CITY OF PUYALLUP

PIERCE COUNTY **WASHINGTON**

WATER POLLUTION CONTROL PLANT
THIRD SECONDARY CLARIFIER CIP NO. 20-018

STORMWATER SITE PLAN

G&O #21462
FEBRUARY 2024

Gray & Osborne, Inc.
CONSULTING ENGINEERS

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning
Engineering | Public Works
Fire | Traffic

PRCNC20240061

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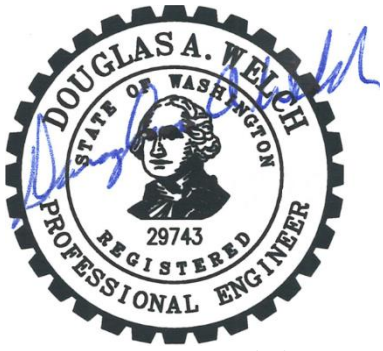

2/27/2024

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G&O #21462
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CONSULTING ENGINEERS

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PROJECT OVERVIEW

The Water Pollution Control Plant (WPCP) Third Secondary Clarifier Project includes the construction of a new 110-foot diameter Secondary Clarifier, approximately 175 feet of new piping and associated electrical work to connect the new clarifier to the existing hydraulic and SCADA systems, installation of a magnetic flow meter and a 4th return activated sludge pump in the lower level of the existing RAS/WAS Building, HVAC, architectural and electrical work in the main floor of the RAS/WAS Building, installation of a new submersible pump, radar level sensor and piping revisions at the existing effluent flowmeter manhole to create a scum pump station. Site restoration will include replacement of existing asphalt impacted by underground trenching and installation of new crushed surfacing gravel on the south and west sides of the new clarifier. The project is located on two of the five parcels that are included in the WPCP site, Parcels No. 0420204132, 0420208044 and 042020136. Parcels No. 0420204132 and 0420208044 are the subject of a current Lot Combination Application. The project site includes existing buildings, equipment pads, asphalt service road and open water surface process tanks. Figure 1 shows the existing WPCP site plan and the existing drainage system. The Modified Site Plan (Sheet G-7) (Appendix A) shows the location of the new Third Secondary Clarifier and new asphalt surfacing on the west side of the Third Secondary Clarifier.

This stormwater site plan describes the existing and proposed land coverage and drainage calculations.

The existing and proposed site surfaces for the combined parcels are summarized in Table 1.

TABLE 1

Project Areas

		Project Site (acres)
Existing	Total Hard	2.05
	Non-Pollution-Generating Hard	*0.53*
	Pollution-Generating Hard	*1.52*
	Total Open Water	2.06
	Total Pervious	2.55
	Total Project Area	**6.66**
	% Hard Surfaces, and Open Water Tanks (Existing)	**62%**

TABLE 1 – (continued)

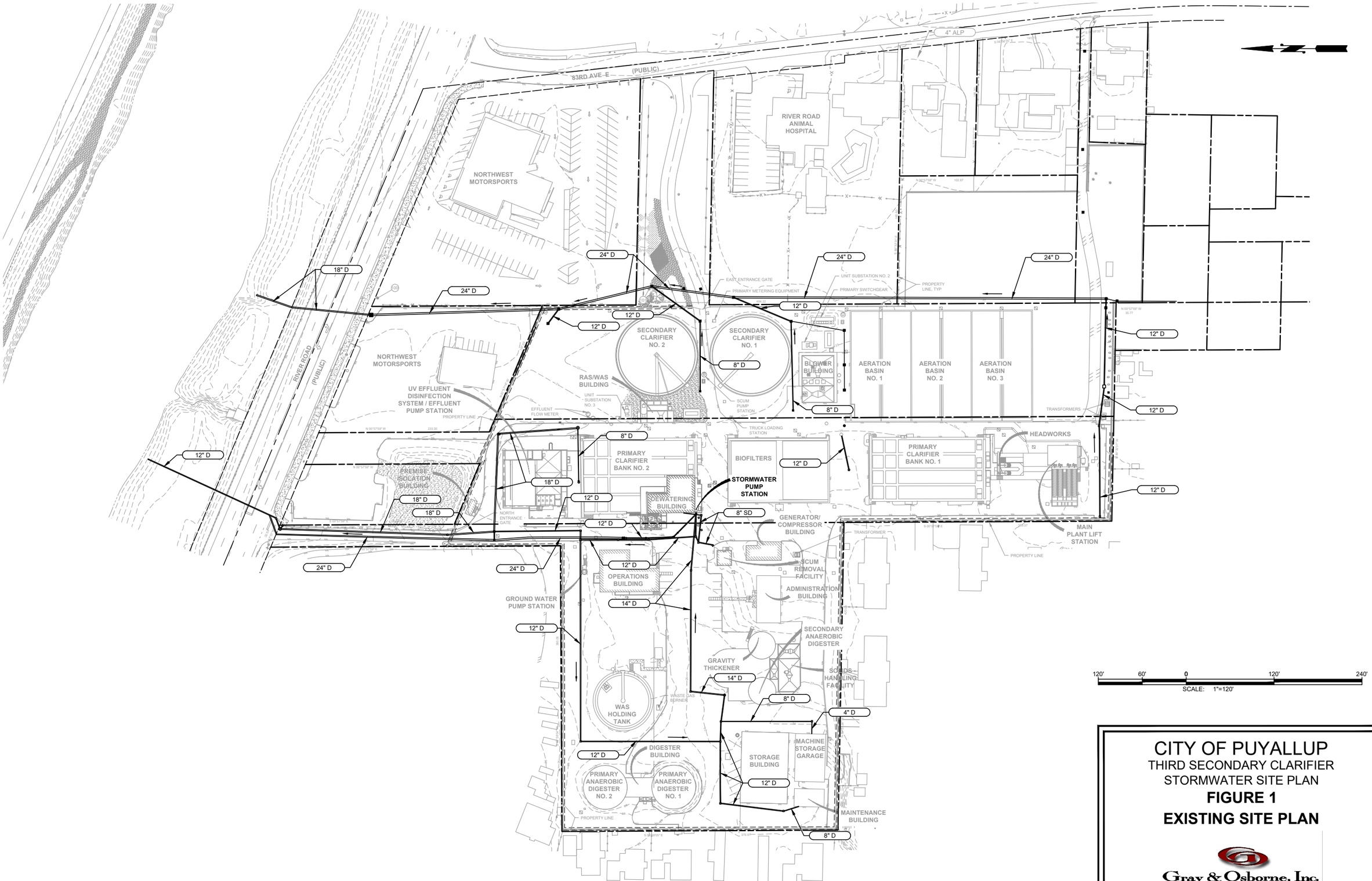
Project Areas

		Project Site (acres)
Proposed	Total Hard	2.12
	Non-Pollution-Generating Hard	-
	Unchanged	0.53
	Pollution-Generating Hard	
	Unchanged	1.42
	New	.07
	Replaced	0.10
	Total Open Water	2.28
	Unchanged	2.06
	New	0.22
	Total Pervious	2.26
	Total Project Area	**6.66**
	% Hard Surfaces and Open Water Tanks (Proposed)	**66%**

This Stormwater Site Plan is provided to outline the project stormwater management requirements and compliance with the guidelines in the 2019 Department of Ecology's Stormwater Management Manual for Western Washington (Ecology Manual). This project is considered a redevelopment project. The percentage of the site covered by hard surfaces and open water tanks (precipitation falling on open water tanks does not discharge to the ground) is 62 percent. With more than 35 percent existing impervious coverage and open water tanks, the project is defined as redevelopment. Per the attached Flow Chart for Determining Requirements for Redevelopment, Ecology Manual, Minimum Requirements 1 through 5 apply to the new and replaced hard surfaces and the land disturbed. The total of new plus replaced hard surfaces is greater than 5,000 sf; however, the value of the proposed improvements does not exceed 50 percent of the replacement value of the existing facilities in the project site.

EXISTING CONDITIONS SUMMARY

As indicated in the Project Overview, the existing conditions on the site include wastewater treatment structures including buildings and open tanks, asphalt driveways and gravel surfaces. The WPCP is served by two north draining stormwater collections systems that convey storm drainage from the WPCP and off-site areas to the Puyallup River. The two collection systems are in a single Threshold Discharge Area (TDA). Stormwater is discharged directly to the Puyallup River via manmade systems. Per Table I-A.1: Flow Control Exempt Receiving Waters (Ecology Manual) the Puyallup River in this vicinity is a flow control exempt receiving water. The combined WPCP and off-site flows are not detained.



CITY OF PUYALLUP

THIRD SECONDARY CLARIFIER
STORMWATER SITE PLAN

FIGURE 1

EXISTING SITE PLAN

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The stormwater drainage system within the WPCP is shown in Figure 1. The eastern drainage system collects off-site flow from approximately 20 acres of the City to the south and east of the WPCP. The attached screen shot of the City's stormwater map identifies the off-site drainage areas (Appendix B).

Stormwater that falls on the surface of the open water tanks is conveyed through the treatment process and is discharged as treated effluent.

HYDRAULIC MODEL

The Western Washington Hydraulic Model (WWHM) was used to evaluate the existing and proposed flows for the project area. As discussed above, stormwater that falls on the surface of the open water tanks does not contribute to stormwater flow. The open water tanks are not included in the areas contributing to stormwater runoff.

The model input parameters and results are shown in Table 2. The total area of the project site is less in the mitigated (developed condition) since the third Secondary Clarifier is an open water tank that has not been included in the model. Screen shots of the WWHM model are attached. Flow control is not required for this project since storm drainage from the WPCP discharges directly to a flow control exempt water body. If this project were subject to flow control requirements the project would not meet the required 0.15 cfs or greater increase in the 100-year flow frequency using a model based on the 15-minute time step that would trigger a need to provide flow control.

The model input and output are shown in Figures 2 through 4.

TABLE 2

WWHM Model Parameters

Parameter	Existing	Developed
Land Coverage		
Pervious Surface	2.55 acres	2.26 acres
Impervious Surface		
Roof	0.53 acres	0.53 acres
Driveway	1.52 acres	1.59 acres
Flow (15 Min. Time Step)		
2-year	0.8208 cfs	0.8336 cfs
10-year	1.4040 cfs	1.4101 cfs
100-year	2.3620 cfs	2.3469 cfs

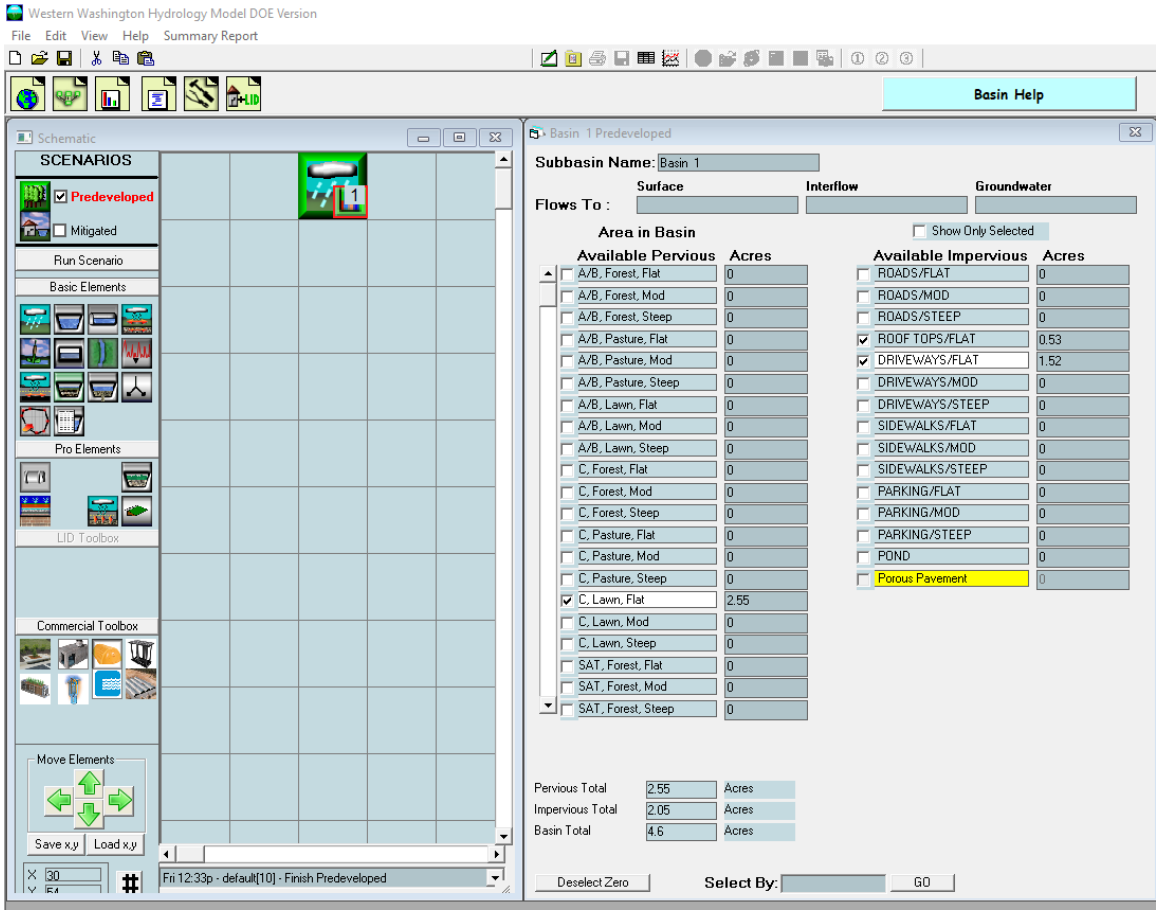


FIGURE 2

WWHM Predeveloped Input Data

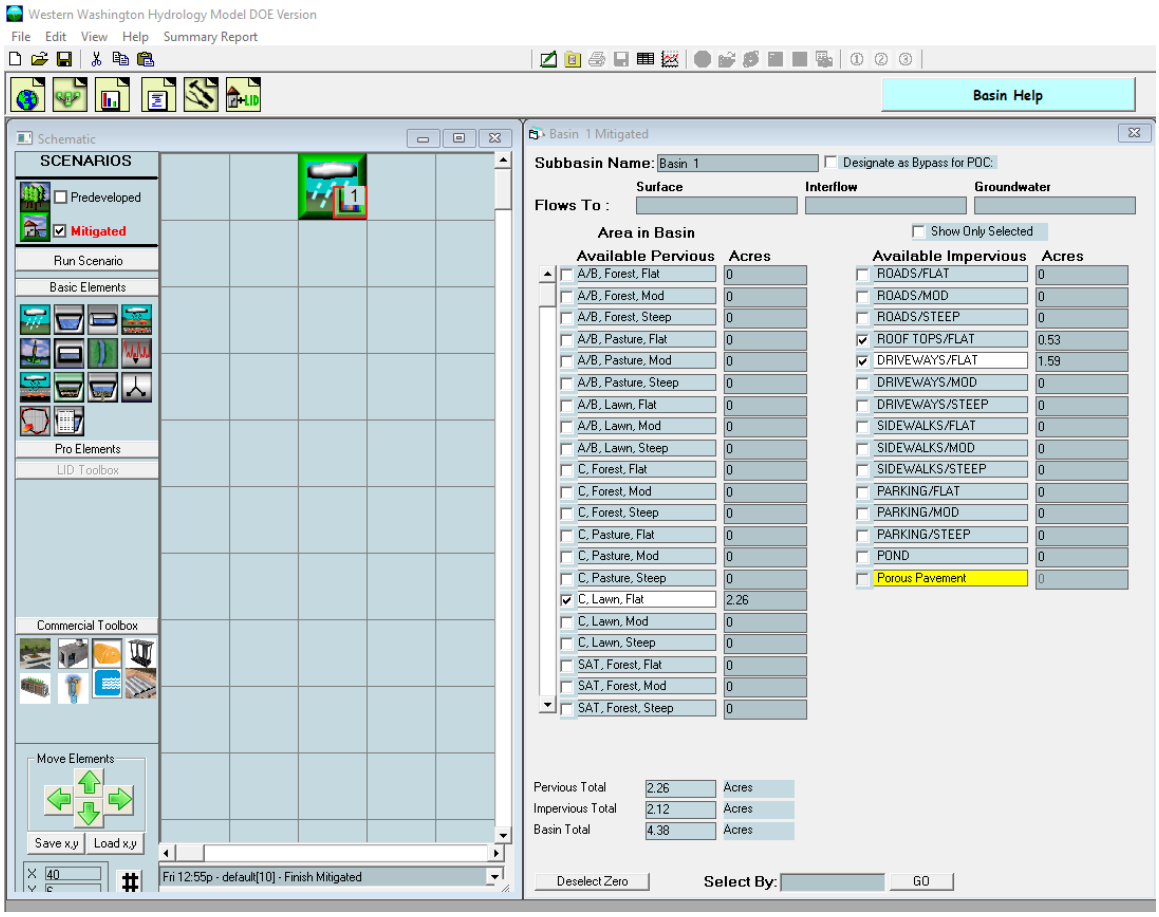


FIGURE 3

WWHM Mitigated Input Data

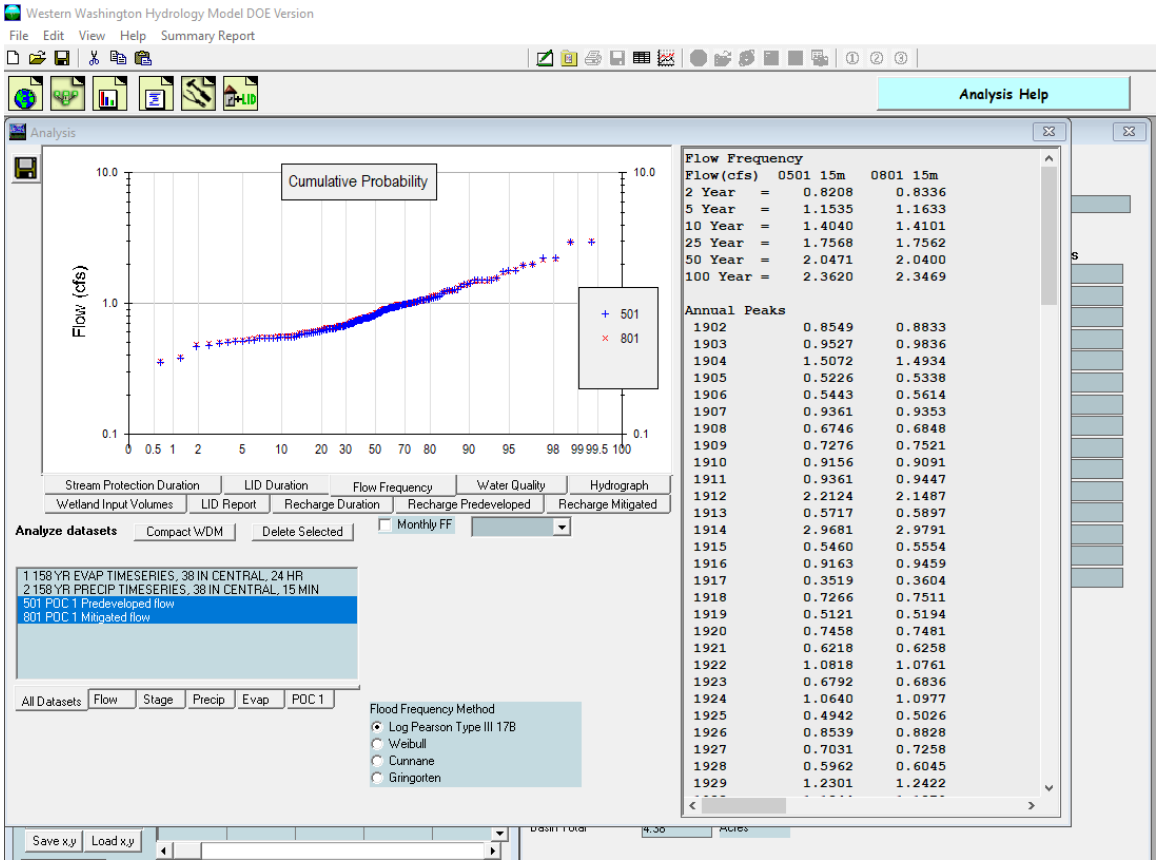
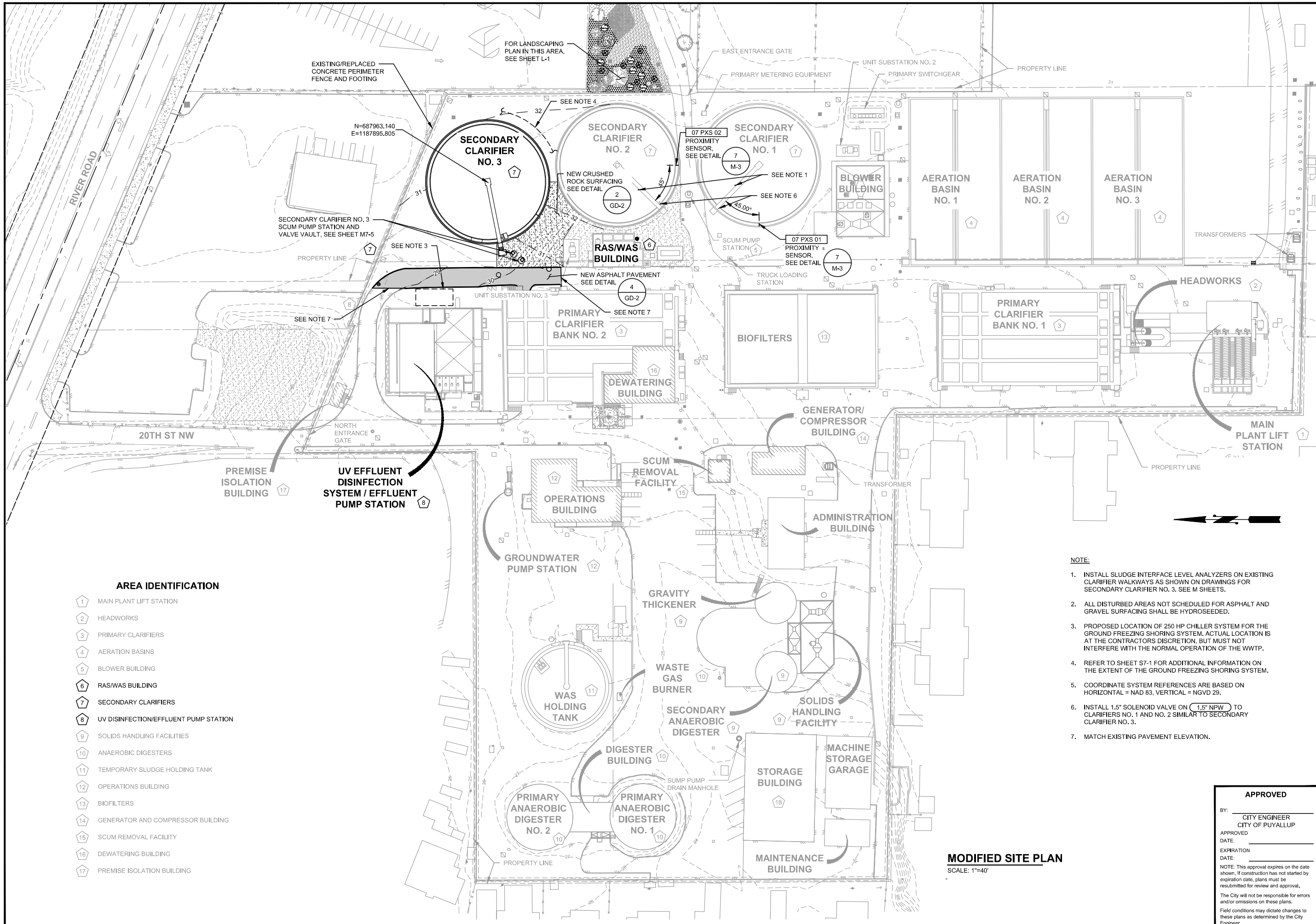


FIGURE 4

WWHM Output Data

APPENDIX A

MODIFIED SITE PLAN



AREA IDENTIFICATION

1. MAIN PLANT LIFT STATION
2. HEADWORKS
3. PRIMARY CLARIFIERS
4. AERATION BASINS
5. BLOWER BUILDING
6. RAS/WAS BUILDING
7. SECONDARY CLARIFIERS
8. UV DISINFECTION/EFFLUENT PUMP STATION
9. SOLIDS HANDLING FACILITIES
10. ANAEROBIC DIGESTERS
11. TEMPORARY SLUDGE HOLDING TANK
12. OPERATIONS BUILDING
13. BIOFILTERS
14. GENERATOR AND COMPRESSOR BUILDING
15. SCUM REMOVAL FACILITY
16. DEWATERING BUILDING
17. PREMISE ISOLATION BUILDING

MODIFIED SITE PLAN

SCALE: 1"=40'

NOTE:

1. INSTALL SLUDGE INTERFACE LEVEL ANALYZERS ON EXISTING CLARIFIER WALKWAYS AS SHOWN ON DRAWINGS FOR SECONDARY CLARIFIER NO. 3. SEE M SHEETS.
2. ALL DISTURBED AREAS NOT SCHEDULED FOR ASPHALT AND GRAVEL SURFACING SHALL BE HYDROSEEDED.
3. PROPOSED LOCATION OF 250 HP CHILLER SYSTEM FOR THE GROUND FREEZING SHORING SYSTEM. ACTUAL LOCATION IS AT THE CONTRACTORS DISCRETION, BUT MUST NOT INTERFERE WITH THE NORMAL OPERATION OF THE WWTP.
4. REFER TO SHEET S7-1 FOR ADDITIONAL INFORMATION ON THE EXTENT OF THE GROUND FREEZING SHORING SYSTEM.
5. COORDINATE SYSTEM REFERENCES ARE BASED ON HORIZONTAL = NAD 83, VERTICAL = NGVD 29.
6. INSTALL 1.5" SOLENOID VALVE ON (1.5" NPW) TO CLARIFIERS NO. 1 AND NO. 2 SIMILAR TO SECONDARY CLARIFIER NO. 3.
7. MATCH EXISTING PAVEMENT ELEVATION.

APPROVED

BY: _____
CITY ENGINEER
CITY OF PUYALLUP
APPROVED
DATE: _____
EXPIRATION
DATE: _____

NOTE: This approval expires on the date shown. If construction has not started by expiration date, plans must be resubmitted for review and approval.

The City will not be responsible for errors and/or omissions on these plans.

Field conditions may dictate changes to these plans as determined by the City Engineer.

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(206) 284-0860

BLAINE JACOBSEN — STATE OF WASHINGTON — 14062 — REGISTERED PROFESSIONAL ENGINEER

DOUGLAS A. WELCH — STATE OF WASHINGTON — 29743 — REGISTERED PROFESSIONAL ENGINEER

CITY OF PUYALLUP

WATER POLLUTION CONTROL PLANT THIRD SECONDARY CLARIFIER CIP NO. 20-018

1602 18TH ST NW,
PUYALLUP, WA 98371

No.	DATE	REVISION

ISSUED FOR:	BID SET
ISSUE DATE:	JANUARY 2024
APPROVED BY:	DAW
CHECKED BY:	DAW
DRAWN BY:	CRR
DESIGNER:	BJ
G & O JOB NO.:	21462.00
FILE:	AREA_PLN.DWG

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

GENERAL

MODIFIED SITE PLAN AND AREA IDENTIFICATION

DRAWING: G-7 OF: 9
SHEET: 7 OF: 58

PRCNC20240061

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APPENDIX B

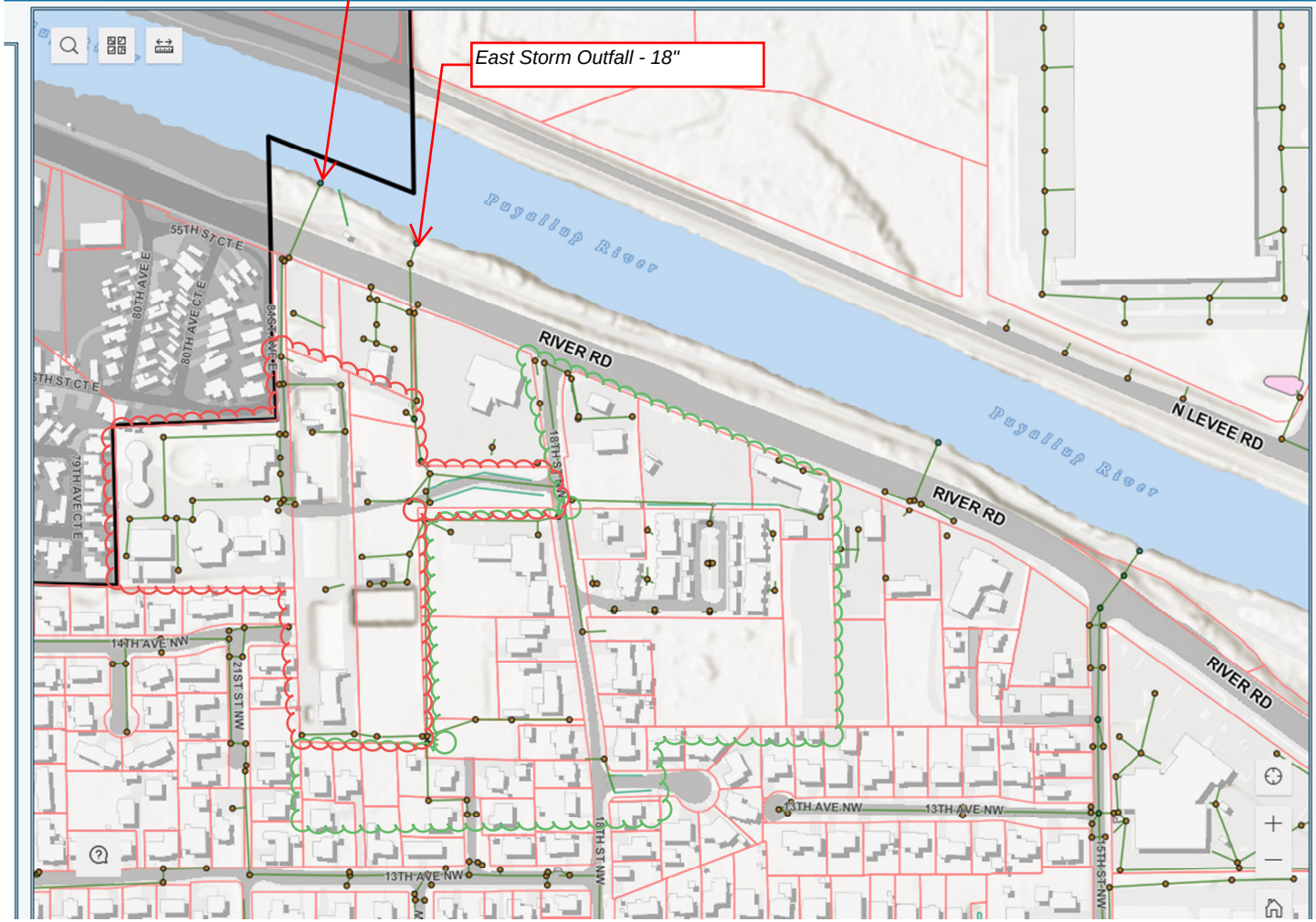
WPCP DRAINAGE COLLECTION SYSTEM

WPCP Drainage Collection System

City of Puyallup Public Data Viewer

West Storm Outfall - 12"

East Storm Outfall - 18"



Legend

- Utilities
  - Storm Water
    - Outfalls
    - Manholes
    - Inlets
    - Control Structures
    - Culverts
    - Pipes
    - Channels
    - Facilities

WPCP Basin - total 12.15 acres

Off-site Basin - approx. 20 acres

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