City of Sierra Vista Water Reclamation Facilities

SEAGO 208 Amendment
Tribute WRF, Section 36 WRF, and Bella Vista WRFs

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Executive Summary

The City of Sierra Vista, located in Cochise County, AZ requests to amend the Regional Water Quality Management Plan (208 Plan) in order to expand its existing 208 Planning Area to include two proposed water reclamation facilities to handle anticipated future growth and to reclaim the effluent for irrigation.

The City currently relies on groundwater for all of its potable and irrigation needs. It is projected that the City’s population will increase to approximately 60,000 people by the year 2025, resulting in an increased demand for groundwater. The City plans to construct four water reclamation facilities (WRF), the Tribute WRF, the Section 36 WRF, and two Bella Vista WRFs to treat wastewater and to reclaim the high quality effluent for irrigation, thus alleviating demand on groundwater. All of the WRFs will be permanent facilities with the exception of the first Bella Vista WRF. This facility will be an interim plant until the Bell Vista Development generates sufficient flow to implement the permanent facility.

The Tribute WRF, the Section 36 WRF and the Bella Vista WRFs will produce effluent that meets Arizona Title 18 Class A+ Reclaimed Water Standards and will supply the City with a new source of irrigation water. At build-out, these facilities will provide an additional 4.7 MGD capacity. Wastewater will be diverted from the existing 4.0 MGD City of Sierra Wastewater Treatment Plant (WWTP) to the new Tribute and Section 36 WRFs to match irrigation demand with recycled water. The Section 36 WRF will have a 0.4 MGD capacity. The Tribute WRF will begin with a 0.5 MGD capacity, and will be expanded in phases as the population increases to an ultimate 2.0 MGD capacity. The first of the two Bella Vista WRFs, the Interim Bella Vista WRF, will have a 0.25 MGD capacity and will be implemented while the development is under construction. The second facility, the Bella Vista WRF will be designed for a full build capacity of 2.3 MGD and will service the completed Bella Vista development.

The Southeastern Arizona Governments Organization (SEAGO) is the designated Area Wide Water Quality Management Planning Agency with the authority under Section 208(a) (2) (B) of the Clean Water Act (CWA) to prepare the 208 Plan for Cochise, Graham, Greenlee, and Santa Cruz Counties. The goal of the 208 Plan is to identify area-wide wastewater treatment needs, water quality management problems, and establish a program to alleviate them. The purpose of this application is to request an amendment to the current Section 208 Regional Water Quality Management Plan. The requested amendment includes the following:

1.1 Amendment Item 1 - Expansion of the 208 Planning Area for the City of Sierra Vista

The current Sierra Vista 208 Planning Area encompasses about 14,900 acres and was last updated in May of 1999 with a 208 Amendment prepared by Fluid Solutions. The 1999 amendment expanded the service area of the Sierra Vista Wastewater Treatment Plant to include a portion of the Bella Vista Ranch development, which has not been developed. This development has changed ownership and is now known as Bella Vista.

The proposed 208 Planning Area (Exhibit 1) will include an additional 15,100 acres of surrounding land to the north east, west, and south of the City and will expand the City’s planning area to include all of the current City’s zoning and annexation areas as shown in Exhibit 2. With the approval of this expansion, the City’s 208 Planning Area will encompass a total of approximately 30,000 acres.

1.2 Amendment Item 2 - The New Tribute WRF

The Tribute WRF will serve the southwest portion of the City of Sierra Vista and will be located east of Avenida Del Sol and south of Snyder Blvd, as indicated on Exhibit 3. It will be owned and operated by the City of Sierra Vista. The WRF will have an initial capacity of 0.5 MGD with phased expansion to 2.0 MGD at full build-out. The new facility will treat wastewater to meet Arizona Title 18 Class A+ Reclaimed Water standards. Reclaimed water will be used to irrigate the Pueblo Del Sol Golf Course and public parks and rights-of-way in the future 2,000-acre Tribute Development.
According to the Tribute Water Reclamation Facility Design Concept Report (Brown and Caldwell, August 2007), the developed Fuego Del Sol Golf Course is currently using an average annual irrigation demand of 400,137 gallons per day and the future Tribute Development will require approximately 1.6 million gallons per day of water for irrigation throughout the life of the project. With a full build-out capacity of 2.0 MGD, the Tribute WRF will be able to satisfy most of the irrigation needs for its service area with its reclaimed effluent. Excess effluent will be recharged to the underlying aquifer through recharge wells to help replenish the groundwater supply.

1.3 Amendment Item 3- The New Section 36 WRF

The Section 36 WRF will serve the northwest portion of the City of Sierra Vista and will be located east of N. Coronado Drive and south of E. Tacoma Street. It will be owned and operated by the City of Sierra Vista. The WRF will have a 0.4 MGD capacity and will treat wastewater to ADEQ Title 18 Class A+ effluent standards. Reclaimed water will be used to supply irrigation demands for the Domingo Pauz Sports Complex, Bill Stbine Sports Complex, and Veterans Memorial Park.

According to the Section 36 Water Reclamation Facility Design Concept Report (Brown and Caldwell, August 2007), the current irrigation demands for the sports complex and park, is a minimum monthly average of 0.04 MGD in the winter and a maximum monthly average of 0.31 MGD in the summer. Future demands will increase because the City will be adding more ball fields in the sports complex and they would like to extend irrigation to the Apache Middle School near the WRF site. With the added acreage of open space, the future irrigation demands are calculated to be at minimum 0.05 MGD in the winter and at maximum 0.44 MGD in the summer. With a full build-out capacity of 0.4 MGD, the Section WRF will be able to satisfy most of the irrigation needs for its service area with its reclaimed effluent. Excess effluent will be recharged to the underlying aquifer through recharge wells to help replenish the groundwater supply.

1.4 Amendment Item 4- The Proposed Bella Vista WRFs

Two future wastewater reclamation facilities will provide wastewater service to the proposed Bella Vista Development, located in the northeast portion of the City of Sierra Vista (see Exhibit 1). Bella Vista Development will be in phases, where wastewater from the initial phases of the development will be treated by the Interim Bella Vista WRF. The interim facility will have a wastewater treatment capacity of 250,000 gallons per day. As the development grows, a larger 2.3 MGD Bella Vista WRF will be constructed to service the build-out of the development. The interim facility will either be decommissioned or serve as a satellite facility for the larger 2.3 MGD permanent facility. The two facilities will be constructed by the developer but will be owned and operated by the City of Sierra Vista. The effluent from the facility will meet ADEQ Title 18 Class A+ effluent standards. Reclaimed effluent will be used to supply irrigation demands within the development with excess effluent being recharge or discharge via an AZPDES permit. The potential point source discharge and the discharge location are not certain at this time. In the future, if and when a point source discharge or discharge points are determined for one or more locations for the Bella Vista project, a 208 amendment will be required.

This Clean Water Act 208 Amendment application provides information on the proposed 208 Planning area expansion and the construction of the Tribute WRF, the Section 36 WRF and the Bella Vista WRFs. The following sections describe how the Section 208 requirements are addressed, including treatment alternatives, permitting, treatment facility design, sludge management, construction, financing, impacts, and public participation.
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADEQ</td>
<td>Arizona Department of Environmental Quality</td>
</tr>
<tr>
<td>ADOC</td>
<td>Arizona Department of Commerce</td>
</tr>
<tr>
<td>ADWR</td>
<td>Arizona Department of Water Resources</td>
</tr>
<tr>
<td>APP</td>
<td>Aquifer Protection Permit</td>
</tr>
<tr>
<td>AZPDES</td>
<td>Arizona Pollutant Discharge Elimination System</td>
</tr>
<tr>
<td>City</td>
<td>City of Sierra Vista</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>CWA</td>
<td>Clean Water Act</td>
</tr>
<tr>
<td>DU</td>
<td>Dwelling Units</td>
</tr>
<tr>
<td>E.D.</td>
<td>Equivalent Dwelling</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>gpd</td>
<td>Gallons Per Day</td>
</tr>
<tr>
<td>gpdc</td>
<td>Gallons Per Day Per Capita</td>
</tr>
<tr>
<td>MBR</td>
<td>Membrane Bioreactor</td>
</tr>
<tr>
<td>MGD</td>
<td>Million Gallons Per Day</td>
</tr>
<tr>
<td>MMAD</td>
<td>Maximum Month Average Day</td>
</tr>
<tr>
<td>MSDS</td>
<td>Material Safety Data Sheets</td>
</tr>
<tr>
<td>O&amp;M</td>
<td>Operations and maintenance</td>
</tr>
<tr>
<td>PACE</td>
<td>Pacific Advanced Civil Engineering, Inc.</td>
</tr>
<tr>
<td>POPTAC</td>
<td>Population Technical Advisory Committee</td>
</tr>
<tr>
<td>POTW</td>
<td>Publicly Owned Treatment Works</td>
</tr>
<tr>
<td>NTU</td>
<td>Nephelometric Turbidity Unit</td>
</tr>
<tr>
<td>RAS</td>
<td>Return Activated Sludge</td>
</tr>
<tr>
<td>RAZ</td>
<td>Regional Analysis Zone</td>
</tr>
<tr>
<td>SEAGO</td>
<td>SouthEastern Arizona Governments Organization</td>
</tr>
<tr>
<td>SPA</td>
<td>Special Planning Area</td>
</tr>
<tr>
<td>USF</td>
<td>Underground Storage Facility</td>
</tr>
<tr>
<td>UV</td>
<td>Ultra Violet Light</td>
</tr>
<tr>
<td>WAPA</td>
<td>Western Area Power Administration</td>
</tr>
<tr>
<td>WRF</td>
<td>Water Reclamation Facility</td>
</tr>
<tr>
<td>WWTP</td>
<td>Wastewater Treatment Plant</td>
</tr>
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</table>
Clean Water Act Section 208 Amendment Checklist
1 20-Year Needs

SEAGO is the designated Planning Agency with the authority under Section 208(a) (2) (B) of the CWA to prepare the Regional Water Quality Management Plan (208 Plan) for the City of Sierra Vista. The purpose of this application is to request a Clean Water Act Section 208 amendment to the current 208 Plan to facilitate the expansion of the 208 Planning Area for the City of Sierra Vista and the inclusion of the City of Sierra Vista 2.0 MGD Tribute WRF, the 0.4 MGD Section 36 WRF, the 0.25 MGD Bella Vista Interim WRF, and the 2.3 MGD Bella Vista WRF. The requested amendment includes the following:

1.1 Amendment Item 1 - Expansion of the 208 Planning Area for the City of Sierra Vista

The current Sierra Vista 208 Planning Area encompasses about 14,900 acres and was last updated in May of 1999 with a 208 Amendment prepared by Fluid Solutions. The 1999 amendment expanded the service area of the Sierra Vista Wastewater Treatment Plant to include a portion of the Bella Vista Ranch development, which has not been developed. This development has changed ownership and is now known as Bella Vista.

The proposed 208 Planning Area (Exhibit 1) will include an additional 15,100 acres of surrounding land to the north east, west, and south of the City and will expand the City’s planning area to include all of the current City’s zoning and annexation areas as shown in Exhibit 2. With the approval of this expansion, the City’s 208 Planning Area will encompass a total of approximately 30,000 acres.

1.2 Amendment Item 2 - Construction of the New Tribute WRF

The Tribute WRF will serve the southwest portion of the City of Sierra Vista and will be located east of Avenida Del Sol and south of Snyder Blvd, as indicated on Exhibit 3. It will be owned and operated by the City of Sierra Vista. The WRF will have an initial capacity of 0.5 MGD with phased expansion to 2.0 MGD at full build-out. The new facility will treat wastewater to meet Arizona Title 18 Class A+ Reclaimed Water standards. Reclaimed water will be used to irrigate the Pueblo Del Sol Golf Course and public parks and rights-of-way in the future 2,000-acre Tribute Development.

According to the Tribute Water Reclamation Facility Design Concept Report (Brown and Caldwell, August 2007), the developed Pueblo Del Sol Golf Course is currently using an average annual irrigation demand of 400,137 gallons per day and the future Tribute Development will require approximately 1.6 million gallons per day of water for irrigation throughout the life of the project. With a full build-out capacity of 2.0 MGD, the Tribute WRF will be able to satisfy most of the irrigation needs for its service area with its reclaimed effluent. Excess effluent will be recharged to the underlying aquifer through recharge wells to help replenish the groundwater supply.

1.3 Amendment Item 3 - Construction of the New Section 36 WRF

The Section 36 WRF will serve the northwest portion of the City of Sierra Vista and will be located east of N. Coronado Drive and south of E. Tacoma Street. It will be owned and operated by the City of Sierra Vista. The WRF will have a 0.4 MGD capacity and will treat wastewater to ADEQ Title 18 Class A+ effluent standards. Reclaimed water will be used to supply irrigation demands for the Domingo Paiz Sports Complex, Bill Stone Sports Complex, and Veterans Memorial Park.

According to the Section 36 Water Reclamation Facility Design Concept Report (Brown and Caldwell, August 2007), the current irrigation demands for the sports complex and park, is a minimum monthly average of 0.04 MGD in the winter and a maximum monthly average of 0.31 MGD in the summer. Future demands will increase because the City will be adding more ball fields in the sports complex and they would like to extend irrigation to the Apache Middle School near the WRF site. With the added acreage of open space, the future irrigation demands are calculated to be at minimum 0.05 MGD in the winter and at maximum 0.44 MGD in the summer. With a full buildout capacity of 0.4 MGD, the Section WRF will be able to satisfy most of the irrigation needs for its service area with its reclaimed effluent. Excess effluent
will be recharged to the underlying aquifer through recharge wells to help replenish the groundwater supply.

1.4 Amendment Item 4- The Proposed Bella Vista WRFs

Two future wastewater reclamation facilities will provide wastewater service to the proposed Bella Vista Development, located in the northeast portion of the City of Sierra Vista (see Exhibit 1). Bella Vista Development will be in phases, where wastewater from the initial phases of the development will be treated by the Interim Bella Vista WRF. The interim facility will have a wastewater treatment capacity of 250,000 gallons per day. As the development grows, a larger 2.3 MGD Bella Vista WRF will be constructed to service the build-out of the development. The interim facility will either be decommissioned or serve as a satellite facility for the larger 2.3 MGD permanent facility. The two facilities will be constructed by the developer but will be owned and operated by the City of Sierra Vista. The effluent from the facility will meet ADEQ Title 18 Class A effluent standards. Reclaimed effluent will be used to supply irrigation demands within the development with excess effluent being recharged or discharged via an A2PDES permit. The potential point source discharge and the discharge location are not certain at this time. In the future, if and when a point source discharge or discharge points are determined for one or more locations for the Bella Vista project, a 208 amendment will be required.

The following sub-sections describe existing wastewater facilities, considered alternatives for wastewater from future developments, the proposed wastewater collection and treatment system, and regulatory requirements for implementation.

1.5 Description of Existing Wastewater Facilities

Most of the wastewater service within the City of Sierra Vista is currently being provided by the City of Sierra Vista WWTP with the exception of a small development that is currently on septic (See Exhibit 1). Besides this existing development, the City will not allow for any new septic system use. The existing City of Sierra Vista WWTP is located east of Sierra Vista near MM325 on SR 90 (Exhibit 1). The facility utilizes a conventional aerated lagoon system with a design capacity of 4.0 MGD. Effluent from the facility discharges to a managed wetlands and flows to percolation basins for effluent disposal. The facility consists of 30 acres of recharge basins and 50 acres of constructed wetlands. There are currently no private utilities or private sanitation districts existing within the City of Sierra Vista service areas. However, there are some active septic tanks within the service area for the City of Sierra Vista WWTP.

Two subdivisions, Town and Country Estates and Village Meadows Estates, were constructed in the 1970’s with large lots and septic tanks. These subdivisions are shown on Exhibit 1. Providing sewer service to these subdivisions would have required construction of approximately 3 miles of interceptor sewer. Due to costs, the interceptor was never constructed. The area south and west of these subdivisions would also have been served by the interceptor sewer (included in the area shown on Exhibit 1). This area remains as a Cochise County island. It was also developed with large lots on septic tanks. The construction of the interceptor sewer and associated collection systems is not likely to occur. It is assumed that the area currently being served by septic tanks will remain as-is.

Septic tanks are regulated by Cochise County, not the City of Sierra Vista. The County Health Department enforces the State of Arizona regulations regarding septic systems found in the Arizona Administrative Code. The applicable code is Chapter 18, Environmental Quality; Title 9, Department of Environmental Quality, Water Pollution Control; Article 3, Aquifer Protection Permits, General Permits. New or replacement septic fields are only allowed within the service area if they meet the requirements of Section A309,a,5 of this Administrative Code. The Cochise County Health Department is diligent in coordinating with the City Public Works Department to be sure these requirements are met before issuing construction permits for septic systems within the service area for the City of Sierra Vista WWTP.

Besides the City of Sierra Vista WWTP, the next closest existing facility is the Ft. Huachuca WWTP located northwest of the City of Sierra Vista. The Ft. Huachuca WWTP is outside the City of Sierra Vista 208 Planning Area and is not under the jurisdiction of the City.
1.6 Population, Water Supply, and Wastewater Generation Estimates

The population growth for the City of Sierra Vista is estimated to be approximately 60,000 by 2025, according to POPTAC 2006-2055 Arizona Department of Commerce Population Projections. Using a wastewater generation rate of 75 gallons per day capita (gpd/cap) based on the City of Sierra Vista Sewer Master Plan (Cheyne Owens Limited, 1984); the wastewater flow projection for the City of Sierra Vista is approximately 4.5 MGD by 2025. These calculations are shown below in Table 1.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population a</th>
<th>Wastewater Flow b (MGD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>42,310</td>
<td>3.17</td>
</tr>
<tr>
<td>2010</td>
<td>46,771</td>
<td>3.50</td>
</tr>
<tr>
<td>2015</td>
<td>51,774</td>
<td>3.88</td>
</tr>
<tr>
<td>2020</td>
<td>56,164</td>
<td>4.21</td>
</tr>
<tr>
<td>2025</td>
<td>59,972</td>
<td>4.50</td>
</tr>
</tbody>
</table>

a Source: POPTAC 2006-2055 ADOC Population Projections
b Source: City of Sierra Vista Wastewater Management Sewerage Master Plan (Cheyne Owens Ltd., ’986)

1.7 Alternatives 1 – Upgrade and Expand Existing Infrastructure

The first alternative is to upgrade existing infrastructure to meet Class A+ effluent standards and expand the existing facility to meet future needs. Upgrading and expanding the plant would not only require additional treatment process equipment, but would also include reclaimed water infrastructure. The existing WWTP is located about four to six miles from the parks and golf course that require irrigation. Reclaimed water pipelines and pumping infrastructure would have to be constructed to deliver reclaimed water from the existing plant to these areas. Constructing new treatment plants near the reuse areas is a more economical solution.

1.8 Alternative 2 - Construct New Wastewater Reclamation Facilities

The second alternative is to construct new wastewater reclamation facilities with improved treatment processes to create a new supply of irrigation water and reduce reliance on groundwater pumping. New facilities would generate reclaimed water that meets Arizona Class A+ Reclaimed Water Standards for unrestricted reuse and recharge. Groundwater indirectly augments the flow to the San Pedro River by providing the base flow that is essential to sustaining habitat and wildlife within the San Pedro River Basin. The use of reclaimed water for irrigation will reduce dependency on groundwater. New WRFs would be sited close to the areas that will be using reclaimed water for irrigation, minimizing the length of transmission pipeline required. With this alternative, some of the wastewater flow would be diverted from the existing treatment plant to the two new facilities. The existing WWTP would continue to operate at a reduced capacity.

1.9 Tribute WRF

1.9.1 Site Location, Property Ownership, and Service Area

The proposed Tribute WRF will be located in the southeastern area of the City of Sierra Vista east of Avenida Del Sol and south of Snyder Blvd within the existing City of Sierra Vista 208 Management Area. The WRF site is currently owned by Castle & Cooke Arizona, LLC. Ownership will be transferred to the City of Sierra Vista for the purpose of maintaining and operating the facility. The Tribute WRF will service
an estimated 5,400 acres of land. Exhibit 1 illustrates the proposed location service area of the treatment facility. Exhibit 3 presents the proposed layout of the new facility.

1.9.2 Water Reclamation Facility Description

The Tribute WRF will be designed and constructed in phases and will have a treatment capacity of 6.5 MGD in Phase I and expand to 2.0 MGD at build-out. It is anticipated that there will be an additional 3 phases to bring the facility to its full capacity of 2.0 MGD. The facility will utilize a Membrane Bioreactor (MBR) treatment process to produce effluent meeting ADEQ Title 18 Class A+ effluent standards. The facility will provide biological oxidation of organics and nutrient removal through activated sludge, followed by filtration through low-pressure membranes and UV disinfection. The MBR wastewater treatment is comprised of the following unit operations:

- **Headworks** - raw wastewater is pumped from the collection system to the plant headworks for coarse and fine screening.
- **Anoxic Stage** - exposes microorganisms to nitrates generated and recycled from the MBRs for nutrient removal.
- **Pre-aeration Basin** - air is supplied to mixed liquor from the Anoxic Basin to provide oxygen or carbonaceous BOD removal and nitrification (ammonia conversion to nitrates).
- **MBR Basins** - partially stabilized mixed liquor then flows by gravity into the MBR basins, which contain the low-pressure membranes. The membranes provide the critical liquid-solid separation that is traditionally performed by secondary clarifiers. The membranes provide greater than 6-log removal of bacteria and 4-log removal of viruses, so disinfection requirements should be greatly reduced from that required with conventional activated sludge technologies.
- **Sludge dewatering and stabilization** - in Phase I, waste activated sludge produced from the facility will either be discharged to the existing City of Sierra Vista WWTP for further sludge processing or will be dewatered directly from the MBR basins. As the facility expands, aerobic digesters will be constructed to provide onsite sludge stabilization and dewatering. The dewatered bio-solids will be landfilled, land-applied on restricted city property or further processed through composting to meet EPA Class A biosolids requirements.

Appendix D contains the Tribute WRF MBR process modeling results using BioWin Dynamic Modeling Software. Modeling results clearly show the effluent quality meeting Class A+ Reclaimed Water Standards.

Odor and noise control and aesthetic measures will also be incorporated into the design in accordance with the Title 18 Arizona Administrative Code; including meeting requirements for the 350’ setback surrounding the plant (see Exhibit 3 for setback boundary).

1.9.3 Facility Capacity

The facility will divert flow from the existing sewer infrastructure, therefore allowing it to have a constant flow to the treatment process with no diurnal peaking. The design treatment capacity of the Tribute WRF will be as follows:

- Phase I: 0.5 MGD
- Phase II: 1.0 MGD
- Phase III: 1.5 MGD
- Phase IV: 2.0 MGD

1.9.4 Site Description

The WRF site is on approximately 6 acres and is in a portion of the northwest quarter of Section 8, Latitude 31°32′20″N / 110°14′17″W of the San Pedro Watershed, Cochise County, AZ. The proposed site is undeveloped, uninhabited desert. The site generally slopes to the northeast and will be elevated above
the 100-year floodplain. The Mesa Mountain Wash is located northwest of the site and runs along a northeast directional. The closest paved road to the site at this time is Avenida Del Sol, which runs north/south approximately 1/4 mile west of the proposed Tribute WRF.

1.9.5 Water Reclamation Requirements

The treated effluent will meet ADEQ Title 18, Chapter 11 requirements for Class A+ reclaimed water for unrestricted irrigation of reclaimed effluent, for use of groundwater recharge, and potentially for discharge through an AZPDES Permit. If an AZPDES permit is pursued for effluent discharge to surface water, the receiving water will be the Mountain Mesas Drainage Way located adjacent to the Tribute WRF on the northwest corner of the site (See Exhibit 3 for discharge location).

Class A+ reclaimed water must undergo treatment via the following mechanisms:
- Secondary treatment, filtration, nitrogen removal, and disinfection
- Chemical feed capabilities are mandatory to allow coagulation prior to filtration and disinfection to ensure low turbidity (see below)

Effluent water quality must conform to the following:
- Turbidity < 2 NTU (24 hour mean)
- Turbidity < 5 NTU (any time)
- Fecal Coliform = none detected (4 of 7 samples)
- Fecal Coliform < 23 CFU/100mL (any time)
- Total Nitrogen < 10 mg/L (5 day mean)

Sludge disposal options includes landfill disposal and/ or land-applied on restricted city property, and/or composting as a process to further reduce pathogens to meet EPA Class A Biosolids.

1.9.6 Stormwater Discharges

All stormwater generated within the project site will be detained on-site following completion of construction (stormwater discharge will occur in compliance with the City’s Development Codes). During construction, flows will be discharged from the site under an AZPDES temporary construction discharge permit. A Stormwater Pollution Prevention Plan (SWPPP) will be implemented to accompany the discharge permit.

1.9.7 Plant Overflow

The Tribute WRF will be designed with full redundancy and safe guards to prevent any overflow of wastewater from the WRF to the surrounding areas. In addition, the facility will divert wastewater flow from the existing sewer infrastructure, and therefore can bypass the flow if necessary to prevent any unauthorized discharge.

1.9.8 Existing Sanitary Districts, Private Utilities, and WRF Service Areas

There are no private sanitary districts or utilities that exist within the proposed service area for the Tribute WRF.

1.9.9 Permitting Requirements

The Tribute WRF will require the following permits and clearances:
- Aquifer Protection Permit (APP) issued by the Arizona Department of Environmental Quality (ADEQ) for reclaimed water and sludge disposal
- ADEQ Reclaimed Water Reuse Permit for effluent reuse.

And Potentially:
- Underground Storage Facility and Recovery Permit by the Arizona Department of Water Resources (ADWR) for groundwater recharge.
- ADEQ AZPDES Permit for discharge to the Mountain Mesas Drainage Way.

1.9.10 Pretreatment Requirements

No industrial user will be connected to the system (only residential and commercial wastewater). If industrial users are added to the service area of the facility, a pretreatment program will be developed with the industrial user being subject to pretreatment standards as regulated by the EPA and by the City of Sierra Vista Code of Ordinances Chapter 50 (See Appendix F for City Ordinance).

1.9.11 Sludge Management Requirements

In Phase I, waste activated sludge produced from the facility will either be discharged to the existing City of Sierra Vista WWTP for further sludge processing or will be dewatered directly from the MBR basins. As the facility expands, aerobic digesters will be constructed to provide onsite sludge stabilization and dewatering. The dewatered bio-solids will be landfilled, land-applied on restricted cty property or further processed through composting to meet EPA Class A bio-solids requirements.

1.10 Section 36 WRF

1.10.1 Site Location, Property Ownership, and Service Area

The proposed Section 36 WRF will be constructed within the existing City of Sierra Vista 208 Management Area. The WRF site is on approximately 1.5 acres and is in a portion of the Northwest Quarter of Section 36, Latitude 31°33'50.50"N / 110°15'59.73"W, of the San Pedro Watershed, Cochise County, AZ. The plant will be constructed on land owned by the City of Sierra Vista. The Section 36 WRF will service an estimated 880 acres of land. Exhibit 1 illustrates the proposed location and service area of the treatment facility.

1.10.2 Water Reclamation Facility Description

The Section 36 WRF will utilize a membrane bioreactor (MBR) treatment process to produce effluent meeting ADEQ Title 18 Class A+ effluent standards. The facility will provide biological oxidation of organics and nutrient removal through activated sludge, followed by ultrafiltration through membranes and UV disinfection. The MBR wastewater treatment is comprised of the following unit operations:

- **Headworks** - raw wastewater is pumped from the collection system to the plant headworks for coarse and fine screening.
- **Anoxic Stage** - exposes microorganisms to nitrates generated and recycled from the MBRs.
- **Pre-aeration Basin** - air is supplied to mixed liquor from the Anoxic Basin to provide oxygen for carbonaceous BOD removal and nitrification (ammonia conversion to nitrates).
- **MBR Basins** - partially stabilized mixed-liquor then flows by gravity into the MBR basins, which contain the low-pressure membranes. The membranes provide the critical liquid-solid separation that is traditionally performed by secondary clarifiers. The membranes provide greater than 6-log removal of bacteria and 4-log removal of viruses, so disinfection requirements should be greatly reduced from that required with conventional activated sludge technologies.
- **Sludge dewatering and stabilization** – waste activated sludge produced from the facility will either be discharged to the existing City of Sierra Vista WWTP for further sludge processing or will be dewatered directly from the MBR basins. The dewatered bio-solids will be landfilled, land-applied on restricted cty property or further processed through composting to meet EPA Class A bio-solids requirements.

Odor and noise control and aesthetic measures will also be incorporated into the design in accordance with the Title 18 Arizona Administrative Code, including meeting requirements for the 350’ setback surrounding the plant.
1.10.3 Facility Capacity

The Section 36 WRF will divert flow from the existing sewer infrastructure, therefore allowing it to have a constant flow to the treatment process with no diurnal peaking. The treatment capacity of the facility will be designed for 0.4 MGD.

1.10.4 Site Description

The WRF site is approximately 1.5 acres and is in a portion of the Northwest Quarter of Section 36, Latitude 31°33’50.50”N / 110°15’59.73”W, of the San Pedro Watershed, Cochise County, AZ. The proposed site is partially developed, containing an existing well and pumping station for the irrigation of ball fields north of the site. The site slopes generally to the south and will be elevated above the 100-year floodplain. An unnamed wash is located south of the site and runs along a northeast direction. The closest paved road to the site at this time is Tacoma Street, which runs east/west approximately 0.15 mile north of the proposed Section 36 WRF.

1.10.5 Water Reclamation Requirements

The treated effluent will meet ADEQ Title 18, Chapter 11 requirements for Class A+ reclaimed water for unrestricted irrigation of reclaimed effluent and for use of groundwater recharge. No surface discharge is anticipated for the Section 36 WRF.

Class A+ reclaimed water must undergo treatment via the following mechanisms:

- Secondary treatment, filtration, nitrogen removal, and disinfection
- Chemical feed capabilities are mandatory to allow coagulation prior to filtration and disinfection to ensure low turbidity (see below)

Effluent water quality must conform to the following:

- Turbidity $< 2$ NTU (24 hour mean)
- Turbidity $< 5$ NTU (any time)
- Fecal Coliform = none detected (4 of 7 samples)
- Fecal Coliform $< 23$ CFU/100mL (any time)
- Total Nitrogen $< 10$ mg/L (5 day mean)

Sludge disposal options include landfill disposal and/or land-applied on restricted city property, and/or composting as a process to further reduce pathogens to meet EPA Class A Biosolids.

1.10.6 Stormwater Discharges

All stormwater generated within the project site will be detained on-site following completion of construction (stormwater discharge will occur in compliance with the City’s Development Codes). During construction, flows will be discharged from the site under an AZPDES temporary construction discharge permit. A Stormwater Pollution Prevention Plan (SWPPP) will be implemented to accompany the discharge permit.

1.10.7 Plant Overflow

The Section 36 WRF will be designed with full redundancy and safe guards to prevent any overflow of wastewater from the WRF to the surrounding areas. In addition, the facility will divert wastewater flow from the existing sewer infrastructure, and therefore can bypass the flow if necessary to prevent any unauthorized discharge.
1.10.8 Existing Sanitary Districts, Private Utilities, and WRF Service Areas

No private sanitary districts or utilities exist within the proposed service area for the Section 36 WRF.

1.10.9 Permitting Requirements

The Section 36 WRF will require the following permits and clearances:

- Aquifer Protection Permit (APP) issued by the Arizona Department of Environmental Quality (ADEQ) for reclaimed water
- ADEQ Reclaimed Wastewater Reuse Permit

And Potentially:
- Underground Storage Facility and Recovery Permit by the Arizona Department of Water Resources (ADWR) for groundwater recharge

1.10.10 Pretreatment Requirements

No industrial user will be connected to the system (only residential and commercial wastewater). If industrial users are added to the service area of the facility, a pretreatment program will be developed with the industrial user being subject to pretreatment standards as regulated by the EPA and by the City of Sierra Vista Code of Ordinances Chapter 50 (Appendix F).

1.10.11 Sludge Managemen Requirements

Waste activated sludge produced from the facility will be discharged to the existing City of Sierra Vista WWTP for further sludge processing. The bio-solids will be disposed of in accordance with the current permit for the City of Sierra Vista WWTP.

1.11 Bella Vista WRFs

1.11.1 Site Location, Property Ownership, and Service Area

The two proposed Bella Vista WRFs will provide wastewater service to the proposed Bella Vista Development, located in the northeastern area of the City of Sierra Vista (see Exhibit 1). The development and WRF site is currently owned by ABCDW, LLC (previously owned by Bella Vista Ranches Limited Partnership). Ownership of the WRFs will be transferred to the City of Sierra Vista for the purpose of maintaining and operating the facilities. The WRFs will service an estimated 3,000 acres of land. Exhibit 1 illustrates the proposed location service area of the treatment facilities.

1.11.2 Water Reclamation Facility Description

Both of the proposed WRFs are in the planning stages and details on the specific design parameters are not known. However, the facilities will be designed and constructed as the property develops. The first of the two WRFs to be implemented will be the Interim Bella Vista WRF and will have a treatment capacity of 250,000 gpd. The second facility, the Bella Vista WRF, will be designed to service the build-out condition of the development and will have a design treatment capacity of 2.3 MGD. The interim facility will either be decommissioned or serve as a satellite facility for the larger 2.3 MGD permanent facility.

Both facilities will utilize activated sludge to provide biological oxidation of organic matter and nutrient removal. Effluent from the facility is anticipated to meet Arizona Title 18 Class A+ Reclaimed Water Standards.

Odor and noise control and aesthetic measures will also be incorporated into the design in accordance with the Title 18 Arizona Administrative Code, including meeting requirements for the 350’ setback surrounding the facilities.

1.11.3 Facility Capacity
Wastewater generated from the Bella Vista Development will be treated at the two proposed WRFs. The design average day treatment capacities of the facilities are:

Interim Bella Vista WRF: 0.25 MGD
Bella Vista WRF: 2.3 MGD

1.11.4 Site Description

The Interim Bella Vista WRF will be located within the Bella Vista Development. It is tentatively sited in the southwest quarter of Section 21, Township 21 South, Range 21 East. The Bella Vista WRF will also be located within the Bella Vista Development and is tentatively sited in the southeast quarter of Section 22, Township 21 South, Range 21 East. Both proposed sites are currently undeveloped, uninhabited desert with the topography sloping generally to the northeast.

1.11.5 Water Reclamation Requirements

The treated effluent will meet ADEQ Title 18, Chapter 11 requirements for Class A+ reclaimed water for unrestricted irrigation of reclaimed effluent, for use of groundwater recharge, and potentially for discharge through an AZPDES Permit. The potential point source discharge and the discharge location are not certain at this time. In the future, if and when a point source discharge or discharge points are determined for one or more locations for the Bella Vista project, a 208 amendment will be required.

Class A+ reclaimed water must undergo treatment via the following mechanisms:

- Secondary treatment, filtration, nitrogen removal, and disinfection
- Chemical feed capabilities are mandatory to allow coagulation prior to filtration and disinfection to ensure low turbidity (see below)

Effluent water quality must conform to the following:

- Turbidity < 2 NTU (24 hour mean)
- Turbidity < 5 NTU (any time)
- Fecal Coliform = one detected (4 of 7 samples)
- Fecal Coliform < 23 CFU/100mL (any time)
- Total Nitrogen < 10 mg/L (5 day mean)

Sludge disposal options includes landfill disposal and/or land-applied on restricted city property, and/or composting as a process to further reduce pathogens to meet EPA Class A Biosolids.

1.11.6 Stormwater Discharges

All stormwater generated within the project site will be detained on-site following completion of construction (stormwater discharge will occur in compliance with the City’s Development Codes). During construction, flows will be discharged from the site under an AZPDES temporary construction discharge permit. A Stormwater Pollution Prevention Plan (SWPPP) will be implemented to accompany the discharge permit.

1.11.7 Plant Overflow

The Bella Vista WRFs will be designed with full redundancy and safe guards to prevent any overflow of wastewater from the WRFs to the surrounding areas.

1.11.8 Existing Sanitary Districts, Private Utilities, and WRF Service Areas

There are no sanitary districts or utilities (private or public) that exist within the proposed service area for the proposed Bella Vista Development.

1.11.9 Permitting Requirements
The Bella Vista WRFs will require the following permits and clearances:

- Aquifer Protection Permit (APP) issued by the Arizona Department of Environmental Quality (ADEQ) for reclaimed water and sludge disposal
- ADEQ Reclaimed Water Reuse Permit for effluent reuse.

And Potentially:

- Underground Storage Facility and Recovery Permit by the Arizona Department of Water Resources (ADWR) for groundwater recharge.
- ADEQ AZPDES Permit (clarify)

1.11.10 Pretreatment Requirements

No industrial user will be connected to the system (only residential and commercial wastewater). If industrial users are added to the service area of the facility, a pretreatment program will be developed with the industrial user being subject to pretreatment standards as regulated by the EPA and by the City of Sierra Vista Code of Ordinances Chapter 50 (Appendix F).

1.11.11 Sludge Management Requirements

Aerobic digesters will be constructed to provide onsite sludge stabilization and dewatering. The dewatered bio-solids will be landfilled, land-applied on restricted city property or further processed through composting to meet EPA Class A bio-solids requirements.
2 Construction

2.1 Tribute Water Reclamation Facility

2.1.1 Construction and Operation Requirements

The WRF is currently under design and will be completed by 1st or 2nd quarter of 2009 with construction following design. The construction of the facility is anticipated to be 12 to 14 months. Once the facility is constructed, portions of the wastewater flow to the existing WWTP will be diverted to the Tribute WRF for treatment at the Phase I design flow rate of 0.5 MGD. As the proposed Tribute Development is constructed, the WRF will be expanded to meet the increase capacity with projected build-out of 2.0 MGD. A copy of the Tribute WRF design and construction schedule is attached in Appendix C.

2.1.2 Sources of Pollution

The construction of the wastewater reclamation facility will not be a significant source of pollution. Anticipated pollution from construction activities includes fugitive dust, exhaust emissions from construction equipment, and construction related solid waste. Erosion control measures during construction and grading will be implemented to prevent potential storm water runoff to water bodies. The project contractor shall comply with local and county regulatory requirements and provisions of construction permits issued including dust control permits.

2.2 Section 36 Water Reclamation Facility

2.2.1 Construction and Operation Requirements

The design phase is expected to take approximately 6 months with construction lasting 12-14 months after design. Start of design is not anticipated until mid-2009. Once the facility is constructed, portions of the wastewater flow to the existing WWTP will be diverted to the Section 36 WRF for treatment at the design flow rate of 0.4 MGD. Future expansion is not anticipated at this facility.

2.2.2 Sources of Pollution

The construction of the wastewater reclamation facility will not be a significant source of pollution. Anticipated pollution from construction activities includes fugitive dust, exhaust emissions from construction equipment, and construction related solid waste. Erosion control measures during construction and grading will be implemented to prevent potential storm water runoff to water bodies. The project contractor shall comply with local and county regulatory requirements and provisions of construction permits issued including dust control permits.

2.3 Bella Vista WRFs

2.3.1 Construction and Operation Requirements

These facilities will be constructed by the developer(s). Design and construction has not been planned for these facilities. However, it is anticipated that the design phase is expected to take approximately 6 months with construction lasting 12-14 months after design.

2.3.2 Sources of Pollution

The construction of the wastewater reclamation facility will not be a significant source of pollution. Anticipated pollution from construction activities includes fugitive dust, exhaust emissions from construction equipment, and construction related solid waste. Erosion control measures during construction and grading will be implemented to prevent potential storm water runoff to water bodies. The project contractor shall comply with local and county regulatory requirements and provisions of construction permits issued including dust control permits.
3 Financing and Other Actions to Implement Plan

3.1 Financing Plan for the Tribute, Section 36 Water Reclamation Facilities

The City of Sierra Vista is a full service municipality that is the sole provider of sewer services to the community. The City is the Wastewater Service Provider for its planning and services areas. To help ensure the system has the necessary funding to meet its current and future needs, the City Council has designated the sewer operations as an enterprise activity. This requires the City to establish a separate fund for the sewer operations, and that all of the funds personnel, operating and capital outlays be covered by its user fees and charges.

The main source of revenue for the proposed treatment plants is the Sewer Fund’s connection fee. City has hired a consultant to update this fee to include the proposed plants and other future capital infrastructure needs. Once the study is completed, the City will incorporate their recommendation in its rate structure.

3.2 Financing Capability to Construct the Tribute and Section 36 Facilities

The City of Sierra Vista will provide the necessary funds for the design, construction, and operation of the Tribute and Section 36 WRFs. The funds will be established through different funding avenues, including but not limited to municipal capital improvement bonds, service fees, federal and state grants, and low interest loans. The City’s financial report can be found in Appendix B. The Bella Vista WRFs will be constructed by the developer with ownership of the facilities to be turned over to the City of Sierra Vista after the construction phase. The City will operate the facilities using the same funding sources described above.
4 Impacts and Implementation Plan

4.1.1 Implementation Plan
Both the Tribute and Section 36 WRFs will be intercepting wastewater flows from the existing WWTP, thereby reducing the wastewater load of the existing plant. The effluent from both proposed plants will create irrigation water for their service areas and will greatly reduce the groundwater pumping that is currently being used for golf course, parks and landscape irrigation. Similarly, the Bella Vista WRFs will treat wastewater from the development and will reuse the effluent for irrigation within the development, reducing the groundwater demand.

All wastewater service will be provided by the existing Sierra Vista WWTP until the proposed Tribute and Section 36 WRFs are operating. The interim Bella Vista WRF would need to be constructed prior to home occupancy in the Bella Vista Development.

4.1.2 Impacts of the Proposed Water Reclamation Facility
The construction and operation of the proposed WRFs are not expected to adversely impact any neighboring municipality, sanitary district, certificated area, community, or business. The WRFs will provide sewage treatment services within the City of Sierra Vista, which will encourage residential and business growth.

Potential environmental issues include odor, noise, vectors and hazardous materials. The following briefly discuss and addresses these issues.

Odors: The plant will include odor-scrubbing systems for process equipment, tankage, and sludge processing areas. All process tanks are covered to maintain negative pressure on the odor-control system. All headworks and sludge processing equipment is housed inside buildings. In addition, wastewater and sludge will be aerobically treated which reduces ammonia, sulfide, and other odor producing compounds.

Noise: All process equipment will be enclosed in insulated masonry buildings. Additionally, the aerator blowers will be provided with sound attenuation enclosures. All pumps and aerators will be submersible type and will minimize noise production.

Vectors: The treatment facilities will be properly operated and maintained to reduce vector attraction. Headworks equipment and sludge processing facilities will be covered and enclosed in building structures.

Hazardous Materials: The wastewater treatment facility will not accept any hazardous materials. Only residential domestic and commercial sewage will be accepted. An emergency plan will be developed to isolate and contain any hazardous materials discovered. The proposed treatment system does not require the use of any hazardous materials beyond the use of activated carbon contained within the odor control system, polymers for sludge dewatering and diesel fuel for the back-up power generator. A current set of Material Safety Data Sheets (MSDS) will be maintained for all chemicals, polymers, and bio-augmentation products used at the facility.
5 Public Participation

As part of the SEAGO Water Quality Management Plan Regional Continuing Planning Process, the Southeastern Arizona Governments Organization with cooperation of the City of Sierra Vista is responsible for ensuring that the following actions are implemented after submittal of the draft 208 Amendment:

- Notify all parties of a local public hearing on the plan or plan amendment with a notice at least 45 days prior to the hearing.
- Make Amendment materials available for public review at least 30 days prior to the hearing.
- Preparation and submittal of a transcript of the public hearing.
- Preparation and submittal of a responsiveness summary of the issues and comments.