Date:	March 23, 2009 (Revised)
To:	Core 4, Reserves Steering Committee
From:	Core 4 Technical Team
Re:	Preliminary Analysis of Providing Urban Level Water Service Within Reserves Study Area

Background & Overall Analysis Approach

The purpose of the Urban and Rural Reserves project is, in part, to designate appropriate land for each reserve type by addressing the factors listed in Oregon Administrative Rule 660 Section 27. The set of urban reserve factors that must be considered range in scale from assessing whether land can be served with public facilities and services in an efficient and cost-effective manner to determining whether areas can be designed to be walkable with a well-connected transportation system. For this reason, the Core 4 Technical Team (Tech Team), made up of staff from the three counties and Metro, chose to conduct a suitability of land analysis using a phased approach.

This memo describes the first step in this phased approach for urban level water service. It consists of an initial screening of the entire approximately 400,000-acre study area to address the following two urban reserve factors in the state rule:

UR-1: *Can be developed at urban densities in a way that makes efficient use of existing and future public and private infrastructure investments.*
UR-3*: Can be efficiently and cost-effectively served with public schools and other urban level public facilities and services by appropriate and financially capable service providers.*

The state rule defines 'public facilities and services' as sanitary sewer, water, transportation, storm water management facilities and public parks. Due to the sheer size of the study area, the Tech Team looked at it through a broad landscape-scale lens to assess suitability of the land for meeting these two reserve factors. This approach led to the Tech Team limiting this first screen analysis to sanitary sewer, water and transportation.

The particular methodology and results for the water element is discussed below. The result of this assessment is expressed graphically on a map that will be combined with a similar map from the sewer element, to create a composite map for these two similar services. This composite map will then be compared with two transportation maps, to form a preliminary assessment that begins to answer the two reserve factors above. The next phase of this process is described under Next Steps below.

Water Element Strategy & Methodology

While most of the major water providers only service areas inside the urban growth boundary, there are a number of providers that do service rural areas, such as Clackamas River Water and the Boring Water District. The Portland Water Bureau also serves some larger water districts east of Gresham (Lusted and Pleasant Home) and in the northwest (Burlington). The infrastructure in these rural areas is sized to service a rural population and would need to be upgraded in the future if urbanization was to occur. Otherwise, most service providers have not planned for service to the rural areas beyond what is in current master plans or future vision documents. There are major water facilities located within rural areas, such as transmission lines, treatment plants and reservoirs.

The Regional Water Providers Consortium serves as a collaborative and coordinating organization to improve the planning and management of municipal water supplies in the Portland metropolitan region. Utilizing the Consortium's members, small groups of water providers were convened on a geographic basis to complete an initial assessment for providing water to the study area. Prior to the meeting, proposed criteria for evaluating the study area and a study area map were provided to each participant. The proposed criteria included:

- Proximity to a current service provider;
- Institutional capabilities;
- Topography;
- Efficient use of existing resources;
- Source of supply;
- Timing; and
- Water/wastewater interface.
- Water services that pass through rural areas

During these initial discussions it became apparent that the key set of criteria for this first landscape scale analysis is proximity to a current service provider, topography, use of existing resources, and source. The other criteria will be included in the next level of analysis. The Regional Water Providers staff provided initial ideas for criteria.

At the small group meetings, additional maps were provided that displayed the following GIS information: slopes greater than 25%, shaded relief, major rivers and streams, wetlands, floodplains, public lands and major arterials. During the discussions staff took notes and made comments on the maps. In evaluating the study area, it was assumed that water services would be provided from a service provider in the Metro region and not from a water provider in a neighboring city such as Sandy, Estacada or Molalla.

The following service providers participated: City of Gresham, Sunrise Water Authority, City of Lake Oswego, Oak Lodge Water District, South Fork Water Board, City of Hillsboro, Tualatin Valley Water District, Clackamas River Water, City of Portland, City of Wilsonville and City of Forest Grove. Follow-up meetings were scheduled with some of the service providers.

Staff presented preliminary mapped results to the Water Providers Consortium Technical Committee (CTC) in January 2009. Technical committee members present at the meeting included most of the districts/jurisdictions that participated in the initial meetings, as well as representatives from the City of Beaverton, City of Tualatin, and the City of Tigard. After the meeting the draft map was sent to all CTC members for review and comment. In addition, staff has since met with engineering staff from the City of Sherwood and the City of Oregon City.

Water Element Results
This exercise, while based on service provider expertise and knowledge of the local landscape, does not assign a particular unit cost to serving any of the areas. Cost estimates to serve an area can only be assessed after assumptions are made regarding the number of dwelling units and employment acres to be served, which in turn dictate facilities such as the number of reservoirs or pump stations, and size of distribution system piping needed.

Some general issues of providing water services surfaced during the discussions.

1. Topography has a profound effect on the cost of distribution. Since water is heavy, pumping water to serve all elevations (natural or built) can be a significant operational cost.
2. Crossing natural resource areas adds additional cost to the distribution network due to measures to mitigate impacts to the resource.
3. System Development Charges (SDCs) are one of the primary ways to fund expansion, along with bonding authority. Therefore the size of the water provider entity is a factor in being able to provide needed new services in addition to SDCs being used to recover costs as development occurs.
4. Operational cost for future services is minor compared to the cost of expanding the water system
5. Currently water supply is not an issue for most major water providers as they have existing capacity for a number of years (2020-2050), depending on the individual provider. In addition, planned expansions such as the Tualatin Basin Supply Project (Scoggins Dam Raise), the City of Portland's statutory rights to increase surface water source in Bull Run and their unexercised groundwater rights in the Columbia south shore, and the extensive capacity at the Willamette River water treatment plant located in Wilsonville offer additional supply for the future.
6. Water coordination is still a challenge; the Regional Water Providers Consortium is partly addressing this matter through the additional work on emergency preparedness and a system interconnection study to be completed in 2009.
7. Dead end water service along corridors from the existing UGB present challenges versus areas that allow for looped distribution services to provide more robust service.

The attached map indicates a number of sub-areas that were identified with a suitability rating of high, medium or low suitability for providing water services. The ratings on the map are defined below:

<u>High Suitability</u> – generally these areas will only require typical extensions of service – general distribution lines, reservoirs, no major facilities needed.

<u>Medium Suitability</u> – these areas require more than one substantial investment in facilities or other defining issues– examples include additional reservoirs or significant upgrading of existing lines, water/waste water management issues.

<u>Low Suitability</u> – these areas require significant infrastructure improvements, usually associated with distance and topographic issues. The areas have a number of issues related to location of supply, reservoirs, pump stations, or great distances for distribution.

In many instances, the boundaries of the sub-areas are defined by features of the landscape, including extensive floodplains, edges of steep sloped areas or major water features, as these features tend to add cost to providing services. Existing water service boundaries as well as distance from existing service areas also influenced the sub-area boundaries. As noted above, water is expensive to move over long distances, thus it is not surprising that areas farther away from existing services or supplies were determined to be less suitable to serve. (The question of whether new sources could be developed for

these areas was not discussed as there are too many variables involved, especially at this scale.) Areas of significant topographic constraints, such as the Chehalem and Tualatin Mountains were also determined to be less suitable, due to distance as well as the extra cost of pumping. The location of existing infrastructure also influenced the rating. For instance the Joint Water Commission's transmission lines or the Bull Run transmission line influenced the suitability of nearby areas. The Three Basin Rule in the Clackamas River sub-basin, which limits new or increased waste discharges to the river, also impacts water service in this sub-basin as it relates to the possible future need for a water re-use program. Although this work is focused on the suitability of potential urban reserve areas, it is also relevant to note that the costs of upgrading existing water system facilities to serve higher densities within the existing UGB would also be substantial. Necessary improvements would include replacement and upsizing of existing water in lines in developed areas and additional pumping capacity to serve multistory buildings. In either situation, expanded water treatment capacity would be necessary to serve an expanded population in the region.

Finally, this is an initial evaluation of a very large area of land, as additional analysis work is completed, smaller areas within the larger sub-areas, particularly those sub-areas closer to the existing service boundaries may be identified that have a different rating than the overall sub-area.

Next Steps

The water services map is one element to be used in creating a composite map, which will be the foundation of the first screen analysis. Information derived from this composite map should provide a basis for eliminating some of the study area from further consideration as urban reserves. The next screen analysis will involve more detailed analyses of the remaining potential urban reserve areas. These areas will be referred to as priority candidate urban reserve areas.

For reference, the additional urban reserve factors outlined in the Administrative Rule that will be applied to the candidate urban reserve areas, in addition to refining factors 1 and 3 are:

UR-2: Includes sufficient development capacity to support a healthy economy;
UR-4: Can be designed to be walkable and served with a well-connected system of streets, bikeways, recreation trails and public transit by appropriate service providers;
UR-5: Can be designed to preserve and enhance natural ecological systems;
UR-6: Includes sufficient land suitable for a range of needed housing types;
UR-7: Can be developed in a way that preserves important natural landscape features included in urban reserves; and
UR-8: Can be designed to avoid or minimize adverse effects on farm and forest practices, and adverse effects on important natural landscape features, on nearby land including land designated as rural reserves.

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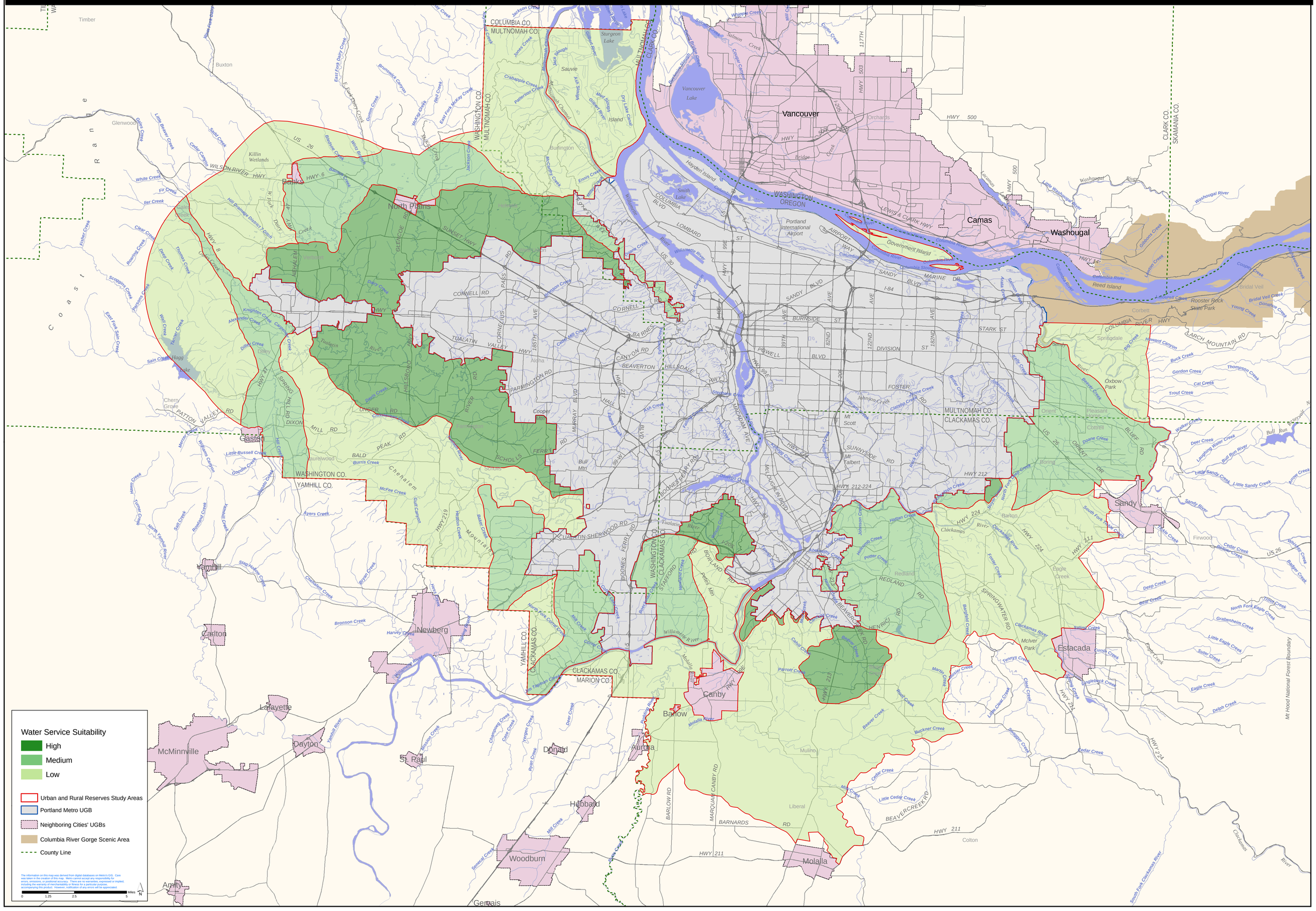
Urban and Rural Reserve Study Areas

Preliminary Water Service Suitability



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