

Chapter 6 – Utilities

The availability of utilities (water, wastewater, and storm water facilities, electricity, and garbage) continues to be a key component in determining locations and opportunities for new development. It is not always possible to know when the demand for the extension of these services will occur. It is possible to estimate the requirements that new development will place on existing facilities and to determine the scope of effort and investment needed to provide for future growth. Therefore it is important for future utility expansions to align with future land use and development plans.

Water Supply System

Water Supply. The City of Pierre has thirteen raw water supply wells that feed the City as shown in Table 6.1 and Figure 6.1. The maximum day well output is 6,675 gpm, which was verified by field testing of the pumps. The City has the ability to meet maximum day demands with current well production. Water quality varies from well to well but can generally be described as exhibiting very high manganese levels, moderate iron levels, high levels of sulfates, high dissolved solids, and high hardness. During testing in 2005, Wells 4 and 8 were found to have traces of perchloroethylene (PCE), trichloroethylene (TCE) and methyl tertiary butyl ether (MTBE). Well 4 is not currently in operation due to the levels detected in that well. Wells 1 & 2 have shown a drop in production capacity over the last 10 years.

Ground water is the current source for all water used by the city. The alternative to this source is surface water from the Missouri River. It is likely that the Missouri River could be a viable water supply source for the City of Pierre. However, it should be noted that the average annual elevation of the Oahe Reservoir, based on average monthly levels, has dropped approximately 30 feet since 1968. This level is dependent upon runoff from contributing areas and how the river system is managed by the Corps of Engineers. Surface water contains organic materials, which must be removed to make the water safe for drinking and aesthetically pleasing. The water must also be disinfected to protect against water-borne pathogens such as giardia, cryptosporidium, and viruses.

Table 6.1. Pierre existing water supply sources (Banner Engineering 1996; Ulteig 2007).

Source	2007 Yield (gpm)	Depth (ft)	Screen Diameter (in)	Pump hp	Date Constructed
Well #1	415	63.0	24	125	1927
Well #2	335	62.5	22	125	1930
Well #3	745	62.0	26	100	1935
Well #4*	-	63.8	20	100	1948
Well #5	375	61.8	20	60	1954
Well #6	515	66.5	24	75	1957
Well #7	525	62.8	24	75	1961
Well #8	450	57.0	24	100	1972
Well #9	533	60.5	24	100	1978
Well #10	1,075	60.3	24	125	1978
Well #11	1,000	68.0	24	125	1990
Well #12	725	60	24	75	2002
Well #13	727	60	24	75	2002

* well not currently in operation; 1996 yield was 400gpm

Water Treatment. Currently, the City of Pierre provides no mechanical treatment of the raw water. Chemicals are added at the well houses to provide for disinfection, fluoridation and corrosion control. During a study completed in 2007 water treatment options were evaluated. Design of the Pierre water treatment facilities would take into consideration the water demands, regulations relating to the Safe Drinking Water Act (SDWA), and aesthetic issues. Regardless of the raw water source, the treatment process may provide for the removal and/or reduction of the following:

- Turbidity
- Pathogens
- Disinfection by-products
- Hardness
- Total Dissolved Solids
- Iron and Manganese

A recommended site for a future water treatment facility is in Griffin Park.

Water Distribution. The City of Pierre's water distribution system, consisting of approximately 80 miles of transmission and distribution pipe lines, is predominately a grid-type system with only minor "branching" or "dead-end" type feed arrangements. It is a fairly typical distribution system for cities of this size, age and geographical location. Pipelines in the Pierre distribution system range in size from 4" to 16" diameter and the material composition is mostly cast iron, ductile iron and pvc pipe with small amounts of high density poly ethylene and asbestos cement pipe. Construction of the original water system was in the 1920's.

Replacement of aging water mains is completed by City Personnel annually based on needs and available funds. Hydrants and valves are typically exercised annually to ensure future workability.

Due to the topography of Pierre, the City is currently divided into three pressure zones.

- Euclid/Harrison Pressure Zone 1
- Airport Pressure Zone 2
- Snake-Butte Pressure Zone 3

Various hills and valleys located throughout the City dictate the size and location of each zone. Figure 6.1 illustrates the location of the aforementioned zones.

Water Storage. The City of Pierre has six water storage reservoirs located throughout the City as shown in the Table 6.2 and Figure 6.1.

Table 6.2. Pierre existing water storage facilities.

Existing Water Storage Facilities					
Facility	Volume (gal)	Hydraulic Grade (ft)	Pressure Zone	Rated Pumping Capacity (gpm)	Date Constructed
Euclid 1	1,600,000	1683.71	1		1950
Euclid 2	1,600,000	1683.71	1	1400	1957
Harrison 1	1,600,000	1683.71	1		1954
Harrison 2	1,600,000	1683.71	1	1400	1971
Airport	1,600,000	1818.81	2	600	1978
Snake Butte	500,000	1950.00	3	n/a	2004

Each reservoir provides water to and pressurizes a designated pressure zone, as shown in Table 6.2 and Figure 6.1. Water from pressure zone 1 is boosted to the reservoir in Zone 2. The same occurs between Zone 2 and Zone 3. Specific booster pumping capacities are also shown in Table 6.2.

Water Supply Analysis

The primary function of a water utility within any city is to deliver potable water at an adequate flow and pressure under a wide range of demand conditions. Standards for system operating pressures vary throughout the country and thus it is primarily up to each water utility to set the minimum and maximum values for system pressures.

Based on the Comprehensive Water Study completed in 2007 and its anticipated growth and demand projections, the general water supply system needs were identified.

Transmission/Distribution System. Two transmission line segments operate below appropriate capacity levels during peak flow conditions and should be upgraded. One of these lines, between the Harrison booster pump and Taylor Avenue will continue to worsen as demands for water supply in Zones 2 and 3 grow over time.

Many distribution pipe lines operate below appropriate capacity levels during peak flow conditions. Most of these are located in pressure zone 1. This is primarily due to the age of the pipe, proximity to supply wells and lack of transmission line capacity in surrounding area.

The analysis of the existing distribution system revealed that the pressure levels in several areas fell below the appropriate range for optimal service. Two key locations are in Zone 1 and should be considered for placement into Zone 2. Modeling analysis indicated that system pressures in these areas quite often fall well below 40 psi.

Storage. Storage needs for Pressure Zone 1 are adequate through the year 2035. By the year 2035, an additional 300,000 gallons of storage capacity may be needed for Zone 2. In Zone 3, storage will be adequate until the year 2015, when it appears that 300,000 gallons of additional storage may be required.

Pumping Capacity. Based on the field tests performed during the 2007 Comprehensive Water Study it appears that extra water production capacity will be required. By the year 2010 the City will hit maximum day capacity for well production and at that point an additional water supply well will have to be added to the system.

It also appears that additional booster pumping capacity will be required at the Airport Booster Station around the year 2030.

New Development Service Costs. One of the underlying issues of future development is the cost to the City and its ratepayers of providing municipal services to the new development areas. In order to help understand the cost impacts, the primary future expansion areas were defined and costs to serve those areas with water extensions were calculated. These expansion areas are identified in Figure 6.2 and the estimated costs for providing water transmission main extensions to each area are noted in Table 6.3.

Table 6.3. Estimated water main costs for development areas.

Area	Cost Estimate
A	\$1,853,916
B	\$1,711,059
C	\$884,770
D	\$1,146,942
E	\$929,956

Transmission mains should be provided at half-mile intervals in new growth areas whenever feasible. To assure system security and adequate supply to all areas, looped mains will be installed at appropriate locations in the distribution grid. Installation of transmission mains should be coordinated with the construction of major streets when possible. The future water supply system recommendations are illustrated in Figure 6.3.

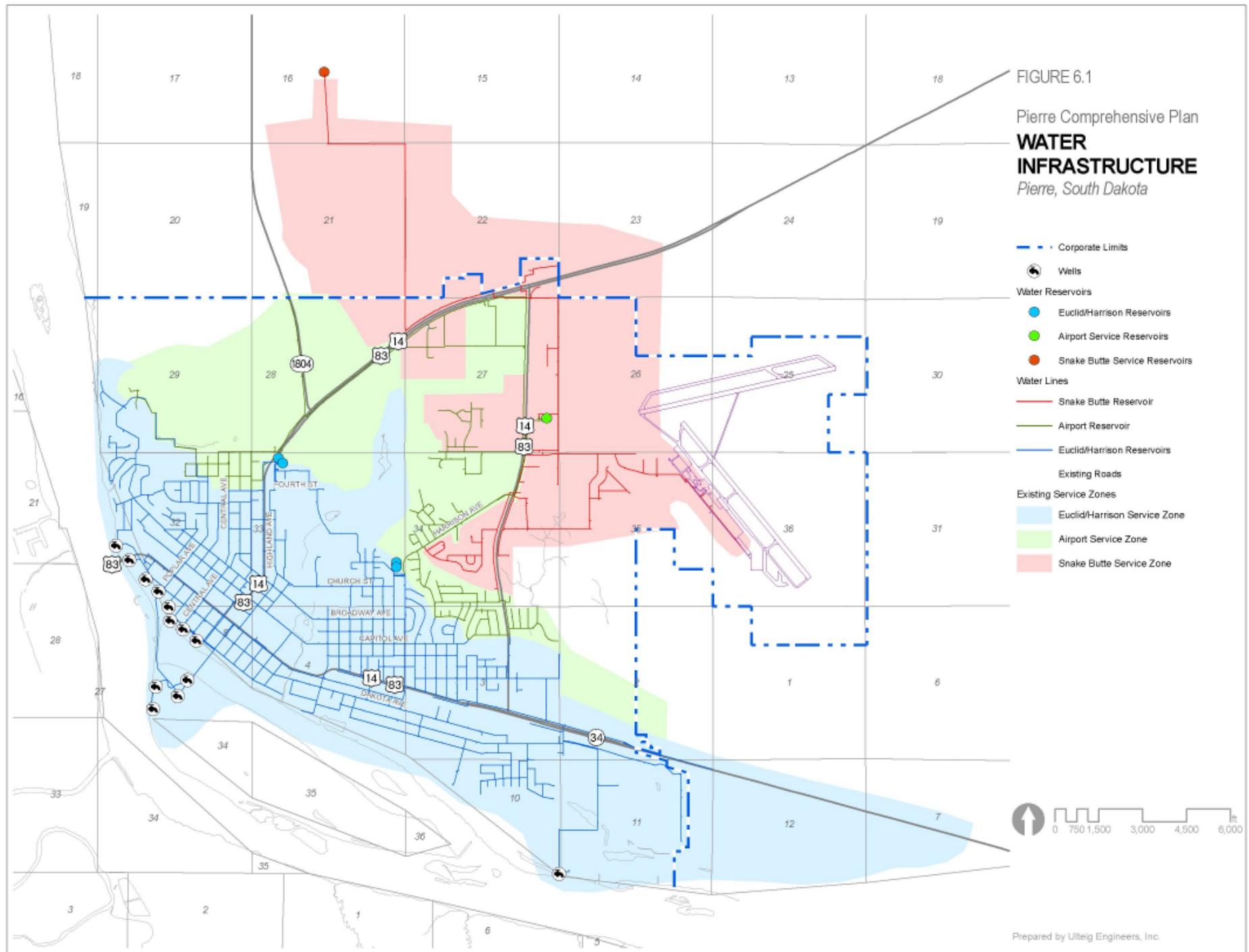
The City does provide some limited water service beyond the corporate limits including individual users and private water systems. As the City expands outward into these service areas, the existing rural water infrastructure may be converted to city water services, which in some cases can create financial hardship on affected property owners. The City should continue to coordinate service expansion into future growth

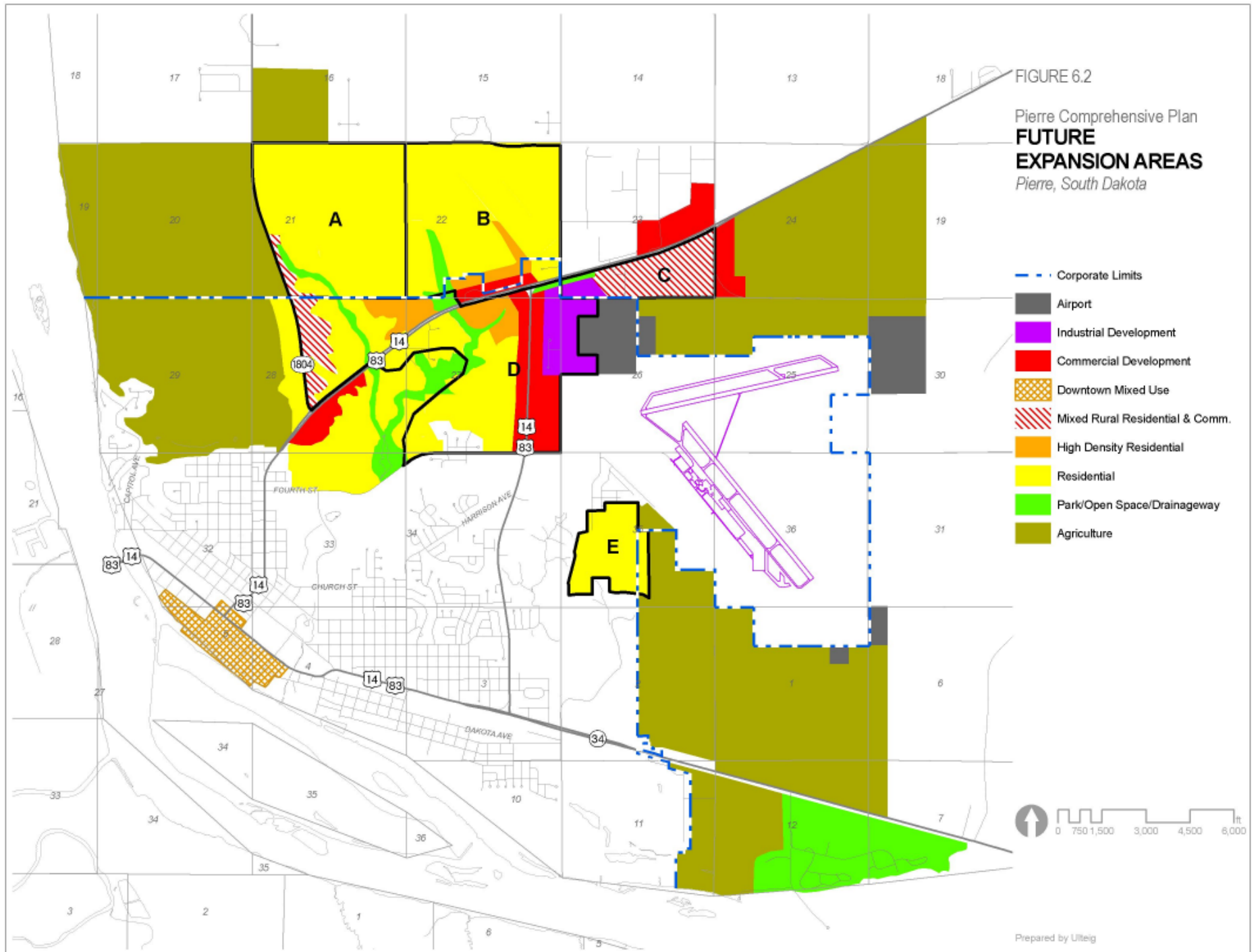
areas with the rural water system and with the private water systems to eliminate future duplication of water system investments.

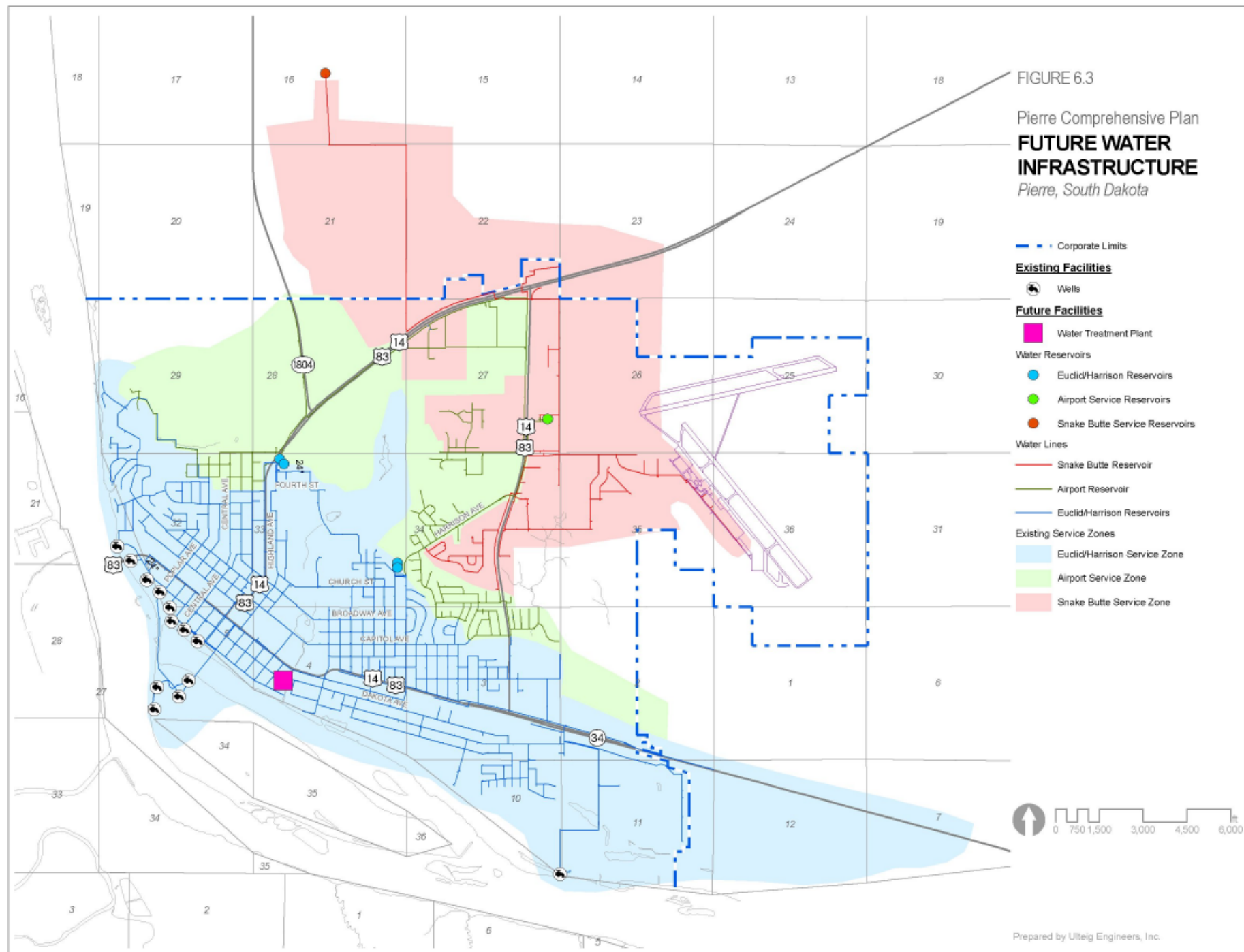
Water Supply Recommendations

Based on the detailed analysis of Pierre's water supply system completed in the 2007 Comprehensive Water Study, and its anticipated growth and demand projections, a number of recommendations were made. These are summarized as follows:

- Limit water service beyond the City limits.
- Require private financing of water system improvements in new development areas except projects that provide a community wide benefit.
- Maintain a schedule of facility improvements and expenditures through the Capital Improvement Program.
- Fund an updated analysis and long range improvement plan.
- Encourage the practical use of water resources.
- Continue an annual program to upgrade existing services.
- Construct a water treatment facility for iron and manganese removal to improve water quality within the City
- Construct necessary water transmission and distribution mains linking the new treatment plant to the rest of the water supply system. (Note: Further information is provided in Pierre's water supply study.)







Waste Water System

The following assessment of Pierre's waste water system is based primarily on the Pierre Sanitary Sewer Facilities Plan completed in 2005.

Waste Water Sources. The City of Pierre has residential, commercial, and industrial water users who contribute to the waste water flows in the sanitary sewer collection system. Groundwater infiltration and rainfall inflow also add to the waste water stream handled by the City's system. There are wide variations in waste water flows based on seasonal changes in water usage patterns and weather conditions. Based on a 1997 Waste Water Facilities study, the breakdown between residential and non-residential winter water usage is approximately 64% residential and 36% non-residential.

While it may be desirable, it is not economically feasible to completely eliminate groundwater infiltration or rainwater inflow from the waste water stream. Based on a comparison of average daily winter water consumption and average daily waste water flows, the dry weather infiltration rate is estimated at 69.2 gallons per day per acre. The flow rates during wet weather are not considered to have a significant influence on the Pierre waste water treatment system.

Collection and Conveyance. The sanitary sewer collection system is fairly typical of Cities such as Pierre. It is comprised of approximately 63 miles of sewer mains of various sizes (Figure 6.4). The City of Pierre owns and operates nine wastewater lift stations as shown in the Table 6.4 and Figure 6.4.

Table 6.4. Pierre's lift station capacity.

Lift Station Inventory			
Station No.	Name	No. of Pumps	Pump Capacity (gpm)
1	Fairway	2	70
2	Golf Course	2	70
3	Airport	2	70
4	Winchester	2	140
5	Missouri	2	360
6	McDonald	2	105
7	Ulmen	2	211
8	Neltom	2	100
9	Riverplace	2	140

Five of these lift stations (No. 5 through 9) are used to serve the Whiskey Gulch drainage basin located in northwest Pierre. The

Whiskey Gulch natural drainage outlet is to the Missouri River between Terri Lane and River Road.

Most of the areas east of the U.S Route 14/83 Bypass route drain to the Missouri River at locations downstream from the City's wastewater treatment plant. Collectively these areas are called the Southeast Pierre Area basin. Sanitary sewer flows from this basin are conveyed to the wastewater treatment plant via lift stations No. 1, 2 & 3.

The central portion of Pierre is a part of the Hilgers Gulch drainage basin. It extends north of the existing city limits into Pierre's primary future development area in Sections 21 and 22. The natural terrain allows existing and future development in this area to be served by gravity flow sewerage.

Detailed information about the sizing, age and condition of the sanitary sewer collection system is not available.

Waste Water Treatment. The City's wastewater treatment plant was originally constructed in the 1960's and was reconstructed in 2000. It was designed for a year 2020 population of 16,900, an average daily flow (ADF) of 2.2 MGD, and a peak wet weather flow (PWF) of 6.7 MGD. The peak hydraulic capacity of the plant is set by the firm capacity of the raw wastewater pumps at 6.7 MGD. Treatment process facilities were designed based on a flow of 2.5 MGD and 5-day BOD of 377 mg/L, for an organic loading capacity of 7,923 pounds per day.

Waste Water Analysis

The waste water system master plan was prepared in 2005. It completed a detailed analysis of the capacities and constraints of Pierre's waste water system. The waste water flows were modeled by sub-basin to determine the capacity of the existing system to handle existing dry and wet weather flows, and projected future flows.

The dry weather analysis indicated that all existing sewers have adequate capacity to convey peak sanitary flows without backing up or overflowing through manholes.

The wet weather analysis indicated that the capacity of some sewer segments was inadequate to handle modeled flows. However, none of

the inadequacies were considered great enough to justify providing relief sewers for the current wet weather flows.

In order to model the future sewer capacity requirements, build-out conditions were projected for potential growth areas inside and outside city limits. Then sewer line extensions were laid out schematically to provide a conceptual future sewerage system. When this conceptual design was modeled the resulting flows were analyzed to determine cases where the existing sewerage system capacity would be insufficient. The resulting extension sewerage design and existing system capacity constraints are noted by drainage area in the following paragraphs. Figure 6.5 illustrates the extension sewerage design.

Southeast Basin Service Area. A small portion of this area could be adequately served by the extension of an existing 8" line on Bushfield. The remaining area would require a new extension sewer running up the drainage channel on the western side. Nearly half of the remaining area in this basin slopes to the east. Instead of planning for a lift station for this area, it was determined to avoid pumping by requiring local sewers within the property to be designed for gravity flow to the extension sewer running up the western side. It is anticipated that 8" line would be sufficient for anticipated level of development in this area as well.

Hilgers Gulch Service Area. The extension sewers to the Hilgers Gulch Service Area form two main branches. Both stem from the north branch of the existing Hilgers Branch sewer lines. The eastern branch extends to serve Section 22, and the western branch extends to serve Section 21. Proposed extension sewer lines would range up to 18" in diameter for the eastern branch and up to 10" in diameter for the western branch. At full build out the flows stemming from the Hilgers Gulch Service area would require increased capacity in five reaches of the existing sewerage system.

Whiskey Gulch Service Area. Constructing a gravity flow sewer system in this basin would be challenging at best, due to steep and unstable slopes, and rough terrain. While it may be technically feasible to serve this area with sewer using a lift station, it is not a preferred area for urban density development. Strong consideration should be given to only allowing very low density rural residential development which uses

onsite septic treatment systems which are reviewed and approved by the City.

The capacity of the water treatment plant can be measured in several ways. The plant is currently operating at about 75% of its average daily flow (ADF) capacity. ADF is projected to exceed capacity by about 2025. It is operating at about 90% of its peak hydraulic capacity. PWF is projected to exceed capacity by about 2012.

New Development Service Costs. One of the underlying issues of future development is the cost to the City and its taxpayers of providing municipal services to the new development areas. In order to help understand the cost impacts, the primary future growth areas were defined and costs to serve those areas with sewer extensions were calculated. These growth areas are identified in Figure 6.2 and the estimated costs for providing trunk sewer extensions to each area are noted in Table 6.5.

Table 6.5. Estimated sanitary sewer trunk line costs for development areas.

Area	Cost Estimate
A	\$2,704,084
B	\$371,741
C	\$464,631
D	\$3,655,058
E	\$619,044

The City generally does not provide sewer service beyond the corporate limits, with the exception of a private sanitary sewer system east of the City limits on State Highway 34. This policy promotes contiguous growth, allowing better control of treatment capacity and long-term development of the system. The City also generally does not allow septic systems within corporate limits. Exceptions to this general policy may be considered based upon individual development proposals. Criteria to be considered are topographical features, geological/soil characteristics, land use compatibility, the availability of existing infrastructure, and protecting taxpayers from future costs to retrofit rural subdivisions.

The cost of local wastewater development is generally paid by the benefiting property owners. Developers are required to pay the cost of providing sewers of sufficient size and capacity for the area being

developed. Large diameter sewers, if needed to serve future growth areas, are assessed to benefiting properties or subsidized by the City.

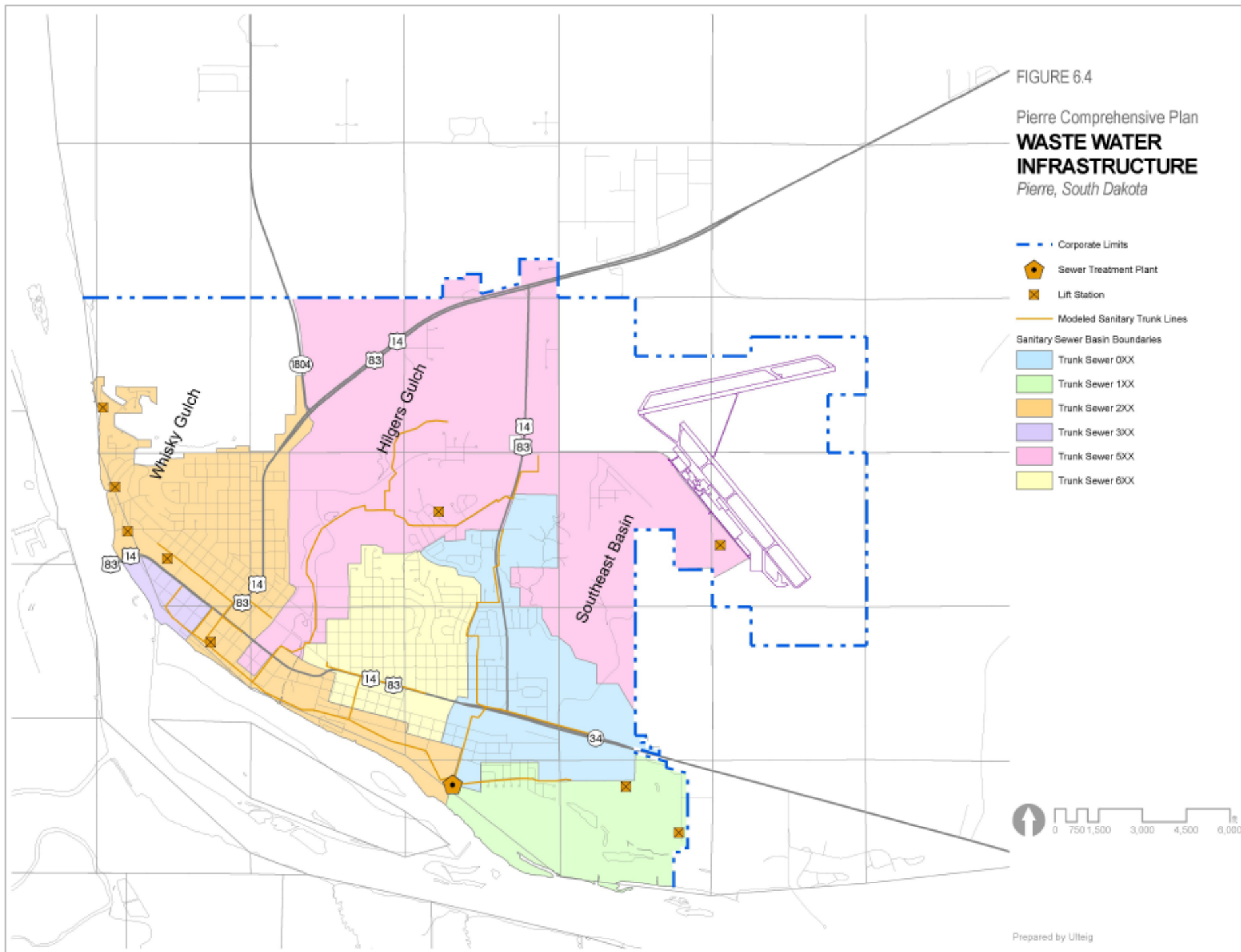
Waste Water Recommendations

The 2005 Sanitary Sewer Facilities Plan provided a plan for future expansion of infrastructure as illustrated in Figure 6.5. The plan shows future service areas and the general location of proposed sewer lines to provide sewer service to the areas. A number of additional recommendations were also made. These are summarized as follows:

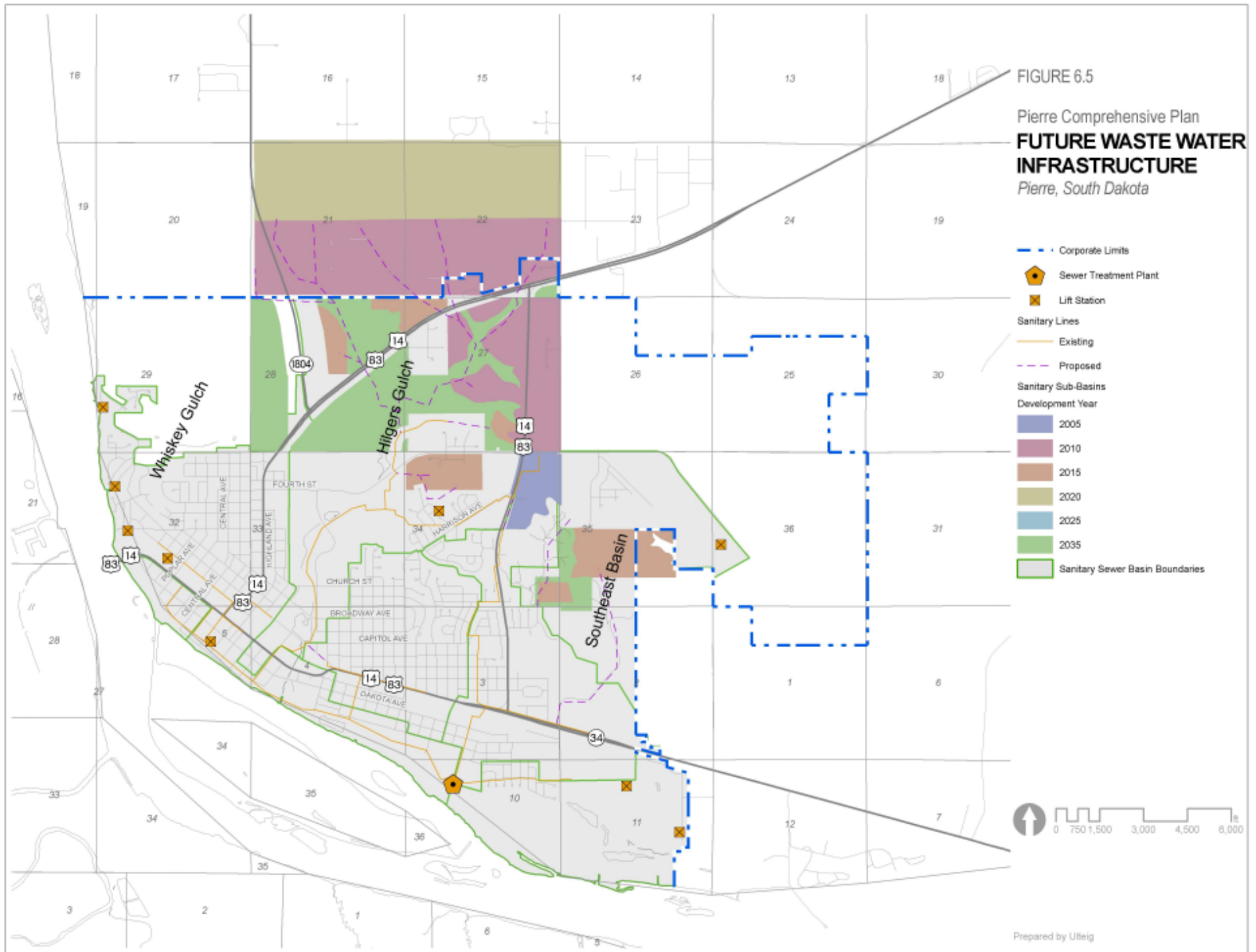
- Initiate planning for additional treatment capacity so that the additional capacity is available when needed (estimated to be needed by 2025)
 - Take steps to increase peak hydraulic capacity for wet weather flows (estimated to be needed by 2012)
 - Install relief sewers to meet the peak flow capacity needs caused by new development. Three of these are estimated to be needed by 2010, and one by 2035.
 - Extend new trunk sewer lines to provide service to new developments as warranted by development activity. See Figure 6.5
 - Evaluate the potential to construct a gravity sewer line which would allow the elimination of either the Riverplace or Neltom lift stations
 - Develop a program to prioritize and repair manholes and sewer lines
 - Prepare a Capacity, Management Operation and Maintenance Program Plan to anticipate increased federal and state regulation of sanitary sewers
 - Initiate five specific activities to support the City of Pierre's ongoing sanitary sewer systems needs as an ongoing service plan as follows:
 - o Establish a GIS of the sewer infrastructure
 - o Conduct a flow and rainfall monitoring program
 - o Maintain communications with state and federal regulators regarding the Sanitary Sewer Facilities Plan and sewer system issues
 - o Conduct an evaluation of the existing WWTP options to meet projected PWF
 - o Provide design, bid and construction phase services for recommended facilities.
- Limit sanitary sewer service beyond the corporate boundaries.
 - Require new development to finance sewer facility costs.
 - Program future expenditures through the Capital Improvement Program.
 - Continue to avoid lift stations unless absolutely necessary.
 - Complete a detailed analysis of the appropriate conditions under which very low density rural residential development should be allowed in the Whiskey Gulch Service Area, and if considered appropriate, amend or adopt an ordinance to regulate such development. The ordinance should specify that if city sewer service is extended to the area, all existing and future development would be required to hook up to the City sewer system at the property owners' expense.

FIGURE 6.4

Pierre Comprehensive Plan
**WASTE WATER
 INFRASTRUCTURE**
 Pierre, South Dakota



Prepared by Ulteig



Storm Sewer System

The City of Pierre's terrain provides natural positive drainage for most of the City. Figure 6.6 illustrates the topography of the City and adjoining land. The most important component of the City's drainage system is the Missouri River and its related drainage basins. The watershed that affects Pierre has an approximate area of 6,600 acres. The three primary drainage basins are: the Hilgers Gulch basin, the Whiskey Gulch basin and two smaller basins at the eastern edge of the City. In addition to recreational benefits, the greenway or park system adjacent to the Missouri River also protects potential flood areas from development and allows unrestricted flow of flood waters.

Collection System

The City has a storm sewer system to help manage storm water. It has pipe line ranging in diameter from 12" to 66." While the storm water management system operates as designed, on occasion, there is storm sewer backup in the southeastern part of the City. One cause for flooding in this area is the storm water from the hillsides to the north, which must cross the development as it proceeds to the river. The second cause of flooding is the Missouri River, which occurs when power demand from the Oahe Dam is high, requiring a higher release of water from the dam. The river channel capacity is being reduced by siltation which also contributes to flooding. Figure 6.6 illustrates the storm sewer system of the City of Pierre.

The City of Pierre has established a Storm Water Management Plan which conforms to the EPA requirements. It addresses six areas where the city will meet minimum control measures. These areas are:

- Public Education and Outreach
- Public Participation/Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Control
- Post-Construction Runoff Control
- Pollution Prevention/Good Housekeeping

The City has established strategies and regulations which are consistent with and implement its storm water management plan.

Flood Management

The City participates in the National Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA). On May 17, 2004, FEMA updated the Flood Insurance Rate Map (FIRM) and the Flood Insurance Study (FIS) for the City of Pierre and Hughes County. Flood plain areas are mapped and land use regulations which restrict development in these areas have been adopted. To be proactive in flood plain management the City has also instituted a minimum building elevation.

Storm Water Analysis

The terrain of the Pierre area promotes natural drainage to the Missouri River. Some of the soil and slope conditions in potential development areas are relatively unstable. The natural drainageways are often inappropriate locations for future development but appropriate areas for permanent open space, or inexpensive pedestrian linkages between residential neighborhoods and the river or park/trail systems. These natural drainageways should be maintained or improved to allow them to function as the primary system for storm drainage wherever possible. These greenways can also function as multi-use path locations which can link neighborhoods and other recreational facilities.

Urban development increases the rate of runoff by reducing the size of permeable areas and increasing the volume and velocity. Therefore it is essential to provide onsite management of storm water. Wherever possible these onsite retention areas should be incorporated into the natural landscape and constructed in a manner enhancing neighborhood aesthetics.

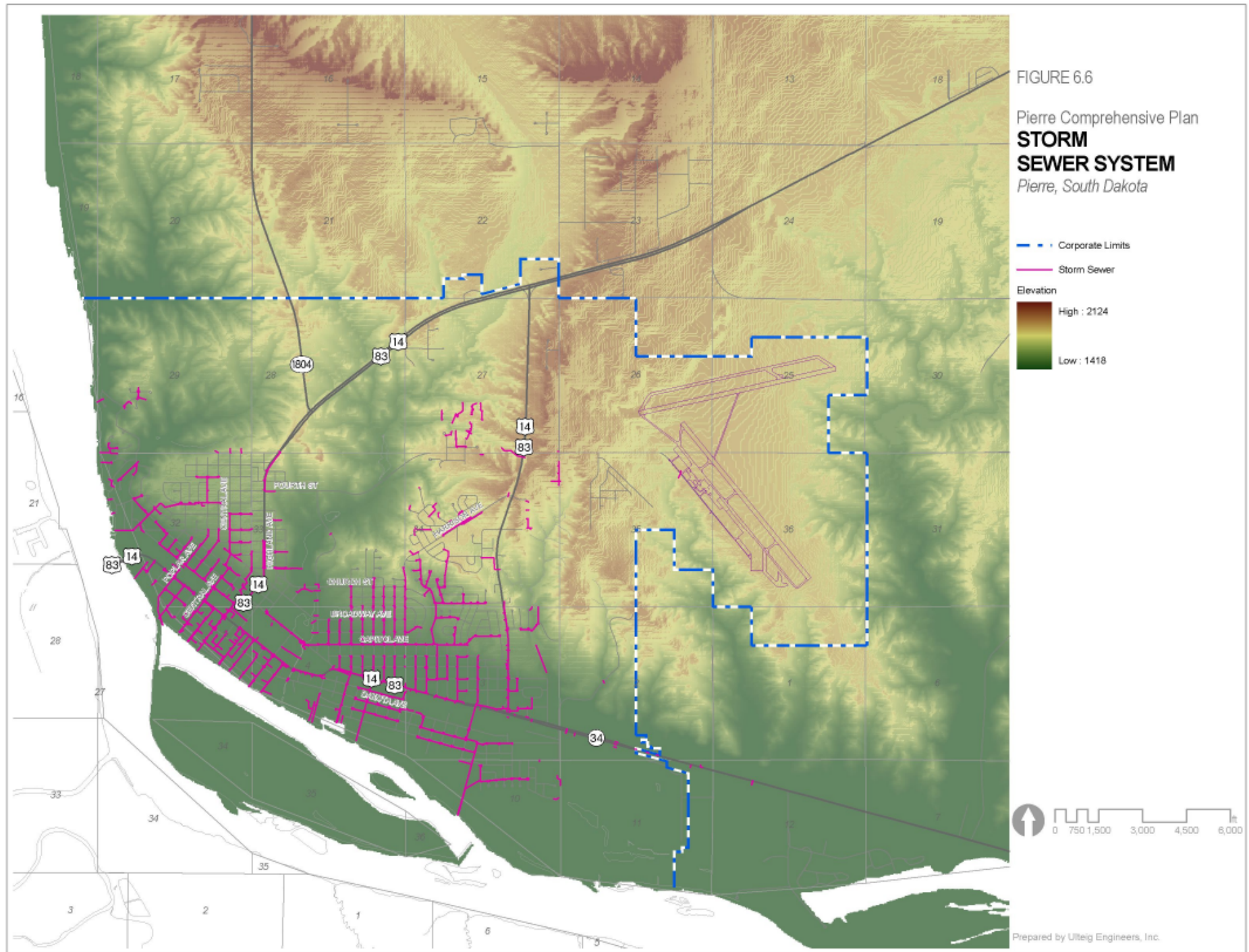
On-site management of stormwater for positive use such as retention or detention for landscaping or recreational use, and the multiple use of stormwater drainageways for open space amenities should be incorporated with land use regulations and project design.

In 1998, a Comprehensive Storm Sewer Study was developed which identified long-range drainage improvements needed to accommodate the anticipated 10-year and 25-year storm events. The study has been utilized to prioritize storm sewer projects and to minimize future flood damage by construction of flood control projects. It is strongly recommended that developers submit thorough engineering studies to more specifically identify needed drainage improvements within

additional future growth areas. These drainage studies should be completed before additional large-scale development occurs.

Storm Water Recommendations

- Continued regulation of development in floodplain areas
- Require engineering studies with adequate scope to insure post development discharge does not exceed predevelopment discharge.
- Program future expenditures through the Capital Improvement Program.
- Utilize natural drainageways to manage runoff.
- Expand the storm water management plan to include redevelopment of existing properties.
- Require erosion control plans and storm water permits from the state of South Dakota as required.
- Increased enforcement of new and existing storm water management policies.



Electrical Supply System

Supply Sources. Pierre purchases electrical power from the Department of Energy's Western Area Power Authority (WAPA) and the Missouri River Energy System (MRES) through long-term contracts, and sells it to local customers. WAPA supplies about 60% of Pierre's current electrical energy needs. The power available from WAPA is a fixed amount. Therefore, MRES provides the additional power when it is needed.

A rural electric cooperative, Oahe Electric, provides electrical power to the area surrounding the City of Pierre. Based on a recently established agreement pertaining to the future urban development area in Section 21 & 22, the City of Pierre will supply electricity to Section 21 and the west half of Section 22, while Oahe Electric supplies electricity to the eastern half of Section 22.

Distribution System

The City of Pierre owns two substations and shares the use of a third substation owned by WAPA. The substations and distribution system are illustrated in Figure 6.7. The entire distribution system is underground. There are about 310 miles of primary underground cable within the City.

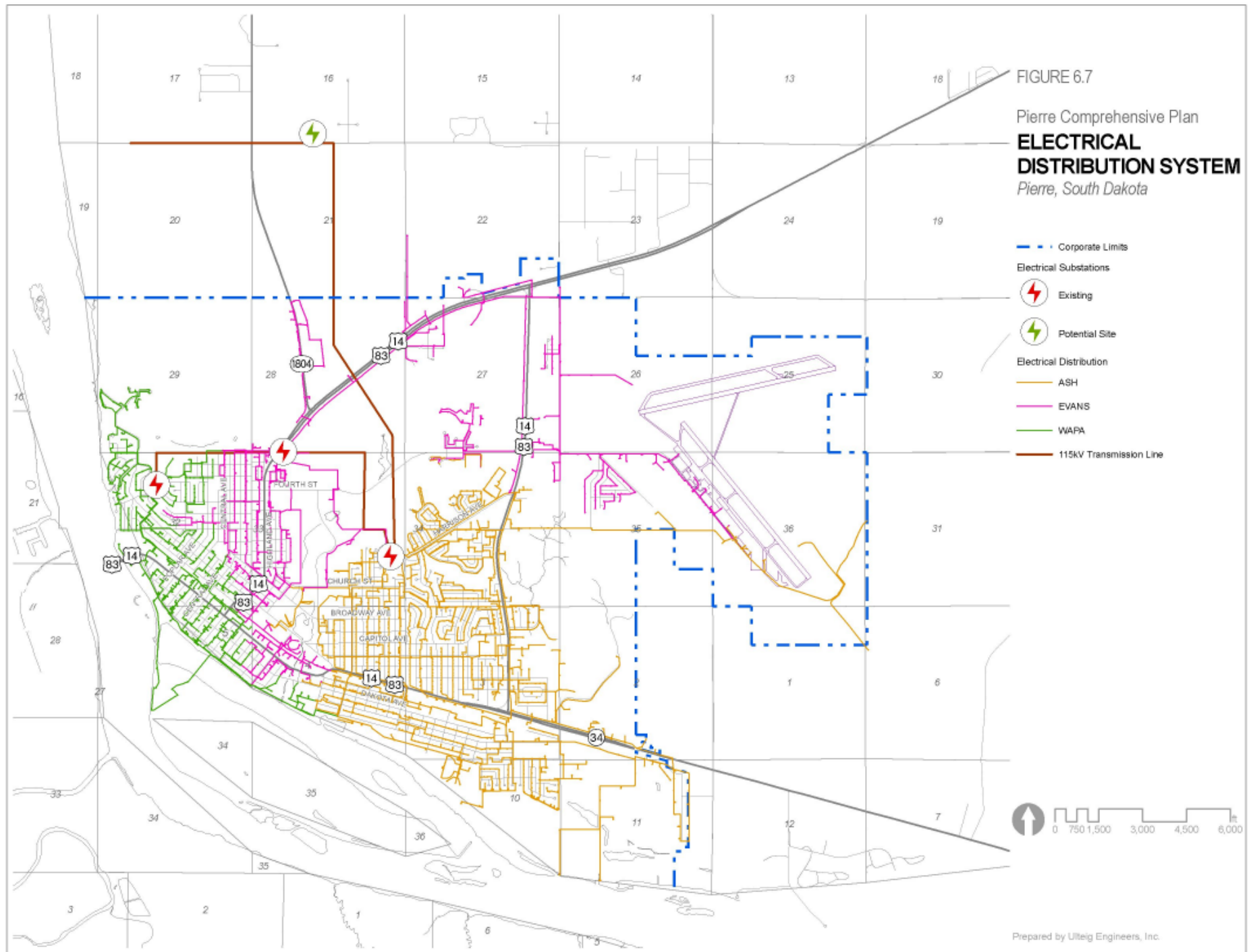
Electrical crews continue to actively replace high voltage cable that is reaching the end its life as well as provide new service to expanding areas. In the last 10 years the annual average amount of cable installation is approximately eight and half miles. This replacement helps maintain system reliability at a high level which the more than 7,000 customers expect. In 2001, a rebuild of the existing transmission system and the addition of just over four miles of new 115,000 volt line created a looped transmission system that further enhances the reliability of the power system.

Electrical Supply Analysis and Recommendations

The existing electrical supply system has the capacity to provide all power anticipated to be necessary to serve the future development areas of Pierre. It may be as the City approaches full development in Sections 21 and 22, that another substation should be provided. This substation should be located on City purchased property in the vicinity of the Snake Butte Water Reservoir.

With the continuing growth and demands on the electrical system it would be advised that the department consider a system study to help plan and make recommendations for future growth of the system as well as analyze the existing system in order to assure that it is operating to the best and full potential. The long-standing Supervisory Control and Data Acquisition (SCADA) system has reached its full potential and consideration should be given to replacing it in coordination with other SCADA system improvements that may be occurring in the Water and Waste Water departments. Greater consideration should also be given to outsourcing the analysis of a new system with the scope to include the possibility of a two way automated meter reading system that could be utilized in both the electric and water departments.

A major improvement that is scheduled to occur in 2008 is the replacement of the City Electric Shop. The existing shop was constructed in 1958 and was not designed to hold equipment and material in the 4,000 square foot area that is now used for the underground distribution system needs. A larger more appropriate building at a new site would allow for greater efficiencies in the department and better longevity of equipment and materials that can be housed inside. A fenced yard would also add to the security of equipment and materials and the design would meet the requirements for a Spill Prevention Control and Countermeasure plan that is now required by the Environmental Protection Agency.



Solid Waste Disposal System

Solid waste disposal for the City of Pierre involves collection and disposal systems. The City of Pierre owns and operates one of 15 municipal waste landfills in the State of South Dakota. Collection of waste material is accomplished by the City and two private haulers.

Collection System

The City of Pierre operates a waste transfer station near the southeastern edge of the City. All loose garbage is baled at the transfer station before being hauled to the landfill.

The city provides residential waste collection services along with two private haulers. Currently, the city hauls approximately one third of the residential garbage of the City. Commercial garbage collection service is provided by two private haulers.

City residential waste collection is a “pay as you throw” program. It is paid for through the purchase of trash bags. The City is operating the residential collection service as a self-supporting service. Cost of trash bags was raised in 2005 in an effort to recover the cost of providing the service. Currently, residential garbage bags cost \$47.00 for a roll of 25 bags. The current cost of yard waste bags is \$41.00 for a bundle of 50 bags or a \$1.00 per individual bag. Residents have the alternative of hauling their yard waste to the collection site at no charge.

The City encourages recycling by providing drop-off bins at three locations. The City collects materials from the drop-off sites and transports them to a local privately owned recycling facility.

Disposal

Pierre opened a new municipal landfill approximately seven miles straight east of the Pierre Airport in 2003. This replaces the previous landfill located between the airport and State Highway 34 on the eastern edge of the City of Pierre. The previous landfill was capped in November 2006. Portions of the old landfill site are still permitted and used for composting yard waste, disposal of rubble, and collection of asphalt and select concrete material for recycling.

The new landfill currently takes in about 23,000 tons of garbage annually. Garbage from the City of Pierre accounts for approximately 14,000 tons. The remainder of the garbage comes from several surrounding communities. At its current rate of usage the Pierre

Landfill has the capacity for 238 years. The rubble landfill site still has the capacity for another 10-15 years at the current rate of usage.

Solid Waste Analysis

There are three main issues pertaining to the Solid Waste Disposal system of the City of Pierre: the cost-effectiveness of the residential solid waste collection program, the location of the baling facility, and the operating costs to tonnage ratio of the landfill.

The City of Pierre has maintained a residential solid waste collection system in order to provide citizens seeking a lower cost alternative with privately owned haulers. The recovery of costs at the current volume of service is marginal. The City has subsidized the collection program to ensure competition and to provide a usage based alternative that families could utilize to control their waste disposal costs. If the number of residential garbage collection pickups drops, it may not be feasible to continue operating the city owned collection service.

As previously noted, nearly all material disposed at the Pierre Regional Landfill is baled. The current baling facility is located on Park Street near Lowell Avenue in the southeastern area of Pierre. Municipal solid waste is compressed into bales at that facility and then transported approximately 13 miles to the landfill for disposal. Consideration should be made to relocate the baling facility to the landfill site to reduce handling and operating costs.

All landfills have relatively fixed operational costs that are offset by the tonnage received for disposal. Common strategies for improving self sufficiency of the operation include increasing tonnage and utilizing resources to the highest level possible. Currently nine other municipalities from as far away as 135 miles patronize the Pierre Regional Landfill.

Solid Waste Recommendations

The City should:

- Continue to monitor the cost recovery of its residential solid waste program and raise rates in order to cover program costs.
- Initiate a study with strong stakeholder participation to evaluate best practices which would allow the possible relocation of the baling facility to the current landfill.
- Continue to solicit other communities as potential landfill customers as opportunities become available.
- Program future expenditures through the Capital Improvement Program, including development of additional cells at the landfill and remediation of closed landfill sites.

Utilities Goal

The City of Pierre will maintain sustainable utilities in order to minimize costs to its occupants while ensuring adequate services for present needs and for economic development.

Objectives:

1. Minimize or eliminate the subsidy of new development by taxpayers.
2. Program future expenditures through the Capital Improvement Program, including a potential water treatment facility, construction of relief sewers, and an upgraded SCADA system.
3. Initiate a study to explore the issues and benefits of relocating the baling operation to the Pierre Landfill.
4. Implement a formal inspection system and a warranty period prior to the city accepting infrastructure and utility improvements.
5. Discourage the individual metering of private utility systems.