# APPENDIX 7

# ACCEPTANCE TEST PROCEDURES AND STANDARDS

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### 7.1. PURPOSE

The purpose of the Acceptance Testing is to demonstrate that the Facility meets all performance requirements set forth in the Service Contract. This Appendix sets forth the requirements for pre-Acceptance Testing and Acceptance Testing of the Facility required under Article V of the Service Contract.

### 7.2. ACCEPTANCE TESTING DEFINITIONS

The following terms are defined for use in this Appendix:

**Clean Water** – potable water purchased by the Company from the local water utility serving the Facility.

**Component** – an individual item of equipment such as a pump, valve, blower, clarifier, thickener, compressor, piping, etc.

**Component Test** – using Clean Water and operating the component at its design point from the local control station or local control panel under manual control.

**Discharge Monitoring Report** – the formal Facility discharge monitoring report (DMR) required by the AZPDES permit to be submitted to the regulatory agency.

**Facility Hydraulic Test** – a full scale test to demonstrate the ability of the Facility to satisfactorily convey peak day flows.

**Reclaimed Water** – water purchased by the Company from the City of Tucson Water Reclamation System.

**Service Water** – non-potable water from the Roger Road WRF's non-potable water system (volumes of Service Water may be limited and shall be coordinated with the County).

**System** – an assembly of mechanical, electrical and electronic components that function together as a unit.

**System Test** – using Clean Water, reclaimed water, service water or wastewater and operating the system via the Facility PLC control system under both remote manual and remote automatic control.

## 7.3. TESTING ELEMENTS

The testing requirements of this Appendix consist of the following test elements:

(1) Acceptance Testing Plan

(2) Pre-Acceptance Tests:

(a) Component Tests

(b) System Tests

(c) Facility Hydraulic Test

(3) Acceptance Test

## 7.4. ACCEPTANCE TESTING CONDITIONS

All labor, materials, equipment, chemicals, fuels, sampling, laboratory testing, and services required to perform the Acceptance Test shall be supplied by the Company. During the test, the Company shall operate all systems under normal operating conditions, including routine equipment operation, maintenance services, chemical usage and electricity usage. The County and the County Engineering Representative shall be permitted to witness any tests conducted at the Facility Site to verify compliance with requirements in this Appendix.

## 7.5. ACCEPTANCE TESTING TIMETABLE

### 7.5.1 Pre-Acceptance Testing Requirements

The Company shall not commence the performance of Acceptance Testing prior to satisfaction of the conditions to Acceptance Testing set forth in Section 5.2 of the Service Contract. The Company shall complete and certify to the County that the Component Tests, System Tests and Facility Hydraulic Tests have been completed prior to the commencement of the Acceptance Tests in accordance with this Appendix.

#### 7.5.1.1. Component Tests

Component testing shall demonstrate that each component is installed correctly, functions as intended and meets the Technical Specifications. The Company shall verify proper motor rotation, lubrication, installation, and mechanical soundness of all equipment. Each piece of instrumentation and control equipment shall be brought into service in accordance with manufacturer's recommendations, and all calibrations and process parameter setpoints shall be verified.

#### 7.5.1.2. System Tests

The Company shall perform system tests of the liquid stream systems, solids handling systems and support systems (e.g., chemical storage and metering systems, solids thickening, heating, ventilating and air conditioning systems) to demonstrate the following:

(1) System components meet the Technical Specifications.

(2) Operation of manual and automatic control of the Facility components and systems from the PLC/SCADA system.

(3) Ability of all pumps controlled by variable frequency drives to respond to speed setpoint changes generated by the control strategy programming in the Facility PLC.

(4) All alarm functions for Facility components and systems on the PLC/SCADA system.

(5) Proper operation of the electrical power automatic transfer switch in transferring the Facility operation from the normal source to the standby source and back to the normal source.

(6) Proper operation of the alarm autodialer or similar system for notifying Facility personnel during time periods that the Facility is unstaffed.

#### 7.5.1.3. Facility Hydraulic Test

The Company shall perform the Facility Hydraulic Test prior to commencement of the Acceptance Test. The Company shall provide a Facility Hydraulic Test report to the County within 15 days of completion. The Company shall comply with the following requirements in the performance of the Facility Hydraulic Test:

(1) The Company shall prepare and provide to the County, as a component of its Acceptance Test Plan, a Facility Hydraulic Test Plan for approval by the County in accordance with Section 5.2 of the Service Contract. The Facility hydraulic test plan component of the Acceptance Test Plan shall include the following information:

(a) Facility configuration – identify which of the components in each unit process will be utilized in the test.

(b) Test date – the scheduled date the test will be performed by the Company.

(c) Related systems required – the test will involve coordination with ancillary or support systems including temporary pumping, piping, valves and controls. Identify these ancillary or support systems in the plan and schedule.

(d) Tasks and responsibilities, staffing requirements, support – the specific tasks or activities, both non-process and process related, which are required for the successful completion of the test shall be presented.

(2) Testing of the Facility can be conducted with Clean Water, Wastewater, Reclaimed Water or Service Water, if applicable.

### 7.5.2 Acceptance Test

The Company shall perform the Acceptance Test in accordance with the Contract Standards. The Company shall provide the first whole month Discharge Monitoring Report to the County within 15 days following completion of the Acceptance Test and shall provide the County with the Acceptance Test report in accordance with Section 5.2 of the Service Contract.

## 7.6. ACCEPTANCE TESTING PLAN

The Company shall prepare and provide the Acceptance Test Plan to the County for its approval in accordance with Section 5.2 of the Service Contract. In addition to the Facility hydraulic test plan component required pursuant to Section 7.5.1.3 of this Appendix, the Acceptance Test Plan shall include a schedule of all testing and shall include the following information and minimum requirements:

- Facility configuration – identify which of the components in each unit process will be utilized in the test.

- Provide anticipated chemical dosages to be used.

- Test date – the scheduled date the test will be performed by the Company.

- Related systems required – if the test will involve coordination with ancillary or support systems, identify these ancillary or support systems in the plan and schedule.

- Tasks and responsibilities, staffing requirements, support – the specific tasks or activities, both non-process and process related, which are required for the successful completion of the test;

- Response procedures for unsuccessful test results including definition of threshold results that constitute overall Acceptance Test failure;

- Internal and external communications protocols;

- Operating and maintenance schedule during testing;

- Operating conditions for Influent and Effluent systems;

- Procedures for demonstrating compliance with every Acceptance Test Procedure and Standard; and

- Procedure for testing cathodic protection systems, if such systems are provided. Such cathodic protection system testing shall occur after Substantial Completion and prior to Acceptance.

The Acceptance Test Plan shall also describe methods for demonstrating compliance with Performance Guarantees during the performance of the Acceptance Tests, including:

- A list of all parameters to be monitored and measurements to be made including but not limited to all Influent and Effluent and Sludge parameters to be monitored and a schedule of monitoring, describing sampling locations, analytical methods and sampling frequencies at which parameters will be monitored on a continuous or other defined basis.

- Identification of equipment calibrations to be performed, descriptions of all calibration techniques to be used and timing of calibrations relative to Acceptance Testing (all instruments used in Acceptance Testing operations and to monitor and evaluate Acceptance Testing shall be calibrated in accordance with manufacturer's requirements), QA/QC procedures, including those to be utilized for all equipment used for testing and measuring different parameters within the treatment process and at the

process control laboratory, contract laboratories and County laboratory. The description shall address the calibration practices, including the frequency and accuracy requirements. The calibration procedures shall consider intermediate spot and cross checks, in addition to the formal calibration periods.

- A full description of any analytical methods and techniques that will be utilized to ensure that all Applicable Law and Performance Guarantees are met. In addition, descriptions of how data collected will be compared with Performance Guarantees shall be provided and shall be in a manner that complies with Applicable Law. Provide examples of any tools such as flow charts, check sheets or any other data presentation and evaluation techniques that will be utilized.

- Supervisory Control and Data Acquisition (SCADA) system monitoring and control functions.

- A list of real-time data fields that will be provided to the County during Acceptance Testing.

- A protocol for enabling the County to collect samples during Acceptance Testing.

The Acceptance Test Plan shall also specify the form and contents of the Acceptance Test report and include specific, detailed sampling protocols to be utilized while conducting the Acceptance Tests. Laboratory analyses to determine compliance with the Performance Guarantee will be conducted by the County laboratory.

The Acceptance Test Plan shall describe the Company's approach and details for meeting the requirements of this Appendix.

## 7.7. ACCEPTANCE TEST PROCEDURES AND STANDARDS

The Company shall perform Acceptance Testing in accordance with the requirements of the approved Acceptance Test Plan. If there is a failure to meet Acceptance Test Procedures and Standards, the Company shall conduct re-tests until the Acceptance Procedures and Standards are met in accordance with Section 5.2 of the Service Contract.

No temporary equipment shall be allowed to operate during Acceptance Testing. The Acceptance Test shall be repeated in its entirety at the Company's expense if the Company is forced to use any temporary equipment to maintain operation.

### 7.7.1 General Acceptance Standards

The Company shall perform the Acceptance Test for a continuous 30-day period to demonstrate that the Facility can meet the Performance Guarantees including the Performance Guarantee for Total Phosphorus removal over the range of Influent flows and loadings received at the Facility. In order to achieve Acceptance, the Company must certify to the County in the Acceptance Test report that the Facility:

(a) was designed and constructed in accordance with the Contract Standards;

(b) operated in accordance with the Contract Standards with only the normal complement of employees included in the Company's staffing plan. Additional staff may be on-site to aid with sample collection and engineering support only. Additional staff and duties to be approved and authorized by County. Use of unauthorized staff will be cause to invalidate the Acceptance Test;

(c) operated with all automated and computerized systems in full and continuous operation;

(d) operated properly during manual and automatic shutdown and start-up; and

(e) met the Performance Guarantees for the duration of the Acceptance Test, including the Phosphorus Removal Guarantee.

### 7.7.2 Odor Control Acceptance Standards

In addition, the Company shall perform tests to demonstrate the ability of the odor control system to treat odorous air and meet the Technical Specifications pertaining to odor control and the Odor Guarantee. If compost filter beds are used, such testing shall be performed following an acclimation period as agreed to by the parties. The odor control system testing shall be performed with all ductwork and odor control fan systems properly balanced and the odor control systems installed and functioning normally. The Company may perform testing for odor control Acceptance standards concurrently with the general Acceptance standards testing.

For odor control Acceptance Testing, the hydrogen sulfide concentration inlet and outlet shall be monitored and recorded for each odor control unit utilizing constant readout electrochemical-type sensors, such as the OdaLog Gas Logger. The inlet sensor shall have a 0.0 to 50.0 ppm measurement range and the outlet exhaust sensor shall have a 0.00 to 2.00 ppm measurement range. The inlet and outlet hydrogen sulfide levels shall be recorded at 10-

minute intervals. The air flow rate through each odor control unit shall be recorded daily at the start and end of each day.

During the test period, the Company shall certify that the Facility was operated in accordance with Section 7.7.1. of this Appendix.

## 7.8. ACCEPTANCE TEST REPORTS

The Company shall prepare reports describing and documenting each Acceptance Test. The reports shall include at a minimum the following information:

(a) A certification stating that testing was conducted in accordance with the approved Acceptance Test Plan.

(b) A certification of the results of each Acceptance Test, including:

i. A determination of the extent to which the results comply with the Acceptance Test Procedures and Standards.

ii. For each Performance Guarantee a determination of the extent to which the Facility complies with the Performance Guarantee, including the Phosphorus Removal Guarantee.

(c) All required data measured and recorded during the Acceptance Test, including all laboratory analyses, chemical consumption, instrument calibrations, pressures and other measurements. Copies of original data sheets, log sheets, calculations, laboratory reports and test sheets shall be provided. Company shall retain all original data sheets, log sheets, calculations, laboratory reports and test sheets and make them available for County inspection upon request.

(d) All necessary certifications relating to testing, evaluation, analyses and performance.

(e) A record of all equipment failures, repairs and preventative maintenance.

(f) A summary of all data and calculations demonstrating the ability of the Facility to meet the requirements of the Performance Guarantees.

(g) A summary of test results and conclusive evidence of compliance with all Acceptance Test requirements.

(h) Any additional data reasonably requested by the County in approving the Acceptance Test Plan to be included in such report.

All certifications required in the Acceptance Test report shall be signed by the Company and signed and sealed by an engineer employed by the lead design firm.