



**Request for Proposals (RFP)  
RFP # VSW-KTB-2019-20**

**Addendum Two**

**City of Thorne Bay, Alaska  
Water Plant and Wastewater Plant Improvement Contractor**

**Department of Environmental Conservation  
Village Safe Water Program**

**Date of Issue: January 15, 2019**

The RFP Package is hereby clarified or changed as follows:

1. Submittal deadline is not changed.
2. Questions and Answers
3. Addition of Scope
4. Attachments

The questions and answers, addition of scope, and attachments begin on page 2. This Addendum is hereby made part of the RFP and is a total of 3 pages.

All other terms and conditions for this RFP remain unchanged.

Issued by: Fred Parrish  
Procurement Officer  
(907) 269-7674

## 2. Questions and Answers

**Question 1:** I will probably have several more questions but for now I am curious about the Commissioning. I wasn't sure if the is to be an actual Commissioning agent, and if so who is supposed to furnish this service.

**Answer 1:** There are a couple of commissioning tasks. (i) The pressure filter automation startup will be headed up the by Systems Integrator who is also providing the Water Treatment plant Control Panel (WTCP) and associated programming. (ii) The nanofiltration equipment commissioning will be led by the nanofiltration supplier representative. The Systems Integrator will be on site as well, because when the WTCP starts and stops the water treatment process it signals the nanofiltration control panel through an Ethernet connection to start and stop.

**Question 2:** I found the RFP on the Plansroom, fairly late in the game. I am a little troubled that no General contractors or instrumentation/control contractors have been added to the bidders list on that site. Do you have another bidders list?

**Answer 2:** We do not have another bidders list. Addendum 1 changed the proposal due date to February 4, 2019.

**Question 3:** Is it possible that if no General contractors join the bidders list that the bid could be delayed to regroup?

**Answer 3:** We certainly want to get a competitive proposal from a qualified builder. The original proposal due date was changed in Addendum 1 to February 4, 2019.

**Question 4:** There does not appear to be information regarding Pipe and Duct (Mechanical) insulation requirements specified for this project. Will there be information released concerning the insulation required for the new pipe and duct systems, if any?

**Answer 4:** All piping is either indoors or buried. The interior spaces are heated. There will be no pipe or duct insulation required.

**Questions 5:** I would like to clarify the disposition of the control panel. Is the panel supplied by the SI or is a shop to build it and the SI will test and accept on behalf of Village Safe Water.

**Answer 5:** The SI is providing the WTCP as part of the SI scope of work. Part of the control panel fabrication is bench testing at the SI shop to demonstrate the panel function. The Engineer shall observe and confirm WTCP function before it leaves the panel shop.

**Question 6:** The next to the last paragraph on page 9 states that “the sealed proposal package(s) may be hand delivered, or U.S. mail”. The first paragraph on page 10 states that “Faxed, oral or mailed proposals are not acceptable.

**Answer 6:** Page 10 should read “Faxed, oral or e-mailed proposals are not acceptable.”

**Question 7:** Are you looking for design work?

**Answer 7:** No.

### **3. Addition of Scope**

Add the following to RFP VSW-KTB-2019-20, Part – 2, Detailed Scope Statement, B. Phase 2, WTP Filter Automation and Nanofiltration Installation, Section 3:

“c. Installation of Turbidity Meters - The Thorne Bay water plant scope of work is modified to include replacement and relocation of individual filter and combined filter turbidity meters (4 each), and installation of a raw water turbidity meter. The pre-approved new individual and combined filter turbidity meters are Hach TU5300 meters. The new raw water turbidity meter shall be one of the existing Hach 1720e instruments that are being salvaged from the turbidity meters that are being replaced.”

The Attachments detail the turbidity meter scope of work addition.

### **4. Attachments**

The following sheets supersede the plan sheets and specifications previously issued:

1. Thorne Bay WTP General and Mechanical Sheets Revision 1 – sheets G03, D03, D05, D06, D11, D12, and D17
2. Thorne Bay WTP Turbidimeter Meter Electrical Revision 1 – sheets E03, E06, E07, ICO3, IC08, and IC09
3. Thorne Bay WTP Specifications 33 09 10 Instruments Revision 1 -- changes addition of section 2.1 part (G), which is underlined.

Offerors must acknowledge receipt of this addendum prior to the submittal deadline.

The proposal documents require acknowledgment individually of all addenda to the drawings and/or specifications. This is a **mandatory requirement** and any proposal received without acknowledgment of receipt of addenda may be classified as not being a responsive proposal.

### **End of Addendum**

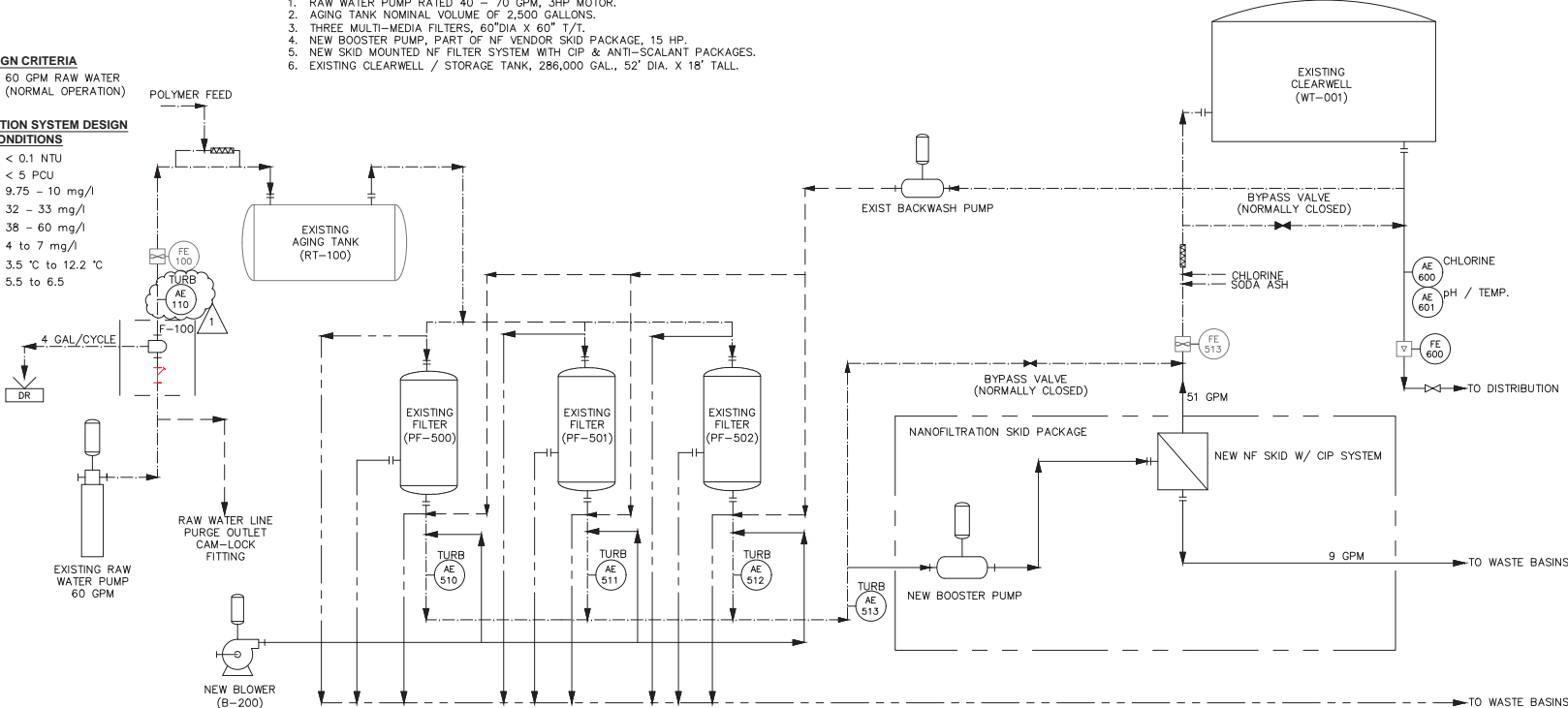
- NOTES:
1. RAW WATER PUMP RATED 40 – 70 GPM, 3HP MOTOR.
  2. AGING TANK NOMINAL VOLUME OF 2,500 GALLONS.
  3. THREE MULTI-MEDIA FILTERS, 60” DIA X 60” T/T.
  4. NEW BOOSTER PUMP, PART OF NF VENDOR SKID PACKAGE, 15 HP.
  5. NEW SKID MOUNTED NF FILTER SYSTEM WITH CIP & ANTI-SCALANT PACKAGES.
  6. EXISTING CLEARWELL / STORAGE TANK, 286,000 GAL., 52’ DIA. X 18’ TALL.

DESIGN CRITERIA

60 GPM RAW WATER  
DESIGN FLOW (NORMAL OPERATION)

NANOFILTRATION SYSTEM DESIGN  
CONDITIONS

TURBIDITY < 0.1 NTU  
COLOR < 5 PCU  
HARDNESS 9.75 – 10 mg/l  
ALKALINITY 32 – 33 mg/l  
TDS 38 – 60 mg/l  
TOC 4 to 7 mg/l  
TEMPERATURE 3.5 °C to 12.2 °C  
pH 5.5 to 6.5



OPERATIONAL DESCRIPTION:

**WATER SOURCE:** RAW WATER FROM WATER LAKE RESERVOIR IS PUMPED VIA AN EXISTING SUBMERSIBLE PUMP WITH CLEANABLE SCREEN HUNG BELOW THE DOCK FROM WATER LAKE THROUGH APPROXIMATELY 2,400 FEET OF 8" PIPE TO THE WATER TREATMENT PLANT.

**RAW WATER TRANSMISSION LINE PURGING:** THE 8" HDPE RAW WATER LINE NEEDS TO BE PURGED PERIODICALLY (TWICE A YEAR) TO REMOVE DEPOSITED ALGAE AND PLANT MATTER THAT ACCUMULATES IN THE LINE. A TRAILER-MOUNTED ENGINE POWERED SELF-PRIMING PUMP IS HOOKED UP TO A BRANCH TEE IN THE 8" HDPE TRANSMISSION LINE. A 6-IN SUCTION LINE IS SET ON THE DOCK AND CONNECTED TO THE PUMP. THIS PORTABLE PUMP DELIVERS 750 GPM AT 80 FT OF HEAD TO THE RAW WATER LINE. PURGING WATER AT 750 GPM (ABOUT 6 FT/S VELOCITY) IS PUMPED FROM WATER LAKE THROUGH THE LINE TO A DISCHARGE POINT AT THE WATER TREATMENT PLANT.

**TRANSMISSION LINE AIR RELEASE / VACUUM BREAKERS:** THE RAW WATER TRANSMISSION LINE HAS A HORIZONTAL SECTION AT ITS HIGH POINT. AT EACH END OF THIS HORIZONTAL LINE ARE TWO AIR RELEASE / VACUUM BREAKER VALVES IN ORDER TO PURGE THE LINE OF AIR DURING STARTUP, OPERATIONS, AND TO ALLOW AIR INTO THE TRANSMISSION LINE WHILE IT IS BEING DRAINED.

**DEER CREEK BRIDGE CROSSING:** THE RAW WATER LINE CROSSES OVER A STEEL TRUSS BRIDGE SPANNING DEER CREEK. A PORTABLE ELECTRIC SUMP PUMP IS HANGING ON THE BRIDGE IN CASE THE WATER LAKE RESERVOIR IS NOT AVAILABLE. THE PORTABLE PUMP WOULD BE LOWERED INTO DEER CREEK AND USED TO PUMP WATER TO THE WATER TREATMENT PLANT IN EMERGENCY CASES ONLY.

**WATER TREATMENT PLANT PURGING VALVES:** TWO 6" VALVES IN THE WTP, ONE ON THE DOWNSTREAM END OF THE TEE RUN OF THE RAW WATER LINE AND THE OTHER ON THE TEE BRANCH, ARE USED TO ALLOW PURGING OF THE RAW WATER LINE WHEN THE PURGING OPERATION IS UNDERWAY. THE DOWNSTREAM VALVE IS CLOSED, THE BRANCH VALVE IS OPENED, AND THE NEW SCREEN IS ISOLATED WITH TWO NEW 3" VALVES TO ALLOW APPROXIMATELY 750 GPM OF MIXED AIR, WATER, AND PIPELINE SEDIMENT TO BE PUMPED THROUGH THE PIPELINE AND TO THE DISPOSAL FIELD.

**COAGULANT INJECTION AND STATIC MIXER:** THIS STEP IS THE BEGINNING OF THE WATER TREATMENT PROCESS. A COAGULANT POLYMER IS INJECTED INTO THE RAW WATER AT THE INITIAL STATIC MIXER. THE COAGULANT IS FED INTO THE INJECTION POINT NEAR BY A CHEMICAL FEED PUMP. A RAW WATER INLET FLOW METER REPORTS THE FLOW RATE AND CAN BE USED TO PACE THE CHEMICAL FEED PUMP. A STREAMING CURRENT DETECTOR CAN ALSO BE USED TO ADJUST COAGULANT FEED RATES BY OPTIMIZING THE NET CHARGE ON THE COATED COLLOIDAL MATERIAL (MAINLY COLOR, TURBIDITY, AND COAGULANTS) IN THE WATER. THE STATIC MIXER CREATES STRONG EDDY CURRENTS, THOROUGHLY MIXING COLLOIDAL CONTAMINANTS AND COAGULANT.

**REACTION / AGING TANK:** A 2,500 GALLON BAFFLED REACTION TANK PROVIDES RESIDENCE TIME FOR THE COAGULATION PROCESS TO TAKE PLACE. AT 60 GALLONS PER MINUTE FLOW RATE, THE TANK PROVIDES 41 MINUTES OF RESIDENCE TIME, WHICH JAR TESTS HAVE SHOWN TO BE ADEQUATE TIME TO FORM FLOC THAT IS LARGE ENOUGH TO BE FILTERED. A COMBINATION AIR RELEASE / VACUUM BREAKER VALVE PROVIDES FOR THE VENTING OF AIR OUT OF THE TANK AND ADMITTANCE OF AIR

INTO THE TANK WHEN IT IS DRAINED DOWN FOR CLEANING.

**PRESSURE FILTRATION:** FLOC-LADEN WATER ENTERS THE PRESSURE FILTERS WHICH ARE NORMALLY ON-LINE IN PARALLEL. THE HEAD SPACE IN THE FILTER VESSELS ABOVE THE FILTER MEDIA PROVIDES AN ADDITIONAL 7 MINUTES OF RESIDENCE TIME FOR FLOC FORMATION. FLOC-LADEN WATER FLOWS THROUGH LAYERED FILTER MEDIA, ANTHRACITE, QUARTZ SAND, GARNET, AND GRAVEL UNDERBED LAYERS BEFORE IT EXITS THE FILTER VESSEL THROUGH THE UNDERDRAIN SCREENS. FILTERED WATER FLOWS THROUGH A FLOW CONTROL VALVE WHICH MAINTAINS A CONSTANT RATE OF 20 GPM THROUGH THE FILTER MEDIA IN EACH VESSEL. A VARIABLE AREA FLOWMETER IS USED TO MANUALLY MONITOR FLOW AND SET THE FLOW RATE. FILTERED WATER THEN FLOWS TO THE NF SKID FOR FURTHER TREATMENT TO REMOVE ORGANICS. A TURBIDIMETER MONITORS TURBIDITY OF THE FILTERED WATER FROM EACH FILTER VESSEL AND THE COMBINED FILTERED WATER STREAM. A FILTERED WATER FLOW METER IS PROVIDED TO RECORD THE AMOUNT OF FILTERED WATER PRODUCED, AS WELL AS THE TOTAL FLOW RATE.

**PRESSURE FILTER CLEANING:** WHEN THE PRESSURE FILTERS ARE FULL OF CONTAMINANTS (EITHER HIGH DIFFERENTIAL PRESSURE OR TURBIDITY BREAKTHROUGH) THE FILTRATION OPERATION STOPS AND BACKWASH BEGINS. MOTORIZED VALVES ARE PROVIDED TO ADJUST THE FLOW FOR EACH OF THE FOLLOWING SEQUENCES:  
WATER ABOVE THE ANTHRACITE FILTER MEDIA LAYER IS DRAINED DOWN, THE AIR BLOWER STARTS AND RUNS FOR APPROXIMATELY 2 MINUTES, THE BLOWER STOPS. A SLOW FILL AT 75 GPM OF POTABLE WATER FROM STORAGE GENTLY ELIMINATES TRAPPED AIR IN THE FILTER MEDIA AND FILLS THE HEAD SPACE ABOVE THE FILTER MEDIA (ABOUT 3 MINUTES). A CLA-VAL PROVIDES 240 TO 300 GPM OF BACKWASH FLOW (AS DESIRED) THROUGH THE FILTER MEDIA AND OUT OF THE FILTER VESSEL TO WASTE. WHEN THE BACKWASH OPERATION IS COMPLETE,

ALL MOTORIZED VALVES ARE CLOSED AND THE FILTER RESTARTS BY FILTERING TO WASTE FOR 10 TO 15 MINUTES TO CONDITION THE MEDIA. AN INDIVIDUAL FILTER VESSEL CAN BE BACKWASHED AND CONDITIONED WHILE THE OTHER TWO FILTER VESSELS ARE ONLINE IN FILTRATION MODE. AFTER CONDITIONING, THE FILTER RETURNS TO NORMAL FILTRATION MODE.

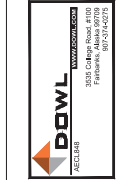
**NANOFILTRATION MEMBRANE SKID:** THIS PROJECT ADDS A NEW NANOFILTRATION MEMBRANE SKID TO FILTER OUT ADDITIONAL TOC IN THE WATER PRIOR TO CHLORINATION. DETAILS OF THE OPERATION OF THIS SYSTEM ARE PROVIDED IN THE OPERATING MANUAL.

**DISINFECTION:** A 12.5% SOLUTION OF SODIUM HYPOCHLORITE IS INJECTED AT THE FINAL STATIC MIXER FOR DISINFECTION OF THE FILTERED WATER (1-LOG INACTIVATION OF GIARDIA UNDER THE SWTR). IF DESIRED, A SODA ASH SOLUTION CAN ALSO BE INJECTED FOR INCREASING THE PH OF THE WATER FOR CORROSION CONTROL PURPOSES.

**WATER STORAGE AND DISTRIBUTION:** TREATED WATER THEN FLOWS INTO A 280,000 GALLON WATER STORAGE TANK. A CIRCULATING PUMP CONSTANTLY CIRCULATES 50-GPM THROUGHOUT THE TANK TO KEEP IT THOROUGHLY MIXED. A NEW WATER LEVEL TRANSMITTER PROVIDES AN INDICATION OF TANK LEVEL AND A SIGNAL TO START OR STOP THE WATER TREATMENT PLANT. WATER FLOWS OUT OF THE STORAGE TANK THROUGH A NEW FLOW METER / TOTALIZER AND INTO THE 8-IN BURIED POTABLE WATER DISTRIBUTION MAIN TO TOWN.

REV 1 JAN 19  
**FINAL BID SET**  
APPROVED FOR CONSTRUCTION

CITY OF THORNE BAY  
THORNE BAY, ALABAMA 36939  
(907) 828-3380  
FAX (907) 828-3374  
www.thornebay.ak.gov



WTP IMPROVEMENTS  
PROCESS FLOW  
DIAGRAM &  
DESIGN CRITERIA

REVISION	BY	DATE
1	DESIGN	ON 3-18
2	REVIEW	ON 5-18
3	AGENCY SUBMITAL	ON 11-18
4	FINAL BID SET	ON 11-18
5	REV 1	ON 1-19

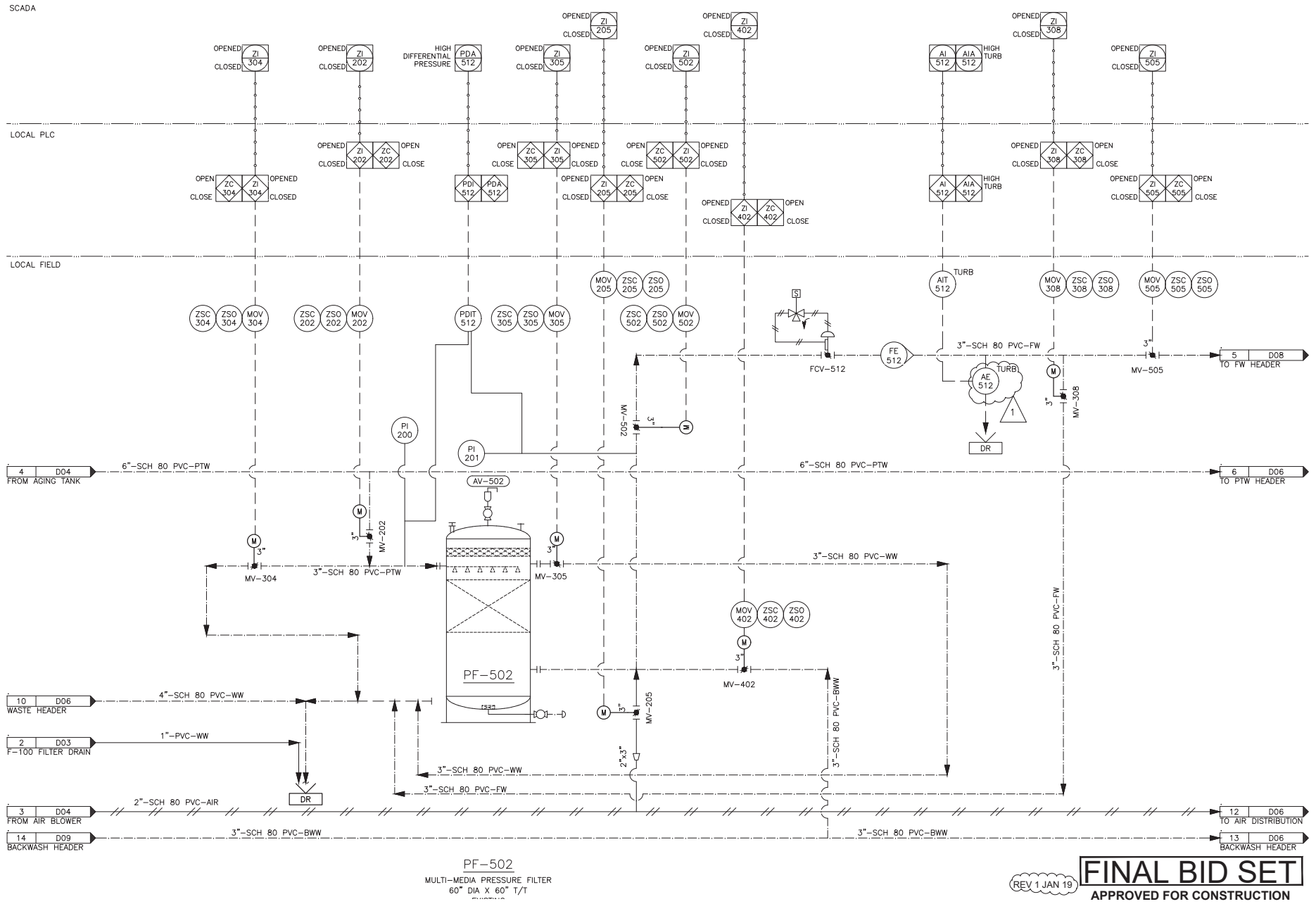
Project No. 1509-00053.0  
Date 2013-01-04  
Designed  
Drawn  
Approved

Sheet No. G03

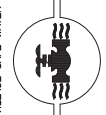
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# Addendum 2, Attachment 1



**CITY OF THORNE BAY**  
THORNE BAY, ALABAMA 36693  
(907) 828-3380  
FAX (907) 828-3374  
www.thornetbay.ak.gov



## WTP IMPROVEMENTS PROCESS & INSTRUMENTATION DIAGRAM 3

REVISION	BY	DATE
1	ESS	REVIEW SET ON 3-18
2	ESS	AGENCY SUBMITTAL ON 5-18
3	FINAL_BID_SET	ON 11-18
4	REV 1	ON 1-19

Project No. 15242-00053.0  
Date 2013-01-06  
Designed  
Drawn  
Approved

Sheet No. **D05**

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**EXISTING INSTRUMENT SCHEDULE**

TAG	DESCRIPTION	FUNCTION	LOCATION	MFR	MODEL	DWG
AIT-100	STREAMING CURRENT DETECTOR	-	-	MILTON ROY	SC5200	D04
FE-510	FLOW INDICATOR	ALLOWS VISUAL OBSERVATION OF FLOW THROUGH FILTER PF-500	ON FILTERED WATER LINE NEAR FILTER PF-500	BLUE WHITE	F452N	D07
FE-511	FLOW INDICATOR	ALLOWS VISUAL OBSERVATION OF FLOW THROUGH FILTER PF-501	ON FILTERED WATER LINE NEAR FILTER PF-501	BLUE WHITE	F452N	D06
FE-512	FLOW INDICATOR	ALLOWS VISUAL OBSERVATION OF FLOW THROUGH FILTER PF-502	ON FILTERED WATER LINE NEAR FILTER PF-502	BLUE WHITE	F452N	D05
FE-100	FLOW METER	PADDLE WHEEL FLOW METER RECORDING INFLUENT FLOWS TO THE WTP	ON RAW WATER LINE IN LAB ROOM	-	-	D04
FE-410	FLOW METER	PADDLE WHEEL FLOW METER RECORDING BACKWASH FLOWS	ON BACKWASH LINE NEAR CHEMICAL STORAGE ROOM IN SW CORNER OF PROCESS ROOM	-	-	D09
FE-513	FLOW METER	PADDLE WHEEL FLOW METER RECORDING FLOWS UPSTREAM OF WATER STORAGE TANK USED FOR FLOW-PACED CHLORINE AND SODA ASH INJECTION	ON FILTERED WATER LINE NEAR SOUTH WALL OF PROCESS ROOM	-	-	D08
FE-600	FLOW METER	PADDLE WHEEL FLOW METER RECORDING FLOWS TO THE DISTRIBUTION SYSTEM	ON POTABLE WATER LINE NEAR DISCHARGE TO DISTRIBUTION SYSTEM	-	-	D09
PI-100	PRESSURE GAUGE	4" DIAMETER FACE, 0-100 PSIG, GLYCERIN FILLED, 1/4" NPT BOTTOM PIPING CONNECTION	RAW WATER PUMP DISCHARGE	-	-	D03
PI-101	PRESSURE GAUGE	4" DIAMETER FACE, 0-100 PSIG, GLYCERIN FILLED, 1/4" NPT BOTTOM PIPING CONNECTION	RAW WATER INLET LINE	-	-	D03
PI-102	PRESSURE GAUGE	4" DIAMETER FACE, 0-100 PSIG, GLYCERIN FILLED, 1/4" NPT BOTTOM PIPING CONNECTION	SCREENED WATER LINE	-	-	D04
PI-200	PRESSURE GAUGE	4" DIAMETER FACE, 0-100 PSIG, GLYCERIN FILLED, 1/4" NPT BOTTOM PIPING CONNECTION	PF-502 INLET	-	-	D05
PI-201	PRESSURE GAUGE	4" DIAMETER FACE, 0-100 PSIG, GLYCERIN FILLED, 1/4" NPT BOTTOM PIPING CONNECTION	PF-502 OUTLET	-	-	D05
PI-202	PRESSURE GAUGE	4" DIAMETER FACE, 0-100 PSIG, GLYCERIN FILLED, 1/4" NPT BOTTOM PIPING CONNECTION	PF-501 INLET	-	-	D06
PI-203	PRESSURE GAUGE	4" DIAMETER FACE, 0-100 PSIG, GLYCERIN FILLED, 1/4" NPT BOTTOM PIPING CONNECTION	PF-501 OUTLET	-	-	D06
PI-204	PRESSURE GAUGE	4" DIAMETER FACE, 0-100 PSIG, GLYCERIN FILLED, 1/4" NPT BOTTOM PIPING CONNECTION	PF-500 INLET	-	-	D07
PI-205	PRESSURE GAUGE	4" DIAMETER FACE, 0-100 PSIG, GLYCERIN FILLED, 1/4" NPT BOTTOM PIPING CONNECTION	PF-500 OUTLET	-	-	D07
PI-400	PRESSURE GAUGE	4" DIAMETER FACE, 0-100 PSIG, GLYCERIN FILLED, 1/4" NPT BOTTOM PIPING CONNECTION	BACKWASH HEADER	-	-	D08
PI-500	PRESSURE GAUGE	4" DIAMETER FACE, 0-100 PSIG, GLYCERIN FILLED, 1/4" NPT BOTTOM PIPING CONNECTION	FILTERED WATER HEADER TO NF	-	-	D09
SM-100	STATIC MIXER	STATIC INJECTION MIXER FOR IN-LINE MIXING OF POLYMER PRIOR TO RT-1	ON INLET SIDE OF RT-1 LOCATED AT POLYMER INJECTION POINT	WESTFALL	MODEL 2800	D04
SM-500	STATIC MIXER	STATIC INJECTION MIXER FOR IN-LINE MIXING OF CHLORINE & SODA ASH PRIOR TO WT-1	FILTERED WATER LINE TO WATER STORAGE TANK, DOWNSTREAM OF NF RETURN CONNECTION	WESTFALL	MODEL 2800	D08

**EXISTING EQUIPMENT SCHEDULE**

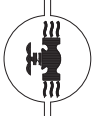
TAG	DESCRIPTION	FUNCTION	SYSTEM/LOCATION	MANUFACTURER	MODEL	DWG NUMBER
CF-100	DIAPHRAGM TYPE - POSITIVE DISPLACEMENT PUMP	CHEMICAL FEED PUMP RATE CONTROLLED BY 4-20 mA SIGNAL. 25 mL/hr - 2 L/hr. DIGITAL SETTINGS. MENU CONTROL	FW	LMI	SERIES G MODEL SD2	D04
CF-500	POSITIVE DISPLACEMENT PUMP	CHEMICAL FEED PUMP RATE CONTROLLED BY 4-20 mA SIGNAL FROM FE-513.	FW	LMI	SERIES G MODEL SD2	D08
CF-501	POSITIVE DISPLACEMENT PUMP	CHEMICAL FEED PUMP rate controlled by 4-20 mA SIGNAL FROM FE-513. 75 ML/HR - 3.76 L/HR. DIGITAL SETTINGS. MENU CONTROL. SW CORNER OF WTP IN CHEMICAL STORAGE ROOM.	FW	LMI	SERIES G MODEL SD2	D08
CT-100	BULK POLYMER TANK	CHEMICAL STORAGE TANK, 50 GAL. POLYETHYLENE WITH COVER	RW	-	-	D04
CT-500	CHEMICAL STORAGE TANK	50 GAL. POLYETHYLENE WITH COVER	FW	-	-	D08
CT-501	CHEMICAL STORAGE TANK	50 GAL. POLYETHYLENE WITH COVER	FW	-	-	D08
P-100	SUBMERSIBLE WELL PUMP	PUMPS RAW WATER FROM LAKE TO TREATMENT PLANT	BWW	GRUNDFOS	16S10-10	D03
P-410	BACKWASH PUMP	BACKWASH OF SAND FILTERS	PTW	G&L	5SH2L52D0	D08
P-411	RECIRCULATION PUMP	PROVIDE MIXING AND TURNOVER WITHIN THE WATER STORAGE TANK	PTW	G&L	NPE / 3ST	D08
PF-500	MULTI-MEDIA PRESSURE FILTER	FILTRATION	PTW	-	-	D07
PF-501	MULTI-MEDIA PRESSURE FILTER	FILTRATION	RW	-	-	D06
PF-502	MULTI-MEDIA PRESSURE FILTER	FILTRATION	PW	-	-	D05
RT-100	AGING TANK	PROVIDE RAW WATER CONTACT TIME WITH POLYMER PRIOR TO FILTRATION	RW	-	-	D04
WT-001	TREATED WATER STORAGE	PROVIDES EQUALIZATION BETWEEN TREATED WATER FROM THE PLANT AND POTABLE WATER USED IN THE DISTRIBUTION SYSTEM	PW	-	CUSTOM	D08
MS-600A	EYE WASH STATION	EMERGENCY EYE WASH IN CASE OF CONTACT WITH CHEMICALS NEAR THE AGING TANK	PW	-	-	-
MS-600B	EMERGENCY SHOWER	EMERGENCY SHOWER IN CASE OF CONTACT WITH CHEMICALS NEAR THE AGING TANK	PW	-	-	-

REV 1 JAN 19

**FINAL BID SET**

APPROVED FOR CONSTRUCTION

**CITY OF THORNE BAY**  
THORNE BAY, ALABAMA 36919  
(907) 828-3380  
FAX (907) 828-3374  
www.thornebay-al.gov



WTP IMPROVEMENTS  
EXISTING  
INSTRUMENTATION &  
EQUIPMENT SCHEDULES

REVISION	BY	DATE
100% REVIEW SET	ON	3-18
95% AGENCY SUBMITTAL	ON	5-18
FINAL BID SET	ON	11-18
REV 1	ON	1-19

Project No. 1509-0005.00	Date 2019-01-08
Designed	Drawn
Approved	
Sheet No. D11	
SHEET 11 OF 71	



## NEW INSTRUMENT SCHEDULE

TAG	DESCRIPTION	FUNCTION	MEDIUM	MFR	MODEL	SUPPLIED BY	DWG	SPEC
AE-110	TURBIDITY METER	RAW WATER TURBIDITY SAMPLING DOWNSTREAM OF SCREEN SC-100. RE-USE EXISTING.	RW	HACH	1720E	OWNER	D07	33 09 10
AE-510	TURBIDITY METER	TURBIDITY SAMPLING DOWNSTREAM OF FILTER PF-500	FW	HACH	TU5300	CONTRACTOR	D07	33 09 10
AE-511	TURBIDITY METER	TURBIDITY SAMPLING DOWNSTREAM OF FILTER PF-501	FW	HACH	TU5300	CONTRACTOR	D06	33 09 10
AE-512	TURBIDITY METER	TURBIDITY SAMPLING DOWNSTREAM OF FILTER PF-502	FW	HACH	TU5300	CONTRACTOR	D05	33 09 10
AE-513	TURBIDITY METER	TURBIDITY SAMPLING OF COMBINED MEDIA FILTER DISCHARGE PRIOR TO NF SKID	FW	HACH	TU5300	CONTRACTOR	D08	33 09 10
AE-600	CHLORINE METER / ANALYZER	MEASURE AND REPORT CHLORINE LEVELS TO DISTRIBUTION SYSTEM FOR RECORDING	PW	HACH	CLF10	CONTRACTOR	D05	33 09 10
AE-601	pH METER / ANALYZER	MEASURE AND REPORT pH LEVELS TO DISTRIBUTION SYSTEM FOR RECORDING	PW	HACH	CLF10	CONTRACTOR	D09	33 09 10
PDIT-510	PRESSURE TRANSMITTER	DIFFERENTIAL PRESSURE THROUGH FILTER PF-500 FOR BACKWASH OPERATION CONTROL	FW	ROSEMOUNT	3051	CONTRACTOR	D07	33 09 10
PDIT-511	PRESSURE TRANSMITTER	DIFFERENTIAL PRESSURE THROUGH FILTER PF-501 FOR BACKWASH OPERATION CONTROL	FW	ROSEMOUNT	3051	CONTRACTOR	D08	33 09 10
PDIT-512	PRESSURE TRANSMITTER	DIFFERENTIAL PRESSURE THROUGH FILTER PF-502 FOR BACKWASH OPERATION CONTROL	FW	ROSEMOUNT	3051	CONTRACTOR	D05	33 09 10
PIT-100	PRESSURE TRANSMITTER	PRESSURE IN RAW WATER LINE FOR OPERATION CONTROL	FW	ROSEMOUNT	3052	CONTRACTOR	D03	34 09 10
MOV-100	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-100	RW	BRAY	S70-008	CONTRACTOR	D03	40 11 11
MOV-200	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-200	PTW	BRAY	S70-006	CONTRACTOR	D07	40 11 11
MOV-201	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-201	PTW	BRAY	S70-006	CONTRACTOR	D06	40 11 11
MOV-202	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-202	PTW	BRAY	S70-006	CONTRACTOR	D05	40 11 11
MOV-203	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-203	PTW	BRAY	S70-006	CONTRACTOR	D07	40 11 11
MOV-204	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-204	PTW	BRAY	S70-006	CONTRACTOR	D06	40 11 11
MOV-205	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-205	PTW	BRAY	S70-006	CONTRACTOR	D05	40 11 11
MOV-300	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-300	BWW	BRAY	S70-006	CONTRACTOR	D07	40 11 11
MOV-301	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-301	BWW	BRAY	S70-006	CONTRACTOR	D07	40 11 11
MOV-302	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-302	BWW	BRAY	S70-006	CONTRACTOR	D06	40 11 11
MOV-303	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-303	BWW	BRAY	S70-006	CONTRACTOR	D06	40 11 11
MOV-304	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-304	BWW	BRAY	S70-006	CONTRACTOR	D05	40 11 11
MOV-305	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-305	BWW	BRAY	S70-006	CONTRACTOR	D05	40 11 11
MOV-306	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-306	BWW	BRAY	S70-006	CONTRACTOR	D07	40 11 11
MOV-307	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-307	BWW	BRAY	S70-006	CONTRACTOR	D06	40 11 11
MOV-308	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-308	BWW	BRAY	S70-006	CONTRACTOR	D05	40 11 11
MOV-400	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-400	WW	BRAY	S70-006	CONTRACTOR	D07	40 11 11
MOV-401	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-400	WW	BRAY	S70-006	CONTRACTOR	D06	40 11 11
MOV-402	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-402	WW	BRAY	S70-006	CONTRACTOR	D05	40 11 11
MOV-500	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-500	FW	BRAY	S70-006	CONTRACTOR	D07	40 11 11
MOV-501	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-501	FW	BRAY	S70-006	CONTRACTOR	D06	40 11 11
MOV-502	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-502	FW	BRAY	S70-006	CONTRACTOR	D05	40 11 11
MOV-503	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-503	FW	BRAY	S70-006	CONTRACTOR	D07	40 11 11
MOV-504	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-504	FW	BRAY	S70-006	CONTRACTOR	D06	40 11 11
MOV-505	MOTORIZED VALVE ACTUATOR	OPEN/CLOSE VALVE MV-505	FW	BRAY	S70-006	CONTRACTOR	D05	40 11 11

## NEW VALVE SCHEDULE

TAG	SIZE	DESCRIPTION	FUNCTION	LOCATION	STATUS	MFR	MODEL	MEDIUM	SUPPLIED BY	DWG	SPEC
HV-110	3"	MANUALLY OPERATED LUG TYPE BUTTERFLY VALVE	ISOLATION ENTERING BAC WAS: ING SCREEN SC-100	NEAR RAW WATER INLET IN WTP PROCESS ROOM	NORMALD OPEN			RW	CONTRACTOR	D03	40 11 11
HV-111	3"	MANUALLY OPERATED LUG TYPE BUTTERFLY VALVE	ISOLATION ENTERING LUG TYPE SCREEN SC-100	NEAR RAW WATER INLET IN WTP PROCESS ROOM	NORMALD OPEN			RW	CONTRACTOR	D03	40 11 11
HV-112	6"	MANUALLY OPERATED BUTTERFLY VALVE	ALLOWS B: PASS OF SCREEN SC-100	NEAR RAW WATER INLET IN WTP PROCESS ROOM	NORMALD CLOSED			RW	CONTRACTOR	D03	40 11 11
HV-203	2"	MANUALLY OPERATED BALL VALVE	ISOLATION LEAVING AIR BLOWER B-100	NEAR BLOWER DISCHARGE IN NANOFILTRATION ROOM	NORMALD OPEN			AIR	CONTRACTOR	D04	40 11 11
HV-500	4"	CHECK VALVE	PREVENTS BAC FLOW OF C: LORINATED WATER AFTER T: E NF S: PPL: LINE	ON FILTERED WATER LINE AFTER FILTER PF-100	N/A			FW	CONTRACTOR	D08	40 11 11
HV-501	4"	MANUALLY OPERATED LUG TYPE BUTTERFLY VALVE	ALLOWS B: PASS OF NANOFILTRATION S: ID	ON FILTERED WATER LINE AFTER FILTER PF-100	NORMALD CLOSED			FW	CONTRACTOR	D08	40 11 11
HV-502	4"	MANUALLY OPERATED LUG TYPE BUTTERFLY VALVE	CONTROLS FLOW TO NANOFILTRATION S: PPL: LINE	ON NANOFILTRATION S: PPL: LINE IN PROCESS ROOM	NORMALD OPEN			FW	CONTRACTOR	D08	40 11 11
HV-600	4"	MANUALLY OPERATED LUG TYPE BUTTERFLY VALVE	ISOLATION FROM NANOFILTRATION RET: RN LINE	ON NANOFILTRATION RET: RN LINE IN PROCESS ROOM	NORMALD OPEN			PW	CONTRACTOR	D08	40 11 11
HV-601	4"	CHECK VALVE	PREVENTS BAC FLOW OF C: LORINATED WATER T: RO: T: E NANOFILTRATION RET: RN LINE	ON NANOFILTRATION RET: RN LINE IN PROCESS ROOM	N/A			PW	CONTRACTOR	D08	40 11 11

## NEW EQUIPMENT SCHEDULE

TAG	DESCRIPTION	FUNCTION	MEDIUM	MFR	MODEL	DWG	SUPPLIED BY
B-200	BACKWASH AIR SCOUR BLOWER	PROVIDES AIR FOR IMPROVED BACKWASHING OF THE MULTIMEDIA VESSEL FILTERS.	AIR	KAESER	BB52C	D04	CONTRACTOR
SC-100	SELF-BACKWASHING SCREEN	REMOVES DEBRIS FROM THE RAW WATER SOURCE PRIOR TO TREATMENT	RW	AMIAD/FILTOMAT	M103C	D03	CONTRACTOR
NF-502	NANOFILTRATION SKID & PACKAGE	FILTRATION AND TOC REMOVAL	FW	PURE AQUA	NF-500	D08	OWNER
MS-601	EYE WASH STATION & SHOWER	EMERGENCY EYE WASH IN CASE OF CONTACT WITH CHEMICALS NEAR THE NF SKID	PW	BRADLEY	S19-310PVC	D09	CONTRACTOR
P-601	DOMESTIC WATER PUMP	PROVIDES PRESSURE TO DOMESTIC WATER SUPPLY WITHIN THE TREATMENT PLANT BUILDING	PW	GOULDS	JRD5X	D09	CONTRACTOR

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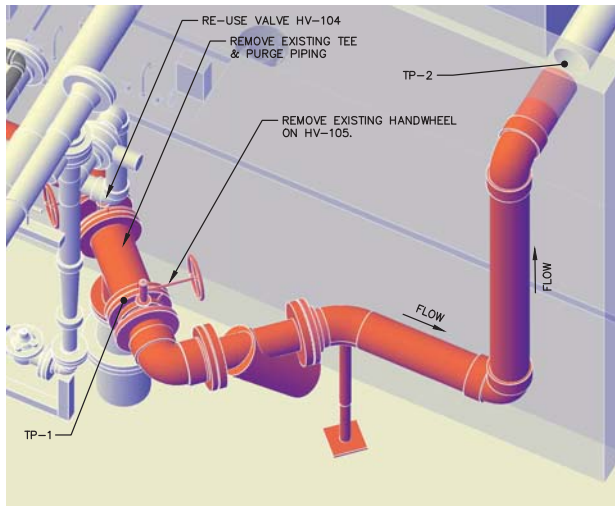


WTP IMPROVEMENTS  
 NEW INSTRUMENT  
 VALVE & EQUIPMENT  
 SCHEDULES

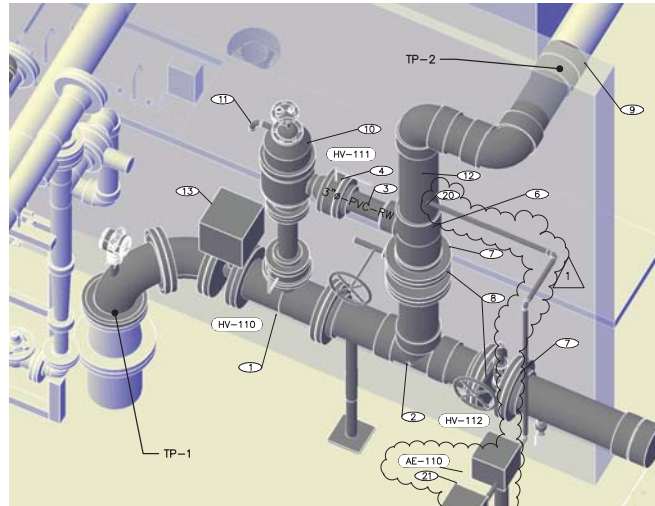
REVISION	BY	DATE
1	ON	3-18
2	ON	5-18
3	ON	11-18
4	ON	1-19

Project No. 1524-2005.00  
 Date 2019-01-08  
 Drawn  
 Approved  
 Sheet No. D1  
 SHEET 1 of 71

# Addendum 2, Attachment 1



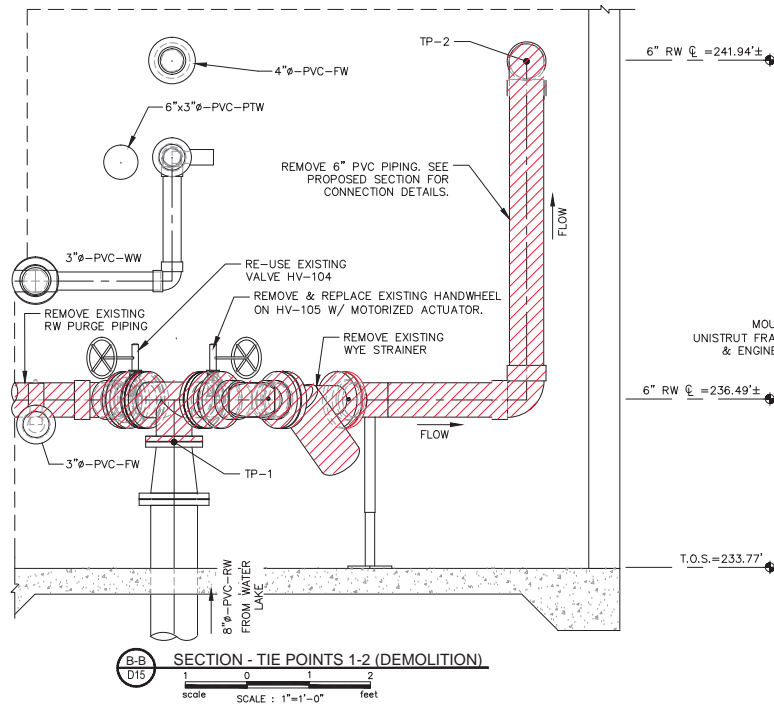
ISOMETRIC VIEW - DEMOLITION - TIE POINTS 1-2  
SCALE=NTS



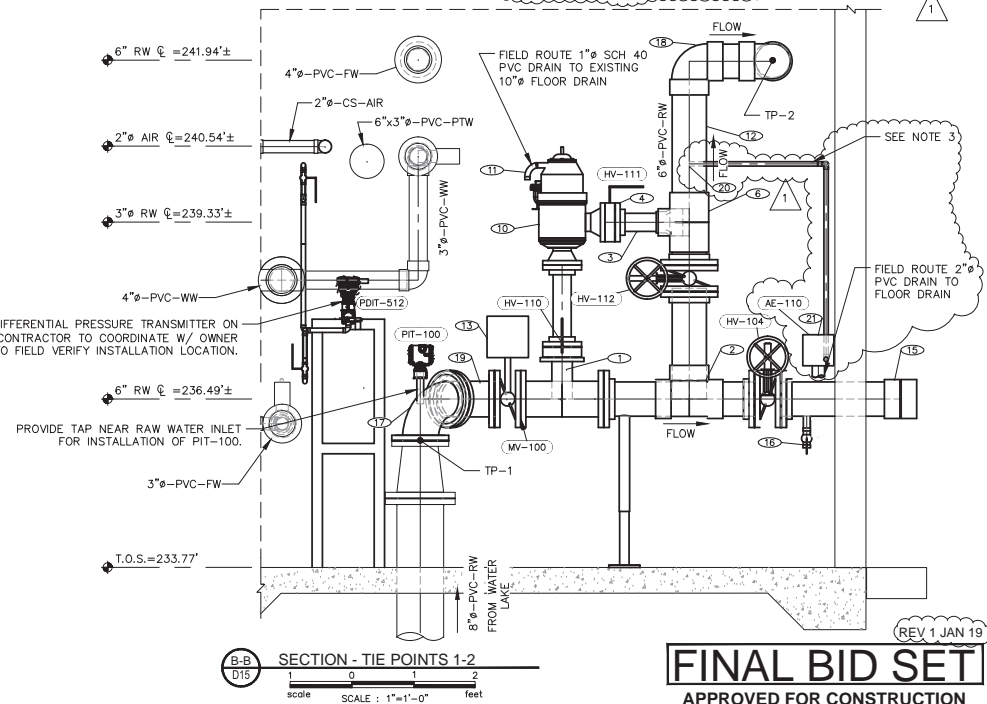
ISOMETRIC VIEW - PROCESS PIPING - TIE POINTS 1-2  
SCALE=NTS

ID	SIZE	DESCRIPTION	COMMENTS
1	6"x3"	TEE	FL x FL, DUCTILE IRON
2	6"x6"	TEE	SCH 80 PVC
3	3"	PVC PIPE	SCH 80 PVC
4	3"	BUTTERFLY VALVE	HV-111 & HV-112
5	3"	90 DEGREE BEND	SCH 80 PVC
6	6"x3"	TEE	SCH 80 PVC
7	6"	FLANGE ADAPTER	SCH 80 PVC
8	6"	BUTTERFLY VALVE	HV-113
9	6"	UNION COUPLING	SCH 80 PVC
10	-	SELF BACKWASHING FILTER	F-100
11	1"	PVC PIPE	SCH 40
12	6"	PVC PIPE	SCH 80 PVC
13	-	ELECTRIC ACTUATOR	HV-105
14	-	PRESSURE TRANSMITTER	PIT-100
15	-	CAM-LOCK	-
16	1/2"	BALL VALVE	DRAIN VALVE
17	6"	90 DEGREE BEND	FL x FL
18	6"	90 DEGREE BEND	SCH 80 PVC
19	-	45 DEGREE BEND	FL x FL
20	-	SAMPLE TAP	-
21	-	TURBIDIMETER	RE-USE EXISTING HACH MODEL 1720E

NOTES:  
 1. PROTECT AND MAINTAIN ALL PIPING AND EQUIPMENT NOT SPECIFICALLY NAMED FOR DEMOLITION.  
 2. ~~NOF-ALL HVAC, ELECTRICAL AND MISC. EQUIPMENT SHOWN IN DRAWINGS.~~  
 3. FIELD ROUTE FLEXIBLE TUBING TO TURBIDIMETER (AE-110). INSTALL AE-110 AND NEW TURBIDIMETER INSTRUMENTS ON SOUTHEAST WALL. SEE ELECTRICAL.



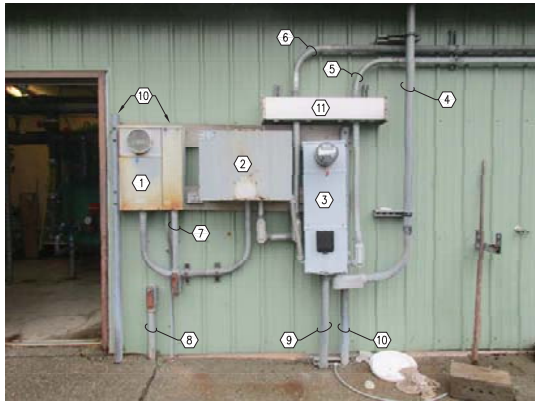
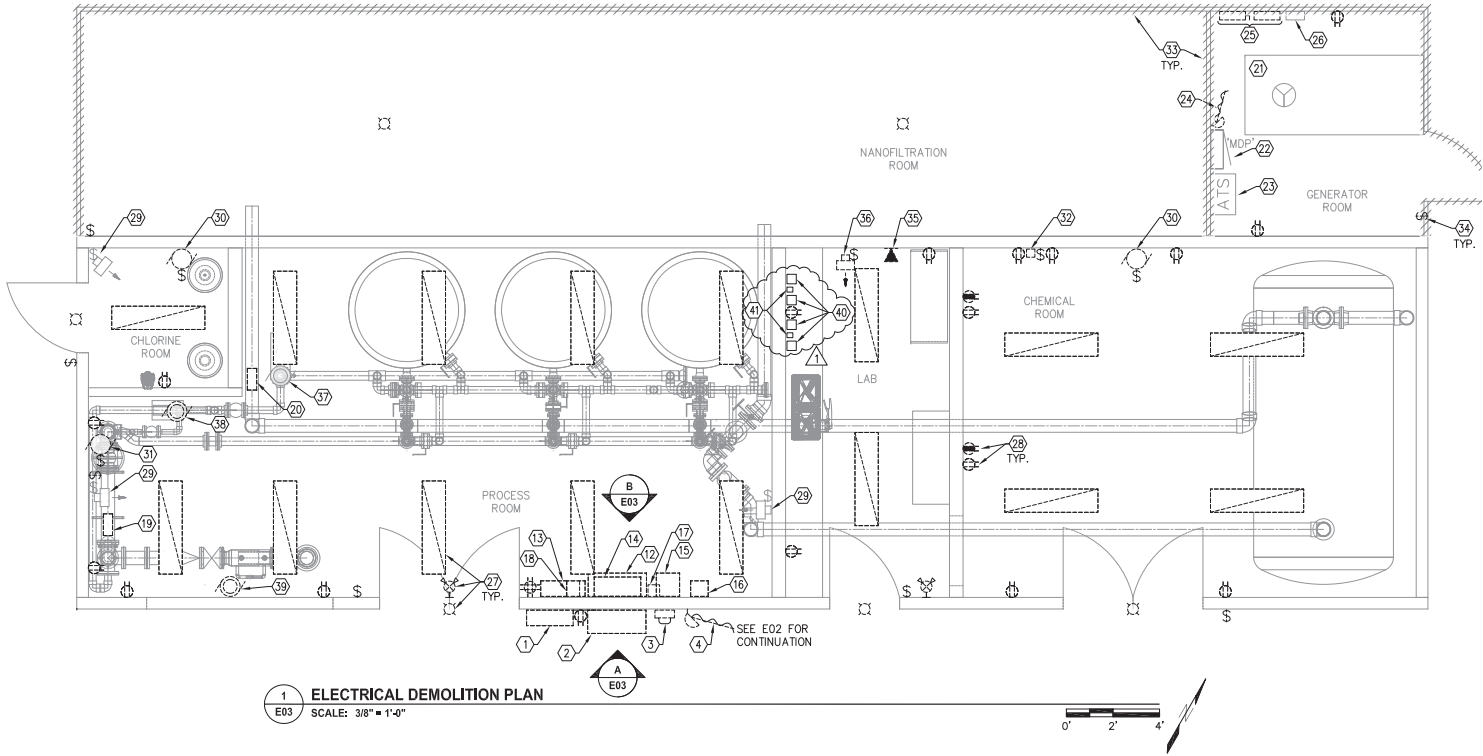
B-B  
D15  
SECTION - TIE POINTS 1-2 (DEMOLITION)  
scale  
SCALE: 1"=1'-0" feet



B-B  
D15  
SECTION - TIE POINTS 1-2  
scale  
SCALE: 1"=1'-0" feet

**FINAL BID SET**  
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Addendum 2, Attachment 2



**A**  
E03  
ELEVATION "A"  
SCALE: NTS



**B**  
E03  
ELEVATION "B"  
SCALE: NTS

GENERAL DEMOLITION NOTES

1. ALL ELECTRICAL DISTRIBUTION EQUIPMENT, INCLUDING THE SERVICE EQUIPMENT, LIGHTING DISTRIBUTION PANELBOARD AND ALL BRANCH CIRCUITS AND ASSOCIATED CONDUITS, WIREWAYS, FITTINGS AND CONDUCTORS TO BE REMOVED IN THEIR ENTIRETY, UNLESS OTHERWISE NOTED.
2. ALL EXISTING INTERIOR, EXTERIOR AND EMERGENCY LIGHTING FIXTURES AND ASSOCIATED SWITCHES, CONDUIT AND CONDUCTORS TO BE REMOVED IN THEIR ENTIRETY, UON.
3. EQUIPMENT SHOWN IS FOR REFERENCE ONLY AND DOES NOT SHOW ALL DEVICES REQUIRED TO BE REMOVED.
4. FOR EQUIPMENT IDENTIFIED TO BE REMOVED, ALL ASSOCIATED CONDUITS, CONDUCTORS, SWITCHES, RECEPTACLES, INSTRUMENTS, ANNUNCIATING DEVICES, ETC. SHALL ALSO BE REMOVED UON.

SHEET NOTES

1. ABANDONED METERBASE TO BE REMOVED.
2. 30KVA, 480:208Y120V TRANSFORMER TO BE REMOVED.
3. METER/MAIN TO BE REMOVED.
4. SERVICE RISER AND SERVICE DROP TO BE REMOVED. COORDINATE WITH LOCAL UTILITY, AP&T (907)826-3202.
5. FEEDER TO ATS IN GENERATOR ROOM TO BE REMOVED.
6. FEEDER FROM 480V MAIN DISTRIBUTION PANELBOARD "MDP" IN GENERATOR ROOM TO BE REMOVED.
7. FEEDER TO 208V PANELBOARD TO BE REMOVED.
8. FEEDER TO OUTSIDE AREA LIGHT TO BE REMOVED.
9. GROUNDING ELECTRODE CONDUCTOR TO BE REMOVED.
10. SERVICE EQUIPMENT SUPPORT POSTS AND BOARDS TO BE REMOVED.
11. WIREWAY TO BE REMOVED.
12. VACUUM PUMP STATUS PANEL TO BE REMOVED.
13. 208V, PANELBOARD "A" TO BE REMOVED.
14. BACKWASH PUMP CONTROL PANEL TO BE REMOVED.
15. CHEMICAL PUMP CONTROL PANEL "C" TO BE REMOVED.
16. TREATED WATER STORAGE TANK CIRCULATION PUMP STARTER TO BE REMOVED.
17. MANUAL STARTER FOR DOMESTIC WATER PUMP TO BE REMOVED.
18. DISCONNECT TO BE REMOVED.
19. CHLORINE INJECTION PUMP #2 PANEL TO BE REMOVED.
20. BACKWASH PUMP CONTROL VALVE PANEL TO BE REMOVED.
21. 30KW STANDBY GENERATOR TO BE REMOVED AND REINSTALLED. SEE SHEET E04.
22. 480V, MAIN DISTRIBUTION PANEL TO BE REMOVED AND REINSTALLED. SEE SHEET E04.
23. AUTOMATIC TRANSFER SWITCH TO BE REMOVED AND REINSTALLED. SEE SHEET E04.
24. 480V, OVERHEAD FEEDER TO WATER LAKE RAW WATER PUMP TO BE REMOVED.
25. DISCONNECT SWITCH AND 2KW TRANSFORMER FOR BATTERY CHARGER TO BE REMOVED.
26. BATTERY CHARGER TO BE RELOCATED. SEE SHEET E04 FOR NEW LOCATION.
27. LIGHT FIXTURE TO BE REMOVED.
28. RECEPTACLE TO BE REMOVED.
29. UNIT HEATER AND DISCONNECT SWITCH TO REMAIN. RECONNECT AS SHOWN ON SHEET E04.
30. EXHAUST FAN TO BE REMOVED.
31. EXHAUST FAN, EF-2 AND DISCONNECT SWITCH TO REMAIN. RECONNECT AS SHOWN ON SHEET E04.
32. EXHAUST FAN TIMER TO BE REMOVED.
33. WALL BEING DEMOLISHED.
34. SWITCH TO BE REMOVED.
35. TELEPHONE OUTLET TO BE REMOVED.
36. UNIT HEATER AND DISCONNECT SWITCH TO BE RELOCATED TO ACCOMMODATE NEW DOORWAY. SEE SHEET E04.
37. BACKWASH PUMP TO REMAIN. RECONNECT PER SHEET E04.
38. RECIRCULATION PUMP TO REMAIN. RECONNECT PER SHEET E04.
39. DOMESTIC WATER PUMP, TANK AND SWITCH TO BE REMOVED.
40. TURBIDIMETER TO BE REMOVED AND DELIVERED TO OWNER.
41. SC200 CONTROLLER TO BE REMOVED AND REINSTALLED. SEE SHEET E06.

REV 1 JAN 19  
**FINAL BID SET**  
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**CITY OF THORNE BAY**  
THORNE BAY, ALASKA 99505  
(907) 826-3380  
FAX (907) 826-3374  
www.thornebay.ak.gov

**VILLAGE SAFE WATER**

**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION**  
DIVISION OF ENVIRONMENTAL REGULATION  
1000 W. BROADWAY, SUITE 100  
ANCHORAGE, ALASKA 99501  
(907) 261-5700  
WWW.AK.DEC.GOV

**EDC, INC.**  
213 W. FREWED LANE  
ANCHORAGE, ALASKA 99503  
(907) 276-7865  
LICENSE NO. A800706

**WTP IMPROVEMENTS**  
**ELECTRICAL**  
**DEMOLITION PLAN**

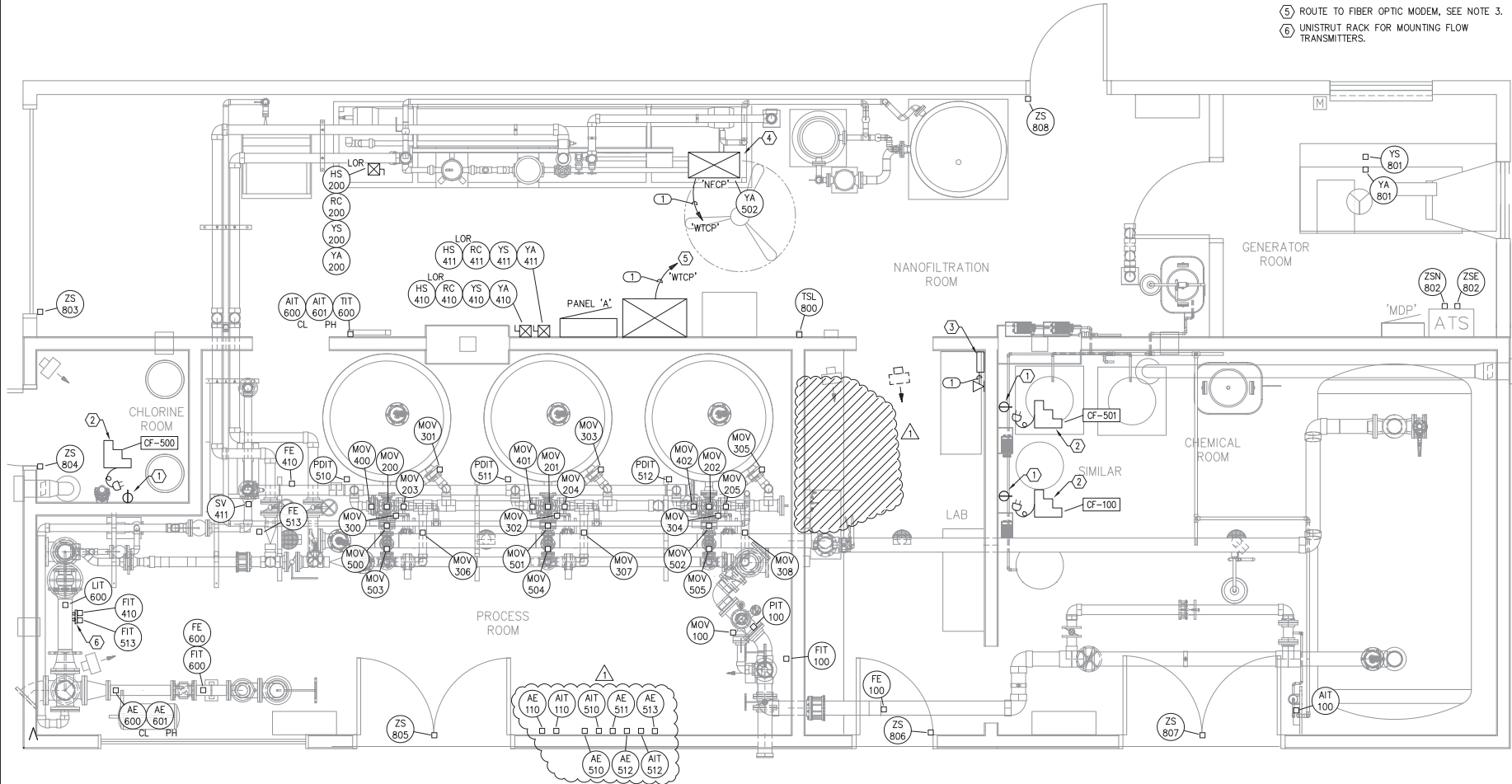
REVISION	BY	DATE
1	DN	3-18
2	DN	5-18
3	DN	11-20
4	DN	1-19
5	DN	1-19

Project No.	Date	Design	Drawn	Approved
1528-5003.01	2018-11-30	JF	DN	JF

Sheet No. **E03**  
SHEET 52 of 71



Addendum 2, Attachment 2



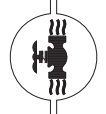
**1 INSTRUMENTATION PLAN**  
E06 SCALE: 1/2" = 1'-0"

CIRCUIT / FEEDER SCHEDULE	
TAG	DESCRIPTION
1	3/4" C, (1) CAT 6 ETHERNET CABLE

**SHEET NOTES**

- RECEPTACLE CIRCUIT CONTROLLED BY "WTCP".
- CHEMICAL FEED PUMP. SEE SHEET E11 FOR SCHEMATIC.
- FIBER OPTIC DEMARCATION POINT AND MODEM BY AP&T. COORDINATE INSTALLATION REQUIREMENTS WITH UTILITY.
- NANO-FILTRATION SKID CONTROL PANEL FURNISHED BY OTHERS.
- ROUTE TO FIBER OPTIC MODEM, SEE NOTE 3.
- UNISTRUT RACK FOR MOUNTING FLOW TRANSMITTERS.

**CITY OF THORNE BAY**  
THORNE BAY, ALASKA 99820  
907.838.3380  
907.838.3374  
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**WTP IMPROVEMENTS  
INSTRUMENTATION  
PLAN**

REVISION	BY	DATE
1	DN	3-18
2	DN	5-18
3	DN	11-18
4	DN	1-19

Project No. 1528-2003.01	Designated	DN
Date: 2018-11-30	Drawn	DN
Final Bid Set	Approved	JF
Rev. 1		

**FINAL BID SET**  
APPROVED FOR CONSTRUCTION

REV 1 JAN 19

## Addendum 2, Attachment 2

## INSTRUMENT CONNECTION SCHEDULE

TAG ID	SIGNAL CIRCUIT SIZE	DESTINATION	POWER CIRCUIT SIZE (IF REQUIRED)	DESTINATION	NOTES
AIT-100	3/4"C, 1PR#18 TWSH 3/4"C, 1PR#18 TWSH	WTCP CF-100	3/4"C, (2)#12 & (1)#12 (G)	'WTCP'	1
FE-100	EXISTING CABLE	FIT-100			1
FIT-100	3/4"C, 1PR#18 TWSH 3/4"C, 1PR#18 TWSH	WTCP CF-100			1
MOV-100	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
PIT-100	3/4"C, 1PR#18 TWSH	WTCP			
AE-110	EXISTING CABLE	AIT-110			1
AIT-110	3/4"C, 1PR#18 TWSH	WTCP	3/4"C, (2)#12 & (1)#12 (G)	WTCP	
HS/RC/YS/YA-200	3/4"C, (6)#14 & (1)#14 (G)	WTCP			
MOV-200	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-201	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-202	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-203	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-204	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-205	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-300	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-301	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-302	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-303	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-304	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-305	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-306	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-307	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-308	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-400	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-401	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-402	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
FE-410	EXISTING CABLE	FIT-410			1
FIT-410	3/4"C, 1PR#18 TWSH	WTCP			1
HS/RC/YS/YA-410	3/4"C, (6)#14 & (1)#14 (G)	WTCP			
HS/RC/YS/YA-411	3/4"C, (6)#14 & (1)#14 (G)	WTCP			
SV-411	3/4"C, (2)#14 & (1)#14 (G)	WTCP			1
MOV-500	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
TIT-500	3/4"C, 1PR#18 TWSH	WTCP			

## INSTRUMENT CONNECTION SCHEDULE

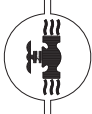
MOV-501	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-502	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
TAG ID	SIGNAL CIRCUIT SIZE	DESTINATION	POWER CIRCUIT SIZE (IF REQUIRED)	DESTINATION	NOTES
YA-502	3/4"C, (2)#14 & (1)#14 (G)	WTCP			
FE-513	EXISTING CABLE	FIT-513			1
FIT-513	3/4"C, 1PR#18 TWSH 3/4"C, 1PR#18 TWSH	WTCP CF-500/CF-501			1
MOV-503	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-504	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
MOV-505	3/4"C, (5)#14 & (1)#14 (G)	WTCP			
AE-510	CABLE SUPPLIED WITH SENSOR	AIT-510/511			
AE-511	CABLE SUPPLIED WITH SENSOR	AIT-510/511			
AE-512	CABLE SUPPLIED WITH SENSOR	AIT-512/513			
AE-513	CABLE SUPPLIED WITH SENSOR	AIT-512/513			
AIT-510/511	3/4"C, (2) 1PR#18 TWSH	WTCP	3/4"C, (2)#12 & (1)#12 (G)	'WTCP'	1
AIT-512/513	3/4"C, (2) 1PR#18 TWSH	WTCP	3/4"C, (2)#12 & (1)#12 (G)	'WTCP'	1
PDIT-510	3/4"C, 1PR#18 TWSH	WTCP			
PDIT-511	3/4"C, 1PR#18 TWSH	WTCP			
PDIT-512	3/4"C, 1PR#18 TWSH	WTCP			
AE-600	CABLE SUPPLIED WITH SENSOR	AIT-600			
AIT-600	3/4"C, 1PR#18 TWSH	WTCP	3/4"C, (2)#12 & (1)#12 (G)		
AE-601	CABLE SUPPLIED WITH SENSOR	AIT-601			
AIT-601	3/4"C, 1PR#18 TWSH	WTCP	3/4"C, (2)#12 & (1)#12 (G)	'WTCP'	
FE/FIT-600	3/4"C, 1PR#18 TWSH	WTCP	3/4"C, (2)#12 & (1)#12 (G)	'WTCP'	
LIT-600	3/4"C, 1PR#18 TWSH	WTCP			
TIT-600	3/4"C, 1PR#18 TWSH	WTCP			
TSL-800	3/4"C, (2)#14 & (1)#14 (G)	WTCP			
YA-801	3/4"C, (2)#14 & (1)#14 (G)	WTCP			2
YS-801	3/4"C, (2)#14 & (1)#14 (G)	WTCP			2
ZSN-802	3/4"C, (2)#14 & (1)#14 (G)	WTCP			2
ZSE-802	3/4"C, (2)#14 & (1)#14 (G)	WTCP			2
ZS-803	3/4"C, (2)#14 & (1)#14 (G)	WTCP			
ZS-804	3/4"C, (2)#14 & (1)#14 (G)	WTCP			
ZS-805	3/4"C, (2)#14 & (1)#14 (G)	WTCP			
ZS-806	3/4"C, (2)#14 & (1)#14 (G)	WTCP			
ZS-807	3/4"C, (2)#14 & (1)#14 (G)	WTCP			
ZS-808	3/4"C, (2)#14 & (1)#14 (G)	WTCP			

NOTE 1: EXISTING INSTRUMENT.  
NOTE 2: STATUS SWITCH IN EXISTING EQUIPMENT.

## GENERAL NOTES

- SIGNAL CIRCUIT REQUIREMENTS SHOWN IN THE TABLE ARE FOR THE FINAL TERMINATION AT THE INSTRUMENT OR SENSOR. MULTIPLE SIGNALS MAY BE COMBINED IN A SINGLE RACEWAY WHEN ROUTED TO A COMMON DESTINATION PROVIDED THAT NEC CONDUIT FILL REQUIREMENTS ARE NOT EXCEEDED. MAXIMUM CONDUIT SIZE SHALL NOT EXCEED 2".
- WHEN COMBINING CIRCUITS, 120VAC POWER OR SIGNAL CONDUCTORS SHALL NOT BE COMBINED WITH ANALOG OR 24V SIGNAL CONDUCTORS IN A COMMON RACEWAY.

**CITY OF THORNE BAY**  
THORNE BAY, ALASKA 99505  
(907) 828-3380  
FAX (907) 828-3374  
www.thornebay.ak.gov



# WTP IMPROVEMENTS INSTRUMENT CONNECTION SCHEDULE

REVISION	BY	DATE
1	EDC	3-18
2	EDC	5-18
3	EDC	11-20
4	EDC	1-19
5	EDC	1-19

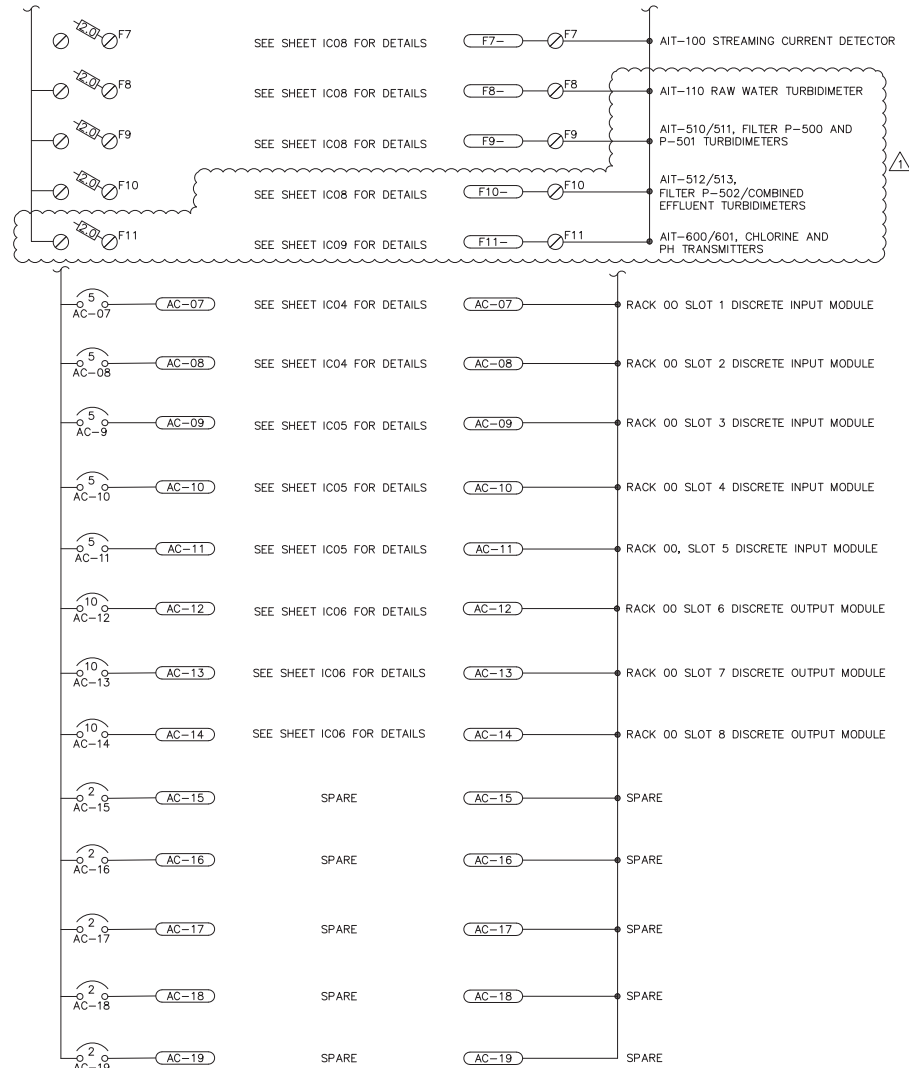
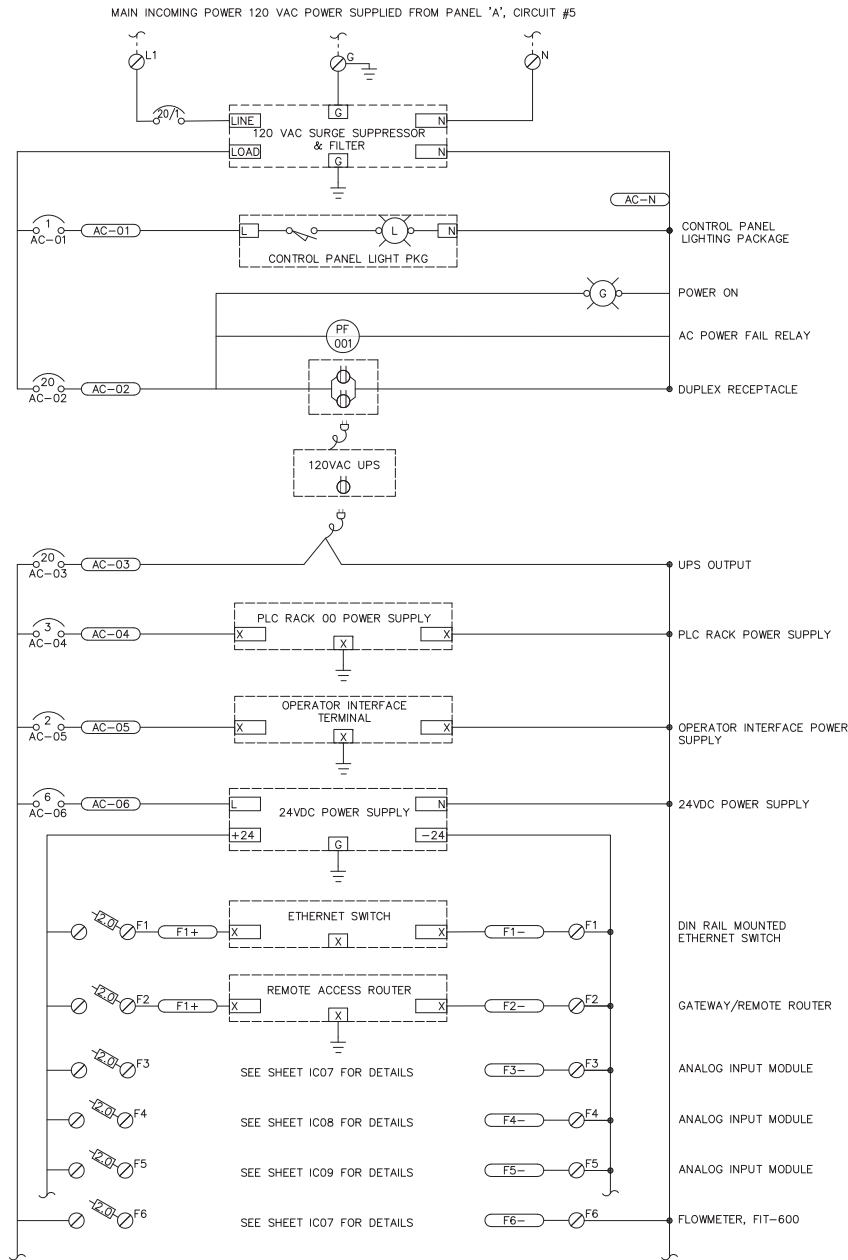
Project No. 1529-0003.01	Design Date 2018-11-30	Designed JF	Drawn DM	Approved JF
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Sheet No. **E07**  
SHEET 56 of 71

**FINAL BID SET**  
APPROVED FOR CONSTRUCTION

REV 1 JAN 19

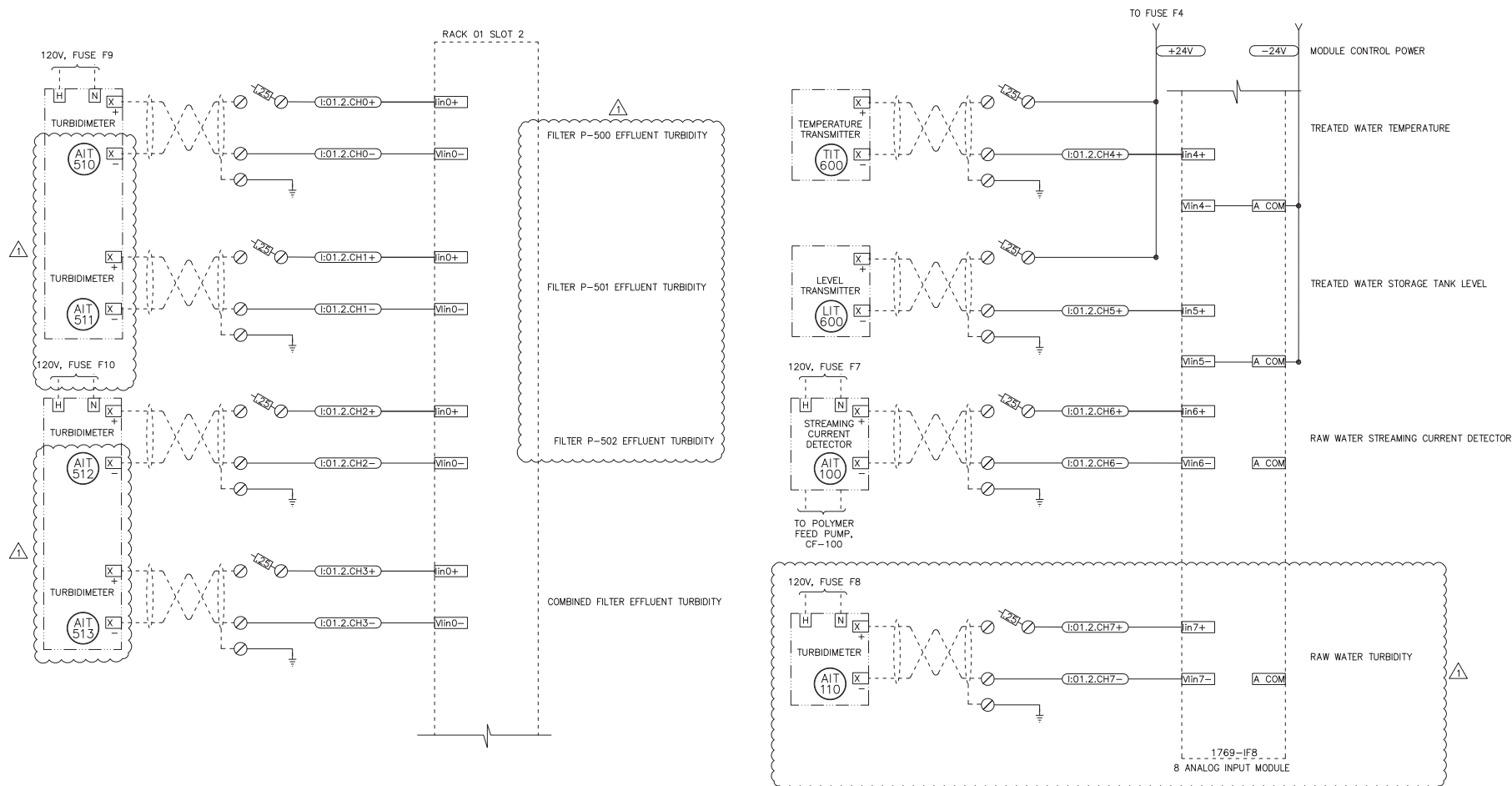
# Addendum 2, Attachment 2



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**FINAL BID SET**  
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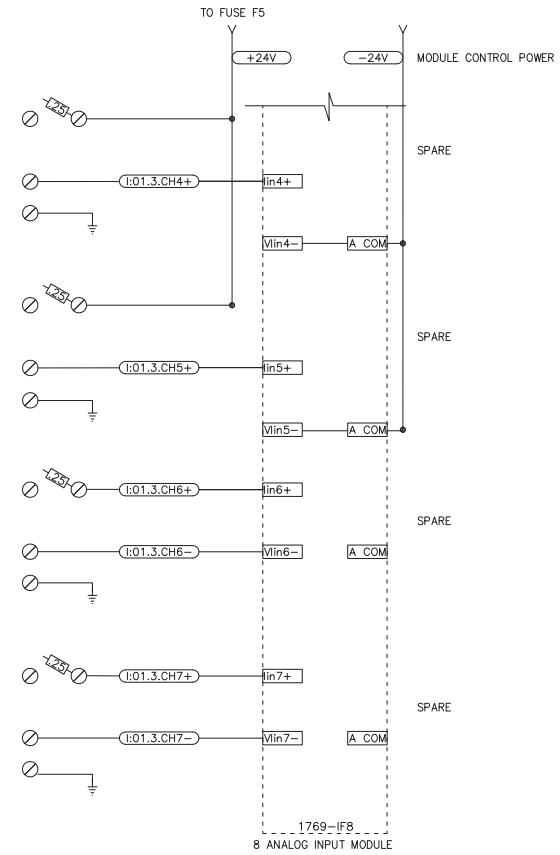
# Addendum 2, Attachment 2



REV 1 JAN 19

**FINAL BID SET**  
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<p><b>CITY OF THORNE BAY</b> THORNE BAY, ALASKA 99505 (907) 828-3380 FAX (907) 828-3374 www.thornebay.ak.gov</p>											
<p><b>VILLAGE SAFE WATER</b></p>											
<p><b>EDC, INC.</b> 213 W. FREWED LANE ANCHORAGE, AK 99503 (907) 276-7855 LICENSE NO. A800708</p>											
<p><b>WTP IMPROVEMENTS WATER TREATMENT CONTROL PANEL ANALOG INPUTS</b></p>											
<p>REVISION</p> <table border="1"> <tr> <th>BY</th> <th>DATE</th> </tr> <tr> <td>ESK</td> <td>3-18</td> </tr> <tr> <td>AGENCY</td> <td>5-18</td> </tr> <tr> <td>FINAL</td> <td>11-20</td> </tr> <tr> <td>REV. 1</td> <td>1-19</td> </tr> </table>	BY	DATE	ESK	3-18	AGENCY	5-18	FINAL	11-20	REV. 1	1-19	<p>Project No. 1528-2003.01 Date 2018-11-30 Designed JF Drawn OM Approved JF</p>
BY	DATE										
ESK	3-18										
AGENCY	5-18										
FINAL	11-20										
REV. 1	1-19										
<p>Sheet No. <b>IC08</b></p>											
<p>SHEET 70 OF 71</p>											



**FINAL BID SET**  
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## **SECTION 33 09 10 – INSTRUMENTATION AND CONTROL FOR WATER UTILITIES**

### **PART 1 - GENERAL**

#### **1.1 BASIS**

- A. This Specification includes instrument details for all new or modified items located in the water treatment plant. For details on control strategy and operating sequences see Section 33 09 12.
- B. Related documents: see the instrument list included in the drawing set.

#### **1.2 SECTION REQUIREMENTS**

- A. Submittals: Product Data adequate to demonstrate compliance with any and all specifications outlined in this document and referenced specifications.
- B. Warranty: Provide copies of manufacturer's standard limited warranty for all units placed in service.
- C. Manuals: Provide Owner's Representative with a copy of all manuals for each unit placed in service.
- D. Electrical Requirements: See Division 26 and 40 for requirements.

#### **1.3 FIELD TESTS**

- A. Tests shall be conducted by a factory trained, qualified representative. All system components shall be checked to verify they have been installed properly and that all terminations have been made correctly and all deficiencies and irregularities shall be corrected.
- B. Witnessed Field tests shall be performed on the complete system.
- C. Each function shall be demonstrated to the satisfaction of the Owner's Representative.
- D. Each test shall be witnessed and signed off by the system supplier and the Owner's Representative upon satisfactory completion.
- E. Provide written certification from the manufacturer to the Owner's Representative that the installation is in accordance with the manufacturer's requirements and the warranty is validated.

## PART 2 - PRODUCTS

### 2.1 INSTRUMENTS AND GAUGES

#### A. Chlorine Analyzer System

1. System Description:
  - a. The objective of this unit is the collection and reporting of free chlorine level, pH, and temperature of water being sent to distribution.
  - b. The amperometric chlorine analyzer shall be designed for continuous measure of free chlorine, pH and temperature in aqueous solutions. The chlorine analyzer system shall include a Hach CLF10 sc analyzer and a SC200 Dual Input controller with added expansion module for a total of five 4-20mA outputs or approved equal.
2. Measurement Procedures
  - a. The method of measuring free or total chlorine will be with a three-electrode amperometric sensor immersed into an electrolytic medium with a membrane, selective to chlorine, separating it from the sample.
3. Alternates
  - a. Other methods of chlorine measurement, such as two-electrode amperometric, open cell amperometric, or measurements with external pH compensation are not acceptable. Methods requiring reagents are also not acceptable for this installation.
4. Performance Requirements
  - a. Chlorine:
    - 1) Measurement range: 0 to 5 mg/L (ppm) free chlorine residual
    - 2) Accuracy:  $\pm 5\%$  of reading or  $\pm 0.03$  mg/L (ppm), whichever is greater
    - 3) Precision: 5% of reading or 0.01 mg/L (ppm), whichever is greater
    - 4) Minimum detection limit: 0.03 mg/L (ppm)
    - 5) Resolution: 0.01 mg/L (ppm)
    - 6) Repeatability: 5% of reading or 0.05 mg/L (ppm), whichever is greater
    - 7) Cycle Time: 2.5 minutes maximum
  - b. pH:
    - 1) Measurement range: 2.0 to 12.0 pH
    - 2) Repeatability: 0.1%
  - c. Temperature:
    - 1) Measurement range: 32 to 113 °F
    - 2) Accuracy:  $\pm 1$  °F

5. Operational Criteria

- a. Sample flow rate: 200 to 500 mL/minute
- b. Sample pressure (with conditioning kit if required): 120 psi (8.27 bar)
- c. Sample temperature: 41 to 104 °F (5 to 40 °C)
- d. Operating temperature: 41 to 104 °F (5 to 40 °C)
- e. Operating humidity: 90% at 40 °C maximum

6. Accessories:

- a. SC Controller:
  - 1) System Description:  
A modular single or dual channel controller that works with analog sensor modules and/or digital sensors, Hach model SC200 or approved equal.
  - 2) Controller shall be equipped with a minimum of **four** analog 4-20 mA outputs with a maximum impedance of 500 ohms. Controller shall be capable of reporting free chlorine, pH and temperature.
  - 3) The controller shall accept 4 different analog sensor modules in any combination to measure the following:
    - a) pH/ORP module
    - b) Conductivity module
      - 1. Contacting conductivity
      - 2. Inductive conductivity
      - 3. Cationic conductivity (Calculated pH)
    - c) Dissolved Oxygen module
    - d) Analog mA IN module
  - 4) Power Requirements:
    - a) Voltage: 120V AC
    - b) Frequency: 60 Hz
    - c) Phase: 1
    - d) Power: 37 W with 25 W sensor/network card load.
  - 5) The controller shall be equipped with an SD card reader for data download and controller software upload.

- 6) Four electromechanical, UL rated, SPDT relays shall be provided for user-configurable contacts rated 100 to 230 VAC, 5 Amp at 30 VDC resistive maximum.
    - b. pH sensor:
      - 1) Optional pH sensor shall be included with the chlorine analyzer configuration.
  7. Components:
    - a. Standard Equipment
      - 1) Stainless steel mounting panel
      - 2) Chlorine sensor with Membrane and Electrolyte
      - 3) Chlorine sensor flow cell
      - 4) Flow meter with control valve
      - 5) Digital gateway to sc controller with cable
      - 6) The analyzer must be housed in a NEMA 4X enclosure that is IP65 rated with the gasketed door latched.
    - b. Dimensions
      - 1) Sensor:
        - a) Length: 7.68 inches
        - b) Diameter: 0.98 inches
      - 2) Panel:
        - a) Length: 19.0 inches
        - b) Width: 19.5 inches
        - c) Depth: 5.95 inches
      - 3) Gateway to Controller cable: 3 ft minimum
  8. Pre-Approved Manufacturers:
    - a. Hach Company, Loveland, CO
      - 1) Model CLF10 Chlorine Analyzer with pH compensation option and optional pH sensor, Free Chlorine Residual.
      - 2) Hach model sc200 Controller
    - b. Chemtrac Inc., Norcross, GA, Model HydroACT with temperature and pH compensation option, Free Chlorine Residual.
- B. Pressure gauges
1. Bourdon tube style 4.5" or 6" face liquid filled pressure gauge.
    - a. Range 0 – 200 psig
    - b. Liquid filled with Glycerin
    - c. 316 SS case
  2. Pre-approved model: Ashcroft Type 1009 (others with engineering approval)

C. Pressure switch

1. Double set point, field adjustable, IP65 rated pressure switch.
2. Pre-approved model: Ashcroft GP Series, model GPD-N4-GG-B-25-200PSI (others with engineering approval)

D. Pressure transmitter

1. Adjustable pressure range as needed to match the parameters of the system (0-200 psi).
2. Accuracy of +/- 0.5 of full operating range.
3. All wetted parts NSF-61 compliant.
4. Provide 4-20 mA output signal.
5. Pre-approved model: Rosemount model 3051CG or CD for differential pressure applications.

E. Flow Meter

1. Pre-approved model: Rosemount 8750W series, 4" flowtube, flanged ends, integral transmitter mount.
2. Transmitter Output: 4-20 mA
3. Flanged magnetic style flow tube, PTFE liner, 316 SS electrode.
4. Capable of processing signals from fluids that are traveling between 0.04 and 39 ft/s (0.01 to 12 m/s) for both forward and reverse flow.
5. Power Requirements:
  - a. Voltage: 120V AC
  - b. Frequency: 60 Hz
  - c. Phase: 1
6. Accuracy of  $\pm 0.5\%$  within normal operating range.

F. Sample Taps:

1. Connections: 1/2"(M) NPT inlet by plain-end spout.
2. Ball or needle valve design with smooth-nosed spout.
3. Functions: drip-tight shut-off; sample draw flow control.
4. Body: Brass, chrome plated, lead free.

G. New Turbidity Meters

1. Pre-approved instruments for this application are Hach TU5300 (four required) with Hach SC200 controller (reuse two existing, one new required). Alternates will be considered with Engineers approval; however, Owner prefers to use Hach equipment to match existing.
2. There are four existing turbidity meters in the current water treatment plant (AE-510/511/512/513). One turbidity meter for the filtered water outlet of each filter and one combined treated water turbidity meter. Sample points are in the filter room and meters are located in the lab area. The three individual turbidity units will be removed and replaced with new Hach TU5300 units. The one combined turbidity unit will be removed and replaced with a new Hach TU5300 unit. All existing 1720e units will be saved and returned to the Owner. One unit will be selected (by Owner) for reinstallation (by Contractor) as a raw water turbidity meter (AE-110).
3. Final configuration will be four new TU5300 and one existing 1720e, all located on the south wall of the main filter room in the location previously occupied by control panels. New tubing from the existing sample point to the new meter locations shall be field routed to minimize tubing length. One new sample point for raw water shall be installed just downstream of the self-backwashing screen outlet block valve (between HV-111 and Tie-Point 2) on the side of the raw water pipe. A new 2" field routed pvc line will be required to collect water from the drains of all instruments and route to the existing wastewater floor drain.

2.2 BUILDING ALARMS

A. Door Alarms:

1. One intrusion alarm for each door is required for this installation, including existing doors.
2. 3/4" recessed door contacts on the door.
3. Delay timer and acknowledge code in PLC.
4. GE intrusion switch 2500 Series or engineering approved equal.

B. High Low Temperature Alert:

1. Mechanical temp alert that requires no power for operation.
2. Adjustable high and low set points
3. 2 dry contact closure contacts for high and low alarms.
4. Dayton Line voltage thermostat, Model 2E816 or engineering approved equal.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install equipment as per manufacturer's recommendations.

### 3.2 TESTING AND STARTUP

- A. All elements of the control system shall be tested to demonstrate a fully functional control system.
- B. Control system supplier shall provide all special testing materials and equipment.
- C. Coordinate and schedule all testing and start up work with the Owner's Representative.

### 3.3 TRAINING

- A. Provide a minimum on site 8-hour training to demonstrate operation of all control system components.
- B. Instructors shall be thoroughly trained in operating theory as well as practical operation and maintenance work for each component of the system.

- END OF SECTION -