



CITY OF CUMBERLAND, MARYLAND  
CUMBERLAND WASTEWATER TREATMENT PLANT  
ENHANCED NUTRIENT REMOVAL (ENR) UPGRADE

CITY PROJECT NO. 15-03-WWTP

ADDENDUM NO. 1

December 15, 2008

This addendum contains revisions, clarifications, and information pertinent to the bid documents of the referenced project and shall supplement, amend and become part of the procurement documents for the title project and contract. All bids shall be based on this Addendum, in accordance with the bid documents.

This addendum consists of fourteen (14) pages and Attachments 1 through 3.

Acknowledgment of this addendum shall be made by initialing the appropriate place on page 00410-1 of the Bid Form, including addendum number and date. Failure to acknowledge addendum may subject the bidder to disqualification.

**The bid due date has been changed to January 21, 2009 at 2:00 pm local time, as changed per this addendum.**

Except as noted herein, all terms and conditions of the document referenced, as heretofore changed, remain unchanged and in full force and effect.

**I. REVISIONS TO THE CONTRACT SPECIFICATIONS**

1. Section 00020, NOTICE TO BIDDERS, first paragraph: DELETE “Wednesday, January 7, 2009” and REPLACE with “Wednesday, January 21, 2009”.
2. Section 00020, NOTICE TO BIDDERS, fifth paragraph: ADD the following after the fourth sentence: “Hard copies of the contract documents are also available at a cost of \$400.00 per set for standard size drawings (24” x 36”) and \$300.00 per set for half size drawings (12” x 18”).”
3. Section 00410, BID FORM, Article 5.0 Bid Schedule, Item A-2: DELETE “\$3,670,000.00” in the unit price and total price columns and REPLACE with “\$3,735,645.00”.
4. Section 00800, SUPPLEMENTAL CONDITIONS: ADD the following before paragraph SC-3.03: “SC-2.03 Replace the last sentence of Paragraph 2.03 with the following: “In no event will the Contract Times commence to run later than the one hundred twentieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.””
5. Section 13220, DENITRIFICATION FILTER SYSTEM, Paragraph 2.01.I: DELETE second sentence and REPLACE with the following: “The Denitrification Filter Manufacturer shall provide Iconics™ HMI graphics and configuration utilized for Denitrification Filter monitoring

and control to be integrated into the Plant Iconics™ Process Control System by the System Integrator.”

6. Section 13220, DENITRIFICATION FILTER SYSTEM, Paragraph 2.01.I: DELETE second to last sentence and REPLACE with the following: “The Denitrification Filter Manufacturer shall also provide the System Integrator with tag database configuration points necessary for filter monitoring and control to be integrated into the Plant Iconics™ Process Control System.”
7. Section 13220, DENITRIFICATION FILTER SYSTEM, Paragraph 3.05: DELETE paragraph and REPLACE with the following:

“A. Furnish and deliver to Owner at site the following spare parts, all identical and interchangeable with similar parts installed within the work. Provide:

1. Air Blowers  
Six (6) air filter cartridges for Inlet Filter  
Three (3) V-belt Sets  
One (1) 5 gallon container lubricant  
One (1) tube of grease
2. Backwash Pumps  
One (1) set of mechanical seals  
Two (2) sets of gaskets and O-ring seals
3. Mudwell Pumps  
One (1) set of mechanical seals  
Two (2) sets of gaskets and O-ring seals
4. Metering Pumps  
One (1) repair kit  
Two (2) changes of lubricant
5. Instrument Air System  
One (1) set V-belts  
One (1) intake filter element  
One (1) pre-filter element  
One (1) post-filter element  
Two (2) changes of lubricant
6. Valves  
One (1) positioner for Modulating Valves  
One (1) cylinder repair kit for each actuator size  
Two (2) limit Switches  
Two (2) Solenoids
7. Instruments  
One (1) backwash air flow switch

- One (1) float switch
- One (1) pressure gage of each type
- One (1) temperature gage
- One (1) magnetic flow meter transmitter/converter
- One (1) instrument air low pressure switch
- One (1) sonic level element"

8. Section 13320, METERS AND INSTRUMENTATION, Paragraph 2.07: DELETE paragraph in its entirety.
9. Section 17299, INPUT OUTPUT POINT LISTS, Appendix (I/O list): On page 1 of 4 on the EP2 PLC Input/Output List, REPLACE "Data Field 2" units of PSI for EP2LI109 and EP2LI110 with "FEET".
10. Section 17299, INPUT OUTPUT POINT LISTS, Appendix (I/O list): On page 3 of 4 on the EP2 PLC Input/Output List, REPLACE "EP2AF803" with "EP2LD803".
11. Section 17010, SYSTEM INTEGRATOR, Paragraph 1.1: ADD Items 1-3 to Subsection B as follows:

"1. The System Integrator shall demonstrate the requisite resources of in-house staff, facilities and finances to complete the project in the schedule specified. These resources shall include personnel who are direct payroll employees of the System Integrator to design, fabricate, stage, implement and test the entire integrated hardware and software system at the System Integrator's facilities. In-house personnel shall include all disciplines associated with system manufacture, fabrication, and integration to include but not be limited to engineering, drafting, analog and digital control systems and wiring design, construction, wiring, labeling, software configuration, programming, project management, documentation creation, and quality control. The System Integrator shall have staff who is experienced in conducting and performing training of Owner's operations and maintenance staff in the use and troubleshooting of the specific instrumentation, controls, hardware and software provided on the project.

2. The System Integrator shall assign a specific person to be the System Integrator Project Manager for this project. The Project Manager shall be a direct employee of the System Integrator, shall be assigned to this specific project, and shall be skilled and experienced in project management, and in the type of work described herein. The Project Manager shall be assigned for the period of the Contract. Should it become necessary to replace the System Integrator Project Manager, the Contractor shall submit to the Engineer the credentials of the person assigned as a replacement.

3. The following firms (listed in alphabetical order), in the opinion of the Engineer, meet the qualifications and requirements for a System Integrator identified herein.

Allied Control Services, Inc.  
611 Garfield Ave.  
West Point, PA 19486  
(215) 699-2955  
Contact: Paul Mamzic

GES Technology, Inc.  
1918 Greenwood St.  
Harrisburg, PA 17104  
(717) 236-8733  
Contact: Gary Slatt

Gill-Simpson, Inc.  
2834 Loch Raven Road  
Baltimore, MD 21218  
(410) 467-3335  
Contact: Ronald Michael

Micro-Tech Designs, Inc.  
4312 Black Rock Rd.  
Suite 1  
Hampstead, MD 21074  
(410) 239-2885  
Contact: Mark Duvall

Trijay Systems Inc.  
10 Maple Ave.  
Line Lexington, PA 18932  
(215) 997-5833  
Contact: Jim Arevalo

The above list is being provided only as a courtesy to the Contractor. Qualifications of the proposed System Integrator shall be submitted regardless of whether or not they are listed herein. Qualifications shall be submitted in accordance with the submittal requirements of this specification section as well as those contained in the General Provisions. It shall be the responsibility of the Contractor to verify that the proposed System Integrator meets the requirements of the Contract Documents.”

12. Section 17010, SYSTEM INTEGRATOR, Paragraph 1.1: ADD Subsection C after Subsection B, increasing Part 1.1 Subsections to A-E. Subsection C is as follows:

“C. System Integrator qualifications package shall be submitted for the proposed System Integrator for this project, whether or not the particular System Integrator is listed in Part 1.1B of this Section. The qualifications package shall include the following information, and shall be organized into separate subsections in the qualifications package submittal in the order indicated:

1. Company Background - Provide a brief company overview detailing System Integrator’s experience, capabilities, and available resources. Description of available resources shall include labor categories, staffing, equipment, material availability, testing equipment, and training staff and aids.
2. Experience in Municipal Water and Wastewater Applications - Provide a list and detailed description of a minimum of five (5) recent projects involving Water and/or Wastewater Pumping, Storage or Treatment Facilities that the System Integrator has had

responsibility for as the Systems Integrator within the last seven (7) years from this Contract's bid date. Each project shall be provided with the project duration and date of completion. At the Engineer's discretion and request, the System Integrator shall provide as-built project documentation, drawings, and client contact information for the instrumentation and control systems integration work performed by the System Integrator for one of the projects contained on the list of projects provided. Each of the listed projects shall be provided with the System Integrator Project Manager's name.

3. Reference Letters - Provide a minimum of five reference letters summarizing the System Integrator's performance on the projects listed in item 2 above. Reference letters shall be from Contractors or Owners that have had contractual relationships with the System Integrator on those projects. Each letter shall be associated with a separate project.

4. Project Plan - Provide a brief project task list detailing the personnel to be utilized for engineering and design, fabrication, installation, calibration, testing, demonstration, and training for this project. Include personnel resumes for all personnel which will be performing services for this project including the System Integrator Project Manager.

5. Quality Assurance Plan - Provide a brief summary of the System Integrator's in-place quality assurance plans for performing work from shop drawing and submittal preparation and engineering through testing and training.

6. Facilities and Equipment - Provide a detailed list of fabrication space and location where fabrication of panels will take place at the System Integrator's location. List numbers and types of Computer Aided Drafting (CAD) software and workstations that are available for use at the facility during the course of this project for preparing project-required drawings."

13. Section 17010, SYSTEM INTEGRATOR, Paragraph 1.1. Subsection E (Formerly Subsection D): ADD the following sentence to the end of Item 12 and subitems a-e to Item 12 as follows:

"System Integrator shall submit coordination drawings for review and approval by the Engineer. Drawings shall include as a minimum:

- a. System block diagrams.
- b. Interconnection wiring diagrams showing control panels and field wiring to components, regardless of whether or not the components are furnished by the System Integrator, for panels and field devices furnished under this Contract. Indication of field wiring to components shall include terminations in intermediate terminal boxes, field devices, instrumentation, control panels, mechanical equipment and electrical equipment. Diagrams shall include terminal numbers for all new terminations to equipment.
- c. Control panel wiring diagrams for equipment control panels furnished or fabricated by the System Integrator.
- d. Scaled control panel elevations, panel layouts, equipment mounting racks.
- e. Wiring diagrams and panel and compartment elevations and layouts for all modifications to existing motor control center compartments and control panels."

14. Section 17010, SYSTEM INTEGRATOR, Paragraph 1.1.D.14: DELETE entire paragraph and REPLACE with the following:

- “14. Coordinate with Severn Trent Services. Severn Trent Services will supply PLC Panel EP & ICP and will perform programming of the PLC. Severn Trent Services will perform configuration and graphics development in Iconics™ for control and monitoring of the Denitrification Filters. The Severn Trent Services work will include, but not be limited to, graphics development and database creation. The System Integrator shall be responsible for integrating the Severn Trent Services Iconics™ HMI graphics and database into the Plant operating PCS Iconics™ HMI. One of the System Integrator-supplied operator workstations shall be located in the Denitrification Filter Facility Electrical Room as shown on the drawings and shall be used for monitoring and control once the Denitrification Filter graphics and I/O database have been integrated into the upgraded Plant PCS. The System Integrator shall coordinate receipt of the Iconics™ HMI graphics and I/O database with Severn Trent Services. The System Integrator shall participate in testing of a subset of Denitrification Filter graphics and I/O once they have been integrated in to the upgraded Plant PCS to ensure monitoring and control functions remain as required by Severn Trent Services. The System Integrator shall include 24 hours of on-site time for this testing.”
15. Section 17010, SYSTEM INTEGRATOR, Paragraph 3.1.P: DELETE “Pump Control System Provider” and REPLACE with “System Integrator”.
16. Section 17010, SYSTEM INTEGRATOR, Paragraph 3.1.Q: DELETE “Pump Control System Provider” and REPLACE with “System Integrator”.
17. Section 17440, PROCESS CONTROL SYSTEM HMI SOFTWARE AND HARDWARE, Paragraph 3.4 D: ADD the following after “... elsewhere in Division 17.”: “I/O utilized by Severn Trent Services for Denitrification Filter monitoring and control shall also be configured. The tag database for this I/O shall be obtained from Severn Trent Services and integrated into the tag database for the upgraded Plant PCS. For bid purposes, Contractor shall include integration of tags consisting of 30 Analog Inputs, 12 Analog Outputs, 110 Digital Inputs and 52 Digital Outputs.”
18. Section 17440, PROCESS CONTROL SYSTEM HMI SOFTWARE AND HARDWARE, Paragraph 3.4 F: ADD Item 3. as follows: “3. The SQL database shall be configured with I/O utilized by Severn Trent Services for Denitrification Filter control and monitoring. Contractor shall obtain final I/O from Severn Trent Services. For bid purposes include 30 Analog Inputs, 12 Analog Outputs, 110 Digital Inputs and 52 Digital Outputs with 25 additional alarms.”
19. Section 17440, PROCESS CONTROL SYSTEM HMI SOFTWARE AND HARDWARE, Paragraph 3.5 D: ADD Item 7. as follows: “7. Graphics developed by Severn Trent Services shall be integrated into the upgraded Plant PCS. For bid purposes, Contractor shall include integration of 20 additional graphics. Graphics shall be developed and configured by Severn Trent Services in Iconics™. These graphics shall be utilized for monitor and control of the Denitrification Filters from the Operator Workstation to be installed in the Denitrification Filter Electrical Room, as shown on the drawings.”
20. Appendix B, DENITRIFICATION FILTER SYSTEM INFORMATION, Section B.9: REPLACE Severn Trent Services Proposal 34531, Rev 5, with the Severn Trent Services Proposal 34531, Rev. 7 dated December 5, 2008. This proposal is Attachment 2 of this addendum.
21. Appendix B, DENITRIFICATION FILTER SYSTEM INFORMATION, Section B.13: ADD new Section B.13 to Appendix B entitled “Denitrification Filter System Price Information”. This new section is Attachment 3 of this addendum.

**II. REVISIONS TO THE CONTRACT DRAWINGS**

1. Drawing Sheet I00.17: On the VFD Elementary Control Diagram, DELETE “18-pulse VFD” and REPLACE with “6-pulse VFD”.

**III. PRE-BID MEETING QUESTIONS AND RESPONSES**

1. Will the completion dates be extended if permitting is delayed?  
*Answer: All permits to be obtained by the Owner, as listed in Section 01400, Paragraph 1.01.D will be obtained prior to Notice to Proceed. The Contractor is responsible for all other permits and the contract times will not be extended due to delays in obtaining such permits.*
2. On page 4 of the geotechnical report the use of sheeting during filtration building excavation is a 'recommendation'. Is the use of sheeting a requirement?  
*Answer: The geotechnical report is a recommendation, not a requirement. Temporary excavation support should be completed as directed in Section 02200 Earthwork, Excavation, Trenching and Backfilling.*
3. The sequence of construction requires the denitrification facility to be 'complete' before work begins on biological reactors or clarifiers. Does the denitrification facility need to fully operational before construction begins on the biological reactors or clarifiers, or does flow through denitrification influent pump station and effluent line need to be complete?  
*Answer: The denitrification filter facility does not need to be fully operational prior to construction of the biological reactor and clarifier improvements. Refer to Specification Section 01100, paragraph 1.03.C.2 for specific structures and piping systems that need to be completed.*
4. How soon after the notice of award will the notice to proceed be given?  
*Answer: The Owner intends to issue notice to proceed as soon as possible after notice of award. Refer to Specification Section 00700, paragraph 2.03 for commencement of contract times and note changes per this Addendum.*
5. Can the budgetary estimate for the ENR project be made available?  
*Answer: The budgetary estimate will not be made available.*

**III. BIDDER QUESTIONS AND RESPONSES**

1. The contract documents do not indicate whether the M/WBE package is to be submitted with the bid or afterwards. Please clarify.  
  
*Answer: Refer to Page 1 of Section 00801, which requires all information be submitted to the Owner prior to the Owner's award of the contract. Completed page 4 of Section 00801 is to be submitted with the bid.*

2. The bid documents contain Executive Order 13202. Is the intent here that the contractor does not need to pay prevailing wage? Please clarify.

*Answer: Prevailing wage rates do not apply to this project.*

3. Will the agreement (contract) between the Owner and their proposed Design/Build Heat Drying Facility Provider be provided to the Contractor prior to bidding this project? If not, the ability of the Contractor to assess risk through the assignment process will be severely compromised. It is assumed that a negotiation process leading to a Design/Build Heat Drying Facility contract will occur where in terms may change including price, schedule, performance criteria, etc. As a matter of normal business processes, it would be highly irregular for a contractor and its surety to accept a firm fixed price on a major component of work (Heat Drying Facility) for which the terms remain unknown prior to the Contractors bid. Please clarify.

*Answer: The Design/Build Contract is not expected to be available prior to the bid date. If it is, it will be provided to the bidders.*

*Adjustment to the price for the Heat Drying Facility listed in Item A-3 on the Bid Form will be made by change order as described in Section 11010, Paragraph 1.04.B. The price will be adjusted to reflect the price in the Design/Build Contract.*

*In the event the Design/Build Contract has a duration that exceeds the contract times specified in the agreement or if the Change Order for the assignment of the Design/Build Contract is executed more than fourteen (14) days after the date when the Contract Times commence to run, then a corresponding extension of contract times shall be executed by change order.*

*Please also refer to Section 00800, SC-3.03 regarding the order of precedence with respect to the Design/Build Contract.*

4. AE/AIT-200. This device is shown on drawing I00.10 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: Drawing I00.10 shows AIT-201 and FIT-200. There is no AE/AIT-200. If the question is referring to AIT-201, this is the Influent Dissolved Oxygen analyzer provided by the Filter Manufacturer. This is shown in plan view on I03.03. As this device is provided by the Filter Manufacturer, it can also be found on E34531-D102 in Appendix B. The Contractor is responsible for providing wiring for this analyzer to EP & ICP as indicated in the Controls Conduit and Cable Schedule conduit C224. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements. If the question is regarding FIT-200, this is the Denitrification Influent Flow and is shown in plan view on I03.02. This is a Venturi flowmeter to be provided and installed by the Contractor and is shown in the I/O list in the Appendix of Section 17299. The conduit and wiring for this flowmeter is indicated in the Controls Conduit and Cable Schedule as C229 from the flowmeter to EP2 & ICP. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements.*

5. AF-106. This device is shown on drawing I00.08. There are no notations as to what it is. Please clarify what this device is and if it is to be provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: As shown on I00.08, AF-106 is the hydrocarbon alarm for the Methanol Facility Sump. This is shown in plan view on drawing I04.01 as conduit C359, which is the Methanol Sump Discrete I/O. AF-106 is listed in the I/O list in the Appendix of Section 17299. This device is also represented by SLD on M04.01. Contractor is responsible for providing and installing this device and associated conduit and wire. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements. Refer to Specification Section 11306, paragraph 2.04 for specifications for the device.*

6. FE/FIT-305. This device is shown on drawings I00.10 and I03.02 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: This is a magnetic flowmeter for backwash flow to be provided by the Filter Manufacturer. As indicated on drawing I03.02, Filter Manufacturer P&ID drawings provide additional information for filter instrumentation and controls. For FE/FIT-305, they are found on E34531-D106 in Appendix B of the bid package. The Contractor is responsible for providing wiring and conduit from this device to EP & ICP. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements.*

7. FE/FIT-404. This device is shown on drawings I00.10 and I03.02 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: This is a magnetic flowmeter for backwash flow to be provided by Filter Manufacturer. As indicated on drawing I03.02, Filter Manufacturer P&ID drawings provide additional information for filter instrumentation and controls. For FE/FIT-404, they are found on E34531-D106 in Appendix B of the bid package. The Contractor is responsible for providing wiring and conduit from this device to EP & ICP. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements.*

6. FSL-504. This device is shown on drawings I00.10 and I03.02 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project.

*Answer: This is a flow switch to provide alarm condition for low backwash air flow and is provided by the Filter Manufacturer. As indicated on drawing I03.02, Filter Manufacturer P&ID drawings provide additional information for filter instrumentation and controls. For FSL-504, it is found on E34531-D107 in Appendix B of the bid package. Contractor is responsible for providing wiring and conduit from this device to EP & ICP. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements.*

7. LD-803. This device is shown on drawing I00.08. There are no notations as to what it is. Please clarify what this device is and if it is to be provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: As noted on I00.08 this provides "Oil Leak" indication. This device is represented in plan view by C006 on drawing I03.03, which is also listed in the Conduit and Cable Schedule as "Discrete I/O for Transformer Pad Sump". The I/O list in the Appendix of Section 17299 inadvertently lists this point as AF803 with the correct description "Transformer Pad Sump Hydrocarbon Detected". Contractor is responsible for providing and installing this device and associated conduit and wire. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements. Refer to Specification Section 11306, paragraph 2.04 for specifications for the device.*

8. LIT-103. This device is shown on drawing I04.01 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: This device is the ultrasonic level detection for methanol storage tank no. 1. This device is provided by the Filter Manufacturer. As indicated on drawing I04.01, Filter Manufacturer P&ID drawings provide additional information for filter instrumentation and controls. For LIT-103, it is found on E34531-D108 in Appendix B of the bid package. Contractor is responsible for providing wiring and conduit from this device to EP & ICP as shown on I04.01 and listed in the Controls Conduit and Cable Schedule. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements.*

9. LIT-104. This device is shown on drawing I04.01 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: This device is the ultrasonic level detection for methanol storage tank no. 2. This device is provided by the Filter Manufacturer. As indicated on drawing I04.01, Filter Manufacturer P&ID drawings provide additional information for filter instrumentation and controls. For LIT-104, it is found on E34531-D108 in Appendix B of the bid package. Contractor is responsible for providing wiring and conduit from this device to EP & ICP as shown on I04.01 and listed in the Controls Conduit and Cable Schedule. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements.*

10. LE/LIT-109. This device is shown on drawings I00.08 and I05.01 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: This device is an ultrasonic level instrument used to measure flow in the Parshall Flume. The use of this device is described in specification Section 17445. This device is listed in the I/O list in the Appendix of Section 17299, which inadvertently lists engineering units as PSI instead of units of flow. This device is also shown on M03.01. This device is to be provided and installed by the Contractor. Contractor is responsible for providing and installing this device and associated conduit and wire. As stated on the drawings, conduits may be combined or split*

*as necessary to meet field conditions and NEC requirements. Refer to Specification Section 13320, paragraphs 2.02 and 2.08 for specifications for the device.*

11. LE/LIT-110. This device is shown on drawings I00.08 and I05.01 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: This device is an ultrasonic level instrument used to measure flow in the Parshall Flume. The use of this device is described in specification Section 17445. This device is listed in the I/O list in the Appendix of Section 17299, which inadvertently lists engineering units as PSI instead of units of flow. This device is also shown on M03.01. This device is to be provided and installed by the Contractor. Contractor is responsible for providing and installing this device and associated conduit and wire. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements. Refer to Specification Section 13320, paragraphs 2.02 and 2.08 for specifications for the device.*

12. LE/LIT-300. This device is shown on drawings I00.10 and I03.03 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: This is an ultrasonic level meter to be provided by Filter Manufacturer. As indicated on drawing I03.03, Filter Manufacturer P&ID drawings provide additional information for filter instrumentation and controls. For LE/LIT-300, they are found on E34531-D106 in Appendix B of the bid package. Contractor is responsible for providing wiring and conduit from this device to EP & ICP. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements.*

13. LE/LIT-400. This device is shown on drawings I00.10 and I03.03 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: This is an ultrasonic level meter to be provided by Filter Manufacturer. As indicated on drawing I03.03, Filter Manufacturer P&ID drawings provide additional information for filter instrumentation and controls. For LE/LIT-400, they are found on E34531-D106 in Appendix B of the bid package. Contractor is responsible for providing wiring and conduit from this device to EP & ICP. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements.*

14. LSL-300. This device is shown on drawing I00.10 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: This is a float switch to be provided by Filter Manufacturer. This device is also found on I03.03 as represented by LAL-300 and conduit C239. C239 can also be found in the Controls Conduit and Cable Schedule providing conduit and wiring for "Clearwell Low Level Pump Shutdown and Alarm Indication". As indicated on drawing I03.03, Filter Manufacturer P&ID drawings provide additional information for filter instrumentation and controls. For LSL-300, it is found on E34531-D106 in Appendix B of the bid package. Contractor is responsible for*

*providing wiring and conduit from this device to EP & ICP. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements.*

15. LSL-400. This device is shown on drawing I00.10 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: This is a float switch to be provided by Filter Manufacturer. This device is also found on I03.03 as represented by LAL-400 and conduit C239. C238 can also be found in the Controls Conduit and Cable Schedule providing conduit and wiring for "Mudwell Low Level Pump Shutdown and Alarm Indication". As indicated on drawing I03.03, Filter Manufacturer P&ID drawings provide additional information for filter instrumentation and controls. For LSL-300, it is found on E34531-D106 in Appendix B of the bid package. Contractor is responsible for providing wiring and conduit from this device to EP & ICP. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements.*

16. NA-1. This device is shown on drawing I00.10 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project. If it is to be provided or replaced, please clarify what type of device it is to be.

*Answer: This is the nutrient analyzer to be provided by the Filter Manufacturer. This device is shown on M03.09. This device is also shown on I03.03 with conduit C234. C234 can also be found in the Controls Conduit and Cable Schedule providing conduit and wiring for "Influent and Effluent Nutrient Analyzer Analogs". Contractor is responsible for providing wiring and conduit from this device to EP & ICP. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements.*

17. PIT-505. This device is shown on drawings I00.10 and I03.03 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project.

*Answer: This is a pressure transmitter to be provided by Filter Manufacturer for Backwash Air Pressure. As indicated on drawing I03.03, Filter Manufacturer P&ID drawings provide additional information for filter instrumentation and controls. For PIT-505, it is found on E34531-D107 in Appendix B of the bid package. Contractor is responsible for providing wiring and conduit from this device to EP & ICP. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements.*

18. PSL-600. This device is shown on drawings I00.10 and I03.03 and does not appear anywhere else. Please confirm that this device exists and will not be replaced or provided under this project.

*Answer: This is a pressure switch to be provided by Filter Manufacturer for low air compressor discharge pressure. As indicated on drawing I03.03, Filter Manufacturer P&ID drawings provide additional information for filter instrumentation and controls. For PSL-600, it is found on E34531-D110 in Appendix B of the bid package. Contractor is responsible for providing wiring and conduit from this device to EP & ICP. As stated on the drawings, conduits may be combined or split as necessary to meet field conditions and NEC requirements.*

19. 13300.2.03 Venturi Flow Meters. This section is provided in the project specifications, but it does not appear that there are any venturi flow meters to be provided. Please clarify and confirm.

*Answer: The correct specification section is 13320, not 13300. The venturi flow meter is shown M03.01 and M03.08 and related sheets elsewhere in the documents.*

20. 13300.2.07 Pressure Transmitters. This section is provided in the project specifications, but it does not appear that there are any pressure transmitters to be provided. Please clarify and confirm.

*Answer: The correct specification section is 13320, not 13300. Paragraph 2.07 has been deleted in its entirety, per this addendum.*

21. 13300.2.08 Parshall Flume. This section is provided in the project specifications, but it does not appear that there are any flumes to be provided. Please clarify and confirm.

*Answer: The correct specification section is 13320, not 13300. The Parshall flume is shown M03.01 and M05.01 and related sheets elsewhere in the documents.*

22. Magnetic Flowmeter. It appears from the drawings that FE/FIT-200 is to be provided and this device is shown as a magnetic flowmeter. There is no section specifying magnetic flowmeters in specification 13300. Please confirm and clarify.

*Answer: FE/FIT-200 is a venturi flow meter, not a magnetic flow meter.*

23. Ultrasonic Flowmeters. It appears from the drawings that FE/FIT-341 through 344, inclusive, are to be provided and these devices are shown as ultrasonic flowmeters. There is no section specifying ultrasonic flowmeters in specification 13300. Please confirm and clarify.

*Answer: FE/FIT-341 through 344, inclusive are existing. Refer to section 13320, paragraph 3.01.B for installation requirements.*

24. On drawing E03.05 it shows a size 1 starter inside the new MCC delegated for the “Blower Unloading Control Valve (BCV-1)”. There isn’t an elementary control diagram for this unit. What kind of operating valve is this and what control functions are needed?

*Answer: The Blower Unloading Control Valve is provided by Severn Trent Services and is a butterfly valve with open/close electric actuation. The valve will be controlled from a control station mounted near the valve (due to its elevation) and can also be controlled remotely by the PLC. Wiring for remote PLC open/close and local/remote feedback is provided to the actuator – See C313 on the Controls Conduit and Cable Schedule. Open/Close indications are wired to the Backwash Air Local Control Panel – see C314. The valve will not be operated from the starter bucket.*

25. On drawing E03.03 note 8 states, “6 Pulse Variable Frequency Drive for Lift Pump”, and on drawings I00.17 it shows the VFD as an 18 Pulse. Which of these is correct?

*Answer: It is a 6 pulse VFD. Refer to clarification per this addendum.*

26. Due to the size and complexity of this project, a bid date extension for the above referenced project of at least two (2) weeks is requested. The extension would allow subcontractors and suppliers, especially the small businesses, additional time to provide a more comprehensive quote. Many of these businesses have limited hours over the holidays. We appreciate your consideration.

*Answer: Refer to the bid extension per this addendum.*

27. Can we use the ball field as a temporary lay down, staging and trailer area, or is there another area the owner would prefer we use?

*Answer: The ball field area outside the LOD may not be used. Temporary lay down, staging and trailer area will be within the plant site and coordinated with the Owner.*

28. Is it possible for WR&A to provide us with CAD drawings for Dwgs. # C00.02, C00.03 and C00.07?

*Answer: CADD drawing files will not be provided to bidders.*

### **Attachments**

1. Pre-bid meeting sign-in sheet
2. Severn Trent Services Proposal, Rev 7, dated December 5, 2008
3. Appendix B, Section B.13 Denitrification Filter System Price Information

END of Addendum No. 1

**ATTACHMENT 1**  
**Pre-bid meeting sign-in sheet**



WHITMAN, REQUARDT AND ASSOCIATES, LLP

CITY OF CUMBERLAND  
DEPARTMENT OF PUBLIC UTILITIES:  
CUMBERLAND WWTP ENR UPGRADE

PRE-BID MEETING  
SIGN IN SHEET

NOVEMBER 25, 2008

REPRESENTATIVE NAME	COMPANY NAME	COMPANY ADDRESS	PHONE NUMBER	FAX NUMBER
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Kenneth Johns	FRU-CON	4310 PRINCE WILLIAM PKWY Suite 200 WOODBRIDGE, VA 22192	703-586-6100	703-586-6101
BILL BARTON	WALTER N. YOPER	16200 MCMULLEN HWY CUMB. MD 21572	301-729-0610	301-729-1517
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Ian Frederick	Allan A. Myers	1805 Banks RD Worcester, PA 15430	610-884-6020	610-222-4359
MARK SCHROVER	BEITZEL CORPORATION	12072 BITTINGER ROAD GRANTSVILLE MD 21536	301-245-4107 EXT 2203	301-245-4527
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Jim Merrell	Bearing Construction	885 Shine Smith Rd Sudlersville MD	410-556-6100	6574



WHITMAN, REQUARDT AND ASSOCIATES, LLP

CITY OF CUMBERLAND  
DEPARTMENT OF PUBLIC UTILITIES:  
CUMBERLAND WWTP ENR UPGRADE

PRE-BID MEETING  
SIGN IN SHEET

NOVEMBER 25, 2008

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HARRY KOENIGS	JEET INDUSTRIES	21722 COOVERSVILLE NY	607 433-2100	
DAVE WENRICH	Wenrich Painting INC	116 W Chestnut St Ephrata, PA 17522	717-738-0916	717-738-2738

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WHITMAN, REQUARDT AND ASSOCIATES, LLP

CITY OF CUMBERLAND  
DEPARTMENT OF PUBLIC UTILITIES:  
CUMBERLAND WWTP ENR UPGRADE

PRE-BID MEETING  
SIGN IN SHEET

NOVEMBER 25, 2008

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Dave Bennett	Allegheny Aggregates + Allegheny Concrete	National Pike P.O. Box 127 Cumberland, MD	301-777-1777	301-478-3008
Bruce Kocsis	Kocsis Scaffolding Systems, LLC	14 FIENNER TR. GETTYSBURG, PA 17325	301-957-8973	717-642-9298
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WHITMAN, REQUARDT AND ASSOCIATES, LLP

CITY OF CUMBERLAND  
DEPARTMENT OF PUBLIC UTILITIES:  
CUMBERLAND WWTP ENR UPGRADE

PRE-BID MEETING  
SIGN IN SHEET

NOVEMBER 25, 2008

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John DiFonzo	City	PB Box 1702 Cumb., MD 21502	301-759-6601	301-759-6606

**ATTACHMENT 2**  
**Severn Trent Services Proposal, Rev 7, dated December 5, 2008**



*Filtration  
Products*

## **CUMBERLAND WWTP**

**CITY OF CUMBERLAND, MD**

**PROPOSAL FOR**

**Tetra DeepBed™ DENITRIFICATION  
FILTRATION SYSTEM WITH TETRAPace®**

**EIGHT (8) 11'-8" X 90'-0" FILTERS**

This proposal contains proprietary or confidential information of STWP regarding patent protected proprietary technologies and their implementation in the field, recommended uses and costs. Any such proprietary or confidential information disclosed herein is provided at Buyer's request and solely for the purpose of enabling Buyer to evaluate this proposal.

In receiving and reading this proposal, Buyer agrees that it will not reveal or otherwise distribute its contents to any third party without STWP's prior written consent. The foregoing limitation shall not preclude Buyer from disclosing the contents of this proposal to its employees, on a need to know basis, who have the responsibility to evaluate and/or implement the program set forth in this proposal. This proposal shall at all times remain the exclusive property of STWP until accepted by the party to which it was tendered.

**STWP Proposal 34531, Rev 7  
December 5, 2008**

## **TABLE OF CONTENTS**

- 1.0 Introduction
- 2.0 Equipment Description
- 3.0 Field Services – Summary of Services
- 4.0 Production Schedule
- 5.0 Process Guarantee

## 1.0 INTRODUCTION

Severn Trent Water Purification, Inc. (STWP) is pleased to offer this technical description for the scope of supply of equipment, materials and services for eight (8) 11'-8" x 90'-0" Tetra DeepBed™ denitrification filters for the WWTP for the City of Cumberland, MD. This scope is in accordance with the specifications and drawings of the RFP document provided to STWP dated May 2007 and Addendum #1 dated June 6, 2007, Addendum #2 dated June 12, 2007 and Addendum #3 dated June 28, 2007. Exceptions and comments to the RFP and Technical Specifications are noted in the "Qualifications and Comments" tab. Further, adjustments have been made based on the first technical meeting between STWP and WR&A on October 23, 2007 and the second technical meeting on December 6, 2007 and review comments to the 95% specifications and drawings issued in May and revised in June 2008. Finally, STWP has reviewed a final draft of drawings and specifications sent via cover letter of October 29, 2008 and has responded per a separate memo of November 10, 2008. This proposal incorporates the comments of that memo.

## 2.0 EQUIPMENT DESCRIPTION

### 2.1 Filter Mechanical Equipment

#### 3 Backwash Air Blowers

- Positive displacement rotary lobe type rated 2626 icfm at 10 psig
- Motor 200 HP, ODP motor. Motors will include winding and bearing thermistors and 120V space heater
- Motor and blower to be mounted to a framed assembly with belt drive
- Inlet filter with steel housing and differential pressure transducer (DP vendor to be Rosemount)
- Inlet and discharge silencers, if required, horizontal, supported from blower frame
- Spring or weighted pressure relief valve
- Flexible connectors
- Each blower will have a non-witnessed ASME PTC-9 1 psi slip test
- Blowers and noise enclosures will be painted per manufacturer's standard paint system
- Each blower mounted in a standard vendor noise enclosure for free-field noise generation not to exceed 80 dBA at 3'.
- Vendors: Roots

#### 1 Blower Vent Silencer

Silencer will be sized for the capacity of two blowers. Exhaust is to be to the outdoors.

#### 2 Backwash Water Pumps

- Horizontal, end suction centrifugal pumps, CI casing and impeller, stainless steel shaft sleeve and wear rings, with standard mechanical seals.

- Rated 6300 gpm at 35' TDH
- 75 HP TEFC, 900 rpm, premium efficiency motor, with 120V space heater
- Each pump and motor mounted to a baseplate with coupling and coupling guard.
- Manufacturer's standard hydrostatic test.
- Pumps will be painted per manufacturer's standard paint system
- Vendors: Fairbanks-Morse

2 Mudwell Water Pumps

- Horizontal, in-line split-case centrifugal pumps, CI, bronze impeller and wear rings, bronze shaft sleeve and standard mechanical seals.
- Rated 1050 gpm at 75' TDH
- 30 HP TEFC, 1200 rpm, premium efficiency motor
- Each pump and motor mounted to a baseplate with coupling and coupling guard.
- Manufacturer's standard hydrostatic test.
- Pumps will be painted per manufacturer's standard paint system
- Vendors: Fairbanks-Morse

1 Duplex Instrument Air Compressor System

- Two reciprocating compressors, each rated approximately 15 scfm at 100 psig: each mounted on one 80 gallon, minimum, receiver.
- 5 hp TEFC motors
- Each assembly includes PSV, pressure switch and drain valve
- Enclosed in noise enclosure, free-field noise generation not to exceed 80 dBA at 3'.
- One (1) NEMA 12 or 1 local control panel to operate both compressors with motor starters

1 Instrument Air Prefilter

Cartridge type with automatic drain.

1 Instrument Air Postfilter

Cartridge type with manual drain.

1 Instrument Air Dryer

Desiccant type. 30 scfm at 100 psig.

1 Instrument Air Dryers

Refrigerant type. 30 scfm at 100 psig.

Vendor for instrument air equipment: Kaeser, Champion, IR

## 2.2 Filter Internals

8 lots Filter Collection Sump Cover Plates

Precast concrete construction, 4 1/2" thick with reinforcement.

- 8 lots Backwash Air Distribution Header and Laterals  
3/16" thick 316L stainless steel headers and 316L stainless steel laterals. Included are gaskets, 316 stainless steel bolts, anchor brackets and 316 stainless steel concrete anchors.
- 8 lots Backwash Air Supply Header Pipe  
Schedule 5, 316L stainless steel pipe from the wall sleeve inside the filter cell to the connection on the air header. Included are pipe supports for inside the filter cell and 316 stainless steel concrete anchors.
- 8 lots Air/Water Distribution Blocks  
5000 psig precast concrete construction, high density polyethylene jackets with interlocking spacer lugs.
- 8 lots Weir Blocks  
Precast concrete construction with galvanized steel mounting angles and 316 stainless steel concrete threaded rod anchor bolts.
- 630 tons Media Support Gravel  
Five graded gravel layers 1-1/2" to 1/8". 1.5' total depth, shipped in super sacks.
- 2520 tons Sand Filter Media  
Tetra #5 high grade silica sand. 6' depth, shipped in super sacks.

### **2.3 Filter Process Vessels**

Design and installation of concrete filter vessels and related structures are by others.

### **2.4 Filter Automatic Valves**

#### **2.4.1 Pneumatic Actuated open/close Butterfly Valves**

- 8 20" Diameter Filter Influent Control Valves with mechanical stops
- 8 20" Diameter Clean Backwash Control Valves
- 8 24" Diameter Dirty Backwash Control Valves
- 8 12" Diameter Backwash Air Control Valves

Open/Close control valves, butterfly type, meeting the requirements of AWWA Standard C504, with cast iron bodies and discs and 304 stainless steel shafts. Valve Class will be 150B. Valve operators are pneumatic type, with two limit switches for valve position indication, open/close speed control valves, and one 120V solenoid valve for valve operation mounted on the actuator. Operators are sized based on a maximum pressure differential of 25 psi, minimum instrument air pressure of 60 psi, and maximum flow rate of 8 fps.

## 2.4.2 Pneumatic Actuated modulating Butterfly Valves

- 8 24" Diameter Filter Effluent Control Valves
- 1 18" Diameter Backwash Water Flow Control Valve with Mechanical Stop

Modulating control valves, butterfly type, meeting the requirements of AWWA Standard C504, with cast iron bodies and discs and 304 stainless steel shafts. Valve Class will be 150B. Valve operators are pneumatic type, with position feedback for valve position indication mounted on the actuator. Operators are sized based on a maximum pressure differential of 25 psi, minimum instrument air pressure of 60 psi, and maximum flow rate of 8 fps.

## 2.4.3 Electric Actuated open/close Butterfly Valves

- 1 8" Diameter Blower Unloading Control Valve

The Blower Unloading Control Valve will be a butterfly type meeting the requirements of AWWA Standard C504, with cast iron bodies and discs, and 304 stainless steel shafts. Valve Class will be 150B. The valve operator will be an open/close electric actuation type using 480V, 3 ph, 60 hz power and provided with a handwheel manual override. Operator is sized based on a maximum pressure differential of 25 psi and an open/close speed of 60 seconds minimum.

Based on the 95% plant layout the blower unloading valve will be more than 5' above the floor, therefore, the valve's electric operator will have a remote operator station. Wiring between the remote station and the unloading valve will be by the contractor.

## 2.4.4 Butterfly Valves - General

All butterfly valves will be finish painted on the interior and prime painted on the exterior per Section 09900. Exterior will be finish painted in field by contractor.

Valve vendors: Pratt, DeZurik. Both Pratt and DeZurik utilize their own pneumatic actuator. Electric actuators will be by AUMA, Rotork or Limitorque.

## 2.5 Filter Instrumentation

- 1 Backwash Water Flow Meter  
20" flanged magmeter with stainless steel grounding rings and remote transmitter. Mounting bracket for transmitter is not by STWP.

Vendor: Rosemount 8700 series

- 1 Mudwell Discharge Flow Meter  
8" flanged magmeter with stainless steel grounding rings and remote transmitter. Mounting bracket for transmitter is not by STWP.  
  
Vendor: Rosemount 8700 series
- 1 Backwash Air Flow Switch  
Thermal dispersion type.  
  
Vendor: Kobold Model KAL-L
- 8 Filter Water Level Transmitters  
Vendor: E-H Prosonic M FMU41 2-wire Ultrasonic level transmitter
- 1 Clearwell Level Element  
Vendor: E-H Prosonic M FMU41 2-wire Ultrasonic level transmitter
- 1 Mudwell Level Element  
Vendor: E-H Prosonic M FMU41 2-wire Ultrasonic level transmitter
- 1 Clearwell Level Switch  
Vendor: Peabody-Barnes mercury float switch with PP ball.
- 1 Mudwell Level Switch  
Vendor: Peabody-Barnes mercury float switch with PP ball.
- 1 Instrument Air Low Pressure Switch  
Vendor: Square D
- 1 Instrument Air Pressure Control Valve  
Vendor: Fisher Controls
- 1 Backwash Air Blower Pressure Transducer  
Vendor: Rosemount
- 3 Backwash Air Local Temperature Indicators  
Vendor: Ashcroft, or equal
- 12 Pressure Gauges  
0 - 15 psi for backwash blowers,  
0 - 30 psi for backwash pumps,  
0 - 30 psi Mudwell pumps with diaphragm seals,  
0 - 200 psi for air compressors
- 1 Dissolved Oxygen Analyzer  
Mounted on combined influent main. Vendor: E&H

## 2.6 Methanol Storage and Feed System Equipment

### 2 Methanol Feed Pumps

- Positive displacement diaphragm type
- Each rated up to 61 gph, minimum, by use of an SCR variable speed drive
- Diaphragm leak detection
- Discharge backpressure valve and pressure relief valve; stainless steel construction
- Suction y-strainer; carbon steel body with stainless steel screen.
- Motor: ½ HP, XPFC 56C T'STATS, C-face, foot-mounted DC motor.
- Variable speed drive: Reliance Electric DC2 Variable Speed Drive
- Vendor: Pulsafeeder or Neptune

### 1 Methanol Pump Discharge Pulsation Dampener

Vendor: Pulsafeeder, Neptune, Jesco, or equal

### 1 Methanol Pump Calibration Cylinder

Vendor: Kenco, Valcom

### 2 Pressure Gauges for Methanol Pumps

Vendor: Ashcroft, or equal

### 2 Methanol Storage Tanks

- Vertical, cylindrical, closed top with bolted manway and nozzles for vacuum/pressure relief valve and flame arrestor, level probe, drain, fill and withdraw lines.
- 10'-0" diameter x 18'-0" straight side, carbon steel construction, 10,000 gallon capacity designed to API 650 for above ground installation.
- Exterior protective prime coated per Section 09900
- Ladder with cage and roof handrail for access to instruments on roof.
- Manway has extended bolts to function as emergency relief per API-2000.

### 2 Methanol Storage Tank Pressure/Vacuum Relief Vent & Flame Arrestor 3" diameter, 2.25" WC pressure set point, 2" WC vacuum set point, carbon steel external construction, 316 stainless steel internals.

Vendor: Varec

### 2 Methanol Storage Tank Level Indicating Systems

System includes radar type level element, indicating transmitter.

Vendor: Siemens Sitrans

1 Nitrate Analyzers

Analyzer transmits to PLC as part of the TETRAPace® system. Note the analyzer must be in a building and near a floor drain. Read nitrate-nitrogen, ammonia-nitrogen and ortho-phosphorous

Vendor: Chemscan Model 4100

2 Analyzer Sample Pumps

15 gpm sample pumps for influent and effluent. ¾ hp TEFC 460, 3 ph, 60 hz motors.

Vendor: Grundfos

1 Methanol Control Panel

NEMA 4X 304 stainless steel enclosure to be located near, but outside of the hazardous area. All wiring to field devices will be terminated at a numbered terminal strip mounted in the panel. Lights to be push-for-test. The panel includes:

- Methanol Tank High Level Alarms and Lights
- Methanol Tank Level Indicators
- Horn with Silence Pushbutton
- Methanol Pump Selection Switch
- Methanol Pump On/Off Pushbuttons and Run Lights
- Controllers for Methanol Pump Control

## 2.7 Control System Equipment

1 Main Control Panel

Main Control Panel in a painted steel NEMA 12 enclosure. The panel contains the necessary equipment, instruments, ancillary control devices, hardware and logic to perform the automation functions of the filtration plant. The program includes SPEED BUMP® and TETRAPace®. All wiring to field devices will be terminated at a numbered terminal strip mounted directly in the panel. The panel includes:

- Redundant Programmable Controllers (PLC), including a Central Processing Unit (CPU), Input/Output (I/O) racks with I/O cards, Ethernet switch, and auxiliary equipment and cables for PLC internal data transfer. (Modicon Quantum Processor 140CPU43412A programmed using Concept Version 2.6 software)
- UPS for 15 minutes backup of the PLC
- Surge protection for analogue I/O

SPEED BUMP®

This service offers a patented technique for removing gas buildups from biological filter cells containing granular media. An upward flow of water

is induced to remove the gas in a manner that minimizes filter down time and valve movement. A group of such filters is quickly and seamlessly degassed sequentially.

#### TETRAPace®

TETRAPace® is a service that provides automatic dose control which regulates the dosage of chemical additives in a variety of processes, in this case methanol for denitrification. Influent and effluent chemical concentrations and process flow rate are measured continually. These parameters are used by an algorithm in the control software, along with operator-adjustable parameters, to provide proactive process control.

#### Control Panel Environmental and Power Conditions

Electronic equipment such as the Programmable Controller, Instrument Controllers, Indicators, Recorders, Totalizer, etc., located inside of the control panel, require specific environmental and power conditions in order to perform per the manufacturers' specifications.

The Main Control Panel is to be installed in the area which satisfies the following ambient conditions:

Relative Humidity: 5 - 95% non-condensing

Temperature: 41 - 129°F (5 - 54°C)

#### Control Panel Grounding

Computer grade grounding with a ground to earth resistance of 3 ohms or less and low resistance connections are to be provided for the control panel by the Buyer.

#### Operator Workstation Configuration and Programming

The STWP provided control panel will not have an HMI; instead the Client's Systems Integrator will provide a New Operator Workstation, complete with software and license, in the DNF Electrical Room. STWP will do the configuration and graphics development for the Operator Workstation using Iconics development package. STWP will coordinate with the System Integrator during development to assure that the STWP provided information is in the correct format for integration, particularly the KepServer EX.

The Denite Filter system configuration, I/O and graphics will be loaded onto the new operating PCS system by the Systems Integrator. Once the System Integrator incorporates the STWP I/O, graphics and configuration information into the system, STWP will confirm, through testing of a subset of items, that the system is functioning properly.

#### PLC Software and Documentation

The PLC will be fully programmed, staged and debugged at STWP's facility. Program finalization and further equipment troubleshooting will

be done during start-up at the site.

STWP will provide software documentation consisting of a fully annotated Ladder Logic Listing with cross-reference of internal coil and contact usage and location.

The PLC software development package is excluded from this supply.

- 1 Backwash Air Blower Local Control Panel  
Local NEMA 12 control panel servicing all three blowers. Contains start/stop pushbuttons and lights, motor/bearing temperature alarm system and position indication of unloading valve.

### **3.0 FIELD SERVICES – SUMMARY OF SERVICES**

STWP will furnish the services of a qualified field representative to instruct operation personnel and advise on filter internals installation and start-up as follows:

- 30 man-days in up to 8 separate trips for filter internals installation assistance.
- 20 man-days in up to 4 separate trips for EIC start-up and operator training.
- 10 man-days in 2 trips for process assistance in start-up
- 2 man-days in 1 trip of process assistance for training

#### Installation Assistance:

Internals installation assistance will be sufficient to train and supervise the contractor's crew and be present during all air pattern testing. It does not mean we will have an individual on site 100% of the time during installation.

#### Operator Training:

We will provide two 4-hour classroom and two 4-hour hands-on training sessions.

Additional services can be purchased, if desired, at the rate of \$1,250 per day (8 hr/day max.), including travel days, plus travel and living expenses at cost.

When the STWP field representative arrives on-site at the time requested by the contractor/purchaser, all equipment must be ready for work to begin. If equipment is not ready then our standard per diem rate, plus travel and living expenses, will apply.

STWP will provide 6 copies of the operation and maintenance manuals in draft form and 6 copies in final form.

### **4.0 PRODUCTION SCHEDULE**

- Submittal of PID's and mechanical drawings for approval 6 to 8 weeks after acceptance of purchase order from contractor
- Submittal of EIC drawings for approval 6 to 8 weeks after acceptance of purchase order from contractor
- Delivery of equipment, except filter gravel and media, 16 to 25 weeks after

drawing approval.

- Delivery of media and gravel will require production and shipments over a 9-month period. Therefore, STWP must begin producing media and shipping it to the site soon upon issue of the contract. The contractor will be responsible to protect the bags by covering with tarps to protect against UV degradation. If required, the contractor will be responsible for any pallets on the ground to protect the bags. STWP can provide storage of the media, but at extra cost.

## 5.0 **PROCESS GUARANTEE**

The process guarantee offered by STWP is as follows. No other process warranty or guarantee, express or implied, is given by STWP or shall be part of this proposal.

The Tetra DeepBed™ denitrification filter system is guaranteed to produce an effluent of acceptable quality with 8 filters operating as follows

	Average	Max-Month	Peak-Hour
Flow (MGD)	15	25	40
Suspended Solids (mg/l)			
Filter Influent	10	10	10
Filter Effluent	5	5	5
Nitrate-Nitrogen (mg/l)			
Filter Influent	15	15	
Filter Effluent	0.5	1.0	

The suspended solids and nitrate-nitrogen concentrations are defined as a 24-hour composite sample. The process guarantee shall be applicable at a filter influent temperature equal to or greater than 12 °C. Biologically toxic materials in the filter influent in amounts detrimental to the treatment process shall not exist.

All composited samples shall be collected in a refrigerated sampler and stored in a refrigerated compartment prior to analyses. The influent sample shall be withdrawn from mid-depth of the filter influent pipe upstream of the methanol injection. The effluent sample shall be withdrawn from mid-depth of the filter effluent pipe downstream of the filters, but prior to disinfection. Effluent sampling shall not be interrupted during periods of no flow or low flow due to backwash water pumping rate exceeding filter influent flow rate.

STWP shall provide detailed written instructions to the general contractor and City of Cumberland, MD (hereafter referred to as Owner) on the complete installation and operation of the denitrification system. These instructions shall be followed explicitly.

All testing will be done by the general contractor or Owner in accordance with accepted standards, procedures and number of tests as mutually agreed upon by STWP, the general contractor and Owner. A transmittal of all pertinent data and

