Introduction

Colorado Springs Utilities (Utilities) is preparing an Integrated Water Resource Plan (IWRP). The IWRP is a long-term strategic plan for providing a reliable, sustainable water supply to Utilities’ customers in a cost-effective manner. It is a holistic approach to water resource planning that focuses on water supply while incorporating water demand, water quality, infrastructure reliability, environmental protection, water reuse, financial planning, energy use, regulatory and legal concerns, and public participation.

The first step in the IWRP was to identify and prioritize issues, risks and opportunities associated with Utilities’ raw water system now and when our service area is fully developed. The greatest issues, risks and vulnerabilities were organized into six categories. This Issue Paper summarizes risks in the Infrastructure Failures category.

Background

» Most of Utilities’ water supplies are conveyed to Colorado Springs through three major pipelines (four when Southern Delivery System comes online in 2016) and various other smaller raw water delivery pipelines from many local and regional sources.

» Most supplies are stored in reservoirs prior to delivery to the city.

» Even temporary pipeline, pump station or dam failures could limit our ability to deliver supplies to our water treatment plants.

» Many of our key infrastructure components are aging, increasing risk of failure or compromised operation. For example, the Blue River system was built in the 1950s and the Homestake system was built in the 1960s.

» The recent Otero Pump Station fire and Homestake Pipeline rock slide are examples of risks from infrastructure outages.

» The SDS project significantly improves our delivery system reliability by greatly enhancing our ability to access our Arkansas River and Colorado River Basin water supplies.

Utilities' Major Yield Systems (Water Producing Systems) and Delivery Systems (Water Moving Systems)
**Discussion**

High priority issues and risks related to **Infrastructure Failures** are summarized below.

- **Aging Infrastructure** – Risks of unanticipated failures or extended downtimes for maintenance increase as our critical water infrastructure ages. Typical design lives of water infrastructure are 50-100 years; many of our key facilities are in that range.

- **Deferred Maintenance** – The need to commit financial and other resources to addressing urgent needs (e.g., drought, wildfire) and implementing large capital projects can force deferral of routine maintenance of critical infrastructure. In the long term this can increase the overall cost of sustaining a dependable raw water system.

- **Security Threats** – In this era of heightened security concerns, we must remain vigilant of threats of vandalism or sabotage at dams, pump stations and treatment plants.

- **Natural Hazards** – Wildfires, floods, landslides, sedimentation, and other natural processes can affect raw water infrastructure. Potential impacts of natural hazards can include:
  - **Wildfire Issues** – facility damage, increased reservoir sedimentation, water quality degradation at water treatment plants
  - **Landslide Issues** – facility damage, dam failure
  - **Flood Issues** – facility damage, erosion exposing existing water and sewer lines, sedimentation
  - **Sedimentation** – loss of reservoir storage, buried diversion structures

Other factors affecting **Infrastructure Failures** include:

- Based on the importance to our raw water system, infrastructure condition, and vulnerability, the Local Yield System and the Otero Delivery System present the greatest concerns for infrastructure risk.

- Bringing SDS Phase 1 online in 2016 will result in a significant improvement in raw water system delivery reliability by providing another method of delivering our water supplies stored in Pueblo Reservoir. SDS redundancy will decrease over time as demand increases.

- Power outages due to local electrical system problems or grid failures could affect delivery operations because our water supplies from the Arkansas River and Colorado River Basins must be pumped to the city.

- Attacks of sabotage targeting Utilities’ facilities may impact infrastructure and potentially affect water quality.

In the next steps of the IWRP analysis, Utilities will quantify the impacts of **Infrastructure Failures** and other key risks on our raw water system. Projects, programs and policies will then be evaluated for mitigating the impacts of those risks. The most robust solutions will be combined into a roadmap for future water resources decision-making.