



7. NATURAL AND ENVIRONMENTAL RESOURCES ELEMENT

7.1 INTRODUCTION

7.1.1 DESCRIPTION OF THE NATURAL AND ENVIRONMENTAL RESOURCES ELEMENT

The management and preservation of natural resources is a key component of the General Plan. Major policy decisions and Land Use designations can either be enhanced or compromised if limitations of and opportunities to enjoy the natural environment are not properly considered. Key natural and environmental resource issues that affect Land Use decisions include ground and surface water resources, water quality, soil conditions, agricultural resources, habitat, air quality, and natural hazards.

Preservation of natural and environmental resources is guided by the goals, objectives and policies of the Natural and Environmental Resources Element. The overall goal of the element is to promote a high level of environmental quality with a safe, healthy, and enjoyable environment for Riverton City citizens. This goal is achieved by implementing the objectives, together with the related policies, for each natural and environmental resource component:

<i>NATURAL AND ENVIRONMENTAL RESOURCES COMPONENT</i>	<i>RELEVANT GOALS</i>
High Environmental Quality	7.A
Resources/Quality	7.B
Agricultural Land	7.C
Environmental Resources	7.D

7.1.2 NATURAL AND ENVIRONMENTAL RESOURCES ISSUES SUMMARY

Continued local and regional growth in the southern Salt Lake Valley will invariably place development pressures on lands at the urban fringe of Riverton. The challenge remains to achieve a balance between orderly growth and the protection of Riverton City’s natural resources. Air quality, water quality and other natural systems are regional elements that extend beyond municipal political boundaries and require regional effort to achieve solutions. This section discusses natural resources, and air and water quality issues. Locally available solutions to these issues are expected to support other elements of this General Plan. The natural and environmental resource issues are:



WATER: Many of the water sources in the Salt Lake region exhibit high salinity levels and are not suitable for use as drinking water. Without conservation, Salt Lake County will exceed its current water supply within the 10-year planning horizon. The Kenworth Plume and Reclamation Project, and efforts by the Riverton City Storm Water Phase II, offer a new source of secondary water through reuse. Even with aggressive conservation measures, the water supply is expected to last only until 2016. Water supply resources need to be ensured to achieve the significant growth that is projected by the General Plan.

SOILS: The region along the west side of the Jordan River is generally not suitable for septic tank fields, landscaping, small farms and gardens, playgrounds, picnic areas, and paths and trails due to a high water table. Scattered sites in the southwest section of the city are not suitable for playgrounds, picnic areas and paths and trails, depending upon the severity of the site slope. Future Land Uses need to consider the appropriateness of the site for urban development.

AGRICULTURAL LANDS: The projected growth rates for Riverton City will continue to convert agricultural areas to residential and commercial Land Uses. In addition to a loss of agricultural land, the new development will result in the loss of visual open space, which is currently primarily provided by agricultural lands. Loss of agricultural lands could also affect the microclimate of neighborhoods and increase stormwater flow runoff, from increased impervious surfaces. The city's agricultural Protection Overlay Zone can occur only on parcels larger than 250 acres.

AIR QUALITY: Salt Lake County is a nonattainment area for Particulate Matter (PM10). In addition, Salt Lake City (19 miles north of Riverton City) and Provo/Orem (25 miles south of Riverton City) are also "non-attainment areas" for Carbon Monoxide (CO) pollutants. Vehicular traffic is the primary cause of this type of pollution. The increased growth and sprawling Land Use patterns that necessitate increased vehicular travel will tend to increase both PM10 and CO production.

NATURAL HAZARDS: Riverton City is located in an area of high earthquake probability, but hazard from soil liquefaction is low. Structural integrity needs to be ensured in new development, and retrofitted development where structures are prone to earthquake damage.

7.2 EXISTING CONDITIONS

7.2.1 GROUND AND SURFACE WATER RESOURCES

Riverton City is located within the Great Basin approximately 12 miles north of Utah Lake and 21 miles south of the Great Salt Lake. The Great Basin, an area of inland drainage between the Wasatch Range on the east and Sierra Nevada and Cascade Range on the west, was formed approximately two million years ago when sedimentary rock was uplifted and dropped by the movement of geologic plates. The



waterways of the Great Basin flow into desert flats rather than the ocean. The Great Salt Lake, Sevier and Utah Lakes are the primary lakes that form the Great Basin.

Utah Lake, located in Utah County, is a freshwater lake; however, due to certain springs that feed into the lake and a high evaporation rate, the lake tends to be slightly saline. The lake serves as a primary irrigation source for farmland in Salt Lake County, including Riverton City. The Jordan River, an outlet for the lake, forms the eastern limits of Riverton City and eventually drains into the Great Salt Lake. Canals were built in the late 1800's to disperse irrigation water to additional lands. Four of the canals pass through Riverton City. The canals in Riverton City include the South Jordan, Utah and Salt Lake, Utah Lake, and Provo (Welby Jacob) Reservoir Canals.

The South Jordan Canal (built in 1870) can transport irrigation water at a maximum rate of 142 cubic feet per second. The Utah and Salt Lake Canal (also built in 1870) has a capacity of 246 cubic feet per second. In addition, many shares of Utah Lake water are owned by a number of canal companies and other interests in Salt Lake County. The Utah Lake Distribution Canal receives water from Utah Lake at a rate of 135 cubic feet per second. The Provo Reservoir Water Users Company, which owns water rights in the Provo River, receives Utah Lake water through a pumping plant to the Provo Reservoir Canal. The Provo Reservoir canal is located in the western portion of Riverton City.

Unlike the majority of Salt Lake County residents, who receive their potable water from the nearly 350,000 acre-feet of surface water in the basin, Riverton City residents receive their water from seven underground wells. It is projected that Salt Lake County will exceed its current water supply by about the year 2010. Implementing conservation and water reuse measures will extend the water supply to about 2016.

7.2.2 WATER QUALITY

The Utah State Department of Environmental Quality (DEQ) is responsible for monitoring water quality. The DEQ has divided the State into ten watershed management units, which were combined to create five monitoring regions. This allows the DEQ to monitor a majority of the perennial streams statewide, and to identify waters that are not meeting beneficial uses. A water quality management plan has been created for each of the basins. Riverton City is located within the Jordan River Basin.

CLEAN WATER COMPLIANCE: The State classifies water bodies as either streams or lakes and assesses them as fully, partially or non-supporting its beneficial uses. Under the Clean Water Act, Utah must establish and maintain water quality standards designed to protect, restore, and preserve the quality of its waters. These standards include narrative criteria for designated uses; specific chemical and biological criteria



necessary for the protection of the designated uses; and anti-degradation provisions. When a lake, river or stream fails to meet water quality standards, section 303(d) of the Clean Water Act (CWA) requires that the State place the waterbody on a list of "impaired" waters (303(d) list) and prepare a Total Maximum Daily Load (TMDL) analysis. The Jordan River has not met the CWA standards at times in the past.

The Jordan River has been divided into four segments for monitoring: 6400 South to 7800 South, 7800 South to Bluffdale (the segment that comprises the eastern boundary of Riverton), Bluffdale to Narrows and Narrows to Utah Lake. The Bluffdale to Narrows and Narrows to Utah Lake segments are located upstream from the segment adjacent to Riverton City. In 1998, these segments were listed for TMDL analysis due to the quantity of Total Dissolved Solids (TDS). The *Draft Utah Year 2000 303(d) List of Waters* recommended removing these segments from the list because the most recent assessment indicated that water quality meets state standards for TDS.

JORDAN RIVER AQUATIC ECOSYSTEM RESTORATION: The U.S. Army Corps of Engineers (ACOE) prepared an environmental assessment of the Upper Jordan River. The study determined that significant aquatic ecosystem degradation has occurred along the Jordan River between 1600 South and 16600 South. In Riverton City this included a 160-foot portion of the left bank of the river with habitat loss due to erosion. The project to address the degradation placed erosion control fabric and appropriate native vegetation including the planting of riparian, emergent, and seasonal wetland vegetation, reduced non-native, exotic species, and established the natural riverbank and riverbed for approximately three miles along the Jordan River corridor.

In addition, approximately 274 acres of riparian habitat on the Jordan River is being repaired using damage settlement funds from two Superfund sites. The restoration includes removal of invasive exotic plants, establishment of native plants, and recontouring the banks of the Jordan River to restore the flood plain. Three sites along the river were restored by the Corps and County with bioengineered bank stabilization; they include two sites in South Jordan totaling 185 acres and one site in West Jordan totaling 90 acres. These sites are downstream from Riverton City.

7.2.3 Soil Conditions

Riverton City contains soils from three of the eleven associations within Salt Lake County, as identified in a 1974 Soil Survey prepared by the Soil Conservation Service. This Survey defines a soil association as a landscape with a distinctive proportional pattern of soils, which normally consists of one or more major soil types. The delineation of soil associations provides a general idea of the soils in an area and is useful when comparing different areas. Each of the primary soil associations within the city limits is discussed below.



- **CHIPMAN-MAGNA-IRONTAN** is characterized by poorly drained and very poorly drained soils on flood plains. This association is located in the eastern-most portion of Riverton City in the vicinity of the Jordan River. In these areas, the predominant soil types are Chipman and Magna. According to the 1974 Survey, the Chipman soils are well suited to irrigated crops and the Magna soils are better suited to irrigated pasture than other uses.
- **BLUFFDALE-TAYLORSVILLE-HILLFIELD-BRAMWELL** is characterized by well-to poorly drained soils (clays) on low and intermediate terraces. This association is located in the central portion of the city, which generally comprises the existing developed areas. Soils within this association are generally well suited for irrigated crops of small grains, corn, alfalfa, sugar beets and truck crops. In addition, the soil types are compatible with most urban development Land Uses, but onsite studies should be considered if industrial Land Uses are planned.
- **KIDMAN-PARLEYS-WELBY** is characterized by well-drained soils on high lake terraces. This association is located primarily in western portions of Riverton City. Although this soil type is not a constraint for urban development, it is also well suited for irrigated crops consisting of small grains, corn, alfalfa, orchards and vineyards.

Development limitations of soils can include shrink-swell potential, permeability and salinity. Other factors such as texture, water-holding capacity and pH are important, but do not factor as heavily as impediments for urban development.

- Most of the soils in the northern half, and parts of the central city, west of the South Jordan Canal, are very unfavorable to septic tank filter fields.
- Most sites along the west side of the Jordan River are not suitable for septic tank fields, landscaping, small farms and gardens, playgrounds, picnic areas, and trails.
- Scattered sites in the southwest section of the city are not suitable for playgrounds, picnic areas, and paths and trails, depending upon the site slope.

An explanation of development limitations is provided below.

- **SHRINK-SWELL potential** is the ability of a soil to expand or shrink as the moisture content increases or decreases. Shrinking and swelling of soils causes damage to building foundations.
- **PERMEABILITY** is the rate at which water moves through the soil and is primarily determined by the texture of the soil. Soils with slow permeability rates are problematic for septic tank absorption fields as they do not properly absorb effluent.



- *SALINITY* refers to the amount of soluble salts in the soil and affects the suitability of a soil for crop production and its corrosiveness to metals and concrete.

7.2.4 AGRICULTURAL LAND

In 1960, agricultural land comprised approximately 94 percent of Riverton City. Residential and commercial growth over the past 30 years has converted agricultural land to residential use across the eastern half of the city. Much of the western portion of the city is still cultivated for irrigated farming. The Church of Jesus Christ of Latter-Day Saints farms large parcels of agricultural land in the western portion of Riverton City, commonly referred to as the “church farms.”

Although agricultural lands comprise the majority of the city’s western portion, there is only one parcel currently zoned for agriculture Land Use, with the remaining acreage zoned for either residential or commercial development. The areas adjacent to the Bangerter Highway were rezoned several years ago primarily for regional commercial and professional office uses. The western edge of the city is currently zoned for residential Land Uses ranging from one to three dwelling units per acre.

If projected growth rates continue for Riverton City, development will convert more agricultural land to residential and commercial Land Uses. In addition to a loss of agricultural land, new development will also result in a loss of open space provided by agricultural lands.

7.2.5 HABITAT AREAS

Riverton City is located in the Great Basin ecoregion of Salt Lake County. This region generally includes the northwestern portion of Utah and the central portion of Nevada.

The eastern portion of Riverton City, in the vicinity of the Jordan River, is a riparian area. Riparian areas are narrow bands of water-dependent vegetation located between streams or rivers and typical upland vegetation of the ecoregion. These areas are important to a wide variety of wildlife, and for watershed and recreation values. The vegetation in this area is important to reducing the amount of sediment transported into the Jordan River. The areas east of the riparian area, adjacent to the Jordan River area, are primarily typical of a high desert-type environment.

STATE AND FEDERALLY PROTECTED “SPECIAL STATUS” OR “ENDANGERED SPECIES”: The U.S. Fish and Wildlife Service (USF&WS) maintains the list of federally protected species. The Utah Division of Wildlife Resources maintains a list of protected wildlife species native to the State.



As defined by the Endangered Species Act of 1973 (ESA), “endangered species” are in danger of extinction throughout all, or a significant portion of, their habitat range. A state endangered species is defined as threatened with expiration or disappearance from Utah, resulting from very low declining numbers, alteration and/or reduction of habitat, detrimental or environmental changes, or any combination of the above. Riverton City is located within the distribution area of the endangered American Peregrine Falcon.

- **PEREGRINE FALCON:** The American Peregrine Falcon breeds in Utah at sites along the Wasatch Front. They nest on tall cliffs, near streams, rivers, or reservoirs. Many peregrines migrate through Utah, and some remain for the winter. The population decline in the 1940’s through 1960’s is attributed to the effects of pesticide residues that cause thin eggshells and lead to decreased birth rates. The number of falcons has increased significantly in Utah over the last 40 years. Currently, the primary threat to the Peregrine Falcon is the loss of foraging habitat and disturbance of nest sites along the Wasatch Front.

ESA defines “threatened species” as likely to become endangered in the near future. A state threatened species is defined as likely to become endangered within the foreseeable future throughout all or a significant portion if its habitat range in Utah. Riverton City is located within the distribution area of the threatened Bald Eagle.

- **BALD EAGLE:** Very few Bald Eagles nest in Utah (only four nest sites were known in 1997), but their recent nesting sites are located along the Jordan River. Although there are very few nesting eagles in Utah, there are thousands of Bald Eagles in Utah during the winter. These eagles migrate to Utah, where they spend the winter fishing ice-free waters and feeding on dead waterfowl, rabbits and deer. The decline of the Bald Eagle population in Utah was caused from habitat loss, shooting, trapping and widespread pesticide contamination and pollution. Actions taken to increase the survivability of Bald Eagles include constructing raptor-safe power lines, and reducing accidental or intentional trapping, shooting, and poisoning through education and prosecution, and reducing disturbances to nest sites.



- **PLANTS:** The federally listed plants in Utah are identified below.

Autumn buttercup	Maguire primrose
Barneby reed-mustard	Navajo sedge
Barneby ridge-cress	San Rafael cactus
Clay phacelia	Shrubby reed-mustard
Clay reed-mustard	Toad-flax cress
Dwarf bear-poppy	Siler pincushion cactus
Heliotrope milk-vetch	Unija Basin hookless Cactus
Jones cycladenia	Ute ladies'-tresses
Kodachrome bladderpod	Welsh's milkweed
Last Chance townsendia	Wright fishhook cactus
Maguire daisy	

7.2.6 AIR QUALITY

The Clean Air Act (CAA) requires that the State of Utah develop plans for attaining and maintaining ambient air quality standards for ozone in Salt Lake County. The Utah DEQ, Division of Air Quality measures the concentrations of specific air pollutants at eight locations in Salt Lake County. The closest monitoring station to Riverton City is Herriman, which abuts the western boundary of Riverton City.

EPA is required by the Clean Air Act to set two types of National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. These standards set limits to protect the following:

- *PRIMARY STANDARDS:* public health, including health of sensitive populations such as asthmatics, children and the elderly; and
- *SECONDARY STANDARDS:* public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation and buildings.

The Clean Air Act defines a “nonattainment area” as a locality where air pollution levels persistently exceed National Ambient Air Quality Standards. The Environmental Protection Agency (EPA) will normally designate an area as a “nonattainment area” only after air quality standards have been exceeded for several consecutive years.

Salt Lake County is a nonattainment area for Particulate Matter (PM10). In addition, Salt Lake City (19 miles north of Riverton City) and Provo/Orem (25 miles south of Riverton) are “non-attainment areas” for Carbon Monoxide (CO). Salt Lake County was designated a nonattainment area for ozone in 1977, but attainment was declared in 1996.



PM10 is any solid or liquid particle less than 10 microns in diameter suspended in the air. The particulate matter becomes deeply imbedded in human lung tissue and causes respiratory problems. In Utah, PM10 exceedances are characterized as a wintertime problem when strong temperature inversions trap air in the valleys. The primary man-made sources of PM10 include fugitive dust from motor vehicles, combustion of solid fuels, and agricultural and construction activities.

CO occurs by the decomposition of organic matter, such as incomplete combustion of fuels (primarily gasoline) and wood burning. Weather conditions and the number of automobiles influence CO levels. High levels of CO can have acute health effects on humans by reducing the supply of oxygen in the bloodstream, which can aggravate existing conditions such as heart and lung diseases.

7.2.7 NATURAL HAZARDS

Natural hazards affecting Riverton City include the potential for earthquakes, liquefaction and radon, and are discussed below.

EARTHQUAKES: The Wasatch Front region of Utah is a seismically active region. The Wasatch Fault Zone is located at the western base of the mountain range, approximately five miles east of the city. In addition, the Granger and Taylorsville Faults are located approximately 10 miles north of Riverton City.

Based on historical earthquake records, the probability of a strong earthquake in the Wasatch Front area is 16 percent in 50 years and 30 percent in 100 years. The probability is even greater for the Salt Lake City segment of the Wasatch Front, where the probability of a strong earthquake is 57 percent in 100 years.

LIQUEFACTION: Liquefaction is a condition that occurs when the soil loses strength and behaves like a liquid. This occurs when water-saturated soils are subjected to earthquake ground shaking, causing severe structural damage to buildings and structures. The potential for liquefaction is determined according to the probability of having an earthquake occur within a 100-year period that is strong enough to cause it.

The majority of Riverton City exhibits a very low potential for liquefaction. The northeastern portion of the city has a moderate potential and the eastern edge along the Jordan River has a high potential for liquefaction.



RADON: Radon is the radioactive decay product of uranium that moves through gases in the soil. The radon hazard level for Riverton City is moderate, along with the majority of the Western Salt Lake Valley. Low hazard levels occur in areas along the Jordan River in the eastern edge of the city. Health hazards to building occupants can be caused if the radon is able to penetrate building foundations and accumulate in sufficient quantities inside the building, providing opportunities for prolonged exposure.

7.3 NATURAL AND ENVIRONMENTAL RESOURCE CONCEPTS

Review of the existing conditions and issues provides the basis for developing key natural and environmental resource concepts. The Natural and Environmental Resources Element succeeds in meeting the Vision by adhering to the following concepts:

- Protect waterways as open space corridors;
- Maintain safe and clean surface and groundwater;
- Focus growth and development within the city to prevent premature conversion of productive farmland;
- Maintain open space greenbelts for their vegetation and habitat value; and
- Preserve habitat and migration corridors for protected species of wildlife.

7.4 GOALS, OBJECTIVES, AND POLICIES

A goal is a general statement of the vision pertaining to city policy. The goals are ideal conditions, which the community hopes to attain. The first goal is the overall goal for the element. For every other goal, the supporting objectives and policies are listed.

Objectives are specific statements of purpose relating directly to the goal.

Policies are an action, activity or strategy utilized to implement the related objective and goal.

GOAL 7.A: HIGH ENVIRONMENTAL QUALITY

Promote a high level of environmental quality with a safe, healthy and enjoyable community for Riverton City residents.



GOAL 7.B: RESOURCE QUALITY
Protect the quality of water and air resources.

Objective 7.B.1 **Maintain and improve the quality of potable water through constantly updating and modernizing treatment plants and protecting water supply.**

- Policy 7.B.1.1 Protect areas that are directly influenced by waterways or which influence other waterways, in open spaces or in a natural setting for water infiltration, flood control, pollution reduction, and other important natural processes.
- Policy 7.B.1.2 Conserve culinary water by continued education of citizens about conservation, and utilizing secondary water.
- Policy 7.B.1.3 Development should not be approved until protection of water resources is ensured.

Objective 7.B.2 **Improve air quality through better monitoring of automotive emissions, fireplace and industrial pollution, and support enforcement of Department of Environmental Quality (DEQ) and Environmental Protection Agency (EPA) standards.**

- Policy 7.B.2.1 Promote, encourage and require adherence to all state and federal air quality environmental regulations.

GOAL 7.C: AGRICULTURAL LAND
Preserve agricultural land, as it reflects the tradition and history of Riverton.

Objective 7.C.1 **Protect and preserve agriculture as a viable Land Use within the areas designated Agriculture and Preservation on the Land Use map.**

- Policy 7.C.1.1 Preserve the integrity of rural neighborhoods and productive farmlands within the city.
- Policy 7.C.1.2 Support continued farming of agricultural land until production is no longer viable.
- Policy 7.C.1.3 Limit encroachment of urban development onto active agricultural areas through strategic CIP programming.
- Policy 7.C.1.4 Promote agricultural use within floodplains and other natural hazard zones.



Policy 7.C.1.5 Utilize Agriculture (AG) Protection overlay zones for agricultural land in contiguous parcels greater than 250 acres.

GOAL 7.D: ENVIRONMENTAL RESOURCES
Retain valuable environmental resources that contribute to the quality of life in Riverton City.

Objective 7.D.1 Maintain and preserve areas with significant habitat, or where natural hazards are present.

Policy 7.D.1.1 Develop ordinances that would protect native plant life, encourage native planting, maintain greenbelts, and preserve habitat for protected species of wildlife.

Policy 7.D.1.2 Utilize and frequently update information and the status of threatened and endangered species location and condition for reference when evaluating development proposals.

Policy 7.D.1.3 Utilize cluster development and transfer of development rights to maintain and protect natural resources and environmental features.

7.5 IMPLEMENTATION PROGRAM

The implementation program for the Natural and Environmental Resources Element of the Riverton City General Plan is presented in Table 7.1, *Natural and Environmental Resources Implementation Program*. The table is presented under the following headings:

Implementation Measure	Lists the action necessary to carry out the Natural and Environmental Resources Element of the General Plan.
Lead Department/Agency	Identifies the responsible City Department or agency for accomplishing that particular program.
Timeframe	Identifies and prioritizes the timeframe from one to five years for the measure to be initiated.
Projected Resources	Lists the potential funding, City staff, volunteer or other community resources necessary to carry out the implementation action.



The implementation measures are listed from the additional actions necessary to implement the Natural and Environmental Resources Element. The timing, responsibility and resources for the implementation measures are provided in Table 7.1, and are described below:

TABLE 7.1
NATURAL AND ENVIRONMENTAL RESOURCES IMPLEMENTATION PROGRAM

Implementation Measure	Lead Department/ Agency	Timeframe	Projected Resources
Natural and Environmental Resources Element Implementation			
A. Water Influence Studies	Engineering	Ongoing	Staff Time
B. Environmentally Sensitive Maps	Planning and Engineering	1 year	Staff time or General Fund expenditure
C. Open Space Dumping - Public Awareness	Planning (code enforcement)	Ongoing	Staff time
D. Working Model Farm	Planning and Historical Society	5 years	Staff, Historic Society and FFA volunteer time and fund raising

Source: BRW, Inc. January 2001.

NATURAL AND ENVIRONMENTAL RESOURCES IMPLEMENTATION MEASURES

- A. Require development proposals which are located in a water-influence area to prepare an impact study, funded by the developer, to determine the boundaries of the water influence, the local natural processes (floods, springs, etc.) and the protective actions that will be used to safeguard the ecosystem. Development should not be approved until the protection of water resources is ensured.
- B. Develop an inventory and series of environmentally sensitive area maps with the location of valuable open space use based in criteria such as water influence areas, special view, needed buffers between conflicting development types, travel corridors, and prime soil types, etc. Use these maps when reviewing initiated development proposals.
- C. A public awareness program should be initiated to keep environmentally sensitive areas from becoming illegal dump areas or harbors of criminal activity.
- D. Consider maintaining a small “working model” farm to act as a nature center for the education and enjoyment of all ages.