APPENDIX G – DARNEILLE PUMP STATION IMPROVEMENT OPTIONS

Darneille Pump Station Recommendations

As shown in this CSMP, Darneille Pump Station is significantly undersized to handle PWWFs starting under existing conditions. By 2035, PWWF is projected to be almost twice as much as current pump station firm capacity. This area serves the Redwood service area and flow monitoring revealed significant amount of Inflow and Infiltration on these basins. Inflow is an issue upstream of the Darneille Pump Station where significant flow enters the system through leaking manholes and private sewer laterals. In this area, most of the main lines are either relatively new or free from defects such as cracks, holes, or missing pipes. It is recommended that the City looks into its direct inflow issue in this area in an attempt to reduce peak flows to the Darneille Pump Station.

The upgrade to the Darneille Pump Station pumping capacity is necessary to resolve the capacity limitations and eliminate upstream surcharging that is currently greater than the 2-feet criteria. In addition, increasing the pumping capacity at Darneille will reduce the related capacity issues at Redwood Pump Station that occur when all flow that Darneille pump station cannot handle is diverted towards Redwood Pump Station.

Five high level options were developed as part of this Plan to improve Darneille Pump Station.

1. **Option 1: Darneille Pump Station Upgrade** - This option consists of upgrading the existing Darnielle Pump Station to the firm capacity of 7.8 mgd and allow higher than design criteria velocities through the 14-inch force main under the bridge crossing the Rogue River upstream of WRP. The Redwood diversion will be removed. (See Figure 1 in this Appendix).

   This option will be the easiest to gain approvals from the regulatory agencies and simplest for the O&M personnel since there will not be any significant changes in the operation. However, this option does not provide River crossing redundancy that the City desires. Any upgrade to the existing pump station has to include processes which significantly remove plastics and Fat, Oil, and Grease (FOG) from the discharge pipelines.

2. **Option 2: New Pump Station and River Crossing** - This option consists of building a new pump station south of the Rogue River and along Dowell. Road A new river crossing for a new 14-inch force main is needed along with a force main north of and along the Rogue River to the WRP. Any new pump station design needs to include provisions for the removal of plastics for the force main system and better management of FOG. (See Figure 2 in this Appendix).

3. **Option 3: Peak Flow Storage** - This option consists of building an equalizing tank at the Darneille Pump Station site to hold a peak flow of 1.5 mgd and upgrade the Darneille Pump Station to the maximum capacity the 14-inch force main across the Rogue River can handle without exceeding velocity criteria (i.e. 6.5 mgd). (See Figure 3 in this Appendix).

4. **<u>Option 4</u>: Redwood Treatment and Discharge** - This option consists of using the discharge permit to the Rogue River the City has at the Redwood Pump Station. Under this option, the Darneille Pump Station is upgrades to the maximum capacity of the 14-inch force main upstream of the WRP. Peak flows above this value will be routed towards the Redwood Pump Station through the existing diversion. The Redwood Pump Station will then need to be upgraded to handle this additional peak flow. A new physical/chemical treatment system will be installed at the Redwood Pump Station before discharging peak flows to the Rogue River during wet weather season. (See Figure 4 in this Appendix).

5. **<u>Option 5</u>: Treatment with Natural Systems** - This option consists of routing Peak Flows from the Darneille Pump Station across the Rogue River north, to the 250 acres site owned by the City for natural treatment. (See Figure 5 in this Appendix).

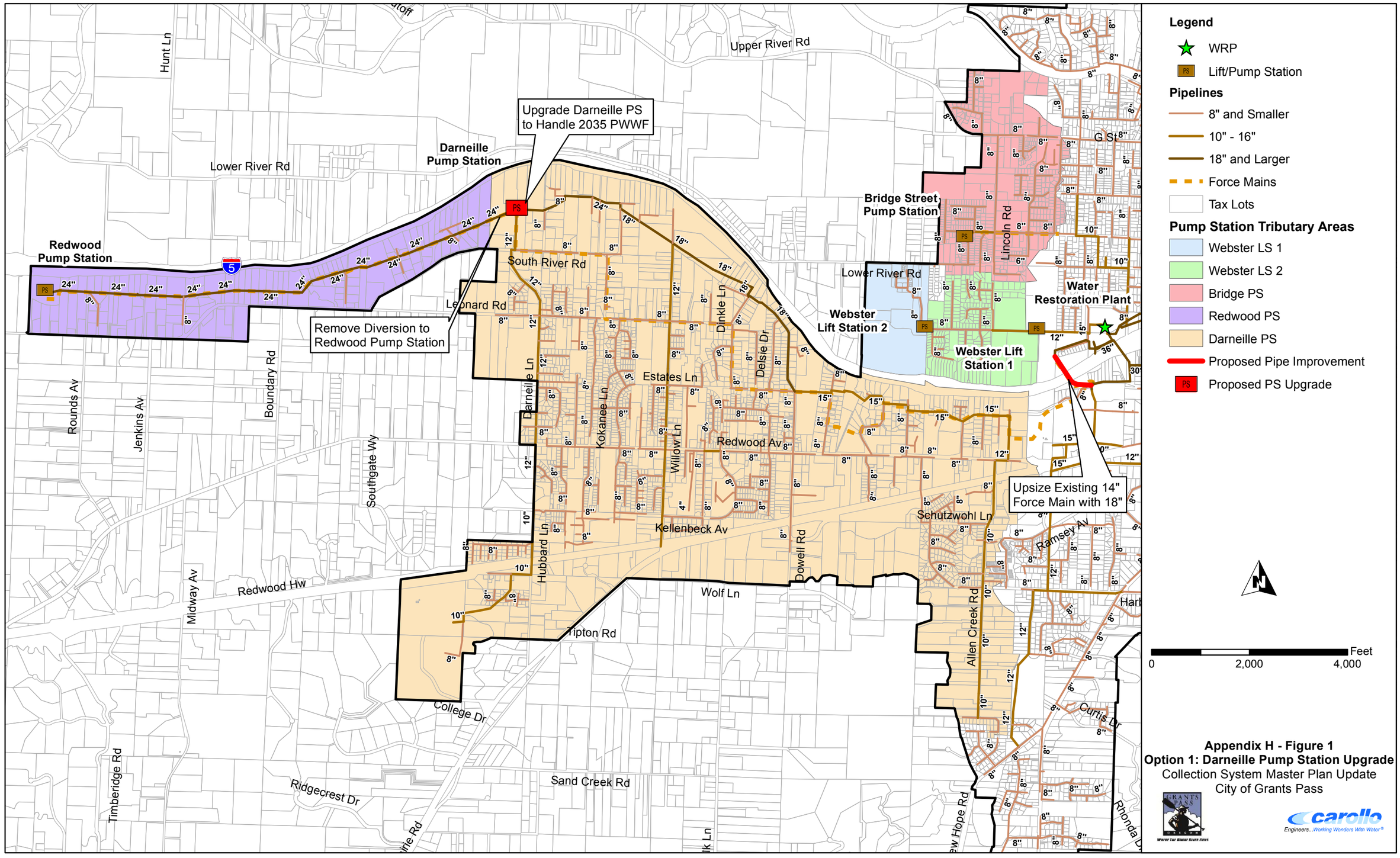
   Option 5 will be similar to Option 4 except the final effluent will be applied to engineered treatment wetlands. This provides the City with thermal load offset that may be imposed by DEQ in the future. In addition, this option provides the City with River crossing redundancy.

A recommendation for Darneille Pump Station should be made following an Alternative Analysis evaluating costs and other parameters in further detail to develop a recommended solution to the capacity limitations at the Darneille Pump Station. A summary of alternative analysis is presented in Table 1. This table compares each alternative against five parameters presented below, using a rating scale of 1 to 5 (1 being least favorable and 5 is most favorable):

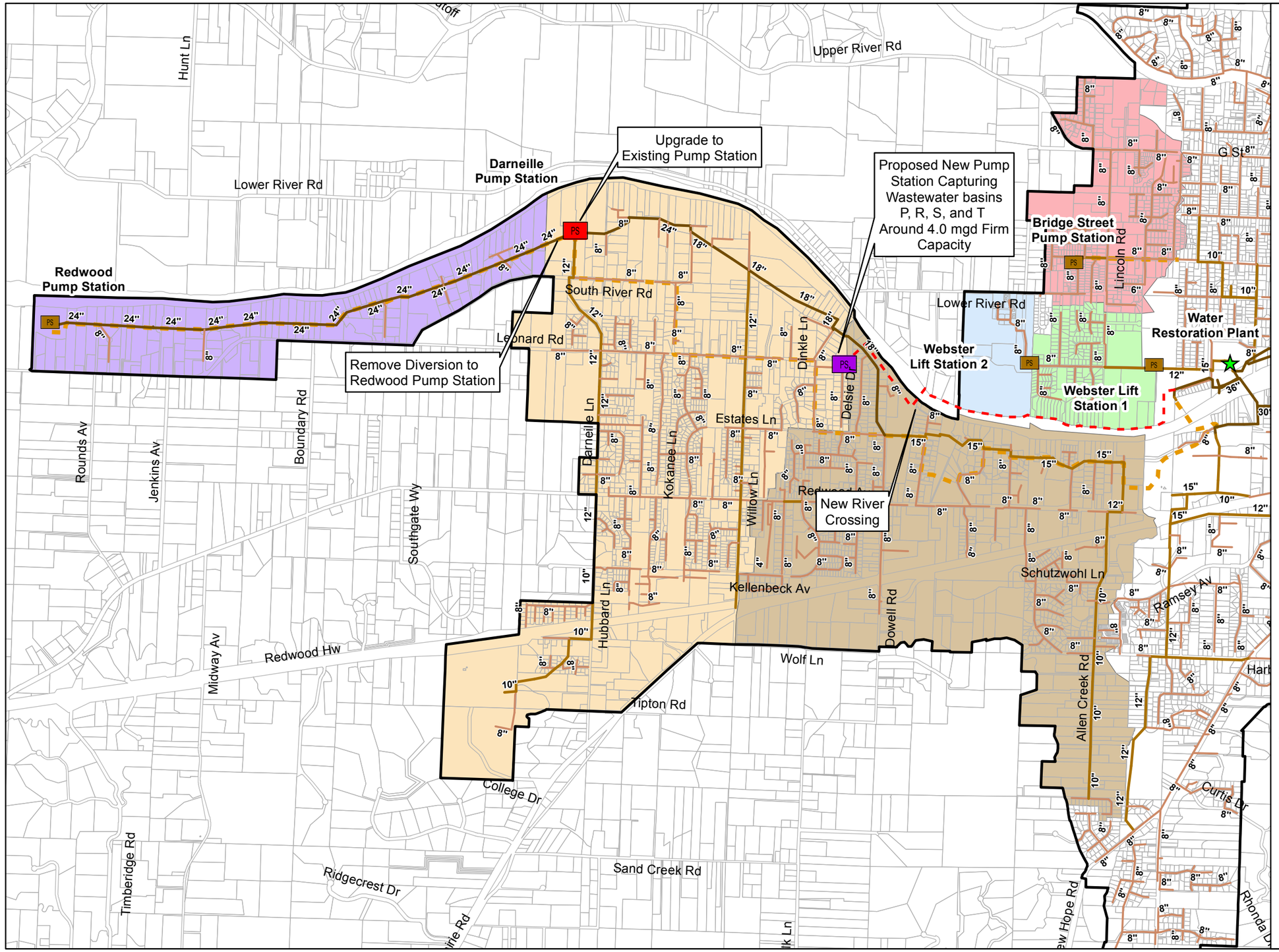
1. Ease to get regulatory approval,
2. Provides redundant river crossing,
3. Offsets existing WRP expansion/provides additional thermal benefits,
4. Reduces operational and maintenance challenges, and
5. Cost implication to the City.

Table 1 Darneille Pump Station Improvement Options
Wastewater Collection System Master Plan
City of Grants Pass

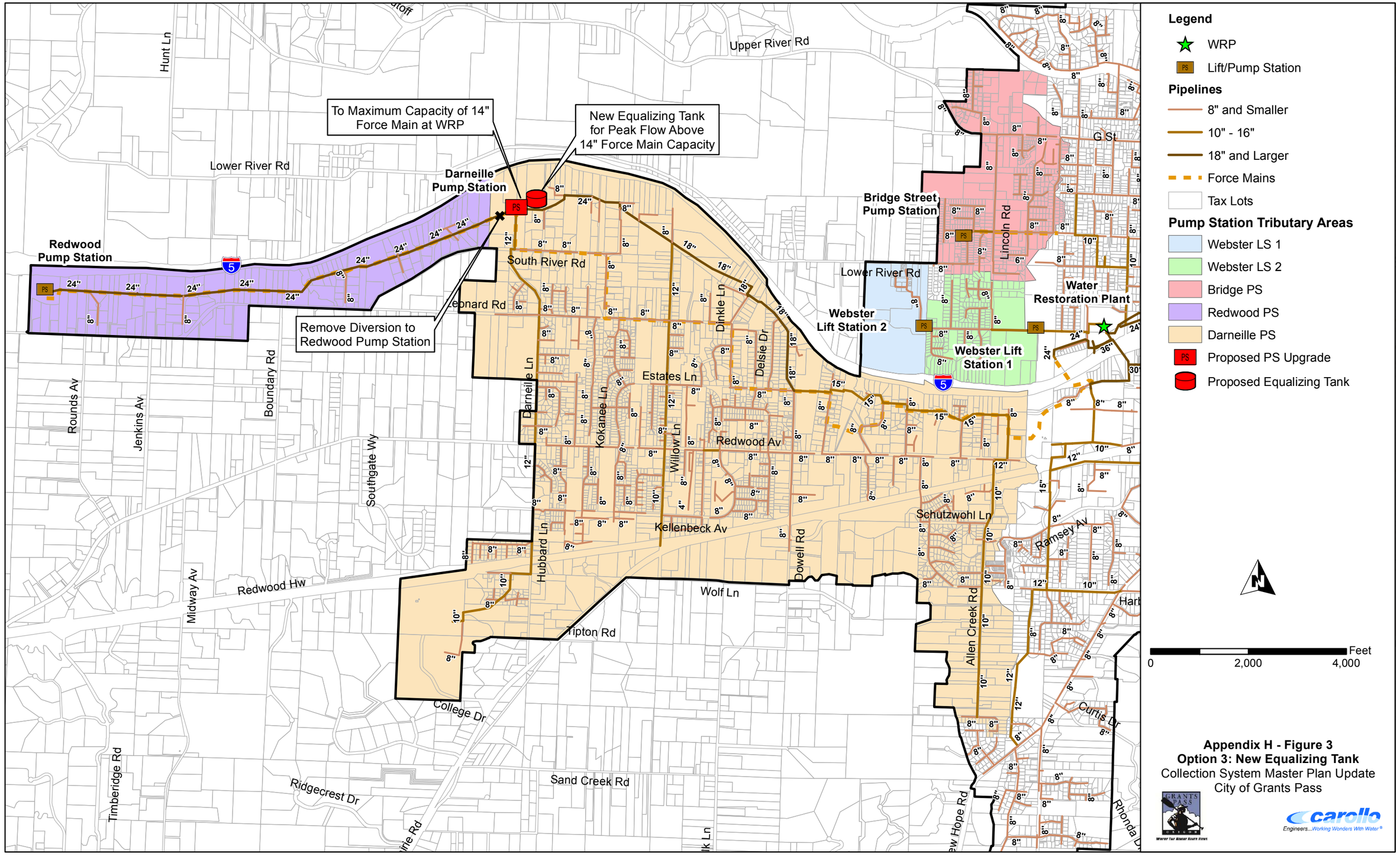
Option	Regulatory	River Xing Redundancy	New Treatment	O&M	Flow Division	Cost
Option 1	5	1	3	5	2	5
Option 2	4	5	3	5	3	4
Option 3	5	1	3	3	3	3
Option 4	2	1	5	3	5	2
Option 5	2	5	5	2	5	1



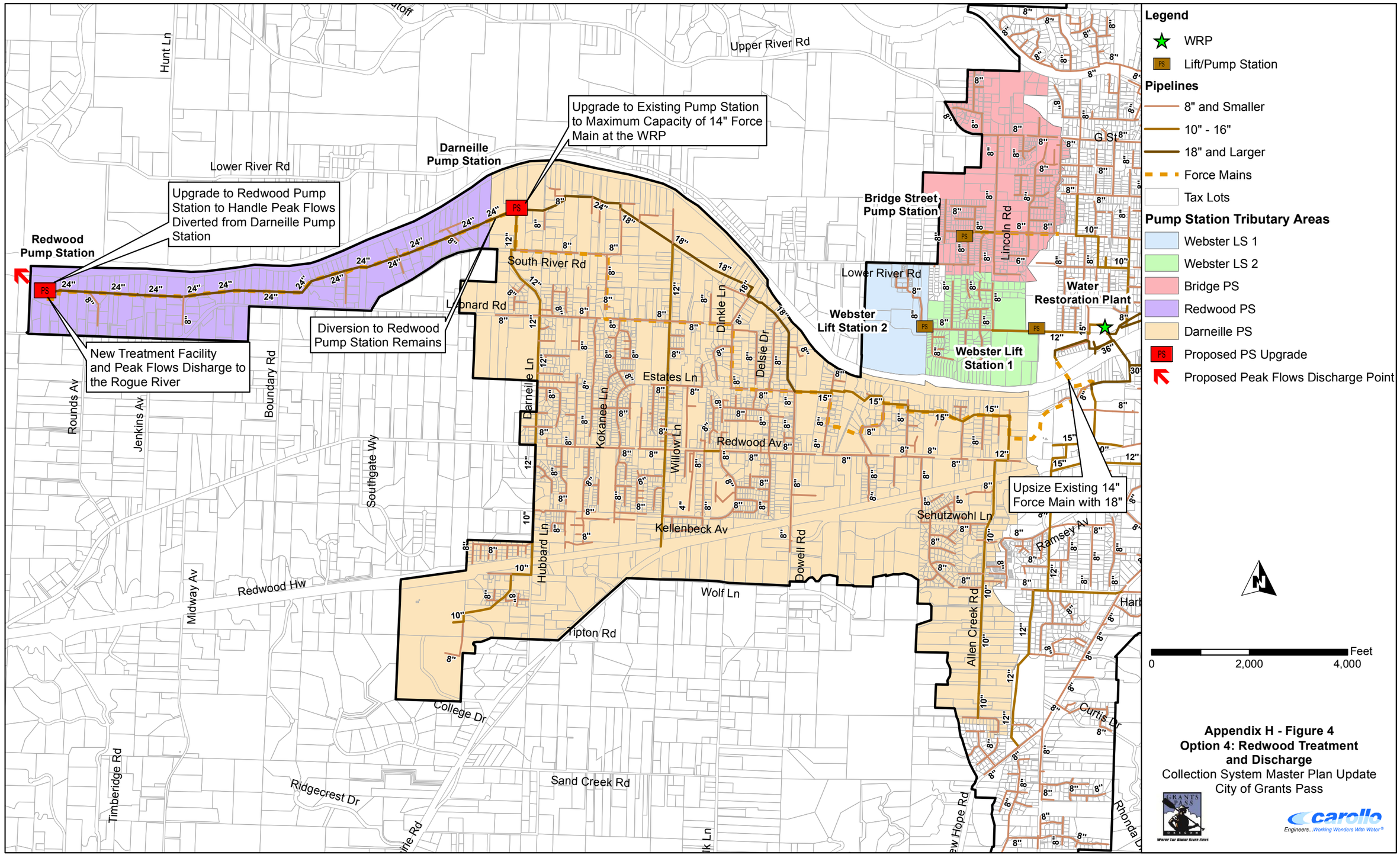
Appendix H - Figure 1
Option 1: Darneille Pump Station Upgrade
Collection System Master Plan Update
City of Grants Pass



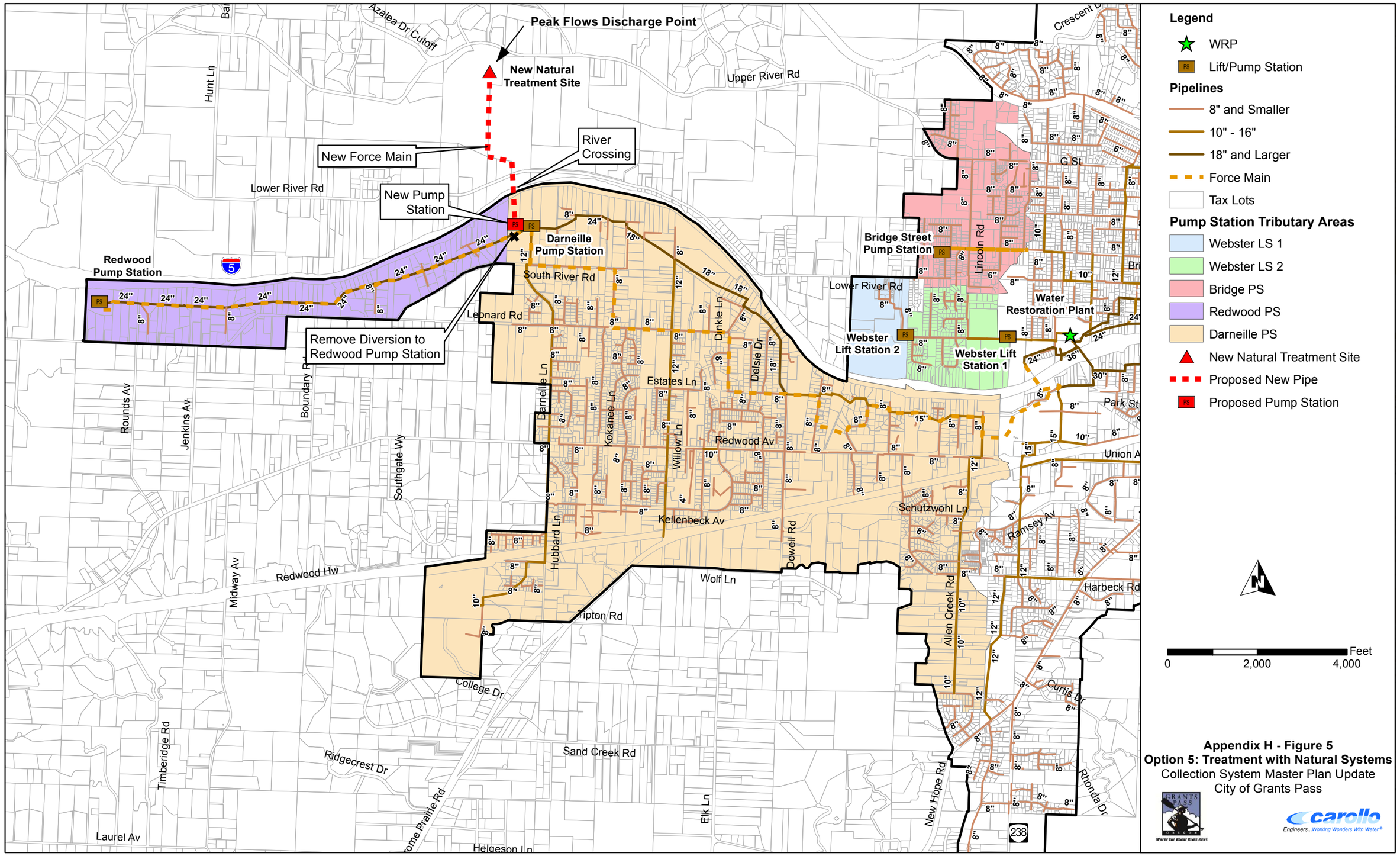
Appendix H - Figure 2
Option 2: New Pump Station and River Crossing
Collection System Master Plan Update
City of Grants Pass



Appendix H - Figure 3
Option 3: New Equalizing Tank
Collection System Master Plan Update
City of Grants Pass



Appendix H - Figure 4
Option 4: Redwood Treatment and Discharge
Collection System Master Plan Update
City of Grants Pass



Appendix H - Figure 5
Option 5: Treatment with Natural Systems
Collection System Master Plan Update
City of Grants Pass