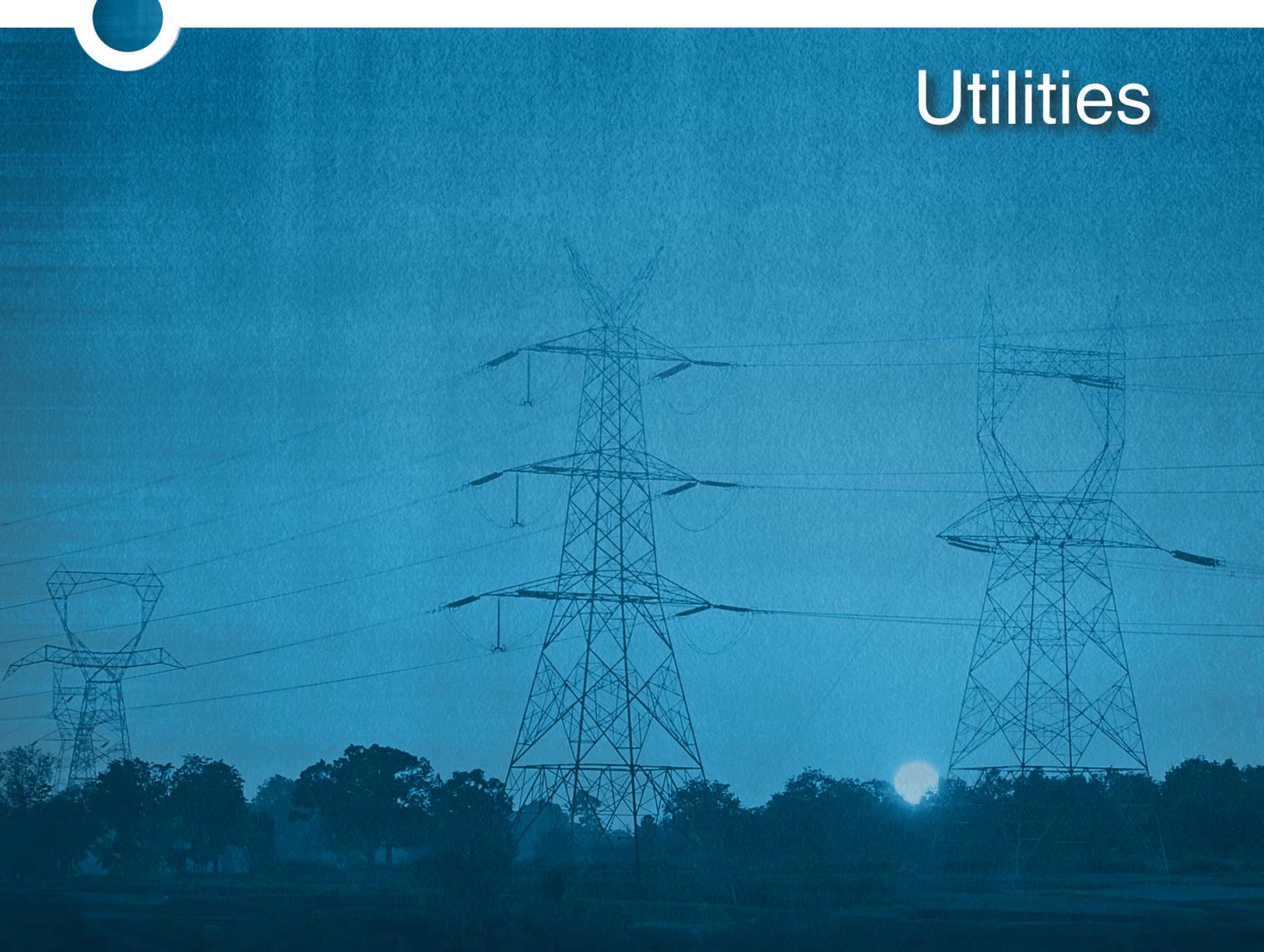
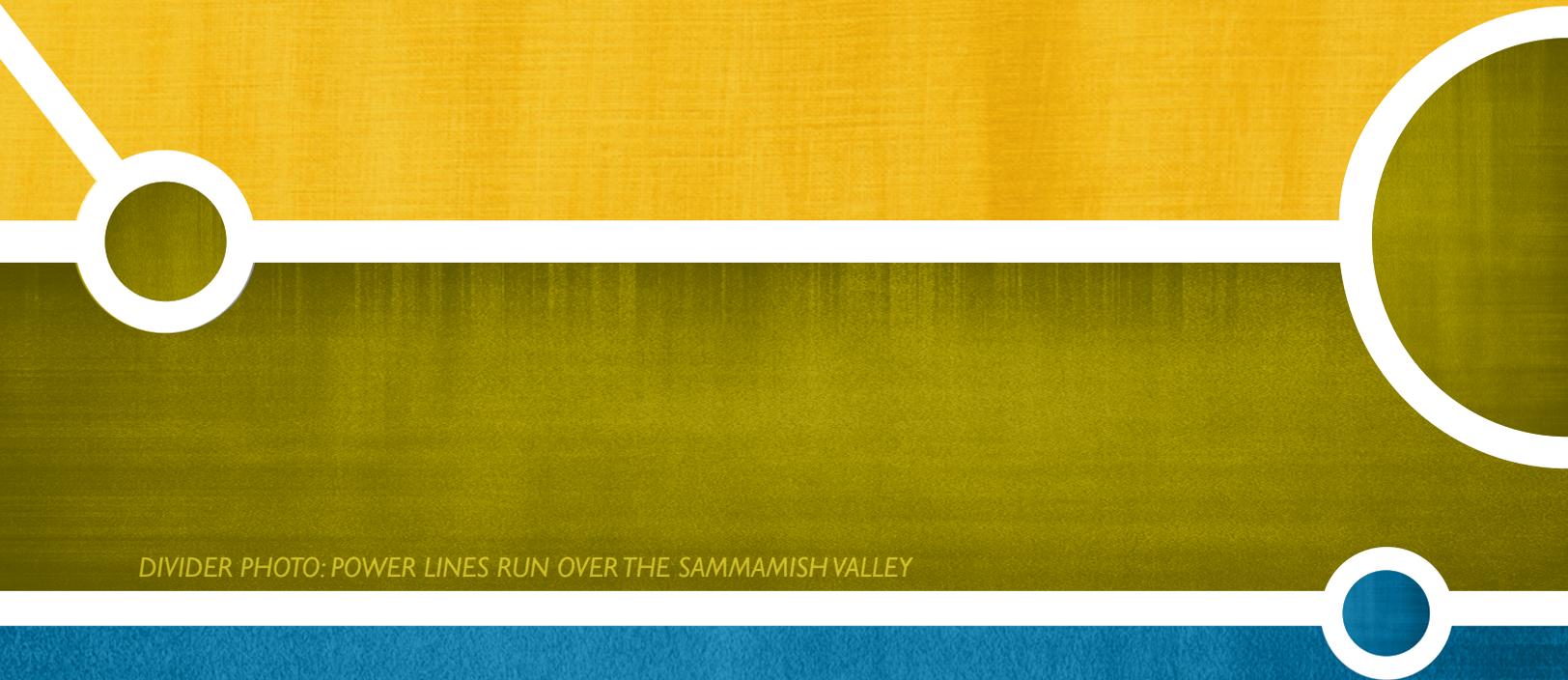




Utilities





DIVIDER PHOTO: POWER LINES RUN OVER THE SAMMAMISH VALLEY

in fountains
and pools,
on streetlit
summer nights.

Future Vision for Redmond: Utilities

The planning and placement of utilities in Redmond has supported the community's vision for the location and amount of growth.

Utility planning for future annexation areas and higher growth areas such as Downtown and Overlake has advanced the vision. The City provides certain utilities in support of the desired location and pace of growth. For those utilities provided by private companies, the City has ensured sufficient area is available to locate such facilities and provided a reasonable regulatory climate.

Utility planning has contributed to a high quality of life for Redmond residents and businesses by ensuring efficient utility delivery.

Communications facilities are keeping up with changes in technology. Conservation and protection of existing resources has ensured a continued supply of clean water and energy.

Proper utility planning has also protected Redmond's natural environment and resources.

Upgrades to the sanitary sewer system have eliminated many septic systems, thereby controlling contaminants released into the environment. The City has protected the natural environment by developing stormwater systems to prevent or reduce excess stormwater runoff, by designing and upgrading systems and plans to prevent damage to the environment, by fostering conservation operationally and by implementing low-impact development practices.

Organization of This Element

A. General Utility Policies

B. Water

C. Sewer

D. Stormwater

E. Solid Waste

F. Energy

G. Telecommunications

H. Hazardous Liquid Pipelines

A. General Utility Policies

Adequacy and Phasing of Facilities

The City of Redmond provides a variety of utility services, including water, sewer and stormwater. Investor-owned private utilities, such as solid waste removal, cable, gas, electric and telecommunications, serve the City under franchise or other agreements.

Availability of utilities is an important factor considered by developers when deciding where, when and whether to build. Having adequate utilities

is also very important to people who live or work in Redmond. Therefore, land use and utility policies can work together to help achieve Redmond's vision for the future of the community.

To encourage annexation, public utilities are generally not extended beyond the city limits. However, City services will be allowed outside the city limits to address health and safety issues or to serve areas where previous agreements include the area in the Redmond service area. If service is extended to rural lands due to service agreements, design of the systems must be rural in nature to prevent urban sprawl.

- UT-1** **Ensure that adequate public utilities and facilities are planned for, located, extended, and sized consistent with the planned growth described in the Goals, Vision and Framework Policies; Annexation and Regional Planning; and Land Use Elements.**
- UT-2** **Design and maintain public utility facilities to meet service standards identified in the Capital Facilities Element and corresponding functional plans.**
- UT-3** **Encourage the use of innovative technologies to:**
- Provide and maintain utility services;
 - Reduce the negative impacts of additional utility service demands;
 - Improve the existing service; and
 - Reduce, where appropriate, the overall demand on utility systems.
- UT-4** **Prevent extension of City-provided urban utilities to rural areas outside the Urban Growth Area except to meet State Department of Health or other applicable health, safety and welfare codes. Design such extensions to rural standards and do not condition the extension with other urban development**

standards, such as street widening, sidewalks or street lighting.

- UT-5** **If utility extension to an unincorporated area becomes necessary and immediate annexation is not possible per Policy A-10 (Annexation and Regional Planning Element), condition extension with an agreement to annex in a timely manner and an agreement to design the extension to City development standards.**
- UT-6** **Conduct City operations in a manner that leads by example through activities, such as recycling, water conservation, energy conservation and low-impact development processes whenever possible.**

Economic Considerations

In order to balance capital expenditures with revenues and still maintain established service standards, new development will have to pay for the portion of facility improvements related to its level of demand on the system. In this respect, both development money and City funds have a role in building the City's capital infrastructure.

There are cases where one development occurs prior to another and is not adjacent to existing infrastructure. The new development may extend transmission pipes across the frontage of nondeveloped properties and incur the cost of that extension in order to develop their parcel. Reimbursement agreements have been a method that Redmond has used to employ equitable cost sharing for development costs. These provide for a reimbursement to the original developer of costs associated with that portion of the line that is later used by another development. This is one way of maintaining the concept of fair share financing.

In limited cases, public utilities may be extended outside the city limits. However, it is more costly to provide long-term, low-density service. Public utilities presently fund improvements from revenues. If, in

the future, general taxes were to be used to fund infrastructure, properties outside the city would benefit from the infrastructure without paying those taxes to fund it. Equity can be established through a differential rate structure or differential connection fees to ensure that city residents are not subsidizing the extension of services outside city boundaries.

Right-of-way acquisition and installation of facilities are also factors in the cost of utilities. Coordination of facility planning can reduce those costs in several ways. For instance, if utilities are notified of roadway construction and repairs, they may be able to place or upgrade lines or pipes at the same time, or several utilities may be able to use the same trench. Right-of-way acquisition cost could be shared where such right-of-way would serve joint uses.

UT-7 Require development to pay for or construct the growth-related portion of infrastructure needs.

UT-8 Create equity in financing of capital facilities among city residents and those outside the city by reflecting the full cost of providing service outside city limits; for example, in the Novelty Hill service area.

UT-9 Promote the efficiency of utility placement both in cost and timing through methods such as the following:

- Collocate public and private utilities in shared trenches or utility corridors, provided that such joint use is consistent with limitations as may be prescribed by applicable legal and safety considerations;
- Coordinate facility planning so that utilities may locate in transportation corridors and other dedicated rights-of-way;
- Provide timely notice to utilities or coordinate with them when the construction or repair of existing and new roadway, bridges or sidewalks is anticipated;
- Provide a reasonable regulatory climate,

recognizing that utilities provide a critical service to the community;

- Provide expeditious permitting, recognizing that avoiding utility project delay can minimize service disruptions and associated costs for residents and businesses;
- Design new public infrastructure to allow for projected future utilities that may be placed within those facilities at a later time; and
- Encourage joint use of utility corridors for utilities, recreation and appropriate nonmotorized connections.

UT-10 Determine utility infrastructure necessary for a given development concurrently with site plan entitlement.

Environmental Considerations

Redmond has many natural features, such as fish spawning creeks, open space and forested areas. Minimizing utility intrusion into these areas is a means of protecting these important assets by preventing initial destruction of habitat for installation. When utilities are allowed to build in wetlands, periodic maintenance will require intrusion and constructed access into sensitive areas and may disrupt wildlife during critical reproductive periods. Utility corridors often need to be free of vegetation for maintenance purposes. Similarly, sewage or stormwater lines that are not carefully located, designed and constructed can create undesirable environmental impacts.

Placing utilities underground prevents the need to prune trees and shrubs, which can be detrimental to the plant and often result in oddly shaped plants. Undergrounding also can be more aesthetically pleasing. Though undergrounded facilities may not be readily accessible for maintenance, they can reduce the incidence of power and telecommunications loss due to events, such as storms and auto/utility pole accidents, as well as protect the public from fallen lines. Above ground facilities can be designed to be compatible with or to enhance an area. Examples include Well No. 4, the King County York Pump Station at Willows and NE 124th Street, and the SE Redmond Water tank.



Water tank on Education Hill



Trailhead kiosk

UT-11 Balance the need for provision of utilities at a reasonable cost with the need to protect the environment and natural resources.

UT-12 Design, locate and construct facilities to minimize adverse impacts to the environment and to protect environmentally sensitive areas. Take into account both individual and cumulative impacts. Minimize impacts through actions such as:

- Using construction methods and materials to prevent or minimize the risk of overflows into watercourses and water bodies;
- Locating utility corridors in existing cleared areas;
- Locating utility facilities and corridors outside of wetlands;
- Minimizing crossings of fish-bearing watercourses;
- Using biostabilization, riprap or other engineering techniques to prevent erosion where lines may need to follow steep slopes; and
- Minimizing corridor widths.

UT-13 Require underground installation of all new utility distribution lines, except where underground installation would cause greater environmental harm than alternatives or where the Washington Utilities and Transportation Commission tariff structure is not consistent with this policy. Consider new technologies such as wireless transmission as they become available.

UT-14 Promote the undergrounding of existing utility lines by means such as:

- Requiring undergrounding of utility distribution lines or provide for future undergrounding as a condition for development projects,
- Undergrounding utility distribution lines or provide for future undergrounding as street projects occur,
- Funding undergrounding through a capital improvement program or through formation of a local improvement district, and
- Requiring individual service lines to be undergrounded when significant site improvements are made.

UT-15 Require reasonable screening or architecturally compatible design of above ground utility facilities, such as transformers and associated vaults. Promote high-quality design of utility facilities through measures such as:

- Use of varied and interesting materials,
- Use of color,
- Additions of artwork, and
- Superior landscape design.

B. Water

Sources of Supply

Redmond provides water service to most areas within the city limits, the Novelty Hill Urban Area to the east, and some properties outside the city. The City's water supply comes from its wells and the Cascade Water Alliance (CWA). CWA supplies water from Seattle Public Utilities (SPU) through connections to SPU's Tolt pipeline No. 2; Tolt Tie-line; and the Tolt Eastside Supply Line. Redmond operates facilities jointly with the cities of Bellevue and Kirkland. A number of water purveyors service the areas surrounding the city, including Bellevue, Kirkland, Woodinville Water District, Northeast

Sammamish Sewer and Water District, Union Hill Water Association, and Sammamish Plateau Water and Sewer District.

Future water supply demands will be met by the City through wholesale purchases from CWA and from Redmond's wells. To meet the growing needs of its members, CWA will continue to pursue additional sources of water supply. CWA has purchased Lake Tapps as a future water supply resource. Redmond's well system draws from a shallow aquifer and is susceptible to contamination, especially as urbanization of the Aquifer Recharge zone continues. It is imperative to maintain the water quality of the well source. Redmond's Wellhead Protection Program helps to preserve the resource. In addition, reducing water use through conservation measures lessens the demand for new supply.

The water service area is shown in the City's adopted Water System Plan, together with an inventory of water facilities.

UT-16 Continue to utilize, protect and sustain the Redmond well system to maximize the efficiency of the system. Ensure water is treated to meet state and federal drinking water regulations.**UT-17 Protect groundwater sources by maintaining and monitoring a Wellhead Protection Program which guides:**

- Land use decisions,
- Development regulations,
- Stormwater facility requirements,
- Coordination with other agencies, and
- Other measures necessary to protect Redmond's well system.

UT-18 Participate with the Cascade Water Alliance to acquire additional sources of supply for future needs.**UT-19 Reduce average annual and peak day water use by participating**

in Cascade Water Alliance's conservation programs.

Facilities

Standardization of design ensures facilities will be compatible and have a reasonable economic life. There are known and accepted system designs which may be less costly to build, less costly to operate or more reliable, such as looped systems and gravity feed systems. If the City maintains a set of standards, developers can be assured of knowing the standards prior to design, and the public can be assured that the system is designed as an integrated whole. System inter-ties allow cooperation between systems other than Redmond's to provide adequate flow in emergency situations. This reduces the need to build larger and more expensive facilities. Defining service standards offers a way of measuring adequacy and safety performance against community standards.

- UT-20 Design water delivery and storage systems to provide efficient and reliable service, to balance short- and long-term costs, and to comply with state and federal regulations through methods, including but not limited to:**
- Use of gravity feed whenever feasible,
 - Development of a looped system, and
 - Standardization of transmission and distribution facility sizing and materials.
- UT-21 Require new development to construct water system improvements necessary to serve the development and to provide a reliable integrated distribution system.**
- UT-22 Maintain adequate storage facilities to meet equalizing and fire demand volume and emergency supply.**
- UT-23 Pursue the creation of emergency inter-ties with adjacent purveyors.**

Redmond is dependent upon City wells to provide a water source. Preventing and reducing the

penetration of the aquifer by numerous individual wells helps to ensure the integrity of City wells against both excessive draw and contamination.

- UT-24 Prohibit the creation of new water systems within the City of Redmond to ensure that Redmond is the primary provider of water service. Facilitate the City being the sole provider by encouraging the connection to City water for those properties on existing private well systems.**
- UT-25 Require connection to the City water system for all new development permitted by the City.**
- UT-26 Require connection to the City water system for existing uses when development, such as a short plat, subdivision or other significant land use action, occurs to that property.**

C. Sewer

Facilities

A majority of Redmond is served by a sanitary sewer. However, there are still a few areas which have on-site disposal systems such as septic tank systems. Most of the proposed annexation areas lack sewer. A proliferation of septic systems can reduce the health and safety of the community. Therefore, Redmond should require or encourage connection to the sanitary sewer.

Redmond needs to ensure standardization of sewer facility design so that facilities will be compatible, less costly and have a reasonable economic life. Standards which include system designs such as gravity flow are less costly and more reliable and therefore should be used. Defining service standards offers a way of measuring performance against community standards. Standardization of design and level of service standards also assists the developer in design and cost calculations.

Regional treatment facilities have replaced local ones in the Seattle Metropolitan area due to environmental reasons and economies of scale. Regional facilities have been able to ensure higher levels of treatment for sewage before release back into the environment. This system will likely be the system of choice for some time into the future. King County, which provides wastewater treatment facilities, currently has sufficient capacity to meet Redmond's present needs and capacity to serve future demand has been added by construction of the Brightwater Wastewater Treatment Plant.

The sewer service area is shown in the City's adopted General Sewer Plan, together with an inventory of sewer facilities.

UT-27 Ensure that the City of Redmond is the primary provider of wastewater service within the city limits.

UT-28 Require connection to the City wastewater system for all new development and for existing uses when development, such as a short plat, subdivision or other significant land use action, occurs to that property. Extend a waiver in limited circumstances where the economic impact of connection is high and there is no public safety concern.

UT-29 Design wastewater systems to provide efficient and reliable service while balancing short- and long-term costs. Use gravity collection whenever feasible.

UT-30 Require development to construct sewer system improvements necessary to serve the development and to use design and construction standards for wastewater facilities that:

- Facilitate long-term operation and maintenance at the lowest reasonable cost,

- Meet or exceed the State Department of Ecology standards,
- Comply with state or federal regulations, and
- Provide a reliable integrated collection system.

UT-31 Support a regional approach to wastewater treatment by contracting with King County for transmission and treatment of Redmond's wastewater.

UT-32 Adopt or allow new technologies for waste disposal if they prove equal or superior to existing methods.

Some areas in Redmond are currently served by septic or other on-site wastewater disposal systems. As urbanization continues, these systems become less viable. Sometimes individuals do not properly pump and maintain their systems. To compensate for poor soil conditions, systems more frequently are incorporating mechanical pumps which require periodic maintenance and flow regulation. Some systems are located in Critical Aquifer Recharge Areas (CARA) and pose potential contamination issues to Redmond's groundwater supply. Generally, soil type and saturation levels in this area are not well suited to these systems. It is necessary to prevent the proliferation of new systems and to convert the existing on-site systems to sewer in order to protect the public health and safety.

UT-33 Require existing development to connect to the City wastewater collection system when on-site systems have failed and sewer facilities are available.

UT-34 Encourage conversion from on-site wastewater disposal systems as sewer lines become available so that all septic systems in the city are eventually eliminated.

UT-35 Prohibit stormwater connections to the sanitary sewer system and

require separation of stormwater and sewer systems except in cases where the public health and safety calls for such connections.

D. Stormwater

Redmond's stormwater management programs focus on stormwater runoff, groundwater recharge, surface waters, and riparian (water-related) habitat. Programs address basic conveyance of runoff, flood hazard reduction, water quality issues, riparian habitat protection, and protection of groundwater quality. It is especially important that new development or significant redevelopment effectively manages stormwater with the appropriate facilities to ensure the public's protection.

UT-36 Maintain, use and require development to use stormwater design and construction standards that:

- Address rate of discharge, water quality and method of storm drainage;
- Incorporate the principles of "Best Management Practices";
- Address methods to control runoff during construction to limit erosion, siltation and stream channel scouring; and
- Minimize adverse impacts to natural watercourses.

UT-37 Evaluate the feasibility of regional detention and treatment facilities and support their use where the concept proves feasible.

UT-38 Ensure that the design of stormwater management facilities approximates predevelopment levels of infiltration and that they are designed to provide recharge in those areas where recharge is appropriate.

UT-39 Encourage open channel drainage systems, natural or man-made, whenever feasible through

retention of existing systems and the development of new ones.

Stormwater facilities can serve multiple purposes. They not only allow recharge and support plant life, but they can be incorporated into the landscaping design as an aesthetically pleasing element. They can also provide a park amenity, comprise a part of a streetscape, and can lower building temperatures when incorporated into roof gardens. Allowing stormwater facilities to fulfill some of the open space requirement increases the land available for actual development, reducing the burden on the developer, while still meeting the intent of open space requirements.

UT-40 Allow stormwater retention/detention facilities to qualify towards fulfilling open space requirements. Tie the percentage allowed to the intensity of use and density: a smaller percentage for low-density residential graduating to a higher percentage for high-density residential and nonresidential.

UT-41 Encourage incorporation of natural systems into building designs to minimize runoff. Examples of such designs are sod roofs or rainwater capture to provide on-site landscape watering.

UT-42 Pursue the development of street standards that incorporate natural systems into the design of the streets. Examples of this are swales planted with native vegetation, such as the Street Edge Alternative (SEA) project, a natural drainage roadway in Seattle's Broadview neighborhood.

There are a number of mandates for groundwater management plans. Even without these mandates, groundwater management is important for Redmond because the City relies on groundwater for a water supply source. Drainage basins extend across city limits and as such require cooperation to manage.

UT-43 Use the 2001 Western Washington Stormwater Management Manual with adjustments to suit local conditions when conditioning development or designing systems.

UT-44 Cooperate and participate in groundwater management and basin plans with surrounding jurisdictions and implement policies where local action is feasible.

Private maintenance of stormwater facilities such as private oil separators is not always performed or is performed improperly. If these systems are not properly maintained, they become dysfunctional, defeating the purpose of requiring such systems.

Ground and surface water management must deal with this; with setting standards for storage, disposal and accidental spillage of hazardous materials; and with preparing for emergency responses to spills. Spill response involves police, fire and transportation, as well as City maintenance or inspections crews. If these staff work together to develop standards and regulations for storage of hazardous materials and an emergency response plan to deal with contamination emergencies, staff time can be reduced by coordination, a wider range of expertise is available, and plans or regulations can address multiple needs.

UT-45 Maintain and enforce minimum operation and maintenance standards for publicly and privately owned stormwater systems as set forth in the Stormwater Plan and the Municipal Code.

UT-46 Coordinate publicly and privately owned stormwater system maintenance activities in accordance with established standards.

UT-47 Consider upgrading existing retention or detention facilities when new technologies prove more efficient or when upgrades such as attractive

fencing or landscape materials can add amenity value to the neighborhoods.

UT-48 Develop and implement regulations and procedures concerning the storage and use of hazardous materials in coordination with other City departments.

UT-49 Develop and implement an emergency response plan for responding to surface and groundwater contamination emergencies to protect Redmond wells, coordinating among affected City departments.

UT-50 Follow standards concerning street waste and decant facility management procedures found in the Redmond Stormwater Facility Plan and the Municipal Code.

E. Solid Waste

Solid Waste Planning

Through an interlocal agreement, King County prepares comprehensive solid waste plans on behalf of the City to ensure that the community has access to safe, reliable, efficient and affordable solid waste handling and disposal. Garbage and recycling pickup and removal is provided by a private company under a contract with the City. Garbage and recycling subscriptions are voluntary for residential and commercial customers; however, the cost for residential curbside recycling is included as part of the residential garbage fee.

Whether pickup is by private carrier, individual or is self-hauled by businesses, the waste stream portion is taken to a transfer station and then hauled to the King County Cedar Hills regional landfill. There is adequate landfill capacity until 2018. Several factors make it difficult to predict future capacity for solid waste disposal: community members' changing views with respect to waste; technologies of the solid waste

industry; economic trends; state environmental, solid waste and hazardous waste laws; and the regional nature of landfill and recycling operations.

UT-51 Continue to coordinate with King County on regional hazardous and solid waste issues, such as product stewardship and the “wastemobile,” waste studies, and construction and demolition debris.

Solid Waste Management

The Washington State Solid Waste Reduction Act and the Hazardous Waste Management Act include mandates on reduction of the waste stream, education and recycling. A decline in waste generation typically means that the amount of materials disposed, both garbage and recycling, has been reduced. Even with increased recycling and waste prevention, recent studies indicate that about 60 percent of materials disposed in the landfill could have been recycled.

UT-52 Provide solid waste and recycling collection services within the city, using contract hauling, or whichever method is most economical and efficient for both residents and businesses, and uses sustainable practices.

UT-53 Continue public education programs on solid waste management, recycling, waste reduction, and the proper storage and disposal of hazardous wastes.

UT-54 Enforce codes to ensure adequate and conveniently located space for garbage and recycling collection containers in commercial, multifamily and mixed-use buildings

City offices can serve as a good example to the community in waste reduction by recycling and purchase of recycled goods. The City also sponsors special recycling days for items which are not easily hauled with curbside service but have recycle or

reuse capability. King County sponsors special days for the collection of hazardous substances.

UT-55 Support recycling through such means as:

- Composting food waste from kitchen and lunch areas, yard waste from landscaping practices and manure from Farrell McWhirter Farm;
- Placing disposal containers in convenient locations;
- Using incentive programs to encourage recycling of materials;
- Purchasing City goods containing recycled materials; and
- Encouraging procurement of recycled-content products by residents and businesses.

UT-56 If solid waste reduction and recycling goals are not met, consider implementing mandatory programs which would further sustainability goals by minimizing impact to the Cedar Hills landfill and preventing cost increases associated with securing alternative waste disposal sites.

UT-57 To prepare for potential emergencies, work with state and county agencies to coordinate a debris management plan so that materials can be recycled and disposed of properly.

F. Energy

Relation to Redmond’s Sustainability Principles
A variety of energy sources are used in Redmond, each playing a vital role in the City’s infrastructure. Energy directly contributes to Redmond’s economy and community character, residents’ quality of life, and the experience for Redmond visitors. Energy also has an environmental dimension; how the City, residents and businesses consume energy in buildings, processes

and vehicles can influence the environmental impacts associated with energy production. Efficiencies in energy distribution, such as smart grid technology, and energy consumption, such as low-voltage LED lighting, make it possible to reduce energy demand without compromising benefits.

Moreover, clean energy, such as wind and solar, and alternative approaches, such as electric vehicle charging, can potentially increase Redmond's energy supply in an environmentally sustainable manner. Pursuing these options can enhance our economic security and prosperity while minimizing environmental risks associated with traditional energy sources.

Because energy is so intimately tied to Redmond's economy and quality of life and because environmental impacts of energy consumption have local, regional and global implications, sound energy practices are prime contributors in furthering Redmond's sustainability principles.

Service Overview

The availability of energy infrastructure can influence developers' decisions to locate particular land uses. Conversely, demands resulting from land use decisions may influence the need for energy utilities to support the land use. It is important to link the provision of energy with the Land Use Plan.

The City can take steps to promote efficient use of energy resources. Examples of such steps include land use planning that can reduce vehicle trips or encourage transit, using building codes to promote efficient heating/cooling, encouraging common wall construction, adding street trees which cool asphalt, and maintaining height codes which protect solar gain. Less conversion of fossil fuels to energy or use of cleaner, more efficient fuels can also lead to cleaner air and reduced cost to individuals and society. It is also prudent to encourage conservation and efficient land uses to reduce the need for additional facilities which can result in higher utility costs.

Electrical energy and natural gas is provided to the City of Redmond and surrounding communities by Puget Sound Energy (PSE).

UT-58 Work with energy service providers to ensure energy facility plans reflect and support Redmond's Land Use Plan and that energy resources are available to support the Land Use Plan.

UT-59 Work with energy service providers to promote an affordable, reliable and secure energy supply that increases development and use of renewable and less carbon-intensive sources, and that minimizes demand and consumption.

UT-60 Coordinate and seek to cooperate with other jurisdictions when energy transmission facility additions or improvements cross jurisdictional boundaries. Include efforts to achieve consistency between jurisdictions in permit timing.

Electrical Energy and Facilities

Redmond is served by PSE, a private electrical utility whose operation and rates are governed by the Washington Utilities and Transportation Commission. PSE is part of a western regional system, which means electricity is produced elsewhere and transported to Redmond through high-voltage transmission lines. As electricity nears its destination, the voltage is reduced and redistributed through the use of transmission substations, distribution substations and transformers. Redmond has several high-voltage transmission lines running east-west and north-south. At present, it has one transmission substation and a number of smaller distribution substations.

Map UT-1 shows the locations of major existing electrical facilities.

Map UT-2 shows proposed major electrical facilities.

Planning for electrical production and distribution is done on a regional basis. Currently the majority of electricity in the region is from hydroelectric, natural gas and coal-fired plants, and increasingly wind

generation. Future possibilities of demand reduction are also factored into the planning process through probable conservation factors.

The electrical transmission system is a utility system that fills an essential public need. Therefore, zoning should allow the siting of major transmission lines at or above 115 kilovolt capacity and substation facilities in areas where it is reasonably necessary to provide efficient service. With coordination between the utility and the City in advance of facility siting, problems of conflicting land uses may be reduced or avoided.

UT-61 Recognize the current Electrical Facilities Plan, authored by Puget Sound Energy, as the facility plan for electrical utilities serving Redmond and the vicinity. Use this plan, where it is consistent with Redmond’s land use goals, as a guide in identifying and preserving utility corridors and locating electrical facilities.

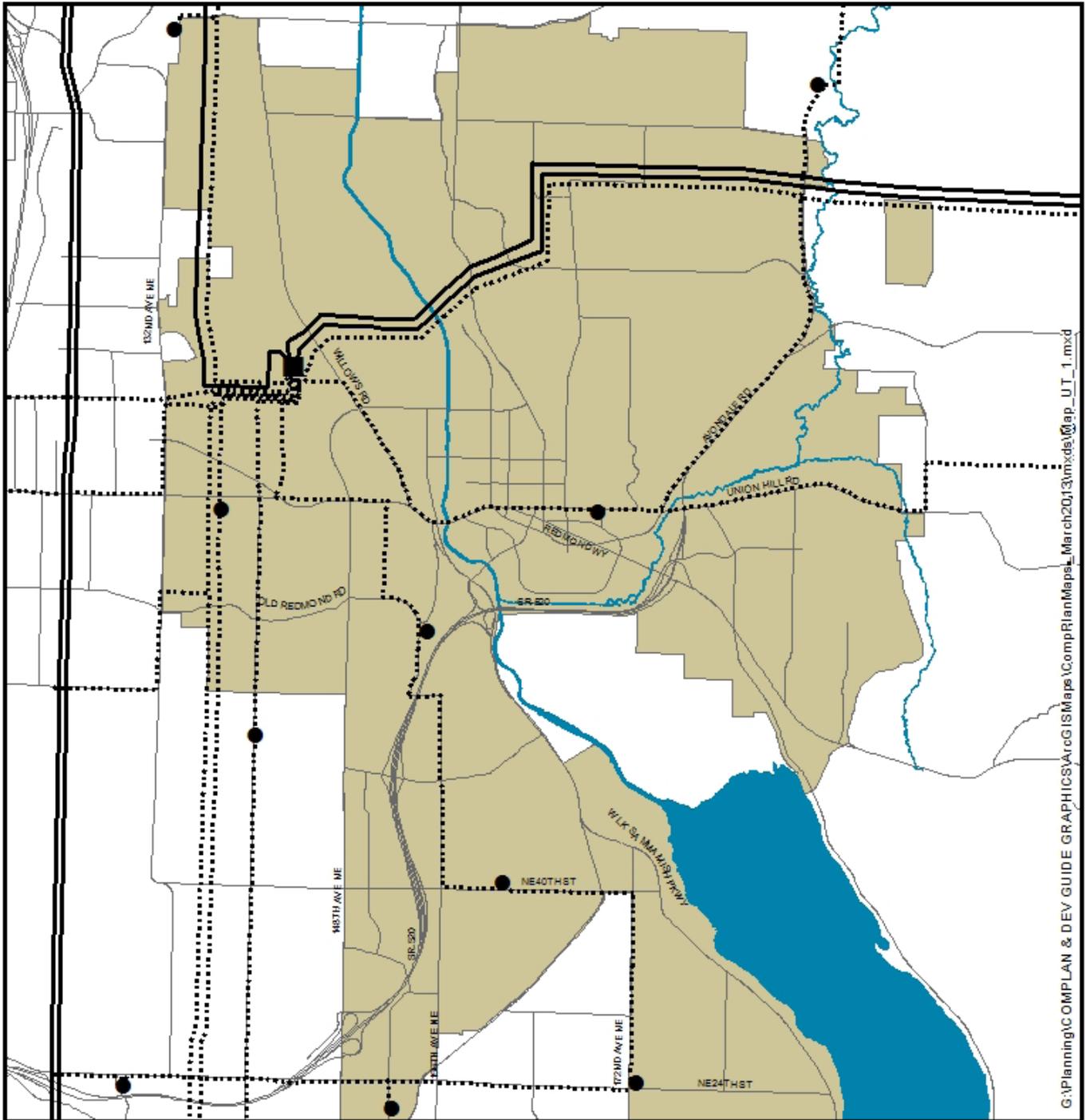
UT-62 Allow electrical utility facilities as a permitted use where appropriate to ensure that land is available for the siting of electrical facilities.



Stormwater facilities help prevent flooding and improve water quality



Redmond area stormdrain



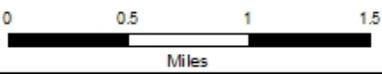
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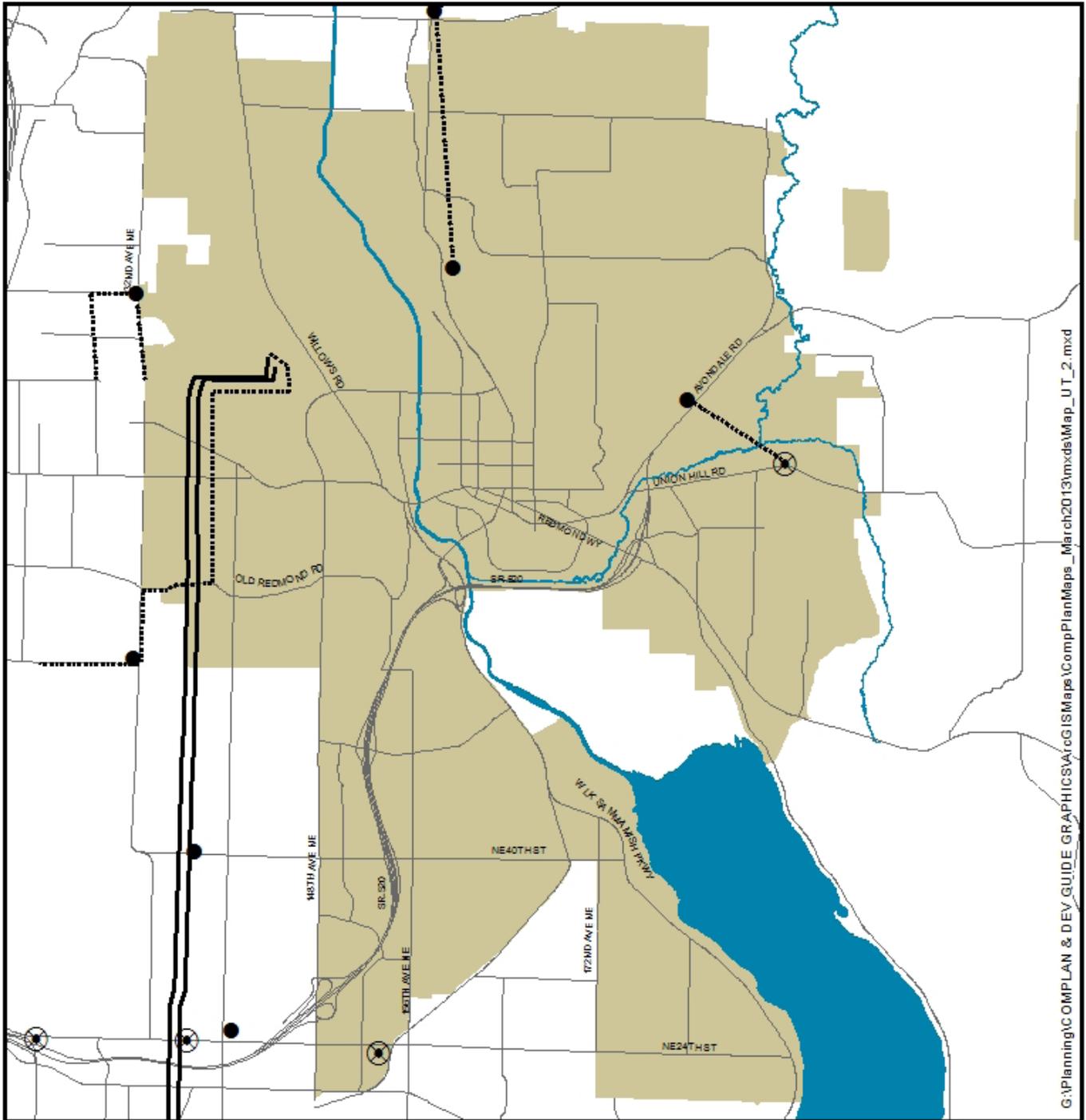
Legend

Electric Station Type	Electric Lines Size
■ Transmission	⋯ 115 KV
● Distribution	— 230 KV

MAP UT-1
Existing Electrical Facilities
 Effective: December 17, 2011

Note:
 This map depicts electrical facilities as of 2011.
 For updates or more information contact
 Puget Sound Energy.





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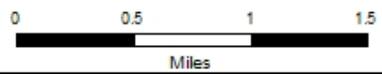
Legend

Electric Stations		Electric Lines	
Type		Size	
■	Transmission	⋯	115 KV
⊗	Transmission Switch	—	230 KV
●	Distribution		

MAP UT-2
Proposed Electrical Facilities

Effective: December 17, 2011

Note:
This map depicts proposed electrical facilities as of 2011. For updates or more information contact Puget Sound Energy.



UT-63 Coordinate with Puget Sound Energy or any successor when considering land use designations or new development in the vicinity of proposed facility locations that might affect the suitability of the designated areas for location of facilities.

Community members have a high regard for maintaining the forested appearance of Redmond. Professional arborists have expressed concern that excessive pruning around electrical lines can kill or weaken trees. While the City of Redmond values safe and reliable electrical power, which requires proper pruning and appropriate removal of vegetation, at the same time care must be taken to minimize damage to and the loss of trees. It is also preferable to reduce the use of herbicides to control such growth as this can contaminate surface and groundwater.

UT-64 Encourage pruning of trees to direct growth away from overhead utility lines, education about proper placement and choice of landscape plants, and encourage phased replacement of vegetation located improperly in the right-of-way. To the extent possible, maintain ecological functions and values when managing vegetation located in critical areas.

UT-65 Ensure that pruning of trees necessary for safe and reliable utility service is performed in an aesthetic manner to the greatest extent possible and performed according to professional arboricultural specifications and standards.

UT-66 Discourage the use of herbicides to control vegetative growth around utility facilities, encourage alternative methods such as mowing or selective treatment, and encourage more environmentally friendly herbicides.

There have been a number of studies that have examined possible health effects of extremely low-frequency (ELF) electric and magnetic fields (EMF) which are generated by power lines, household wiring and appliances. Many are statistical incidence studies, not controlled laboratory studies. Even with controlled laboratory studies, results have been mixed and do not clearly point to a connection between ELF/EMF and health effect. Since some evidence indicates there may be an effect on the body but at present the effect is not sufficiently linked with a particular result, the risk remains undefined.

Facility siting and design standards, many of which are presently used by electrical utilities, can reduce exposure to ELF/EMF. Transmission line configurations affect field strength. Reverse phasing, a method of running current in opposite directions, may result in magnetic field reductions. Magnetic field strength also falls off dramatically as distance increases. Any of these known and acceptable low-cost methods can be used to reduce ELF/EMF exposure without placing an undue burden on the electrical provider.

UT-67 Require designs that incorporate known and accepted low-cost technological methods of reducing magnetic fields or the exposure to them when siting high-voltage electrical facilities until further research provides more information on the health effects of electromagnetic fields. Methods may include:

- Line configurations that reduce field strength,
- Sufficient right-of-way widths, and
- Sufficient height of lines from the ground for high-voltage transmission facilities.

UT-68 Periodically review the state of scientific research on ELF/EMF and modify policies and regulations, if warranted, by changing knowledge or if new state or federal regulation requires changes.

Electrically powered buses and cars are available in the market. These vehicles cause no emissions harmful to air quality at the point of vehicle usage, although

there may be increased environmental effects at the location where the electrical energy is generated. The change in technology or the use of existing electric vehicle systems will result in infrastructure changes. Redmond should continue to adapt to newer and cleaner technologies as conditions warrant.

UT-69 Implement electric vehicle charging stations infrastructure to help encourage the deployment of electric vehicles, using public and private facilities throughout the central Puget Sound region.

UT-70 Transition the City’s fleet away from fossil fuels to alternatives such as electric and hybrid vehicles.

Natural Gas Energy and Facilities

PSE, a private utility that provides natural gas service to six counties within the Puget Sound region, is the provider of natural gas within Redmond and the surrounding annexation area. PSE purchases natural gas from a number of sources; the natural gas is transported to the Redmond area via a high-pressure pipeline system operated by Williams Northwest Pipeline and delivered at the Redmond Gate Station. The pressure is reduced, an odorant is added for safety, and the gas is metered. The pressure is further reduced at limiting stations, district regulators and at individual meters. Existing delivery systems within Redmond have enough capacity to meet current demand.

Map UT-3 shows the location of natural gas facilities.

Direct heating by burning natural gas is more efficient than certain types of electrical heating because there is a loss of energy during production and transmission of electricity. Redmond can encourage energy efficiency by facilitating conversion to natural gas through such efforts as a timely and simplified permit processing and reasonable permitting fees.

Some personal and mass transit vehicles are designed to be fueled by natural gas, and there is a potential for conversion of other types of vehicles to natural gas. These vehicles give off substantially cleaner emissions, and their use would improve air quality. In addition, natural gas delivery technologies do not use underground storage tanks, thus avoiding an environmental concern associated with other fossil fueled vehicles.

UT-71 Encourage and provide opportunities to convert existing homes or businesses to natural gas from oil and less efficient electric space and water heating equipment.

UT-72 Facilitate efforts to develop a natural gas fuel infrastructure.**This may include:**

- Updating regulations to address this technology,
- Training fire and police personnel so they are well versed with this technology,
- Taking leadership or cooperating with other jurisdictions in building a natural gas fueling facility for government vehicles, and
- Identifying areas for the potential siting of a biomass production facility.

Alternative Energy

Energy sources that provide an alternative to carbon-based fuels provide many benefits. Renewable energy can create new jobs and promote economic development. Alternative energy can provide a hedge against rising fuel prices and add to the reliability of the electricity grid. Solar and wind technology are emission free, making them attractive from an environmental standpoint, since use of carbon-based fuels contribute to climate change. Additionally, applications of renewable energy (and energy conservation) can enhance the disaster resiliency of the community and individual structures.

PSE is incorporating wind generation technology to meet future demand and is assessing the use of other alternative energy generation technologies such as solar. There is also a possibility that biomass production (the burning of methane or organic products to produce energy) may become economically viable in the long-term future.

Present technologies are producing and using methane from sewage treatment and landfills. A greater percentage of the natural gas source may come from renewable resources as technology advances the use of biomass production.

UT-73 Promote, support and increase the use of clean alternative energy by:

- Advocating for the development of renewable energy sources;
- Facilitating development and use of innovative technologies, such as

alternative fuels and on-site renewable energy; and

- Providing incentives for development that incorporates renewable energy.

Energy Efficiency

Awareness of energy conservation practices can help make a positive impact by allowing individuals and businesses to be more efficient in their energy consumption. Home, school, office, government and industrial environments all benefit from cost-saving and energy-saving innovations. Studies show that energy conservation at the local level has been quantified as tons of air pollutants avoided and dollars saved. This can be accomplished in the home by using energy-efficient lighting, programmable thermostats, or by simply turning lights off when leaving a room.

Driving eco-friendly cars, walking and using transit are other ways to save energy. For businesses, it could mean conducting energy audits and reviewing operational procedures or processes to ensure efficient energy consumption that maximizes energy cost savings. It could also mean purchasing only Energy Star equipment and appliances for business operations. Conserving energy allows the efficient consumption of energy resources. The community benefit is less contamination of the land, water and air, and support for a sustainable lifestyle.

UT-74 Support an affordable, efficient and secure energy supply that increases the development and use of renewable and less carbon-intensive sources and that minimizes demand and consumption.**UT-75 Promote decreased energy consumption and enhanced energy efficiency throughout the City's building stock.****UT-76 Explore methods to increase the opportunities for individuals to realize greater energy efficiencies in their use of the built environment.**

UT-77 Promote the development of energy management technologies as part of efficiently meeting the City’s energy needs through techniques, such as benchmarking buildings for energy performance, optimizing input energy requirements, and initiating incentive programs for net-zero energy structures.

- Encouraging building design with natural solar gain for heating;
- Promoting energy-efficient design, including siting, building envelope and use of natural light; and
- Providing tools that help residents and businesses quantify the effectiveness of their conservation efforts.

UT-78 Support economic development strategies that emphasize recruitment of businesses involved in renewable and clean energy.

UT-79 Develop an energy conservation awareness program that:

- Educates residents on the benefits of energy conservation;
- Educates the public on the energy benefits of having trees and planting trees;
- Educates business owners and employers in long-term savings from energy efficient investments; and
- Assists businesses with identification of funding assistance for energy upgrades, retrofits and new technology.

UT-80 Reduce energy consumption through actions by the City of Redmond and encourage residents and businesses to conserve energy through measures such as:

- Supporting trip-reducing or transit-oriented land use;
- Supporting community use of alternative fuel vehicle;
- Using alternative-fuel vehicles;
- Requiring installation of street trees and parking landscape;
- Allowing clustering with common wall construction;
- Encouraging the use of “Green” roofs or reflective roofing materials that reduce the heat island effect;

G. Telecommunications

Inventory of Conditions and Future Needs

Telephone service for Redmond is provided by Frontier and Comcast Communications and wireless phones service by a number of different providers. Cable services are provided by Comcast. Telephone facilities consist of transmission lines and switching facilities. Cellular facilities consist of switching offices and low-powered antennas which transmit and receive radio signals. Cable facilities consist of microwave relay sites and a branching trunk system of overhead and buried cable.

Frontier and Comcast have facilities in place to provide land line service to all Redmond households and businesses. Future capacity is more demand driven in nature due to regulations governing investment recovery. Cellular technology planning is demand driven also. The capacity to serve is presently governed by the ability to finance and place new infrastructure, primarily antennas, often associated with large poles.

Map UT-4 shows the location of telecommunications facilities.

Facilities

The telecommunications industry is changing rapidly from fiber optics to digital technology. The distinction between phone service, data transmission and video transmission has become blurred. For residents and business, Redmond should encourage new technological advances, while still considering the implications of continuing availability of basic communication services to all persons.



Redmond promotes a variety of telecommunications



Wifi hotspots help people connect at local businesses

UT-81 Work with telecommunications providers to ensure facility plans reflect and support Redmond’s Land Use Plan and that resources are available to support the Land Use Plan.

UT-82 Negotiate mutually beneficial franchise contract conditions that support the delivery of cost-effective services desired by Redmond residents and businesses.

UT-83 Promote a wide range of telecommunications options. This can include:

- Making City facilities available for placement of antennas,
- Treating attached cellular base antennas as other building or rooftop appurtenances, and
- Support website communication between the City and its residents and customers.

UT-84 Reconsider and update, as appropriate, existing regulation of satellite dishes as newer technology leads to downsizing of the dish antennas.

The changing regulatory framework and rapidly advancing communications industry have created new pressures to find appropriate locations for the placement of antennas. Because these systems operate on line-of-sight communications, mounting at the highest point in a given area, which could be a publicly owned water tank or large telecommunications tower, is often necessary. To reduce visual impacts, the City can encourage use of existing structures and shared or cluster facilities.

UT-85 Prioritize City emergency and operating communications over private telecommunications in the case where a private telecommunication service desires use of a public building or facility to avoid conflicts between signal interference and mounting space.

UT-86 Acknowledge the importance of citizen band and amateur radio services in potential emergency situations when considering regulatory changes that would affect the operational ability of such facilities.

UT-87 Avoid the proliferation of telecommunications towers and reduce the visual impact of telecommunications equipment through such means as:

- Requiring facilities to be mounted on existing high structures such as water towers if sites are available,
- Requiring telecommunications providers to share tower facilities except in cases where the location would not be feasible due to operating parameters,
- Using paint colors or tower materials that blend with or complement the nearby area,
- Encouraging individual taller towers over multiple shorter ones,
- Requiring removal of towers no longer needed, and
- Using screening or architecturally compatible design of service boxes.

UT-88 Maintain Redmond's competitiveness in support of businesses, residents and visitors by promoting access to advanced and affordable communications technology citywide.

H. Hazardous Liquid Pipelines

Facilities, Inventory of Conditions and Future Needs

The Olympic Pipe Line Company, operated by BP Pipelines, North America, operates a 400-mile-long petroleum pipeline system from Ferndale, Washington, to Portland, Oregon. Two parallel lines, 16-inch and 20-inch, pass through the west portion of Redmond generally along the Puget Sound Energy easement. The pipelines carry gasoline, diesel and aviation fuel. Delivery lines carry products from this mainline to bulk terminals at Sea-Tac International Airport; Seattle, Tacoma, Olympia and Vancouver, Washington; and Linnton and Portland, Oregon.

The pipelines are hazardous liquid pipelines, as defined by state law. Liquid pipelines transport petroleum products much more efficiently and safely than is possible by truck. Pipeline facilities, if ruptured or damaged, can pose a significant risk to public safety and the environment due to the high operating pressure and the highly flammable, explosive and toxic properties of the transported products.

The Federal Office of Pipeline Safety (OPS) is responsible for regulation of interstate pipeline facilities and addresses safety in design, construction, testing, operation, maintenance and emergency response for pipeline facilities. The Washington State Utilities and Transportation Commission (UTC) has authority to act as an agent for OPS.

In 2000 Redmond's Fire Department established a response plan in the event of a pipeline failure. The Olympic Pipeline Response Plan includes technical information about the pipeline, potential hazards, a guide to hazardous materials scene management, emergency response and evacuation plans, and contacts and other resources.

The policies below supplement existing state regulations and the City's risk management/response plan by focusing primarily on land use measures that help minimize and prevent unnecessary risk to the public due to hazardous liquid pipelines, recognizing it is impossible to eliminate risk entirely. These policies address the risk by addressing the issues most likely to be safety concerns, such as:

- Damage to hazardous liquid pipelines due to external forces such as construction equipment, the leading cause of pipeline accidents;
- Location of land uses with high on-site populations that are difficult to evacuate; and
- Location of emergency facilities and other land uses where the consequence of the loss in the event of a pipeline failure is high.

Other actions that can be taken to ensure a higher degree of safety include early detection of potential pipeline damage or failures through adequate maintenance of the hazardous liquid pipeline corridor, neighborhood education, and working with other governments and industry representatives to seek improvements in safety measures for hazardous liquid pipelines. Although many of these provisions by their nature address uses, individuals, class of individuals or organizations located near the hazardous liquid pipeline, they are more broadly intended to protect the health, safety and welfare of the general public.

Policies to Minimize Pipeline Damage

The corridor for the hazardous liquid pipeline system through Redmond varies, but is typically about 50 feet wide and contains the pipelines and right-of-way or easements. The depth and location of the pipelines within the corridor also varies, although the lines are typically buried at a depth of less than five feet. The depth of cover over the pipelines may change over time due to erosion or other reasons. If not properly directed, on- or off-site stormwater discharge can erode soil cover over the pipelines, particularly where the pipeline is located in areas of steep slope, such as the Willows/Rose Hill Neighborhood.

External forces, accounting for 31 percent of all accidents, are the leading cause of reported pipeline releases according to OPS statistics. Damage from external forces such as construction equipment

can produce an immediate release or a scratch on a coated-steel pipeline can lead to accelerated corrosion and failure at a later time.

During development review and construction for projects in the vicinity of the pipelines, setting requirements for avoidance of damage and coordination between Redmond and the pipeline operator, Olympic Pipe Line Company, or its successor can help avoid problems. The following actions can reduce the chance of an incidence:

- Identifying the location of the pipeline corridor on site plans, plats or other construction drawings;
- Using the one-call locator service, particularly during construction on adjacent properties;
- Physically verifying pipeline locations as needed to minimize the likelihood of damage;
- Establishing and maintaining setback requirements from the hazardous liquid pipelines for new or expanded structures and other significant land disturbance; and
- Monitoring land disturbance close to the pipeline by the pipeline operator or its representative.

UT-89 Require proposed developments, expansions of existing uses and construction projects, both public and private, located near hazardous liquid pipeline to:

- Show the location of the liquid pipeline corridors in relation to proposed structures, utilities, or clearing and grading activities;
- Use techniques prior to and during construction to minimize the potential for disturbing the pipeline;
- Identify and mitigate potential erosion over pipelines from stormwater discharge;
- Use setbacks and other site design techniques to minimize the potential hazard; and
- Develop emergency plans as appropriate.

UT-90 Coordinate with the pipeline operator when developments

are proposed near a hazardous liquid pipeline corridor to reduce the potential for problems. Methods include but are not limited to:

- Notifying the pipeline operator of proposed development projects located within one-quarter mile of a pipeline corridor;
- Seeking the pipeline operator's participation in preconstruction meetings for projects located within 150 feet of a pipeline corridor;
- Requesting the operator to determine if additional measures above the normal locating process are necessary to physically verify pipeline locations before proceeding to develop; and
- Seeking monitoring by the pipeline operator of development that involves land disturbance or other significant work within the pipeline corridor, or within 30 feet of a pipeline, whichever is greater.

Land Use Compatibility

Redmond can help reduce the risk of injury in the event of a pipeline failure by not allowing certain land uses to locate near hazardous liquid pipelines. Land uses with high-density on-site populations that cannot be readily evacuated or protected in the event of a pipeline failure are considered "high consequence land uses." Examples are schools and multifamily housing exclusively for elderly or handicapped people. Uses such as these carry a relatively higher risk and have higher potential consequences in the event of a pipeline failure and therefore are not as appropriate as other uses near pipelines. Facilities that serve critical "lifeline" or emergency functions, such as fire and police facilities or utilities that provide regional service, are also considered "high consequence land uses."

UT-91 Prohibit new high consequence land uses from locating near a hazardous liquid pipeline corridor. Design proposed expansions of existing high consequence land uses to, at a minimum, avoid increasing the level of risk in the event of a pipeline failure, and where feasible, to reduce the risk.

There are other developments, such as the businesses located along Willows Road and multifamily development in the Grass Lawn and Willows/Rose Hill Neighborhoods, that while not defined as high consequence land uses are located in the vicinity of the hazardous liquid pipelines. Because of this location, these developments warrant special consideration due to the number of occupants, characteristics of the development or other factors and should have in place appropriate emergency procedures, such as an emergency guide or plan. New or expanded developments can use measures such as site planning that reflect anticipated flow paths for leaking hazardous materials and emergency procedures.

UT-92 Require appropriate mitigation measures that help reduce adverse impacts in the event of a pipeline failure to be used by commercial, industrial, multifamily or other development which, because of proximity to a hazardous liquid pipeline corridor, poses safety concerns due to characteristics of the occupants, development or site.

Pipeline Safety

The pipeline operator can help reduce the likelihood of accidental damage by adequately maintaining the pipeline corridor. Dense vegetation such as blackberry bushes can impede visibility and access. Instead, the pipeline corridor can be properly maintained with grass or other low-growing vegetation that enables easy inspection while preventing erosion. Ensuring that the pipeline locations are marked and that missing markers are replaced is also important, as is periodic aerial inspection of the pipeline corridor to detect potential problems. Redmond can assist this effort when permits are necessary for inspections or repair with prompt processing of permits.

UT-93 Require, through a franchise agreement or other mechanisms, maintenance of the hazardous liquid pipeline corridor through activities, including but not limited to the following:

- Maintaining vegetation to enable visibility and access for inspection while ensuring that such maintenance does not contribute to soil erosion;

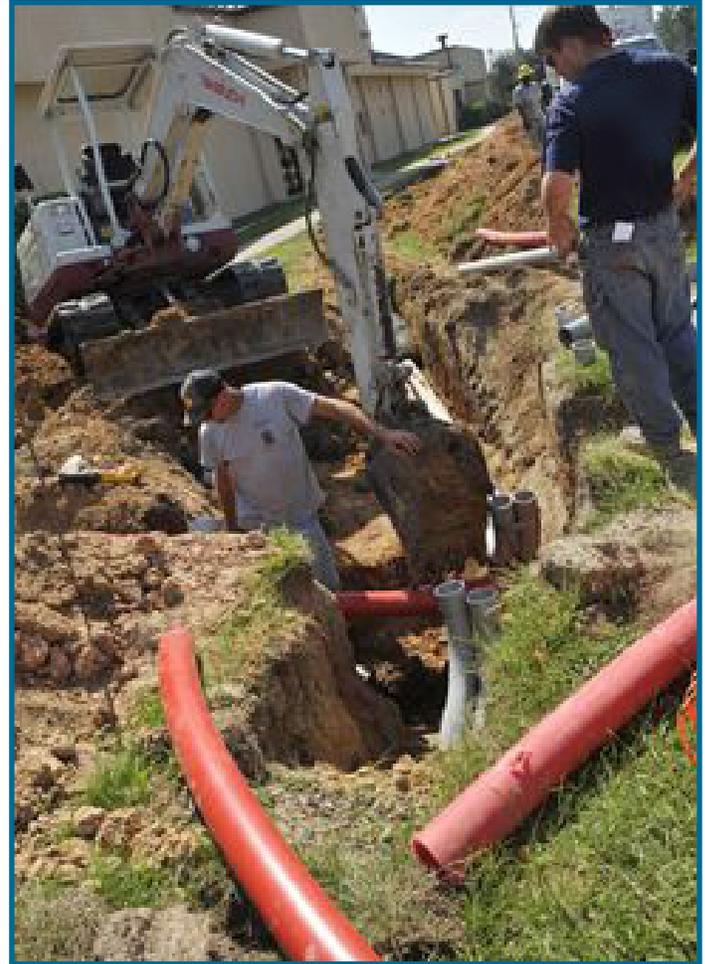
- Using plant species and plantings that prevent erosion;
- Ensuring that above and below grade pipeline markers containing information, such as operator name and number and facility type, are in place; and
- Conducting periodic visual inspections of the corridor.

UT-94 Expedite permits for the hazardous liquid pipeline company necessary for inspections and repairs.

People who live, own property or work near the pipelines can play an important part in avoiding pipeline damage and identifying potential problems early on. Redmond and the Olympic Pipe Line Company or its successor can promote public safety through periodic neighborhood mailings and meetings. Important information should include facts about the pipelines, how to avoid damage, potential problems to watch out for, such as unusual smells or suspicious construction activities, and how to respond in the event of a failure or other problem. Working with other jurisdictions and agencies as part of a unified approach to addressing pipeline safety issues is also important. This unified approach can address issues, such as maintaining a model franchise agreement, periodic review of the pipeline operator's safety action plan to identify any deficiencies, and advocacy of City and County concerns regarding pipeline safety regulation.

UT-95 Strive to establish, in cooperation with the pipeline operator, a neighborhood education program with a frequency of every two years for those who live or work within one-quarter mile of the hazardous liquid pipeline to educate them and the general public about pipeline safety.

UT-96 Continue to work with other jurisdictions, state and federal governments, and the pipeline operator to seek improvements in safety measures for hazardous liquid pipelines.



Workers access underground utilities