



**CITY COUNCIL REGULAR AGENDA**  
**Saturday, January 17, 2015, 11:45 AM**  
**Camas School District**  
**Zellerbach Administration Center Board Room**  
**841 NE 22nd Avenue**

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**Special Meeting**

NOTE: There are two public comment periods included on the agenda. Anyone wishing to address the City Council may come forward when invited; please state your name and address. Public comments are typically limited to three minutes, and written comments may be submitted to the City Clerk. Special instructions for public comments will be provided at the meeting if a public hearing or quasi-judicial matter is scheduled on the agenda.

**I. CALL TO ORDER**


**II. PLEDGE OF ALLEGIANCE**

**III. ROLL CALL**

**IV. PUBLIC COMMENTS**

**V. CONSENT AGENDA**







- A. Approve the minutes of the January 5, 2015, Camas City Council Meeting and the Work Session minutes of January 5, 2015.

 [010515 CITY COUNCIL REGULAR MEETING MINUTES - DRAFT](#)  
[010515 CITY COUNCIL WORKSHOP MEETING MINUTES - DRAFT](#)

- B. Approve the claim checks as approved by the Finance Committee.

- C. Authorize Mayor to sign the amendment to the Interagency Agreement and Funding Authorization with the State of Washington Department of Enterprise Services (DES) for the Wastewater Treatment Plant Blower Control and Ultraviolet Disinfection Control Energy Efficiency Upgrades Project. Approval of the attached agreement and forms will authorize DES to move forward on the project on the City's behalf. (Submitted by Steve Wall)

 [WWTP Energy Services Proposal](#)  
[Department of Enterprise Services Interagency Agreement Amendment](#)  
[Department of Enterprise Services Funding Approval - Design](#)  
[Department of Enterprise Services Funding Approval - Construct](#)

- D. Authorize Mayor to sign the Jones Creek Flow Monitoring Project Interlocal Agreement with Clark County to assist in the operation of the City's slow sand water filtration plant that will be under construction in 2015. The annual cost is estimated to be \$4,120, which will be paid out of the Water Utility fund. As discussed with Council at the January 5, 2015 workshop, please note the Proposed Amount on Page 4 now shows the correct contract amount. (Submitted by Steve Wall)
-  [Jones Creek Monitoring Interlocal Agreement](#)
- E. Authorize Mayor to sign the second amendment in the amount of \$19,500 to BergerABAMs scope for North Urban Growth Area Sewer System Alternatives Analysis. This amendment will allow the project team to develop a sewer system phasing program for the preferred alternative and to develop a conceptual design and cost estimates for the first phase of improvements. As discussed at the January 5, 2015 Workshop, the work in this amendment is anticipated to be completed within the same timeframe as the original Scope of Services, which is early February 2015 based on contract approval dates. (Submitted by Steve Wall)
-  [BergerABAM Amendment No. 2 for NUGA Sewer Analysis](#)
- F. Authorize payment of Change Order No. 1 to Green Construction, Inc. in the amount of \$6,021.49 for Project S-583 NW 18th Ave. Bike & Pedestrian Trail. (Submitted by James Carothers)
-  [Project S-583 Change Order No. 1](#)
- G. Authorize Fire Chief to sign the Professional Services Agreement with Lynn Wittwer, MD. Doctor Wittwer is having all county agencies sign new professional services agreements for his continued oversight. This was presented to Council at the January 5, 2015, workshop. (Submitted by Nick Swinhart)
-  [Wittwer Contract](#)
- H. Authorize the Fire Department to surplus outdated fire apparatus (1998 ALF ladder truck, 1988 Seagraves pumper and a 1978 Mack pumper) and to list for them for sale. Following the completion of the merger/contract between Camas and Washougal, there is an excess of old and obsolete fire apparatus that are expensive to maintain. Additionally, few meet current minimum safety standards. The department is recommending use of a national advertiser to list the vehicles for sale. (Submitted by Nick Swinhart)
- I. Authorize Pay Estimate No. 7 to AAA Septic Service for Project WS-741 2014 STEF/STEP Tank Pumping in the amount of \$8,943.96 for work through December 31, 2014. This project provides for on-going pumping of STEF & STEP tanks throughout Camas and is funded by the Water/Sewer fund. (Submitted by James Carothers)
-  [WS-741 Pay Est 7 \(Signed\)](#)
- J. Authorize Pay Estimate No. 7 to Nutter Corp. for Project S-565 NW 38th Avenue Roadway Improvements, Ph. 2 in the amount of \$84,773.35 for work completed from December 8, 2014 thru December 31, 2014. (Submitted by James Carothers)
-  [S-565 Signed PayEstimate 7](#)
- K. Authorize the December 2014 Emergency Medical Services (EMS) write-offs in the amount of \$82,364.55. (Submitted by Cathy Huber-Nickerson)

- L. Authorize Pay Estimate No. 6 to McDonald Excavating, Inc. for Project S-566 Friberg Street/Goodwin Road Improvements in the amount of \$604,447.52 for work completed through December 31, 2014. (Submitted by James Carothers)

 [Friberg Road Improvements Pay Estimate No. 6](#)

NOTE: Any item on the Consent Agenda may be removed from the Consent Agenda for general discussion or action.

## **VI. NON-AGENDA ITEMS**

- A. Staff
- B. Council

## **VII. MAYOR**

- A. Announcements

## **VIII. MEETING ITEMS**

## **IX. PUBLIC COMMENTS**

## **X. ADJOURNMENT**

## **XI. CLOSED SESSION**

- A. Labor Negotiations

NOTE: The City of Camas welcomes and encourages the participation of all of its citizens in the public meeting process. A special effort will be made to ensure that a person with special needs has the opportunity to participate. For more information, please call 360.834.6864.



**CITY COUNCIL REGULAR MINUTES - DRAFT**  
**Monday, January 5, 2015, 7:00 PM**  
**Camas School District**

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**I. CALL TO ORDER**

Mayor Scott Higgins called the meeting to order at 7:00 p.m.

**II. PLEDGE OF ALLEGIANCE**

**III. ROLL CALL**

Staff: Bernie Bacon, Kristin Berquist, Pete Capell, Jennifer Gorsuch, Mitch Lackey, Eric Levison, Shawn MacPherson, Robert Maul and Steve Wall

Press: Heather Acheson, Camas-Washougal Post-Record

**IV. PUBLIC COMMENTS**

Dorothy Simone, 2828 NE Everett St., Unit 20, Camas, shared with Council a copy of the American Nurses Association Resolution to Ban Fracking of Oil, an email to Melissa Smith dated January 5, 2015, and a handout entitled, Fracking of Oil dated November 20, 2014 by Ms. Simone.

**V. CONSENT AGENDA**

- A. Approved the minutes of the December 15, 2014, Camas City Council Meeting and the work session minutes of December 15, 2014.

 [City Council Meeting Minutes 12-15-14](#)  
[City Council Workshop Minutes 12-15-14.pdf](#)

- B. Approved claim checks numbered 124278-124451, in the amount of \$548,799.81.

- C. Authorized release of retainage for Project No. WS-714 / WS-729 STEP Sewer RR Crossing / Garfield Water Relocation Project, in the amount of \$30,734.67 to 3 Kings Environmental, Inc. All City and State project documentation has been received and verified. (Submitted by Jim Hodges)

 [WS-729 - WS-714 pay est 5 Final.pdf](#)

- D. Approved Pay Estimate No. 3 for Project P-899 (less retainage), Fallen Leaf Lake ADA Ramp in the amount of \$20,015.23 for work through December 19, 2015. This project is fully funded in the City's adopted 2014 Budget. (Submitted by Steve Wall)

 [P-899 Fallen Leaf Lake ADA Ramp Pay Estimate 3](#)

**It was moved by Councilmember Chaney, seconded by Councilmember Dietzman, to approve the Consent Agenda. The motion carried unanimously.**

## **VI. NON-AGENDA ITEMS**

### A. Staff

There were no comments from staff.

### B. Council

Dietzman commented about the January 2nd First Friday.

Turk invited the public to the Vision Summit on Thursday, January 8th, at Lacamas Lake Lodge beginning at 6 p.m. Doors open at 5:30 p.m.

Anderson shared information about the Washougal Burlington Northern rail and oil train forum he attended on December 9th. He hoped Council would discuss this subject with a path forward in the near future.

## **VII. MAYOR**

### A. Announcements

### B. Council's Confirmation Vote of Mayor's Appointment to the Position of Public Works Director

Mayor asked Council to appoint Steve Wall, the current Utilities Manager, as the new Public Works Director. The current Public Works Director, Eric Levison, will be retiring February 28, 2015. Mayor explained the history of hiring the Utilities Manager position in light of the upcoming open position.

**It was moved by Councilmember Anderson, seconded by Councilmember Turk, that this Action Item be adopted. The motion carried unanimously.**

## VIII. MEETING ITEMS

- A. Resolution 15-001 Adopting a City of Camas Fee Schedule  
Details: Resolution No. 1314 was approved December 15, 2014, establishing a 2015 Fee Schedule with an effective date of January 1, 2015. Resolution No. 1314 had the incorrect fee schedule (2014) attached rather than the proposed 2015 Fee Schedule as presented on November 3, 2014 with City Council and considered during Public Hearing on November 17, 2014.  
Presenter: Cathy Huber Nickerson, Finance Director

 [010515 RES 15-001 Adopting a City of Camas Fee Schedule](#)

Huber Nickerson and MacPherson explained that Resolution No. 1314 with the attached 2014 Fee Schedule should be repealed in order to adopt RES 15-001 with the attached 2015 Fee Schedule.

**It was moved by Councilmember Turk, seconded by Councilmember Dietzman, that Resolution No. 1314 be repealed. The motion carried unanimously.**

**It was moved by Councilmember Turk, seconded by Councilmember Hazen, that Resolution No. 15-001 be read by title only. The motion carried unanimously.**

**It was moved by Councilmember Dietzman, seconded by Councilmember Hazen, that Resolution No. 15-001 be adopted. The motion carried unanimously.**

- B. Ordinance Amending Title 16 Environment, Chapter 16.53 Wetlands  
Details: On December 15, 2014, Council held a public hearing to consider amendments to the Camas Municipal Code, Chapter 16.53 Wetlands. At the conclusion of the public hearing, Council approved the amendments and directed the City Attorney to prepare an ordinance for adoption. The amendments are intended to comply with new mandates from the Department of Ecology.  
Presenter: Sarah Fox, Senior Planner


 [010515 ORD 15-001 Amending Chapter 16.53 of the Camas Municipal Code](#)

There were no comments or questions from Council.

**It was moved by Councilmember Chaney, seconded by Councilmember Anderson, that this Ordinance be read by title only. The motion carried unanimously.**

**It was moved by Councilmember Chaney, seconded by Councilmember Dietzman, that this Ordinance be adopted and published according to law. The motion carried unanimously.**

- C. Ordinance to Adopt the Annual 2014 Comprehensive Plan Amendments  
Details: City Council conducted a public hearing on December 15, 2014, to review the proposed Annual Comprehensive Plan Amendments, which included the following: the Grass Valley Plan (File No.CPA14-02); the Parks, Recreation, and Open Space Comprehensive Plan (File No. CPA14-03 “PROS” Plan); and miscellaneous map amendments. City Council accepted public testimony, considered the proposed amendments concurrently, and rendered a decision of approval. Council directed the City Attorney to prepare an ordinance for adoption.  
Presenter: Sarah Fox, Senior Planner

 [010515 ORD 15-002 Adopting Revisions to the City of Camas Comprehensive Plan, to the Comprehensive Land Use Map of the City of Camas, and to the Zoning Map of the City of Camas PROS Plan 110714](#)  
[PROS Plan appendices](#)  
[Camas Comprehensive Plan Map](#)  
[Camas Zoning Map](#)

There were no comments or questions from Council.

**It was moved by Councilmember Turk, seconded by Councilmember Hazen, that this Ordinance be read by title only. The motion carried unanimously.**

**It was moved by Councilmember Turk, seconded by Councilmember Dietzman, that this Ordinance be adopted and published according to law. The motion carried unanimously.**

- D. Stoneleaf Final Plat  
Details: This is the final plat for Stoneleaf Phase 1, which is a condominium project that is being platted into fee simple lots. Preliminary plat approval was granted on October 14, 2014. Staff is recommending approval.  
Presenter: Robert Maul, Planning Manager

 [FP14-06 Staff Report](#)  
[STONELEAF PLAT Final 122314](#)

**It was moved by Councilmember Anderson, seconded by Councilmember Chaney, that the Stoneleaf final plat be approved. The motion carried unanimously.**

## **IX. PUBLIC COMMENTS**

No one from the public wished to speak.

## **X. ADJOURNMENT**

The meeting adjourned at 6:19 p.m.

## **XI. CLOSED SESSION**

A. Labor Negotiations

The meeting adjourned at 6:19 p.m. and Council went into a closed session to discuss labor negotiations.

NOTE: The City of Camas welcomes and encourages the participation of all of its citizens in the public meeting process. A special effort will be made to ensure that a person with special needs has the opportunity to participate. For more information, please call 360.834.6864.





**CITY COUNCIL WORKSHOP MINUTES - DRAFT**  
**Monday, January 5, 2015, 4:30 PM**  
**City Municipal Center, 616 NE 4th Avenue**

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**I. CALL TO ORDER**

Mayor Scott Higgins called the meeting to order at 4:30 p.m.

**II. ROLL CALL**

Staff: Bernie Bacon, Kristin Berquist, Phil Bourquin, Pete Capell, Curleigh Carothers, Cathy Huber Nickerson, Mitch Lackey, Eric Levison, Robert Maul, and Nick Swinhart

Press: No one from the press was present

**III. PUBLIC COMMENTS**

There were no comments from the public.

**IV. WORKSHOP TOPICS**

- A. Authorize Mayor to sign the Jones Creek Flow Monitoring Project Interlocal Agreement with Clark County to assist in the operation of the City's slow sand water filtration plant that will be under construction in 2015. The annual cost is estimated to be \$4,120, which will be paid out of the Water Utility fund. As discussed with Council at the January 5, 2015 workshop, please note the Proposed Amount on Page 4 now shows the correct contract amount. (Submitted by Steve Wall)

 [Jones Creek Monitoring Interlocal Agreement](#)

Steve will look at the discrepancy in the numbers between the Interlocal Agreement Attachment A on page 4 and the table on page 6. The amount listed the page 6 of the table is correct.

**This agenda item will be included on the January 17, 2015, Consent Agenda.**


- B. Authorize Mayor to sign the second amendment in the amount of \$19,500 to BergerABAMs scope for North Urban Growth Area Sewer System Alternatives Analysis. This amendment will allow the project team to develop a sewer system phasing program for the preferred alternative and to develop a conceptual design and cost estimates for the first phase of improvements. As discussed at the January 5, 2015 Workshop, the work in this amendment is anticipated to be completed within the same timeframe as the original Scope of Services, which is early February 2015 based on contract approval dates. (Submitted by Steve Wall)

 [BergerABAM Amendment No. 2 for NUGA Sewer Analysis](#)

**This agenda item will be included on the January 17, 2015, Consent Agenda.**

- C. Pay Estimate No. 3 for project P-899 Fallen Leaf Lake ADA Ramp  
Details: Pay Estimate No. 3 is in the amount of \$20,015.23 is for work completed through December 19, 2014. This project is fully funded in the City's adopted 2014 Budget.

Presenter: Steve Wall, Utilities Manager

-  [P-899 Fallen Leaf Lake ADA Ramp Pay Estimate 3](#)  
Fallen Leaf ADA Ramp 1  
Fallen Leaf ADA Ramp 2  
Fallen Leaf ADA Ramp 3

This was also placed on the January 5, 2015, Consent Agenda.

- D. Public Works Miscellaneous and Updates

There were no miscellaneous or update items.

- E. Authorize payment of Change Order No. 1 to Green Construction, Inc. in the amount of \$6,021.49 for Project S-583 NW 18th Ave. Bike & Pedestrian Trail. (Submitted by James Carothers)

-  [Project S-583 Change Order No. 1](#)

**This agenda item will be included on the 1/17/2015, Consent Agenda.**

- F. Community Development Miscellaneous and Updates

Phil Bourquin, Community Development Director, informed Council that the Columbia River Economic Development Council (CREDC) annual agreement for services in the amount of \$25,150 will be included on the Consent Agenda for January 17, 2015.

Bourquin updated Council on the progress of completing the Camas Meadows Drive project.

- G. Authorize Fire Chief to sign the Professional Services Agreement with Lynn Wittwer, MD. Doctor Wittwer is having all county agencies sign new professional services agreements for his continued oversight. This was presented to Council at the January 5, 2015, workshop. (Submitted by Nick Swinhart)

-  [Wittwer Contract](#)

**This agenda item will be included on the January 17, 2015, Consent Agenda.**

- H. Authorize the Fire Department to surplus outdated fire apparatus (1998 ALF ladder truck, 1988 Seagraves pumper and a 1978 Mack pumper) and to list for them for sale. Following the completion of the merger/contract between Camas and Washougal, there is an excess of old and obsolete fire apparatus that are expensive to maintain. Additionally, few meet current minimum safety standards. The department is recommending use of a national advertiser to list the vehicles for sale. (Submitted by Nick Swinhart)

**This agenda item will be included on the January 17, 2015, Consent Agenda.**

I. City Administrator Miscellaneous Updates and Scheduling

Pete Capell, City Administrator, informed Council that the agenda was prepared with the new Granicus software and the minutes will also be prepared with the new software. There were a few glitches that will need to be worked out. He noted that it is going to be a great time saver. The old system took a full day to prepare the agenda. The new software produces the agenda very quickly. The review process is vastly improved too. He added that as staff becomes more experienced, he is confident that the software will pay for itself with the reduced hours required by staff to produce the agenda and minutes.

Capell reported that the City's Annual Planning Conference is Friday, January 16th and Saturday, January 17th. The agenda is as follows:

Friday, January 16, 2015

- Introductions & Opening Remarks (1:00 p.m.)
- Flag Page (1:30 p.m.)
- Break (2:30 p.m.)
- Vision 2035 (2:45 p.m.)
- Strategic Plan (3:30 p.m.)
- Community Center (4:15 p.m.)
- Public Comment/Closing Review (4:45 p.m.)
- Joint Meeting with the Camas School Board (5:00 p.m.) - dinner will be provided
- Adjournment

Saturday, January 17, 2015

- Opening Comments/ Planning Conference Agenda Review (9:00 a.m.)
- Recognition of Library Director, David Zavortink (9:10)
- Community Development Work Plan (9:15 a.m.)
- Comprehensive Plan (9:30 a.m.)
- Break (10:15 a.m.)
- LED Street Lighting (10:30 a.m.)
- Public Works Reorganization (11:00 a.m.)
- Adjournment of Planning Conference (11:45 a.m.)
- Regular Council Meeting (11:45 a.m.)
- Adjournment (noon)
- Luncheon and event honoring Linda Dietzman (noon) - lunch will be provided

Capell asked Council to complete their Flag Page by Friday, January 9th.

Capell also informed Council that applications for the Council vacancy are due on Friday, January 9th. One application has been received, but Capell anticipates five or six more. Interviews are scheduled for Monday, January 26, 2015, at 4:30 p.m.

NOTE: The City of Camas welcomes and encourages the participation of all of its citizens in the public meeting process. A special effort will be made to ensure that a person with special needs has the opportunity to participate. For more information, please call 360.834.6864.

## **V. COUNCIL COMMENTS AND REPORTS**

Turk commented about the Camas 2035 Vision Summit.

Mayor commented about the opening of Feast 316 in downtown Camas and the other restaurants that are expanding or coming to the downtown area. He commended the Camas Police Department for their service to the community.

Hogan and Mayor commented about the Salvation Army Bell Ringing event and how generous the citizens of Camas are.

Dietzman commented about First Friday and that it included more activities for young children. She thanked everyone for their well wishes and the expressions of appreciation for the work the Council does.

Hogan commented about the Downtown Camas Association (DCA) as a member of the Washington State Main Street Program.

Anderson commented about C-Tran Board representation that begins this year for the City of Camas and Council's position of being proactive in caring for Lacamas Lake.

Chaney commented on his renewed enthusiasm for the new year.

## **VI. PUBLIC COMMENTS**

Chris Kralik, 631 NW 18th Loop, Camas, commented about the Camas Police and Fire Departments and the care of Lacamas Lake.

# ENERGY SERVICES PROPOSAL

## City of Camas Wastewater Treatment Plant Energy Efficiency Upgrades



**Presented by:**

### **Abacus Resource Management Company**

**12655 SW Center Street, Suite 250  
Beaverton, Oregon 97005**

**Contact: Steve Rubbert**

**[SteveR@AbacusRM.com](mailto:SteveR@AbacusRM.com)**

**503-936-6526**



**A B A C U S  
R E S O U R C E  
M A N A G E M E N T  
C O M P A N Y**

December 02, 2014

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## **EXECUTIVE SUMMARY**

Abacus Resource Management Company (Abacus) is pleased to present this proposal for the implementation of energy efficiency upgrades at the City of Camas Wastewater Treatment Plant.

This Proposal follows the outline contained in the Conditions of the Master Energy Services Agreement No. 2013-133 A (1). As such, it presents the contractual terms under which Abacus, the City of Camas, and the State of Washington will work together over the term of the project. This agreement describes the services rendered, payment methods, guarantees, and other aspects of the project.

An estimated \$123,265 in Clark Public Utility District incentives are expected for this project. In addition, Abacus has assisted the City of Camas in applying for the Washington State Department of Commerce Energy Efficiency Grant Program for the 2013-2015 biennium. Single grants may be obtained up to \$500,000 for local agencies.

### **Description of the Project**

The project scope of work consists of upgrades to the ultraviolet (UV) control systems and the aeration system controls to allow automated variation of the power utilized to match the plant loads.

### **Scope of Services**

The scope of services under this Proposal includes the design, construction, and commissioning of the proposed measures and the verification of savings.

### **Financial Benefits**

The project will produce an estimated \$22,104 annually in utility savings as described in the Investment Grade Audit (IGA).

### **Guarantees**

Abacus is providing three guarantees under this Proposal. First, we are guaranteeing the Maximum Project Cost as defined in paragraph IV will not exceed \$406,176. Second, Abacus is guaranteeing that the City of Camas realizes actual energy/utility savings of not less than 387,013 kWh, which at the baseline utility rates (as defined in the Energy Audit), represents an annual cost savings of \$17,977. Third, we are guaranteeing the energy equipment will perform at or above the levels of service defined in Paragraph VI.

In addition to these guarantees, we will provide the City of Camas an "open book" process regarding the actual construction costs. If the actual construction costs are less than we forecast, the City of Camas will realize the financial savings. City representatives will be invited to review the quotes and/or bids from subcontractors and interview the subcontractors to be used on this project.

## Project Summary

Total Estimated Project Cost (including all fees and taxes)	\$473,294
Maximum Guaranteed Project Cost (total less DES fees and taxes)	\$406,176
Guaranteed Energy Savings (at current rates)	\$ 17,977
Annual total kWh guaranteed	387,013
Estimated Clark PUD incentive	\$123,265

### I. FACILITY DESCRIPTION

The Camas Wastewater Treatment Plant, located in Camas, WA treats municipal wastewater for the City of Camas, with a population of approximately 20,000. While the wastewater flows 24 hours a day through this plant, all year; the rate of water flow varies from less than 1 MGD (million gallons / day) to 8 MGD. Two of the water treatment processes were evaluated for energy saving opportunities in this report – (1) is the process of adding oxygen to three settling tanks in order to maintain the proper water chemistry for the biological activation, and (2) is the process of applying ultraviolet (UV) light to the water as the last stage of treatment.

Oxygen is delivered through a 150-hp low pressure blower system, which operates 24 hours a day without the ability to automatically stage down power usage during times of light load. This results in excessive electrical energy usage.

UV light is applied with a series of 384 lamps rated for 33.6 kW. The UV lights operate 24 hours a day without the ability to automatically stage down power use during times of light load, resulting in excessive electrical energy usage. In addition, newer high efficiency UV lamps are available that can reduce the full load power, and provide improved step control through dimming ballasts.

Abacus was contracted by Clark Public Utilities and the Bonneville Power Administration (BPA) to provide a project assessment of the energy efficiency opportunities associated with the blower system and UV system at the Camas Wastewater Treatment Plant. Three years of historical operational data from the plant's data historian (SCADA) system, coupled with input from plant personnel on typical operations were utilized to complete the analysis.

For more details about the existing buildings see the Detailed Energy Audit presented in Appendix B.



## II. ESCO EQUIPMENT

The overall scope of the work is the following:

### **EEM 1: Optimize UV System Controls**

This measure incorporates leaving the existing UV system in place and optimizing the controls. The current controls keep the UV system operating at full load 24 hours a day, regardless of the actual load on the system. By optimizing the controls, the power draw of the existing UV system can vary based upon the actual load. This measure consists of the following:

- Leave the existing UV system in place (Trojan 3000 system)
- Install a new Controller that will incorporate plant effluent flow rate into the UV controller and vary the UV power output based upon the actual UV demand (which is proportional to the effluent flow)

Specific tasks will include:

1. Provide all required permits and inspections.
2. Leave the four existing banks of UV lamps in place.
3. Install new UV controls with an input for the plant flow rate.
4. Program the controls so that only the minimum number of banks of UV lamps are used to properly disinfect the actual flow.
5. Commission system to ensure proper system operation.
6. Provide operator training on all systems.

### **EEM 3: Optimize Blower System Controls**

This measure incorporates leaving the existing Blowers and valves in place and optimizing the controls of the existing Blower system. The current controls are not automatically varying the individual control valves on the tanks, so the valves are set in manual fixed positions that are occasionally, manually adjusted. The current controls also control the blowers to operate at the required speed to maintain the pressure setpoint – and the pressure setpoint is manually adjusted by operators up to several times a day to vary the flow of air through all of the valves at the same time. The operators do not work 24 hours a day and they have limited ability to optimize energy use because the valves are not automatically varying to their individual loads, which do vary. This measure proposes to automate the control of the nine air valves so they modulate as needed to maintain the dissolved oxygen (DO) setpoints. This measure will then incorporate a variable pressure setpoint control strategy so that the lowest pressure will be generated by the blowers in order to satisfy the DO setpoints. By incorporating feedback loops, optimizing the valve operation, and optimizing the pressure setpoint of the blower system the energy use of the blowers can be minimized. This measure consists of the following:

- Replace (4) of the existing VFDs with new VFDs (mounted in the Electrical Room)\*
- Leave the (4) existing Blowers and their individual controllers in place (mounted on the blowers)
- Leave the Blower Master Controller in place (mounted in the Electrical Room), and replace failed equipment / components as necessary
- Leave the Rotork Valve Controller in place (mounted in the Electrical Room) and replace failed equipment as necessary\*
- Troubleshoot and reprogram as needed the Rotork Valve controller so that each valve automatically modulates to maintain the dissolved oxygen pressure setpoint for that individual tank.\*
- Troubleshoot and reprogram as needed the Blower Master Controller so that the system pressure setpoint automatically resets downward when all the valves are less than 80% open, and it automatically resets upward when one of the valves is more than 90% open.
- Troubleshoot the oxygen flow meters and the SCADA total plant oxygen flow calculation so that they are within 10%.

\* Rotork valve replacement and replacement VFD line filters are not included in the cost estimate of this proposal. Any remaining construction funds and contingency may be utilized towards replacement of these components as necessary. If additional funds are required to replace Rotork valves, actuators, controls or line filters the City of Camas will need to add the additional funding by change order.

Specific tasks will include:

1. Provide all required permits and inspections.
2. Supply and install (4) new blower VFDs
3. Repair the SCADA system to automatically control the blowers and individual Rotork valves to maintain the DO setpoints in each control zone.
4. Commission controls to establish optimum operational performance.
5. Provide Owner training on modifications.
6. Supply Operation & Maintenance manuals, as applicable.

### III. ESCO SERVICES

ESCO will provide the following services:

#### A. CONSTRUCTION SERVICES

1. Construction: Provide, or cause to be provided, all material, labor, and equipment, including paying for permits, fees, bonds, and insurance, required for the complete

and working installation of the ESCO equipment, except as noted. The ESCO intends to solicit construction costs from selected subcontractors and equipment suppliers who will competitively acquire all material, labor and subcontractors, except the following tasks will be completed by ESCO's own staff:

- a) Field Superintendent: onsite supervision of the work.

When ESCO has completed the installation of the Equipment, including start-up and operation verification and training in accordance with the Proposal, ESCO shall provide to Owner a "Notice of Commencement of Energy Savings" and Owner shall have 14 days within which to accept or challenge the Notice.

2. Performance Verification: Complete the M&V protocols outlined in the Energy Audit and work with Clark PUD and the Owner to document the savings upon which the utility incentives will be based.
3. Performance Maintenance: The ESCO will monitor system performance and will review expected performance and actual performance with the Owner on a quarterly basis during the first year following the commencement of energy savings and thereafter annually through the term of the performance guarantee.
4. Equipment Maintenance: The ESCO will provide no equipment maintenance other than warranty services. Following the completion of the installation and Owner acceptance of the Equipment, Owner shall provide all necessary service, repairs, and adjustments to the Equipment so that the Equipment will perform in the manner and to the extent set forth in the Proposal. ESCO shall have no obligation to service or maintain the Equipment after Completion and Acceptance unless ESCO and Owner have entered into a separate maintenance agreement. ESCO shall coordinate manufacturer's standard warranty on equipment and materials.
5. Hazardous Waste: ESCO intends to notify the Owner of all locations where the work may encounter hazardous materials and request the Owner abate the hazard prior to the work. However, upon the request of Owner, ESCO may, without assuming the ownership thereof and acting in the name and on behalf of the Owner, have the hazardous material or substances removed and disposed of or contained and the cost of such work is not included in the project. Owner agrees and acknowledges that it has not relied on or employed ESCO to analyze or identify the presence of any hazardous substance on the Owner's premises.
6. Operation and Maintenance Measures: None.
7. Warranty: ESCO will respond to and correct all warranty claims initiated by the Owner for a period of one year following the "Notice of Commencement of Energy Savings."

## B. PROFESSIONAL SERVICES

1. Project Management: Overall development and management of the project throughout the term of the agreement. Specific tasks include project development, management of Owner/Designer issues, Management of Owner/Constructor issues, and management of warranty issues. ESCO will keep Owner informed on project status via regular emails and project meetings. ESCO will issue formal meeting minutes of all meetings.
2. Energy Audit: Detailed engineering analysis to establish scope and feasibility of conservation measures.
3. Design Services: Provide sketches, material lists, drawings, specifications, and/or other documentation which may be required for Owner's review and to obtain permits and negotiate or receive competitive prices for construction of the ESCO equipment. Design services include all mechanical and electrical design required for the project. Specific tasks will include:
  - a. Collect record drawings and conduct site surveys.
  - b. Meet with Owner to determine design standards.
  - c. Preliminary design submittal and review.
  - d. Final design submittal and review.
  - e. Negotiating & Bidding (including document reproduction and distribution).
  - f. Contractor interviews and selection.
  - g. Submittal/shop drawing review.
  - h. As-built drawing preparation as applicable.
  - i. Six month and one year warranty inspections.
4. Construction Management: Provide construction management services to coordinate and supervise the work. Specific tasks will include:
  - a. Execute all subcontracts.
  - b. Secure all required bonds, permits, and insurance coverage.
  - c. Coordinate and control the construction schedule.
  - d. Maintain complete and accurate project accounting records including invoicing.
  - e. Coordinate and control all construction activities.
  - f. Execute project closeout.
  - g. Resolve all warranty claims.

The owner is expected to coordinate day-to-day communications with system operators and any scheduling of affluent relocations in and around the work.

5. Start-Up, Testing and Operation Training: The ESCO will provide:
  - a. Complete start-up, testing, and commissioning of ESCO equipment.
  - b. Training of building staff to perform basic adjustments and scheduling of the affected equipment.

6. Ongoing Services: For a period one year following the "Notice of Commencement of Energy Savings" the ESCO will provide:
- a. Remote monitoring, quarterly reporting, and meetings as needed to address concerns related to actual performance of the ESCO equipment.
  - b. Coordination with subcontractors and suppliers as required to resolve warranty claims made by Owner.

For an additional two year period, the ESCO will provide:

- a. Remote monitoring, annual reporting, and meetings as needed to address concerns related to actual performance of the ESCO equipment.

IV. PROJECT COSTS

- A. ESCO guarantees that the Maximum Project Cost for scope items listed in paragraph II will not exceed \$406,176 (all costs are **not** including sales tax). In addition to these costs which are included in the agreement, there are costs budgeted outside the agreement for sales tax and DES project management fee (\$67,118 total) bringing the total project budget to \$473,294.
- B. Maximum Project Cost includes:
- 1. Construction Services .....\$ 278,929
  - 2. Professional Services (ESCO Fees) .....\$ 105,994
  - 3. Other Costs (Contingency).....\$ 21,253
- C. Construction Services: Will be charged at actual costs not to exceed the guaranteed maximum price of \$278,929. These costs are estimated as follows:

A. CONSTRUCTION COSTS		Proposed Cost
Labor and Material:		
EEM-1	UV Controls	\$ 120,948
EEM-3	Blower Controls	\$ 50,807
	VFD Replacements	\$ 101,705
Subtotal Labor and Materials Cost		\$ 273,460
	Permits (included above)	\$ -
	Construction Bond	2.0% \$ 5,469
<b>TOTAL CONSTRUCTION COST</b>		<b>\$ 278,929</b>

Invoicing for the construction services will be on a monthly basis based on percentage of work completed. Invoicing backup data will be provided including schedule of values and corresponding subcontractor invoices or other source of costs.

The ESCO shall provide a Schedule of Values at the end of construction bidding. At a minimum, the schedule shall identify the costs of subcontractors, Abacus direct purchased material, bonds, permits, and direct project expenses.

- D. Professional Services: Will be lump sum fees and will be billed as a percentage of completion. The total fee for all professional services is \$105,994 which breaks down as follows:

B. PROFESSIONAL SERVICES FEES			
Audit Fee (Amount Paid by Utility)		\$	-
Design M,E,C,S	10.0%	\$	27,893
Construction Management	6.0%	\$	16,736
ESCO M and V Cost	2.0%	\$	5,579
Ongoing M&V (Years 2 and 3)	2.0%	\$	5,579
Overhead and Profit	18.0%	\$	50,207
<b>TOTAL ESCO FEES</b>		<b>\$</b>	<b>105,994</b>

- E. Energy Performance Monitoring and Verification Fee: Is included in Professional Services Fees above and will be billed at the end of the first year of energy savings (one year after commencement of energy savings). The ongoing M&V fee for years 2 and 3 will be billed at the end of those years as applicable (\$2,789.50 per year.)

- F. Contingency: Within the Guaranteed Maximum Price, a contingency of \$21,253 is available to the ESCO to cover unanticipated costs associated with the work. These additional costs can be added to the agreement via a Change Order request from ESCO. Any unspent contingency will revert to the Owner at project closeout.

- G. Other Costs: The following costs are not guaranteed by the ESCO and are listed here for budgetary or funding authorization purposes only:

1. Estimated DES Project Management Fee: \$29,000 + \$4,000 for 2 years M&V fee = \$33,000 total.

2. Sales Tax: sales tax will be charged at the prevailing rate (currently 8.4%) to yield the following estimated tax amounts:

Sales Tax - Construction Portion	\$23,430
Sales Tax - Professional Services Portion	\$ 8,903
Sales Tax - Contingency Portion	<u>\$ 1,785</u>
Total Sales Tax	\$34,118

V. PROJECT ACCOUNTING

A. Accounting Records

The ESCO shall check all material, equipment and labor entering into the Work and shall keep such full and detailed accounts as may be necessary for proper financial management under this Agreement. The accounting system shall be satisfactory to the Owner. The Owner shall be afforded access to all the ESCO's records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda and similar data relating to this Contract, and the ESCO shall preserve all such records for a period of three years, or for such longer period as may be required by law, after the final payment.

B. Construction Services

Project accounting records will be used for the sole purpose of documenting actual cost of the Construction Services.

C. Reconciliation of Actual Project Costs

1. The guaranteed maximum project cost is based on an estimate of construction services costs. In recognition that actual costs may vary from the estimate, the following procedures are established to reconcile this difference:
  - a. When actual costs exceed the estimate and contingency, the additional expense will be borne by the ESCO.
  - b. When actual costs are less than the estimate, the remaining funds will be returned to the Owner by executing a deductive change order at project completion.

VI. STANDARDS OF COMFORT SERVICE

- A. Heating: Not Applicable
- B. Cooling: Not Applicable
- C. Ventilation: Not Applicable

VII. ESTIMATED ANNUAL SAVINGS AMOUNT

- A. The ESCO estimates that annual utility savings will be 475,874 kWh.
- B. The ESCO estimates that annual utility cost savings will be \$22,104.

VIII. METHOD OF CALCULATING ENERGY AND ENERGY COST SAVINGS (M&V PLAN)

We will measure and verify the electric energy savings resulting from this project using the IPMVP (International Performance Measurement and Verification Protocol). The electric energy savings for EEM 1 (UV controls) will be based upon IPMVP Option C approach (Building Utility Meter method), and the savings for EEM 2 (Blower controls) will be based upon IPMVP Option A approach (Retrofit Isolation with Key Parameter Measurement).

Annual utility cost (\$) savings for both EEMs will be guaranteed at the utility rates currently in effect at the time of this proposal and as documented in the IGA listed in Appendix B.

M&V will be provided for each installed EEM. The equipment installed for each EEM will be verified and documented. To verify EEM performance, the following data will be obtained:

1. Utility bills for the UV Building electric meter
2. Blower current draw for all four blowers
3. Blower discharge pressure
4. Blower total airflow
5. Plant Daily average influent and effluent flow (MGD) and BOD (lb), TSS (lb) Ammonia (lb)

The facility SCADA system and/or portable data loggers will be utilized to obtain the data.

For EEM 1, the energy savings predicted are over 40% of the entire electric meter existing energy usage. Since the predicted savings are much greater than 10% of the entire utility meter existing usage, we propose to use Option C to directly measure the savings for this measure. This method (Option C) is the most cost effective option for



this EEM because it will allow us to utilize the existing electric utility meter to measure the energy savings without installing individual sub meters.

Note: If the owner installs additional equipment to this utility electric meter, or if they remove equipment currently connected to this meter, then we will make static adjustments to the M&V approach to take these into account. For instance, if the owner removes a 10 kW load that operates 24 hours a day from this meter, then we will subtract this energy from the baseline energy use, so that we do not claim savings for something that was not part of our upgrade. Likewise if the owner adds a 10 kW load that operates 24 hours a day to this meter, then we will subtract this energy from the post-upgrade energy use, so that the energy savings we measure from the meter is due to the EEM installed.

For EEM 2, the energy savings predicted is not significantly more than 10% of the existing baseline energy used by the meter that serves this building. Therefore IPMVP does not recommended measuring the energy savings directly from the utility meter, because there are other factors that have more impact on the utility meter than the EEM being installed, and because the relative % of savings is too small. We therefore propose to use the IPMVP Option A (Retrofit Isolation with Key Parameter Measurement) to measure the savings for this EEM. We have already directly measured the existing energy used by the equipment affected by this upgrade as part of our energy audit by installing current sensors on each of the four blowers for a one week period. We propose to install current sensors and measure the energy used by these same four blowers after the upgrade, to directly measure the after-upgrade energy used by the blowers. The average power measured will be multiplied by the annual hours of operation to determine the annual energy savings. We propose to install these sub-meters and measure the after-upgrade energy use one time each year throughout the duration of the M&V reporting period.

If there are changes to the way the plant operates it may necessitate further changes to the baseline energy use of these systems. If there is a significant change in the amount of and/or the quality of influent received at this facility it may necessitate a change to the baseline energy use. If there is a significant change in the amount of and/or the quality of effluent sent out from this facility it may necessitate a change to the baseline energy use.

IX. ENERGY COST SAVINGS GUARANTY

The ESCO guarantees that the actual energy/utility savings will not be less than 387,013 kWh, which at the baseline utility rates (as defined in the Energy Audit), represents an annual cost savings of \$17,977.

In the event that actual energy cost savings, pursuant to Section VIII Method of Calculating Energy and Energy Cost Savings, are less than this guaranteed minimum, the ESCO shall pay the Owner the difference between the actual cost savings and the guaranteed amount. This savings guarantee will be in effect only for the first 3 years after the commencement of savings unless the Owner executes a separate performance maintenance agreement for additional year(s) of Performance Monitoring and Verification Services.

X. FINANCING

Project financing will be provided by the Owner. The ESCO agrees to waive any finance fees related to the financing of project costs (as described in Section IV) provided the Owner agrees to make monthly progress payments to the ESCO based on the percentage of completion of each task. Progress payments will be less 5% for retention. Retention amounts will be due after project completion per the ESCO Agreement.

XI. INSURANCE AND BONDING

- A. The ESCO shall provide a payment and performance bond in the amount of 100% of the Construction Services cost plus applicable sales tax on that cost. The Bond shall be in the form of AIA Document A312. The "Sum Amount of Bond" shall specifically exclude coverage for those portions of the Energy Services Agreement and/or Energy Services Agreement Addendum pertaining to design services, energy cost savings guarantee, maintenance guarantee, utility incentives, efficiency guarantees, and any other clauses which do not relate specifically to construction management and supervision of work for purchasing and installing of ESCO Equipment, or for work to be accomplished by the Owner. The Bond must be with a Surety or Bonding Company that is registered with the State of Washington Insurance Commissioner's Office.
- B. For the purposes of this Agreement, the "Sum Amount of Bond" shall be \$302,359 (\$278,929 construction services plus \$23,430 sales tax).
- C. Certificates of General Liability insurance will be provided prior to contract signing. The State of Washington shall be named as an additional insured on all insurance certificates.

XII. MODIFICATIONS TO BASELINE BY OWNER

- A. The Owner shall maintain all existing facilities and installed ESCO equipment during the term of this contract at or above current maintenance levels. Owner agrees to maintain the energy efficiency of the systems installed.
- B. The energy savings are based on operating the energy systems in a similar manner that was represented and logged during our analysis period. In the event the Owner elects to operate the energy systems differently, thereby increasing the energy usage of the system or load in the spaces served, the ESCO will prepare a calculation of the additional energy used for such additional usage and be allowed to adjust the baseline use and savings accordingly.
- C. We have assumed that the annual water flow and quality into the plant and out of the plant will not change significantly in the future. If there is a change to the amount of water being processed, or of the quality of water entering or leaving the plant, then we will need to adjust the energy savings to take this into account.
- D. We have assumed that the biological treatment processes that are used at this plant will remain the same in the future. If the owner makes significant changes to the way that they process the water, then we will need to adjust the energy savings to take this into account.

XIII. PROJECT SCHEDULE

ESCO proposes the following schedule for completion of design and construction activities:

City of Camas acceptance of ESP	December 15, 2014
ESCO Notice to Proceed	January 9, 2015
Subcontractor Bids Awarded	January 23, 2015
Submittal approval & order materials	February 6, 2015
Construction Begins	April 13, 2015
Construction Substantially Complete	June 26, 2015
Commencement of Energy Savings	July 20, 2015

These dates are preliminary. A more definitive schedule will be produced upon execution of contract documents and equipment selection for lead time.

## **APPENDICES**

The following documents are attached to this proposal and included as part intended to be a part of the proposal:

The Project Financial Tables are included as Appendix A.

The Investment Grade Energy Audit for the Camas Wastewater Treatment Plant is included in this proposal as Appendix B.

**APPENDIX A – FINANCIAL TABLES**

<b>Budget Summary</b>			
Project:	City of Camas - WWTP energy upgrades Camas, Washington	Measure:	WWTP Projects
		Date:	12/2/2014
		Phase:	ESPC Proposal
<b>A. CONSTRUCTION COSTS</b>			Proposed Cost
	Labor and Material:		
EEM-1	UV Controls		\$ 120,948
EEM-3	Blower Controls		\$ 50,807
	VFD Replacements		\$ 101,705
<b>Subtotal Labor and Materials Cost</b>			<b>\$ 273,460</b>
	Permits (included above)		\$ -
	Construction Bond	2.0%	\$ 5,469
<b>TOTAL CONSTRUCTION COST</b>			<b>\$ 278,929</b>
<b>B. PROFESSIONAL SERVICES FEES</b>			
	Audit Fee (Amount Paid by Utility)		\$ -
	Design M,E,C,S	10.0%	\$ 27,893
	Construction Management	6.0%	\$ 16,736
	ESCO M and V Cost	2.0%	\$ 5,579
	Ongoing M&V (Years 2 and 3)	2.0%	\$ 5,579
	Overhead and Profit	18.0%	\$ 50,207
<b>TOTAL ESCO FEES</b>			<b>\$ 105,994</b>
<b>C. OTHER COSTS</b>			
	Project Contingency	5.5%	\$ 21,253
<b>TOTAL OTHER COSTS</b>			<b>\$ 21,253</b>
<b>D. TOTAL GUARANTEED CONSTRUCTION &amp; ESCO SERVICES</b>			<b>\$ 406,176</b>
<b>E. NON-GUARANTEED COSTS</b>			
	Sales Tax - Construction Portion	8.4%	\$ 23,430
	Sales Tax - Professional Services Portion	8.4%	\$ 8,903
	Sales Tax - Contingency Portion	8.4%	\$ 1,785
	DES Admin. Fee		\$ 29,000
	DES M and V Fee (Years 2 & 3)		\$ 4,000
<b>TOTAL NON GUARANTEED COSTS</b>			<b>\$ 67,118</b>
<b>F. TOTAL PROJECT COST</b>			<b>\$ 473,294</b>

Utility Incentives (Estimate)	\$ 123,265
Commerce Grant (Estimate)	\$ 118,323
Net Project Cost	\$ 231,705
Estimated Annual Utility Cost Savings	\$ 22,104
Simple Payback (years)	10.5
Simple Payback (years) without Commerce Grant	15.8

## Camas WWTP - EEM Cost Breakdown

### EEM -1

#### UV Controls

\$73,095	WH Reilly quote for new UV Control Panel , Programming, Startup & Labor
\$8,800	OCD Quote for SCADA Integration
\$2,500	Estimated Wiring costs
\$1,000	Estimated Freight Charges
\$85,395	TOTAL BASE PROJECT QUOTE (Does not include replacement boards for UV system)

#### UV Spare Parts

\$8,100	WH Reilly quote for (4) Communication Boards (Total of (4) existing)
\$2,244	WH Reilly quote for (4) Module Control Boards (Total of (48) existing)
\$1,160	WH Reilly quote for (4) Relay Boards (Total of (48) existing)
\$5,000	Labor estimate to install any boards that are needed
\$19,049	Misc parts & Freight Charges
\$35,553	TOTAL Estimated Cost of Spare Parts

<b>\$120,948</b>	<b>TOTAL EEM-1 ANTICIPATED COSTS (Controls and Spare Parts)</b>
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### EEM -3

#### Aeration Controls

\$39,600	OCD Quote for OCD Work
\$3,185	OR Electric quote for Electrical work needed for OCD scope
\$42,785	Option 1 EEM-3 cost estimate

<b>\$50,807</b>	<b>Alternate quote from Control Engineers (turn key)</b>
-----------------	--

#### VFD Replacements

\$77,917	EC Quote for (4) VFDs
\$6,600	RD estimate of SCADA integration
\$17,188	Additional installation, wiring costs and replacement equipment
<b>\$101,705</b>	<b>Estimated cost of VFD replacements</b>

## **APPENDIX B – INVESTMENT GRADE AUDIT**



# Project Assessment Report

## Camas Wastewater Treatment Plant

Presented to: Eric Levison – Public Works Director, City of Camas

Facility located at  
1129 SE Polk St,  
Camas, WA 98607

Sponsored by:



and

Clark Public Utilities

Submitted by:



12655 SW Center Street, Suite 250  
Beaverton, OR 97007

TSP Project Number: #0374  
10/08/14

## **Disclaimer**

The intent of this Project Assessment report is to estimate energy savings associated with recommended Energy Efficiency Measures (EEMs). Appropriate detail is included in Sections 2-4 of this report. However, this report is not intended to serve as a detailed engineering design document. It should be noted that detailed design efforts may be required in order to implement the recommended upgrades. As appropriate, costs for those design efforts are included as part of the cost estimate for each measure.

While the recommendations in this report have been reviewed for technical accuracy and are believed to be reasonably accurate, the findings are estimates and actual results may vary. As a result, Abacus, Clark Public Utilities, and the Bonneville Power Administration (BPA) are not liable if estimated savings or economics are not actually achieved. All savings and cost estimates in the report are for informational purposes, and are not to be construed as a design document or as guarantees.

The City of Camas should independently evaluate any advice or direction provided in this report. In no event will Abacus, Clark Public Utilities, and/or BPA be liable for the failure to achieve a specified amount of energy savings and any incidental or consequential damages of any kind in connection with this report or the installation of recommended measures.

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# 1 EXECUTIVE SUMMARY

## 1.1 Introduction

The Camas Wastewater Treatment Plant, located in Camas, WA treats municipal wastewater for the City of Camas, with a population of approximately 20,000. While the wastewater flows 24 hours per day through this plant, all year; the rate of water flow varies from less than 1 MGD (million gallons / day) to 8 MGD. Two of the water treatment processes are evaluated for energy saving opportunities in this report – 1) is the process of adding oxygen to three aeration basins in order to maintain the proper conditions for the biological treatment, and 2) is the process of applying ultraviolet (UV) light to disinfect the water as the last stage of treatment.

Oxygen is delivered through a low pressure aeration system, which operates 24 hours per day without the ability to automatically stage down power usage during times of light biochemical oxygen demand (BOD) load. This results in excessive electrical energy usage.

UV light is applied with a series of 384 lamps rated for 33.6 kW. All of the UV lamps operate 24 hours per day without the ability to automatically stage down power use during times of low flow, resulting in excessive electrical energy usage. In addition, newer high-efficiency UV lamps are available that can reduce the full load power, and provide improved step control through dimming ballasts.

Abacus was contracted by Clark Public Utilities and the Bonneville Power Administration (BPA) to provide a project assessment of the energy efficiency opportunities associated with the aeration system and UV system at the Camas Wastewater Treatment Plant. Three years of historical operational data from the plant's data historian (SCADA) system, coupled with input from plant personnel on typical operations was utilized as part of this analysis.

The City of Camas should notify Clark Public Utilities or its Energy Smart Industrial Partner (ESIP) if it intends to implement any of the efficiency measures outlined in this report. Your utility and ESIP are responsible for obtaining approval for incentives. Once Clark Public Utilities approval has been granted, the City of Camas is free to place equipment orders or make other financial commitments to implement efficiency measures.

## 1.2 Summary of Findings and Recommendations

Multiple individual energy efficiency measures (EEMs) have been considered for the aeration and UV processes. Below is a brief description of each measure. More detailed descriptions can be found in Section 2.

**EEM 1: Optimize UV System Controls:** This measure recommends leaving the existing UV system in place and optimizing the controls. The current controls keep the UV system operating at full load 24 hours per day, regardless of the actual flow through the system. By optimizing the controls the power draw of the existing UV system can vary based upon the actual flow. This measure consists of the following:

- Leave the existing UV system in place (Trojan 3000 system)

- Install a new Controller that will incorporate plant effluent flow rate data into the UV controller and vary the UV power output based upon the actual UV demand (proportional to the effluent flow)

**EEM 2: Install New UV System and Optimize UV System Controls:** This measure recommends replacing the existing UV system with a new high efficiency system and optimizing the controls. The existing UV system consumes about 32 kW at full load. The proposed new UV system consumes about 17 kW at full load. New controls are required that incorporate feedback loop so that the controls will automatically vary the power of the UV system based upon the actual influent flow, instead of operating at 100% power 24 hours per day. This measure consists of the following:

- Remove the existing UV system (Trojan 3000) and install a new high-efficiency UV system (Trojan 3000Plus)
- Install a new Controller that will incorporate plant effluent flow rate data into the UV controller and vary the UV power output based upon the actual UV demand (proportional to the effluent flow)

**EEM 3: Optimize Aeration System Controls:** This measure recommends leaving the existing blowers and valves in place and adding automated controls to use “most open valve” control strategy. The current controls only vary blower speed to maintain a pressure setpoint, leaving valves set in manual, fixed positions that are only occasionally manually adjusted. The existing blowers operate at the required speed to maintain a pressure setpoint – and the pressure setpoint is manually adjusted by operators up to several times a day to vary the flow of air through all of the valves at the same time. hours per day. The facility is staffed by operators approximately 12 hours per day and the operators have limited ability to optimize energy use. This measure would automate the control of the nine air valves so they modulate as needed to maintain required dissolved oxygen (DO) setpoints. By incorporating feedback loops, optimizing the valve operation, and continuously optimizing the pressure setpoint of the aeration system the energy use of the blowers can be minimized. This measure consists of the following:

- Leave the (4) existing VFDs in place (mounted in the Electrical Room)
- Leave the (4) existing blowers and their individual controllers in place (mounted on the blowers)
- Leave the Blower Master Controller in place (mounted in the Electrical Room), and replace failed equipment/components as necessary
- Leave the Rotork Valve Controller in place (mounted in the Electrical Room) and replace failed equipment as necessary
- Troubleshoot and reprogram as needed the Rotork Valve controller so that each valve automatically modulates to maintain the dissolved oxygen pressure setpoint for that individual tank
- Troubleshoot and reprogram as needed the Blower Master Controller so that the system pressure setpoint automatically resets downward when all the valves are less than 80% open, and it automatically resets upward when one of the valves is more than 90% open.
- Troubleshoot the airflow meters and the SCADA total plant airflow calculation so that they are within 10%

### **1.2.1 Recommendations**

Abacus recommends the implementation of EEMs 1 and 3. These recommended measures reduce existing facility-wide energy use by over 25% and produce a simple payback of about 4 years after the incentives from Clark Public Utilities and BPA.

In the future the owner should evaluate the potential energy savings that can be achieved by new high efficiency blower(s) sized appropriately for actual BOD and ammonia load, instead of replacing any existing blowers with similar blowers. Energy savings of 10%-35% may be possible for a new high-efficiency blower.

### 1.3 Economic Summary

Table 1: Savings and Cost Summary

Cost of Energy: \$0.046 /kWh

EEM No.	Description	Include in Package?	Annual Energy Savings (kWh/yr)	Annual Energy Cost Savings (\$)	Cost Eligible for Incentives (\$)	Pre-Incentive Payback (yrs)
1	Optimize UV System Controls	Yes	204,023	\$9,477	\$122,745	13.0
2	Install New UV System and Optimize UV System Controls	No	215,464	\$10,008	\$276,333	27.6
3	Optimize Aeration System Controls	Yes	271,851	\$12,627	\$53,347	4.2
<b>TOTALS FOR RECOMMENDED MEASURES</b>			<b>475,874</b>	<b>\$22,104</b>	<b>\$176,092</b>	<b>8.0</b>

Table 2: Incentive Summary

Energy Incentive Rate \$0.25 /kWh  
 Incentive Cap, % of Project Cost: 70% /kWh  
 Busbar Energy Savings Factor 1.09056

EEM No.	Description	Utility/BPA Incentive Calculation				
		Incentive Cap, Project Cost (\$)	Incentive Cap, Energy Savings (\$)	Final Incentive (\$)	Cost After Incentive (\$)	Final Payback (yrs)
1	Optimize UV System Controls	\$85,922	\$55,625	\$55,625	\$67,120	7.1
2	Install New UV System and Optimize UV System Controls	\$193,433	\$58,744	\$58,744	\$217,588	21.7
3	Optimize Aeration System Controls	\$37,343	\$74,117	\$37,343	\$16,004	1.3
<b>TOTALS FOR RECOMMENDED MEASURES</b>		<b>\$123,265</b>	<b>\$129,742</b>	<b>\$123,265</b>	<b>\$83,124</b>	<b>3.8</b>

Fraction of Project Cost Covered by Utility/BPA Incentives: 70.0%



## 1.4 Implementation Summary

Clark Public Utilities and BPA must approve the EEMs specified in this report to be eligible for incentives. Clark Public Utilities and BPA approval is highly recommended prior to placing equipment orders or making other financial commitments to implement EEMs in order to be eligible for incentives.

1. *Review this report and make an implementation decision.* Your staff has assisted in the development of this report. Because equipment and operational changes are recommended, your organization needs to be comfortable with the data, the analysis and the proposed EEMs for the project to be a success. The City of Camas should independently evaluate the information contained in this report as you normally would for other projects of this scope. Contact vendors to firm up bids. Do your normal diligence and make a decision.
2. *Notify your utility or ESIP of your implementation decision.* Contact your utility or ESIP with your implementation decision. The contact information for your utility and ESIP has been included with this report. Your utility and ESIP are responsible for obtaining utility and BPA approval for EEM incentives.
3. *Obtain approval from your utility and BPA for incentives.* Your utility or ESIP will notify you when utility and BPA approval has been obtained. You may be required to sign an incentive agreement with your utility as part of this process. It is suggested to obtain utility and BPA approval prior to placing an equipment order or making other financial commitments to implement EEMs.
4. *Obtain approval for any other project incentive.* You are free to apply for additional incentives, grants, or tax credits that may be available for the project. Your utility and ESIP are available to assist in this process.
5. *Implement the project.* Finalize the design in a manner consistent with equipment, set-points, and algorithms described in Section 2 of this report. Any significant differences should be discussed with your utility or ESIP to confirm that they do not have a negative impact on energy efficiency performance. Sign purchase orders and contracts with contractors. Complete the installation.
6. *Track project costs.* All project costs must be documented and supported to receive incentives. Maintain records of all project costs (invoices, etc.) and ensure that project costs eligible for incentives can be clearly identified and are not bundled with other costs that are not eligible for incentives.
7. *Notify your utility or ESIP when project implementation is complete.* Contact your utility or ESIP when project implementation is complete, online, and operating in a steady state manner.
8. *Assist in the preparation of the project completion report.* Approval of a project completion report by your utility and BPA is required before the project incentive is issued. Your utility and ESIP are responsible for managing the development of the completion report. In most cases, the Technical Service Provider (TSP) consultant that provides the project assessment report will be utilized for the completion report. Funding of the TSP consultant for the completion report is available upon BPA approval. BPA may require you to share a portion of the TSP consultant cost. As part of the completion report development, you will be asked to provide documentation of all project costs that you are seeking incentives for. The completion report will also include Measurement and Verification (M&V) and commissioning of the project. Your assistance may be necessary in the M&V and commissioning efforts.

## 2 DETAILED DESCRIPTION: PROPOSED EQUIPMENT/OPERATION

### 2.1 EEM 1 – Optimize UV System Controls

#### 2.1.1 EEM 1 – Source of Energy Savings

Only operate as many of the UV banks as needed for proper disinfection.

All four of the UV banks are operating 24 hours per day. Based on data provided by the manufacturer of these UV banks, at lower plant flows fewer banks are needed. By turning off banks of UV lamps electricity will be saved.

#### 2.1.2 EEM 1 – Specific Equipment Recommendations

- Leave the four existing banks of UV lamps in place
- Install new UV controls with an input for the plant flow rate
- Program the controls so that only the minimum number of banks of UV lamps are used to properly disinfect the actual flow

#### 2.1.3 EEM 1 – Setpoints and Algorithms Recommended to Achieve Energy Performance

- The following is a guide to the initial operation of the four UV banks

Flow (MGD)	# of Banks Needed	UV 3000 Power (kW)
10	3	25.2
9	3	25.2
8	2	16.8
7	2	16.8
6	2	16.8
5	2	16.8
4	1	8.4
3	1	8.4
2	1	8.4
1	1	8.4

## **2.2 EEM 2 – Install New UV System and Optimize UV System Controls**

### **2.2.1 EEM 2 – Source of Energy Savings**

Install new UV lamps that use lower wattage to provide the same disinfection as the existing system. Only operate as many of the UV banks as needed for proper disinfection.

Based on data provided by the manufacturer of these new UV banks, lower wattage is required at all flows and these lamps will be variable output, providing increased control levels than the existing system. By turning off banks of UV lamps electricity will be saved, and by lowering the output of a bank electricity will be saved.

### **2.2.2 EEM 2 – Specific Equipment Recommendations**

- Remove the four existing banks of UV
- Install two new banks of UV, high efficiency style, rated for approximately 17 kW of power at 10 MGD
- Install new UV controls with an input for the plant flow
- Program the controls so that only the minimum number of banks of UV lamps are used to properly disinfect the actual flow

### **2.2.3 EEM 2 – Setpoints and Algorithms Recommended to Achieve Energy Performance**

- The following is a guide to the initial operation of the new UV system

Flow (MGD)	UV 3000PLUS Power (kW)
10	16.8
9	15.1
8	14.3
7	12.6
6	12.6
5	10.1
4	8.8
3	7.1
2	6.3
1	6.3

## **2.3 EEM 3 – Optimize Aeration System Controls**

### **2.3.1 EEM 3 – Source of Energy Savings**

There are two sources of savings for this EEM:

1. Minimize pressure - the more energy the blowers use to deliver air. By reducing the pressure the blowers use less energy.
2. Minimize the airflow – we know that at times some of the basins are provided with excess air, by providing automatic control of the valves serving the basins at times there will be less airflow delivered.

The air valves do not modulate automatically to maintain DO setpoints. The blowers are currently operated with a fixed pressure setpoint that is manually adjusted by operators several times a day, often resulting in more oxygen being delivered overnight and on weekends than is needed. This provides frequent overshoot of the DO setpoints, and results in excess electric energy used by the blowers. The controls will either be repaired or reprogrammed, or new controls will be installed as needed and commissioned to fully automate the amount of oxygen delivered to each zone using “most open valve” control strategy, so that it maintains proper setpoints and does not deliver more air than needed. In addition, the blower pressure setpoint will be automatically adjusted based upon actual plant demand, to minimize the pressure whenever possible. Less air will be delivered, and the air that is delivered will be at a lower pressure, resulting in electrical energy savings by minimizing the amount of work that the blowers perform.

### **2.3.2 EEM 3 – Specific Equipment Recommendations**

- Leave the (4) existing VFDs in place (mounted in the Electrical Room)
- Leave the (4) existing blowers and their individual controllers in place (mounted on the blowers)
- Leave the Blower Master Controller in place (mounted in the Electrical Room), and replace failed equipment as necessary
- Leave the Rotork Valve Controller in place (mounted in the Electrical Room) and replace failed equipment as necessary
- Troubleshoot the (9) existing valves to be sure they are responding to the automatic control signals properly
- Troubleshoot and reprogram as needed the Rotork Valve controller so that each valve automatically modulates to maintain the dissolved oxygen pressure setpoint for that individual tank.
- Troubleshoot and reprogram as needed the Blower Master Controller so that the system pressure setpoint automatically resets downward when all the valves are less than 80% open, and it automatically resets upward when one of the valves is more than 90% open.
- Troubleshoot the oxygen flow meters and the SCADA total plant oxygen flow calculation so that they are within 10%.

### **2.3.3 EEM 3 – Setpoints and Algorithms Recommended to Achieve Energy Performance**

- Target an initial startup blower pressure pressure of 10 psi. Include an automatic reset strategy that polls the position of the air valves, and automatically lowers the pressure setpoint by 0.1 psi if all valves are < 80% open for five minutes, and automatically increases the setpoint by 0.1 psi if one of the valves is > 90% open for five minutes. If they all remain < 80% after five minutes operating under the reduced pressure, then lower the pressure by another 0.1 psi. If one of the valves reaches 90% open then increase the pressure setpoint by 0.1 psi and repeat.

- Ensure that the DO setpoints are being maintained by reviewing SCADA trendlogs.
- Ensure that the Blower pressure setpoint is being reset by reviewing SCADA trendlogs
- Analyze how quickly the plant reacts to changes in DO levels, and verify that the DO levels never fall below 1.0 ppm threshold. Adjust control strategy as necessary to achieve this.

### 3 ENERGY EFFICIENCY MEASURE COSTS

Table 3: Summary of EEM 1 Costs

<b>EEM 1: Optimize UV System Controls</b>			
Item	Description	Bidder	Total
1	Controls Equipment	Wm Reilly Co	\$61,300
2	Installation	Wm Reilly Co	\$3,300
3	Programming / Startup / Commissioning	Wm Reilly Co	\$8,500
4	New Control Boards	estimate	\$35,000
5	SCADA Integration	OCD Automation	\$8,800
<b>Sub-Total</b>			<b>\$116,900</b>
Sales Tax		0.0%	\$0
Contingency		5.0%	\$5,845
<b>Total Cost Eligible for Incentives</b>			<b>\$122,745</b>

Table 4: Summary of EEM 2 Costs

<b>EEM 2: Install New UV System and Optimize UV System Controls</b>			
Item	Description	Bidder	Total
1	UV Equipment	Wm Reilly Co	\$225,000
2	Installation	Wm Reilly Co	\$29,374
3	Programming / Startup / Commissioning	Wm Reilly Co	\$0
4	SCADA Integration	estimate	\$8,800
<b>Sub-Total</b>			<b>\$263,174</b>
Sales Tax		0.0%	\$0
Contingency		5.0%	\$13,159
<b>Total Cost Eligible for Incentives</b>			<b>\$276,333</b>

Table 5: Summary of EEM 3 Costs

<b>EEM 3: Optimize Blower System Controls</b>			
Item	Description	Bidder	Total
1	Equipment	Control Engineers	\$50,807
2	Installation	Control Engineers	
3	Programming / Startup / Commissioning	Control Engineers	
4	SCADA Integration	Control Engineers	
<b>Sub-Total</b>			<b>\$50,807</b>
Sales Tax		0.0%	\$0
Contingency		5.0%	\$2,540
<b>Total Cost Eligible for Incentives</b>			<b>\$53,347</b>

## 4 BASELINE AND ANALYSIS OVERVIEW

### 4.1 Baseline Description

The City of Camas, WA treats municipal wastewater for approximately 20,000 people and businesses. Biological treatment of the wastewater requires adding dissolved oxygen with an aeration system, and final disinfection is achieved by applying ultraviolet (UV) light to the water. Both of these treatment processes have been evaluated for energy savings opportunities in this report.

The amount of wastewater being treated at any one time varies significantly throughout the year, and because of this variation there is an opportunity to save energy by refining the operation of the treatment processes. The variation in system flow is described here, followed by descriptions of the UV and aeration systems.

#### **System Flow Variations:**

The plant is designed to treat 10 million gallons per day of wastewater (10 MGD). The actual amount of wastewater that the plant treats varies from day to day, and from hour to hour. We have analyzed the historical amounts of wastewater treated for several years, and the following is a representation of the average daily flows for three and a half years:

<b>Range of Water Flows (MGD)</b>	<b>Days Occurring from Jan 2011 - June 2014</b>	
9-10	0	0%
8-9	0	0%
7-8	2	0%
6-7	8	1%
5-6	11	1%
4-5	39	3%
3-4	166	13%
2-3	971	76%
1-2	80	6%
0-1	0	0%

Thus the plant clearly is usually operating at flows well below the peak design. The table above shows the average daily flows, and even within the course of one day the flow varies. Flow typically starts to increase in the mornings as people wake up and start their day and as businesses begin production. Flows typically drop off in the evenings, overnight, and on weekends. Peak flows are experienced during rainfall periods.

**UV System:**

The final treatment prior to leaving the plant is to apply ultraviolet light to the waterstream. This is accomplished in the UV building. A channel of water passes under the floor, and UV lamps are placed directly in the water so the ultraviolet light is within a few inches of the water.

There are (4) arrays of UV lamps (visible in the picture), and each array is supplied power from a single disconnect in the motor control center. We recorded the power draw of each array for ten days at the motor control center, and we observed that all four banks are operating at full power 24 hours per day.

Each array has (12) banks of underwater lamps, and there is a single power cord that provides power for the single bank of lamps.

Each bank contains (8) lamps, and the lamps are rated for a nominal 87.5 watts each.



**Existing UV System Baseline**

# of Arrays	4
# of Banks/Array	12
# of Lamps/Bank	8
Total # of Lamps	384
# of Lamps/Array	96
Nominal Watts/Lamp	87.5
Nominal Watts/Array	8,400
Nominal Watts for ALL LAMPS	33,600
Average Measured Watts for ALL LAMPS	32,085



### **Aeration System:**

The facility has four centrifugal blowers housed in the Blower Building that provide air at approximately 10 psi, primarily to the three aeration basins. There is also small amount of air (< 10% overall airflow) delivered to the septic receiving station. Air can also be sent to the Head Cell Selectors, but they have been manually closed and are expected to remain in that position for the foreseeable future.

The blowers were each designed to deliver 1,400 scfm at 9.5 psi. According to the computer readouts, the airflow delivered ranges from 750 – 1,400 scfm at pressures that range from 9.7 – 10.2 psi.

Air delivered to the septic receiving tank should vary based on the level of water in the tank. During our visit the setpoint was 55 scfm, and 134 scfm was being measured by the flowmeter.

Air delivered to the Head Cell Selectors supply coarse bubble diffusers used to mix the water. The air feeding these zones has been manually closed for at least a year, as the operator is trying to minimize the amount of air in the water at this location, to promote anaerobic (without oxygen) treatment.

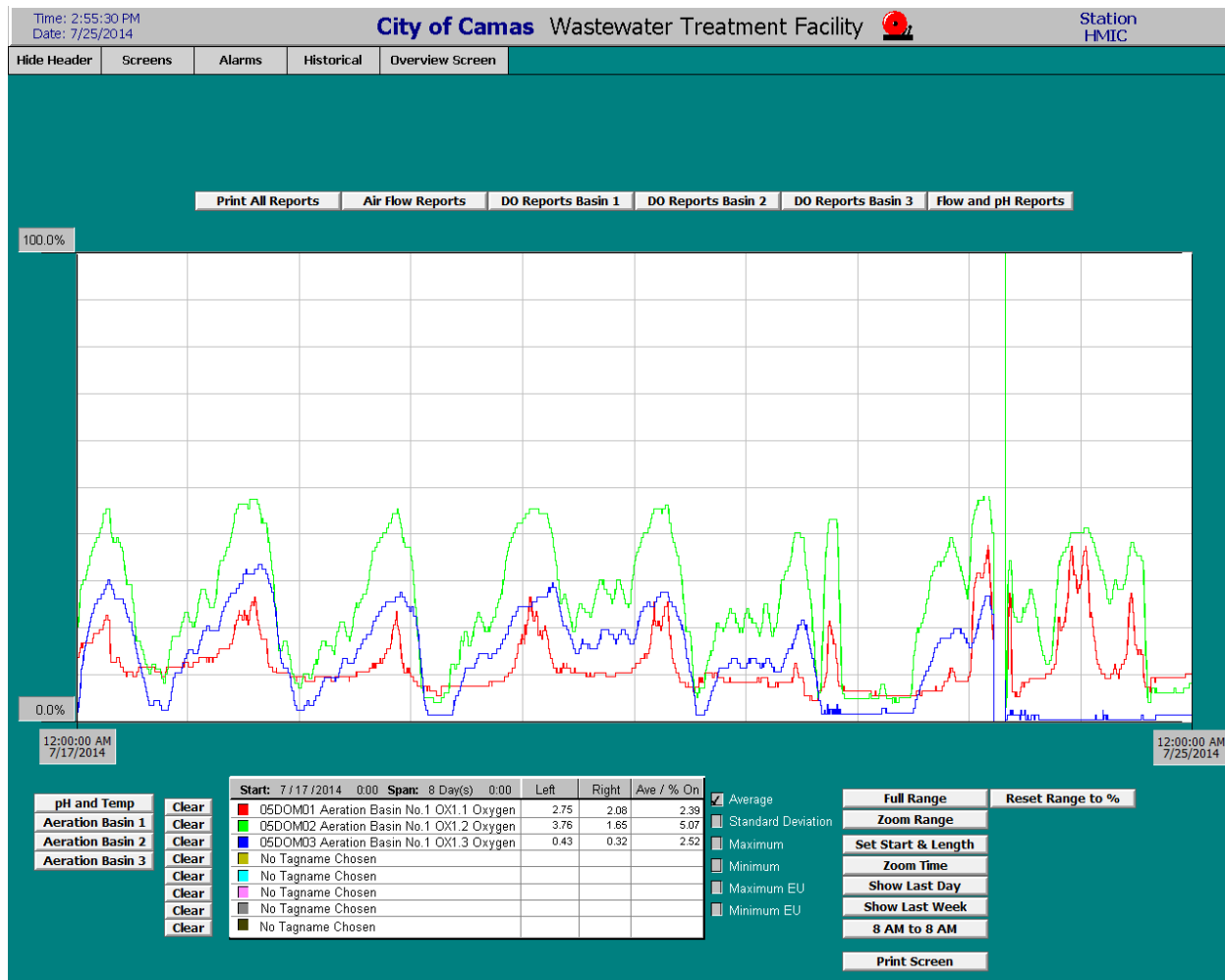
Air delivered to the three aeration basins supplies fine bubble diffusers that are located in three zones of each basin, for a total of nine zones. The first two basins are designed to operate with a DO setpoint of 2.0 ppm, to promote aerobic treatment. The third basin is designed to operate with a DO setpoint of 0.5 ppm, to allow aerobic treatment while minimizing the amount of oxygen in this stage, because some of the water from this stage is recirculated back to the head cell selectors, where they are trying to eliminate oxygen.

Each of these nine zones has one DO sensor, one airflow meter, and one automatic air valve that was designed to automatically adjust as needed to maintain the proper DO setpoint. These valves do not work automatically, and the valves have been manually positioned so that the system provides sufficient air at peak plant loads. This results in more air being provided than is necessary most of the time, especially overnight and on weekends when the plant loading is lighter.

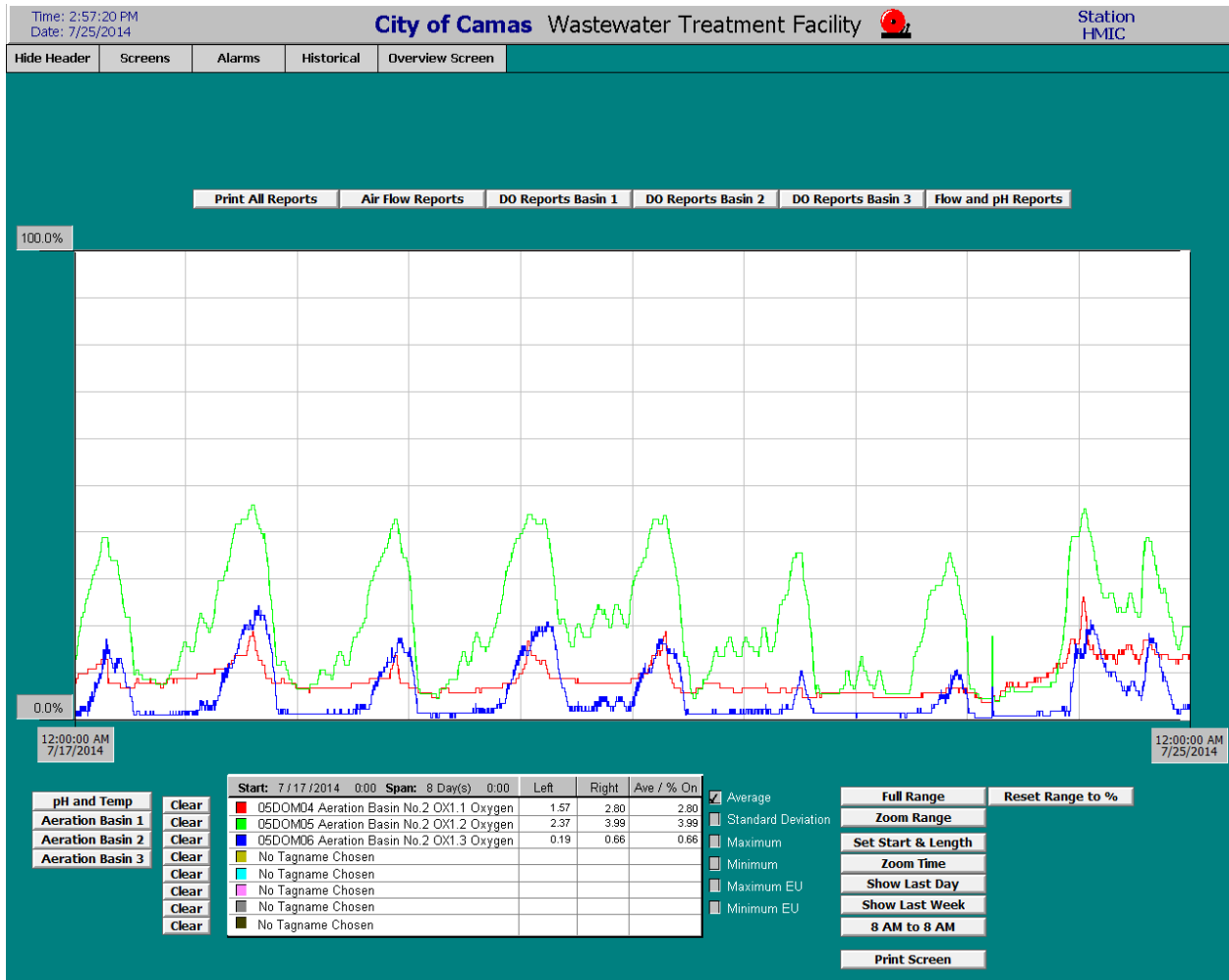
We have reviewed trends from the SCADA system that show the DO levels being recorded in each zone of both basins, and it is clear that the DO setpoints are often exceeded.



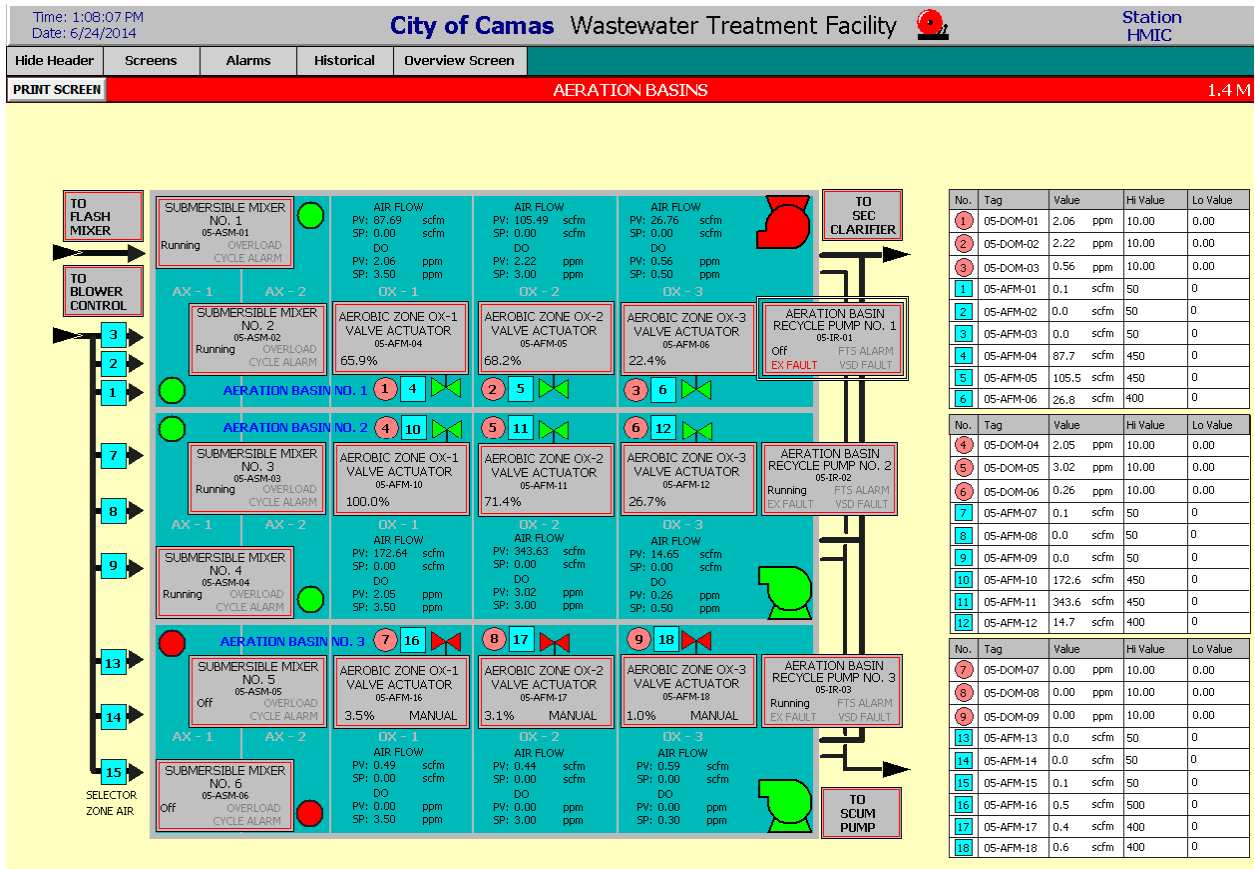
The trend below shows ten days of actual DO levels in all three zones of Aeration Basin 1. Over this time, the average DO levels in oxic zone 1 were 2.39 ppm, zone 2 was 5.07 ppm, and zone 3 was 2.52. So while there were times when all the zones had too little oxygen in them, on average over these ten days they all had more oxygen supplied to them than necessary, resulting in wasted electricity.



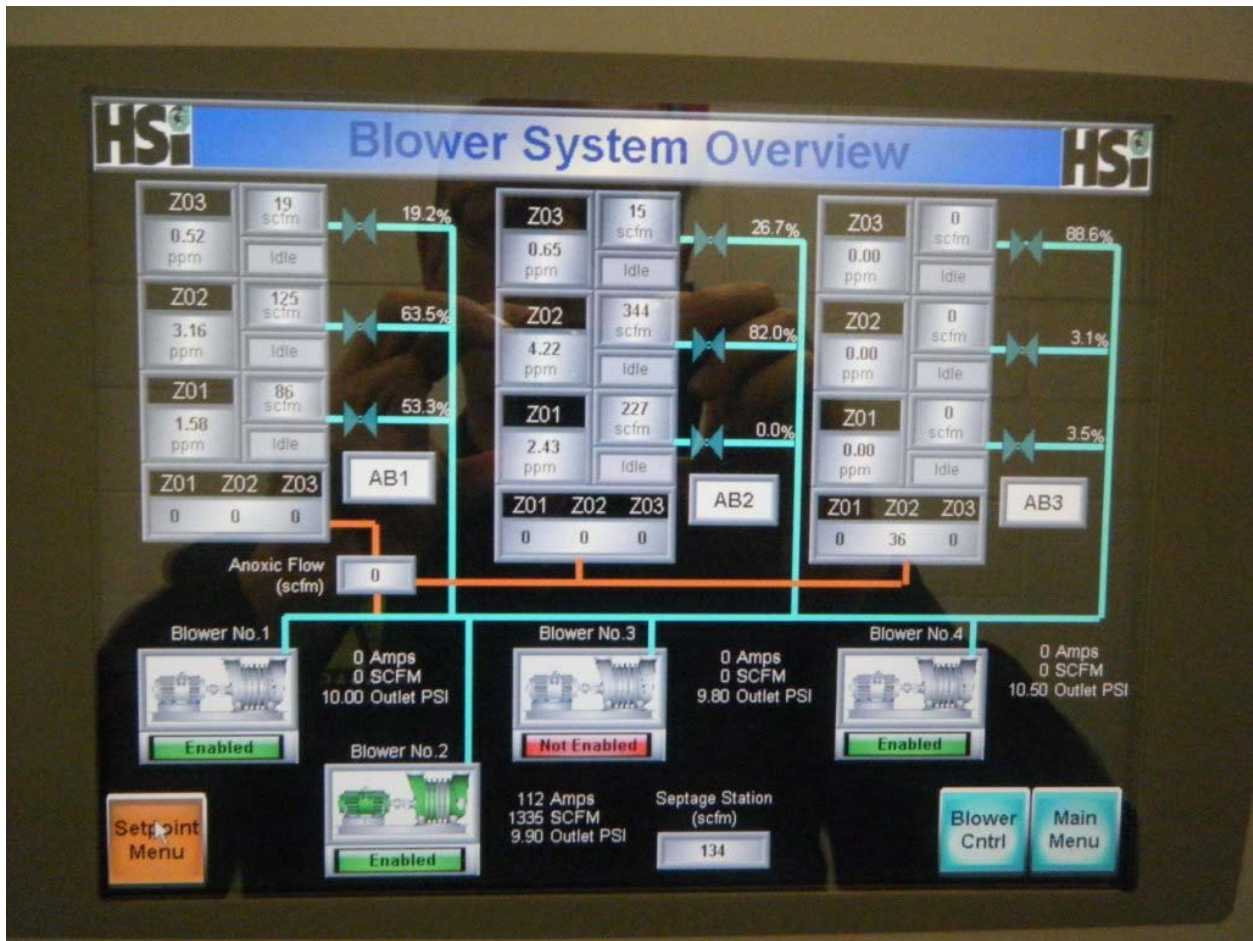
The trend below shows ten days of actual DO levels in all three zones of Aeration Basin 1. Over this time, the average DO levels in oxic zone 1 were 2.80 ppm, zone 2 was 3.99 ppm, and zone 3 was 0.68. So while there were times when all the zones had too little oxygen in them, on average over these ten days they all had more oxygen supplied to them than necessary, resulting in wasted electricity.



Here is a screen shot from the SCADA system showing the nine valves, setpoints and actual DO levels. Three of the valves are in red (16, 17 & 18) because they have been closed and that basin is not in use, nor is it expected to be used in the foreseeable future.



There is a Blower Master Control PLC that communicates with the Blower Building Level PLC, the individual Blower PLCs, and the Pacscan/Rotork controller.



## 4.2 Overview of Technical Approach

Custom spreadsheets were used to calculate the existing energy use, and proposed energy use for the measures evaluated in this report. After the existing energy use was calculated, it was compared to the actual metered energy use of the facility to be sure that the existing energy use is reasonable. The results of these spreadsheets are included in the appendix of this report.

### 4.2.1 Data Monitoring Results

Three and one half years of operational logs, 1/1/2011 – 6/30/14, was obtained for the overall plant from the on-site supervisor. Data was provided as average daily values. The following data was obtained from the on-site supervisor:

1. Plant Flow (MGD)
2. BOD5 (mg/L)
3. BOD5 (lb)
4. Suspended Solids (mg/L)
5. TSS (lb)
6. Ammonia (mg/L)
7. Ammonia (lb)

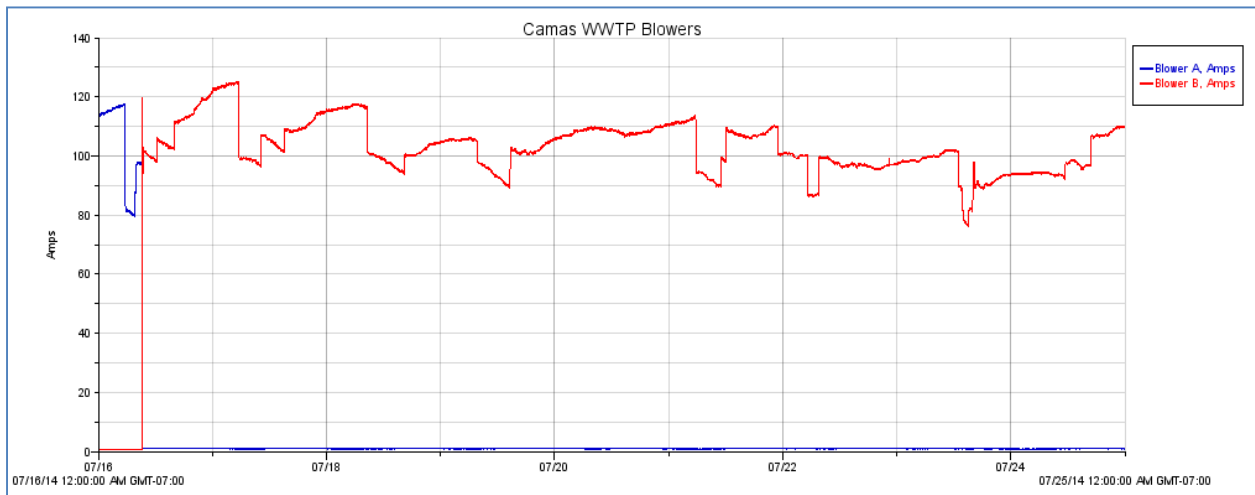
From the data above, we analyzed and determined an annual average daily flow profile as follows:

Range of Water Flows (MGD)	Days Occurring from Jan 2011 - June 2014	
9-10	0	0%
8-9	0	0%
7-8	2	0%
6-7	8	1%
5-6	11	1%
4-5	39	3%
3-4	166	13%
2-3	971	76%
1-2	80	6%
0-1	0	0%

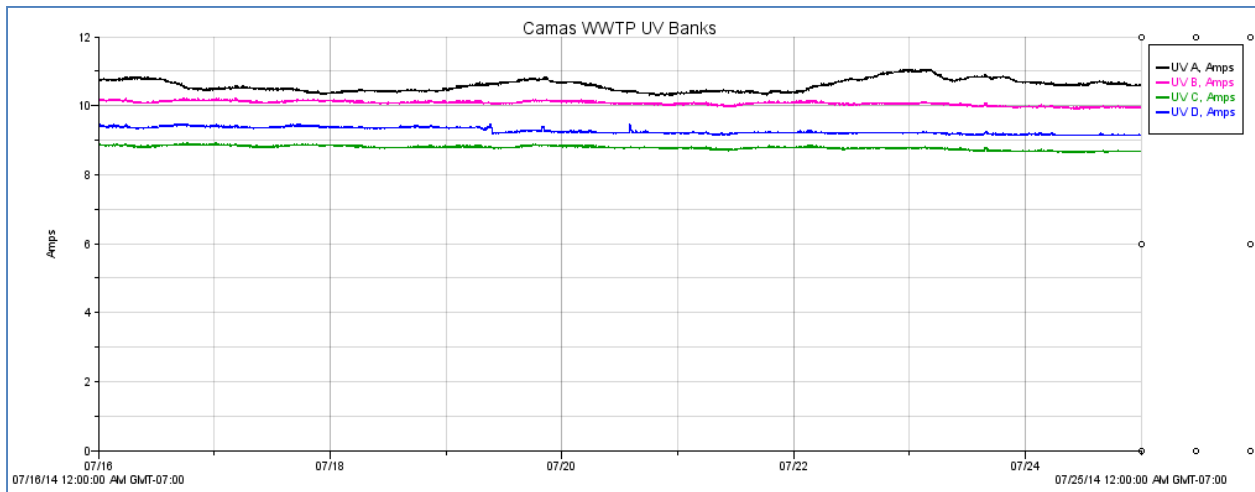
Spot (instantaneous) power (kW, volts, amps, power factor) measurements were taken on the operating blower while we adjusted the operating pressure across the range of pressures that the systems operate under throughout the year. Three different readings were taken, at 9.7 psi, 10.0 psi, and 10.2 psi. We interpolated linearly between these pressure readings to assume power at 9.8 psi, 9.9 psi, and 10.1 psi.

Current (amp) measurements were also taken on the four banks of UV lamps, and on the four blowers for ten days (7/15/14 – 7/25/14). Only one blower operated at a time, averaging 75 kW, and we are informed this is typical. Using the volts and power factor averages from our spot measurements, the one blower operating at a time averaged 75 kW. The current draw is seen to take sharp drops and spikes, and this correlates to times when the operator manually changed the pressure setpoints.

All four UV banks operated all the time, averaging 32 kW, and we are informed this is typical.



**Figure 1: Blower Current**



**Figure 2: UV Current**

#### 4.2.2 Load Profiles

A daily load profile of the UV system was developed to model the proposed UV energy use. The load is based on the daily average flow rates. The existing UV energy use is constant 24 hours per day all year.

An hourly load profile was developed to model the existing baseline and proposed blower energy use. For the existing profile we plotted the measured kW at five different pressures, and we applied a % use load for each pressure so that the average annual kW matched the average kW recorded during nine days in July 2014. For the proposed profile we assumed that for all the hours operating at a given pressure, only a small percentage of hours are needed at this pressure, and most of the time the needs can be satisfied at a lower pressure. We were unable to use manufacturer curves to determine annual airflow delivered, nor were historical data available to us to use any other means to extrapolate the annual energy use. The annual utility use is a fairly flat profile, so it seems safe to assume the blower operates at this average condition all year.

### 4.2.3 Baseline Analysis

Both the UV and blower power were modeled assuming the average kW recorded in July is the same as the average kW used all year, 24 hours per day.

The blower analysis correlated this to pressure and power plots that were recorded on site, using measured kW values for three different operating pressures (9.7, 10.0 and 10.2 psi) and linearly interpolating points between. These values were used because the operators inform us that these are the maximum and minimum (and near the middle) manual setpoints they typically use to adjust airflow to the aeration basins. There is no historical SCADA data that the owner has been able to provide to use any other assumptions. We assumed a corresponding % use per year profiles that was applied to these seven pressure/power points and modified them until the annual blower power average matched the average recorded power in July.

Final combined baseline energy use was determined to be 936,781 kWh/yr.

Note: It is anticipated that the blower energy use does vary from season to season, depending on both the weather and the loads imparted on the plant. The loads are primarily a function of flow, BODs, and ammonia. Because the power will likely vary throughout the year, the **baseline energy use for the blower for the utility incentive program may be adjusted prior to the EEM being installed**. This can be accomplished by measuring the blower power flow for one additional week in the winter, and two additional weeks in the spring or fall, and then averaging the four weeks of blower power and assuming that on an annual average the plant operates at the average power recorded during these four weeks. An alternate method to adjust the baseline energy use for the utility incentive program is to measure the blower power for four consecutive weeks, while simultaneously having the SCADA record hourly values of the flow, ammonia and BODs both entering and leaving the plant. The blower power can then be described as a function of flow, ammonia and BODs. This function can then be applied to the historical flows to calculate the annual baseline energy use for the blowers. In order for this method to be used, the SCADA system must be capable of recording the trends at precise intervals and downloading this data for utility review. This does not currently seem to be in place at this point in time.

### 4.2.4 EEM 1 – Optimize UV System Controls Analysis

The UV was modeled with controls that vary the power based on the wastewater flow. The manufacturer of the UV system (Trojan) provided the power required at various flows, and we assumed flows over the last 3 ½ years are typical.

### 4.2.5 EEM 2 – Install New UV System and Optimize UV System Controls Analysis

The new UV was modeled with reduced power demands, and controls that vary the power based on the wastewater flow. The manufacturer of the new UV system (Trojan) provided the power required at various flows, and we assumed flows over the last 3 ½ years are typical.

### 4.2.6 EEM 3 – Optimize Aeration System Controls Analysis



The aeration system was modeled with reduced pressure requirements resulting from providing only the amount of air needed, and a control strategy that automatically lowers and raises the pressure setpoint as needed, based on actual demand.

## **4.3 Key Assumptions**

### **4.3.1 Key Assumptions for Baseline Analysis**

The following key assumptions were made in the baseline analysis:

1. UV Power draw is constant all year.
2. Annual Average Blower Power is equal to the average blower power recorded over ten days in July, 2014.

### **4.3.2 Key Assumptions for EEM 1 – Optimize UV System Controls Analysis**

The following key assumptions were made in the EEM analysis:

- The proposed power required by the UV matches the power requirements that the manufacturer (Trojan) stated.
- Adequate decontamination levels will be achieved by using the proposed UV power requirements from the manufacturer (Trojan)
- The flows through the plant will remain the same as the last 3 ½ years

### **4.3.3 Key Assumptions for EEM 2 Install New UV System and Optimize UV System Controls Analysis**

The following key assumptions were made in the EEM analysis:

- The proposed power required by the new UV matches the power requirements that the manufacturer (Trojan) stated.
- Adequate decontamination levels will be achieved by using the proposed UV power requirements from the manufacturer (Trojan)
- The flows through the plant will remain the same as the last 3 ½ years

### **4.3.4 Key Assumptions for EEM 3 Optimize Aeration System Controls Analysis**

The following key assumptions were made in the EEM analysis:

- One blower operates to satisfy the demand all year.
- At pressures of 9.7, 10.0 and 10.2 psi the power recorded on site are typical throughout the year for the same operating pressure.
- Between the three pressures above the power will change linearly as the pressure changes.
- At operating pressures below 9.7 psi the power of the blower will only be reduced by 1 kW per psi.

- The airflow requirements of the plant will not increase in the future (this implies that the overall flow, BODs and ammonia levels do not increase).
- The following assumptions are made regarding the proposed operating pressures:

3% of the airflow at a given existing pressure is actually required to be at a pressure that high	
5% of the airflow at a given existing pressure is actually required at	0.1 psi lower than existing
7% of the airflow at a given existing pressure is actually required at	0.2 psi lower than existing
9% of the airflow at a given existing pressure is actually required at	0.3 psi lower than existing
11% of the airflow at a given existing pressure is actually required at	0.4 psi lower than existing
13% of the airflow at a given existing pressure is actually required at	0.5 psi lower than existing
15% of the airflow at a given existing pressure is actually required at	0.6 psi lower than existing
13% of the airflow at a given existing pressure is actually required at	0.7 psi lower than existing
11% of the airflow at a given existing pressure is actually required at	0.8 psi lower than existing
9% of the airflow at a given existing pressure is actually required at	0.9 psi lower than existing
4% of the airflow at a given existing pressure is actually required at	1.0 psi lower than existing

For instance, when the blower currently delivers air at 10.2 psi, only 3% of the time does the air need to be at this high of a pressure, 5% of the time it can be delivered at 10.1 psi, 7% of the time it can be delivered at 10.0 psi, 9% of the time it can be delivered at 9.9 psi, etc. These assumptions lead to the anticipated plant typically operating at 9.5 psi +/- 0.2 psi for 60% of the year.

- The overall energy savings calculated for this EEM is 41% of the existing blower energy. This is a relatively high percentage energy savings to expect and there are several factors that lead us to conclude that the predicted energy savings are reasonable. The system is operating with manual controls – and these must be set to meet the worst case conditions – resulting in delivering too much air. The system is also operating with fixed pressure, which means it is always delivering air at a higher pressure than needed. The system is essentially operating manually to clean the water, and it is doing a good job of that, but it is doing it at the expense of energy use. Just as we saw in the UV system running out of control – where we are predicting over 75% energy savings for that system.

#### 4.4 Summary of Results

Table 6: Modeling Summary - Recommended Package

EEM	Description	UV System Energy (kWh/yr)	Blower System Energy (kWh/yr)	Total System Energy (kWh/yr)	Energy Savings (kWh/yr)	Energy Savings (%)
	Baseline (UV & Blowers)	281,064	655,716	936,781		
1	Optimize UV System Controls	77,041	655,716	732,758	204,023	21.8%
3	Optimize Aeration System Controls	77,041	383,865	460,907	271,851	29.0%
<b>TOTALS</b>				<b>936,781</b>	<b>475,874</b>	<b>50.8%</b>

## 5 COMPLETION REPORT PLAN

After EEMs have been installed and are online and operating in a steady state manner, it is necessary to provide a completion report. Project incentives are paid upon utility and BPA approval of the completion report. In general, the completion report consists of the following:

1. Measurement and verification (M&V) of installed EEMs
2. Summary of commissioning of installed EEMs
3. Summary of actual projects costs of installed EEMs

The completion report will document the actual energy savings achieved by each EEM and actual implementation cost. The estimated energy savings and implementation costs provided in this project assessment may differ from what is ultimately determined in the completion report.

In most cases, the TSP consultant that provided this project assessment report will be utilized for the completion report. Funding of the TSP consultant for the completion report is available from BPA upon BPA approval. BPA may require the City of Camas to share a portion of the TSP consultant cost.

### 5.1 Measurement and Verification Plan

M&V will be provided for each installed EEM. The equipment installed for each EEM will be verified and documented. To verify EEM performance, the following data will be obtained:

1. UV current draw (amperes) for all four banks
2. Blower current draw for all four blowers
3. Blower discharge pressure
4. Blower total airflow
5. Plant Daily average influent and effluent flow (MGD) and BOD (lb), TSS (lb) Ammonia (lb)

The facility SCADA system and/or portable data loggers can be utilized to obtain the data.

For EEM 1 Four weeks of data will likely be necessary to verify EEM performance. At the same time the UV current is measured, the SCADA should be recording the flowrate. The measured current can then be correlated to actual flowrates, and then the historical annual flowrates can be used to project future annual energy use based upon the four weeks of recorded data, correlated with historical annual flowrates.

For EEM 2, Four weeks of data will likely be necessary to verify EEM performance. We suggest one week during the summer, one week during the winter, and two weeks in either the Fall or Spring – during times which represent typical conditions for the plant. The average power recorded during these four weeks would then be used to calculate the annual energy used by the blowers.

Note: As an alternate to measuring the power of the blowers for one week in the summer, one week in the winter, and two weeks in the fall or spring – instead four consecutive weeks could be recorded at the same time that the plant SCADA records flow, BODs and ammonia loads on the plant in at least hourly values. This four week of data could then be used to correlate the after-upgrade blower power against plant flow, ammonia and BODs – and then a model could be used to calculate the annual energy that this blower would use based on historical flows, BODs and ammonia loads and the after-upgrade measured power.

The baseline developed in this PAR will be revised based on recording the power of the blowers measured over four weeks – one week in the summer, one in the winter, and two weeks in the fall or spring. The average power recorded during these four weeks will be used to calculate the revised baseline energy used by the existing blowers prior to this upgrade.

If there are changes to the way the plant operates it may necessitate further changes to the baseline energy use of these systems. If there is a significant change in the amount of and/or the quality of influent received at this facility it may necessitate a change to the baseline energy use. If there is a significant change in the amount of and/or the quality of effluent sent out from this facility it may necessitate a change to the baseline energy use.

## **5.2 Instrumentation Required**

Portable data loggers and SCADA will be used to provide M&V and commissioning of the EEMs. The existing facility SCADA system will be utilized to obtain the necessary data for the airflow and discharge pressure. Daily logs of plant flows, TSS, BOD and ammonia will be used to track changes to the plant operation. Portable loggers will be used to measure the current draw of the UV and blower systems.

## **5.3 Personnel Required**

Plant personnel will be asked to provide the following as part of the preparation of the completion report:

1. A tour of the installed EEMs
2. Forward periodic downloads of SCADA system hourly data by email to completion report agent
3. Forward daily logs of flows and BODs, TSS, ammonia to completion report agent
4. Documentation of EEMs implementation costs

## **5.4 Logistical Requirements**

Multiple site visits are anticipated as part of the completion report process:

- Prior to upgrade being installed – one trip to install portable loggers in the Fall, and one trip to retrieve them
- Prior to upgrade being installed – one trip to install portable loggers in the Winter, and one trip to retrieve them
- After the upgrade – one trip to install loggers and one trip to retrieve them – this may happen one time for four weeks consecutively – or it may happen in three different time periods – one in the summer, one in the winter, and one in the spring or fall.

## 6 APPENDIX 1 – ENERGY CALCULATIONS

### Calculation of Savings for EEM 1 – Optimize UV System Controls

#### Energy Use Calculation with Existing UV 3000 System

Average MGD	Days / Year	Existing UV Power (kW)	Existing UV Energy (kWh)	Proposed UV Power (kW)	Proposed UV Energy (kWh)	UV Energy Savings (kWh)
9.5	0	32	0	25.2	0	0
8.5	0	32	0	25.2	0	0
7.5	1	32	440	16.8	230	210
6.5	2	32	1,761	16.8	922	839
5.5	3	32	2,421	16.8	1,268	1,153
4.5	11	32	8,584	16.8	4,495	4,089
3.5	47	32	36,536	8.4	9,565	26,971
2.5	278	32	213,715	8.4	55,951	157,763
1.5	23	32	17,608	8.4	4,610	12,998
0.5	0	32	0	8.4	0	0
<b>TOTALS</b>	<b>365</b>		<b>281,064</b>		<b>77,041</b>	<b>204,023</b>

### Calculation of Savings for EEM 2 – Install New UV System and Optimize UV System Controls

#### Energy Use Calculation with New UV 3000PLUS System

Average MGD	Days / Year	Existing UV Power (kW)	Existing UV Energy (kWh)	Proposed UV Power (kW)	Proposed UV Energy (kWh)	UV Energy Savings (kWh)
9.5	0	32	0	16.8	0	0
8.5	0	32	0	15.1	0	0
7.5	1	32	440	14.3	196	244
6.5	2	32	1,761	12.6	691	1,069
5.5	3	32	2,421	12.6	951	1,470
4.5	11	32	8,584	10.1	2,702	5,882
3.5	47	32	36,536	8.8	10,044	26,493
2.5	278	32	213,715	7.1	47,559	166,156
1.5	23	32	17,608	6.3	3,457	14,150
0.5	0	32	0	6.3	0	0
<b>TOTALS</b>	<b>365</b>		<b>281,064</b>		<b>65,600</b>	<b>215,464</b>

### Calculation of Savings for EEM 3 – Optimize Aeration System Controls

#### Existing Energy Use Calculation

Pressure (psi)	% of Time	Hours / Year	Existing Average Power (kW)	Existing Annual Energy (kWh)
10.2	60%	5,256	82	429,845
10.1	20%	1,752	73	127,267
10.0	9%	788	64	50,038
9.9	5%	438	56	24,488
9.8	4%	350	48	16,911
9.7	2%	176	41	7,168
9.6	0%	0		
9.5	0%	0		
9.4	0%	0		
9.3	0%	0		
9.2	0%	0		
9.1	0%	0		
9.0	0%	0		
8.9	0%	0		
<b>TOTALS</b>	<b>100%</b>	<b>8,760</b>	<b>75</b>	<b>655,716</b>

#### Proposed Energy Use Calculation

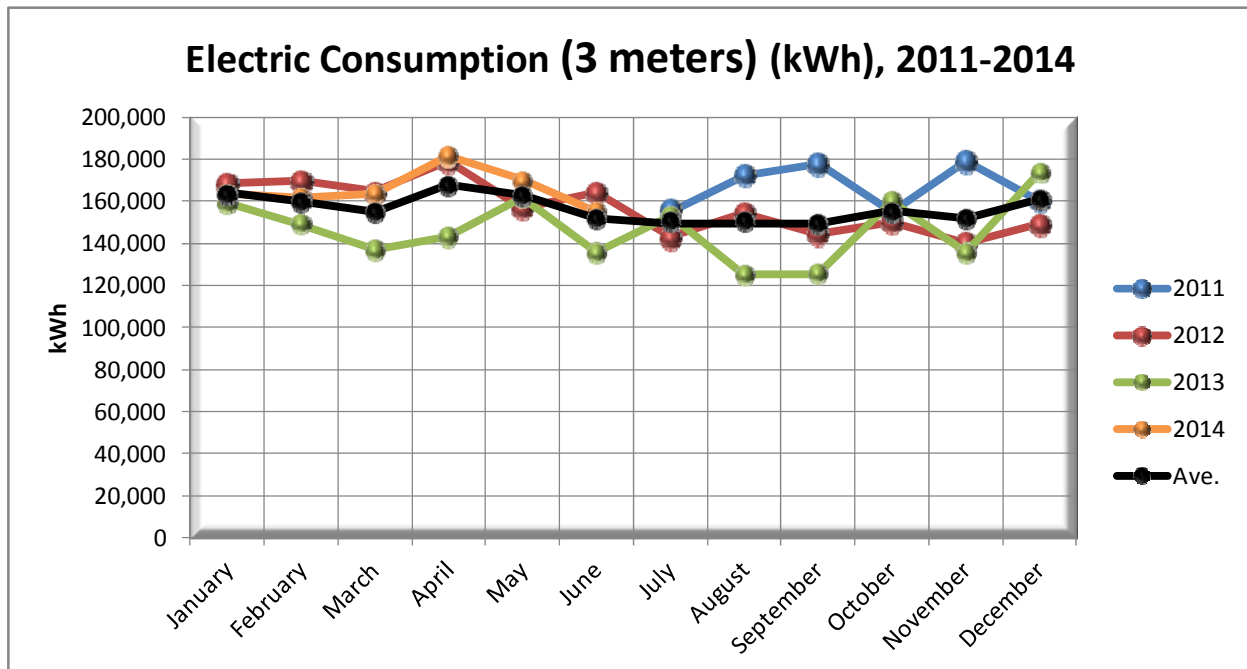
Pressure (psi)	% of Time	Hours / Year	Proposed Average Power (kW)	Proposed Annual Energy (kWh)	Proposed Energy Savings (kWh)
10.2	2%	158	82	12,895	416,950
10.1	4%	315	73	22,908	104,359
10.0	5%	479	64	30,427	19,611
9.9	7%	648	56	36,241	-11,753
9.8	9%	823	48	39,784	-22,873
9.7	11%	1,000	41	40,739	-33,572
9.6	13%	1,176	40	46,699	-46,699
9.5	13%	1,141	39	44,166	-44,166
9.4	12%	1,035	38	39,060	-39,060
9.3	10%	899	37	33,007	-33,007
9.2	7%	587	36	20,967	-20,967
9.1	3%	261	35	9,066	-9,066
9.0	2%	132	34	4,462	-4,462
8.9	1%	105	33	3,445	-3,445
<b>TOTALS</b>	<b>100%</b>	<b>8,760</b>	<b>44</b>	<b>383,865</b>	<b>271,851</b>



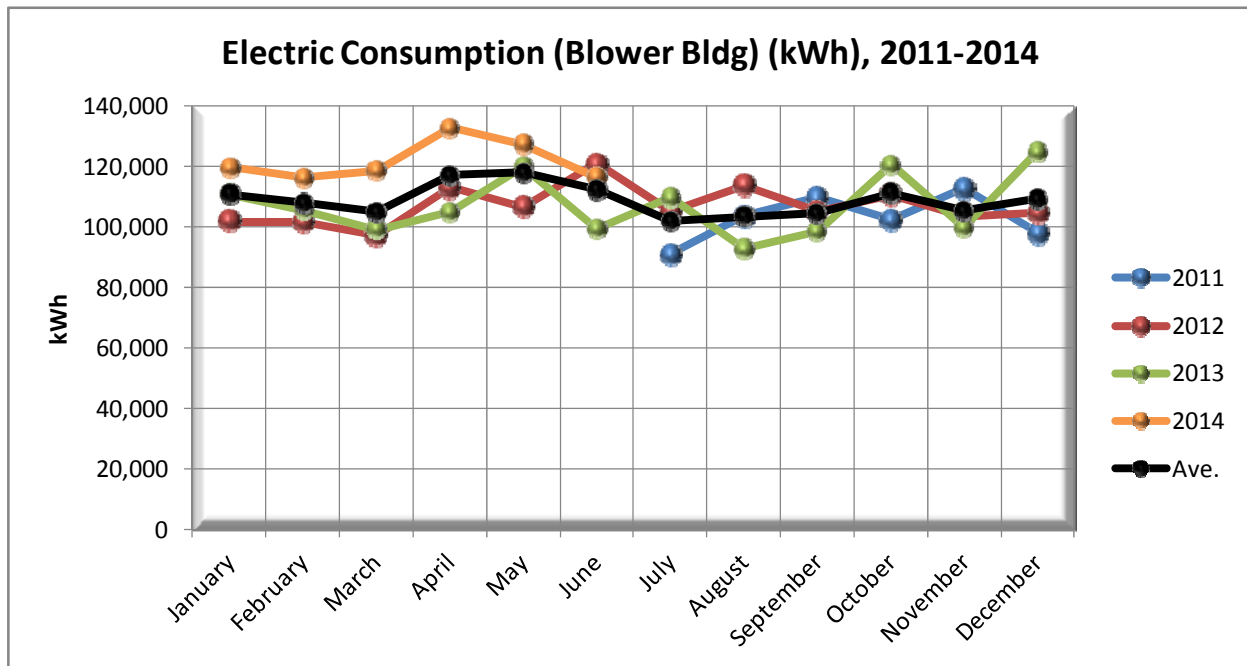
## 7 APPENDIX 2 – EXISTING UTILITY USE

This site has three electric meters. There is one meter that is attached to the UV building, and the UV energy use appears on this meter. There is one meter that is attached to the Blower building, and the Blower energy use appears on this meter. There is one other smaller meter in a storage shed building, and most of the load served by this meter has been moved to the UV meter over the last few years.

Overall the energy used at these meters is fairly constant over the course of a year, and is fairly consistent from year to year.



	Electric Usage (3 meters) (kWh)					
	2011	2012	2013	2014	Last 12 Mo.	Ave.
January		168,320	159,520	163,600	163,600	163,813
February		169,600	149,120	161,520	161,520	160,080
March		164,400	137,280	163,440	163,440	155,040
April		178,880	143,200	181,360	181,360	167,813
May		156,880	162,240	170,000	170,000	163,040
June		164,160	135,840	154,720	154,720	151,573
July	156,240	142,880	153,200		153,200	150,773
August	172,800	154,160	125,120		125,120	150,693
September	177,840	144,160	125,760		125,760	149,253
October	155,200	149,840	160,480		160,480	155,173
November	179,360	140,160	136,080		136,080	151,867
December	160,480	149,040	174,400		174,400	161,307
<b>Total</b>	<b>1,001,920</b>	<b>1,882,480</b>	<b>1,762,240</b>	<b>994,640</b>	<b>1,869,680</b>	<b>1,880,427</b>



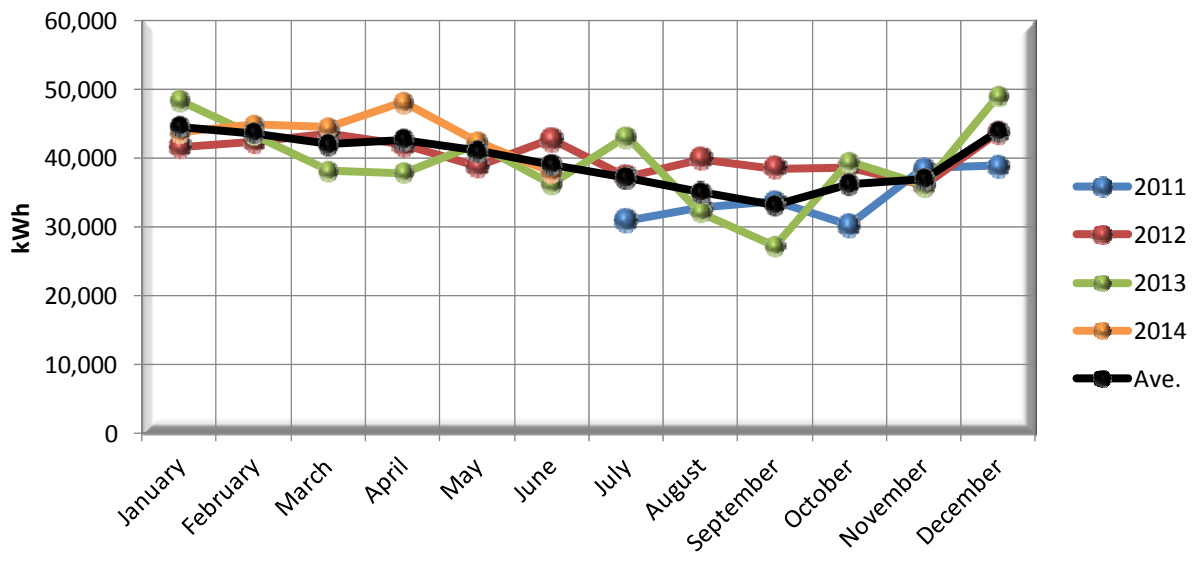
Electric Usage (Blower Bldg meter) (kWh)						
	2011	2012	2013	2014	Last 12 Mo.	Ave.
January		102,240	110,880	119,760	119,760	110,960
February		102,000	105,600	116,400	116,400	108,000
March		97,440	99,120	118,800	118,800	105,120
April		113,280	105,120	132,960	132,960	117,120
May		107,040	120,000	127,440	127,440	118,160
June		121,200	99,360	116,640	116,640	112,400
July	90,960	105,360	109,920		109,920	102,080
August	103,680	114,000	92,880		92,880	103,520
September	109,680	105,360	98,400		98,400	104,480
October	102,240	110,880	120,720		120,720	111,280
November	112,800	103,920	99,840		99,840	105,520
December	97,920	105,120	125,040		125,040	109,360
<b>Total</b>	<b>617,280</b>	<b>1,287,840</b>	<b>1,286,880</b>	<b>732,000</b>	<b>1,378,800</b>	<b>1,308,000</b>

Note 1: The Blower Building meter accounts for 70% of the overall site energy use

Note 2: The Blower equipment energy use accounts for 50% of the Blower Building metered energy use

Note 3: The Blower equipment energy use accounts for 35% of the overall site energy use

### Electric Consumption (UV Bldg) (kWh), 2011-2014



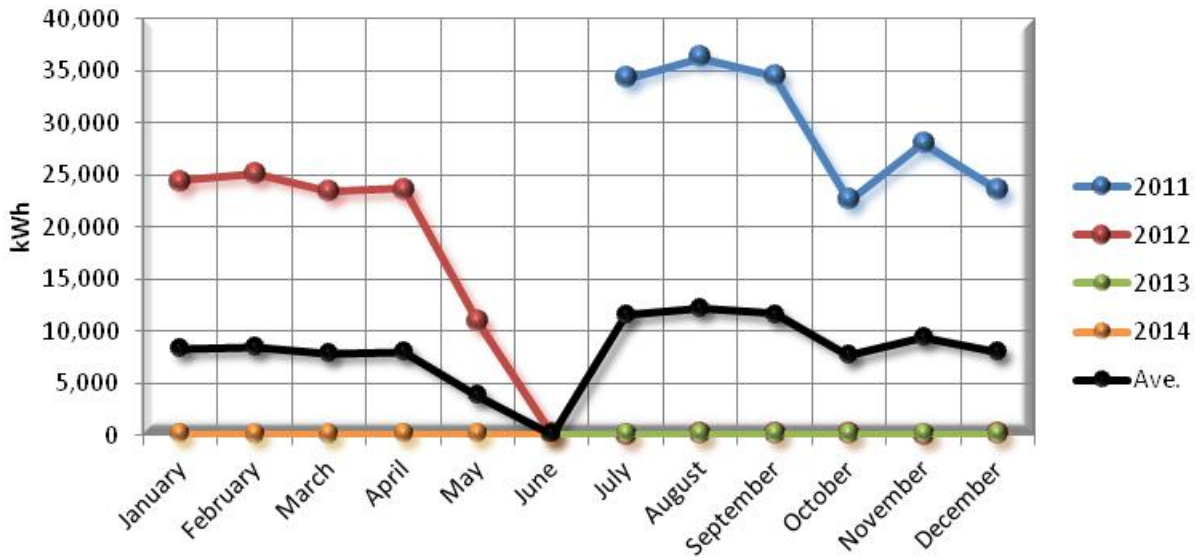
Electric Usage (UV Bldg meter) (kWh)						
	2011	2012	2013	2014	Last 12 Mo.	Ave.
January		41,680	48,400	43,680	43,680	44,587
February		42,480	43,440	44,880	44,880	43,600
March		43,600	38,080	44,480	44,480	42,053
April		42,000	37,840	48,160	48,160	42,667
May		38,880	42,000	42,320	42,320	41,067
June		42,720	36,320	38,000	38,000	39,013
July	30,960	37,440	43,120		43,120	37,173
August	32,800	40,000	32,080		32,080	34,960
September	33,680	38,640	27,200		27,200	33,173
October	30,320	38,800	39,520		39,520	36,213
November	38,480	36,160	36,080		36,080	36,907
December	38,960	43,760	49,120		49,120	43,947
<b>Total</b>	<b>205,200</b>	<b>486,160</b>	<b>473,200</b>	<b>261,520</b>	<b>488,640</b>	<b>475,360</b>

Note 1: The UV Building meter accounts for 25% of the overall site energy use

Note 2: The UV equipment energy use accounts for 59% of the UV Building metered energy use

Note 3: The UV equipment energy use accounts for 15% of the overall site energy use

### Electric Consumption (Shed Bldg) (kWh), 2011-2014



#### Electric Usage (Shed Bldg meter) (kWh)

	2011	2012	2013	2014	Last 12 Mo.	Ave.
January		24,400	240	160	160	8,267
February		25,120	80	240	240	8,480
March		23,360	80	160	160	7,867
April		23,600	240	240	240	8,027
May		10,960	240	240	240	3,813
June		240	160	80	80	160
July	34,320	80	160		160	11,520
August	36,320	160	160		160	12,213
September	34,480	160	160		160	11,600
October	22,640	160	240		240	7,680
November	28,080	80	160		160	9,440
December	23,600	160	240		240	8,000
<b>Total</b>	<b>179,440</b>	<b>108,480</b>	<b>2,160</b>	<b>1,120</b>	<b>2,240</b>	<b>97,067</b>

## 8 APPENDIX 3 – EXISTING PLANT USAGE

The owner has provided us with 3 ½ calendar years of plant usage history, detailing the quantity and quality of the wastewater that enters the plant to be treated. To calculate the proposed energy use, we have assumed that the future plant usage will remain relatively constant. If the quantity (or quality) of the wastewater entering the plant to be treated changes significantly in the future, then this will affect the future energy use. Likewise, if future regulations require changes in the quality of the treated effluent leaving the plant, this will also affect the future energy use.

<b>2011</b>		<b>Plant Influent</b>					
Date	Flow (MGD)	BOD (mg/l)	BOD (lbs)	Suspended Solids (mg/l)	TSS (lbs)	Ammonia (mg/L)	Ammonia (lbs)
<b>AVG</b>	<b>2.5</b>	<b>108</b>	<b>2221</b>	<b>130</b>	<b>2733</b>	<b>44.2</b>	<b>893</b>
<b>MIN</b>	<b>1.9</b>	<b>32</b>	<b>1189</b>	<b>25</b>	<b>411</b>	<b>14.6</b>	<b>500</b>
<b>MAX</b>	<b>6.6</b>	<b>214</b>	<b>8454</b>	<b>472</b>	<b>17014</b>	<b>73.8</b>	<b>1441</b>
<b>TOTAL</b>	<b>918.1</b>		<b>464,106</b>		<b>568,418</b>		<b>184,899</b>

<b>2012</b>		<b>Plant Influent</b>					
Date	Flow (MGD)	BOD (mg/l)	BOD (lbs)	Suspended Solids (mg/l)	TSS (lbs)	Ammonia (mg/L)	Ammonia (lbs)
<b>AVG</b>	<b>2.748</b>	<b>100</b>	<b>2206</b>	<b>129</b>	<b>2842</b>	<b>39.4</b>	<b>874</b>
<b>MIN</b>	<b>1.928</b>	<b>36</b>	<b>813</b>	<b>2</b>	<b>40</b>	<b>0.3</b>	<b>7</b>
<b>MAX</b>	<b>7.534</b>	<b>237</b>	<b>4463</b>	<b>2426</b>	<b>51634</b>	<b>59.1</b>	<b>1614</b>
<b>TOTAL</b>	<b>1,003.1</b>		<b>458,879</b>		<b>591,179</b>		<b>180,993</b>

<b>2013</b>		<b>Plant Influent</b>					
Date	Flow (MGD)	BOD (mg/l)	BOD (lbs)	Suspended Solids (mg/l)	TSS (lbs)	Ammonia (mg/L)	Ammonia (lbs)
<b>AVG</b>	<b>2.416</b>	<b>112</b>	<b>2,229</b>	<b>138</b>	<b>2,706</b>	<b>39.8</b>	<b>790</b>
<b>MIN</b>	<b>1.867</b>	<b>45</b>	<b>1,024</b>	<b>38</b>	<b>1,004</b>	<b>10.1</b>	<b>356</b>
<b>MAX</b>	<b>7.093</b>	<b>347</b>	<b>7,903</b>	<b>602</b>	<b>11,015</b>	<b>60.7</b>	<b>1,426</b>
<b>TOTAL</b>	<b>881.8</b>		<b>465,801</b>		<b>565,577</b>		<b>163,516</b>

<b>2014</b>	<b>Plant Influent</b>						
Date	Flow (MGD)	BOD (mg/l)	BOD (lbs)	Suspended Solids (mg/l)	TSS (lbs)	Ammonia (mg/L)	Ammonia (lbs)
<b>AVG</b>	<b>2.711</b>	<b>92</b>	<b>2026</b>	<b>93</b>	<b>2066</b>	<b>35.0</b>	<b>763</b>
<b>MIN</b>	<b>1.989</b>	<b>51</b>	<b>1265</b>	<b>35</b>	<b>834</b>	<b>10.3</b>	<b>260</b>
<b>MAX</b>	<b>5.115</b>	<b>217</b>	<b>4327</b>	<b>247</b>	<b>6922</b>	<b>93.1</b>	<b>1703</b>
<b>TOTAL</b>	<b>490.7</b>		<b>206,692</b>		<b>212,839</b>		<b>78,539</b>

Note: The table above for 2014 only covers ½ the year – through June 30, 2014

## 9 APPENDIX 4 – VENDOR QUOTES

### Vendor Quote for EEM 1 – Optimize UV System Controls

**TROJAN UV**  
WATER CONFIDENCE™

**UV3000™ DISINFECTION SYSTEM  
UPGRADE**

**For**

**CITY OF CAMAS WWTP  
1129 S. E. POLK STREET  
CAMAS, WA 98607**

**ATTENTION: JIM DICKINSON**

**Date: July 24, 2014  
Report No: RO\_Project No\_311103**

**NOTICE**

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Camas, WA WWTP  
without the express written permission of Trojan Technologies.**

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Vendor Quote for EEM 1 – Optimize UV System Controls (continued)



**Upgrade Summary**

The UV3000 system's SCC (system control center) was modified some time ago and can no longer be supported by Trojan Technologies. It is recommended that the site upgrades the SCC to a new platform and/or consider upgrading the UV3000 system to a newer UV disinfection technology.

The following factors have been considered/incorporated into the SCC upgrade recommendation:

- Utilize Trojan's standard AB Compact Logix PLC platform; this enables the new SCC to be utilized within an overall system upgrade to a UV3000+ in future
- Programming will be for the original UV3000 control philosophy and will incorporate the 4<sup>th</sup> added bank into the control architecture
- Any control or communication boards within the existing UV equipment are considered to be in good working order; any other items modified or removed during the previous SCC modifications have not been allowed for in the quoted scope of works

The recommended scope of work, equipment and services to upgrade the SCC are described on the following pages. Should you require any clarification or if you have any questions then please call or email.

Yours truly,

**Original Signed by Mark Eyre**

**Mark Eyre**  
Municipal Service  
Refurbishment & Optimization

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Vendor Quote for EEM 1 – Optimize UV System Controls (continued)



**System Control Center (SCC) Scope of Supply: Parts**

A new System Control Center (SCC) shall be supplied to monitor & control the UV System and contains the main components as outlined in the table below. The price does not allow for site installation services. Site service is described separately.

QTY	DESCRIPTION	UNIT MODEL NUMBER / COMMENT
1	Processor: AB Compact Logix L35	1769-L35
1	Operator Interface: PanelView Plus 700 Color, 7 inch	2711P-T7C4D1
1	SCADA Communications Ethernet/IP	Built into PLC
1	Panel 30"H x 30"W x 12"D estimated (new cabinet required).	Panel Construction: 304 SS; wall mounted, outdoor location; sunshade, NEMA 4X enclosure rating; service outlet; panel heater, lifting lugs. Electrical: 120VAC, 60 Hz. Drawing approval process confirms site fit/location.
1	Digital Inputs/Outputs	16/16 available
1	Analog Inputs/Outputs	4/0 available
1	PLC Programming & testing	Downloaded and configured to original site control philosophy
<b>Total SCC Panel Price US\$</b>		<b>61,300.00</b>

**System Control Center (SCC) Scope of Supply: Service**

The following site service will be required to complete the inspection, commissioning and startup of the new SCC.

Description	Certified Technician	Total Price (US\$)
Travel Days, estimated, invoice @ actual	2-Service	2,920.00
Site Days Required, estimated, invoice @ actual	3-Service	4,380.00
Number of Technicians	1-Service	n/a
Daily Rate (US\$)	1,460	n/a
Airfare, estimated, invoice @ actual (US\$)	1,200 ea	1,200.00
<b>Total Service Price US\$</b>		<b>8,500.00</b>

Note: Travel is based on utilizing Trojan Technician @ \$1,460 day rate; utilizing certified technician from local Trojan representative could reduce travel (days & flight/car) to nil; we would utilize most cost effective service technician as per overall order and customers' preference.

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## Vendor Quote for EEM 1 – Optimize UV System Controls (continued)



### Site Responsibility:

Site will be responsible for approving (or providing approval as noted) the submittal drawing(s) and SCADA address list (if applicable). Site will be responsible for removing the old SCC panel & installing & mounting the new SCC panel as indicated on the final drawing.

Site will be responsible for the transfer of (or new supply of) the following connections from the old panel to the new panel:

1. One (1) 120 volt, 60 Hz, 1 Phase, 2 wire (plus ground), power supply
2. One (1) ground link, 14 gauge minimum type TWH stranded, daisy chained to the PDC's
3. Serial communication links from the PDC's (daisy chained)
4. One (1) analog input from the plant flow meter
5. One (1) digital input from the Low Level Sensor & seven (7) digital outputs (banks status, alarms, heater)
6. One communication cable from plant SCADA (if required)
7. Any communications wiring that is too short for direct connection to the new SCC panel connections will have to be replaced as "splicing" is not allowed

*Note that panel installation and power connections are required to be completed prior to Certified Service Technician arrival on site. Failure for site to be ready could result in technician needing to return at additional cost.*

Site will be responsible for making operators available for training on the new SCC control panel.

### Trojan Responsibility:

Trojan will be responsible for providing submittal drawing(s) for site approval (or approval as noted).

Certified Service/Control Technician is responsible for:

1. Verifying correct installation (power, mounting, configuration, communications, etc) of the SCC;
2. Verifying correct SCC/PDC operation;
3. Providing operator training.

### Documentation:

One electronic copy of the following documentation will be supplied by Trojan:

1. Submittal drawings for approval; final (as approved) submittal drawings
2. Appropriate sections of the O&M Manuals updated

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Vendor Quote for EEM 1 – Optimize UV System Controls (continued)



**Terms & Conditions:**

Trojan Technologies Terms and Conditions of Sale and Service apply and are available upon request.

Shipment terms are ExWorks (ExW) London Ontario Canada. Partial shipments allowed.

Freight costs are available on request and freight will be added to the invoice.

Payment terms are NET 30 days.

Quote validity is 30 days.

Delivery is 10 -12 weeks to be confirmed at order placement.

Warranty is one (1) year materials and labour.

Daily Rate and Travel Daily Rate, if quoted, includes hourly rate, accommodations, and meals. It does not include airfare.

Airfare, if quoted, is an estimated cost and assumes the flight is booked at least 14 days in advance. The actual air fare receipt will be provided and the final invoice adjusted accordingly. Airfare within North America is booked on the basis of fully flexible refundable economy class tickets with airline of choice.

Trojan employee on-site work will be performed during the working hours of 0830 – 1700 Monday through Friday except for statutory holidays. If site access/working hours are different from this then please advise and we will work to accommodate site hours.

Purchase order must state that "Canadian labor, service and technical support on site from Trojan Technologies is required". In addition, a "letter of invitation" on company letterhead will be requested after PO receipt. We will advise our requested wording (based on the PO received) to ensure it matches the PO, both of which will provide USA customs and passport control officers with the required supporting paperwork to allow our entry to complete work.

TROJAN TECHNOLOGIES 3000 GORE ROAD, LONDON, ONTARIO, CANADA N6Y 4T7 T 519 457 8400 F 519 457 8539 WWW.TROJANUV.COM

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Page 1 of 1

## Vendor Quote for SCADA (Wonderware) Integration of EEM 1

**Rich Davis**

---

**From:** Justin Colton [jcolton@jocdautomation.com]  
**Sent:** Wednesday, September 3, 2014 2:25 PM  
**To:** Rich Davis  
**Co:** Justin Colton  
**Subject:** City of Camas Numbers

### UV System

#### Approach

- We would use 480V contactors to turn the UVs on and off. This was an idea proposed by a Trojan tech support person.
  - They do not publish nor are they willing to sell the protocol used to communicate with the UV boards.
- A new Compact Logix PLC with an analog input card (flow and intensities) and a relay output card would replace the SLC500.
- Intensity signals on the UV are 4-20mA. An on-board I to I isolator would allow the new Logix PLC to read the intensity values.
- Plant flow would be wired to the new PLC, or sent across the network.

#### Scope

- Site discovery
- Engineering/drafting
- PLC Programming, Wonderware programming, at the plant PC and locally
- PLC parts
  - Power supply
  - CPU
  - Relay output module
  - Analog input module
- Coordination with electrical contractor
- Startup and testing/tuning

Cost of SCADA integration only

Price: \$37,680  
Suggested EC Budget: \$5,000 (including four 480V contactors)  
Price if OCD does Wonderware only: \$8,800

### Blower System

#### Approach

- Discovery time up front to determine I/O wiring, PLC network
- Bring the dissolved oxygen, flow signals into the Allen-Bradley PLC in the blower panel
- Control the existing valve network with the Allen-Bradley PLC, using the existing Pak Scan interface.
- Re-program the Red Lion converter to transfer any data required in the Modicon system
- Program to a control specification written by OCD Automation, approved by City of Camas and Abacus.

#### Scope

- Site discovery
- Engineering/drafting
- PLC Programming, Wonderware programming, at the plant PC and locally
- (18) I/I isolators for all of the D.O. and Flow signals currently wired to the Modicon
- Coordination with electrical contractor

**Manufacturer documentation of UV power (kW) at various flows for existing UV3000 system (EEM 1)  
and for proposed new UV3000Plus system (EEM 2)**

**Rich Davis**

---

**From:** Bill Reilly [bill@whreilly.com]  
**Sent:** Friday, August 1, 2014 1:20 PM  
**To:** Rich Davis; Bob Busch  
**Co:** Kim Batiste; Mike Reilly  
**Subject:** FW: Trojan UV controls retrofit

Rich and Bob,

Here are the power numbers. We are working on the installation numbers and should have them by the end of next week.

Bill

Bill Reilly | Wm. H. Reilly & Co.  
 503-223-4100 Office | 503-223-0840 Fax | 503-214-8388 Cell  
[bill@whreilly.com](mailto:bill@whreilly.com)

---

**From:** <Fournier>, Jordan Fournier <jfournier@trojanuv.com>  
**Date:** Friday, August 1, 2014 at 12:54 PM  
**To:** Bill Reilly <bill@whreilly.com>  
**Cc:** Kim Batiste <kim@whreilly.com>, Mike Reilly <mreilly@whreilly.com>  
**Subject:** RE: Trojan UV controls retrofit

Bill,

I have completed a spreadsheet showing the power consumption for both systems at flows ranging from 1 to 10 MGD.

Flow (MGD)	Power (kW)	
	3000	3000Plus
1	8.4	6.3
2	8.4	6.3
3	8.4	7.14
4	8.4	8.82
5	16.8	10.1
6	16.8	12.6
7	16.8	12.6
8	16.8	14.28
9	25.2	15.12
10	25.2	16.8

Let me know if you have any questions.  
 Regards  
 Jordan

## Vendor Quote for Labor for EEM 1 & EEM 2

**Rich Davis**

---

**From:** Bill Reilly [bill@whreilly.com]  
**Sent:** Wednesday, September 3, 2014 9:38 PM  
**To:** Rich Davis  
**Cc:** Bob Busch; Steve Rubbert; Kim Batiste  
**Subject:** Re: Camas UV installation options

Rich,

Add \$4000 to the quote for installing the new 3000 Plus and \$600 for installing the new control panel for the existing 3000 to get to prevailing wages.

Thanks.

Bill

Bill Reilly | Wm. H. Reilly & Co. | 503-223-6197 w | 503-314-8386 c

Sent from my iPhone. Please excuse typos.

On Sep 3, 2014, at 11:50 AM, "Rich Davis" <[RichD@abacusrm.com](mailto:RichD@abacusrm.com)> wrote:

Bill,

Does the original quote you provided for the 3000PLUS equipment (\$225,000) include startup and programming by your company?  
I don't see anything in the quote below that includes this, and I noticed on the UV controls equipment you had a separate line item for programming startup and commissioning.  
Thanks in advance for the clarification.

Also, we are meeting with the Head of Public Works tomorrow morning to discuss these projects, so we need the quotes below updated with prevailing wages by the end of today.

Thanks in advance.

Rich Davis  
Abacus  
503-936-7163

---

**From:** Bill Reilly [<mailto:bill@whreilly.com>]  
**Sent:** Tuesday, September 2, 2014 11:53 AM  
**To:** Rich Davis  
**Cc:** Bob Busch; Steve Rubbert; Kim Batiste  
**Subject:** Camas UV installation options

Rich,

I apologize for the delay. I thought these prices had already been sent to you. Please see below. I will also track down the prices on the existing control boards and get them over to you ASAP. Please let me know if you have any questions or require additional information.

I hope this provides you with the information that you require at this time. Please let me know if you have any questions.

Thanks.

1

## Vendor Quote for Labor for EEM 1 & EEM 2 (continued)

Bit

Bill Reilly | Wm. H. Reilly & Co.  
503-223-6197 Office | 503-223-0845 Fax | 503-314-8386 Cell  
[Bill@whreilly.com](mailto:Bill@whreilly.com)

### **Option 1 - Install new Trojan Technologies UV3000Plus and remove existing UV3000 system**

#### **OPTION 1 JOB TO INCLUDE LABOR, MATERIAL AND CLARIFICATIONS AS FOLLOWS:**

1. Provide 2 480VAC 30KVA transformers to create the neutral necessary to power the system.
2. Provide labor and materials to install 2 PDCs, 4 Module Support Racks, 1 Expansion Baffle, 1 HSC, 1 ALC, 2 new 30 KVA transformers, and one new SCC.
3. Provide labor and materials to wire power, controls, and communication wiring for 2 PDCs, 1 HSC, 2 30 KVA transformers, and 1 new SCC.

#### **Project Specific Exclusions:**

1. PLC and SCADA programming and integration.
2. PDCs, the HSC, the SCC, the ALC and the expansion baffle are provided by Trojan Technologies and are not included in this price.
3. Prevailing wages not included.

#### **Qualifications:**

1. No back charges for clean up will be accepted unless prior written notice and forty eight (48) hours has been given to comply.
2. General Contractor/Owner shall submit construction schedule in electronic format as part of any subcontract and shall update the schedule weekly during the project.
3. Construction activities shall not commence, nor be scheduled, until applicable submittals have been approved.
4. All construction activities shall be coordinated with approved schedule. No construction activities shall commence less than seventy two (72) hours prior to corresponding change in construction schedule. In the event contractor's personnel are prohibited from performing scheduled activities, General Contractor/Owner shall be billed at contractor's "standby" rates until allowed to commence work or is dismissed by General Contractor. A two (2) hour minimum charge shall apply.
5. Equipment and materials supplied by the contractor are warranted only to the extent that the same are warranted by the manufacturer.
6. The contractor shall not be liable for indirect loss or damage.
7. If a formal contract is required, its' conditions must not deviate from this proposal without our permission.
8. Anything (verbal or written) expressed or implied elsewhere, which is contrary to these conditions shall be null and void.
9. Any alteration or deviation from the above specifications involving extra cost would be executed on written orders and will become an extra charge above and beyond the price listed.
10. This estimate is for completing the job as described above. It is based on our evaluation and does not include material price increases or additional labor or materials which may be required should unforeseen problems or adverse weather conditions occur after the work has started.
11. In the event suit or action is instituted to enforce any terms of this contract, the prevailing party shall be entitled to recover from the other party, such sum as the court may adjudge reasonable, as attorney fees at trial or on appeal of such suit or action, in addition to all other sums provided by law.

#### **Additional Exclusions:**

1. All applicable taxes are excluded in our submission.
2. The contractor shall not be held liable for errors or omissions in design by others, nor inadequacies of materials.
3. HVAC and Mechanical, controls, control wiring and starters unless specifically included above.
4. Unless included in this proposal, all bonding and/or special insurance requirements are supplied at additional cost.
5. Temporary power unless specifically included above.
6. All Utility costs and fees.
7. Trenching, backfilling and compaction.
8. Equipment and device mounting brackets and stands unless specifically included above.

**Total Price for Option 1: \$23,374.**

### **Option 2 – Install new UV Control Panel for Existing Trojan UV3000 system**

#### **OPTION 2 JOB TO INCLUDE LABOR, MATERIAL AND CLARIFICATIONS AS FOLLOWS:**

1. Labor to remove existing UV control panel.
2. Labor and materials to install new UV control panel.
3. Connect all wiring associated with the new UV control panel.
4. Install all existing conduits back into the new UV control panel.

#### **Project Specific Exclusions:**

## Vendor Quote for Labor for EEM 1 & EEM 2 (continued)

1. Hamer Electric will not be providing the new UV control panel will be supplied by Trojan Technologies and is not included in this price.
2. PLC and SCADA programming and integration.
3. Prevailing wages not used.

Qualifications:

Same as items 1 – 11 above.

Exclusions:

Same as items 1 – 8 above

**Total Price for Option 2: \$2,694,39**



## Vendor Quote for EEM 2 – Install New UV System and Optimize UV System Controls

TROJAN **UV3000PLUS™**

PROPOSAL FOR THE CITY OF CAMAS, WA  
QUOTE: LJK1909  
7/21/2014



The TrojanUV3000Plus™ is operating in **over 1300** municipal wastewater plants around the world. Disinfecting **over 17 billion** gallons a day, the TrojanUV3000Plus™ has become the reference standard in the industry.

## Vendor Quote for EEM 2 – Install New UV System and Optimize UV System Controls (continued)

July 21, 2014

In response to your request, we are pleased to provide the following TrojanUV3000Plus™ proposal for the Camas Replacement project.

The TrojanUV3000Plus™ has been shown in over 1300 installations to provide dependable performance, simplified maintenance, and superior electrical efficiency. As explained in this proposal, the system incorporates innovative features to reduce O&M costs, including variable output electronic ballasts to provide dimming capability and Trojan's revolutionary ActiClean-WW™ system – the industry's only online chemical and mechanical quartz sleeve cleaning system. All Trojan installations are supported by a global network of certified Service Representatives providing local service and support.

Please do not hesitate to call us if you have any questions regarding this proposal. Thank you for the opportunity to quote the TrojanUV3000Plus™ and we look forward to working with you on this project.

With best regards,

Jordan Fournier  
3020 Gore Road  
London, Ontario N5V 4T7  
Canada  
(519) 457 – 3400 ext. 2193  
jfournier@trojanuv.com

### Local Representative:

Bill Reilly, Jr.  
WM. H. REILLY & CO.  
910 S.W. 18th Avenue  
Portland, OR 97205  
USA  
(503) 223-8197

## DESIGN CRITERIA

### CAMAS REPLACEMENT

Peak Design Flow:	<b>10.04 MGD</b>
UV Transmittance:	<b>70%</b> (minimum)
Total Suspended Solids:	<b>30 mg/l</b> (30 Day Average, grab sample)
Disinfection Limit:	<b>200 fecal coliform per 100 ml</b> , based on a 30 day Geometric Mean of consecutive daily grab samples
Design Dose:	<b>30,000 <math>\mu</math>Ws/cm<sup>2</sup></b> , bioassay validated
Validation Factors:	<b>0.98</b> end of lamp life factor (Low-Pressure Amalgam Lamps) <b>0.95</b> fouling factor (ActiClean-WW™ Chemical / Mechanical Cleaning System)

Camas Replacement  
7/21/2014

- 2 -

LJK1909

Vendor Quote for EEM 2 – Install New UV System and Optimize UV System Controls (continued)

**DESIGN SUMMARY**

QUOTE: LJK1909

Based on the above design criteria, the TrojanUV3000Plus™ proposed consists of:

<b>CHANNEL (Please reference Trojan layout drawings for details.)</b>	
Number of Channels:	1
Approximate Channel Length Required:	30 ft
Channel Width Based on Number of UV Modules:	28 in
Channel Depth Recommended for UV Module Access:	54 in
<b>UV MODULES</b>	
Total Number of Banks:	2
Number of Modules per Bank:	7
Number of Lamps per Module:	6
Total Number of UV Lamps:	84
Maximum Power Draw:	21 kW
<b>UV PANELS</b>	
Power Distribution Center Quantity:	2
System Control Center Quantity:	1
<b>MISCELLANEOUS EQUIPMENT</b>	
Level Controller Quantity:	1
Type of Level Controller:	Weighted Gate (ALC)
Automatic Chemical / Mechanical Cleaning:	Trojan ActiClean-WW™
UV Module Lifting Device:	Davit Crane
Standard Spare Parts / Safety Equipment:	Included
Other Equipment:	
<b>ELECTRICAL REQUIREMENTS</b>	
<ol style="list-style-type: none"> <li>Each Power Distribution Center requires an electrical supply of one (1) 480 Volts, 3 phase, 4 wire (plus ground), 16.6 kVA.</li> <li>The Hydraulic System Center requires an electrical power supply that is powered from the Power Distribution Center.</li> <li>The System Control Center requires an electrical supply of one (1) 120 Volts, 1 phase, 2 wire (plus ground), 15 Amps.</li> <li>Electrical disconnects required per local code are not included in this proposal.</li> </ol>	

Camas Replacement  
7/21/2014

- 3 -

LJK1909

## Vendor Quote for EEM 2 – Install New UV System and Optimize UV System Controls (continued)

### COMMERCIAL INFORMATION

Total Capital Cost: \$225,000 (US\$)

This price excludes any taxes that may be applicable and is valid for 90 days from the date of this letter.

### EQUIPMENT WARRANTIES

1. Trojan Technologies warrants all components of the system (excluding UV lamps) against faulty workmanship and materials for a period of 12 months from date of start-up or 18 months after shipment, whichever comes first.
2. UV lamps purchased are warranted for 12,000 hours of operation or 3 years from shipment, whichever comes first. The warranty is pro-rated after 9,000 hours of operation. This means that if a lamp fails prior to 9,000 hours of use, a new lamp is provided at no charge.
3. Electronic ballasts are warranted for 5 years, pro-rated after 1 year.

Camas Replacement  
7/21/2014

- 4 -

LJK1909

Note: This is material quote only, labor quote received separately via email.

## Vendor Quote for EEM 3 – Optimize Aeration System Controls



### Control and Electrical Systems Engineering

August 25, 2014

Rich Davis  
Abacus Resource Management

RE: Camas, WA WWTP Energy Improvements

Dear Rich:

Control Engineers is pleased to provide this proposal for the Camas WWTP project. This proposal is based on information taken from a site visit on 8/13/2014 and from subsequent information provided by Bob Busch. The aeration system and the UV system were the main areas of focus.

#### Aeration System

The system consists of master blower control panel (MBCP), four centrifugal blowers on VFDs, each with their own control panel, tied to a common air header which feed three aeration basins and a septage receiving station. Each aeration basin has three zones and each zone has a dissolved oxygen (DO) meter, air flow meter and a modulating air flow control valve (FCV). The blowers are supposed to maintain the header pressure and the FCVs are supposed to modulate in order to maintain the DO set-point for each zone in each basin. The FCVs are connected to a Pakscan 2s device that controls the valves over a two wire current loop and reports valve status back to the various PLCs.

According to plant personnel, the aeration system has never worked properly. Currently, the operators manually control the number of blowers, each blowers speed and the individual valve positions. The exact reason for the system not working properly is unknown but the likely culprits are:

- Incorrect programming of the Pakscan device
- Corrupt or faulty Pakscan device
- Incorrect programming of the MBCP
  - This could be the Allen Bradley PLC, the Red Lion protocol converter or even the Digi Ethernet to Serial converter

As part of this proposal, we have included the cost to replace the Pakscan device as it is by far the most expensive item. Should any other device require replacing, it will be covered by the Pakscan cost. It should be noted that the Pakscan 2s model has been superseded by the P3 model.

Per the owner's request, we are providing a line item to replace the aeration blower VFDs. It is our intent to use the existing enclosure and retrofit it with the new VFD.

Our scope of work includes:

- Diagnosing and documenting how the various pieces of equipment communicate and their functions.

(208) 433-9997 fax(208) 426-0550 [www.control-engineers.com](http://www.control-engineers.com) 1095 S. Federal Way, Boise, Idaho 83705

Vendor Quote for EEM 3 – Optimize Aeration System Controls (continued)

- Analyze the PLC programming and make changes as necessary to implement the Most Open Valve control technique. This includes PLCs, Pakscan device, protocol converters, HMIs and SCADA.
- Provide onsite system testing and four hours of training. A revised sequence of operations will be provided in PDF format
- Provide four new aeration blower variable frequency drives.
  - Each drive shall be a Square D Altivar 71 series, 150HP, constant torque unit
  - We will provide connection diagrams and drive configuration services
  - Drive installation is not included in this scope
  - We have also included the cost of a site visit by a HSI technician to re-program the individual blower PLCs should the need arise due to the change in VFDs

A summary of estimated costs for the Aeration System Improvements is shown below:

Description	Labor / Expense Cost	Equipment Cost	Subtotal
Diagnose and Fix Aeration Controls	\$32,695	\$18,113	\$50,807
Provide four blower VFDs	\$9,028	\$64,118	\$73,146
<b>Total</b>			<b>\$123,954</b>

**UV System**

The UV system consists of a master control panel (MCP) and four UV banks. According to plant personnel, this system does not function correctly so the operators run all four banks in a manual mode. The SCADA system has no feedback from the UV system whatsoever. According to some of the documentation provided, it appears that at some time in the past, the original MCP was replaced by a company called MethodWorks and that the replacement project did not go well. The scope and extent of what was accomplished by MethodWorks is unknown as they have refused to speak to us about it.

We believe that the master PLC has lost its program, judging from the LED indicators on the processor. In order for Control Engineers to fix the UV dosing system program, the City would need to get a copy of the program from Methodworks so that the appropriate fixes could be made. The cost to perform these fixes would certainly be less than the cost to replace the system as quoted by Trojan, but is undeterminable without a copy of the program from Methodworks. We believe it is Methodworks' responsibility to provide this program to the City, but they will not give it to Control Engineers. If this is not possible, then we recommend that Abacus contract directly with Trojan to replace the MCP as previously quoted by Trojan.

We look forward to the opportunity to work with you on this project. Thank you for your consideration and please contact me if you have any questions or concerns with this proposal.

Sincerely,



Anthony Chris Cocozzo  
Project Manager

(208) 433-9997 fax(208) 426-0550 [www.control-engineers.com](http://www.control-engineers.com) 1095 S. Federal Way, Boise, Idaho 83705

# **INTERAGENCY Amendment**

*Department of Enterprise Services*

Date: December 30, 2014  
Agreement No: K1263  
Project No.: 2013-146  
Amendment No: 3

**Interagency Agreement Between the  
State of Washington  
Department of Enterprise Services  
and the  
City of Camas**

The parties to this Agreement, the Department of Enterprise Services, Facilities Division, Engineering & Architectural Services, hereinafter referred to as “DES”, and the City of Camas, hereinafter referred to as the “CLIENT AGENCY”, hereby amend the Agreement as follows:

## **1. Statement of Work**

DES shall furnish the necessary personnel and services and otherwise do all things necessary for or incidental to the performance of the work set forth in Attachment “**A-1**” and Attachment “**C-1**”, attached hereto and incorporated herein by reference. Unless otherwise specified, DES shall be responsible for performing all fiscal and program responsibilities as set forth in Attachment “**A-1**” and Attachment “**C-1**”.

Energy/Utility Conservation projects shall be authorized by Amendment to this Agreement.

- 1.1 HVAC System & Controls Improvements, Library and Police Station, outlined in the Abacus Resource Management Company Energy Services Proposal dated December 11, 2012.
- 1.2 **Wastewater Treatment Plant Energy Upgrades, outlined in the Abacus Resource Management Company Energy Services Proposal dated December 2, 2014.**
- 1.3 **Review of Measurement and Verification reports years two and three for the Wastewater Treatment Plant Energy Upgrades, outlined in the Abacus Resource Management Company Energy Services Proposal dated December 2, 2014.**

Attachment “A” Scope of Work Energy/Utility Conservation Projects Management Services is revised to Attachment “**A-1**” and Attachment “C” Scope of Work Energy/Utility Conservation Projects Monitoring Services is revised to Attachment “**C-1**” to update the Statewide Energy Performance Contracting Program Master Energy Services Agreement number from Agreement No. 2011-169 to Agreement No. **2013-133**, attached hereto and incorporated herein by reference.

### 3. Period of Performance

Subject to its other provisions, the period of performance of this Agreement shall commence on November 16, 2012, and be completed on **December 31, 2019**, unless altered or amended as provided herein.

### 4. Consideration

Compensation under this Agreement shall be by Amendment to this Agreement for each authorized project. Each Amendment will include a payment schedule for the specific project.

For Project Management Services provided by DES under Attachment “A-1” of this Agreement, the CLIENT AGENCY will pay DES a Project Management Fee for services based on the total project value per Project Management Fees Schedule set forth in Attachment “B”.

If the CLIENT AGENCY decides not to proceed with an Energy/Utility Conservation project that meets the CLIENT AGENCY’s cost effective criteria, then the CLIENT AGENCY will be charged a Termination Fee per Attachment “B”. The Termination Fee will be based on the estimated Total Project Value outlined in the Energy Audit and Energy Services Proposal prepared by the Energy Services Company (ESCO).

If measurement and verification services are requested by the CLIENT AGENCY and provided by DES under Attachment “C-1” of this Agreement, the CLIENT AGENCY will pay DES \$2,000.00 annually for each year of monitoring and verification services requested.

Compensation for services provided by the ESCO shall be paid directly to the ESCO by the CLIENT AGENCY, after DES has reviewed, approved and sent the invoices to the CLIENT AGENCY for payment.

4.1 Energy Project Management Fee for the work described in Section 1.1 is \$24,800.00.

4.2 **Energy Project Management Fee for the work described in Section 1.2 is \$29,000.00. Anticipated billing date for this Amendment is February 1, 2016.**

4.3 **Measurement and Verification Fee for the work described in Section 1.3 is \$4,000.00. Anticipated billing dates for this Amendment are February 1, 2018, and February 1, 2019.**

**The new total Agreement value is \$57,800.00.**

### 5. Billing

DES shall submit a single invoice to the CLIENT AGENCY upon substantial completion of each authorized project, unless a project specified a Special Billing Condition in the



Amendment. Substantial completion of the project will include the delivery and acceptance of closeout documents and commencement of energy savings notification. Each invoice will clearly indicate that it is for the services rendered in performance under this Agreement and shall reflect this Agreement and Amendment number.

DES shall invoice the CLIENT AGENCY for any remaining services within 60 days of the termination of this Agreement.

**Special Billing Condition: Section 1.3 in the Statement of Work. DES shall submit invoice to the CLIENT AGENCY annually for \$2,000.00 on or before February 2 each year, beginning in 2018 and ending in 2019, unless terminated earlier.**

All sections above have been fully amended and are shown in their entirety.

All other terms and conditions of this Agreement remain in full force and effect. The requirements of RCW 39.34.030 are satisfied by the underlying Agreement and are incorporated by reference herein.

Each party signatory hereto, having first had the opportunity to read this Amendment and discuss the same with independent legal counsel, in execution of this document hereby mutually agree to all terms and conditions contained herein, and as incorporated by reference in the original Agreement.

**City of Camas**

**Department of Enterprise Services  
Facilities Division  
Engineering & Architectural Services**

\_\_\_\_\_  
\_\_\_\_\_  
Title Date

\_\_\_\_\_  
William J. Frare, P.E.  
Public Works Administrator  
\_\_\_\_\_  
Title Date

K1263amd3af

# ATTACHMENT A-1

## Scope of Work Energy/Utility Conservation Projects Management Services

### Statewide Energy Performance Contracting Program Master Energy Services Agreement No. **2013-133**

DES will provide the following project management services for each specific project for the CLIENT AGENCY. Each individual project shall be authorized by Amendment to this Agreement.

1. Assist the CLIENT AGENCY in the selection of an Energy Service Company (ESCO) consistent with the requirements of RCW 39.35A for local governments; or 39.35C for state agencies and school districts.
2. Assist in identifying potential energy/utility conservation measures and estimated cost savings.
3. Negotiate scope of work and fee for ESCO audit of the facility(s).
4. Assist in identifying appropriate project funding sources and assist with obtaining project funding.
5. Assist in negotiating the technical, financial and legal issues associated with the ESCO's Energy Services Proposal.
6. Review and recommend approval of ESCO energy/utility audits and Energy Services Proposals.
7. Provide assistance during the design, construction and commissioning processes.
8. Review and approve the ESCO invoice vouchers for payment.
9. Assist with final project acceptance.
10. Provide other services as required to complete a successful energy performance contract.

# ATTACHMENT C-2

## Scope of Work Energy/Utility Conservation Projects Monitoring Services

### Statewide Energy Performance Contracting Program Master Energy Services Agreement No. **2013-133**

If requested DES will provide the following monitoring services for each specific project for the CLIENT AGENCY.

1. Monitor actual energy use and dollar costs, compare with the ESCO's annual Measurement and Verification (M&V) report and any ESCO guarantee, resolve differences, if needed, and approve any vouchers for payment.
2. Monitor facility operations including any changes in operating hours, changes in square footage, additional energy consuming equipment and negotiate changes in baseline energy use which may impact energy savings.
3. Provide annual letter report describing the ESCO's performance, equipment performance and operation, energy savings and additional opportunities, if any, to reduce energy costs.



STATE OF WASHINGTON  
DEPARTMENT OF ENTERPRISE SERVICES

1500 Jefferson St. SE, Olympia, WA 98501  
PO Box 41476, Olympia, WA 98504-1476

December 29, 2014

TO: Steve Wall, City of Camas

FROM: Andrea Faust, Contracts Specialist, (360) 407-9365

RE: Agreement No. 2013-146 B (2)  
Wastewater Treatment Plant Energy Upgrades

Abacus Resource Management Company

SUBJECT: Funding Approval

The Department of Enterprise Services, E&AS, requires funding approval for the above referenced contract document(s). The amount required is as follows:

Design and Implementation of Energy Conservation Measures	\$ 94,836.00
First Year Measurement & Verification	\$ 5,579.00
Years 2 and 3 Measurement & Verification	\$ 5,579.00
WSST Tax (8.4%)	\$ 8,903.50
<b>Total</b>	<b>\$ 114,897.50</b>

**In accordance with the provisions of RCW 43.88, the signature affixed below certifies to the Facilities Division, Engineering & Architectural Services that the above identified funds are appropriated, allotted or that funding will be obtained from other sources available to the using client/agency. The using/client agency bears the liability for any issues related to the funding for this project.**

By \_\_\_\_\_ Date \_\_\_\_\_  
Name / Title

Please sign and return this form to E&AS. If you have any questions, please call me.

2013146Bagrfdaf



STATE OF WASHINGTON  
DEPARTMENT OF ENTERPRISE SERVICES

1500 Jefferson St. SE, Olympia, WA 98501  
PO Box 41476, Olympia, WA 98504-1476

December 29, 2014

TO: Steve Wall, City of Camas

FROM: Andrea Faust, Contracts Specialist, (360) 407-9365

RE: Contract No. 2013-146 H (2-1)  
Wastewater Treatment Plant Energy Upgrades

Abacus Resource Management Company

SUBJECT: Funding Approval

The Department of Enterprise Services, E&AS, requires funding approval for the above referenced contract document. The amount required is as follows:

ESCO Contract Amount	\$ 278,929.00
Sales Tax (8.4%)	\$ 23,430.04
Contingency Amount (with Tax)	\$ <u>23,037.46</u>
<b>Total</b>	<b>\$ 325,396.50</b>

**In accordance with the provisions of RCW 43.88, the signature affixed below certifies to the Facilities Division, Engineering & Architectural Services that the above identified funds are appropriated, allotted or that funding will be obtained from other sources available to the using client/agency. The using/client agency bears the liability for any issues related to the funding for this project.**

By \_\_\_\_\_ Date \_\_\_\_\_  
Name / Title

Please sign and return this form to E&AS. If you have any questions, please call me.

**INTERLOCAL AGREEMENT  
CITY OF CAMAS AND CLARK COUNTY  
JONES CREEK FLOW MONITORING PROJECT**

This Interlocal Agreement (AGREEMENT) between the municipalities is made and executed this \_\_\_\_\_ day of \_\_\_\_\_ 2014, by and between the CITY OF CAMAS, (CITY) and CLARK COUNTY (COUNTY), pursuant to RCW 39.34.080.

WHEREAS, the COUNTY has completed stream flow monitoring in Jones Creek above the CITY water system intake (hereinafter called the "Project") since 2004 as part of its regional monitoring program.

WHEREAS, the CITY foresees the need to acquire Jones Creek stream flow data in the form of daily reports and yearly flow records for a period of at least ten years and does not have in-house resources to complete the Project.

WHEREAS, the County requires funding to continue to implement the Project.

WHEREAS, it is mutually beneficial for the CITY and COUNTY to work cooperatively to complete the Project as generally described in ATTACHMENT A, Project Scope, which is attached hereto and incorporated herein.

NOW THEREFORE it is mutually agreed between the parties hereto as follows:

1. The COUNTY agrees to provide services which will include stream flow project management, field visits, dry season daily flow rate updates, and yearly flow records as described in ATTACHMENT A. The CITY, in consideration of the work described agrees to reimburse COUNTY for all actual costs incurred in executing the Project as set forth herein.
2. Except as otherwise provided herein, any modification to this AGREEMENT must be in the form of a written amendment that is signed by each party. The COUNTY agrees to not exceed the estimated yearly budget amounts described in ATTACHMENT A without first providing an explanation for exceeding the estimated amount and receiving written permission (email acceptable) from the CITY.
3. The CITY agrees to allow the COUNTY to increase the hourly rate for the Natural Resource Specialist III identified in ATTACHMENT A, including salary and benefits, by the lesser of the Consumer Price Index for All Urban Consumers (CPI-U) each year, or the actual labor increase.
4. The CITY agrees to make progress payments to the COUNTY quarterly and at completion of the project based on ATTACHMENT A billing rates for county staff and expenses
5. No liability shall attach to the CITY or the COUNTY by reason of entering into this AGREEMENT except as expressly provided herein. This AGREEMENT is executed for the benefit of the parties and the public generally. This AGREEMENT is not intended and shall not

INTERLOCAL AGREEMENT  
CITY OF CAMAS AND CLARK COUNTY  
JONES CREEK FLOW MONITORING PROJECT  
Page 2 of 6

be construed as creating any third-party beneficiary. Each party agrees to indemnify, defend and hold harmless the other and all its officers, agents, employees and consultants from and against any and all demands, claims, judgments, awards of damages, costs, losses, or liability, including attorney's fees, for any and all claims for damages or injuries to persons, property or agents of the user which arise from its negligent or intentional acts or omissions. In the event of such claims or lawsuits, each party shall assume all costs of its defense thereof, and shall pay all resulting awards of damages, fees, costs or judgments that may be obtained against it or its officers, consultants, agents, or employees. Further each party has insured against its own liability herein and will promptly notify the other of any material change in such coverage.

6. This AGREEMENT does not establish or create a separate legal or administrative entity or a joint board to accomplish the purposes hereof. The CITY and the COUNTY shall be jointly responsible for administering the performance of this AGREEMENT as provided herein. Any instrumentation or equipment used or acquired by the COUNTY in connection with the performance of this AGREEMENT shall be disposed of by the COUNTY as it shall determine in its discretion.

7. The duration of this AGREEMENT is from date of execution of the AGREEMENT through September 30, 2019 and may be renewed for additional five year periods indefinitely through written concurrence by both the COUNTY and CITY.

8. Either party may terminate this AGREEMENT by providing to the other party 30 days' advance written notice of the date of termination, and by paying in full any balance owing for services rendered to the other as of the date of termination. Written notice shall be deemed given when it is actually received by the other party at the address as set forth with its signature, below.

9. This AGREEMENT shall be deemed to have been executed and delivered within the State of Washington. The rights and obligations of the parties hereunder shall be construed and enforced in accordance with, and governed by, the laws of the State of Washington without regard to the principles of conflict of laws. Any action or suit brought in connection with this AGREEMENT shall be filed in the Superior Court of Clark County, Washington.

10. The COUNTY shall not sublet or assign any of the services covered under this AGREEMENT without express written consent by the CITY.


11. This AGREEMENT, including ATTACHMENT A, and any future amendments hereto, constitutes the entire agreement between the parties, and supersedes any prior writing or understanding between the parties on the subject matter of the AGREEMENT.

IN WITNESS WHEREOF, the parties hereto have executed this AGREEMENT as of the day, month and year first above written.

INTERLOCAL AGREEMENT  
CITY OF CAMAS AND CLARK COUNTY  
JONES CREEK FLOW MONITORING PROJECT  
Page 3 of 6


DATED this 22<sup>nd</sup> day of December 2014.  
FOR CLARK COUNTY

DATED this \_\_\_ day of \_\_\_\_\_ 2014.  
FOR the CITY of CAMAS

  
\_\_\_\_\_  
Mark McCauley, Clark County Administrator  
1300 Franklin Street  
PO Box 9810  
Vancouver, WA 98666-9810

\_\_\_\_\_  
Scott Higgins,  
Mayor

Approved as to form only:  
Anthony F. Golik,  
Clark County Prosecuting Attorney

By:   
\_\_\_\_\_  
Christine M. Cook,  
Deputy Prosecuting Attorney

By: \_\_\_\_\_  
Shawn MacPherson,  
City Attorney



**Attachment A**  
**Scope of Work**  
**Jones Creek Flow Monitoring Project**

Submitted by: Clark County Department of Environmental  
Services  
1300 Franklin Street  
Vancouver, WA, 98666

Proposed Amount: \$4,120/year services plus equipment  
replacement costs

Period of Performance: Yearly

Technical Point of Contact: Ian Wigger  
360-397-2121 x4282  
Ian.Wigger@Clark.WA.gov

Business Point of Contact: Bobbi Trusty  
360-397-2121 x5268.  
e-mail address

## SCOPE OF WORK

### INTRODUCTION

#### *Background*

Clark County Clean Water Program (Clean Water) has been collecting stream flow and rainfall data in several Clark County streams to support its stormwater management program. Jones Creek above the City of Camas (Camas) water intake is one of those sites. Recently, budget constraints have limited Clean Water's ability to continue operation of several gauges including Jones Creek. At the same time, Camas sees an increased need for Jones Creek data as part of regional efforts to manage water resources. This Scope of Work proposes to use Clean Water staffing to continue stream flow monitoring in Jones Creek as a service to Camas.

#### *Project Overview*

Camas needs daily flow values for the months of July through October and a flow record for the balance of the year. Clark County will provide this information and continue its monitoring of Jones Creek.

### PROJECT SCOPE

Clean Water will perform the following activities:

- 6 (bi-monthly) site visits to maintain the site, calibrate equipment as needed, and perform a discharge measurement.
- Yearly rating curve maintenance and development.
- Calculate 15 minute flow data for each water year.

Clean Water will provide the following deliverables:

- Access to stage via the internet and a stage discharge table.
- Yearly hydrological metrics such as daily mean, minimum, and maximum discharges.
- Yearly flow record at 15 minute interval.

#### Contingency and Equipment Replacement

- Contingency is included to account for unforeseeable expenses due to changes in the stream channel geometry.
- Camas will reimburse Clark County for replacement equipment.

The following assumptions apply to this project:

- Clean Water equipment and instrumentation are already in place, so no set up costs are incurred other than data logger replacement.
- Clark County staff will have continued access to the Jones Creek gauge at Camas water intake.

**ESTIMATED COST**

Costs should only be from labor, and are as follows:

<b>Task</b>	<b>Days/Year</b>	<b>Cost/Year</b>
Site maintenance and measurement	5	\$2,600
Rating curve development	1	\$520
<b>Sub-Total</b>	6	\$3,120
Contingency		\$1,000
Equipment Replacement		-
<b>Total annual estimated cost</b>		<b>\$4,120</b>
<b>Data logger upgrade (one time)</b>	labor	\$520
	Equipment	\$1,200

Rate for Natural Resource Specialist III: \$65/hour or \$520/day including salary and benefits.

Equipment replacement will be direct cost plus labor. Estimated to be less than \$500/yr.

Monday, December 29, 2014

Mr. Steve Wall, PE  
Utilities Manager  
City of Camas  
1620 SE Eighth Avenue  
Camas, WA 98607

Subject: Preliminary Engineering North Urban Growth Area Sewer Service Alternative  
Analysis – Supplemental Budget

Dear Mr. Wall:

We are pleased to have the opportunity to submit a supplement budget to the City of Camas (City) for additional professional engineering services for the North Urban Growth Area (NUGA) Sewer Service Alternatives Analysis project. There are several components of the project that BergerABAM will need to provide additional analysis and additional time to complete. The supplemental budget will be used to complete the review and development of a Phase 1 program and a future phasing program for sewer system assessment including system layout, pumping analysis, cost estimating, schedule, and meetings with the City and development community.

#### SCOPE OF WORK

##### Task 1: Project Management

This task includes budget and scope monitoring, internal meetings, internal staff scheduling, communications with the City, and invoicing. The task also includes the establishment of a quality assurance/quality control (QA/QC) plan and its implementation during the analysis process.

Task 1 Fee: \$500

##### Task 2: NUGA Phase 1

There are a number of proposed land use developments within the NUGA project area that are currently in various stages of design. BergerABAM with the help of the City will coordinate with these developers/developments and review and evaluate the potential for phasing a sewer system design (Phase 1). The supplemental budget will be used for a more detailed review of Phase 1 project and connecting the system to the existing 10 inch STEP main in Everett. We will evaluate assumptions of the anticipated sewer flows and costs to provide service. We will work closely with City staff in the analysis of the capacity and pressure available 10 inch STEP main. Work will include the preparation of a NUGA Phase 1 schedule for design, permitting and construction, and meetings with the City and development representatives. We will summarize

Mr. Steve Wall  
Monday, December 29, 2014  
Page 2

our work in a memorandum, which will provide an overview of NUGA phase 1 activities and anticipated capital needs associated with a phased approach.

Task 2 Fee: \$12,000

Task 3: Programing Future Phases

If work completed in Task 2 indicates the ability to phase the project, BergerABAM will work with City staff in preparing a phasing schedule for future years. System upgrades will be required as the NUGA area continues to develop in the future and Phase 1 infrastructure reaches capacity. Work will include the development of a high level program and schedule for system improvements up to full build-out. We will summarize our work in a memorandum, which will provide an infrastructure implementation schedule.

Task 3 Fee: \$7,000

#### COST ESTIMATE

Professional fees noted above total \$19,500 will be incurred on a not to exceed time and materials basis for these initial scope of services.

Should you wish to accept this proposal, please sign below indicating your authorization to proceed and agreement to the terms and conditions contained herein. This proposal is valid for 30 days. We look forward to working with you. If you have questions, please call me at 360/823-6126. We want to be of service.

Sincerely,



Sam Adams, Senior Project Manager

ACCEPTED BY  
BergerABAM

---

Signature

---

Sam Adams

---

Name (Printed)

---

Senior Project Manager

---

Title

---

December 29, 2014

---

Date

City of Camas, WA

---

Signature

---

Name (Printed)

---

Title

---

Date





City of Camas  
 Contract Change Order No. 1  
 Date: December 30, 2014

Contract for: S-583 NW 18<sup>th</sup> Ave. Bike & Pedestrian Trail Link  
 To: Mike Green Construction, Inc. P.O. Box 142, Washougal, WA 98671  
 (Contractor)

You are hereby requested to comply with the following changes from the contract plans and specifications.

Description of Changes (Supplemental Documentation Attached)	Decrease in Contract Price	Increase in Contract Price
A. Subcontractor standby delay of 4.5 hours.		\$2,709.97
B. Contractor 12% markup of Subcontractors standby delay billing.		\$325.20
C. Adjust trail vertical alignment to match existing driveway at station 13+00.		\$1,876.32
D. Adjust existing culvert grade at Station 22+83.		\$675.00
E. Vertically adjust existing pressure sewer service at Station 15+80.		\$435.00
F. Adjust contract working days from 25 days to 27 days.		\$0.00

**Net Increase in Contract Price: \$6,021.49**

NOTES: **Item A:** Subcontractor crew and equipment standby delay of 4.5 hours during gas main and storm pipe conflict resolution. Redesign storm pipe grade providing adequate separation under existing gas main increasing material costs slightly for the extra depth. This work approved by W. Heigh, P.M. **Item B:** Contractors 12% markup of subcontractors billing for standby delay. **Item C:** Grade of trail needed to be vertically adjusted to provide usable and smooth driveway access across trail. This work approved by W. Heigh, P.M. **Item D:** Due to field adjustment of storm alignment to miss the existing gas line contractor need to install additional 4 feet of PVC pipe and associated bends to tie into the existing culvert on the east side of NW Deerfern St. This work approved by W. Heigh, P.M. **Item E:** A new pressure sewer service lateral not shown on the plans needed to be raised to provide clearance for the new storm pipe. This work approved by W. Heigh, P.M. **Item F:** Contractor requested two additional working days due to weather delays and existing utility conflicts. Additional working days approved by W. Heigh, P.M.

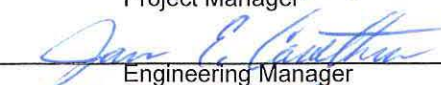
The amount of the contract, prior to sales tax, will be (decreased) **(INCREASED)** (unchanged) by the sum of: Six Thousand Twenty One dollars and Forty Nine cents (\$6,021.49).

The contract total, including the original contract total, this and previous change orders will be: TWO HUNDRED FORTY THOUSAND, TWO HUNDRED SEVENTY THREE DOLLARS and THIRTY TWO CENTS (\$240,273.32). Including Sales Tax.

The contract period provided for completion will be **(INCREASED)**: 2 days.

This document will become a supplement to the contract and all provisions will apply hereto.

Requested  12/30/14  
Project Manager Date

Recommended  1/6/15  
Engineering Manager Date

Accepted  12/30/14  
Contractor Date

Approved \_\_\_\_\_  
Mayor Date



**Michael Green Construction, Inc.**

**PO Box 142  
Washougal, WA 98671**

**Invoice**

Date	Invoice #
12/29/2014	3609

Bill To
City of Camas 616 NE 4th Ave. Camas, WA 98607

Receipt #	Terms	Nature of Service
	Due on receipt	Extra - NW 18th Ave

Quantity	Description	Rate	Amount
<del>40</del>	<del>12" C900 Piping/Per LF (Added Run To Existing West Of Deerfern)</del>	<del>42.46</del>	<del>1,698.40T</del>
36	Rock, 1 1/4" Minus/Per Yard (Build Up In Field To Redesign Existing Drive To Match Grade At Path)	52.12	1,876.32T
1	Subcontractor (McDe) Billing For Gas Conflict	2,709.97	2,709.97T
1	Markup @ 12% - McDonald Billing	325.20	325.20T
1	Adjust Grade On Culvert At Sta 22.83 - Provide 4' 3034, 22 Degree Bend, 2 HR Laborer, 2 HR Dumptruck, 2HR Mini Excavator, 2Hr Backhoe w/Hoepac (10-27-14)	675.00	675.00T
	Pressure Sewer Conflict - 3HR Mini Excavator, 3 Hrs Labor (10-17-14)	435.00	435.00T

Thank you for your business.	<p><i>ITEMS NOT SUBJECT TO TAX WGAH</i></p> <p><b>Sales Tax (8.4%)</b> <del>-\$648.47</del></p>
	<p><b>Total</b> <del>\$8,368.36</del> <i>\$6,021.49 WGAH</i></p>
	<p><b>Payments/Credits</b> \$0.00</p>
	<p><b>Balance Due</b> <del>\$8,368.36</del> <i>\$6,021.49 WGAH</i></p>

**Daily Change Order Summary Sheet  
NW 18th Ave Bike and Pedestrian Trail**

McDonald Excavating, Inc.  
Prime Contractor: Green Construction, Inc  
McDE Project No. 14067

Date of Work: 10/17/14 Form Completed By: RM Checked By: RM  
Description of Work: Gas Line Conflict  
Gas Line Conflict with 12" C900 Storm. Lower 12" Storm Line to get Clearance under gas line. Redesign Slope on run.

Notice of Change No. \_\_\_\_\_ Phase \_\_\_\_\_

LABOR						
Classification	Regular	Overtime		Rate	OT Rate	Amount
Foreman	4.50		hours @	\$ 57.57	\$ 77.86	\$ 259.07
Operator	4.50		hours @	\$ 55.65	\$ 74.97	\$ 250.43
Operator	4.50		hours @	\$ 55.65	\$ 74.97	\$ 250.43
Laborer	4.50		hours @	\$ 49.02	\$ 65.02	\$ 220.59
Truck Driver (prevailing)	4.50		hours @	\$ 48.39	\$ 63.95	\$ 217.78
None			hours @	\$ -	\$ -	\$ -
None			hours @	\$ -	\$ -	\$ -
None			hours @	\$ -	\$ -	\$ -
Sub-Total						\$ 1,198.26
		29.00%	Markup			\$ 347.60
<b>Total Labor</b>						<b>\$ 1,545.76</b>

CONTRACTOR OWNED EQUIPMENT (Blue-Book Values)							
Equip ID No.	Description	Regular	Standby		Rate	SB Rate	Amount
P17	07 Ford F-550 Foremans Truck	4.5		hours @	\$ 20.00	\$ 8.00	\$ 80.00
I02	2004 JD 624H Wheel Loader	4.5		hours @	\$ 62.00	\$ 24.80	\$ 279.00
EX10	2014 JD 85G Excavator	4.50		hours @	\$ 48.00	\$ 19.20	\$ 216.00
T03	86 Mack 3 Axle Dump Truck (Solo)	4.5		hours @	\$ 35.00	\$ 14.00	\$ 157.50
None				hours @	\$ -	\$ -	\$ -
None				hours @	\$ -	\$ -	\$ -
None				hours @	\$ -	\$ -	\$ -
None				hours @	\$ -	\$ -	\$ -
None				hours @	\$ -	\$ -	\$ -
Sub-Total							\$ 742.50
		21.00%	Markup				\$ 155.93
<b>Total Equipment</b>							<b>\$ 898.43</b>

OUTSIDE RENTALS						
Description	Supplier	Inv. No.	Date	Hours	Amount	
					\$ -	
					\$ -	
					\$ -	
Sub-Total					\$ -	
		21.00%	Markup		\$ -	
<b>Total Services</b>						<b>\$ -</b>

SUBCONTRACTORS & MATERIALS (See Attached Invoices)						
Description	Supplier	Qty	Price	Date	Amount	
3/4" 0	Cemex	12.13	9.75	10/17/2014	\$ 118.27	
Sand	Cemex	6.77	13.50	10/17/2014	\$ 91.40	
Dump Fees	ECM	10.00	1.00	10/17/2014	\$ 10.00	
					\$ -	
					\$ -	
					\$ -	
Sub-Total					\$ 219.66	
		21.00%	Markup		\$ 48.13	
<b>Total Materials</b>						<b>\$ 265.79</b>

**GRAND TOTAL FOR DAY** **\$ 2,709.97**



# Field Draft Work Order

Reference No: \_\_\_\_\_

Date: 10/17/14

Job: Mike Green

Project #: 14067

For: City CAMAS

Address: N.W. 13<sup>th</sup> Avenue Bike and Pedestrian Trail

Description: Gas line conflict with 12" C 900 Storm. Lower 12" storm line to get clearance under Gas line. Re Design Slope on run.

EQUIPMENT AND SMALL TOOLS (MCDE OWNED)			MATERIALS AND OUTSIDE RENTALS		
Equip. No.	Equipment	Hours	PO No.	Vendor	Quantity
P17	Ford 550	4.5		Cemex /	6.77 Tons <i>smcl</i>
L02	JD 624H loader	4.5		Cemex	12.13 Tons <i>3/4"</i>
EX10	JD 856 Track hoe	4.5		East <del>Cemex</del> <i>Quality Materials</i>	10 yds <i>Dirct</i>
T03	Mack Dump truck	4.5			
Equipment subtotal:			Materials and outside rentals subtotal:		
LABOR			SUBCONTRACTORS		Quantity
Trade	Name	Hours			
OF	Joe Lingle	4.5			
G0	Roy Browning	4.5			
G0	Tim Schade	4.5			
GL	Wyne Neil	4.5	Subcontractor's subtotal:		
			COST SUMMARY		Quantity
			Equipment		
			Labor		
			Materials and Outside Rentals		
			Subcontractors		
			SUBTOTAL		
			OVERHEAD & PROFIT		%
Labor subtotal:			TOTAL		

McDE Representative: \_\_\_\_\_

Date: \_\_\_\_\_

Authorized By: \_\_\_\_\_

Date: \_\_\_\_\_



# Field Draft Work Order

Reference No: \_\_\_\_\_

Date: 10/17/14

Job: Mike Green

Project #: 17067

For: City of Ames — Mike Green Construction

Address: RW 18<sup>th</sup> Avenue Lake and Pedestrian Trail

Description: Excavation work with 12' x 3m Shovel remove 12' Shovel hole to get clearance over gas line. Re Design Slope on site.

EQUIPMENT AND SMALL TOOLS (MCDE OWNED)			MATERIALS AND OUTSIDE RENTALS		
Equip. No.	Equipment	Hours	PO No.	Vendor	Quantity
P17	Ford 550	4.5		Cemex /	6.77 Tons
LOZ	JD 624H loader	4.5		Cemex	12.13 Tons
EX10	JD B5G Track hoe	4.5		East Family Materials	10 yds
TO3	MAACK Dump truck	4.5			
Equipment subtotal:			Materials and outside rentals subtotal:		
LABOR			SUBCONTRACTORS		Quantity
Trade	Name	Hours			
OF	Joe Lingle	4.5			
GO	Roy Browning	4.5			
GO	Tim Schade	4.5			
GL	Wayne Weil	4.5	Subcontractor's subtotal:		
TD	Shawn Hanna	1.5			
			COST SUMMARY		Quantity
			Equipment		
			Labor		
			Materials and Outside Rentals		
			Subcontractors		
			SUBTOTAL		
			OVERHEAD & PROFIT		%
Labor subtotal:			TOTAL		

Sand  
3/4"  
Dirt

McDE Representative: \_\_\_\_\_

Date: \_\_\_\_\_

Authorized By: \_\_\_\_\_

Date: \_\_\_\_\_



3.214085



Date	Plant #	Plant Name	Ticket Time
Project #	Job #	PO #	Zone Map ID
Customer #	Sold to		Truck #
Delivery Address			Haulor/Truck Description
			WeighMaster
Instructions			

LOAD QUANTITY	CUMULATIVE QUANTITY	# OF LOADS	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT PRICE	AMOUNT
			0-01.001	6.77 Tons		14067

SUB-TOTAL	TAX	TICKET TOTAL
-----------	-----	--------------

The undersigned promises to pay all costs, including reasonable attorney's fees, incurred in collecting any sums owed.

All accounts not paid within 30 days of delivery will bear interest at the rate of 18% per annum.

Not Responsible for Reactive Aggregate or Color Quality. No Claim Allowed Unless Made at Time Material is Delivered.

A \$40.00 Service Charge and Loss of the Cash Discount will be collected on all Returned Checks.

Standby \_\_\_\_\_  
Time \_\_\_\_\_ Initials \_\_\_\_\_

**TRUCKER'S DAMAGE RELEASE TO BE SIGNED BY DRIVER TO BE MADE INSIDE CURB LINE**  
Dear Customer: The driver of this truck who is presenting this RELEASE to you for your signature is of the opinion that the size and weight of his truck may possibly cause damage to the premises and/or adjacent property if he places the material in this Spot where you desire it. It is not wish to help you in every way that we can. In order to do this the driver is requesting that you sign this RELEASE relieving him and the supplier from any responsibility for any damage that may occur to the premises and/or adjacent property, buildings, sidewalks, drive ways, curbs, etc. by the delivery of this material and that you also agree to hold him harmless from the wheels of his vehicle so that he will not start the public street. Further, as additional consideration, the undersigned agrees to indemnify and hold harmless the driver of this truck and this supplier for any and all damage to the premises and/or adjacent property which may be claimed by anyone to have arisen out of delivery of this order.  
SIGNED \_\_\_\_\_

**NOTICE: MY SIGNATURE BELOW INDICATES THAT I HAVE READ THE HEALTH WARNING NOTICE AND SUPPLIER WILL NOT BE RESPONSIBLE FOR ANY DAMAGE CAUSED WHEN DELIVERING INSIDE CURB LINE.**

LOAD RECEIVED BY:  \_\_\_\_\_ AUTHORIZED SIGNATURE

The signature above signifies receipt and acceptance of the listed materials and acknowledgement of and agreement to the terms and conditions on the face and reverse side of this ticket.



# INVOICE



001306

MCDONALD EXCAVATING INC  
2719 MAIN ST  
WASHOUGAL, WA 98671-4109

CEMEX  
PO Box 2037  
Everett, WA 98213-2037

Rinker Materials  
Portland/Vancouver

Date	10/17/14
Invoice No.	9429582327
Reference No.	

Terms: Net 10th prox

Payment Due On 11/10/14  
Job No. 14000796  
Legal Address: NW 18TH AVE & BRADY RD CAMAS  
Customer Job No.  
Account: 3032673

Remit To:

CEMEX  
PO Box 73261  
Chicago, IL 60673-3261

For All Inquiries Call: 800-355-2772

PO Number		Delivery Address				City			Zip Code			
DATE SHIPPED	DELIVERY NUMBER	REF#	PRODUCT CODE	PRODUCT DESCRIPTION	DELIVERED QTY	UOM	NET UNIT PRICE	PRICED BY	UOM	UNITS	MATERIAL AMOUNT	FREIGHT
NO PO		NW 18TH & BRADY ROAD				VANCOUVER					98684	
10/17/14	8063988392	1481336402	1000041	CONCRETE SAND * <i>Washed</i>	6.770	TON	13.50	1	TON	6.770	\$91.40	\$0.00
PO Subtotal:		0.00	Yards	6.77	Tons		\$91.40	Material		\$0.00	Freight	
NO PO / SHAWN		NW 18TH AVE & BRADY RD				VANCOUVER					98683	
10/17/14	8063987015	1484402543	1307564	3/4"-0 BASE COARSE	12.320	TON	9.75	1	TON	12.320	\$120.12	\$0.00
10/17/14	8063988626	1484402550	1307564	3/4"-0 BASE COARSE	11.830	TON	9.75	1	TON	11.830	\$115.34	\$0.00
10/17/14	8063988644	1484402564	1307564	3/4"-0 BASE COARSE	12.000	TON	9.75	1	TON	12.000	\$117.00	\$0.00
10/17/14	8063988875	1484402686	1307564	3/4"-0 BASE COARSE	12.130	TON	9.75	1	TON	12.130	\$118.27	\$0.00
PO Subtotal:		0.00	Yards	48.28	Tons		\$470.73	Material		\$0.00	Freight	

14067 2-01.001  
0-01.001

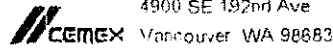
\$352.46  
\$209.127  
\$

Yards	0.00	Tons	55.05	Freight Total	0.00	Other	0.00	Sales Tax Total	0.00	Invoice Total	562.13
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Weighed At Fisher Quarry

1484402686



4900 SE 192nd Ave

Vancouver WA 98683

Location: 1484

Order: Dispatch: 0 Date: 10/17/2014

Ship To: 3032673 - MCDONALD EXCAVATING INC

NW 18TH AVE & BRADY RD

NW 18TH AVE & BRADY RD-CAMAS

VANCOUVER, WA 98683

Instruct: NW 18TH AVE & BRADY RD-CAMAS

Job #: PO: NO PO / SHAWN

Product: 1307564 - 3/4"-0 BASE COARSE

Carrier: -

Vehicle: 2126663 - P875-850SO MCDONALD EXCAVATING

Tractor / Trailer 1 / Trailer 2 - / -

Qty: 12 13 ton --- DRIVER ON AT TARE & GROSS---				
Weighmaster:		lb	ton	tne
CEMEX	Gross:	46,780	23 39	21.22
Deputy Weighmaster:	Tare:	22,520	11 26	10.21
Canby Roads	Net:	24,260	12 13	11.00
Scale: 6	* Predetermined Tare			
In:	Today Loads:			4
Out: 1 28 pm	Today Qty:			48 28 ton
				0-01.001
				0.00
				12.13 Tons
				0.00
				14067

CEMEX'S STANDARD TERMS AND CONDITIONS INCORPORATED HEREIN

Signature of Receiving Agent

Driver:

METRIC CONVERSION FORMULA: POUNDS DIVIDED BY 2204.623, ROUNDED TO 2 DECIMALS  
SEE REVERSE SIDE FOR PRODUCT LABEL INFORMATION



Site:  
913 NE 172nd Ave  
Vancouver, WA 98664  
Phone: (360) 253-3054



Fax: (360) 253-3055

Mailing:  
Rotschy, Inc.  
9210 NE 62nd Ave  
Vancouver, WA 98665

Account: 51235  
Name: McDonald Excavating, Inc.

Ticket: 150516

Vehicle: 850  
McDonald Excavating, Inc.

PO Number : N W 18th & Brady  
Job Number:

Time In: 10/17/2014 9:23:51 AM  
Time Out: 10/17/2014 9:23:51 AM

Material: Fill Class S  
In: 10  
Out: 0

Net: 10 = 10yd  
Price \$1.00 per yd

0-01.001  
10 yds Dirt  
14067  
JK

Sale : \$10.00  
Sales Tax : \$0.00  
Total Charge : \$10.00

X \_\_\_\_\_

ALL LOADS are subject to inspection and approval by the pit operator before dumping. Loads will be segregated and dumped in areas designated by the pit operator so that testing can be done to prevent the dumping of contaminated materials.

Any materials containing hazardous waste will be removed at dumper's expense, including the removal of soil to which the contamination has spread and the dumper hereby indemnifies Rotschy, Inc. and Grayrock Resources, L.L.C. from any cost or expense as a result of any such hazardous waste.

By dumping at this site, the dumper acknowledges and agrees that it has read and shall be bound by the contents of this ticket.

Soil, whether screened or unscreened, received from East County Materials, is sold as-is, where-is. Purchasers are hereby notified that said soil meets no testing standards for moisture content or purity from contamination such as weed seeds. Removal from loading site constitutes acceptance by purchaser.

CUSTOMER

## Wes Heigh

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**From:** Green Construction, Inc. <greenconstinc@peoplepc.com>  
**Sent:** Tuesday, December 30, 2014 10:53 AM  
**To:** Wes Heigh  
**Subject:** NW 18th Ave. Additional Days

Wes,

Due to weather delays, utility conflicts, and the extras we had to perform on the trial project has put us in a position to need to request two additional days to complete project and punch list items.

Thank you for your consideration.

Mike

## PROFESSIONAL SERVICES AGREEMENT

THIS AGREEMENT is made as of the 1st day of January, 2015 by and between **Lynn Wittwer, MD, PC**, a Washington professional corporation, doing business as the Clark County EMS Medical Program Director, (MPD), and **Camas-Washougal Fire Department (CFD)**.

1. Duties of MPD.
  - (a) MPD hereby contracts with CFD to provide medical oversight, consultation, training, and quality assurance services as per the MPD duties and responsibilities defined in WAC 246-976 and delineated in the MPD Work Plan City of Vancouver and Clark County Fire/EMS Districts (attachment 1).
  - (b) CFD may choose to request further MPD services pertaining to occupational medicine as per mutual agreement between CFD and MPD.
2. Compensation. CFD shall pay MPD \$12,727 per year, divided into quarterly payments of \$3,181.66, based upon the Compensation Formula (attachment 2).
3. Term of Agreement.
  - (a) Initial Term. The term of this Agreement shall be from the initial date of January 1st, 2015 ("Initial Date") to the ending date of December 31st, 2015 ("Ending Date").
  - (b) Renewal of Term. ("Evergreen"). Unless, on or before 30 days prior to the Ending Date of the current term of this Agreement, written notification is received by either party not to renew the terms of this Agreement, this Agreement shall automatically renew for an additional one-year period, provided that adjustments to the Compensation Formula may be made by mutual agreement.
  - (c) Termination. Either party may terminate this Agreement with "cause" at any time upon written notice to the other party. "Cause" shall include, but shall not be limited to, any failure to act in accordance with or otherwise meet the terms and conditions of this Agreement.
4. Qualifications. Prior to commencing services under the terms of this Agreement, MPD shall obtain all licenses and credentials necessary for the practice of medicine and dispensing of medications used in the practice of prehospital care in the state of Washington. MPD shall maintain these licenses and credentials throughout the term of this Agreement and any extensions thereof. In the event MPD shall fail to obtain or maintain the licenses and credentials, this Agreement shall terminate automatically as of the date MPD's licenses or credentials lapse.
5. Notices. All notices required or sent pursuant to this Agreement shall be delivered in person or mailed by certified mail, return receipt requested, to the parties at the following addresses:

MPD: Lynn K.Wittwer, M.D., PC  
900 W Evergreen Blvd  
Vancouver, WA 98660-3035

CFD: Nick Swinhart, Chief  
Camas-Washougal Fire Dept.  
616 NE 4th Avenue  
Camas, WA 98607

6. Governing Law. This Agreement shall be governed by and construed according to the laws of the state of Washington.
7. IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

Nick Swinhart, Chief  
CFD

Lynn Wittwer, MD, PC  
MPD, Clark County EMS

**Clark County Medical Program Director  
Work Plan for City of Vancouver and Clark County Fire/EMS Districts**

**1. Clinical Protocols, Guidelines and Operating Procedures**

- 1.1 Emergency Medical Dispatch Protocols WAC 246-976-920 (3) (d):  
1) Assist Clark Regional Emergency Services Agency (CRESA) and other control centers involved in Emergency Medical Dispatch (EMD) call taking in developing EMD protocols; 2) Determine appropriate EMS response upgrades to given EMD call types; and 3) Further define, as required in EMD protocols, specific direction given by local medical control pertaining to patient care.
- 1.2 Prehospital Care Guidelines WAC 246-976-920 (3) (b):  
Regularly complete a review of prehospital care protocols and revise as appropriate. Protocol revision shall take into consideration results of medical audits, input from other qualified healthcare providers, research and best practices.
- 1.3 Controlled Substance Guidelines WAC 246-976-920 (3) (c):  
Establish standards for storing, dispensing and administering controlled substances in accordance with state and federal regulations and guidelines.
- 1.4 Regional EMS and Trauma Care Plans WAC 246-976-920 (3) (d):  
Provide recommendations in the development and revision of the SW Region EMS and Trauma Care Plan.
- 1.5 EMS System Design WAC 246-976-920 (3) (a-g):  
In addition to the above, work with local agency administrators to develop, review and implement County Operating Procedures and EMS System Design Policies.

**2. Training, Continuing Education, and Certification**

- 2.1 Approve EMT Course Content and Instructors. WAC 246-976-023 (3):  
Review and approve initial EMS training courses at all levels provided in Clark County. Approve all participating instructors and provide course instruction as appropriate.
- 2.2 Recommend Senior EMS Instructors. WAC 246-976-920 (3) (k):  
Recommend to the DOH, SEIs who are responsible for initial EMR and EMT-Basic courses.
- 2.3 Approve and Supervise CME, or OTEP and Special Training WAC 246-976-161 (1 - 5):  
CME Option: Approve and supervise the Continuing Medical Education (CME) training offered and ensure it meets DOH guidelines for recertification.  
OTEP Option: Approve and supervise the Ongoing Training and Evaluation Program (OTEP) for Clark County BLS personnel (including endorsements) in didactic and skills learning.  
PCEP: Approve and supervise the Paramedic Continuing Education Program (PCEP) based on guidelines for recertification via DOH and NREMT in didactic and skills learning.
- 2.4 Special Training (as necessary) WAC 246-976-024 (1 - 6):  
As necessary, approve specialized training that is not included in the standard course curricula.

**3. Quality Assurance**

- 3.1 Prospective WAC 246-976-920 (3):  
In collaboration with EMS agency management, establish the standards for field observation process for new hires, probationary employees, and lead paramedic candidates as well as Emergency Medical Dispatchers (EMD). Ensure proper documentation of performance observation is being done.
- 3.2 Concurrent - WAC 246-976-920 (3)  
Participate in direct evaluation of Clark County EMS personnel provision of out-of-hospital care that includes, but is not limited to:  
a) Random ride-a-longs

- b) Evaluation of clinical skills performance in practical skill and simulation training
- c) Establish patient outcome and feedback loops with both Clark County receiving facilities.
- 3.3 Retrospective WAC 246-976-920 (3):
  - a) Oversee the EMD quality assurance process used by control centers operating in the county
  - b) In collaboration with EMS providers, determine specific clinical treatment areas and low frequency-high risk skills for flag chart review
  - c) Monitor specific clinical treatment trends and sentinel events for case review as well as adjusting prehospital scope of practice
- 3.4 Inquiry/Complaint WAC 246-976-191 (3) (4):
  - a) In collaboration with EMS agency management, conduct incident fact finding in response to complaints/inquiries regarding out-of-hospital care.
  - b) As needed, conduct appropriate counseling and develop corrective action plans working with the involved agency's management.
  - c) As per State of Washington guidelines for MPD's, provide necessary reporting to DOH, of those instances that meet Threshold Determination Guidelines.

#### **4. Certification and Recertification**

- 4.1 Exams WAC 246-976-920 (3) (e)  
Develop and oversee the initial written exam for Clark County Paramedics; conduct a one-on-one interview with those Paramedics that meet appropriate certification requirements and have successfully passed the written exam; and establish and oversee the remedial training necessary for those individuals who do not successfully complete the written exam.
- 4.2 Recommendation WAC 246-976-920 (3) (i)  
Recommend EMS personnel certification, recertification, or denial of same to the DOH
- 4.3 Oversee certification process used for control center EMDs  
Ensure compliance with regulations established for control center personnel

#### **5. Boards and Meetings**

- 5.1 Monthly EMS Training and Quality Management  
Coordinate monthly EMS Training and Quality Improvement Committee meetings for the purpose of: 1) coordinating EMS training and CME including review of State mandated curriculum and content changes as well as oversight of instructor qualifications and lesson plan development; 2) review of patient care incidents as they pertain to the standard of care and county operating procedures; 3) development of patient care guidelines; and 4) evaluation of new EMS procedures, equipment and medications.
- 5.2 Medical Dispatch Review Committee  
Regularly attend the Medical Dispatch Review Committee meetings for the purpose of: 1) coordinating EMD education and training; 2) quality review of pertinent EMS calls; 3) implementation of new protocols; and 4) special projects
- 5.3 County EMS and Trauma Care Council WAC 246-976-920 (3) (d)  
Regularly attend, as an Executive Committee member, the County EMS and Trauma Care Council that: 1) Reviews, evaluates and recommends to the SW Region EMS and Trauma Care Council (SW EMS/TC) the provision of and plan for EMS and trauma care in the region; 2) Makes recommendations to SW EMS/TC about the development of regional patient care procedures; 3) Reviews SEI applications and make recommendations to the DOH; 4) Recommends initial training classes and OTEP programs to the DOH; and 5) participate in any special projects as they arise.
- 5.4 Ambulance Contract Oversight Board  
Regularly attend the Ambulance Contract Oversight Board meetings and provide clinical expertise regarding EMS System performance pertaining to the Contract for Ambulance Service.
- 5.5 Regional Research and Protocol Development

Regularly attend monthly meetings in the Portland-Vancouver metro area to jointly work on EMS research and protocol development.

5.6 Regional EMS and Trauma Care Council WAC 246-976-920 (3) (d)

Regularly attend the SW Region EMS and Trauma Care Council that includes in part: 1) Assessment of regional EMS and trauma care needs; 2) Identification of resources (personnel, training, facilities and equipment) to meet those needs; 3) Development of a regional plan to meet the state standards of patient care; 4) Establishing the number and level of trauma care facilities; and 5) Recommending to the Department the number and level of out-of-hospital care services.

5.7 State EMS Related Committee's As Required

Regularly attend state EMS committees i.e., Governor's Steering Committee (GSC) that advises the state on the Prehospital EMS and Trauma State Plan, and on administrative rules pertaining to prehospital provider licensing and certification; and participate in any appropriate Prehospital TAC reporting to the GSC.

5.8 State MPD

Attend the regularly scheduled Medical Program Directors meeting.

5.9 Other

Attend and participate in other regional, State, and national meetings that are relevant to the continuum of emergency medical care.

## 6. Counseling, Remedial and Corrective Action

6.1 Counseling, Personal Improvement Plan, Suspension, Revocation WAC 246-976-191 (3 – 6)

- a) Coordinate with Clark County EMS agencies appropriate counseling and personal improvement plans regarding patient care for those EMT's and Paramedics requiring remediation;
- b) Immediately report to the DOH any EMS personnel incident requiring investigation as per State guidelines.

## 7. Reports

7.1 Out-of-Hospital Care Audit Reports

- a) Key performance indicators
- b) Annual cardiac arrest outcomes

7.2 Monthly EMD Compliance

Review the monthly EMD compliance reports provided by CRESA and the other control centers operating in the county.

7.3 Annual Report

Provide an annual written report outlining: 1) Recommendations for system improvement to the clinical performance of the system; and 2) results of current research projects and studies.

7.4 WACARES

Participate with the Washington CARES Program and provide an annual report on cardiac arrest outcomes in Clark County.

7.5 Other

Collaboratively work with the EMS providers to develop reports that are useful at improving patient care.

## 8. Current System Studies

- 8.1 Lead in the establishment of a research agenda for the County as well as oversee and participate in other area research projects related to out-of-hospital care.

# MPD Agency Budget – CFD

	Transport Agencies			1st Resp. BLS Non Transport	
	AMR	Camas	NCEMS	ECF&R	Washougal
<b>Medic Training Cost</b>		27			
Cost per medic \$156.52		\$4,067.28			
<b>QA/QI Cost (\$112,200)</b>					
\$106,590.00 95% ALS QA Hours	92% of Transports				
\$5,610.00 5% BLS QA Hours	6% of Transports	\$3,705.75			
\$79,943.00 75% Transport Agencies	2% of Transports				
\$26,648.00 agency					
\$5,329.60					
<b>General Oversight (\$114,900)</b>					
Cost per Encounter \$1.74	# of Encounters	1,771		373	885
		\$2,896.28		\$610.00	\$1,447.32
<b>Total</b>	<b>Total</b>	<b>\$0.00</b>	<b>\$10,669.31</b>	<b>\$610.00</b>	<b>\$1,447.32</b>

**Total Agency Budget: \$12,726**



CITY OF CAMAS PROJECT NO. WS-741 2014 STEP/STEF Tank Pumping			PAY ESTIMATE: SEVEN PAY PERIOD: 12/1/2014 Through 12/31/2014				AAA Septic Service PO Box 1668 Brush Prairie, WA 98606 (360) 687-8960				
			ORIGINAL CONTRACT AMOUNT: \$67,662.48								
ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS EST.	TOTAL THIS EST.	QUANTITY TO DATE	TOTAL TO DATE

SANITARY SEWER											
1	Residential STEP & STEF Tank Pumping	EA	504	\$116.89	\$58,912.56	389.00	\$45,470.21	55.00	\$6,428.95	444.00	\$51,899.16
2	EMERGENCY Residential STEP & STEF Tank Pumping	EA	15	\$116.89	\$1,753.35	1.00	\$116.89	4.00	\$467.56	5.00	\$584.45
3	Commercial STEP and STEF Tank Pumping	1000 Gal	15	\$116.89	\$1,753.35	0.00	\$0.00	15.00	\$1,753.35	15.00	\$1,753.35

<b>SUBTOTAL:</b>					\$62,419.26		\$45,587.10		\$8,649.86		\$54,236.96
Sanitary Sales Tax (8.4%):					\$5,243.22		\$3,829.32		\$726.59		\$4,555.90
<b>Total:</b>					\$67,662.48		\$49,416.42		\$9,376.45		\$58,792.86

ORIGINAL CONTRACT TOTAL	CONTRACT TOTAL	TOTAL PREVIOUS	TOTAL THIS EST.	TOTAL TO DATE
\$62,419.26	\$62,419.26	\$45,587.10	\$8,649.86	\$54,236.96
ADDITIONS / DELETIONS	\$0.00	\$0.00	\$0.00	\$0.00
SUBTOTAL	\$62,419.26	\$45,587.10	\$8,649.86	\$54,236.96
SALES TAX (8.4%)	\$5,243.22	\$3,829.32	\$726.59	\$4,555.90
TOTAL CONTRACT	\$67,662.48	\$49,416.42	\$9,376.45	\$58,792.86
LESS 5% RETAINAGE		(\$2,279.36)	(\$432.49)	(\$2,711.85)
<b>TOTAL LESS RETAIN.</b>		<b>\$47,137.06</b>	<b>\$8,943.96</b>	<b>\$56,081.02</b>

SAN. ACT. NUMBER: 424.00.535.811.48

SAN. THIS PAY EST: \$8,943.96

F.I.

Project Engineer

Date


Contractor

Date

Project Manager

Date

 1/6/15

 1/6/15

 1/6/15

CITY OF CAMAS PROJECT NO. S-565 DESCRIPTION: NW 38th Avenue Roadway Improvements, Ph. 2		NUTTER CORPORATION 7211 NE 43rd Avenue, Vancouver, WA 98661 Phone: (360) 573-2000 Original Contract Total: \$4,219,597.22 (Includes Sales Tax Amount: \$6,646.42)			STP / TIB / REET FUNDING		WATER / SEWER ACCOUNT		Previous Estimate Totals		Current Estimate Totals		Totals to Date			
PAY ESTIMATE #7 Special Council Meeting Date: January 17, 2015 Work Period Date: December 8, 2014 - December 31, 2014		ORIGINAL QUANTITIES, ETC.			Quantity		Amount		Quantity	Amount	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS ESTIMATE	TOTAL THIS ESTIMATE	QUANTITY TO DATE	TOTAL TO DATE
ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	Quantity	Amount	Quantity	Amount	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS ESTIMATE	TOTAL THIS ESTIMATE	QUANTITY TO DATE	TOTAL TO DATE	
<b>Schedule A</b>																
A 1	Mobilization	LS	1.0	\$314,000.00	\$314,000.00	1.00	\$314,000.00			1.00	\$314,000.00			1.00	\$314,000.00	
A 2	Roadway Surveying	LS	1.0	\$30,000.00	\$30,000.00	1.00	\$30,000.00			1.00	\$30,000.00			1.00	\$30,000.00	
A 3	SPCC Plan	LS	1.0	\$1,000.00	\$1,000.00	1.00	\$1,000.00			1.00	\$1,000.00			1.00	\$1,000.00	
<b>Traffic Control</b>																
A 4	Traffic Control Supervisor	LS	1.0	\$25,000.00	\$25,000.00	0.72	\$17,884.79			0.72	\$17,884.79			0.72	\$17,884.79	
A 5	Flaggers and Spotters	HR	2,350.0	\$49.00	\$115,150.00	2,469.50	\$121,005.50			2,348.00	\$115,052.00	121.50	\$5,953.50	2,469.50	\$121,005.50	
A 6	Other Traffic Control Labor	HR	200.0	\$49.00	\$9,800.00	281.00	\$13,769.00			258.50	\$12,666.50	22.50	\$1,102.50	281.00	\$13,769.00	
A 7	Construction Signs, Class A	SF	120.0	\$24.00	\$2,880.00	160.00	\$3,840.00			160.00	\$3,840.00			160.00	\$3,840.00	
A 8	Portable Changeable Message Sign	HR	336.0	\$15.00	\$5,040.00	190.00	\$2,850.00			190.00	\$2,850.00			190.00	\$2,850.00	
A 9	Other Temporary Traffic Control	LS	1.00	\$7,000.00	\$7,000.00											
<b>Grading</b>																
A 10	Clearing and Grubbing	LS	1.0	\$75,000.00	\$75,000.00	1.00	\$75,000.00			1.00	\$75,000.00			1.00	\$75,000.00	
A 11	Removal of Structures and Obstructions	LS	1.0	\$40,000.00	\$40,000.00	1.00	\$40,000.00			1.00	\$40,000.00			1.00	\$40,000.00	
A 12	Roadway Excavation, Incl. Haul	CY	3,000.0	\$18.00	\$54,000.00	3,009.05	\$54,162.90			3,009.05	\$54,162.90			3,009.05	\$54,162.90	
A 13	Unsuitable Foundation Excavation, Incl. Haul	CY	1,600.0	\$9.50	\$15,200.00											
A 14	Gravel Borrow, Incl. Haul (CO#1 Adjusted final quantity to 4,285 cy)	CY	14,300.0	\$18.50	\$264,550.00	4,285.00	\$79,272.50			3,641.63	\$67,370.16	643.37	\$11,902.35	4,285.00	\$79,272.50	
A 15	Ditch Excavation, Incl. Haul	CY	550.0	\$25.00	\$13,750.00	543.00	\$13,575.00			531.20	\$13,280.00	11.80	\$295.00	543.00	\$13,575.00	
A 16	Channel Excavation, Incl. Haul	CY	29,000.0	\$8.50	\$246,500.00	28,805.00	\$244,842.50			28,805.00	\$244,842.50			28,805.00	\$244,842.50	
A 17	Stormwater Facility Excavation, Incl. Haul	CY	10,000.0	\$8.50	\$85,000.00	9,999.40	\$84,994.90			9,999.40	\$84,994.90			9,999.40	\$84,994.90	
A 18	Construction Geotextile for Separation	SY	235.0	\$3.00	\$705.00	288.80	\$866.40			288.80	\$866.40			288.80	\$866.40	
<b>Bases</b>																
A 19	Crushed Surfacing Base Course	TON	11,020.0	\$20.00	\$220,400.00	11,578.19	\$231,563.80			11,578.19	\$231,563.80			11,578.19	\$231,563.80	
A 20	In Place Cement Amended Base	SY	6,450.0	\$3.40	\$21,930.00	7,038.00	\$23,929.20			7,038.00	\$23,929.20			7,038.00	\$23,929.20	
A 21	Cement for CAB	TON	193.0	\$116.00	\$22,388.00	189.47	\$21,978.52			189.47	\$21,978.52			189.47	\$21,978.52	
<b>Surface Treatment and Pavements</b>																
A 22	HMA CL 1/2 In. PG 64-22	TON	4,040.0	\$76.00	\$307,040.00	1,912.20	\$145,327.20			1,912.20	\$145,327.20			1,912.20	\$145,327.20	
A 23	Preparation of Existing Surfaces	TON	4.0	\$570.00	\$2,280.00											
A 24	HMA for Approach CL 1/2 In. PG 64-22	TON	105.0	\$85.00	\$8,925.00	114.03	\$9,692.55			114.03	\$9,692.55			114.03	\$9,692.55	
<b>Structures</b>																
A 25	Precast Reinf. Conc. Three Sided Structure No. 1	LS	1.0	\$235,000.00	\$235,000.00	0.45	\$105,750.00			0.45	\$105,750.00			0.45	\$105,750.00	
A 26	Precast Reinf. Conc. Three Sided Structure No. 2	LS	1.0	\$230,000.00	\$230,000.00	0.45	\$103,500.00			0.45	\$103,500.00			0.45	\$103,500.00	
<b>Storm Sewer, Sanitary Sewer, and Water Mains</b>																
A 27	Underdrain Pipe, 8 In. Diam.	LF	390.0	\$43.00	\$16,770.00	433.00	\$18,619.00			433.00	\$18,619.00			433.00	\$18,619.00	
A 28	Aluminized Steel Culvert Arch Pipe 41-In. x 53-In. Diam.	LF	312.0	\$140.00	\$43,680.00	312.00	\$43,680.00			312.00	\$43,680.00			312.00	\$43,680.00	
A 29	Tapered End Sect with Debris Barrier 12 In. Diam.	EA	2.0	\$650.00	\$1,300.00	2.00	\$1,300.00					2.00	\$1,300.00	2.00	\$1,300.00	
A 30	Corrugated Polyethylene Storm Sewer Pipe, 10 In. Diam.	LF	950.0	\$46.00	\$43,700.00	909.00	\$41,814.00			909.00	\$41,814.00			909.00	\$41,814.00	
A 31	Corrugated Polyethylene Storm Sewer Pipe, 12 In. Diam.	LF	2,735.0	\$48.00	\$131,280.00	2,638.00	\$126,624.00			2,638.00	\$126,624.00			2,638.00	\$126,624.00	
A 32	Corrugated Polyethylene Storm Sewer Pipe, 18 In. Diam.	LF	400.0	\$55.00	\$22,000.00	454.00	\$24,970.00			454.00	\$24,970.00			454.00	\$24,970.00	
A 33	Testing Storm Sewer Pipe	LF	4,020.0	\$2.00	\$8,040.00	3,862.00	\$7,724.00			3,862.00	\$7,724.00			3,862.00	\$7,724.00	
A 34	Manhole 48 In. Diam. Type 1	EA	14.0	\$2,500.00	\$35,000.00	14.00	\$35,000.00			14.00	\$35,000.00			14.00	\$35,000.00	
A 35	Manhole 60 In. Diam. Flow Control	EA	2.0	\$5,200.00	\$10,400.00	1.00	\$5,200.00			1.00	\$5,200.00			1.00	\$5,200.00	
A 36	Manhole 96 In. Diam. Type 3, Stormwater Filtration	EA	2.0	\$39,000.00	\$78,000.00	2.00	\$78,000.00			2.00	\$78,000.00			2.00	\$78,000.00	
A 37	Curb Inlet	EA	13.0	\$1,800.00	\$23,400.00	13.00	\$23,400.00			13.00	\$23,400.00			13.00	\$23,400.00	
A 38	Double Curb Inlet	EA	16.0	\$3,100.00	\$49,600.00	16.00	\$49,600.00			16.00	\$49,600.00			16.00	\$49,600.00	
A 39	Catch Basin Type 1	EA	1.0	\$1,300.00	\$1,300.00	1.00	\$1,300.00			1.00	\$1,300.00			1.00	\$1,300.00	
A 40	Adjust Manhole	EA	2.0	\$500.00	\$1,000.00											
A 41	Adjust Catch Basin	EA	2.0	\$400.00	\$800.00											
A 42	Removal and Replacement of Unsuitable Material	CY	310.0	\$65.00	\$20,150.00	12.70	\$825.50			12.70	\$825.50			12.70	\$825.50	
A 43	Shoring	LF	4,725.0	\$2.00	\$9,450.00	3,408.00	\$6,816.00			3,408.00	\$6,816.00			3,408.00	\$6,816.00	
A 44	Adjust Valve Box	EA	7.0	\$220.00	\$1,540.00											
<b>Erosion Control and Water Pollution Control</b>																
A 45	ESC Lead	DAY	50.0	\$60.00	\$3,000.00	21.00	\$1,260.00					21.00	\$1,260.00	21.00	\$1,260.00	
A 46	Seed Mix B	AC	2.6	\$2,900.00	\$7,540.00											
A 47	Stabilized Construction Entrance	SY	300.0	\$20.00	\$6,000.00	381.50	\$7,630.00			381.50	\$7,630.00			381.50	\$7,630.00	
A 48	Street Cleaning	HR	60.0	\$130.00	\$7,800.00	8.00	\$1,040.00			8.00	\$1,040.00			8.00	\$1,040.00	
A 49	Silt Fence	LF	6,960.0	\$2.00	\$13,920.00	6,980.00	\$13,960.00			6,980.00	\$13,960.00			6,980.00	\$13,960.00	
A 50	High Visibility Fence	LF	2,865.0	\$2.00	\$5,730.00	2,380.00	\$4,760.00			2,380.00	\$4,760.00			2,380.00	\$4,760.00	
A 51	Inlet Protection	EA	45.0	\$60.00	\$2,700.00	53.00	\$3,180.00			53.00	\$3,180.00			53.00	\$3,180.00	

CITY OF CAMAS PROJECT NO. S-565 DESCRIPTION: NW 38th Avenue Roadway Improvements, Ph. 2		NUTTER CORPORATION 7211 NE 43rd Avenue, Vancouver, WA 98661 Phone: (360) 573-2000 Original Contract Total: \$4,219,597.22 (Includes Sales Tax Amount: \$6,646.42) ORIGINAL QUANTITIES, ETC.				STP / TIB / REET FUNDING		WATER / SEWER ACCOUNT		Previous Estimate Totals		Current Estimate Totals		Totals to Date	
PAY ESTIMATE #7 Special Council Meeting Date: January 17, 2015 Work Period Date: December 8, 2014 - December 31, 2014		UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	Quantity	Amount	Quantity	Amount	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS ESTIMATE	TOTAL THIS ESTIMATE	QUANTITY TO DATE	TOTAL TO DATE
A 52	Wattle	LF	100.0	\$7.00	\$700.00	25.00	\$175.00			25.00	\$175.00			25.00	\$175.00
<b>Streambank Stabilization</b>															
A 53	Work Area Isolation	LS	1.0	\$60,000.05	\$60,000.05	0.25	\$15,000.01			0.25	\$15,000.01			0.25	\$15,000.01
A 54	Weir Log	EA	12.0	\$1,400.00	\$16,800.00	13.00	\$18,200.00			13.00	\$18,200.00			13.00	\$18,200.00
A 55	Log with Root Wad	EA	50.0	\$1,200.00	\$60,000.00	50.00	\$60,000.00			50.00	\$60,000.00			50.00	\$60,000.00
A 56	Streambed Gravel	TN	1,660.0	\$43.00	\$71,380.00	1,211.64	\$52,100.52			1,211.64	\$52,100.52			1,211.64	\$52,100.52
A 57	Stream Boulder, 18 In. Diam.	TON	40.0	\$130.00	\$5,200.00	54.04	\$7,025.20			54.04	\$7,025.20			54.04	\$7,025.20
A 58	Stream Boulder, 24 In. Diam.	TON	60.0	\$130.00	\$7,800.00	50.91	\$6,618.30			50.91	\$6,618.30			50.91	\$6,618.30
A 59	Woven Coir Matting	SY	8,820.0	\$3.30	\$29,106.00	6,859.11	\$22,635.06			6,859.11	\$22,635.06			6,859.11	\$22,635.06
A 60	Non-Woven Coir Matting	SY	8,820.0	\$2.75	\$24,255.00	6,859.11	\$18,862.55			6,859.11	\$18,862.55			6,859.11	\$18,862.55
A 61	Light Loose Riprap	TON	290.0	\$55.00	\$15,950.00	398.51	\$21,918.05			398.51	\$21,918.05			398.51	\$21,918.05
A 62	Quarry Spalls	TON	33.0	\$40.00	\$1,320.00	199.91	\$7,996.40			199.91	\$7,996.40			199.91	\$7,996.40
<b>Landscaping</b>															
A 63	Landscaping	LS	1.0	\$147,000.00	\$147,000.00										
A 64	Irrigation System, Design/Build	LS	1.0	\$168,000.00	\$168,000.00	0.31	\$52,080.00			0.19	\$31,920.00	0.12	\$20,160.00	0.31	\$52,080.00
<b>Wetland Mitigation Planting</b>															
A 65	Wetland Mitigation	LS	1.0	\$114,000.00	\$114,000.00	0.17	\$19,380.00			0.17	\$19,380.00			0.17	\$19,380.00
<b>Traffic</b>															
A 66	Cement Conc. Traffic Curb	LF	2,215.0	\$10.00	\$22,150.00	2,224.00	\$22,240.00			2,224.00	\$22,240.00			2,224.00	\$22,240.00
A 67	Cement Conc. Traffic Curb and Gutter	LF	5,510.0	\$10.00	\$55,100.00	5,521.00	\$55,210.00			5,521.00	\$55,210.00			5,521.00	\$55,210.00
A 68	Cement Concrete Driveway Entrance, Type 1	SY	55.0	\$70.00	\$3,850.00	57.00	\$3,990.00			57.00	\$3,990.00			57.00	\$3,990.00
A 69	Cement Concrete Driveway Entrance, Type 3	SY	300.0	\$60.00	\$18,000.00	338.00	\$20,280.00			311.00	\$18,660.00	27.00	\$1,620.00	338.00	\$20,280.00
A 70	Raised Pavement Marker Type 2	HUND	1.5	\$760.00	\$1,140.00										
A 71	Black Vinyl Coated Chainlink Fence Type 3	LF	94.0	\$29.00	\$2,726.00										
A 72	Cement Conc. Sidewalk	SY	4,120.0	\$38.00	\$156,560.00	3,625.00	\$137,750.00			2,865.00	\$108,870.00	760.00	\$28,880.00	3,625.00	\$137,750.00
A 73	Cement Conc. Curb Ramp Type 1	EA	8.0	\$1,100.00	\$8,800.00	8.00	\$8,800.00					8.00	\$8,800.00	8.00	\$8,800.00
A 74	Cement Conc. Curb Ramp Type Directional	EA	2.0	\$1,200.00	\$2,400.00	2.00	\$2,400.00			2.00	\$2,400.00			2.00	\$2,400.00
A 75	<b>Illumination System</b>	LS	1.0	\$140,000.00	\$140,000.00	0.45	\$63,000.00			0.45	\$63,000.00			0.45	\$63,000.00
<b>Material-on-Hand (MOH) for Illumination System</b>		Amount paid based on supplied invoices from NE Electric								0.06	\$8,779.28			0.06	\$8,779.28
A 76	Traffic Signal System Modification - NW 38th Ave/ NW Parker St	LS	1.0	\$44,000.00	\$44,000.00	0.23	\$10,120.00			0.23	\$10,120.00			0.23	\$10,120.00
A 77	Permanent Signing	LS	1.0	\$3,500.00	\$3,500.00	1.00	\$3,500.00					1.00	\$3,500.00	1.00	\$3,500.00
A 78	Paint Line	LF	5,655.0	\$0.25	\$1,413.75										
A 79	Painted Wide Lane Line	LF	5,960.0	\$0.35	\$2,086.00										
A 80	Plastic Traffic Arrow	EA	14.0	\$100.00	\$1,400.00										
A 81	Plastic Crosswalk Line	SF	180.0	\$5.00	\$900.00										
A 82	Plastic Stop Line	LF	46.0	\$5.00	\$230.00										
A 83	Plastic Bicycle Lane Symbol	EA	13.0	\$260.00	\$3,380.00										
<b>Other Items</b>															
A 84	Joint Utility Trench, Incl. Backfill	LF	3,120.0	\$9.00	\$28,080.00	2,992.50	\$26,932.50			2,992.50	\$26,932.50			2,992.50	\$26,932.50
<b>Subtotal</b>					<b>\$4,113,826.80</b>		<b>\$2,891,720.85</b>			<b>\$2,815,726.79</b>		<b>\$84,773.35</b>		<b>\$2,900,500.13</b>	
<b>Schedule A Change Orders</b>															
CO 1	<b>Item A - Bid Item A14 to be measured by TN, paid by CY, conversion factor 1.6 TN/CY.</b>														
	<b>Item B - Bid Item A14 original bid quantity adjusted from 14,300 CY to 4,285 CY. Original unit cost to remain at \$18.50/CY for the adjusted quantity.</b>														
	<b>Item C - Common Borrow/Native Material to be used in-place of Bid Item A14. Remaining balance of 10,015 CY to be paid at \$8.50/CY.</b>	CY	10,015.0	\$8.50		10,015.40	\$85,130.90			10,015.40	\$85,130.90			10,015.40	\$85,130.90
<b>Subtotal</b>							<b>\$85,130.90</b>			<b>\$85,130.90</b>				<b>\$85,130.90</b>	
<b>Schedule B - Plant Establishment</b>															
B 1	1-Year Plant Establishment Performance Bond-Landscape Plant	LS	1.00	\$10,000.00	\$10,000.00										
B 2	1-Year Plant Establishment Performance Bond-Wetland Mitigation	LS	1.00	\$10,000.00	\$10,000.00										
<b>Subtotal</b>					<b>\$20,000.00</b>										

CITY OF CAMAS PROJECT NO. S-565 DESCRIPTION: NW 38th Avenue Roadway Improvements, Ph. 2 <b>PAY ESTIMATE #7</b> Special Council Meeting Date: January 17, 2015 Work Period Date: December 8, 2014 - December 31, 2014		NUTTER CORPORATION 7211 NE 43rd Avenue, Vancouver, WA 98661 Phone: (360) 573-2000 Original Contract Total: \$4,219,597.22 (Includes Sales Tax Amount: \$6,646.42) ORIGINAL QUANTITIES, ETC.			STP / TIB / REET FUNDING		WATER / SEWER ACCOUNT		Previous Estimate Totals		Current Estimate Totals		Totals to Date	
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ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	Quantity	Amount	Quantity	Amount	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS ESTIMATE	TOTAL THIS ESTIMATE	QUANTITY TO DATE	TOTAL TO DATE
<b>Schedule C - Water / Sewer</b>															
<b>Water</b>															
C 1	Ductile Iron Pipe for Water Main, 6" Dia.	LF	68.00	\$53.00	\$3,604.00			39.00	\$2,067.00	39.00	\$2,067.00			39.00	\$2,067.00
C 2	Ductile Iron Pipe for Water Main, 8" Dia.	LF	40.00	\$59.00	\$2,360.00			80.00	\$4,720.00	80.00	\$4,720.00			80.00	\$4,720.00
C 3	Ductile Iron Pipe for Water Main, 12" Dia.	LF	330.00	\$62.00	\$20,460.00			148.00	\$9,176.00	148.00	\$9,176.00			148.00	\$9,176.00
C 4	Blowoff Assembly	EA	5.00	\$1,000.00	\$5,000.00			5.00	\$5,000.00	5.00	\$5,000.00			5.00	\$5,000.00
C 5	Tapping Sleeve and Valve Assembly, 12 In.x8 In.	EA	1.00	\$3,500.00	\$3,500.00			2.00	\$7,000.00	2.00	\$7,000.00			2.00	\$7,000.00
C 6	Tapping Sleeve and Valve Assembly, 12 In.x12 In.	EA	4.00	\$5,000.00	\$20,000.00			3.00	\$15,000.00	3.00	\$15,000.00			3.00	\$15,000.00
C 7	Resetting Existing Hydrant	EA	3.00	\$1,500.00	\$4,500.00			3.00	\$4,500.00	3.00	\$4,500.00			3.00	\$4,500.00
C 8	Service Connection, 1-In. Dia.	EA	1.00	\$1,100.00	\$1,100.00			1.00	\$1,100.00	1.00	\$1,100.00			1.00	\$1,100.00
<b>Sanitary Sewer</b>															
C 9	Class 200 Sewer Pipe, 6 In. Diam.	LF	180.00	\$50.00	\$9,000.00			180.00	\$9,000.00	180.00	\$9,000.00			180.00	\$9,000.00
C 10	Tapping Sleeve and Assembly, 10 In. x 6 In.	EA	3.00	\$2,900.00	\$8,700.00			3.00	\$8,700.00	3.00	\$8,700.00			3.00	\$8,700.00
C 11	Sanitary Sewer Service Connection 1 In. Diam.	EA	1.00	\$900.00	\$900.00			1.00	\$900.00	1.00	\$900.00			1.00	\$900.00
<b>Subtotal</b>					<b>\$79,124.00</b>			<b>\$67,163.00</b>	<b>\$67,163.00</b>		<b>\$67,163.00</b>				<b>\$67,163.00</b>
<b>Schedule B Change Orders</b>															
C 1															

ORIGINAL CONTRACT TOTAL	\$4,212,950.80	Funding Totals	\$2,891,720.85	Water/Sewer Totals	\$67,163.00	Previous Estimates	\$2,882,889.79	Current Estimate	\$84,773.35	Totals to Date	\$2,967,663.13
CHANGE ORDERS TO DATE	-----	CO'S To Date	\$85,130.90	CO'S To Date		CO'S To Date	\$85,130.90	CO'S To Date		CO'S To Date	\$85,130.90
SUBTOTAL	\$4,212,950.80	Subtotal	\$2,976,851.75	Subtotal	\$67,163.00	Subtotal	\$2,968,020.69	Subtotal	\$84,773.35	Subtotal	\$3,052,794.03
SALES TAX (8.4%) - SCHEDULE C ONLY	\$6,646.42			Sales Tax (8.4%)	\$5,641.69	Sales Tax (8.4%)	\$5,641.69	Sales Tax (8.4%)		Sales Tax (8.4%)	\$5,641.69
TOTAL CONTRACT	\$4,219,597.22	Total =	\$2,976,851.75	Total =	\$72,804.69	Total =	\$2,973,662.38	Total =	\$84,773.35	Total =	\$3,058,435.73

This Information is for internal use/tracking purposes only.			
	Current Estimate Totals	Previous Estimate Totals	Totals-To-Date
Sch. A & B - STP / TIB / REET Account Number: 313-20-595-300-65	\$84,773.35	\$2,900,857.69	\$2,985,631.03
Sch. C - Water Account Number: 424-00-594-340-65		\$47,764.29	\$47,764.29
Sch. C - Sewer Account Number: 424-00-594-350-65		\$20,162.40	\$20,162.40
Sch. C - Fire Suppression Acct. No.: 115-09-522-500-48		\$4,878.00	\$4,878.00
<b>Total This Estimate =</b>	<b>\$84,773.35</b>	<b>\$2,973,662.38</b>	<b>\$3,058,435.73</b>

Anita Ashton 1/6/15 Project Engineer Date  
 Edward Schupp 1/6/15 Contractor Date  
 P. Castron 1-6-15 Engineering Manager Date

<b>CITY OF CAMAS</b> <b>PROJECT NO. S-566</b> <b>Project Name: NW Friberg St/NE Goodwin Rd Roadway</b>			<b>PAY ESTIMATE: SIX</b> PAY PERIOD: 12/1/2014/ Through 12/31/2014  ORIGINAL CONTRACT AMOUNT: \$4,102,170.92				McDonald Excavating, Inc. 2719 Main Street Washougal, WA 98671 360-835-8794				
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ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS EST.	TOTAL THIS EST.	QUANTITY TO DATE	TOTAL TO DATE
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**SCHEDULE A: ROAD AND STORM**

A1	Roadway Surveying	LS	1.00	\$33,350.00	\$33,350.00	0.75	\$25,012.50	0.15	\$5,002.50	0.90	\$30,015.00
A2	SPCC Plan	LS	1.00	\$300.00	\$300.00	1.00	\$300.00	0.00	\$0.00	1.00	\$300.00
A3	Mobilization	LS	1.00	\$190,000.00	\$190,000.00	1.00	\$190,000.00	0.00	\$0.00	1.00	\$190,000.00
A4	Traffic Control Supervisor	LS	1.00	\$10,500.00	\$10,500.00	0.75	\$7,875.00	0.15	\$1,575.00	0.90	\$9,450.00
A5	Flaggers and Spotters	HR	1,680.00	\$50.00	\$84,000.00	2,860.00	\$143,000.00	714.00	\$35,700.00	3574.00	\$178,700.00
A6	Other Traffic Control Labor	HR	80.00	\$50.00	\$4,000.00	264.00	\$13,200.00	117.00	\$5,850.00	381.00	\$19,050.00
A7	Other Temporary Traffic Control	LS	1.00	\$3,500.00	\$3,500.00	0.75	\$2,625.00	0.15	\$525.00	0.90	\$3,150.00
A8	Portable Changeable Message Sign	HR	9,400.00	\$3.00	\$28,200.00	7,440.00	\$22,320.00	936.00	\$2,808.00	8376.00	\$25,128.00
A9	Construction Sign Class A	SF	110.00	\$20.00	\$2,200.00	186.00	\$3,720.00	0.00	\$0.00	186.00	\$3,720.00
A10	Clearing and Grubbing	AC	7.00	\$7,500.00	\$52,500.00	7.00	\$52,500.00	0.00	\$0.00	7.00	\$52,500.00
A11	Removal of Structures and Obstructions	LS	1.00	\$7,500.00	\$7,500.00	1.00	\$7,500.00	0.00	\$0.00	1.00	\$7,500.00
A12	Sawcutting Asphalt Pavement	LF	4,225.00	\$1.00	\$4,225.00	4,225.00	\$4,225.00	0.00	\$0.00	4225.00	\$4,225.00
A13	Roadway Excavation, Incl. Haul	CY	8,600.00	\$14.35	\$123,410.00	7,503.00	\$107,668.05	1,997.00	\$28,656.95	9500.00	\$136,325.00
A14	Gravel Borrow, Incl. Haul	CY	2,550.00	\$22.32	\$56,916.00	2,120.00	\$47,318.40	800.00	\$17,856.00	2920.00	\$65,174.40
A15	Embankment Compaction	CY	7,150.00	\$6.50	\$46,475.00	8,326.00	\$54,119.00	674.00	\$4,381.00	9000.00	\$58,500.00
A16	Unsuitable Foundation Excavation, Incl. Haul	CY	100.00	\$20.00	\$2,000.00	1,287.00	\$25,740.00	563.00	\$11,260.00	1850.00	\$37,000.00
A17	Structure Excavation Class A, Incl. Haul	CY	75.00	\$27.00	\$2,025.00	75.00	\$2,025.00	0.00	\$0.00	75.00	\$2,025.00
A18	Gravel Backfill for Wall	CY	90.00	\$50.00	\$4,500.00	36.00	\$1,800.00	54.00	\$2,700.00	90.00	\$4,500.00
A19	Crushed Surfacing Base Course, 1 1/4" (-) C.S.B.C.	CY	6,065.00	\$36.00	\$218,340.00	5,488.00	\$197,568.00	2,988.00	\$107,568.00	8476.00	\$305,136.00
A20	Planing Bituminous Pavement	SY	3,460.00	\$3.00	\$10,380.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A21	HMA Cl. 1/2" PG 64-22	TN	5,500.00	\$70.00	\$385,000.00	1,780.98	\$124,668.60	1,142.92	\$80,004.40	2923.90	\$204,673.00
A22	HMA for Approach, Cl. 1/2" PG 64-22	TN	80.00	\$200.00	\$16,000.00	0.00	\$0.00	93.27	\$18,654.00	93.27	\$18,654.00
A23	Structural Earth Wall	SF	1,450.00	\$20.00	\$29,000.00	135.00	\$2,700.00	1,315.00	\$26,300.00	1450.00	\$29,000.00
A24	Testing Storm Sewer Pipe	LF	7,165.00	\$2.00	\$14,330.00	6,330.00	\$12,660.00	835.00	\$1,670.00	7165.00	\$14,330.00
A25	Corrugated Polyethylene Storm Sewer Pipe, 6" Dia.	LF	40.00	\$85.00	\$3,400.00	40.00	\$3,400.00	0.00	\$0.00	40.00	\$3,400.00
A26	Corrugated Polyethylene Storm Sewer Pipe, 10" Dia.	LF	228.00	\$58.00	\$13,224.00	228.00	\$13,224.00	0.00	\$0.00	228.00	\$13,224.00
A27	Corrugated Polyethylene Storm Sewer Pipe, 12" Dia.	LF	1,693.00	\$50.00	\$84,650.00	1,693.00	\$84,650.00	0.00	\$0.00	1693.00	\$84,650.00
A28	Corrugated Polyethylene Storm Sewer Pipe, 15" Dia.	LF	991.00	\$42.00	\$41,622.00	991.00	\$41,622.00	0.00	\$0.00	991.00	\$41,622.00
A29	Corrugated Polyethylene Storm Sewer Pipe, 18" Dia.	LF	784.00	\$65.00	\$50,960.00	784.00	\$50,960.00	0.00	\$0.00	784.00	\$50,960.00
A30	Corrugated Polyethylene Storm Sewer Pipe, 21" Dia.	LF	191.00	\$70.00	\$13,370.00	191.00	\$13,370.00	0.00	\$0.00	191.00	\$13,370.00
A31	Corrugated Polyethylene Storm Sewer Pipe, 24" Dia.	LF	641.00	\$80.00	\$51,280.00	356.00	\$28,480.00	285.00	\$22,800.00	641.00	\$51,280.00
A32	Corrugated Polyethylene Storm Sewer Pipe, 60" Dia., Detention System	LF	2,400.00	\$310.00	\$744,000.00	2,400.00	\$744,000.00	0.00	\$0.00	2400.00	\$744,000.00
A33	Polyvinyl Chloride (PVC) C-905 Storm Sewer Pipe, 20" Dia.	LF	345.00	\$80.00	\$27,600.00	345.00	\$27,600.00	0.00	\$0.00	345.00	\$27,600.00
A34	Polyvinyl Chloride (PVC) C-905 Storm Sewer Pipe, 24" Dia.	LF	80.00	\$105.00	\$8,400.00	80.00	\$8,400.00	0.00	\$0.00	80.00	\$8,400.00
A35	Manhole 48" Dia. Type 1	EA	6.00	\$3,000.00	\$18,000.00	6.00	\$18,000.00	0.00	\$0.00	6.00	\$18,000.00

<b>CITY OF CAMAS</b> <b>PROJECT NO. S-566</b> <b>Project Name: NW Friberg St/NE Goodwin Rd Roadway</b>			<b>PAY ESTIMATE: SIX</b> PAY PERIOD: 12/1/2014/ Through 12/31/2014  ORIGINAL CONTRACT AMOUNT: \$4,102,170.92				McDonald Excavating, Inc. 2719 Main Street Washougal, WA 98671 360-835-8794				
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ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS EST.	TOTAL THIS EST.	QUANTITY TO DATE	TOTAL TO DATE
A36	Manhole 48" Dia. Type 3	EA	12.00	\$2,690.00	\$32,280.00	12.00	\$32,280.00	0.00	\$0.00	12.00	\$32,280.00
A37	Manhole 54" Dia. Type 1	EA	2.00	\$4,000.00	\$8,000.00	2.00	\$8,000.00	0.00	\$0.00	2.00	\$8,000.00
A38	Manhole 54" Dia. Type 3	EA	2.00	\$3,700.00	\$7,400.00	0.00	\$0.00	2.00	\$7,400.00	2.00	\$7,400.00
A39	Manhole 54" Dia. Type 1 - Flow Control	EA	1.00	\$6,400.00	\$6,400.00	1.00	\$6,400.00	0.00	\$0.00	1.00	\$6,400.00
A40	Riser, 36" Dia.	EA	7.00	\$6,920.00	\$48,440.00	7.00	\$48,440.00	0.00	\$0.00	7.00	\$48,440.00
A41	Catch Basin, Type 1	EA	2.00	\$1,600.00	\$3,200.00	2.00	\$3,200.00	0.00	\$0.00	2.00	\$3,200.00
A42	Catch Basin, Type 2	EA	14.00	\$1,650.00	\$23,100.00	14.00	\$23,100.00	0.00	\$0.00	14.00	\$23,100.00
A43	Ditch Inlet	EA	1.00	\$1,765.00	\$1,765.00	1.00	\$1,765.00	0.00	\$0.00	1.00	\$1,765.00
A44	Oversized Ditch Inlet	EA	2.00	\$2,150.00	\$4,300.00	1.00	\$2,150.00	1.00	\$2,150.00	2.00	\$4,300.00
A45	Area Drain, 18 Inch Basin	EA	4.00	\$3,000.00	\$12,000.00	4.00	\$12,000.00	0.00	\$0.00	4.00	\$12,000.00
A46	Area Drain, 24 Inch Basin	EA	7.00	\$3,000.00	\$21,000.00	7.00	\$21,000.00	0.00	\$0.00	7.00	\$21,000.00
A47	Joint Trench	LF	355.00	\$36.00	\$12,780.00	355.00	\$12,780.00	0.00	\$0.00	355.00	\$12,780.00
A48	Shoring, Trench Safety System (\$1.00 min./LF)	LF	7,165.00	\$2.00	\$14,330.00	6,752.00	\$13,504.00	413.00	\$826.00	7165.00	\$14,330.00
A49	Kristar Vault 7'x12' 10 Cartridges	EA	1.00	\$38,000.00	\$38,000.00	1.00	\$38,000.00	0.00	\$0.00	1.00	\$38,000.00
A50	Kristar Vault 9'x16' 23 Cartridges	EA	1.00	\$41,000.00	\$41,000.00	1.00	\$41,000.00	0.00	\$0.00	1.00	\$41,000.00
A51	ESC Lead	DAY	140.00	\$32.00	\$4,480.00	94.00	\$3,008.00	32.00	\$1,024.00	126.00	\$4,032.00
A52	Seeding, Fertilizing, Mulching	AC	1.00	\$12,000.00	\$12,000.00	0.75	\$9,000.00	0.00	\$0.00	0.75	\$9,000.00
A53	High Visibility Fence	LF	1,175.00	\$2.00	\$2,350.00	1,400.00	\$2,800.00	339.00	\$678.00	1739.00	\$3,478.00
A54	Erosion Control	LS	1.00	\$32,250.00	\$32,250.00	0.90	\$29,025.00	0.05	\$1,612.50	0.95	\$30,637.50
A55	Pipe Outfalls	EA	5.00	\$300.00	\$1,500.00	2.00	\$600.00	3.00	\$900.00	5.00	\$1,500.00
A56	Compost Mulch	CY	450.00	\$44.50	\$20,025.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A57	Top Soil Type A	CY	1,360.00	\$20.00	\$27,200.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A58	Root Barrier	LF	7,640.00	\$9.45	\$72,198.00	3,820.00	\$36,099.00	2,400.00	\$22,680.00	6220.00	\$58,779.00
A59	PSIPE - Acer platanoides 'Crimson Sentry', 3" Cal.	EA	27.00	\$360.00	\$9,720.00	0.00	\$0.00	22.00	\$7,920.00	22.00	\$7,920.00
A60	PSIPE - Amelanchier laevis 'Autumn Brilliance, 2" Cal.	EA	42.00	\$306.00	\$12,852.00	0.00	\$0.00	21.00	\$6,426.00	21.00	\$6,426.00
A61	PSIPE - Carpinus caroliniana, 3" Cal.	EA	59.00	\$360.00	\$21,240.00	59.00	\$21,240.00	0.00	\$0.00	59.00	\$21,240.00
A62	PSIPE - Fraxinus pennsylvanica 'Summit', 3" Cal.	EA	12.00	\$360.00	\$4,320.00	0.00	\$0.00	10.00	\$3,600.00	10.00	\$3,600.00
A63	PSIPE - Prunus serrulata 'Amagawa', 2" Cal.	EA	35.00	\$306.00	\$10,710.00	0.00	\$0.00	26.00	\$7,956.00	26.00	\$7,956.00
A64	PSIPE - Tilia cordata, 3" Cal.	EA	70.00	\$360.00	\$25,200.00	70.00	\$25,200.00	0.00	\$0.00	70.00	\$25,200.00
A65	PSIPE - Euonymus alata 'Pipzam', 3 Gal.	EA	17.00	\$28.00	\$476.00	0.00	\$0.00	8.00	\$224.00	8.00	\$224.00
A66	PSIPE - Mahonia aquifolium 'Compacta', 3 Gal.	EA	260.00	\$28.00	\$7,280.00	0.00	\$0.00	130.00	\$3,640.00	130.00	\$3,640.00
A67	PSIPE - Rosa Gymnacarpa, 3 Gal.	EA	247.00	\$28.00	\$6,916.00	0.00	\$0.00	123.00	\$3,444.00	123.00	\$3,444.00
A68	PSIPE - Symphoricarpos albus, 3 Gal.	EA	254.00	\$28.00	\$7,112.00	0.00	\$0.00	127.00	\$3,556.00	127.00	\$3,556.00
A69	PSIPE - Spiraea x bumalda 'Gold Flame', 3 Gal.	EA	229.00	\$28.00	\$6,412.00	0.00	\$0.00	115.00	\$3,220.00	115.00	\$3,220.00
A70	PSIPE - Ajuga reptans, 4" Pot	EA	4,925.00	\$5.60	\$27,580.00	0.00	\$0.00	2,800.00	\$15,680.00	2800.00	\$15,680.00
A71	PSIPE - Arctostaphylos uva-ursa, 4" Pot	EA	3,025.00	\$5.60	\$16,940.00	0.00	\$0.00	1,500.00	\$8,400.00	1500.00	\$8,400.00
A72	PSIPE - Berberis thunbergii 'Crimson Pygmy', 1 Gal.	EA	161.00	\$11.00	\$1,771.00	0.00	\$0.00	80.00	\$880.00	80.00	\$880.00

<b>CITY OF CAMAS</b> <b>PROJECT NO. S-566</b> <b>Project Name: NW Friberg St/NE Goodwin Rd Roadway</b>			<b>PAY ESTIMATE: SIX</b> PAY PERIOD: 12/1/2014/ Through 12/31/2014  ORIGINAL CONTRACT AMOUNT: \$4,102,170.92				McDonald Excavating, Inc. 2719 Main Street Washougal, WA 98671 360-835-8794				
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ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS EST.	TOTAL THIS EST.	QUANTITY TO DATE	TOTAL TO DATE
A73	PSIPE - Fragaria chiloensis, 4" Pot	EA	267.00	\$5.60	\$1,495.20	0.00	\$0.00	135.00	\$756.00	135.00	\$756.00
A74	PSIPE - Juniperous horizontalis 'Waukegan', 1 Gal.	EA	549.00	\$11.00	\$6,039.00	0.00	\$0.00	329.00	\$3,619.00	329.00	\$3,619.00
A75	PSIPE - 2nd Year	LS	1.00	\$9,450.00	\$9,450.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A76	Irrigation System	LS	1.00	\$72,285.00	\$72,285.00	0.30	\$21,685.50	0.20	\$14,457.00	0.50	\$36,142.50
A77	Cement Concrete Traffic Curb and Gutter	LF	7,225.00	\$7.50	\$54,187.50	5,169.00	\$38,767.50	2,056.00	\$15,420.00	7225.00	\$54,187.50
A78	Cement Concrete Traffic Curb	LF	1,275.00	\$10.00	\$12,750.00	1,216.00	\$12,160.00	59.00	\$590.00	1275.00	\$12,750.00
A79	Cement Concrete Curb, Thickened	LF	35.00	\$42.00	\$1,470.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A80	Decommission Existing Well	EA	3.00	\$925.00	\$2,775.00	3.00	\$2,775.00	0.00	\$0.00	3.00	\$2,775.00
A81	Cement Concrete Driveway Entrance	SY	235.00	\$67.00	\$15,745.00	91.72	\$6,145.24	143.28	\$9,599.76	235.00	\$15,745.00
A82	Chain Link Fence (42" Black Coated Vinyl)	LF	505.00	\$28.00	\$14,140.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A83	Cement Concrete Sidewalk	SY	4,175.00	\$33.00	\$137,775.00	2,110.69	\$69,652.77	297.90	\$9,830.70	2408.59	\$79,483.47
A84	Cement Concrete Curb Ramp, Parallel	EA	5.00	\$1,670.00	\$8,350.00	0.00	\$0.00	1.00	\$1,670.00	1.00	\$1,670.00
A85	Cement Concrete Curb Ramp, Single Direction	EA	2.00	\$1,670.00	\$3,340.00	2.00	\$3,340.00	0.00	\$0.00	2.00	\$3,340.00
A86	Paint Line	LF	8,027.00	\$0.19	\$1,525.13	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A87	Painted Wide Lane Line	LF	10,370.00	\$0.29	\$3,007.30	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A88	Plastic Traffic Arrow	EA	23.00	\$133.00	\$3,059.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A89	Plastic Crosswalk Line	SF	1,460.00	\$5.00	\$7,300.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A90	Plastic Stop Line	LF	215.00	\$7.00	\$1,505.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A91	Plastic Bicycle Lane Symbol	EA	13.00	\$306.00	\$3,978.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A92	Raised Pavement Marker Type 2	Hund.	2.00	\$445.00	\$890.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A93	Permanent Signing	LS	1.00	\$27,800.00	\$27,800.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A94	Illumination System	LS	1.00	\$95,000.00	\$95,000.00	0.89	\$84,550.00	0.11	\$10,450.00	1.00	\$95,000.00
A95	Traffic Signal System - Friberg St/Goodwin Rd	LS	1.00	\$196,340.00	\$196,340.00	0.53	\$104,060.20	0.28	\$54,975.20	0.81	\$159,035.40
A96	Traffic Signal System - Friberg St/1st St (Loop Replacement)	LS	1.00	\$2,500.00	\$2,500.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
A97	ITS (Interconnect)	LS	1.00	\$10,565.00	\$10,565.00	0.95	\$10,036.75	0.00	\$0.00	0.95	\$10,036.75
A98	Field Office Building	LS	1.00	\$7,000.00	\$7,000.00	0.60	\$4,200.00	0.10	\$700.00	0.70	\$4,900.00
A99	Project Documentation (\$25,000 Minimum Bid)	LS	1.00	\$25,000.00	\$25,000.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00

SCHEDULE A SUBTOTAL (NON-TAXABLE)					\$3,714,955.13	\$2,830,214.51	\$597,595.01	\$3,427,809.52
Retainage (5%) - N/A Retainage Bond Posted								
<b>SCHEDULE A TOTAL</b>					<b>\$3,714,955.13</b>	<b>\$2,830,214.51</b>	<b>\$597,595.01</b>	<b>\$3,427,809.52</b>

<b>CITY OF CAMAS</b> <b>PROJECT NO. S-566</b> <b>Project Name: NW Friberg St/NE Goodwin Rd Roadway</b>			<b>PAY ESTIMATE: SIX</b> PAY PERIOD: 12/1/2014/ Through 12/31/2014  ORIGINAL CONTRACT AMOUNT: \$4,102,170.92				McDonald Excavating, Inc. 2719 Main Street Washougal, WA 98671 360-835-8794				
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ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS EST.	TOTAL THIS EST.	QUANTITY TO DATE	TOTAL TO DATE
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**SCHEDULE B: WATER AND SANITARY (TAXABLE ITEMS)**

B1	D.I. Pipe for Watermain Pipe, 8 In. Dia.	LF	235.00	\$79.00	\$18,565.00	235.00	\$18,565.00	0.00	\$0.00	235.00	\$18,565.00
B2	D.I. Pipe for Watermain Pipe, 12 In. Dia.	LF	34.00	\$120.00	\$4,080.00	34.00	\$4,080.00	0.00	\$0.00	34.00	\$4,080.00
B3	Shoring, Trench Safety System (\$1.00 min./LF)	LF	269.00	\$2.00	\$538.00	269.00	\$538.00	0.00	\$0.00	269.00	\$538.00
B4	Adjust Valve Box, Assembly No. 400	EA	9.00	\$30.00	\$270.00	4.00	\$120.00	5.00	\$150.00	9.00	\$270.00
B5	Relocate AARV Assembly, Assembly No. 401	EA	1.00	\$935.00	\$935.00	1.00	\$935.00	0.00	\$0.00	1.00	\$935.00
B6	Relocate Fire Hydrant, Valve and Fittings, Assembly No. 402	EA	2.00	\$770.00	\$1,540.00	2.00	\$1,540.00	0.00	\$0.00	2.00	\$1,540.00
B7	Cut, Connect and Fittings, Assembly No. 403	EA	1.00	\$325.00	\$325.00	1.00	\$325.00	0.00	\$0.00	1.00	\$325.00
B8	Connect, Valve and Fittings, Assembly No. 404	EA	1.00	\$3,555.00	\$3,555.00	1.00	\$3,555.00	0.00	\$0.00	1.00	\$3,555.00
B9	Connect, Valve and Fittings, Assembly No. 405	EA	1.00	\$2,805.00	\$2,805.00	1.00	\$2,805.00	0.00	\$0.00	1.00	\$2,805.00
B10	Connect, Valve and Fittings, Assembly No. 406	EA	3.00	\$3,545.00	\$10,635.00	3.00	\$10,635.00	0.00	\$0.00	3.00	\$10,635.00
B11	Water Service, Assembly No. 407	EA	1.00	\$1,130.00	\$1,130.00	0.00	\$0.00	1.00	\$1,130.00	1.00	\$1,130.00
B12	Adjust AARV Assembly, Assembly No. 408	EA	1.00	\$55.00	\$55.00	0.00	\$0.00	1.00	\$55.00	1.00	\$55.00
B13	Adjust Meter Box, Assembly No. 409	EA	1.00	\$55.00	\$55.00	0.00	\$0.00	1.00	\$55.00	1.00	\$55.00
B14	Adjust Irrigation Valve Box, Assembly No. 410	EA	1.00	\$55.00	\$55.00	0.00	\$0.00	1.00	\$55.00	1.00	\$55.00
B15	Relocate Water Service, Assembly No. 411	EA	1.00	\$645.00	\$645.00	1.00	\$645.00	0.00	\$0.00	1.00	\$645.00
B16	Fire Hydrant Assembly, Assembly No. 412	EA	3.00	\$3,800.00	\$11,400.00	3.00	\$11,400.00	0.00	\$0.00	3.00	\$11,400.00
B17	Relocate Fire Hydrant, Valve and Fittings, Assembly No. 413	EA	1.00	\$5,850.00	\$5,850.00	1.00	\$5,850.00	0.00	\$0.00	1.00	\$5,850.00
B18	Cut, Connect, Pipe and Fittings, Assembly No. 414	EA	1.00	\$3,000.00	\$3,000.00	1.00	\$3,000.00	0.00	\$0.00	1.00	\$3,000.00
B19	Cut, Connect and Fittings, Assembly No. 415	EA	2.00	\$325.00	\$650.00	2.00	\$650.00	0.00	\$0.00	2.00	\$650.00
B20	PVC Pressure Sanitary Sewer Pipe, 8 In. Dia.	LF	2,950.00	\$43.00	\$126,850.00	2,950.00	\$126,850.00	0.00	\$0.00	2950.00	\$126,850.00
B21	PVC Pressure Sanitary Sewer Pipe, 6 In. Dia.	LF	55.00	\$41.00	\$2,255.00	55.00	\$2,255.00	0.00	\$0.00	55.00	\$2,255.00
B22	PVC Pressure Sanitary Sewer Pipe, 4 In. Dia.	LF	1,155.00	\$36.00	\$41,580.00	1,155.00	\$41,580.00	0.00	\$0.00	1155.00	\$41,580.00
B23	Shoring, Trench Safety System (\$1.00 min./LF)	LF	4,160.00	\$1.00	\$4,160.00	4,160.00	\$4,160.00	0.00	\$0.00	4160.00	\$4,160.00
B24	Plug Valve, 10 In.	EA	3.00	\$3,835.00	\$11,505.00	3.00	\$11,505.00	0.00	\$0.00	3.00	\$11,505.00
B25	Plug Valve, 6 In.	EA	2.00	\$3,770.00	\$7,540.00	2.00	\$7,540.00	0.00	\$0.00	2.00	\$7,540.00
B26	Plug Valve, 4 In.	EA	7.00	\$855.00	\$5,985.00	7.00	\$5,985.00	0.00	\$0.00	7.00	\$5,985.00
B27	12 In. Sewer Fittings	EA	1.00	\$500.00	\$500.00	1.00	\$500.00	0.00	\$0.00	1.00	\$500.00
B28	8 In. Sewer Fittings	EA	10.00	\$375.00	\$3,750.00	10.00	\$3,750.00	0.00	\$0.00	10.00	\$3,750.00
B29	6 In. Sewer Fittings	EA	1.00	\$120.00	\$120.00	1.00	\$120.00	0.00	\$0.00	1.00	\$120.00
B30	4 In. Sewer Fittings	EA	10.00	\$140.00	\$1,400.00	10.00	\$1,400.00	0.00	\$0.00	10.00	\$1,400.00
B31	Adjust Sewer Cleanout or Valve Box	EA	3.00	\$55.00	\$165.00	0.00	\$0.00	3.00	\$165.00	3.00	\$165.00
B32	AARV Assembly including Manifold and Soil Filter	EA	2.00	\$2,600.00	\$5,200.00	0.75	\$1,950.00	1.25	\$3,250.00	2.00	\$5,200.00
B33	Testing Pressure Sewer Pipe	LF	4,160.00	\$1.50	\$6,240.00	4,952.00	\$7,428.00	241.00	\$361.50	5193.00	\$7,789.50
B34	Sewer Cleanout	EA	1.00	\$1,100.00	\$1,100.00	0.00	\$0.00	1.00	\$1,100.00	1.00	\$1,100.00

SCHEDULE B SUBTOTAL	\$284,438.00	\$279,666.00	\$6,321.50	\$285,987.50
Sales Tax (8.4%):	\$23,892.79	\$23,491.94	\$531.01	\$24,022.95
Retainage (5%) - N/A Retainage Bond Posted				
<b>SCHEDULE B TOTAL</b>	<b>\$308,330.79</b>	<b>\$303,157.94</b>	<b>\$6,852.51</b>	<b>\$310,010.45</b>



<b>CITY OF CAMAS</b> <b>PROJECT NO. S-566</b> <b>Project Name: NW Friberg St/NE Goodwin Rd Roadway</b>			<b>PAY ESTIMATE: SIX</b> PAY PERIOD: 12/1/2014/ Through 12/31/2014  ORIGINAL CONTRACT AMOUNT: \$4,102,170.92				McDonald Excavating, Inc. 2719 Main Street Washougal, WA 98671 360-835-8794				
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ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS EST.	TOTAL THIS EST.	QUANTITY TO DATE	TOTAL TO DATE
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**SCHEDULE C: GRASS VALLEY WETLAND MITIGATION**

C1	Clearing and Grubbing	AC	0.50	\$4,000.00	\$2,000.00	0.50	\$2,000.00	0.00	\$0.00	0.50	\$2,000.00
C2	High Visibility Fence	LF	1,905.00	\$2.00	\$3,810.00	1,905.00	\$3,810.00	0.00	\$0.00	1905.00	\$3,810.00
C3	Seeding, Fertilizing, Mulching	AC	0.50	\$12,000.00	\$6,000.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C4	Compost Stock	LF	390.00	\$8.00	\$3,120.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C5	Temporary Haul Road	LS	1.00	\$5,200.00	\$5,200.00	1.00	\$5,200.00	0.00	\$0.00	1.00	\$5,200.00
C6	Invasive Species Removal	LS	1.00	\$5,000.00	\$5,000.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C7	PSIPE - Oregon Ash, 2-4'T Bare Root	EA	70.00	\$4.50	\$315.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C8	PSIPE - Red Alder 2-4'T Bare Root	EA	40.00	\$4.50	\$180.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C9	PSIPE - Black Cottonwood 2-4'T Bare Root	EA	10.00	\$4.50	\$45.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C10	PSIPE - Cascara 2-4'T Bare Root	EA	14.00	\$4.50	\$63.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C11	PSIPE - Western Crab Apple 2-4'T Bare Root	EA	10.00	\$4.50	\$45.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C12	PSIPE - Nootka Rose 2-4'T Bare Root	EA	150.00	\$4.50	\$675.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C13	PSIPE - Pacific Ninebark 2-4'T Bare Root	EA	100.00	\$4.50	\$450.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C14	PSIPE - Black Hawthorn 2-4'T Bare Root	EA	144.00	\$4.50	\$648.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C15	PSIPE - Vine Maple 2-4'T Bare Root	EA	44.00	\$4.50	\$198.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C16	PSIPE - Red Osier Dogwood, Live Stake	EA	250.00	\$3.50	\$875.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C17	PSIPE - Sitka Willow, Live Stake	EA	50.00	\$3.50	\$175.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C18	PSIPE - Red Elderberry, 2-4'T Bare Root	EA	74.00	\$4.50	\$333.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C19	PSIPE - Black Twinberry, 2-4'T Bare Root	EA	74.00	\$4.50	\$333.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C20	PSIPE - Scouler Willow, Live Stake	EA	150.00	\$3.50	\$525.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C21	Wildlife Snag	EA	2.00	\$650.00	\$1,300.00	2.00	\$1,300.00	0.00	\$0.00	2.00	\$1,300.00
C22	Habitat Logs	EA	2.00	\$550.00	\$1,100.00	2.00	\$1,100.00	0.00	\$0.00	2.00	\$1,100.00
C23	Brush Piles	EA	3.00	\$450.00	\$1,350.00	3.00	\$1,350.00	0.00	\$0.00	3.00	\$1,350.00
C24	PSIPE 2nd Year	LS	1.00	\$6,675.00	\$6,675.00	0.00	\$0.00	0.00	\$0.00	0.00	\$0.00
C25	Irrigation System	LS	1.00	\$16,680.00	\$16,680.00	0.90	\$15,012.00	0.00	\$0.00	0.90	\$15,012.00
C26	Wetland Mitigation Excavation and Haul	CY	1,550.00	\$13.00	\$20,150.00	1,550.00	\$20,150.00	0.00	\$0.00	1550.00	\$20,150.00
C27	Wetland Mitigation Topsoil Placement (Topsoil Type B)	CY	410.00	\$4.00	\$1,640.00	410.00	\$1,640.00	0.00	\$0.00	410.00	\$1,640.00

SCHEDULE C TOTAL (NON-TAXABLE)					\$78,885.00		\$51,562.00		\$0.00		\$51,562.00
Retainage (5%) - N/A Retainage Bond Posted											
<b>SCHEDULE C TOTAL</b>					<b>\$78,885.00</b>		<b>\$51,562.00</b>		<b>\$0.00</b>		<b>\$51,562.00</b>

<b>CITY OF CAMAS</b> <b>PROJECT NO. S-566</b> <b>Project Name: NW Friberg St/NE Goodwin Rd Roadway</b>			<b>PAY ESTIMATE: SIX</b> PAY PERIOD: 12/1/2014/ Through 12/31/2014  ORIGINAL CONTRACT AMOUNT: \$4,102,170.92				McDonald Excavating, Inc. 2719 Main Street Washougal, WA 98671 360-835-8794				
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ITEM NO.	DESCRIPTION	UNIT	ORIGINAL QUANTITY	UNIT PRICE	CONTRACT TOTAL	QUANTITY PREVIOUS	TOTAL PREVIOUS	QUANTITY THIS EST.	TOTAL THIS EST.	QUANTITY TO DATE	TOTAL TO DATE
<b>CHANGE ORDERS - SCHEDULE A: ROAD AND STORM</b>											
2A	Clear Additional Trees from Sta 36+00 to 40+00 Right	LS	1.00	\$42,366.63	\$42,366.63	1.00	\$42,366.63	0.00	\$0.00	1.00	\$42,366.63
2B	Accelerate Contract Schedule due to 9-Day Delay	LS	1.00	\$18,611.55	\$18,611.55	1.00	\$18,611.55	0.00	\$0.00	1.00	\$18,611.55
2C	Stormwater Treatment Vault Upsize	LS	1.00	\$13,073.00	\$13,073.00	1.00	\$13,073.00	0.00	\$0.00	1.00	\$13,073.00
2D	additional Silt Fence	LF	1,500.00	\$2.50	\$3,750.00	1,500.00	\$3,750.00	0.00	\$0.00	1500.00	\$3,750.00
2F	Modify Field Inlet Drain Pipe, Sta. 14+09.07, 19+69.60	LS	1.00	\$2,518.00	\$2,518.00	1.00	\$2,518.00	0.00	\$0.00	1.00	\$2,518.00
2G	Modify Field Inlet Drain Pipe, Sta. 25+53.94, 28+70.96	LS	1.00	\$1,976.00	\$1,976.00	1.00	\$1,976.00	0.00	\$0.00	1.00	\$1,976.00
2H	Cut and Abandon Unmarked 8" Utility Pipe	LS	1.00	\$1,132.10	\$1,132.10	1.00	\$1,132.10	0.00	\$0.00	1.00	\$1,132.10
SCHEDULE A SUBTOTAL (NON-TAXABLE)					\$83,427.28		\$83,427.28		\$0.00		\$83,427.28
Retainage (5%) - N/A Retainage Bond Posted											
<b>SCHEDULE A TOTAL</b>					<b>\$83,427.28</b>		<b>\$83,427.28</b>		<b>\$0.00</b>		<b>\$83,427.28</b>

<b>CHANGE ORDERS - SCHEDULE B: WATER AND SANITARY (TAXABLE ITEMS)</b>											
2E	Over-Excavation for Mis-Marked Waterline at 202nd	LS	1.00	\$1,272.28	\$1,272.28	1.00	\$1,272.28	0.00	\$0.00	1.00	\$1,272.28
2I	Remove Concrete Thrust Block @ 12" San FM Stub	LS	1.00	\$2,086.29	\$2,086.29	1.00	\$2,086.29	0.00	\$0.00	1.00	\$2,086.29
SCHEDULE B SUBTOTAL					\$3,358.57		\$3,358.57		\$0.00		\$3,358.57
Sales Tax (8.4%):					\$282.12		\$282.12		\$0.00		\$282.12
Retainage (5%) - N/A Retainage Bond Posted											
<b>SCHEDULE B TOTAL</b>					<b>\$3,640.69</b>		<b>\$3,640.69</b>		<b>\$0.00</b>		<b>\$3,640.69</b>

