RESOLUTION NO. 660-2018

A RESOLUTION ADOPTING A SANITARY SEWER MASTER PLAN FOR THE PUBLIC FACILITIES FINANCING PLAN – AREA 3.

Findings

A. The City Council finds it to be in the best interest of the public to construct a sewer line in the portion defined in the May 13, 2013, Public Facilities Financing Plan (PFFP) as Area 3.

B. The City deems it necessary and beneficial to adopt a sanitary sewer Master Plan for the Public Facilities Plan Area 3.

Based on the findings, the City of Hubbard resolves as follows:

1: The City of Hubbard hereby adopts the Sanitary Sewer Master Plan for the city of Hubbard Public Facilities Financing Plan – Area 3 as set forth in the attached document marked "Exhibit A" attached hereto and by this reference incorporated herein and entitled *"Sewer Master Plan for the City of Hubbard Public Facilities Financing Plan – Area 3."*

ADOPTED BY THE CITY COUNCIL this 13th day of November 2018.

CITY OF HUBBARD, OREGON

BY: Charles Kostka
MAYOR

ATTEST:

BY: Vickie L Noyle
RECORDER

APPROVED AS TO FORM:

BY:
CITY ATTORNEY

Sewer Master Plan
For the City of Hubbard
Public Facilities Financing Plan - Area 3

Date: August 2017

Prepared For:

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November 19, 1991
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Exhibits:

A. **City of Hubbard Comprehensive Plan**
B. **Plan Area 3 Overview**
C. **Future Sewer Service Areas**

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ENGINEERING & FORESTRY

Acknowledgements

AKS Engineering & Forestry, LLC (AKS) appreciates the cooperation and assistance of the following persons whose help aided the completion of this master plan:

City of Hubbard: Vickie Nogle, Director of Administration/City Recorder
Jaime Estrada, Director of Public Works
Melinda Olinger, Public Works Department

Chapter 1 - Introduction

1.1 AUTHORIZATION

In spring of 2017, the City of Hubbard (City) received the 31-lot Kooiman Estate Subdivision application. The application includes the annexation of a portion of the Urban Growth Boundary defined in the May 13, 2013 Public Facilities Financing Plan (PFFP) as Area 3. The City authorized AKS to evaluate the ultimate build-out and future sewer service for PFFP Area 3 since the PFFP states that, as a condition of approval, any proposed development within PFFP Area 3 will require the development of a Sewer Master Plan (SMP) for the area.

1.2 PURPOSE/OBJECTIVE

The purpose of this SMP is to guide expansion of the sanitary sewer system for development within PFFP Area 3. Objectives include:

1.2.1 Identification of a conceptual sewer trunkline route that could serve the undeveloped and un-sewered areas in PFFP Area 3, including an assessment of the possible need for a wastewater pump station.

1.2.2 Confirm that adequate system capacity will be available to serve the needs of PFFP Area 3 and verify that the pipe proposed for the Kooiman Estates Subdivision has adequate depth and size for future gravity sewer extensions to serve the future build-out of PFFP Area 3.

1.2.3 Establishment of design criteria that will consider topography, area, comprehensive plan designations, and Infiltration and Inflow (I&I).

1.2.4 Preparation of cost estimates for the sewer system required to serve PFFP Area 3 and develop of an equitable formula to credit the initial developer a portion of their up-front investment in the sewer pipeline needed to serve their subdivision and PFFP Area 3.

1.3 NATURE AND SCOPE

This SMP includes the following elements:

1.3.1 A review of the study area's physical environment, including topography, geography, soils, land use, and City population.

1.3.2 Determination of factors that affect the design of the sewer system such as basin size, topography, land use, anticipated future infiltration/inflow, etc.

Chapter 2 - Study Area Physical Environment

2.1 GEOGRAPHY, TOPOGRAPHY, AND POPULATION

As defined in the PFFP, Area 3 encompasses approximately 56 acres in the southwest corner of the City. Most of PFFP Area 3 can be developed except for the banks of Mill Creek, which are steep and may have environmental permitting restrictions.

The topography for this area consists primarily of relatively flat farmland bounded to the west by Mill Creek. The area is traversed by several drainage gullies that may limit development unless they are filled and regraded with engineered fill. Development of the property within PFFP Area 3 will require consultation with a natural resource specialist to fully assess environmental conditions and development limitations.

The City's Comprehensive Plan identifies the zoning for PFFP Area 3 as a combination of Medium-Density Residential (R2) and High-Density Residential (R3).

2.2 SOILS

A geotechnical report was not prepared as part of this SMP. However, historical farming of the developable area indicates that the soils are probably consistent with most mid-Willamette Valley soil types, which are usually poorly drained clayey silts. These soil types make construction during the wet months difficult but should not present any unusual challenges for the construction of the underground utility infrastructure when appropriate construction methods are used.

2.3 LAND USE

As designated by the City's Comprehensive Plan, PFFP Area 3 is composed of a mixture of R2 and R3 land use zones. To be generally consistent with the City of Hubbard Comprehensive Plan, this SMP assumed the southern 70% of PFFP Area 3 will develop as R2 and the northern 30% as R3. A copy of the Comprehensive Plan is attached for reference in Exhibit A.

Chapter 3 - Existing Facilities

3.1 GENERAL OVERVIEW OF EXISTING FACILITIES

As described in the PFFP, the existing City of Hubbard 3rd St. pumping station is located within the 3rd St. right-of-way near PFFP Area 3, and most of the developable area of PFFP Area 3 can be served by this pumping station.

The City provided runtime data and seasonal operational information for the 3rd Street pump station, along with a summary of their visual field observations and evaluation of surcharges in the gravity system during recent heavy rain events. Based on the information provided by the City, the pump station and downstream gravity conveyance system appear to have adequate capacity to handle future flow from the Kooiman Estate Subdivision. However, as development in PFFP Area 3 and the industrial area east of the railroad tracks progresses, each development phase will need to reanalyze the existing capacity of the 3rd Street pump station and downstream conveyance system.

3.2 INTEGRATION OF NEW FACILITIES INTO THE EXISTING SEWER SYSTEM

Consistent with the PFFP, the Kooiman Estates Subdivision is proposing to install a gravity sewer trunkline extension from the 3rd St. pumping station. A 10-inch gravity sewer trunkline is proposed to run down the 3rd St. right-of-way and into PFFP Area 3 as shown in Exhibit C. A gravity sewer extension from the termination of this 10-inch trunkline is proposed to continue north and east to serve the Kooiman Estate Subdivision. Future sewer flows from the R2 area of PFFP Area 3 can also connect to this same 10-inch gravity trunkline and flow to the 3rd Street pumping station.

Chapter 4 - Design Methodology

4.1 FACTORS AFFECTING LOADING

The study area for this SMP was limited to the developable land within PFFP Area 3 with land use designations of R2 and R3, as discussed above. Required capacity was determined by the application of engineering design standards and flow projections derived from land use designations and corresponding population projections.

4.2 DETERMINATION OF THE DESIGN LOADING

Wastewater flow estimates were generated based on land use and area. The components making up the flows within this SMP are average daily residential flows corresponding to the land use designations of R2, including peaking factors and I&I contributions.

The area within PFFP Area 3 that can be served by gravity sewer is approximately the same as the R2 area as shown on Exhibit B, except for the steep slopes along Mill Creek. The developable area is approximately 33 acres as shown on Exhibit C.

The average daily residential flows were determined by using a population density of 12 dwelling units per acre and 2.5 persons per dwelling unit for a total population of 990 persons in the R2 area. Applying a wastewater flow value of 100 gallons per person per day resulted in a daily flow of 99,000 gallons (69 gallons per minute) for the 33-acre service area. In addition, a peaking factor of 4 was applied, increasing the flow rate to 276 gallons per minute. An additional 1,600 gallons per acre per day, which equates to a constant flow of 37 gallons per minute, was added to account for future I&I. The aggregate flow rate, with the application of peaking factors and I&I, equals 313 gallons per minute (0.70 cubic feet per second). A summary of this analysis is included in Table 1 below:

Table 1: Summary of Flow/Loading	
Area to be Served	33 Acres
12 Dwelling Units/Acre, 2.5 People per Dwelling Units	990 Persons
100 Gallons per Capita per Day	99,000 Gallons/Day = 69 Gallons/Minute
Peaking Factor of 4	276 Gallons/Minute
I&I Contribution = 1,600 Gallons per Acre per Day	52,800 Gallons/Day = 37 Gallons/Minute
Total Flow from PFFP Area 3 Gravity Sewer Area	313 Gallons/Minute = 0.70 Cubic Feet/Second
Manning's Equation Variables = 10-inch PVC, n=0.013, s=0.3%	0.5-Foot Depth of Flow

4.3 DETERMINATION OF SEWER PIPE SIZES

The sewer extension from the 10-inch trunkline needed to serve the R2 area of PFFP Area 3 is anticipated to be an 8-inch gravity pipe at minimum slope. We used Manning's Equation to determine that for the anticipated flow rate of 313 gallons per minute at full build-out, the depth of flow in the 10-inch trunkline would be 0.5 feet (n=0.013, s=0.3%). Based on this calculation, the 10-inch sewer

trunkline will have adequate capacity for full development of the R2 area of PFFP Area 3, plus the Kooiman Estates subdivision.

However, and as described earlier in this SMP, the existing 3rd St. pumping station should have capacity to handle the additional flow from the Kooiman Estates Subdivision, but it may not have available capacity to handle the additional flow from PFFP Area 3 when it fully develops. As future development in PFFP Area 3 progresses, the capacity of the pumping station should be reevaluated at each phase of development.

4.4 SEWER SERVICE FOR NORTHERN AREA OF PFFP AREA 3

As described above, this SMP has determined that the R2 area of PFFP Area 3 can be served via gravity by connecting to the 10-inch gravity sewer trunkline proposed to be installed for the Kooiman Estates Subdivision. The northern area (the R3 area) of PFFP Area 3 cannot be served by the same gravity system due to the existing topography and limitations of how far the gravity pipe system originating from the 3rd Street pump station can be extended at minimum slope. Future sewer flows from the R3 area of PFFP Area 3 were not factored into this study since the flow will need to be routed to the north with a future pump station. Additionally, this SMP did not attempt to determine the volume of flow or size of the pump station. This will need to be determined when the R3 area develops.

Chapter 5 - Cost Analysis

5.1 ESTIMATED COST OF KOOIMAN ESTATES SUBDIVISION SEWER THAT WILL BENEFIT FUTURE DEVELOPMENT

The Kooiman Estates Subdivision is proposing to install the trunkline that will serve the subdivision plus future flows from PFFP Area 3. This trunkline will include 820 feet of 10-inch gravity sewer pipe sewer pipe and five manholes. Applying unit construction costs of $75 per foot for 10-inch pipe and $8,000 per manhole, the total estimated cost for the Kooiman Estates Subdivision investment in sewer infrastructure that will eventually benefit the PFFP Area 3 development is expected to be approximately $122,000 (including a contingency factor of 20%). In addition, the Kooiman Estates Subdivision developer is also paying for the surveying, engineering and permitting of the PFFP Area 3 trunkline, as well as the cost of developing this SMP. The survey, engineering, permitting and SMP costs are estimated to be approximately $25,000 which brings the total estimated cost for the trunkline to $147,000 ($122,000 plus $25,000).

5.2 COST SHARE FOR FUTURE DEVELOPMENT

To balance the Kooiman Estates Subdivision's initial investment in sewer infrastructure with future developments in PFFP Area 3, it will be necessary to distribute the estimated $147,000 initial investment on a pro-rata basis proportional to the area. PFFP Area 3 has a total area of 56 acres, but we estimate that approximately 37 acres lies within the southern 70% of the area (as shown in Exhibit B). The Kooiman Estates Subdivision will develop 31 lots on a total of 5 acres – 1 acre of which was annexed into the City from PFFP Area 3 while the other 4 acres were already within City limits. A total of 37 acres of land in PFFP Area 3 has the potential to benefit from the gravity sewer trunkline installed by the developer of the Kooiman Estates Subdivision. On a per-acre pro-rata basis, future development should reimburse the Kooiman Estates Subdivision developer at an estimated rate of approximately $4,000 per acre ($147,000 divided by 37 acres). The final reimbursement rate is subject to recalculation based on actual construction and engineering costs as verified and approved by the City of Hubbard.

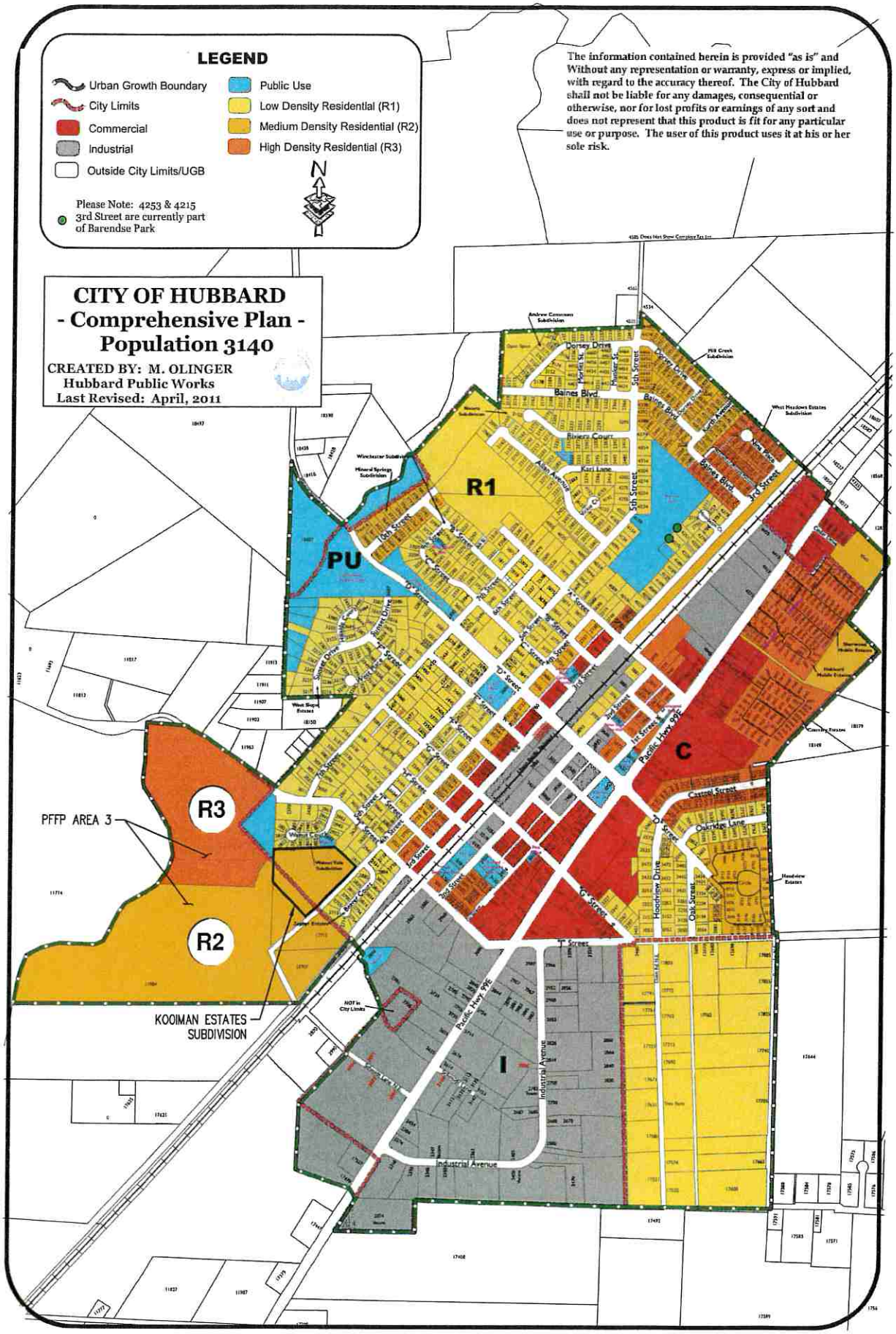
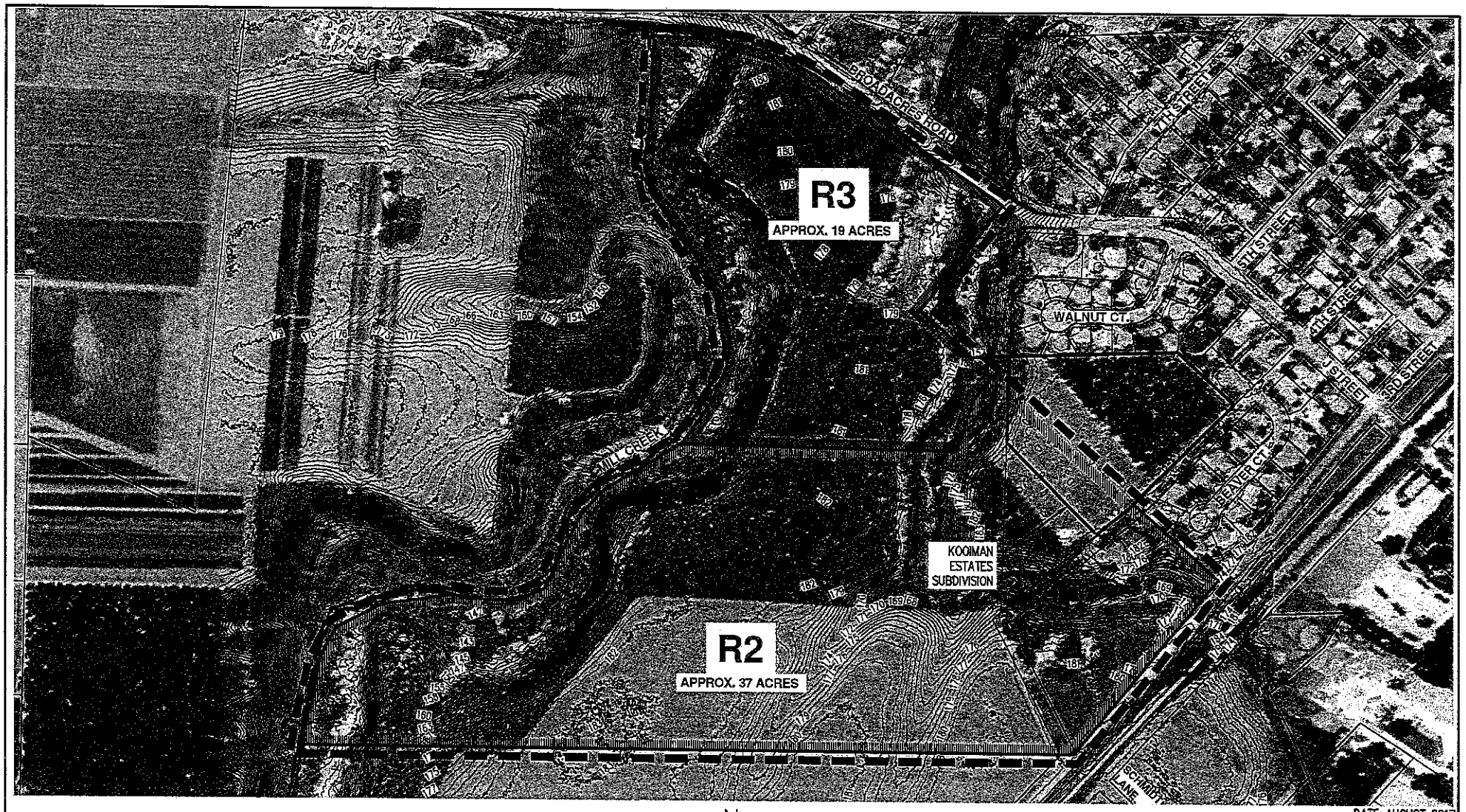

LEGEND
Urban Growth Boundary
City Limits
Commercial
Industrial
Outside City Limits/UGB
Public Use
Low Density Residential (R1)
Medium Density Residential (R2)
High Density Residential (R3)
Please Note: 4253 & 4215 3rd Street are currently part of Barendse Park
N
The information contained herein is provided "as is" and Without any representation or warranty, express or implied, with regard to the accuracy thereof. The City of Hubbard shall not be liable for any damages, consequential or otherwise, nor for lost profits or earnings of any sort and does not represent that this product is fit for any particular use or purpose. The user of this product uses it at his or her sole risk.
CITY OF HUBBARD
- Comprehensive Plan -
Population 3140
CREATED BY: M. OLINGER
Hubbard Public Works
Last Revised: April, 2011
R1
PU
C
R3
R2
I
PFFP AREA 3
KOOIMAN ESTATES SUBDIVISION
Baines Blvd.
Dorsey Drive
Riviera Court
Kari Lane
5th Street
3rd Street
Pacific Hwy 99E
Castrol Street
Oakridge Lane
Hoodview Drive
Oak Street
Industrial Avenue
Winchester Subdivision
Mineral Springs Subdivision
West Meadows Estates Subdivision
Hill Creek Subdivision
Andrew Commons Subdivision
Hubbard Mobile Estates
Country Estates
Hoodview Estates
NOT in City Limits

EXHIBIT A



DATE: AUGUST 2017

NOTES:
1. CONTOURS ARE APPROXIMATE AND ARE BASED ON LIDAR.
2. DEFINES BOUNDARY FOR PFFP AREA 3.
3. R2 – MEDIUM DENSITY RESIDENTIAL.
4. R3 – HIGH DENSITY RESIDENTIAL.

N

SCALE: 1"=250 FEET

250 0 100 150 200 250

SEWER MASTER PLAN FOR CITY OF HUBBARD PFFP PLAN AREA 3 OVERVIEW	EXHIBIT B
AKS ENGINEERING & FORESTRY, LLC 4300 CHERRY AVE NE KEIZER, OR 97303 P:503.400.6028 F:503.400.7722 dks-eng.com	DRWN: LEG CHKD: JK AKS JOB: 4354-23

DWG: 4354-23 EXHIBITS A-B | EXHIBIT B

DATE: AUGUST 2017

NOTES:
1. CONTOURS ARE APPROXIMATE AND ARE BASED ON LIDAR.
2. DEFINES BOUNDARY FOR PFFP AREA 3.
3. R2 – DEVELOPABLE AREA WITH R2.
4. R3 – HIGH DENSITY RESIDENTIAL.

N

SCALE: 1"=250 FEET

250 0 100 150 200 250

SEWER MASTER PLAN FOR CITY OF HUBBARD FUTURE SEWER SERVICE AREAS	EXHIBIT C
AKS ENGINEERING & FORESTRY, LLC 4300 CHERRY AVE NE KEIZER, OR 97303 P:503.400.6028 F:503.400.7722 aks-eng.com	DRWN: LEG CHKD: JK AKS JOB: 4354-23

DWG: 4354-23 EXHIBITS A-B | EXHIBIT C