Scope of Work

Background

The Salt River Project (SRP)/Central Arizona Project (CAP) Interconnection Facility (SCIF) project aims to enable SRP water to be pumped into the CAP canal. The SCIF would allow the use of existing infrastructure and provide operational flexibility for two of the largest water providers in Arizona. If implemented, the SCIF would allow water stored in SRP reservoirs to be transported to customers with water treatment plants outside SRP's service territory. Cities like Mesa, Chandler, Scottsdale, Phoenix, and Glendale, which have ownership of water within the conservation space behind Roosevelt Dam, could benefit by receiving water through CAP, optimizing their water resource utilization. The SCIF is essentially the reverse of a previous project, the CAP/SRP Interconnection Facility (CSIF), completed in 1990, which allowed CAP water to be delivered through the SRP system.

Introduction

The purpose of this **SCIF Downstream Impact Study** (Study) is to evaluate the impact to water users downstream of the SCIF, specifically the Town of Gilbert (Gilbert), City of Chandler (Chandler), and City of Mesa (Mesa) (collectively Owners). This Study is being jointly funded by these three municipalities and will be managed by Gilbert and executed by Water Works Engineers (Engineer). Cost sharing will be executed through existing Inter-Governmental Agreements (IGAs) between Owners.

While providing the water resource benefits listed above, operation of the SCIF will impact downstream water users due to the blending of SRP and CAP water. This blending could affect several key water quality parameters, including Total Organic Carbon (TOC) and turbidity, potentially exceeding the limits of existing plant processes and systems.

Total Organic Carbon

TOC levels in SRP water are higher than those typically found in CAP water. Elevated TOC can lead to increased formation of disinfection byproducts (DBPs) during the water treatment process. To manage higher TOC levels, downstream water treatment plants may need to implement additional or enhanced treatment processes. This could result in significant capital improvements to upgrade existing infrastructure.

Turbidity

Turbidity also varies between SRP and CAP sources. Higher turbidity levels in SRP water could challenge the existing clarification and filtration systems at downstream treatment plants,

potentially requiring upgrades to filtration systems or the addition of pre-treatment processes to ensure compliance with regulatory standards. This would involve capital expenditures on new equipment and modifications to existing systems.

Scope of Work

Task Series 1 Project Administration

Task 1.1 Project Management

This task involves overseeing all aspects of the Study, including:

- Coordinating with Gilbert and Owners to ensure clear communication and alignment on project goals, scope, and deliverables.
- Managing the project schedule, budget, and resources to ensure timely and cost-effective completion of the project.
- Facilitating regular meetings and progress updates to address any issues or changes in the project scope.

Task Series 2 Data Collection and Review

Engineer will complete data collection and review phase as described in the following tasks.

Task 2.1 Historical Source Water Quality from both SRP and CAP

SRP is currently completing a blend analysis that evaluates the range of operating blend scenarios from the SRP and CAP source waters. It is anticipated that this will include parameters such as TOC, turbidity, pH, Alkalinity, TDS, Hardness, Sodium, Chloride, Sulfate, Bromide, UV254 and other relevant constituents. It is also understood that this SRP blend analysis will assess variability in flow rates from both SRP and CAP sources and evaluate the likelihood and implications of a scenario where 100% of the water in the CAP canal is sourced from SRP. The Study will develop and analyze a single worst-case scenario in coordination with the stakeholders. The effort included under this task is to document and incorporate the results of this SRP blend analysis into the study.

Task 2.2 Historical WTP Raw Water Quality and WTP Performance

Under this task, historical raw water quality data will be collected from each of the respective water treatment plants (WTPs) involved in the study: San Tan Vista Water Treatment Plant (SVWTP), Signal Butte WTP, and Brown Road WTP. This data will include measurements of key water quality parameters identified above. Historical performance data from each WTP will be collected to evaluate the effectiveness of existing treatment processes. This includes data on settled water turbidity, filtered water turbidity, TOC removal efficiency, and other performance metrics. Historical operating parameters such as the types and dosage rates of chemicals used in the

treatment processes will be reviewed. This includes data on coagulants, polymers, acids, caustics, disinfectants, filter run durations, etc. The scope of this analysis will be limited to three (3) 1-year periods identified by the Owners as capturing significant or excursion events that created operational challenges in the past.

Task Series 3 Existing WTP Evaluation

Task 3.1 Identify Existing Treatment System Sizing and Capacity

Engineer will document the existing water treatment processes and system sizing at each WTP. This includes the size, capacity, and number of sedimentation basins, filter basins, and other critical components.

Task 3.2 Evaluate Existing Treatment Processes under SCIF Scenarios

Engineer will evaluate the performance of the existing treatment processes under the previously described SCIF scenarios. This evaluation will identify any treatment capability gaps where the existing processes are insufficient. This will involve assessing the effectiveness of sedimentation, filtration, TOC removal, chemical feed, and other critical processes in handling the blended water quality. Engineer will also identify the predicted reduced capacity of each WTP under the various SCIF scenarios developed previously.

Task 3.3 Evaluate Solids Handling Processes under SCIF Scenarios

Treating water with higher turbidity and TOC levels will generate more solids which must be concentrated, dewatered, and disposed of appropriately. Engineer will perform a mass balance to assess solids loading rates in residuals treatment processes to evaluate existing capacity and reduced capacity under SCIF scenarios.

Task Series 4 WTP Upgrades and Recommendations

Task 4.1 Process Upgrades

Engineer will identify new or modified unit processes to meet water quality standards under maximum SCIF impact scenarios. New or modified unit processes could include pre-sedimentation, oxidation, enhanced filtration, optimized chemical dosing, etc., to ensure compliance with regulatory standards and maintain overall treatment efficacy under SCIF scenarios.

Task 4.2 Cost Development

Engineer will evaluate the cost impacts associated with implementing new unit processes and upgrades at each WTP. This evaluation will include several key areas:

- Capital Expenditures

- Increased Chemical Usage
- Electrical
- Solids Handling and Disposal
- Maintenance Costs
- Staffing Costs

Task Series 5 Impact Study

Task 5.1 Report Development

The Engineer will provide a draft and final comprehensive report summarizing the findings from the evaluation of the existing WTPs under various scenarios. This report will include proposed upgrades to address identified gaps in treatment capabilities, detailed cost impacts associated with implementing new unit processes, and compliance evaluations to ensure adherence to regulatory standards. The engineer will develop conceptual designs for the recommended upgrades and document the cost estimates for these new unit processes. Additionally, the engineer will offer operational recommendations to optimize the performance of the WTPs under the anticipated water quality conditions.