

# Study Area Characteristics

---

## 2.1 Study Area

The service area, or watershed, is defined by all sanitary basins that can physically contribute flow to the TCWTP. The plant is located in the Foothills area of Lake Oswego, southeast of the intersection of Terwilliger Boulevard and Highway 43/State Street. The plant discharges treated wastewater directly to the Willamette River. The service area includes portions of Portland, Dunthorpe-Riverdale, and Lake Oswego jurisdictions. Figure 2-1 shows the basins that make up the TCWTP service area. For further descriptions of the individual collection systems and their current condition refer to Section 3.1.

The total Lake Oswego area contributing to the TCWTP is 6,176 acres. This total includes 5,486 acres in the Lake Oswego basins and 80 acres within the City of Portland that discharge to the plant via a dedicated pipeline. The total also includes 610 acres that discharge from Lake Oswego to the Tryon Creek Interceptor (TCI). The City of Portland Tryon Creek and Riverview basins are served by the TCWTP. These basins cover an area of 4,790 acres.

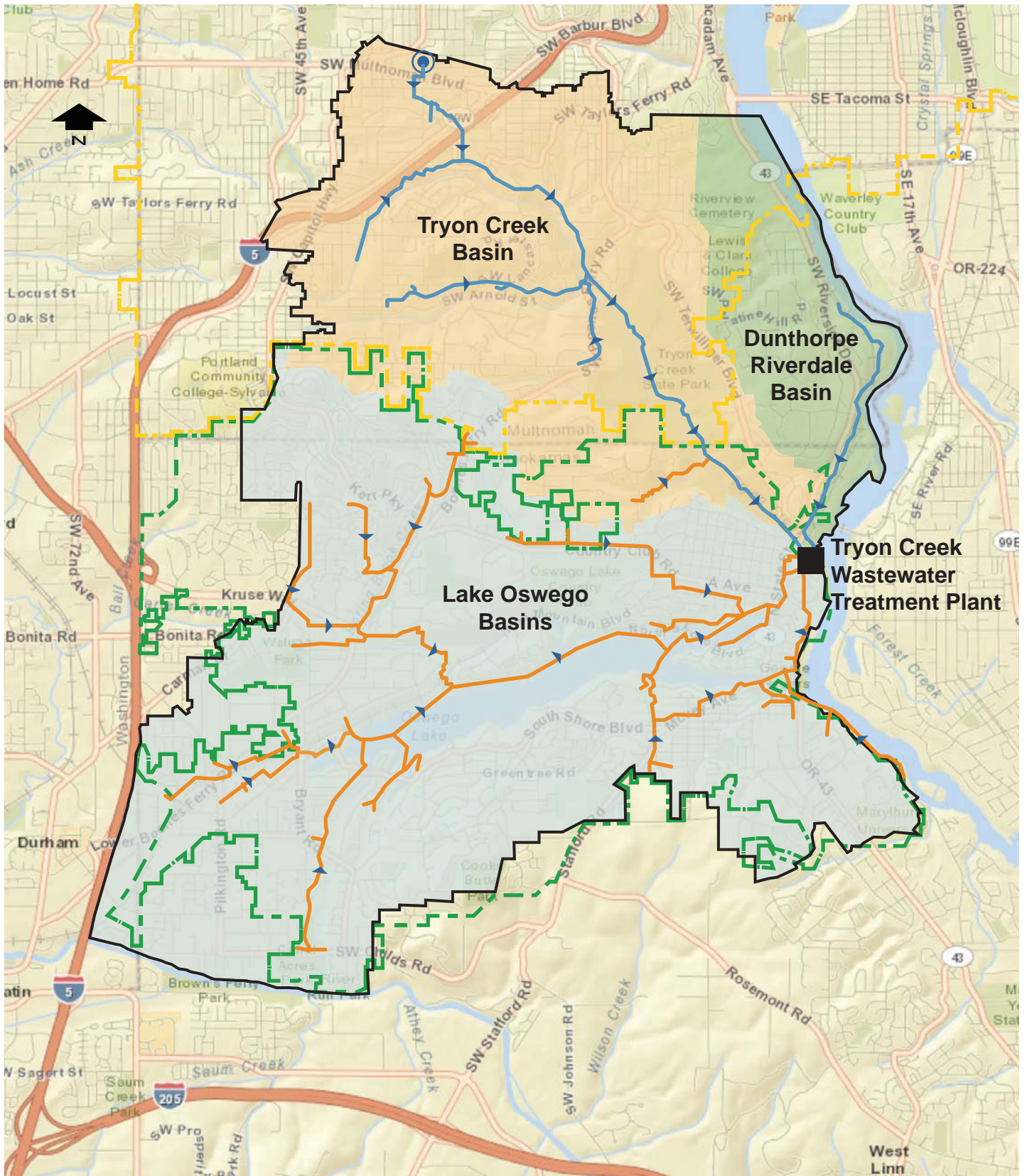
## 2.2 Physical Environment

### 2.2.1 Climate






The TCWTP service area is located at the north end of the Willamette Valley (east of the Coast Range) and thus enjoys a drier, more continental climate than the coastal areas. The area has a mild and temperate climate with a dry summer season and a rainy winter. Westerly winds generally pick up moisture from the Pacific Ocean. As a result of the orographic effect of the Coast Range, precipitation decreases as the winds flow eastward into the Willamette Valley.

Historical climatic data for the Lake Oswego/Southwest Portland area are summarized in Table 2-1. The data in this table are from the closest National Weather Service reporting station, located at the Portland Airport.

Although summer days can be consistently sunny, hot weather that is continuous and prolonged is rare and nights are generally cool. Similarly, continuous and prolonged subfreezing weather is rare during the winter; snowfall is usually light. Approximately 70 to 75 percent of the mean annual precipitation falls during the wet season, November through April (based on data from Table 2-1).



**LEGEND**

-  Tryon Creek Interceptor
-  Tryon Creek Wastewater Treatment Plant Service Area Boundary
-  Lake Oswego Collection System
-  Approximate City of Portland Boundary
-  Approximate City of Lake Oswego Boundary

**FIGURE 2-1**  
**Tryon Creek Wastewater Treatment Plant Service Area**  
*Tryon Creek Wastewater Treatment Plant Facilities Plan*

TABLE 2-1  
**Historical Climatic Data: Portland Airport Station 1971–2000**  
*Tryon Creek Wastewater Treatment Plant Facilities Plan*

Month	Average Maximum Temperature (°F)	Average Minimum Temperature (°F)	Average Mean Temperature (°F)	Mean Precipitation (inches)
January	45.6	34.2	39.9	5.07
February	50.3	35.9	43.1	4.18
March	55.7	38.6	47.2	3.71
April	60.5	41.9	51.2	2.64
May	66.7	47.5	57.1	2.38
June	72.7	52.6	62.7	1.59
July	79.3	56.9	68.1	0.72
August	79.7	57.3	68.5	0.93
September	74.6	52.5	63.6	1.65
October	63.3	45.2	54.3	2.88
November	51.8	39.8	45.8	5.61
December	45.4	35.0	40.2	5.71
Annual Average	62.1	44.8	53.5	37.07

Note: Dry weather season data are shaded.

°F = degrees Fahrenheit.

## 2.2.2 Topography and Soils

Tryon Creek is located in Portland's West Hills. The topography of the Tryon Creek basin is characterized by significant slopes and ravines. The I-5 freeway and SW Barbur Boulevard bisect the basin. SW Multnomah Boulevard and SW Vermont Street are two other prominent streets in the basin. There is a logical split into upper and lower portions along SW Multnomah Boulevard, which divides the distinct areas of the basin. The upper basin trunk begins near SW Tower Way and SW 36th Avenue. The neighborhood collectors west of the upper basin trunk generally flow from east to west. Downstream of SW Multnomah Boulevard, the TCI conveys flow generally from northwest to southeast to the TCWTP.

The Upper Tryon sanitary basin is a divide between the upper reaches of Fanno and Vermont Creeks, with elevation ranging from 450 to 550 feet msl. The Tryon sanitary basin generally follows the same boundary as the surface water drainage basin for Tryon Creek, with elevations ranging from 150 to 450 feet msl. Riverview basin slopes northeasterly from the Tryon Creek/Willamette River divide to the Willamette River. Elevations range from 50 to 500 feet msl. The hillside topography in portions of the basin affects the construction of sanitary sewer systems, which are typically shallower than in areas with less elevation change. These shallower systems cannot accept as much surcharge as a deeper system without increasing the potential for basement flooding.

The abundance of relatively impermeable soils tends to increase the amount of rainfall infiltration and groundwater that surrounds sanitary pipelines because of the relatively porous nature of the bedding and backfill material used in pipeline construction. Infiltration through pipe defects can be more pronounced under these conditions.

The topography of the Lake Oswego area is characterized by relatively steep hillsides, rises, and ridges. The land generally slopes east toward the Willamette River, south toward the Tualatin River, west toward Fanno Creek, or east toward Lake Oswego. Most land lies between 100 and 400 feet in elevation. A hillcrest elevation in the Mountain Park area exceeds 950 feet, and the riverside elevations along the Willamette River measure less than 50 feet.

Soil conditions in Lake Oswego can be described in part through the construction activities associated with the city's sanitary sewer pipeline rehabilitation projects. Most of the basins where rehabilitation work

has occurred are in topographically steep areas, with layers of permeable soil reaching to the invert of the sewer and impermeable soil just below the pipe invert.

### 2.2.3 Geologic Hazards

Landslide and slump hazard areas are not significantly present in the Tryon Creek service area; see Map 9 of the *Clackamas County Natural Hazards Mitigation Plan* (Clackamas County Hazard Mitigation Advisory Committee, September 2007). The TCWTP is in between two earthquake fault lines; the Bolton Fault to the southwest and the Oatfield Fault to the northeast. Map 10 in the above document indicates that the treatment plant is in a moderate to high earthquake hazard zone.

### 2.2.4 Public Health Hazards

The TCWTP and associated collection system provides service to the entire service area described above. Only a handful of private subsurface wastewater disposal systems (septic tanks) still exist within the service area. The City of Lake Oswego and the City of Portland have a policy in place to transition these systems over to the public sewer system where possible.

### 2.2.5 Energy Production and Consumption

Power supply in the area is adequate to reliably operate the TCWTP and collection system pump stations. One Portland General Electric (PGE) 12.47 kilovolt (kV) service feeder feeds the entire site. A 600 kilowatt (kW) diesel generator is connected to the main switchboard above by an automatic transfer switch. The 600 kW generator backs up the entire TCWTP load during normal (PGE) power failure.

Utilization of digester gas for energy production is not currently practiced at TCWTP. However, digester gas is captured for beneficial reuse and burned in boilers to provide process heat for the digestion system.

### 2.2.6 Water Resources

Three watersheds lie within the Tryon Creek service area boundary: Oswego Lake, Tryon Creek, and Palatine. All of these watersheds ultimately discharge to the Willamette River.

The main water courses include the Willamette River, Tryon Creek, Oswego Creek, and Spring Brook Creek. The area has one natural lake (though artificially enlarged), Oswego Lake.

### 2.2.7 Flora and Fauna

The TCWTP area is extensively urbanized; therefore, much of the vegetation has been introduced as part of residential and commercial landscaping. Excluding wetland vegetation, the native vegetation includes Douglas fir, big leaf and vine maple, Oregon grape and Oregon white oak, and various ferns such as sword fern. Common understory shrubs include Indian plum, snowberry, and red elderberry. The floodplain vegetation often includes red-osier, red osier dogwood, willows, salmonberry, and thimbleberry. In general, the TCWTP native vegetation is typical of the lower Willamette River riparian communities and the immediately adjacent upland areas. The wildlife in the TCWTP area is typical of urbanized portions of the areas adjacent to the lower Willamette River. Common song bird species include the red-breasted nuthatch, black-capped and chestnut-backed chickadee, house finch, pine siskin, song and fox sparrows, rufous-sided towhee, robin, and varied thrush. Water birds include various duck species, common merganser, great blue heron, and belted kingfisher. Various amphibians such as salamanders, newts, toads, and frogs, as well as reptiles including turtles, lizards, and snakes exist within and adjacent to the study area. Typical mammals include various species of mole, shrew, bat, squirrel, vole, and rat. Beaver and nutria are also present.

Fish species within the Willamette River system include all of the salmon, trout, and steelhead species common to the Willamette River system, e.g., Chinook salmon, Coho salmon (a threatened and endangered species in the Clackamas River system) and steelhead, rainbow, cutthroat, and brown trout. Numerous warm-water species also occur, such as largemouth and smallmouth bass, yellow perch, walleye, various types of catfish and suckers, and whitefish.

## 2.2.8 Natural Resources

The service area of the TCWTP covers thousands of acres and contains a wide variety of natural resources. These natural resources have been inventoried by the jurisdictions in which they lie. Specifically, resources within Lake Oswego are shown in the *Lake Oswego Natural Resource Inventory* (City of Lake Oswego Planning, 1992), and those in and around Dunthorpe are shown in the *Inventory of Natural, Scenic, and Open Space Resources for Multnomah County Unincorporated Urban Areas* (City of Portland Bureau of Planning, 1992). These inventories show hundreds of resource sites lying within the service area; the sites are identified in the documents. The natural resources that lie within the TCWTP site itself are addressed below in Section 2.4, Land Use Regulation for TCWTP.

Generally, natural resources within the service area can be described as falling into one of the categories described below.

**Fish and Wildlife Habitat:** A variety of environments exist in the service area that provide fish and wildlife habitat. These areas include remnants of native woodlands, open fields, wetlands, and water bodies such as Oswego Lake, the Willamette River and numerous year-round and intermittent streams. Mature landscapes and trees within developed areas are also valuable to several wildlife species. Furthermore, properly managed private property, including residential lots, can provide valuable nesting, food, and cover.

**Tree Groves:** Tree groves within Lake Oswego's Urban Services Boundary include coniferous and mixed deciduous/coniferous stands of trees. The area's remaining forested areas and tree groves are located mostly on steep hillsides, dry rocky bluffs, in or near wetlands, and along streams.

**Wetlands:** The area has both emergent wetlands and forested wetlands. The dominant plant communities in emergent wetlands are rushes, sedges, and grasses. Although many of these wetlands often appear to be dry grassy meadows in the summer, they are wet in the winter and early spring. They often serve as significant habitat for migrating and wintering waterfowl. They often function as temporary storage areas for runoff and traps for sediment, nutrients, and pollution carried by stormwater. Forested wetlands are seasonally flooded and located in low lying areas, near springs or seeps, or adjacent to stream corridors. The typical plant community consists of a multi-layered canopy of cottonwoods, oaks, ashes, willow, and a complex understory shrub community. This multilayered canopy provides cover, food, nesting, and perching sites for wildlife. Forested wetlands also provide flood storage and water quality enhancement by filtering sediment and nutrients from stormwater.

**Ponds:** These resources consist of natural ponds, abandoned quarries, and ponds created for stormwater detention and agricultural uses. Ponds provide a year-round water source for wildlife including waterfowl. Their value as wildlife habitat increases when they are located adjacent to upland wildlife habitat. When ponds are adjacent or within stream corridors they may slow stormwater runoff and alleviate flooding in downstream areas. Also ponds can serve to enhance water quality by trapping and filtering sediment, nutrients, and pollutants.

**Stream Corridors:** Stream corridors are located throughout service area—28 major stream corridor drainage basins are within Lake Oswego's Urban Services Boundary. Vegetation within stream corridors lessens downstream flooding and benefits water quality by slowing runoff and preventing erosion. Also, stream corridors provide vegetated corridors necessary for wildlife habitat and travel. Lake Oswego has a complex geography with many steep, wooded hillsides and streams that flow from the higher areas into the Tualatin River, Oswego Lake, and the Willamette River. Streams can be seasonal or year-round, and sometimes run below the surface or into canals that feed Oswego Lake. Stream corridors are essential components of Lake Oswego's surface water management system because they convey and store stormwater and help control flooding. Streams also provide habitat and travel corridors for wildlife, and are valued by residents for their open space and aesthetic aspects. They are often found in conjunction with other natural areas such as wetlands and tree groves.

**Oswego Lake:** Oswego Lake is a large natural feature located in the heart of the service area. The lake's natural features have been highly modified, first by logging in the late 1800s, and later by residential development, which cleared much of the original forest that surrounded the lake. Shoreline development, including seawalls, docks, and boathouses, is strictly controlled by the Lake Corporation,

which owns and controls the lake. There are a few remaining undeveloped natural areas surrounding the lake at the mouths of streams, and forested areas on steep slopes. A few natural riparian areas and small pockets of wetlands remain along the streams that enter the lake. These natural edges are important for wildlife nesting, food, and shelter. The remaining forest is typically Douglas fir on the north-facing slopes and oak/madrone and fir on the south-facing rocky bluffs. These remaining forested areas provide perch sites for birds of prey such as osprey and heron. The lake is also an important habitat for resident and migratory waterfowl including dabblers, diving ducks, Canada geese, and great blue heron. Fish species in the lake include bass, catfish, bluegill, carp, crappie, and yellow ring tail perch.

**Willamette River Greenway:** The Willamette River Greenway is a valuable natural asset along the east boundary of the service area. Protected by its own statewide planning goal, the Greenway boundary includes all lands within 150 feet of ordinary low water. These lands have identified natural, scenic, historical, agricultural, economic, and recreational qualities.

### 2.2.9 Land Use Issues for Service Area

The TCWTP service area contains a mixture of residential, multifamily, and commercial land uses. In the City of Portland, the Tryon Creek and Riverview basins contain a mixture of land uses, but are predominantly residential. There are significant areas of commercial and multifamily development along Barbur Boulevard, the I-5 corridor, and Capitol Highway and in the Multnomah district.

In the Lake Oswego basins, residential land use predominates. There are some areas of commercial and multifamily development in the downtown area of Lake Oswego and along SW Boones Ferry Road.

Because of the current land use laws, the characteristics of the area are expected to remain fairly stable. Specific issues and regulatory requirements are outlined in Section 2.4.

## 2.3 Population

### 2.3.1 Population

The total population in the City of Portland portion of the TCWTP service area for 2010 is estimated to be approximately 19,000 (Collins, 2012). The total population in the Lake Oswego portion of the TCWTP service area for 2010 is estimated to be approximately 36,600 (Metro, 2012).

### 2.3.2 Population Growth Projections

The methodology used to project flows relies on land use requirements and population growth projections from both the Portland and Lake Oswego comprehensive plans (City of Lake Oswego, 1994/1999; City of Portland Bureau of Planning and Sustainability, 1980/2011). Flow and load projections were developed by Lake Oswego as part of its *City of Lake Oswego Wastewater Collection System Master Plan Update* (Carollo Engineers, 2013) and by BES in the technical memorandum *Asset Systems Management Memorandum ASM02: Tryon Creek Wastewater Treatment Plant—Portland Design Flows* (Collins, 2012) (copy provided in Appendix B). For further information regarding the development of this information and the associated population projections, refer to these documents and the two cities' respective comprehensive plans.

The projected total population in the City of Portland portion of the TCWTP service area for 2035 is estimated to be approximately 24,000 (Collins, 2013). ). The projected total population in the Lake Oswego portion of the TCWTP service area for 2035 is estimated to be approximately 45,700 (Metro, 2012).

## 2.4 Land Use Regulation for TCWTP

This section covers anticipated permits, thresholds for review, timelines, and implications that apply to potential improvements to the TCWTP. The review of individual permits generally covers context, applicability, key issues, application requirements, and supporting documentation. The actual extent of the permits required will be based on actual improvements undertaken, and determined during the final design process and in further discussions with the responsible agencies.



Land use approval of potential TCWTP upgrades would be a key critical path item prior to implementing facility improvements. The current regulations that apply to the TCWTP site are such that any significant alteration to the site will trigger a major (Type III) review process with separate layers of land use reviews. Each review has its own set of discretionary criteria all of which will be discussed at public hearings. Once an application with detailed narrative and plans is prepared and submitted, the local review process is expected to run approximately 5 months.

The most critical issues for permitting TCWTP upgrades are likely to be:

- Demonstrating that the use is “reasonably compatible” with adjacent uses
- Demonstrating that the site is “physically capable” of accommodating the treatment plant use
- Potential conditions that impose limits on layout or operation of the plant

### 2.4.1 Foothills District Planning

The TCWTP is located in Lake Oswego’s Foothills Plan District, which generally calls for substantial redevelopment from industrial to a mixture of commercial and residential uses. The Lake Oswego City Council adopted the Foothills Plan (but did not implement zoning) in December 2012. As shown in Figure 2-2, the Foothills Plan designates most of the existing TCWTP site “Public Function” and “Parks and Natural Areas” while adjacent properties to be acquired for facility expansion are designated for “Foothills Mixed Use.” It is anticipated that existing industrial zoning will be changed to FMU to match the applicable Foothills Plan designation. To simplify future review processes, BES has suggested that the entire TCWTP site, including any newly acquired property, be designated “Public Function.”

Planned redevelopment in Foothills Mixed Use designation does not have a direct regulatory impact on the TCWTP, because the standards currently in place on the site will not change. However, the context for review of proposed TCWTP improvements will change considerably. Construction and operational impacts will be reviewed *in relation to* adjacent properties, which are now planned for a mixture of commercial and residential uses, rather than industrial uses. For example, the size of property line setbacks, the standard for building design, and possible limits on operations for the plant are related to surrounding development. In that respect, future Foothills development standards and what kind of neighboring development these regulations create have a strong *indirect* influence on TCWTP facilities.

Very recently, BES has proposed changes to the Lake Oswego Community Development Code (CDC) to more effectively address impacts from proposed TCWTP improvements. Note that proposed facility improvements are necessary to meet state and federal environmental standards, do not increase the capacity of the TCWTP, and generally will have fewer offsite impacts than existing operations. The goal of the proposed CDC changes is to provide for greater certainty in the development review process while effectively mitigating existing and potential environmental or neighborhood impacts. Two options were considered. One suggestion was to review planned facility improvements based on objective performance standards, rather than discretionary (subjective) conditional use criteria. Another suggestion was to create a master facility planning process that would allow a longer term, staged approval while mitigating for neighborhood and environmental impacts. These changes are under consideration by the City of Lake Oswego.



FIGURE 2-2  
**Proposed Land Use Zoning Changes Neighborhood of TCWTP Site**  
 FMU = Foothills Mixed Use; PF = Public Function.

This section focuses on the regulatory landscape as it exists today because the proposed regulations in the Foothills zone are still changing and will have only an indirect impact on the TCWTP. Despite the uncertain final outcome, Foothills District changes to adjacent property are real and likely to be implemented, in some form, within the TCWTP facilities planning horizon. Proposed regulations in their current form would have a significant impact on the development of the plant; however the timing of those changes are undefined.

## 2.5 City of Lake Oswego Permits

This section provides background on individual City of Lake Oswego permits and approvals, thresholds for review, timelines, and implications for design and construction of upgrades to the TCWTP.

The TCWTP is located within the City of Lake Oswego, and is therefore subject to the land use regulations and permit requirements of this jurisdiction. The property is operated by BES. The TCWTP serves most of the City of Lake Oswego and a portion of the City of Portland. For land use permitting purposes, the actual location of the plant is the only relevant factor. Expansion or alteration of plant infrastructure requires a land use permit from the City of Lake Oswego and is subject to the review process, criteria, and standards of the Lake Oswego CDC. This permit comes at the conclusion of a land use application process where the applicant (in this case Portland BES) must demonstrate to the satisfaction of the City of Lake Oswego that CDC criteria and standards have been met. The City of Lake Oswego's Development Review Division will oversee the process and apply the code requirements. Consequently, this section addresses the process criteria and standards found in the Lake Oswego CDC, as they apply to any future proposal at the TCWTP site.

Overall, the likelihood of gaining land use approval for proposed facility improvements depends on whether the proposed plan complies with the criteria and standards in the Lake Oswego CDC. The



existing process is highly discretionary because of the code language. Many of the important decision criteria have much room for interpretation; for example “physically capable,” “reasonably compatible,” “complementary in appearance.” Moreover, Lake Oswego decision-makers have wide latitude to apply conditions to the approval, in order to have a project meet the discretionary standards. The CDC explicitly instructs the city to apply conditions to the permit as necessary that can include limits on operations, changes to the location and size of buildings, or additional buffers. Ultimately, the Lake Oswego’s Development Review Commission (DRC) decides whether a proposed site design meets all the relevant standards. In the event that the DRC’s decision is appealed, the final local decision maker is the Lake Oswego City Council.

The land use rules described in this section will therefore strongly influence design choices for the plant, and what the ultimate configuration of the site will be. These regulatory constraints act as a guide to a permissible whole plant alternative.

## **2.5.1 Land Use Reviews**

### **2.5.1.1 Overview of Process**

The process for obtaining a land use approval is generally as follows:

1. Choose design alternative
2. Prepare and submit application
3. Lake Oswego planning staff reviews materials and recommends action
4. Lake Oswego DRC makes decision (public hearing)
5. DRC decision can be appealed to Lake Oswego City Council

The application must be for a specific proposal and not a range of alternatives. The design team will choose a specific layout of the site and program for new or modified buildings and structures. Although the owner does not need to provide specific construction details for all facilities, the overall site plan and elevations for the proposed development must be fixed. A land use approval is a binding legal decision, so changing the site design significantly after a decision is issued would require a modification to the conditional use approval, which would be another land use application.

The preferred design will be the basis for a detailed application to the City of Lake Oswego, demonstrating compliance with all the relevant standards and criteria in the code. This application must include a narrative explaining the project, findings against the standards and criteria, and supporting drawings, studies, or other information. Before submitting the application, the applicant is required by code to attend a pre-application meeting with city planning staff, and to hold a neighborhood meeting to solicit input from the public. Because of the type of use that is proposed and the zoning district that applies to the site, redevelopment of the TCWTP site will initiate a “Type III” land use process. Type III processes are reserved for those that require the most judgment, and therefore require public notice, a public hearing, and an opportunity for anyone to appeal the decision.

After the application is submitted to Lake Oswego, planning staff will review the application, including all supporting materials for “completeness.” Within 30 days, the city responds with a request for any additional information needed to make the decision. After the applicant responds, the city’s official review period begins. This review is limited by state law to no more than 120 days after the City deems the application “complete” for review. This time limit may be extended by the applicant.

After its review, the staff will issue an analysis of all the arguments presented and recommend approval or denial to the decision-maker, which is in this case the Lake Oswego DRC. The DRC is a seven-member citizen advisory body appointed by Lake Oswego City Council. At an open, publicly-noticed hearing, the DRC will make a decision on the land use application. The hearing includes the analysis from city staff, a presentation by the applicant and its team, and public testimony from any people supporting or opposing the proposal. At the end of this hearing, the commission will vote on the application.

The local land use decision ends with the decision of the DRC, unless there is an appeal. If any party objects, an appeal goes before the Lake Oswego City Council, in another public hearing. In all cases, city staff and decision makers only approve or deny the application based on the relevant criteria and standards in the CDC. The core of any decision is what the code says about the rules that apply. After

the local decision is final—either at the DRC or the City Council—it could then be appealed as a legal case through the court system.

### 2.5.1.2 Application Requirements

The requirements for an application to the City of Lake Oswego are extensive, and will require a significant level of detail. The CDC outlines some of the key elements necessary for a complete land use application, including:

- Authorization form and proof of property ownership.
- A survey map that illustrates existing structures on the site, existing setbacks, topography, easements, and trees 5 inches in diameter or greater.
- All relevant graphic information such as a scaled site plan, floor plans, and detailed elevation drawings.
- Detailed landscape, parking, utility, and grading plans.
- Technical reports such as drainage, arborist, traffic, or geotechnical reports.
- If tree removal is proposed, a site plan illustrating the location, size, and species of all trees on the site and identifying those designated for removal.
- A narrative addressing all applicable standards outlined in a pre-application meeting.
- Information from a required neighborhood meeting.
- Additional information as identified by the city.

The Lake Oswego land use review fee for a conditional use application is \$4,846, due at the time of submittal.

This section addresses the relevant standards and criteria that will apply to the application for development at the TCWTP. The reviews needed and the key criteria are addressed in the sections that follow.

## 2.5.2 Review Summaries

Because of where it is located and what is likely to be proposed, the TCWTP site is subject to multiple layers of city land use review. These multiple reviews will occur concurrently, but all the relevant standards must be met for the project to gain approval. The reviews on the site are the product of zoning rules and designations.

The TCWTP property is designated *Public* (P) on the Lake Oswego Comprehensive Plan map and *Public Function* (PF) on the Lake Oswego land use zoning map. The Lake Oswego Code (LOC) defines a sewage treatment plant as a “major facility” and a “major development” and related standards apply.

Modifications to the plant are subject to the city’s conditional use review process. To be approved, the applicant must demonstrate to the satisfaction of the DRC that the “functional characteristics of the site are such that it can be made reasonably compatible with uses in the vicinity.”

### 2.5.2.1 Conditional Use

As shown on in Figure 2-3, the TCWTP is located in a PF zone. Zoning on the site was changed from Industrial in 2003.

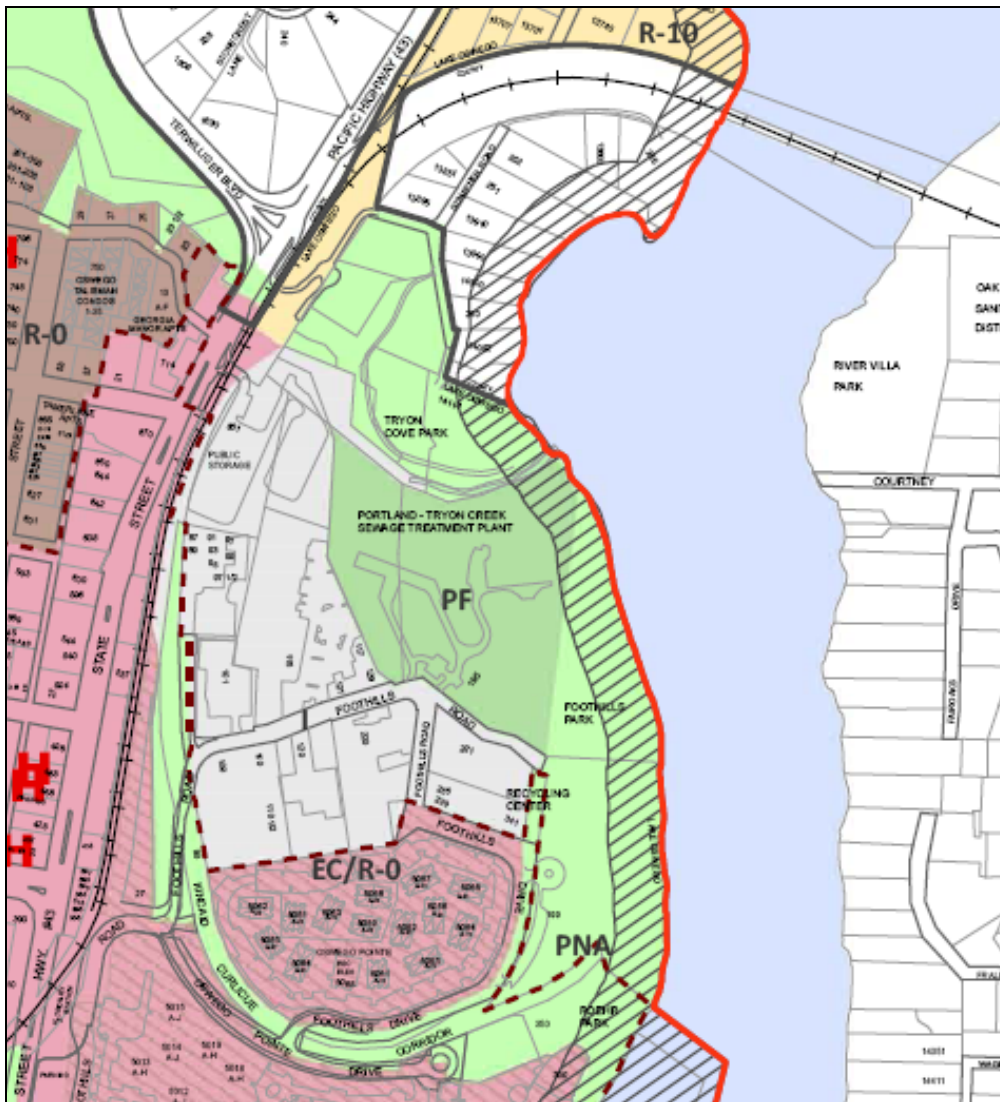


FIGURE 2-3  
**Lake Oswego Land Use Zoning Map**  
 PF = Public Function.

The purpose of the PF zone is to specify “appropriate land uses and development standards for public uses, such as government services, education, and similar activities” (LOC 50.02.003).

According to the definitions chapter of the LOC, a wastewater treatment plant is a “major public facility” use, as indicated by a combined reading of the LOC 50.10.003.2 definitions for major and minor public facilities, which are provided below (emphasis added):

**Public Facility, Major**

*Any public service improvement or structure developed by or for a public agency that is not defined as a minor public facility.*

**Public Facility, Minor**

*The following public service improvements or structures developed by or for a public agency:*

- a. Minor utility structures, except substations, but including poles, lines, pipes, telecommunications facilities or other such facilities.*
- b. Sewer, storm drainage, or water system structures, including reconstruction of existing facilities, pump stations, manholes, valves, hydrants or other portions of the collection, treatment and distribution systems, except treatment plants, reservoirs, or above-ground trunk lines.*

A major public facility can be allowed in a PF zone, upon approval of a conditional use permit (LOC 50.03.002.3). A conditional use is permitted in a zone, but “because of some characteristics which are not entirely compatible with other uses allowed in the zone, cannot be permitted outright” (LOC 50.07.005.1.a). The TCWTP has never obtained a conditional use permit, and none has ever been needed, because the use was lawfully established, and previously allowed outright in what was designated at the time as an Industrial zone. When the underlying zoning was changed to PF in 2003, the use became non-conforming. The code was later changed to make major public facilities, such as the TCWTP, a “conditional use.”

Ordinary maintenance of the non-conforming use on the site is allowed without a land use review. Alteration requires a review. TCWTP upgrades at the site would qualify as an alteration, which would require a conditional use permit. What the CDC and the city consider “repair” is typically only very minor changes: “normal repairs or replacement of non-bearing walls, fixtures, wiring or plumbing” (LOC 50.01.006.6). In other words, even if the improvements at the TCWTP do not actually expand capacity, any alteration or reconstruction of the facility will trigger a conditional use process.

As for the conditional use criteria and standards (LOC 50.07.005.3.a), these are the most discretionary of the reviews and allow for a great deal of discretion and interpretation. Since they are brief, they are quoted below in full:

- a. An application for a conditional use shall be allowed if:*
- i. The requirements of the zone are met; and*
  - ii. Special conditions found in LOC ...50.03.003.3.b...are met [this refers to a set of standards applicable to major public facilities]; and*
  - iii. The site is physically capable of accommodating the proposed use; and*
  - iv. The functional characteristics of the proposed use are such that it can be made to be reasonably compatible with uses in its vicinity.*

The last two of these criteria require city decision makers to interpret the meaning of subjective terms such as “physically capable,” “accommodating,” “reasonably compatible,” and even “vicinity.” The first two criteria refer to standards in other chapters that are generally more objective, but still contain areas for interpretation. For example, the section incorporated by reference in criterion (ii) consists of seven standards that apply to institutional uses and major public facilities. Most of these standards are plainly inapplicable since they apply only to residential uses. However, one could potentially have a big impact on the plant: “Levels of operations shall be adjusted to avoid conflict with adjacent uses where practical” (LOC 50.03.003.3.b.vii). The CDC does not specify what facility operations could be considered conflicting, how best to avoid these conflicts, or at what point an imposed adjustment would not be considered practical.

Following that idea, the section after the conditional use criteria allows the hearing body to impose conditions on the approval of the use. The list of possible conditions that can be imposed could have a significant potential impact to the facilities plan. New conditions have to be “suitable and necessary to assure compatibility,” but they can limit the hours of operation, require additional measures to limit emissions or odor, relocate a structure or limit its size, create bigger setbacks from property lines, or require public improvements. LOC 50.07.005.3.b reads as follows:

- b. In permitting a new conditional use, or the modification of an existing conditional use, the hearing body, or the City Manager in the case of a minor modification, may impose conditions which are suitable and necessary to assure compatibility of the proposed use with other uses in the vicinity. These conditions may include, but are not limited to:*
- i. Limiting the manner in which the use is conducted, by restricting the time an activity may take place and by minimizing such environmental effects as noise, vibration, air pollution, glare and odor.*
  - ii. Establishing a special yard, setback, lot area or other lot dimension.*
  - iii. Limiting the height, size or location of a building or other structure.*
  - iv. Designating the size, number, location and design of vehicle access points.*
  - v. Increasing roadway widths, requiring street dedication, and/or requiring improvements within the street right-of-way.*

- vi. *Designating the size, location, screening, drainage, surfacing or other improvement of a parking area or truck loading area.*
- vii. *Limiting or otherwise designating the number, size, location, height and lighting of signs.*
- viii. *Limiting the location and intensity of outdoor lighting, requiring its shielding, or both.*
- ix. *Requiring berming, screening or landscaping and designating standards for its installation and maintenance.*
- x. *Designating the size, height, location and materials for fences.*
- xi. *Protecting and preserving existing trees, soils, vegetation, water resources, wildlife habitat or other significant natural resources.*
- xii. *On- and off-site public improvements.*

In short, the conditional use criteria, and the conditions that stem from them, create a great degree of latitude for Lake Oswego to modify the project. Because the use is existing and allowed conditionally in the zone, it is unlikely that the permit would be denied outright, but the city has broad authority to apply conditions to shape the new development on the site. This process creates a great deal of uncertainty for both the facility operators and nearby residents and business owners.

### **2.5.2.2 Willamette River Greenway Overlay**

The Willamette River Greenway (Greenway) is a protected area of the site that extends inland 150 feet from the ordinary low water line of the river. The purpose of this overlay is to “superimpose additional protection and regulation upon property which may alter the requirements of the underlying zone” (LOC 50.05.009.1.b). If a use like the wastewater treatment plant was within the Greenway overlay and in existence before 1982, the use may be continued. However any “intensification” of that use is subject to all the standards of this section.

The primary check on development in the Greenway is that all development must meet 11 “objectives” listed in the CDC designed to protect the riparian resource. These objectives parallel those in Oregon Statewide Planning Goal 15 for protection of the Willamette River Greenway, as follows:

- i. Significant fish and wildlife habitats will be protected.*
- ii. Significant natural and scenic areas, viewpoints and vistas will be protected and enhanced.*
- iii. Areas of ecological, scientific, historical or archeological significance will be protected, restored, or enhanced to the maximum extent possible.*
- iv. The quality of the air and water in and adjacent to the river will be maintained or enhanced in the development, change of use, or intensification of use of land within the GM Overlay.*
- v. Areas of annual flooding, water areas, and wetlands will be retained in their natural state to the maximum possible extent to provide for water retention, overflow and other natural functions as well as protect the health, safety and welfare of the public. Areas subject to the 100-year flood level are also regulated by the floodplain standard.*
- vi. The natural vegetative fringe shall be maintained or enhanced to assure scenic quality, protection of wildlife, protection from erosion and screening of uses from the river.*
- vii. Areas considered for development, change or intensification of use which have erosion potential will be protected from erosion by means compatible with the natural character of the Greenway.*
- viii. Recreational needs will be satisfied by public and private means in a manner consistent with the natural limitations of the land. Conflicts with adjacent land uses will be minimized.*
- ix. Public safety and protection of public and private property will be provided to the maximum extent practicable, especially from vandalism and trespass.*
- x. Nonwater related or dependent structures shall be located west of and no closer than 25 ft. to the following setback lines:[...]*
- xi. Necessary public access will be provided to and along the river including pedestrian, bicycle and water related uses.*

Overall, the language of these objectives makes new development within the Greenway setback difficult. Additionally, Lake Oswego could use objective (xi) above to impose a requirement for a new pedestrian and bicycle connection along the riverfront, or through access to the water.

### 2.5.3 Development Standards

In addition to the approval criteria for conditional use and sensitive lands/Greenway reviews, TCWTP upgrades will generally be subject to development standards that would apply to any project within Lake Oswego. Generally, these are more objective, and include standards for development in the floodplain, dimensional standards, and overall development standards.

#### 2.5.3.1 Flood Hazard

The TCWTP is within a city-designated “flood management area.” This area is shown on city maps. The flood management area combines two areas: the land indicated on Federal Emergency Management Agency flood insurance maps, and those areas inundated by the February 1996 flood. The base flood elevation on the TCWTP property is 36.2 feet, which equals the 1996 flood level. The Lake Oswego Flood Management Area is shown in Figure 2-4.

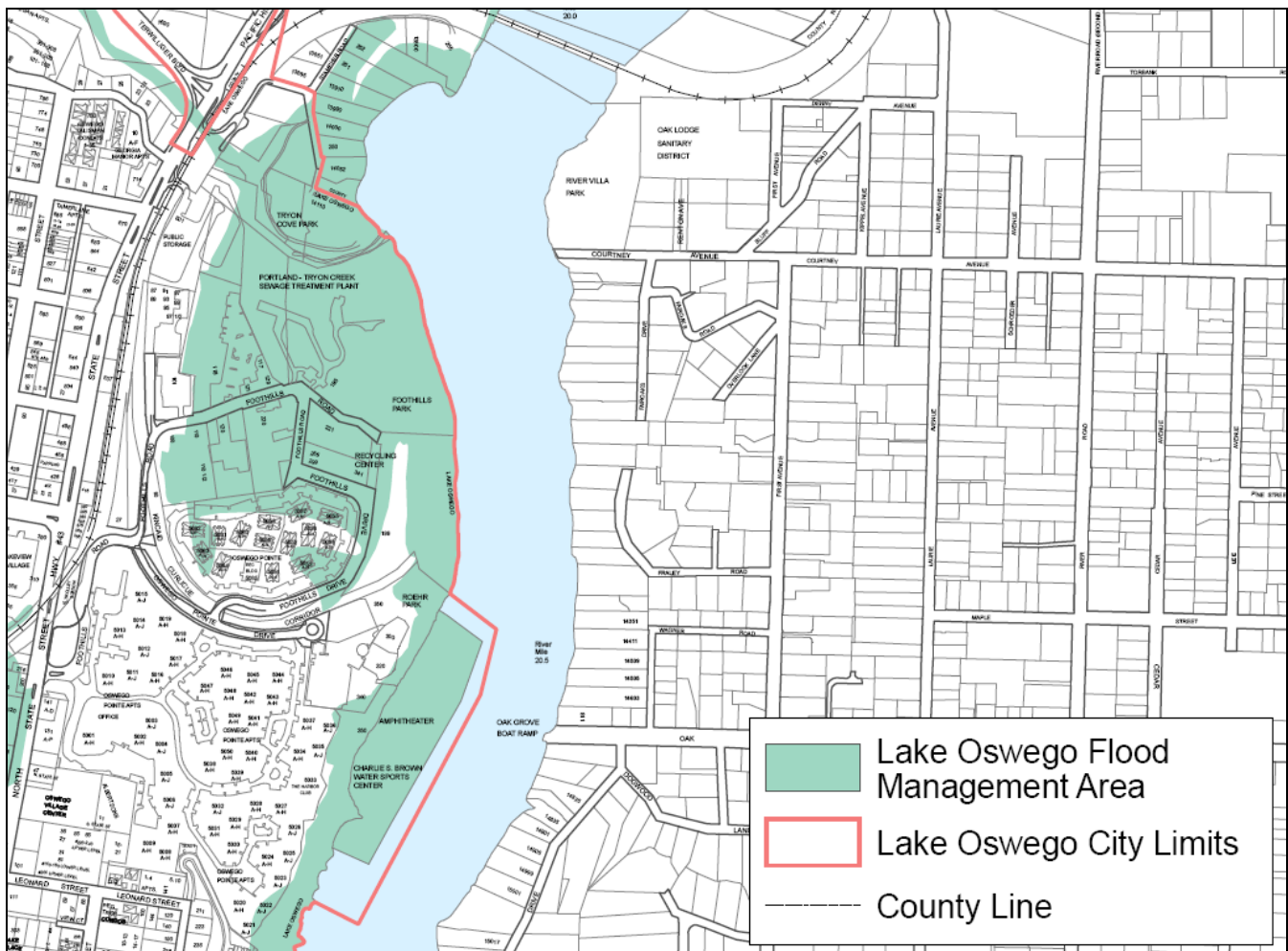


FIGURE 2-4  
Lake Oswego Flood Management Area

All uses allowed in the base zone, including wastewater treatment, are allowed within the flood management area, provided they meet development standards. If the development occurred on less-flood prone properties, these limitations would not be needed. Among the standards listed are the ones described below.

**Balanced cut and fill:** Fill material may only be deposited in the flood area “when balanced with removal of an equal amount of material” (LOC 50.05.011.7.b.i.2.b.ii).



**Hazardous materials:** Within the flood area, city code prohibits any development “providing for the storage or processing of materials that are buoyant, flammable, explosive, toxic, or that could be injurious to human, animal, or plant life in time of flooding” (LOC 50.05.011.7.b.iii.1).

**Elevation:** The lowest “habitable” floor of a new structure must be raised above the flood management area, at least 1 foot above the base flood level. Alternatively, the area beneath the base flood level can be flood-proofed, i.e., armored against floodwaters, if the construction methods are certified by an engineer.

**Variances:** As part of the permitting process, the property owner can ask for a variance from any of the flood standards identified above. However, the criteria for approval of a variance are very stringent and would be difficult to meet. The applicant must show that denying the variance “would result in an exceptional hardship” and the request is “the minimum necessary, considering the flood hazard, to afford relief” (LOC 50.05.011.9.b). These criteria create a high regulatory barrier for approving designs that do not meet flood standards.

Finally, the Foothills District Framework Plan (Williams/Dame & White, 2011) contains a proposal for a blanket exemption to the balanced cut and fill standards described above. Engineering studies commissioned by Foothills advocates “concluded that placement of the proposed fill within the 100-year floodplain will result in ‘no-rise’ to the base flood elevation either upstream or downstream” (Williams/Dame & White, 2011, Executive Summary, p. V). The cut and fill requirement would be amended to allow unlimited fill in newly-zoned areas in the Foothills area. The amendment would read (new language underlined):

*Fill in quantities greater than ten cubic yards is permitted within the floodplain of Oswego Lake and the developed areas of its outlets and within the floodplain depicted on LOC Figure 50.05.011-D that is zoned FMU and located at least 200 feet from the Ordinary High Water elevation of Tryon Creek and the Willamette River.*

Because this exemption only applies to areas “zoned FMU,” PF-zoned TCWTP property would still be required to balance cut and fill. A future change to also exempt the Tryon Creek area from cut-and-fill requirements could be considered, which would have to be justified by hydrologic analysis and implemented by an additional change to the zoning code.

### 2.5.3.2 Dimensional Standards

All development in the PF zone is subject to certain dimensional standards, independent of what kind of use or facility it is. The relevant standards listed in the code are for setbacks, height, and lot coverage.

**Setbacks.** Setbacks in the PF zone are equal to those on surrounding property (LOC 50.02.003.2.b.i). Currently, the project is adjacent to Industrial (I) zoning, which has no minimum or maximum setback. The zoning on adjacent property—and a portion of the BES property—is proposed to change to a new FMU zone, which, in its draft form, does not establish a rear or side yard setback. Consequently, it appears that the TCWTP property has no objective setback requirement. However, the dimensional standards also state that “additional setback requirements for any yard may be established through the conditional use permit process.” This means the setback requirement would be subject to the discretionary criteria for the conditional use review, i.e., “reasonably compatible,” “avoid conflict,” etc. Furthermore, the conditional use chapter explicitly lists “establishing a special yard, setback, lot area, or other lot dimension” (LOC 50.07.005.3.b.ii) as a condition that may be imposed on development to assure compatibility with other uses in the vicinity. In short, the setback requirement will be set by non-objective factors, as part of the land use review.

**Height.** For all practical purposes, the maximum allowable height in the PF zone is 35 feet.

**Lot Coverage.** Maximum lot coverage in the PF zone is 50 percent. All “structures over 30 inches in height” on the treatment plant site count toward lot coverage.

### 2.5.3.3 Development Standards

Certain standards apply to all development in Lake Oswego. The applicability of development standards to the TCWTP depends on the specific language in the code.

**Building Design.** The most unusual and potentially discretionary development regulation in this section is the standard for building design (LOC 50.06.001.5). This section explicitly applies to major public facilities, as follows:

*Buildings shall be designed and located to complement and preserve existing buildings, streets and paths, bridges and other elements of the built environment, and to assure accessibility for bicyclists, pedestrians, and users of other transportation modes.*

*i. Design buildings to be complementary in appearance to adjacent structures of good design with regard to:*

- (1) Materials;*
- (2) Setbacks (for retail/commercial part specifically);*
- (3) Rooflines;*
- (4) Height; and*
- (5) Overall proportions.*

The city's DRC, and the City Council on appeal, would determine the discretionary elements of this regulation. This includes the meaning of "complementary," and which structures qualify as "adjacent structures of good design." Another element of this design standard is also potentially problematic:

*d. Buildings shall be designed and constructed to reduce noise impacts on interior occupied spaces and adjacent property.*

*i. Use solid barriers such as fences, berms, natural land forms and structures to reduce sound levels. The effectiveness of the barrier increases as barrier height increases and as it is moved closer to either the source or the receiver.*

*ii. Minimize the window surface on sides facing adverse sound sources, where possible.*

*iii. Mechanical equipment, including heat pumps and air conditioning equipment, shall meet the required setbacks of the zone and be located so that operating noise does not affect use of living areas such as bedrooms, outdoor decks or patio areas and adjacent property.*

The DRC would need to determine at what level the "operating noise" from mechanical equipment at the TCWTP would "affect" the use of living areas on adjacent property, which includes outdoor space such as patios. They could potentially apply a condition or modify the design to "locate" these facilities in a different position on the site plan.

**Parking.** Because a wastewater treatment plant is a "use not specifically mentioned" in the CDC, the amount of required parking is not specified and would be set by a parking study, completed by the applicant before submittal (LOC Table 50.06.002-1.H).

**Access/Circulation.** Access standards to the site are determined by a traffic study and subject to certain driveway safety requirements. It is likely that the existing driveway access to the site meets all the current standards, including a vision clearance triangle (LOC 50.06.011), but this would need to be confirmed by a traffic engineer. In addition, upgrades at the plant are likely excluded from this section, because it only applies to developments that are new or increase the use of a site. Increased use is defined as likely to generate an increase in trip generation or parking (LOC 50.06.003.2.a).

**Drainage.** Major development must manage stormwater runoff from impervious surfaces created on the site. The management plan must minimize pollutants, and maintain runoff rates at natural undeveloped levels. A drainage plan must be prepared by an engineer and submitted to the city.

**Landscaping and Open Space.** Major Public Facilities are required to provide 20 percent of gross land area as "landscaping and/or open space" (50.06.004.1.b.i). Specific landscaping standards—plant lists, soil requirements—are contained in this section. Fences are also regulated here; for major public facilities, the height limitation is 10 feet (LOC 50.06.004.2.c.x.i).

**Lighting.** Outdoor lighting in the PF zone is regulated with regard to wattage, shielding, curfew times, and other highly technical requirements (LOC 50.06.004.3).

## 2.5.4 Air Quality, Noise, Lighting

Outside of the land use review process, the city has polices in its code to protect adjacent properties from nuisance impacts. These include things like air quality, noise, and glare. The city may determine anything to be a public nuisance if it meets their definition: “any condition or use of property which causes or tends to cause detriment or injury to the public health, safety, or welfare” (LOC 34.08.400). A process for enforcing, or abating public nuisances, is outlined in this section.

City standards for odor control are found within the conditional use chapter and would be imposed as part of that land use review (see LOC 50.07.005.3.b). No DEQ air quality or emissions permits are currently in place for the TCWTP and are not required for the current configuration of combustible gas equipment. If in the future, the TCWTP were to install any equipment that employed internal combustion of digester gas, a Simple Air Contaminant Discharge Permit would be required, per Oregon Administrative Rule (OAR) 340-216-0020, i.

For noise, *LOC 34.10.537* provides an extremely general and subjective standard for restricting noise within city limits:

*It shall be unlawful for any person to create, assist in creating, permit, continue or permit the continuance of any loud, disturbing or unnecessary noise in the City at any time of day.*

The subsequent section *LOC 34.10.539* on specific noise prohibitions is also subjective:

*1. It shall be unlawful for any person to commit, create, assist in creating, permit, continue or permit the continuance of any of the following:*

*c. The use of any mechanical device, operated by compressed air, steam, gasoline or otherwise, unless the noise created thereby is effectively muffled.*

Compliance with this standard is triggered by complaints. The ultimate determination of what is “loud, disturbing or unnecessary” or “effectively muffled” would fall to the City Council. Currently, ambient noise levels at the TCWTP during the day are currently within the range of 50 to 55 decibels (A-weighted scale). As background, DEQ sets acceptable noise levels for existing industrial facilities (OAR 340-35-035 - Table 7), which could be used as an objective standard informing a future decision about what the meaning of “loud” is in the LOC. The allowable DEQ statistical ( $L_{50}$  - level exceeded for 50 percent of the time) noise levels in any 1 hour for existing industrial facilities is 55 decibels (A-weighted scale) (dBA) between 7 a.m. and 10 p.m., and 50 dBA between 10 p.m. and 7 a.m.

TCWTP must also comply with the lighting standards set forth in LOC 50.63. These standards limit the maximum wattage of outdoor lighting and required shielding for lights in PF zones. The code provides for both prescriptive and performance options for complying with the standards.

## 2.5.5 Intergovernmental Agreements

The City of Portland and Lake Oswego have a current wholesale agreement for “Sewage Treatment and Disposal.” This agreement, approved in September 1984, stipulates the conditions and terms under which the City of Portland will continue to treat and dispose of Lake Oswego’s wastewater. The agreement provides for full payment by Lake Oswego for its share of the costs of operation and maintenance (O&M) of the facility. In addition, the contract requires Lake Oswego to pay its fair share of the costs of depreciation, and a return on investment for the City of Portland’s investment in facilities that serve Lake Oswego. Based on the City of Portland’s sizable investment in treatment facilities, this agreement is contracted to continue in force for “at least 50 years” from the date of approval (1984). A copy of the agreement is provided in Appendix C.

This agreement is a flow-based cost sharing agreement for ongoing costs, allocating the cost of O&M based on the portion of the facility that is allocated to treating Lake Oswego flows as a percentage of the overall flow to the treatment plant. These costs are then billed to the City of Lake Oswego on a monthly basis, and the City of Lake Oswego passes these costs to its ratepayers (along with the cost of owning, operating, and maintaining its own collection system).

The current agreement for cost allocation is based on a 50 percent capacity split (50 percent Lake Oswego and 50 percent City of Portland) until the dry weather flow from one or the other exceeds more than 50 percent of the overall plant capacity.

The sanitary sewer collection system in the Dunthorpe-Riverdale basin is provided by the Dunthorpe-Riverdale Sanitary Service District No. 1 (District). The District's board of directors consists of Multnomah County Commissioners. Previously, the District collection system facilities were maintained by Multnomah County, but they are now maintained by the City of Portland through an agreement that also arranges for Dunthorpe-Riverdale basin sewage to be treated at the TCWTP.