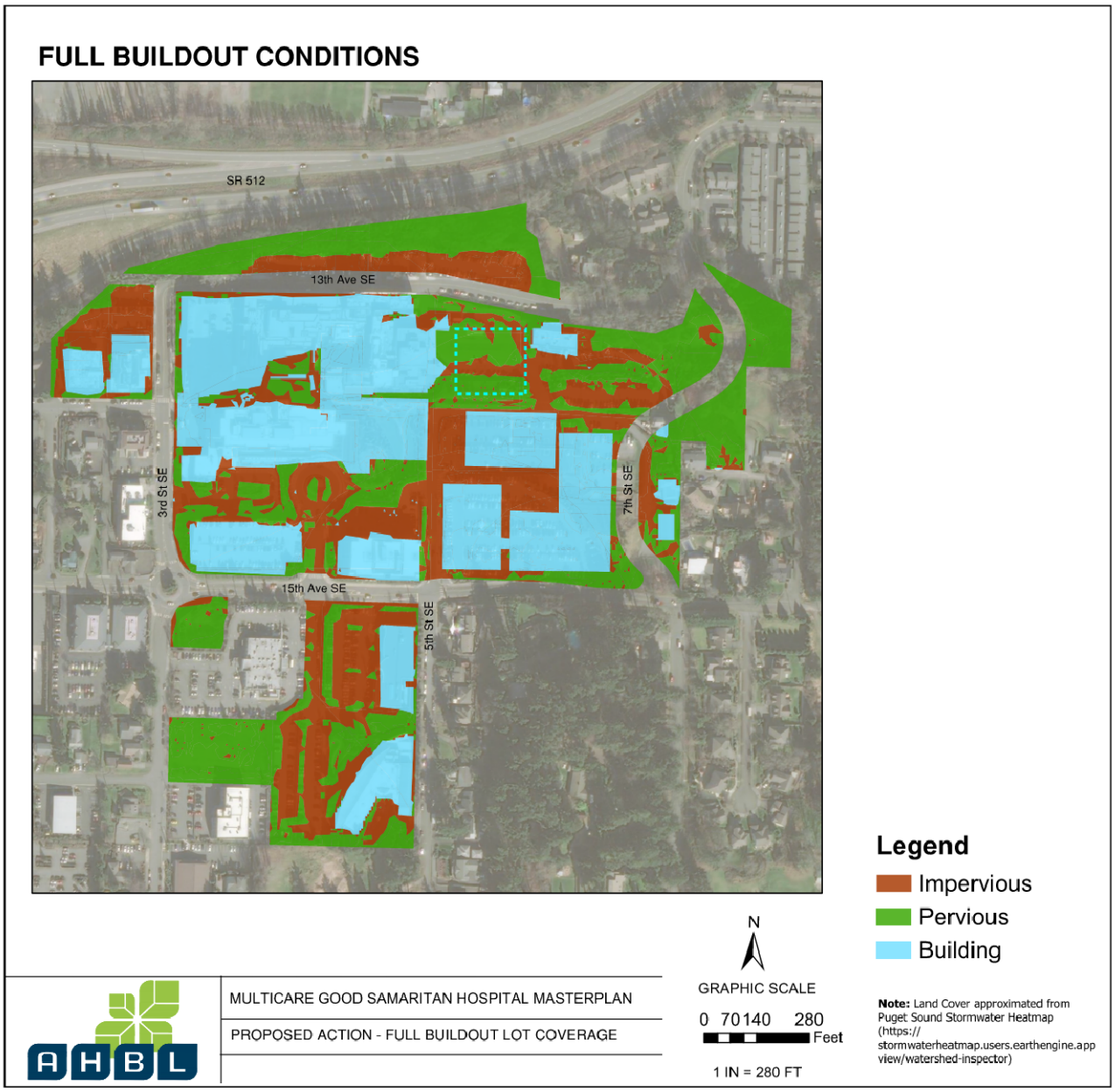
The *Proposed Action* would have a modest increase of 4% in impervious area compared to existing conditions given that the site is already heavily developed.

Table 3.3-1 Comparison of EIS Alternatives Areas

Area Type	Proposed Action	Alternative 1	No Action Alternative
Campus Acreage	34.86 acres	34.86 acres	34.86 acres
Impervious Area (Buildings, Parking Lots, sidewalks etc.)	23.4 acres (67%)	22.9 acres (66%)	22.1 acres (63%)
Pervious Area (landscape/lawn)	11.5 acres (33%)	12.0 acres (34%)	12.8 acres (37%)

Source: MGSH Master Plan, 2023.

Figure 3.3-1 Proposed Lot Coverage for Proposed Action and Alternative 1



Source: Original figure provided by AHBL from Figure II-M in MultiCare Good Samaritan Hospital 2023 Master Plan.

3.3.2 Minimum Requirements

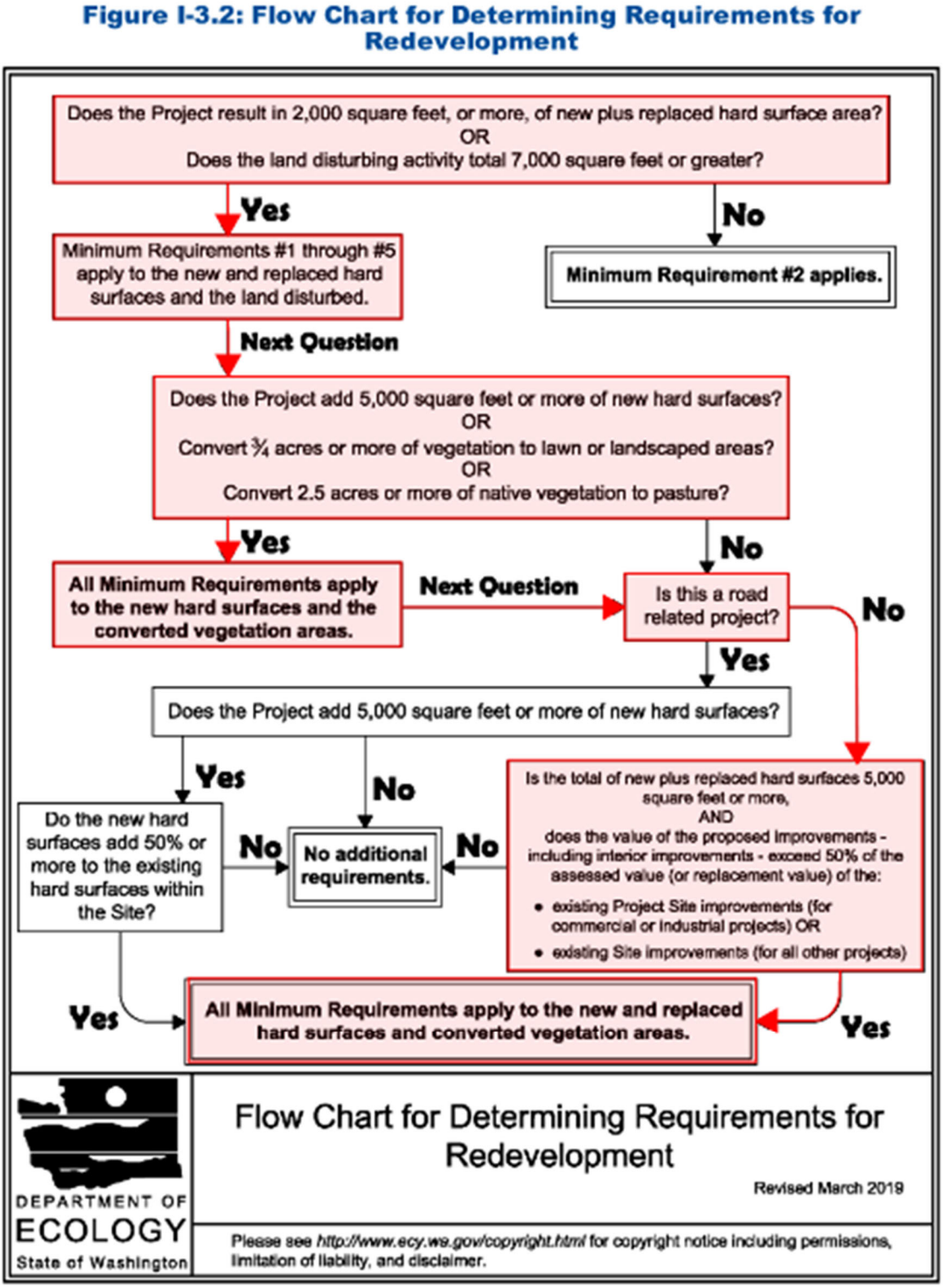
Stormwater facilities for the full buildout of the *Proposed Action* and *Alternative 1* would be designed in accordance with City of Puyallup stormwater requirements which currently has adopted the 2019 Washington State Department of Ecology Stormwater Management Manual for Western Washington (SWMMWW). A flow chart of triggered Minimum Requirements (MR) can be reviewed in Figure 3.3-2 and a summary of the MRs can be reviewed in Table 3.3-2. Minimum Requirements would be assessed for each Threshold Discharge Area (TDA) within the site. For MGSH site, there are two TDAs: one basin to Clarks Creek and one basin to State Highway as described in Section 2.3.

As shown in the flow chart in Figure 3.3-2, it is assumed that the value of the proposed improvements in the *Proposed Action Master Plan* and *Alternative 1* including interior improvements would exceed 50% of the assessed value (or replacement value) of the existing project site improvements, as such stormwater management facilities will need to be sized to address both new and replaced hard surfaces. If the assessed value is less, then the stormwater management facilities would be sized for the new hard surfaces. Requirements for sizing would be determined by the City of Puyallup once the assessed values are determined for the improvements.

For the *Proposed Action* and *Alternative 1*, as shown in Table 3.3-2 and Figure 3.3-2, MR 1 through 9 would apply to each of the TDAs, Clarks Creek and State Highway Basin. A further description of the code stormwater management Minimum Requirements is described in Section 3.3.3.

For the *No Action Alternative,* no improvements are proposed so the Minimum Requirements noted in SWMMWW would not apply and existing stormwater management conditions would remain the same.

Figure 3.3-2 Flow Chart for Determining Minimum Requirements for Proposed Action and Alternative 1



Source: Washington State Department of Ecology Stormwater Management Manual for Western Washington, 2019, Volume I, Figure I-3.2.

Table 3.3-2 Summary of Applicable Stormwater Minimum Requirements for the Proposed Action and Alternative 1 EIS Alternatives

SWMMWW Minimum Requirement No.[1]	Description for Proposed Action and Alternative 1
MR1: Preparation of Stormwater Site Plans	Stormwater Site Plan must be developed.
MR2: Construction Stormwater Prevention Plan (SWPPP)	SWPPP must be developed. The entire project will include more than 1 acre of disturbed area and therefore will need to apply for coverage under the State Construction General Permit.
MR3: Source Control of Pollution	All known, available, and reasonable source control BMPs must be applied.
MR4: Preservation of Natural Drainage Systems and Outfalls	The proposed design will maintain outfalls/connections to existing drainage basins (conveyance systems to Clarks Creek and State Highway basin). See Section 3.3.3 for more description
MR5: On-Site Stormwater Management	On-site stormwater management BMPs (e.g., porous pavement, bioretention) will be required to the extent feasible as described in SWMMWW. See Section 3.3.3 for more information.
MR6: Runoff Treatment	Runoff Treatment BMPs will be provided within each TDA (drainage to Clarks Creek and State Highway Basin) if the new and replaced pollution generating surfaces meet the thresholds noted in SWMMWW.
MR7: Flow Control	Flow Control BMPs will be required since more than 5,000 square feet of new hard surfaces are expected to be added within each TDA. See section 3.3.3 for more information.
MR8: Wetland Protection	There are no mapped wetlands within the project area.
MR9: Operation and Maintenance	An O&M manual will be required for any installed BMPs.

[1] SWMMWW Minimum Requirements (MR) are from Washington State Department of Ecology Stormwater Management Manual for Western Washington, 2019 version.

3.3.3 Stormwater Management

3.3.3.a Proposed Action and Alternative 1

In general, a stormwater site plan will be designed and constructed to manage stormwater runoff from the site. Stormwater runoff will be collected from the new building roof areas, hardscape areas, parking garages and landscape areas. Collection of conveyance will be through catch basins, yard drains, area drains and storm maintenance holes and piped to their respective detention system for flow attenuation and treatment system for water quality.

Stormwater systems on site will be sized based on the current edition of the Washington State Department of Ecology Stormwater Management Manual for Western Washington as adopted by the City of Puyallup at the time of permit and will convey the required storm flow. Stormwater from new and replaced hard surfaces will be managed, detained, and treated in compliance with SWMMWW.

MR4: Preservation of Natural Drainage Systems and Outfalls

Private on-site stormwater piped conveyance and collection system, including catch basins, yard drains and maintenance holes, will be extended to collect runoff from site areas. Discharge to the natural drainage systems for each TDA will be preserved.

From the MGSH 2023 *Master Plan*, for the *Proposed Action* and *Alternative 1*, stormwater runoff from the Patient Care Tower, Emergency Department Expansion, [Dally] Tower expansion and Central Utility Plant expansion would flow through the on-site flow control and treatment systems then discharge and connect into the storm drain main that flows to Clarks Creek basin to the west, while the proposed PCT Parking Garage and Medical Office Buildings east of 5th Street SE would drain through the proposed MGSH on-site detention and treatment systems and connect into the existing 12-inch storm main in 13th Ave SE that flows into the State Highway basin MGSH owned detention system. See Figure 3.3-3 for concept.

MR5: On-Site Stormwater Management

On-site Stormwater Management systems (OSSM) designed to infiltrate, disperse, and retain stormwater runoff on site (such as bioretention systems, porous pavements, rain gardens) would be provided to the extent feasible in accordance with requirements outlined in SWMMWW for meeting MR5. Further site-by-site geotechnical evaluations will be required to determine where infiltration facilities would be feasible during the design phase for new building permits. Compliance with MR5 could be obtained either by using the LID BMPs from List #2 (SWMMWW Table I-3.2) or design flow control BMPs to achieve the LID Performance Standard (see SWMMWW Section I-3.4.5).

If the existing OSSM facilities (See Figure 2.3-2 for rain gardens, porous pavements) are impacted by the *Proposed Action* or *Alternative 1*, they would need to be replaced or modified in accordance with current SWMMWW as adopted by the City of Puyallup.

MR6: Water Quality Treatment

Enhanced stormwater treatment systems for MR6 would be provided for each of the stormwater detention systems if thresholds are met for pollution generating surfaces in compliance with the current SWMMWW. If existing treatment systems (bioretention, StormFilter vaults, oil/water separators) are impacted by the improvements they would be relocated and/or resized to meet SWMMWW requirements for treatment.

MR7: Flow Control

Discharge of the site's stormwater is divided across two individual drainage basins as described in Section 2.3. Existing basin boundaries are to be maintained for discharge of stormwater from the site. Detention facilities would be sized to manage flows from hard surfaces and land cover conversions to meet MR7 outlined in SWMMWW for flow control for each TDA basin.

TDA for Drainage to Clarks Creek: From the MGSH 2023 *Master Plan*, stormwater runoff from new buildings and facilities located in the Clarks Creek basin would be managed by a new detention facility that is conceptually shown to be located in the existing parking lot north of the Central Utility Plant (See Figure 3.3-3) and then connect to the storm main in 13th Ave SE that discharges into the Clarks Creek basin. The facility would be sized to detain stormwater runoff from new and converted surfaces and release it at a flow rate and duration for the predeveloped condition (typically defined as forested) as defined in the current SWMMWW. Based on data provided by MGSH and AHBL, preliminary sizing of this new detention facility shown in Figure 3.3-3 was based on 2.4 acres of impervious land cover changes to match flows from a predeveloped forested condition.

TDA for Drainage to State Highway basin:

Currently the 2019 SWMMWW does not require flow control for runoff to the State Highway Basin that has a direct discharge or indirect discharge via a Municipal Separated Storm Sewer System (MS4) to a specified exempt receiving water. Discharges to the Puyallup River, which is listed as an exempt receiving water (Appendix I-A in SWMMWW Volume I), would not be required to provide flow control with redevelopment.

However, due to the City's concerns that the capacity of the existing conveyance system in SR 512 is undersized as described in Section 2.3, to mitigate potential impact of the *Proposed Action* and *Alternative 1*, it is assumed that flow control/detention would be required (and sized similar to facility for Clarks Creek to meet MR7) for stormwater collected on-site from the full buildout of the MGSH campus *Proposed Action* and *Alternative 1*. This would then reduce the potential impact of exacerbating the conveyance capacity issues downstream from the site.

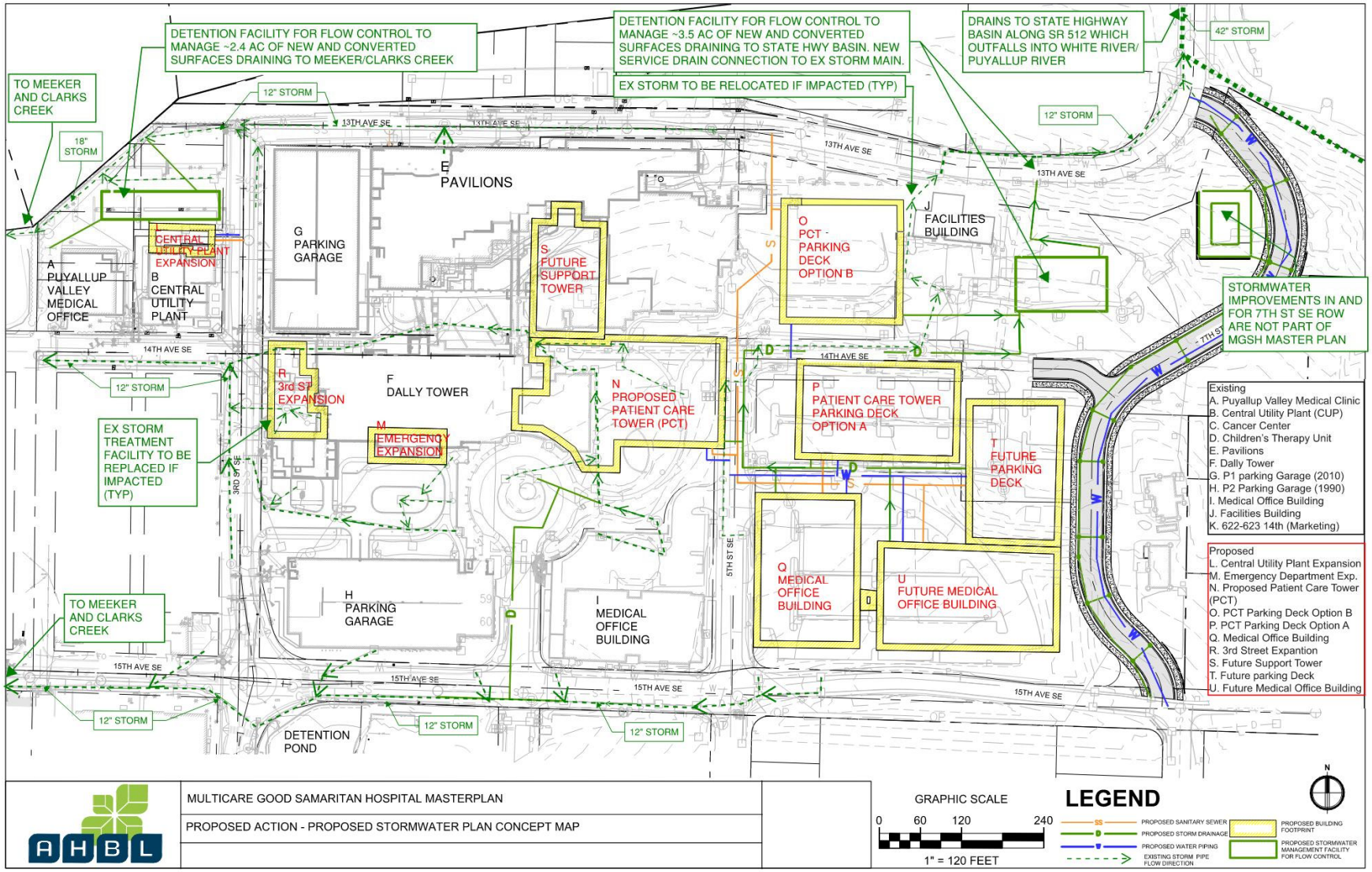
As shown in Figure 3.3-3, stormwater runoff from areas that drain to the State Highway basin would be managed by a detention vault conceptually located in the existing parking lot southwest of the Facilities Building and then connect to the storm main in 13th Avenue SE that drains to the State Highway basin. Based on data provided by MGSH and AHBL, preliminary

sizing of the new detention facility was based on 3.2 acres of impervious land cover changes to match flows from a forested condition.

3.3.3.b No Action Alternative

For the *No Action Alternative,* no improvements are proposed, and so existing on-site stormwater management conditions would remain the same.

Figure 3.3-3 Proposed Stormwater Concept for Proposed Action and Alternative 1



Source: Based on Figure III-K prepared by AHBL in MGHS 2023 Master Plan. Additional notes added for reference.

3.3.4 Construction Impacts

3.3.4.a Proposed Action and Alternative 1

The construction activities associated with *Proposed Action* and *Alternative 1* would have an impact on stormwater management on the site. Some level of grading, trenching, clearing, and excavating would be incorporated into all the EIS alternatives. Exposed soils would increase the risk of erosion and sediment transport. The potential for erosion and sediment transport during construction is increased during wet weather.

In accordance with City of Puyallup requirements, a Construction Stormwater Pollution Prevention Plan (SWPPP) as part of the Stormwater Site Plan (SWMMWW MR1: Preparation of Stormwater Site Plan) would be required since full buildout of the *Master Plan* would add more than 2,000 square feet of new and replaced impervious surface. The SWPPP would use Best Management Practices (BMPs) that fall within these 18 elements of water quality and downstream resources protection:

1. Preserve Vegetation / Mark Clearing Limits
2. Establish Construction Access
3. Control Flow Rates
4. Install Sediment Controls
5. Stabilize Soils
6. Protect Slopes
7. Protect Drain Inlets
8. Stabilize Channels and Outlets
9. Control Pollutants
10. Control Dewatering
11. Maintain BMPs
12. Manage the Project
13. Protect Low Impact Development BMPs

3.3.4.a.i Flow Control

As elements of the *Master Plan* are developed with an increase in the amount of impervious surface there is a reduction in the amount of infiltration and groundwater recharge resulting in an increase of stormwater runoff flows. In accordance with City of Puyallup stormwater management requirements for new developed (i.e., adopted SWMMWW), permanent flow control facilities would be installed to mitigate the increased stormwater flow and potential downstream impacts. Flow control facilities would be installed prior to placement of new hard surfaces in accordance with Puyallup requirements. Typically, these facilities are designed to manage flows from new and replaced surfaces to a predeveloped forest condition, such that there is not an increase in runoff from the site from current conditions.

3.3.4.a.ii Water Quality

Temporary Erosion and Sediment Control (TESC) measures would be installed prior to site disturbance and maintained throughout construction. TESC measures would be determined

during design per City of Puyallup and SWMMWW requirements for Best Management Practices (BMPs).

Construction under the *Proposed Action* would have slightly more potential to affect water quality than *Alternative 1* since it includes more removal of existing impervious surface and earthwork.

The primary risk to water quality during construction would be from sediments carried in stormwater from erodible soils, as described above. Pollution from concrete work and construction machinery, as well as accidental spills (i.e., of vehicle fuel and oil) could also have impacts on water quality. Temporary water quality treatment facilities would be constructed onsite in accordance with the City of Puyallup requirements and would include BMPs to limit water quality impacts. With the proper use of BMPs and effective accidental spill response planning, significant impacts to water quality and downstream resources would not be expected.

In the permanent built condition, there would be pollution sources like motor vehicles in parking lots and access drives and potentially landscape chemicals. If existing on-site water quality treatment facilities are impacted, they would be removed and replaced to provide water quality treatment for the pollution sources that they manage. Runoff from new pollution generating surfaces (e.g., driveways, open parking areas) on campus would be conveyed to water quality treatment facilities on site prior to discharge into the City's storm mains that drain to Clarks Creek and Puyallup River. The treatment facilities would be designed in accordance with City of Puyallup requirements and SWMMWW.

3.3.4.a.iii Right-of-Way Improvements

Utility service connections to the public sewer, water, and stormwater mains, would require street restoration for the trenches. The restoration of existing sidewalks, curbs and pavement would be in accordance with City of Puyallup standards. Traffic control would be provided during construction in the right-of-way.

3.3.4.a.iv Surface Grading

In general, site grading would follow the existing drainage patterns with the site sloping to the north with a split to west and east along 5th Street SE. The site surface would be graded to promote drainage away from future buildings.

3.3.4.b No Action Alternative

There would be no construction activities associated with the *No Action Alternative* since no improvements for this alternative are included.

3.3.5 Operational Impacts

3.3.5.a Proposed Action and Alternative 1

Operational impacts are presented at full buildout when maximum impacts to stormwater runoff would occur due to the increased amounts of new and replaced impervious surface areas (i.e., building roofs, sidewalks, and parking areas), relative to existing conditions.

A permanent stormwater management system would be provided to serve the new and replaced areas for implementation of the proposed MGSH *Master Plan*. The stormwater management would consist of private stormwater infrastructure (conveyance, flow control, treatment, and on-site-stormwater management BMPs and facilities) that then drain into the existing stormwater infrastructure in the city right-of-way adjacent to the site. Per applicable City of Puyallup/SWMMWW requirements, for the drainage to Clarks Creek, the predeveloped condition to size the detention facilities is forested. For drainage to State Highway, the predeveloped condition is also assumed to be forested. Flow control requirement per the 2019 SWMMWW states that the proposed design must match 50% of the 2-year and 100% of the 50-year discharge for the predeveloped condition for the new and replaced surfaces.

3.3.5.b No Action Alternative

Operational impacts would remain the same as current conditions since no improvements are included with the *No Action Alternative*.

4.0 CUMULATIVE IMPACTS

There are no known future projects adjacent to the MGSH campus that would occur during implementation of MGSH 2023 *Master Plan*. If there are other adjacent projects, it is assumed that necessary improvements, extensions, or connections to existing utilities (water, sanitary sewer, and stormwater utilities) associated with other (unknown) adjacent project developments would be designed and constructed in compliance with applicable City of Puyallup regulations.

4.1 WATER

Analysis by Gray & Osborne did not identify any cumulative impacts of the *Proposed Action Alternative 1* when factoring in the City's future water demand projections in 2038 (by others) referenced in the City's Water System Plan. The existing private 8-inch water main on the east side of MGSH campus would still need to be upsized if it is to provide a fire flow of 4,000 gpm for 4 hours for the campus facilities as described previously. See Appendix for their analysis and assumptions.

4.2 SANITARY SEWER

Analysis by BHC included evaluation of *Phase 1* of the *Proposed Action* and *Alternative 1, full buildout* of the *Proposed Action* and the *No Action Alternative* with future projections for the planning horizon of the year 2034 (projected unknown other projects in 2034). Projections for 2034 in the hydraulic sewer model were based on assumptions in the City's 2015 Comprehensive Sewer Plan (2015 CSP). BHC modeled several scenarios comparing the Alternatives with future projections for 2034 and with and without City planned capital improvement projects identified in the City's Comprehensive Sewer Plan. In summary:

- With the *No Action Alternative* (no changes to the MGSH campus) and City's projected Planning Horizon 2034, deficiencies are noted in the city sewer system which is consistent with 2015 CSP.
- With implementation of *Phase 1* of the *Proposed Action* and *Alternative 1* and the City's projected Planning Horizon 2034, the magnitude of the identified deficiencies was estimated to increase. If the City constructed planned capital sewer improvements in CSP, then the deficiencies are mostly resolved with predicted surcharging in the downstream.
- For full buildout of the *Proposed Action* with planning horizon 2034, deficiencies are noted in the city sewer system downstream even when factoring in City planned capital improvements. BHC's analysis noted that capital improvements would be required, upsizing 310 LF of 8-inch sewer pipe to 10-inch, just downstream to the west of the campus, would be needed to support the *Proposed Action.* (City sewer main is located between MH S5-01777 and MH S5-01828 that is approximately along east edge of S Meridian street north of 14th Ave SE.)

See BHC's Technical Memorandum in the Appendix for their analysis. In summary, they recommended, that their results be "further verified, and any changes in assumptions or new information as it relates to the collection system or assumptions around flows and sewer

capacity could change the results, and additional monitoring and review of performance of the locations discussed above are recommended as development occurs."

4.3 STORMWATER

For stormwater, other projects would also have to comply with the City of Puyallup code for stormwater mitigation for flow control facilities, water quality treatment facilities prior to discharge into the City's stormwater system and drainage basins, if thresholds for new and replaced surfaces are met. By implementing the stormwater facilities, discharges into the public stormwater system would be controlled to existing conditions and not cause further capacity problems downstream that drain to the Clarks Creek basin. For areas that drain to the state highway basin that has a direct discharge to the Puyallup River, the city would be responsible for assessing proposed developments and their stormwater management requirements given the City's concerns regarding conveyance capacity of the system along the State Highway.

5.0 PROPOSED MITIGATION

5.1 WATER

The design and construction of all private water services (domestic, irrigation, fire), fire hydrants and water mains would comply with the City of Puyallup Public Works Department standard plans, specifications, regulations, and design standards. Connections to existing public water mains would be in accordance with City of Puyallup standards.

The private 8-inch water main on the east side of the campus will need to be upsized to a 12-inch if it is to provide fire flow of 4,000 gpm for 4 hours as described previously. It will also need to be relocated outside the undeveloped right-of-way of 7th Street SE and maintain a loop system by reconnecting to existing public 12-inch water mains in 13th Ave SE and 15th Ave SE to maintain adequate pressure for the city water system in the vicinity.

5.2 SANITARY SEWER

The design and construction of the private sanitary side sewer systems would comply with the City of Puyallup Public Works Department standard plans, specifications, regulations, and design standards. Connections to existing sanitary sewer mains would be in accordance with City of Puyallup standards.

A portion of the City sanitary sewer main downstream from the site may need to be upsized to provide flow conveyance capacity as described in BHC's memorandum (see Appendix) depending upon where the new sanitary sewer flows from the site discharge into the public sewer system. For example, there is a potential that if the city does not address some planned capital improvements downstream for discharge of sewer flows to the west, approximately 310 lineal feet of sanitary sewer main pipe (between City's Maintenance Holes ID MH S5-01777 and MH S5-01829) would need to be upsized to minimum 10-inch pipe to convey the sewer flows for *Phase 1* of the *Proposed Action* and *Alternative 1*. Furthermore, for full buildout of the *Proposed Action* and *Alternative 1*, and with City planned capital sewer system improvements downstream, BHC's analysis showed that this same pipe section would need to be upsized to

10-inch pipe to provide capacity for the increase in predicted sewer flows at full buildout of the *Master Plan*. See Appendix for BHC's Technical Memorandum of the analysis.

Further analysis and discussion with the City is required to determine what would be MGSH's responsibility for upsizing the downstream sanitary sewer conveyance system and/or if the previously identified capacity deficiencies that are exacerbated by the added flows from the *Proposed Action* and *Alternative 1* could still be resolved by the same improvements and sizing requirements in the City's Comprehensive Sewer Plan and planned capital improvements.

5.3 STORMWATER

The design and construction of the private stormwater management system for full buildout of the MGSH *Master Plan Proposed Action* and Alternative 1 would comply with the current City of Puyallup adopted stormwater manual (2019 SWMMWW or most recent edition adopted at time of construction), design standards, specifications, and regulations. Measures would be implemented to reduce or offset potential impacts to water resources (Clarks Creek Basin and State Highway Basin to Puyallup River) resulting from the full buildout.

Aside from standard utility connections to the City's public storm drain system, it is not expected that public stormwater conveyance improvements would be needed since the private stormwater management systems installed for flow control and water quality treatment would not increase the discharge of flows from the site's current condition for the *Proposed Action* and *Alternative 1*. The discharge from the site for the *No Action Alternative* would also remain the same.

The MGSH campus is located within a Wellhead Protection Area and Critical Aquifer Recharge Area to the Central Pierce County Aquifer as described in MGSH's 2023 *Master Plan*. Stormwater facilities will be designed to provide wellhead protection nor negatively affect recharge rates or the water quality of the aquifer as required with Puyallup's Municipal Code Chapter 21.06 and City of Puyallup's adopted stormwater manual.

5.4 CONSTRUCTION

Temporary erosion and sedimentation control measures and BMPs would be utilized during construction in accordance with City of Puyallup and SWMMWW requirements. A Stormwater Pollution Prevention Plan (SWPPP) would be prepared and implemented as required by the SWMMWW.

Construction entrances, wheel washes, street cleaning, and other BMPs would be used to prevent the tracking of soils beyond the project limits. Construction stormwater runoff would be collected on site and treated per requirements outlined in City of Puyallup stormwater manual and the City's National Pollutant Discharge Elimination System (NPDES) permit with Ecology prior to discharge into the public storm drainage system.

Measures to control any impacts of excavation dewatering could include site-specific design and careful control of dewatering systems, minimizing the extent and duration of dewatering, treatment of water collected from dewatering to City of Puyallup standards and NPDES permit prior to discharge into the storm drainage system.

The degree of dewatering is unknown and will depend on the depth of excavation during construction and the depth to perched groundwater and for Wellhead Protection and Critical Aquifer Recharge Area protection. The depth to perched groundwater is unknown from the available information provided by MGSH. From MGSH's 2023 *Master Plan* it was noted a "Stormwater Feasibility Evaluation conducted by Geosciences, updated on May 24, 2018, and provided by the City of Puyallup describes the soils of the North Parking Lot and Central Parking Lot areas on the MGSH campus (near the intersection of 5th St SE and 14th Ave SE … as Vashon Glacial Drift. Drift includes variable mixtures of silt, sand, gravel, and cobbles and is typically medium dense to very dense. Drift can resemble glacial trill, undifferentiated outwash, and ice-contact deposits." "Cobalt Geosciences also summarizes that no groundwater was observed at depths of 1.5 to 5.5 feet below grade; however, another report referenced in the Evaluation describes that groundwater is locally present at elevations ranging from 148 to 190 feet in elevation." A copy of the Stormwater Feasibility Evaluation conducted by Cobalt Geosciences, was provided in Appendix B of MGSH's 2023 *Master Plan*.

5.5 OPERATION

Multi-care Good Samaritan Hospital would be responsible for maintaining and operating the private utility services and the stormwater management systems that are implemented for the project. Drainage to Clarks Creek and State Highway basins would follow the requirements outlined in the 2019 SWMMWW for water quality and flow control facilities. A stormwater Operation and Maintenance Plan would be prepared for the stormwater systems installed.

6.0 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

No significant unavoidable adverse impacts are anticipated for any of the EIS Alternative with implementation of the required and proposed mitigation measures noted previously herein.

7.0 REFERENCES

BHC Consultants, LLC Memorandum, *MultiCare Good Samaritan Hospital Sewer Impacts Analysis*, March 13, 2024. Memo from Jordan Zier, PE and Kevin Cook PE to Michele Sarlitto, EA Engineering.

Brown and Caldwell letter, *Summary of Existing Conditions*, January 30, 2024, letter prepared by Margaret Ales to Kathryn Gwilym, MIG.

City of Puyallup Comprehensive Plan available on City webpage as of March 2024 https://www.cityofpuyallup.org/438/Comprehensive-Plan

City of Puyallup Comprehensive Sewer Plan, February 2016, prepared by BHC Consultants.

City of Puyallup Public Works Water Division, email correspondence from Brian Johnson and Alicia Sullivan on February 14, 2024, to MIG regarding annual water consumption for existing domestic meter accounts on MGSH campus.

City of Puyallup Water System Plan Update Figure 1-5 for Major Water System Facilities, prepared by Gray & Osborne, Inc. 2015.

City of Puyallup web page, *History of Puyallup Water* posted on November 28, 2023 https://www.cityofpuyallup.org/1136/History-of-Puyallup-Water

Criteria for Sewage Works Design, Washington State Department of Ecology, Publication No. 98-37 WQ, Revised August 2008 https://apps.ecology.wa.gov/publications/documents/9837.pdf

Gray & Osborne, Inc. email correspondence from Kerri Sidebottom, P.E. and Russ Porter to Kathryn Gwilym, MIG, dated November 20 & 28, 2023, regarding City of Puyallup water system.

Gray & Osborne, Inc. Technical Memorandum, *Hydraulic Modeling to Assess DESI MGSH Master Plan, City of Puyallup, Pierce County*, March 12, 2024. Letter from Kerri Sidebottom, P.E. and Russ Porter, P.E. to Kathy Gwilym, PE, MIG.

MultiCare Good Samaritan Hospital, 2022 Master Plan Proposal to City of Puyallup, WA, January 9, 2023, 2022 Master Plan Proposal Clarification & Response, July 5, 2023 and pages 41-56 from December 2023 Multicare Good Samaritan Hospital Master Plan. (2023 *Master Plan*)

Tetra Tech, *Clarks Creek Sediment Study Watershed Model Report*, Prepared for Puyallup Tribe of Indians, October 2012. (Tetra Tech 2012)

Washington State Department of Ecology *Stormwater Management Manual for Western Washington*, 2019. (SWMMWW)

Washington State Department of Health (WA DOH), Water System Design Manual, WA DOH Publication No. 331-123 (Revised June 2020) https://doh.wa.gov/sites/default/files/2022-02/331-123.pdf?ver=2019-10-03-153237-220

Washington State Department of Health, Water Use Efficiency, Annual Performance Report 2022 submitted by City of Puyallup. (WUE 2022) https://www.cityofpuyallup.org/DocumentCenter/View/17521/2022-WUE-Report

APPENDIX TO UTILITIES TECHNICAL REPORT

- Water (Domestic and Fire) supply analysis
  Gray & Osborne, Inc.'s Technical Memorandum from Kerri Sidebottom, PE and Russ Porter, PE, Gray & Osborne, Inc. to Kathy Gwilym PE, MIG, regarding Hydraulic Modeling to Assess DEIS MGSH Master Plan, City of Puyallup, Pierce County, Washington, March 12, 2024.

- Sanitary Sewer downstream analysis
  BHC Consultants, LLC's Memorandum from Jordan Zier, PE and Kevin Cook, PE, of BHC Consultants, LLC to Michele Sarlitto, EA Engineering, Science and Technology, Inc. regarding MultiCare Good Samaritan Hospital Sewer Impacts Analysis, March 13, 2024.

- Drainage and stormwater downstream analysis
  Brown and Caldwell's Letter from Margaret Ales, PE, Brown and Caldwell, to Kathryn Gwilym, MIG, regarding *Summary of Existing Conditions* regarding stormwater and drainage downstream of MultiCare Good Samaritan Hospital, January 30, 2024.

Gray & Osborne, Inc.
CONSULTING ENGINEERS

TECHNICAL MEMORANDUM

TO:	KATHY GWILYM, P.E.
FROM:	KERRI SIDEBOTTOM, P.E. RUSS PORTER, P.E.
DATE:	MARCH 12, 2024
SUBJECT:	HYDRAULIC MODELING TO ASSESS DEIS MGSH MASTER PLAN CITY OF PUYALLUP, PIERCE COUNTY, WASHINGTON G&O #23620.00

We have analyzed the adequacy of the City's water system to provide service to the future developments planned at the Multicare Good Samaritan Hospital Campus located at 401 15th Avenue SE in Puyallup, under two of the EIS Alternatives: The Proposed Action – Proposed Master Plan and Alternative 1 – Reduced Medical Office Building Size. The hospital is located within the City water system's Zone 2. The City's water system model developed for the Water System Plan was used to evaluate the suitability of the system to accommodate the proposed demand.

The setup of the hydraulic model and the assumptions used to determine the static pressure and available fire flow are noted as follows.

- Water system demands are based on projected 2038 demands and reservoirs are depleted of fire suppression and equalizing storage, as established in the *2019 Water System Plan* (WSP), approved by the Department of Health (DOH). The City's water model was updated in 2021 to reflect additional system improvements since the WSP was developed.

- All pump stations are idle, and the Salmon Springs source is operating at 1,100 gallons per minute (gpm).

The site is located in Zone 2, which is supplied by Well 27, the 15th Avenue SE and the Maplewood Springs Booster Stations, as well as the Wildwood Park Reservoirs, and the 23rd Avenue SW Reservoir. The system was modeled as-is, with no new piping proposed at this time.

1130 Rainier Avenue S., Suite 300 Seattle, Washington 98144 (206) 284-0860 Fax (206) 283-3206

According to the modeling (described in more detail below), the City's water system appears to be capable of supplying the demands to the Proposed Action, provided the Final Building Design does not require fire flows higher than for the existing facilities.

EXISTING SYSTEM

The existing hospital site is served by public 12-inch water mains along 15th Avenue SE, south of the campus, 13th Avenue SE, north of the campus, and 3rd Street SE, on the west side of the campus. An additional private 8-inch main is located on the campus site connecting to the 12-inch City main in 15th Avenue SE, and the main in 13th Avenue SE. This is indicated on the figure in Appendix A, provided by MIG and AHBL.

The Proposed Action may occur in four phases, with the following elements proposed.

- Phase 1
    - Central Utility Plant Expansion (L)
    - Emergency Department Expansion (M)
    - Proposed Patient Care Tower (N)
    - Parking Deck Option B (O)
    - Parking Deck Option A (P)
- Phases 2 through 4
    - Medical Office Building (Q) (not included in Alternative 1)
    - Dally Tower Expansion to 3rd Street (R)
    - Future Support Tower (S)
    - Future Parking Deck (T)
    - Future Medical Office Building (U)

The Proposed Action is indicated on the figures included in Appendix B. Alternative 1 includes the same developments with the exception of the 100,000-square foot Medical Office Building (Q), which would not be built.

For the purpose of the water system analysis, all of the developments proposed for both phases are included in the modeling. Phase 1 is anticipated to begin construction by 2025 and Phase 2 is anticipated to occur by 2043. The 20-year demand projection timeline included in the City's water model extends to 2038, so the complete buildout of the hospital site is included in the modeling, in order to present a conservative estimate of the future flows and their impact on the water system.

CURRENT DEMANDS

The City's WSP was last updated in 2017 and included an estimated average day demand (ADD) for the hospital campus of 103,000 gallons per day (gpd) or 72 gpm, as of 2016. The WSP used the general peaking factors developed for the system as a whole, to estimate peak hour demand (PHD) and maximum day demands (MDD). MDD is estimated at 2 times the ADD, or 144 gpm for the campus, and PHD is estimated at 1.62 times the MDD, or 233 gpm for the campus. It was assumed in the WSP that this demand would be similar in the future, as an expansion of the campus was not included in the analysis for the WSP.

The fire flow demand for the existing hospital facility was reported to be 4,000 gpm for 4 hours, in the WSP.

Consumption data from the City as of 2022 indicated an annual water consumption at the campus of approximately 29.6 million gallons, resulting in an ADD of 81,200 gpd, or 56 gpm, as noted in Appendix A. For the purpose of this analysis, the more conservative water usage determined in the WSP is used as a starting point, to which the anticipated demands associated with the Proposed Action are added.

FUTURE DEMANDS

The anticipated demands for the Proposed Action were provided by MIG and are included in Appendix A. The model includes projected demands to 2038, which was the end of the 20-year planning period analyzed in the WSP. Demands for the rest of the City beyond 2038 were not estimated as part of this effort, and the 2038 demands for the rest of the service area are used to evaluate the system capacity. Table 1 includes the MDD and PHD for each part of the Proposed Action as provided by MIG.

TABLE 1

Proposed Action Anticipated Water Demands as of 2043

Phase	Building	Building Label	MDD (gpm)	PHD (gpm)	Model Node
1	Central Utility Plant Expansion	L	0.69	100	J2278
1	Emergency Department Expansion	M	0.6	1	J-249
1	Proposed Patient Care Tower	N	69.4	113	J2278
1	Parking Deck Option B	O	15	75	J2278
1	Parking Deck Option A	P			
2-4	Medical Office Building	Q	34.7	113	J2278
2-4	Dally Tower Expansion to 3rd Street	R	17.3	100	J-596
2-4	Future Support Tower	S	10	60	J-596
2-4	Future Parking Deck	T	30	100	J2278
2-4	Future Medical Office Building	U	34.7	113	J2278
Total New Development			**212.39**	**775**	--
--	Existing Site	--	144	233	Various
Total, Including Existing			**356.39**	**1,008**	--

Alternative 1 – Reduced Medical Office Building Size would result in the same increase in demands as the Proposed Action, with the exception of Building Q, which would not be constructed.

Fire flow requirements for the future buildings have not been provided at this time. The requirement is anticipated to be similar to the current fire flow requirement, as the buildings will be of similar size to those currently on the site, will have similar uses, and are assumed to use similar construction methods to the current buildings.

It should be noted that the City allows nesting of standby storage and fire suppression storage. An increase in fire suppression storage within Zone 2 due to this higher fire flow requirement would impact the level of the reservoirs in the hydraulic model. However, for the purpose of this analysis, the fire flow requirement is assumed to be the same as the requirement for the existing campus of 4,000 gpm, for 4 hours. The Proposed Action will include buildings of a similar, or smaller height and square footage to the existing hospital buildings, and will include the same types of land use. Therefore, it is assumed that 4,000 gpm for 4 hours will be adequate for the future buildings. No change to the reservoir levels in the 20-year modeling analysis is necessary, as the fire flow requirement is assumed to be the same as the existing requirement.

MODELING ANALYSIS

Peak Hour Pressures

The available pressure under 2038 peak hour demands at the site is included in Table 2 and shown on Figure 1. Table 2 includes a comparison of the PHD pressures at the site under the demands included in the WSP for the year 2038, as well as the modeled pressures with the additional demand anticipated for the Proposed Action.

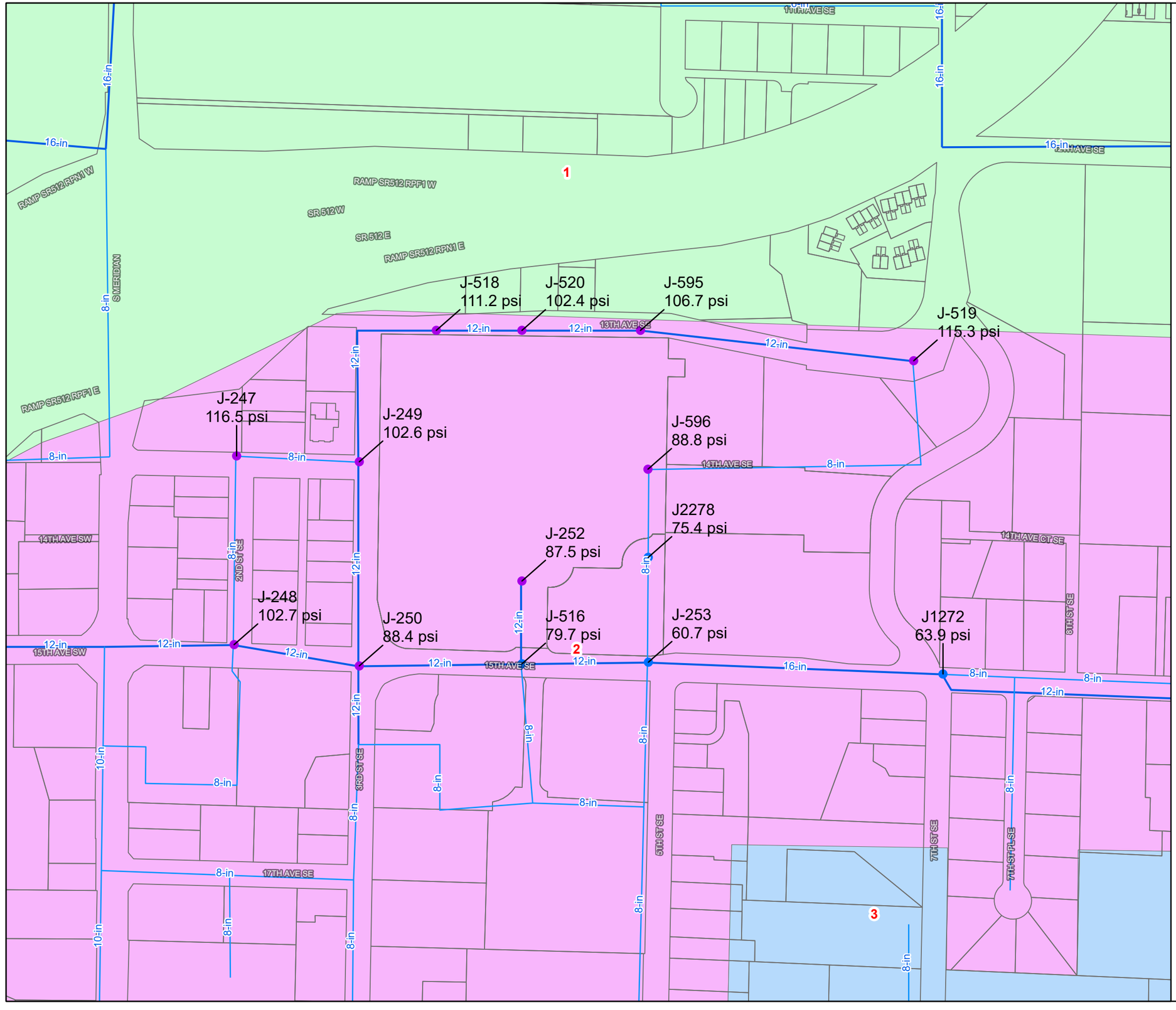
TABLE 2

Peak Hour Pressure

Node	Elevation, feet	Peak Hour Pressure – Current, psi	Peak Hour Pressure – With Proposed Action, psi	Difference, psi
J-249	110	104.4	102.6	-1.8
J-250	143	90.1	88.4	-1.7
J-252	145	89.3	87.5	-1.8
J-253	207	62.4	60.7	-1.7
J-516	163	81.5	79.7	-1.8
J-518	90	113	111.2	-1.8
J-519	80	117.4	115.3	-2.1
J-520	110	104.4	102.4	-2
J-595	100	108.7	106.7	-2
J-596	140	91.4	88.8	-2.6
J2278	171	78	75.4	-2.6

The peak hour pressures to the site may decrease by approximately 2 to 3 psi, due to the additional demand anticipated from the full buildout of the Master Plan in 2043.

Pressures within the rest of Zone 2 are shown to decrease by approximately 1 to 2 psi, due to the additional peak hour demand modeled for the Proposed Action. This change in pressures resulting from the Proposed Action does not cause any nodes in the system to drop below the required 30-psi minimum pressure.



N

0 500 1,000 1,500 2,000 Feet

WATERLINES
DIAMETER
- < 12"
- 12" AND LARGER

- PRESSURE ZONE NO. 1 - HGL = 180 FT
- PRESSURE ZONE NO. 2 - HGL = 359 FT
- PRESSURE ZONE NO. 3 - HGL = 496 FT
- PRESSURE ZONE NO. 3A - HGL = 354 FT
- PRESSURE ZONE NO. 4 - HGL = 685 FT
- PRESSURE ZONE NO. 4A - HGL = 607 FT
- PRESSURE ZONE NO. 4B - HGL = 523 FT
- PRESSURE ZONE NO. 4C - HGL = 509 FT
- PRESSURE ZONE NO. 4D - HGL = 455 FT
- PRESSURE ZONE NO. 4E - HGL = 402 FT
- PRESSURE ZONE NO. 4F - HGL = 401 FT
- PRESSURE ZONE NO. 4G - HGL = 536 FT
- PARCELS

MODELED PRESSURE
- < 30 PSI
- 30 - 35 PSI
- 35 - 40 PSI
- 40 - 60 PSI
- 60 - 80 PSI
- > 80 PSI

4A PRESSURE ZONE NUMBER

CITY OF PUYALLUP

GOOD SAMARITAN HOSPITAL ANALYSIS
FIGURE 1
2038 PEAK HOUR PRESSURES

Gray & Osborne, Inc.

M:\PUYALLUP\Good Samaritan Site Planning\GIS\APRX\GoodSammModel.aprx

Modeled Fire Flow

Available fire flow was modeled along the 12-inch and 8-inch pipes surrounding and within the campus. The analysis requires that 20 psi be maintained at all service locations system-wide, during the fire flow event and that velocities within the system distribution mains do not exceed 10 feet per second during a fire flow event. The velocity limit is applied to distribution mains, and not piping within any facility sites, such as reservoir or booster station piping. These facilities may experience higher velocities during high flows, but are typically designed for this.

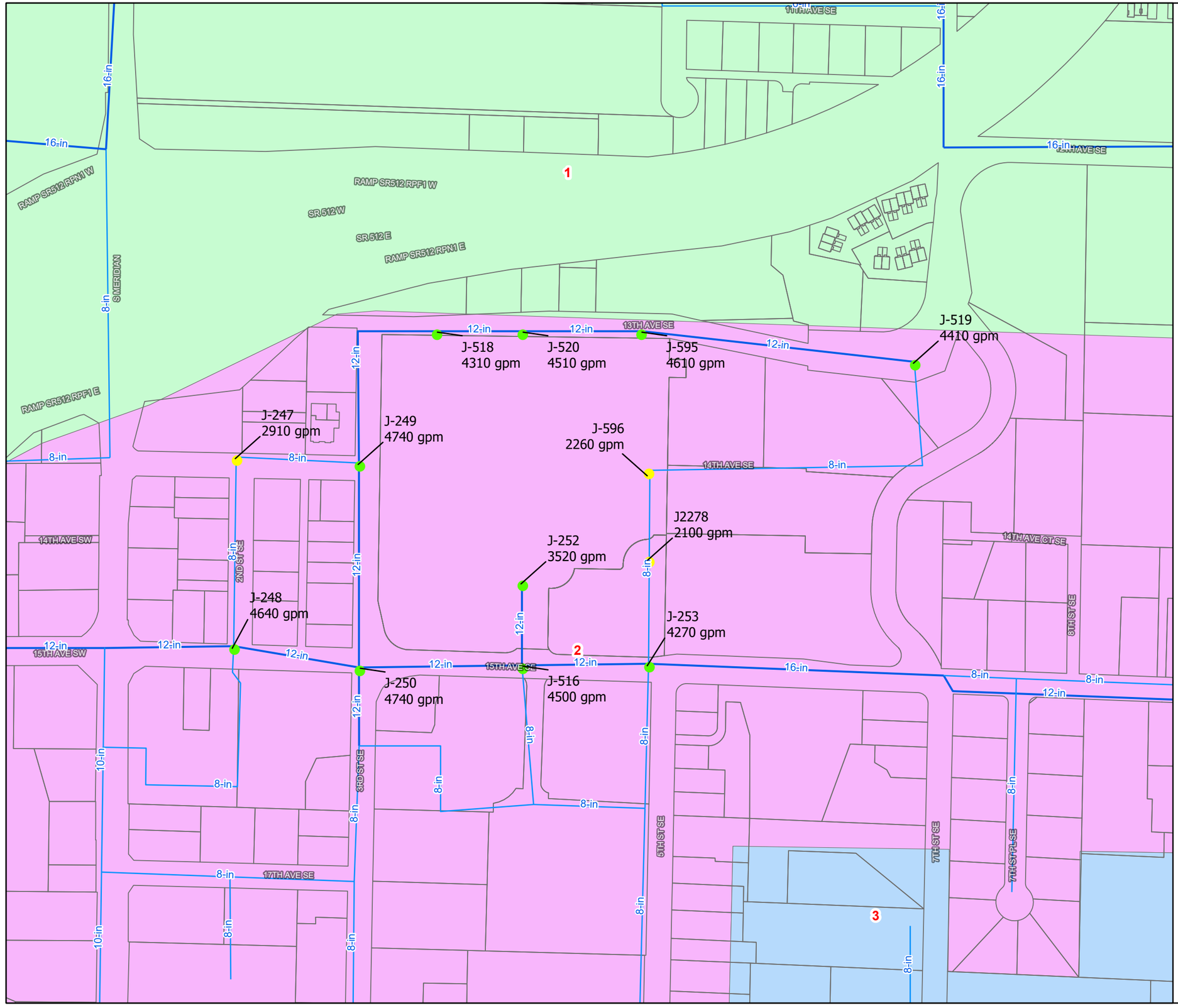
The modeled fire flow under 2038 peak hour demands at the site is included in Table 3 and shown on Figure 2.

TABLE 3

Modeled Fire Flow Availability

Node	Modeled Fire Flow – Current, gpm	Modeled Fire Flow – with Proposed Action, gpm	Difference, gpm
J-247	2,910	2,910	0
J-248	4,830	4,640	-190
J-249	5,000	4,740	-260
J-250	4,940	4,740	-200
J-252	3,520	3,520	0
J-253	4,470	4,270	-200
J-516	4,720	4,500	-220
J-518	4,360	4,310	-50
J-519	4,800	4,410	-390
J-520	4,550	4,510	-40
J-595	4,650	4,610	-40
J-596	2,500	2,260	-240
J2278	2,130	2,100	-30

Fire flow to the site is limited by the velocity through the 12-inch and 8-inch pipes within and adjacent to the hospital campus. Fire flow is reduced by approximately 200 to 400 gpm in some locations within the campus, due to the additional demand resulting from the Proposed Action.



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The fire flow code requirements for the Proposed Action must be confirmed to determine whether the system is adequate to supply the needed fire flow. This would be established during the Building Design, as it is calculated from the International Fire Code based on the building materials, size, and sprinkler system. As noted, the current fire flow requirement for the hospital campus is 4,000 gpm for 4 hours, which is available from the 12-inch pipes surrounding and within the hospital campus.

The 8-inch private main within the eastern side of the campus cannot provide 4,000 gpm to the site while maintaining a velocity below 10 feet per second. If any of the buildings associated with the Proposed Action will require 4,000 gpm to be supplied from the 8-inch main, it is recommended that this main be replaced with a 12-inch main in the future. If the pipe must be replaced as part of the work associated with the Proposed Action or Alternative 1, it is recommended that it be upsized to 12 inches.

Fire flow availability within the rest of Zone 2 is shown to decrease by approximately 100 to 200 gpm in some areas due to the additional demand modeled for the Proposed Action. However, this change resulting from the Proposed Action does not reduce the modeled fire flow at any location such that the location would have a deficiency, and no new deficiencies are indicated as a result of the Proposed Action.

The City's existing water system appears to have capacity to provide the fire flow and domestic demands of the Proposed Action based on the modeling and assumptions described in this memo. As noted, Alternative 1 includes fewer buildings, thus a lower water demand than the Proposed Action, and therefore, the City's water system appears to have capacity for Alternative 1 as well.

The Department of Health and City Standards for water distribution systems are to meet the peak hourly demand of the system while providing a minimum pressure of 30 psi, system-wide. Under peak daily demand with a fire flow, the system is designed to maintain a minimum pressure of 20 psi, system-wide. Although the peak hourly demand pressure may currently be higher than these standards, the Developer must recognize that the City may not provide pressure higher than 30 psi in the future. The flows and pressures determined in this memo are based on the approximate hydrant elevation at ground level. The Developer may design their sprinkler system for whatever pressure they wish, however they must recognize and be responsible for conditions when the pressure may be less than currently exists.

APPENDIX A

WATER DEMANDS

CUP Increase:
Peak 100 GPM
Max 1000 GPD
365,000 Gal/yr (AHBL Estimate)
5,475,000 Gal/yr (based on utility bills)

Increase with New Central Support Tower
Peak 60 GPM
Max 14,400 GPD
5,256,000 Gal/year (per AHBL)
2,628,000 Gal/yr (based on utility bills)

EX 12" DI WATER

Improvements in and for 7th Street SE are not part of Master Plan DEIS

EX 12" DI WATER

E
Pavilions

New Patient Care Tower:
Peak 113 GPM
Max 100,000 GPD
6,716,000 Gal/year

J
Facilities Bldg

Central Utility Plant Expansion

A
Puyallup valley Medical Clinic

B
Central Utility Plant

G
Parking Garage

S
Future Support Tower

O
PCT Parking Deck Option B

New Parking Structures
Peak 30 GPM
with irrigation 75 gpm
Not expected to be significant domestic water demand.

EX 8" DI WATER (PRIVATE)

Existing private 8" W to be relocated if 7th St SE is developed

R
3rd St Expansion

F
Dally Tower

N
Proposed Patient Care Tower (PCT)

EX 8" DI WATER (PRIVATE)

P
PCT Parking Deck Option A

T
Future Parking Deck

Dally increase:
Peak 100 gpm
Max 24870 GPD
8,818,400 Gal/yr (AHBL Estimate)
934,400 gal/year (based on utility bills)

M
Emergency Expansion

Q
Medical Office Building

U
Future MEDICAL OFFICE BUILDING B

EX 12" DI WATER

Existing parking garage had 0 CCF in 2022

H
Parking Garage

EX 12" DI WATER (PRIVATE)

I
Medical Office Building

EX 12" DI WATER

C
Cancer Care Center

New MOB A
Peak 113 GPM
Max 50,000 GPD
Average 1,825,000 Gal/year

New MOB B
Peak 113 GPM
Max 50,000 GPD
Average 1,825,000 Gal/year

EX 12" DI WATER

13TH AVE SE
14TH AVE SE
15TH AVE SE
7TH ST SE
3RD ST SE

Existing
A. Puyallup Valley Medical Clinic
B. Central Utility Plant (CUP)
C. Cancer Center
D. Children's Therapy Unit
E. Pavilions
F. Dally Tower
G. P1 parking Garage (2010)
H. P2 Parking Garage (1990)
I. Medical Office Building
J. Facilities Building
K. 622-623 14th (Marketing)

Proposed
L. Central Utility Plant Expansion
M. Emergency Department Exp.
N. Proposed Patient Care Tower (PCT)
O. PCT Parking Deck Option B
P. PCT Parking Deck Option A
Q. Medical Office Building
R. 3rd Street Expantion
S. Future Support Tower
T. Future parking Deck
U. Future Medical Office Building

MIG WORKING DRAFT FOR INTERNAL COORDINATION

AHBL

MULTICARE GOOD SAMARITAN HOSPITAL MASTERPLAN

PROPOSED ACTION MASTER PLAN - PROPOSED WATER MAP

MIG Estimate of Increase in Water Consumption for the Master Plan. Estimate does not include fire flow and existing water demand.
Draft 12-21-2023
Increase in domestic water consumption based on review of Master Plan, existing domestic water utility bills in 2022 provided by City, data and estimate provided by AHBL and DOH Water Design Manual.

GRAPHIC SCALE
60 120 240
1" = 120 FEET

LEGEND
SANITARY SEWER PIPING
STORM DRAINAGE PIPING
WATER PIPING PROPOSED
EX WATER
BUILDING FOOTPRINT
STORMWATER MANAGEMENT FACILITY

N

Multi-care Good Samaritan Hospital Master Plan DEIS
ESTIMATE OF WATER FLOWS FOR ALTERNATIVES

Not for Distribution
Draft for Internal Coordination

MIG#15271

Prepared by KG

Model Node	Map ID	Facility	Proposed Footprint (sf)	Proposed GSF	Notes from Perkins Will/AHBL	MIG Notes from review of AHBL and Chapter 2 DEIS	Avg Gallons/year based on estimating from ex utility bills	Data from AHBL: Avg Gallons/year combining AHBL est. and MIG review of utility bills.	Info from AHBL: Maximum Gal/Day	Peak GPM
J2278	N	**Patient Care Tower**	40,000	230,000		250 beds	6,716,000	6,716,000	100,000	113
J2278	P	**Parking Structure (PS) 1 Option A**	28,000	190,000	2" WM 20-30 gpm max, if irrigated roof 75 gpm	Max 30 gpm for 12 hours	-	-	21,600	75
J-249	L	**Central Utility Plant Expansion**	10,000	10,000	Cooling tower would be the largest demand. Makeup water. Max 100gpm but 1000 gal/day. Yield of 365,000 gal/year.	Provide expansion to existing centralized chilled water and emergency generator systems to support the new Patient Care Tower and the potential central tower expansion.	5,475,000	365,000	1,000	100
J-596	S	**Patient Care Tower Shell Buildout**		0		Included in Patient Care Tower	-	-	-	
J2278	Q	**Medical Office Building (MOB) A**	20,000	100,000		Private physician offices and related outpatient facilities	1,825,000	1,825,000	50,000	113
J2278	T	**Parking Structure (PS) 2**	35,000	260,000	Minimal water demand – assume hose bibs for washdown and irrigation lines for a few planters. 2-1/2" riser with no more than 100 GPM planned.		-	-	44,444	100
J2278	U	**Medical Office Building (MOB) B**	20,000	100,000		Private physician offices and related outpatient facilities	1,825,000	1,825,000	50,000	113
J-596	S	**Central Supply Tower**	15,000	90,000	Assume a peak flow of 60 GPM for 4 hours/day. Yield of 14,400 gal/day or 5,256,000 gal yearly consumption. Hard to estimate. Would be better to ask facilities what their utility bills are per month. Engineering estimate could vary greatly. We can do this for you if you get us the bills.	Hospital support and ancillary services	2,628,000	5,256,000	14,400	60
J-249	M	**Dally Tower Emergency Department Expansion**	2,000	2,000		Expansion of Emergency Department patient waiting, prescreening, triaging, and intake service	58,400	58,400	870	1
J-249	R	**Dally Tower Expansion towards 3rd Street**	15,000	30,000	Assuming part inpatient and part outpatient/office. 3 stories, 45 patient rooms. 100 gpm peak flow. Assuming peak flow for 4 hours a day yields 24,000 gal, or yearly commitment of 8,760,000 gal. Hard to estimate yearly demand because office would be low usage while inpatient or sterile processing could be very large loads. Better to use the facility utility bill.	Patient Care programs and hospital support	876,000	8,760,000	24,000	100
		Total	**Total new GSF:**	1,012,000		**Total**	19,403,400	**24,805,400**	**306,314**	**775**
		Total new GSF minus parking:		562,000						
					Existing Water Consumption from City 2022 Utility Bill:		29,626,599			
						From GO 2016 estimate	37,500,000			

Kathy Gwilym <kgwilym@migcom.com>

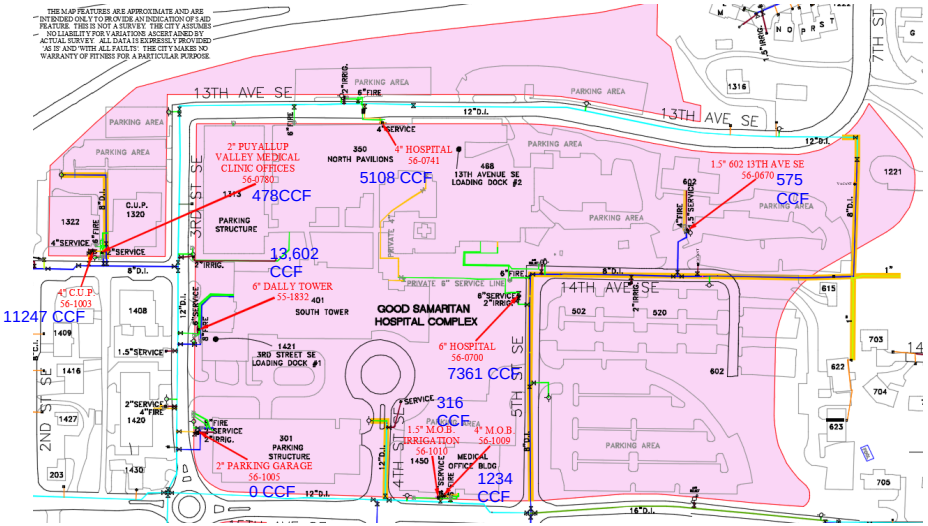
RE: Good Sam Hospital Master Plan pDEIS Sewer analysis info needs

1 message

Brian Johnson <BrianJ@puyallupwa.gov> Wed, Dec 13, 2023 at 1:47 PM
To: Kathy Gwilym <kgwilym@migcom.com>
Cc: Chris Beale <CBeale@puyallupwa.gov>, Mark Higginson <MHigginson@puyallupwa.gov>, Alicia Sullivan <ASullivan@puyallupwa.gov>, Mark Davies <mdavies@migcom.com>, Jordan Zier <Jordan.Zier@bhcconsultants.com>, Sakaru Tsuchiya <stsuchiya@migcom.com>, "Sarlitto, Michele" <msarlitto@eaest.com>, "Schipanski, Rich" <rschipanski@eaest.com>

Kathy –

Hopefully the screenshot below answers your questions. I've attached a PDF to make viewing easier.



Existing domestic meters
2022 consumption

Brian Johnson

City of Puyallup

Public Works

Water Division

From: Kathy Gwilym <kgwilym@migcom.com>
Sent: Tuesday, December 12, 2023 4:50 PM
To: Chris Beale <CBeale@PuyallupWA.gov>
Cc: Mark Davies <mdavies@migcom.com>; Jordan Zier <Jordan.Zier@bhcconsultants.com>; Sakaru Tsuchiya <stsuchiya@migcom.com>; Sarlitto, Michele <msarlitto@eaest.com>; Schipanski, Rich <rschipanski@eaest.com>; Mark Higginson <MHigginson@PuyallupWA.gov>; Alicia Sullivan <ASullivan@PuyallupWA.gov>
Subject: Re: FW: Good Sam Hospital Master Plan pDEIS Sewer analysis info needs

APPENDIX B

PROPOSED DEVELOPMENT

III. PROPOSED DEVELOPMENT

Introduction. MultiCare Good Samaritan Hospital (MGSH) in Puyallup, Washington requests approval of a new Master Plan, as governed by Chapter 20.88 of the City of Puyallup Zoning Code. A master plan for the MGSH campus was last submitted and approved in 2007, which is now expired. The key feature of the 2007 Master Plan was Dally Tower, a patient care building including emergency, diagnostic and treatment services, and nursing units which significantly increased the hospital's capacity and established a new main entrance. Buildout of the prior master plan also included a parking garage, central utility plant (CUP), and a medical office building with connected parking deck. The 2007 Master Plan allowed for 913,000 gsf, of which approximately 648,000 was built, represented by the projects named above. (The phase 2 diagnostic and treatment expansion to Dally Tower and additional parking garage (PS-3) were not completed.) See description of comparison between the 2007 and the 2003 Master Plans on page 3 of this Master Plan.

At full build-out in 2034, the multi-phase 2022 Master Plan calls for construction of up to 1,012,000 new gsf, bringing total on-campus development up to approximately 2.2 million gsf. Concurrently, a SEPA Checklist and Environmental Impact Statement (EIS) are being prepared and submitted as companion documents to the Master Plan. The SEPA Checklist is available as *Appendix D* to this document.

Planning Principles. The following planning principles are rooted in MultiCare's mission and are reflective of Puyallup's Comprehensive Plan.

1. Patient-centered approach/healing environment
2. Employee/physician satisfaction
3. Community/neighborhood sensitivity
4. Site preservation
5. Facility flexibility
6. Maintenance of operation during construction
7. Environmental stewardship

Economic Benefits. There are several community economic benefits associated with the proposed expansion of MGSH. The City of Puyallup and MGSH have linked destinies; the City's growth promotes further need for healthcare services, and Good Samaritan's growth and increasing technical sophistication increases the community's quality of life and access to healthcare, while also helping to attract new residents and jobs.

As the City's only full-service medical center, MGSH also provides a considerable community benefit in the form of uncompensated care. In 2021, MGSH netted a total community benefit amount of over $57 million. This included approximately $47 million of Medicaid shortfall and charity care for individuals and families with inadequate or no health coverage. The additional $10 million covered miscellaneous programs that provide a benefit to patients and the community.

In addition to providing a medical benefit, MGSH provides significant non-medical social services through the MultiCare Good Samaritan Foundation.

MGSH continues to be one of the City's largest employers. As of October 2022, MultiCare employs approximately 3,600 people in Puyallup, and over 12,000 in Pierce County across multiple healthcare campuses. Regional medical centers also provide the nucleus for medically related spin-off activities, including senior and other specialty housing, conference centers, laboratories, bio-medical research/manufacturing and related support services. It also leads to development and job creation in other industries and sectors, particularly in the immediate vicinity of the medical center.

Need. MultiCare Good Samaritan Hospital is the premiere provider for acute care services in East Pierce County. Additional capacity is needed to maintain the quality of care and service levels expected by the community, given recent and expected future population growth in the region. MGSH currently operates at very high inpatient occupancy percentages, and it has the largest emergency department (including off-campus EDs) in the State of Washington.

As the population in East Pierce County continues to grow, so does the need for healthcare services. In a parallel exercise, MGSH has undergone comprehensive growth studies to support its Certificate of Need application to the Washington State Department of Health. Estimates indicate that Puyallup and surrounding communities will require an additional 140 acute care beds by 2028, and 250 beds by 2036. This represents a 33% increase over MGSH's current licensed bed count of 375.

Without expansion of MGSH, access to acute care services will be constrained for East Pierce residents, and they will be forced to delay or leave the community for care. This will create significant barriers to accessing necessary care and negatively impact the health of our community. With the proposed expansion at MGSH, we will continue to meet the needs of the community by providing appropriate access to high-quality acute care services.

Proposed Development Plan. The Master Plan responds strategically to both immediate and projected needs. In addition to the noted inpatient bed demand, MGSH operates a very busy emergency department which needs intake and flow improvements. Early phases of the Master Plan address these two needs, while later phases address ancillary growth as a result of the hospital capacity expansion.

Land availability on campus points to a development strategy on the eastern portion of the current MGSH campus in a zone bound by 15th Ave. SE to the south and the 7th Street SE right-of-way (ROW) to the east as identified by the City of Puyallup and Pierce County. There are potential development zones on both the north and south sides of the current 14th Ave. SE.

Primary components of the Master Plan are as follows and are detailed further in the following phasing plan and project descriptions.

A. Emergency Department Expansion – Early project within the life of the Master Plan to address intake and flow challenges. The expansion is proposed to occur adjacent to the current ED entrance, in proximity to the current patient drop off area.
B. New Patient Care Tower (PCT) – This project will increase the inpatient capacity on campus in accordance with need projections on file with the State of Washington Department of Health. The PCT will be built directly to the east of the current Dally

Tower, will have physical connection to the current hospital, and is proposed to utilize the existing main entrance and drop off zone. This development will create a need for utilities infrastructure expansion, likely resulting in expansion of the existing Central Utilities Plant (CUP).

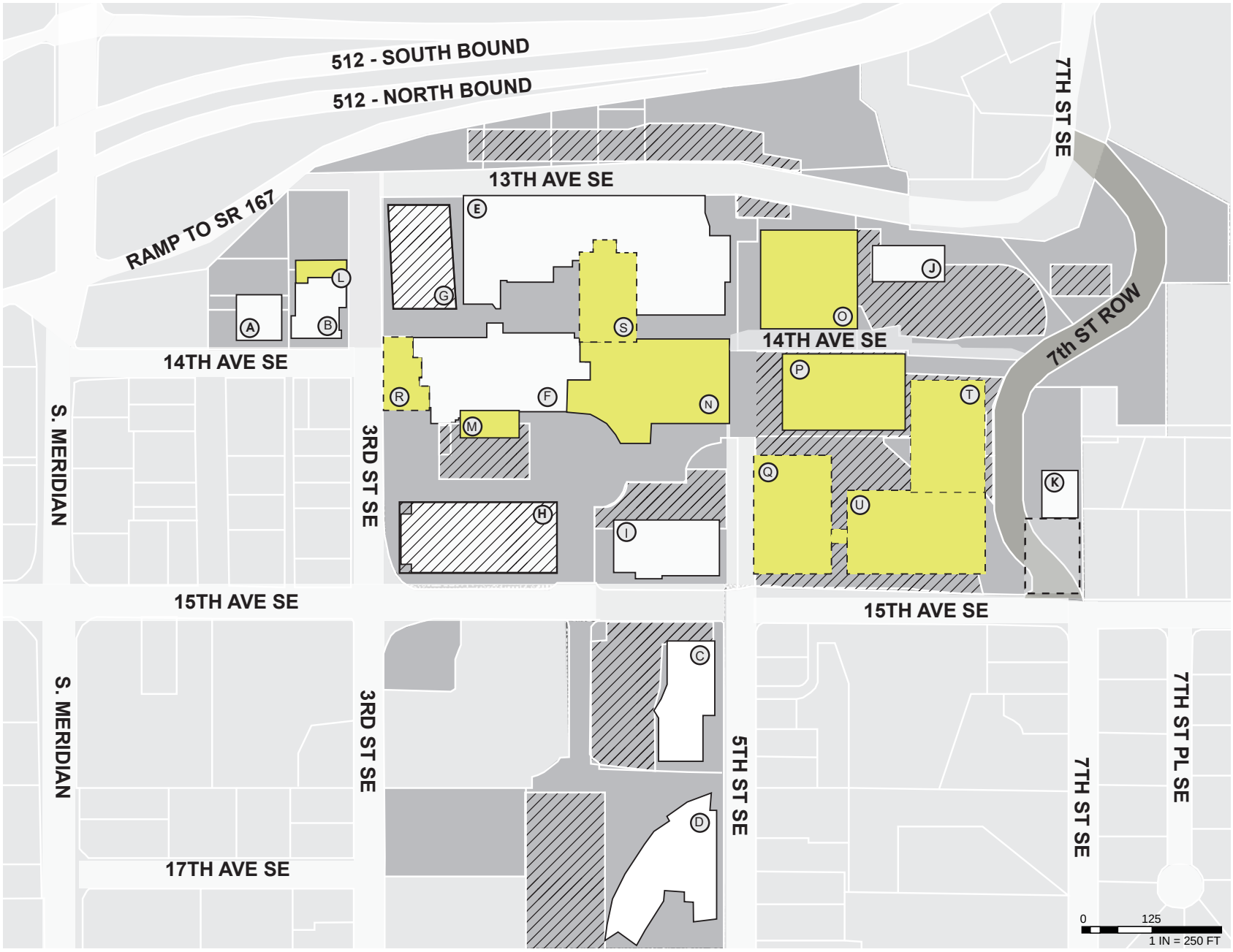
C. PCT Parking Structure – Concurrent to the construction of the new PCT, a new parking structure will be built to support the new parking demand driven by the new building. Two potential sites are identified for this structure in the Master Plan. These include the site of a current surface parking lot southeast of the intersection of 5th Street SE and 14th Ave. SE, and also to the north of 14th Ave. SE. The final location of this structure will be determined at the time of final design based on parking need and site circulation.
D. Medical Office Building(s) – As hospital capacity increases, so too will the need for outpatient clinical facilities. To house these functions, the Master Plan proposes medical office space in the form of up to two (2) new Medical Office Buildings (MOB) to the east of the current hospital and MOB, and north of 15th Ave. SE.
E. MOB Parking Structure – A second parking structure is proposed to accommodate the additional parking demand created by the new MOB(s). The parking structure will be built with near adjacency to the building(s) it supports.
F. Hospital Support Expansions – Potential support expansions for the hospital have been identified, and will be determined based on need late in the timeframe of the Master Plan. One option is a multi-story Central Support Tower which would be constructed immediately to the north of Dally Tower, with physical connection to existing building(s). Another potential expansion could occur along 3rd Street SE immediately to the west of the Emergency Department (ED). This expansion could support, among other things, expansion to the ED, diagnostic and treatment departments, and hospital support services.

Table III-A summarizes the full-build-out program by phase:

TABLE III-A
PROPOSED CAMPUS BUILD-OUT (2023 – 2043)

FACILITY	PHASE 1		FUTURE PHASES*	
	PHASE	PROPOSED SF	PHASE	PROPOSED SF
Patient Care Tower	1A	230,000 gsf		
Parking Structure (PS) 1	1A	190,000 gsf		
Central Utility Plant Expansion	1A	10,000 gsf		
Patient Care Tower Shell Buildout	1B	Shell Buildout		
Dally Tower Emergency Department Expansion	1C	2,000 gsf		
Medical Office Building (MOB) A			2	100,000 gsf
Parking Structure (PS) 2			2	260,000 gsf
Medical Office Building (MOB) B			3	100,000 gsf
Central Support Tower			4	90,000 gsf
Dally Tower Expansion towards 3rd Street			4	30,000 gsf
Subtotal		432,000 gsf		580,000 gsf

Total: 1,012,000 gsf
**Construction phases may not occur chronologically according to phase numbers*



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O. PCT Parking Deck Option B
P. PCT Parking Deck Option A
Q. Medical Office Building
R. 3rd Street Expantion
S. Future Support Tower
T. Future parking Deck
U. Future Medical Office Building

LEGEND

PARKING

EXISTING FACILITY

MGSH CAMPUS

PROPOSED DEVELOPMENT

Perkins&Will

1301 5th Ave, Suite #2300
Seattle, WA. 98101
206.381.6000 tel

MULTICARE GOOD SAMARITAN HOSPITAL MASTER PLAN

MGSH CAMPUS AT FULL BUILD OUT

SOURCE: GOOGLE EARTH, CITY OF PUYALLUP GIS

III-A

Architectural Design. Figure III-3A illustrates the full build-out plan expected to be completed by 2034. The new campus development will focus on expanding to the campus's east side and take advantage of what is currently green field and surface parking. Most of the new development will occupy and transform the surface car park bound by 5th Street SE, 15th Avenue SE, and 14th Avenue SE.

The full build out will be broken into multiple phases; phase one will include a new patient care tower directly connected to the Dally Tower, a new parking garage supporting new patient beds and staff, a small expansion to the existing emergency department, expansion to the existing central utility plant. If deemed necessary, the potential extension of 7th Street SE to connect south to 15th Avenue SE could occur in the first phase. The patient care tower will extend directly off the east end of the Dally Tower and have internal connections on all levels to maintain continuity with the existing hospital. Due to existing site topography floors below level 3 in the new patient care tower are expected to be below grade.

Power, heating and cooling will be supplied by the expanded Central Utility Plant, while water, sanitary sewer, and storm sewer will be connected to the existing underground infrastructure around the building site.

Patients and visitors coming to the new patient care tower expansion will continue to use the primary hospital drop-off at Dally Tower off 15th Avenue SE. Access to the phase one parking garage located to the east of the new patient tower could potentially be off 5th Street SE and/or14th Avenue SE. As an alternate phase one location the parking garage could be located just north of 14th Ave. SE and west of the existing MGSH Facilities Building.

The phase one potential road extension of 7th Avenue SE south into 15th Avenue SE may provide clarity and improved access over the Good Samaritan campus's vehicular circulation. While further analysis is needed, this may lessen congestion around the intersection of 15th Avenue SE and 3rd Street SE.

Additional phases include potential for two medical office buildings, a second new parking garage, and an eventual central tower expansion connected to the north of Dally Tower and the new Patient Care Tower. The proposed location for the two medical office buildings and parking structure is north of 15th Street. All future phase development beyond the initial Patient Care Tower is speculative and will be developed on an as-needed basis as determined by MGSH.

The potential medical office buildings will have new, dedicated mechanical, plumbing, and electrical systems. Normal power, emergency power, heating and cooling will all be new systems installed within the project footprint, and may be contained, in part, within the building envelope, The central tower expansion will be supplied with mechanical, plumbing and electrical similar to the new patient care tower.

Throughout all phases of the Master Plan, building and site design will be approached in a thoughtful manner to ensure new developments fit into the existing campus in regard to aesthetics, form and scale. Wayfinding, circulation, landscaping, and relationships with neighboring properties will continue to be key aspects of campus design.

PHASE I DEVELOPMENT (2023-2028)

Description of Projects. There are five projects anticipated in Phase 1, totaling up to 432,000 net gsf, bringing the total campus development up to approximately 1,678,396 gsf. Phase 1 development projects are described below and summarized in Figure III-4. Please note that occupancy dates are estimates only, subject to need and funding and regulatory approvals.

1. Dally Tower Emergency Department Expansion

Location: Dally Tower level 1 emergency department at 401 15th Ave SE

Size: 2,000 gsf

Height: Existing Dally Tower level 1 to level 2

Program: Expansion of Emergency Department patient waiting, prescreening, triaging, and intake services

Displaced Facilities: Necessary modifications will be addressed.

Hours of Operation: 7 days week/24 hours a day

Occupancy: 2027

2. Patient Care Tower

Location: Directly east of Dally Tower with internal connections to it on all levels.

Size: up to 230,000 gsf over 9 levels

Footprint: 40,000 gsf

Height: Expected height will match that of Dally Tower. The height of the Dally Tower is approx. 157'-6" (7'-6" below the max height limit of 165') from the finished average adjoining grade to the top of the penthouse roof. The elevation at the top of the penthouse for the new Patient Care Tower will not exceed the elevation at the top of the penthouse for the Dally Tower.

Program: Inpatient nursing units, Observation unit, Surgical pre-admit testing unit, patient registration, retail, and shelled space.

Displaced Facilities: Site landscape and a paved area with tables and chairs. A portion of the Dally Tower will be demolished including patient registration and retail space. These programs will be relocated in the new Patient Care Tower.

Hours of Operation: 7 days week/24 hours a day

Occupancy: 2027

3. Parking Structure (PS) 1 - Currently there are two proposed locations: Option A to the south of 14th Ave SE and an option B to the north of 14th Ave SE

Location: Both options are located east of the proposed new Patient Care Tower with option A locating at the southeast corner of 5th St SE and 14th Ave SE and option B locating at the northeast corner of 5th St SE and 14th Ave SE

Size: Option A could be sized at 190,000 gsf over 7 levels with the top being exposed roof parking. The first two parking garage levels are proposed to be below grade. Option B could be sized at 160,000 gsf over 6 levels with the top being exposed roof parking.

Footprint: Approximately 28,000gsf for both options A and B

Height: Targeting 50' for both options A and B

Program: Option A will provide 600 parking spaces for new Patient Care Tower and Main Hospital Complex. Option B will provide 540 parking spaces since its location does not remove any surface parking stalls.

Displaced Facilities: +/-60 surface parking stalls for option A and zero for option B

Hours of Operation: Generally 7 AM - 9 PM; night shift inpatient employees

Occupancy: 2027

4. Central Utility Plant

Location: Directly off current central utility plant located at the northwest corner of 14th Avenue SE and 3rd St SE

Size: 10,000 gsf

Footprint: 10,000 gsf

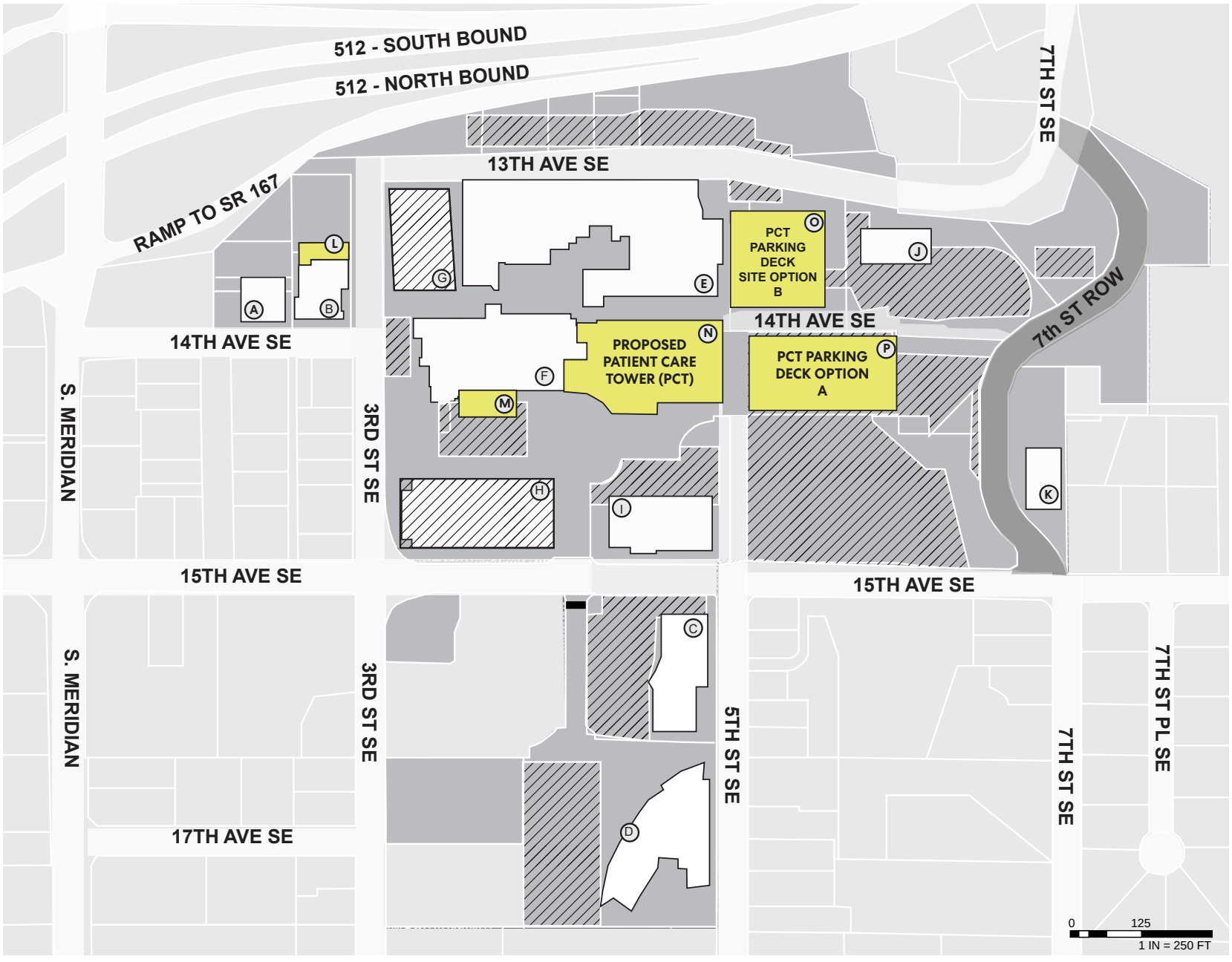
Height: Targeting 25'

Program: Provide expansion to existing centralized chilled water and emergency generator systems to support the new Patient Care Tower and the potential central tower expansion

Displaced Facilities: Displaces around 50 parking spaces, of which are targeted to be replaced by new stalls in new Parking garage

Hours of Operation: 7 days week/24 hours day.

Occupancy: 2027



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J. Facilities Building
K. 622-623 14th (Marketing)

Proposed
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M. Emergency Department Exp.
N. Proposed Patient Care Tower (PCT)
O. PCT Parking Deck Option B
P. PCT Parking Deck Option A

LEGEND
- PARKING
- EXISTING FACILITY
- MGSH CAMPUS
- PROPOSED DEVELOPMENT

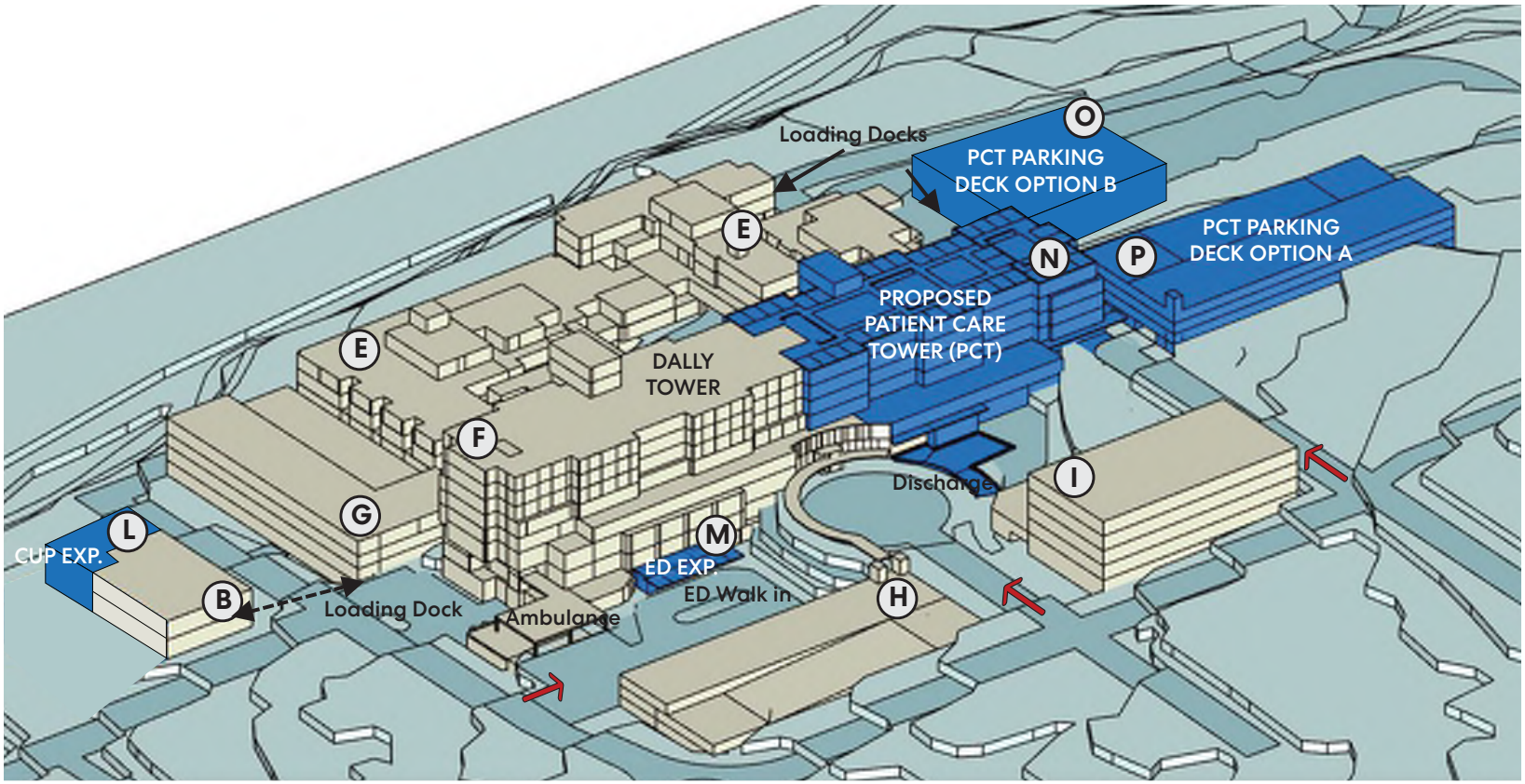
Perkins&Will
1301 5th Ave, Suite #2300
Seattle, WA. 98101
206.381.6000 tel

MULTICARE GOOD SAMARITAN HOSPITAL MASTER PLAN

PHASE 1A-1C

SOURCE: GOOGLE EARTH, CITY OF PUYALLUP GIS

III-B



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*Buildings not shown on the plan are not critical to the proposed development zones.

LEGEND

EXISTING FACILITY

PROPOSED DEVELOPMENT

Perkins&Will

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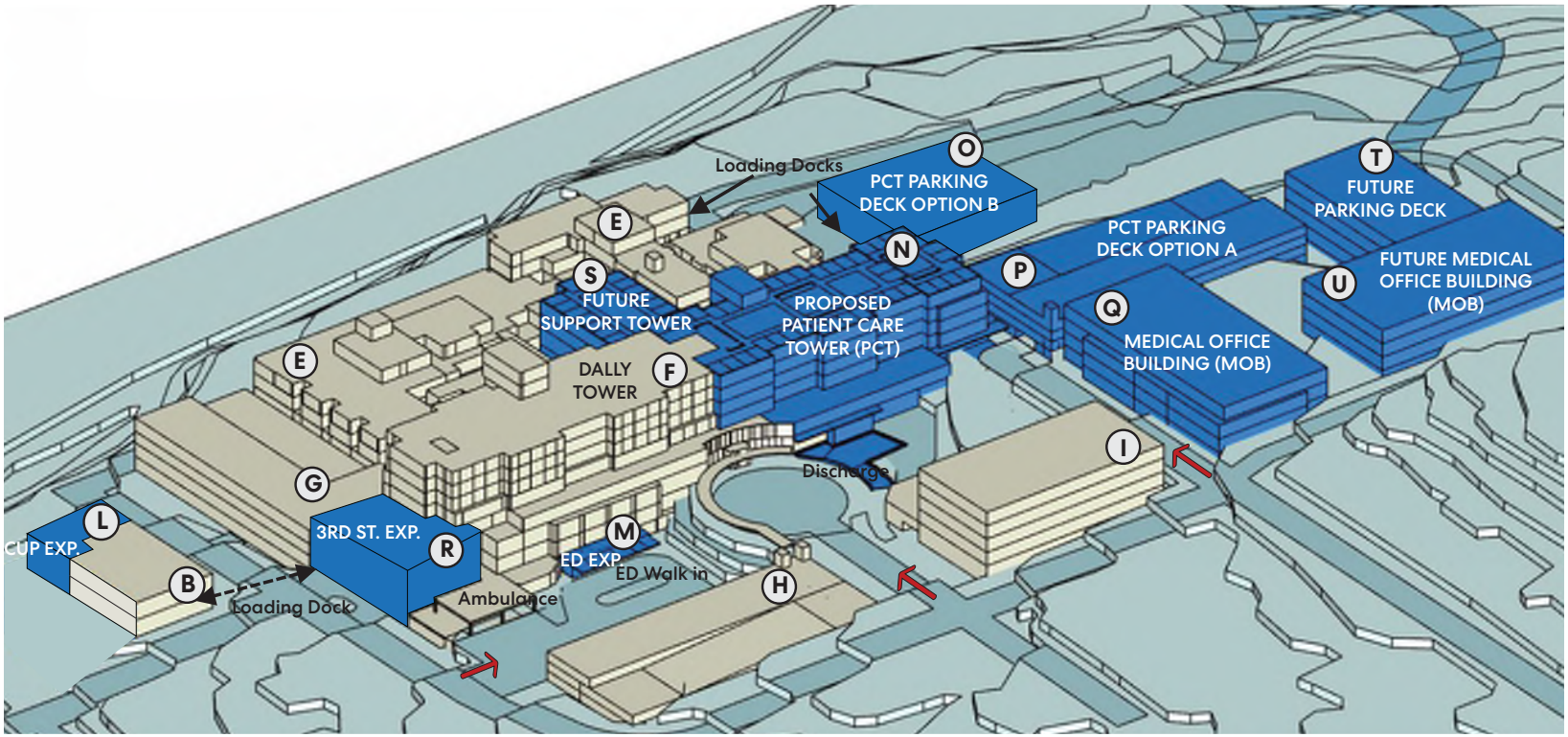
MULTICARE GOOD SAMARITAN HOSPITAL MASTER PLAN

CAMPUS MASTER PLAN VISION - PHASE 1

SOURCE: CBRE, PERKINS&WILL

III-B.1



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LEGEND

EXISTING FACILITY

PROPOSED DEVELOPMENT

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MULTICARE GOOD SAMARITAN HOSPITAL MASTER PLAN

CAMPUS MASTER PLAN VISION - FULL BUILD OUT

SOURCE: CBRE, PERKINS&WILL

III-B.2

Future Phase Development – Phases 2 – 4 [2027 – 2043]

Description of Projects. Future phase development projects are described below and summarized in *Figures III-B – III-E*. Future phase projects represent another 580,000 net gsf, bringing the total campus development up to 2,258,396 gsf, up from 1,678,396 gsf at the end of Phase 1. Please note that occupancy dates are estimates only, subject to need and funding.

Medical Office Building (MOB) A

Location: Northeast comer of 15th Avenue SE and 5th Street SE

Size: up to 100,000 gsf

Footprint: 20,000 gsf

Height: Average: 74'; Maximum: 85'

Program: Private physician offices and related outpatient facilities

Displaced Facilities: Around 80 surface parking stalls that plan to be relocated to future phase parking expansion

Hours of Operation: 7 AM- 6 PM Monday-Friday

Occupancy: 2034

Central Support Tower

Location: Expansion tower north from proposed new Patient Care Tower

Size: 90,000 gsf

Footprint: 15,000 gsf

Height: Around 90’

Program: Hospital support and ancillary services to be determined.

Displaced Facilities: Partial demolition of River Pavilion.

Hours of Operation: 7 days week/24 hours a day

Occupancy: 2043

Medical Office Building (MOB) B

Location: Just east of MOB A at Northeast comer of 15th Avenue SE and 5th Street SE

Size: 100,000 gsf

Footprint: 20,000 gsf

Height: Average: 74'; Maximum: 85'

Program: Private physician offices and related outpatient facilities

Displaced Facilities: Around 80 surface parking stalls that plan to be relocated to future phase parking expansion

Hours of Operation: 7 AM- 6 PM Monday-Friday

Occupancy: 2043

Parking Structure (PS) 2

Location: Adjacent to new MOB

Size: up to 260,000 gsf

Footprint: 35,000 gsf

Height: Average: 59'; Maximum: 68'

Program: Provide parking for MOB

Displaced Facilities: Around 20 surface parking stalls to be relocated in parking garage

Hours of Operation: 7 AM - 6 PM, Monday - Friday

Occupancy: 2034

Dally Tower Expansion to 3rd Street

Location: Expansion of 2-3 levels from the lower portion of the existing Dally tower. The expansion would extend west towards 3rd Street and may extend above the current loading area.

Size: 30,000 gsf

Footprint: 15,000 gsf

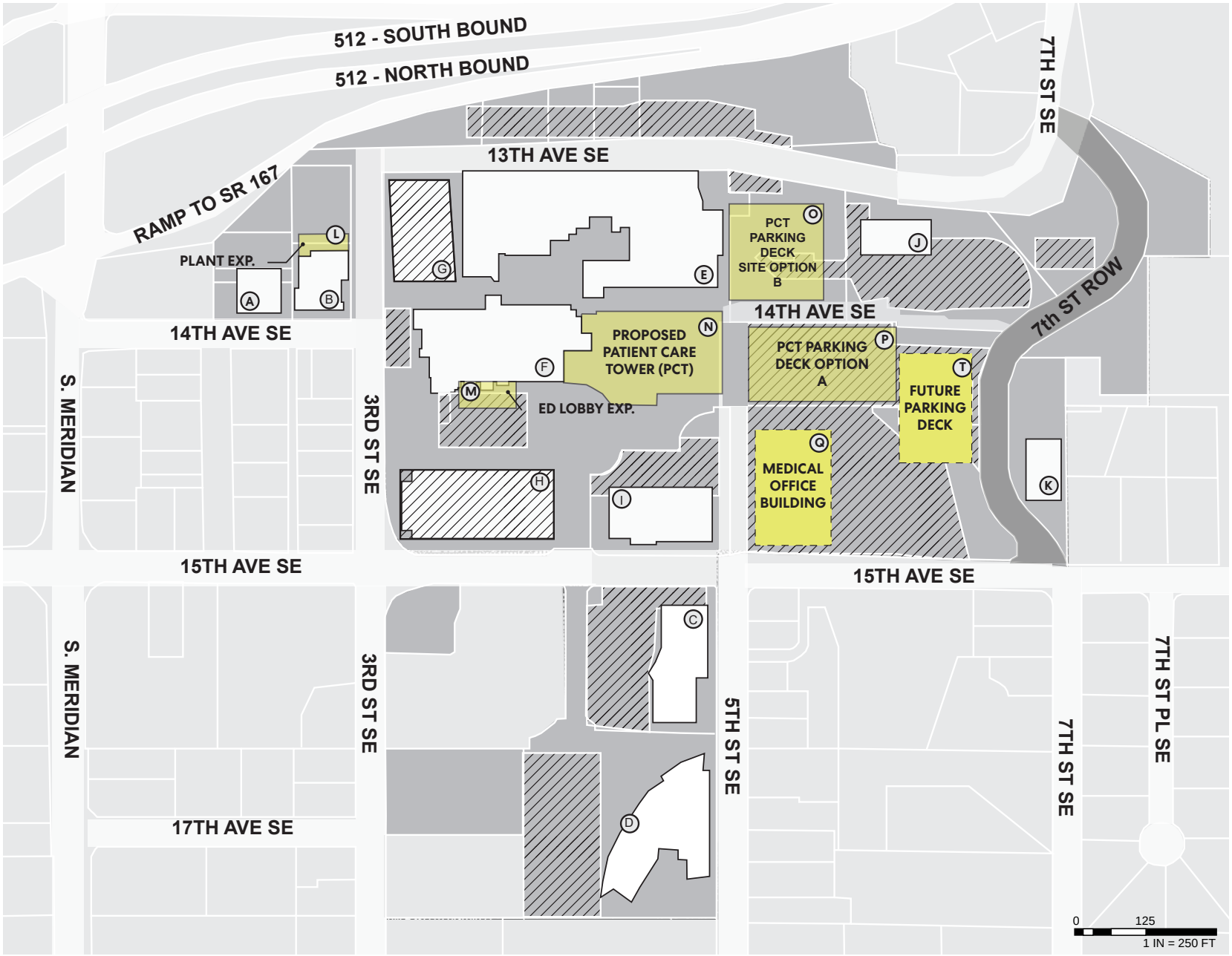
Height: Around 50’

Program: Patient care programs may include diagnostic imaging, surgery, procedures, Emergency Department, hospital support programs

Displaced Facilities: None

Hours of Operation: 7 days week/24 hours a day

Occupancy: 2043



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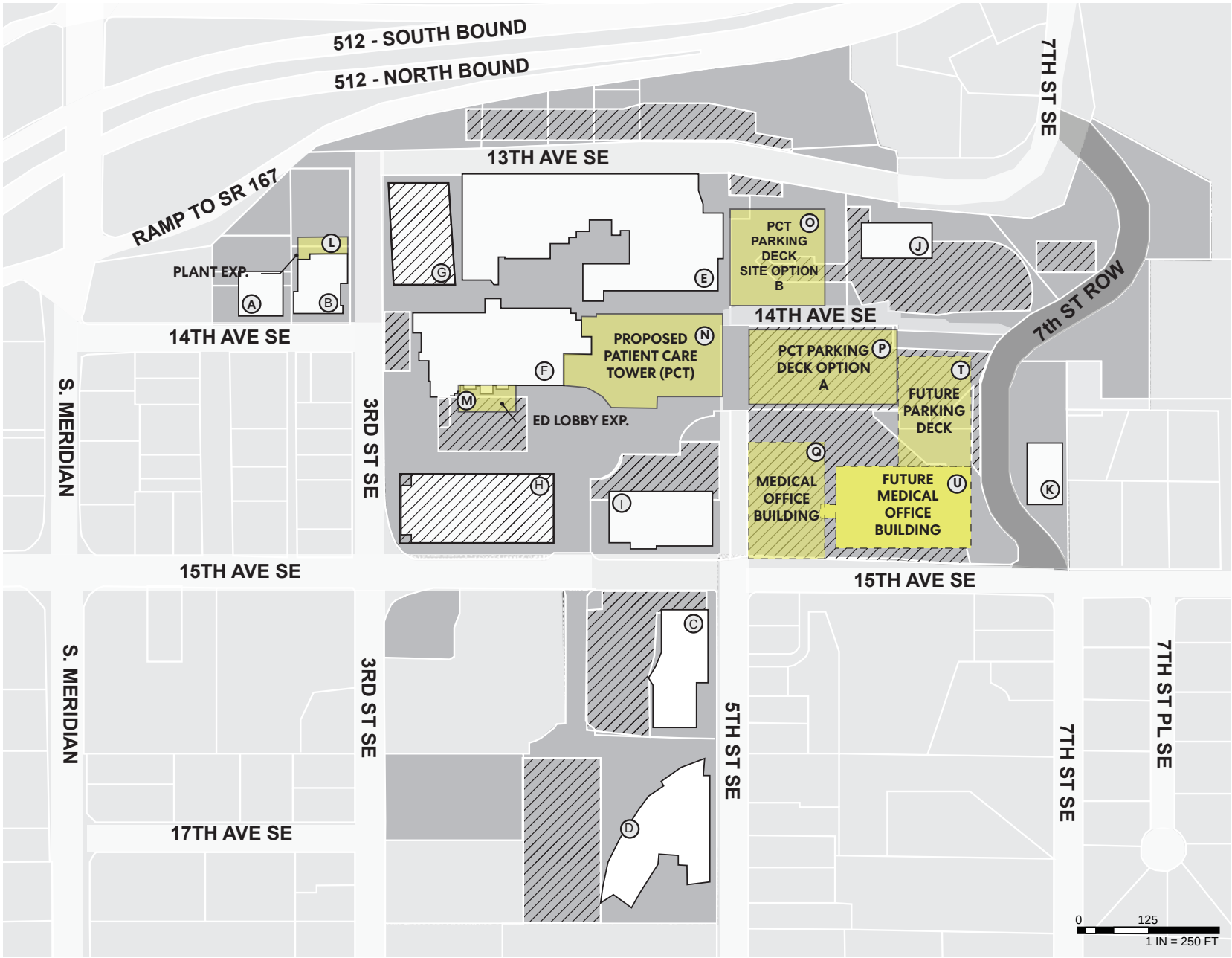
MULTICARE GOOD SAMARITAN HOSPITAL MASTER PLAN

FUTURE PHASES - PHASE 2

SOURCE: GOOGLE EARTH, CITY OF PUYALLUP GIS

III-C



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Seattle, WA. 98101
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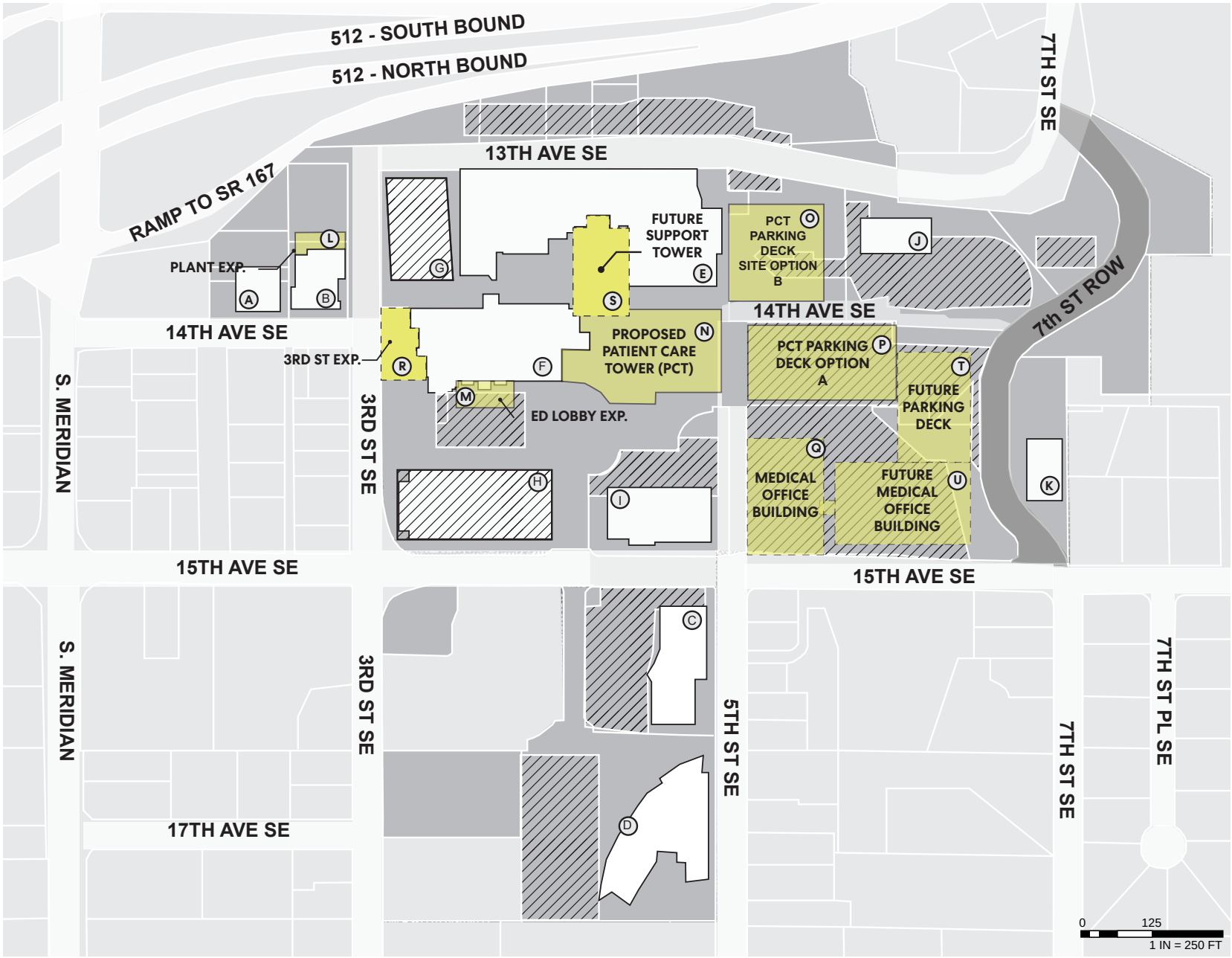
MULTICARE GOOD SAMARITAN HOSPITAL MASTER PLAN

FUTURE PHASES - PHASE 3

SOURCE: GOOGLE EARTH, CITY OF PUYALLUP GIS

III-D



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- EXISTING FACILITY
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- PROPOSED DEVELOPMENT

Perkins&Will
1301 5th Ave, Suite #2300
Seattle, WA. 98101
206.381.6000 tel

MULTICARE GOOD SAMARITAN HOSPITAL MASTER PLAN

FUTURE PHASES - PHASE 4

SOURCE: GOOGLE EARTH, CITY OF PUYALLUP GIS

III-E

701 Pike Street, Suite 1300
Seattle, WA 98101

T: 206.624.0100

January 30, 2024

Kathryn Gwilym, PE, LEED AP
MIG
119 Pine Street, Suite 400
Seattle, WA 98101

185514

Subject: Summary of Existing Conditions

Dear Kathryn,

At your request, Brown and Caldwell (BC) summarized existing conditions and known drainage problems downstream of the MultiCare Good Samaritan Hospital (GSH).

GSH is pursuing a Master Plan permit for the expansion of the Puyallup Campus (Site). As indicated in Table 1, the GSH Master Plan proposes to increase the impervious area at the Site by about 4 percent (1.3 acres) at Full Build Out (Hinthorne, 2023). The proposed expansion would trigger applicable Minimum Requirements (MR) for redevelopment as specified in the 2019 Department of Ecology Stormwater Management Manual for Western Washington (SWMMWW) (Ecology 2019) since the impervious area exceeds MR thresholds.

Table 1. Comparison of EIS Alternatives

	Proposed Master Plan (Full Build out) (acres)	EIS Alternative 1 (acres)	No Action Alternative (acres)
Total Campus Area	34.9	34.9	34.9
Impervious Area [1]	23.4 (67%)	22.9 (66%)	22.1 (63%)
Pervious Area [2]	11.5 (33%)	12.0 (34%)	12.8 (37%)

(1) *Includes area in building footprint, roadways, parking, and hardscape.*

(2) *Includes area in landscaping and other natural open space.*

Please note: 7th Street SE Extension portion of the project is not considered in this table. This is a potential future roadway connection between 13th Avenue SE and 15th Avenue SE.

The Site drains into two different drainage basins: Clarks Creek basin and the State Highway basin. Stormwater from the Clarks Creek portion of the Site discharges to Meeker Creek which then discharges to Clarks Creek. Stormwater from the State Highway basin discharges to a joint City-State-owned storm pipe (SR 512 storm pipe) that discharges to the Puyallup River. During most storms, each portion of the of the Site drain to their respective basins. During very large storms, some flow in SR 512 storm pipe is diverted to the Meeker/Clarks system (Tetra Tech 2012) where 15th Ave intersects with SR 512. The diversion occurs upstream from where drainage from Good Samaritan Hospital campus discharges into the SR 512 system (see Figure 1).

The SWMMWW includes a Threshold Drainage Area (TDA) exemption that allows direct discharge, or indirect discharge via a Municipal Separate Storm Sewer System (MS4), to specified exempt receiving waters. Clarks Creek is not listed as an exempt receiving water in the SWMMWW. As previously stated, stormwater from the State Highway basin discharges to the SR 512 storm pipe that discharges to the Puyallup River, which meets the requirements for a TDA exemption. However, the City believes the SR 512 storm pipe is at capacity and intends to verify the capacity in the future with a calibrated model (Personal communication with Paul Marrinan 2023). Therefore, stormwater from any new improvements in portions of the Site discharging to the State Highway basin would not qualify for direct discharge to the Puyallup River but would need to meet all applicable MRs including MR#7 Flow Control.

BC reviewed flooding locations at the City's request in support of the 2024 Stormwater Comprehensive Plan (SWCP). There is one known flooding location located within the State Highway basin in proximity to the Site as shown in Figure 1, the 12th Avenue SE and 13th Street SE Flooding location. Identified in the 2007 State Highway Basin Plan, the 12th Avenue SE and 13th Street SE Flooding occurs in an area with high groundwater and a general lack of stormwater infrastructure. However, the flooding is relatively minor, and is not anticipated to be addressed as a capital project in the capital improvement program update in the 2024 SWCP (personal communication with Kelton Parker 2023).

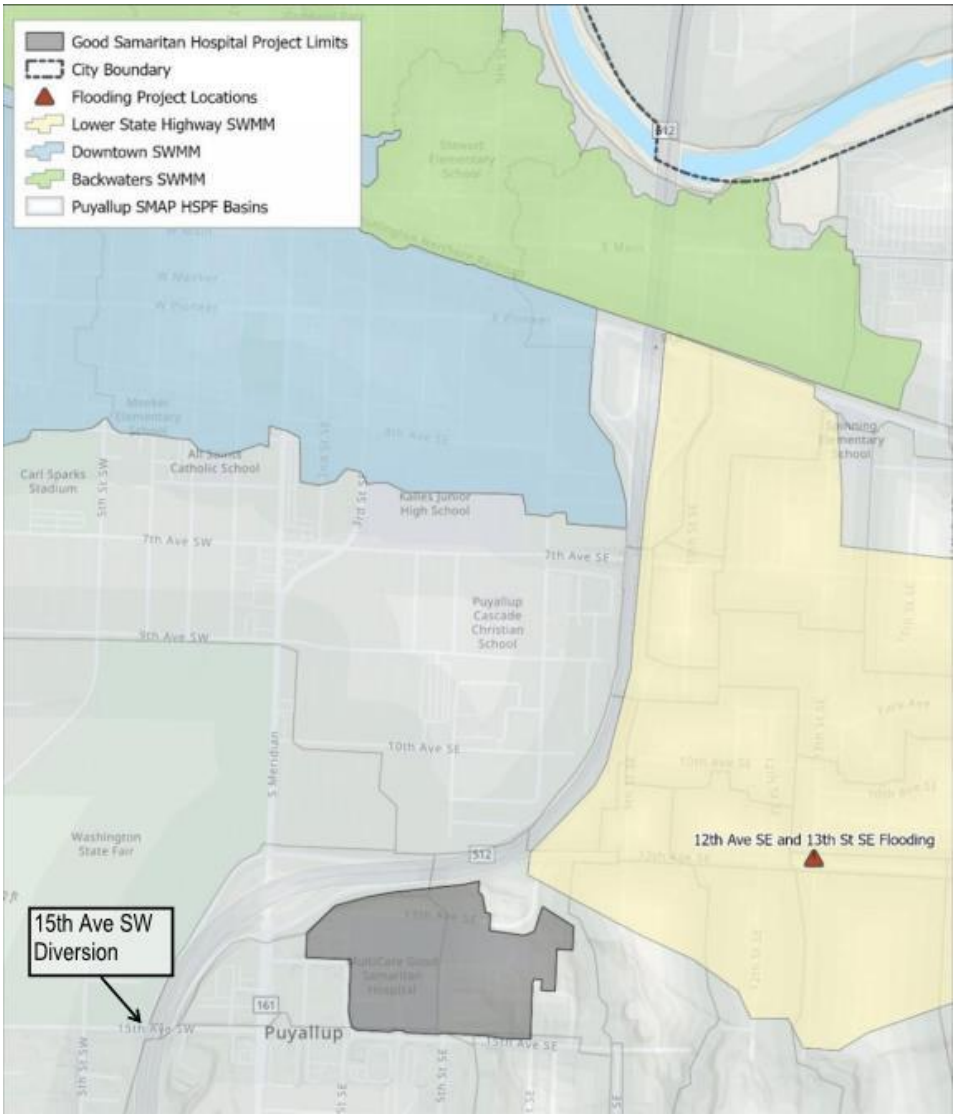


Figure 1. Flooding project location near the Site

Brown and Caldwell appreciates that EA Engineering, Science, Technology, Inc. and MIG have requested our services in assisting with this project. Should you have any questions, please do not hesitate to call me at (206) 749-5817.

Sincerely yours,

Brown and Caldwell

Margaret Ales, P.E., Project Manager
Seattle, Washington

cc: Michele Sarlitto, EA Engineering, Science and Technology, Inc.

References

Hinthorne, Brad, *Full Combined GSH Info Needs – Outstanding Items*, Perkins & Will, December 2023.

Tetra Tech, *Clarks Creek Sediment Study Watershed Model Report*, Prepared for Puyallup Tribe of Indians, October 2012.

Water Quality Program, *2019 Stormwater Management Manual for Western Washington*, Publication number 19-10-021, Department of Ecology State of Washington, July 2019.

Limitations:

This document was prepared solely for EA Engineering, Science and Technology, Inc (EAEST) in accordance with professional standards at the time the services were performed and in accordance with the contract between EASEST and Brown and Caldwell dated 12/1/2023. This document is governed by the specific scope of work authorized by EAEST; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by EAEST and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

MEMORANDUM

Date: March 13, 2024

To: Michele Sarlitto, EA Engineering, Science, and Technology, Inc.

From: Jordan Zier, PE; Kevin Cook, PE, BHC Consultants, LLC

Copy: Kathy Gwilym, PE, MIG, Inc.; Gretchen Brunner, EA Engineering, Science and Technology, Inc.

Subject: MultiCare Good Samaritan Hospital Sewer Impacts Analysis

1. Introduction

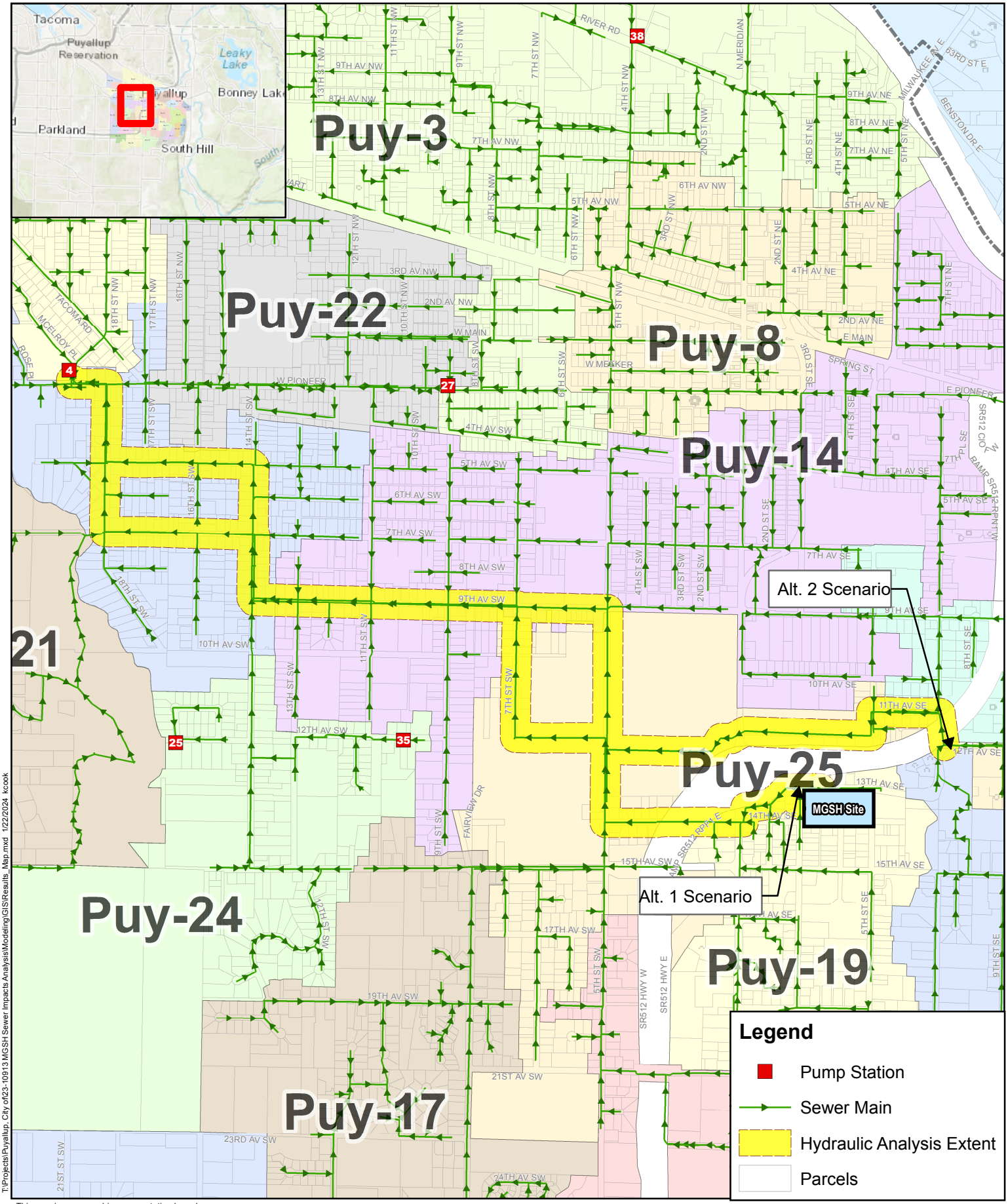
MultiCare Good Samaritan Hospital (MGSH) is located at 401 15th Avenue SE, Puyallup, WA 98372. MGSH is proposing a new 10-year Proposed Master Plan permit that would govern the future buildout and expansion of the campus. The Proposed Master Plan proposes expansion of the MGSH campus to be divided over two phases, including: a new patient care tower, two new medical office buildings, a central support tower, 3rd Street expansion, expansion of the existing Emergency Department, added building area and infrastructure related to the campus Central Utility Plant, new off-street parking, utility improvements, street improvements, landscaping, storm water infrastructure, and other improvements.

The City of Puyallup (City) will be processing the Proposed Master Plan application and is conducting an Environmental Impact Statement (EIS). As part of the EIS, sanitary system impacts will be evaluated and documented.

The purpose of this Memorandum (memo) is to document the methodology, results, and limitations of the hydraulic analysis in support of the City's review of the EIS of existing sewer collection system flows and increase in flows from Proposed Master Plan.

2. Methodology

The City's hydraulic model that was previously calibrated and used for hydraulic analysis and development of recommended capital improvement projects as part of the 2015 Comprehensive Sewer Plan (2015 Plan) was used as the baseline model for analysis. Flow estimations on existing usage as well as flow projections for planned expansions were input into the model and simulated to evaluate deficiencies for the modeled hydraulics and to evaluate performance of previously recommended improvements as well as identification of new capacity issues and recommendations because of development. Figure 1 shows the study area extents and key locations as well as the routing scenarios.



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bhc CONSULTANTS

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Study Area Extent
City of Puyallup
MultiCare Good Samaritan Hospital
January 2024

Figure **1**

Two routing scenarios were evaluated to convey flows from the MGSH expansion. The scenarios are:

- Scenario 1 – Connect to sanitary sewer line west and north of the property along 3rd Street and 13th Avenue South, respectively.
- Scenario 2 – Connect to sanitary sewer northeast of property and cross State Route (SR) 512.

2.1 Model Updates

The hydraulic model from the 2015 Plan was developed using DHI's MikeUrban software. The model included several planning horizons corresponding to the planning milestones identified in the 2015 Plan. The 6-year planning scenario correlated to the 2020 planning year and was used as the basis for analysis. The 2034 scenario model was also used to evaluate longer term impacts.

The hydraulic model contained a truncated version of the City's collection system, with sanitary and wet weather loads distributed accordingly. The modeled collection system was expanded to include additional pipes that extended north and west of MGSH for increased resolution. The sanitary loads were re-distributed to account for this additional hydraulic resolution based on assumed annual water usage. New flows were loaded into the model based on the scenario being analyzed.

The improvements identified as part of the 2015 Plan were modeled 'as is' to evaluate their performance with the MGSH development phases and determine if additional analysis or improvements were warranted.

2.2 Deficiency Criteria

The criteria to evaluate deficiencies within the collection were consistent with the 2015 Plan. This corresponds to a surcharge tolerance of 200% of the pipe diameter for a 25-year storm e.g., a 12-inch pipe can have up to 12-inches of water depth above the crown of the pipe.

The analysis of the collection system was limited to the sewer lines immediately downstream of the proposed development site and scenario routing points, to the point where they reconnect near Pump Station (PS) 4 (19th and Pioneer PS).

2.3 Flow Analysis

Flow estimates were developed for new facilities shown in the Proposed Action Flow Estimates (see Attachment A). These were input into the model as direct inflows corresponding to both their phase as well as the discharge scenario routing. A constant inflow was assumed to correspond to the sewer peak flow for the purposes of this analysis, to provide a conservative estimate of hydraulic capacity. Table 1 shows the peak flow estimates for each facility and corresponding phase.

Table 1
Proposed Action Flow Estimates

Facility	Phase[1]	Maximum Gal./Day	Sewer Peak Flow (GPM)[2]
Patient Care Tower	Initial	75,000	84
Parking Structure Option A	Initial	13,333	30
Central Utility Plant Expansion	Initial	1,500	150
Dally Tower Emergency Department Expansion	Initial	652	0.73
Medical Office Building (MOB) A	Future	50,000	113
Parking Structure 2	Future	44,444	100
Medical Office Building (MOB) B	Future	50,000	113
Central Supply Tower	Future	14,400	60
Dally Tower Expansion towards 3rd Street	Future	24,000	100
		Initial Phase Total[3]	**265**
		Future Phase Total[3]	**750**

Notes:
1) Initial Phase includes Phase 1A to 1C (Phase 1 in the Proposed Master Plan and Alternative 1; assumed to be built between 2023 and 2027) and Future Phase includes Phases 2 to 4 noted in the MGSH Master Plan (Phases 2 – 4 with the Proposed Master Plan; Phases 2 – 3 with Alternative 1; dates of construction less certain).
2) Sewer peak assumed peaking factor of 1.62 and subject to minor rounding precision. Peaking assumptions varied based on estimated time of peak and planned operation.
3) This excludes the existing MGSH and surrounding property sewer flow. Existing model flows/loads for MGSH corresponds to roughly 125 GPM based on historical water demand records and inherited model peaking factors.

2.4 Hydraulic Simulations

Multiple hydraulic simulations were conducted to evaluate the performance of the collection system. Several iterations representing different planning horizons, MGSH phases, as well as system hydraulics were completed. Table 2 shows the 15 simulations that were completed to evaluate the hydraulic capacity of the system.

Table 2
Hydraulic Simulation Matrix

Simulation	Collection System[1]	Planning Horizon[2]	MGSH Phase[3]	MGSH Routing Scenario
1	Existing	2020	None	None
2	Existing	2020	Initial	Scenario 1
3	Existing	2020	Future	Scenario 1
4	Existing	2020	Initial	Scenario 2
5	Existing	2020	Future	Scenario 2
6	Existing	2034	None	None
7	Existing	2034	Initial	Scenario 1
8	Existing	2034	Future	Scenario 1
9	Existing	2034	Initial	Scenario 2
10	Existing	2034	Future	Scenario 2
11	Plan Improvements	2034	Initial	Scenario 1
12	Plan Improvements	2034	Future	Scenario 1
13	Plan Improvements	2034	Initial	Scenario 2
14	Plan Improvements	2034	Future	Scenario 2
15	Plan Improvements Plus Addl Imps	2034	Future	Scenario 1

Notes:

1) Collection system represents model hydraulics for simulation:
   a) Existing – Existing collection system (pipe diameters, material, slopes, routing, etc.) as established as part of previous sewer plan, with updates listed for this analysis.
   b) Plan Improvements – Existing collection system with previously identified capital improvements.
   c) Plan Improvements Plus MGSH – Existing collection system with previously identified capital improvements with additional identified improvements recommended based on newly simulated deficiencies.
2) Planning Horizon representative of planning years from sewer plan.
3) MGSH Phase:
   a) Initial – Proposed Action Phase 1A to 1C.
   b) Future – Proposed Action Phases 2 – 4.

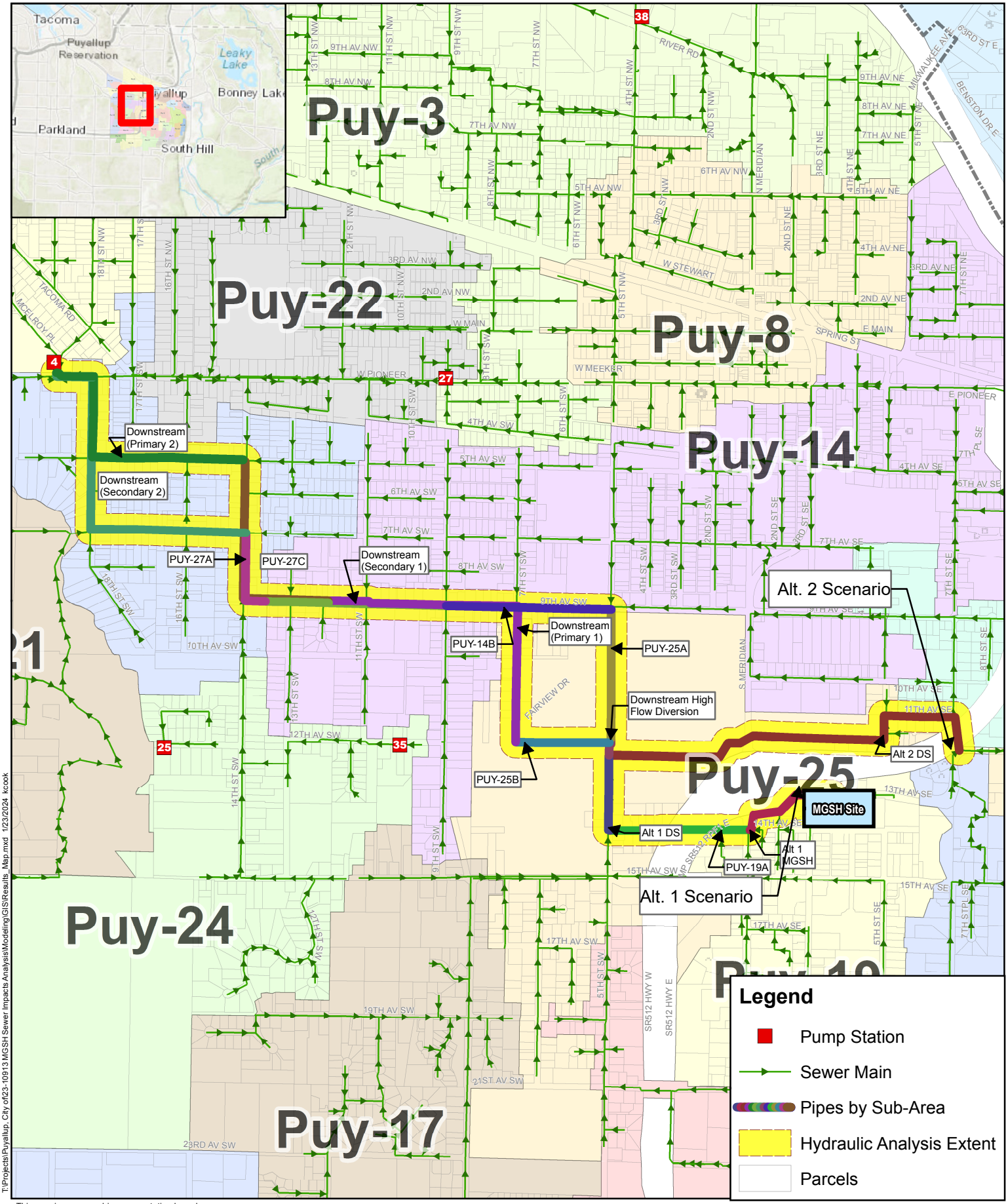
3. Results

Hydraulic simulations were conducted for the scenarios above and results tabulated for the deficiency criteria. Pipes were grouped by sub-area to evaluate the maximum simulated deficiency. Sub-areas were based on a variety of factors, including but not limited to, the previously identified capital improvement nomenclature, MGSH routing scenario, primary or secondary flow path, and relative location the MGSH site.

Figure 2 shows the location of each sub-area grouping and each sub-area is described below.

- Scenario 1 MGSH – Area northwest of MGSH, corresponding to Scenario 1 routing, upstream of PUY-19A.
- PUY-19A – Previously identified improvement.
- Scenario 1 Downstream (DS) – Area downstream of PUY-19A heading north along 5th Street SW, prior to joining in with flow from the east, and south of the high flow diversion.
- PUY-25B – Previously identified improvement.
- Downstream (Primary 1) – Flow along primary flow path, downstream of PUY-25B, extending to PUY-27C.
- PUY-27C – Previously identified improvement.
- Downstream (Primary 2) – Flow along primary flow path, downstream of PUY-27C, extending to pump station.
- Scenario 2 DS – Area corresponding to Scenario 2 routing, heading west, prior to joining in with flow from the south, and south of the high flow diversion.
- PUY-25A – Previously identified improvement.
- PUY-14B – Previously identified improvement.
- Downstream (Secondary 1) – Flow along secondary flow path from diversion, downstream of PUY-14B, extending to PUY-27A.
- PUY-27A – Previously identified improvement.
- Downstream (Secondary 2) – Flow along secondary flow path from diversion, downstream of PUY-27A, extending to pump station.
- Downstream High Flow Diversion – Flow near diversion structure along 5th Street SW where flows from Scenario 1 DS and Scenario 2 DS merge.

Results were aggregated for each of the simulations and summarized to identify new capacity issues as well changes to previously recommended improvements. Figure 3 and Figure 4 are provided to reference manholes (MH).



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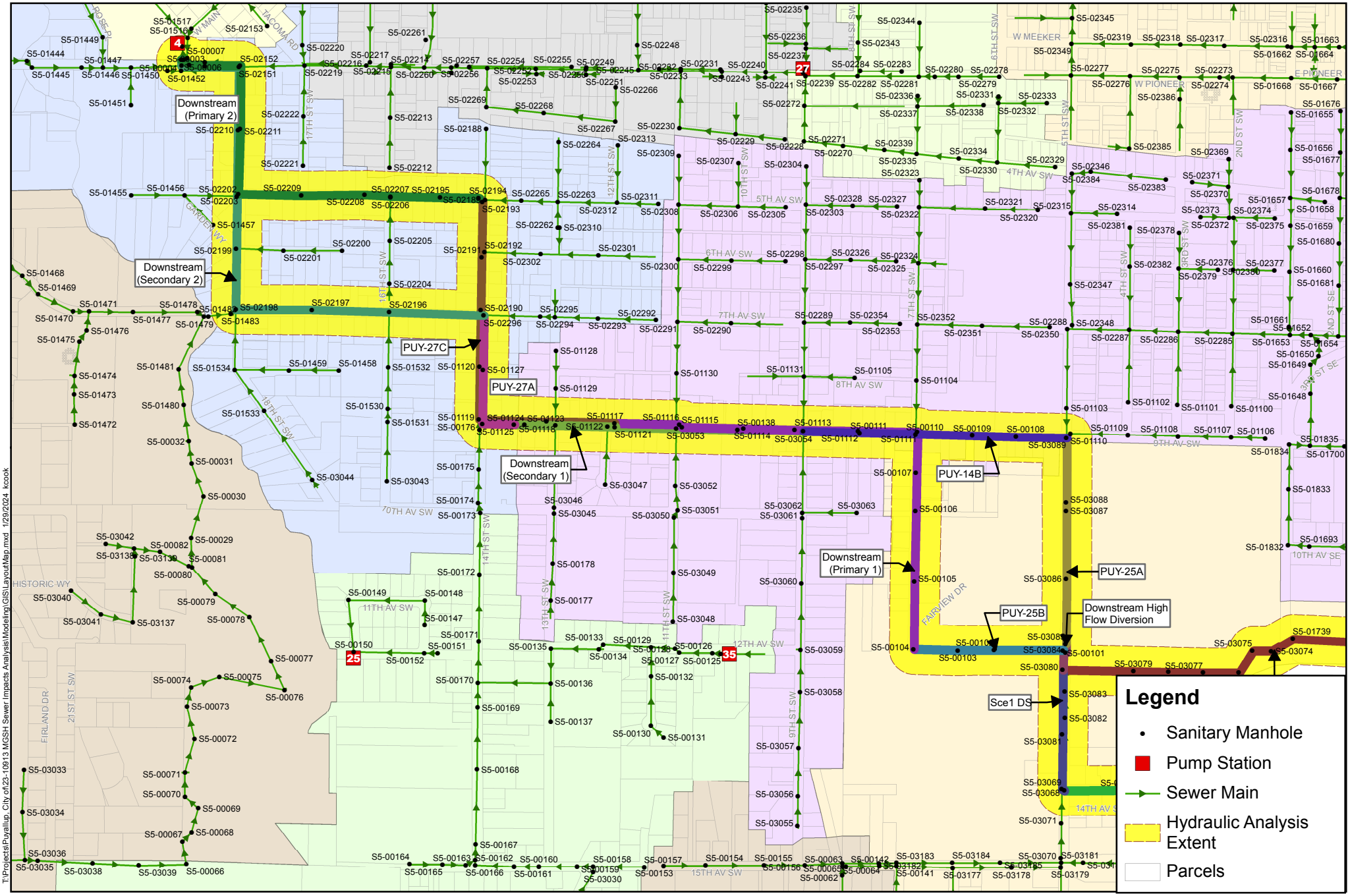
CITY OF PUYALLUP STATE OF WASHINGTON

Hydraulic Sub-Areas
City of Puyallup
MultiCare Good Samaritan Hospital
January 2024

Figure **2**



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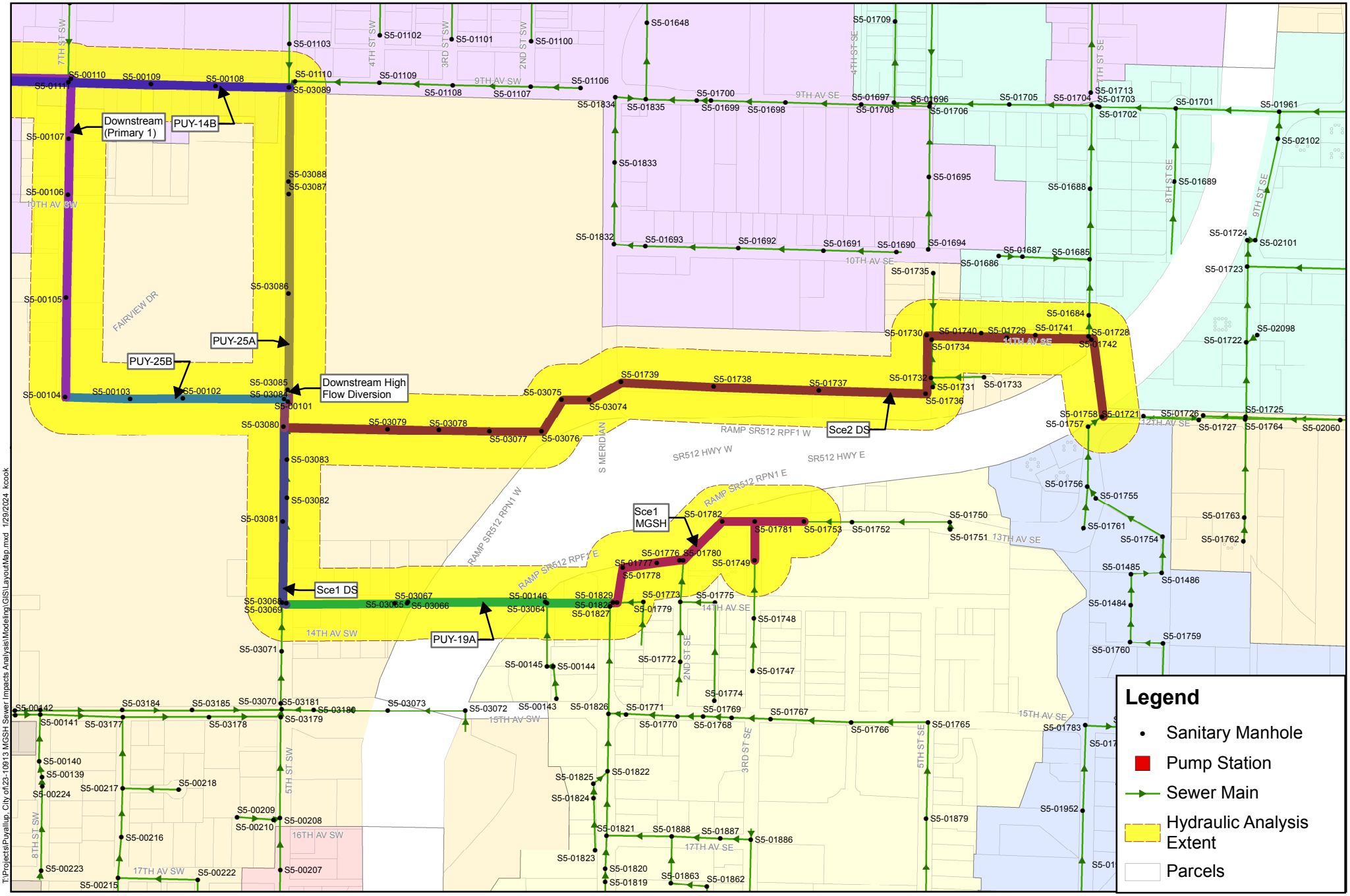
Study Area With MHs, West

City of Puyallup
MultiCare Good Samaritan Hospital
January 2024

Figure 3



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Study Area With MHs, East

City of Puyallup
MultiCare Good Samaritan Hospital
January 2024

Figure 4

3.1 Planning Horizon 2020 – Impacts to Existing System

Simulation 1 (see Table 2) represents estimated 2020 sewer flows with no MGSH expansion (No Action). Simulations 2 through 5 represent existing collection system with estimated 2020 sewer flows plus Initial and Future MGSH expansion phase flows. New flows are simulated in the model through both flow routing Scenarios 1 and 2.

- *No Action 2020 (Simulation 1):* The existing system results are consistent with the 2015 Plan, where deficiencies are noted for PUY-19A, PUY-14B, and PUY-25A.
- *Initial MGSH Phase, Scenario 1 (Simulation 2):* When adding estimated sewer flows into the model from the Initial Phase of the Proposed Action and assuming flow routing Scenario 1, model results indicate new capacity deficiencies in the MGSH sub-area west of the site. New deficiencies are shown between MH S5-01777 and MH S5-01828. Although added flows trigger the new deficiencies shown in the model results, new deficiencies are believed to be a result of backwater influence from the existing downstream capacity issues between sewer piping in S Meridian Avenue and the Fairgrounds (PUY-19A CIP). Put simply, deficiencies between MH S5-01777 and MH S5-01828 are not predicted if PUY-19A CIP improvements are constructed prior to the Initial Phase of Proposed Action.
- *Future MGSH Phase, Scenario 1 (Simulation 3):* Results are similar to Simulation 2 (see bullet above). However, in Future MGSH phase, model results show capacity deficiencies in MH S5-01777 and MH S5-01828 regardless of whether PUY-19A CIP is constructed or not. The model indicates that capacity improvements between MH S5-01777 and MH S5-01828 are needed to support the Future MGSH phase expansion.
- *Initial MGSH Phase, Scenario 2 (Simulation 4):* When adding estimated sewer flows for Initial MGSH phase expansion and assuming flow Scenario 2 routing, the model does not show any new capacity deficiencies. Previously identified capacity deficiencies are slightly exacerbated but could still be resolved by the improvements shown in the 2015 Plan.
- *Future MGSH Phase, Scenario 2 (Simulation 5):* When adding estimated sewer flows for Future MGSH phase expansion and assuming flow Scenario 2 routing, model results indicate new capacity deficiencies in the Scenario 2 DS in the existing system, just before the diversion structure. The simulated deficiency has a d/D value (d=maximum sewer level, D = pipe diameter) of less than 2.2, so is slightly above the City's surcharge criteria of d/D equal or less to 2.0. This deficiency may be within the level of modeling tolerance and uncertainty (see discussion on Limitations and Sources of Uncertainty).

3.2 Planning Horizon 2034 – Impacts to Existing System

Simulation 6 (see Table 2) represents estimated 2034 sewer flows with no MGSH expansion (No Action). Simulations 7 through 10 represent existing collection system with estimated 2034 sewer flows plus Initial and Future MGSH expansion phase flows. New flows are simulated in the model through both flow routing scenarios 1 and 2.

- *No Action 2020 (Simulation 6):* The existing system results are consistent with the 2015 Plan, where deficiencies are noted for PUY-19A, PUY-14B, PUY-25A, PUY-25B, and PUY-27C.
- *Initial MGSH Phase, Scenario 1 (Simulation 7):* Model results indicate deficiencies and results consistent with Planning Horizon 2020 (see Simulation 2 in Section 3.1). The new deficiencies occur in the same location but are higher in magnitude due to the 2034 model representing higher flows than the 2020 model. Similar to Simulation 2, if PUY-19A CIP improvements are constructed prior to the Initial Phase of Proposed Action then deficiencies would not be predicted between MH S5-01777 and MH S5-01828.
- *Future MGSH Phase, Scenario 1 (Simulation 8):* Results are similar to Simulation 7 (see bullet above). However, in Future MGSH phase, model results show capacity deficiencies in MH S5-01777 and MH S5-01828 regardless of whether PUY-19A CIP is constructed or not. The model indicates that capacity improvements between MH S5-01777 and MH S5-01828 are needed to support the Future MGSH phase expansion.
- *Initial MGSH Phase, Scenario 2 (Simulation 9):* When adding estimated sewer flows for Initial MGSH phase expansion and assuming flow Scenario 2 routing, capacity deficiencies are shown in the Scenario 2 DS sub-area, near MH S5-03080. Some of the previously identified capacity deficiencies are slightly exacerbated but could still be resolved by the improvements shown in the 2015 Plan.
- *Future MGSH Phase, Scenario 2 (Simulation 10):* Although added flows from the Future MGSH phase expansion exacerbate downstream issues (higher d/D), the location of the deficiencies is the same.

3.3 Planning Horizon 2034 – Impacts to Planned Improvements

The 2015 Plan identified deficiencies for different planning horizons and recommended improvements. The relevant improvements identified for the purposes of this analysis include:

- PUY-19A – 1,400 linear feet (lf) of gravity upsizing (10- and 12-inch to 15-inch). SR-512 crossing - S Meridian to 5th Street SW (6-year CIP postponed to 2021 – 2035 CIP period).
- PUY-25B – Approximately 1,000 lf gravity upsize - 24-inch to 36-inch - Fairgrounds between Fairview Drive and 5th Street SW.

- PUY-25A – Approximately 850 lf gravity upsize - 12-inch to 18-inch - 5th Street SW between 9th Avenue SW and Fairgrounds.
- PUY-14B – Approximately 1,590 lf gravity upsize - 24-inch to 36-inch - 9th Avenue SW between 9th Street SW and 5th Street SW.
- PUY-27C – Approximately 2,450 lf gravity upsize - 36-inch to 42-inch - 14th Street SW between 5th Street SW and 9th Avenue SW, 9th Avenue SW between 14th Street SW and 12th Street SW.
- PUY-27A – Relay approximately 850 lf of 36-inch gravity due to adverse slope issues - 14th Street SW between 7th Avenue SW and 9th Avenue SW and 9th Avenue SW one pipe east (non-capacity related improvement).

Simulations 11 through 14 (see Table 2) represent the collection system with planned improvements as indicated in the 2015 Plan and as noted above. Flows are 2034 sewer flows from the model plus Initial and Future MGSH expansion phase flows. New flows are simulated in the model through both flow routing Scenarios 1 and 2.

- *Initial MGSH Phase, Scenario 1 (Simulation 11):* Model results indicate that capacity issues are mostly resolved when implementing PUY-19A, PUY-14B, PUY-25A, PUY-25B, and PUY-27C capital improvements per the 2015 Plan. Model results indicate a more immediate need for the PUY-19A project to accommodate the Initial MGSH phase expansion. Further, the model shows minor surcharging in PUY-27C when accounting for the previously identified PUY-27C improvements. The simulated deficiency has a value of less than 2.2 d/D and may be within the level of modeling tolerance and uncertainty (see discussion on Limitations and Sources of Uncertainty). Extending PUY-27C east to MH S5-01113 to approximately 9th Street SW would improve capacity in this sub-area.
- *Future MGSH Phase, Scenario 1 (Simulation 12):* Results are similar to Simulation 11, except that under Future MGSH phase expansion, the pipes between MH S5-01777 and MH S5-01828 are capacity deficient. Capacity improvements between MH S5-01777 and MH S5-01828 are needed to support the Future MGSH phase expansion.
- *Initial MGSH Phase, Scenario 2 (Simulation 13):* Similar to bullets above, implementation of the 2015 Plan improvements would resolve future capacity deficiencies. The exception being, under flow routing Scenario 2, there are additional capacity deficiencies identified in Scenario 2 DS, near MH S5-03080 and the downstream high flow diversion. Additional investigation on the division of flows and hydraulics around this structure to better understand intended operation are recommended to provide improvement recommendation in this area.

- *Future MGSH Phase, Scenario 2 (Simulation 14):* Same as bullet above except maximum surcharging, or wastewater levels, are slightly exacerbated with added flow from Future MGSH phase expansion.

3.4 Planning Horizon 2034 – Recommendations for Additional Planned Improvements Based on Simulated Results

Based on the assumptions and results of the modeling analysis, recommended improvements were analyzed for the 2034 Future Phase Scenario 1. Additional modeling focused on resolving the issues near the Scenario 1 MGSH area and identifying additional downstream impacts (Simulation 15 in Table 2).

Scenario 1 MGSH shows potential for surcharge levels that exceed the City's deficiency criteria and are not resolved with implementation of previously identified improvements. This is triggered by the Future Phase, with the Initial Phase not showing any deficiencies with the construction of the PUY-19A improvement. Additional modeling analysis showed that the simulated deficiencies in the Scenario 1 MGSH area, inclusive of pipes between MH S5-01777 to MH S5-01829 (approximately 310-lf) would need to be upsized to a minimum of 10-inches to accommodate the Future Phase based on the modeling assumptions and simulated results. All other deficiencies were deemed to be consistent and acceptable with either the existing condition or previously identified improvements.

If Scenario 2 flow routing is pursued, immediate improvements – before Initial MGSH phase expansion – would be needed near MH S5-03080. The extent and scope of improvements are not yet defined and would require additional investigation and coordination to formulate a more-defined improvement plan.

4. Summary

MultiCare Good Samaritan Hospital (MGSH) expansion and redevelopment will create added sewer demand on the City's sanitary sewer conveyance system. Under both routing scenarios – Scenario 1 and Scenario 2 – new and previously unidentified capacity issues are predicted. Under Scenario 1 routing, pipes between MH S5-01777 to MH S5-01829 would need to be upsized for the Future Phase based on this modeling analysis. Under Scenario 2 routing, surcharging is predicted near MH S5-03080 in both Initial and Future Phases. Improvements to accommodate Scenario 2 would need to be better defined through additional desktop investigations, field investigations and discussions with the City. For the exception of PUY 27-C (see first bullet of Section 3.3), previously identified capacity deficiencies are exacerbated by added flows but could still be resolved by the same improvements and sizing requirements in the City's Comprehensive Sewer Plan CIP.

5. Limitations and Sources of Uncertainty

The results and recommendations build off previous work completed as part of the 2015 Plan. All inherent limitations and sources of uncertainty identified previously with regards to model development, calibration, and improvement identification were carried forward and included as part of this analysis. The model was updated to include additional hydraulics near the MGSH to evaluate impacts more readily in the immediate vicinity.

Flow estimates are based on a combination of previous modeling assumptions, water meter records, and estimates about future planning criteria based on estimated usage as well Department of Ecology recommendations for sanitary sewer design. Previous modeling assumptions included an aggregate of all flows contributing from the PUY-19 basin. These flows were broken out based on an assumed typical daily usage from annual water records for MGSH, and actual daily usage may be different than the assumed value for this analysis. Estimated peak flow values for both the Initial and Future Phases of the MGSH expansion are based on estimates and are subject to change as development occurs. Similarly, localized peaking factors can also vary widely based on peak usage, and more localized analyses can benefit from higher peaking factors to account for less conservative assumptions around typical flows. A conservative estimate of flows that included contributions from the parking garages as well as the central utility plant expansion were included in this analysis. While typical operation and peak flows from the parking garages and central utility plant would not coincide with typical peak flows from other MGSH facilities are unlikely to occur, a conservative approach was used to evaluate the hydraulic capacity of the sewer system.

The improvements identified for Scenario 1, that are triggered based on the Future Phase based on the modeling results, are influenced by downstream conditions and improvements associated with PUY-19A. Given the uncertainty around flows and peaking factors, it is possible that even with improvements associated with PUY-19A, the Initial Phase of development could cause surcharging in the Scenario 1 MGSH area due to insufficient pipe capacity.

The results provided herein are recommended to be further verified, and any changes in assumptions or new information as it relates to the collection system or assumptions around flows and sewer capacity could change the results, and additional monitoring and review of performance of the locations discussed above are recommended as development occurs.

ATTACHMENT A

Proposed Action Flow Estimates

Increase in Wastewater from Master Plan (Existing not included)
Wastewater Discharge: 24,600,000 gal/year
Maximum 273,330 gal/day (including pkg, testing in CUP)
Peak Flow 750 gal/min (including pkg, testing in CUP)
Peak Flow 470 gal/min (not including CUP testing and parking garages)

ASSUMED NEW SIDE SEWER CONNECTION FOR MASTER PLAN

Improvements in and for 7th Street SE are not part of Master Plan DEIS

Goes to SR-512 Hwy Basin

8-INCH SS

8-INCH SS

8-INCH SS

13TH AVE SE

13TH AVE SE

13TH AVE SE

13TH AVE SE

E
Pavilions

L
CENTRAL UTILITY PLANT EXPANSION

A
Puyallup valley Medical Clinic

B
Central Utility Plant

G
Parking Garage

S
Future Support Tower

O
PCT Parking Deck Option B

J
Facilities Bldg

EX 8" DI WATER (PRIVATE)

New Parking Structures Peak 30 GPM (per AHBL) Not expected to be significant sewer discharge.

Goes to Clarks Creek Basin

14TH AVE SE

R
3rd St Expansion

F
Dally Tower

N
Proposed Patient Care Tower (PCT)

12" STORM

P
PCT Parking Deck Option A

7TH ST SE

AHBL notes peak of 100 GPM for washdown

AHBL notes during CUP testing discharge 150 gpm for 10 minutes 2x month.

M
Emergency Expansion

3RD ST SE

T
Future Parking Deck

57TH ST SE

8-INCH SS

GOES TO MEEKER CREEK

H
Parking Garage

I
Medical Office Bldg

Q
MEDICAL OFFICE BUILDING

U
Future MEDICAL OFFICE BUILDING

8-INCH SS

15TH AVE SE

15TH AVE SE

15TH AVE SE

15TH AVE SE

C
Cancer Care Center

MIG WORKING DRAFT FOR INTERNAL COORDINATION

Existing
A. Puyallup Valley Medical Clinic
B. Central Utility Plant (CUP)
C. Cancer Center
D. Children's Therapy Unit
E. Pavilions
F. Dally Tower
G. P1 parking Garage (2010)
H. P2 Parking Garage (1990)
I. Medical Office Building
J. Facilities Building
K. 622-623 14th (Marketing)

Proposed
L. Central Utility Plant Expansion
M. Emergency Department Exp.
N. Proposed Patient Care Tower (PCT)
O. PCT Parking Deck Option B
P. PCT Parking Deck Option A
Q. Medical Office Building
R. 3rd Street Expantion
S. Future Support Tower
T. Future parking Deck
U. Future Medical Office Building

FIGURE ORIGINALLY PROVIDED AHBL

MULTICARE GOOD SAMARITAN HOSPITAL MASTERPLAN DEIS

PROPOSED ACTION MASTER PLAN - PROPOSED SANITARY SEWER DISCHARGE

NOT FOR DISTRIBUTION - FOR INTERNAL COORDINATION FOR DEIS

MIG Estimate of Increase in Wastewater Discharge for the Master Plan. Does not include existing sewer flows. Draft 1-4-2024
Increase in wastewater discharge based on review of Master Plan, existing domestic water utility use in 2022 provided by City, data provided by AHBL, DOH Water Design Manual and Ecology's Orange Book for Sewer Design.

GRAPHIC SCALE
60 120 240
1" = 120 FEET

LEGEND
PROPOSED
SS SANITARY SEWER PIPING
D STORM DRAINAGE PIPING
W WATER PIPING
EX STORM
EX 8-INCH SS
EX WATER
BUILDING FOOTPRINT
STORMWATER MANAGEMENT FACILITY

N

Multi-care Good Samaritan Hospital Master Plan DEIS
ESTIMATE OF WASTEWATER/SEWER FLOWS FOR Preferred Alternative of Master Plan
MIG#15271

From AHBL MDD

1.62 Peak is from Gray Osborne for Water

Map ID	Facility	Proposed Footprint (sf)	Proposed GSF	Average Annual Wastewater Discharge (gal/year)	Assumptions for Maximum	Maximum Gal/Day	Sewer Hours/ Day	Sewer Peak Factor	Sewer Peak GPM
N	**Patient Care Tower**	40,000	230,000	6,716,000	Maximum based on 300 gpd/bed for 250 beds from Table G2-2. Design Basis for New Sewage Works, Ecology Orange Book	75,000	24	1.62	84
P	**Parking Structure (PS) 1 Option A**	28,000	190,000	-	Assume max is 30gpm per AHBL. Wastewater discharge is negligible so not tabulated.	13,333	12	1.62	30
L	**Central Utility Plant Expansion**	10,000	10,000	100,000	Per AHBL 150 gpm for 10 min for peak sewer flow	1,500			150
S	**Patient Care Tower Shell Buildout**		0	-	Already accounted for in tower	-			
Q	**Medical Office Building (MOB) A**	20,000	100,000	1,825,000	Maximum based on 500 gpd/1000sf per DOE Table G2-2. Design Basis for New Sewage Works Orange Book	50,000	12	1.62	112.50
T	**Parking Structure (PS) 2**	35,000	260,000	-	Per AHBL We assume Wastewater discharge is negligible so not tabulated.	44,444	12	1.62	100
U	**Medical Office Building (MOB) B**	20,000	100,000	1,825,000	Maximum based on 500 gpd/1000sf per DOE Table G2-2. Design Basis for New Sewage Works Orange Book	50,000	12	1.62	112.50
S	**Central Supply Tower**	15,000	90,000	5,256,000	AHBL estimate of annual discharge is higher than water bills from City but will use AHBL for DEIS to be conservative.	14,400	4		60
M	**Dally Tower Emergency Department Expansion**	2,000	2,000	58,400	Assume it is proportional Patient Care Tower, increase is negligible	652	24	1.62	0.73
R	**Dally Tower Expansion towards 3rd Street**	15,000	30,000	8,760,000	AHBL estimate of annual discharge is higher than water bills from City but will use AHBL for DEIS to be conservative.	24,000	4		100
	Total	**Total new GSF:**	1,012,000	**24,540,400**		**273,330**			**750** gpm
	Total new GSF minus parking:		562,000		W/O Pkg & Flow out during Supply Tower Testing:				470 gpm

Rounded 24,600,000 gal/year