Commission Meeting Agenda

CITY OF Hobbs NEW MEXICO

Mayor
Samuel D. Cobb

City Commission

R. Finn Smith – District 1
Christopher R. Mills – District 2
Larron B. Fields – District 3
Joseph D. Calderón – District 4
Dwayne Penick – District 5
Don R. Gerth – District 6

City Manager
Manny Gomez

May 13, 2024

Hobbs City Commission

Special Meeting
City Hall, City Commission Chamber
200 E. Broadway, 1st Floor Annex, Hobbs, New Mexico

Monday, May 13, 2024 - 5:00 p.m.

Sam D. Cobb, Mayor

R. Finn Smith Commissioner – District 1	Christopher R. Mills Commissioner – District 2	Larron B. Fields Commissioner – District 3
Joseph D. Calderón Commissioner – District 4	Dwayne Penick Commissioner – District 5	Don R. Gerth Commissioner – District 6

A G E N D A

City Commission Meetings are
Broadcast Live on KHBX FM 99.3 Radio and
Available via Livestream at **www.hobbsnm.org**

CALL TO ORDER AND ROLL CALL

INVOCATION AND PLEDGE OF ALLEGIANCE

PUBLIC COMMENTS *(Citizens who wish to speak must sign the Public Comment Registration Form located in the Commission Chamber prior to the beginning of the meeting.)*

ACTION ITEMS *(Ordinances, Resolutions, Public Hearings)*

1. PUBLIC HEARING: Resolution No. 7475 – Approving or Denying a Substitution of Subcontractor in the RFP 536-23, City of Hobbs Wastewater Reclamation Facility SCADA System Design and Replacement *(Valerie Chacon, City Attorney)*

COMMENTS BY CITY COMMISSIONERS, CITY MANAGER

2. Next Meeting Dates:

- **City Commission Regular Meetings**:
  - Monday, May 20, 2024, at 6:00 p.m.
  - Monday, June 3, 2024, at 6:00 p.m.
  - Monday, June 17, 2024, at 6:00 p.m.

ADJOURNMENT

If you are an individual with a disability who needs a reader, amplifier, qualified sign language interpreter, or any other form of auxiliary aid or service to attend or participate in the above meeting, please contact the City Clerk's Office at (575) 397-9200 at least 72 hours prior to the meeting or as soon as possible. Public documents, including the agenda and minutes, can be provided in various accessible formats. Please contact the City Clerk's Office if a summary or other type of accessible format is needed.

ACTION ITEMS

CITY OF HOBBS

COMMISSION STAFF SUMMARY FORM

MEETING DATE: May 13, 2024

SUBJECT: PUBLIC HEARING TO APPROVE OR DENY A SUBSTITUTION OF SUBCONTRACTOR IN THE RFP NO. 536-23 CITY OF HOBBS WASTEWATER RECLAMATION FACILITY SCADA SYSTEM DESIGN AND REPLACEMENT

DEPT. OF ORIGIN: Legal Department
DATE SUBMITTED: May 9, 2024
SUBMITTED BY: Valerie S. Chacon, City Attorney

Summary:

The City of Hobbs was approached by the contractor, IPS, in the SCADA projects regarding the substitution of the subcontractor, Tesco Controls. The contractor alleged that the subcontractor failed and/or refused to perform their duties. Pursuant to NMSA Sect. 13-4-36, no contractor whose bid is accepted shall substitute any person as a subcontractor in place of the subcontractor listed in the original bid, except that the using agency shall consent to the substitution. Prior to approval of the contractor's request for substitution of a subcontractor, the subcontractor shall be given notice of the request to substitute the subcontractor, and if an objection is provided to the using agency, City of Hobbs, a hearing shall be set. Tesco Controls filed their objection and a hearing has been set in front of the City Commission who approved the RFP.

Fiscal Impact:

Reviewed By: Deborah Corral — Digitally signed by Deborah Corral Date: 2024.05.09 15:05:51 -06'00'

Finance Department

There is no fiscal impact. The SCADA project amount of $6,921,054.97, including NMGRT (budgeted in FY2022-2023), will not change.

Attachments:

Resolution, IPS Request substitution, Notice of substitution, Objection letter from Tesco Controls and RFP-536-23

For Legal Review:

Approved As To Form: /s/ Valerie S. Chacon
City Attorney

Recommendation:

Proposed Resolution and Agreement

Approved For Submittal By:

/s/ Valerie S. Chacon
Department Director

City Manager

CITY CLERK'S USE ONLY
COMMISSION ACTION TAKEN

Resolution No._____ Continued To: _____
Ordinance No._____ Referred To: _____
Approved_____ Denied _____
Other_____ File No. _____

CITY OF HOBBS

RESOLUTION NO. 7475

RESOLUTION APPROVING OR DENYING A SUBSTITUTION OF SUBCONTRACTOR IN THE RFP NO. 536-23, CITY OF HOBBS WASTEWATER RECLAMATION FACILITY SCADA SYSTEM DESIGN AND REPLACEMENT

WHEREAS, The City of Hobbs City Commission approved the Request for Proposal (RFP) No. 536-23 for the City of Hobbs Wastewater Reclamation Facility SCADA System Design and Replacement; and

WHEREAS, The City Commission awarded the RFP No. 536-23 to IPS Inc. on February 21, 2023; and

WHEREAS, IPS, Inc. has formally requested to substitute the subcontractor, Tesco Controls on December 22, 2023; and

WHEREAS, pursuant to NMSA § 13-4-36, the City has formally given notice to the subcontractor, Tesco Controls, of the request for substitution on March 18, 2024; and

WHEREAS, pursuant to NMSA § 13-4-36, the subcontractor, Tesco Controls, filed their objection on March 27, 2024; and

WHEREAS, pursuant to NMSA § 13-4-36, the hearing is set before the City of Hobbs City Commission to approve or deny the subcontractor substitution.

NOW, THEREFORE, BE IT RESOLVED BY THE GOVERNING BODY OF THE CITY OF HOBBS, NEW MEXICO, that the request in RFP No. 536-23, SCADA Project, submitted by the contractor IPS Inc. to substitute the subcontractor, Tesco Controls, has been approved or denied.

PASSED, ADOPTED AND APPROVED this 13th day of May, 2024.

SAM D. COBB, Mayor

ATTEST:

JAN FLETCHER, City Clerk

IPS, Inc.
1612 W. Sanger St.
Hobbs, NM 88240
Office: 575.393.1417

received
2-22-24

Dear City of Hobbs,

This letter is to inform the City of Hobbs that IPS (PRIME Contractor) is a requesting a new subcontractor on the SCADA System Design and Replacement Project (RFP-536-23). The project has not met the proposed milestones for progress in Phase I. Tesco has been given plenty of time to get their SOW completed in Phase I and have not met the deadlines of completion that was originally proposed.

IPS has sent several emails without any formal responses to the concerns of the project. IPS sent another email on February 2, 2024, to inform Tesco that they have not met the proposed deadline and will forfeit their role if no responses are provided. It was at that time a response was received late on the following day of the deadline. Tesco has also failed to provide an approved schedule of completion to Phase I. IPS feels that Tesco does not have the qualified personnel to complete this project in a timeframe that was originally proposed. Currently Tesco is roughly 25% completed with Phase I and are several months behind in completing this Phase.

IPS has the best intentions of getting this project completed within the timeframe that was originally proposed and ultimately providing the client with a product that exceeds their expectations. IPS has been proactive in this matter and has researched another reputable subcontractor with the qualifications for the SOW within this project that is ready to work with us upon approval of this request. Please review with your team and let me know how to proceed.

Sincerely,

Ryan Gray
IPS Automation & Electric
C: 575-390-3064
E: r.gray@ipsaecorp.com

TESCO CONTROLS www.TescoControls.com

Corporate Office
8440 Florin Road, Sacramento, CA 95828
P.O. Box 299007, Sacramento, CA 95829
PH: 916.395.8800 FX: 916.429.2817

March 21, 2024

RECEIVED
MAR 27 2024
BY: CSP

Valerie S. Chacon
City of Hobbs
c/o City Attorney's Office
200 East Broadway
Hobbs, New Mexico 88240
575-397-9226

Re: City of Hobbs – Wastewater Reclamation Facility (WWRF) SCADA System Project
Subcontractor Substitution Objection
Tesco Job No.: T-55548

Dear Valerie S. Chacon,

We are in receipt of your letter dated March 18, 2024 (received March 19, 2024) regarding the "City of Hobbs Wastewater Reclamation Facility (WWRF) SCADA System" project referencing a request made by IPS, Inc., ("IPS") the City of Hobbs' primary contractor for this project, to substitute Tesco Controls, LLC as the subcontractor on this project (herein referred to as "Notice"). Please accept this correspondence as Tesco Controls LLC ("Tesco") formal written objection, pursuant to NMSA § 13-4-36(B).

The contractor substitution outlined in the City of Hobbs ("City") Notice is subject to the requirements of New Mexico Subcontractors Fair Practices Act ("Act") which is designed to prevent bid shopping and bid peddling by prohibiting the contractor from making subcontractor substitutions after the using agency accepts the contractor's bid. Once the using agency accepts a contractor's bid, the Act requires that no contractor shall substitute any person as subcontractor in place of the subcontractor listed in the original bid, except that the using agency shall consent to the substitution of another person as a subcontractor in the seven circumstances enumerated in Section 13-4-36(A).

The City's Notice does not cite to any of the circumstances enumerated in Section 13-4-36(A) and the description provided to justify Tesco's replacement is wholly contained in a single six sentence paragraph. Likewise, the City does not provide any indication of the contractor it has apparently approved to take over Tesco's scope of work (See *Romero Excavation v. Bradley Const*, "*Romero*" 121 N.M. 471, 476 (N.M. 1996) "the Act contemplates affirmative approval by the using agency"). It must be made clear at the outset, however, that Tesco will vigorously pursue all of its rights and remedies under the Act if the specific circumstances demonstrate that the Act's purpose of protecting subcontractors is subverted.

In this case, IPS has rejected every attempt made by Tesco to formalize the subcontract agreement executed by IPS and Tesco prior to the award of the project. As will be demonstrated at the upcoming hearing, Tesco specifically advised IPS that they "believe it beneficial and necessary to execute an additional subcontract agreement that outlines the scope of work IPS expects TESCO to complete." IPS repeatedly rebuffed these efforts to formalize a legally binding set of benchmarks, prices and schedules. Despite these efforts, Tesco has not received a complete subcontract agreement from IPS. Specifically, the subcontract agreement, executed between parties in December 2022 in pursuit of this project (prior to project award by the City of Hobbs), does not contain all proper elements, including reference to scope, deliverables, and fee. Tesco Controls made multiple attempts to coordinate the finalization of a proper subcontract agreement but have not received a proper subcontract agreement to date. Instead, Tesco Controls received on November 10, 2023, an email from IPS that provides a reference to the Fee Schedule in association with the executed subcontract agreement, but still fails to incorporate any defined scope, deliverables, or fee as an attached exhibit to the subcontract agreement.

In the absence of a workable subcontract, the City appears to have relied on a one-page graphic in the project proposal that was clearly not intended to operate as a schedule of values or workable schedule. It is unknown what representations were made by IPS to the City regarding these initial timeframes considering the fact that Tesco has made consistent efforts to qualify and contextualize those initial estimates. In November 2023, Tesco's Project Manager forwarded Tesco Controls' draft project schedule to the project team for consideration with various qualifications regarding the assumptions contained therein. This schedule was rejected, not because of timeframes, but because it was considered over-complicated. Tesco Controls subsequently attempted to schedule an in-person workshop to collaborate and refine the project schedule, but this workshop was cancelled by IPS or the City and did not occur.

In short, IPS never finalized a workable subcontract, and it never prepared a schedule that would allow IPS or the City to hold Tesco to certain timeframes associated with Phase 1. Despite this fact, Tesco Controls has been cautiously performing work on this project in good faith. In the onset of the project pursuit, the only representation by the City of Hobbs to critical path concerns regarding schedule were specific to field cut-over lead-times of process areas (which are the time frames in which to cut over from existing system to new system per process area), which was identified by the RFP and enumerated under Attachment "I" of the RFP and Proposal submission (as an included proposal submission form). There is no representation for other project tasks that requires performance constraints like that inferred by Attachment "I". If there are new constraints that must be considered as part of this project, Tesco Controls is prepared to work with the City on reasonably considering such constraints in a revised project schedule.

Tesco Controls maintains that it has made meaningful progress on this project and asserts that considering a subcontractor substitution is premature and unwarranted. We anticipate a formal hearing will be scheduled following our objection, conducted by an impartial party to consider our objection and allow Tesco the opportunity to speak to these issues more fully. Likewise, Tesco will be prepared to speak to the overall project schedule and how any initial delays will impact the anticipated timeline of the final deliverable.

Should you require any additional information or would like to discuss further, please feel free to contact me.

Respectfully,

Delven Diaz
Commercial Director

cc: Todd Fierro, Chief Operating Officer
Jason Martin, VP of Project Management
Adam Simmons, Project Manager
Ryan J. Mass, Radoslovich | Shapiro, PC, Attorneys
Frank M. Radoslovich, Radoslovich | Shapiro, PC, Attorneys

CITY ATTORNEY'S OFFICE

200 East Broadway
Hobbs, New Mexico 88240

575-397-9226
575-391-7876 fax

March 18, 2024

Delven Diaz
Tesco Controls, LLC
8440 Florin Road
Sacramento, CA, 95828

VIA MAIL ONLY

Re: City of Hobbs Waste Water Reclamation Facility (WWRF) SCADA System

Dear Delven Diaz:

I am writing regarding the SCADA system design for the City of Hobbs Waste Water Reclamation Facility (hereinafter WWRF). You, Tesco Controls, and Ryan Gray, IPS, Inc., authored and submitted a bid that included a project proposal for the SCADA system design—in the proposal Tesco Controls and IPS, Inc., provided a scope of service performed by highly skilled and seasoned personnel, a timeframe for the services, and material and labor costs. The City of Hobbs (hereinafter City) relied on the project proposal and, on February 27, 2023, accepted the proposal by awarding the SCADA project to the primary contractor, IPS, Inc., which included Tesco Controls as the subcontractor for the WWRF SCADA system design.

According to the project proposal, phase one of the project was to be completed within six to nine months, starting in April 2023 and completed by January 2024. Phase two was to begin in August 2023. Tesco Controls did not meet any of its timelines nor requested additional time. Recently, IPS, Inc. and the City were made aware of Tesco Controls change in management and complete transformation in the project team. Tesco Controls never conveyed to IPS, Inc., nor the City, that there was a change in management and that the set and agreed upon personnel were no longer on the project. In addition, it was certainly never agreed upon to change the leading project managers and engineers that were agreed upon by the City of Hobbs Commissioners.

As of today, March 18, 2024, Tesco Controls has not met the terms of the proposal. IPS, Inc., the City's primary contractor, is requesting a subcontractor substitute. Pursuant to NMSA § 13-4-36, the City is formally providing Tesco Controls with a Notice of the contractor's (IPS) request to remove Tesco Controls from the project. Tesco Controls has five working days to submit a written objection of this subcontractor substitution to the City of Hobbs, in care of the City Attorney's Office at the above mailing address.

Please feel free to contact me should you have any questions or concerns. Thank you for your time and consideration.

Respectfully,

/s/*Valerie S. Chacon*

Valerie S. Chacon
City Attorney

cc: Tim Woomer, Utilities Director
Manny Gomez, City Manager

CITY OF Hobbs NEW MEXICO

IT ALL HAPPENS HERE℠

EXHIBIT: B

REQUEST FOR PROPOSALS

FOR

MATERIALS, LABOR, PROGRAMMING, AND
ASSOCIATED ENGINEERING SERVICES:

CITY OF HOBBS
WASTEWATER RECLAMATION FACILITY
SCADA SYSTEM DESIGN AND REPLACEMENT

RFP No: 536-23

DUE DATE/TIME: December, 20 2022 / 02:00 PM

TABLE OF CONTENTS

This Request for Proposals is separated into two parts: Part I - General Requirements, and Part II - Attachments. Part I and Part II are part of the Request for Proposals and the terms, conditions, and criteria therein must be met by any proposer.

PART I -- GENERAL REQUIREMENTS

DIVISION I - ADVERTISEMENT

PROPOSAL NO. 536-23

CITY OF HOBBS

WASTEWATER RECLAMATION FACILITY

SCADA SYSTEM DESIGN AND REPLACEMENT

City of Hobbs, New Mexico

Sealed Proposals must be received by the City of Hobbs Finance Department, Room 224, Hobbs City Hall, 2nd Floor, 200 E. Broadway St., Hobbs, New Mexico 88240 by **02:00 PM December, 20 2022** to provide Materials, Labor, Programming, and associated engineering services for the Waste Water Reclamation Facility (WWRF) Scada System Design And Replacement Project at the City of Hobbs. Proposals received after the RFP's due date/time will be considered non-responsive and will be returned unopened.

This project consists of designing and replacing the existing WWRF SCADA System with new automation and communication equipment.

The proposer will submit a detailed scope of work and cost estimate to replace the existing SCADA System with new automation and communication equipment including overall system programming and control strategy, process controllers, enclosures deemed necessary, network switches, servers, workstations, remote view nodes, automation, and HMI software. The communication network shall be realized with new network switches capable of using the existing Fiber Optic (FO) Infrastructure in the Facility. The existing FO is an OM1, 12-strand Multi-Mode 62.5 micro meter cable.

DEADLINE – 02:00 PM on December 20, 2022

Submitted proposals shall not be publicly opened. Any proposal received after the stated time will be returned unopened.

Request for Proposal packages may be obtained from the City of Hobbs Finance Department, 200 E. Broadway, Hobbs, NM. Contact Shelly Raulston @ sraulston@hobbsnm.org or 575-397-9244.

In case of ambiguity or lack of clarity, the City of Hobbs, New Mexico reserves the right to adopt the most advantageous thereof or to reject any or all proposals and waive irregularities.

CITY OF HOBBS, NEW MEXICO

Manny Gomez, City Manager

Publication Date: October 10, 2022

DIVISION II – PROJECT DESCRIPTION AND SCOPE OF SERVICES

CITY OF HOBBS REQUEST FOR PROPOSAL(S)

The City of Hobbs ("COH" or "Owner") extends an invitation to interested and qualified firms or individuals to submit a Proposal for Materials, Labor, Programming, and Associated Engineering Services, for a new SCADA and communications system, and construction-related services for the **WWRF SCADA System Design and Replacement Project** (SCADA Replacement) at the COH.

1. Any individual(s) or firm(s) proposing to perform the services and provide the materials required for this RFP should familiarize themselves with the requirements by conducting a site inspection before the RFP closing date. A Certificate of Site Inspection is included within the RFP and must be included within the Proposers' formal response whether a site inspection was performed or not. After the proposal has been submitted, the Proposer shall not assert that there was a misunderstanding concerning the quantities or the nature of the work to be done. The RFP contains the requirements to be met in the project's design and construction and the Proposer's required to use accepted design and SCADA Systems construction practices in the execution of the project. Information received from an officer, agent, or employee of the Owner or any other person shall not affect the risks or obligations assumed by the Proposer or relieve him from fulfilling any of the conditions of the contract, including but not limited to the responsibilities of completing control and monitoring functions within the parameters required by the manufacturers of the equipment to be monitored and controlled.

PROJECT DESCRIPTION AND SCOPE OF SERVICES

The SCADA Replacement shall be implemented with the old System operating in parallel to the new System to allow for continuous service of the wastewater system without interruption.

Problem #1: Transition PLC (S7-315) is connected to multiple Siemens ET-200 I/O Racks (Distributed I/O) that create a single point of failure. The new System shall have one PLC per Process Area (PLC Centric Control Strategy).

Problem #2: The system is in Service for over 20 years and has undergone at least 3 Major Upgrades for which most of the Documentation is missing or incomplete.

Problem #3: System Engineering Station is out of Service.

The WWRF Control Room and the Server Room will serve as the WWRF Division's operations headquarters.

A new series of rack-mounted redundant servers, networking equipment, and UPS systems shall be installed in a pre-determined location within the facility. Workstations shall be installed in the Control Room and connected to the networking equipment to provide operator monitoring and control of the entire system. Required control and network wiring shall be routed to a predetermined location within the office area of the facility. Development software for the HMI program(s), communication software, and PLC software shall be installed on these systems. The software shall be used to develop the PLC and HMI programs for the WWRF and all other affected sites within each phase of the overall project. The Software shall become property of the City of Hobbs after completion of the Project.
System critical alarms need to be interfaced to the COH 800 MHz radio system and include an additional voice call or SMS option.

PROJECT ASSUMPTIONS

The scope of services for this proposal has been prepared using the following assumptions as a basis for its preparation:

1. The project area is described as the City of Hobbs WWRF SCADA and communication system Replacement. Proposer shall understand that this is a SCADA Design Project based on an operational Waste Water Reclamation Facility and that therefore many challenges will arise. Within reason, the owner will provide its technical assistance and knowledge of the system, however, Proposer is responsible for verifying all information provided as a requirement of the project.

2. Proposer is an authorized representative of the manufacturer with an authorized service center for warranty repairs and service within 500 miles of Hobbs, New Mexico. The proposer will be able to provide spare parts and perform repairs on the equipment and materials provided.

3. Proposer understands that the phases not under construction will remain in service during the project and is capable of providing personnel 24 hours/7 days a week for all aspects of the RFP who are knowledgeable and competent to perform the services required. The proposer will provide any safety equipment required for its personnel and be responsible for ensuring that work is conducted in accordance with Local, State, and Federal electrical, and mechanical code and safety regulations.

4. Owner will provide access to facility as-builds if available, including other pertinent information, as necessary to assist Proposer with the selection of replacement equipment.

Minimum Proposer's Requirements and Qualifications

The Proposer shall be regularly engaged in the design and installation of SCADA systems, computer systems, data communications systems, and their associated subsystems as they apply to the public water and wastewater utility industry and meet the following minimum qualifications and criteria.

1. The Proposer shall provide and employ on its payroll full-time personnel experienced in the design, installation, and deployment of process control systems and SCADA systems.
2. The Proposer shall provide and employ on its payroll full-time personnel experienced in the project management, procurement, assembly, installation, development, calibration, programming, testing, servicing of process instrumentation, control systems, SCADA systems, Networking, radio telemetry systems, and related subsystems.
3. The Proposer shall provide and employ on its payroll full-time personnel who have successfully installed a minimum of three (3) projects similar in size and scope to that required in this document and that used a similar architecture specified in this project.
4. The Proposer shall perform the work required in this project. Any sub-contractors must be listed by the Proposer and the percentage of work to be completed by each sub-contractor

must be approved by the COH. The use of employees from a temporary or a staffing company for meeting requirements of this section, or to circumvent federal or state employment law related to the payment of benefits or overtime shall not be allowed.

5. The Proposer shall provide a list of at least three references for which it has performed SCADA work in the water/wastewater industry within the last 6 years each of which shall be within a 600-mile radius of the owner's site.
6. To insure quality control and compatibility with the existing system listed experience must be acceptable in the following areas:
    a. Provide successful references for SCADA integration experience in the wastewater utility industry serving similar types of organizations with at least three (3) projects for radio telemetry and Fiber Optic Infrastructure within the last six years.
    b. Provide successful references for SCADA integration experience in the Waste Water utility industry with PLCs using MODBUS, Modbus/IP, Ethernet/IP, **PROFIBUS, and PROFINET Protocols as a native format to Siemens**, and Alan-Bradley as well as ABB PLC's, Spread Spectrum Radios and Ignition, VTScada or FactoryTalk HMI Software.
7. **The project shall be designed and supervised by a Project Manager with a minimum of five years' experience in the design and construction of integrated SCADA systems in the wastewater industries.**
8. The Proposer's panel shop must hold an Underwriters Laboratory 508A Listing.

The Proposer will specify equipment and quantities which are proposed to be used for the project. The COH is well aware of the current Supply Chain issues and requires monthly updates.

The Proposer shall provide a schedule of the warranty for work completed under this specification and a non-warranty service schedule with pricing and terms beyond the warranty period with the final documentation. The SCADA system as specified shall be warranted to be free of defects in materials and workmanship for a period of one year from the date of substantial completion. Substantial Completion is defined as a SCADA System Panel performing the monitoring and control functions as described in **"Proposal Specifications and Requirements"** with all the equipment delivered and installed satisfactorily. Proposer shall keep a record of Warranty start and end dates and include this in the O&M Manual.

PROJECT CONTACTS:

Questions regarding the selection process:

Contact: Toby Spears, Finance Director
Address: 200 E. Broadway
City / State / Zip: Hobbs, NM 88240
Phone Number: 575-397-9235

Technical Questions regarding the scope of work:

Peter Zacharias
Sr. Utilities System Specialist
1300 S. 5th St.
Hobbs, NM 88240
575-397-9315

pzacharias@hobbsnm.org

WWRF Process Areas	PLC's
Influent Pump Station, Bio Filtration Odor Control, Equalization Basin Flow and Level	Transition PLC (Located in the Control Room, Interfaced with both Servers) and PLC 1 with IM 360 and IM 361 Modules
Grit and Sum Removal System, Grit and Scum Pumping (*)	Transition PLC, PLC 3, PLC 11, and PLC 3A (with SIMATIC ET 200 Interface Module IM 153-4 I/O System) I/O shall be moved from PLC 3 to PLC 3A (with deletion of PLC 3)
Headworks, Grit Dewatering System, Fine Screen Systems, Scum Concentrator (*)	Transition PLC, PLC 11 (with SIMATIC ET 200 Interface Module IM 153-4 I/O System)
MLE Process Basins, Master Aeration Process, Bio Solid Thickeners, Final Clarifiers, RAS/WAS, and Scum pumping	Transition PLC, PLC 10 (with SIMATIC ET 200 Interface Module IM 153-4 I/O System)
UV Disinfection, Effluent Palmer Bolus Flume	Transition PLC, PLC 9 interconnected with UV PLC Packaged Unit OZONIA over PROFINET
Aerobic Digester North and South System (*)	PLC 4A and PLC 4B are both CPU 1511-1
Sludge Dewatering, Centrifuges	ABB AC 800M PLC, Connection to SCADA through ABB OPC Software
Bio Solids Drying	Allen Bradley SLC 5/05 PLC, Connection to SCADA through Kepware OPC Software (Modbus)
Effluent Pump Station, 3 PRV Sites, Surge Tank, Prairie Heaven Cemetery Irrigation	Transition PLC, PLC 7 with IM 360 and IM 361 Module
Oxy Petroleum Pump Station, Dome Storage	RBS 8 with IE/PB Link and ET 200M (IM 153-1)
2 Remote Pressure Sustaining Valve Sites (Communication over 5,8 GHz PtP Radio Links)	Transition PLC, interfaces with SCADA through Kepware OPC Software (Modbus)
Electrical Monitoring	Generator (12,470 VAC) and Transfer Switch PLC 11,
PLC # 2, Remote Base Station (RBS) # 2	S7-200 PLC no I/O used, shall be removed, Fiber Optic Equipment needs to stay.
PLC # 5, RBS # 5	No I/O used, shall be removed IE/PB Link and ET200 M, Fiber Optic Equipment needs to stay.
PLC # 6, RBS # 6	One DI and one AI were used, to propose a wireless I/O radio Link to PLC 7
BIO Tower	PLC 215 Series, Comms over 2.4 GHZ Radio

(*) Located in different Buildings, but part of the same "process"

The below-mentioned timeframe does not include the Front-end installation of SCADA Equipment like Server Rack, Power distribution, set up of the Operator Workstations, and build out of a secondary redundant Fiber optic ring for the communication between the newly installed PLCs.

This part of the Project is the least impactful stage and shall not interfere with the daily operation of the WWRF.

During all other times the affected Process Area has to be operated in manual control which requires Plant Personal to be on Site 24/7, therefore any work done by the PCSI has to be fast, efficient, and safe. Within reason, COH SCADA and Operations Personnel will be available to assist.

Enter the best estimate on Timeframe for each Process Area in the Table below (Attachment I) and return with your proposal.

WWRF Process Areas	Estimated Timeframe on Site
Influent Pump Station, Bio Filtration Odor Control, Primary Clarifier	
Grit and Sum Removal System, Grit and Sum Pumping	
Headworks, Grit Dewatering System, Fine Screen Systems, Scum Concentrator	
MLE Process Basins, Master Aeration Process, Bio Solid Thickeners, Final Clarifiers, RAS< WAS, and Scum pumping	
UV Disinfection, Effluent Palmer Bolus Flume	
Aerobic Digester North and South System	
Sludge Dewatering, Centrifuges	
Bio Solids Drying	
Effluent Pump Station, 3 PRV Sites, Surge Tank, Prairie Heaven Cemetery Irrigation	
Oxy Petroleum Pump Station, Dome Storage	
2 Remote Pressure Sustaining Valve Sites (Communication over 5,8 GHz PtP Radio Links)	
Electrical Monitoring	
PLC # 2, Remote Base Station (RBS) # 2	
PLC # 5, RBS # 5	
PLC # 6, RBS # 6	
Bio Tower	

SITE DESCRIPTION

The City of Hobbs (COH) WWRF SCADA System is located at 1300 South 5th Street in Hobbs, NM, 88240.

The COH WWRF Supervisory Control And Data Acquisition (SCADA) System controls the aforementioned Process Areas.

The automation equipment currently in use is the Siemens S7-200, S7-300, and S7-1500 series PLCs, one ABB AC 800M, one Allen Bradley SLC 5/05 Programmable Logic Controller (PLC), and ET 200 M Remote I/O Controllers as well as IE-PB Links (PROFIBUS to PROFINET conversion).

The control of the system is dedicated solely to the Transition PLC also called PLC 1 (Remote I/O controller) which might lead to confusion because the Influent PLC is also called PLC 1. Therefore, the I/O Controller PLC 1 is from here on called **Transition PLC**.

Operation and control of the system is done via computer interface screens. These screens reside at the WWRF integrated with the plant's Human Machine Interface (HMI) system. The HMI system is accessible locally at the WWRF control room or remotely via static IP and VPN tunneling.

See Attachment **"J"** for a complete System description.

The control strategies are written descriptions of the basic configuration and/or programming required to implement regulatory and sequential control of the processes as shown in the Panel Drawings. They do not in all cases describe the process characteristics fully. Finalizing and tuning of strategies, as required, by process characteristics shall be accomplished during meetings with WWRF Staff and at start-up. Control strategies shall fully reside in the memory of the designated control unit. The process inputs/outputs referred to in Attachment **"J"** are shown on the Drawings. Any additional I/O (Minimum 25 percent) required shall be added during the Shop Drawing review. It shall be provided at no additional cost to the OWNER.

DIVISION III – PRE-SUBMITTAL SITE INSPECTION

A pre-submittal Site Inspection should be performed at the City of Hobbs WWRF before the proposal closing date to fully familiarize themselves with the requirements of the project and to score the associated points outlined in the Evaluation Criteria (Division V).

DIVISION IV – RESPONSE FORMAT AND ORGANIZATION

Delivered or hand-carried submittals must be delivered to the City of Hobbs Finance Department at the location listed below. On the submittal package, please display the firm name, project title, and project number.

All submittals should be sent or delivered to:

CITY OF HOBBS – CITY HALL
Finance Dept. – Room 224
200 E. Broadway
Hobbs, NM 88240

Attention: Toby Spears, Finance Director

NUMBER OF RESPONSES: Only one proposal may be submitted by each entity for the one project, which is the subject of this RFP.

NUMBER OF COPIES: Proposers shall provide five **(5) identical** copies, and one copy in electronic form, of their proposal to the location specified in the Advertisement and before the closing date and time for receipt of proposals.

PROPOSAL FORMAT

The proposal must be limited in format and length. The format will be 8-1/2" x 11" with foldout sheets, allowed up to 11" x 17" in size. The length of the proposal shall be limited to a maximum of fifty (50) pages (printed sheet faces) of text and/or graphic material for project proposals. If there is any question as to format requirements they shall be directed to the City of Hobbs, Finance Director for clarification, before submittal of documents.

Material excluded from the fifty (50) pages maximum count shall include and shall be limited to:

- Front cover (blank on the back side)
- Submittal letter (one-page maximum)
- Tables of Contents page (one-page maximum)
- Divider pages (See Sections below)
- Certificate(s) of Insurance
- Proposal Signature Form (Attachment A)
- Campaign Contribution Declaration Form (Attachment B)
- Veterans' Preference Form (Attachment C)
- Resident Business Certification (Optional)
- Non-Collusion (Attachment D)
- Related Party (Attachment E)
- Certification Regarding Debarment (Attachment F)
- Certificate of Site Inspection (Attachment H)
- Back cover (blank on one side)

ANY SHEETS OR PAGES INCLUDED IN THE PROPOSAL, BUT NOT SPECIFICALLY EXCLUDED, AS NOTED ABOVE - SHALL BE COUNTED TOWARDS THE 50-PAGE MAXIMUM.

Divider Pages are noted herein. The Selection Committee will score proposals based on these Sections. Detailed descriptions and points assigned to each Section are provided under V. EVALUATION.

- Section 1- Business Profile
- Section 2- Equipment Specifications
- Section 3- Personnel Responsible to Perform Work
- Section 4- Material and Labor Costs
- Section 5- References
- Section 6- New Mexico Residence Business
- Section 7- Certificate of Site Inspection

Any proposal deemed non-conforming by the Selection Committee regarding format will be considered non-responsive. Proposers shall contact the City of Hobbs Representative to clarify any questions concerning format before submission.

Proposal Organization - All pages should be numbered except for those specifically excluded as noted above. All foldout pages shall be counted as two (2) pages and should be numbered as such. Proposals should be organized in the same order as the evaluation criteria. Tabs for each evaluation criterion, Sections 1 through 5, are helpful.

Submittal Letter - Each proposal must be accompanied by a submittal letter. The submittal letter (the following information will be required to contract for the project) should:

- identify the submitting business as an authorized Automation Engineering Firm;
- identify and provide the physical address of the equipment manufactures authorized repair facility;
- identify the name and title of the person(s) authorized by the company to contractually obligate the business for this RFP;
- identify the names, titles, and telephone numbers of persons to be contacted for clarification questions regarding this RFP;
- be signed by a person authorized to contractually obligate the Proposer;

Proposal Signature Form (Attachment A) – Include with the submittal letter the completed Signature Sheet and acknowledge any addendums

Campaign Contribution Declaration Form (Attachment B) – Include with the submittal letter the completed Contribution Declaration Form.

Resident/Veterans Preference Form (Attachment C) - Include with the submittal letter.

Non-Collusion Form (Attachment D) - Include with the submittal letter.

Related Party Form (Attachment E) - Include with the submittal letter.

Certification Regarding Debarment (Attachment F) - Include with the submittal letter.

DIVISION V – EVALUATION CRITERIA

A Selection Committee will evaluate the Proposals submitted in response to this RFP. The evaluation criteria will relate to the qualifications and ability of the Proposer to provide the materials and perform the services under this RFP. Proposals submitted should be fully self-contained and include the information requested below in the listed order and index tabbed the same.

A maximum total of 160 points are possible in scoring. The Selection Committee will evaluate the proposals and may conduct interviews with Proposers applying for selection. The evaluation criteria to be used by the Selection Committee and the corresponding point values for each criterion are as follows:

1. **Business Profile:** Business description, years in service, years of experience in the Automation and communications industry, including network design, capabilities of the business, Work already performed for the COH including services offered..... **30 points**

2. **Equipment Specifications:** Specifications of equipment being proposed including available options..... **20 points**

3. **Personnel Responsible for Performing Work:** Qualifications and experience of Personnel who will perform the work required of the project, and willingness to work longer hours or on weekends should finishing the Process Area under construction requires it to be fully operational and Commissioned within the allotted timeframe. .....**30 points**

4. **Material and Labor Costs:** Total cost of equipment, materials, and labor .....**20 points**

5. **References:** A business's record of performance in providing automation, communication, networking, and associated services .....**30 points**

6. **Resident Proposer/Veterans Preference:** .....**10 points**

7. **Certificate of Site Inspection:** ..... **20 points**

Grand Total of .....160 points

1. **Business Profile** - Provide specific information about the business that demonstrates its ability to provide the equipment and services being requested. Provide years in business, years as an authorized automation equipment manufacturer representative, number of employees, and services offered, including any professional affiliations or certifications. If the services of a third party, or subcontractor, are to be utilized, provide a brief company description, contact information, and identify those services to be provided by the subcontractor.

2. **Equipment Specifications** – List equipment manufacturers utilized for communication, PLCs, programming, etc... Provide manufacturers certifications where applicable. Provide a minimum of one (1) year warranty upon successful completion of startup and performance testing. List any available options including a recommended spare parts list with pricing valid for 6 months after project completion. Provide a thorough description, including drawings and a complete material list for replacing the WWRF SCADA and Communication system.

3. **Personnel Responsible for Performing Work** – Provide a list of the personnel who will be responsible for performing the requirements of the project. List their respective areas of responsibility, years of experience, licensing/certification if applicable, including any other pertinent information to demonstrate their ability to perform the services required competently and safely. Personnel performing the work shall be aware that longer work days might be required to commission a Process Area under construction.

4. **Material and Labor Costs** – Provide a detailed breakdown of equipment and labor costs for replacing the WWRF SCADA and communication system and associated components required for the project. Labor costs include the individual startup and performance testing of each new phase of the project and the removal/deletion of TAGs from the existing system (if possible) before any work begins on the succeeding phase. **Note** that part of the WWRF system will remain in service during the duration of the project. The proposers are responsible for complying with all Local, State, and Federal electrical/mechanical codes and safety regulations while performing work.

5. **References** – Provide three (3) references who can discuss the business's ability to provide and perform the services being proposed and the quality of work. Provide a brief description of the services provided, including the names of contact personnel and a current phone number.

6. **New Mexico Business** – 5 points will be given to businesses within the State of New Mexico. 5 Points will also be given to New Mexico businesses with Veterans preference. A certificate must be included within the submitted proposal.

7. **Certificate of Site Inspection** – Return Certificate of Site Inspection whether it was performed or not.

DIVISION VI – THE SELECTION PROCESS AND PROJECT SCHEDULE

SELECTION PROCESS. A Selection Committee will evaluate and score each submitted Proposal based on the criterion. The City reserves the right to determine the interview process as an optional component and proceed, at its discretion, to verify references. If an interview is held, the Selection Committee may secure additional information and/or request clarifications.

DIVISION VII – GENERAL INFORMATION

INFORMAL QUESTIONS. If you have informal questions regarding this Request for Proposals or if you have informal questions about the purchasing process, please contact:

Shelly Raulston, Tel: 575-397-9244, E-mail Address: sraulston@hobbsnm.org

Note: The City of Hobbs will answer informal questions orally and makes no warranty of any kind as to the correctness of any oral answers and uses this process solely to provide minor clarifications rapidly. Oral statements or instructions shall not constitute an amendment to this RFP. Proposers shall not rely on any verbal responses. If you have formal questions about any part of this Request for Proposals, which could result in a material issue or a formal amendment to this RFP, see INTERPRETATIONS AND ADDENDA below.

INTERPRETATIONS AND ADDENDA. Should a Proposer find any ambiguity, inconsistency or error in the Request for Proposals, or should the Proposer be in doubt as to their meaning, he shall at once notify the City Finance Director, in writing, who will send a written addendum either by facsimile or US mail to all Proposers who are on record with the Finance Department as having requested a copy of the RFP. Neither the City of Hobbs nor its representatives will be responsible for oral instructions or information. Interpretation or correction of the RFP will be made only by written addendum, which will be mailed or delivered to each Proposer of record. The City of Hobbs is not responsible for any other explanations or interpretations of the RFP.

The Owner is not responsible for assuring delivery of addenda to any Proposer. Failure to receive addenda or failure to acknowledge receipt shall not constitute a basis for a claim, protest, or reissue of the Request for Proposals.

This RFP, the Proposal of the successful Proposer, and any addenda issued by the Owner during the RFP period are to be included in and will become a part of the agreement when awarded. The Proposers shall acknowledge receipt of addenda on the Proposal form in the space provided, on the RFP Submittal Certification Form, see Attachment A.

All formal inquiries or requests for significant or material clarification or interpretation, or notification to the City of Hobbs of errors or omissions relating to this Request for Proposals must be directed, in writing, email, or by facsimile, to:

THE CITY OF HOBBS
Toby Spears, Finance Director
200 E. Broadway, Hobbs, NM
Phone: (575) 397-9235
Fax: (575) 397-9450
Email address: tspears@hobbsnm.org

All formal inquiries must be submitted before the time and date set for closing this RFP. Failure to submit inquiries by this deadline may result in the inquiry not being answered.

PROPRIETARY INFORMATION. If you are submitting any information you consider proprietary, you must place it in a separate envelope and mark it "Proprietary Information". If the Legal and Finance Department concurs, this information will not be considered public information. The City of Hobbs Legal Department is the final authority as to the extent to which material is considered proprietary or confidential. The Owner assumes no liability for disclosure or use of unmarked data. Unless identified, information submitted in response to this RFP may be disclosed pursuant to the applicable New Mexico Public Records Law and applicable New Mexico Statutes.

OBLIGATIONS. This RFP does not obligate the City of Hobbs to pay any costs incurred in the preparation and submission of Proposals nor to enter into an agreement with any of the applicants.

SITE INSPECTION. The proposer should perform a Site inspection at the City of Hobbs WWRF before Proposal closing date to fully familiarize themselves with the requirements of the project and to score the associated points outlined in the Evaluation Criteria. As-built drawings and schematics are on location and will be made available for review and copying.

WITHDRAWAL OF PROPOSAL. Proposals may be withdrawn either personally or by written request at any time before the scheduled date and time set for receipt.

AWARD OR REJECTION OF PROPOSALS. The Owner has the right to cancel this Request for Proposals, reject any or all Proposals, waive or decline any irregularities in any submitted Proposals, or withhold the award for any reason it may determine in the best interest of the Owner and also reserves the right to hold open any or all Proposals for a period of NINETY (90) DAYS after the date of the opening thereof and the right to accept a Proposal not withdrawn before the scheduled opening date.

NEGOTIATION OF THE AGREEMENT. The City of Hobbs may proceed to negotiate a contract for materials and services at compensation that it determines to be fair and reasonable. In making this decision, the City of Hobbs may take into account the estimated value of the scope of services, the complexity, and the services to be rendered. If unable to negotiate a satisfactory contract with the business considered to be the most qualified, at a price determined to be fair and reasonable, negotiations with that business will be formally terminated. The City of Hobbs may then undertake negotiations with the next most qualified business in sequence until an agreement is reached or a determination is made to reject all proposals.

RETURN OF PROPOSALS. The City of Hobbs will not return any Proposals that are submitted.

PART II: ATTACHMENTS

Attachment A: Proposal Signature Form

Attachment B: Campaign Contribution Disclosure Form

Attachment C: Veterans' Preference Form

Attachment D: Non-Collusion

Attachment E: Related Party

Attachment F: Certification Regarding Debarment

Attachment G: Submittal Inquiry Form

Attachment H: Certificate of Site Inspection

Attachment I : Estimated Timeline per Process Area

Attachment J: Proposal Specifications and Requirement

ATTACHMENT A: PROPOSAL FORM SIGNATURE SHEET

PROPOSAL 536-23

CITY OF HOBBS
WASTEWATER RECLAMATION FACILITY
SCADA SYSTEM DESIGN AND REPLACEMENT

TO: The City of Hobbs, New Mexico_____, 20___

Proposal of_____:
(Company Name)

A) A Corporation under the laws of the State of; or

B) A partnership consisting of_____; or

C) An individual trading as_____.

The undersigned offeror, pursuant to the foregoing "Request for Proposals", has carefully examined the instructions to Offerors, this proposal form, and the Specifications.

_____
Company Name:

_____
By:

_____
Type or Print Name:

_____
Address:

_____
City **State** **Zip**

_____
E-Mail Address

_____
NM Business Registration

NOTE: To be valid, bid must be signed. The signature of a corporation is its president, or an authorized representative. A signature of a partnership must be a valid partner or authorized representative.

THE FOLLOWING ADDENDA ARE HEREBY ACKNOWLEDGED AS FOLLOWS:

ADDENDUM NUMBER:_____DATED:_____ADDENDUM NUMBER:_____DATED:_____

ADDENDUM NUMBER:_____DATED:_____ADDENDUM NUMBER:_____DATED:_____

ATTACHMENT B: CAMPAIGN CONTRIBUTION DISCLOSURE FORM

CAMPAIGN CONTRIBUTION DISCLOSURE FORM

Pursuant to NMSA 1978, § 13-1-191.1 (2006), any person seeking to enter into a contract with any state agency or local public body **for professional services, a design and build project delivery system, or the design and installation of measures the primary purpose of which is to conserve natural resources** must file this form with that state agency or local public body. This form must be filed even if the contract qualifies as a small purchase or a sole source contract. The prospective contractor must disclose whether they, a family member or a representative of the prospective contractor has made a campaign contribution to an applicable public official of the state or a local public body during the two years prior to the date on which the contractor submits a proposal or, in the case of a sole source or small purchase contract, the two years prior to the date the contractor signs the contract, if the aggregate total of contributions given by the prospective contractor, a family member or a representative of the prospective contractor to the public official exceeds two hundred and fifty dollars ($250) over the two year period.

Furthermore, the state agency or local public body shall void an executed contract or cancel a solicitation or proposed award for a proposed contract if: 1) a prospective contractor, a family member of the prospective contractor, or a representative of the prospective contractor gives a campaign contribution or other thing of value to an applicable public official or the applicable public official's employees during the pendency of the procurement process or 2) a prospective contractor fails to submit a fully completed disclosure statement pursuant to the law.

THIS FORM MUST BE FILED BY ANY PROSPECTIVE CONTRACTOR WHETHER OR NOT THEY, THEIR FAMILY MEMBER, OR THEIR REPRESENTATIVE HAS MADE ANY CONTRIBUTIONS SUBJECT TO DISCLOSURE.

The following definitions apply:

"**Applicable public official**" means a person elected to an office or a person appointed to complete a term of an elected office, who has the authority to award or influence the award of the contract for which the prospective contractor is submitting a competitive sealed proposal or who has the authority to negotiate a sole source or small purchase contract that may be awarded without submission of a sealed competitive proposal.

"**Campaign Contribution**" means a gift, subscription, loan, advance or deposit of money or other thing of value, including the estimated value of an in-kind contribution, that is made to or received by an applicable public official or any person authorized to raise, collect or expend contributions on that official's behalf for the purpose of electing the official to either statewide or local office. "Campaign Contribution" includes the payment of a debt incurred in an election campaign, but does not include the value of services provided without compensation or unreimbursed travel or other personal expenses of individuals who volunteer a portion or all of their time on behalf of a candidate or political committee, nor does it include the administrative or solicitation expenses of a political committee that are paid by an organization that sponsors the committee.

"**Family member**" means spouse, father, mother, child, father-in-law, mother-in-law, daughter-in-law or son- in-law.

"**Pendency of the procurement process**" means the time period commencing with the public notice of the request for proposals and ending with the award of the contract or the cancellation of the request for proposals.

"**Person**" means any corporation, partnership, individual, joint venture, association or any other private legal entity.

"**Prospective contractor**" means a person who is subject to the competitive sealed proposal process set forth in the Procurement Code or is not required to submit a competitive sealed proposal because that person qualifies for a sole source or a small purchase contract.

"**Representative of a prospective contractor**" means an officer or director of a corporation, a member or manager of a limited liability corporation, a partner of a partnership or a trustee of a trust of the prospective contractor.

DISCLOSURE OF CONTRIBUTIONS:

Contribution Made By: _____

Relation to Prospective Contractor: _____

Name of Applicable Public Official: _____

Date Contribution(s) Made: _____

_____

Amount(s) of Contribution(s) _____

_____

Nature of Contribution(s) _____

_____

Purpose of Contribution(s) _____

_____

(Attach extra pages if necessary)

_____ _____

Signature Date

_____

Title (position)

--OR—

NO CONTRIBUTIONS IN THE AGGREGATE TOTAL OVER TWO HUNDRED FIFTY DOLLARS ($250) WERE MADE to an applicable public official by me, a family member or representative.

_____ _____

Signature Date

_____

Title (Position)

ATTACHMENT C: VETERANS' PREFERENCE FORM

Resident Veterans Preference Certification

_____ (NAME OF CONTRACTOR) hereby certifies the following in regard to application of the resident veterans' preference to this procurement:

Please check one box only

□ I declare under penalty of perjury that my business prior year revenue starting January 1 ending December 31 is less than $3M allowing me the 10% preference discount on this solicitation. I understand that knowingly giving false or misleading information about this fact constitutes a crime.

"I agree to submit a report, or reports, to the State Purchasing Division of the General Services Department declaring under penalty of perjury that during the last calendar year starting January 1 and ending on December 31, the following to be true and accurate:

"In conjunction with this procurement and the requirements of this business' application for a Resident Veteran Business Preference/Resident Veteran Contractor Preference under Sections 13-1-21 or 13-1-22 NMSA 1978, when awarded a contract which was on the basis of having such veterans preference, I agree to report to the State Purchasing Division of the General Services Department the awarded amount involved. I will indicate in the report the award amount as a purchase from a public body or as a public works contract from a public body as the case may be.

"I declare under penalty of perjury that this statement is true to the best of my knowledge. I understand that giving false or misleading statements about material fact regarding this matter constitutes a crime."

_____ _____

(Signature of Business Representative)* (Date)

*Must be an authorized signatory for the Business.

The representations made in checking the boxes constitutes a material representation by the business that is subject to protest and may result in denial of an award or unaward of the procurement involved if the statements are proven to be incorrect.

ATTACHMENT D: NON-COLLUSION AFFIDAVIT FORM

NON-COLLUSION AFFIDAVIT

STATE OF _____)
City OF_____)

_____(name) being first duly sworn, deposes and says that he/she is (title)_____
of (organization)_____
who submits herewith to the City of Hobbs, a bid/proposal:
That all statements of fact in such bid/proposal are true:
That said proposal/bid was not made in the interest of or on behalf of any undislosed person, partnership, company, association, organization or corporation;
That said proposer/bidder has not, directly or indirectly by agreement, communication or conference with anyone attempted to induce action prejudicial to the interest of the City of Hobbs, or of any proposer/bidder of anyone else interested in the proposed contract; and further,
That prior to the public opening and reading of bid/proposal, said bidder/proposer;

1. Did not directly or indirectly, induce or solicit anyone else to submit a false or sham proposal
2. Did not directly or indirectly collude, conspire, connive or agree with anyone else that said bidder or anyone else would submit a false or sham proposal, or that anyone should refrain from bidding or withdraw his/her proposals;
3. Did not in any manner, directly or indirectly, seek by agreement, communication or conference with anyone to raise or fix the proposal price of said bidder or of anyone else, or to raise or fix any overhead, profit or cost element of their proposal price, or of that of anyone else;
4. Did not directly or indirectly, submit his proposed price or any breakdown thereof, or the contest thereof, or divulge information or data relative thereto, to any corporation, partnership, company, association organization, bid depository or to any member or agent thereof, or to any individual group of individuals, except that City of Hobbs, or to any person or persons who have a partnership or other financial interests with said proposer/bidder in his/her business.

By:_____
Title:_____

SUBSCRIBED and sworn to before me this _____day of _____, 20_____
Notary Public:_____

ATTACHMENT E: RELATED PARTY DISCLOSE FORM

RELATED PARTY DISCLOSURE FORM

(Bidders and Proposers only)

1. Are you indebted to or have a receivable from any member of the City of Hobbs Commissioners, administration officials, department heads, and key management supervisors with the City of Hobbs?

   YES____NO_____

2. Are you, or any officer of your company related to any member of the City of Hobbs Commissioners, administration officials, department heads, key management supervisors of the City of Hobbs and have you had any of the following transactions since January 1, 2017 to which City of Hobbs was, is to be, a party?

   Sales, Purchase or leasing of property? YES____NO_____
   Receiving, furnishing of goods, services or facilities? YES____NO_____
   Commissions or royalty payments? YES____NO_____

3. Does any member of the City Commission; administration officials, department heads, key management supervisors with the City of Hobbs, have any financial interest in your company whether a sole proprietorship, partnership, or corporation of any kind that currently conducts business with the City of Hobbs?

   YES____NO_____

4. At any time from January 1, 2017 through the present, did you, your company, or any officer of your company have an interest in or signature authority over a bank account for the benefit of a member of the City Commission administration officials, department heads, key management supervisors with the City of Hobbs?

   YES____NO____

5. Are you negotiating to employ or do you currently employ any employee, officer, or family member of an employee or officer for the City of Hobbs?

6. Are you an employee of the City of Hobbs or a member of your family an employee of the City of Hobbs?

   YES___NO____

The answers to the foregoing questions are correctly stated to the best of my knowledge and belief.

Signature of Owner or Company President_____**Date**_____

(Print Name and Title):_____

ATTACHMENT F: CERTIFICATION REGARDING DEBARMENT FORM

City of Hobbs
Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion

The Bidder/Proposer certifies, by submission of this bid/proposal, neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this submission of bid/proposal by any Federal, State or Local government. It further agrees by submitting this bid/proposal that it will include this clause without modification in all lower tier transactions, solicitations, proposals, contracts and subcontracts. Where the bidder/proposer or any lower tier participant is unable to certify to this statement, it shall attach an explanation to this bid/proposal submission

Failure to acknowledge the above conditions would render the Bid/Proposal non-responsive.

I acknowledge:

Company Name:_____

Signature_____

Print Name_____

ATTACHMENT G: SUBMITTAL INQUIRY FORM

(Pre-submittal Questions, General Clarifications, etc.)

PROJECT NAME: CITY OF HOBBS WASTEWATER RECLAMATION FACILITY SCADA SYSTEM DESIGN AND REPLACEMENT

RFP NUMBER: 536-23

INQUIRY DEADLINE: October 31, 2022

QUESTIONS ON: ORIGINAL RFP PACKET or ADDENDUM NO. _____

SECTION NUMBER: _____

WRITER: _____

FAX NO. _____ PHONE NO. _____

COMPANY: _____

COMPANY E-MAIL ADDRESS: _____

DATE: _____

QUESTIONS:

ATTACHMENT H: CERTIFICATE OF SITE INSPECTION

This certificate of site inspection must be completed and included by all Proposers in their response to this Request for Proposals.

STATEMENT BY PROPOSER

I hereby certify that a Site Inspection of the WWRF SCADA system Design and Replacement at the City of Hobbs Waste Water Facility has been conducted to determine the mechanical, electrical, control, and safety requirements of the RFP.

PROPOSER	CITY OF HOBBS REPRESENTATIVE
_____	_____
Typed/Printed Name	Typed/Printed Name
_____	_____
Signature	Signature
_____	_____
Date of Site Inspection	Date of Verification

ARRANGEMENT FOR SITE INSPECTION: To arrange for a site inspection, call: Peter Zacharias, Senior Utilities System Specialist's at O: (575) 397-9315 or C: **575-318-3748**

Attachment I: Estimated Time Line per Process Area

WWRF Process Areas	Estimated Timeframe on Site
Influent Pump Station, Bio Filtration Odor Control, Primary Clarifier	
Grit and Sum Removal System, Grit and Sum Pumping	
Headworks, Grit Dewatering System, Fine Screen Systems, Scum Concentrator	
MLE Process Basins, Master Aeration Process, Bio Solid Thickeners, Final Clarifiers, RAS< WAS, and Scum pumping	
UV Disinfection, Effluent Palmer Bolus Flume	
Aerobic Digester North and South System	
Sludge Dewatering, Centrifuges	
Bio Solids Drying	
Effluent Pump Station, 3 PRV Sites, Surge Tank, Prairie Heaven Cemetery Irrigation	
Oxy Petroleum Pump Station, Dome Storage	
2 Remote Pressure Sustaining Valve Sites (Communication over 5,8 GHz PtP Radio Links)	
Electrical Monitoring	
PLC # 2, Remote Base Station (RBS) # 2	
PLC # 5, RBS # 5	
PLC # 6, RBS # 6	
Bio Tower	

Attachment J: System description and Proposal Specification / Requirements

System Description

Influent Pumping and Preliminary Treatment

Overview

The purpose of the influent pump station and headworks is to lift the influent wastewater flow up to an elevation that allow the wastewater to pass through the treatment plant by gravity, to provide preliminary treatment (reduction or removal of non-biodegradable solids in the influent), and to provide a measurement of the plant influent flow. The headworks is also the location for the collection of representative test samples of the wastewater to provide information necessary to adjust plant operations to accommodate changing influent characteristics.

The major equipment in the preliminary treatment process includes:

- One in-channel grinder screen with Auger Monster
- Three submersible influent pumps
- One magnetic flow meter
- Two equalization basins (emergency use only)
- One combination aerated grit basin/grease flotation/pre-aeration/odor stripping tank (Grit Chamber)
- Two grit slurry pumps
- Two primary scum pumps
- Two grit dewatering/classification units
- Two stair-type fine screens [3 millimeters (mm)] with dedicated washer/compactors
- One scum concentrator for dewatering and concentrating primary and secondary scum
- One belt conveyor for transferring dewatered grit and screenings to a dumpster
- One backup grit settling basin ((non-aerated) Grit Chamber)

All of the headworks processes are provided with odor control covers and directly ventilated to two redundant biofilter odor treatment vessels except the equalization basins, belt conveyor, and backup grit chamber.

Wastewater flows through the City of Hobbs collection system and enters the WWTP via a 30" diameter line. This line discharges into the below-grade wet well divided into four compartments. The first compartment contains a grinder screen that has a washer/auger screw extending to the surface (Auger Monster). The other three compartments are equipped with submersible raw wastewater pumps. Two other lines enter the Influent Pump Station:

- A 6" diameter line that conveys the flow from the plant drain system, including flows from the septage truck discharge station.
- A 12" diameter line that conveys the return flow (dewatered sludge centrate, Supernatant out of the Digester Basins, and VACTOR Truck discharge) from the equalization basins. This flow is measured by an inline Ultrasonic Flowmeter.

Flow is calculated by a 12" magnetic flow meter located on the 24" diameter common discharge line from the influent pumps. This flow reading is sent to the SCADA System for display at the Operator Workstation (OWS) and the Operator Interface Terminal (OIT/HMI) located on the PLC-1 panel. The SCADA system calculates the totalized flow and displays it to the operator.

After measurement, the flow can be directed to any of three locations:

- Aerated Grit Chamber
- Backup Grit Chamber
- Equalization Basins

The normal flow is to the aerated grit basin. This basin serves four purposes; (a) remove heavy inorganic material (grit) by sedimentation; (b) remove grease and other floatable by air entrainment; (c) remove volatile toxic compounds from the wastewater that may inhibit downstream biological processes by aeration stripping; and (d) remove the odor-causing compounds by aeration stripping. The grit slurry is pumped to the grit dewatering/classification units. The de-gritted wastewater is conveyed to the stair-type fine Screens via a 24-inch diameter line. The screens remove objects larger than 3 mm in size and lift the screenings into the screenings washer/compactors to wash organic material out of the screenings and return that organic material to the wastewater for downstream treatment in the activated sludge process.

Influent Pumping dedicated to PLC # 1

Once the flow of the Hobbs facility reaches the Influent Pump Station, it needs to be pumped to a higher elevation so that it can continue by gravity flow through the process.

The Influent Pump Station wet well receives raw wastewater as well as recycle flows, such as centrifuge centrate, return flow from the Equalization Basins including Digester Supernatant, trucked-in wastewater from septage and VACTOR trucks, as well as flow from the plant drain system.

The Influent Pump Station is equipped with one in-channel grinder/auger and three variable speeds, submersible pumps located in individual wet wells that are inter-connected. The pumps discharge through dedicated 12-inch diameter discharge lines joining into a common 24-inch diameter header that transfers flow to the Aerated Grit Chamber, the Backup Grit Chamber, or the Equalization Basins.

Process Control

Normal Operation

The wet well is a 31-feet long, 6-feet wide, and 6-feet deep concrete structure. Wastewater passes thru the grinder/auger channel where inorganic materials larger than 3/8-inch are screened, washed, and conveyed to the top for disposal. The grinder operates continuously, while the auger is operated by an adjustable timer within the grinder/auger controller (packaged unit). The normal operation of the auger spiral rotation is based on the time of day and the flow conditions. The forward and reverse rotation of the auger and time interval is set by the Operator at the Controller; 2 min. forward,10 sec. reverse, and 2 min. forward as frequently as needed (as low as 15 min.). A float is also wired to the controller which starts the auger when the water level reaches a determined point.

After passing thru the grinder, wastewater flows into the adjacent submersible pump wet wells. A submersible level transmitter sends a signal 4-20mA signal to PLC-1 which controls submersible pump start/speed/stop signals. Control is based on the level within the wet wells.

There are three submersible, raw sewage pumps in the Influent Pump Station available for service. During normal operation, all three pumps are in "Auto" and will alternate according to the time interval set by the operator at the OWS (daily).

Operation of the influent pumps from their respective variable frequency drive provides two options to the operator:

1. Hand– This mode allows the operator to manually start (or stop) the respective pumps. Pump speed can be raised and/or lowered by using the potentiometer control knob which adjusts the output hertz from the drive to the pump motor.

2. Automatic – This mode allows the SCADA application to start and adjust the speed of the "Lead" pump when the wet well level reaches the "Lead Pump On" set point, based on the signal from the wet well level transmitter. When the level reaches the Lag Pump #1

set point, the next pump in sequence, and auto, will commence the start pump sequence. If the wet well level continues to rise and reaches Lag Pump #2 setpoint, the remaining pump will start up if in Auto. As the wet well level decreases, the controller automatically shuts the pumps off in the same sequence that the pumps started. The SCADA system automatically advances the Lead Pump, Lag Pump #1, and Lag Pump #2 sequence so that all three pumps are operated on regularly.

a Additional functions that are covered by the Influent PLC-1 are:

LEL Gas monitoring and alarming

PH and Temperature measurement

Total suspended Solids measurement

Side stream Flow measurement at the 12" pipe from the Equalization Basin

Control of an actuated Valve within that 12" pipe

Equalization basin level measurement

Start and Stop of the Equalization Basin Mixers

Bio Filter monitoring

Operator Check momentary switch

SCALANCE Ring Switch 204-2 (PLC-1)
Ethernet Fault

HARDWIRED INPUT/OUTPUT (I/O) LIST FOR PLC 1

Digital Inputs

Tag	Process/Command	Notes
Combustible Gas		
YA-1701	Warning	
YAH-1701	Alarm	
YA-1702	Fault	
EQ Valve		
ZSC-1801	Valve Closed	
ZSO-1801	Valve Open	
Generalized Input Alerts		
ZS-****	Op Check	
JA-1001	Power Fail	
JS-1001	Gen Running	
EQ Mixer #1		
YS-1411	Running	
YA-1411	Overload	
EQ Mixer #3		
YS-1431	Running	
YA-1431	Overload	
EQ Mixer #5		
YS-1451	Running	
YA-1451	Overload	
EQ Mixer #6		
YS-1461	Running	
YA-1461	Overload	

Digital Inputs (Cont.)

Tag	Process/Command	Notes
Pump #1		
TAH-1101	Overtemperature	
YA-1101	Seal Fail	
Pump #2		
TAH-1201	Overtemperature	
YA-1201	Seal Fail	
Pump #3		
TAH-1301	Overtemperature	
YA-1301	Seal Fail	

Grinder/Auger		
YS-1501	Grinder Running	
YS-1502	Auger Running	
YA-1501	Fault	
LAH-1501	Grinder Hi Level	
Bio Filter #1		
YS-1611	Fan Running	
YS-1612	Irrigation Running	
PSL-1611	Low Pressure	
Bio Filter #2		
YS-1621	Fan Running	
YS-1622	Irrigation Running	
PSL-1621	Lo Press.	

Digital Inputs (Cont.)

Tag	Process/Command	Notes
VFD #1		
ZHS-1101	In Auto	
YS-1101	Ready	
YS-1102	Running	
YS-1103	Fault	
VFD #2		
ZHS-1201	In Auto	
YS-1201	Ready	
YS-1202	Running	
YS-1203	Fault	
VFD #3		
ZHS-1301	In Auto	
YS-1301	Ready	
YS-1302	Running	
YS-1303	Fault	
EQ Mixer #2		
YS-1421	Running	
YA-1421	Overload	
EQ Mixer #4		
YS-1441	Running	
YA-1441	Overload	

Digital Output Module

Tag	Process	Notes
YC-1101	VFD #1 Start/Stop	
YC-1201	VFD #2 Start/Stop	
YC-1301	VFD #3 Start/Stop	
YC-1411	South Mixer Start/Stop	
YC-1441	North Mixer Start/Stop	
YO-1801	EQ Valve Open Command	
YC-1801	EQ Valve Close Command	
YC-1411	Mixer #1 Start/Stop	
YC-1431	Mixer #3 Start/Stop	
YC1451	Mixer #5 Start/Stop	
YC-1461	Mixer #6 Start/Stop	

Analog Inputs

Tag	Process	Notes
LIT-1001	Wet Well Level	
LIT-1002	EQ Level	
FIT-1001	Pump Flow Rate	
FIT-1002	EQ Flow Rate	
TT-1001	Influent Pump Temp.	
AIT-1001	Process PH Meter	
AIT-1002	Combustion Gas	
AIT-1003	Suspended Solids	
SIT-1101	VFD#1 Speed Indication	
SIT-1102	VFD#2 Speed Indication	
SIT-1103	VFD#3 Speed Indication	

Analog Outputs

Tag	Process	Notes
SC-1101	VFD#1 Speed	
SC-1201	VFD#2 Speed	
SC-1301	VFD#3 Speed	

GRIT/GREASE REMOVAL AND PRE-AERATION PROCESS DEDICATED TO TRANSITION PLC, PLC 3A, AND PLC 11

The Hobbs Grit/Grease Removal and Pre-aeration (Primary Grit Chamber) process is a unique process designed specifically for the needs of this facility.

The detention time at peak flow of 40 minutes is about three times longer than typical detention times of aerated grit removal processes. This would normally result in excessive organic material in the grit; however, two mechanisms are used to prevent excessive organic material in the final grit product conveyed to the dumpster in the headworks building:

1. Vigorous aeration is provided at the point where the raw sewage enters the Primary Grit Chamber, breaking up the organic material, making it more soluble, and stripping it from the grit.

2. The Slurry Cups are commonly used in sludge degritting applications, so any organic material remaining with the grit slurry will be washed out in the Slurry Cups and discharged back into the wastewater flow to the MLE Basins.

The process consists of one of the Grit Chambers converted to provide multiple functions:

1. Aerated grit removal

2. Scum and grease flotation

3. Aeration stripping of volatile compounds that may be toxic to downstream biological processes

4. Aeration stripping of odorous compounds to decrease the odors in the downstream headworks processes and anoxic zones of the MLE process basins

The process consists of:

1. One (1) covered primary clarifier tank.

2. Sixteen (16) non-clog coarse bubble aeration diffusers mounted on the inside of the center well.

3. Aeration provided by one (1) positive displacement blower.

4. Scum removal using the existing skimmer and scum beach with scum manually pumped using scum pumps (one duty, one standby).

5. Grit pumping using two recessed impeller grit pumps (one duty, one standby).

6. Grit separation, classification, and dewatering – This process consists of two (2) Eutek Slurry Cup/Snail systems. Each system is designed to handle the flow from one grit slurry pump, so this is a fully redundant process (one duty, one standby). This operation consists of the slurry cup; a vessel that the flow is pumped into and this creates a free vortex within that vessel that throws the grit to the outside of the tank using centrifugal force and this grit settles along the walls of the tank into a "hydraulic valve" because it uses a pressurized water stream to pressurize the "spin chamber" within the hydraulic valve and create a "water curtain" that keeps the grit in the spin chamber while preventing organics from entering the chamber. The concentrated washed grit is continuously discharged from the bottom of the slurry cup into a clarifier that further dewaters the grit. Concentrated grit from the clarifier slurry is discharged to a grit dewatering/transport device known as a Snail where all remaining free water drains from the grit.

7. Final dewatered grit is discharged from the Snail to the belt conveyor where it is conveyed to a dumpster.

8. Backup grit removal provided by the second uncovered secondary Grit Chamber.

GRIT AND SCUM PUMPING PLC-3A

A. General

1. The grit pumps transfer grit from the grit chambers (primary or secondary) to the grit dewatering system.

2. Each grit pump has a dedicated solenoid valve used to provide seal water to the pump. The seal water solenoid valve opens automatically whenever the pump needs to run. This control occurs in the MCC regardless of whether the local or remote mode is selected.

B. Control – Local

1. A Local/Remote selector switch is located at the MCC. The switch is a maintained position switch. This switch is used as follows:

   a. Local: When the switch is in the local position, the pump is started and stopped via the start and stop pushbuttons on the MCC.
   b. Remote: When the switch is in the remote position, the pump is controlled via the SCADA system.

C. Control – SCADA System

1. General

   a. Each pump control pop-up display has manual and auto pushbuttons to select the mode of control.

2. Manual Control

   a. Each pump control pop-up display has start and stop pushbuttons to control the pump.

3. Automatic Control

   a. A single Pump1/Pump2 selector is provided at the HMI to select which pump is the duty pump. The pump that is not selected shall automatically be set as the standby pump.

   b. A Primary/Backup Grit Chamber selector provided at the HMI, allows the operator to select which grit chamber is being used.

   c. The following permissives must be met for the automatic grit pump control to take place:

      1) The duty pump must be ready for automatic control (in remote, automatic mode, and not failed).
      2) All valves associated with the duty pump must be ready for automatic control (in remote mode and auto mode): The grit slurry suction valve for the grit chamber being used (as selected at the HMI), the flush water supply valve, the associated flush water return valve, and the associated discharge valve.

   d. Off-time and on-time setpoints are provided at the HMI (common for both pumps). The pumps will remain off for the period defined by the off-time setpoint. The duty pump will then be requested to start. When requested to start, a flush sequence is required. The following sequence will take place:

      1) The grit pump flush water supply valve will open.

      2) The duty grit pump flush water return valve will open.

      3) When the flush water supply and return valves are both open, the grit slurry suction valve from the grit chamber being used (as selected at the HMI) will close.

      4) The duty grit pump discharge valve will close.

      5) The duty grit pump will start.

      6) This flushing will occur for the period defined by the HMI adjustable flush duration setpoint (in minutes). After the timer expires, the following steps take place:

      7) The grit slurry suction valve from the grit chamber being used (as selected

at the HMI) will open.

8) The duty grit pump discharge valve will open.

9) When the grit slurry suction valve and pump discharge valve are confirmed open, the grit pump flush water supply valve will close.

10) The duty grit pump flush water return valve will close.

e. The duty grit pump remains running for the period defined by the on-time setpoint, and then shuts down.

f. After the pump is off, the associated discharge valve will close, and the grit slurry suction valve will close.

g. If the sequence fails for any reason, an alarm is indicated at the HMI, and the standby pump shall take over (if all permissives are met for the standby pump). For the standby pump to take over, the same steps listed above must take place for the standby pump (i.e. flushing sequence, etc.).

4. Upon loss of power, the grit pump(s) must be automatically re-started as follows: If the pump is running from the SCADA system, and run status is lost followed by the generator run status indicating "Generator ON" and the transfer switch indicating "Generator Power", then the pump shall be re-started automatically.

GRIT PUMPS FLUSH WATER SUPPLY VALVE

A. General

1. The grit pumps have one suction flush water valve, which brings flush water from the grit chamber effluent box to the grit pumps.

B. Control - Local

1. A Local/Remote selector switch is located at the valve. The switch is a maintained position switch. This switch is used as follows:

a. Local: When the switch is in the local position, the valve is opened and closed via the open/stop/close controls located at the valve.
b. Remote: When the switch is in the remote position, the valve is controlled via the SCADA system.

C. Control – SCADA System

1. General

a. The valve control pop-up display has manual and auto pushbuttons to select the mode of control.

2. Manual Control

    a. The valve control pop-up display has open and close pushbuttons to control the valve.

3. Automatic Control

    a. Each valve shall automatically open and close from the grit pumps sequence described above and the grit pump flushing sequence described below.

GRIT PUMPS FLUSH WATER RETURN VALVE

A. General

1. Each Grit Pump Return Flush Valve returns flush water from the discharge line of the associated grit pump to the suction line.

B. Control – Local

1. A Local/Remote selector switch is located at the valve. The switch is a maintained position switch. This switch is used as follows:

    a. Local: When the switch is in the local position, the valve is opened and closed via the open/stop/close controls located at the valve.
    b. Remote: When the switch is in the remote position, the valve is controlled via the SCADA system.

C. Control – SCADA System

1. General

    a. Each valve control pop-up display has manual and auto push buttons to select the mode of control.

2. Manual Control

    a. Each valve control pop-up display has open and close push buttons to control the valve.

3. Automatic Control

    a. Each valve shall automatically open and close from the grit pumps sequence described above) and the grit pump flushing sequence described below.

GRIT PUMPS DISCHARGE VALVES

A. General

1. Each Grit Pump Discharge Valve allows flow from the discharge line of the associated grit pump to the grit dewatering system.

B. Control – Local

1. A Local/Remote selector switch is located at each valve. The switch is a maintained position switch. This switch is used as follows:
   a. Local: When the switch is in the local position, the valve is opened and closed via the open/stop/close controls located at the valve.
   b. Remote: When the switch is in the remote position, the valve is controlled via the SCADA system.

C. Control – SCADA System

1. General
   a. Each valve control pop-up display has manual and auto pushbuttons to select the mode of control.
2. Manual Control
   a. Each valve control pop-up display has open and close pushbuttons to control the valve.
3. Automatic Control
   a. Each valve shall automatically open and close from the grit pumps sequence described above) and the grit pump flushing sequence described below.

GRIT PUMPS AUTOMATIC FLUSHING SEQUENCE

A. General

1. This description is used in conjunction with Loops above.

2. In addition to the flushing sequence that happens during the grit pump startup, the operator can manually or automatically initiate a flushing sequence at desired intervals.

B. Control – SCADA System

1. For the flushing sequence to be active, all of the following permissives must be true:

   a. The duty grit pump (as selected at the HMI) must be ready for automatic control (remote mode, auto mode, and not failed).

   b. The grit slurry suction valve from the grit chamber being used (as selected at the HMI) must be ready for automatic control (remote mode and auto mode).

   c. The grit pumps flush water supply valve must be ready for automatic control (in remote mode and auto mode).
   d. The duty grit pump flush water return valve must be ready for automatic control (in remote mode and auto mode).
   e. The duty grit pump discharge valve must be ready for automatic control (in remote mode and auto mode).

2. The flushing sequence can be initiated either manually or automatically. A Manual/Time selector, a start flush, and a stop flush button shall be provided at the HMI for each pump. When manual is selected, the sequence is started and stopped from the start flush and stop flush buttons. When time is selected, the sequence runs as follows:

   a. A flush frequency timer setpoint shall be provided at the HMI in hours. The sequence will go through a flushing sequence every time the frequency setpoint expires.

3. When the flush sequence is initiated, provided that the above permissives are satisfied, the following shall occur simultaneously:

   a. The grit pump flush water supply valve will open.

   b. The duty grit pump flush water return valve will open.

   c. When the flush water supply and return valves are both open, the grit slurry suction valve from the grit chamber being used (as selected at the HMI) will close.

   d. The duty grit pump discharge valve will close.

   e. The duty grit pump will start if not already running.

f. This flushing will occur for the period defined by the HMI adjustable flush duration setpoint (in minutes). After the timer expires, the following steps take place:

g. The grit slurry suction valve from the grit chamber being used (as selected at the HMI) will open.

h. The duty grit pump discharge valve will open.

i. When the grit slurry suction valve and pump discharge valve are confirmed open, the grit pump flush water supply valve will close.

j. The duty grit pump flush water return valve will close.

4. If this flush sequence fails for any reason, an alarm is displayed at the HMI, and the valves shall be re-positioned automatically for normal grit pump operation (flush valves closed and slurry suction valve and discharge valve opened).

IMPORTANT: The automated flushing cycle is critical to the successful operation of this system and must operate before and after grit pumping to ensure that the suction line does not plug. Plugging of the suction line will make it necessary to take the Grit Chamber out of service and put the standby Grit Chamber in service and this chamber does not have odor control or aeration capabilities.

HARDWIRED I/O LIST FOR PLC 3A

Digital Inputs

Tag	Process	NOTES
YS-20000	PD Blower ON/OFF	
GRIT CHAMBER COMBUSTION GAS		
AIT-21000A	WARNING	
AIT-21000B	ALARM	
AIT-21000C	DETECTION FAULT	
PRIMARY GRIT CHAMBER SLURRY VALVE		
YS-21501	LOC/REM	
ZSO-21501	OPENED	
ZSC-21501	CLOSED	
SECONDARY GRIT CHAMBER SLURRY VALVE		
YS-21502	LOC/REM	
ZSO-21502	OPENED	
ZSC-21502	CLOSED	
GRIT PUMPS		
YS-22001A	NO. 1 LOC/REM	
YS-22001B	NO. 1 RUNNING	
YS-22001C	NO. 1 FAIL	
PSL-22001	NO. 1 LO PRESSURE SD	
PSH-22001	NO. 1 HI PRESSURE SD	
YS-22002A	NO. 2 LOC/REM	
YS-22002B	NO. 2 RUNNING	
YS-22002C	NO. 2 FAIL	
PSL-22002	NO. 2 LO PRESSURE SD	
PSH-22002	NO. 2 HI PRESSURE SD	

Digital Inputs *cont.*

Tag	Process	Notes
GRIT PUMP FLUSH WATER VALVES		
YS-22500	SUPPLY LOC/REM	
ZSO-22500	SUPPLY OPENED	
ZSC-22500	SUPPLY CLOSED	
YS-23001	NO. 1 RTN LOC/REM	
ZSO-23001	NO. 1 RTN OPENED	
ZSC-23001	NO. 1 RTN CLOSED	
YS-23002	NO. 2 RTN LOC/REM	
ZSO-23002	NO. 2 RTN OPENED	
ZSC-23002	NO. 2 RTN CLOSED	
GRIT PUMP DSCH VALVES		
YS-23501	NO. 1 LOC/REM	
ZSO-23501	NO. 1 OPENED	
ZSC-23501	NO. 1 CLOSED	
YS-23502	NO. 2 LOC/REM	
ZSO-23502	NO. 2 OPENED	
ZSC-23502	NO. 2 CLOSED	
GRIT PUMP FLUSH WATER VALVES		
SW-102	ETHERNET FAULT	

Analog Inputs

Tag	Process	Notes
ST-20000	PD BLOWER SPEED	
FIT-20500	PD BLOWER AIR FLOW RATE	
AIT-21000	GRIT CHAMB. COMB. GAS	
LIT-21200	GRIT CHAMB. SCUM LVL	
ST-62001	DIG. SOLIDS NO. 1 SPD FDBK	Old Tag moved to new Digester
ST-62002	DIG. SOLIDS NO. 2 SPD FDBK---	Old Tag moved to new Digester

Digital Outputs

Tag	Process	Notes
GRIT CHAMBER SLURRY VALVE		
XS-21501A	(BU) OPEN	
XS-201501B	(BU) CLOSE	
XS-201502A	OPEN	
XS-201502B	CLOSE	
GRIT PUMPS		
XS-22001A	NO. 1 START	
XS-22001B	NO. 1 STOP	
XS-22002A	NO. 2 START	
XS-22002B	NO. 2 STOP	
GRIT PUMP FLUSH WATER VALVES		
XS-22500A	SUPPLY OPEN	
XS-22500B	SUPPLY CLOSE	
XS-23001A	NO. 1 RTN OPEN	
XS-23001B	NO. 1 RTN CLOSE	
XS-23002A	NO. 2 RTN OPEN	
XS-23002B	NO. 2 RTN CLOSE	
GRIT PUMP DSCH VALVES		
XS-23501A	NO. 1 DSCH OPEN	
XS-23501B	NO. 1 DSCH CLOSE	
XS-23502A	NO. 2 DSCH OPEN	
XS-23502B	NO. 2 DSCH CLOSE	

GRIT SLURRY CUP AND GRIT SNAIL SYSTEM NO. 1 AND NO. 2 (PLC 11)

A. General

1. The purpose of each of these systems is to dewater the grit received from the grit chambers and send the grit-free effluent onto the screen influent channels. The dewatered grit is then transported to a dumpster via a conveyor.

B. Control - Local

1. Local control for this system occurs via the associated control panel. Refer to the Grit Slurry Cup and Grit Snail System O & M manual for detailed control descriptions.
2. When the Local/Remote switch for the slurry cup is remote, the slurry cup drive is started and stopped from the SCADA system. The SCADA system issues a start command when one of the grit pumps is running. The SCADA system issues a stop command when both grit pumps are off.
3. When the Local/Remote switch for the Dry/Wet weather selection is remote, the system goes into wet weather mode when the SCADA system issues a wet weather command.

C. Control – SCADA System

1. The SCADA system has control of only two components of the Grit Slurry Cup and Grit Snail System: the slurry cup drive and the wet weather command. Refer to the local mode description above for a description of this control.

FINE SCREEN SYSTEMS

A. General

1. The purpose of the fine screen systems is to remove screenings from the sewage received from the grit chambers and send the screened sewage to the MLE process basins. The screenings are then transported to a dumpster via the conveyor.
2. There is no SCADA control for the fine screen systems system. All control occurs at the local control panel.

B. Control - Local

1. Local control for this system occurs via the associated control panel. Refer to the Fine Screen System O & M manual for detailed control descriptions.

GRIT AND SCREENINGS CONVEYOR

A. General

1. The Grit and Screenings Conveyor transports screenings and dewatered grit to the dumpster.

B. Control – Local

1. A Local/Remote selector switch is located at the conveyor control panel. The switch is a maintained position switch. This switch is used as follows:
   a. Local: When the switch is in the local position, the conveyor is started and stopped via the start and stop buttons located on the control panel.
   b. Remote: When the switch is in the remote position, the conveyor is controlled via the SCADA system.

C. Control – SCADA System

1. General
   a. The conveyor control pop-up display has manual and auto push buttons to select the mode of control.
2. Manual Control
   a. The conveyor control pop-up display has start and stop pushbuttons to control the conveyor.
3. Automatic Control
   a. HMI adjustable On Time and Off Time setpoints are provided. The conveyor remains off for the duration defined by the off-time setpoint. It then automatically starts and remains on for the time defined by the on-time setpoint. When the on-time duration expires, the conveyor is shut down.

FINE SCREEN AREA COMBUSTIBLE GAS DETECTION

A. General

1. Combustible gas is measured at the fine screen area.

SCUM CONCENTRATION SYSTEM

A. General

1. There is no SCADA control for this system. All control occurs at the local control panel.

B. Control - Local

1. Local control for this system occurs via the associated control panel. Refer to the Scum Concentration System O & M manual for detailed control descriptions.

Additional Devices to this process are as follows:

Roots positive displacement Blower (PLC 3A)

Provides aeration for the Primary Grit Chamber. The Primary Grit Chamber is covered while the Secondary is not. Due to this aeration, the Combustible Gas monitor has been removed and the associated three Alarm (DI) have been disconnected.

No SCADA Control

PD Blower Run Status ON/OFF

Grit Chamber PD Blower Speed Feed Back

Grit Chamber PD Blower Air Flow Rate

SCALANCE Ring Switch 204-2 (PLC 3A)

Ethernet Fault

HARDWIRED I/O LIST FOR PLC 11

Digital Inputs

Tag	Process	Notes
YS-25001C	Grit Snail No. 1 Fail	
YS-25001D	Grit Snail No. 1 In Auto	
YS-25002C	Grit Snail No. 2 Fail	
YS-25002D	Grit Snail No. 2 In Auto	
YS-25001A1	Snail No. 1 Dry/Wet LOC/REM	
YS-25001A2	Slurry Cup No. 1 LOC/REM	
YS-25002A1	Snail No. 2 Dry/Wet LOC/REM	
YS-25002A2	Slurry Cup No. 2 LOC/REM	
YS-27500A	Screening Conveyor LOC/REM	
YS-27500B	Screening Conveyor Running	
YS-27500E	Screening Conveyor E-Stop	
YS-27500C	Screening Conveyor 0 Speed Alarm	
YS-27500D	Screening Conveyor Overload	
AIT-27700A	Fine Screen Combustible Warn	
AIT-27700B	Fine Screen Combustible ALM	
AIT-27700C	Fine Screen Combustible Fault	
Scum Conc.		
LSLL-28000	Sys Day Tank LO-LO	
LSHH-28000	Sys Day Tank HI-HI	
YS-28000B1	Sys Scum Pump Running	
YS-28000C1	Sys Scum Pump TRBL ALM	
YS-28000B2	Skimmer Running	
YS-28000C2	Skimmer TRBL ALM	
YS-28000B3	Sys Mixer Running	
YS-28000C3	Sys Mixer TRBL ALM	
Generator		
YS-90000B	Emergency Gen Running	
YS-90000C	Emergency Gen Alarm	
YS-90000D	Emergency Gen Shutdown	
YS-90000	UTY/GEN PWR	
JA-92003	UTY PWR Fail Alarm	
SW-102	Ethernet Fault	

Digital Outputs

Tag	Process	Notes
XS-25001B	Slurry Cup/Grit Snail 1 Wet CMD	
XS-25001A	Slurry Cup 1 Start/Stop	
XS-25002B	Slurry Cup/Grit Snail 2 Wet CMD	
XS-25002A	Slurry Cup 2 Start/Stop	
XS-27500A	Grit & Screen Conv. Start/Stop	
XS-28000A2	Skimmer Start/Stop	

Analog Input

Tag	Process	Notes
AIT-27700	Fine Screen Comb. Gas ALM	
XS-25001A	Scum Conc. Sys Day Tank LVL	

MLE Process PLC 10

After this treatment, the wastewater is conveyed to the MLE Basins distribution channel. MLE is the acronym used for the Modified Ludzack-Ettinger treatment process that utilizes both anoxic (no free oxygen and recirculated nitrates) zones and aerobic zones to produce a high-quality effluent that is low in ammonia and nitrate.

In this channel, the Internal Recycle (IR) flow and the Return Activated Sludge (RAS) are also discharged to mix with the influent wastewater. The resulting mixture, Mixed Liquor, is distributed to the three MLE Basins.

Three 14-inch weir slide gates are used to distribute the flow evenly across the three MLE Basins. There is no automatic mode of operation for the weir slide gates either locally at the gate or the OWS. Height adjustment of the gates can be set by positioning the jack screw collars once the flow is evenly balanced to all of the "online" treatment trains.

Each MLE Basin consists of four-square Anoxic Zones (also called Selectors), which can only be operated in series, and four Aerobic (or Oxic) Zones. Each Anoxic Zone is equipped with a submersible mixer to keep the Mixed Liquor Suspended Solids (MLSS) in suspension and contact with the organic material in the influent wastewater. These mixers are capable of keeping the solids suspended without introducing oxygen into the zones. The Anoxic Zones are identified as Zones A, B, C, and D in order.

The Anoxic Zones serve two purposes. They provide:

- Denitrification (conversion of nitrates (NO_3) to nitrogen gas (N_2)
- Improve settleability of MLSS in the Final Clarifiers by inhibiting the growth of filamentous organisms.

Flow travels from zone to zone passing over weir walls that separate the zones. The flow travels sequentially through the zones, that is from Zone A to Zone B to Zone C and finally to Zone D. Flow from the fourth Anoxic Zone enters the first Aerobic (Oxic) Zone (A) over a weir wall. Each of the MLE Basins has four Aerobic Zones, which are identified as Zone A, B, C, and D. Zone C is sub-divided with a small portion of Zone C designated as Zone D. Zone D is to be used to assist the operator in maintaining low DO level in Zone C to avoid recirculating excessive DO to the anoxic zones with the Internal Recycle Pumps.

Both the IR flow and the RAS flow from the Final Clarifiers are discharged into the IR/RAS Return Channel located in between MLE Basin #1 and #2.

The Mixed Liquor flows out of Zone C of the MLE Basins and drops into an effluent channel common to all three basins. The scum that overflows all the dividing walls of the MLE basin is captured in the effluent channel, where the flow drives the scum to the west end of the channel. An adjustable weir is located at the west end of the effluent channel to allow passage of the scum to a collection box that drains to the secondary scum pump station.

The MLSS is conveyed via a 36-inch diameter line to the Final Clarifier Distribution Box. The distribution box is equipped with three fixed straight weirs (10 ft 6-inch in length). These fixed weirs provide equal distribution of the MLSS to each of the three clarifiers through 24-inch diameter lines. Slide gates are used to isolate each of the clarifiers.

The main functions of the Final Clarifiers are to provide a quiescent condition for the MLSS to separate from the treated wastewater and collect the settled activated sludge so that it may be returned to the MLE Basins before all the DO is depleted. Since the MLSS has a specific gravity greater than water, the sludge settles out in the bottom of the tank. Spiral-type collection arms with squeegee blades collect the settled sludge and direct it to a sump cast into the base of the clarifier. Greases and other floatables are collected with the upper skimmer arms which have neoprene squeegees attached to the bottom. These squeegees guide the floatable material over the scum beach and into the scum trough. Each passing of the skimmer arm over the scum beach also opens a float valve which allows clarified water to flow into the trough and carry these floatables into the scum wet well. The scum wet well has two dedicated pumps which pump the contents of the wet well to the scum concentrator. Both pumps operation is done at the local control panel. In the auto mode, pump start/stop is done via one Siemens LUT 440 Ultrasonic level and pump controller.

The settled sludge flows from each Final Clarifier's sump that is directly connected with 12-inch pipes to the RAS/WAS Pump Station. Each clarifier has a dedicated RAS wet well with a submersible pump. The wet well operates at the same water level as the clarifier. As the RAS pumps pump the RAS back to the MLE Basins, the settled sludge is pumped from the clarifier sump. Each clarifier has a dedicated pump.

Each RAS wet well has a submerged gated opening to the WAS pump wet well containing two WAS pumps. Each WAS pump is designed to pump the full design WAS flow (duty/standby). The WAS pumps are used to waste sludge from the process The WAS pump pulls sludge from the RAS wet wells through the submerged openings and pumps it to the drum thickeners.

Internal Recycle and Return Activated Sludge

Denitrification depends on two principal factors:

1. An adequate aeration tank volume based on minimum temperatures.
2. An adequate internal recycle volume to move the nitrates produced in the aerobic (oxic) zones back to the anoxic zones for the denitrification process and subsequent dilution of the nitrate concentration in the MLE Basin effluent.

The Internal Recycle (IR) Pumps have a recycle rate of 6.48 MGD per MLE Train, or 4 times the average daily flow when all three MLE Basins are in service. The IR Pumps are single, centrifugal submersible, pumps equipped with variable frequency drives for speed control.

The large IR/RAS Return Channel located between MLE Trains #1 and #2 is designed to deplete DO in the return flows before entering the anoxic zones.

Process Controls

Introduction

This section discusses the interrelation of the following unit processes and associated equipment, to achieve biological treatment process goals:

- Anoxic Selectors (Anoxic Zones)
- MLE Basins
- Internal Recycle flow
- Return Activated Sludge (RAS) flow
- Waste Activated Sludge (WAS) flow

Operational Modes

The system operates in plug flow mode. In this mode of operation, the contents of the tank are, ideally, completely homogenous. The oxygen demand decreases as the wastewater travels along the length of the MLE Basins. Both the influent flow, RAS, and Internal Recycle are uniformly mixed and fed to the anoxic and oxic zones. The plug flow process is very stable and is resistant to the "pass-thru" of the organic material during higher flow periods.

Dissolved Oxygen Control

The activated sludge process depends on having sufficient oxygen for the biological degradation (oxidation of organic material to CO_2 and H_2O) of the organic material for nitrification (conversion of ammonia to nitrates) in the wastewater and the maintenance (cell synthesis and endogenous respiration) of the biological population. The aeration system has been designed to provide oxygen for peak oxygen demand periods. However, the system oxygen demand is typically much less than peak during typical diurnal flow periods. Also important is DO control of the IR/RAS and the operation of the Anoxic Selectors. The IR/RAS Channel is designed to deplete 1 mg/L of DO.

To provide flexibility in meeting the varying oxygen demand in MLE Basins, the operator has several options available to control the airflow into the MLE Basins. The operator may choose between manual or automatic control. The aeration blower output is controlled by the position of the inlet valve to the blower.

Normally, the operator will use automatic control. In the automatic mode the operator can choose from two options:

1. **DO Control** is based on the nine (9) DO probes located in the three Aerobic Zones of each MLE Basin. The values from the nine probes are averaged and the average number is used to control the output of the aeration blowers.

2. Time-of-Day Control is based on the 24-hour day divided into six four-hour periods:

   00:00-04:00

   04:00-08:00

   08:00-12:00

   12:00-16:00

   16:00-20:00

   20:00-24:00

For each of the periods, the operator must select the number of blowers to run and the inlet valve position.

The Aerobic Zones are equipped with fine bubble membrane disc diffuser systems with air supplied by three multi-stage centrifugal blowers. The speed of the blowers is fixed and the output varies based on the position of the inlet valves. In DO Control mode, as the DO probes call for a greater volume of airflow to the Aerobic Zones, blower inlet valves will open causing an increase in the airflow into the diffuser system. Using the DO control mode ensures sufficient DO for the process while reducing energy consumption.

The DO set points in each zone may be set by the operator. The DO probes are located in the Aerobic Zones approximately halfway along the length of each zone. It is also important to periodically measure DO at various points throughout the zones with a portable DO meter to ensure that the fixed DO probes are accurately reporting the actual conditions of the zones.

Oxic Zone A is equipped with an MLSS probe. Using an MLSS probe for operational control is much more reliable than relying upon sampling and lab testing due to variations in sampling and testing procedures. The MLSS probe should regularly be checked with carefully sampled and analyzed lab samples.

ANOXIC ZONE MIXERS, OXIC ZONE MIXERS

General

There is no SCADA control for the mixers. All control occurs at the respective local control panel and the MCC. Under Control – Local mode, the mixer is started and stopped from the controls located on each local control panel and at the MCC. Hardwired Communication Signals consist of:

1. Mixer On/Off Status
2. Mixer Fail Alarm

BLOWER INLET VALVE POSITIONING

General

A Pressure transducer is used by SCADA solely to regulate the MLE aeration blower inlet valve(s) based on pressure on the main air header line and to protect equipment.

DO Probes 325-01A&B&C thru 325-03 A&B&C are used for SCADA control of the blower inlet valve(s) based on an average of the MLE dissolved oxygen meters in service. The number of dissolved oxygen meters in or out of service is determined by the operator and controlled at the OWS.

MLE PROCESS BASINS RECYCLE PUMPS

General

A Local/Remote selector switch is located at each pump's local control panel. The switch is a maintained position switch. This switch is used as follows:

a. Local: When the switch is in the local position, the pump is started and stopped and its speed is controlled via the start and stop buttons and potentiometer located at the control panel.

b. Remote: When the switch is in the remote position, the pump is controlled from the Motor Control Center (MCC).

A Local/Remote selector switch is located at each pump MCC. The switch is a maintained position switch. This switch is used as follows:

a. Local: When the switch is in the local position, the pump is started and stopped at the MCC and its speed is controlled via the VFD controller.

b. Remote: When the switch is in the remote position, the pump is controlled via the SCADA system in either "Manual" or "Auto" mode. When operating under "Auto" mode, SCADA adjusts the pump speed based on the flow rate within the internal recycle channel matching a determined percentage of the influent flow. This percent value is determined by the operator and entered at the OWS. Via a PID loop, SCADA flow paces the recycle pumps to consistently recycle nitrates formed during the aerobic process to the anoxic zones for conversion to nitrogen gas and nitrites.

Each pump control pop-up display has start and stop push buttons to control the pump at the SCADA system.

MLE PROCESS BASINS SUSPENDED SOLIDS ANALYZER

General

Suspended solids (also called MLSS before) are measured in each of the three aeration basins oxic zone influent. Hardwired Communication Signals include Suspended Solids.

INTERNAL RECYCLE FLOW

General

Flow thru the internal recycle channel is measured with a velocity meter and displayed locally and also on SCADA. At the OWS, the internal recycle pump speed is set to operate at a percentage of influent flow.

MLE AERATION BLOWERS

General

Via SCADA, the aeration blowers will rotate and operate in either "Time of Day" or "DO Control" mode when the respective blower control panel is placed in "Remote". In event of high air header pressure, blowers are also stopped and not allowed to restart until the pressure returns to normal. Refer to the Blower System O & M manual for detailed control descriptions.

When a cold or storm front passes through the Air becomes denser and a PLC logic has to be implemented to prevent the Blower motor from tripping due to an over amp condition.

Normal Operation

The normal mode of operation of the MLE process consists of having the Mixed Liquor, a combination of influent wastewater and Return Activated Sludge, distributed equally to all three of the MLE Basins. The influent wastewater will enter the influent channel to the basins where it will mix with the combined IR/RAS flow from the IR/RAS channel. The Mixed Liquor will then enter the first of four zones of the Anoxic Selector. Each Anoxic Zone is equipped with a submersible mixer, which will keep the MLSS in suspension without adding Dissolved Oxygen to the MLSS. These mixers will normally be operated manually from the local control panel or the respective MCC. There is no automatic mode for these mixers.

The aerated cells of the MLE Basins will be normally operated in the DO Control mode. This control strategy uses the nine DO meters/probes, one in each aerobic zone, to control the airflow to the basins. The operator will set the DO setpoint in the SCADA System at the OWS. The SCADA takes the readings from each of the DO meters and averages them for comparison to the setpoint. If the actual DO differs from the setpoint, either higher or lower, the control will automatically adjust the inlet valve to the aeration blower, either to close or open, in response and bring the actual DO back to the setpoint value.

The Internal Recycle Pumps will be operated in the automatic mode, recycling MLSS from Cell C of each MLE Basin to the IR/RAS channel which returns the microorganisms and nitrates to the influent channel to the Anoxic Selectors. The IR pump flow rate is based on the total flow from the influent multiplied by an operator-input setpoint at the OWS. Each pump's VFD will adjust the speed of the pump to maintain the ratio as the flows change.

The RAS pumps are controlled similarly. An operator-input setpoint is used to flow pace the RAS pumps using the influent flow meter signal and the setpoint multiplier. The resulting flow requirement is split among the three RAS pumps. For example, if the setpoint was set at 100 percent, each pump would pump at a rate of approximately 33 percent of the influent flow. Effluent flow from the Aeration Tanks travels via a 36-inch line to the clarifier distribution box. From this point, the flow is split with approximately one-third of the flow going to each of the Final Clarifiers.

FINAL CLARIFIERS

The main purpose of the Final Clarifiers is to allow for the separation of the liquid and solid portions of the mixed liquor suspended solids (MLSS). Since the MLSS have a higher specific gravity than the wastewater, the quiescent conditions in the Final Clarifiers allow the activated sludge to settle to the bottom of the clarifiers and the supernatant passes over the v-notch weirs and into the clarifier launder to the UV Disinfection.

A portion of the settled solids, called Return Activated Sludge (RAS), is returned to the IR/RAS channel in the MLE Basins. This is done to provide sufficient numbers of microorganisms for continuous treatment of the pollutants in the wastewater. The clarifier scraper arms slowly rotate and push the settled sludge (sludge blanket) toward the circular sludge sump cast into the clarifier base. A 12-inch diameter RAS line is used to draw the settled sludge out of the sump through the use of hydraulic siphoning and discharge into the RAS/WAS Pump Station. The three RAS pumps are located in separate wet wells and the level of the wet well is maintained at the same height as the clarifier due to the siphoning action.

Scum is removed from the clarifier surface and directed over a full-radius beaching plate where the scum then flows by gravity down a trough through a 6-inch diameter pipe to the RAS/WAS Pump Station and into the scum wet well. Scum from the well is routinely pumped by the scum pumps into the Scum Concentrator located in the Headworks Building.

General

There is no SCADA control for the clarifiers. All control occurs at each of the three local control panels. The clarifier is started and stopped from the controls located on the respective local control panel.

Normal Operations

Normal operation of the Final Clarifiers consists of all three clarifiers online and operating. The clarifiers are operated in manual mode; there is no automatic mode, from the OWS. Sludge is continuously withdrawn from the clarifiers via the siphoning system and the Return Activated Sludge (RAS) pumps located in the RAS/WAS Pump Station. These pumps are equipped with

VFDs and are flow paced based on a signal from the influent flow meter. The ratio of return to influent flow is an operator input at the OWS. The flow is measured via three Magnetic Flowmeters.

Settled activated sludge above the amount needed for the MLE Basins (WAS) is collected as RAS in a sump cast into the bottom of each clarifier. The WAS passes from the RAS wet wells to the WAS wet wells through 10-inch ports, controlled by manual slide gates, to the Waste Activated Sludge (WAS) pumps.

Scum is collected with every revolution of the clarifier skimmer arm and deposited into a scum trough. Each clarifier has a single full-radius scum trough which discharges to the scum wet well located in the RAS/WAS Pump Station. The RAS/WAS Pump Station is equipped with two scum pumps, one duty, and one standby.

Return Activated Sludge and Waste Activated Sludge pumping

Overview

The purpose of the Activated Sludge pumping systems, Return Activated Sludge (RAS) and Waste Activated Sludge (WAS), is to convey settled sludge (sludge blanket) from the three Second Stage Clarifiers to either the influent end of the MLE basins or to the Rotary Drum Thickeners (RDTs).

RETURN ACTIVATED SLUDGE (RAS) PUMPS

General

Each RAS pump is shut down when the low-level float switch is tripped in its respective wet well. This shutdown will occur whether the pump is started from the local control panel, from the MCC, or the SCADA system. Each RAS pump has a dedicated discharge flow transmitter. This transmitter is used for indication as well as for automatic flow control.

A Local/Remote selector switch is located at each pump's local control panel. The switch is a maintained position switch. This switch is used as follows:

a. Local: When the switch is in the local position, the pump is started and stopped and its speed is controlled via the start and stop buttons and potentiometer located at the control panel.

b. Remote: When the switch is in the remote position, the pump is controlled from the Motor Control Center (MCC).

A Local/Remote selector switch is located at each pump MCC. The switch is a maintained position switch. This switch is used as follows:

a. Local: When the switch is in the local position, the pump is started and stopped and its speed is controlled via the start and stop buttons on the MCC and the VFD potentiometer.

b. Remote: When the switch is in the remote position, the pump is controlled via the SCADA system.

Each pump control pop-up display has manual and auto push buttons to select the mode of control at the SCADA system. Each pump control pop-up display has start and stop pushbuttons to control the pump in manual mode at the SCADA system.

In Automatic control mode, an HMI adjustable percent of Influent Flow Setpoint is provided (common for all 3 pumps). This setpoint is multiplied by the measured influent flow rate (sum of the three flow meters at the Influent Pump Station) to determine the return flow setpoint. The return flow setpoint is divided by the number of RAS pumps that are running to determine the flow setpoint of each RAS pump. Each RAS pump shall automatically vary its speed to maintain the RAS flow setpoint calculated above.

WASTE-ACTIVATED SLUDGE (WAS) PUMPS

General

Each WAS pump shall be shut down when the low-level float switch is tripped. This shutdown will occur whether the pump is started from the local control panel, from the MCC, or the SCADA system.

A Local/Remote selector switch is located at each pump's local control panel. The switch is a maintained position switch. This switch is used as follows:

a. Local: When the switch is in the local position, the pump is started and stopped and its speed is controlled via the start and stop buttons and potentiometer located at the control panel.

b. Remote: When the switch is in the remote position, the pump is controlled from the Motor Control Center (MCC).

A Local/Remote selector switch is located at each pump MCC. The switch is a maintained position switch. This switch is used as follows:

a. Local: When the switch is in the local position, the pump is started and stopped and its speed is controlled via the start and stop buttons on the MCC and the VFD potentiometer.

b. Remote: When the switch is in the remote position, the pump is controlled via the SCADA system.

Each pump control pop-up display has manual and auto push buttons to select the mode of control at the SCADA system. Each pump control pop-up display has start and stop pushbuttons to control the pump in manual mode at the SCADA system.

In Automatic Control mode:

a. One pump is lead and the other is lag. When the lead pump is shut down, the pumps shall automatically alternate. If one of the pumps is local, manual, or failed, then the other pump shall automatically be set as the lead pump.

b. The lead pump will automatically start when one of the screw thickeners is running. If two screw thickeners are running, then the lag WAS pump shall be started.

c. An HMI adjustable WAS flow setpoint is provided. The WAS pump(s) speed shall be automatically adjusted to maintain the flow setpoint to the screw thickeners (sum of flow meters FIT-700-01, 02).

The lag pump shall shut down when one thickener is off. The lead pump shall shut down when both thickeners are off.

Scum Pumping

There is no SCADA control for this process

The scum wet well has two dedicated pumps which pump the contents of the wet well to the scum concentrator in the Headworks Building. Both pumps operation is done at the local control panel. In the auto mode, pump start/stop is done via one Siemens LUT 440 Ultrasonic level and pump controller.

Hardwired I/O for PLC 10

Digital Inputs

Tag	Device Tag	Process	Notes
Anoxic Zone Mixer 1			
YS-31001AB	4E-101	1A - ON	
YS-31001AC	4E-101	1A - FAULT	
YS-31001BB	4E-102	1B - ON	
YS-31001BC	4E-102	1B - FAULT	
YS-31001CB	4E-103	1C - ON	
YS-31001CC	4E-103	1C - FAULT	
YS-31001DB	4E-104	1D - ON	
YS-31001DC	4E-104	1D - FAULT	
Anoxic Zone Mixer 2			
YS-31002AB	4E-105	2A - ON	
YS-31002AC	4E-105	2A - FAULT	
YS-31002BB	4E-106	2B - ON	
YS-31002BC	4E-106	2B - FAULT	
YS-31002CB	4E-107	2C - ON	
YS-31002CC	4E-107	2C - FAULT	
YS-31002DB	4E-108	2D - ON	
YS-31002DC	4E-108	2D - FAULT	
Anoxic Zone Mixer 3			
YS-31003AB	4E-109	3A - ON	
YS-31003AC	4E-109	3A - FAULT	
YS-31003BB	4E-110	3B - ON	
YS-31003BC	4E-110	3B - FAULT	
YS-31003CB	4E-111	3C - ON	
YS-31003CC	4E-111	3C - FAULT	
YS-31003DB	4E-112	3D - ON	
YS-31003DC	4E-112	3D - FAULT	
Oxic Zone Mixers			
YS-31501B	4E-113	MIXER 1 ON	
YS-31501C	4E-113	MIXER 1 FAULT	
YS-31502B	4E-114	MIXER 2 ON	
YS-31502C	4E-114	MIXER 2 FAULT	
YS-31503B	4E-115	MIXER 3 ON	
YS-31503C	4E-115	MIXER 3 FAULT	

Digital Inputs (*cont.*)

Tag	Device Tag	Process	Notes
MLE Process Basins IRP			
YS-33501A	4P-101	NO. 1 LOC/REM	
YS-33501B	4P-101	NO.1 ON	
YS-33501C	4P-101	NO.1 MF ALM	
YS-33502A	4P-102	NO. 2 LOC/REM	
YS-33502B	4P-102	NO.2 ON	
YS-33502C	4P-102	NO.2 MF ALM	
YS-33502A	4P-103	NO. 3 LOC/REM	
YS-33502B	4P-103	NO.3 ON	
YS-33502C	4P-103	NO.3 MF ALM	
Aeration Blower No. 1			
PDSH-36001	PDSH-360-01	FILTER HI DP	
ZSO-36001	7V-109	INLET VLV OPEN	
ZSC-36001	7V-109	INLET VLV CLOSED	
VSH-36001	7E-101	VIB HI-LEVEL ALARM	
VS-36001	7E-101	VIB SHUTDOWN	
YS-36001E	7E-101	SURGE SHUTDOWN	
YS-36001D	7E-101	BLOWER READY	
YS-36001A	7E-101	BLOWER LOC/REM	
Aeration Blower No. 2			
PDSH-36002	PDSH-360-02	FILTER HI DP	
ZSO-36002	7V-107	INLET VLV OPEN	
ZSC-36002	7V-107	INLET VLV CLOSED	
VSH-36002	7E-102	VIB HI-LEVEL ALARM	
VS-36002	7E-102	VIB SHUTDOWN	
YS-36002E	7E-102	SURGE SHUTDOWN	
YS-36002D	7E-102	BLOWER READY	
YS-36002A	7E-102	BLOWER LOC/REM	
Aeration Blower No. 3			
PDSH-36003	PDSH-360-02	FILTER HI DP	
ZSO-36003	7V-108	INLET VLV OPEN	
ZSC-36003	7V-108	INLET VLV CLOSED	
VSH-36003	7E-103	VIB HI-LEVEL ALARM	
VS-36003	7E-103	VIB SHUTDOWN	
YS-36003E	7E-103	SURGE SHUTDOWN	
YS-36003D	7E-103	BLOWER READY	
YS-36003A	7E-103	BLOWER LOC/REM	

Digital Inputs (*cont.*)

Tag	Device Tag	Process	Notes
Final Clarifier No. 1			
YS-40001B	5E-101	ON	
YS-40001C	5E-101	FAULT	
YS-40001D	5E-101	95% TORQUE	
YS-40001E	5E-101	115% TORQUE	
Final Clarifier No. 2			
YS-40002B	5E-102	ON	
YS-40002C	5E-102	FAULT	
YS-40002D	5E-102	95% TORQUE	
YS-40002E	5E-102	115% TORQUE	
Final Clarifier No. 3			
YS-40003B	5E-103	ON	
YS-40003C	5E-103	FAULT	
YS-40003D	5E-103	95% TORQUE	
YS-40003E	5E-103	115% TORQUE	
RAS Pump No. 1			
LSLL-45001	LSLL-450-01	LO-LO LVL ALM	
YS-45001A	5P-101	LOC/REM	
YS-45001B	5P-101	ON	
YS-45001C	5P-101	MF ALM	
RAS Pump No. 2			
LSLL-45002	LSLL-450-02	LO-LO LVL ALM	
YS-45002A	5P-102	LOC/REM	
YS-45002B	5P-102	ON	
YS-45002C	5P-102	MF ALM	
RAS Pump No. 3			
LSLL-45003	LSLL-450-03	LO-LO LVL ALM	
YS-45003A	5P-103	LOC/REM	
YS-45003B	5P-103	ON	
YS-45003C	5P-103	MF ALM	

Digital Inputs (*cont.*)

Tag	Device Tag	Process	Notes
WAS Pump No. 1			
LSLL-46001	LSLL-460-01	LO-LO LVL ALM	
YS-46001A	5P-106	LOC/REM	
YS-46001A	5P-106	ON	
YS-46001A	5P-106	MF ALM	
PSH-46001	PSH-460-01	HI PRESSURE SD	
WAS Pump No. 2			
LSLL-46001	LSLL-460-01	LO-LO LVL ALM	
YS-46001A	5P-107	LOC/REM	
YS-46001A	5P-107	ON	
YS-46001A	5P-107	MF ALM	
PSH-46002	PSH-460-02	HI PRESSURE SD	
Scum Pumps			
YS-47001B	5P-104	SCUM PUMP NO.1 ON	
YS-47001C	5P-104	SCUM PUMP NO.1 FAULT	
YS-47002B	5P-105	SCUM PUMP NO.2 ON	
YS-47002C	5P-105	SCUM PUMP NO.2 FAULT	
LSH-47000	LSH-470	SCUM PUMPS HI LVL ALM	
RDT NO. 1			
YS-70001B1	7P-101	THICKENED SLUDGE PMP ON	
YS-70001C	7P-101	THICKENED SLUDGE PMP FAULT	
YS-70001B2	7E-104	SPRAY BAR ON/OFF	
YS-70001B3	7E-104	DRUM ON/OFF	
YS-70001B4	700-01	FLOCCULATOR ON/OFF	
YS-70001E	700-01	E-STOP	
ZSO-70501	7V-110	INLET VLV OPEN	
ZSC-70501	7V-110	INLET VLV CLOSED	
RDT NO. 2			
YS-70002B1	7P-102	THICKENED SLUDGE PMP ON	
YS-70002C	7P-102	THICKENED SLUDGE PMP FAULT	
YS-70002B2	7E-105	SPRAY BAR ON/OFF	
YS-70002B3	7E-105	DRUM ON/OFF	
YS-70002B4	700-02	FLOCCULATOR ON/OFF	
YS-70002E	700-02	E-STOP	
ZSO-70502	7V-111	INLET VLV OPEN	
ZSC-70502	7V-111	INLET VLV CLOSED	

Digital Inputs (*cont.*)

RDT Polymer System			
Tags	Device tags	Process	Notes
YS-71001B	7E-106	NO. 1 ON/OFF	
YS-71001A	7E-106	NO. 1 LOC/REM	
YS-71001C	7E-106	NO. 1 FAIL ALM	
YS-71002B	7E-107	NO. 1 ON/OFF	
YS-71002A	7E-107	NO. 1 LOC/REM	
YS-71002C	7E-107	NO. 1 FAIL ALM	
JA-92002	***	UTY PWR FAIL ALM	
SW-102	***	ETHERNET FAULT	
Plant PRV			
DI-7591_Open	7E-106	PLANT PRV OPEN LIMIT	
DI-7591_Closed	7E-106	PLANT PRV CLOSED LIMIT	

Digital Outputs

Tag	Device Tag	Process	Notes
MLE Process Basin IRPs			
XS-33501A	4P-101	NO. 1 START	
XS-33501B	4P-101	NO. 1 STOP	
XS-33502A	4P-102	NO. 2 START	
XS-33502B	4P-102	NO. 2 STOP	
XS-33503A	4P-103	NO. 3 START	
XS-33503B	4P-103	NO. 3 STOP	
Aeration Blowers			
XS-36001A	7E-101	NO. 1 START	
XS-36001B	7E-101	NO. 1 STOP	
XS-36002A	7E-102	NO. 2 START	
XS-36002B	7E-102	NO. 2 STOP	
XS-36003A	7E-103	NO. 3 START	
XS-36003B	7E-103	NO. 3 STOP	
RAS Pumps			
XS-45001A	5P-101	NO. 1 START	
XS-45001B	5P-101	NO. 1 STOP	
XS-45002A	5P-102	NO. 2 START	
XS-45002B	5P-102	NO. 2 STOP	
XS-45003A	5P-103	NO. 3 START	
XS-45003B	5P-103	NO. 3 STOP	
WAS Pumps			
XS-46001A	5P-106	NO. 1 START	
XS-46001B	5P-106	NO. 1 STOP	
XS-46002A	5P-107	NO. 2 START	
XS-46002B	5P-107	NO. 2 STOP	
RDT Polymer System			
XS-71001A	7E-106	NO. 1 START/STOP	
XS-71002A	7E-107	NO. 2 START/STOP	

Analog Inputs

Tag	Device Tag	Process	Notes
MLE Oxic Zones			
FIT-32000	FIT-320	BLOWER AIRFLOW	
FIT-32501A	FIT-325-01A	1A DROP LEG AIR FLOW	
AIT-32501A	AIT-325-01A	1A DISSOLVED OXYGEN	
FIT-32501B	FIT-325-01B	1B DROP LEG AIR FLOW	
AIT-32501B	AIT-325-01B	1B DISSOLVED OXYGEN	
FIT-32502A	FIT-325-02A	2A DROP LEG AIR FLOW	
AIT-32502A	AIT-325-02A	2A DISSOLVED OXYGEN	
FIT-32502B	FIT-325-02B	2B DROP LEG AIR FLOW	
AIT-32502B	AIT-325-02B	2B DISSOLVED OXYGEN	
FIT-32503A	FIT-325-03A	3A DROP LEG AIR FLOW	
AIT-32503A	AIT-325-03A	3A DISSOLVED OXYGEN	
FIT-32503B	FIT-325-03B	3B DROP LEG AIR FLOW	
AIT-32503B	AIT-325-03B	3B DISSOLVED OXYGEN	
FIT-33001A	FIT-330-01A	1C PRIM. DROP LEG AIR FLOW	
FIT-33001B	FIT-330-01B	1C SEC. DROP LEG AIR FLOW	
FIT-33002A	FIT-330-02A	2C PRIM. DROP LEG AIR FLOW	
FIT-33002B	FIT-330-02B	2C SEC. DROP LEG AIR FLOW	
FIT-33003A	FIT-330-03A	3C PRIM. DROP LEG AIR FLOW	
FIT-33003B	FIT-330-03B	3C SEC. DROP LEG AIR FLOW	
AIT-33001	AIT-330-01	1C DISSOLVED OXYGEN	
AIT-33002	AIT-330-02	2C DISSOLVED OXYGEN	
AIT-33003	AIT-330-03	3C DISSOLVED OXYGEN	
Misc.			
AIT-72000	AIT-720	THICKENED SLDG SUS. SOL.	
PIT-32000	PIT-320	BLOWER DISCH HEADER PSI	
FIT_7591	FIT-7591	PLANT PRV FLOW READING	
PIT_7591	PIT-7591	PLANT PRV PSI READING	

Analog Inputs *(cont.)*

Tag	Device Tag	Process	Notes
MLE Process Basins			
ST-33501	4P-101	IRP NO.1 SPEED FDBK	
ST-33502	4P-102	IRP NO. 2 SPEED FDBK	
ST-33503	4P-103	IRP NO.3 SPEED FDBK	
AIT-34001	AIT-340-01	SUSPENDED SOLIDS	
AIT-34002	AIT-340-02	SUSPENDED SOLIDS	
AIT-34003	AIT-340-03	SUSPENDED SOLIDS	
FIT-34500	FIT-345	INTERNAL RECYCLE FLOW	
Aeration Blowers			
7V-109	ZT-36001	NO. 1 INLET VLV POS. FDBK	
7V-107	ZT-36002	NO. 2 INLET VLV POS. FDBK	
7V-108	ZT-36003	NO. 3 INLET VLV POS. FDBK	
7E-101	VT-36001A	NO. 1 INLET BRG VIB.	
7E-101	VT-36001B	NO. 1 OUTLET BRG VIB.	
7E-101	IT-36001	NO. 1 AMPS	
7E-102	VT-36002A	NO. 2 INLET BRG VIB.	
7E-102	VT-36002B	NO. 2 OUTLET BRG VIB.	
7E-102	IT-36002	NO. 2 AMPS	
7E-103	VT-36003A	NO. 3 INLET BRG VIB.	
7E-103	VT-36003B	NO. 3 OUTLET BRG VIB.	
7E-103	IT-36003	NO. 3 AMPS	
RAS Pumps			
FIT-45001	FIT-450-01	NO. 1 DISCH. FLOW	
FIT-45002	FIT-450-02	NO. 2 DISCH. FLOW	
FIT-45003	FIT-450-03	NO. 3 DISCH. FLOW	
ST-45001	5P-101	NO. 1 SPEED FDBK	
ST-45002	5P-102	NO. 2 SPEED FDBK	
ST-45003	5P-103	NO. 3 SPEED FDBK	
WAS Pumps			
ST-46001	5P-106	NO. 1 DISCH. FLOW	
ST-46002	5P-107	NO. 2 DISCH. FLOW	
FIT-70001	FIT-700-01	RDT NO. 1 WAS FLOW	
FIT-70002	FIT-700-02	RDT NO. 2 WAS FLOW	

Analog Outputs

Tag	Device Tag	Process	Notes
MLE			
SC-33501	4P-101	IRP NO. 1 SPEED SP	
SC-33502	4P-102	IRP NO. 2 SPEED SP	
SC-33503	4P-103	IRP NO. 3 SPEED SP	
Aeration			
ZC-36001	7V-109	BLOWER NO. 1 VLV POS. SP	
ZC-36002	7V-107	BLOWER NO. 2 VLV POS. SP	
ZC-36003	7V-108	BLOWER NO. 3 VLV POS. SP	
RAS Pumps			
SC-45001	5P-101	NO. 1 SPEED SETPOINT	
SC-45002	5P-102	NO. 2 SPEED SETPOINT	
SC-45003	5P-103	NO. 3 SPEED SETPOINT	
WAS Pumps			
SC-46001	5P-106	NO. 1 SPEED SETPOINT	
SC-46001	5P-107	NO. 2 SPEED SETPOINT	
FC-70001	700-01	FLOW TO MCC-4A1 (RDT NO. 1)	
FC-70002	700-02	FLOW TO MCC-4A1 (RDT NO. 2)	
FC-71001	710-01	FLOW TO POLY SYS NO. 1	
FC-71002	710-02	FLOW TO POLY SYS NO. 2	
PC_7591	***	PLANT PRV SP CONTROL	

EFFLUENT FLOW

Ultraviolet (UV) Disinfection PLC 9 and AQR 40 PLC

Overview

After the final clarification process, the effluent from the Final Clarifiers flows through separate 20-inch diameter lines into a common 30-inch diameter line. The 30-inch diameter line passes through the Effluent Flow Metering Vault into the UV Disinfection facility. The flow enters a small distribution box which is used to control the flow to one, or both, of the UV channels. The distribution box is equipped with two manually-operated 18-inch x 18-inch slide gates.

The ultraviolet disinfection system uses ultraviolet light to disinfect the filtered effluent before discharge to the effluent reuse sites (Farm and City facilities Irrigation) via the Effluent pump Station or to be used as the oil field production water (OXY pump station).

UV disinfection is achieved as the wastewater passes through the rows of lamps installed vertically in a module. Each of the channels contains two modules, mounted in the channel in series. Each module contains 5 rows of 8 bulbs. Quartz jackets protect the UV bulbs from damage. The exact spacing of the bulbs ensures that the wastewater passes within the effective distance of the UV bulbs.

The flow through the facility can be directed through one or both flow channels. Each of these channels contains two modules; with each module consisting of 40 lamps. Each of the modules is controlled by a single Power and Data Distribution Center (PDDC, OZONIA) and Local Operator Interface (LOI) panel, which controls and monitors the UV modules. The PDDC receives its electrical power from a power distribution center, into which the main electrical power is introduced.

When the system is placed in the "Auto" mode, at least one row of bulbs will be online based on the flow through the UV disinfection system. As the flow increases more rows are called to operate. When the flow decreases rows of bulbs will drop out of operation. One row of bulbs will always remain in service, regardless of the total effluent flow.

Equipment Controls

There is no SCADA control for the UV system. All control is at the Local Operator Interface (LOI).

Local:

The communications board (PDDC) of the UV disinfection system consists of a programmable controller which continually monitors and controls the UV disinfection system's functions.

Through the application of a touch screen, referred to as the LOI, facility personnel can access and monitor any aspect of the UV system's operation.

The LOI consists of a touch screen that communicates to the programmable logic controller. The operator can monitor and control the entire system from the various screen displays. The information available to facility personnel from the LOI, included in the Table below, is presented on ten separate screens:

Main Screen	The main screen displays an overview of the UV system status. The following elements are accessible from this screen: ▪ CONFIG SCREEN – accesses the CONFIGURATION screen. ▪ SETUP SCREEN accesses the display setup screen. ▪ ALARMS access to the ALARM screen. ▪ FLOW PACE COEFFICIENT displays the current flow pace setpoint as inputted by the operator. The range for this setpoint is 50 percent to 150 percent. When the value is less than 100 percent more lamps will come on in response to an increase in flow. When the value is greater than 100 percent fewer lamps will come on in response to an increase in flow. On the Main Screen, information for each channel is represented by an information box. This information includes: 1. Channel operation mode, which is either "ON" or "OFF". 2. UV Intensity 3. Number of lamp rows on. 4. Mode – either "Auto" or "Manual" 5. "View Channel" button accesses the Channel screen.

Channel Screen	This screen displays an overview of the channel status. Several options are available from this screen, including: 1. MAIN returns to the MAIN screen. 2. Alarms switch to the ALARMS screen. 3. MODULE # accesses the MODULE screen for the module selected. The operator can select global manual or automatic operation for a specific channel from this screen through the use of the following buttons: ▪ ALL AUTO PACE results in all modules being automatically flow paced. *Note: This is the Normal mode of operation.* ▪ MANUAL ALL OFF turns off all modules. ▪ MANUAL ON allows manual control of all modules. The number of rows in operation is controlled by the "# MANUAL ROWS" selection.
Module Screen	This screen displays an overview of a specific module's status. Several available from this screen, including: 1. MAIN returns to the MAIN screen. 2. CHANNEL returns to the CHANNEL screen. 3. ALARMS accesses the ALARMS screen. 4. CLEANING accesses the CLEANING screen. 5. Assign UVINT sensor activates monitoring of the UV sensor. 6. DCA INFORMATION box shows the status of monitored values, including communications status, current intensity reading, temperature of the module, battery backup status and adjacent lamp failure. 7. ROW information is displayed, including lamp status, row status and VIEW ROW, which accesses the ROW screen. 8. HOA – Hand/Off/Auto control is available from this screen.
LCA Row Screen	This screen shows an overview of individual lamp status. Lamp status is indicated by the color of the lamp status box; black is Off, green is On and red is alarm. The actual operating hours and the number of On/Off cycles is displayed.
LCA ROW SET ROW DATA Screen	This screen allows the operator to either set or reset lamp hours and cycles. This screen should be accessed whenever a lamp is replaced.

LCA ROW SET LAMP DATA Screen	This screen allows the operator to set lamp hours and cycles. This screen should be accessed whenever a lamp is replaced. This Screen is normally accessed is data is lost due to controller failure.
CLEANING SYSTEM CONTROL Screen	The operator can monitor and control the cleaning system from this screen.
ALARM Screen	This screen displays the historical record of all system alarms, both active and acknowledged.
CONFIGURATION Screen	This screen allows the operator to change the operating parameters of the system.
UVT and DOSE CONTROL Screen	This screen displays the current UVT measurement from the online UVT analyzer, the calculated UV dose and the target dose.

Operation

Normal Operation

The UV Disinfection system should be in operation whenever wastewater is flowing through either of the UV channels. Failure to properly operate the system will likely result in a loss of disinfection and the potential discharge of pathogenic organisms. Normally the system is operated in the Automatic mode, which will automatically add or subtract lamps based on the flow rate and the lamp intensity reading. In the auto mode, there should be only minimal tasks required of the facility staff to ensure proper disinfection.

Automatic Flow Pacing

The automatic flow pacing system ensures that the proper UV dosage is used, based on the flow through the channel. The number of lamps will be controlled by the system. Lamps are added in rows rather than by individual lamps.

Since the UV disinfection process requires exposure of only seconds, when the flow rate is low adequate disinfection can be delivered by only a small number of rows of lamps and only one or two rows may be on in an individual module. As the flow increases and the velocity of the wastewater through the channel are increased, more rows of lamps are turned on to meet the exposure time for the proper dosage.

Alternate Operations

The UV disinfection system is installed within two parallel flow channels containing two UV modules each. Each module has 40 lamps. The system has a high level of redundancy built into it since only one channel is normally required to provide adequate disinfection of the wastewater. Alternate operations would normally entail the operation of the system in manual mode. This mode of operation would be used if there was a failure of a system component such as the flow meter which would result in the loss of the flow pacing signal. In this case the operator should set the dosage at a level high enough to ensure that normal flow peaks are adequately disinfected.

Digital Inputs

Tag	Process	Notes
JA-92001	UTY PWR FAILURE ALARM	
SW-102	ETHERNET FAULT	Scalance_PLC 9 (SCADA TAG Management)

Analog Inputs

Tag	Process	Notes
FIT-52000	PLANT EFFLUENT FLUME FLOW	From FIT-520

All other setpoints, alarms, and information related to the OZONIA UV System is conveyed via Ethernet Data Highway directly to the HMI Software.

Effluent Pumping Station

PLC 7 and RBS 8

Overview

After the UV Treatment the effluent is conveyed to a Palmer Bolus Flume to measure the plant effluent flow. The flow signal form here is duplicated and send to the UV system for the flow pacing, and to a Chlorine Gas (CL2) injection valve to inject CL2 as a second form of disinfection for the effluent.

The flow then enters a splitter Box where it is diverted either to a storage Pond or a wet well located at the effluent pump station.

A junction box will allow flow in both directions, i.e., the wet well level of the effluent pump station corresponds directly to the level in the storage pond and junction box.

Should the pond level drop below the effluent piping, the wet well can be filled via an additional storage pond (Dome) adjacent to the wet well. This is strictly done by the Operator using a manually operated valve.

During times of surplus effluent water, this Dome can be filled via a Motor Operated Valve (MOV) from the wet well, all other times the Dome will be filled by two remediation water wells (North and South Well).

The Dome also provides effluent water to a pump station operated by Oxy Petroleum.

After entering the wet well the effluent flows through a Fine Screen (MultiRake) and then into the actual wet well.

The wet well has provisions to accommodate 7 vertical turbine line shaft pumps. At the current state the COH has two 300 HP (Phase1) and three 100 HP (Phase2) pumps installed.

The Phase 1 pumps serve the irrigation needs south of the facilities which is one Farm, a cemetery and a contingency/Emergency disposal Facility. The flow is measured through a 20" magnetic flowmeter.

At the point of delivery to the Farm (S&H Farms), a Pressure Sustaining/Flow Control Valve (PS/FCV) Station has been installed. The purpose of this PSV is to keep the pressure of the upstream side of the valve constant at different flow demands. This is necessary to keep the fire Hydrants along this Pipeline charged at the right pressure.

The Phase 2 pumps serve all the side streams within the WWRF as well as irrigation needs at the following locations, the Prairie Heaven Cemetery, the MLK Soccer Plex, and the Rockwind Community Links Golf Course. The flow is measured through a 16" magnetic flowmeter.

At the point of delivery to the Rockwind Community Links Golf Course, a Pressure Sustaining/Flow Control Valve (PS/FCV) Station has been installed. The purpose of this

PS/FCV is to keep the pressure of the upstream side of the valve constant at different flow demands. This is necessary to keep the fire Hydrants along this Pipeline charged at the right pressure.

Both PS/FCV's are remote sites and communicate with the WWRF SCADA System via PtP 5.8 GHz Radios. (MODBUS Ethernet/IP Protocol)

Due to the lengths of the Pipeline, (the pressure on this line is 78-80 psi), 4 Pressure Reducing Valves (PRV) are required to lower the pressure according to the needs of the different users, These Valves are installed at various locations within the WWRF.

- Prairie Haven cemetery PRV
- East Plant PRV
- West Plant PRV
- MLK Soccer Plex PRV (Remote site comms over 900 MHz i/o Radio)

To compensate for pressure surges in the Phase 2 pipeline a Hydro-pneumatic Tank has been installed as well as a surge anticipation valve at each Header pipe for Phase 1 and 2 which will divert a possible surge back into the wet well.

Operation

After the effluent enters the wet well it flows first into a smaller splitter box were the flow can be diverted, via the manual opening of slide gates, through a channel with a Fine Screen ((Stair screen) were the final scum removal takes place) or a bypass channel with a fixed orifice screen. The bypass channel is only in use when major Maintenance for the Fine (Stair) screen is scheduled. At the outflow of those channels is a small sump to catch settled solids that can then be pump out.

The screened effluent water then enters the wet well which is common to all pumps.

Two Radar Level instruments installed in stilling wells send the level to the PLC 7 located in the Effluent Building which also houses the MCC and VFD's for Pumps # 11P-101,11P-102 (Phase 1 pump set), 11P-105, 11P-106, and 11P-107 (Phase 2 pump set).

The level transmitters operate as "fail-safe" with the primary level indication for control and the secondary as its backup. In the event the primary level transmitter fails, the station control parameters associated with the level transmitters are diverted to the secondary level transmitter.

At least one pump of Phase 1 and Phase 2 are always pumping into their pipelines to meet the demand of downstream users.

Should the demand increase beyond the capability of one pump a second one will start, and in case of Phase 2 even a third one if necessary.

These pumps discharge into separate headers. The first set of pumps (Phase I) discharge into the S&H Farms distribution Pipeline. The second set of pumps (Phase II) discharge into the MLK Distribution, Plant Distribution, Dome Storage, and the Rockwind Golf Course Pipeline.

Both sets of pumps share a common wet well and water source.

All five Line Shaft Pump Motors have a vibration Sensor installed that constantly monitor the vibration and will trigger an alarm should the Motor reach a certain vibration threshold this alarm will not trigger a shutdown of the affected motor.

Another pump station operated by Occidental Petroleum Corporation (Oxy) draws directly from the dome reservoir, which can be filled via the Phase II stations MOV as well as two remediation Wells. This station is independent of the reuse station and is operated by Oxy. Monitored via RBS 8, the two remediation wells are controlled via a level instrument through RBS 8.

S&H Farms Distribution (Phase I).

This pump set provides the S&H Farms, a cemetery and, a contingency/Emergency disposal Facility with reuse water. The pump set is to maintain either flow or pressure as selected by the operator via the HMI. A 20" magnetic Flowmeter or a pressure transducer on the discharge header is used as the process variable. The pump speed (controlled by VFD) is varied to control the discharge pressure or flow as required.

MLK Distribution, Plant Distribution, Dome Storage and Rockwind Golf Course Pump Set (Phase II).

This pump set has multiple operational requirements. They are as follows:

- These pumps operate to maintain water distribution pressure with the help 4 four before mentioned PRV's. The exception here is the pipeline to the Rockwind Community Links Golf Course which is a direct extension of the discharge Header. A pressure transducer on the discharge header is used as the process variable. The pumps' speed (controlled by VFD) are varied to control the discharge pressure.

- Each PRV (CLA-VAL) is equipped with upstream and downstream Pressure Transducers, an internal vortex shedding Flowmeter and a motorized Pilot Control valve. The only exemptions are the Prairie Heaven Cemetery and the MLK Soccer Plex which are using magnetic flowmeters.

- The discharge header is equipped with a motor operated valve (MOV). This MOV diverts discharge flow to the dome. The dome is equipped with a level transmitter. The MOV is modulated according to a setpoint determined by Plant Personnel to maintain the dome water level.

Both pump sets (Phase I and Phase II) are slowed to a settable value (speed), less than that of their current operating speed, at a preset intermediate level. Once the level of the wet well has risen above the intermediate level, for a settable duration (time), the pump set(s) operate at their current normal speed.

All pumps shut down automatically on a preset low level.

All pumps limit the number of starts per hour to 4.

Both pump sets are programmed to alternate and shall be automatically removed from the alternating sequence when not in Auto.

The dome level is maintained at a setpoint level at all times in order to supply sufficient water to the independent pump station operated by Oxy and to supplement the wet well if needed. Controlled via RBS 8.

A small lift station is monitored by the reuse pump station control panel. These lift station pumps are used in alternation to empty the lift stations well.

Hydro-Pneumatic Tank

The operators are able to operate the system by level control only. There is a Hydro-Pneumatic Tank Control and Monitoring Screen for the operators to monitor this system.

When the operator selects level control there will be an area for the operator to input a high-water level and a low water level. This level will be from a range from a Radar Level instrument installed in a stilling well with an additional sight glass. The stilling well is located within the Effluent station control Building. In general, the water level in the Hydro-Pneumatic tank will be rising as the air is absorbed into the water. When the high-water level is reached for an operator adjustable time period, PLC 7 will energize a Solenoid Valve allowing air into the tank. The water level will begin to drop and when the water level reaches the low water level the PLC will de-energize the Solenoid Valve. If the water level is below the low water level for an operator adjustable time period, the PLC will energize another solenoid valve which will allow air to vent from the tank.

The Hydro-Pneumatic Tank Control and Monitoring Screen display the tank pressure and level respectively. The screen has a diagrammatic view of the system.

Compressed air is delivered by two air compressors one primary and one secondary.

The pressure within this tank will determine the system pressure.

Control:

Fine Screen

Hand:

When the Screen Selector switch is in the HAND position, the Screen will operate in the FORWARD-OFF-REVERSE (For-Off-Rev) according to the selector switch. The switch will spring return to off.

Auto:

When the screen selector switch is in the AUTO position the Screen will start to run once the water level reaches the start level setpoint of the level controller or the remote start call is received. Should the level instrument fail an emergency Float switch will start the Screen.

Press

Hand:

When the Screen Selector switch is in the HAND position, the Press will operate in the FORWARD-OFF-REVERSE (For-Off-Rev) according to the selector switch. The switch will spring return to off.

Auto:

There is no SCADA Control for the Press and associated Spay wash modes.

S&H Distribution Pumps 11P- 101 through 11P- 103 (Phase I)

Hand:

When the HAND-OFF-AUTO switch (HOA) is in Hand at the VFD enclosure the pump/motor will be started via a Start pushbutton, and the speed is controlled via a potentiometer at each enclosure. To stop a pump/motor the Stop pushbutton has to be activated.

Auto:

When the HOA switch is in Auto the SCADA System and/or the Operator have control over the pumps/motors.

The pump set's for Phase I are controlled either by Flow or Pressure setpoints.

A pressure transducer and a magnetic Flowmeter are installed in the common Header pipe for that purpose.

The SCADA system will add or subtract a pump to stay within those parameters, set by the Operator.

Two Radar level instruments (primary and backup) measure the level in the wet well and will slow the pumps down to a settable speed/pressure set point should the level reach a settable level determined by the operator to be safe for the pumps to run at for a period of time, and will return to normal once the level is higher than the setpoint for a period of time determined by the

operator. The operator can override this function at any time.

The SCADA system will auto alternate the pumps according to the Operators input in either Days or Runtimes.

MLK Distribution, Plant Distribution, Dome Storage and Rockwind Golf Course Pumps 11P-104 to 11P-107 (Phase II).

Hand:

When the HAND-OFF-AUTO switch (HOA) is in Hand at the VFD enclosure the pump/motor will be started via a Start pushbutton, and the speed is controlled via a potentiometer at each enclosure. To stop a pump/motor the Stop pushbutton has to be activated.

Auto:

When the HOA switch is in Auto the SCADA System and/or the Operator have control over the pumps/motors.

The pump set's for Phase II are controlled by a Pressure setpoint.

A pressure transducer is installed in the common Header pipe for that purpose.

The SCADA system will add or subtract a pump to stay within those parameters, set by the Operator.

Two Radar level instruments (primary and backup) measure the level in the wet well and will slow the pumps down to a settable speed/pressure set point should the level reach a settable level determined by the operator to be safe for the pumps to run at for a period of time, and will return to normal once the level is higher than the setpoint for a period of time determined by the operator. The operator can override this function at any time.

The SCADA system will auto alternate the pumps according to the Operators input in either Days or Runtimes.

A small Sewer Lift station is also monitored by PLC 7. There are no controls associated except for 5 DI see I/O list.

PRESURE REDUCING AND PRESSURE SUSTAINING / FLOW CONTROL VALVES

There is no Manual Control for the PRV's.

In Automatic Control the SCADA system receives the downstream pressure and sends a 4-20 mA signal according to a settable pressure setpoint by the Operator to a Pilot control Motor (CLA-VAL CRD 33) which adjusts the valve accordingly.

3 of the 4 PRV's are controlled from PLC 7, two are hardwired and one signal is send via a 900 MHz Phoenix Contact I/O Radio. The fourth PRV is controlled from PLC 10.

The two remote PS/FCV's can be controlled in manual by either isolation valves, or the CLA-VAL D22 Electronic Valve Controller. The City of Hobbs would prefer to replace those Controllers with a PLC at each site. The Ethernet Radio infrastructure is already in place and can be utilized.

To control those Sites, up to 4 AI, 1 AO, and 2 DO would be necessary.

At the current configuration the pressure sustaining part of the valve is set manually by a pressure regulator. The flow through this valve is measured by a magnetic Flowmeter and according to the setpoint determined by Plant Personal, a 4-20 mA signal will be transmitted to the valve controller which in turn opens or closes the valve via two Solenoid valves till it reaches the flow required. A Valve position indicator sends the position back to SCADA.

The communication between both sites and SCADA (Modbus/EthernetIP) is done through an OPC Software pack (Kepware).

OXY Petroleum Pump Station

The pump station is independently operated by the Control Panel within the Pump Station. SCADA monitors the following Data:

- Flow
- Large Pump running
- Small Pump Running
- Pressure

Storage Dome

Manual filling operation from the Phase II pump station occurs via the SCADA system through operator input for the MOV.

Automatic filling is done through a level instrument and operator settable levels, at which 2 remediation Wells will be started or stopped.

A manual Float switch will send an alarm and stop both Wells if the level reaches unsafe conditions (2 feet before Overflow).

Hardwired I/O for PLC 7 and RBS 8

Digital Inputs PLC 7

Tag	Process	Notes
VFDs		
11P-104		
ZHS-7110	In Auto	
YS-7110	Ready	
YS-7111	Running	
YS-7112	Fault	
11P-105		
ZHS-7120	In Auto	
YS-7120	Ready	
YS-7121	Running	
YS-7122	Fault	
11P-106		
ZHS-7130	In Auto	
YS-7130	Ready	
YS-7131	Running	
YS-7132	Fault	
11P-101		
ZHS-7210	In Auto	
YS-7210	Ready	
YS-7211	Running	
YS-7212	Fault	
11P-102		
ZHS-7220	In Auto	
YS-7220	Ready	
YS-7221	Running	
YS-7222	Fault	
ZHS-7230	In Auto	
YS-7230	Ready	
YS-7231	Running	
YS-7232	Fault	
11P-107		

ZHS-7140	In Auto	
YS-7140	Ready	
YA-7141	Running	
YA-7142	Fault	
Dome MOV		
ZSO-7531	Closed	
ZSC-7531	Opened	
YA-7531	Over torque	
Lift Station		
YS-7011	Lift Pump 1 ON	
YA-7012	Lift Pump 1 MF	
YA-7021	Lift Pump 2 On	
YA-7022	Lift Pump 2 MF	
LA-7010	Lift Station High Level	
Moving Screen		
ZHS-7041	in Auto	
YS-7041	On	
YA-7041	Fault	
LA-7041	High Level	
ZS-7000	Operator Key	
PSH-7301	Phase II Mainline PSI	
PSH-7401	Phase I Mainline PSI	

Digital Outputs PLC 7

Tag	Process	Notes
YC-7110	11P-104 CF	
YC-7120	11P-105 CF	
YC-7130	11P-106 CF	
YC-7210	11P-101 CF	
YC-7220	11P-102 CF	
YC-7230	11P-103 CF	
YC-7140	11P-107 CF	
YC-7041	Moving Screen Start CF	
YSO-7531	Dome MOV Open CF	
YSC-7531	Dome MOV Close CF	
YC-7521	Hydro Sol IN	
YC-7522	Hydro Sol OUT	

Analog Inputs PLC 7

Tag	Process	Notes
FIT-7501	Phase II Header Flow	To MLK Distribution
FIT-7601	Phase I Header Flow	To S&H Distribution
LIT-7001	Wet well Level 1	
LIT-7002	Wet well Level 2	
PIT-7301	Phase II Header PSI	To MLK Distribution
PIT-7401	Phase I Header PSI	To S&H Distribution
ZT-7531	Dome MOV Position	
PIT-7531	Dome Level via PSI	
VFD Speed		
SIT-7110	VFD 11P-104 Speed	
SIT-7120	VFD 11P-105 Speed	
SIT-7130	VFD 11P-106 Speed	
SIT-7140	VFD 11P-107 Speed	
SIT-7210	VFD 11P-101 Speed	
SIT-7220	VFD 11P-102 Speed	
SIT-7230	VFD 11P-103 Speed	
VFD Vibration		
VT-7110	VFD 11P-104 Vibration	
VT-7120	VFD 11P-105 Vibration	
VT-7130	VFD 11P-106 Vibration	
VT-7140	VFD 11P-107 Vibration	
VT-7210	VFD 11P-101 Vibration	
VT-7220	VFD 11P-102 Vibration	
VT-7230	VFD 11P-103 Vibration	
PRVs		
FIT-7511	Plant PRV Flow	
PIT-7511	Plant PRV PSI	
FIT-7551	Cemetery PRV Flow	
PIT-7551	Cemetery PRV PSI	
FIT-7571	MLK PRV Flow	Remote IO via Radio
PIT-7571	MLK PRV PSI	Remote IO via Radio
LT-7521	Hydro Tank Level	
PT-7521	Hydro Tank PSI	

Analog outputs PLC 7

Tag	Process	Notes
SIC-7110	11P-104 SP	
SIC-7120	11P-105 SP	
SIC-7130	11P-106 SP	
ZC-7531	Dome MOV SP	
SIC-7210	11P-101 SP	
SIC-7220	11P-102 SP	
SIC-7230	11P-103 SP	
SIC-7140	11P-107 SP	
PC-7511	W. Plant PRV PSI SP	
PC-7551	Cemetery PRV PSI SP	Prairie Heaven
PC-7571	MLK PRV PSI SP	Remote IO via Radio

Digital Inputs (5) RBS 8

Tag	Process	Notes
LMF1A3	Filter Hi-Level Alarm	!!!OBSOLETE!!!
OCS42S1	Filter Pump Operator Check	
PMF1A5	Filter Pump 1 MF	!!!OBSOLETE!!!
PMF1S1	Filter Pump 1 ON	!!!OBSOLETE!!!
PMF2A5	Filter Pump 2 MF	!!!OBSOLETE!!!
PMF2S1	Filter Pump 2 ON	!!!OBSOLETE!!!
PCB10A5	Cemetery Booster Pump MF	!!!OBSOLETE!!!
PCB10S1	Cemetery Booster Pump ON	!!!OBSOLETE!!!
EMF1A5	Industrial Filter MF	!!!OBSOLETE!!!
EMF1S1	Industrial Filter ON	!!!OBSOLETE!!!
LMF2A3	Dome Hi-Level	
PF8A5	Power Fail	
SWELL1	South Well Running	
???	South Well OFF	!!!OBSOLETE!!!
NWELL1	North Well running	
???	North Well OFF	!!!OBSOLETE!!!

???	OXY Large ON	
???	OXY Small ON	

Digital Outputs (2) RBS 8

Tag	Process	Notes
PMF1S2	Filter Pump 1 CF	!!!OBSOLETE!!!
PMF2S2	Filter Pump 2 CF	!!!OBSOLETE!!!
SouthWell CF	South Well	
NorthWell CF	North Well	

Analog Inputs (2) RBS 8

Tag	Process	Notes
???	North Well ON	!!!OBSOLETE!!!
???	North Well OFF	!!!OBSOLETE!!!
PMF1S2	Filter Pump 1 CF	!!!OBSOLETE!!!
PMF2S2	Filter Pump 2 CF	!!!OBSOLETE!!!
	OXY Flow	TAG IS UNKNOWN
LMF2M1 Raw	Dome Level Metritape	

WASTE-ACTIVATED SLUDGE (WAS) FLOW

General

As already discussed before, two WAS pumps (primary and secondary) convey the flow to two Rotary Drum Thickeners (RDT). There is only one WAS pump and one RDT is serviced at any given time.

The WAS flow is measured by two magnetic flowmeters depending on which WAS pump is in service.

Polymer units injecting into the line of the selected RDT. Which is solely operated manually by the Operator.

The RDT discharges into a Hopper with a positive displacement pump attached in the bottom. A high-pressure switch shall shut the RDT and associated WAS Pump down should the pressure in the discharge line reaches the shutdown setpoint (High Pressure).

An Ultrasonic level instrument determines the pumping cycle and ensures that the Hopper does not overflow.

A suspended Solids instrument is installed in the common header pipe of both RDTs.

After that treatment, the WAS is called Thickened Waste Activated Sludge (TWAS) and is pumped to the Aerobic Digesters.

At the current stage, both RDTs are bypassed and the WAS is pumped directly to the Aerobic Digester.

The programming for the RDTs shall be done with an enable "bit" to enable/ disable the process for each RDT while in bypass mode.

Refer to Tag list PLC 10 for number of I/O.

AEROBIC DIGESTERS

The Aerobic Digesters are the latest upgrade to the WWRF. The SCADA control Panels are built with Siemens 1500 Series PLCs, I/O cards, and HMIs. The programming was done, using TIA Portal 15.1.

FUNCTIONAL DESCRIPTION

Process Overview

This facility is a multi-cell aerated digester segregated into a first-stage and second-stage flow in a two-stream, with an ultimate three-stream configuration.

The first-stage digester basins are controlled by a First Stage Plant Control Panel (FPCP) and the second-stage digester basins are controlled by a Second-Stage Process Control Panel (SPCP).

Each panel gathers status, and alarm signals from the following:
MCC1, MCC2, and the Aerzen Blowers at each Stage via Ethernet Data Highway as well as hardwired I/O points.

Each panel allows full operator interface and control of both first-stage and second-stage equipment.

Each panel outputs collected information to an Operator Interface Terminal (OIT), mounted to the front of its enclosure, for a graphic display of process status and alarms.

The SI working on integrating the new Siemens system with the existing (Siemens Step 7 Ver.5.5 SP1) was not successful with one critical Signal, the Digested Solids (DS) Pumps need a permissive from the Centrifuge to start (Centrifuge Ready).
The problem seemed to be the ABB OPC software, the solution to this problem is a hard-wired connection to the SPCP which is not shown in the Tag List or on the Drawings.

Since the Programming has been done (according to our preference) we just include the I/O List in this Document.

The only changes that have to occur are the transition from Win CC to either Ignition or VT Scada HMI software and a new I/P Addressing scheme.

Digester Tag List PLC 4A and 4B

System	Stage	Description				1st Stage - FPCP			2nd Stage - SPCP		
			Tag	DB	Add.	DB	Add.	Type	DB	Add.	Type
Aeration Blowers	1st Stage	In Remote	YL-102A	170	3.0						
Aeration Blowers	1st Stage	Motor Winding Temperature Fault	XA-102B	170	3.3						
Digester Basin	1st Stage	pH Level	PH-402	170	46						
Digester Basin	1st Stage	Basin Level	LI-402A	170	38						
Aeration Blowers	1st Stage	In Remote	YL-102A	170	3.0	88	3.0	Bool			
Aeration Blowers	1st Stage	Blower Ready	YL-102B	170	3.1	88	3.1	Bool			
Aeration Blowers	1st Stage	High Inlet Pressure Fault	XA-102A	170	3.2	88	3.2	Bool			
Aeration Blowers	1st Stage	Motor Winding Temperature Fault	XA-102B	170	3.3	88	3.3	Bool			
Aeration Blowers	1st Stage	Oil Pressure Fault	XA-102C	170	3.4	88	3.4	Bool			
Aeration Blowers	1st Stage	Oil Temperature Fault	XA-102D	170	3.5	88	3.5	Bool			
Aeration Blowers	1st Stage	Discharge Air Temperature Fault	XA-102E	170	3.6	88	3.6	Bool			
Aeration Blowers	1st Stage	Discharge Air Pressure Fault	XA-102F	170	3.7	88	3.7	Bool			
Aeration Blowers	1st Stage	Blower in Auto	YL-102E	170	2.0	88	2.0	Bool			
Aeration Blowers	1st Stage	VFD Ready	YL-102D	170	2.1	88	2.1	Bool			
Aeration Blowers	1st Stage	VFD Running	YL-102C	170	2.2	88	2.2	Bool			
Aeration Blowers	1st Stage	VFD Fault	XA-102G	170	2.3	88	2.3	Bool			
Aeration Blowers	1st Stage	In Remote	YL-103A	170	2.4	88	2.4	Bool			
Aeration Blowers	1st Stage	Blower Ready	YL-103B	170	2.5	88	2.5	Bool			
Aeration Blowers	1st Stage	High Inlet Pressure Fault	XA-103A	170	2.6	88	2.6	Bool			
Aeration Blowers	1st Stage	Motor Winding Temperature Fault	XA-103B	170	2.7	88	2.7	Bool			
Aeration Blowers	1st Stage	Oil Pressure Fault	XA-103C	170	1.0	88	1.0	Bool			
Aeration Blowers	1st Stage	Oil Temperature Fault	XA-103D	170	1.1	88	1.1	Bool			
Aeration Blowers	1st Stage	Discharge Air Temperature Fault	XA-103E	170	1.2	88	1.2	Bool			
Aeration Blowers	1st Stage	Discharge Air Pressure Fault	XA-103F	170	1.3	88	1.3	Bool			
Aeration Blowers	1st Stage	Blower in Auto	YL-103E	170	1.4	88	1.4	Bool			
Aeration Blowers	1st Stage	VFD Ready	YL-103D	170	1.5	88	1.5	Bool			
Aeration Blowers	1st Stage	VFD Running	YL-103C	170	1.6	88	1.6	Bool			
Aeration Blowers	1st Stage	VFD Fault	XA-103G	170	1.7	88	1.7	Bool			

Aeration Blowers	2nd Stage	In Remote	YL-100A	171	3.0					88	3.0	Bool
Aeration Blowers	2nd Stage	Blower Ready	YL-100B	171	3.1					88	3.1	Bool
Aeration Blowers	2nd Stage	High Inlet Pressure Fault	XA-100A	171	3.2					88	3.2	Bool
Aeration Blowers	2nd Stage	Motor Winding Temperature Fault	XA-100B	171	3.3					88	3.3	Bool
Aeration Blowers	2nd Stage	Oil Pressure Fault	XA-100C	171	3.4					88	3.4	Bool
Aeration Blowers	2nd Stage	Oil Temperature Fault	XA-100D	171	3.5					88	3.5	Bool
Aeration Blowers	2nd Stage	Discharge Air Temperature Fault	XA-100E	171	3.6					88	3.6	Bool
Aeration Blowers	2nd Stage	Discharge Air Pressure Fault	XA-100F	171	3.7					88	3.7	Bool
Aeration Blowers	2nd Stage	Blower in Auto	YL-100E	171	2.0					88	2.0	Bool
Aeration Blowers	2nd Stage	VFD Ready	YL-100D	171	2.1					88	2.1	Bool
Aeration Blowers	2nd Stage	VFD Running	YL-100C	171	2.2					88	2.2	Bool
Aeration Blowers	2nd Stage	VFD Fault	XA-100C	171	2.3					88	2.3	Bool
Aeration Blowers	2nd Stage	In Remote	YL-101A	171	2.4					88	2.4	Bool
Aeration Blowers	2nd Stage	Blower Ready	YL-101B	171	2.5					88	2.5	Bool
Aeration Blowers	2nd Stage	High Inlet Pressure Fault	XA-101A	171	2.6					88	2.6	Bool
Aeration Blowers	2nd Stage	Motor Winding Temperature Fault	XA-101B	171	2.7					88	2.7	Bool
Aeration Blowers	2nd Stage	Oil Pressure Fault	XA-101C	171	1.0					88	1.0	Bool
Aeration Blowers	2nd Stage	Oil Temperature Fault	XA-101D	171	1.1					88	1.1	Bool
Aeration Blowers	2nd Stage	Discharge Air Temperature Fault	XA-101E	171	1.2					88	1.2	Bool
Aeration Blowers	2nd Stage	Discharge Air Pressure Fault	XA-101F	171	1.3					88	1.3	Bool
Aeration Blowers	2nd Stage	Blower in Auto	YL-101E	171	1.4					88	1.4	Bool
Aeration Blowers	2nd Stage	VFD Ready	YL-101D	171	1.5					88	1.5	Bool
Aeration Blowers	2nd Stage	VFD Running	YL-101C	171	1.6					88	1.6	Bool
Aeration Blowers	2nd Stage	VFD Fault	XA-101C	171	1.7					88	1.7	Bool
Motive Pump	1st Stage	High Discharge Pressure Fault	XA-202A	170	0.0	88	0.0	Bool				
Motive Pump	1st Stage	Motor Winding Temperature Fault	XA-202B	170	0.1	88	0.1	Bool				
Motive Pump	1st Stage	Low Suction Pressure Fault	XA-202C	170	0.2	88	0.2	Bool				
Motive Pump	1st Stage	Pump in Auto	YL-202A	170	0.3	88	0.3	Bool				
Motive Pump	1st Stage	VFD Ready	YL-202B	170	0.4	88	0.4	Bool				
Motive Pump	1st Stage	VFD Running	YL-202C	170	0.5	88	0.5	Bool				
Motive Pump	1st Stage	VFD Fault	XA-202D	170	0.6	88	0.6	Bool				
Motive Pump	1st Stage	High Discharge Pressure Fault	XA-203A	170	0.7	88	0.7	Bool				
Motive Pump	1st Stage	Motor Winding Temperature Fault	XA-203B	170	7.0	88	7.0	Bool				
Motive Pump	1st Stage	Low Suction Pressure Fault	XA-203C	170	7.1	88	7.1	Bool				
Motive Pump	1st Stage	Pump in Auto	YL-203AA	170	7.2	88	7.2	Bool				
Motive Pump	1st Stage	VFD Ready	YL-203B	170	7.3	88	7.3	Bool				
Motive Pump	1st Stage	VFD Running	YL-203C	170	7.4	88	7.4	Bool				
Motive Pump	1st Stage	VFD Fault	XA-203D	170	7.5	88	7.5	Bool				
Motive Pump	2nd Stage	High Discharge Pressure Fault	XA-200A	171	0.0					88	0.0	Bool
Motive Pump	2nd Stage	Motor Winding Temperature Fault	XA-200B	171	0.1					88	0.1	Bool
Motive Pump	2nd Stage	Low Suction Pressure Fault	XA-200C	171	0.2					88	0.2	Bool

Motive Pump	2nd Stage	Pump in Auto	YL-200A	171	0.3				88	0.3	Bool
Motive Pump	2nd Stage	VFD Ready	YL-200B	171	0.4				88	0.4	Bool
Motive Pump	2nd Stage	VFD Running	YL-200C	171	0.5				88	0.5	Bool
Motive Pump	2nd Stage	VFD Fault	XA-200D	171	0.6				88	0.6	Bool
Motive Pump	2nd Stage	High Discharge Pressure Fault	XA-201A	171	0.7				88	0.7	Bool
Motive Pump	2nd Stage	Motor Winding Temperature Fault	XA-201B	171	7.0				88	7.0	Bool
Motive Pump	2nd Stage	Low Suction Pressure Fault	XA-201C	171	7.1				88	7.1	Bool
Motive Pump	2nd Stage	Pump in Auto	YL-201A	171	7.2				88	7.2	Bool
Motive Pump	2nd Stage	VFD Ready	YL-201B	171	7.3				88	7.3	Bool
Motive Pump	2nd Stage	VFD Running	YL-201C	171	7.4				88	7.4	Bool
Motive Pump	2nd Stage	VFD Fault	XA-201D	171	7.5				88	7.5	Bool
Digester Basin	1st Stage	Flood Probe	XA-442	170	7.6	88	7.6	Bool			
Digester Basin	1st Stage	High Level Switch	XA-402	170	7.7	88	7.7	Bool			
Digester Basin	1st Stage	Flood Probe	XA-443	170			N/A	Bool			
Digester Basin	1st Stage	High Level Switch	XA-403	170	6.0	88	6.0	Bool			
Digester Basin	2nd Stage	Flood Probe	XA-440	171	7.6				88	7.6	Bool
Digester Basin	2nd Stage	High Level Switch	XA-400	171	7.7				88	7.7	Bool
Digester Basin	2nd Stage	Flood Probe	XA-441	171						N/A	Bool
Digester Basin	2nd Stage	High Level Switch	XA-401	171	6.0				88	6.0	Bool
Sludge Pump	2nd Stage	High Discharge Pressure Fault	XA-300A	171	6.1				88	6.1	Bool
Sludge Pump	2nd Stage	Motor Winding Temperature Fault	XA-300B	171	6.2				88	6.2	Bool
Sludge Pump	2nd Stage	Low Suction Pressure Fault	XA-300C	171	6.3				88	6.3	Bool
Sludge Pump	2nd Stage	Pump in Auto	YL-300A	171	6.4				88	6.4	Bool
Sludge Pump	2nd Stage	VFD Ready	YL-300B	171	6.5				88	6.5	Bool
Sludge Pump	2nd Stage	VFD Running	YL-300C	171	6.6				88	6.6	Bool
Sludge Pump	2nd Stage	VFD Fault	XA-300D	171	6.7				88	6.7	Bool
Sludge Pump	2nd Stage	High Discharge Pressure Fault	XA-302A	171	5.0				88	5.0	Bool
Sludge Pump	2nd Stage	Motor Winding Temperature Fault	XA-302B	171	5.1				88	5.1	Bool
Sludge Pump	2nd Stage	Low Suction Pressure Fault	XA-302C	171	5.2				88	5.2	Bool
Sludge Pump	2nd Stage	Pump in Auto	YL-302A	171	5.3				88	5.3	Bool
Sludge Pump	2nd Stage	VFD Ready	YL-302B	171	5.4				88	5.4	Bool
Sludge Pump	2nd Stage	VFD Running	YL-302C	171	5.5				88	5.5	Bool
Sludge Pump	2nd Stage	VFD Fault	XA-302D	171	5.6				88	5.6	Bool
Aeration Blowers	1st Stage	Blower Speed Indication	SI-102	170	14	88	44.0	Real			
Aeration Blowers	1st Stage	Blower Speed Indication	SI-103	170	18	88	48.0	Real			
Motive Pump	1st Stage	Pump Speed Indication	SI-202	170	22	88	52.0	Real			
Motive Pump	1st Stage	Pump Speed Indication	SI-203	170	26	88	56.0	Real			

Digester Basin	1st Stage	Flow Meter	FIT-400	170	30	88	60	Real					
Digester Basin	1st Stage	Flow Meter	FIT-410	170	34	88	64	Real					
Digester Basin	1st Stage	Flow Meter	FIT-420				N/A	Real					
Digester Basin	1st Stage	Basin Level	LI-402A	170	38	88	68	Real					
Digester Basin	1st Stage	Basin Level	LI-402B	170	42	88	72	Real					
Digester Basin	1st Stage	pH Level	PH-402	170	46	88	76	Real					
Digester Basin	1st Stage	Dissolved Oxygen Level	DO-402	170	50	88	80	Real					
Digester Basin	1st Stage	Basin Level	LI-403A	170	54	88	84	Real					
Digester Basin	1st Stage	Basin Level	LI-403B	170	58	88	88	Real					
Digester Basin	1st Stage	pH Level	PH-403	170	62	88	92	Real					
Digester Basin	1st Stage	Dissolved Oxygen Level	DO-403	170	66	88	96	Real					
Aeration Blowers	2nd Stage	Blower Speed Indication	SI-100	171	14				88	44.0	Real		
Aeration Blowers	2nd Stage	Blower Speed Indication	SI-101	171	18				88	48.0	Real		
Motive Pump	2nd Stage	Pump Speed Indication	SI-200	171	22				88	52.0	Real		
Motive Pump	2nd Stage	Pump Speed Indication	SI-201	171	26				88	56.0	Real		
Sludge Pump	2nd Stage	Pump Speed Indication	SI-300	171	30				88	60.0	Real		
Sludge Pump	2nd Stage	Pump Speed Indication	SI-302	171	34				88	64.0	Real		
Digester Basin	2nd Stage	Basin Level	LI-400A	171	38				88	68.0	Real		
Digester Basin	2nd Stage	Basin Level	LI-400B	171	42				88	72.0	Real		
Digester Basin	2nd Stage	pH Level	PH-400	171	46				88	76.0	Real		
Digester Basin	2nd Stage	Dissolved Oxygen Level	DO-400	171	50				88	80.0	Real		
Digester Basin	2nd Stage	Basin Level	LI-401A	171	54				88	84.0	Real		
Digester Basin	2nd Stage	Basin Level	LI-401B	171	58				88	88.0	Real		
Digester Basin	2nd Stage	pH Level	PH-401	171	62				88	92.0	Real		
Digester Basin	2nd Stage	Dissolved Oxygen Level	DO-401	171	66				88	96.0	Real		
Digester Basin	2nd Stage	Basin 1 TSS	PST-400	171	70				88	100.0	Real		
Digester Basin	2nd Stage	Basin 2 TSS	PST-401	171	74				88	104.0	Real		

G2-60 DECANTER CENTRIFUGE

The Digested solids pumps located at the Digester will send the Digested Sludge to the Centrifuge.
The centrifuge manufacturer was responsible for providing a complete control system.

GENERAL DESCRIPTION

A. Drive System

1. The bowl drive system consists of an electric motor and a belt drive system. The belt drive system consists of multiple belts as required to provide full capacity and also to withstand the full starting torque of the system.
2. The drive system uses one motor for the bowl drive and a separate back drive motor for differential adjustment.

B. Back drive System

1. The centrifuge is equipped with a complete back drive system to control differential speed between the conveyor and the bowl. The back drive provides an infinitely adjustable differential speed variation over its range of operation.
2. Both motors are connected to VFDs within the supplied Control Panel.

C. Centrifuge Control Panel

The centrifuge operator control panel contains an ABB AC 800 M PLC, an external graphic color interface unit with touch screen (Operator Panel), indicating lights for running, off, and fault indication of all major components, an elapsed time meter, emergency stop push-button, alarm horn, and alarm acknowledge/lamp rest push-button. A duplex 120 VAC receptacle for customer use up to 3 amps, non-inductive loads shall be mounted internal to the enclosure.

1. The back drive is controlled by the PLC/Operator Panel and applicable set point values are entered via the touch screen.
2. Control logic is done by the PLC and its associated operator Panel. The operator Panel consists of a color display with a touch screen. All operator functions described below will be provided through menus and function keys on the operator interface unit. The PLC shall be supplied with a battery backup so all programs and

settings are retained if a power supply failure occurs. Digital and analog I/O units shall be supplied. The PLC and associated operator interface unit operate off of an internal 24 VDC power supply. All 24 VDC power supplies must provide short circuit fold-back protection.

3. The operator Panel unit is capable of automatic or manual start/stop operations, as well as provides display readings of the following: Centrifuge drive motor amps, sludge and polymer actual flow rates, sludge and polymer desired flow rates, fault monitoring, pre-set and actual timing operations, local/remote control status, auto/manual control status, back drive torque, back drive speed, differential speed, and bowl speed.

4. The operator Panel has selector keys to allow the operator to toggle between feed pump 1 or feed pump 2 and polymer pump 1 or polymer pump 2 which are supplied by others.

5. The Control system has the capability to be hardwired to any control system for remote operation and monitoring through analog I/O and digital I/O of the centrifuge and ancillary equipment supplied by others such as conveyors, feed pumps, diverter gates, etc.

6. The ABB PLC interfaces with the plant SCADA system via an Ethernet communication cable over our FO ring. An ABB OPC software is required to realize this interface.

7. The centrifuge is equipped with an accelerometer-type vibration monitor to protect against excessive vibration. The monitor is interlocked with the controls to shut down the centrifuge if excessive vibration is sensed. The monitor provides an analog output signal proportional to the vibration magnitude for display and monitoring at the operator interface

8. The centrifuge is equipped with a cover switch so the centrifuge cannot be started when the cover is open.

D. Control System Operation

1. The centrifuge is able to be started automatically or manually. To automatically start the centrifuge, press the "Auto Start" key on the operator interface unit.

2. The PLC will issue a "run" command to the centrifuge main drive motor and the bowl will begin to accelerate. The polymer and feed systems are interlocked with the centrifuge controls to prevent their operation at this time. During acceleration of the centrifuge, the PLC shall issue a "run" and speed command to the back drive. This will make the back drive run at a pre-programmed start-up speed to provide the maximum scrolling of residual solids from the bowl. After a pre-set, timed interval, when the bowl has reached full operating speed, the feed and polymer pumps will start automatically. As process requirements vary, the back-drive speed shall be

infinitely adjustable via the PLC, maintaining the set speed, utilizing a closed loop feedback. In this mode, the back-drive speed shall be maintained while the torque is allowed to vary as process parameters change.

3. Automatic torque mode can also be selected at any time. In this mode, the back-drive torque shall be maintained while the speed is allowed to vary, within pre-set limits, in order to maximize residence time. If torque begins to rise above the set point, the differential speed shall be increased to scroll solids out of the bowl at a faster rate, thereby lowering the torque back to the set point. The PLC is equipped with a built-in PID Autotune feature that will allow for automatic adjustment of the PID Proportional, Integral, and Derivative values from the operator interface. Separate software, computers, and communication cables are not required to activate this feature.

4. The centrifuge is able to be started manually as well, by pressing the appropriate keys as prompted by the manual operation screen of the operator interface unit.

5. Upon stopping the centrifuge by pressing the "Auto Stop" key on the operator interface unit, or via a fault condition, the feed and polymer system interlock contact shall open, thereby insuring feed to the centrifuge is stopped. An auto flush valve will also be opened for a pre-determined time during shutdown.

E. Control System Fault Detection

1. In the event that a fault condition occurs, the sounding of an alarm horn will take place, and an alarm text fault message will be displayed on the operator Panel to facilitate troubleshooting. An Alarm Acknowledge push-button, mounted on the front panel, will flash when a fault condition occurs. When pressed, the horn will be silenced and the flashing will turn solid. When the alarm fault is corrected and reset, the solid light will be turned off.

2. The following faults are provided as alert conditions and shut off the feed pump, and polymer system as required:

   a. Feed pump fault
   b. Polymer system fault
   c. Cake conveyor fault
   d. Torque alert
   e. Low differential

3. The following faults are provided as alarms and will cause a shutdown of the main drive and back drive motors:

   a. Main motor overheats
   b. Main drive malfunction
   c. Excessive vibration
   d. Back drive motor overheated

e. Back drive malfunction

f. Centrifuge cover open

g. Torque alarm

h. Centrifuge bowl over speed

F. Help Menu

1. A screen is provided within the Operator Panel to provide the operator with online help pages for each controlled device. The help pages include relevant flow charts and written descriptions as provided in the O&M manual.

CONTROL – AUXILIARY EQUIPMENT INTERFACES

A. The following auxiliary control is provided within the centrifuge control panel for use with the currently installed equipment and future installed options. These features can be enabled or disabled as required by the Operator Panel.

1. Positive Displacement Sludge Feed Pumps Interface. The sludge feed pumps are provided with a VFD for speed control and a hand-off-auto switch (Digester SPCP). in hand, the pump speed can be controlled locally from the VFD, but still interlocked with the centrifuge feed permissive signal. In the auto position, the pump will accept a run command and a 4-20mA speed control signal from the centrifuge Decanter PLC. In the off position, the pump will be locked out of operation. The pumps have multiple Status and Fault contacts. Both digested biosolids pumps shall be controlled from the centrifuge control panel via Ethernet signals sent to the main plant Transition PLC. Pump start, stop, and speed control shall be available from the operator interface terminal (OIT) as well as status and alarm signals (Currently not available).

3. Flow meters

One flow meter shall be placed in the centrifuge feed line prior to all polymer addition points. A second flow meter shall be provided in the polymer feed line to indicate the process flow rate of diluting polymer to the centrifuge system. Each flow meter shall provide a 4-20 mA output signal to the centrifuge PLC/Operator Panel for indication and closed loop PID control of flow rate. The signals shall be scaled in accordance with the actual GPM range of the meter (Polymer Unit = GPH).

4. Packaged Polymer System Control Interface

The existing packaged polymer system is equipped with a self-contained local control panel with a hand-off-auto switch, a dilution water flow control valve, a

dilution water flow meter, and a logic system to maintain constant dilute polymer concentration.

In the off position, the polymer system is locked out of operation. In hand, the polymer system is controlled locally from the polymer system local control panel. The system will accept a run command from the centrifuge. In the auto position, the dilution water control valve accepts a 4-20 mA control signal from the centrifuge PLC/Operator Panel. The flow meter sends a 4-20 mA output signal to the Operator Panel for indication and display of the actual polymer flow rate.

All I/O points are to be taken from the Centrifuge Schematics and the SCADA Tags shall be taken from the ABB OPC Tag List. Both will be included in the electronic forms that will be given out at the time of the Site Inspection.

After the Solids have been dewatered they are sent to the Dying Unit via a conveyor belt.

BIOSOLIDS DRYER

Control Panel and Electrical

1. One Allen Bradley SLC 5/05 programmable controller is provided, complete with internal timers to control the time/temperature regimes and all machine functions. The panel will be supplied with Panel View Plus 1000. Network communication is done through Ethernet Port. Necessary I/O devices are furnished to operate the equipment safely and efficiently and to certify that the dried sludge meets the requirements for Class A sludge classification. One (1) main disconnect is provided in the enclosed cabinet.

2. Motor Sizes

a.	Dehydrator Disk Drive Motor	50 hp
b.	Hopper Drive Motor (1)	5 hp
c.	Hopper Drive Motor (2)	5 hp
d.	Hopper Leveling Auger Drive	0.5 hp
e.	Hopper Cross Feed Conveyor	7.5 hp
f.	Combustion Fan Motor	10 hp
g.	Thermal Fluid Circulation Pump Motor	30 hp
h.	Condenser Fan Motor	20 hp
i.	Dried Sludge Exit Conveyor Motor	5 hp
	Full Load	133 hp

4. Control Voltage
   a. One 2 KVA step down transformer (120V/1ph/60HZ) will be furnished and installed in the control panel.

General Operation: PLC Controlled Automatic Batch Process

1. The dryer, under PLC control, is started in preheat mode to heat the thermal fluid to a system operating temperature.

2. The feed hopper receives waste material from the Centrifuge with a storage capacity as stated above.

3. The PLC calls for biosolids to be fed to the dryer chamber.

   a. The feed airlock door opens.
   b. The feed auger feeds biosolids to the dryer chamber per level control.
   c. The internal thermal fluid heated rotor moves and breaks up the biosolids to create maximum exposure to the heated surface of the rotor and the thermal fluid heated dryer chamber.
   d. The PLC senses the satisfaction of the time/temperature requirement of the dehydration process.
   e. The discharge door opens, the discharge conveyor is activated, and the rotor is changed to a one-direction rotation to move the dried material to the discharge conveyor.
   f. When the discharge time is satisfied, the discharge door is closed and the PLC resets to automatically feed a new batch and starts the process over.
   g. This automatic batch process continues to cycle until the operator stops the sequence and places the system into cool-down mode.
   h. All I/O points are to be taken from the Dryer Schematics and the SCADA Tags shall be taken from the Kepware OPC Tag List. Both will be included in the electronic forms that will be given out at the time of the Site Inspection.

   i. To minimize wear and tear on the Bearings and Chain Drive System for the wipers located within the Hopper, plant personnel installed two VFDs inside the Control Panel.

SCOPE OF WORK

The Process Control System Integrator (PCSI) shall develop the control System applications for the whole WWRF to change from a Distributed I/O System to a PLC-centric control strategy, i.e. every process area within the WWRF shall have its own PLC and can run autonomously should the SCADA Server fail.

Communication between each PLC and the HMI in the Control room shall occur on the Ethernet Communication Highway (Profinet Protocol on redundant Fiber Optic Media).

All PLC controller programming and Human Machine Interface (HMI) or Operator Work Station (OWS) graphics and programming shall be done by the PCSI.

The PCSI is cautioned to understand that all of the Field Devices will stay in place and must organize the PLC and HMI program in a fashion that will conform to the individual process already in place to allow continuous Operation of the WWRF. **This does not necessarily rule out any improvements to the programming for the PLC/HMI or process by the PCSI after discussion with COH Staff.**

Due to missing Documentation, especially Process descriptions, the PCSI has to work with the available Ladder logic, Panel Drawings, and multiple meetings with Plant personnel to develop the program for each process area. Available documentation can be picked up during the Site Inspection. The PCSI shall understand that the Documentation can be easily misinterpreted because PLC 1 is mentioned twice throughout, one PLC 1 is actually the "Transition PLC" or I/O Controller with no physical I/O Cards while the other PLC 1 is the S-7 300 Series PLC within the Influent Pump Station PLC Cabinet (Upgrade in 2013)

All panels shall be field documented wire by wire, including all field wiring to the instruments.

Where applicable the PCSI shall provide Factory Tested PLC racks or complete PLC enclosures with pigtails connected to the I/O Modules and connect those to the existing Field wiring or vice versa in the case of a complete Enclosure. All pigtails shall have wire Ferrules and wire labels installed. The majority of PLC Cabinets shall be reused by this measure.

The Factory Testing shall be witnessed by COH SCADA Personnel.

The PCSI shall commission each PLC immediately after installation, and bring it online with the new HMI running on the new OWS.

Due to recent changes to the SCADA System in the potable water production division, the PCSI shall provide Siemens Hardware to keep the Utility Division on the same programming Platform (TIA Portal) which is already in use at the new Digester within the WWRF, and in the Potable Water Production Division. In addition, this will keep spare parts inventory stocked by the COH to a minimum of interchangeable parts between both Divisions.

Each PLC Cabinet shall have an HMI and a panel mounted, dedicated RJ-45 jack to interface with a Maintenance or Operator laptop.

One very important aspect is the implementation of the COH 800 MHz Radio system used for alarming and alarm acknowledgment utilizing Voice over IP Technology.

COH is currently exploring options with TAPI lines and devices that can "key up" a Radio and send voice messages over the airwaves.

Information we can share about this is strictly experimental and shall not be taken as a fact in implementing the Radio System.

The implementation is directly related to the capabilities of the chosen HMI Software and their Voice over IP capability.

Each PLC Rack or PLC enclosure shall include one spare DI, DO, AI, and AO Module for future expansion.

Each PLC Enclosure shall have a momentary switch to indicate "Operator Check" via One (DI).

PSCI shall evaluate and certify existing fiber optic cable prior to installing new fiber optic devices (preferable Siemens Scalance Series).

Should existing fiber optic infrastructure not comply with the latest standards, PCSI shall install new fiber optic cable within existing conduit throughout the WWRF.

Each PLC shall be furnished with a removable storage media that shall hold the PLC program.

The PSCI shall only use Development Software for a Dual Server Redundant Application with the possibility of a remote disaster recovery Site. All Software used in Developing the SCADA System shall become the Owner's property after completion of the Project.

The PSCI shall provide, at no cost to the COH, the following Training for the SCADA Staff:

1. SCADA-HMI Training
2. PLC application programming training
3. Complete system maintenance and support training

The PCSI shall follow the following general Criteria:

A. All alarm interlocks shall be wired failsafe to the discrete input cards and thus shall be programmed as a fail-safe. A fail-safe alarm is an input that opens when it is in alarm. Terminology associated with interlocks is as follows:

1. When a contact or status is true, the SCADA computer will receive power to its input channel. The SCADA computer registers this as a binary bit of one.

2. When a contact or status is false, the SCADA computer will receive no power (open circuit) to its input channel. The SCADA computer registers this as a binary bit of zero.

B. When an analog signal goes outside the 4-20 mA range due to a failure at the instrument or PLC card, the following SCADA programming shall take place:

1. If the analog signal is associated with a control loop or ratio control loop that loop shall go into manual and send an Alarm.

2. If the analog signal is used in a calculation, that calculation shall use the last good analog signal. The computer shall place the control loop in manual if using the calculation and send an Alarm.

C. All alarms derived from analog signals and shutdown conditions shall be configured with adjustable time delays (initially set at 5 seconds) in the HMI. All operator-controlled devices shall include verification logic within the HMI that shall require a second positive selection of the control action by the operator before the command is executed.

D. Sequence malfunctions shall incorporate operational timer logic to alarm upon an incomplete sequence or a sequence malfunction if the required sequence of actions is not completed within a predetermined time period.

E. All software adjustable alarm setpoints accessible from the HMI shall have adjustable dead bands, unless specifically noted otherwise.

F. All process analog inputs are displayed, historically collected, and trended. Low-low, low, high, and high-high alarms shall be provided at the HMI. Nuisance alarms, such as low turbidity, shall be inhibited. When a valve is closed or a pump is not running, the analog flow signal associated with that valve or pump shall not generate a low flow alarm. Provide high and low alarm trip points at 90% and 10% of the span for all analog points. All alarm dead bands shall default to 3% deviation from setpoint unless plant personnel enter a different value. Every alarm dead band shall be capable of being set independently of all other alarm dead bands.

G. Plant personnel must acknowledge all alarms before they can be cleared. No alarm shall clear automatically until it has been acknowledged.

H. For all controlled devices (such as pumps and mixers) if a device is commanded to start or stop by the programmable logic controller (PLC) and the device feedback state does not match the commanded state within a preset time, an equipment command fail alarm is generated by the PLC for display and alarming at the HMI, and the device is commanded to stop. After a command fail alarm occurs, the device cannot be started again until a Reset is issued at the HMI.

I. For all discrete controlled valves, if the valve is commanded to open or close by the PLC and the valve feedback state does not match the commanded state within a preset time, a valve command fail alarm is generated by the PLC for display and alarming at the HMI and the commanded state remains unchanged.

J. For all variable speed pumps, if the pump is commanded to run at a specific speed and the speed feedback signal deviates from the commanded speed by a preset dead band for a preset time period, a speed deviation alarm is generated by the PLC for display and alarming at the HMI.

K. For all analog modulating valves, if the valve is commanded to open or close to a specific position and the position feedback signal deviates from the commanded position by a preset dead band for a preset time period, a valve deviation alarm is generated by the PLC for display and alarming at the HMI.

L. All tuning parameters for each PLC software PID controller are entered at the HMI. Tuning trends are provided to tune and monitor the PID operations. Tuning parameters settings shall be password protected.

M. Runtimes for all motorized equipment are totalized in the PLC and indicated at the HMI. Current day and accumulated runtime are indicated. The accumulated runtime is reset from the HMI. The runtime reset is password protected.

N. All process flows shall be totalized in the PLC. Previous day and current day totals shall be displayed and historically collected. When a valve is closed or a pump is not running, the flow totalizer shall not accumulate values caused by noise or errors in calibration.

O. Graphic Displays
   1. All displays shall incorporate references to both instrumentation tag numbers and plant equipment numbers. All displays shall be logically arranged so that an operator can drill down into the system with overview displays leading to process displays, then specific equipment displays, then to setpoint display for the specific equipment. Additionally, the PCSI shall provide a method to allow an operator to navigate from any display in the system to any other display in the OIT with no more than two selections.
   2. Unless specifically noted, all timers, setpoints, alarm actuation levels, etc., shall be adjustable from the operator interface. No changes shall be made to the system through the operator interface without the entry of a password.

The PCSI will enable and configure passwords on all systems as directed by the OWNER.

3. Index Displays - These displays shall provide an alpha-numeric listing of every display on the system, thus allowing an operator access to any system-wide display with a single action.
4. Plant Process Control Overview Display - This display shall provide a graphical overview of the entire process system. The operator shall have the ability to highlight on the graphical elements of the overview and navigate directly to that specific process element or location. All major graphic displays shall be accessible from the Plant Overview Display.
5. Individual Device Control Detail Displays - This display type shall provide specific information and allow control on a single process device or group. The display shall depict basic process diagrams with representative symbols for equipment, levels, flows, etc., combined with real time process variables or conditions. The displays shall be dynamic (i.e., symbols for a motor shall change color indicating run or stop or alarm, the volume of tanks shall be indicated by varying the height of the interior color of the tank symbol, etc.). All of the current data in the database shall be available for graphic displays. All process variables shall be displayed on their associated display(s) with correct engineering units. Process variables shall display their associated data quality flags.
6. Alarm Summary Display - The display shall consist of all points currently in alarm and shall include the tag number, description, time of occurrence, and present status (high, low, normal, etc.). The alarm summary shall identify alarm points by severity by utilizing distinct colors for each severity category.
7. System Diagnostic Displays - The displays shall summarize the error status of all system devices capable of reporting errors (i.e., PLCs, etc.). The display shall indicate if an error is detected or a failure occurs. Status of primary and backup devices shall be indicated on display.

P. Alarm/Equipment Status Reporting

1. The alarm log shall display all alarms as they occur. The alarm message shall include the time of occurrence, tag name, tag number, and whether it is a low, high, or failure alarm. When the point in alarm returns to normal, the time, point identification number, and return to normal data shall be displayed. All reports shall include the plant equipment number of the associated device.
2. The equipment status shall be logged whenever a change in status occurs (i.e., start, stop). The equipment status log shall include the time, equipment name, tag number, and the particular change in status.
3. The alarm log shall be retrievable by simple commands such that an alarm shall be reviewable for a certain period of time. The intent of this requirement is to assist with troubleshooting efforts after an alarm condition has been cleared.

3. The PCSI shall provide a time adjustable (Hours, Days, and Month) enable/disable bit to disable alarms when parts of the WWRF are being bypassed, or taken out of

Service for Maintenance reasons. Under no circumstance shall an Operator/Maintainer action create an alarm. This bit shall require a second confirmation.

The Final Documentation shall include:

1. Final system testing and validation Documents
2. System diagrams and related documentation
3. Final record drawings for all industrial control panels, including installation details
4. Complete operations and maintenance manuals (O&Ms)

The PCSI shall provide all required warranty support during the official warranty period.

The PCSI shall provide pricing for long-term technical support after the official warranty expires and for critical and major system upgrades.