Superstition Mountains Community Facilities District No. 1

2021 Water Reclamation Facility Master Plan

Stantec Project No. 18130988

Prepared For:
SMCFD No. 1
5661 South Ironwood Drive,
Apache Junction, AZ 85120

Prepared By:
Stantec Consulting Services Inc.
3133 West Frye Road, Suite 300,
Chandler, AZ 85226
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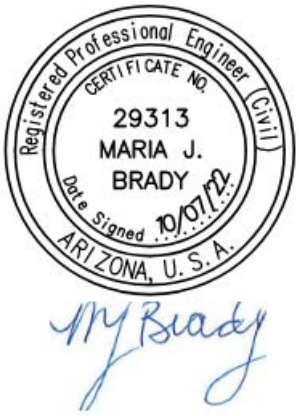
SMCFD 2021 Water Reclamation Facility Master Plan

Final

October 7, 2022



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Revision	Description	Author		Quality Check		Independent Review	
0	Draft	Jack Bryck	JB	H. Tugaoen	HT	Maria Brady	MB
1	Draft	Jack Bryck	JB	H. Tugaoen	HT	Maria Brady	MB

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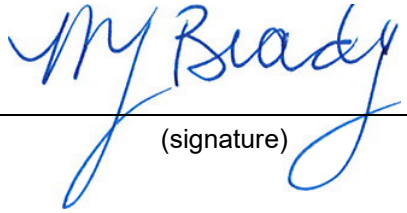
Jack Bryck

Reviewed by  (signature)

Heather Tugaoen

Approved by  (signature)

Maria Brady

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ABBREVIATIONS

AAC	Arizona Administrative Code
ACC	Arizona Corporation Commission
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
AF/af	Acre-foot/feet
AJWD	Apache Junction Water District
AMA	Active Management Area
APP	Aquifer Protection Permit
ASLD	Arizona State Land Department
ASR	Aquifer Storage and Recovery
AZPDES	Arizona Pollutant Discharge Elimination System
AWC	Arizona Water Company
BOD	Biochemical Oxygen Demand
CAG	Central Arizona Governments
CAGRD	Central Arizona Groundwater Replenishment District
CAP	Central Arizona Project
CAWCD	Central Arizona Water Conservation District
DPR	Direct Potable Reuse
DU	Dwelling Units
F/M	Food to Microorganism Ratio
FT/ft	Feet or foot (in context
GIS	Geographic Information System
gpcd	Gallons per Capita per Day
gpd	Gallons per Day
GPM	Gallons per Minute
HDPE	High-density Polyethylene
HRT	Hydraulic Residence Time
M&I	Municipal and Industrial
MAG	Maricopa Association of Governments
MBR	Membrane Bioreactor
MG	Million Gallons
mg/L	Milligrams per Liter
MGD	Million Gallons per Day
MPA	Municipal Planning Area
N	Nitrogen
PFAS	per- and polyfluoroalkyl substances
POC	Point of Compliance
ROM	Rough Order of Magnitude
SA	Service Area
SF/sf	Square Foot
SMCFD	Superstition Mountains Community Facilities District
SMRF	Superstition Mountain Recharge Facility
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TSS	Total Suspended Solids
UV	Ultraviolet
VSS	Volatile Suspended Solids
VZ	Vadose Zone
WTP	Water Treatment Plant
WRF	Water Reclamation Facility

Executive Summary

Superstition Mountains Community Facilities District No. 1 (SMCFD or the District) was formed by the City of Apache Junction (City) in 1992 to provide sewer services to the community. SMCFD operates and maintains a wastewater collection and treatment system consisting of sanitary sewer pipes, a pump station, a 2.1 MGD capacity WRF and groundwater recharge basins. The District's service area is predominantly within the City of Apache Junction boundary. SMCFD is governed by an independent Board of Directors.

The SMCFD 2021 Water Reclamation Facility Master Plan (WRF Master Plan) areas align with the City of Apache Junction General Plan 2020 - 2050 (2020 General Plan). The 2020 General Plan identifies land use in the City's Municipal Planning Area (MPA) including the incorporated area and planning areas outside the City's incorporated boundary. The total land area in the 2020 General Plan is approximately 95 square miles. The plan's land use element contains goals and policies that provide direction on how the City will develop in the future.

The WRF Master Plan has been prepared to evaluate expansion, modification and treatment options for the WRF to serve all areas within the City's MPA and the District's Service Areas (SAs). The plan divides the MPA into 4 SA's which are defined in Chapter X.X of this plan.

Estimates of the future average day wastewater flows and population were made for each of the four service areas. The estimated wastewater flows and populations for each SA are based on the City's planned land use zoning, SMCFD historical flow data, ADEQ guidance documents and the City of Phoenix Guidelines for commercial and industrial land uses. The design and planning criteria are based on guidance by ADEQ and the AAC.

There is no suggestion in the 2020 General Plan on when full buildout will be achieved, but it is expected to be decades in the future. No assumptions are made on the many factors and constraints, such as availability of water, that will shape future development.

The average wastewater flow from the existing SMCFD collection system to the WRF has not significantly increased over the last five years when compared to the increase in the service area population. This may be a result of water saving initiatives put in place over the last five to ten years by the AJWD and AWC, who both provide drinking water within the City.

This plan assumes that the existing WRF site will receive and treat all effluent from SA1, SA2 and SA3. A future WRF will likely be sited east of the CAP Canal when SA 4 is developed.

1.0 INTRODUCTION

SMCFD owns and operates a treatment facility on 97 acres of land located at 5661 South Ironwood Drive, Apache Junction. The facility is rated to treat approximately 2.1 MGD using an extended aeration activated sludge process to reclaim water to B+ quality. The District is undergoing a capacity increase to 3.0 MGD. Treated effluent is either recharged into the aquifer through engineered groundwater recharge basins located on the WRF property or discharged to an unnamed wash, tributary to the Siphon Draw water course (Siphon Draw). Effluent is anticipated to be a critical element of the water supply system either by recharging effluent and pumping groundwater, or for beneficial reuse.

This report updates the District's Water Reclamation Facility Master Plan for land within the District's service and planning areas, and supersedes all Wastewater Treatment Facility Master Plans. The existing SMCFD Service and Planning Area – CAG 208 2021 boundary is illustrated in **Figure 1**. Concurrent to the development of the WRF Master Plan, Stantec updated updating the Wastewater Collection System Master Plan (CS Master Plan, 2021).

1.1 BACKGROUND INFORMATION

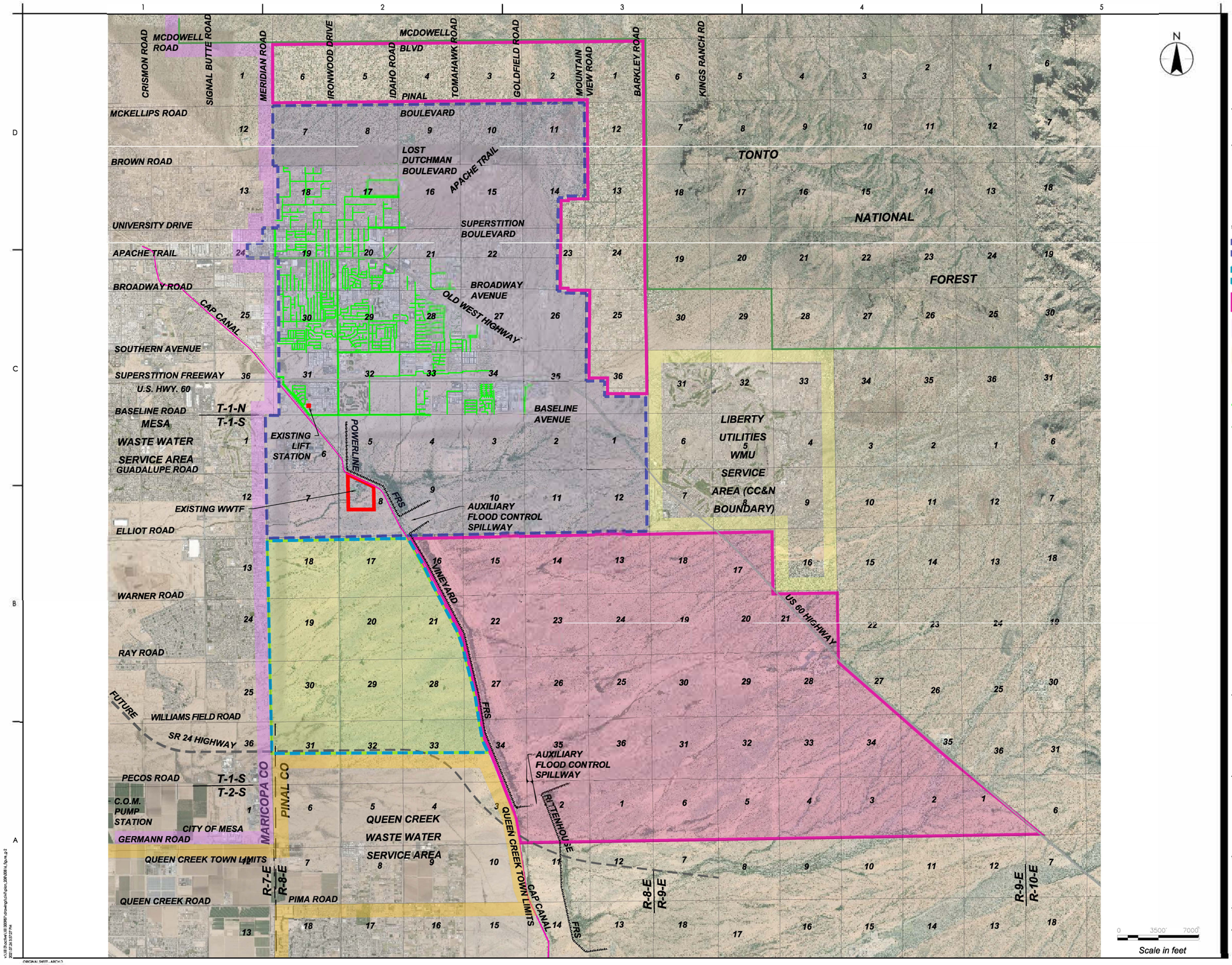
SMCFD Wastewater Master Plan 2006: The District's wastewater collection and treatment system was constructed in 1995. The 2006 Master Plan included an increase to the District's planning boundaries, service area population and wastewater flow; recommendations for planning of improvements and increased capacity for the existing WRF and, at a later date, a second WRF to serve the area south of Elliot Avenue; recommendations for the purchase of additional land at the WRF site to allow for future improvements with expected increased wastewater flows; and recommended expansion of the wastewater collection system. The plan recognized the impact that the sale of State Land would have on the District and recommended a modification of the CAG 208 plan to incorporate the noted areas.

SMCFD 208 Plan and DMA Boundary Amendment (2021): The District updated the 208 Plan and DMA Boundary to incorporate new land into their service area (approved 2021 by CAG).

City of Apache Junction General Plan: SMCFD considered the City's 1999 general plan, that documented proposed growth planning for the City and its surrounding area, when drafting the 2006 Master Plan. This Master Plan used the Apache Junction 2020 General Plan for referenced updates.

Kimley Horn- Lost Dutchman Land Development Project Report: Kimley Horn Lost Dutchman Report was due for public release in December 2019 and was publicly released June 2020.

Superstition Vistas Development Reports: A series of engineering reports and master planning studies were completed for the Superstition Vistas (retitled from Lost Dutchman) service area throughout 2021-2022. These reports serve as ancillary information to the District Master Plan herein.



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LEGEND

- CITY OF APACHE JUNCTION LIMITS AND EXISTING DMA BOUNDARY
- EXPANDED DMA BOUNDARY
- FUTURE PLANNING AREA
- MESA DMA BOUNDARY
- QUEEN CREEK DMA BOUNDARY
- LIBERTY UTILITIES WMU SERVICE AREA (CC&N BOUNDARY) DMA BOUNDARY
- SMCFD NO. 1 EXISTING SERVICE (COLLECTION SYSTEM)
- TONTO NATIONAL FOREST BOUNDARY

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SMCFD

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SUPERSTITION MOUNTAINS CFD NO. 1
WATER RECLAMATION FACILITY MASTER PLAN

Apache Junction, Arizona

Title
FACILITY LOCATIONS

Project No.
181300988

Scale
AS SHOWN

Revision
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Sheet
of

Figure
1

1.2 SCOPE OF WORK

The objectives for the 2021 SMCFD WRF Master Plan include the following wastewater treatment and collection system tasks and data:

- **Data Collection:** All available relevant background data for the project was collected, including hydrogeological reports; effluent recharge data; effluent quality data and permitted limits; discharge and recharge data; and sludge handling and disposal data. The SMCFD Collection System Master Plan provides additional background data to this WRF Master Plan.
- **Hydrogeological Design Criteria and Standards:** Review existing SMCFD and CAP hydrogeological reports to develop effluent reuse strategies; review recharge basin design reports, plans and standards; and develop design criteria for evaluating recharge of treated effluent via recharge basins and injection wells.
- **Current and Future Effluent Limits and Standards:** Review current and potential future effluent limits that significantly impact wastewater treatment processes, disposal and land area requirements.
- **Sludge Handling:** Review existing WRF biosolids production rates and classifications, including a review of sludge production criteria for estimating future buildout sludge quantity. Review the existing sludge handling system and evaluate options to meet future needs and space requirements.
- **Effluent Disposal:** Evaluate existing effluent discharged to surface water sources, reused for irrigation or recharged to the ground via basins or wells. Identify potential recharge options for future increased WRF capacity.
- **Flow Projections:** Assess estimated and anticipated flows to the WRF at full City buildout based on the 2020 General Plan and wastewater flows estimated in the CS Master Plan.
- **Water Reclamation Facility Site Assessment:** Review existing WRF site conditions and capacity for future treatment processes to meet required regulatory limits, effluent disposal means and sludge handling options at full buildout based on the 2020 General Plan.
- **Order of Magnitude Cost Estimate:** Prepare rough order of magnitude (ROM) cost estimates for recommended options including effluent recharge, sludge handling, facility expansion and connection of new pump station(s) to the headworks.
- **Preliminary and Final WRF Master Plan:** Prepare a draft Master Plan report for SMCFD review and comments, to be incorporated into the final report.

1.3 MASTER PLANNING AREAS

SMCFD has identified four service areas within the City's MPA which are illustrated on Figure 2 and described in detail below.

Service Area 1 (SA1)

SA1 is the existing area served by the District and is based on the CAG 208 Area Wide Water Quality Management Plan DMA Boundary for the City. It is generally bounded by McKellips Road on the north, Baseline Avenue on the south, Meridian Road on the west and the Barkley Road alignment on the east. It includes the historic, institutional and commercial areas of Apache Junction. Wastewater from this area flows through the District's existing wastewater collection system to the WRF. Many buildings in the City were constructed prior to the development of the sanitary sewer system therefore not all commercial and residential properties in SA1 are connected to the District's wastewater system.

Service Area 2 (SA2)

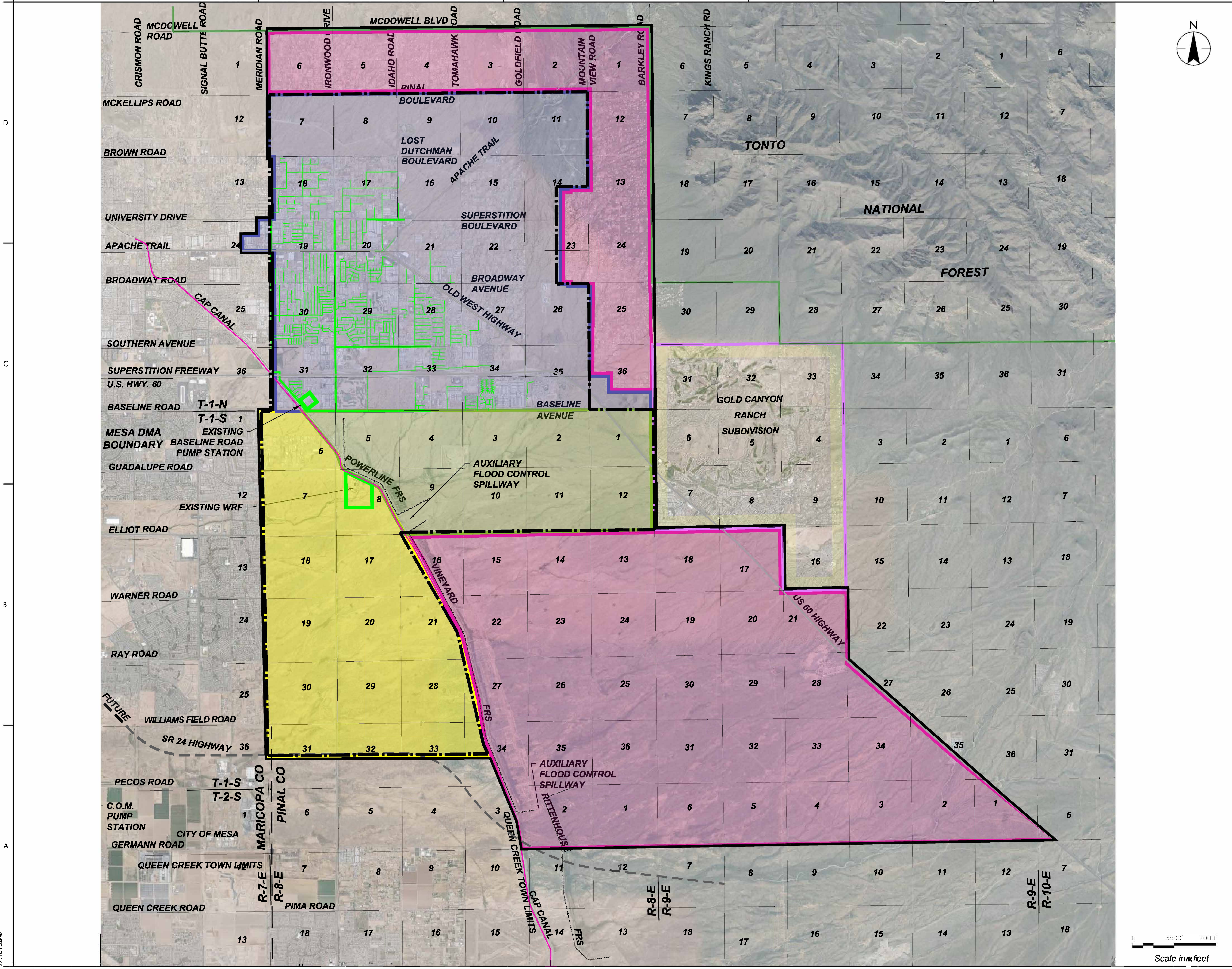
SA2 is generally bounded by Baseline Avenue on the north, the Frye Road alignment on the south, Meridian Road on the west and the CAP Canal on the east. The land within the boundary is currently undeveloped State Trust Land, part of which was recently sold to a developer with the remaining land being subject to future sale by the State. The land is designated by the Future Land Use section of the 2020 General Plan as "Master Planned Community".

Service Area 3 (SA3)

SA3 is a future planning area that is generally bounded by Baseline Avenue on the north, the Elliot Avenue alignment on the south, the CAP Canal on the west and the Barkley Road alignment on the east. There is a development planned in this service area that will require a small pump station to the Baseline Avenue interceptor and will eventually be connected to a future pump station proposed to be located east of the CAP Canal near the Elliot Avenue alignment. This area is designated by the Future Land Use section of the General Plan 2020 as "Master Planned Community".

Service Area 4 (SA4)

SA4 is a future planning area that is generally bounded by Elliot Avenue on the north, Germann Road on the south, the CAP Canal on the west and the U.S. Highway 60 on the east. The land within SA4 is vacant land owned by ASLD that may be sold in the future for further development. This area is designated by the Future Land Use section of the General Plan 2020 as "Master Planned Community". There are also areas within SA4 along the north and east boundaries of SA1 that are identified as low-density development by the 2020 General Plan and are not likely to connect to the District's wastewater system.



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LEGEND

- SMCFD SA1
- SMCFD SA2
- SMCFD SA3
- SMCFD SA4
- SMCFD NO. 1 EXISTING SEWER COLLECTION SYSTEM
- PROPOSED FORCE MAIN
- TONTO NATIONAL FOREST BOUNDARY
- CITY OF APACHE JUNCTION INCORPORATED LIMITS
- MUNICIPAL PLANNING AREA

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SUPERSTITION MOUNTAINS COMMUNITY FACILITY DISTRICT NO. 1 COLLECTION SYSTEM MASTER PLAN

Apache Junction, Arizona

Title
SMCFD SERVICE AREAS

Project No.	Scale
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Drawing No.
2

1.4 CITY OF APACHE JUNCTION 2020 GENERAL PLAN

The City of Apache Junction adopted its updated General Plan in August 2020. The information supplied by the City and applicable to the WRF Master Plan in preparation of this report. Specific relevant sections of the 2020 General Plan include Part 1 Introduction and Community Profile, and Part 2 Plan Elements, Water Resources and Land Use.

One H_2O Resources Element

The Water Resources element of the 2020 General Plan advocates for a holistic approach to consider all the City's water resources including surface water, groundwater, wastewater, potable water, recycled water, water runoff and stormwater. This element provides a general overview of the City's commitment to sustainable water management. The WRF Master Plan aligns with and builds on the concept of the City's One H2O Water Resources concept as it relates to wastewater treatment and effluent reuse.

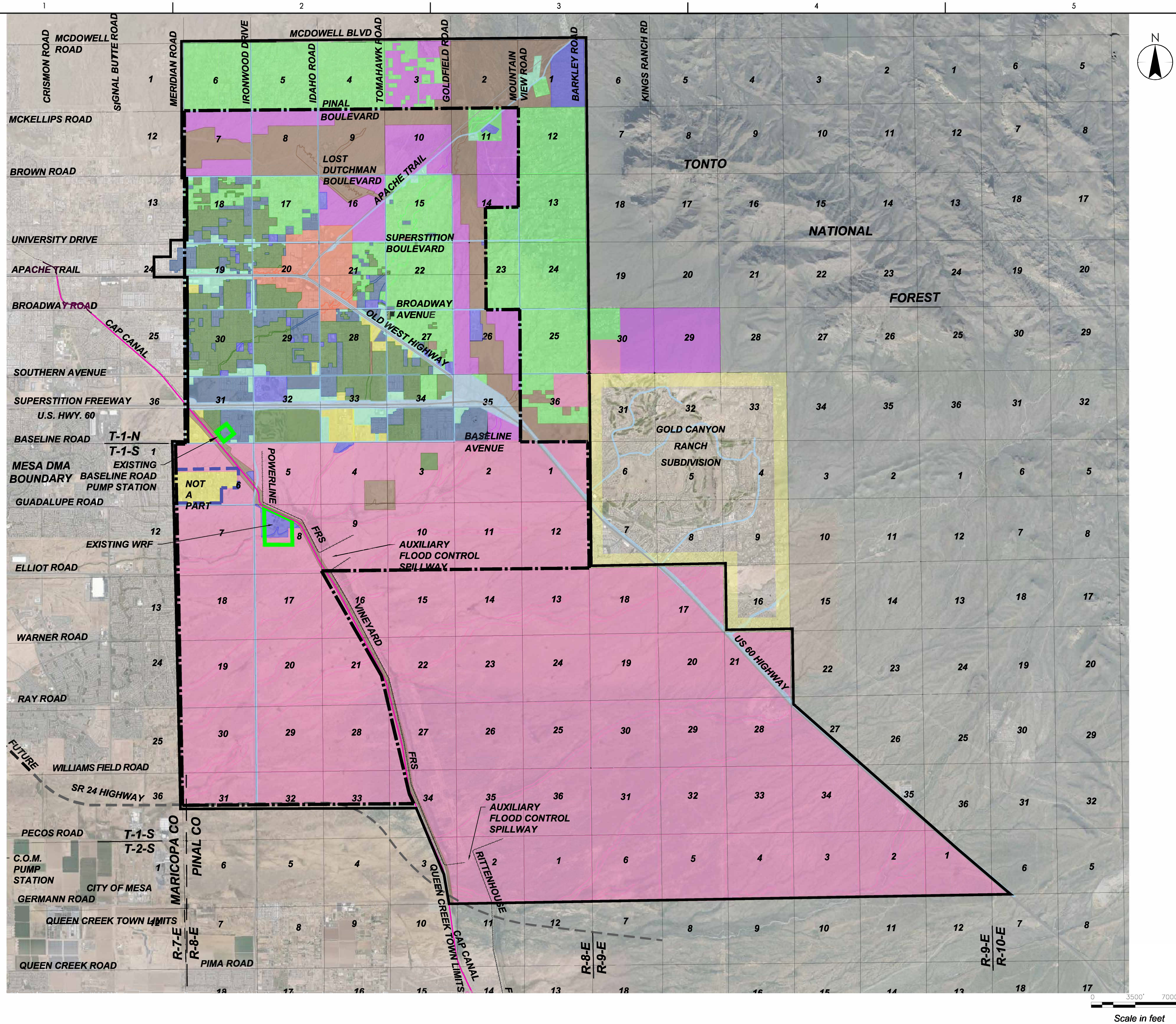
The Water Supply and Demand section identifies groundwater recharge and effluent reuse as renewable water resources that will remain an important part of the focus of water supplies for future development. The plan notes a pipeline corridor connecting the AJWD WTP to the SMCFD WRF to leverage future water reuse technologies and develop a renewable water resource. The Water Conservation section encourages the continued decrease in per capita water consumption. This decrease in water consumption will need to be recognized in future planning and operation of the WRF.

Land Use Plan Element

The 2020 General Plan identifies approximately 34.8 square miles of land in the City's incorporated land area, with 11 square miles currently in the annexation process and approximately 29 square miles remaining in the planning area outside the City's incorporated boundary that the City may consider for future annexation. The total land area in the 2020 General Plan is approximately 95 square miles. This element contains goals and policies that provide direction on how the City will develop in the future, as shown in **Figure 3**.

This Master Plan has adopted the 2020 General Plan planning area boundary as well as the zoning densities anticipated by the General Plan in terms of distribution, basic use and density proposed at full buildout. Buildout is defined as the theoretical point at which the City and, for purposes of the WRF Master Plan SMCFD, are completely developed in accordance with the City 'Future Land Use' map in the General Plan.

The City electronically provided the land area for this Master Plan within each planning land use category, which was used by SMCFD to estimate the wastewater flow at full City buildout. Figure 2, the City of Apache Junction 2020 General Plan Land Use Planning Map, illustrates the City's planning land use categories.



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LEGEND

LAND USE

- COMMERCIAL
- CONSERVATION (1DU/AC)
- DOWNTOWN MIXED USE
- HIGH DENSITY RESIDENTIAL (40 DU/AC Max)
- LIGHT INDUSTRIAL/BUSINESS PARK AND INDUSTRIAL
- LOW DENSITY RESIDENTIAL (1 DU/1.25 AU)
- MASTER PLANNED COMMUNITY (20 DU/AC Max)
- MEDIUM DENSITY RESIDENTIAL (10 DU/AC Max)
- OPEN SPACE AND RECREATION
- PUBLIC/INSTITUTION
- TRANSPORTATION
- GOLD CANYON RANCH SUBDIVISION
- CITY OF APACHE JUNCTION INCORPORATED LIMITS
- MUNICIPAL PLANNING AREA

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SUPERSTITION MOUNTAINS CFD NO. 1
WATER RECLAMATION FACILITY
MASTER PLAN

Apache Junction, Arizona

Title
LAND USE MAP

Project No.
181300988

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AS SHOWN

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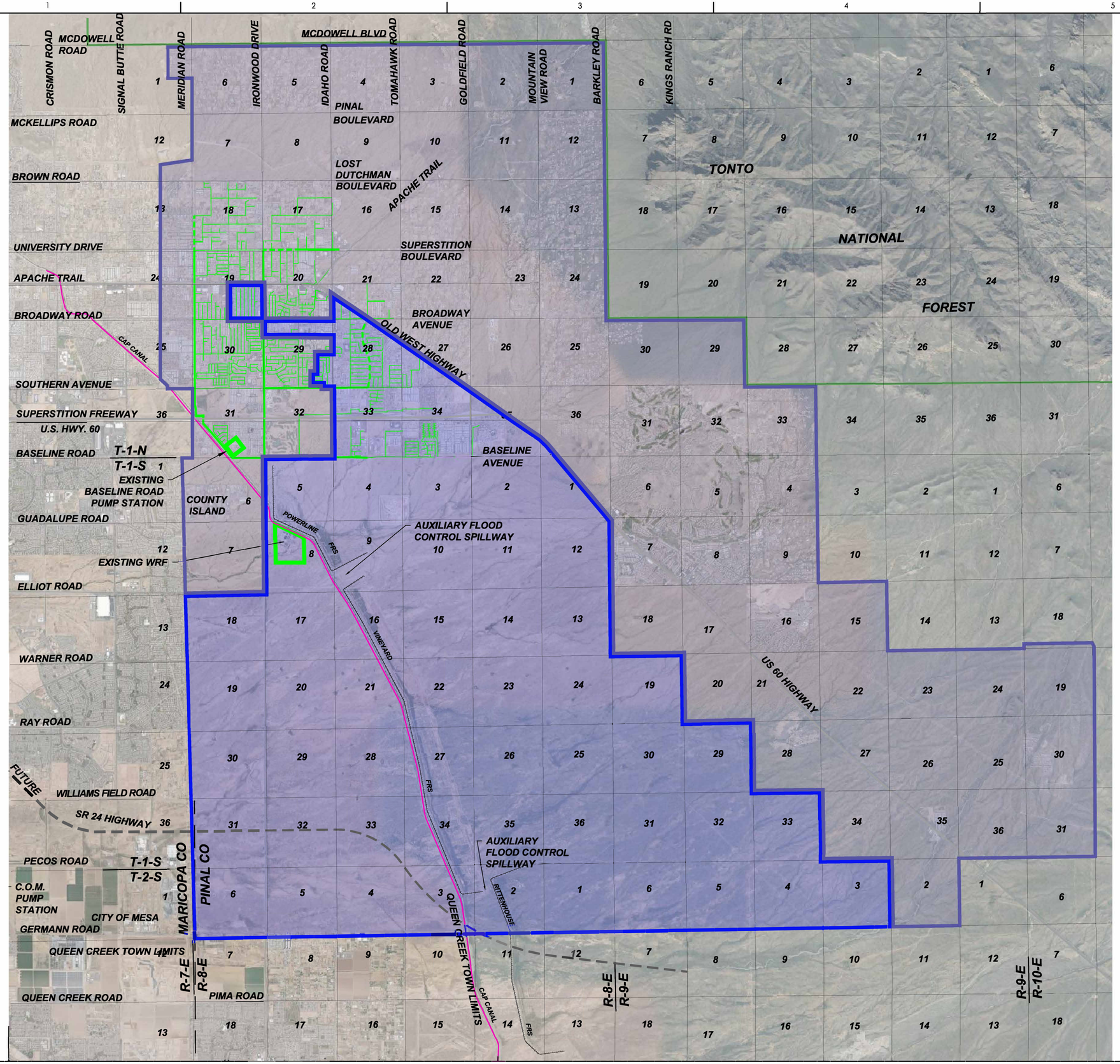
3

1.5 DRINKING WATER SERVICE PROVIDERS

The City's drinking water needs are served by two providers, the Apache Junction Water District and Arizona Water Company, that rely on a combination of surface water and groundwater to meet the needs of their customers. The wastewater treatment process produces cleaned water, or effluent, that is considered a commodity that could be reused for a variety of beneficial uses to contribute to a sustained water supply. It is important for the District to coordinate with these water service providers to determine the appropriate level of treatment and provide a product that can benefit the community.

Boundaries for the AJWD and Arizona Water Company service areas are shown on **Figure 4**.



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LEGEND

- APACHE JUNCTION WATER DISTRICT SERVICE AREA BOUNDARY
- ARIZONA WATER COMPANY SERVICE AREA BOUNDARY
- SMCFD NO. 1 EXISTING SEWER COLLECTION SYSTEM PIPELINE
- SMCFD NO. 1 EXISTING SEWER COLLECTION SYSTEM PIPELINE
- TONTO NATIONAL FOREST BOUNDARY

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SMCFD

Client/Project
SUPERSTITION MOUNTAINS CFD NO. 1
WATER RECLAMATION FACILITY
MASTER PLAN

Apache Junction, Arizona

Title
SYSTEM BOUNDARIES FOR ARIZONA WATER COMPANY AND CITY OF APACHE JUNCTION WATER DISTRICT

Project No.	Scale
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Revision Sheet	Figure 4

ORIGINAL SHEET - ARCH D

2.0 HYDROGEOLOGIC STUDIES

Hydrogeologic studies conducted for the WRF and three hydrogeologic studies completed for the CAP were also reviewed to evaluate potential additional effluent recharge sites in the SMCFD planning area. The studies below have been reviewed and used in Section 5.0 of this Master Plan to identify potential future recharge options for SMCFD.

2.1 MATRIX NEW WORLD ENGINEERING

SMCFD contracted with Matrix New World Engineering (formerly Southwest Groundwater) to investigate options for additional onsite recharge to support rerating the WRF. The Supplemental Site Characterization Study for Recharge Basins, dated July 22, 2016, documented the findings of a perched aquifer mounding analysis using a simplified numerical groundwater flow model and data from the Regional Salt River Valley Groundwater Flow Model. The discharge impact analysis found that SMCFD could discharge 3.0 MGD over a 40-year period. The conclusion was '*the aquifer is capable of meeting the water storage needs of the SMCFD WWTP'* for the proposed 3.0 MGD re-rating.

2.2 CENTRAL ARIZONA GROUNDWATER REPLENISHMENT DISTRICT

The CAGRD is a division of the CAP and is operated by CAWCD. In the early 1900s, the seven states that share the Colorado River Basin, Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, negotiated for shares of its water. Arizona was originally allocated 2.8 million AF of Colorado River water per year.

In 1993, the State of Arizona assigned CAGRD the responsibility to 'replenish, recharge, or otherwise replace groundwater' to help water providers in the Phoenix, Tucson, and Pinal AMAs, without access to sufficient renewable water supplies such as CAP water, to demonstrate the required 100-year assured water supply under Arizona law.

The State does not allow water providers to rely solely on groundwater pumping for their water needs in the Phoenix, Tucson, and Pinal AMAs. By State law, CAGRD is required to acquire or develop renewable water supplies to replace groundwater pumped by its members, which may include CAP water not used in any given year. Since 2011, CAGRD has also included municipal effluent and ADWR long-term storage credits.

The three studies listed below, prepared for CAP, were reviewed as part of the master planning data collection phase for potential future recharge locations:

- Data Report and Report of Initial Weighting of Sites - East Salt River Valley Siting Study, dated July 25, 2002
- Hydrogeologic Summary Report - East Salt River Valley Siting Study, dated December 15, 2003

Hydrogeologic Studies

- Shallow Vadose Zone Technical Memorandum - East Salt River Valley Siting Study, dated June 27, 2003

These studies investigated areas along the CAP Canal and provided data for planning future SMCFD recharge sites south of Baseline and into the northern portion of Queen Creek, essentially the undeveloped State Land in the Apache Junction and SMCFD planning and service areas. These studies resulted in recommendations for a recharge site south of SMCFD and east of the CAP Canal. Initial discussions with CAWCD indicate that effluent disposal at this location will not be allowed.

3.0 SMCFD FINANCIAL PLANNING

A review of the District's 2022 Long Range Financial Plan is also provided in this section. The financial plan will likely be updated to include the approved recommendations from this master plan and the Wastewater Collection System Master Plan.

The District has prepared a long range financial plan forecasting to 2030. The forecasted revenues range from $8.8 million in fiscal year 2022 to $19.9 million in 2030. The District engaged Tischler Bise to complete Wastewater Connection Fee and Sewer Cost of Service and Rate studies which were completed in 2022. These studies were utilized in the long range financial planning process. The plan assumes a WRF hydraulic capacity of 3.0 MGD from 2022 to 2025 increasing to 6.0 MGD between 2026 to 2035.

4.0 SMCFD REGULATORY PERMITS

4.1 ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY: AQUIFER PROTECTION PERMIT (APP) P-102873

The APP authorizes SMCFD to operate the WRF such that the Aquifer Wastewater Quality Standards (AWQS) are not violated at the compliance points established in the permit. In 2018, the District engaged Tetra Tech to conduct an analysis of the WRF to determine whether the facility could be re-rated to a greater capacity (*Rerating Study*).

In May 2020 ADEQ authorized the District to increase its rated capacity from 2.1 MGD to 3.0 MGD in two phases, with specific requirements for each phase. Some of these improvements included additional blowers and diffusers, and secondary filters. The District is in the process of completing this rerating. The WRF is permitted to treat domestic sewage and consists of headworks, grit removal systems, extended aeration/activated sludge processing with nitrogen removal, clarifiers, chlorination and de-chlorination, if necessary.

The District produces Class B+ reclaimed water and recharges its treated effluent in 11 recharge basins that are equipped with either vadose zone wells or gravel lined columns. Sludge treatment using sludge thickening lagoons and sludge drying beds is also permitted. The sludge can be used for composting or disposed of at an approved landfill. Screenings, grit, and scum are hauled to a landfill for disposal.

The facility operations must conform to the approved Certified Areawide Water Quality Management Plan according to the 208-consistency determination at the time of the permit issuance.

The Points of Compliance are established at the following locations:

- POC #1 Southwest side of Recharge Basins, MW-1A
- POC #2 South side of Recharge Basins, MW-2
- POC #3 Outfall 001 to Siphon Draw
- POC #4 Proposed for future recharge expansion

The SMCFD WRF is currently permitted to treat to Class B+ Effluent Quality Standards but will likely be required to treat to Class A+ Effluent Quality Standards in the future to reuse the effluent to the highest beneficial use. The APP effluent standards for various classes are presented in **Table 1**.

Table 1 APP Effluent Quality Standards by Classification

Parameter	Class A+	Class B+	Class B	Class C	Minimum Discharge Standard
BOD, 30-day average	30	30	30	30	30
BOD, Single Sample	45	45	45	45	45
TSS, 30-day average	30	30	30	30	30
TSS, Single Sample	45	45	45	45	45
Turbidity (ntu)	2	NNS	NNS	NNS	NNS
Turbidity, max (ntu)	5	NNS	NNS	NNS	NNS
Fecal Coliform, 4 out of last 7 days (cfu/100ml)	ND	200	200	1000	126 *
Fecal Coliform, Single Sample (cfu/100ml)*	23	800	800	4000	235 *
Nitrate (mg/l)	NNS	NNS	NNS	NNS	NNS
Nitrite (mg/l)	NNS	NNS	NNS	NNS	140
Total Nitrogen as N (mg/l)	10.0	10.0	NNS	NNS	NNS
pH	6.5-9	6.5-9	6.5-9	6.5-9	6.5

ND = Non-detect
NNS = No numerical standard
* = Discharge Standard is for e-coli and rather than fecal coliform

4.2 ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY: ARIZONA POLLUTANT DISCHARGE ELIMINATION SYSTEM (AZPDES) PERMIT AZ0023931

The AZPDES Permit authorizes the District to discharge treated domestic wastewater to an unnamed wash that is tributary to Siphon Draw. The current maximum permitted flow is 2.14 MGD and a permit amendment will be required to increase this to 3.0 MGD once the APP phasing requirements are met.

The permit authorizes intermittent discharge to the Siphon Draw tributary only when effluent flow is higher than what the recharge basins can accept, or when the recharge basins are offline. Designated uses for the receiving water are aquatic and wildlife dependent and partial body contact. The Weekly Average Discharge Concentration for Biological Oxygen Demand (BOD_5) is 45 mg/L and for Total Suspended Solids (TSS) is 45 mg/L. The permit also calls for effluent toxicity testing, annual VOC sampling and quarterly metals sampling.

4.3 ARIZONA DEPARTMENT OF WATER RESOURCES: UNDERGROUND STORAGE FACILITY (USF) PERMIT 71-584469.0003 AND WATER STORAGE (WS) PERMIT 73-584469.0101

The USF Permit grants authority to SMCFD to operate a constructed underground storage facility subject to the limitations and conditions in the permit. The maximum permitted storage at the facility for both permits is 3,363 af/yr. The permit includes a maximum of 38 vadose zone recharge wells without modifying the permit. The required monitoring includes 4 existing monitoring wells and 1 future monitoring well, recharge flow metering, and land subsidence monitoring.

5.0 EXISTING WATER RECLAMATION FACILITY

5.1 WRF UNITS

The existing WRF consists of a headworks, two extended aeration activated sludge basins with integrated secondary clarifiers, a chlorine disinfection system and a dechlorination system. The process flow diagram is provided as **Figure 5** and the unit processes are shown on the WRF site layout on **Figure 6.**

The headworks includes a 6-millimeter mechanical bar screen, two aerated grit tanks and a grit washing and dewatering system consisting of a cyclone and a classifier. The District recently upgraded the bar screen and installed a new effluent filter.

The existing sludge handling system of the WRF includes sludge storage, solar and sand drying beds and a polymer dosing system. Biosolids are currently disposed of at a landfill.

The District's WRF accepts septic waste from commercial haulers, who provide services both within and outside of the service areas, and is equipped with septage receiving facilities to process this waste stream. Septage flows are not anticipated to increase as development takes place because all new systems are required to connect to the District's wastewater system. In the future, this flow is expected to decline as more septic systems are required to connect to the regional sewer collection and treatment system.

Recharge basins currently manage all effluent flows, with the option to intermittently discharge to the ephemeral stream adjacent to the WRF. **Figure 7** shows the locations for current and planned recharge basins.

WATER RECLAMATION PROCESS

BIOSOLIDS PROCESS

Force Main

Influent Screening Dumpster

Continuous Bar Screen (1/8" Openings)

Grit Removal Dumpster

WEST Aerated Grit Removal Chamber

EAST Aerated Grit Removal Chamber

Septage Receiving Stations

WEST Extended Air, Activated Sludge Aeration Basin

EAST Extended Air, Activated Sludge Aeration Basin

R A S

Clarifiers

Waste Activated Sludge

Future Tertiary Disk Filter

Tertiary Disk Filter

Filter Backw

Chlorination by sodium hypochlorite solution

Chlorine Contact Chamber

Splitter Box

Discharge Pipeline

Dechlorination by sodium thiosulfate solution

Recharge Basins 1 – 11 *(including Vadose Zone Wells)*

Existing Effluent Stream

Supernatant Pump Station

West Sludge Lagoon for digestion and gravity thickening

East Sludge Lagoon for digestion and gravity thickening

Biosolids Processing Building *(polymer injection)*

Water drained from sludge

NORTH Solar Drying Bed

Sand Drying Beds

WEST Solar Drying Bed

SOUTH Solar Drying Bed

Water drained from sludge

Windrow Composting

Compost Screening

Class A, EQ Biosolids Compost Storage *(sold or given away)*

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SUPERSTITION MOUNTAINS CFD NO. 1
WATER RECLAMATION FACILITY
MASTER PLAN

Apache Junction, Arizona

Title

EXISTING WASTEWATER TREATMENT PROCESS FLOW DIAGRAM

Project No.	Scale
181300988	AS SHOWN
Revision Sheet	Figure
	5

Point Table		
Point #	**Latitude**	**Longitude**
1	N033° 21' 45"	W111° 33' 31"
2	N033° 21' 44"	W111° 33' 28"
3	N033° 21' 44"	W111° 33' 26"
4	N033° 21' 44"	W111° 33' 25"
5	N033° 21' 42"	W111° 33' 21"
6	N033° 21' 41"	W111° 33' 30"
7	N033° 21' 41"	W111° 33' 27"
8	N033° 21' 38"	W111° 33' 27"
9	N033° 21' 39"	W111° 33' 36"
10	N033° 21' 37"	W111° 33' 37"
11	N033° 21' 38"	W111° 33' 32"
12	N033° 21' 36"	W111° 33' 33"
13	N033° 21' 36"	W111° 33' 29"
14	N033° 21' 35"	W111° 33' 30"
15	N033° 21' 32"	W111° 33' 26"
16	N033° 21' 47"	W111° 33' 28"
17	N033° 21' 40"	W111° 33' 32"
18	N033° 21' 39"	W111° 33' 30"
19	N033° 21' 33"	W111° 33' 32"
20	N033° 21' 35"	W111° 33' 36"
21	N033° 21' 31"	W111° 33' 35"
22	N033° 21' 32"	W111° 33' 40"
23	N033° 21' 40"	W111° 33' 32"
24	N033° 21' 39"	W111° 33' 31"
25	N033° 21' 40"	W111° 33' 37"
26	N033° 21' 35"	W111° 33' 32"
27	N033° 21' 43"	W111° 33' 17"
28	N033° 21' 30"	W111° 33' 42"
29	N033° 21' 39"	W111° 33' 31"

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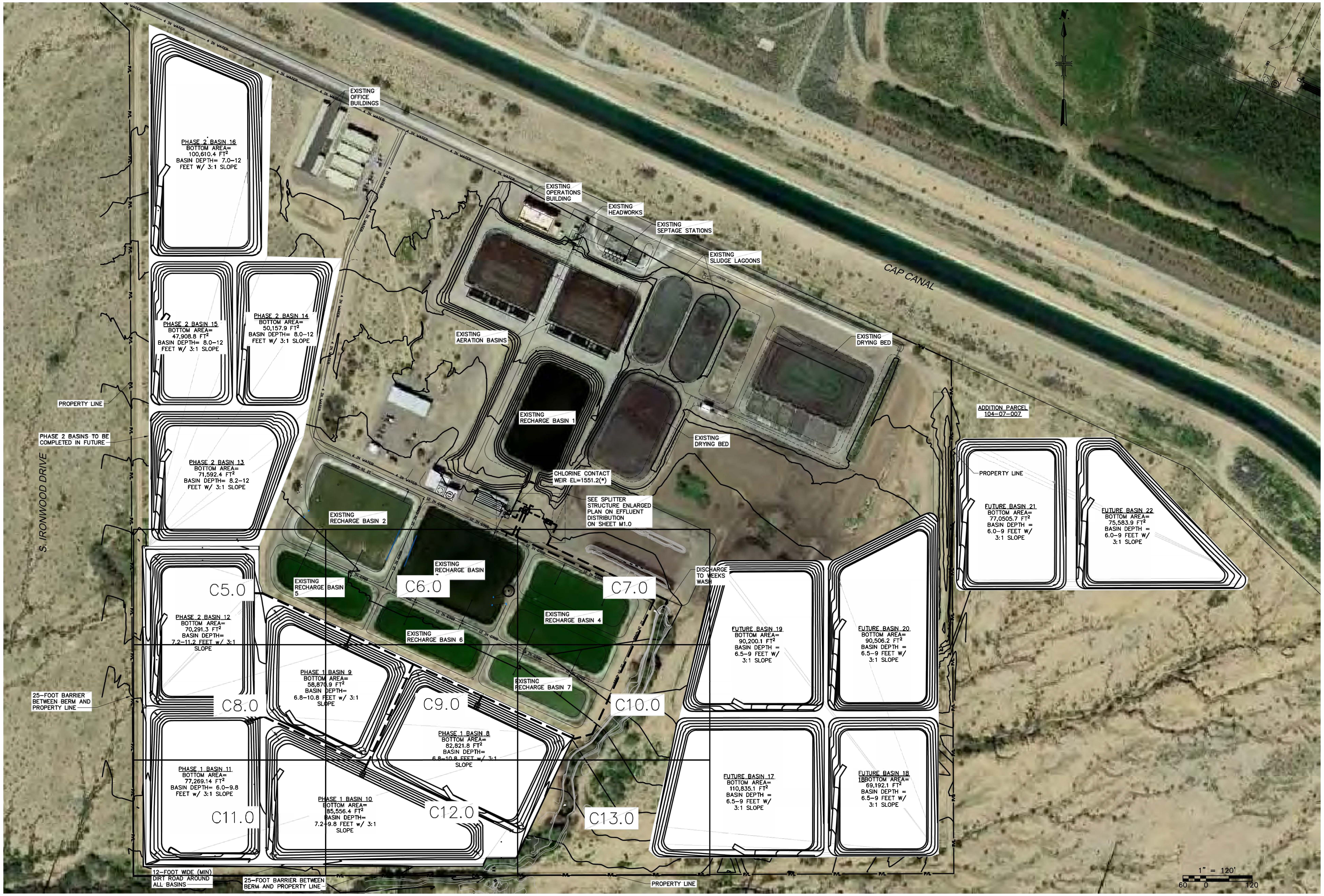
WATER RECLAMATION FACILITY
MASTER PLAN

Apache Junction, Arizona

Title
EXISTING WASTEWATER TREATMENT FACILITY SITE PLAN

Project No.	Scale
181300988	AS SHOWN
Revision Sheet	Figure 6



DRAWING SOURCE:
VALENTINE ENVIRONMENTAL ENGINEERS, LLC.
RECHARGE FACILITY IMPROVEMENTS OVERALL SITE PLAN
C2.dwg SHEET 9 OF 33, SEPTEMBER 2018

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SUPERSTITION MOUNTAINS CFD NO. 1
WATER RECLAMATION FACILITY
MASTER PLAN

Apache Junction, Arizona

Title

EXISTING AND FUTURE
EFFLUENT RECHARGE BASINS

Project No.	Scale
181300988	AS SHOWN

Revision	Sheet	Figure
		7

5.2 EXISTING WRF UNIT PROCESSES

SMCFD engaged Tetra Tech to conduct a rerating study for the WRF. The Rerating Study evaluated each process unit based on the typical design criteria for the process to determine the treatment, or hydraulic limit, of each unit. In addition, the overall plant capacity was evaluated to determine the reasonable rerating limit. The report then provided recommendations for each unit to increase the plant's rating to the reasonable capacity limit.

The study found that the Baseline Pump Station and WRF Headworks maximum monthly flow capacities are each about 3.0 MGD. The existing aeration blowers limit extended aeration/activated sludge treatment to about 2.7 MGD maximum monthly flow. Biosolids and chlorine contact hydraulic residence time can support a maximum monthly flow of approximately 4.0 MGD. The study also determined *'it would take major construction to increase the capacity of the WRF significantly beyond 3.0 MGD'*.

The Rerating Study was used as documentation to rerate the WRF's permitted capacity to 3.0 MGD upon the completion of certain upgrades. These upgrades included replacing the headworks screen (completed) and improving blower operation (underway). A disk filter was installed to improve recharge basin performance and, with the addition of a second filter in the future, would also allow the facility effluent to meet A+ standards under the APP. It is anticipated that future uses may require effluent to meet A+ standards.

The following **Table 2** provides a summary of the wastewater unit processes that were reviewed in the Rerating Study.

Table 2 Summary of Existing WRF Unit Processes

Unit Process	Findings from Tetra Tech Rerating Study
Septage Receiving Station	SMCFD accepts septage from commercial haulers. It is pre-treated prior to blending in the WRF influent channel before the bar screens. The pre-treatment includes screening, five aerated holding tanks and a pumping system to pump into the WRF influent channel. The operating plan includes aeration for 12 hours before merging with the domestic wastewater stream.
Headworks	As recommended by the Tetra Tech Study, a new bar screen and new grit pumps were installed. The headworks is now considered a 3.0 MGD average day flow system. The grit classifier is scheduled to be upgraded in 2022.

Unit Process	Findings from Tetra Tech Rerating Study
Aeration Basins	Wastewater flow from the existing headworks is split into two aeration basins. The aeration basins are lined with HDPE and are constructed with 1:2 side slopes. With a water depth of 12 feet, the volume of each basin is approximately 2.12 million gallons (MG) for a total of 4.24 MG. Almost 20% of the volume is contained in the unaerated volume along the two sides of the basins. Floating air distribution headers cover the flat bottom area of the basins. These floating headers are slightly longer than the width of the aerated section and when aerated, move back and forth to provide nearly full bottom coverage through an oscillating motion. Air is supplied to the aeration basins by three centrifugal blowers. The capacity of the aeration basins can be limited by solids loading, HRT, F/M, nitrification capacity, maximum month aeration capacity, or peak day aeration capacity all of which were described in the report. Overall, the capacity of the aeration basins is limited to 2.66 MGD at peak day and 2.84 MGD by the maximum month blower capacity required for the aeration basin volume. The corresponding organic capacity of the aeration basins is limited to 7,015 lb/day of BOD_5.
Clarifiers	"Mixed liquor", a combination of settled wastewater and activated sludge, from the aeration basins is discharged to six rectangular clarifiers. Each aeration basin has three clarifiers, which are dedicated to that aeration basin. The east and west sets of clarifiers are separated and cannot be comingled. Each clarifier is 55 ft wide and 24 ft long providing 1,320 sq ft of surface area. The combined surface area for all six clarifiers equals 7,920 sq ft. Settled sludge is removed through a perforated pipe located in the center of each clarifier. Return Activated Sludge (RAS) is then pumped through air-lift pumps and sent to the influent of the aeration basins. The RAS flowrate from each set of clarifiers is measured by a Parshall flume with an ultrasonic level sensor. The sludge blanket is moved by chains to the pump well for the RAS pumps.
Filtration	As recommended in the Rerating Study, SMCFD added filtration after the clarifiers. A disk filter was installed to improve recharge basin performance and, with the addition of a second filter in the future, would also allow the facility effluent to meet A+ standards under the APP
Disinfection/Contact Basins	The facility uses sodium hypochlorite for chlorine disinfection and sodium thiosulfate for de-chlorination. The current facility storage capacity for the sodium hypochlorite is 5,000 gallons. At a dose of 8 mg/L of a 12.5% sodium hypochlorite solution, the chlorine feed system has a 4.22 MGD flow capacity. The overall pump capacity is 1.3 L/min. The contact basin is designed to meet a minimum hydraulic retention time of 15 minutes at a peak hour capacity of 7.2 MGD. Chlorine pumps limit maximum flow to 4.08 MGD per the report.

Unit Process	Findings from Tetra Tech Rerating Study
Solids Process and Handling	The Waste Activated Sludge (WAS) is sent to two solids lagoons before being sent to solar drying beds. The lagoons are not adequately sized to provide Class B biosolids. However, the combination of lagoons and drying beds provide sufficient degree-days of solids digestion to produce Class B biosolids. The WRF also utilizes polymer assisted drying beds. The current treatment process produces 2,072 lb/day of WAS per MGD of flow. The 6 existing drying beds can process 40,320 lbs of biosolids. With a 5-day turnaround to load, dry and remove the solids the beds can be loaded at 8,064 lbs/day equating to a flow limitation of 3.89 MGD of maximum monthly flow.

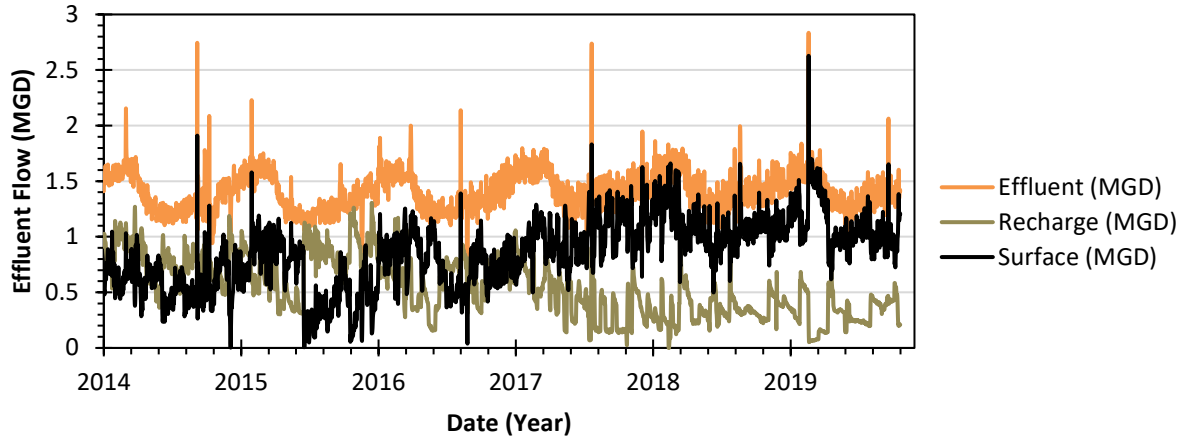
5.3 EXISTING EFFLUENT DISPOSAL

The WRF effluent is currently delivered to onsite recharge basins, or intermittently discharged to Siphon Draw, when the WRF effluent flow exceeds the capacity of the recharge basins. Effluent recharge is the primary intended disposal option.

5.3.1 Groundwater Recharge

SMCFD has eleven recharge basins that are equipped with either vadose zone wells or gravel lined columns, and three monitoring points of compliance. **Figure 8** depicts the wastewater flow to the existing recharge basins and the surface discharge. Prior to the completion of additional recharge basins there was an increasing trend to discharge effluent rather than recharge due to basin infiltration limitations. Basins, vadose zone wells, and injection wells all have recharge limitations over time. These include silting, bacterial or algae growth, and hydrogeologic limitations. The District recognized these reductions in effluent recharge and contracted with hydrogeologists to investigate options to increase recharge and subsequently constructed additional basins which have greatly improved its recharge results.

Figure 8 WRF Effluent Flow (2014-2019)



SMCFD earns annual long term storage credits, issued by ADWR, for the actual amount of effluent recharged through the District's facility. Effluent discharged to Siphon Draw does not qualify for

groundwater recharge credits. As the owner of long-term storage credits, the District has the option of selling them to qualified buyers. The credits are sold based on the Water & Replenishment Component rate charged to users by the CAGRD. The Final 2020/2021 – 2025/2026 Rate Schedule is included in **Appendix C**. The sale of these credits may provide SMCFD with an additional source of revenue.

5.3.1.1 Existing Effluent Recharge Capacity Analysis

As influent flow to the SMCFD WRF increased, additional recharge basins were needed. In addition, over time it was identified that less effluent was being recharged than in previous years (See **Figure 8** above). As noted in Section 2.0, SMCFD contracted with Matrix New World Engineering to investigate options for additional recharge and to support the APP rerating study for the treatment train that was conducted by Tetra Tech.

Matrix prepared a hydrogeologic report, dated May 14, 2019, supporting rerating the effluent recharge system from 2.1 MGD to 3.0 MGD. Matrix conducted a perched aquifer mounding analysis using a simplified numerical groundwater flow model and data from the Regional Salt River Valley Groundwater Flow Model. The discharge impact analysis found that SMCFD could recharge 3.0 MGD over a 40-year period. The conclusion was '*the aquifer is capable of meeting the water storage needs of the SMCFD WWTP'* for the proposed 3.0 MGD rerating.

To achieve 3.0 MGD of recharge, additional onsite basins are required. SMCFD previously used seven (7) recharge basins, with thirty-six (36) vadose zone wells and three (3) points of compliance. Four (4) basins were added to the site in 2020 (Basins 8, 9, 10 and 11) using gravel lined columns rather than vadose zone wells (see **Figure 6)**. The capacity increase to 3.0 MGD would be achieved through one more phase of construction with one additional new recharge basin with gravel lined columns (see **Figure 7)**.

5.3.1.2 WRF Filtration

SMCFD has installed a rotating disk filtration system located just upstream of the chlorine contact chamber. The intent is to reduce the loading of total suspended solids going to the recharge basins, resulting in less sediment buildup at the water/soils interface in the recharge basins in order to increase the recharge percolation rates. The filter was installed as part of the WRF rerating to increase permitted capacity from 2.1 MGD to 3.0 MGD. A second filter will be required by ADEQ when A+ effluent becomes necessary. Filter backwash will be sent to the sludge lagoons for processing.

5.3.2 Effluent Discharge

The District is permitted under its AZPDES permit to intermittently discharge treated effluent to Siphon Draw when effluent flow is higher than the recharge basins can accept or the recharge basins are offline

5.4 SCADA SYSTEM

The District's SCADA system includes both process monitoring and process control. SMCFD provided information on the WRF SCADA system. A summary table highlighting the features by unit process area is included in **Appendix D**.

6.0 POPULATION AND FLOW PROJECTION

The 2020 General Plan presents a comprehensive examination of critical issues the City will face over the next thirty years. Land use will determine the magnitude, timing and projection of future wastewater flows within the District's planning areas. Proposed future expansion of the WRF is provided based on analysis of the historical and projected population growth and wastewater flows. This section also provides projected treatment standards that the facility may be required to meet in the future.

The City provided GIS files which included the boundaries, land use and zoning within the planning areas. **Figure 3** identifies these boundaries for each land use category.

City of Apache Junction Population

An assessment of the City's population is provided in the 2020 General Plan. The 2010 Census reported a population of 35,838 people. The population estimate in the 2020 General Plan is approximately 41,739 people and the population is projected to increase to 56,402 by 2040. The Maricopa Association of Governments' Socioeconomic Projections - Population and Employment dated June 2019 estimates a population of 69,200 by 2050. **Table 3** summarizes the historic and projected City of Apache Junction population.

Table 3 Apache Junction Historic and Projected Population

Census Year	Population
1980	9,935
1990	18,100
2000	31,814
2010	35,838
2018 – 2019 (EST)	41,739
2020	40,458
2025	43,708
2030	47,409
2035	51,557
2040	56,502
2045	62,800
2050	69,200

SMCFD Service Area Population

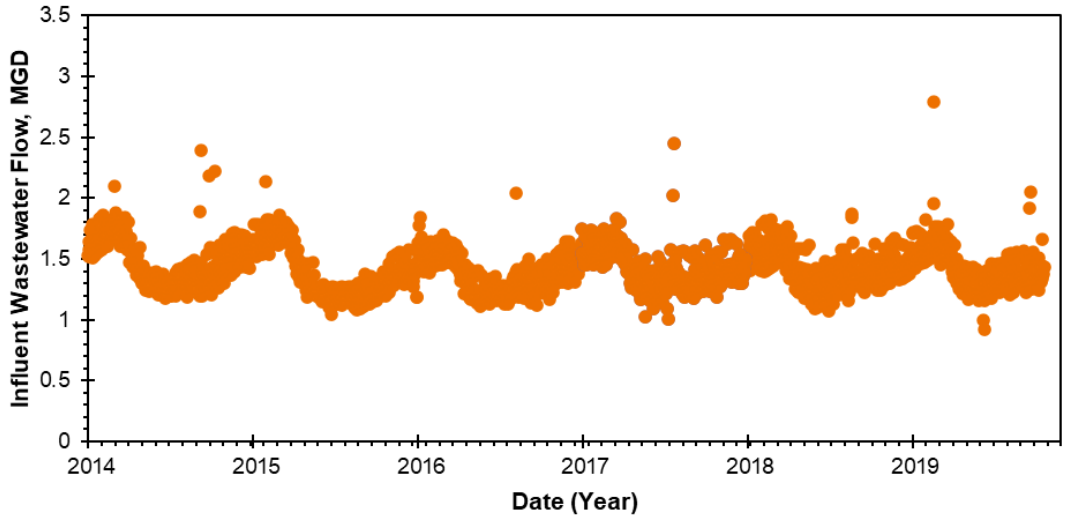
The District's population in SA1 is not the same as the City's population because not all the buildings in Apache Junction are connected to the wastewater collection system. The buildings that are not connected to the wastewater collection system have on site wastewater treatment and leach field/drain field disposal systems. The majority of these are located in low density development areas with lot sizes of greater than 0.5 acre. It is assumed that many of these onsite wastewater systems for low density development will remain in place.

SMCFD currently has about 7,000 service connections to the wastewater collection system. The estimated SA1 population, based on the number of service connections, is approximately 20,000 compared to the estimated current Apache Junction population of 35,838 residents. Based on these estimates about fifty-five percent of the City's population is served by the District's wastewater collection and treatment systems.

6.1 CURRENT FLOW RATE

The SMCFD average day wastewater influent flows to the WRF between 2014 and 2019 are illustrated on Error! Reference source not found.. The average day flow varies on an annual basis with peak flows from December to February, corresponding with the presence of winter visitors in the SMCFD Service Area, and minimum flows from June to August corresponding with the absence of winter visitors. Peak week average day influent wastewater flow was approximately 1.7 MGD in 2014 and 1.8 MGD in 2019. The minimum week WRF average day influent flows ranged from 1.1 to 1.3 MGD.

Figure 9 SMCFD Influent Wastewater Flow (2014-2019)



Even though flows have not increased significantly over the past several years, flows from SA 1 are anticipated to increase for several reasons. New development within the City is required to connect, if serviceable by SMCFD. Properties are also required to connect if their septic or leach system fails, if serviceable by the District.

6.2 PROJECTED POPULATION FLOW RATE - BUILDOUT

Estimates of average day wastewater flow at full land buildout were made for SA1 – SA4 based on a number of assumptions and population estimates, including the land use zoning categories provided by the City which are shown in **Tables 4.2 and 4.3**. Buildings in the Low Density Zoning category are assumed to have onsite treatment and disposal, and therefore would not be connected to the SMCFD collection system and are not included in the estimated flows. Full buildout is assumed to be completed decades in the future therefore no assumptions were made on the many factors and constraints that will shape future development.

This plan uses fewer maximum dwelling units per acre than the City land use plan to avoid overestimating sewer flow rates. The estimated SMCFD population at full buildout is based on the density assumptions in **Table 4**. The estimated SMCFD average day wastewater flow at full buildout is based on a unit wastewater flow of 80 gallons per capita per day (gpcd), which is the ADEQ recommended flow per person.

Table 4 Estimated Wastewater Flow by City Residential Zoning Category

Zoning Category (Population Based)	Dwellings per Acre	Persons per Dwelling	Persons per Acre	Wastewater Flow (GPD/Acre)
Low Density	1	3.2	3.2	0
Medium Density	3.5	3.0	10.5	896
High Density	12	2.0	24	1,920
Conservation	1	3.2	3.2	256
Master Planned Community	6	2.0	12	960

Average day wastewater flow for land area within City Non-Residential Zoning Categories is summarized in **Table 5**.

Table 5 Estimated Wastewater Flow by City Non-Residential Zoning Category

Zoning Category (Estimated Flow Based)	Wastewater Flow (GPD/Acre)
Commercial	1,500
Conservation	10
Light Industrial/Business Park and Industrial	1,000
Public/Institutional	1,500
Downtown Mixed Use	1,500
Open Space and Recreation	0
Transportation	0

The estimated population and average wastewater flow at full land buildout is summarized in **Figure 10**. The estimated population based on the land use density for the total area at full buildout is approximately 465,000. The 2006 SMCFD Master Plan estimated that population at full buildout would be 365,000 and average day wastewater flow would be 36 MGD. The principal reason for the larger population and flow estimates in this report compared to 2006 is that the planning areas identified in this plan include additional land. Wastewater flow rates by service area are shown in **Table 6**.

Table 6 Estimated Average Day Wastewater Flow Rate by Service Area[1]

Projected Parameter	Units	SA1	SA2	SA3	SA4	Total
Service Area Average Day Wastewater Flowrate	MGD	10	7	5	20	42

[1]Details for population projections and buildout flow calculations can be found in the CS Master Plan.

Total flow projections to the WRF at full buildout recognize that portions of the service areas on the far east and far north will likely continue to use onsite treatment and disposal systems and therefore would not be required to connect to the Collection System. The properties in these areas are one or more acres and are in areas that are geographically challenging and cost prohibitive for the District to serve.

6.3 PROJECTED POPULATION AND FLOW RATES – 2020 TO 2050

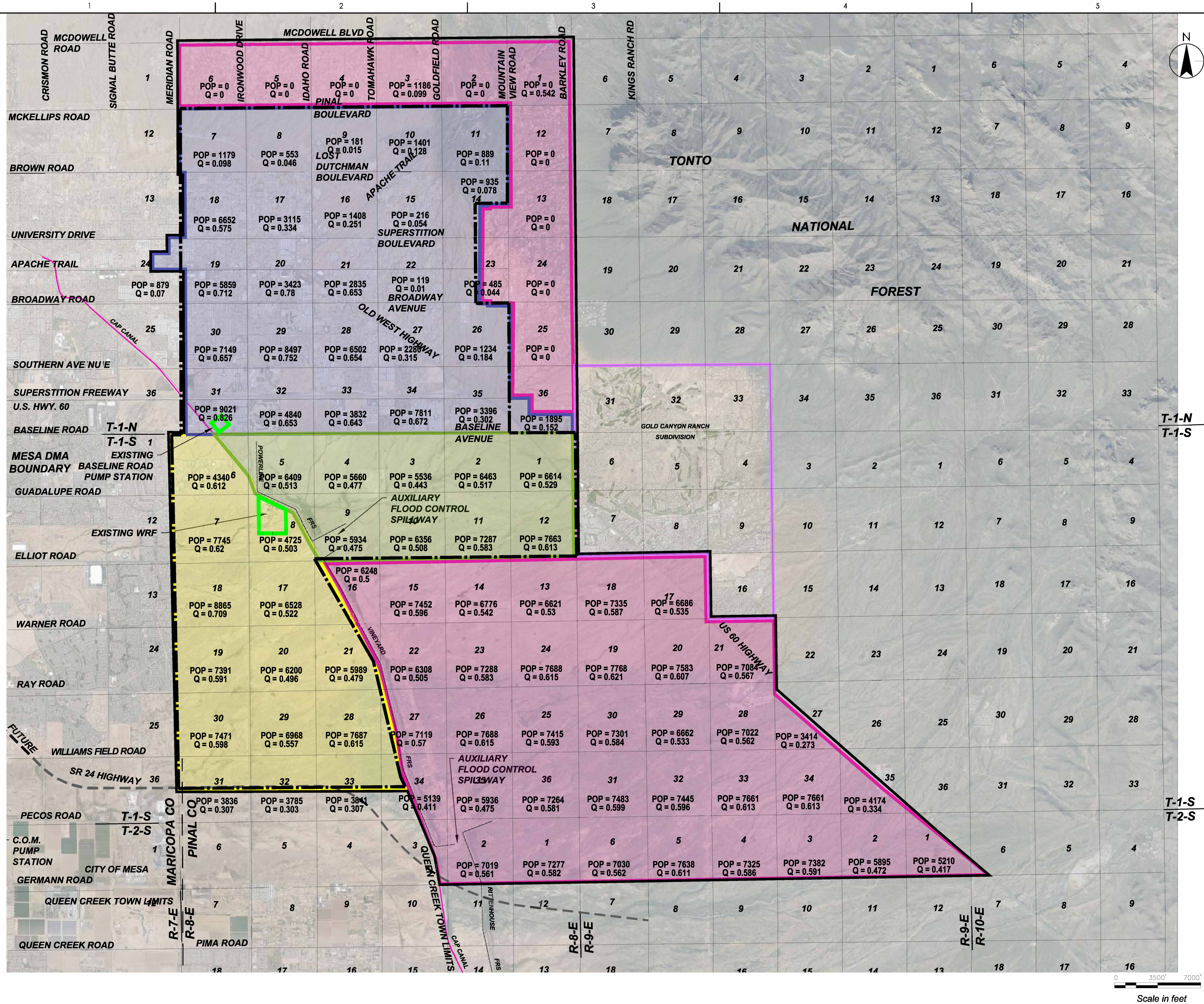
Projecting the rate of growth and wastewater requirements for development is dependent on a number of factors including the pace of development, economic forecasts and population estimates. To account for these factors, three scenarios have been identified (see Error! Reference source not found.) for the projected SMCFD wastewater flows from 2020 to 2050 as follows:

Scenario 1: SA1 population growth based on 2% growth
Scenario 2: SA1 and SA2 population growth based on 2% growth plus the Superstition Vistas development at 2 People/DU
Scenario 3: SA1 and SA2 population growth based on 2% growth plus the Superstition Vistas development at 3 People/DU

Scenario 1 represents a baseline increase of 2% per year from 2020 to 2050, reflecting the recent historical growth rate related to new building development and the connection of individual onsite wastewater treatment and disposal systems to the SMCFD collection system in SA1. The SA1 population (lower grey line) is estimated to grow from approximately 20,000 people (7000 connections) in 2020 to 35,750 people (about 12,500 connections). As discussed above, this is lower than the Apache Junction MAG population growth (dashed grey line) because not all units are connected or expected to connect to the collection system.

Scenarios 2 and 3 have been evaluated as a result of the development of 4 square miles of State Land located in SA2. The development is generally bounded by Elliot Avenue on the north, the Frye Road alignment on the south, Meridian Road on the west and the CAP Canal on the east. The development has been zoned as Master Planned Community by the City which has a maximum density of 20 DU/AC. This plan uses a density of 6 DU/AC and between 2 and 3 people per dwelling unit for planning purposes.

In Scenarios 2 and 3 the population is estimated to grow from 20,000 customers in 2020 to 70,200 or 87,450 total customers in 2050 respectively. This provides a reasonable time range for population growth that can be used to estimate wastewater flow increases to the WRF. At full buildout the population of the Superstition Vistas development is estimated to be between 30,000 and 45,000 persons.



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LEGEND

- SMCFD SA1
- SMCFD SA2
- SMCFD SA3
- SMCFD SA4
- CITY OF APACHE JUNCTION INCORPORATED LIMITS
- MUNICIPAL PLANNING AREA
- TONTO NATIONAL FOREST BOUNDARY

SERVICE AREA	BUILDOUT FLOW (MGD)
SA 1	10
SA 2	7
SA 3	5
SA 4	20
TOTAL	42

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SUPERSTITION MOUNTAINS COMMUNITY FACILITY DISTRICT NO. 1
WATER RECLAMATION FACILITY
MASTER PLAN

Apache Junction, Arizona

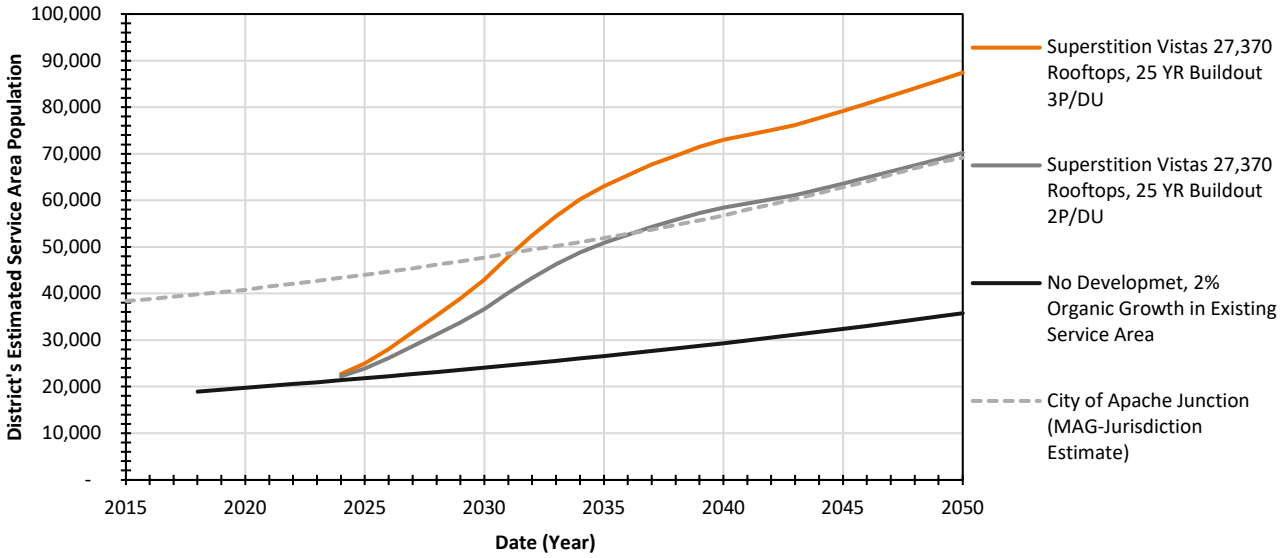
Title
AVERAGE DAILY SEWER FLOW & POPULATION PER SECTION

Project No. 181300987
Scale AS SHOWN

Figure
10

ORIGINAL SHEET - ARCH D

Figure 11 Estimated SMCFD Existing WRF Population Projections (2020-2050)



Population projections are converted to estimated wastewater flow using the ADEQ recommended average day flow rates of 80 gpcd. As illustrated on **Figure 12** and tabulated on **Table 7** the WRF influent wastewater flow would increase to 2.9 MGD in Scenario 1, 5.5 MGD in Scenario 2 and 7.0 MGD in Scenario 3 by 2050.

Figure 12 Estimated SMCFD Existing WRF Average Daily Flows (2020-2050)

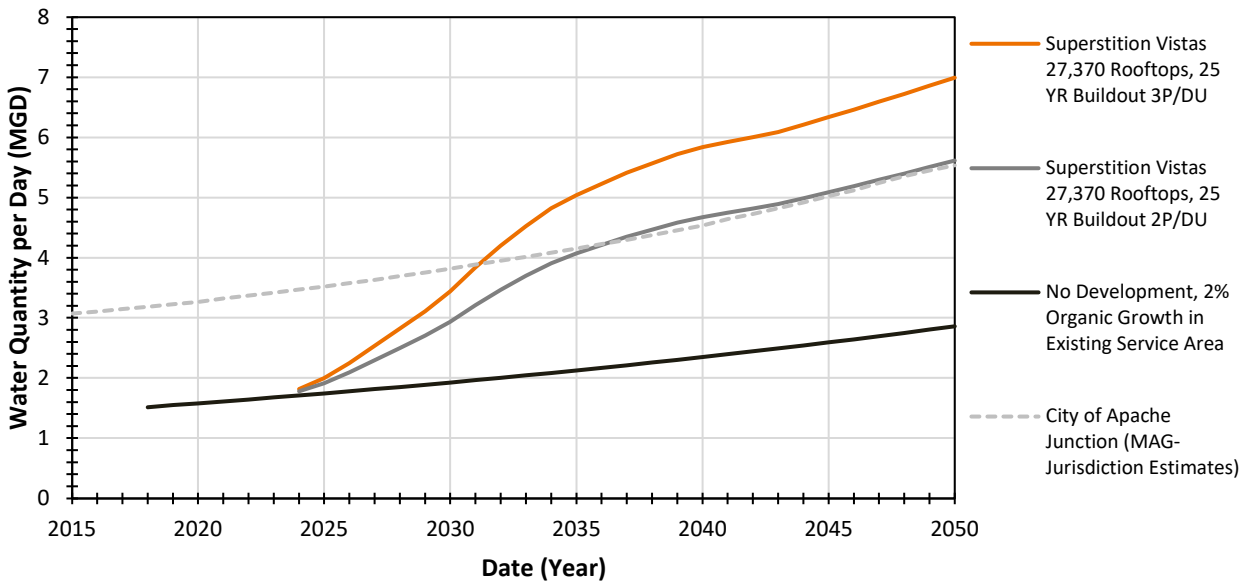
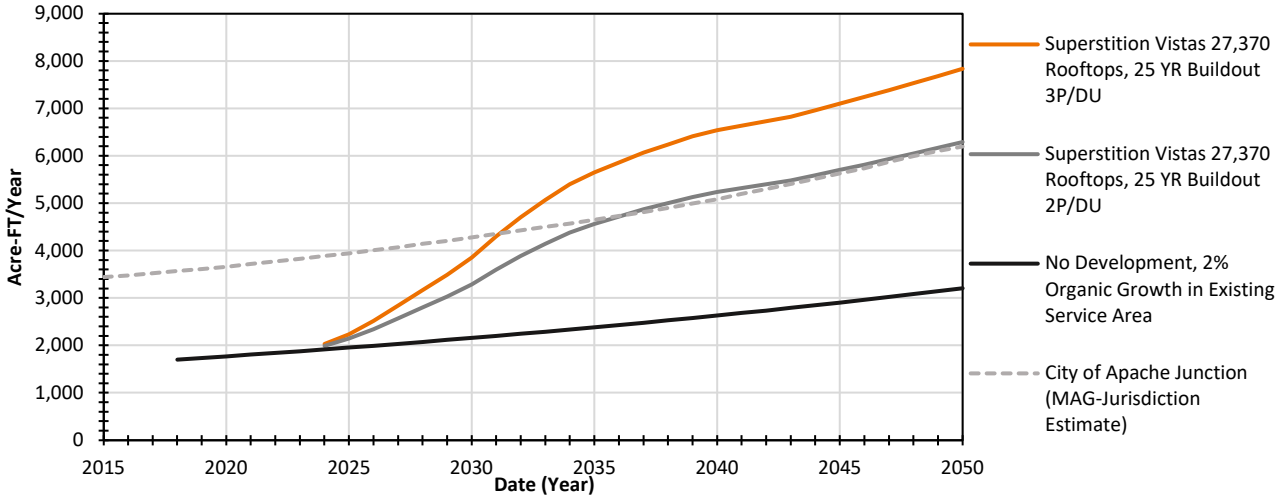


Table 7 Estimated WRF Average Day Influent Flow, MGD (2020-2050)

Year	Scenario 1	Scenario 2	Scenario 3
2020	1.8	1.8	1.8
2025	1.8	2	2
2030	2	2.9	3.5
2035	2.1	4.1	5
2040	2.3	4.5	5.8
2045	2.6	5.0	6.3
2050	2.9	5.5	7

Effluent must be either reused, recharged, or disposed of in some manner. If effluent can be reused or recharge credits sold, there is a value to effluent. As a water supply, effluent is typically measured in acre-feet (AF). Wastewater flow Scenario 3 converted to annualized effluent is shown on **Figure 13**. Total effluent that could be used as a water supply is estimated to be 27,000 AF from 2020 to 2030, 84,000 AF from 2020 to 2040 and 155,000 AF from 2020 to 2050.

Figure 13 SMCFD WRF Estimated Annual Effluent Volume (2020 to 2050)



1.

6.3.1 Recommended WRF Flow Projections

The total estimated average day wastewater flow at full land buildout for the four Service Areas based on the Land Use Plan in the City's 2020 General Plan is 42 MGD. The estimated full buildout average day wastewater flow within each of the four Service Areas is as follows:

- SA1 is 10 MGD,
- SA2 is 7 MGD, and
- SA3 and SA4 combined are 25 MGD.

SA1 drains to the Baseline Road Lift Station and SA 2 drains to the Williams Field Lift Station. Both are located west of the CAP Canal and flow from these areas will be treated at the existing WRF site. The full buildout wastewater flow for these two service areas is 17 MGD (see **Figure 10**).

SA 3 and SA 4 are located east of the CAP Canal and the PVR Dams. Crossing these features with pipelines is very difficult. Therefore, the wastewater flow from these service areas will be treated at a new SMCFD WRF located in the vicinity of the extension of SR 24 and the east side of the CAP Canal. The land in this area is owned by the State of Arizona. The need for this facility will depend on the sale and rate of development of State land. A timeline for the need and possible release of land parcels for development in the area is uncertain. It is expected to be several decades in the future, likely beyond 2040 to 2050. No detailed planning is included in this plan and a specific location for a future WRF is not provided.

The Arizona Administrative Code (AAC) requires that wastewater treatment facilities begin expansion planning when a facility is receiving 80% of the design capacity and begin construction by 90% of the design capacity. Upon completion of the required improvements, the existing WRF capacity will be 3.0 MGD. Therefore, expansion planning should begin when flows are averaging 2.4 MGD.

Based on analysis above and flow projections for the Superstition Vistas development, it is recommended that SMCFD begin planning for expansion now. Recommended expansion projections for the existing WRF are from 3 to 6 MGD and then to 12 MGD to accommodate flows from SA 1 and both proposed development scenarios for SA 2 (see **Figure 14**).

Figure 14 illustrates the estimated growth in wastewater flow to the WRF from SA 1 and SA 2 under three growth scenarios:

Scenario 1: SA 1 population growth based on 2% growth

Scenario 2: SA 1 and SA 2 population growth based on 2% growth plus Superstition Vistas development at 2 People/DU

Scenario 3: SA 1 and SA 2 population growth based on 2% growth plus the Superstition Vistas development at 3 People/DU

This figure also identifies when the scenario flows will exceed a 3 MGD and a 6 MGD WRF.

Without the Superstition Vistas development, a 3 MGD facility will not be exceeded until beyond 2050. No additional capacity would be required under this scenario for the near-term.

Under either Superstition Vistas development scenario, 80% of capacity (2.4 MGD) is reached by about 2026 and 3 MGD treatment capacity would be exceeded by about 2029 or 2031. It is recommended to begin planning an expansion of the existing facility as soon as possible and begin construction by about 2026 at the latest.

The timing for when planning and construction for a 12 MGD facility should commence is not the same for the two Superstition Vistas scenarios. The earliest planning date is 2034 and the latest is 2040. The earliest construction completion date is 2043 and the latest is beyond 2050.

Monitoring growth will be critical to determine when the facility should expand from 6 to 12 MGD. In addition, if growth is slower than anticipated, an interim expansion of 4.5 MGD could be considered depending on the treatment and effluent disposal options.

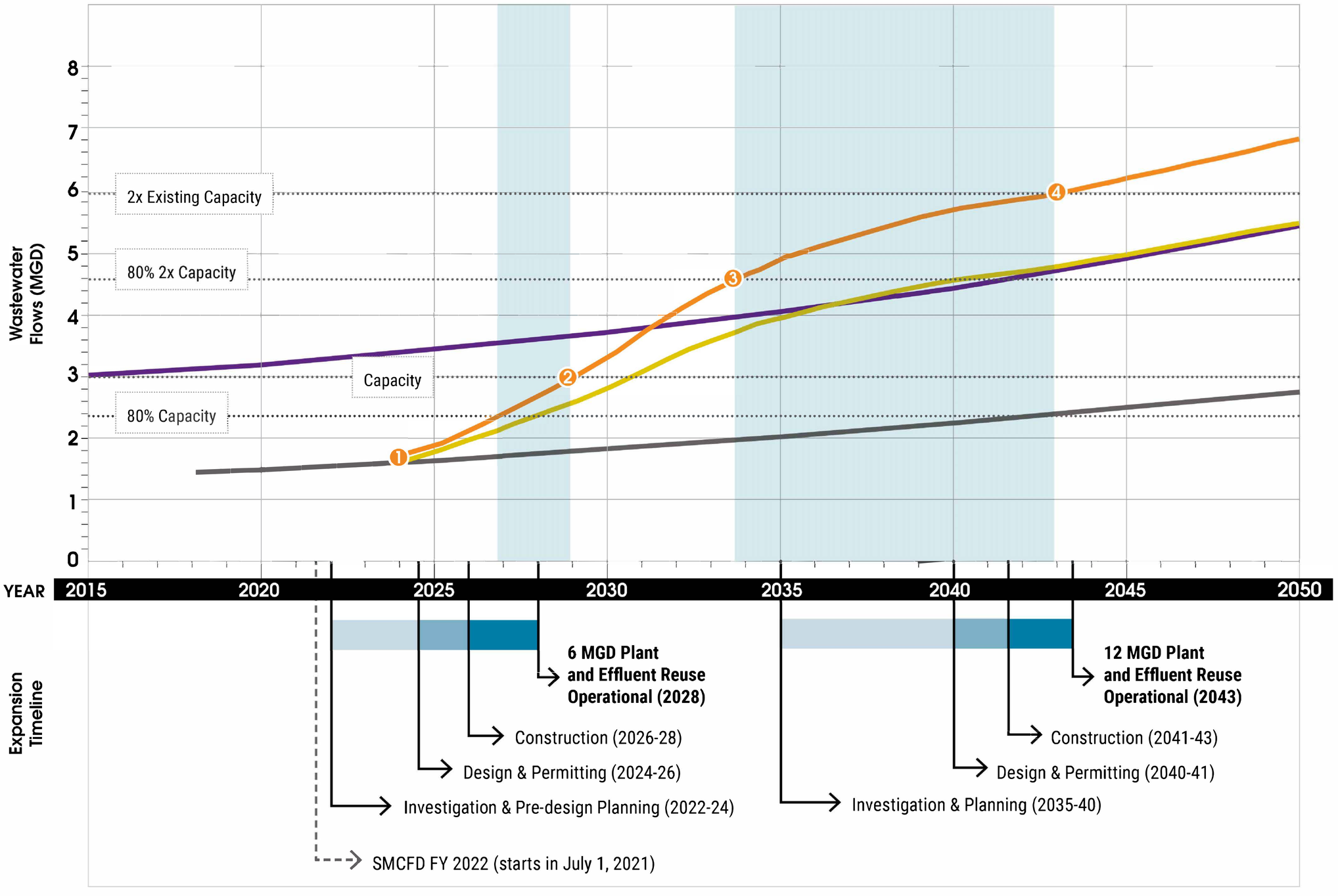
Figure 14 assumes the expansion projects will take five years including pre-design, ADEQ permitting, detailed design, contractor procurement, construction, startup and commissioning.

It is important to note that the SMCFD estimated Master Plan growth rate in the period 2025 to 2045 is largely driven by the rate of development of Superstition Vistas or other State Land development projects that may occur in the SMCFD Service Areas during that time. The estimated wastewater flow in **Figure 14** does not identify or include any development on State Land in SA1 or SA2 other than Superstition Vistas.

The SMCFD Master Plan implementation schedule must recognize and align with the State Land schedule to auction lands in the SMCFD Service Areas. This means that program schedules may need to advance more quickly if development occurs faster or scaled back if the rate of development is slower than estimated in 2022.

WWTF and Reuse Expansion Timeline 2020 to 2050

1. Lost Dutchman anticipated flow to begin
2. 6 MGD capacity in place (WWTF and effluent reuse)
3. 12 MGD plant expansion planning/design should begin, including effluent reuse
4. 12 MGD capacity in place (WWTF and effluent reuse)



KEY

- LOST DUTCHMAN 15000 ROOFTOPS, 20-YEAR BUILDOUT 3 PEOPLE/DU
- LOST DUTCHMAN 15000 ROOFTOPS, 20-YEAR BUILDOUT 2 PEOPLE/DU
- CITY OF APACHE JUNCTION (MAG JURISDICTION ESTIMATES)
- EXISTING WWTF FLOW WITH 2% ORGANIC GROWTH
- PLANT CAPACITY
- TRIGGER AND WINDOW FOR PLANNED EXPANSIO

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SMCFD

Client/Project
SUPERSTITION MOUNTAINS CFD NO. 1
WATER RECLAMATION FACILITY
MASTER PLAN

Apache Junction, Arizona

Title
WRF MASTER PLANNING TIMELINE

Project No.
181300988

Scale
AS SHOWN

Revision Sheet

Figure
14

6.4 WASTEWATER QUALITY CHARACTERISTICS

This section presents a summary of the wastewater quality characteristics in the SMCFD WRF. The existing influent water quality is assumed to be typical of future water quality fromSA2, SA3 and SA4 because the existing land use is similar to the proposed planned land use. It should also be noted that the existing WRF receives septage which can significantly modify the daily influent characteristics given unpredictable changes in quantity and strength received. Further, much of the data gathered is combined influent and septage data.

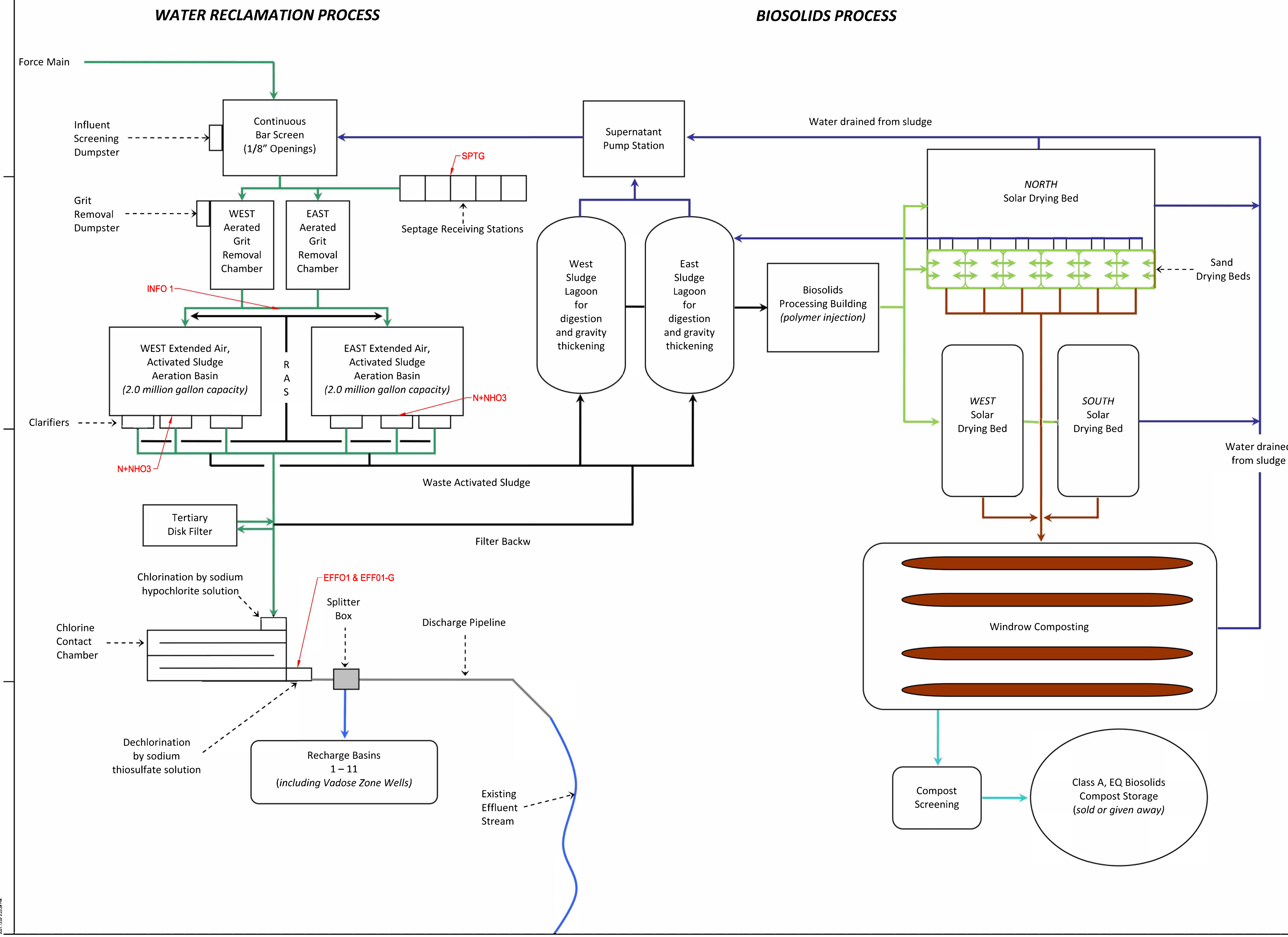
6.4.1 WRF Sampling Locations

SMCFD has six WRF water sampling locations (**Table 8**). The sampling data is collected either for internal WRF process control or for regulatory permitting reporting. The locations are illustrated on the accompanying **Figure 15** and described as follows:

Table 8 Sampling Location Description and Use

Sampling Location	Description and Use
SPTG	Internal process control sampling of the septage water quality for BOD and TSS in the septage aeration basin.
INF01	Internal process control sampling and external analysis (BOD/TSS) for permitting purposes of the wastewater flow into the plant after the aerated grit removal and before the extended aeration basins. The Sampling Point 'INF01' is after the blending of the septage flow and the domestic wastewater flow.
N+NH_3 West	Internal process control sampling of ammonia and nitrate after the extended aeration basins.
N+NH3 East	Internal process control sampling of ammonia and nitrate after the extended aeration basins.
EFF01	External analysis for all regulatory parameters.
EFF01-G	Internal process control sampling and regulatory reporting for total Residual Chlorine and pH.
MW1 and MW3	Internal groundwater monitoring wells used by SMCFD to provide additional sampling data.
MW1A, MW2, and Siphon Draw Outfall	ADEQ Regulatory Points of Compliance (POC) for APP and AZPDES permits respectively.

SMCFD provided the historical water quality data at various locations to provide information regarding the wastewater quality coming into the WRF and the wastewater quality at various locations within the WRF. This historical data can be used as the basis for future WRF influent design criteria. The comparable effluent data is provided as confirmation of the existing facility's treatment capability.



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NOTES

SPTG	IN HOUSE BOD/TSS SAMPLES FOR PROCESS CONTROL
INFO1	IN HOUSE BOD/TSS SAMPLES FOR PROCESS CONTROLS AS WELL AS EXTERNAL LAB TESTING FOR REGULATORY PURPOSES
EFF01	EXTERNAL LAB FOR REGULATORY. NO INTERNAL TESTING.
EFF01 - G	IN-HOUSE TRC & PH FOR REGULATORY & EXTERNAL LAB FOR EVERYTHING ELSE REQUIRED BY PERMIT
N+NHO3	IN-HOUSE NITROGEN AND AMMONIA FOR PROCESS CONTROL

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SMCFD

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SUPERSTITION MOUNTAINS CFD NO. 1
WATER RECLAMATION FACILITY
MASTER PLAN

Apache Junction, Arizona

Title
EXISTING SMCFD SAMPLING LOCATIONS

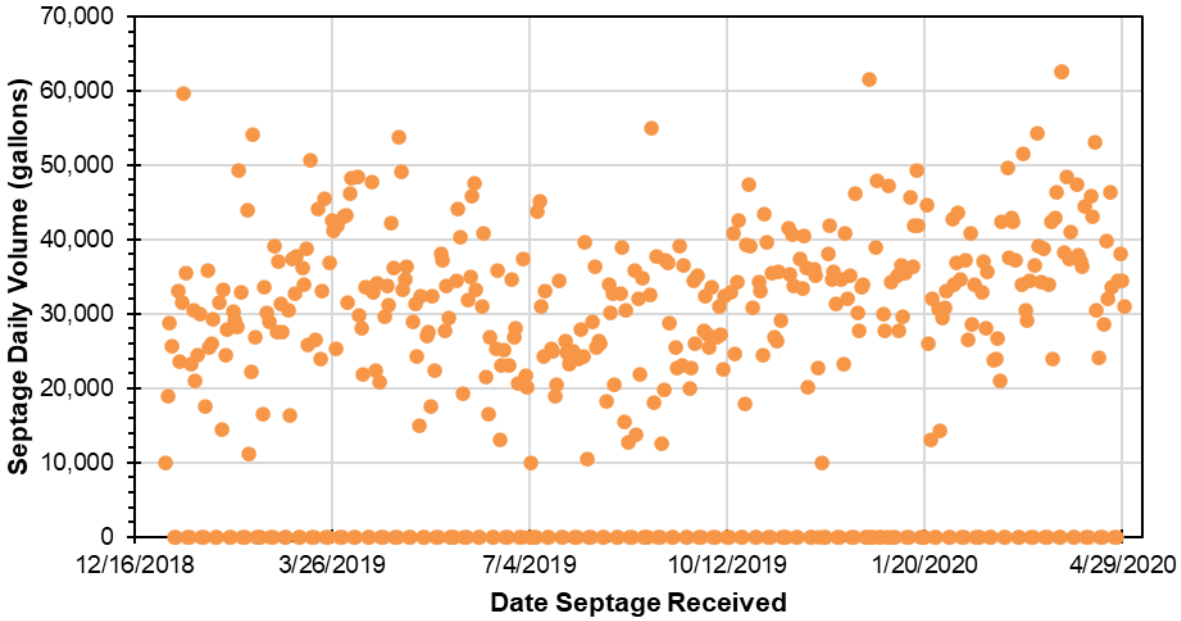
Project No. 181300988
Scale AS SHOWN
Revision
Sheet
Figure 15

6.4.2 Septage Delivery Volumes and Water Quality

The WRF includes a septage receiving system that provides a revenue stream for the District and provides a valuable service given that it is one of the few facilities in the East Valley that accepts this type of waste. The septage received is reported to be from septic tank pumping and not wastewater pump and haul. This section provides a summary of the volume of septage received from January 2019 to April 2020 along with the BOD and TSS measurements. Where applicable the data is separated by influent and septage.

The daily septage volume received by the WRF is illustrated on **Figure 16**. Delivery is only during weekdays with no deliveries on weekends. The dates with no deliveries are represented by the cluster of data points at 0. The maximum volume delivered in a day was 62,500 gallons per day while the average day delivery was 22,545 gallons per day (excluding the days of no delivery).

Figure 16 Septage Daily Volume Received (January 2019 to April 2020)



The septage is aerated for about twelve hours before blending with the domestic wastewater flow. The blending tank capacity is approximately 28,000 gallons at the septage receiving station. If the WRF receives more than that in a day, some septage may enter the plant before receiving 12 hours of aeration. When sampling septage, SMCFD closes off one of the holding tanks at the end of the workday and takes the sample the following day after the aeration period. The goal is to have a mix of septage loads and SMCFD considers the sample to be a composite sample.

6.4.2.1 Septage BOD, TSS, and Ammonia

The BOD_5, TSS, and Ammonia are tested in the blended septage, typically after 12 hours of aeration. These constituents are illustrated in **Figure 17**, **Figure 18**, and **Figure 20.** The BOD ranged from about

500 to 3,500 milligram per liter (mg/L). The TSS ranged from about 900 to 14,300 mg/L. The ammonia ranged from about 40 to 100 mg/L. It should be noted that influent nitrogen is not currently monitored. Therefore, additional testing prior to full design of the WRF should be done.

Figure 17 Septage BOD_5 (SPTG, 2014-2019)

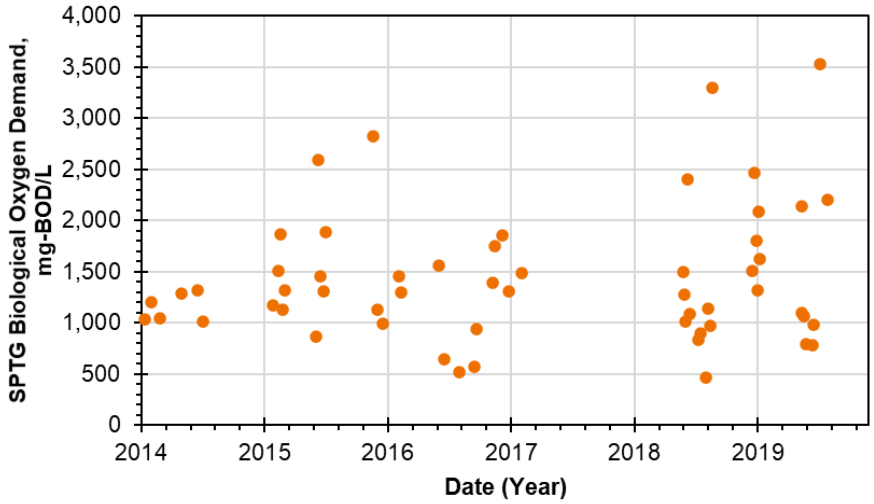


Figure 18 Septage TSS (SPTG, 2014-2019)

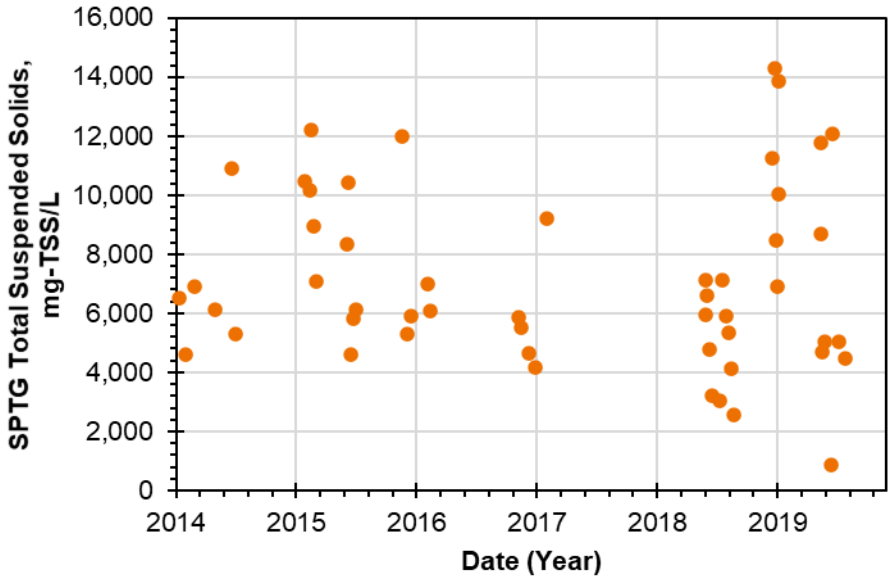
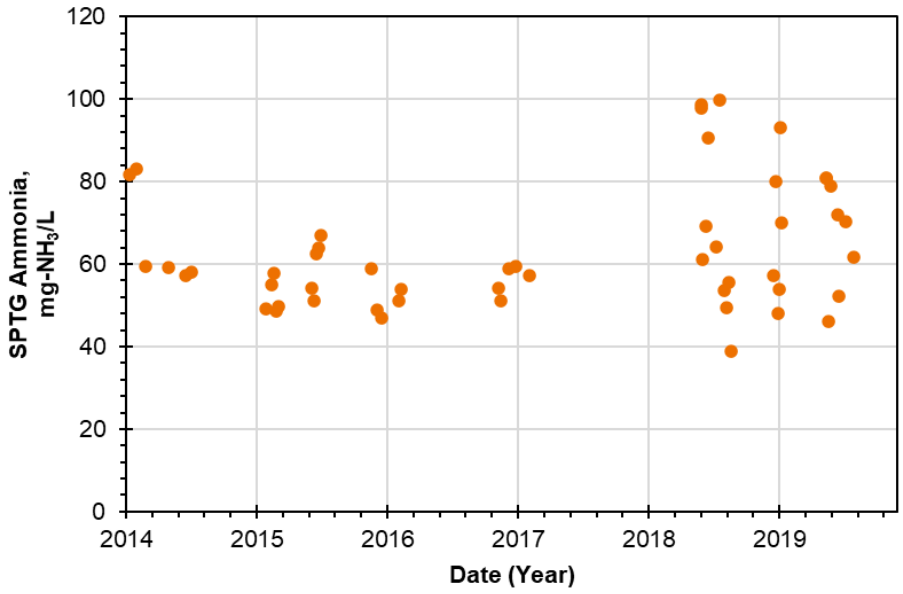


Figure 19 Septage Ammonia (SPTG, 2014-2019)



During follow-up data review, it was found that the sampling protocol for ammonia may not be suitable for ammonia quantities over 60 mg/L. Updates to sampling protocols were proposed in July 2020. The effects of these changes should be reviewed when designs proceed for WRF expansion.

Operations staff has identified that the WRF has experienced ammonia bleed over and other treatment issues that may be attributable to the variability and strength of septage waste. Based on studies conducted by Stantec on a previous facility, 15,000 gallons of septage has the same BOD_5 as 420,000 gallons of domestic wastewater and the same TKN as 233,330 gallons of domestic wastewater. This can have a huge impact on a small facility like SMCFD. Because septage is a revenue source and SMCFD provides a needed service by accepting it, future wastewater treatment scenarios should include how to treat the most septage possible while maintaining appropriate effluent standards.

6.4.3 Existing WRF Water Quality Data

Water quality data for the SMCFD WRF is presented by constituent below. The influent data is a combination of influent and septage data. As noted previously, septage has a significant impact on the influent characteristics and considerable variability.

6.4.3.1 Influent and Effluent BOD_5

The WRF influent BOD from 2014 to 2019, as presented on **Figure 20,** ranges between 100 and 470 mg-BOD_5/L. The WRF treated effluent, as presented on **Figure 21,** typically has less than 25 mg-BOD_5/L with one reported value of 45 mg-BOD_5/L meeting both the APP and AZPDES limits.

Figure 20 WRF Influent Including Septage BOD_5 (INF-01, 2014-2019)

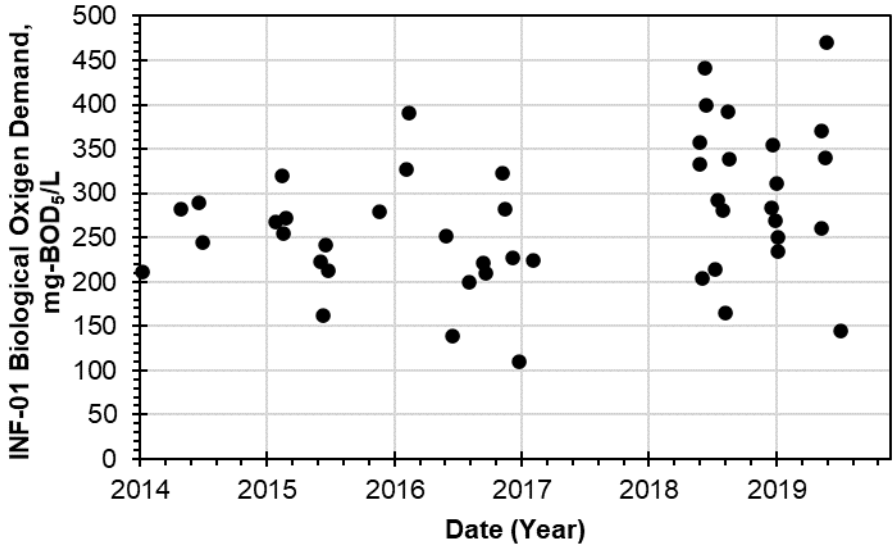
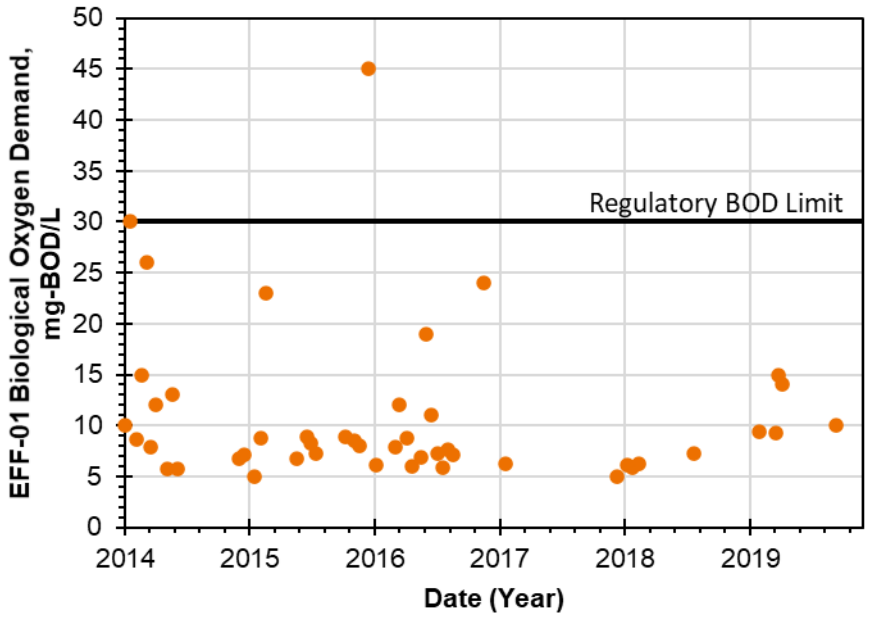


Figure 21 WRF Effluent BOD_5 (EFF-01, 2014-2019)

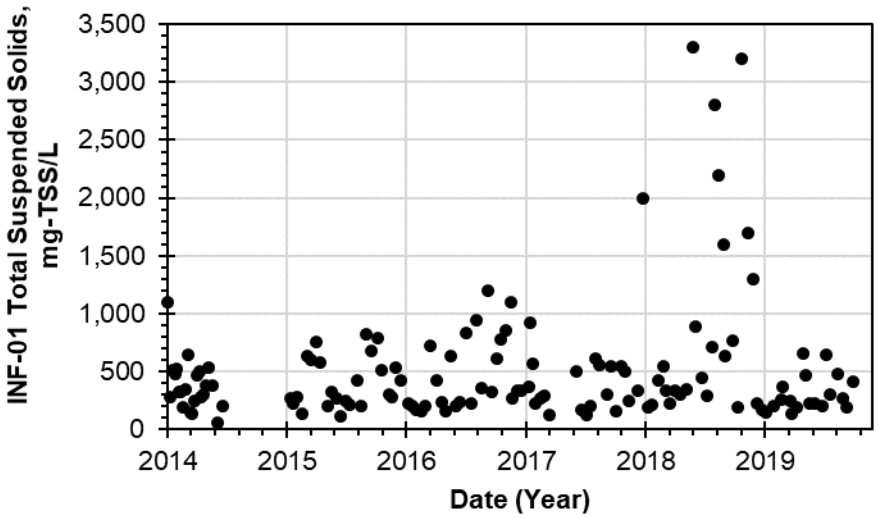


6.4.3.2 Influent and Effluent TSS

The WRF influent TSS from 2015 to 2019, presented on **Figure 22,** was typically between 60 and 1,200 mg-TSS/L. However, in 2018 the TSS was as high as 3,300 mg/L. It is not known why the TSS was so

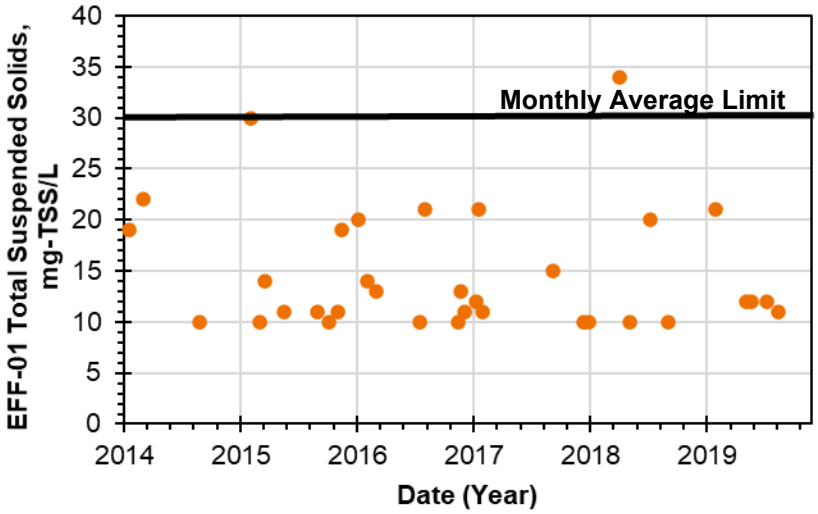
high during this period but based on analysis of the data it would appear to be related to septage received at that time.

Figure 22 Influent WRF TSS (INF-01, 2014-2019)



The WRF effluent TSS, presented on **Figure 23,** was typically less than 35 mg/L. The ADEQ permitted TSS level is 30 mg/L monthly average and 45 mg/L weekly average. The WRF effluent consistently met the ADEQ APP and AZPDES permit levels.

Figure 23 WRF Effluent TSS (EFF-01, 2014-2019)

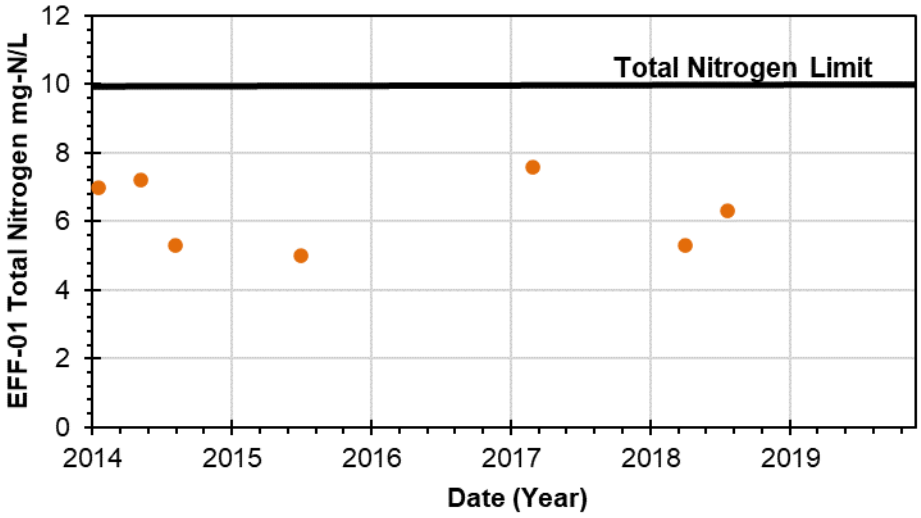


6.4.3.3 Effluent Total Nitrogen

Influent data for Nitrogen is not currently monitored. It is recommended that SMCFD add influent nitrogen sampling prior to designing expansions to the WRF.

WRF effluent Total Nitrogen, shown on **Figure 24,** was typically between 1 and 7 mg-N/L. The ADEQ permitted Total Nitrogen level is 10 mg-N/L. The WRF effluent met the ADEQ APP and AZPDES permit levels for Total Nitrogen.

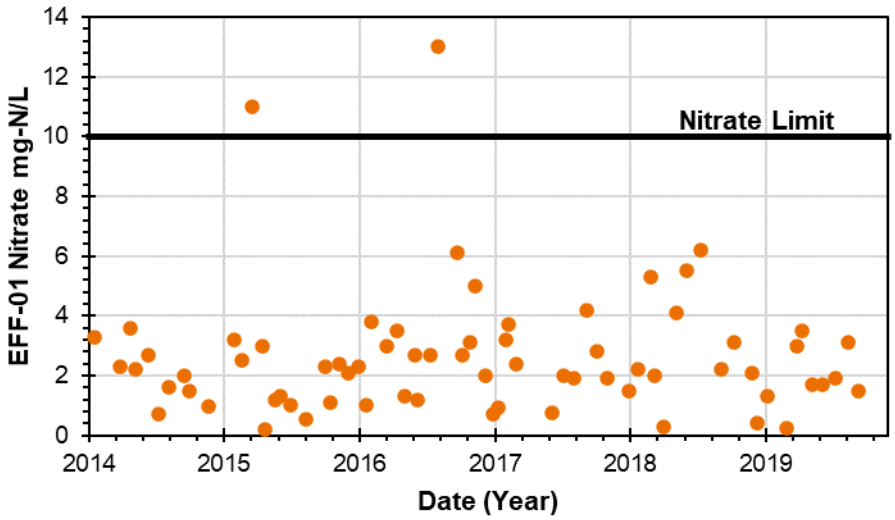
Figure 24 WRF Effluent Total Nitrogen (EFF-01, 2014-2019)



6.4.3.4 Effluent Nitrate (NO_3^- as N)

Effluent nitrate are monitored just prior to discharge to the recharge basins or Siphon Draw and presented on Error! Reference source not found. The nitrate in the effluent are typically between 0.5 mg/L and 6 mg/L with two samples measuring at 11 mg/L and 13 mg/L in the period from 2014 to 2019. The ADEQ AZPDES permitted effluent discharge nitrate level is 10 mg/L.

Figure 25 WRF Effluent Nitrate (EFF-01, 2014-2019)



The nitrate in MW-1 and MW-2 are shown on **Figure 26 and Figure 27** respectively for 2014 to 2019. The ADEQ APP permitted groundwater nitrate level is 10 mg/L. In MW-1, nitrate is typically below 3 mg/L but there are two spikes at 4 and 6 mg/L. In MW-2, nitrate trended between 6 and 8 mg/L with recent spikes over 10 mg/L. This may be an indicator of nitrate mobilization in the soil. The District has an investigation ongoing to identify the nature of the exceeding values.

Figure 26 Monitoring Well #1 Nitrate-Nitrite (MW-1, 2014-2019)

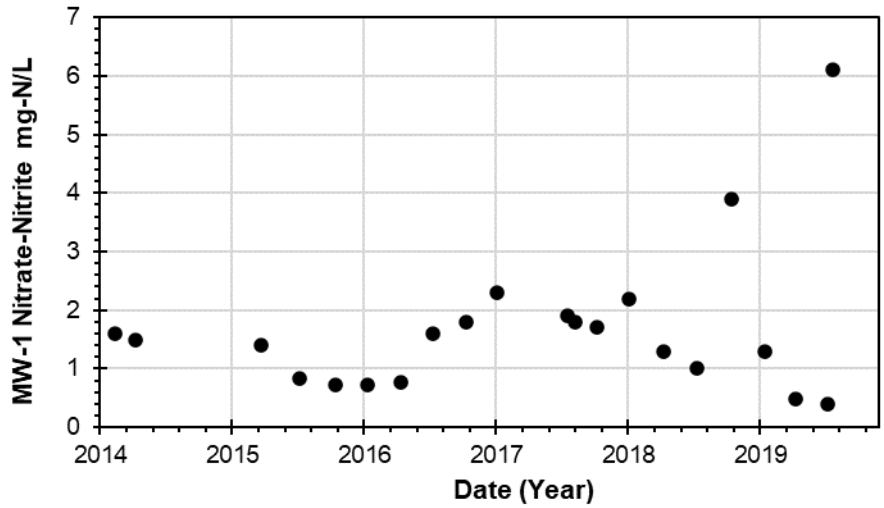
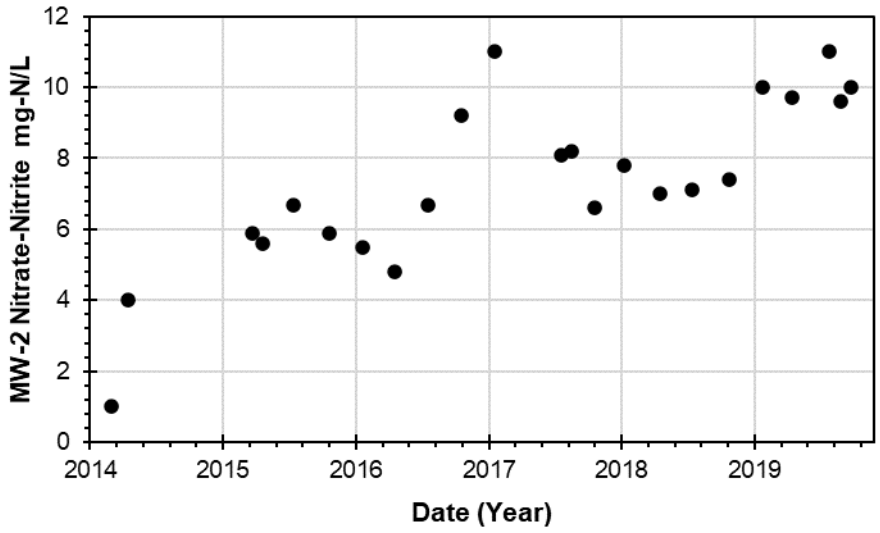


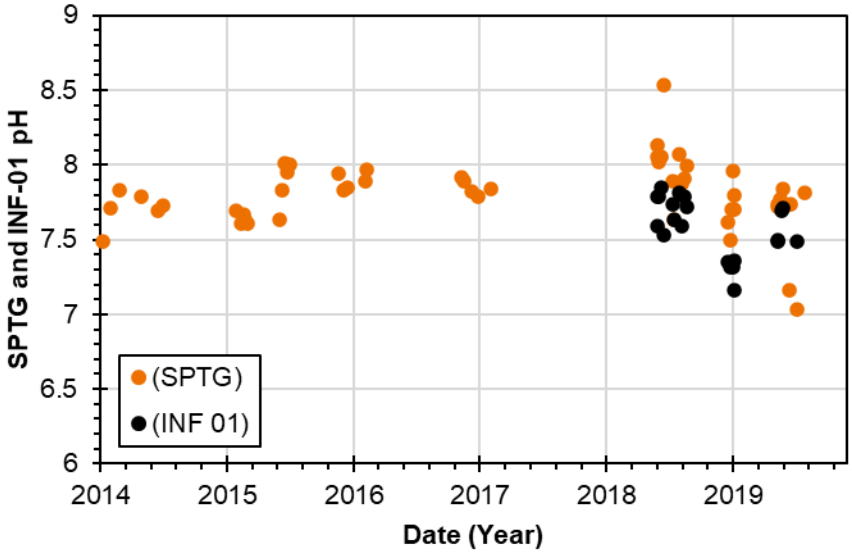
Figure 27 Monitoring Well #2 Nitrate-Nitrite (MW-2, 2014-2019)



6.4.3.5 Influent and Septage pH

Combined influent and septage pH has been largely consistent throughout the period from 2014 to 2019, between 7.0 and 8.0 as shown in **Figure 28.** The pH of the septage alone, based on a limited data set, was between 7.0 and 8.5.

Figure 28 Influent and Septage pH (INF-01 and SPTG, 2014-2019)

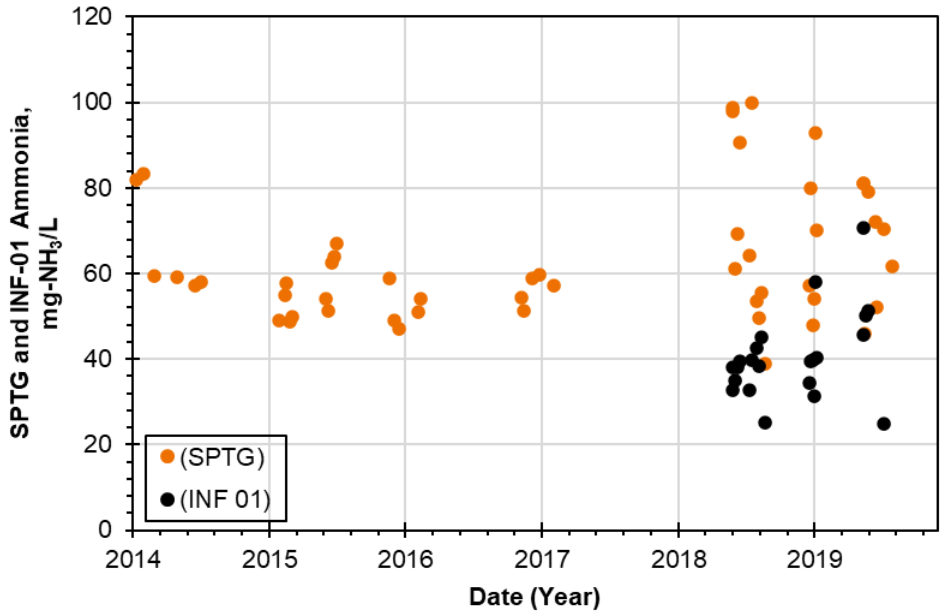


6.4.3.6 Influent and Septage Ammonia

Combined influent and septage ammonia data was collected between 2018 and 2019. During this period, ammonia ranged from 25 to 70 mg/L with an average value of 40 mg/L. Septage only ammonia data was collected for a longer period from 2014 to 2019. From 2014 to 2017, the septage ammonia concentrations appeared to remain consistent. After 2018, the ammonia concentrations experienced larger variations. Overall, the septage ammonia concentrations ranged from 39 to 100, with an average value of 63. As shown in **Figure 29**, the septage ammonia values were typically higher than the influent ammonia values. These large variations coincide with increasing septage disposal at SMCFD in recent years. As a result of the increased volume, SMCFD has recently implemented a daily limit and stops taking septage when flow reaches 25,000 gallons per day.

As noted above, during follow-up data review, it has been found that the sampling protocol for ammonia may not be suitable for ammonia quantities over 60 mg/L. Updates to sampling protocols were proposed in July 2020. The effect of these changes should be reviewed when designs proceed for WRF expansion.

Figure 29 Influent and Septage Ammonia (INF-01 and SPTG, 2014-2019)



6.4.3.7 Other Effluent Water Quality Parameters

The SMCFD ADEQ APP permit includes ten metals and twenty volatile and semi-volatile organic compounds. The metals are sampled and reported to ADEQ quarterly and the semi-volatile organic compounds are sampled and reported to ADEQ semiannually. The results are generally non-detectable, or if detected they are typically below the ADEQ Discharge Limit.

6.4.4 Typical Influent Water Quality Parameters

Table 9 summarizes the typical influent water quality parameters and historical data for the existing WRF. It is anticipated that these will be typical influent parameters for future sanitary sewer flow from SA2. It should be noted that the influence of septage is significant and detailed analysis prior to design to accommodate the continued acceptance of septage in proportion to anticipated sanitary sewer flow should be conducted. In addition, new constituents may need to be addressed, such as selenium, PFAS and TDS if direct potable reuse is considered.

Table 9 Influent Water Quality Summary Table (2014 to 2019)

Water Quality Parameter	Septage Only[1]	Combined WRF Influent[2]
Daily Flow, gpdl	23,000 to 30,000	230,000
BOD, mg/L	500 – 3,500 mg/L	100 to 470 mg/L
TSS, mg/L	900 to 14,300 mg/L	60 to 1,400 mg/L
Ammonia, m	40 to 100 mg/L	40 to 80 mg/L
Total N, mg/L	Not available	Not available
TKN	Not available	Not available
pH	Not available	6.5 – 9

[1] Septage is typically only accepted Monday through Friday. Septage water quality parameters include infrequent peaks.

[2] Combined WRF influent quality is minimum to typical high; excluding the peaks caused by septage. However, design will need to accommodate the septage variability.

Currently SMCFD monitors the following influent parameters with the approximate range for those constituents shown on the above table. Influent TKN is not currently monitored and should be prior to commencing with design. **Appendix E** includes a table with recommended constituents to monitor for better treatment design.

It is recommended that influent TKN and Ammonia both be monitored for one month in the winter for peak flow conditions and one month in the summer for low flow conditions to provide design criteria for future WRF expansion. Approximately 5 to 6 samples should be taken in each month. Samples should be taken for treated septage and combined treated septage and influent, or treated septage and influent separately if possible. Due to travel restrictions that resulted from the COVID-19 pandemic, which may have affected the number of winter visitors in 2021, the peak winter samples could be delayed to 2022.

6.4.5 Recommended Wastewater Treatment Standard

The first step to select wastewater treatment options is to determine the effluent use and the associated effluent standards. The best treatment options can then be determined and evaluated based on the standards that must be met for the required effluent quality. Treatment requirements, treatment methods,

and affordability of treatment are all balanced to determine the best treatment method for the application. SMCFD already has existing APP and AZPDES permit standards, which were discussed in Section 3.0. **Table 10** summarizes basic parameters for the APP and AZPDES permits for all classifications and for discharge to Siphon Draw:

Table 10 Effluent Quality Classifications

Parameter	APP Class A+ Standard	SMCFD Minimum Discharge Standard
BOD, 30-day average	30	30
BOD, Single Sample	45	45
TSS, 30-day average	30	30
TSS, Single Sample	45	45
Turbidity (ntu)	2	NNS
Turbidity, max (ntu)	5	NNS
Fecal Coliform, 4 out of last 7 days (cfu/100ml)	ND	ND
Fecal Coliform, Single Sample (cfu/100ml)*	23.0	23.0
Nitrate (mg/l)	10	10
Nitrite (mg/l)	1	1
Total Nitrogen as N (mg/l)	10.0	10.0
pH	6.5 - 9.0	6.5 – 9.0

ND = Non detection,
NNS = No numerical standard
* = Discharge Standard is for e-coli and rather than fecal coliform

Effluent is considered a valuable commodity to both SMCFD and the City. The City has identified goals for future effluent reuse, recharge, and direct potable reuse under the One H_2O Water Resource Plan.

Discharging effluent does not improve the water supply scenario and the current SMCFD discharge permit does not allow continuous discharge. Treating for discharge should be considered a secondary condition for emergency or temporary circumstances only.

Under the APP permit program, treating to A+ standards allows the greatest opportunity for reuse and recharge. The current facility is permitted for B+ quality effluent. Adding filtration, with redundancy, allows the facility to meet A+ standards. In addition, filtration will improve the long-term efficiency of effluent recharge in either recharge basins or injection wells. It is recommended that future expansions of the WRF be designed to meet A+ standards.

At present, the standards for direct potable reuse have not been finalized by ADEQ. At a minimum, a combination of advanced water treatment systems will be required at either a wastewater treatment facility or water treatment facility to meet future standards. It is anticipated that minimum standards to be met by future SMCFD expansion should be A+ standards and that higher level treatment methods should be considered.

7.0 PROPOSED TREATMENT OPTIONS

As noted in Section 2.0, a WRF produces two end products that are owned by the sanitary sewer provider: cleaned water, or effluent, and solids. Effluent can either be reused, recharged or discharged. Solids can be land applied or disposed of at a qualified landfill. Various treatment options will be identified and evaluated to determine the most viable and appropriate future treatment methods. This section reviews the options available to SMCFD for effluent disposal, and liquid and solids treatment options.

7.1 EFFLUENT STREAM

SMCFD is currently permitted to discharge WRF effluent to onsite recharge basins and to an adjacent watercourse, intermittently, if needed. The upper capacity limit of the onsite recharge basins is estimated to be 3.0 MGD. The estimated future wastewater flow rate from SA1 and SA2 will be about 26 MGD by 2050. In Arizona, effluent is considered a commodity that should be reused to the most beneficial use possible to supplement water supply. Each option will be evaluated based on the functionality, cost and beneficial use.

The following **Table 11** Summary of Effluent Management Options provides an overview of effluent management options and the following sections describe them in greater detail:

Table 11 Summary of Effluent Management Options

Opt. #	Description	Details
1	**Groundwater Basin Recharge (managed infiltration):** Expansion of the existing groundwater recharge basin system to develop additional effluent recharge capacity	
1a	At Existing WRF	SMCFD was permitted to begin groundwater recharge at the WRF in 2005. SMCFD was granted an amendment to its APP permit and constructed additional basins at the 97-acre WRF site to recharge up to 3.0 MGD.
1b	At a new recharge basin site(s) in SA2 and/or SA3	As SMCFD recharge demand surpasses 3.0 MGD offsite managed infiltration may be the best option.
1c	Recharge at the existing CAP Superstition Mountain Recharge Facility (SMRF) overland canal conveyance to CAP recharge site SE of WRF	The CAP SMRF is located about 10 miles south of the SMCFD WRF. Under this option effluent above 3.0 MGD would be transferred to the existing CAP SMRF. Conveyance of the effluent using the CAP canal is assumed in this option.
1d	Recharge at the existing CAP SMRF with a SMCFD 10-mile dedicated pipeline conveyance from the WRF to the SMRF.	Transfer of effluent above 3.0 MGD to the existing CAP SMRF for recharge. A dedicated SMCFD 10-mile pipe system from the WRF to the recharge site will be needed in this option.
2	**Alternative Recharge Methods (indirect potable reuse for future potable use) including Vadose Zone recharge wells and Direct Injection recharge wells:** Indirect Potable Reuse with the goal to provide a long-term sustainable source of water for potable use by AJWD and AWC. Recharge water and recover at a suitable distance as defined by ADEQ to ensure human health and safety. Advanced treatment of the recovered water will be required.	
2a	Vadose Zone (VZ) Recharge Wells	VZ recharge wells take advantage of the significant depths to groundwater in the region. They are designed to inject water above the water table within permeable sedimentary units. Depths of VZ recharge wells up to 180 feet with recharge rates up to 500 gpm depending on favorable permeable sedimentary environment.
2b	Direct Injection (DI) Wells	DI wells recharge water directly into the aquifer, below the water table. Because water is not being pumped from the injection well, no pumps or pumping are required.

Proposed Treatment Options

Opt. #	Description	Details
2c	Aquifer Storage and Recovery (ASR) Wells	ASR recharges water directly into the aquifer, below the water table. By including well pumps, the injected groundwater could be recovered at the same well site. Recharge rates are typically 1/3 to 1/2 of pumping rate at the well.
3	**Non-potable Water (NPW) System (dual distribution):** Development of a NPW system to convey Class A+ water to the end user to replace the use of drinking water for irrigation, construction, industrial, commercial and other process uses.	
3a	Existing irrigation sites in SA1	Locate and develop NPW system to convey Class A+ effluent.
3b	Future Sites in SA2 and SA3	Future Master Planned Communities requiring public amenities such as parks, sports fields, golf courses, etc.
4	**Indoor Use NPW System:** Development of a NPW system to convey Class A+ water to end users to replace the use of drinking water for internal plumbing used in toilet flushing.	
4a	Dual plumbing in larger commercial and industrial buildings and use in industrial processes.	Opportunities in future sites for Master Planned Communities in SA2 and SA3
5	**Direct Potable Reuse (DPR)**	
5a	SMCFD would be required to add a second filter for redundancy to achieve ADEQ Class A+ standards. The Class A+ effluent would undergo drinking water treatment by AJWD and/or AWC for direct entry to the water distribution system.	There are no Arizona water utilities currently permitted by ADEQ to use DPR and less than about ten installations in North America are employing DPR of wastewater effluent. Advanced water treatment would be required at the water treatment plant which requires substantial capital investment. Significant coordination would also be required between the potable water supplier and SMCFD.
5b	Planning for a new WRF to serve SA 3 and SA4 should recognize and plan for the possible adoption of DPR.	The location of a future WTP to serve undeveloped land on the east side of the CAP Canal could be coordinated with a future SMCFD WRF site for planned DPR.

Proposed Treatment Options

Opt. #	Description	Details
6	**Exchange/Lease/Sell:** Sale, lease or exchange of SMCFD Class A+ water to other utilities or water rights holders, such as agricultural users, in the immediate area of SMCFD and the City. A conveyance system would be needed to move the water. This may include possible conveyance in the CAP Canal or SMCFD dedicated pipelines. The opportunities for sale, lease or exchange would need to be developed.	
7	**Surface Water Discharge:** The Class A+ effluent could be used for stream augmentation and restoration.	
7a	Surface Water Discharge - governed by Arizona Pollutant Discharge Eliminate System (AZPDES) permitting	SMCFD is currently permitted to discharge intermittently to a Siphon Draw tributary south of the WRF. SMCFD discharge does occur when the recharge capacity to accept effluent is less than the WRF production or if a recharge basin is offline for maintenance. It is reported that the effluent discharged in the last year or so to the stream infiltrates the stream soils less than 0.5 mile from the discharge point. Converting this to a permanent discharge option would require modification of the AZPDES permit and could potentially include significant impacts to the treatment requirements.

7.1.1 Groundwater Recharge Basins

One option for effluent management is expansion of the existing groundwater recharge basin system by developing additional onsite and offsite effluent recharge basins.

Existing WRF Onsite Recharge Basins

Given the geology and recent groundwater modeling completed by Matrix New World Engineering, the upper limit for effluent groundwater recharge at the site has been established to be 3.0 MGD. SMCFD receives groundwater recharge credits (gross volume recharge minus evaporation loss) from ADWR. Currently, the District can sell and transfer the credits earned.

Recharging all of the District's future effluent onsite will be land intensive and will impact the ability to expand the WRF to 26.0 MGD at full buildout (see **Figure 7**).

Future Offsite Recharge Basins

If recharge is determined to be the primary effluent disposal technique, additional recharge sites will be required. The District will need to find sites with suitable geology. The proposed approach would be to implement a program that includes regional groundwater modeling to evaluate and confirm the capacity for long-term sustainable groundwater recharge. SMCFD would continue to receive groundwater recharge credits that could be sold or transferred to others.

The CAP Canal and the PVR Dams divide the District service areas physically and limit the connectivity between the east and west sides of the service areas. Further, the geology is different between the east and west side.

Land ownership considerations to meet future recharge area requirements will need to be addressed. Currently, there is limited land available within the City and most of the vacant land south and west or east of the CAP canal is owned by ASLD. The siting of any offsite WRF effluent recharge basins will need coincide with the zoning identified in the City's 2020 General Plan. A conveyance piping system from the SMCFD WRF to the future effluent recharge basins will also need to be constructed. The farther away the basins are to the east, the better for near-term development, but the more costly the construction of the pipeline to the recharge basins.

Directly purchasing State Land for recharge basins may be problematic given the potential greater value to the ASLD if the land is sold for development. Coordinating the recharge basins as park areas may address some of this concern for ASLD, but the time frames for acquiring land are also lengthy. The need for additional recharge would become necessary with the further development of State Land; therefore, coordination with future developers and their proposed plans may need to be incorporated. The option to exchange land for some or all of the recharged water may address this issue. CAWCD and the Central Arizona Groundwater Conservation District (CAGCD) may also be interested in a collaborative joint venture for recharge projects. Their interest would probably be limited to recharge areas on the east side of the CAP canal, fed by a piping system, due to hydrogeologic conditions and their current stance. Conversations

with CAWCD identified that effluent discharge to the CAP Canal to carry flow downstream to other recharge locations or for water exchanges is not acceptable at this time.

7.1.2 Alternative Recharge Methods

Indirect potable reuse could be implemented with the goal to provide a long-term sustainable source of water for use by AJWD and AWC. This would involve development of infrastructure to recharge water and recover it at a suitable distance, as defined by ADEQ, to ensure human health and safety. Treatment of the recovered water would be required prior to distribution to the public as potable supply. The District would receive groundwater recharge credits from ADWR which could be sold or transferred to other entities.

Vadose Zone (VZ) Recharge Wells

Several facilities across the Phoenix area utilize VZ wells for recharging reclaimed water into the ground above the water table. One of the most notable local facilities is the Scottsdale Water Campus. VZ recharge requires significant filtration, treatment and active management of recharge rates and distribution to be effective long term.

This type of recharge takes advantage of soil/aquifer treatment before reaching the water table. Vadose zone recharge wells require hibernation treatment (chlorination-acidification) prior to seasonal shutoff in order to reduce microbial impacts to gravel pack and surrounding formation. Periodic rehabilitation is possible if initial well design takes this into account. The upfront cost is higher but the life of the well is extended.

Direct Injection (DI) Wells

DI wells require a deep well, approximately 1,000 ft, to be constructed. These wells require advanced water filtration and treatment prior to injection. At minimum, Class A+ water with filtration is recommended. However, treatment using membrane technology would also improve the life of the well and better ensure ADEQ standards are met.

Downhole equipment (e.g. downhole flow control) is a lower expense compared to aquifer storage and recovery wells with pumps, but equipment would need to be removed periodically to allow for pumping and rehabilitation of the well. Pressure injecting the effluent can improve injection rates but is more costly and requires an appropriate aquifer environment.

Aquifer Storage and Recovery (ASR) Wells

ASR wells, like DI Wells require a deep well, approximately 1,000 ft, to be constructed. As noted above, water requires advanced filtration and treatment prior to injection. ASR wells both inject water into and remove water from the same well. ASR wells require pressure to inject water and downhole pumps to remove the groundwater. The equipment would need to be removed periodically to allow for pumping and rehabilitation of the well.

7.1.3 Non-Potable Water Reuse

Non-Potable Water Supply

Another option for reuse would be the development of a non-potable water system to convey Class A+ effluent to the end user for reuse to replace the use of drinking water for irrigation, industrial, commercial and other process uses. These systems are often called 'purple pipe' systems because the pipeline material is colored/painted purple to differentiate it from potable pipelines. Possible opportunities for reuse include:

- Public parks, sports fields and golf courses within the District's Service Areas
- Industrial processes
- Landscaping
- Dual plumbing in commercial or industrial processes

Irrigation would be seasonally centered around high use in the summer months and lower use in the winter months, which is the opposite of peak flows the District experiences. Use of a purple pipe system would require development of a concept plan with the estimated water distribution capital costs and may be hindered by the need for construction in existing road networks. Implementation of this approach for reuse would require a framework of agreements with developers of State-owned vacant lands identified as Master Planned Communities in the City of Apache Junction General Plan.

Indoor Use NPW System:

This option involves the development of a NPW system to convey Class A+ treated water to the end user to replace the use of drinking water for internal plumbing used in toilet flushing. The traditional focus of this approach is high density commercial and industrial zoned areas. Neither the existing City nor the potential planned development fit the urban model that addresses the indoor plumbing changes required. Further, retrofitting existing areas is expensive and typically not cost effective.

In recent years, many cities have moved away from NPW systems and it is recommended that SMCFD pursue indirect or direct reuse of its effluent over a NPW system for the for the following reasons:

1. The City of Tucson has arguably the largest reuse water system in the country. However, even they cannot use all the effluent produced as the City grows and suffers from supply issues in the summer versus winter. The cost of operating and maintaining a separate system is expensive. At some point effluent needs to either be discharged or reused in some other manner.

2. Much of Arizona's water supply is relatively high in TDS. Golf courses, once a significant user of effluent reuse, now require treatment to address TDS. Scottsdale, another City that has a significant reuse system, is finding that they are required to treat the effluent to remove TDS prior to reuse at golf courses, adding to the cost of treatment.

3. Cross-connections with potable water systems have proven to be problematic. Residential homeowners often do not understand the difference between the two water supplies and even

commercial entities have been known to connect to potable systems as back up for additional water. The City of Chandler has changed their policy and will not allow future developments to include dual systems to residential areas and closely monitors commercial landscape areas that use dual systems.

4. With impending water shortages, many Cities are opting to recharge and recover water knowing that, in a drought, parks and landscape areas would be the first areas to reduce water usage to provide adequate water for drinking. Therefore, using effluent as an indirect or direct source of water is a higher, more beneficial use of effluent when possible.

5. Effluent is highly treated water and is often better-quality water than is required by plants and vegetation in park areas. The transition to direct potable reuse of water is losing much of its stigma with the public. The treatment capability is available to reuse effluent as a potable water supply, and with the rising cost of raw water supplies many cities are looking to use their effluent directly.

7.1.4 Direct Potable Reuse (DPR)

DPR refers to the concept of using effluent as a drinking water supply. SMCFD's effluent would need to be upgraded to Class A+ and treated at an advanced water treatment plant in coordination with AJWD or AWC for direct introduction into their drinking water distribution systems.

While technically possible, there are challenges such as capital and operation costs, public acceptance, plant performance, pathogen control, chemical control and permitting. Although this remains a viable long-term option, it would take an investment of time and money over a period of 10 to 20 years to complete. This would be 2030 to 2040 at the earliest and a DPR project could not be completed without extensive collaboration between the District and a water utility. There are no water utilities in Arizona that are currently permitted for DPR systems under continuous use. Scottsdale does have an intermittent DPR permit for demonstration during tours only, which does not qualify as a community water system at this time.

As noted previously, the AJWD WTP and SMCFD WRF are about a one mile apart, and AJWD has included DPR in their long-term water supply portfolio. AWC has not been as specific about its future water supply portfolio planning, but it is anticipated that either use of long-term storage credits or DPR would be included in their long-term plan.

Treating SMCFD's influent with a more advanced treatment process such as membrane filtration (e.g., MBR) would better prepare the effluent for transfer to and direct use by AJWD for advanced water treatment prior to being blended with treated CAP water and introduced into the AJWD water distribution system. Other treatment processes may be adequate for non-DPR use, but the future need for DPR should be considered to limit capital costs for processes that would need to be replaced sooner than their service life would require.

7.1.5 Exchange/Lease/Sell

Another effluent management option is the sale, lease or exchange of SMCFD Class B+ (current) or A+ (future) water to other utilities or water rights holders, such as agricultural users, in the immediate area of

the District and the City. A conveyance system would be needed to move the water. In the near term this would require SMCFD dedicated pipelines; but in the distant future this may include possible conveyance in the CAP Canal. The possible opportunities for sale, lease or exchange would need to be developed if this is to be a viable effluent management option.

7.1.6 Surface Water Discharge

SMCFD is currently permitted to intermittently discharge their B+ effluent into a Siphon Draw tributary. Effluent could be used for stream augmentation and restoration however, standards for permitting and compliance for surface water discharge are only expected to become significantly more stringent for this use and may exceed the A+ standard. There are also concerns about the quantity of water that would be able to be discharged to Siphon Draw. This option fails to take advantage of effluent as a potential water supply and therefore, should remain an intermittent, low flow option.

7.2 SMCFD EFFLUENT DISPOSAL ANALYSIS

As discussed in section 5.1, the current SMCFD WRF flow is predicted to increase from 1.8 MGD to 6 MGD from 2020 to 2050 based on the full growth scenario of the Superstition Vistas development. Viable options for effluent disposal include recharge, using either basins or wells, direct potable reuse, or water exchanges, leasing or sales. The following sections provide additional technical details and costs for these options.

7.2.1 Effluent Flow Projections and Potential Value

SMCFD owns the effluent and retains legal ownership of the stored effluent regardless of where it is recovered or how it is used until credits are sold. As the owner of ADWR long term storage credits, in the past SMCFD has sold its long-term storage credits to AJWD and CAGRD. The purchase price paid to SMCFD for the credits is based on the current CAGRD Rate Schedule. SMCFD currently receives about $234/AF of effluent credit sold, which is expected to increase to about $293/AF of effluent credit sold by 2026.

The existing annual effluent volume is about 1,700 acre-ft and is estimated to increase to 3,850 acre-ft by 2030, 6,540 acre-ft by 2040 and 7,800 acre-ft by 2050. In the period from 2020 to 2050 the total annual effluent volume is estimated to be 155,000 AF. Currently the annual sale of the long-term storage credits is worth over $350,000 to SMCFD and accounting for anticipated annual increases in the unit sale price, the 155,000 acre-ft total in the period 2020 to 2050 could be worth about $80 million in 2020 dollars. A summary is provided in **Appendix F**.

Effluent recharge should obviously be included in the effluent management plan given the significant value now and in the future.

7.2.2 Groundwater Recharge Using Basins and/or Vadose Zone Wells

It is assumed that additional recharge basins will be added to the existing WRF site and that effluent recharge up to 3.0 MGD can be achieved onsite. Additional offsite recharge areas will be required to accommodate effluent recharge beyond the onsite capability.

The best opportunities for groundwater recharge basins within the District's service areas are to the east of the CAP Canal where more favorable geology is located in the alluvial fans associated with the deltas of the creeks flowing east to west from the Superstition Mountains (see Section 2.4 for studies reviewed). Anticipated locations are labeled Potential Recharge Basins and Vadose Zone Well Development Area on the accompanying **Figure 30** Favorable Site Locations for Recharge Basins and ASR within the SMCFD Planning Area. The figure also shows the location of the existing CAP Superstition Mountain Recharge Area.

Based on the geology of the area, the effluent loading rate to size recharge basin cells is expected to be between 1 to 2 feet of effluent per day. An additional twenty percent land area to allow for berms between the basin cells and room for flow conveyance and monitoring, monitoring wells, vehicle access to all cells and security fencing should be included in sizing estimates.

For the existing facility to add an additional 3.0 MGD of recharge, using basins and vadose zone wells, a recharge facility of 7.5 to 15 acres would be required at the anticipated 1 to 2 ft/d recharge rate with a redundancy allowance. At the estimated City of Apache Junction full land buildout in the Land Use Element of the 2020 General Plan, the District's flow is estimated to increase to 42 MGD and require 90 to 180 acres for recharge.

Additional required infrastructure improvements would include such items as pipelines to convey the effluent from the SMCFD WRF to the recharge basin sites, vehicle access and power supply, perimeter security, setbacks from future development, flow measurement and operation, monitoring and permitting for Point of Compliance wells. Sale of State Land would also be required which could be expensive given that the State is anticipating land in these areas could be sold for residential development, which would result in higher sale prices.

The minimum level of treatment required would be to maintain production of B+ effluent. The recommended level of treatment would implement effluent filtration, primarily to optimize the recharge basin operation and achieve a higher recharge rate.

7.2.3 Direct Injection and Aquifer Storage and Recovery Wells

It is assumed that additional offsite recharge areas will be required to accommodate effluent recharge beyond the onsite capability of 3.0 MGD.

DI and ASR wells require deep soil deposits, approximately 1,000 feet, to be constructed. The most likely locations within the SMCFD service areas for DI and ASR effluent wells are to the west of the CAP Canal and between future State Route 24 (SR 24) and Warner Avenue. This is the area with anticipated soil depths of over 1000 feet. The expected ideal location is illustrated on the accompanying **Figure 30**. With pending development of State Land, it is recommended that the District enter negotiations for land to be allocated for well sites and pipeline easements if this is a selected option. Further, for ASR wells, a joint effort between the water utilities and SMCFD is recommended to facilitate planning, design and construction decision-making and cost-sharing.

Based on the geology of the area, the effluent loading rate to the ASR wells is expected to be between 0.36 MGD per well (low recharge rate) to 1.0 MGD per well (high recharge rate). ASR wells include effluent recharge and water recovery. Based on industry standards, recharge rates are typically 1/3 to 1/2 of the pumping rate of the well. Production rates of existing groundwater wells in the noted area are typically about 1,200 GPM. The recharge rate per ASR for purposes of this report is assumed to be 500 GPM (0.72 MGD). There should also be redundancy, for operation and maintenance purposes, in the number of wells in operation to meet the recharge target rate. For the purposes of this report a redundancy of twenty-five percent is assumed but may need to be adjusted based on pumping rates to allow one or two wells to be out of service and still match the injection rate with the WRF discharge flow.

For the existing facility to add another 3 MGD of recharge using injection or ASR wells, between 5 (high recharge rate) and 14 (low recharge rate) operating wells would be required.

The typical ASR site area requirement is about 1 to 2 acres and they are usually 1/2 to 1 mile apart. The site(s) would include the well, the power supply, pumping control facilities, vehicle access, security wall and an area to allow for maintenance of the well. The pumping equipment will need to be removed periodically to allow for pumping and rehabilitation of the well. This estimated footprint includes treatment of the recovered water by UV or chlorine disinfection but does not include space for onsite water distribution storage tanks or a booster pumping facility. Sale of State Land would be required, or a developer would be required set aside land for the wells. This is expected to be less expensive than recharge basins with vadose zone wells.

A schematic effluent supply line from the SMCFD WRF to potential DI or ASR areas is illustrated on **Figure 30**. Recovery water lines and infrastructure are not shown or included. These facilities would be owned and operated by one of the water utilities.

The recommended level of SMCFD effluent treatment to effectively implement ASR wells would include microfiltration or ultrafiltration using membranes. The District's planned treatment process expansions should accommodate production of high-quality effluent to maintain effective ASR capacity if this is the selected effluent management technology.

7.2.4 Capital Costs for Recharge Basins and VZ Wells, or DI and ASR Wells

Table 12 and **Table 13** summarize the current estimated costs for recharge basins and VZ wells, DI wells and ASR wells based on costs in the Metro Phoenix area and the District's recent recharge basin projects. The table includes the analysis unit, the cost per unit, and a low and high recharge rate. The estimated number of units for the four effluent recharge options, at low and high recharge rates for 6 MGD, 12 MGD, 26 MGD and 42 MGD are shown with the recommended redundancy allowance included. The 12 MGD scenario represents the next major WRF expansion phase beyond 6 MGD. The 26 MGD and 42 MGD are SMCFD estimated effluent flows at full City of Apache Junction buildout as per the Land Use Element of the 2020 General Plan. **Table 12** and **Table 13** include the estimated capital costing in 2020 dollars for the four recharge options at the noted estimated wastewater flows.

Table 12 Concept Level Costing for Recharge Basins, ASR Wells, Injection Wells and Vadose Zone Wells for Low Recharge Rates

Estimated Capacities and Costs for Low Recharge Rates (assumes 25% redundancy)			Recharge rate per unit (low)	Design Effluent Flows per Buildout Stage (MGD)					
				6		12		26	
Method	**Unit**	**Cost per Unit**	**MGD**	**Units Required**	**Cost (no land)**	**Units Required**	**Cost (no land)**	**Units Required**	**Cost (no land)**
Recharge Basins	acre	$100,000	0.27	28	$2,800,000	56	$5,600,000	121	$12,100,000
Vadose Zone Wells	well	$150,000	0.14	53	$7,950,000	105	$15,750,000	226	$33,900,000
Injection Wells	well	$1,000,000	0.36	21	$21,000,000	42	$42,000,000	91	$91,000,000
ASR	well	$2,000,000	0.36	21	$42,000,000	42	$84,000,000	91	$182,000,000

Table 13 Concept Level Costing for Recharge Basins, ASR Wells, Injection Wells and Vadose Zone Wells for High Recharge Rates

Estimated Capacities and Costs for High Recharge Rates (assumes 25% redundancy)			Recharge rate per unit (High)	Design Effluent Flows per Buildout Stage (MGD)					
				6		12		26	
Method	**Unit**	**Cost per Unit**	**MGD**	**Units Required**	**Cost (no land)**	**Units Required**	**Cost (no land)**	**Units Required**	**Cost (no land)**
Basin	acre	$100,000	0.65	12	$1,200,000	24	$2,400,000	50	$5,000,000
Vadose Zone Wells	well	$150,000	0.72	11	$1,650,000	21	$3,150,000	46	$6,900,000
Injection	well	$1,000,000	1.00	8	$8,000,000	15	$15,000,000	33	$33,000,000
ASR	well	$2,000,000	1.00	8	$16,000,000	15	$30,000,000	33	$66,000,000

To put these numbers into perspective, the estimated costs were compared to build recharge basins and injection wells for an additional 3.0 MGD expansion to achieve a 6.0 MGD facility in **Table 14** below. Planning for an additional 4.0 MGD of offsite recharge capacity would allow flexibility for new treatment units on the existing site and for recharge basins that are not meeting anticipated recharge rates over time.

A land cost of approximately $2/SF to $5/SF was estimated for recharge calculations. The current sale prices for State Land were reviewed and the average price was $1.50/SF however, these are land sales for development. The state often sells this land with the anticipation that development will bring in more tax dollars over time and lowers land prices to encourage development. SMCFD needs land for recharge basins therefore, no additional sales tax or income could be expected from the land to the state. In addition, the quantity of land required is small therefore the price would typically be higher than the average.

Based on the poor infiltration rate of the existing SMCFD recharge basins, we have assumed a low infiltration rate for any future offsite basins, 20% additional area for the recharge basins and that the basins will require approximately 8 miles of force main to reach the east side of the CAP Canal. We have assumed a medium-case infiltration rate for the injection wells, ¼-acre per well and only about 2 miles of pipeline since the wells can be closer to the WRF on the west side of the CAP Canal.

The recharge basins appear to be less expensive than injection wells depending on the cost of land. If land costs are high, then the two options are comparable. Additional analysis is required to determine the best recharge locations and to detail specific costs. It should be noted that land for injection wells could be provided by the developers as part of their sewer connection plan to accommodate the effluent to be recharged after treatment. Requests for ¼ acre sites may be more easily negotiated than requests for larger land areas. In addition, constructing a pipeline to the east side of the CAP Canal in the absence of the roads that would cross the CAP Canal and PVR Dams could be extremely problematic.

Table 14 Recharge Basins vs Injection Wells for 4 MGD Expansion

Estimated low land cost ($2/SF)				
	Quantity	**Units**	**Unit Cost**	**Cost**
Recharge Basins (additional 4 MGD)[1]				
Recharge Basins	18.7	acres	$100,000	$1,866,667
Purchase Land	975,744	sf	$2.00	$1,951,488
10-inch diameter force main (8 miles)	42,240	lf	$120	$5,068,800
Subtotal				$8,886,955
Planning, Design, Permitting	25%			$2,221,739
Contingency	35%			$3,110,434
Total Project Cost				**$14,219,127**
Injection Wells[2]				
Injection well	9.7	ea	$1,000,000	$9,666,667
Purchase Land (1/4 acre per well site)	105,270	sf	$2.00	$210,540
10-inch diameter force main (2 miles)	10,560	lf	$120	$1,267,200
Subtotal				$11,144,407
Planning, Design, Permitting	25%			$2,786,102
Contingency	35%			$3,900,542
Total Project Cost				**$17,831,051**

Estimated high land cost ($5/SF)				
Recharge Basins (additional 4 MGD)[1/]				
Recharge Basins	18.7	acres	$100,000	$1,866,667
Purchase Land	975,744	sf	$5.00	$4,878,720
10-inch diameter force main (8 miles)	42,240	lf	$120	$5,068,800
Subtotal				$11,814,187
Planning, Design, Permitting	25%			$2,953,547
Contingency	35%			$4,134,965
Total Project Cost				**$18,902,699**
Injection Wells[2/]				
Injection well	9.7	ea	$1,000,000	$9,666,667
Purchase Land (1/4 acre per well site)	105,270.00	sf	$5.00	$526,350
10-inch diameter force main (2 miles)	10,560.00	lf	$120	$1,267,200
Subtotal				$11,460,217
Planning, Design, Permitting	25%			$2,865,054
Contingency	35%			$4,011,076
Total Project Cost				**$18,336,347**

[1] Assumed worst case given the conditions at SMCFD site

[2] Assumed midway between worst and best condition (9 wells) for 4 MGD additional recharge

7.2.5 Direct Potable Reuse (DPR)

Direct potable reuse requires further advanced water treatment of SMCFD WRF Class A+ effluent prior to use in a drinking water system. The higher level of treatment provided by SMCFD results in higher likelihood the effluent can be sold to AJWD or AWC. The water utility(ies) would be responsible for meeting ADEQ treatment requirements for advanced water treatment and/or blending prior to their respective drinking water distribution systems.

For purposes of this report, it is assumed that effluent would be treated onsite by SMCFD with membrane filtration before sale or transfer to a water utility. The burden of treatment and proof of efficacy in DPR situations falls to the water utility, who can impose requirements on the effluent provider for a minimum level of treatment, but largely assumes responsibility for additional treatment trains. Because SMCFD remains independent from the water utilities, this complexity will need to be resolved for DPR to be implemented.

DPR is technologically feasible, but barriers to implementation remain. The drinking water utilities planning on DPR are facing challenges such as capital and operation costs, public acceptance, plant performance, pathogen control, chemical control and permitting. Rising raw water supply costs and scarce availability of potable water supplies will likely drive the progression of DPR implementation forward. DPR remains a long-term option, as it will take an investment of time and money over 10 to 20 years to complete a project from initial planning efforts to operation.

It is likely that SMCFD effluent will be required for DPR in the 2030 to 2040 time period if growth in the City of Apache Junction proceeds as projected.

7.3 SOLIDS STREAM

As discussed previously, a WRF produces two waste streams: effluent, and solids. Methods of disposal for solids include landfilling, land application and incineration. The following sections describe the current SMCFD solids handling approach, existing solids quantities, estimated future solids quantities for projected flows, regulations for solids reuse and disposal and the recommended approach for future expansion of the existing WRF.

7.3.1 Existing WRF Solids Production

The WRF solids handling system includes sludge lagoons and drying beds. Filter backwash and waste activated sludge (WAS) are delivered to the plant's two sludge lagoons. The sludge lagoons provide equalization before the sludge is pumped to drying beds which allow the solids to settle, stabilize and compact. The supernatant is drawn off the top of the sludge lagoons and is pumped back to the liquid treatment train. From the lagoons, the solids are sent to either two solar drying beds, or to polymer assisted drying beds which have patented, enhanced drying capabilities. From the drying beds, the biosolids placed on an asphalt pad to further dry and are hauled periodically to a qualified landfill.

The District is permitted to produce Class A, Exceptional Quality compost from its treated solids. Until recently, SMCFD biosolids were composted and stockpiled onsite until such time that an end user could be

identified. In the absence of users for land application SMCFD made the decision to landfill the stockpiled compost and to landfill its treated solids for the foreseeable future.

7.3.2 Existing Biosolids Quantities

Historical solids production shown on Error! Reference source not found. below was estimated from three sources.

1. Calculated from average influent and effluent BOD_5 and flows[1]. According to plant data from 2014 to 2019 the annual average BOD_5 ranged from 244 mg/l to 312 mg/l. The data suggests a slight upward trend in BOD_5, which is commonly observed as conservation increases while loadings increase. Average BOD_5 (270 mg/l) was used in this analysis. Average effluent BOD_5 was assumed to be 10 mg/l. Influent BOD measurements taken at sample point INF01 are a blended composite of influent wastewater and treated wastewater from the septage receiving facility.

2. Projected solids production per MGD, as referenced in the 2018 Rerating Study. This report states the estimated WAS dry sludge production from this facility is 2,072 lbs/day/MGD.

3. SMCFD also provided actual solids production data.

Table 15 Annual Biosolids Production

Annual Biosolids Production	
Year	Volume Produced (DMT)
2014	443.3
2015	380
2016	218.6
2017	455.6
2018	170.6

[1]8.34 x (BOD_5 Influent (mg/l) – BOD_5 Effluent (mg/l)) x Flow (MGD) = dry lbs WAS sludge / day

[2]Through October 24, 2019

The actual dry solids production data varies significantly from year to year even though the composite influent loadings and flows are fairly consistent from 2014 to 2018. It is not known why the measured data is so variable; therefore, this data should be studied further before using in future design projections.

The calculated solids production from the influent loading and the Rerating Study are similar. Therefore, the calculated WAS dry solids production from the influent loading are used in this report.

7.3.3 Projected WRF Solids Production

Estimated solids production has been calculated through 2050 based on the flow projections provided previously. As noted previously, septage can have a significant impact on loading for the facility. This report assumed that the variability of the influent characteristics would stabilize as additional residential influent comes to the facility. For these calculations it was also assumed that the future solid and liquid treatment systems would remove more nutrients from the effluent. Such processes could include MBR, digestion processes or other advanced treatment processes. Solids production per gallon of water would increase over current production. It was also assumed that conversion to anaerobic digestion will not occur until influent flows increase to at least 6.0 MGD.

Based on VSS data provided from 2018 to 2019, the calculated average VSS percentage is 81%. This is a common value and within range of other wastewater plants that receive domestic sewage. For this analysis, 80% VSS was used. Anaerobic digesters can typically remove 55% to 65% of VSS. For this analysis 60% VSS reduction was used. Total solids reduction can be calculated by multiplying percent VSS by VSS reduction (e.g. 80% x 60% = 48% total solids reduction).

The following assumptions were made for estimating future solids production at the SMCFD facility.

- The future expanded facility's treatment process will produce the same effluent quality or better than current operations.
- Average influent BOD, TSS and NH_3 loading over a long time span remains fairly constant.
- Anaerobic digesters will be built when SMCFD exceeds 6.0 MGD.
- Sludge lagoon volatile solids reduction is minimal.
- Composting volatile solids reduction is minimal.

Estimates for solids production are provided below and are based upon the three influent flow scenarios shown in **Table 7:**

Scenario 1: SMCFD SA1 population based on 2% growth (**Figure 31)**
Scenario 2: SMCFD SA1 population based on 2% growth plus SA2 at 2 People/DU (**Figure 32)**
Scenario 3: SMCFD SA1 population based on 2% growth plus SA2 at 3 People/DU (**Figure 33)**

Figure 31 Sludge Production Growth Based on Scenario 1

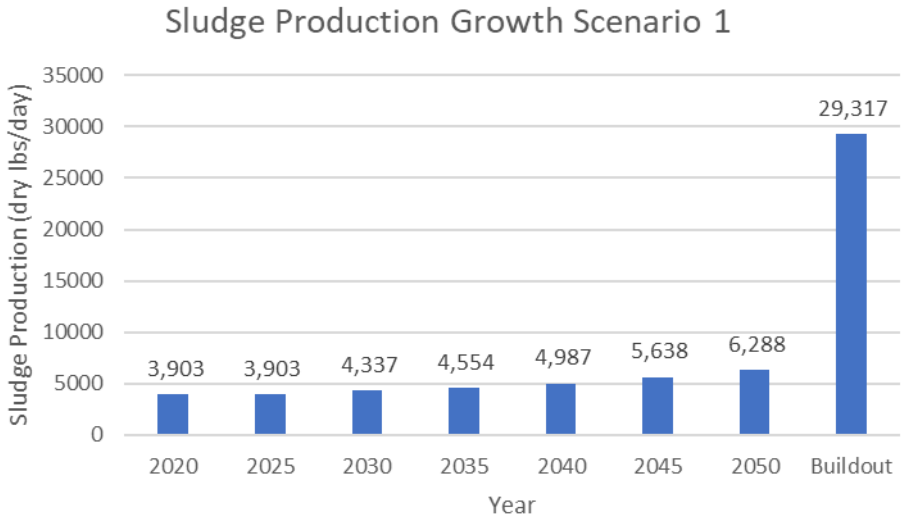


Figure 32 Sludge Production Growth Based on Scenario 2

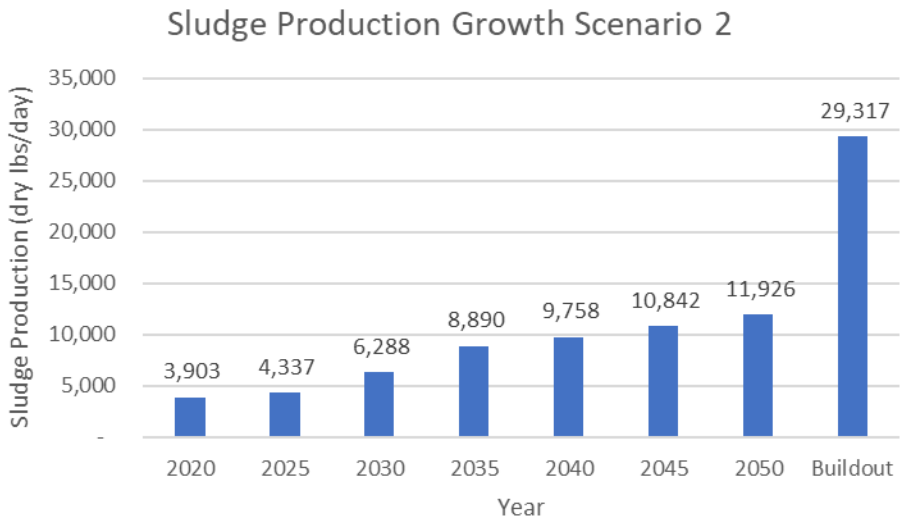
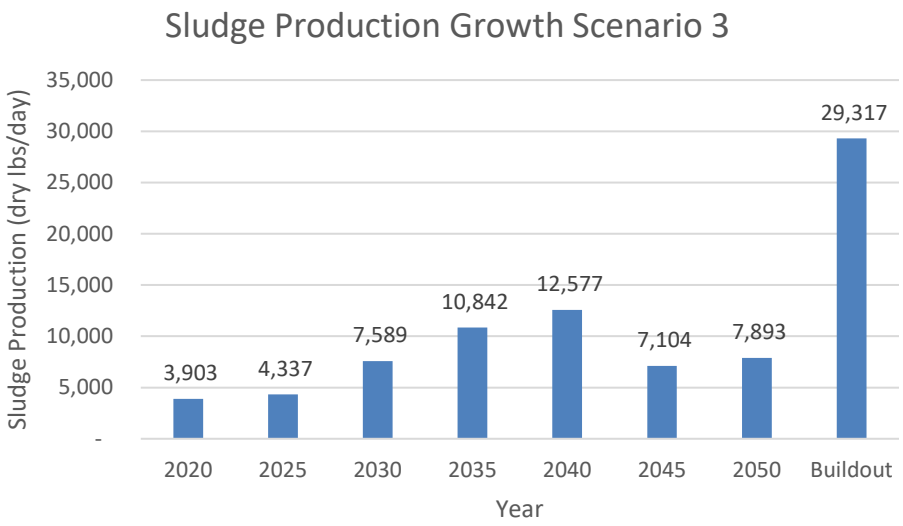


Figure 33 Sludge Production Growth Based on Scenario 3



Influent Flow Scenarios 1 and 2 do not exceed 6.0 MGD until after 2040, so the bar charts do not show solids reduction due to anaerobic digestion (the expansion following 6.0 MGD would involve addition of digestion). Influent Flow Scenario 3 goes beyond 6.0 MGD between 2040 and 2045, so the bar chart shows solids reduction for 2045 and 2050. For the buildout influent flow of 26 MGD, the estimated maximum solids production is 29,317 dry lbs/day.

7.3.4 Solids Disposal Options and Standards

The 1987 Water Quality Act created a program for biosolids, or sewage sludge, management. The Act instructed the EPA to develop guidelines for usage and disposal of biosolids. The EPA regulations: (1) Identify uses for sewage sludge, including disposal; (2) Specify factors to be considered in determining the measures and practices applicable to each such use or disposal, including publication of information on costs; and (3) Identify concentrations of pollutants which interfere with each such use or disposal.

EPA developed a new regulation, The Standards for the Use or Disposal of Sewage Sludge, Title 40 of the Code of Federal Regulations (CFR), Part 503, which was published and became effective in 1993. The Code is often referred to as 'Part 503'. In this document sewage sludge is referred to as biosolids. Biosolids are a primarily organic solid product produced by wastewater treatment processes that can be beneficially recycled or disposed of. Part 503 establishes the minimum treatment requirements prior to:

- land application to condition the soil or fertilize crops or other vegetation grown in soil,
- placement on a surface disposal site for final disposal, or
- firing biosolids in an incinerator.

The rule also identifies that biosolids placed in a municipal solid waste landfill must meet Title 40 CFR Part 258.

Part 503 is designed to protect public health and the environment from any reasonably anticipated adverse effects of certain pollutants and contaminants that may be present in biosolids. Operational standards include monitoring pathogen and vector attraction reduction and total hydrocarbons or carbon monoxide. Other Part 503 regulations establish general requirements, management practices, pollutant limits, monitoring frequency, recordkeeping and reporting.

Biosolids contain nutrients such as nitrogen and phosphorus but also contain significant numbers of pathogens such as bacteria, viruses, protozoa and eggs of parasitic worms. Biosolids also contain more than trace amounts of organic and inorganic chemicals. Benefits of reusing sewage sludge from use of organic and nutrient content in biosolids is valuable resource in improving marginal lands and serving as supplements to fertilizers and soil conditioners. However, agricultural land application is declining in recent years and as noted above, the Class A Exceptional Quality compost created by SMCFD did not find a market for sale.

Alternatively, solids can be landfilled or incinerated to produce energy. SMCFD is unlikely to produce enough biosolids in the early years to find a market for incineration. However, certain treatment options (such as anaerobic digestion) will allow for that to be an option in the future, particularly when energy generation is used to offset onsite treatment energy requirements.

Standards for landfilling require thickening at a minimum to limit the amount of water in the biosolids. Reducing the quantity of water is a requirement and a cost saving measure. Some landfills will not allow biosolids disposal and trucking can be a prohibitive cost.

7.3.5 Solids Stream Treatment Options

Biosolids treatment options include thickening, aerobic or anaerobic digestion, and dewatering. These processes are used to reduce the quantity of water and the potential effects of bacteria, pathogens and vector attraction.

Solids production quantity is assumed to increase linearly with influent flow as it increases. Solids disposal options include landfilling, composting for land application and incineration.

As noted above, treatment requirements for landfilling are relatively simple. Typically, a facility dewaters solids and verifies that solids do not exceed certain limits for metals and other constituents.

Composting solids onsite is not feasible long term because the process is land intensive and odor could be an issue as the area around the WRF develops. Because a market for land application of the compost has not been found, the cost and effort to produce Class A Exceptional Quality compost have not been practical. Therefore, other methods of addressing solids should be considered.

Future treatment options include aerobic and anaerobic digestion, as compared in **Table 15**. Both are used to treat sewage sludge. As the names imply, aerobic digestion uses oxygen and anaerobic digestion occurs in the absence of oxygen.

The basic aerobic digestion process combines WAS and primary sludge, where appropriate, and passes the sludge to a thickener where the solids content is increased. This substantially reduces the volume that is required to be treated in a digester. The process is usually run as a batch process with more than one digester tank in operation at any one time. Air is pumped through the tank and the contents are stirred to provide mixing and oxygen. Carbon dioxide, waste air and small quantities of other gases including hydrogen sulfide are given off. These waste gases require treatment to reduce odors. The digestion is continued until the percentage of degradable solids is reduced to between 20% and 10% depending on local conditions.

Anaerobic digestion is a sequence of processes by which microorganisms break down biodegradable material in the absence of oxygen. The process is used for industrial or domestic purposes to manage waste or to produce fuels. The digestion process begins with bacterial hydrolysis of the input materials. Insoluble organic polymers, such as carbohydrates, are broken down to soluble derivatives that become available for other bacteria. Acidogenic bacteria then convert the sugars and amino acids into carbon dioxide, hydrogen, ammonia and organic acids. In acetogenesis, bacteria convert these resulting organic acids into acetic acid, along with additional ammonia, hydrogen and carbon dioxide. Finally, methanogens convert these products to methane and carbon dioxide.

Anaerobic digestion is widely used as a source of renewable energy. The process produces a biogas, consisting of methane, carbon dioxide, and traces of other 'contaminant' gases. This biogas can be used directly as fuel, in combined heat and power gas engines or upgraded to natural gas-quality biomethane. The nutrient-rich digestate also produced can be used as fertilizer.

With the reuse of waste as a resource and new technological approaches that have lowered capital costs, anaerobic digestion has in recent years received increased attention as a preferred solids handling process.

Table 16 Aerobic vs Anaerobic Digestion

Process	Advantages	Disadvantages
Aerobic Digestion	• Generally, less capital costs • Process is usually run at ambient temperature; in most cases, no energy is required to heat the sludge • Process is typically less complex and easier to manage • Volatile solids reduction is approximately equal to anaerobic digestion • Lower BOD concentrations in supernatant • Potential recovery of more fertilizer nutrients • Can produce Class B biosolids • Can produce Class A biosolids with further treatment	• Operating costs are typically higher because of the blowers, pumps and motors required to add oxygen • Due to operating costs, generally used at plants < 5 MGD • Poor mechanical dewatering characteristics • Process is affected significantly by temperature • No methane byproduct to recover • Relatively low residual energy and sludge cannot be dried and incinerated to produce heat or energy; waste is typically land applied (if it meets Class A or Class B biosolids) or landfilled • Longer solids retention time to produce Class B biosolids
Anaerobic Digestion	• Methane and other gasses can be converted to energy production • Generally, lower operating costs than aerobic digestion • Solid waste can be incinerated to produce heat or energy • Can produce Class B biosolids • Can produce Class A biosolids with further treatment	• Process can be more complex to operate • Generally higher capital cost than aerobic digestion • Usually requires heating to produce Class B biosolids • Production of dangerous gases need to be contained • Poor mechanical dewatering characteristics

7.3.6 Recommended Solids Treatment Plan

In today's facilities, anaerobic digestion is typically more cost effective than aerobic digestion at about the 5 MGD facility size. Therefore, it is recommended that the facility expansion from 3 to 6 MGD convert from composting to anaerobic digestion. In addition, a pre-thickening system using a rotary drum thickener and a post thickener using a belt filter press or a centrifuge is recommended.

Long-term disposal should also be to a landfill as the facility expands.

7.4 WRF TREATMENT RECOMMENDATIONS

The existing WRF dates to the mid 1990's. The estimated average day wastewater flow at full land development of the 2020 General Plan is 42 MGD. Based on physical constraints and the existing SMCFD WRF location, it is recommended that full buildout flow from SA1 and SA2 of 26 MGD be delivered to the existing WRF. It is recommended that the full buildout flow from SA3 and SA4, east of the CAP Canal, would flow to a new WRF with a maximum capacity of 20 MGD.

7.4.1 Proposed Existing WRF Expansion

This section addresses the development of an ultimate WRF process, site and phasing plan for the existing 97-acre WRF site to accommodate an average day wastewater flow of 26 MGD (see **Figure 14**). It includes expansion of the existing WRF in the following phases:

Current Capacity:	Re-rated to 3 MGD
Phase 1:	6 MGD
Phase 2:	12 MGD
Full Buildout:	26 MGD

As discussed previously, a WRF produces two waste streams: water and solids. Effluent reuse and discharge options drive the liquid train treatment requirements. It is anticipated that the long-term beneficial use for the effluent would be direct potable reuse. The short and midterm effluent beneficial uses are anticipated to be recharge basins or some form of injection wells.

The preferred treatment technology for direct potable reuse would be an MBR system to prepare water for an advanced water treatment facility at either the AJWD water treatment facility or a future AWC water treatment facility. In addition, MBR treatment would be a better technology to align with injection wells. The higher quality the water injected, the longer the life of the well and the better for the aquifer as a future drinking water source.

The existing facility is an extended aeration activated sludge nitrification/denitrification system. This system is relatively easy to operate and familiar to the operations staff. Adding filtration to the system will improve the life of the existing and potential future recharge basins. However, the existing facility was constructed in the 1990s and is nearing the end of life for this system. To continue using the existing infrastructure, improvements to the aeration system may be required.

For recharge basins, adding additional aeration technology, with filtration, may be viable and would potentially be less expensive. However, given the existing percolation conditions at the WRF and the initial study for land to the east of the CAP Canal, it is unlikely that recharge basins will be a viable, long-term option. Poor recharge rates will require much larger land areas which must be purchased from ASLD or developers. In addition, the transition from recharge to injection wells or DPR may occur before the life of new aeration systems are exceeded.

Based on this analysis, it is recommended that SMCFD proceed with detailed hydrogeologic studies to identify the best locations for recharge.

It is further recommended that SMCFD proceed with planning the phased expansion of the WRF with the treatment focus on MBR technology.

It is also recommended that an optimization study be conducted to evaluate the existing Biolac operations and to identify upgrades that may be necessary to extend the life of the systems for near term use.

A full buildout layout has been prepared for the WRF and is presented on **Figure 34.** The layout includes an MBR facility with UV disinfection. In addition, the recommended plan includes 10 acres reserved for advanced treatment needs for reuse beyond MBR/UV disinfection that may be needed to meet future regulatory requirements for DPR.

Some land has been set aside for potential additional Biolac treatment, but as noted above, this would only be recommended if recharge basins east of the CAP Canal can be identified and land purchased, as the Biolac is a more land intensive process than alternative secondary treatment configurations. At some point in the phasing of new units, the Biolac basin and other existing process units will be redundant. It is anticipated that the area occupied by these processes will be re-purposed for new elements of the Master Plan.

The recommended Master WRF site plan at full buildout includes the following elements:

1. Fine Screening (3 mm or smaller) - The capacity would be 42 MGD peak flow at buildout with each screen at 6 MGD for a total of 8 units (7duty + 1 standby) to serve the design flow.

2. Grit removal - The capacity would be 42 MGD peak flow at buildout with each unit at 9 MGD for a total of 6 units (no standby).

3. Primary clarifiers – not accounted for in current space planning, but primary clarifiers could be phased to assist in anaerobic digestion and increase capacity in lieu of additional bioreactors.

4. Bioreactors - The design HRT would be 8 hours with 3 MGD per reactor basin for a total of 9 basins.

5. Membrane tanks and accessories - 3 MGD system per unit for a total of 9 units.

6. UV Disinfection - Each UV channel would have 3 UV units in series and each UV channel would be rated at 3 MGD for a total of 9 UV channels.

7. Effluent buffer basin with a pump station to convey effluent to basin recharge, ASR wells and Direct Potable Reuse treatment sites. These would be located on the existing footprint of recharge basin 1.

8. Sludge handling system.

9. Sludge thickening, rotating drum thickener, belt filter press or centrifuge thickening. There would be a total of 3 units (2 duty + 1 standby).

10. Sludge anaerobic digestion. There would be a total 7 units (6 duty + 1 standby).

11. Sludge dewatering with belt filter press or centrifuge. There would be a total of 2 units (1 duty + 1 standby).
12. Electricity co-generation station using anerobic digestion methane gas.
13. Odor control with biofilters. This would include 2 units for the headworks, 2 units for the sludge handling and 2 units for the bioreactors.
14. WRF Site Buildings: motor control center (MCC), electrical building, administration/operation building, maintenance building, chemical building, blower building

PROCESS UNIT CONFIGURATIONS, PHASING AND DIMENSIONS NOTES

1. BUILDOUT DESIGN AVERAGE FLOW = 26 MGD ASSUMED
   BUILDOUT PEAK FLOW = 42 MGD

2. PROPOSED EXPANSION PHASING:
   a. RE-RATE THE EXISTING PLANT TO 3.0 MGD
   b. 3 MGD TO 6 MGD EXPANSION WITH 3 MGD MBR PROCESS UNIT, UPGRADE THE EXISTING SLUDGE HANDLING TO MECHANICAL DEWATERING, BUILD NEW HEADWORKS (SCREENS AND GRIT REMOVAL)
   c. 6 MGD TO 12 MGD ADD TWO ADDITIONAL 3 MGD MBR PROCESS UNITS, DECOMMISSION EXISTING 3 MGD BIOLAC, BUILD ANAEROBIC DIGESTERS/EXPAND HEADWORKS, DECOMMISSION THE EXISTING HEADWORKS AND THE EXISTING TREATMENT FACILITY
   d. 12 MGD TO 26 MGD EXPANSION WITH MBR PROCESS

3. PROPOSED 3 MGD MODULAR/PHASES EXPANSIONS
   a. 3 MGD TO 6 MGD EXPANSION WITH MBR
   b. 6 MGD TO 9 MGD EXPANSION WITH MBR
   c. 9 MGD TO 12 MGD EXPANSION WITH MBR
   d. 12 MGD TO 15 MGD EXPANSION WITH MBR
   e. 15 MGD TO 18 MGD EXPANSION WITH MBR
   f. 18 MGD TO 21 MGD EXPANSION WITH MBR
   g. 21 MGD TO 24 MGD EXPANSION WITH MBR
   h. 24 MGD TO 26/27 MGD EXPANSION WITH MBR

4. FINE SCREENING (2 MM OR SMALLER), BASED ON ASSUMED PEAK FLOW
   a. EACH SCREEN =6 MGD
   b. TOTAL 8 UNITS AT BUILDOUT (7 DUTY+ 1 STANDBY) DEPENDING ON PEAK FLOW
   c. ESTIMATED SCREEN DIMENSION = 6 FT X 25 FT FOR EACH UNIT

5. GRIT REMOVAL, BASED ON PEAK FLOW
   a. 7 MGD PER UNIT DESIGN FLOW DEPENDING ON PEAK FLOW
   b. TOTAL 6 UNITS (NO STANDBY)
   c. EACH UNIT DIMENSION 12 FT X 12 FT PER HYDRO INTERNATIONAL TRAY UNIT

6. BIOREACTORS
   a. DESIGN HRT =8 HOURS
   b. BASIN SWD = 20 FT, FLEXIBLE FOR OTHER PROCESS, AND SMALLER FOOTPRINT
   c. REQUIRED VOLUME FOR 3 MGD = 133,690 FT3
   d. REQUIRED SURFACE AREA FOR 3 MGD = 6,685 SF
   e. TOTAL AREA FOR 26 MGD = 60,160 SF
   f. LENGTH/BASIN = 200 FT
   g. WIDTH/BASIN = 40 FT

7. MEMBRANE TANKS AND ACCESSORIES
   a. 3 MGD SYSTEM WIDTH =25 FT PER ZENON CUT SHEET
   b. 3 MGD SYSTEM LENGTH = 75 FT PER ZENON CUT SHEET

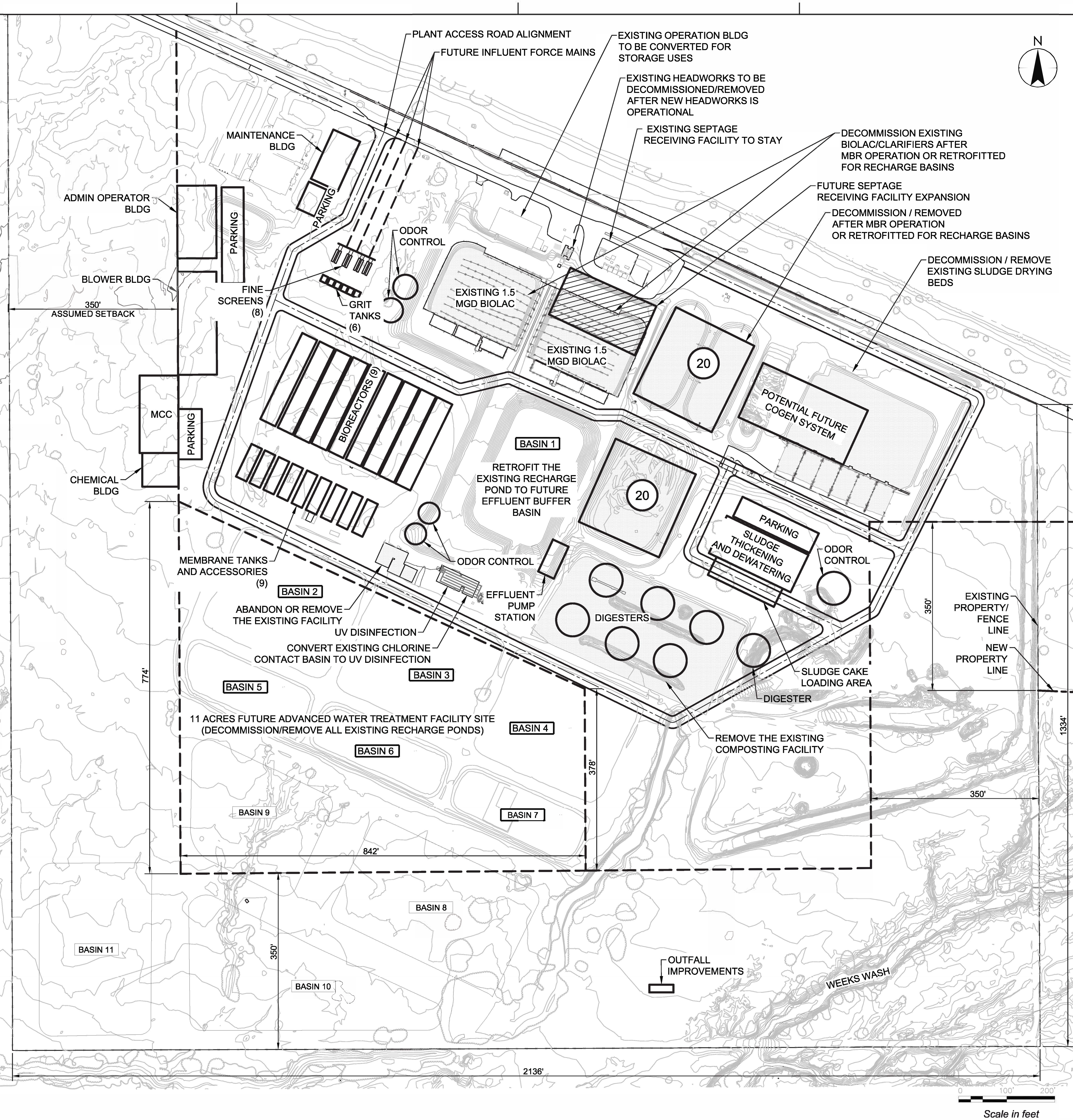
8. SLUDGE HANDLING SYSTEM
   a. SLUDGE THICKENING WITH RDT, OFFSITE TO LANDFILLING
   b. TOTAL 3 UNITS (2 DUTY+ 1 STANDBY)
   c. EACH UNIT FOOTPRINT = 10 FT X 25 FT
   d. SLUDGE ANAEROBIC DIGESTION
   e. TOTAL 7 UNITS (6 DUTY+ 1 STANDBY)
   f. EACH UNIT FOOTPRINT =55 FT DIAMETER
   g. SLUDGE DEWATERING WITH BFP OR CENTRIFUGE
   h. TOTAL 2 UNITS (1 DUTY+ 1 STANDBY)
   i. EACH UNIT FOOTPRINT = 15 FT X 18 FT

9. ODOR CONTROL WITH BIOFILTERS
   a. TWO FOR HEADWORKS, EACH DIAMETER OF 40 FT
   b. TWO FOR SLUDGE HANDLING, EACH DIAMETER OF 30 FT
   c. TWO FOR BIOREACTORS, EACH DIAMETER OF 30 FT

10. MCC BUILDING, 75 FT X 150 FT
11. ADMIN/OPERATION BUILDING, 100 FT X 100 FT
12. MAINTENANCE BUILDING, 125 FT X 50 FT
13. CHEMICAL BUILDING, 75 FT X 60 FT
14. BLOWER BUILDING, 75 FT X 180 FT
15. CONVERT THE EXISTING OPERATION BUILDING TO STORAGE USES

16. EFFLUENT DISINFECTION WITH UV
    EACH UV CHANNEL IS 25 FT LONG PER TROJAN CUT SHEET
    EACH CHANNEL HAS 3 UV UNITS IN SERIES
    EACH UV CHANNEL IS 4 FT WIDE
    EACH UV CHANNEL IS RATED 3 MGD
    TOTAL NO OF UV CHANNELS IS 9

17. CONVERT ONE OF THE RECHARGE BASIN TO FUTURE EFFLUENT BUFFER BASIN
18. BUILD AN EFFLUENT PUMP STATION
19. UPGRADE TO EXISTING OUTFALL
20. OPTION TO RETROFIT 3 MGD ADDITIONAL BIOLAC BASINS IN EXISTING SLUDGE HANDLING BASINS FOR 6 MGD EXPANSION IF RECHARGE BASINS AVAILABLE; DECOMMISSION AND REMOVE AT 12 MGD EXPANSION



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Consultant

LEGEND

- EXISTING PROPERTY/FENCE LINE
- NEW PROPERTY LINE
- EXISTING SETBACK LINE

Client/Project Logo

SMCFD

Client/Project
SUPERSTITION MOUNTAINS CFD NO. 1
WATER RECLAMATION FACILITY
MASTER PLAN

Apache Junction, Arizona

Title
PROPOSED SITE AND PHASING TO 26 MGD

Project No.	Scale
181300988	AS SHOWN

Revision	Sheet	Figure
		34

ORIGINAL SHEET - ARCH D

The recommended site plan includes a buffer area of 350 feet on the east, west and south sides of the property. The north side is bounded by the CAP Canal. The southern half of the property is located within the City flood zone A with multiple washes on the property. The use of this land will need to be reviewed with the City Public Works Department. There are no setbacks needed for recharge and reuse basins.

It is recommended that SMCFD verify that waivers for the north side are in place and recorded with the property in the event that land is sold.

A construction phasing plan will require balancing the cost of treatment with the timing for more advanced treatment, and the funding of the treatment facility through either rate payers, effluent sales or both. SMCFD owns the water that other stakeholders would like to have. It has been estimated that SMCFD can expect over $80 million from 2020 to 2050 if the projected effluent is all recharged. The sale of these recharge credits can help reduce the cost impacts of building the WRF expansions. In addition, limited water supplies in the area could drive the value of the effluent far above this value through sale of the effluent or credits to local water suppliers or developers.

It is recommended that SMCFD proceed with a detailed preliminary design for the WRF expansion that includes a phasing plan, balancing construction costs, recharge / reuse options, and treatment options.

Although both water utilities have expressed interest in the District's effluent, there is no cohesive plan for when effluent will be used by these entities. AJWD was purchasing water credits from SMCFD up until 2015. In recent years AJWD has not purchased these credits, however they may resume these purchases in the future.

In the West Valley, many cities have been unprepared to fund treatment expansion requirements. It has been left to developers to "find" their own water. Sale of the effluent to incoming developers is also an option that SMCFD could consider. Funds from this sale could be used for direct treatment construction funding, impact fees or water sale to augment their water supply portfolio.

Ultimately, the water supply and development stakeholders should help define a phasing strategy and matching treatment technology, including construction funding strategies. This will assist SMCFD in focusing its reuse strategy over the next 30 years and provide an approach to effluent management methods, timing and funding.

It is recommended that SMCFD establish a stakeholder committee that includes the City, local water suppliers and local developers to review options for effluent management and funding required to expand the facility.

7.4.2 SMCFD Future Planning Area (SA4)

The Future Planning Area boundary is illustrated on Error! Reference source not found. The area is bounded by Elliot Avenue on the north, Germann Road on the south, the CAP Canal on the west and the U.S. Highway 60 on the east. The development area within SA4 is zoned by the City of Apache junction

as Master Planned Community. The estimated full buildout population is 97,000. The land is owned by the State of Arizona.

Full buildout refers to the point in time when the land is completely developed to the zoning designation in the 2020 General Plan. It is likely that development in this area will be decades into the future. The estimated average day wastewater flow is 21 MGD. Given the space limitations at the existing WRF site, and the crossing constraints for pipelines at the CAP Canal and PRV Dams, it is recommended that a new WRF be planned to be located east of the CAP Canal.

The need for this facility depends on the rate of development of the State Land. A timeline for the need and possible release of land parcels for development in the area is uncertain. It is expected to be several decades in the future, likely beyond 2040 to 2050. SMCFD should monitor State Land development plans for the area. I

8.0 MASTER PLAN RECOMMENDATIONS

As has been noted previously, a proposed plan for the SMCFD WRF is dependent on the reuse or recharge of effluent. The specific plan will require additional investigation and coordination with water suppliers and with development as it progresses. The following is a list of proposed recommendations to achieve this end for effluent and for treatment. Also presented below is an estimated cost to implement the proposed plan line items and a recommended schedule for implementation to achieve 6 MGD treatment by approximately 2028 and 12 MGD by approximately 2041 to 2043 (see **Figure 14**).

8.1 PROPOSED EFFLUENT REUSE MASTER PLAN

Effluent quality requirements for reuse will drive treatment system components at the facility. This section identifies the development of an effluent reuse strategy for the short term and at full buildout as identified in the City of Apache Junction 2020 General Plan. Summarizing the various data presented and recommendations in previous sections for effluent, the following is a short description of the proposed effluent master plan.

Recommendation ER 1 - Prepare a Long-Term Effluent Reuse Strategy for 2020 – 2050

The recommended effluent disposal in the short term is through basins and ASR wells with direct potable reuse as a longer-term option. SMCFD should also consider exchange/lease/sell and non-potable water systems if the opportunity arises. Coordination with various stakeholders will be critical to develop the best long term, coordinated plan and to purchase or acquire the appropriate land for recharge.

It is recommended that SMCFD organize and manage a stakeholder process to develop a long term SMCFD WRF effluent reuse strategy. This task should be completed by the end of Q2 2023, given the expansion projection from 3 MGD to 6 MGD of the SMCFD WRF by 2028.

The following list of stakeholders have a role in a SMCFD long term reuse strategy:

1. City of Apache Junction,
2. ASLD (owner of the majority of undeveloped land in the SMCD planning areas),
3. ADWR (permitting of groundwater reuse),
4. ADEQ (permitting of wastewater system expansion and improvements),
5. CAGRD,
6. AZC,
7. AJWD and
8. Development Community.

The parties interested in using SMCFD effluent recharge water or credits and DPR water would likely be CAGRD, AZWC and/or AJWD. The strategy should identify key elements including ADWR and ADEQ permitting considerations and needs such as lab and pilot scale testing programs, anticipated effluent quality needs, effluent volume needs and time frame, contractual delivery framework, infrastructure needs

including capital and operation and maintenance costs, financing and cost sharing needs, public consultation and schedule.

This initiative is recommended for immediate implementation with a goal of determining a long-term plan by Q3 2021. However, continued coordination will be required and SMCFD may want to consider using the Stakeholders Group for an extended period or re-initiated as the planning for increasing influent flows is implemented in ER-6 below.

Recommendation ER 2 - Onsite Recharge Operational Improvements Plan

It is recommended that SMCFD create a recharge operation and monitoring plan to manage the existing recharge facility to achieve full available ADWR groundwater recharge credits. The current onsite WRF effluent reuse system has been experiencing reductions in recharge capability and will not meet the long term needs of the facility. Several suggestions have been proposed in various plans that include adding filtration, adding flow monitoring, more frequent bed rehabilitation, and adding more recharge and vadose zone wells or gravel lined columns.

Recommendation ER 3 - Preliminary Recharge Basin/ASR Facility Siting

As part of Effluent Reuse Strategy (ER 1), it is recommended that a preliminary Recharge Basins/ASR siting geophysical investigation be undertaken. The goal is to identify recharge sites for detailed investigation that could be used to increase the WRF recharge capacity to 6 MGD by 2028 and from 6 MGD to 12 MGD by 2041. **Figure 30** illustrates the areas that are most likely favorable and should be the initial focus.

As the near-term collection system expansion is anticipated to be west of the CAP Canal, the first recharge investigations should focus on areas west of the canal. The following narrative assumes the next steps are focused on recharge basin/ASR investigations.

1. A desktop study should include evaluation of soil materials at the surface and lithology of sedimentary materials at depth using available drill logs. This may also include review of historical aerial photographs to better identify stream and wash networks present before street, canal, and dam structures were constructed. As the ultimate investigation corridors are expanded or narrowed, they would be explored using large scale, volumetric techniques such as surface geophysical surveys.

2. Resistivity geophysical surveys may provide the greatest benefit in distinguishing course and fine-grained lithology. High resolution direct current resistivity or time domain electromagnetic surveys crossing several areas of interest would be recommended. It is anticipated that up to 5 miles of surveys would be appropriate to assist in identifying favorable sedimentary conditions within the near surface down to the water table (100 – 200 feet est.).

3. The final recommendations should include identification of the most favorable sites for SMCFD recharge basin and ASR reuse to meet the ER 1 strategy, potential site land ownership issues and total costs to develop effluent reuse at each site including conveyance from the SMCFD

WRF. If considered of value to SMCFD, conveyance system costs from the ASR wells to the point of reuse may be included to encourage water suppliers or water users to purchase the effluent or recharge credits.

Recommendation ER 4 - Investigation and Selection of Sites for 3 to 6 MGD Expansion

Based on the results of the preliminary geophysical surveys (ER 3), it is recommended that the regions identified as favorable for effluent reuse be investigated in further detail by drilling boreholes to confirm favorable lithologic conditions for recharge.

Optimal lithologic conditions would include multiple and thick coarse-grained sedimentary deposits within the near surface down through the vadose zone. Each borehole should be used to test for percolation rates using constant head and falling head testing within several favorable lithologic intervals. Where possible, trench percolation tests should also be conducted in near surface horizons where coarse lithology units are present. Based on borehole lithology and testing results, the potential recharge sites should be further refined for site acquisition and additional recharge testing.

Within ER 1) as detailed above, SMCFD has planned recharge basins at the existing WRF using a significant land area that may be required for future treatment as detailed master planning progresses. Final onsite and offsite recharge area requirements should be determined in this investigation task. An approach and schedule for offsite land acquisition should be included in the final recommendations.

Recommendation ER 5 - Design, Construction, and Commissioning for 6 MGD Expansion

Within the selected sites in ER 4, it is recommended that SMCFD acquire the necessary property and develop the capacity for effluent reuse/ASR wells of at least 6 MGD. It is assumed that some of the existing WRF recharge basins will be re-purposed for WRF infrastructure and 6 MGD of recharge capacity will be needed by 2028.

This task is to deliver a functional recharge system including pre-design, design, construction and startup to align with the expected SMCFD average day wastewater flow rate reaching 6.0 MGD by 2028. This would include securing the necessary land, design and construction of the conveyance between the WRF and the recharge facility, construction of any utilities such as access roads, power, and instrument and control systems.

Recommendation ER 6 - Approach for 12 MGD Expansion

Continued planning and investigation will be required in advance of increasing influent flows from 6 to 12 MGD. It is recommended that SMCFD undertake a performance review of the reuse facilities put into operation by 2028 and the forecasted effluent volumes, effluent reuse needs and siting locations to plan for reuse opportunities to expand from 6 to 12 MGD. At this point, DPR may be a viable opportunity.

As noted in ER 1, SMCFD may want to consider restarting the Stakeholders Group or continuing with this Group through all of the Effluent Recommendation Tasks. The stakeholders identified in ER 1 have a long term interest in the approaches, cost and siting for effluent recharge.

8.2 RECOMMENDED WRF MASTER PLAN AND DEVELOPMENT

Summarizing the various data presented and recommendations in previous sections for treatment, and in coordination with the effluent recommendations above, the following is a short description of the proposed treatment master plan.

Recommendation WRF 1 - Prepare Detailed WRF Expansion Phasing Plan

Using the proposed process and site plan **Figure 34**, prepare a detailed phasing plan for the existing WRF 97-acre site that aligns with the water quality goals identified in the Effluent Reuse Strategy including the role of the existing and planned WRF recharge basins. The phasing plan should cover the period from 2020 to 2050 and beyond and should be developed balancing cost with treatment life cycles and the phased effluent reuse plan developed with Stakeholder input. The recommended SMCFD WRF Phasing Plan is centered on moving forward in a focused manner from the existing treatment process and sludge management process to MBR liquid treatment and anaerobic digestion solids treatment at full build out. The use of MBR treatment provides highly treated effluent water quality in a compact footprint that is most suitable for the long term DPR reuse plan.

The proposed SMCFD facility water quality goals at buildout should meet ADEQ A+ criteria to match the expected SMCFD reuse strategy including basin recharge, direct injection or ASR wells, and eventually DPR. The use of anaerobic solids treatment will reduce the solids generated by the WRF and continue to meet ADEQ Class A biosolids criteria. Anaerobic digestion will also produce methane off-gas which can provide energy for use within the WRF. The final disinfection will be UV disinfection to achieve a high percentage of bacteria and virus reduction in the effluent reuse stream. The WRF will also include effluent odor control that would collect and treat the odorous gases associated with the effluent and the WRF processes.

As per the 2020 Collection System Master Plan, all the effluent will be conveyed from the wastewater collection system to the WRF by pumping. Infrastructure to achieve wastewater conveyance includes the existing Baseline Pump Station, the future Williams Field Lift Station and the future Elliott Road Lift Station. This will establish the headworks hydraulic grade line of the WRF.

SMCFD currently has plans for additional recharge basins to achieve beyond 3 MGD of recharge onsite. Combined with the current biosolids storage and recharge basin excavation debris areas, much of the existing 97-acre site will be utilized leaving limited space for 26 MGD of treatment trains. A detailed layout of the ultimate site may require limiting the number of onsite recharge basins and require more offsite recharge locations.

As the recharge options are fully defined and the stakeholders provide input to effluent reuse/recharge, a detailed phasing plan can be developed. Cost comparisons and life cycle comparisons should be considered to select the best mix of using existing WRF infrastructure, new process unit options, sizing of process units and funding options to meet the coming development needs.

Recommendation WRF 2 - Existing WRF Infrastructure Optimization Study and Training

A WRF optimization report is recommended to review the existing WRF operation and to develop a strategy for performance improvement of the existing processes and equipment. The existing WRF is about 25 years old and at minimum will remain in service until at least 2030. The proposed detailed phasing plan in WRF 1 may retain the existing treatment infrastructure in service until the 6 to 12 MGD expansion. The study should identify potential changes to current operations procedures to improve facility performance including issues with ammonia and nitrate control. This should also include Biolac WRF modeling and a review of the septage treatment, effluent filtration, sedimentation basins, aeration air handling, disinfection and solids handling performance. Estimated costs for these improvements should be included.

As part of the optimization study, additional operator and laboratory training should be included. With the inclusion of septage in the influent, this facility can be complicated to operate. In addition, operator training for any recommended operational improvements or changes in equipment should be completed to ensure permitting compliance.

Recommendation WRF 3 - Additional Influent Water Sampling

It is recommended that influent TKN and Ammonia both be monitored for one month in the winter for peak flow conditions and one month in the summer for low flow conditions. Approximately 5 to 6 samples should be taken in each month. Samples should be taken for both treated septage and combined treated septage and influent, or treated septage and influent separately if possible. Due to travel restrictions that resulted from the COVID-19 pandemic, which may have affected the number of winter visitors in 2021, the peak winter samples could be delayed to 2022 or they should be repeated in 2022 to confirm results.

Recommendation WRF 4 - New Influent Connection to Existing WRF Headworks

Evaluate options, conduct preliminary design and final design for a new force main connection to the existing Headworks from SA2. This aspect of the expansion plan needs to progress in advance of the completion of the phasing plan because the existing Headworks can currently only accommodate 3 MGD of average day flow. Flow from SA2 will not be connected to the Baseline Lift Station and force main. The Baseline Lift Station and force main is currently the only connection to the Headworks. An additional force main connection is required and should be complete by 2023 or 2024 to accommodate the new development shown on **Figure 14**.

As seen in the photo below, there are two options to connect the new force main to the headworks: connecting directly through the headworks wall by coring the wall or over the top using a pipeline gooseneck.

Recommendation WRF 5 - Conduct an Effluent Water Reuse POC Study for Monitoring Wells

Complete a review and analysis of the POC monitoring wells. SMCFD operations staff are concerned about the nitrate level in Monitoring Well 2 which has exceeded the ADEQ permit of 10 mg/l periodically in the 2014 to 2019 period. There are a several analyses and evaluations that could be conducted including monitoring nitrate isotope characteristics in groundwater. Nitrogen isotope ratios (14N/15N) of nitrate combined with oxygen ratios (18O/16O) could help determine the nitrate sources, which may include sewage and animal waste, naturally occurring in soil, fertilizers and precipitation. The approach would include water samples from the monitoring wells and several locations at the WRF as well as from monitoring wells such as the Republic landfill on the east side of the CAP Canal.

Recommendation WRF 6 - 6 MGD WRF Preliminary Design

Upon completion of WRF 1, a preliminary design for the WRF expansion will be required. It is recommended that SMCFD prepare a Phase 1 predesign report for the WRF expansion based on the elements included in WRF 1, WRF 2, and WRF 3 above. The predesign report would include: influent flow projections and water quality loading estimates; site survey; process criteria; modeling and infrastructure development and layout; geotechnical investigation; primary power needs; public consultation; capital funding; ADWR, ADEQ, County and City permitting; and a project schedule. The confirmation of the effluent reuse management should also be part of the consideration in this program. Based on AAC requirements, planning should commence when influent flows reach 80% of the rated capacity which is 2.4 MGD for the 3 MGD rerated WRF and should be complete by 2027 (see **Figure 14**).

Recommendation WRF 7 - 6 MGD WRF Design, Construction Administration and Inspection, and Construction

It is recommended that the SMCFD undertake a program to deliver the 6 MGD of capacity including detailed design, construction, integration, startup, training and commissioning.

8.3 COST ESTIMATES

High-level order of magnitude cost estimates of probable costs have been prepared for the proposed WRF expansion and effluent reuse options and are presented on **Table 16**. Options and basis for cost estimates are included in **Appendix G**.

Based on the Association for the Advancement of Cost Engineering (AACE) recommendations, this cost estimate is considered a Class 4 estimate. Class 4 estimates are generally prepared based on limited information and subsequently have wide accuracy ranges, typically -15% to + 30%. They are typically used for project screening, determination of feasibility, concept evaluation and preliminary budget approval. Typically, the level of project definition is 1%to 15% of full project definition. The costing includes an additional 30% for general conditions, pre-design, design and construction administration. Lastly, the costs are based on Q1 2020 dollars and will need to be adjusted for inflation.

The effluent reuse system cost estimate is based on cost of similar work recently completed in the Phoenix metropolitan area including the recent SMCFD WRF effluent groundwater recharge basins completed in 2019. The cost estimate includes recommended improvements for pipe conveyance between the WRF and the estimated location for reuse facilities. Costing is based on Maricopa Association of Governments (MAG) design standards, typical pipe cover of less than 10 feet, located in a public right of way and construction at the time of subdivision development with minimal conflict with existing buried or surface infrastructure.

The WRF cost includes improvements ‘inside the fence’ using dollars per gallon approximations for each treatment type. Detailed equipment lists, quantities and specific unit costs were not developed at this stage. As the phasing plans are prepared, a greater level of detail will be used to price options that can then be compared against each other to help in selection of the appropriate phasing plan.

8.4 IMPLEMENTATION SCHEDULE

A draft program schedule has been developed for the proposed recommendations. The detailed schedule is included in **Appendix H** and summarized on **Table 17** below.

This program schedule is based on approximate construction time frame requirements to meet population growth presented on **Figure 14**. Each proposed recommendation has been reviewed with respect to estimated time to complete and when needed based on the **Figure 14** schedule. The actual schedule for the Superstition Vistas development will have the most impact on the execution of this schedule. If that development is delayed or slowed, then the program execution can be slowed or delayed. The time available to undertake all the tasks required to arrive at an upgraded WRF in 2029 is likely adequate. The schedule should be finalized, adopted, tracked and updated as the program moves forward.

Table 17 SMCFD WRF Master Plan Recommendations, Cost Estimates, and Schedule

Task #	WRF Master Plan Recommendation	Description	Estimated Cost	Start Date	Completion Date
Effluent Reuse					
ER 1	Prepare a Long Term Effluent Reuse Strategy for 2020 to 2050	SMCFD to create a Stakeholders Group with water suppliers and developers to create an effluent reuse strategy.	$150,000	Q1 2021	Q1 2022
ER 2	Prepare an Onsite Recharge Operational Improvements Plan	Prepare a WRF recharge operations plan including enhanced monitoring.	$50,000	Q3 2020	Q3 2021
ER 3	Preliminary Recharge Basin/ASR Facility Siting Investigation	Conduct a preliminary geophysical investigation of possible recharge sites identified in Task ER 1.	$100,000	Q3 2021	Q1 2022
ER 4	Detailed Investigation and Selection of Recharge/ASR Sites	Conduct in-depth studies for favorable regions identified in ER 3 by drilling several boreholes to confirm favorable lithologic conditions for recharge site(s) selection and land acquisition.	$150,000	Q1 2022	Q3 2023
ER 5	Effluent Reuse Design, Construction, and Commissioning for 6 MGD Expansion	Design and construction of effluent reuse or ASR wells or a combination of both for 6 MGD within the areas identified in ER 4		Q4 2024	Q2 2028
ER 5a	Recharge Basins (6 MGD)	Design and construct up to 28 acres of recharge basins located on the east side of the CAP Canal. Actual recharge infiltration and sizing determined in ER 4. Estimated 15,000 linear feet of conveyance piping to connect the WRF to recharge basins. Cost included land purchase, pipeline easement, power supply and access roads.	$10 to $15M		
ER 5b	ASR Wells (6 MGD)	Design and construct up to 16 ASR wells located west of the CAP Canal. Actual recharge infiltration and number of wells determined in ER 4. Estimated 15,000 linear feet of conveyance piping to connect the WRF to wells. Cost included land purchase, pipeline easement, power supply, and access roads.	$43 to $66M		
ER 6	Detailed Performance Review, Investigation, and Recharge / ASR / DPR Approach for 12 MGD Expansion	Prepare recommended effluent reuse / recharge plan for 12 MGD expansion. Options include recharge basins, ASR wells, and DPR.	$100,000	Q 2034	2036.
WRF					
WRF 1	Prepare Detailed WRF Expansion Phasing Plan	Using the proposed process and site plan, prepare a detailed WRF phasing plan for the existing WRF 97 acre site that aligns with the water quality goals identified in the Reuse Strategy including the role of the existing and planned WRF recharge basins.	$150,000	Q1 2022	Q4 2022
WRF 2	Existing WRF Infrastructure Optimization Study and Training	Conduct an optimization study and training program for the existing WRF to provide compliant treatment. Results of the study will be used to help develop the WRF 1 Phasing Plan.	$100,000	Q2 2020	Q2 2021
WRF 2a		Potential design and construction to provide recommended improvements.	$3,000,000	Q3 2021	Q3 2023
WRF 3	Conduct Additional Influent Water Sampling	At minimum, influent TKN and Ammonia sampling should be conducted to provide design criteria for treatment designs. Timing for sampling may be affected by COVID.	$50,000	Q1 2021	Q4 2022

SMCFD NO. 1 WASTEWATER TREATMENT FACILITY 2020 MASTER PLAN

Master Plan Recommendations

Task #	WRF Master Plan Recommendation	Description	Estimated Cost	Start Date	Completion Date
WRF 3	Add New Influent Connection to Existing WRF Headworks	Evaluate and design headworks upgrade to accommodate a second force main from the expanded service area.	$200,000	Q1 2021	Q4 2021
WRF 4	Landfill Existing Compost Stockpile	The existing compost material needs to be removed from the site to allow space for treatment expansion from 3 to 6 to12 MGD.	$300,000	Q3 2021	Q4 2021
WRF 5a	Conduct an Effluent Water Reuse POC Study for Monitoring Wells	Complete a review of historical water quality and a Nitrate isotope sampling plan to investigate occasional non-compliance in MW#2.	$70,000	Q1 2021	Q1 2022
WRF 5b	POC Correction Modification	To be determined (TBD)	$250,000	TBD	TBD
WRF 6	Phase 1 (6 MGD) WRF Preliminary Design	Complete the preliminary design for the 6 MGD WRF expansion.	$100,000	Q4 2022	Q4 2023
WRF 7	Phase 1 (6 MGD) WRF Design, CAI & Construction	Permitting, detailed design, construction, integration, startup and commissioning for a 6 MGD facility	$86 to $130M	Q1 2024	Q4 2028

APPENDIX A

City of Apache Junction Water – Water Utility Information

Appendix A CITY OF APACHE JUNCTION WATER – WATER UTILIITY INFORMATION

Radke, Brittany

From: Darron Anglin <DAnglin@smcfd.org>
Sent: Tuesday, March 24, 2020 2:47 PM
To: Bryck, Jack
Subject: FW: SMCFD Master Wastewater Plan Proejct

From: Mike Loggins [mailto:mloggins@AJCity.Net]
Sent: Monday, March 23, 2020 1:53 PM
To: Darron Anglin
Subject: RE: SMCFD Master Wastewater Plan Proejct

	2012	2013	2014	2015	2016	2017
January	42,887,000	39,974,000	40,649,000	39,256,000	39,988,000	38,178,588
February	43,303,000	37,318,000	40,126,000	37,008,000	40,546,000	36,833,025
March	46,532,000	43,133,000	46,560,000	43,128,000	45,568,000	43,781,957
April	43,292,000	41,331,000	45,643,000	41,088,000	42,156,000	43,376,011
May	47,339,000	46,620,000	50,587,000	39,249,000	43,994,000	44,334,898
June	49,033,000	50,454,000	50,991,000	43,286,000	48,700,000	51,893,016
July	46,377,000	48,194,000	48,471,000	45,210,000	48,413,000	53,571,144
August	45,387,000	48,181,000	46,749,000	43,726,000	48,775,000	52,535,688
September	38,521,000	40,576,000	39,164,000	41,376,000	42,548,700	48,446,782
October	41,366,000	44,608,000	40,680,000	41,299,000	45,032,637	48,323,976
November	41,198,000	41,296,000	41,137,000	41,076,000	42,477,531	46,224,205
December	38,401,000	37,720,000	38,860,000	40,028,000	39,571,628	41,008,704

Mike Loggins, PE, CPM
Water District Director
Apache Junction Water District
300 East Superstition Boulevard
Apache Junction, AZ 85119
Phone: 480.982.6030 Fax: 480.288.6623
Service **O**ver and **A**bove the **R**est

Office Hours: Monday–Thursday 7:00 AM – 6:00 PM; Closed on Fridays, Saturdays, Sundays and Holidays

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From: Darron Anglin [mailto:DAnglin@smcfd.org]
Sent: Monday, March 23, 2020 12:20 PM

To: Mike Loggins
Subject: FW: SMCFD Master Wastewater Plan Proejct

Mike,

I know they are asking for a lot, can you project some of the data for what they are looking for below. I understand some of the items are more future planning things, but the water demands would be great.

Thanks
Darron

From: Bryck, Jack
Sent: Monday, February 10, 2020 12:33 PM
To: Mike Loggins <mloggins@AJCity.Net>
Cc: Darron Anglin <DAnglin@smcfd.org>; Brady, Maria <maria.brady@stantec.com>; Tugaoen, Heather <Heather.Tugaoen@stantec.com>
Subject: SMCFD Master Wastewater Plan Proejct

Mike: Good morning. We continue working with SMCFD on development of the Master Wastewater Plan (2020 to 2050 with a insight at full build out as per the City General Plan 2020 Land Use Plan). We are reaching out to you for high level data and information from the City of AJ Water. We have reached out to Az Water Company with a similar request. We wonder if you could share by historic Water Department documents (reports, memos, etc.) and your thoughts as follows;

1. What are the City's historic unit water demand rates (2015-2019 if possible) for summer and winter periods and what are the trends City Water is seeing that could affect SMCFD planning (2020 to 2050)
    a. Despite more wastewater service connections in the period 2014 to 2019, the SMCFD average day wastewater flow has not significantly increased.
    b. Are there any water saving initiatives from City Water or AZ Water Co. that have been initiated and may have been successful in lowering the indoor water use that flows to the SMCFD?
2. SMCFD has estimated the waster water flow based on the C of Apache Junction Long Term Zoning Plan in the 2020 General Plan historical population projections and at full land build out from the General Plan Land Zoning Plan..
    a. What is the planning horizon for the City Water projected water demand and service area population?
3. The City Water water demand projections especially the indoor portion that would flow to SMCFD.
    a. Is City Water projecting/planning for a decrease with any additional water saving side initiatives in place or planned?
4. City Water water resource portfolio:
    a. What does the City Water see in the long term (2020-2050) for irrigation, DPR and IDR ASR, industrial/commercial reuse water, others that would/could involve SMCFD
    b. What is the long term water supply strategy(2020 to 2050) in terms in terms of source allocation (ac ft by year or by say 5 year intervals in the period) and role SMCFD wastewater effluent may play / assumed to play
5. Any thoughts that City Water has on the City 2020 General Plan concept of 'One Water' and how fits with their long term strategy and portions that will collaborate/affect SMCD (2020 to 2050)
6. The City Water water sources in the long term and how the water quality from those sources could impact SMCFD treatment and reuse opportunities.
    a. For example a water source high in TDS, N etc. may impact SMCFD in terms of end use and treatment needs.
    b. The City provided thoughts on DPR and use of RO in our meeting with you late last year. Are there any thoughts on the disposition of the brine that could impact SMCFD?
7. Outcome of the review of recharge sites in the area of AJ
8. Any other insights that City Water may want to provide on the role effluent from SMCFD would play in the City Water/Az Water Co long range water supply.

Thank you Mike. We want to keep it at high level and not lead to onerous efforts to the City Water.

Jack Bryck P.E. BCEE

Email jack.bryck@stantec.com
Cell 480 244 6886

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3133 West Frye Road
Suite 300
Chandler, AZ 85226

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	2012	2013	2014	2015	2016	2017	2018	2019	2020
January	42,887,000	39,974,000	40,649,000	39,256,000	39,988,000	38,178,588	41,066,130	40,137,664	42,525,962
February	43,303,000	37,318,000	40,126,000	37,008,000	40,546,000	36,833,025	38,055,575	34,511,636	37,755,245
March	46,532,000	43,133,000	46,560,000	43,128,000	45,568,000	43,781,957	44,125,199	41,054,412	(2,560,059,388)
April	43,292,000	41,331,000	45,643,000	41,088,000	42,156,000	43,376,011	43,477,544	41,774,385	-
May	47,339,000	46,620,000	50,587,000	39,249,000	43,994,000	44,334,898	46,675,744	40,805,249	-
June	49,033,000	50,454,000	50,991,000	43,286,000	48,700,000	51,893,016	47,478,894	46,150,406	-
July	46,377,000	48,194,000	48,471,000	45,210,000	48,413,000	53,571,144	49,300,124	50,752,438	-
August	45,387,000	48,181,000	46,749,000	43,726,000	48,775,000	52,535,688	46,273,481	49,979,872	-
September	38,521,000	40,576,000	39,164,000	41,376,000	42,548,700	48,446,782	47,778,056	46,192,639	-
October	41,366,000	44,608,000	40,680,000	41,299,000	45,032,637	48,323,976	40,828,887	45,415,108	-
November	41,198,000	41,296,000	41,137,000	41,076,000	42,477,531	46,224,205	41,202,220	41,003,556	-
December	38,401,000	37,720,000	38,860,000	40,028,000	39,571,628	41,008,704	38,979,329	37,363,857	-

Stantec

Meeting Notes

SMCFD + AJ Water

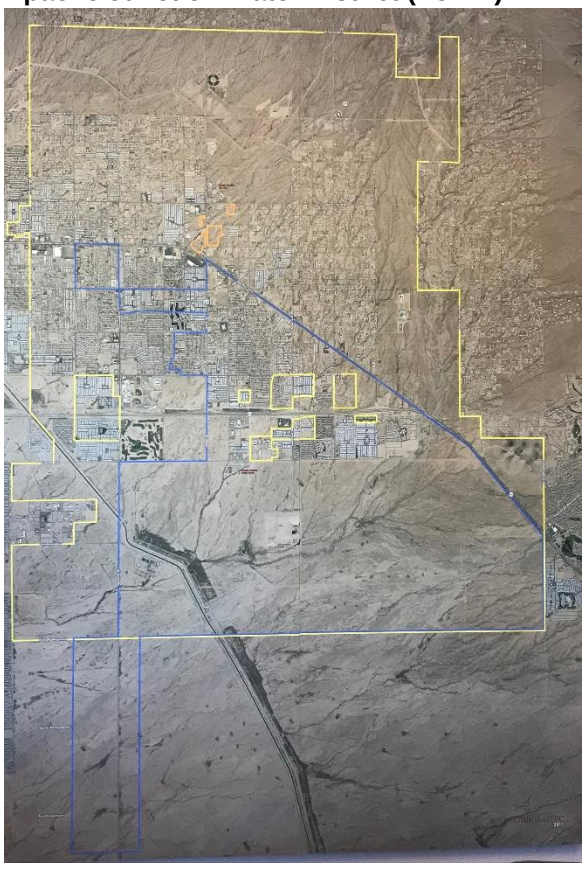
SMCFD No. 1 WW Master Plans / 181300988/181300987

Date/Time:	November 18, 2019 / 1:30 PM
Place:	AJ Water District / City Hall
Next Meeting:	N/A
Attendees:	Mike Loggins Darron Anglin Maria Brady, Heather Tugaoen, Jack Bryck
Absentees:	Absentees
Distribution:	Attendees

Safety Moment: Running Alone

Item:

Apache Junction Water District (AJWD)



City Water service area is about /3 of the City and Arizona Water service area is about 2/3 of the City.

Yellow line – City Limits of AJ, Blue Line – 1/3 of AJ is the District

Baseline to Elliot – Arizona Water.

Original Apache Junction / Queen Creek boundary was Germann now it is Frye Rd alignment / 24 freeway

AJ Water built SWTP 4 years ago at Ironwood 2 MGD, will increase in 2 MGD and space planned to 10MGD including DPR (up to 50%) with water from SMCFD WWTF

Carollo has been working on some preliminary efforts toward DPR. Per their planning efforts, RO was not used.

Action:

AI1: Mike to provide Carollo Report on DPR. Mike to send over info on current water rights: 3,000 acre feet M&I CIP, Lease 1,000 GRIC, 850 NIA [non-Indian ag] earmarked for AJ – not sold to the City yet from Federal.

Item: **Action:**

Action Item 1: Mike to provide Carollo Report on DPR. Mike to send over info on current water rights: 3,000-acre feet M&I CIP, Lease 1,000 ac-ft GRIC, 850 NIA [non-Indian ag] earmarked for AJ – not sold to the City yet from Federal.

- Well water allocation 2400-acre feet. Recharge credits from sewer district. 30,000-acre feet.

New Development 8400 acres as the first State Lands sale; 20,000 acres ultimate master planned build out. First 4 sections 8,000-acre ft; 2600 acres.

Using DPR to advantage to bridge development gap. City can afford 4,000-acre feet in CAP Water. At some point they would need to provide DPR to have enough water

AJWD is planning to drill some more wells and then reclaim water from ground.

Previous agreement: GRIC cost is $3,000 per Acre-ft. based on a 99 year lease

AJ Water Master Plan latest is 2008. AJ charges water resource fee.

AJ used Tischer Bice[TH1]? 1,000-acre feet study to use other contracts. Today's costs and future costs to have a fee in place. When the service agreement is made for the plat is when fees are received.

- Water resources $850 (In future towards buying water leases) , $4500 hook-up fee.

DPR will be continuing evolution and discussion.

- AJWD estimates that about 50% of effluent flows would come back to water plant.

Liberty is sewer provider in Gold Canyon

Blending at certain percentage.

Mike worked for Arizona Water for 14 years before coming to AJ.

Legal status of water rights: . AZ court law states that the water from a WWTF belongs to the WWTF notwithstanding where it originates. Joint facility for recharge across the AJ area is being looked at.

- Looked at entire service area all the way to Florence Junction. Clear Creek and Associated. Best areas along the CAP canal.
- Sense of qty acre-ft – at least 5,000 AF from AJ Water, 5,000 Arizona Water, Company 5,000 City of Phoenix, and 2000 state land to go to the recharge facility.

CAP has made the decision that they carry/transmit water in the CAP. Most recent discussions on DCP and having the CAP moratorium lifted on non–

Item:	Action:

project water have involved Tucson, who indicated they would want 'potable' quality water entering the canal.

Current water portfolio by source:

- TDS out of canal 500-700 mg/L.
- Wells 1000-2000mg/L.
- Reuse of effluent discharge 1100mg/L.

MCFCD – opened up flood control to do recharge / easement.

City of AJ adopting a '1 Water approach'. The approach includes keeping/recharging stormwater in lieu of allowing overland flows to continue to pass through AJ (it has a significant floodplain).

Buildout population for Apache Junction is expected to be between 300,000 to 350,000. Current populations are estimated for: Summer 40,000; Winter 80,000

Current Water Parameters: 120 gpcd and now 99 gpcd for water consumption. Using 140 gpcd for estimates for developments / planning purposes. 2.8 persons per household.

AJ Water will build expansions to the facility in 4MG increments. Current portfolio is 80% surface water and 20% groundwater. AJ has emergency interconnect with Mesa to manage this. Max 1.5 MG / wells surface water or interconnect.

Signal Butte and Elliot WTP is no longer processing AJ's water. They have built their own facility.

AJWD has future plans for a 10-20 MGD plant along CAP Canal.

State hired Michael Baker to review KH development.

What are you using for population? Pinal County estimates 3.2 per housing unit. More family friendly development would be expected in the future build out areas.

Stantec can reach out to Larry Kirch Development Services Director for population projection estimates.

1/3 city on Septic. Some areas have their own wells and are not tied into City services.

The meeting adjourned at 3:00 PM

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

Stantec Consulting Services Inc.

Heather Tugaoen E.I.T., Ph.D.
Engineer in Training

Phone: 602 707 4694
Fax: Fax Number
heather.tugaoen@stantec.com

Attachment: Attachment

c. Cc List

APPENDIX B

Arizona Water Company – Water Utility Information

Appendix B ARIZONA WATER COMPANY – WATER UTILITY INFORMATION

Radke, Brittany

From: Melinda Whittington <mwhittington@azwater.com>
Sent: Monday, February 10, 2020 3:23 PM
To: Bryck, Jack
Cc: Fred Schneider; Deron Allen; Terri Sue Rossi
Subject: Superstition Mountain CFD - Master Plan Data Request - Arizona Water Company Apache Junction
Attachments: Superstition Mountain CFD Master Plan Data Request - 02102020.pdf

Hi Jack,

Thanks so much for revising the questions regarding Arizona Water Company's Apache Junction System. I answered the questions at a high level and hope that the information is helpful. If you have any additional questions, please feel free to reach out again.

Best Regards,
Melinda Whittington

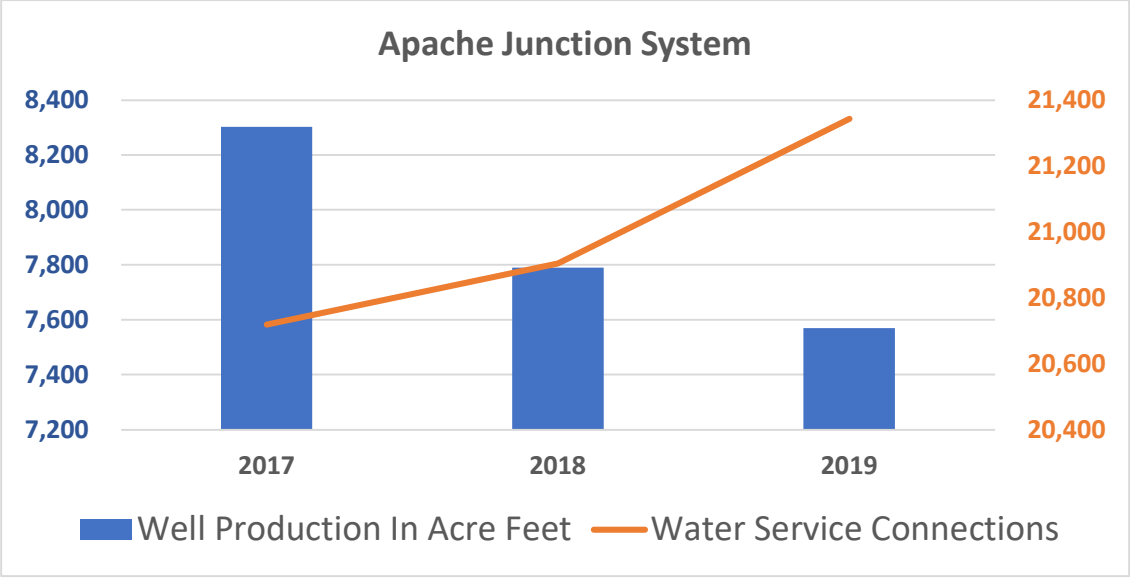
Analyst, Operations
Arizona Water Company
3805 N Black Canyon Highway
Phoenix, AZ 85015-5351

Direct - 602.294.2159
Tel - 602.240.6860 ext. 1213

Arizona Water Company (Company) has operated in the City of Apache Junction since 1955. As the City of Apache Junction has grown, the Company has grown with the community. Arizona Water Company's service area covers nearly 74 square miles and includes the City of Apache Junction, Gold Canyon, and the City of Superior. In the Apache Junction System, Arizona Water Company has approximately 21,300 service connections and serves a population of about 60,000.

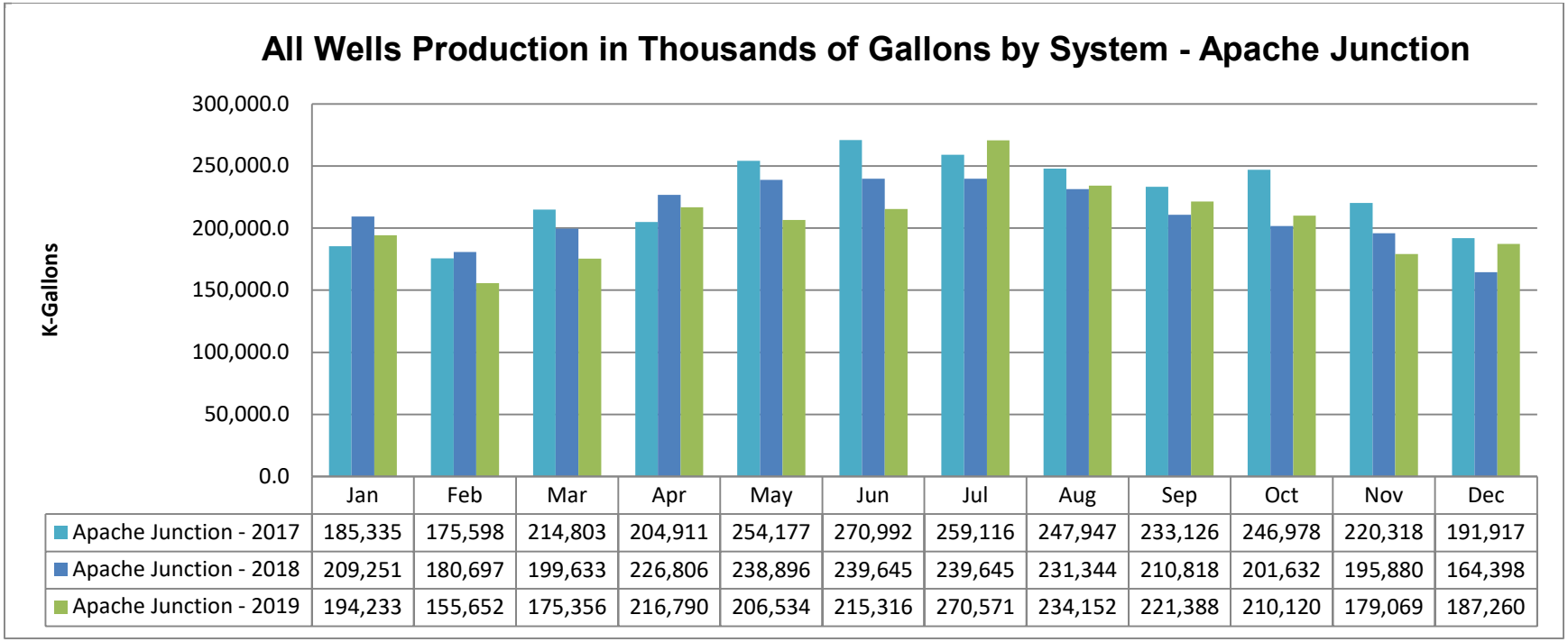
Arizona Water Company serves the community with both Groundwater and CAP water. At this time, the Company's entitlement is split between annual storage & recovery and direct use by golf courses in the service area. In addition, the Company has an agreement with Liberty Utilities to deliver treated effluent to Golf Course customers in the Gold Canyon area. Groundwater pumping and demand have been declining over the past 3 years while the overall connections have been rising. Groundwater pumping has declined over the past three years due to conservation efforts and infrastructure repair and replacement.

Year	2017	2018	2019
MGD	7.4	6.9	6.7



During the past few years, Arizona Water Company has been working with golf courses in the area to increase their use of effluent in lieu of using untreated CAP water. The Company's long-term strategy is to leverage 100% of the effluent produced in the communities it serves, coupled with the full utilization of the CAP M&I Subcontract entitlement. Arizona Water Company has recently opened the first Underground Water Storage Facility in the Pinal Active Management Area (AMA) near the City of Coolidge. The Company is still investigating the viability of another facility in the Phoenix AMA.

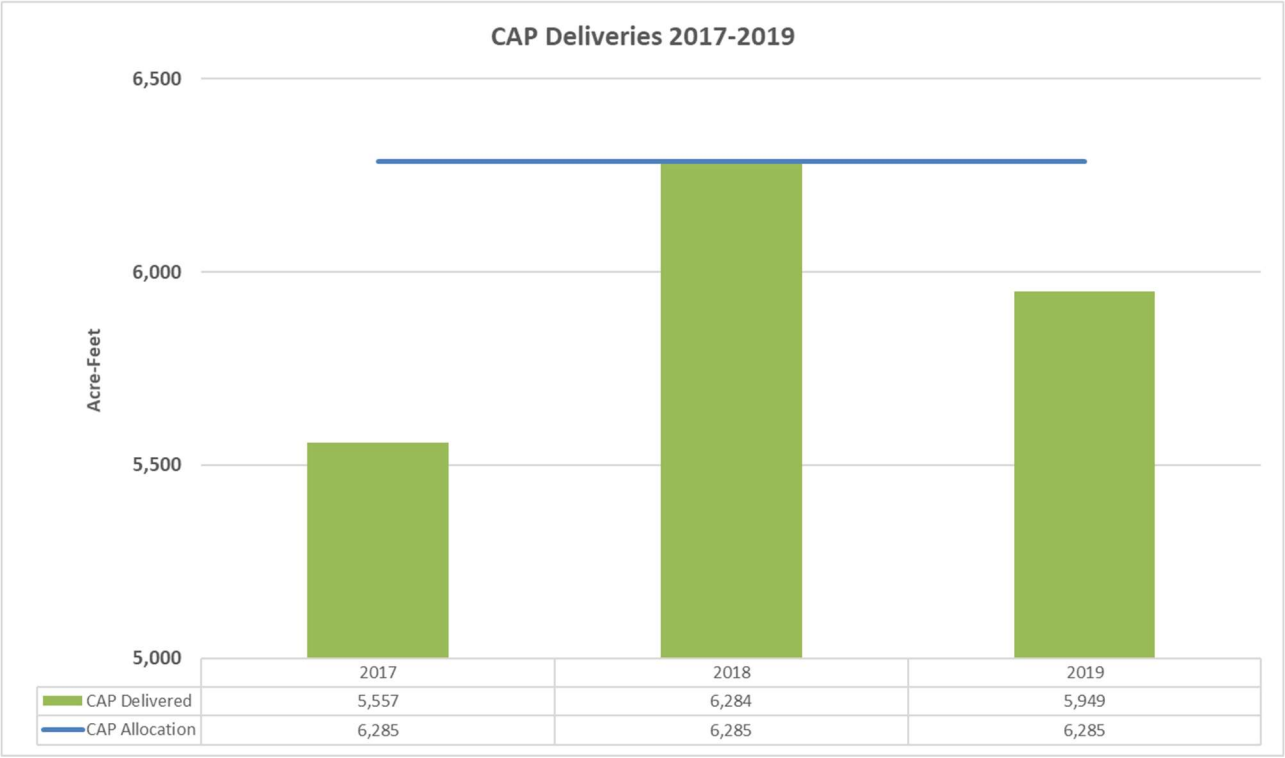
The Company's use of the resources available; groundwater, CAP M&I Subcontract water, and effluent; will ultimately be decided in conjunction with the City and their AJ One H2O goals. Goal 8.2 in the Apache Junction General Plan 2020-2050 indicates strengthening water conservation. Arizona Water Company currently implements a conservation program consistent with the Best Management Practices outlined in the Phoenix AMA Third Management Plan. Arizona Water Company is committed to continuing to foster good working relationships with other municipal providers to expand partnering opportunities for water delivery, facility sharing, regional conservation, and expanding reuse of wastewater in the near term, including Direct Potable Reuse.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Apache Junction - 2017	185,335	175,598	214,803	204,911	254,177	270,992	259,116	247,947	233,126	246,978	220,318	191,917
Apache Junction - 2018	209,251	180,697	199,633	226,806	238,896	239,645	239,645	231,344	210,818	201,632	195,880	164,398
Apache Junction - 2019	194,233	155,652	175,356	216,790	206,534	215,316	270,571	234,152	221,388	210,120	179,069	187,260

Table 1 – Well Production for the Apache Junction System 2017-2019

In Table 1, the data shows the well production by month for the past three years in the Apache Junction system. This data shows that production generally rises in the summer and levels off beginning in August. The reduction in overall groundwater pumping is due to Arizona Water Company's operational commitment to conservation, golf course reclaimed water use increase and infrastructure maintenance. Additionally, the winter of 2019 was wet. Arizona Water Company doesn't model interior usage, but as you can see in Table 1, the lowest production is in February and likely represents interior use. The data suggests that overall interior use is declining due to Arizona Water Company's conservation efforts.



Over the past three years, Arizona Water Company has worked to take delivery of its whole CAP water allocation for the Superstition System. The water from the CAP is split between storing water at the Roosevelt Water Conservation District's Groundwater Savings Facility (GSF) and Direct Use by Golf Course Partners in the service area. The plan was to take delivery in 2019 of the total entitlement, however, there were three events that impacted the company's ability to accept its full allocation.

1. The winter season beginning 2019 was unusually wet
2. Arizona Water Company Golf Course Customers increased their use of reclaimed water from the Entrada Del Oro WWTP
3. The CAP canal was shut down for maintenance on its Salt River Siphon for 6 weeks beginning at the end of October 2019

The Company plans to use all of its CAP M&I Subcontract water by storing and direct use going forward until the regulatory environment requires a shift to surface water treatment.

APPENDIX C

Central Arizona Project 2021 to 2026 Final Rate Schedule

Appendix C CENTRAL ARIZONA PROJECT 2021 TO 2026 FINAL RATE SCHEDULE

June 4, 2020

CENTRAL ARIZONA PROJECT
FINAL 2021-2026 RATE SCHEDULE

DELIVERY RATES FOR VARIOUS CLASSES OF WATER SERVICE

Units = $/ acre-foot

(The Letter Designations in the Formulas Refer to the Rate Components Shown Below)

DCP Tier		T0	T0	T0	T0	T0	T0
		Firm	Provi - sional	Advisory			
	2020	**2021**	**2022**	2023	2024	2025	2026
Municipal and Industrial Subcontract (B+C)	$ 155	**$ 160**	**$ 165**	$ 171	$ 182	$ 188	$ 191
Federal Contract (B+C)	$ 155	**$ 160**	**$ 165**	$ 171	$ 182	$ 188	$ 191
Agricultural Settlement Pool (C) [1]	$ 56	**$ 56**	**$ 56**	$ 57	$ 61	$ 61	$ 63
Excess (A+B+C) [2]	$ 211	**$ 213**	**$ 215**	$ 240	$ 252	$ 256	$ 257
Interstate (A+B+C+D)	TBD	**TBD**	**TBD**	TBD	TBD	TBD	TBD

RATE COMPONENTS

Units = $/acre-foot

		Firm	Provi - sional	Advisory			
	2020	**2021**	**2022**	2023	2024	2025	2026
Capital Charges							
(A) Municipal and Industrial - Long Term Subcontract [3]	$ 56	**$ 53**	**$ 50**	$ 69	$ 70	$ 68	$ 66
Delivery Charges							
Fixed O&M [4]	75	**78**	**80**	82	89	95	96
Big "R" [4]	24	**26**	**29**	32	32	32	32
(B) Fixed OM&R [4]	$ 99	**$ 104**	**$ 109**	$ 114	$ 121	$ 127	$ 128
(C) Pumping Energy Rate [5]	$ 56	**$ 56**	**$ 56**	$ 57	$ 61	$ 61	$ 63
(D) Property Tax Equivalency	TBD	**TBD**	**TBD**	TBD	TBD	TBD	TBD

DIRECT UNDERGROUND WATER STORAGE

Units = $/acre-foot

		Firm	Provi - sional	Advisory			
	2020	**2021**	**2022**	2023	2024	2025	2026
Underground Water Storage O&M [6]							
Phoenix AMA	$ 13	**$ 13**	**$ 13**	$ 13	$ 14	$ 14	$ 15
Tucson AMA	15	**15**	**15**	15	15	15	15
Underground Water Storage Capital Charge [7]							
Phoenix AMA	$ 15	**$ 15**	**$ 15**	$ 15	$ 15	$ 15	$ 15
Tucson AMA	9	**9**	**9**	9	9	9	9

June 4, 2020

CENTRAL ARIZONA PROJECT
FINAL 2021-2026 RATE SCHEDULE

NOTES:

1) Rate is the Pumping Energy Rate component.
2) Excess water is administered via Board Policy "Procedure For Distributing CAP Excess Water and Turn-Back Water for the Period of 2020 Through 2024".
3) For M&I subcontract water, the Capital Charge is paid on full allocation regardless of amount delivered and is not included in delivery rates. The Capital Charge rate is impacted by the following:
   - 2021 - 1-cent of 2019/20 property taxes were approved to be applied to the federal repayment by the CAWCD Board in 2019. An addtional 2- cents of property taxes are being applied to the federal repayment from the 2020/21 property taxest, resulting in a reduction of $26/AF.
   - 2022 - 2 1/2 cents of 2020/21 property taxes are being applied to the federal repayment, resulting in a reduction of $21/AF.
4) Fixed OM&R charge consists of Fixed O&M and "Big R" (Water delivery capital, large extraordinary maintenance projects and bond debt service). Debt service on CAP's Water Delivery O&M Revenue Bonds, Series 2016 is about $3.6 million annually and is included in "Big R". This rate is collected on all ordered water whether delivered or not.
5) The pumping energy rate applies to all actual water volumes delivered as opposed to scheduled.
6) Underground Water Storage O&M is paid by all direct recharge customers using CAP recharge sites.
7) Underground Water Storage Capital Charge is paid by all direct recharge customers except AWBA for M&I firming, the CAGRD, municipal providers within the CAP service area and co-owners of CAWCD recharge facilities using no more than their share of capacity.

Key Assumptions

-Non-Indian Ag reallocation occurs in 2021 for 2022 deliveries

FIXED OM&R RATE AT DCP TIERS (For Planning Purposes Only)

Units = $/ acre-foot

	Provi - sional	Advisory			
	2022	2023	2024	2025	2026
Normal	**$ 102**	$ 107	$ 113	$ 119	$ 120
Tier 0	**$ 109**	$ 114	$ 121	$ 127	$ 128
Tier 1	**$ 136**	$ 143	$ 153	$ 161	$ 162
Tier 2a	**$ 146**	$ 152	$ 165	$ 173	$ 174
Tier 2b	**$ 152**	$ 159	$ 172	$ 181	$ 182
Tier 3	**$ 164**	$ 172	$ 186	$ 196	$ 197

APPENDIX D

WRF SCADA System Summary

Appendix D WRF SCADA SYSTEM SUMMARY

Radke, Brittany

From: James Drye <jdrye@smcfd.org>
Sent: Friday, April 17, 2020 4:02 PM
To: Bryck, Jack; Darron Anglin
Subject: RE: WWTF Process Control SCADA and On Line Water Quality Moitoring
Attachments: SCADA System Information and Controls.pdf; Scada1.jpg; Scada2.jpg

Jack,

There are two pictures attached and a pdf that explains the functionality of our SCADA system. The first picture is of the main screen and the second picture is a close up of available options. Please let me know if you have any questions.

Thanks,

James Drye
Operations Superintendent

Superstition Mountains Community Facilities District No. 1
5661 S Ironwood Drive
Apache Junction, AZ 85120
(480) 941-6754 ext. 190
(480) 671-3180 Fax
www.smcfd.org

From: Bryck, Jack [mailto:Jack.Bryck@stantec.com]
Sent: Thursday, April 16, 2020 9:48 AM
To: Darron Anglin; James Drye
Subject: WWTF Process Control SCADA and On Line Water Quality Moitoring

Good morning Darron/James: I wonder if you could give us a short overview of your Process Control features through the WWTF SCADA system. What equipment, processes and operations within processes (flow meter, pumps, control valves, air flow, water depth-headworks/clarifiers/disinfection contactor etc. , chemical pacing, amps, volts, etc.) are monitored and controlled through the plant SCADA system. Is there a process and instrumentation diagram available and you could share it with us?

What water quality parameters in the WWTF are monitored through in line instrumentation ? Are any of the instrumentation tied to the SCADA system and control unit processes or is the on line instrumentation only used by the operators to manually affect changes in the plant?

What type of records of power usage in the WWTF are kept and are there any sub areas in the WWTF where there is internal power usage metering for specific plant areas such as the blowers?

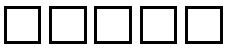
Thanks Jack

Jack Bryck P.E. BCEE

Email jack.bryck@stantec.com
Cell 480 244 6886

StantecConsulting Services
3133 West Frye Road
Suite 300

Chandler, AZ 85226



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Note: Highlighted areas indicate that we can change or control that particular function. Not highlighted areas indicate informational data only.

Baseline Pump Station

- Shows baseline wet well level based on 2 interchangeable level indicators; one ultrasonic level indicator and one pressure transducer. We can choose which of the two level indicators will be used for pump run starts/stops.
- Adjustable pump (3 pumps) start/stop level based on level indicators.
- Adjustable pump speed percent.
- Shows individual pump status (running or off).
- Emergency off mode.
- Alarms: pump high temperature, pump seal failure, odor control system failure, wet well high level, wet well low level.
- Backup generator fuel level.

Headworks

- Influent flow from baseline pumps station
- Bar screen upstream and downstream level indicators
- Grit pump (4 pumps) cycle times and cycle order.
- Grit pump percent speeds.
- Bar screen start and stop levels.
- Shows bar screen and press on/off status.
- Alarms: bar screen upstream and downstream high and low level alarms, power loss alarm.

Septage Receiving Station

- Septage level
- Septage pump start/stop level to prevent overflowing the septage vaults.
- Septage pump start time to pump septage into headworks after at least 12 hours of aeration.
- Septage pump (2 pumps) on/off status.
- Alarms: high/low level alarms.
- Pump flow rate to headworks.

Supernate Pump Station

- Supernate level.
- Pump (2 pumps) on/off status.
- Lead pump start/stop levels.
- Alarms: high level and low level alarms.
- Flow rate to headworks.

East and West Aeration Basins

- Manifold pressure (from 3 aeration blowers).
- Aeration chains on/off status.
- Aeration chain (8 per basin) run/cycle set-points.
- Wasting on/off times to reduce basin MLSS.

- Flow to contact chamber.
- Flow to lagoons (for wasting to reduce basin MLSS).

Biosolids Building

- Run/operate 6 small drying beds.
- Initiate or abort batch when operating 6 small drying beds.
- Select which biosolids pump (2 pumps) to use.
- Biosolids flowrate (biosolids going into 6 small drying beds or 2 larger solar drying beds).
- NPW flowrate (for water usage).
- Alarms: biosolids and NPW high and low level alarms.

Contact Chamber

- Effluent flow going into contact chamber.
- Recharge flow going to recharge beds.
- Chlorine residual at the end of the contact chamber.
- Sodium hypochlorite storage tank level indicator.
- Sodium thiosulfate storage tank level indicator.

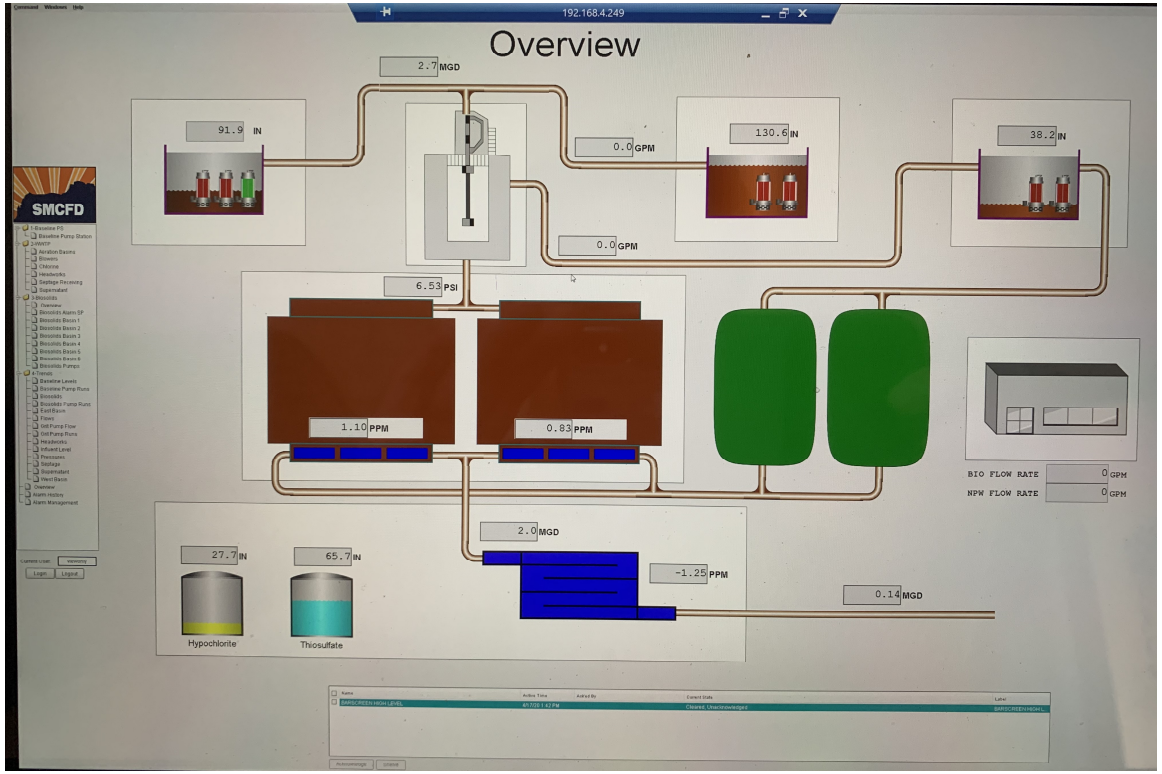
Blowers

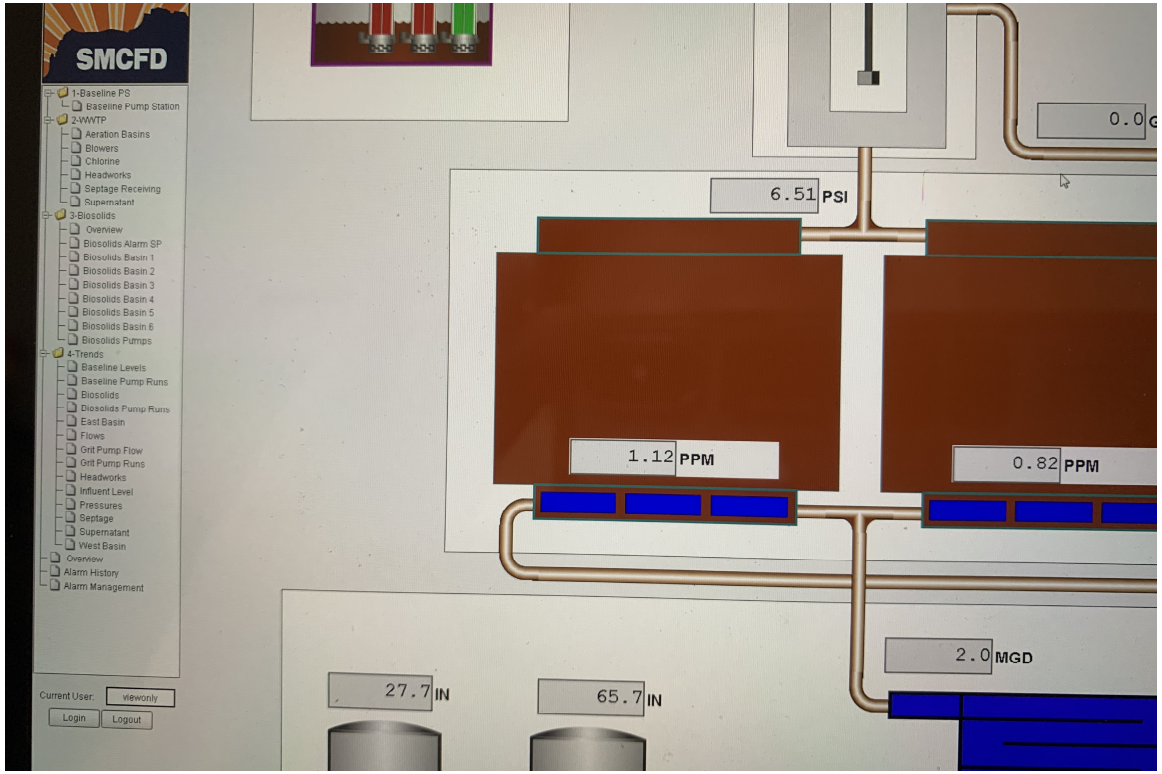
- On/off status of grit blowers (3 blowers) (for grit chamber aeration).
- On/off status of aeration basin blowers (3 blowers).
- On/off status of septage blowers (5 blowers) for aeration of septic waste at the septage receiving station.

Trends (historical data and run time data)

- Baseline pumps station level indicators (ultrasonic and pressure transducer).
- Baseline pump runs.
- Biosolids flows and pump runs.
- East and West aeration basin probe status for dissolved oxygen, pH, and oxygen reduction potential.
- Influent, effluent, and recharge flows.
- Grit pump flow rates and pump runs.
- Headworks bar screen and press runs.
- Influent upstream and downstream levels.
- Manifold pressure, ambient room pressure, and ambient room temperature.
- Septage receiving station levels, flow rates, and pump runs.
- Supernate pump station levels, flow rates, and pump runs.

Alarm History and Alarm Management


192.168.4.249
Overview
2.7 MGD
91.9 IN
0.0 GPM
130.6 IN
38.2 IN
0.0 GPM
6.53 PSI
1.10 PPM
0.83 PPM
BIO FLOW RATE
0 GPM
NPW FLOW RATE
0 GPM
2.0 MGD
27.7 IN
65.7 IN
-1.25 PPM
0.14 MGD
Hypochlorite
Thiosulfate
SMCFD


SMCFD
1-Baseline PS
Baseline Pump Station
2-WWTP
Aeration Basins
Blowers
Chlorine
Headworks
Septage Receiving
Supernatant
3-Biosolids
Overview
Biosolids Alarm SP
Biosolids Basin 1
Biosolids Basin 2
Biosolids Basin 3
Biosolids Basin 4
Biosolids Basin 5
Biosolids Basin 6
Biosolids Pumps
4-Trends
Baseline Levels
Baseline Pump Runs
Biosolids
Biosolids Pump Runs
East Basin
Flows
Grit Pump Flow
Grit Pump Runs
Headworks
Influent Level
Pressures
Septage
Supernatant
West Basin
Overview
Alarm History
Alarm Management
Current User:
viewonly
Login
Logout
0.0
6.51 PSI
1.12 PPM
0.82 PPM
2.0 MGD
27.7 IN
65.7 IN

Summary of WWTF SCADA Monitoring and SCADA Control

WWTF Unit Process	SCADA Monitoring	SCADA Control
Headworks	• Influent flow from baseline pumps station • Bar screen upstream and downstream level indicators • Bar screen and on/off status. • Alarms: bar screen upstream and downstream high- and low-level alarms, power loss alarm.	• Grit pump (4 pumps) cycle times and cycle order. • Grit pump percent speeds. • Bar screen start and stop levels.
Septage Receiving Station	• Septage Level • Septage pump (2 pumps) on/off status. • Alarms: high/low level alarms. • Pump flow rate to headworks.	• Septage pump start/stop level to prevent overflowing the septage vaults. • Septage pump start time to pump septage into headworks after at least 12 hours of aeration.
Supernatant Pump Station	• Supernatant level. • Pump (2 pumps) on/off status. • Alarms: high level and low-level alarms. • Flow rate to headworks.	• Lead pump start/stop levels.
East and West Aeration Basins	• Manifold pressure (from 3 aeration blowers). • Aeration chains on/off status • Flow to contact chamber. • Flow to lagoons (for wasting to reduce basin MLSS).	• Aeration chain (8 per basin) run/cycle set-points. • Wasting on/off times to reduce basin MLSS.
Biosolids Building	• Biosolids flowrate (biosolids going into 6 small drying beds or 2 larger solar drying beds). • Non-potable water (NPW) flowrate (for water usage). • Alarms: biosolids and NPW high and low level alarms.	• Run/operate 6 small drying beds. • Initiate or abort batch when operating 6 small drying beds. • Select which biosolids pump (2 pumps) to use.
Contact Chamber	• Effluent flow going into contact chamber. • Recharge flow going to recharge beds. • Chlorine residual at the end of the contact chamber. • Sodium hypochlorite storage tank level indicator. • Sodium thiosulfate storage tank level indicator.	
Blowers	• On/off status of grit blowers (3 blowers) (for grit chamber aeration). • On/off status of aeration basin blowers (3 blowers). • On/off status of septage blowers (5 blowers) for aeration of septic waste at the septage receiving station	

WWTF Unit Process	SCADA Monitoring	SCADA Control
Trends (historical data and run time data)	• Baseline pumps station level indicators (ultrasonic and pressure transducer). • Baseline pump runs. • Biosolids flows and pump runs. • East and West aeration basin probe status for dissolved oxygen, pH, and oxygen, reduction potential. • Influent, effluent, and recharge flows • Grit pump flow rates and pump runs. • Headworks bar screen and press runs. • Influent upstream and downstream levels. • Manifold pressure, ambient room pressure, and ambient room temperature. • Septage receiving station levels, flow rates, and pump runs. • Supernatant pump station levels, flow rates, and pump runs.	

APPENDIX E

Recommended Influent Testing Parameters

Appendix E RECOMMENDED INFLUENT TESTING PARAMETERS

SMCFD No. 1
Recommended Influent Testing Parameters
September 15, 2020

Daily Samples for Operations

Parameter	Sample Type	Criticality
COD (Chemical Oxygen Demand)	24-hour composite	Very important.
BOD5 or cBOD5 (5-Day Biochemical Oxygen Demand or Carbonaceous BOD5)	24-hour composite	One or the other, not both. Nice to have, but takes much longer and costs more than COD. COD is a better operational parameter.
sCOD or sBOD5 (Soluble COD or BOD5)	24-hour composite	Nice to have. Recommended once or twice per month.
Ammonia	24-hour composite	Very Important.
TKN (Total Kjeldahl Nitrogen, ammonia plus organic nitrogen)	24-hour composite	Important. Easy to test.
Nitrate	24-hour composite	Nice to have, but should be very low in influent.
Nitrate + Nitrite	24-hour composite	Nice to have, but should be very low in influent.
Nitrite	Calculated	Nice to have, but should be very low in influent.
Total Nitrogen	Calculated	Nice to have. Easy to calculate if testing TKN and nitrates + nitrites.
TSS (Total Suspended Solids)	24-hour composite	Very Important.
VSS (Volatile Suspended Solids)	24-hour composite	Important.
Alkalinity	24-hour composite	Important.
Hardness	24-hour composite	Nice to have.
pH	Discrete	Important.
Temperature	Discrete	Important.
Total Phosphorus	24-hour composite	Nice to have if there is not an effluent requirement. Very important if there is an effluent requirement. SMCFD does not have a phosphorus requirement.
Continuous Mass Spectrometer	Continuous	Not really needed. Can detect illegal chemical dumping. If there is an issue, one can be rented.
Mass Spectrometer (lab)	24-hour composite or discrete	Nice to have.

Influent Compliance Testing

Parameter	Sample Type	Notes	Testing Frequency
BOD5 or cBOD5 (5-Day Biochemical Oxygen Demand or Carbonaceous BOD5)	24-hour composite	One or the other, not both. Used to measure removal efficiency (min 85%), which is a requirement of the AZPDES permit. Current SMCFD AZPDES permit requires BOD5.	Per permitting requirements. Current AZPDES is 2 times per month.
TSS (Total Suspended Solids)	24-hour composite	One or the other, not both. Used to measure removal efficiency (min 85%), which is a requirement of the AZPDES permit.	Per permitting requirements. Current AZPDES is 2 times per month.

APPENDIX F

Estimated Value of Groundwater Recharge Credits (2020-2050)

Appendix F ESTIMATED VALUE OF GROUNDWATER RECHARGE CREDITS

SMCFD Master WWTF Plan - Projected Effluent Volume and Potential Revenue Credits

Date: June 15, 2020
BY: Jack Bryck, Stantec

Effluent Sales

Notes: 1. Effluent annual volume= Estimated SMCFD annual average daily estimated inflow 2020 to 2050
2. Effluent Credit Sales are to SMCFD. Historically purchased by CAGRD or City of Apache Junction Water
3. The CAGRD Rate Sheet sales rate ($/Ac Ft) for effluent from 2020 to 2026
and an assumed annual 5% increase in the sales rate 2027 to 2050

Year	Estimated SMCFD WWTF Effluent Volume	Effluent Sales Rate (3)	Estimated Revenue to SMCFD	Comments
	Ac/Ft	$/Ac ft	$	
2020	1769	207	$366,140	CAP Rates
2021	1804	225	$405,938	CAP Rates
2022	1840	235	$432,460	CAP Rates
2023	1877	245	$459,879	CAP Rates
2024	2036	255	$519,072	CAP Rates
2025	2235	260	$581,144	CAP Rates
2026	2516	265	$666,787	CAP Rates
2027	2838	278	$789,755	Assumed 5% rate increase per year
2028	3161	292	$923,585	Assumed 5% rate increase per year
2029	3485	307	$1,069,074	Assumed 5% rate increase per year
2030	3850	322	$1,240,058	Assumed 5% rate increase per year
2031	4296	338	$1,453,032	Assumed 5% rate increase per year
2032	4703	355	$1,670,188	Assumed 5% rate increase per year
2033	5071	373	$1,890,719	Assumed 5% rate increase per year
2034	5399	392	$2,113,690	Assumed 5% rate increase per year
2035	5647	411	$2,321,453	Assumed 5% rate increase per year
2036	5856	432	$2,527,704	Assumed 5% rate increase per year
2037	6066	453	$2,749,208	Assumed 5% rate increase per year
2038	6236	476	$2,967,815	Assumed 5% rate increase per year
2039	6408	500	$3,201,904	Assumed 5% rate increase per year
2040	6540	525	$3,431,355	Assumed 5% rate increase per year
2041	6633	551	$3,654,098	Assumed 5% rate increase per year
2042	6727	578	$3,891,146	Assumed 5% rate increase per year
2043	6822	607	$4,143,414	Assumed 5% rate increase per year
2044	6958	638	$4,437,597	Assumed 5% rate increase per year
2045	7097	670	$4,752,666	Assumed 5% rate increase per year
2046	7239	703	$5,090,105	Assumed 5% rate increase per year
2047	7384	738	$5,451,503	Assumed 5% rate increase per year
2048	7532	775	$5,838,559	Assumed 5% rate increase per year
2049	7682	814	$6,253,097	Assumed 5% rate increase per year
2050	7836	855	$6,697,067	Assumed 5% rate increase per year
Total	155542			
Total 2020 - 2030	27411		$7,453,891	
Total 2020 - 2040	83632		$31,780,960	
Total 2020- 2050	155542		$81,990,212	

APPENDIX G

Cost Estimate

Appendix G COST ESTIMATE

	SMCFD Reuse and WWTF Capital Costing Strategy and Options - WWTF Master Plan 2020			
	Date: June 19, 2020			
	Revised October 1, 2020			
	Costing Notes:			
	MBR		$15 to $20/gallon	
	BioLAc		$7.5 to $10/gallon	
	Project General Conditions/Engineering		30.00%	
	Low End Cost Range		15.00%	
	High End Cost Range		30.00%	

#	Master Plan Task	Capacity , MGD	Task Description	Probable AACE Class 4 Cost, $	General Conditions/Engineering	Total	Probable Class 4 Cost Range, $		Comment
							-15%'	+30%	
1a	**WWTF 2**- WWTF Optimization Study		Optimization Strategy to Improve existing 3 mgd WWTP dependability/performance	$100,000					Imrovements to identify 3 MGD BioLAC WWTF improvements until 2028 when 6 MGD MBR startup is scheduled or to extend the 3 MGD BioLAc to the subsequent expansion phase to 12 MGD
1b	Optimization Study Implementation	3	Upgrade existing WWTF to accommodate up to 3 MGD. Improvement out of Optimization Study. Include install filtration. Allowance - Defined After Report Completion	$3,000,000					Cost allowance for improvements to existing WWTF to meet ADEQ permit conditions until 2028 when MBR startup is scheduled
2	Existing Solids Stockpile		Remove the estimated 7500 tons of treated and stored bio solids	$300,000					Remove stored bio solids to off site landfill. Create additional land space for improvements to the WWTF.
2a	**WWTF 4**- Nitrate POC Review		Report on MW Nitrate Values in Monitoring Well 2	$70,000					Review historic nitrate levels in POC 2, identify source and develop program to end the contamination.
2b	Nitrate POC Funding		Funding subsequent needs out of POC Review, Defined after Report Completion	$250,000					Allowance for addressing nitrate levels in POC Well #2

#	Master Plan Task	Capacity , MGD	Task Description	Probable AACE Class 4 Cost, $	General Conditions/Engineering	Total	Probable Class 4 Cost Range, $		Comment
3	**ER 1**- Reuse Strategy		Develop a long term reuse strategy and cost-Stakeholder Involvement	$150,000					
4	**ER-2** Existing Reuse Operation strategy		Revise the Existing Reuse Operation and Monitoring Strategy	$50,000					Strategy to increase the amount of WWTF effluent going to groundwater recharge to increase the reuse credits to a goal of 100%.
5	**ER 3**- Preliminary Recharge Basin/ASR Facility Siting and Cost (AACE Class 3) Investigation		From the development of a reuse strategy, undertake a preliminary geophysical investigation of possible recharge sites.	$100,000					As an outcome of the ER-1 Reuse Strategy, undertake preliminary efforts to locate effluent recharge sites to go from 3 to 6 MGD and 6 to 12 MGD..
6	**ER 4**-Detailed Investigation, selection and costing (AACE Class 2) of Recharge/ ASR Sites.		From the geophysical surveys, the regions identified as favorable should be investigated further by drilling several boreholes to confirm favorable lithologic conditions for recharge site (s) selection and land acquisition .	$150,000					Based on the ER-3 and identified site locations, undertake detailed on site investigations and preliminary design of the recharge sites.
7	**ER-5** Detailed Design, Cost (AACE Class 1) and Construction. Place into Operation:		Design and construction of the effluent recharged infrastructure.	Costing depends on outcome of ER-1 (Reuse Strategy) and ER-4 (Detailed Investigation)					As an outcome of ER-4, undertake detailed design and construction of the effluent recharge infrastructure.
7a	**Effluent Recharge Option- Recharge Basins - 6 MGD**								
			Land area needs depends on infiltration rate- Likely range between 12 ac and 25 ac-12 ac (High infiltration rate) - $1.2 M and 25 ac (low infiltration rate)- $2.80M - Recharge rate.	$2,800,000	$840,000	$3,640,000			Assume most conservative effluent infiltration rate for capital costing.

#	Master Plan Task	Capacity , MGD	Task Description	Probable AACE Class 4 Cost, $	General Conditions/Engineering	Total	Probable Class 4 Cost Range, $		Comment
			Conveyance - 15,000 ft 30 in @$10/in diameter	$4,500,000	$1,350,000	$5,850,000			Crossing of the CAP Canal will need to be in collaboration with the City and a future City road crossing of the canal and with CAP. Cost for planning or construction of a new reuse pipe in the road crossing is not included in this item.
			Land 25 acres @50,000/acre	$1,000,000		$1,000,000			
			Offsite- Power, Road Access	$1,000,000	$300,000	$1,300,000			
			Total			**$11,790,000**	**$10,021,500**	**$15,327,000**	
7b	**Effluent Recharge- Option- Aqifer Storage and Recovery- 6 MGD**								
			Number of ASR wells depends on the soil conditions- Likely range between 8 and 21 wells- 8 (high infiltration rate) Wells - $16 M and 21 (low infiltration rates) Wells- $42M - Recharge rate. Assume 16 Wells -$32M	$32,000,000	$9,600,000	$41,600,000			Assumed that an ASR project that includes water recovery will involve the purchaser of the water such as a land developer, the City of Apache Junction or Arizona Water Company in collaboration with SMCFD in planning and meeting the capital and operation and maintenance costs. ASR Sites will need to be included in any land subdivision planning.
			Conveyance - 15,000 ft 30 in @$10/in diameter	$4,500,000	$1,350,000	$5,850,000			
			Land 16 acres @50,000/acre	$800,000		$800,000			
			Offsite- Power, Road Access	$2,000,000	$600,000	$2,600,000			
			Total			**$50,850,000**	**$43,222,500**	**$66,105,000**	

#	Master Plan Task	Capacity , MGD	Task Description	Probable AACE Class 4 Cost, $	General Conditions/Engineering	Total	Probable Class 4 Cost Range, $		Comment
8	**WWTF 1**- Develop the Full Build out WWTF Process, Site and Phasing Plan with Costing (AACE Level 3)		A detailed WWTF process, site and phasing plan for the existing WWTF 90-acre site that algins aligns with the water quality goals identified in the Reuse Strategy including the role of the existing and planned WWTF recharge basins	$150,000					Develop a full build out site and process layout for 26 MGD. Need to recognize the buffer zone set backs dictated by ADEQ and CAP. Need to recognize the existing water courses through the existing SMCFD WWTF property . Need to work with the City to understand the land development potential around the SMCFD WWTF site for smell, noise and any other possible operational issues.
	WWTF 3 Force main Connection of inlet structure		Connection of second force main to headworks	$200,000					Connection of a second force main termination into the existing headworks. Program to monitor flows to ensure that the combination of Baseline Pump Station and the second Pump Station flows in total doe not exceed 3 MGD.
9	**WWTF 5**- Predesign WWTF Expansion and Capital Plan - 3 MGD to 6 MGD. Predesign and Capital Planning and costing (AACE Level 2))		A program beginning in 2022 with elements including master plan, predesign, public consultation, capital funding	$100,000					A review of the primary power supply to the SMCFD WWTF to be included in this phase as well as any issues coming out of WWTF 1. Develop a 'Maintenance of Plant Operation Plan' to move from 3 MGD BioLAC to 6 MGD MBR.
10	**WWTF 5**- WWTF Expansion – 3 MGD to 6 MGD- Two Options following:		Permitting, detailed design, costing (AAEE Level 1) construction, integration, startup and commissioning	See the following two options: 1) Transition to 6 MGD and abandon/ demolish the existing 3 MGD BioLAc when the 6 MGD MBR goes into service 2) Maintain 3 MGD BioLAc constructed in 1994 and add a second 3 mgd BioLAc. Will abandon 6 MGD BioLAC and add 9 MGD MBR when expanding from 6 MGD to 12 MGD.					

#	Master Plan Task	Capacity , MGD	Task Description	Probable AACE Class 4 Cost, $	General Conditions/Engineering	Total	Probable Class 4 Cost Range, $		Comment
10a	**Option 1- WWTF 5 Expansion from 3 MGD to 6 MGD - Adoption of MBR - 6 MGD MGD**		**Transition from 3 to 6 MGD, MBR Anerobic and 6 MGD Anerobic Digestion as per the WWTF 1**	**$78,000,000**	**$23,400,000**	**$101,400,000**	**$86,190,000**	**$131,820,000**	Abandon/ demolish existing 3 MGD BioLAc on start up of 6 MGD MBR
			Land	**$0**					No new land area needed.
			Offsite- Power, Road Access	**$0**					Primary power to the expanded SMCFD WWTF will need to be reviewed.
			Total	**$78,000,000**	**$23,400,000**	**##########**	**$86,190,000**	**$131,820,000**	
10b	**Option 2- BioLAc Add 3 MGD to existing 3 MGD (total 6 MGD BioLAc). (Replace with 6 MGD and Add 6 MGD when go from 6 to 12 MGD)**		Transition from 3 MGD BioLAC to 6 MGD (3 MGD existing BioLAC + New 3 MGD BioLAC) , 6 MBD Anerobic Digestion as per the WWTF 1						
			Existing BioLAC + New BioLAc /Anaerobic Digestion	$27,000,000	$8,100,000	$35,100,000	$29,835,000	$45,630,000	
			Land	$0					No new land area needed.
			Offsite- Power, Road Access	$0					Primary power to the expanded SMCFD WWTF will need to be reviewed.
			Total	**$27,000,000**	**$8,100,000**	**$35,100,000**	**$29,835,000**	**$45,630,000**	Will need to spend on 12 MGD Capacity in 2040. Demo 6 MGD of BioLAc including 3 MGD constructed in 2024-2028 and 3 MGD from 1995 and add 9 MGD MBR

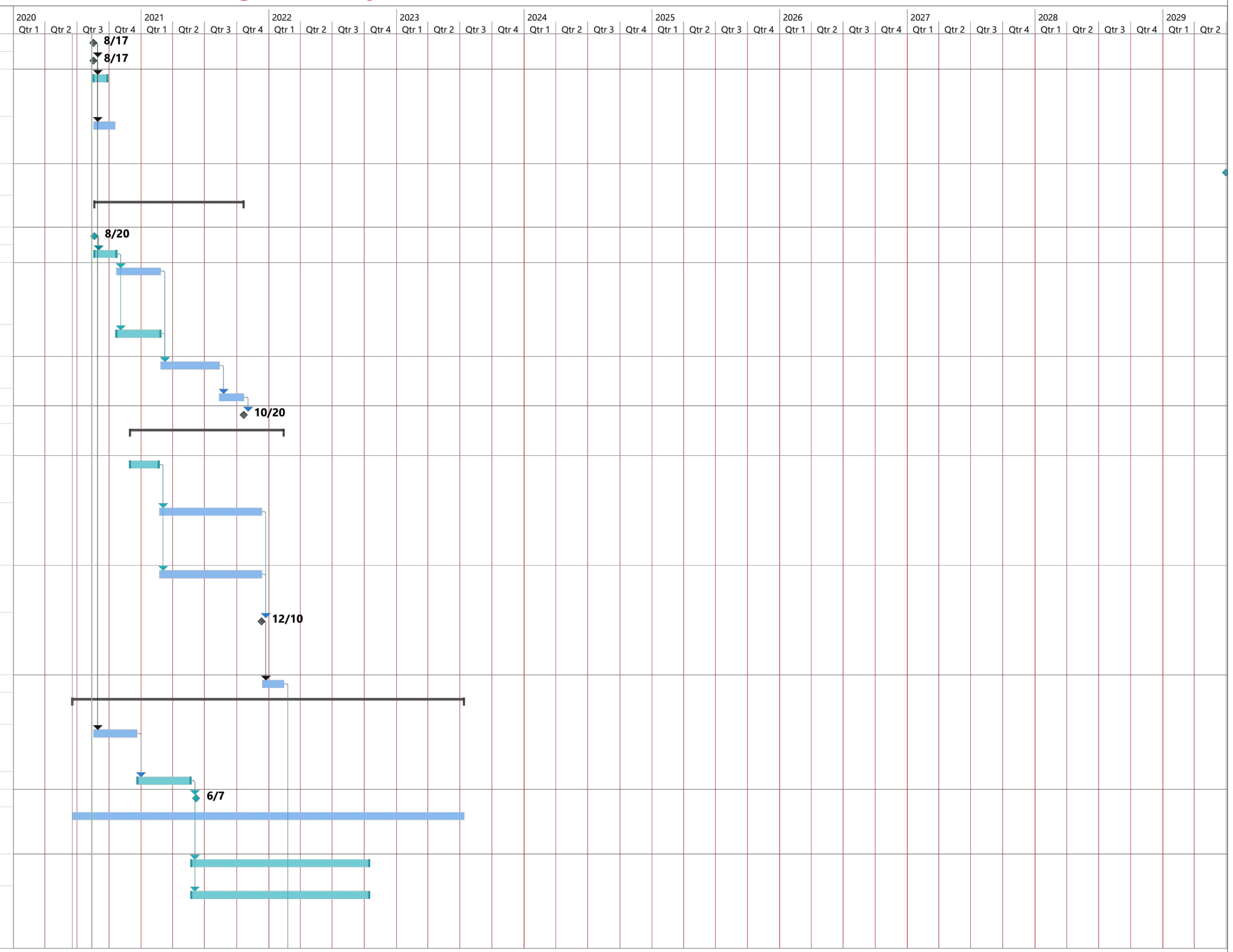
APPENDIX H

Detailed Project Schedule

Appendix H DETAILED PROJECT SCHEDULE

SMCFD Progam Delivery Schedule 2020 2030

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1		Submit Master Plans	0 days	Mon 8/17/20	Mon 8/17/20	
2		Start Program Deliver	0 days	Mon 8/17/20	Mon 8/17/20	1
3		SMCFD 208 SMCFD Planning Area Documentation	30 days	Mon 8/17/20	Fri 9/25/20	2
4		Program Detail/Schedule Development	45 days?	Mon 8/17/20	Fri 10/16/20	2
5		Key Milestone- 6 MGD In operation	0 days	Sat 6/30/29	Sat 6/30/29	
6		**State Lands- Lost Dutchman**	**305 days**	**Thu 8/20/20**	**Wed 10/20/21**	
7		State Auction	0 days	Thu 8/20/20	Thu 8/20/20	
8		State Land Sales	45 days	Thu 8/20/20	Wed 10/21/2	7
9		SMCFD Collection system Preliminary WW Planning in	90 days	Thu 10/22/20	Wed 2/24/21	8
10		SMCFD WWTF Planning	90 days	Thu 10/22/20	Wed 2/24/21	8
11		SMCFD Understanding	120 days	Thu 2/25/21	Wed 8/11/21	9,10
12		SMCFD Board Appr	50 days	Thu 8/12/21	Wed 10/20/2	11
13		Complete	0 days	Wed 10/20/2	Wed 10/20/2	12
14		**Establish 2020-2050 Plan**	**315 days**	**Mon 11/30/20**	**Fri 2/11/22**	
15		Plan Reuse Stakeholders/WW Site Plan	60 days	Mon 11/30/20	Fri 2/19/21	
16		Confirm Reuse Strategy to 26 mgd. Stakeholder Outreach. ER1	210 days	Mon 2/22/21	Fri 12/10/21	15
17		Develop an ultimate WWTF Process, Site and	210 days	Mon 2/22/21	Fri 12/10/21	15
18		Delivery Reuse Strategy, WWTF Process, Site Phasing Plan	0 days	Fri 12/10/21	Fri 12/10/21	16,17
19		Board Approval	45 days	Mon 12/13/2	Fri 2/11/22	18
20		**Upgrade Existing WWTF (to 3 MGD)**	**800 days?**	**Thu 6/18/20**	**Wed 7/12/23**	
21		WWTF Optimization and Improvement Plan WWTF 2	90 days?	Mon 8/17/20	Fri 12/18/20	1
22		Budget for FY 2022	110 days	Mon 12/21/2	Fri 5/21/21	21
23		Budget Approval	0 days	Mon 6/7/21	Mon 6/7/21	22
24		Effluent Water Reuse Point of Compliance - WWTF 3	800 days	Thu 6/18/20	Wed 7/12/23	
25		Existing WWTF Upgrades	365 days	Mon 5/24/21	Fri 10/14/22	22
26		Operational Improvements to Existing Recharge Systems.	365 days	Mon 5/24/21	Fri 10/14/22	22



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Date: Thu 8/13/20

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual Progress

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Client/Project Logo

SMCFD

Client/Project
SUPERSTITION MOUNTAINS CFD NO. 1
WASTEWATER MASTER PLAN

Apache Junction, Arizona

Title
SMCFD PROGRAM DELIVERY
SCHEDULE 2020-2030
(1 of 2)

Project No. 181300987
Scale AS SHOWN
Revision 0
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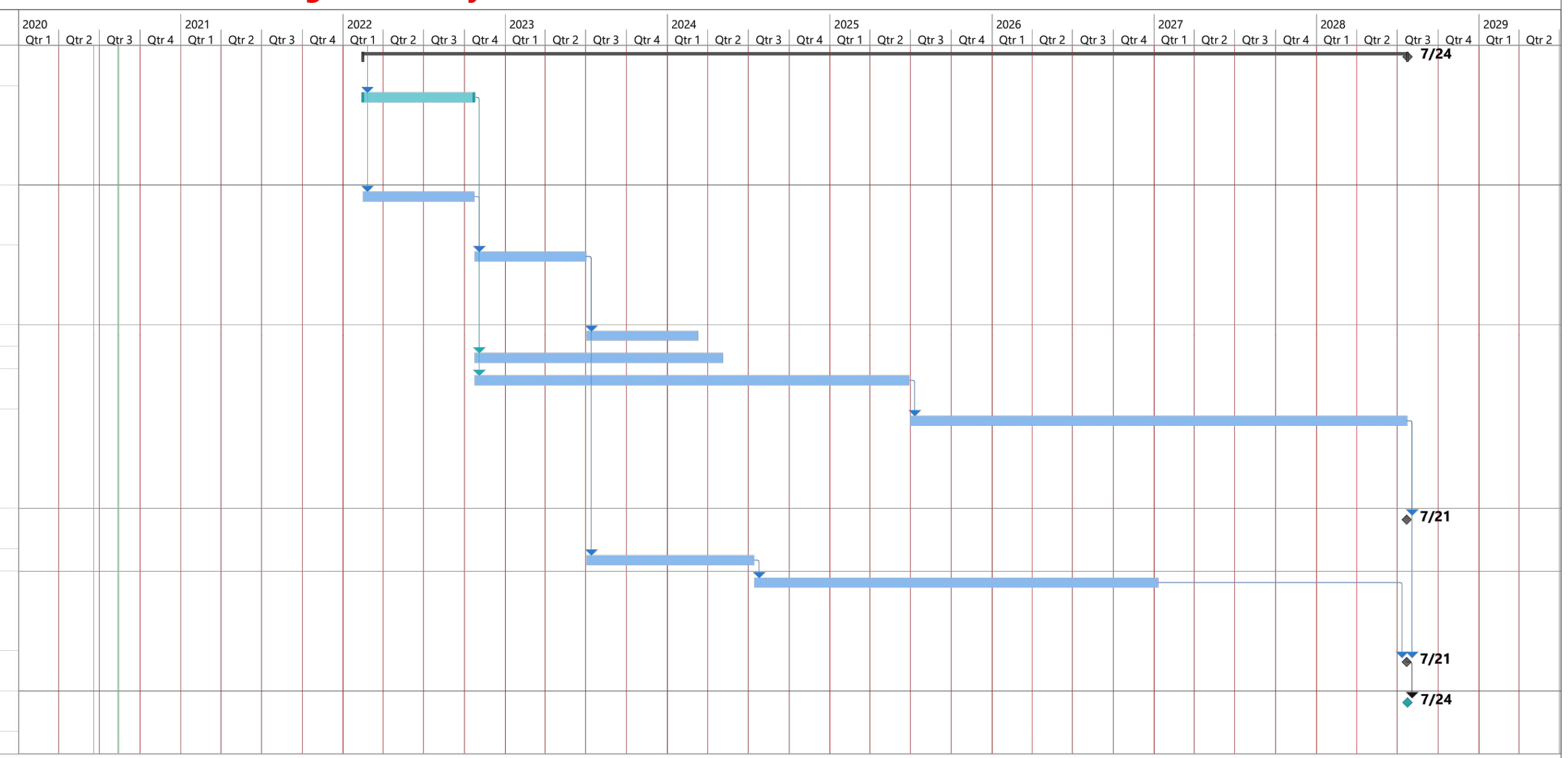
Figure

SMCFD Progam Delivery Schedule 2020 2030

ID	Indicators	Task Mode	Task Name	Duration	Start	Finish	Predecessors
27			**Program Expansion 3 MGD to 6 MGD**	**1680 days**	**Mon 2/14/22**	**Mon 7/24/28**	
28			WWTF Expansion and Capital Plan - 3 MGD to 6 MGD. Predesign and Capital Planning-WWTF 4	180 days	Mon 2/14/22	Fri 10/21/22	19
29			Preliminary Recharge Basin/ASR Facility Siting	180 days	Mon 2/14/22	Fri 10/21/22	19
30			Detailed Investigation and Selection of Recharge/ ASR Sites.-ER4	180 days	Mon 10/24/22	Fri 6/30/23	29
31			Land Purchase	180 days	Mon 7/3/23	Fri 3/8/24	30
32			Permitting	400 days	Mon 10/24/2	Fri 5/3/24	28
33			WWTF Detailed Design WWTF 5	700 days	Mon 10/24/22	Fri 6/27/25	28
34			WWTF construction, integration, ,startup, training and	800 days	Mon 6/30/25	Fri 7/21/28	33
35			WWTF Place into Operation	0 days	Fri 7/21/28	Fri 7/21/28	34
36			Reuse Detailed De:	270 days	Mon 7/3/23	Fri 7/12/24	30
37			Reuse construction, integration, startup, training	650 days	Mon 7/15/24	Fri 1/8/27	36
38			Reuse Place into Operation	0 days	Fri 7/21/28	Fri 7/21/28	37,34
39			**Complete Expansion 3 MGD**	**0 days**	**Mon 7/24/28**	**Mon 7/24/28**	**38**
40							



Project: C:\Users\jbryck\Docum
Date: Thu 8/13/20

Task, Split, Milestone, Summary, Project Summary, Inactive Task, Inactive Milestone, Inactive Summary, Manual Task, Duration-only, Manual Summary Rollup, Manual Summary, Start-only, Finish-only, External Tasks, External Milestone, Deadline, Progress, Manual Progress

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SUPERSTITION MOUNTAINS CFD NO. 1
WASTEWATER MASTER PLAN

Apache Junction, Arizona

Title
SMCFD PROGRAM DELIVERY SCHEDULE 2020-2030 (2 of 2)

Project No.	Scale
181300987	AS SHOWN

Revision	Sheet	Figure
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APPENDIX I

Regulatory Sampling Requirements by WWTF Locations

Appendix I REGULATORY SAMPLING REQUIREMENTS BY WRF LOCATIONS

ADEQ Arizona Department of Environmental Quality

FACT SHEET

Superstition Mountains Community Facilities District #1 Wastewater Treatment Plant
Aquifer Protection Permit #102873
Place ID #400, LTF #63047
OTHER AMENDMENT

The Arizona Department of Environmental Quality (ADEQ) proposes to issue an amendment to the Aquifer Protection Permit (APP) for the subject facility that covers the life of the facility, including operational, closure, and post closure periods unless suspended or revoked pursuant to Arizona Administrative Code (A.A.C.) R18-9-A213. This document gives pertinent information concerning the issuance of the permit. The requirements contained in this permit will allow the permittee to comply with the two key requirements of the Aquifer Protection Program: 1) meet Aquifer Water Quality Standards at the Point of Compliance (POC); and 2) demonstrate Best Available Demonstrated Control Technology (BADCT). The purpose of BADCT is to employ engineering controls, processes, operating methods or other alternatives, including site-specific characteristics (i.e., the local subsurface geology); to reduce discharge of pollutants to the greatest degree achievable before they reach the aquifer; or to prevent pollutants from reaching the aquifer.

I. FACILITY INFORMATION

Name and Location

Name of Permittee:	Superstition Mountains Community Facilities District #1
Mailing Address:	5661 South Ironwood Drive Apache Junction, Arizona 85120
Facility Name and Location:	Superstition Mountains Community Facilities District #1 Wastewater Treatment Plant 5661 South Ironwood Drive Apache Junction, Arizona 85120

Regulatory Status

Listed in the table below are various wastewater licenses issued by ADEQ to the permittee pertaining to the facility:

Type of license	License identifier	Effective date
APP	P-102873	06/27/1995
Major modification	P-102873	01/28/2000

OPERATIONS MAR-8-17 PM1:19

Type of license	License identifier	Effective date
Significant Amendment	P-102873	01/28/2003
Significant Amendment	P-101434	02/03/2005

An application for this other permit amendment was received on September 9, 2016 to replace the liner for Biolac Basin #1 and #2 with 60 mil High Density Polyethylene liner.

The latest inspection report (dated, March 8, 2016), indicates that the facility was found to be in compliance with the APP and Arizona rules and statutes.

Facility Description

The Superstition Mountains Community Facilities District #1 (SMCFD) is authorized to operate the SMCFD Wastewater Treatment Plant (WWTP) with a maximum average monthly flow of 2.1 mgd. The WWTP treats domestic sewage and consists of a headworks, a Biolac treatment system for extended aeration /activated sludge process with nitrogen removal, clarifiers, chlorination and de-chlorination. The Biolac system includes two Basins lined with 60-mil High Density Polyethylene (HDPE) liners.

The treated effluent may be disposed to the 36 vadose zone wells located within the seven recharge basins, or to the Weeks Wash under AZPDES permit no. AZ0023931. The vadose wells have been constructed in the recharge basins to enhance the recharge. The sludge shall be stored in the sludge thickening lagoons, then dried in the sludge drying beds or the six concrete rapid sludge drying beds. The permittee may also use the biosolid storage area for composting the sludge prior to disposal off site. Sludge is composted to Class A for beneficial reuse. Compost is stored on site until removed for use. Screenings, grit, and scum, will be hauled to landfill for disposal in accordance with State and Federal regulations.

Amendment Description

ADEQ has reviewed and approved the replacement of the liners in Biolac Basin #1 and #2 with a 60 mil High Density Polyethylene liner. Other changes include updating the permit language to conform to the most current permit format.

II. BEST AVAILABLE DEMONSTRATED CONTROL TECHNOLOGY

The treatment facility is designed, constructed, operated, and maintained to meet the treatment performance criteria for new facilities as specified in A.A.C. R18-9-B204. The facility shall meet the performance requirement for industrial pre-treatment as per A.A.C. R18-9-B204(B)(6)(b).

The treatment facility shall not exceed a maximum seepage rate of 550 gallons per day per acre for all containment structures within the treatment works.

III. COMPLIANCE WITH AQUIFER WATER QUALITY STANDARDS

Monitoring and Reporting Requirements

To ensure that site operations do not result in violation of Aquifer Water Quality Standards at the point of compliance, representative samples of the effluent is collected downstream of the chlorination system. The permittee shall monitor for flow. The effluent shall be monitored daily for fecal coliform, monthly for total nitrogen, quarterly for metals, and annually for VOCs (see Section 4.2, Table IA-1 in the permit).

Groundwater monitoring is required at POC #1 and POC #2 (See Section 4.2, Table II in the permit). The permittee will monitor the groundwater quarterly for water levels, nitrate/nitrite as N, Total Kjeldahl Nitrogen (TKN), total nitrogen, total coliform, fecal coliform and water level, quarterly for metals, and semi-annually for organic compounds (see Section 4.2, Table II).

Facility inspection and operational monitoring shall be performed on a routine basis (see Section 4.2, Table III in the permit).

Point of Compliance

The POC for this facility is designated at the following location:

POC #	POC Location	Latitude	Longitude	ADWR Registration No
1	West Side of Recharge Basins, MW-1	33° 21' 43"N	111° 33' 31"W	55-583289
2	South of the Recharge Basins, MW-2	33° 21' 35" N	111° 33' 32" W	55-204563
3	Outfall 001 to the Weekes Wash	33° 21' 32" N	111° 33' 26" W	TBD

The groundwater monitoring is required at POC wells #1 and #2. POC well #3 is a theoretical monitoring point of compliance, no groundwater monitoring is required.

The Director may amend this permit to require installation of wells and initiation of groundwater monitoring at the POCs or to designate additional points of compliance if information on groundwater gradients or groundwater usage indicates the need.

IV. SURFACE WATER CONSIDERATIONS

The facility is located near, and discharges into, Weekes Wash. Surface water monitoring will be conducted in the AZPDES permit. The facility is located downstream of the Central Arizona Project canal and the Powerline Flood Retarding Structure which provides protection to the facility from 100-year flood events

VI. COMPLIANCE SCHEDULE

The permittee shall submit an evaluation report for the POC wells per Section 2.7.4.1 of the permit within 180 days of permit issuance.

VII. OTHER REQUIREMENTS FOR ISSUING THIS PERMIT

Technical Capability

The Superstition Mountains Facilities District #1has demonstrated the technical competence necessary to carry out the terms and conditions of the permit in accordance with A.R.S. § 49-243(N) and A.A.C. R18-9-A202(B). Southwest Groundwater Consultants was hired to prepare the amendment application

ADEQ requires that appropriate documents be sealed by an Arizona registered geologist or professional engineer. This requirement is a part of an on-going demonstration of technical capability. The permittee is expected to maintain technical capability throughout the life of the facility.

Financial Capability

The Superstition Mountains Facilities District # 1 has demonstrated the financial responsibility necessary to carry out the terms and conditions of the permit in accordance with A.R.S. § 49-243(N) and A.A.C. R18-9- A203(B)(1)and(2). The estimated dollar amount demonstrated for financial capability is $1,273,000.00. The permittee is expected to maintain financial capability throughout the life of the facility.

Zoning Requirements

The Superstition Mountains Facilities District #1 has been properly zoned for the permitted use and the permittee has complied with applicable zoning ordinances in accordance with A.R.S. § 49-243(O) and A.A.C. R18-9-A201(B)(3).

VIII. ADMINISTRATIVE INFORMATION

Public Notice (A.A.C. R18-9-108(A))

This is an Other Amendment to an APP that ADEQ issued previously, in accordance with A.A.C. R18-9-A211(D). The public notice requirement for an Other Amendment consists

solely of a written notification in accordance with A.A.C. R18-9-A211(E). On a monthly basis ADEQ provides a list of permits in process to the county departments of health, association of governments and other federal, state and local entities, as well as private parties who have requested notification. For Other Amendments, the publication of this list satisfies the public participation process.

IX. ADDITIONAL INFORMATION

Additional information relating to this permit may be obtained from:

Arizona Department of Environmental Quality
Water Quality Division - APP Unit 1
Attn: Monica Phillips
1110 W. Washington Street, Mail Code 5560D
Phoenix, Arizona 85007
Phone: (602) 771-2253

STATE OF ARIZONA
AQUIFER PROTECTION PERMIT NO. P-102873
PLACE ID 400, LTF 63047
OTHER AMENDMENT

1.0 AUTHORIZATION

In compliance with the provisions of Arizona Revised Statutes (A.R.S.) Title 49, Chapter 2, Articles 1, 2 and 3, Arizona Administrative Code (A.A.C.) Title 18, Chapter 9, Articles 1 and 2, A. A. C. Title 18, Chapter 11, Article 4 and amendments thereto, and the conditions set forth in this permit, Superstition Mountains Community Facilities District #1 is hereby authorized to operate the Superstition Mountains Community Facilities District #1 Wastewater Treatment Plant located at 5661 South Ironwood Drive, in Apache Junction, Arizona (Pinal County), over groundwater of the east Salt River Valley Groundwater Sub-Basin, in the Phoenix Active Management Area (AMA), in Township 01 S, Range 08 E, Section 08, of the Gila and Salt River Baseline and Meridian.

This permit becomes effective on the date of the Water Quality Division Director's signature and shall be valid for the life of the facility (operational, closure, and post-closure periods) unless suspended or revoked pursuant to A.A.C. R18-9-A213. The permittee shall construct, operate and maintain the permitted facilities:

1. Following all the conditions of this permit including the design and operational information documented or referenced below, and
2. Such that Aquifer Water Quality Standards (AWQS) are not violated at the applicable point(s) of compliance (POC) set forth below or if an AWQS for a pollutant has been exceeded in an aquifer at the time of permit issuance, that no additional degradation of the aquifer relative to that pollutant and as determined at the applicable POC occurs as a result of the discharge from the facility.

1.1 PERMITTEE INFORMATION

Facility Name:	Superstition Mountains Community Facilities District #1 Wastewater Treatment Plant
Facility Address:	5661 South Ironwood Drive Apache Junction, Arizona 85120
County:	Pinal County
Permittee:	Superstition Mountains Community Facilities District #1
Permittee Address:	5661 South Ironwood Drive Apache Junction, Arizona 85120
Permitted Flow Rate:	2,100,000 gallons per day (gpd)
Facility Contact: **Emergency Phone No.:**	Darron Anglins (480) 941-6760
Latitude/Longitude:	33° 21' 40" North / 111° 33' 30" West
Legal Description:	Superstition Mountains Community Facilities District #1Wastewater Treatment Plant located over groundwater of the east Salt River Valley Groundwater Sub-Basin, in the Phoenix Active Management Area (AMA), in Township 01 S, Range 08 E, Section 08, of the Gila and Salt River Baseline and Meridian.

1.2 AUTHORIZING SIGNATURE

Trevor Baggiore, Director
Water Quality Division
Arizona Department of Environmental Quality

Signed this 2nd **day of** March **, 2017**

THIS AMENDED PERMIT SUPERCEDES ALL PREVIOUS PERMITS

OPERATIONS MAR-8-'17 PM1:13

2.0 SPECIFIC CONDITIONS [A.R.S. §§ 49-203(4), 49-241(A)]

2.1 Facility / Site Description [A.R.S. § 49-243(K)(8)]

The Superstition Mountains Community Facilities District #1 (SMCFD) is authorized to operate the SMCFD Wastewater Treatment Plant (WWTP) with a maximum average monthly flow of 2.1 mgd. The WWTP treats domestic sewage and consists of a headworks, a Biolac treatment system for extended aeration /activated sludge process with nitrogen removal, clarifiers, chlorination and de-chlorination. The Biolac system includes two Basins lined with 60-mil High Density Polyethylene (HDPE) liners.

The treated effluent may be disposed to the 36 vadose zone wells located within the seven recharge basins, or to the Weeks Wash under AZPDES permit no. AZ0023931. The vadose wells have been constructed in the recharge basins to enhance the recharge. The sludge shall be stored in the sludge thickening lagoons, then dried in the sludge drying beds or the six concrete rapid sludge drying beds. The permittee may also use the biosolid storage area for composting the sludge prior to disposal off site. Sludge is composted to Class A for beneficial reuse. Compost is stored on site until removed for use. Screenings, grit, and scum, will be hauled to landfill for disposal in accordance with State and Federal regulations.

This other amendment has been reviewed and approved for the replacement of the liners in Biolac Basin #1 and #2 with a 60 mil High Density Polyethylene liner.

The site includes the following permitted discharging facilities:

Facility	Latitude	Longitude
WWTP	33° 21' 40" N	111° 33' 30" W
Sludge Lagoon - East (lined)	33° 21' 44" N	111° 33' 25" W
Sludge Lagoon - West (lined)	33° 21' 44" N	111° 33' 26" W
Sludge Drying Bed – North (lined)	33° 21' 42" N	111° 33' 21" W
Sludge Drying Bed - South (lined)	33° 21' 41" N	111° 33' 27" W
Rapid Sludge Drying Beds	33° 21' 40" N	111° 33' 29" W
Weekes Wash Outfall	33° 21' 32" N	111° 33' 26" W
Recharge Basin 1	33° 21' 41.5" N	111° 33' 29.7" W
Recharge Basin 2	33° 21' 39" N	111° 33' 35.8" W
Recharge Basin 3	33° 21' 37.8" N	111° 33' 32.4" W
Recharge Basin 4	33° 21' 36.4" N	111° 33' 29.1" W
Recharge Basin 5	33° 21' 37.2" N	111° 33' 36.6" W
Recharge Basin 6	33° 21' 35.9" N	111° 33' 33.4" W
Recharge Basin 7	33° 21' 34.7" N	111° 33' 29.8" W
Recharge Basin 1 Vadose zone wells		
Vadose zone well 1-1	33° 21' 42.36" N	111° 33' 29.39" W
Vadose zone well 1-2	33° 21' 41.55" N	111° 33' 29.94" W
Vadose zone well 1-4	33° 21' 41.93" N	111° 33' 29.28" W
Vadose zone well 1-5	33° 21' 40.93" N	111° 33' 29.85" W
Vadose zone well 1-6	33° 21' 42.09" N	111° 33' 29.75" W
Vadose zone well 1-7	33° 21' 41.27" N	111° 33' 29.19" W
Recharge Basin 2 Vadose zone wells		
Vadose zone well 2-1	33° 21' 39.31" N	111° 33' 36.64" W
Vadose zone well 2-2	33° 21' 49.74" N	111° 33' 35.95" W

Vadose zone well 2-3	33° 21' 38.58" N	111° 33' 36.58" W
Vadose zone well 2-4	33° 21' 39.20" N	111° 33' 35.37" W
Vadose zone well 2-5	33° 21' 38.58" N	111° 33' 35.75" W
Vadose zone well 2-6	33° 21' 39.20" N	111° 33' 34.56" W
Vadose zone well 2-7	33° 21' 38.05" N	111° 33' 35.20" W
Vadose zone well 2-8	33° 21' 38.48" N	111° 33' 34.52" W
Recharge Basin 3 Vadose zone wells		
Vadose zone well 3-1	33° 21' 37.99" N	111° 33' 33.31" W
Vadose zone well 3-2	33° 21' 38.46" N	111° 33' 32.64" W
Vadose zone well 3-3	33° 21' 37.30" N	111° 33' 33.28" W
Vadose zone well 3-4	33° 21' 37.87" N	111° 33' 32.09" W
Vadose zone well 3-5	33° 21' 37.24" N	111° 33' 32.44" W
Vadose zone well 3-6	33° 21' 37.92" N	111° 33' 31.20" W
Vadose zone well 3-7	33° 21' 36.75" N	111° 33' 31.85" W
Vadose zone well 3-8	33° 21' 37.17" N	111° 33' 31.17" W
Recharge Basin 4 Vadose zone wells		
Vadose zone well 4-1	33° 21' 36.76" N	111° 33' 29. 94" W
Vadose zone well 4-2	33° 21' 37.16" N	111° 33' 29.30" W
Vadose zone well 4-3	33° 21' 36.00" N	111° 33' 29.94" W
Vadose zone well 4-4	33° 21' 36.68" N	111° 33' 28.69" W
Vadose zone well 4-5	33° 21' 36.02" N	111° 33' 29.05" W
Vadose zone well 4-6	33° 21' 36.61" N	111° 33' 27.86" W
Vadose zone well 4-7	33° 21' 35.45" N	111° 33' 28.50" W
Vadose zone well 4-8	33° 21' 35.93" N	111° 33' 27.79" W
Recharge Basin 5 Vadose zone wells		
Vadose zone well 5-1	33° 21' 37.41" N	111° 33' 37.22" W
Vadose zone well 5-2	33° 21' 36.88" N	111° 33' 35.84" W
Recharge Basin 6 Vadose zone wells		
Vadose zone well 6-1	33° 21' 36.16" N	111° 33' 33.97" W
Vadose zone well 6-2	33° 21' 35.59" N	111° 33' 32.49" W
Recharge Basin 7 Vadose zone wells		
Vadose zone well 7-1	33° 21' 38.84" N	111° 33' 30.58" W
Vadose zone well 7-2	33° 21' 34.29" N	111° 33' 29.14" W

Annual Registration Fee [A.R.S. § 49-242 and A.A.C. R18-14-104]

The annual registration fee for this permit is payable to ADEQ each year. The permitted flow for fee calculation is 2.1 million gallons per day (mgd). If the facility is not yet constructed or is incapable of discharge at this time, the permittee may be eligible for reduced fees under the rule. Send all correspondence requesting reduced fees to the Water Quality Division of ADEQ. Please reference the permit number, LTF number and why reduced fees are requested under the rule.

Financial Capability [A.R.S. § 49-243(N) and A.A.C. R18-9-A203]

The permittee has demonstrated financial capability under A.R.S. § 49-243(N) and A.A.C. R18-9-A203(C)(2). The permittee shall maintain financial capability throughout the life of the facility. The estimated dollar amount demonstrated for financial capability is $1,273,000.00. The financial capability was demonstrated through A.A.C. R18-9-A203(B)(1) for a local government entity.

2.2 Best Available Demonstrated Control Technology (BADCT) [A.R.S. § 49-243(B) and A.A.C. R18-9-A202(A)(5)]

The SMCFD WWTP is an existing 2,100,000 gpd facility defined in A.R.S. § 49-201(16). The facility meets the BADCT requirements for existing facility as per A.A.C.R18-9-B205.

2.2.1 Engineering Design

The design of the existing WWTP is according to plans approved by the ADEQ Wastewater Design Review Unit, and construction as approved by ADEQ Groundwater Section. The recharge basins shall conform to plans dated March 29, 2000, and March 30, 2004. The liners for the ponds was designed as per the design report prepared and stamped, dated, and signed (sealed) by Christopher Simko, P.E. (Professional Engineer) Stantec Consulting Services, Inc., dated September 2016 and subsequent sealed submittals that served as additions to the design report.

2.2.2 Site-specific Characteristics

Site specific characteristics were not used to determine BADCT.

2.2.3 Pre-operational Requirements

Not required at time of permit issuance.

2.2.4 Operational Requirements

1. The permittee shall maintain a copy of the up-to-date operations and maintenance manual at the WWTP at all times; the manual shall be available upon request during inspections by ADEQ personnel.
2. The pollution control structures shall be inspected for the items listed in Section 4.2, Table III Facility Inspection (Operational Monitoring).
3. If any damage of the pollution control structures is identified during inspection, proper repair procedures shall be performed. All repair procedures and materials used shall be documented in the facility log book as per Section 2.7.2 and reported to ADEQ in the event of a violation or exceedance as per 2.7.3.

2.2.5 Reclaimed Water Classification [A.A.C. R18-9-703(C)(2)(a), A.A.C. R18-11-303 through 307]

This facility is classified as generating Class B+ reclaimed water according to Arizona Administrative Code R18-11-305.

2.2.6 Certified Areawide Water Quality Management Plan Conformance [A.A.C. R18-9-A201(B)(6)(a)]

Facility operations must conform to the approved Certified Areawide Water Quality Management Plan according to the 208 consistency determination in place at the time of permit issuance.

2.3 Discharge Limitations [A.R.S. §§ 49-201(14), 49-243 and A.A.C. R18-9-A205(B)]

1. The permittee is authorized to operate the WWTP with a maximum average monthly flow of 2.1 mgd.
2. The permittee shall notify all users that the materials authorized to be disposed of through the WWTP are typical household sewage and pre-treated commercial wastewater and shall not include motor oil, gasoline, paints, varnishes, hazardous wastes, solvents, pesticides, fertilizers or other materials not generally associated with toilet flushing, food preparation, laundry facilities and personal hygiene.
3. The permittee shall operate and maintain all permitted facilities to prevent unauthorized discharges pursuant to A.R.S. § 49-201(12) resulting from failure or bypassing of applicable BADCT.
4. Specific discharge limitations are listed in Section 4.2, Table IA-1.

2.4 Point(s) of Compliance (POC)[A.R.S. § 49-244]

The Points of Compliance are established at the following locations:

POC #	POC Location	Latitude	Longitude	ADWR Registration No
1	West Side of Recharge Basins, MW-1	33° 21' 43"N	111° 33' 31"W	55-583289
2	South of the Recharge Basins, MW-2	33° 21' 35" N	111° 33' 32" W	55-204563
3	Outfall 001 to the Weekes Wash	33° 21' 32" N	111° 33' 26" W	TBD

The groundwater monitoring is required at POC wells #1 and #2. POC well #3 is a theoretical monitoring point of compliance, no groundwater monitoring is required.

The Director may amend this permit to require installation of wells and initiation of groundwater monitoring at the POCs or to designate additional points of compliance if information on groundwater gradients or groundwater usage indicates the need.

2.5 Monitoring Requirements [A.R.S. § 49-223(G), A.A.C. R18-9-A206(A)]

Unless otherwise specified in this permit, all monitoring required in this permit shall continue for the duration of the permit, regardless of the status of the facility. Unless otherwise provided, monitoring shall commence the first full monitoring period following permit issuance. All sampling, preservation and holding times shall be in accordance with currently accepted standards of professional practice. Trip blanks, equipment blanks and duplicate samples shall also be obtained, and Chain-of-Custody procedures shall be followed, in accordance with currently accepted standards of professional practice. Copies of laboratory analyses and Chain-of-Custody forms shall be maintained at the permitted facility. Upon request, these documents shall be made immediately available for review by ADEQ personnel.

2.5.1 Pre-Operational Monitoring

Not Applicable.

2.5.2 Discharge Monitoring

The permittee shall monitor the effluent according to Section 4.2, Tables IA-1. A representative sample of the effluent shall be collected at the point of discharge downstream of the chlorination system. Effluent flow shall be measured at flow meter downstream of chlorine contact chamber and on the recharge line to monitor Recharge flow.

2.5.3 Reclaimed Water Monitoring

Not Applicable.

2.5.4 Groundwater Monitoring and Sampling Protocols

POC well monitoring shall be conducted under Section 4.2, Table II.

Static water levels shall be measured and recorded prior to sampling. Wells shall be purged of at least three borehole volumes (as calculated using the static water level) or until field parameters (pH, temperature, and conductivity) are stable, whichever represents the greater volume. If evacuation results in the well going dry, the well shall be allowed to recover to 80 percent (%) of the original borehole volume, or for 24 hours, whichever is shorter, prior to sampling. If after 24 hours there is not sufficient water for sampling, the well shall be recorded as "dry" for the monitoring event. An explanation for reduced pumping volumes, a record of the volume pumped, and modified sampling procedures shall be reported and submitted with the SMRF.

2.5.4.1 POC Well Replacement

In the event that one or more of the designated POC wells should become unusable or inaccessible due to damage, exceedance of an alert level (AL) for water level as required by Section 2.6.2.3.4, or any other event, a replacement POC well shall be constructed and installed upon approval by ADEQ. If the replacement well is fifty feet or less from the original well, the ALs and/or aquifer quality limits (AQLs) calculated for the designated POC well shall apply to the replacement well. Otherwise, the ALs and/or AQLs shall be set following the provisions in Section 2.5.4.2.

2.5.5 Vadose Zone Monitoring

Vadose zone monitoring shall be conducted according to Section 4.2 Table IA-2.

2.5.6 Surface Water Monitoring and Sampling Protocols

Routine surface water monitoring is not required under the terms of this permit.

2.5.7 Facility / Operational Monitoring

Operational monitoring inspections shall be conducted according to Section 4.2, Table III.

If any damage of the pollution control structures is identified during inspection, proper repair procedures shall be performed. All repair procedures and materials used shall be documented in the facility log book as per Section 2.7.2 and reported to ADEQ in case of a violation or exceedance as per 2.7.3.

2.5.8 Analytical Methodology

All samples collected for compliance monitoring shall be analyzed using Arizona state-approved methods. If no state-approved method exists, then any appropriate EPA-approved method shall be used. Regardless of the method used, the detection limits must be sufficient to determine compliance with the regulatory limits of the parameters specified in this permit. If all methods have detection limits higher than the applicable limit, the permittee shall follow the contingency requirements of Section 2.6 and may propose "other actions" including amending the permit to set higher limits. Analyses shall be performed by a laboratory licensed by the Arizona Department of Health Services, Office of Laboratory Licensure and Certification unless exempted under A.R.S. § 36-495.02. For results to be considered valid, all analytical work shall meet quality control standards specified in the approved methods. A list of Arizona state-certified laboratories can be obtained at the address below:

Arizona Department of Health Services
Office of Laboratory Licensure and Certification

250 North 17th Avenue
Phoenix, Arizona 85007
Phone: (602) 364-0720

2.5.9 Installation and Maintenance of Monitoring Equipment

Monitoring equipment required by this permit shall be installed and maintained so that representative samples required by the permit can be collected. If new groundwater wells are determined to be necessary, the construction details shall be submitted to the ADEQ Groundwater Section for approval prior to installation and the permit shall be amended to include any new monitoring points.

2.6 Contingency Plan Requirements
[A.R.S. § 49-243(K)(3), (K)(7) and A.A.C. R18-9-A204 and R18-9-A205]

2.6.1 General Contingency Plan Requirements

At least one copy of this permit and the approved contingency and emergency response plan submitted in the application shall be maintained at the location where day-to-day decisions regarding the operation of the facility are made. The permittee shall be aware of and follow the contingency and emergency plans.

Any AL exceedance, or violation of an AQL, DL, or other permit condition shall be reported to ADEQ following the reporting requirements in Section 2.7.3.

Some contingency actions involve verification sampling. Verification sampling shall consist of the first follow-up sample collected from a location that previously indicated a violation or the exceedance of an AL. Collection and analysis of the verification sample shall use the same protocols and test methods to analyze for the pollutant or pollutants that exceeded an AL or violated an AQL or DL. The permittee is subject to enforcement action for the failure to comply with any contingency actions in this permit. Where verification sampling is specified in this permit, it is the option of the permittee to perform such sampling. If verification sampling is not conducted within the timeframe allotted, ADEQ and the permittee shall presume the initial sampling result to be confirmed as if verification sampling had been conducted. The permittee is responsible for compliance with contingency plans relating to the exceedance of an AL or violation of a DL, AQL or any other permit condition.

2.6.1.1 Vadose Zone Monitoring and Injection Contingencies

Vadose zone wells are monitored and cleaned on a regular basis by the operators. Should the wells not be performing at full capacity, discharge is changed to an alternate recharge basin or directly to the wash.

2.6.2 Exceeding of Alert Levels and Performance Levels

2.6.2.1 Exceeding of Performance Levels Set for Operational Conditions

1. If an operational performance level (PL) set in Section 4.2, Table III has been exceeded the permittee shall:
   a. Notify the ADEQ Groundwater Section (by phone, see Section 2.7.5) within five days of becoming aware of the exceedance.
   b. Submit a written report to the ADEQ Groundwater Section within 30 days after becoming aware of the exceedance. The report shall document all of the following:
      (1) A description of the exceedance and its cause;
      (2) The period of the exceedance, including exact date(s) and time(s), if known, and the anticipated time period during which the exceedance is expected to continue;
      (3) Any action taken or planned to mitigate the effects of the exceedance or spill, or

to eliminate or prevent recurrence of the exceedance or spill;

(4) Any monitoring activity or other information which indicates that any pollutants would be reasonably expected to cause a violation of an AWQS; and

(5) Any malfunction or failure of pollution control devices or other equipment or process.

The facility is no longer on alert status once the operational indicator no longer indicates that a PL is being exceeded. The permittee shall, however, complete all tasks necessary to return the facility to its pre-alert operating condition.

2.6.2.2 Exceeding of Alert Levels (ALs) Set for Discharge Monitoring

1. If an AL set in Section 4.2, Table IA-1 has been exceeded, the permittee shall immediately investigate to determine the cause of the AL exceedance. The investigation shall include the following:
   a. Inspection, testing, and assessment of the current condition of all treatment or pollutant discharge control systems that may have contributed to the AL exceedance;
   b. Review of recent process logs, reports, and other operational control information to identify any unusual occurrences; and
   c. Sampling of individual waste streams composing the wastewater for the parameters being exceeded;
2. The permittee shall initiate actions identified in the approved contingency plan referenced in Section 5.0 and specific contingency measures identified in Section 2.6 to resolve any problems identified by the investigation, which may have led to an AL exceedance. To implement any other corrective action the permittee shall obtain prior approval from ADEQ according to Section 2.6.6.
3. Within 30 days of an AL exceedance, the permittee shall submit the laboratory results to the ADEQ Groundwater Section, along with a summary of the findings of the investigation, the cause of the AL exceedance, and actions taken to resolve the problem.
4. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions or other actions.

2.6.2.2.1 Exceeding Permit Flow Limit

1. If the Alert Level (AL) for average monthly flow in Section 4.2, Table IA-1, has been exceeded, the permittee shall begin construction of the next phase, or submit a report to the ADEQ Groundwater Section detailing the reasons it is not necessary to begin the next phase of construction. Acceptance of the report instead of beginning the next phase of construction requires ADEQ approval.
2. Acceptance of the report instead of an application for expansion requires ADEQ approval.

2.6.2.3 Exceeding of Alert Levels in Groundwater Monitoring

2.6.2.3.1 Alert Levels for Indicator Parameters

No ALs have been established for indicator parameters.

2.6.2.3.2 Alert Levels for Pollutants with Numeric Aquifer Water Quality Standards

1. In the case of an exceedance of an AL for a pollutant set in Section 4.2, Table II, the permittee may conduct verification sampling within five days of becoming aware of the exceedance. The permittee may use results of another

sample taken between the date of the last sampling event and the date of receiving the result as verification.

2. If verification sampling confirms the AL exceedance or if the permittee opts not to perform verification sampling, then the permittee shall increase the frequency of monitoring for the pollutants set in Section 4.2, Table II as follows:

Specified Monitoring Frequency (Section 4.2, Table II)	Monitoring Frequency for AL Exceedance
Daily	Daily
Weekly	Daily
Monthly	Weekly
Quarterly	Monthly
Semi-annually	Quarterly
Annually	Quarterly

In addition, the permittee shall immediately initiate an investigation of the cause of the AL exceedance, including inspection of all discharging units and all related pollution control devices, review of any operational and maintenance practices that might have resulted in an unexpected discharge, and hydrologic review of groundwater conditions including upgradient water quality.

3. The permittee shall initiate actions identified in the approved contingency plan referenced in Section 5.0 and specific contingency measures identified in Section 2.6 to resolve any problems identified by the investigation which may have led to an AL exceedance. To implement any other corrective action the permittee shall obtain prior approval from ADEQ according to Section 2.6.6. Alternatively, the permittee may submit a technical demonstration, subject to written approval by the Groundwater Section, that although an AL has been exceeded, pollutants are not reasonably expected to cause a violation of an AQL. The demonstration may propose a revised AL or monitoring frequency for approval in writing by the Groundwater Section.
4. Within 30 days after confirmation of an AL exceedance, the permittee shall submit the laboratory results to the Groundwater Section along with a summary of the findings of the investigation, the cause of the exceedance, and actions taken to resolve the problem.
5. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions or other actions.
6. The increased monitoring required as a result of an AL exceedance may be reduced to the monitoring frequency in Section 4.2, Table II if the results of four sequential sampling events demonstrate that no parameters exceed the AL.
7. If the increased monitoring required as a result of an AL exceedance continues for more than six (6) sequential sampling events, the permittee shall submit a second report documenting an investigation of the continued AL exceedance within 30 days of the receipt of laboratory results of the sixth (6^{th}) sampling event.

2.6.2.3.3 Alert Levels to Protect Downgradient Users from Pollutants Without Numeric Aquifer Water Quality Standards

Not required at the time of permit issuance.

2.6.2.3.4 Alert Level for Groundwater Level

1. If monitoring indicates the groundwater level is not within the allowable range established by the Alert Level (AL) in Section 4.2, Table II, the permittee shall submit a written report within 30 days after becoming aware of the exceedance. The report shall document the following:
   a. the as-built configuration of the well, including the screened interval;
   b. all groundwater level measurements available for the well;
   c. a discussion and analysis of any trends or seasonal variations in the groundwater level measurements;
   d. information on groundwater recharge, withdrawal, or other hydrologic conditions in the vicinity of the well, and;
   e. any other pertinent information obtained by the permittee.
2. If monitoring indicates the groundwater level is not within the allowable range established by the Alert Level (AL) in Section 4.2, Table II, for more than three (3) sequential sampling events, the permittee shall submit a second report which evaluates the cause(s) of the exceedance and recommends whether the well should be replaced pursuant to Section 2.5.4.1. The report shall discuss and demonstrate whether samples representative of the water quality of the relevant aquifer can be practicably obtained from the well.
3. Upon review of the submitted report, the Department may amend the permit to require replacement of the well, require additional permit conditions, or other actions.

2.6.3 Discharge Limit Violation

1. If a DL set in Section 4.2, Table I-1 has been violated, the permittee shall immediately investigate to determine the cause of the violation. The investigation shall include the following:
   a. Inspection, testing, and assessment of the current condition of all treatment or pollutant discharge control systems that may have contributed to the violation;
   b. Review of recent process logs, reports, and other operational control information to identify any unusual occurrences; and
   c. Sampling of individual waste streams composing the wastewater for the parameters in violation, if necessary to identify the cause of the violation.

   The permittee also shall submit a report according to Section 2.7.3, which includes a summary of the findings of the investigation, the cause of the violation, and actions taken to resolve the problem. The permittee shall consider and ADEQ may require corrective action that may include control of the source of discharge, cleanup of affected soil, surface water or groundwater, and mitigation of the impact of pollutants on existing uses of the aquifer. Corrective actions shall either be specifically identified in this permit, included in an ADEQ approved contingency plan, or separately approved according to Section 2.6.6.
2. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, or other actions.

2.6.4 Aquifer Quality Limit Violation

1. If a DL set in Section 4.2, Table II, has been violated, the permittee shall immediately investigate to determine the cause. The investigation shall include the following:
   a. Inspection, testing, and assessment of the current condition of all treatment or pollutant discharge control systems that may have contributed to the violation;
   b. Review of recent process logs, reports, and other operational control information to identify any unusual occurrences;
   c. If the investigation procedures indicated in (a) and (b) above fail to reveal the cause of the violation, the permittee shall sample individual waste streams composing the wastewater for the parameters in violation, if necessary to identify the cause of the violation.

The permittee shall submit a report according to Section 2.7.3, which includes a summary of the findings of the investigation, the cause of the violation, and actions taken to resolve the problem. The permittee shall consider and ADEQ may require corrective action that may include control of the source of discharge, cleanup of affected soil, surface water or groundwater, notification of downstream or downgradient users who may be directly affected by the discharge, and mitigation of the impact of pollutants on existing uses of the aquifer. Corrective actions shall either be specifically identified in this permit, included in an ADEQ-approved contingency plan, or separately approved according to Section 2.6.6.

2. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions, or other action.

2.6.5 Emergency Response and Contingency Requirements for Unauthorized Discharges pursuant to A.R.S. § 49-201(12) and pursuant to A.R.S. § 49-241

2.6.5.1 Duty to Respond

The permittee shall act immediately to correct any condition resulting from a discharge pursuant to A.R.S. § 49-201(12) if that condition could pose an imminent and substantial endangerment to public health or the environment.

2.6.5.2 Discharge of Hazardous Substances or Toxic Pollutants

In the event of any unauthorized discharge pursuant to A.R.S. § 49-201(12) of suspected hazardous substances (A.R.S. § 49-201(19)) or toxic pollutants (A.R.S. § 49-243(I)) on the facility site, the permittee shall promptly isolate the area and attempt to identify the discharged material. The permittee shall record information, including name, nature of exposure and follow-up medical treatment, if necessary, on persons who may have been exposed during the incident. The permittee shall notify the ADEQ Groundwater Section within 24 hours of discovering the discharge of hazardous material which (a) has the potential to cause an AWQS or AQL exceedance, or (b) could pose an endangerment to public health or the environment.

2.6.5.3 Discharge of Non-hazardous Materials

In the event of any unauthorized discharge pursuant to A.R.S. § 49-201(12) of non-hazardous materials from the facility, the permittee shall promptly attempt to cease the discharge and isolate the discharged material. Discharged material shall be removed and the site cleaned up as soon as possible. The permittee shall notify the ADEQ Groundwater Section within 24 hours of discovering the discharge of non-hazardous material which has the potential to cause an AQL exceedance, or could pose an endangerment to public health or the environment.

2.6.5.4 Reporting Requirements

The permittee shall submit a written report for any unauthorized discharges reported under Sections 2.6.5.2 and 2.6.5.3 to the ADEQ Groundwater Section within 30 days of the discharge or as required by subsequent ADEQ action. The report shall summarize the event, including any human exposure, and facility response activities and include all information specified in Section 2.7.3. If a notice is issued by ADEQ subsequent to the discharge notification, any additional information requested in the notice shall also be submitted within the time frame specified in the notice. Upon review of the submitted report, ADEQ may require additional monitoring or corrective actions.

2.6.6 Corrective Actions

Specific contingency measures identified in Section 2.6 have already been approved by ADEQ and do not require written approval to implement.

With the exception of emergency response actions taken under Section 2.6.5, the permittee shall obtain written approval from the Groundwater Section prior to implementing a corrective action to accomplish any of the following goals in response to exceedance of an AL or violation of an AQL, DL, or other permit condition:

1. Control of the source of an unauthorized discharge;
2. Soil cleanup;
3. Cleanup of affected surface waters;
4. Cleanup of affected parts of the aquifer;
5. Mitigation to limit the impact of pollutants on existing uses of the aquifer.

Within 30 days of completion of any corrective action, the operator shall submit to the ADEQ Groundwater Section, a written report describing the causes, impacts, and actions taken to resolve the problem.

2.7 Reporting and Recordkeeping Requirements [A.R.S. § 49-243(K)(2) and A.A.C. R18-9-A206(B) and R18-9-A207]

2.7.1 Self-monitoring Report Form

1. The permittee shall complete the Self-Monitoring Report Form (SMRF) provided by ADEQ, and submit the completed report to the Groundwater Section. The permittee shall use the format devised by ADEQ.
2. The permittee shall complete the SMRF to the extent that the information reported may be entered on the form. If no information is required during a reporting period, the permittee shall enter "not required" on the form, include an explanation, and submit the form to the Groundwater Section.
3. The tables contained in Section 4.0 list the monitoring parameters and the frequencies for reporting results on the SMRF:

   - Table IA-1, Discharge Monitoring
   - Table IA-2, Vadose Zone Monitoring
   - Table II, Groundwater Quality Monitoring for POC #1 and POC #2

   The parameters listed in the above-identified tables from Section 4.2 are the only parameters for which SMRF reporting is required.

   - Table III, Facility Inspection (Operational Monitoring) – Log Book

   The parameters listed in the above-identified table from Section 4.2 are the only parameters shall record the inspection performance levels in a log book as per Section 2.7.2.
4. In addition to the SMRF, the information contained in A.A.C. R18-9-A206(B)(1) shall be included for exceeding an AL or violation of an AQL, DL, or any other permit condition being reported in the current reporting period.

2.7.2 Operation Inspection / Log Book Recordkeeping

A signed copy of this permit shall be maintained at all times at the location where day-to-day decisions regarding the operation of the facility are made. A log book (paper copies, forms, or electronic data) of the inspections and measurements required by this permit shall be maintained at the location where day-to-day decisions are made regarding the operation of the facility. The log book shall be retained for ten years from the date of each inspection, and upon request, the permit and the log book shall be made immediately available for review by ADEQ personnel. The information in the log book shall include, but not be limited to, the following information as applicable:

1. Name of inspector;
2. Date and time inspection was conducted;

3. Condition of applicable facility components;
4. Any damage or malfunction, and the date and time any repairs were performed;
5. Documentation of sampling date and time; and
6. Any other information required by this permit to be entered in the log book.

Monitoring records for each measurement shall comply with A.A.C. R18-9-A206(B)(2).

2.7.3 Permit Violation and Alert Level Status Reporting

1. The permittee shall notify the Groundwater Section in writing (see Section 2.7.5) within five days (except as provided in Section 2.6.5) of becoming aware of an AL exceedance, or violation of any permit condition, AQL, or DL.
2. The permittee shall submit a written report to the Groundwater Section within 30 days of becoming aware of the violation of any permit condition, AQL, or DL. The report shall document all of the following:
   a. Identification and description of the permit condition for which there has been a violation and a description of the cause;
   b. The period of violation including exact date(s) and time(s), if known, and the anticipated time period during which the violation is expected to continue;
   c. Any corrective action taken or planned to mitigate the effects of the violation, or to eliminate or prevent a recurrence of the violation;
   d Any monitoring activity or other information which indicates that any pollutants would be reasonably expected to cause a violation of an AWQS;
   e. Proposed changes to the monitoring which include changes in constituents or increased frequency of monitoring; and
   f. Description of any malfunction or failure of pollution control devices or other equipment or processes.

2.7.4 Operational, Other or Miscellaneous Reporting

The permittee shall record the information as required in Table III in the facility log book as per Section 2.7.2, and report to ADEQ any violations or exceedances as per Section 2.7.3.

2.7.4 Operational, Other or Miscellaneous Reporting

The permittee shall record the information as required in Section 4.2, Table III in the facility log book as per Section 2.7.2, and report to the Groundwater Section any violations or exceedances as per Section 2.7.3.

2.7.4.1 Evaluation Report for POC well # 1 and POC well # 2

Evaluate the construction of POCs wells to determine if it meets the following purposes:
- The well is screened across the water table to adequately monitor potential impacts to the water table by the AZPDES discharge

The permittee shall submit an evaluation report per Section 3.0, Compliance Schedule Item #1. The evaluation report shall consist of the following:
- Screen interval of the POC wells reported
  - As depth in feet below land surface (ft bls) and
  - As elevation in feet above mean sea level (ft amsl)
- Recent depth to groundwater in the well
- Hydrograph of POC wells showing depth to water trends
- Evaluation on appropriateness of current well
- Proposed course of action – the existing POC wells is appropriate or POC wells to be replaced or reconstructed.

2.7.5 Reporting Location

All Self-Monitoring Report Forms (SMRFs) shall be submitted to:

Arizona Department of Environmental Quality
Groundwater Section
Mail Code 5415B-3
1110 West Washington Street
Phoenix, Arizona 85007
Phone (602) 771-4571

Or

Through the myDEQ portal accessible on the ADEQ website at:
http://www.azdeq.gov/welcome-mydeq

All documents required by this permit to be submitted to the Groundwater Section shall be directed to:

Arizona Department of Environmental Quality
Groundwater Section
Mail Code: 5415B-3
1110 West Washington Street
Phoenix, Arizona 85007
Phone (602) 771-4999

2.7.6 Reporting Deadline

The following table lists the quarterly report due dates:

Monitoring conducted during quarter:	Quarterly Report due by:
January-March	April 30
April-June	July 30
July-September	October 30
October-December	January 30

The following table lists the semi-annual and annual report due dates:

Monitoring conducted:	Report due by:
Semi-annual: January-June	July 30
Semi-annual: July-December	January 30
Annual: January-December	January 30

2.7.7 Changes to Facility Information in Section 1.0

The Groundwater Section, and the Groundwater Section, shall be notified within ten days of any change of facility information including Facility Name, Permittee Name, Mailing or Street Address, Facility Contact Person, or Emergency Telephone Number.

2.8 Temporary Cessation [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A209(A)]

The permittee shall give written notice to the Groundwater Section before ceasing operation of the facility for a period of 60 days or greater. The permittee shall take the following measures upon temporary cessation:

1. If applicable, direct the wastewater flows from the facility to another state-approved wastewater treatment facility;
2. Correct the problem that caused the temporary cessation of the facility; and
3. Notify ADEQ Groundwater Section with a monthly facility status report describing the activities conducted on the treatment facility to correct the problem.
4. SMRF reporting is still required during Temporary Cessation.

At the time of notification the permittee shall submit for ADEQ approval a plan for maintenance of discharge control systems and for monitoring during the period of temporary cessation. Immediately following ADEQ approval, the permittee shall implement the approved plan. If necessary, ADEQ shall amend permit conditions to incorporate conditions to address temporary cessation. During the period of temporary cessation, the permittee shall provide written notice to the Groundwater Section of the operational status of the facility every three years. If the permittee intends to permanently cease operation of any facility, the permittee shall submit closure notification, as set forth in Section 2.9 below.

2.9 Closure [A.R.S. §§ 49-243(K)(6), 49-252 and A.A.C. R18-9-A209(B)]

For a facility addressed under this permit, the permittee shall give written notice of closure to the Groundwater Section of the intent to cease operation without resuming activity for which the facility was designed or operated.

2.9.1 Closure Plan

Within 90 days following notification of closure, the permittee shall submit for approval to the Groundwater Section, a closure plan which meets the requirements of A.R.S. § 49-252 and A.A.C. R18-9-A209(B)(3).

If the closure plan achieves clean-closure immediately, ADEQ shall issue a letter of approval to the permittee. If the closure plan contains a schedule for bringing the facility to a clean-closure configuration at a future date, ADEQ may incorporate any part of the schedule as an amendment to this permit.

2.9.2 Closure Completion

Upon completion of closure activities, the permittee shall give written notice to the Groundwater Section indicating that the approved closure plan has been implemented fully and providing supporting documentation to demonstrate that clean-closure has been achieved (soil sample results, verification sampling results, groundwater data, as applicable). If clean-closure has been achieved, ADEQ shall issue a letter of approval to the permittee at that time. If any of the following conditions apply, the permittee shall follow the terms of post-closure stated in this permit:

1. Clean-closure cannot be achieved at the time of closure notification or within one year thereafter under a diligent schedule of closure actions;
2. Further action is necessary to keep the facility in compliance with the AWQS at the applicable POC;
3. Continued action is required to verify that the closure design has eliminated discharge to the extent intended;
4. Remediation or mitigation measures are necessary to achieve compliance with Title 49, Ch. 2; and
5. Further action is necessary to meet property use restrictions.
6. SMRF submittals are still required until Clean Closure is issued.

2.10 Post-closure [A.R.S. §§ 49-243(K)(6), 49-252 and A.A.C. R18-9 A209(C)]

Post-closure requirements shall be established based on a review of facility closure actions and will be subject to review and approval by the Groundwater Section.

In the event clean-closure cannot be achieved pursuant to A.R.S. § 49-252, the permittee shall submit for approval to the Groundwater Section a post-closure plan that addresses post-closure maintenance and monitoring actions at the facility. The post-closure plan shall meet all requirements of A.R.S. §§ 49-

201(30) and 49-252 and A.A.C. R18-9-A209(C). Upon approval of the post-closure plan, this permit shall be amended or a new permit shall be issued to incorporate all post-closure controls and monitoring activities of the post-closure plan.

2.10.1 Post-Closure Plan

A specific post-closure plan may be required upon the review of the closure plan.

2.10.2 Post-Closure Completion

Not required at the time of permit issuance.

3.0 COMPLIANCE SCHEDULE [A.R.S. § 49-243(K)(5) and A.A.C. R18-9-A208]

Unless otherwise indicated, for each compliance schedule item listed below, the permittee shall submit the required information to the Groundwater Section.

No.	Description	Due by:	Permit Amendment Required?
1	The permittee shall evaluate the POC well #1 and POC well #2 and submit an evaluation report per Section 2.7.4.1.	Within 180 days of permit issuance	No

4.0 TABLES OF MONITORING REQUIREMENTS

4.1 PRE-OPERATIONAL MONITORING (OR CONSTRUCTION REQUIREMENTS

TABLE I

INITIAL START-UP PLAN

Not applicable.

4.0 TABLES OF MONITORING REQUIREMENTS

4.2 COMPLIANCE (or OPERATIONAL) MONITORING

TABLE 1A-1
ROUTINE DISCHARGE MONITORING

Sampling Point Number	**Sampling Point Identification**		**Latitude**		**Longitude**
1	Flow meter located downstream of chlorine contact chamber for Total Flow		33° 21' 40" North		111° 33' 32" West
2	Flow meter located on the recharge line to monitor Recharge Flow		33° 21' 39" North		111° 33' 31" West
Parameter	**AL[1]**	**DL[2]**	**Units**	**Sampling Frequency**	**Reporting Frequency**
Total Flow[3]: Daily[4]	Not Established[5]	Not Established	mgd[6]	Daily	Quarterly
Total Flow: Monthly Average[7]	1.9	2.1	mgd	Monthly Calculation	Quarterly
AZPDES Flow: Daily	Not Established	Not Established	mgd	Daily	Quarterly
AZPDES Flow: Monthly Average	1.9	2.1	mgd	Monthly Calculation	Quarterly
Recharge Flow: Daily	Not Established	Not Established	mgd	Daily	Quarterly
Recharge Flow: Monthly Average	1.9	2.1	mgd	Monthly Calculation	Quarterly

[1] AL = Alert Level
[2] DL = Discharge Limit
[3]Total flow for all methods of disposal (AZPDES and Recharge).
[4]Flow shall be measured using a continuous recording flow meter which totals the flow daily.
[5] Not Established means monitoring is required but no limits are specified.
[6] mgd= million gallons per day
[7]Monthly = Calculated value = Average of daily flow values in a month.

4.0 TABLES OF MONITORING REQUIREMENTS

4.2 COMPLIANCE (or OPERATIONAL) MONITORING

TABLE 1A-1
ROUTINE DISCHARGE MONITORING (Continued)

Sampling Point Number	**Sampling Point Identification**		**Latitude**		**Longitude**
2	Flow meter located on the recharge line to monitor Recharge Flow		33° 21' 39" North		111° 33' 31" West
Parameter	**AL**[8]	**DL**[9]	**Units**	**Sampling Frequency**	**Reporting Frequency**
Fecal Coliform (single sample maximum)	Not Established[10]	800	MPN[11]	Daily[12]	Quarterly
Fecal Coliform four (4) of seven (7) samples in a week[13]	Not Established	200[14]	MPN	Weekly Evaluation	Quarterly
Total Nitrogen[15]: Five-sample rolling geometric mean[16]	8.0	10.0	mg/l[17]	Monthly Calculation	Quarterly
Metals (total):					
Antimony	0.0048	0.006	mg/l	Quarterly	Quarterly
Arsenic	0.04	0.05	mg/l	Quarterly	Quarterly
Barium	1.60	2.00	mg/l	Quarterly	Quarterly
Cyanide (as free cyanide)	0.16	0.2	mg/l	Quarterly	Quarterly
Fluoride	3.2	4.0	mg/l	Quarterly	Quarterly
Lead	0.04	0.05	mg/l	Quarterly	Quarterly
Mercury	0.0016	0.002	mg/l	Quarterly	Quarterly
Nickel	0.08	0.1	mg/l	Quarterly	Quarterly
Selenium	0.04	0.05	mg/l	Quarterly	Quarterly
Thallium	0.0016	0.002	mg/l	Quarterly	Quarterly

[8] AL = Alert Level
[9] DL = Discharge Limit
[10] Not Established means monitoring is required but no limits are specified.
[11] MPN = Most Probable Number / 100 ml sample. For MPN, a value of <2.2 shall be considered to be non-detect.
[12] For fecal coliform, "daily" sampling means every day in which a sample can practicably be obtained and delivered in sufficient time for proper analysis, provided that no less than four samples in each week are obtained and analyzed.
[13] Week means a seven-day period starting on Sunday and ending on the following Saturday. The reporting form for this parameter consists of 13 weeks per quarter.
[14] Fecal coliform 4 of 7 samples requires entering "Compliance" or "Non-compliance" on the SMRF for each week of the reporting period. Evaluate the daily fecal coliform results for that week (Sunday through Saturday). If, of these seven days, four or more of the daily fecal coliform results are <200, report "Compliance" for that week's entry on the SMRF. If four or more of the daily fecal coliform results are >200, report "Non-compliance for that week's entry on the SMRF.
[15] Total Nitrogen is equal to nitrate as N plus nitrite as N plus TKN.
[16] The five-sample rolling geometric mean is determined by multiplying the five (5) most recent monthly sample values together then taking the fifth root of the product. *Example:* $GM_5 = \sqrt[5]{(m_1)(m_2)(m_3)(m_4)(m_5)}$
[17] mg/l = milligrams per liter

4.0 TABLES OF MONITORING REQUIREMENTS

4.2 COMPLIANCE (or OPERATIONAL) MONITORING

TABLE 1A-1
ROUTINE DISCHARGE MONITORING (Continued)

Parameter	AL	AQL	Units	Sampling Frequency	Reporting Frequency
Volatile and Semi-volatile Organic Compounds (VOCs and SVOCs):					
Benzene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Carbon tetrachloride	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
o-Dichlorobenzene	0.48	0.6	mg/l	Semi-Annually	Semi-Annually
para-Dichlorobenzene	0.06	0.075	mg/l	Semi-Annually	Semi-Annually
1,2-Dichloroethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
1,1-Dichloroethylene	0.0056	0.007	mg/l	Semi-Annually	Semi-Annually
cis-1,2-Dichloroethylene	0.056	0.07	mg/l	Semi-Annually	Semi-Annually
trans-1,2-Dichloroethylene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Dichloromethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
1,2-Dichloropropane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Ethylbenzene	0.56	0.7	mg/l	Semi-Annually	Semi-Annually
Monochlorobenzene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Styrene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Tetrachloroethylene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Toluene	0.8	1.0	mg/l	Semi-Annually	Semi-Annually
Trihalomethanes (total)	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
1,1,1-Trichloroethane	0.16	0.20	mg/l	Semi-Annually	Semi-Annually
1,1,2 - Trichloroethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Trichloroethylene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Vinyl Chloride	0.0016	0.002	mg/l	Semi-Annually	Semi-Annually
Xylenes (Total)	8.0	10.0	mg/l	Semi-Annually	Semi-Annually

4.2 COMPLIANCE (or OPERATIONAL) MONITORING

TABLE 1A-2
VADOSE ZONE INJECTION WELL MONITORING[18]

Sampling Point Number	Well Name	Latitude	Longitude	ADWR Registration No.	Screened Interval (ft bgs)
3	VZW 1-1	33° 21' 42.36" N	111° 33' 29.39" W	55-221688	0.5-98
4	VZW 1-2	33° 21' 41.55" N	111° 33' 29.94" W	55-221689	0.5-98
5	VZW 1-4	33° 21' 41.93" N	111° 33' 29.28" W	55-206135	0.5-98
6	VZW 1-5	33° 21' 40.93" N	111° 33' 29.85" W	55-206136	0.5-98
7	VZW 1-6	33° 21' 42.09" N	111° 33' 29.75" W	55-221690	0.5-98
8	VZW 1-7	33° 21' 41.27" N	111° 33' 29.19" W	55-221691	0.5-98
9	VZW 2-1	33° 21' 39.31" N	111° 33' 36.64" W	55-221692	0.5-98
10	VZW 2-2	33° 21' 49.74" N	111° 33' 35.95" W	55-206137	0.5-98
11	VZW 2-3	33° 21' 38.58" N	111° 33' 36.58" W	55-212738	0.5-98
12	VZW 2-4	33° 21' 39.20" N	111° 33' 35.37" W	55-221693	0.5-98
13	VZW 2-5	33° 21' 38.58" N	111° 33' 35.75" W	55-221694	0.5-98
14	VZW 2-6	33° 21' 39.20" N	111° 33' 34.56" W	55-206138	0.5-98
15	VZW 2-7	33° 21' 38.05" N	111° 33' 35.20" W	55-212737	0.5-98
16	VZW 2-8	33° 21' 38.48" N	111° 33' 34.52" W	55-221695	0.5-98
17	VZW 3-1	33° 21' 37.99" N	111° 33' 33.31" W	55-221696	0.5-98
18	VZW 3-2	33° 21' 38.46" N	111° 33' 32.64" W	55-206139	0.5-98
19	VZW 3-3	33° 21' 37.30" N	111° 33' 33.28" W	55-212724	0.5-98
20	VZW 3-4	33° 21' 37.87" N	111° 33' 32.09" W	55-221697	0.5-98
21	VZW 3-5	33° 21' 37.24" N	111° 33' 32.44" W	55-221698	0.5-98
22	VZW 3-6	33° 21' 37.92" N	111° 33' 31.20" W	55-206140	0.5-98
23	VZW 3-7	33° 21' 36.75" N	111° 33' 31.85" W	55-212723	0.5-98
24	VZW 3-8	33° 21' 37.17" N	111° 33' 31.17" W	55-221699	0.5-98
25	VZW 4-1	33° 21' 36.76" N	111° 33' 29. 94" W	55-225144	4.5-98
26	VZW 4-2	33° 21' 37.16" N	111° 33' 29.30" W	55-212740	0.5-98
27	VZW 4-3	33° 21' 36.00" N	111° 33' 29.94" W	55-212722	0.5-98
28	VZW 4-4	33° 21' 36.68" N	111° 33' 28.69" W	55-225145	4.5-98
29	VZW 4-5	33° 21' 36.02" N	111° 33' 29.05" W	55-225146	4.5-98
30	VZW 4-6	33° 21' 36.61" N	111° 33' 27.86" W	55-212739	0.5-98
31	VZW 4-7	33° 21' 35.45" N	111° 33' 28.50" W	55-212721	0.5-98
32	VZW 4-8	33° 21' 35.93" N	111° 33' 27.79" W	55-225147	4.5-98
33	VZW 5-1	33° 21' 37.41" N	111° 33' 37.22" W	55-212720	0.5-98
34	VZW 5-2	33° 21' 36.88" N	111° 33' 35.84" W	55-212785	0.5-98
35	VZW 6-1	33° 21' 36.16" N	111° 33' 33.97" W	55-212781	0.5-98
36	VZW 6-2	33° 21' 35.59" N	111° 33' 32.49" W	55-212782	0.5-98
37	VZW 7-1	33° 21' 38.84" N	111° 33' 30.58" W	55-212783	0.5-98
38	VZW 7-2	33° 21' 34.29" N	111° 33' 29.14" W	55-212784	0.5-98

[18] Water level monitoring of the vadose wells is completed at the monitoring wells. Level shall be less than 50' per ADWR, as indicated in Table IA-2.

4.2 COMPLIANCE (or OPERATIONAL) MONITORING

TABLE IA-2
VADOSE ZONE INJECTION WELL MONITORING

Parameter	AL[19]	Units	Sampling Frequency	Reporting Frequency
Depth to Groundwater[20]	50	Feet bgs[21]	Monthly	Quarterly
Recharge Flow: Daily[22]	NE[23]	mgd	Daily	Quarterly
Recharge Flow: Monthly Average	2.1	mgd	Monthly Calculation	Quarterly

[19] AL = Alert Level
[20] See Section 2.6.1.1.
[21] Feet bgs = Feet below ground surface.
[22] If there is no flow, or if a well has not yet been constructed, report "No Flow" (Code 05) on the SMRF.
[23] NE = Not Established = Monitoring is required but no limits are specified.

4.2 COMPLIANCE (or OPERATIONAL) MONITORING

TABLE II
GROUNDWATER MONITORING

Sampling Point Number	**Sampling Point Identification**			**Latitude**	**Longitude**
39	MW #1- West Side of Recharge Basins			33° 21' 43"N	111° 33' 31"W
Parameter	**AL**[24]	**AQL**[25]	**Units**	**Sampling Frequency**	**Reporting Frequency**
Water Level[26]	240-300[27]	Not Established[28]	Feet bgs[29]	Quarterly	Quarterly
Nitrate-Nitrite as N	8.0	10.0	mg/l	Quarterly	Quarterly
Nitrate as N	8.0	10.0	mg/l	Quarterly	Quarterly
Nitrite as N	0.8	1.0	mg/l	Quarterly	Quarterly
Total Nitrogen[30]	8.0	10.0	mg/l[31]	Quarterly	Quarterly
Total Kjeldahl Nitrogen (TKN)	Not Established	Not Established	mg/l	Quarterly	Quarterly
Fecal Coliform	Not Established	Not Established	mg/l	Quarterly	Quarterly
Total Coliform	Absence	Absence	P/A[32]	Quarterly	Quarterly
Metals (total):					
Antimony	0.0048	0.006	mg/l	Quarterly	Quarterly
Arsenic	0.04	0.05	mg/l	Quarterly	Quarterly
Barium	1.60	2.00	mg/l	Quarterly	Quarterly
Beryllium	0.0032	0.004	mg/l	Quarterly	Quarterly
Cadmium	0.008	0.010	mg/l	Quarterly	Quarterly
Chromium	0.08	0.1	mg/l	Quarterly	Quarterly
Cyanide (as free	0.16	0.2	mg/l	Quarterly	Quarterly
Fluoride	3.2	4.0	mg/l	Quarterly	Quarterly
Lead	0.04	0.05	mg/l	Quarterly	Quarterly
Mercury	0.0016	0.002	mg/l	Quarterly	Quarterly
Nickel	0.08	0.1	mg/l	Quarterly	Quarterly
Selenium	0.04	0.05	mg/l	Quarterly	Quarterly
Thallium	0.0016	0.002	mg/l	Quarterly	Quarterly

[24] AL = Alert Level
[25] AQL = Aquifer Quality Limit
[26] See Section 2.6.2.3.4.
[27] If the water level does not fall within this range, the AL is considered to be exceeded.
[28] Not Established means monitoring is required, but no limits are specified.
[29] bgs = below ground surface
[30] The calculation for Total Nitrogen is Nitrate as N plus Nitrite as N plus TKN.
[31] mg/l = milligrams per liter
[32] P/A = Presence or absence of total coliforms in a 100-milliliter sample. If total coliforms are present, enter "Non-compliance on the SMRF. If total coliforms are absent, enter "Compliance" on the SMRF.

4.2 COMPLIANCE (or OPERATIONAL) MONITORING

TABLE II
GROUNDWATER MONITORING (continued)

Parameter	AL	AQ	Units	Sampling Frequency	Reporting Frequency
Volatile and Semi-Volatile Organic Compounds (VOCs and SVOCs):					
Benzene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Carbon tetrachloride	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
o-Dichlorobenzene	0.48	0.6	mg/l	Semi-Annually	Semi-Annually
para-Dichlorobenzene	0.06	0.075	mg/l	Semi-Annually	Semi-Annually
1,2-Dichloroethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
1,1-Dichloroethylene	0.0056	0.007	mg/l	Semi-Annually	Semi-Annually
cis-1,2-Dichloroethylene	0.056	0.07	mg/l	Semi-Annually	Semi-Annually
trans-1,2-Dichloroethylene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Dichloromethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
1,2-Dichloropropane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Ethylbenzene	0.56	0.7	mg/l	Semi-Annually	Semi-Annually
Hexachlorobenzene	0.0008	0.001	mg/l	Semi-Annually	Semi-Annually
Hexachlorocyclopentadiene	0.04	0.05	mg/l	Semi-Annually	Semi-Annually
Monochlorobenzene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Styrene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Tetrachloroethylene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Toluene	0.8	1.0	mg/l	Semi-Annually	Semi-Annually
Trihalomethanes (total)[33]	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
1,1,1-Trichloroethane	0.16	0.2	mg/l	Semi-Annually	Semi-Annually
1,2,4 - Trichlorobenzene	0.056	0.07	mg/l	Semi-Annually	Semi-Annually
1,1,2 - Trichloroethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Trichloroethylene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Vinyl Chloride	0.0016	0.002	mg/l	Semi-Annually	Semi-Annually
Xylenes (Total)	8.0	10.0	mg/l	Semi-Annually	Semi-Annually

[33] Total Trihalomethanes are comprised of Bromoform, Bromodichloromethane, Chloroform, and Dibromochloromethane.

4.2 COMPLIANCE (or OPERATIONAL) MONITORING

TABLE II
GROUNDWATER MONITORING (continued)

Sampling Point Number	**Sampling Point Identification**			**Latitude**	**Longitude**
40	MW-# 2 South of the Recharge Basins			33° 21' 35" N	111° 33' 32" W
Parameter	**AL**[34]	**AQL**[35]	**Units**	**Sampling Frequency**	**Reporting Frequency**
Water Level[36]	220-290[37]	Not Established[38]	Feet bgs[39]	Monthly	Quarterly
Total Nitrogen[40]	8.0	10.0	mg/l[41]	Quarterly	Quarterly
Nitrate-Nitrite as N	8.0	10.0	mg/l	Quarterly	Quarterly
Nitrate as N	8.0	10.0	mg/l	Quarterly	Quarterly
Nitrite as N	0.8	1.0	mg/l	Quarterly	Quarterly
Total Kjeldahl Nitrogen (TKN)	Not Established	Not Established	mg/l	Monthly	Quarterly
Total Coliform	Absence	Absence	P/A[42]	Monthly	Quarterly
Metals (total):					
Antimony	0.0048	0.006	mg/l	Quarterly	Quarterly
Arsenic	0.04	0.05	mg/l	Quarterly	Quarterly
Barium	1.60	2.00	mg/l	Quarterly	Quarterly
Beryllium	0.0032	0.004	mg/l	Quarterly	Quarterly
Cadmium	0.004	0.005	mg/l	Quarterly	Quarterly
Chromium	0.08	0.1	mg/l	Quarterly	Quarterly
Cyanide (as free cyanide)	0.16	0.2	mg/l	Quarterly	Quarterly
Fluoride	3.2	4.0	mg/l	Quarterly	Quarterly
Lead	0.04	0.05	mg/l	Quarterly	Quarterly
Mercury	0.0016	0.002	mg/l	Quarterly	Quarterly
Nickel	0.08	0.1	mg/l	Quarterly	Quarterly
Selenium	0.04	0.05	mg/l	Quarterly	Quarterly
Thallium	0.0016	0.002	mg/l	Quarterly	Quarterly

[34] AL = Alert Level
[35] AQL = Aquifer Quality Limit
[36] See Section 2.6.2.3.4.
[37] If the water level does not fall within this range, the AL is considered to be exceeded.
[38] Not Established means monitoring is required, but no limits are specified.
[39] bgs = below ground surface
[40] The calculation for Total Nitrogen is Nitrate as N plus Nitrite as N plus TKN.
[41] mg/l = milligrams per liter
[42] P/A = Presence or absence of total coliforms in a 100-milliliter sample. If total coliforms are present, enter "Non-compliance on the SMRF. If total coliforms are absent, enter "Compliance" on the SMRF.

4.2 COMPLIANCE (or OPERATIONAL) MONITORING

TABLE II
GROUNDWATER MONITORING (continued)

Parameter	AL	AQ	Units	Sampling Frequency	Reporting Frequency
Volatile and Semi-Volatile Organic Compounds (VOCs and SVOCs):					
Benzene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Carbon tetrachloride	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
o-Dichlorobenzene	0.48	0.6	mg/l	Semi-Annually	Semi-Annually
para-Dichlorobenzene	0.06	0.075	mg/l	Semi-Annually	Semi-Annually
1,2-Dichloroethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
1,1-Dichloroethylene	0.0056	0.007	mg/l	Semi-Annually	Semi-Annually
cis-1,2-Dichloroethylene	0.056	0.07	mg/l	Semi-Annually	Semi-Annually
trans-1,2-Dichloroethylene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Dichloromethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
1,2-Dichloropropane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Ethylbenzene	0.56	0.7	mg/l	Semi-Annually	Semi-Annually
Hexachlorobenzene	0.0008	0.001	mg/l	Semi-Annually	Semi-Annually
Hexachlorocyclopentadiene	0.04	0.05	mg/l	Semi-Annually	Semi-Annually
Monochlorobenzene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Styrene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Tetrachloroethylene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Toluene	0.8	1.0	mg/l	Semi-Annually	Semi-Annually
Trihalomethanes (total)[43]	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
1,1,1-Trichloroethane	0.16	0.2	mg/l	Semi-Annually	Semi-Annually
1,2,4 - Trichlorobenzene	0.056	0.07	mg/l	Semi-Annually	Semi-Annually
1,1,2 - Trichloroethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Trichloroethylene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Vinyl Chloride	0.0016	0.002	mg/l	Semi-Annually	Semi-Annually
Xylenes (Total)	8.0	10.0	mg/l	Semi-Annually	Semi-Annually

[43] Total Trihalomethanes are comprised of Bromoform, Bromodichloromethane, Chloroform, and Dibromochloromethane.

TABLE III
FACILITY INSPECTION (OPERATIONAL MONITORING) - LOG BOOK[44]

Pollution Control Structure/Parameter	Performance Level	Inspection Frequency
Sludge Drying Bed / Sludge Lagoon Freeboard	One (1) Linear Foot	Weekly
Recharge Basin Freeboard	One (1) Linear Foot	Weekly
Pump Integrity	Good working condition	Weekly
Treatment Plant Components	Good working condition	Weekly
Berm Integrity	No visible structural damage, breach, or erosion of embankments	Monthly
Liner Integrity	No cracks or leaks that would exceed a leakage rate of 550 gpd/acre	Monthly
Vadose zone wells	Good working condition	Monthly

[44] The permittee shall record the inspection performance levels in a log book as per Section 2.7.2, and report any violations or exceedances as per Section 2.7.3. In the case of an exceedance, identify which structure exceeds the performance level in the log book.

5.0 REFERENCES AND PERTINENT INFORMATION

The terms and conditions set forth in this permit have been developed based upon the information contained in the following, which are on file with the Department:

1.	APP Amendment Application, dated:	September 9, 2016
2.	Contingency Plan, dated:	January 10, 2017
3.	Final Hydrologist Report, dated:	Not applicable
4.	Final Engineering Report, dated:	November 28, 2016
5.	Public Notice, dated:	Not applicable
6.	Public Hearing, dated:	Not applicable
7.	Responsiveness Summary, dated:	Not applicable

6.0 NOTIFICATION PROVISIONS

6.1 Annual Registration Fees

The permittee is notified of the obligation to pay an Annual Registration Fee to ADEQ. The Annual Registration Fee is based upon the amount of daily influent or discharge of pollutants in gallons-per-day (gpd) as established by A.R.S. § 49-242.

6.2 Duty to Comply [A.R.S. §§ 49-221 through 263]

The permittee is notified of the obligation to comply with all conditions of this permit and all applicable provisions of Title 49, Chapter 2, Articles 1, 2 and 3 of the Arizona Revised Statutes, Title 18, Chapter 9, Articles 1 through 4, and Title 18, Chapter 11, Article 4 of the Arizona Administrative Code. Any permit non-compliance constitutes a violation and is grounds for an enforcement action pursuant to Title 49, Chapter 2, Article 4 or permit amendment, suspension, or revocation.

6.3 Duty to Provide Information [A.R.S. §§ 49-243(K)(2) and 49-243(K)(8)]

The permittee shall furnish to the Director, or an authorized representative, within a time specified, any information which the Director may request to determine whether cause exists for amending or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

6.4 Compliance with Aquifer Water Quality Standards [A.R.S. §§ 49-243(B)(2) and 49-243(B)(3)]

The permittee shall not cause or contribute to a violation of an AWQS at the applicable POC for the facility. Where, at the time of issuance of the permit, an aquifer already exceeds an AWQS for a pollutant, the permittee shall not discharge that pollutant so as to further degrade, at the applicable point of compliance for the facility, the water quality of any aquifer for that pollutant.

6.5 Technical and Financial Capability [A.R.S. §§ 49-243(K)(8) and 49-243(N) and A.A.C. R18-9-A202(B) and R18-9-A203(E) and (F)]

The permittee shall have and maintain the technical and financial capability necessary to fully carry out the terms and conditions of this permit. Any bond, insurance policy, trust fund, or other financial assurance mechanism provided as a demonstration of financial capability in the permit application, pursuant to A.A.C. R18-9-A203(C), shall be in effect prior to any discharge authorized by this permit and shall remain in effect for the duration of the permit.

6.6 Reporting of Bankruptcy or Environmental Enforcement [A.A.C. R18-9-A207(C)]

The permittee shall notify the Director within five days after the occurrence of any one of the following:

1. the filing of bankruptcy by the permittee; or
2. the entry of any order or judgment not issued by the Director against the permittee for the enforcement of any environmental protection statute or rule.

6.7 Monitoring and Records [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A206]

The permittee shall conduct any monitoring activity necessary to assure compliance with this permit, with the applicable water quality standards established pursuant to A.R.S. §§ 49-221 and 49-223 and §§ 49-241 through 49-252.

6.8 Inspection and Entry [A.R.S. §§ 49-1009, 49-203(B), and 49-243(K)(8)]

In accordance with A.R.S. §§ 41-1009 and 49-203(B), the permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to enter and inspect the facility as reasonably necessary to ensure compliance with Title 49, Chapter 2, Article 3 of the Arizona Revised Statutes, and Title 18, Chapter 9, Articles 1 through 4 of the Arizona Administrative Code and the terms and conditions of this permit.

6.9 Duty to Modify [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A211]

The permittee shall apply for and receive a written amendment before deviating from any of the designs or operational practices authorized by this permit.

6.10 Permit Action: Amendment, Transfer, Suspension, and Revocation [A.R.S. §§ 49-201, 49-241 through 251, A.A.C. R18-9-A211, R18-9-A212 and R18-9-A213]

This permit may be amended, transferred, suspended, or revoked for cause, under the rules of the Department. The permittee shall notify the Groundwater Section in writing within 15 days after any change in the owner or operator of the facility. The notification shall state the permit number, the name of the facility, the date of property transfer, and the name, address, and phone number where the new owner or operator can be reached. The operator shall advise the new owner or operators of the terms of this permit and the need for permit transfer in accordance with the rules.

7.0 ADDITIONAL PERMIT CONDITIONS

7.1 Other Information [A.R.S. § 49-243(K)(8)]

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit the correct facts or information.

7.2 Severability [A.R.S. §§ 49-201, 49-241 through 251, A.A.C. R18-9-A211, R18-9-A212 and R18-9-A213]

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby. The filing of a request by the permittee for a permit action does not stay or suspend the effectiveness of any existing permit condition.

7.3 Permit Transfer

This permit may not be transferred to any other person except after notice to and approval of the transfer by the Department. No transfer shall be approved until the applicant complies with all transfer requirements as specified in A.A.C. R18-9-A212(B) and (C).

APPENDIX J

Wastewater Flow Projection at the City of Apache Full Land Buildout (General Plan 2020)

Appendix J WASTEWATER FLOW PROJECTIONS AT THE CITY OF APACHE JUNCTION FULL LAND BUILDOUT (2020 GENERAL PLAN)

Superstition Mountain CFD #1

Master WWTP and Master Collection System 2020

Estimate of Average Daily Sewage Flows

Date: 11/25/2019
By: Michael Koehler
Assumptions:

Zoning Category (Population Based)	Dwellings per Acre	Persons per Dwelling	People Per Acre
Low Density	0	3.2	0
Medium Density	3.5	3.2	11.2
High Density	12	2.0	24
Conservation	1	3.2	3.2
Master Planned Community	6	2.0	12
Downtown Mixed Use	1	2.0	2

Zoning Category (Estimated Flow Based)	Gallons per Acre per Day
Commercial	1500
Conservation	10
Light Industrial/Business Park and	1000
Public/Institutional	1500
Downtown Mixed Use	1500
Open Space and Recreation	0.0
Transportation	0.0

*	open space	neglible flow	Will be reffered to as open space
*	trails and landscaping	neglible flow	
*	park sites	neglible flow	
*	golf courses	neglible flow	
*	Areas of Septic Tank use	neglible flow	

80 Gallons per Capita per Day

T	R	S		Commercial		Conservation (1 DU/AC)		Downtown Mixed Use		High Density Residential (40 DU/AC Max)		Light Industrial/Business Park and Industrial		Low Density Residential (1 DU/1.25 AC)		Master Planned Community (20 DU/AC Max)		Medium Density Residential (10 DU/AC Max)		Open Space and Recreation		Public/Institutional		Transportation		Total Area	2020 Population	2020 Total Flow	2020 Total Flow	2006 Projected Flow	Delta of 2020 Total Flow Minus 2006 Flow	2006 Area	2006 Population	SMCFD NO.1 SERVICE AREA BOUNDARY	NO.1 EXPANDED SERVICE AREA BOUNDARY	SMCFD NO.1 FUTURE PLANNING AREA
				sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq.mi	people	gallons	MGD					%	%	%
1N	7E	24	1N7E24	0.0	0.0	0.0	0.0	0.0	0.0	0.1	36.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.06	879	70,345	0.070	0	70,345	0.0	0.0	100%		
																													0.000				0.0					
1N	8E	1	1N8E1	0.1	71.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	33.1	0.0	0.0	0.0	0.0	0.4	234.6	0.5	289.9	0.0	11.9	1.00	0	541,623	0.542	0	541,623	0.0	0.0	100%		
1N	8E	2	1N8E2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	637.9	0.0	0.0	0.0	2.0	1.00	0	0	0.000	0	0	0.0	0.0	100%		
1N	8E	3	1N8E3	0.0	0.0	0.6	370.5	0.0	0.0	0.0	0.0	0.0	0.0	0.3	195.6	0.0	0.0	0.0	0.0	0.1	74.4	0.0	0.0	0.0	0.0	1.00	1,186	98,554	0.099	0	98,554	0.0	0.0	100%		
1N	8E	4	1N8E4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	631.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7	1.00	0	0	0.000	0	0	0.0	0.0	100%		
1N	8E	5	1N8E5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	624.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.5	1.00	0	0	0.000	0	0	0.0	0.0	100%		
1N	8E	6	1N8E6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	621.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.5	0.99	0	0	0.000	0	0	0.0	0.0	100%		
1N	8E	7	1N8E7	0.0	0.0	0.6	368.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	248.8	0.0	0.0	0.0	19.3	0.99	1,179	97,989	0.098	0	97,989	1.0	0.0	100%		
1N	8E	8	1N8E8	0.0	0.0	0.3	172.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	448.0	0.0	0.0	0.0	19.3	1.00	553	45,942	0.046	0	45,942	1.0	0.0	100%		
1N	8E	9	1N8E9	0.0	0.0	0.1	56.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	569.6	0.0	0.0	0.0	14.5	1.00	181	15,020	0.015	0	15,020	1.0	0.0	100%		
1N	8E	10	1N8E10	0.0	7.6	0.7	460.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	160.0	0.0	0.0	0.0	11.9	1.00	1,401	127,911	0.128	0	127,911	1.0	0.0	100%		
1N	8E	11	1N8E11	0.0	10.2	0.4	277.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	129.3	0.0	0.0	0.0	0.0	0.3	196.4	0.0	13.8	0.0	9.7	1.00	889	109,528	0.110	0	109,528	1.0	0.0	100%		
1N	8E	12	1N8E12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	639.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	0	0	0.000	0	0	0.0	0.0	100%		
1N	8E	13	1N8E13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	635.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	1.00	0	0	0.000	0	0	0.0	0.0	100%		
1N	8E	14	1N8E14	0.0	0.0	0.5	293.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	154.9	0.0	0.0	0.0	0.0	0.3	178.3	0.0	0.0	0.0	12.0	1.00	935	77,695	0.078	0	77,695	1.0	0.0	100%		
1N	8E	15	1N8E15	0.0	24.9	0.0	0.0	0.0	0.0	0.0	12.1	0.0	0.0	0.9	569.9	0.0	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	24.6	1.00	216	53,723	0.054	67,200	-13,477	1.0	672.0	100%		
1N	8E	16	1N8E16	0.0	0.0	0.6	410.6	0.1	70.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	108.6	0.0	18.8	0.0	31.5	1.00	1,408	250,983	0.251	48,000	202,983	1.0	480.0	100%		
1N	8E	17	1N8E17	0.0	1.4	0.0	0.0	0.1	46.1	0.1	81.6	0.0	0.0	0.6	386.3	0.0	0.0	0.0	0.0	0.1	95.1	0.0	0.0	0.0	9.3	0.0	20.4	1.00	3,115	334,372	0.334	363,264	-28,892	1.0	3,632.6	100%		
1N	8E	18	1N8E18	0.0	26.5	0.0	0.0	0.0	0.0	0.2	148.9	0.0	0.0	0.3	165.0	0.0	0.0	0.0	0.0	0.4	274.8	0.0	0.0	0.0	1.8	0.0	20.4	1.00	6,652	574,678	0.575	494,336	80,342	1.0	4,943.4	100%		
1N	8E	19	1N8E19	0.2	150.3	0.0	0.0	0.0	0.0	0.2	102.2	0.0	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	307.5	0.0	0.0	0.0	16.3	0.1	47.7	1.00	5,859	711,597	0.712	758,400	-46,803	1.1	7,584.0	100%		
1N	8E	20	1N8E20	0.0	14.9	0.0	0.0	0.5	333.9	0.0	12.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	221.6	0.0	0.0	0.0	1.1	0.1	55.2	1.00	3,423	780,211	0.780	735,232	44,979	1.0	7,352.3	100%		
1N	8E	21	1N8E21	0.0	4.1	0.0	0.0	0.4	286.3	0.1	86.3	0.0	0.0	0.2	152.4	0.0	0.0	0.0	0.0	0.1	43.5	0.0	0.0	0.0	18.0	0.1	49.2	1.00	2,835	653,287	0.653	230,400	422,887	1.0	2,304.0	100%		
1N	8E	22	1N8E22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	0.0	1.0	611.8	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	21.6	1.00	119	9,547	0.010	0	9,547	1.0	0.0	100%		
1N	8E	23	1N8E23	0.0	0.0	0.2	151.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	309.6	0.0	0.0	0.0	0.0	0.0	0.0	0.2	155.2	0.0	2.2	0.0	20.4	1.00	485	43,593	0.044	0	43,593	1.0	0.0	100%		
1N	8E	24	1N8E24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	628.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.1	1.00	0	0	0.000	0	0	1.0	0.0	100%		
1N	8E	25	1N8E25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	626.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.5	1.00	0	0	0.000	0	0	1.0	0.0	100%		
1N	8E	26	1N8E26	0.0	0.0	0.6	385.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	184.5	0.1	54.2	0.0	15.7	1.00	1,234	183,889	0.184	0	183,889	1.0	0.0	100%		
1N	8E	27	1N8E27	0.1	59.6	0.0	0.0	0.0	0.0	0.1	33.3	0.0	13.5	0.5	312.3	0.0	0.0	0.0	0.0	0.2	132.1	0.0	10.0	0.0	20.5	0.1	59.9	1.00	2,280	314,699	0.315	268,288	46,411	1.0	2,682.9	100%		
1N	8E	28	1N8E28	0.1	33.5	0.0	0.0	0.0	28.9	0.2	103.9	0.1	45.3	0.0	0.0	0.0	0.0	0.0	0.0	0.6	366.0	0.0	9.7	0.0	12.0	0.1	41.1	1.00	6,502	653,663	0.654	736,000	-82,337	1.0	7,360.0	100%		
1N	8E	29	1N8E29	0.0	29.3	0.0	0.0	0.0	0.0	0.3	191.5	0.0	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.6	373.5	0.0	0.0	0.0	14.0	0.0	24.0	1.00	8,497	752,023	0.752	705,024	46,999	1.0	7,050.2	100%		
1N	8E	30	1N8E30	0.1	39.3	0.0	0.0	0.0	0.0	0.1	81.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	473.3	0.0	0.0	0.0	21.4	0.0	24.0	1.00	7,149	657,289	0.657	762,368	-105,079	1.1	7,623.7	100%		
1N	8E	31	1N8E31	0.0	25.9	0.0	0.0	0.0	0.0	0.6	354.1	0.1	64.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	46.5	0.1	43.3	0.0	0.9	0.2	104.5	1.00	9,021	826,252	0.826	1,244,800	-418,548	1.0	12,448.0	100%		
1N	8E	32	1N8E32	0.1	59.1	0.0	0.0	0.0	0.0	0.1	59.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	305.4	0.0	0.0	0.2	118.3	0.2	98.5	1.00	4,840	653,244	0.653	566,400	86,844	1.0	5,664.0	100%		
1N	8E	33	1N8E33	0.2	102.4	0.0	0.0	0.0	0.0	0.1	93.1	0.3	186.6	0.0	0.0	0.0	0.0	0.0	0.0	0.2	156.0	0.0	0.0	0.0	0.0	0.2	103.2	1.00	3,832	643,339	0.643	1,123,200	-479,861	1.0	11,232.0	100%		
1N	8E	34	1N8E34	0.0	31.1	0.0	0.0	0.0	0.0	0.3	223.8	0.0	0.0	0.1	60.2	0.0	0.0	0.0	0.0	0.3	217.8	0.0	0.0	0.0	0.1	0.2	108.5	1.00	7,811	671,615	0.672	1,315,200	-643,585	1.0	13,152.0	100%		
1N	8E	35	1N8E35	0.0	19.5	0.2	119.4	0.0	0.0	0.2	135.6	0.0	0.0	0.0	13.4	0.0	0.0	0.0	0.0	0.0	0.0	0.2	97.9	0.0	0.0	0.4	254.2	1.00	3,396	301,959	0.302	480,256	-178,297	1.0	4,802.6	100%		
1N	8E	36	1N8E36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	223.2	0.2	157.9	0.0	0.0	0.37	236.9	0.0	0.0	0.0	23.3	1.00	1,895	151,565	0.152	0	151,565	1.0	0.0	100%		
																													0.000				0.0					
1S	8E	1	1S8E1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	551.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	43.2	0.93	6,614	529,104	0.529	496,384	32,720	1.0	4,963.8	100%		
1S	8E	2	1S8E2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	594.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.93	6,463	517,009	0.517	768,000	-250,991	1.0	7,680.0	100%		
1S	8E	3	1S8E3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	522.7	0.1	39.9	0.0	25.0	0.0	0.0	0.0	6.1	0.93	5,536	442,916	0.443	674,432	-231,516	1.0	6,744.3	100%		
1S	8E	4	1S8E4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	493.3	0.0	0.0	0.1	76.1	0.0	18.3	0.0	6.1	0.93	5,660	476,545	0.477	494,848	-18,303	1.0	4,948.5	100%		
1S	8E	5	1S8E5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	556.1	0.0	0.0	0.0	18.6	0.0	0.2	0.0	19.0	0.93	6,409	513,041	0.513	595,328	-82,287	1.0	5,953.3	100%		
1S	8E	6	1S8E6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	256.4	0.0	0.0	0.6	361.7	0.0	0.0	0.1	64.0	0.0	5.9	0.0	16.1	1.10	4,340	612,427	0.612	908,160	-295,733	1.2	9,081.6	100%		
1S	8E	7	1S8E7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	741.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.6	1.18	7,745	619,562	0.620	991,360	-371,798	1.2	9,913.6	100%		
1S	8E	8	1S8E8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	474.3	0.0	0.0	0.1	60.2	0.2	98.2	0.0	8.5	1.00	4,725	502,824	0.503	586,880	-84,056	1.0	5,868.8	100%		
1S	8E	9	1S8E9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	614.2	0.0	0.0	0.0	26.9	0.0	0.0	0.0	0.0	1.00	5,934	474,697	0.475	415,744	58,953	1.0	4,157.4	100%		
1S	8E	10	1S8E10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	634.0	0.0	0.0	0.0	6.9	0.0	0.0	0.0	0.0	1.00	6,356	508,470	0.508	637,952	-129,482	1.0	6,379.5	100%		
1S	8E	11	1S8E11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	640.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,287	582,993	0.583	788,480	-205,487	1.0	7,884.8	100%		
1S	8E	12	1S8E12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	640.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.00	7,663	613,055	0.613	868,352	-255,297	1.0	8,683.5	100%		
1S	8E	13	1S8E13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	641.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	6,621	529,648	0.530	716,800	-187,152	1.0	7,168.0			100%
1S	8E	14	1S8E14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	641.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	6,776	542,072	0.542	856,832	-314,760	1.0	8,568.3			100%
1S	8E	15	1S8E15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	641.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,452	596,160	0.596	771,200	-175,040	1.0	7,712.0			100%
1S	8E	16	1S8E16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	588.3	0.0	0.0	0.1	53.0	0.0	0.0	0.0	0.0	1.00	6,248	499,867	0.500	762,880	-263,013	1.0	7,628.8		50%	50%
1S	8E	17	1S8E17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	631.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	1.00	6,528	522,211	0.522	716,800	-194,589	1.0	7,168.0		100%	
1S	8E	18	1S8E18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	741.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.8	1.17	8,865	709,170	0.709	860,160	-150,990	1.2	8,601.6		100%	
1S	8E	19	1S8E19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	738.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.2	1.17	7,391	591,302	0.591	660,000	-68,698	1.0	6,600.0		100%	
1S	8E	20	1S8E20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	632.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	1.00	6,200	496,005	0.496	660,000	-163,995	1.0	6,600.0		100%	
1S	8E	21	1S8E21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	600.9	0.0	0.0	0.1	39.7	0.0	0.0	0.0	0.0	1.00	5,989	479,150	0.479	823,296	-344,146	1.0	8,233.0		85%	15%
1S	8E	22	1S8E22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	630.1	0.0	0.0	0.0	10.5	0.0	0.0	0.0	0.0	1.00	6,308	504,608	0.505	823,296	-318,688	1.0	8,233.0			
1S	8E	23	1S8E23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	640.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,288	583,029	0.583	660,000	-76,971	1.0	6,600.0			100%
1S	8E	24	1S8E24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	640.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,688	615,001	0.615	660,000	-44,999	1.0	6,600.0			100%
1S	8E	25	1S8E25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	640.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,415	593,181	0.593	660,000	-66,819	1.0	6,600.0			100%
1S	8E	26	1S8E26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	640.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,688	615,045	0.615	660,000	-44,955	1.0	6,600.0			100%

Superstition Mountain CFD #1

Master WWTP and Master Collection System 2020

Estimate of Average Daily Sewage Flows

Date: 11/25/2019
By: Michael Koehler
Assumptions:

Zoning Category (Population Based)	Dwellings per Acre	Persons per Dwelling	People Per Acre
Low Density	0	3.2	0
Medium Density	3.5	3.2	11.2
High Density	12	2.0	24
Conservation	1	3.2	3.2
Master Planned Community	6	2.0	12
Downtown Mixed Use	1	2.0	2

Zoning Category (Estimated Flow Based)	Gallons per Acre per Day
Commercial	1500
Conservation	10
Light Industrial/Business Park and	1000
Public/Institutional	1500
Downtown Mixed Use	1500
Open Space and Recreation	0.0
Transportation	0.0

*	open space	neglible flow	Will be reffered to as open space
*	trails and landscaping	neglible flow	
*	park sites	neglible flow	
*	golf courses	neglible flow	
*	Areas of Septic Tank use	neglible flow	

80 Gallons per Capita per Day

T	R	S		Commercial		Conservation (1 DU/AC)		Downtown Mixed Use		High Density Residential (40 DU/AC Max)		Light Industrial/Business Park and Industrial		Low Density Residential (1 DU/1.25 AC)		Master Planned Community (20 DU/AC Max)		Medium Density Residential (10 DU/AC Max)		Open Space and Recreation		Public/Institutional		Transportation		Total Area	2020 Population	2020 Total Flow	2020 Total Flow	2006 Projected Flow	Delta of 2020 Total Flow Minus 2006 Flow	2006 Area	2006 Population	SMCFD NO.1 SERVICE AREA BOUNDARY	NO.1 EXPANDED SERVICE AREA BOUNDARY	SMCFD NO.1 FUTURE PLANNING AREA
				sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq. miles	acre	sq.mi	people	gallons	MGD						%	%	%
1S	8E	27	1S8E27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	593.2	0.0	0.0	0.1	47.2	0.0	0.0	0.0	0.0	1.00	7,119	569,517	0.570	660,000	-90,483	1.0	6,600.0		20%	80%
1S	8E	28	1S8E28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	640.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,687	614,960	0.615	660,000	-45,040	1.0	6,600.0		100%	
1S	8E	29	1S8E29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	631.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	6,968	557,462	0.557	660,000	-102,538	1.0	6,600.0		100%	
1S	8E	30	1S8E30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	734.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	1.16	7,471	597,677	0.598	660,000	-62,323	1.0	6,600.0		100%	
1S	8E	31	1S8E31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	364.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.58	3,836	306,897	0.307	660,000	-353,103	1.0	6,600.0		100%	
1S	8E	32	1S8E32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	315.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.50	3,785	302,763	0.303	660,000	-357,237	1.0	6,600.0		100%	
1S	8E	33	1S8E33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	320.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.50	3,841	307,288	0.307	660,000	-352,712	1.0	6,600.0		100%	
1S	8E	34	1S8E34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	438.6	0.0	0.0	0.1	36.6	0.0	0.0	0.0	0.0	0.74	5,139	411,125	0.411	660,000	-248,875	1.0	6,600.0		40%	60%
1S	8E	35	1S8E35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	640.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	5,936	474,850	0.475	660,000	-185,150	1.0	6,600.0			100%
1S	8E	36	1S8E36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	639.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,264	581,117	0.581	660,000	-78,883	1.0	6,600.0			100%
																													0.000				0.0				
1S	9E	17	1S9E17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	585.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	54.8	1.00	6,686	534,886	0.535	0	534,886	0.0	0.0			100%
1S	9E	18	1S9E18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	646.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.01	7,335	586,797	0.587	0	586,797	0.0	0.0			100%
1S	9E	19	1S9E19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	647.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.01	7,768	621,473	0.621	0	621,473	0.0	0.0			100%
1S	9E	20	1S9E20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	638.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,583	606,632	0.607	0	606,632	0.0	0.0			100%
1S	9E	21	1S9E21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	590.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	48.7	1.00	7,084	566,722	0.567	0	566,722	0.0	0.0			100%
1S	9E	26	1S9E26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.00	1	54	0.000	0	54	0.0	0.0			100%
1S	9E	27	1S9E27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	300.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.4	0.51	3,414	273,143	0.273	0	273,143	0.0	0.0			100%
1S	9E	28	1S9E28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	637.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.00	7,022	561,744	0.562	0	561,744	0.0	0.0			100%
1S	9E	29	1S9E29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	638.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	6,662	532,961	0.533	0	532,961	0.0	0.0			100%
1S	9E	30	1S9E30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	648.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.01	7,301	584,111	0.584	0	584,111	0.0	0.0			100%
1S	9E	31	1S9E31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	649.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.01	7,483	598,614	0.599	0	598,614	0.0	0.0			100%
1S	9E	32	1S9E32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	638.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,445	595,604	0.596	0	595,604	0.0	0.0			100%
1S	9E	33	1S9E33	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	638.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,661	612,896	0.613	0	612,896	0.0	0.0			100%
1S	9E	34	1S9E34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	638.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,661	612,881	0.613	0	612,881	0.0	0.0			100%
1S	9E	35	1S9E35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	369.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.0	0.61	4,174	333,953	0.334	0	333,953	0.0	0.0			100%
1S	9E	36	1S9E36	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.02	92	7,333	0.007	0	7,333	0.0	0.0			100%
																													0.000				0.0				
2S	8E	1	2S8E1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	647.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.01	7,277	582,184	0.582	660,000	-77,816	1.0	6,600.0			100%
2S	8E	2	2S8E2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	642.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,019	561,498	0.561	660,000	-98,502	1.0	6,600.0			100%
2S	8E	3	2S8E3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	105.6	0.0	0.0	0.0	24.2	0.0	0.0	0.0	0.0	0.20	1,083	86,675	0.087	660,000	-573,325	1.0	6,600.0			100%
2S	8E	4	2S8E4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0	0.000	660,000	-660,000	1.0	6,600.0			
2S	8E	5	2S8E5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0	0.000	660,000	-660,000	1.0	6,600.0			
2S	8E	6	2S8E6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0	0	0.000	660,000	-660,000	1.0	6,600.0			
																													0.000				0.0				
2S	9E	1	2S9E1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	449.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.5	0.73	5,210	416,786	0.417	0	416,786	0.0	0.0			100%
2S	9E	2	2S9E2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	641.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	5,895	471,595	0.472	0	471,595	0.0	0.0			100%
2S	9E	3	2S9E3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	638.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,382	590,520	0.591	0	590,520	0.0	0.0			100%
2S	9E	4	2S9E4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	639.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,325	585,962	0.586	0	585,962	0.0	0.0			100%
2S	9E	5	2S9E5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	636.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.99	7,638	611,062	0.611	0	611,062	0.0	0.0			100%
2S	9E	6	2S9E6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	642.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	7,030	562,416	0.562	0	562,416	0.0	0.0			100%
																													0.000		0		0.0				
2S	10E	6	2S10E6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	0.05	319	25,486	0.025	0	25,486	0.0	0.0			100%

APPENDIX K

SMCFD CAP Option Meeting Notes March 3, 2020

Appendix K SMCFD CAP OPTION MEETING NOTES MARCH 3, 2020

Stantec

Meeting Notes

SMCFD No. 1 CAP Options Meeting

SMCFD No. 1 WW Master Plan / 181300988

Date/Time:	March 3, 2020 / 1:30 PM
Place:	Skype/Remote
Attendees:	SMCFD No. 1: Darron Anglin Stantec: Tomas Goode, Dustin Graves, Jack Bryck, Heather Tugaoen, Maria Brady CAP: Marcus Schapiro , Patrick Dent, Third Person with CAGRD unidentified
Distribution:	Attendees

Action:

[Type the action text]

Intent of Meeting: To Understand if CAP can take SMCFD Class A+ water for recharge at the CAP Superstition Mountain Recharge Facility (SMRF) and if so, can it be wheeled via the CAP Canal.

Background: The background on the developing SMCFD Master Wastewater Plan was provided. SMCFD/Stantec is looking at options over the period 2020 to 2050 and beyond for recharging SMCFD effluent. It was noted in the call that SMCFD currently recharges around 2,000 ac ft of effluent at the SMCFD WWTF and are anticipating a total available of 5,000 to 10,000 ac ft per year in the next 30 years.

One option SMCFD would like to understand is the possible recharge at the CAP SMRF and possibly wheeling by the CAP Canal from the SMCFD WWTF to CAP SMRF or a dedicated pipe between the SMCFD WWTF and CAP SMRF.

Discussion: Stantec and SMCFD described some current conditions (3 MGD re-rating, limited recharge access on site with basins, future of Class A+ effluent, long term build out to 5-7MGD in interim term and full buildout between 20-27MGD) and requested information from CAP on their effluent acceptance policies and ability to take in the canal or at their Superstition Mountains Recharge Facility (~10mi SE of SMCFD No.1).

CAP asked whether SMCFD would sell back credits to AJ Water or CAP as part of what they are currently doing and based on the need for expansion. CAP seemed interested in the reuse credits.

CAP Stance on Effluent

Transportation of Effluent

- Effluent is excluded from what types of water CAP is currently considering allowing into the canal (based on the removal of the ban of non-Colorado River Water).
- The SMRF recharge project CAP has SE of the SMCFD would require water to be wheeled via a separate pipeline, not through the canal for the near-term future.

Action:

Acceptance Policy for Effluent

- The current Superstition Mountains recharge facility (also the Lower Santa Cruz or Agua Fria project) does not accept effluent.
- CAP's recharge project does not require an aquifer protection permit so they are not currently permitted to be able to even accept effluent at their recharge facility.
- Other locations in the area of Apache Junction where CAP has studied for possible recharge facilities were discussed. The work was done 6 or 7 years ago but CAP will not share the outcome with the SMCFD. or provide any further detail without a joint partnership in place to build a new recharge facility (requiring financial contribution and possibly a cut of the water recharge credits).
  - CAP is currently built to accept 25,000 ac-ft per year at the SMRF site (Phase 1) , but they have an allotment from ADWR for 56,500ac-ft (Phase 2) based on the original design intent and theoretical ground capacity. No date has been set when they will construct the Phase 2 SMRF project.
  - There could be an option to dedicate basins to effluent, but they would then need to "take on the chore of accepting effluent" including APP, etc. permitting to ensure that the quality was satisfactory.

Capacity Available at the Superstition Mountains recharge facility

- Stantec/SMCFD asked if there is available capacity that is not already being used by Colorado Water (and Colorado River users). CAP responded that year over year they have more water requested to store at SMRP than they can actually take (reasonable backlog / waiting list).
  - CAP indicated that they would not be willing to convert one of their existing basins to effluent recharge for a few thousand acre-ft of water coming in. It would require a larger effluent effort (and Mesa, QC, Gilbert, Chandler have allocations for their effluent to GRIC for CAP raw-water swaps so it's unlikely they would want to do contribute in collaboration).
- The criteria for scheduling is from the water bank. Effluent is included in the potential capacity, but it is subordinate to other water orders and deliveries and there would be real hurdles before CAP would consider this option.
- CAP indicated they have hit the full 25,000 acre-ft each year for the last five years and they don't anticipate these numbers to drop.
- A partnership with SRP has priority space at this facility. They are looking to possibly expand to have other users store water there, but they would de-prioritize effluent.

Options for Moving Forward

- CAP has done jointly developed effluent projects with others (Liberty Water). This model could be made available, but this would not occur at the existing SMRF..

Action:

  - CAP is open to a joint venture to open a new effluent recharge facility, but they would require some portion of the recharge credits in exchange.
  - Stantec asked what % cut do they normally require, and CAP said it was case-by-case and would be based on the assets/funding each partner brought to the project.
  - Liberty Utilities was the cited example in the West Valley for an effluent recharge project with joint use of the water supply credits between Liberty and CAP.
- CAP could expand the existing facility to reach the 56,500 acre-ft but this would require potentially significant permit modifications (including APP). They have a permit already for the Phase 1 and Phase 2 that includes no APP.
  - There is not a currently anticipated date for CAP to initiate Phase 2.
  - If a project were to be initiated on-site then the entire facility might need to undergo re-permitting at that time.
- CAP indicated they would not be willing to share any previously obtained data about good recharge sites in the general vicinity of the SMCFD WWTF and within the City of Apache Junction from their regional study unless a joint venture was underway. They did off-hand indicate that the alluvial plane of Queen Creek (sites with a lot of sand and gravel mining / major alluvial fans) are generally good locations.

Miscellaneous / Summary

Central Arizona Groundwater Replenishment District (CAGRD) contacts:

- 1. Laura Grignano - CAGRD Manager- lgrignano@cap-az.com
- 2. Chris Brooks - Senior Water Resources Analyst- cbrooks@cap-az.com

The meeting adjourned at 2:00 PM

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

Stantec Consulting Services Inc.

Jack Bryck, Heather Tugaoen, Dustin Graves