Miami-Dade Water and Sewer Department P. O. Box 330316 • 3071 SW 38th Avenue Miami, Florida 33233-0316 T 305-665-7471

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Electronic Correspondence/ Original via Certified Mail/ **Return Receipt Requested** 7001-0360-0001-6783-5672 CCN: 50990

March 14, 2008

Mr. Curt Thompson, Senior Regulatory Professional **Environmental Resource Regulation** South Florida Water Management District P. O. Box 24680 West Palm Beach, FL 33416-4680 e-mail: cthompso@sfwmd.gov

Re: Miami-Dade County Consolidated PWS Water Use Permit No. 13-00017-W Calibrate Raw and Finished Venturi Meters at Alex Orr WTP; Submit Interim Report, Exhibit 33, Limiting Condition 48

Dear Mr. Thompson:

Enclosed is a copy of the Interim Report on the Plan to Address Raw Water Flow Measuring Adjustments in accordance with exhibit 33 and limiting condition number 48 of the subject permit.

If you have any questions concerning this submittal; please contact me at (786) 552-8979 or Ms. Bertha Goldenberg, P.E. at (786) 552-8120.

Sincerel w (foolly

Deputy Director. **Regulatory Compliance & Capital Improvements**

Interim Report on the Plan to Address Raw Water Flow Measuring Enclosure: Adjustments

M. Elsner melsner@sfwmd.gov

Delivering Excellence Every Day

Mr. Curtis Thompson, SFWMD

Water Use Permit No. 13-0017-W, Water Accounting

- bc: J. Renfrow
 - J. Ruiz
 - L. Yoder
 - B. Goldenberg
 - L. Aguiar
 - D. Bridges
 - T. Segars
 - M. Balbin
 - S. Negahban
 - J. Epaves
 - E. Turner
 - A. Baldwin
 - R. O'Rourke
 - A. Sanchez

Miami-Dade Water and Sewer Department

Plan to Address Raw Water Flow Measuring Adjustments (FY 2008)

Water Use Permit No. 13-00017-W Limiting Condition No. 48

March 15, 2008

Interim Report

SUMMARY

On November 15, 2007, the South Florida Governing Board (SFWMD) approved the Miami-Dade Consolidated PWS Water Use Permit (WUP) No. 13-00017-W.

Limiting condition No. 48 of the WUP requires:

"By July 1, 2008, the permittee shall submit the final report comparing the volumes of water withdrawn using the cumulative calibrated wellhead flow meter data versus the methods formerly used to estimate flows into/out of the Hialeah-Preston and Alexander Orr water treatment plants. Based on the results of this report and upon District review, the permittee may be required to modify this permit. The necessity to modify the permit will be determined based on a) the degree to which the actual withdrawals (as determined by the calibrated wellhead meters) differs from the historic estimation method, and b) whether the difference is sufficiently large to affect the demonstration that conditions of permit issuance will be met over the life of the permit."

Mr. Rafael A. Terrero, Assistant Director, Miami-Dade Water and Sewer Department (MDWASD) submitted an eight point plan on October 23, 2007 to be undertaken during FY 2008 to reconcile raw water flow measurements in the water system. This plan is the continuation of MDWASD's attempt to reconcile and adjust historical raw water pumpage reports and records in its water supply system.

The status of each of the plan items is as follows:

- 1. Address comments from GE Well Water Flow Meter Installation Report. Optimize current raw water well meter installations and calibration.
 - Southwest Wellfield-Wells 11-15, Alexander Orr Plant-Well 8, & Hialeah-Wells 11, & 13 have been addressed.
- 2. Calibrate Raw and Finished Water Venturi meters at the Alexander Orr WTP. Submit Interim Report by March 15, 2008.
 - Meters were calibrated on September and December 2007. An independent firm, ADS, LLC, verified meter calibration on September 2007. (see Appendices A, B, C, and D)
- 3. Perform a water audit within Alexander Orr WTP to investigate raw to finished water flow differences. Initiate installation, calibration, and certification of process water flow meters (including transfers of water softening residuals to calcium carbonate lagoons and recalcining kilns), as appropriate.
 - A water audit study is underway at Alexander Orr WTP by CDM. A flowmeter was installed in softening residuals line. Troubleshooting and calibration of flowmeter installation is underway.

- 4. Revise the Oracle systems database and create the Oracle based report format to be compliant with SFWMD Water User Permit Allocation and Special Conditions submittal requirements.
 - A SQL Server Database Table was created. SQL based report format was created and implemented. Data is available in new Table starting on May 2007 to present.
- 5. Transition to all new meter reports during December 2007 using the new raw water well flow meters and reports generated by the Oracle system. Begin using the reports generated by the Oracle system meter recorder values for both FDEP and SFWMD reports on January 1, 2008.
 - Since January 1, 2008, all reports are available in both old and new format. The report to be submitted in April 2008, for the first quarter of 2008, will use the new format and data from the new raw water flow meters.
- 6. Undertake the following tasks to analyze raw water flow measuring issues: reconciliation of raw water meter reports between FDEP Monthly Operating Reports (MOR) and Oracle system, record instantaneous well readings to verify the average pumpage of each well, compare reported versus recorded flows for raw and finished water at each WTP, and develop pumpage results for each wellfield on a monthly basis for the first six months of 2008.
 - Ongoing
- 7. Summary report on flow measuring issues analysis by July 31, 2008.
 - Ongoing.
- 8. Submit request for allocation adjustment to SFWMD during the third Quarter of 2008 and no later than September 30, 2008.
 - To be determined.

Although the MDWASD letter of October 23, 2007 planned for a submittal by July 31, 2008, the WUP limiting condition number 48 requires the report submittal by July 1, 2008. MDWASD will comply accordingly.

STATUS OF INDIVIDUAL ITEMS

The following is MDWASD's Interim Status Report on the plan to address raw water flow measurements adjustments as of March 15, 2008. This plan was conceived to be undertaken during FY 2008 to reconcile raw water flow measurements in the water system. This plan is the result of new raw water well meter installations in almost 100 supply wells during FY 2007. This plan is the continuation of MDWASD's attempt to reconcile and adjust historical raw water pumpage reports and records in its water supply system.

Item 1 - Address Comments from GE Well Water Flow Meter Installation

Comments from GE Well Water Flow Meter Installation Report (August 30, 2007) are being addressed. Work has been completed on the Southwest Well Field, Alexander Orr Jr WTP, and two out of three wells have been address on the Hialeah Well Fields.

- Southwest Well Field Wells 11-15 have pipe sizes that are difficult to match up on GE pipe data sheets and appear to have very thick walls. A section of pipe was replaced similar to Well No. 6. Work has been completed.
- Alexander Orr Plant Well No. 8 has flow disturbances and appeared to have intermittent pockets of air that cause signal to be lost. This problem has been addressed.
- Hialeah Wells 11, 12, & 13 piping and valves were replaced but the valves are throttled to create enough back pressure for the transducers to have good signals and sound speed. More work is required on these wells. Wells 11 & 13 have been shut down.
- Miami Springs Some wells needed pipe replacement and were replaced. Wells 1, 2, 3, 4, 5, 6, 7 & 8 had pipe replaced but still have issues with air pockets...Valves were throttled to create backpressure for the transducers to have good signals and sound speed.

Some work is still pending on the GE well meter installation comments, namely Hialeah, and Miami Spring wells.

Item 2 - Calibrate Raw and Finished Water Venturi Meters at Alexander Orr Jr. Water Treatment Plant (WTP) by March 15, 2008

Calibration on the Venturi Meter Flowmeters' Electronic Transmitters at the Alexander Orr Jr. Water Treatment Plant (WTP) is being performed every 90 days. Venturi Meters Electronics were last calibrated on September and December 2007 (see Appendix A and B). All four raw water and five finished water venturi meters at the WTP passed the calibration process satisfactorily. Calibration of the venturi meters electronic transmitters employs a Fluke 744 Documenting Process Calibrator, Emerson Hart Field Communicator Model 375, and an Ametek Pneumatic Dead Weight Tester Model PK II. (See enclosed Appendix C electronic transmitter's for calibration procedures.)

In addition to the above transmitter calibration, an independent firm, ADS, LLC was contacted to verify venturi meter accuracy by performing pitometer tests on the production water meters at the WTP and some well meters in the West Well field. These testing took place between August 27, 2007 and September 24, 2007. (See enclosed appendix D) The test consisted of the following:

- Tested, in place, for accuracy four raw water meters and five finished water meters at the WTP
- Tested, in place, for accuracy three well meters in the West Well Field.
- Preparation of a report detailing the results of the tests including velocity profiles of each of the gauging points used to test the meters.

Pitometer tests results for the Alex Orr WTP raw water venturi meters installation were as follows:

Test Date	Location	Pitometer Flow (mgd)	Meter Flow (mgd)	Percent Accuracy	Comments
8/29/07	Orr WTP 48" Raw Water No.1	24.62	25.47	104%	Meter registers within allowable limits of accuracy
8/29/07	Orr WTP 54" Raw Water No. 2	41.71	43.39	104%	Meter registers within allowable limits of accuracy
9/05/07	Orr WTP 72" Raw Water No. 3	35.67	34.60	97%	Meter registers within allowable limits of accuracy
9/05/07	Orr WTP 72" Raw Water No. 2	78.59	78.76	100%	Meter registers within allowable limits of accuracy

This tests show that the raw water venturi meters as a group are registering on average within 1% of the pitometer flow readings.

Pitometer tests results for the Alex Orr WTP finished water venturi meters installation were as follows:

Test Date	Location	Pitometer Flow (mgd)	Meter Flow (mgd)	Percent Accuracy	Comments
9/24/07	Orr WTP 48" Finished Water No. 1	30.95	30.31	102%	Meter registers within allowable limits of accuracy
9/10/07	Orr WTP 48" Finished Water No. 2	40.56	38.89	96%	Meter registers within allowable limits of accuracy
8/29/07	Orr WTP 72" Finished Water No. 3	26.10	25.96	99%	Meter registers within allowable limits of accuracy
9/11/07	Orr WTP 72" Finished Water No. 4	58.16	60.84	105%	Meter registers within allowable limits of accuracy
9/10/07	Orr WTP 72" Finished Water No. 5	67.05	64.67	96%	Meter registers within allowable limits of accuracy

This tests show that the venturi meters as a group are registering within 1% of the pitometer flow readings.

Item 3 - Perform a water audit within Alexander Orr WTP

CDM has been retained to evaluate the various flow streams identified within the plant and to verify the calibration of the venturi meters at the WTP. A kick-off meeting was held at the WTP on March 11, 2008. CDM will perform a water audit within the WTP to investigate raw to finished water flow differences, and initiate installation, calibration, and certification of process water flow meters (including transfers of water softening residuals to calcium carbonate lagoons and recalcining kilns), as appropriate. CDM will consider the various methodologies required to reliably estimate unmetered or unknown flows. In addition, proper analytical methods for determining sludge density and water content in solids residuals will be identified.

MDWASD's instrumentation personnel installed a flowmeter on the water softening residuals line. Instrumentation personnel are still verifying and checking with the initial readings from this meter.

Item 4 - Revise the Oracle Systems database

The "Oracle systems database" has been revised and is now called the Normalized Database. It is a SQL Database Server Table which has integrated all raw and finished water SCADA meter reading reports within a single table. This table now holds data from May 2007 to present. A SQL based report format to be compliant with SFWMD Water User Permit Allocation and Special Conditions submittal requirements has been created (see enclosed Appendix F).

Item 5 - Transition to all new meter reports during December 2007

Currently, all raw and finished water meter reports are being prepared in both the old and new format while the new meter installations comments are being addressed and the new system's performance is being assessed.

Item 6 - Undertake the following tasks to analyze raw water flow measuring issues

MDWASD performed a Comparison of Measured Withdrawals from Wells and Surface Water Pumps for a three month period: December 2007, January 2008, and February 2008 (see Appendix E).

CDM was recently authorized to perform the following tasks for the Alexander Orr WTP system:

 Reconciliation of raw water meter reports between FDEP Monthly Operating Reports (MOR) and historical Normalized database (alias Oracle) system. CDM will prepare an analysis of daily historical FDEP MOR and historical Normalized Data system meter records for a period of several months.

- Comparative analysis of reported versus recorded flows for raw and finished water. Pumpage results for each wellfield for the month of March 2008.
- Adjustment factor for raw water by wellfield based on WTP influent flow. CDM will derive a factor for the individual wellfield metered flows and plant raw water (Venturi) flows so that the sum of the adjusted wellfield metered flows match the plant raw water Venturi meter flows.

Item 7 - Summary report on flow measuring issues analysis by July 31, 2008 (July 1 on Limiting Condition No. 48)

The summary report is anticipated to be submitted by July 1, 2008.

Item 8 - Submit request for allocation adjustment to SFWMD during the third Quarter of 2008

To be determined based on the results of ongoing analyses and investigations.

The following Appendices are submitted in support of this Interim Report:

Appendix A	Water Report Alex Orr In-Plant Transmitters and Recorders for September 2007 (Venturi Meter Transmitter Calibration September
	2007)
Appendix B	Water Report Alex Orr In-Plant Transmitters and Recorders for
	December 2007 (Venturi Meter Transmitter Calibration December
	2007)
Appendix C	MDWASD Procedures for Venturi Flow Transmitter Calibrations for
	Plant and Pay Meters (Venturi Transmitter Calibration Procedure)
Appendix D	ADS, LLC Pitometer Testing Report, September 2007 (Venturi
	Calibration Verification August - September 2007)
Appendix E	Comparative of Measured Withdrawals from Wells and Surface Water
	Pumps (December 2007 thru February 2008)
Appendix F	Water Treatment Division Data Evaluation and Automation Project
	(Electronic Database Project)

WATER REPORTS

Alex Orr In-Plant Transmitters & Recorders

FOR

Sep-07

MIAMI	DADE
COUNTY	

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Alex Orr Water Treatment Plant

	FIT-505-RAW	-			Serial Number	1597757		
_	Raw Water #1				Rosemount	3051	HART	
Setup	Flow Transmitter				Accuracy	0.075% of Spa	n	
•	input Low	0.00			Output Low	4.000		
	Input High	282.50			Output High	20.000		
	Input Units	in of H2O			Output Units	mA		
	Tolerance mA	0.012	+/-		Square Root	Yes		
	Tolerance inch	0.212	+/-		Square NOOL	163		
			 Seconds					
	Dampening	1.00	Seconds					
On-Line Com	municator							
As Found Input	-		<u>Tolerance</u>	Tolerance	Expected Output		Error	Pass
<u>(in H₂O)</u>	<u>Tolerance Pv +</u>		<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)	<u></u>	Fail
0.00	0.212	-0.212	4.012	3.988	4.000	4.000	0.000	PAS
71.00	71.212	70.788	12.033	12.009	12.021	12.022	0.001	PAS
141.00	141.212	140.788	15.316	15.292	15.304	15.305	0.001	PAS
212.00	212.212	211.788	17.872	17.848	17.860	17.862	0.002	PAS
282.00	282.212	281.788	19.998	19.974	19.986	19.994	0.008	PAS
On-Line Com	municator	_						
As Left Input (in		Tolerance	Tolerance	Tolerance	Expected Output		Error	Pass
<u>H₂O)</u>		<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)	ENVI	Fail
0.00	0.212	-0.212	4.012	3.988	4.000	4.000	0.000	PAS
71.00	71.212	70.788	12.033	12.009	12.021	12.017	-0.004	PAS
141.00	141.212	140.788	15.316	15.292	15.304	15.300	-0.004	PAS
212.00	212.212	211.788	17.872	17.848	17.860	17.856	-0.004	PAS
282.00	282.212	281.788	19.998	19.974	19.986	19.982	-0.004	PAS
Test Equipm	ontllood							
Manufacture					Serial Number	S		
Fluke 744 DP					8495027	•		
	Field Commun	icator Model :	375		11007890			
	matic Dead We				85348			
ADDITIONAL INI Date	-ORMATION	Reason For	Work		Procedure #			
17-Sep-07	,	Schedule			AO-I-01			
Comments			-	Testers				
				P.Anton				

Alex Orr Water Treatment Plant

Tag ID) FIR-505-RAW1 Raw Water #1 48	" Venturi		9401-28153-AO1	
Setup	Flow Recorder				
	Input Low	4.000		Output Low	0
	Input High	20.000		Output High	100
	Input Units	mA		Output Units	MGD
	Square Root	No			
	Tolerance 0.5 % of rescale	ading + 0.05% of full		5 % of Reading 5 % of Full Scale	
Results					
	Even a start Outward	As Faund Output	Total		
As Found Input (mA)	Expected Output (MGD)	As Found Output (MGD)	Calculated	<u>Pass / Fail</u>	
4.000	0.00	<u>(MCD)</u> 0.00	<u>Error ±</u> 0.0500	PASS	
8.000	25.00	25.00	0.0500	PASS	
12.000	50.00	49.99	0.3000	PASS	
16.000	75.00	49.99 74.99		PASS	
20.000	100.00	100.00	0.4250		
20.000	100.00	100.00	0.5500	PASS	
	Expected Output		<u>Total</u>		
As Left Input (mA)	(MGD)	As Left Output (MGD)	Calculated	<u>Pass / Fail</u>	
4.000	0.00	0.00	<u>Error ±</u> 0.0500	PASS	
8.000	25.00	25.00	0.1750	PASS	
12.000	50.00	49.99	0.3000	PASS	
16.000	75.00	74.99	0.4250	PASS	
20.000	100.00	100.00	0.5500	PASS	r.
Test Equipment U	sed				
Manufacturers		_		Serial Numbers	
Fluke 744 DPC				8495027	
Emerson Hart Field	I Communicator Mc	del 375		11007890	
ADDITIONAL INFORM	ATION		ti		
Date	-	Reason For Work		Procedure #	
17-Sep-07	,	Schedule		AO-I-01-10	
Comments			Testers		
			P.Anton		



CALIBRATION CERTIFICATE Tag ID FIT-506-RAW2 Serial Number 1597755 Raw Water #2 -- 54" Venturi Rosemount 3051 HART Setup Flow Transmitter Accuracy 0.075% of Span 0 4.000 Input Low **Output Low** 84.32 20.000 Input High **Output High** in of H2O Input Units **Output Units** mΑ +/-**Tolerance mA** 0.012 Square Root Yes 0.063 +/-**Tolerance inch** Dampening 1.60 Seconds **On-Line Communicator** Tolerance Tolerance Tolerance Expected Output As Found Input Error Pass/ Fail Tolerance Pv + <u>AO+</u> (in H₂O) <u>Pv -</u> <u>AO-</u> <u>(ma)</u> Output (Ma) 0.00 0.063 -0.063 4.012 3.988 4.000 4.000 0.000 PASS 21.00 21.063 20.937 11.997 11.973 11.985 11.989 PASS 0.004 42.00 42.063 41.937 15.304 15.280 15.292 15.295 0.003 PASS 63.00 63.063 62.937 17.842 17.818 17.830 17.835 0.005 PASS 84.00 84.063 83.937 19.982 19.958 19.970 19.975 0.005 PASS **On-Line Communicator** Tolerance Tolerance Expected Output <u>As Left Input (in</u> Error Pass/ Fail Tolerance Pv + <u>Pv -</u> <u>AO+</u> <u>AO-</u> <u>(ma)</u> Output (Ma) <u>H₂O)</u> -0.063 4.012 3.988 -0.001 PASS 0.00 0.063 4.000 3.999 21.00 21.063 20.937 11.997 11.973 11.985 11.987 0.002 PASS 42.00 42.063 41.937 15.304 15.280 15.292 15.294 0.002 PASS 63.00 63.063 62.937 17.842 17.818 17.830 17.833 0.003 PASS 84.00 84.063 83.937 19.982 19.958 19.970 19.974 0.004 PASS **Test Equipment Used** Serial Numbers Manufacturers Fluke 744 DPC 8495027 **Emerson Hart Field Communicator Model 375** 11007890 Ametek Pneumatic Dead Weight Tester Model PK II 85348 ADDITIONAL INFORMATION Date **Reason For Work** Procedure # Schedule AO-I-01 17-Sep-07 Testers Comments P.Anton

MIAMI-DADË COUNTY

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Alex Orr Water Treatment Plant

_	FIR-506-RAW2 Raw Water #2 54	" Venturi		Serial Number	9710-78075-C05
Setup	Flow Recorder Input Low Input High Input Units Square Root Tolerance 0.5 % of re scale	4.000 20.000 mA No ading + 0.05% of full		Output Low Output High Output Units % of Reading % of Full Scale	0 100 MGD
Results					
As Found Input (mA)	Expected Output (MGD)	As Found Output (MGD)	<u>Total</u> <u>Calculated</u> Error ±	<u>Pass / Fail</u>	
4.000	0.00	0.01	0.0500	PASS	
8.000	25.00	25.00	0.1750	PASS	
12.000	50.00	50.00	0.3000	PASS	
16.000	75.00	75.00	0.4250	PASS	
20.000	100.00	99.99	0.5500	PASS	
<u>As Left Input (mA)</u>	Expected Output (MGD)	<u>As Left Output (MGD)</u>	<u>Total</u> Calculated	Pass / Fail	
4.000	0.00	<u>As cent Odtput (MGD)</u> 0.00	<u>Error ±</u> 0.0500	PASS	
8.000	25.00	25.00	0.0300	PASS	
12.000	50.00	23.00 50.00	0.3000	PASS	
16.000	75.00	75.00	0.4250	PASS	
20.000	100.00	99.99	0.4250	PASS	
Test Equipment l	Jsed				
Manufacturers		_		Serial Numbers	-
Fluke 744 DPC	d Communicator M	odol 275		8495027	
Emerson Hart Fiel	a Communicator M	odel 375		11007890	
	ATION			Decederation "	
Date 17-Sep-07		Reason For Work Schedule		Procedure # AO-I-01-10	
Comments		-	Testers P.Anton		·

Alex Orr Water Treatment Plant

Setup	FIT-507-RAW Raw Water #3 - Flow Transmitter Input Low Input High Input Units Tolerance mA Tolerance inch Dampening municator	72" Ventu	ri +/- +/- Seconds		Rosemount Accuracy Output Low Output High Output Units Square Root	3051 0.075% of Span 4.000 20.000 mA Yes	HART	
On-Line Com As Found Input	Input Low Input High Input Units Tolerance mA Tolerance inch Dampening	0 289.00 in of H2O 0.012 0.217	+/-		Output Low Output High Output Units	4.000 20.000 mA		
On-Line Com As Found Input	Input High Input Units Tolerance mA Tolerance inch Dampening	289.00 in of H2O 0.012 0.217	+/-	·	Output Low Output High Output Units	4.000 20.000 mA		
On-Line Com As Found Input	Input Units Tolerance mA Tolerance inch Dampening	in of H2O 0.012 0.217	+/-		Output Units	mA		
On-Line Com As Found Input	Input Units Tolerance mA Tolerance inch Dampening	0.012 0.217	+/-		Output Units			
On-Line Com As Found Input	Tolerance mA Tolerance inch Dampening	0.217	+/-		-	Yes		
On-Line Com As Found Input	Tolerance inch Dampening	0.217	+/-					
On-Line Com As Found Input	Dampening							
As Found Input	municator							
As Found Input	municator							
		•						
(IN H ₂ O)		Tolerance	Tolerance		Expected Output	Output (Ma)	Error	Pass/ Fail
	<u>Tolerance Pv +</u>	<u>Pv-</u>	<u>AO+</u>	<u>AO-</u> 3.988	<u>(ma)</u>	Output (Ma)	0 000	PASS
0.00	0.217	-0.217 71.783	4.012 11.998	3.988 11.974	4.000 11.986	4.000 11.987	0.000 0.001	PASS
72.00	72.217					그 열심 것 같은 것을 사람이 했다.		
145.00	145.217	144.783	15.345	15.321	15.333	15.333	0.000	PASS
217.00	217.217	216.783	17.876	17.852	17.864	17.864	0.000	PASS
289.00	289.217	288.783	20.012	19.988	20.000	20.000	0.000	PASS
On-Line Com	municator	_						
As Left Input (in		Tolerance			Expected Output		Error	Pass/ Fai
	Tolerance Pv +		<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)		
0.00	0.217	-0.217	4.012	3.988	4.000	4.000	0.000	PASS
72.00	72.217	71.783	11.998	11.974	11.986	11.987	0.001	PASS
145.00	145.217	144.783	15.345	15.321	15.333	15.333	0.000	PASS
217.00	217.217	216.783	17.876	17.852	17.864	17.864	0.000	PASS
289.00	289.217	288.783	20.012	19.988	20.000	20.000	0.000	PASS
Test Equipme	ent Used							
Manufacturer					Serial Numbe	rs		
Fluke 744 DP	C				8495027			
Emerson Hart	Field Commu	nicator Mod	el 375		11007890			
Ametek Pneur	matic Dead We	eight Tester	Model PK	1	85348			
ADDITIONAL INF	ORMATION							
Date		Reason F			Procedure #			
17-Sep-07		Schedule			AO-I-01			
				_				
Comments			-	Testers P.Anton				
				r.Anton				



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Alex Orr Water Treatment Plant

-	FIR-507-RAW3 Raw Water #3 72	" Venturi		Serial Number	9310-22855
Setup	Flow Recorder Input Low Input High Input Units Square Root	4.000 20.000 mA No		Output Low Output High Output Units	0 85 MGD
	Tolerance 0.5 % of re scale	ading + 0.05% of full		5 % of Reading 5 % of Full Scale	
Results					
As Found Input (mA) 4.000	Expected Output (MGD) 0.00	As Found Output (MGD) 0.000	<u>Iotal</u> Calculated Error ± 0.0425	<u>Pass / Fail</u> PASS	
8.000 12.000	21.25 42.50	21.250 42.500	0.1488 0.2550	PASS	
16.000 20.000	63.75 85.00	63.750 85.000	0.3613 0.4675	PASS PASS	
<u>As Left Input (mA)</u>	Expected Output (MGD)	As Left Output (MGD)	<u>Total</u> Calculated Error ±	Pass / Fail	
4.000 8.000	0.00 21.25	0.000 21.250	0.0425 0.1488	PASS PASS	
12.000 16.000	42.50 63.75	42.500 63.750	0.2550 0.3613	PASS PASS PASS	· ·
20.000	85.00	85.000	0.3675	PASS	
Test Equipment U Manufacturers	sed			Serial Numbers	
Fluke 744 DPC Emerson Hart Field	I Communicator Mc	- del 375		8495027 11007890	-
ADDITIONAL INFORM	ATION	Reason For Work		Procedure #	
17-Sep-07	7	Schedule		AO-I-01-10	
Comments			Testers P.Anton		

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COUNTY	

CALIBRATION CERTIFICATE Tag ID FIT-508-RAW4 Serial Number 1841929 Raw Water #4 -- 84" Venturi Rosemount 3051 HART 0.075% of Span Setup Flow Transmitter Accuracy 0 4.000 Input Low Output Low 20.000 263.07 Input High **Output High** in of H2O **Output Units** mΑ Input Units 0.012 +/-Square Root Yes Tolerance mA **Tolerance inch** 0.197 +/-1.60 Seconds Dampening **On-Line Communicator** Tolerance Tolerance Expected Output As Found Input **Tolerance** Error Pass/ Fail Output (Ma) (in H₂O) Tolerance Pv + <u>Pv -</u> <u>AO+</u> <u>AO-</u> <u>(ma)</u> 3.988 4.000 4.000 0.000 PASS 0.00 0.197 -0.197 4.012 12.002 12.014 12.010 -0.004 PASS 66.00 66.197 65.803 12.026 -0.003 PASS 15.322 15.334 15.331 132.197 131.803 15.346 132.00 197.197 196.803 17.858 17.834 17.846 17.842 -0.004PASS 197.00 19.998 19.995 -0.003 PASS 19.986 263.00 263.197 262.803 20.010 **On-Line Communicator** Tolerance Tolerance Expected Output As Left Input (in Error Pass/ Fail Output (Ma) <u>(ma)</u> Tolerance Pv + <u>Pv -</u> <u>AO+</u> <u>AO-</u> H₂O) PASS 3.988 4.000 4.000 0.000 -0.197 4.012 0.00 0.197 -0.002 PASS 12.012 12.014 66.00 66.197 65.803 12.026 12.002 15.334 -0.002 PASS 132.197 131.803 15.346 15.322 15.332 132.00 17.846 17.846 0.000 PASS 197.197 196.803 17.858 17.834 197.00 PASS 0.000 19.998 19.998 262.803 20.010 19.986 263.00 263.197 Test Equipment Used **Serial Numbers** Manufacturers 8495027 Fluke 744 DPC Emerson Hart Field Communicator Model 375 11007890 85348 Ametek Pneumatic Dead Weight Tester Model PK II ADDITIONAL INFORMATION **Procedure # Reason For Work** Date Schedule AO-I-01 4-Sep-07 Testers Comments **P.Anton**

		CALIBRATION SI	IEET		
Tag ID	FIR-508-RAW4A			Serial Number	9602-58414-003
	Raw Water #4 84	" Venturi			
Setup	Flow Recorder Che	m. Bldg. #1			
	Input Low	4.000		Output Low	0
	Input High	20.000		Output High	175
	Input Units	mA		Output Units	MGD
	Square Root	No			
	Tolerance 0.5 % of re	ading + 0.05% of full	0.005	% of Reading	
	scale	5	0.0005	% of Full Scale	
Results					
			Total		
	Expected Output	As Found Output	Calculated	<u>Pass / Fail</u>	
As Found Input (mA)	(MGD)	(<u>MGD)</u>	Error ±	DAGO	
4.000	0.00	0.02	0.0875	PASS	
8.000	43.75	43.75	0.3063	PASS	
12.000	87.50	87.50	0.5250	PASS	
16.000	131.25	131.25 175.00	0.7437 0.9625	PASS PASS	
20.000	175.00	nga grador M , ο, QU , Aline ang	0.9625	PASS	
<u>As Left Input (mA)</u>	Expected Output		<u>Total</u> Calculated	<u>Pass / Fail</u>	
AS Leit input lina	(MGD)	As Left Output (MGD)	Error ±	<u>1 433 / 1 411</u>	
4.000	0.00	0.00	0.0875	PASS	
8.000	43.75	43.75	0.3063	PASS	
12.000	87.50	87.50	0.5250	PASS	
16.000	131.25	131.25	0.7437	PASS	
20.000	175.00	175.00	0.9625	PASS	
Test Equipment U	sed				· · · · · · · · · · · · · · · · · · ·
Manufacturers				Serial Numbers	5
Fluke 744 DPC		-		8495027	
Emerson Hart Field	I Communicator Mo	del 375		11007890	
ADDITIONAL INFORM	ATION	Reason For Work		Procedure #	
3-Sep-07	7	Schedule		AO-I-01-1	0
Comments			Testers		
			P.Anton	· · · ·	

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Alex Orr Water Treatment Plant

Tag ID	FIR-509-RAW4B Raw Water #4 84	" Venturi		Serial Number	9401-28155-AO1
Setup	Flow Recorder Che Input Low Input High Input Units	4.000 20.000 mA		Output Low Output High Output Units	0 175 MGD
	Square Root Tolerance 0.5 % of re scale	No ading + 0.05% of full		% of Reading % of Full Scale	
Results					
As Found Input (mA)	Expected Output (MGD)	As Found Output (MGD)	<u>Total</u> Calculated Error ±	<u>Pass / Fail</u>	
4.000 8.000	0.00 43.75	0.00 43.74	0.0875	PASS PASS	
12.000 16.000 20.000	87.50 131.25 175.00	87.49 131.24 174.99	0.5250 0.7438 0.9625	PASS PASS PASS	
As Left Input (mA)	Expected Output		<u>Total</u> Calculated	<u>Pass / Fail</u>	
4.000	<u>(MGD)</u> 0.00	As Left Output (MGD) 0.00	Error ± 0.0875	PASS	
8.000	43.75	43.75	0.3063	PASS	
12.000	87.50	87.50	0.5250	PASS	
16.000 20.000	131.25 175.00	131.25 175.00	0.7438 0.9625	PASS PASS	
Test Equipment U Manufacturers	sed			Serial Numbers	
Fluke 744 DPC		_		8495027	
	d Communicator Mo	odel 375		11007890	
ADDITIONAL INFORM	ATION				······································
Date 4-Sep-07	7	Reason For Work Schedule		Procedure # AO-I-01-1	0
Comments			Testers P.Anton		

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Taa II	D FIT-500-FIN1				Serial Number	1411231		
- . . .	Fininsh Water	#1 48" Ve	nturi		Rosemount	3051	HART	
Setup	Flow Transmitter				Accuracy	0.075% of Span		
	Input Low	0			Output Low	4.000		
	Input High	265.20			Output High	20.000		
	Input Units	in of H2O 0.012	+/-		Output Units	mA		
	Tolerance mA Tolerance inch	0.012	+/- +/-		Square Root	Yes		
	Dampening	1.60	Seconds					
On-Line Co	mmunicator							
As Found Inpu			Tolerance		Expected Output		Error	Pass/ Fail
<u>(in H₂O)</u>	±	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)		
0.00	0.199	-0.199	4.012	3.988	4.000	4.000	0.000	PASS
66.00	66.199	65.801	11.994	11.970	11.982	11.983	0.001	PASS
133.00	133.199	132.801	15.343	15.319	15.331	15.332	0.001	PASS
199.00	199.199	198.801	17.872	17.848	17.860	17.862	0.002	PASS
265.00	265.199	264.801	20.006	19.982	19.994	19.998	0.004	PASS
On-Line Co	mmunicator	-						
As Left Input (Tolerance		Expected Output		Error	Pass/ Fail
<u>H₂O)</u>	±	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)		
0.00	0.199	-0.199	4.012	3.988	4.000	4.000	0.000	PASS
66.00	66.199	65.801	11.994	11.970	11.982	11.983	0.001	PASS
133.00	133.199	132.801	15.343	15.319	15.331	15.332	0.001	PASS
199.00 265.00	199.199 265.199	198.801 264.801	17.872 20.006	17.848 19.982	17.860 19.994	17.862 19.998	0.002 0.004	PASS PASS
Test Equipr Manufactur					Serial Number	S		
Fluke 744 D					8495027			
	art Field Commu	nicator Mod	lel 375		11007890			
	umatic Dead We			11	85348			
ADDITIONAL I	NFORMATION				Deservice "			
Date		Reason F			Procedure #	-		
5-Sep-0	17	Schedule)		AO-I-01			
Comments				Testers				
- on nonto			-	P.Anton				

Alex Orr Water Treatment Plant

Tag ID	FIR-500-FIN1 Finish Water #1 4	18" Venturi		Serial Number	101655-001-902-8716
		to venturi			
Setup	Flow Recorder	4.000		Output Low	0
	Input Low	20.000		Output Low Output High	80 ettas (kend state)
	Input High	mA		Output High Output Units	MGD
	Input Units Square Root	No		Output Offics	MGD
	Tolerance 0.5 % of re		0.005	% of Reading	
	scale	ading + 0.05% of full		% of Full Scale	
Results					
	Expected Output	As Found Output	<u>Total</u> Calculated	Pass / Fail	
As Found Input (mA)	<u>(MGD)</u> 0.00	(MGD) 0.000	Error ± 0.0400	PASS	
4.000	20.00	20.000	0.0400	PASS	
8.000		20.000		PASS	
12.000	40.00	그는 그는 가슴 집안 집안 다 감정한 것 :	0.2400 0.3400	PASS	
16.000	60.00	59.990 80.000	0.3400	PASS	
20.000	80.00		0.4400	PA33	
			<u>Total</u>		
<u>As Left Input (mA)</u>	Expected Output		Calculated	Pass / Fail	
4 000	(MGD)	As Left Output (MGD)	Error ±	DACC	
4.000	0.00	0.000	0.0400 0.1400	PASS PASS	
8.000	20.00	20.000 39.990	0.1400	PASS	
12.000	40.00	그는 것 같아. 이 것을 알려왔는 것을 것이 많이야지 않는	0.2400	PASS	
16.000	60.00	59.990	0.3400	PASS	
20.000	80.00	80,000	0.4400	PA33	
Test Equipment L Manufacturers	lsed			Serial Numbers	
Fluke 744 DPC				8495027	-
	d Communicator Mo	del 375		11007890	
Emerson hart her				11001000	÷
ADDITIONAL INFORM	ATION				<u>.</u>
Date		Reason For Work		Procedure #	
5-Sep-0	7	Schedule		AO-I-01-10)
Comments			Testers		
			P.Anton		



Tag ID	FIT-501-FIN2				Serial Number	1101176		
-	Fininsh Water	#2 60" Ve	nturi		Rosemount	3051	HART	
Setup	Flow Transmitte Input Low Input High	0 68.90			Accuracy Output Low Output High	0.075% of Span 4.000 20.000		
	Input Units	in of H2O			Output Units	mA		
	Tolerance mA	0.012	+/-		Square Root	Yes		
	Tolerance inch	0.052	+/-					
	Dampening	1.60	Seconds					
On-Line Com	municator	_						
As Found Input	_	<u>Tolerance</u>	Tolerance		Expected Output		<u>Error</u>	Pass/ Fai
<u>(in H₂O)</u>	Tolerance Pv +	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)		
0.00	0.052	-0.052	4.012	3.988	4.000	4.000	0.000	PASS
17.00	17.052	16.948	11.960	11.936	11.948	11.958	0.010	PASS
34.00	34.052	33.948	15.252	15.228	15.240	15.248	0.008	PASS
52.00	52.052	51.948	17.912	17.888	17.900	17.912	0.012	FAIL
69.00	69.052	68.948	20.024	20.000	20.012	20.031	0.019	FAIL
On-Line Con	nmunicator	_						,
As Left Input (ir		Tolerance			Expected Output		<u>Error</u>	Pass/ Fai
<u>H₂O)</u>	Tolerance Pv +		<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)		
0.00	0.052	-0.052	4.012	3.988	4.000	4.000	0.000	PASS
17.00	17.052	16.948	11.960	11.936	11.948	11.950	0.002	PASS
34.00	34.052	33.948	15.252	15.228	15.240	15.242	0.002	PASS
52.00	52.052	51.948	17.912	17.888	17.900	17.900	0.000	PASS
69.00	69.052	68.948	20.024	20.000	20.012	20.012	0.000	PASS
Test Equipm	ent Used							
				11	Serial Number 8495027 11007890 85348	rs		
Date		Reason F	or Work		Procedure #			
5-Sep-07	7	Schedule		<u> </u>	AO-I-01	-		
Comments			_	Testers				
				P.Anton		•		

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Alex Orr Water Treatment Plant

Tag ID	FIR-501-FIN2 Finish Water #2 6	0" Vooturi		Serial Number	9602-58412C03
- /		Su" venturi			
Setup	Flow Recorder	4 000		·	0
	Input Low	4.000 20.000		Output Low	0
	Input High	20.000 mA		Output High	128 MGD
	Input Units			Output Units	
	Square Root	No	0.005		No
	Tolerance 0.5 % of re scale	ading + 0.05% of full		% of Reading % of Full Scale	
Results					
	Expected Output	As Found Output	Total Calculated	Pass / Fail	
As Found Input (mA)		(MGD)	Error ±	<u></u>	
4.000	0.00	0.00	0.0640	PASS	
8.000	32.00	32.00	0.2240	PASS	
12.000	64.00	64.00	0.3840	PASS	
16.000	96.00	96.00	0.5440	PASS	
20.000	128.00	128.00	0.7040	PASS	
	Expected Output		Total Calculated	- Pass / Fail	
As Left Input (mA)	(MGD)	As Left Output (MGD)	Error ±	rass / ran	
4.000	0.00	0.00	0.0640	PASS	
8.000	32.00	32.00	0.2240	PASS	
12.000	64.00	64.00	0.3840	PASS	
16.000	96.00	96.00	0.5440	PASS	
20.000	128.00	128.00	0.7040	PASS	
Test Equipment L Manufacturers	lsed			Serial Numbers	
Fluke 744 DPC		-		8495027	
	d Communicator Mo	odel 375		11007890	
	ATION				
Date		Reason For Work		Procedure #	
5-Sep-0	7	Schedule	1	AO-I-01-10	0
Comments		_	Testers		
			P.Anton		



CALIBRATION CERTIFICATE

Tag	Tag ID FIT-502-FIN3			Serial Number	1101177	
	Fininsh Water	#3 72'' Ve	enturi	Rosemount	3051	HART
Setup	Flow Transmitte	r		Accuracy	0.075% of S	Span
	Input Low	0		Output Low	4.000	
	Input High	193.30	· • .	Output High	20.000	
	Input Units	in of H2C)	Output Units	mA	
	Tolerance mA	0.012	+/-	Square Root	Yes	
	Tolerance inch	0.145	+/-			
	Dampening	1.60	Seconds			

On-Line Communicator

As Found Input		Tolerance	Tolerance	Tolerance	Expected Output		Error	Pass/ Fail
<u>(in H₂O)</u>	Tolerance Pv +	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)	LITU	r ass/ r an
0.00	0.145	-0.145	4.012	3.988	4.000	4.000	0.000	PASS
48.00	48.145	47.855	11.985	11.961	11.973	11.971	-0.002	PASS
97.00	97.145	96.855	15.346	15.322	15.334	15.332	-0.002	PASS
145.00	145.145	144.855	17.870	17.846	17.858	17.857	-0.001	PASS
193.00	193.145	192.855	20.000	19.976	19.988	19.988	0.000	PASS

On-Line Communicator

As Left Input (in	<u>l</u>	Tolerance	Tolerance	Tolerance	Expected Output		Error	Pass/ Fail
<u>H₂O)</u>	Tolerance Pv +	<u> Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	<u>Output (Ma)</u>		<u>r assi i an</u>
0.00	0.145	-0.145	4.012	3.988	4.000	4.000	0.000	PASS
48.00	48.145	47.855	11.985	11.961	11.973	11.971	-0.002	PASS
97.00	97.145	96.855	15.346	15.322	15.334	15.332	-0.002	PASS
145.00	145.145	144.855	17.870	17.846	17.858	17.857	-0.001	PASS
193.00	193.145	192.855	20.000	19.976	19.988	19.988	0.000	PASS

Test Equipment Use		
Manufacturers		Serial Numbers
Fluke 744 DPC		8495027
Emerson Hart Field C	Communicator Model 375	11007890
Ametek Pneumatic D	ead Weight Tester Model PK II	85348
ADDITIONAL INFORMAT	ION	
Date	Reason For Work	Procedure #
5-Sep-07	Schedule	AO-I-01
Comments	Teste	rs
	P.Ant	on

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Alex Orr Water Treatment Plant

Tag ID	FIR-502-FIN3 Finish Water #3 7	72" Vonturi		Serial Number	9501-42407-C03
- /					
Setup	Flow Recorder	4 000		• • • •	0
	Input Low	4.000 20.000		Output Low	0 150
	Input High			Output High	MGD
	Input Units	mA		Output Units	NGD
	Square Root	No	0.005		
	Tolerance 0.5 % of re scale	ading + 0.05% of full		 % of Reading % of Full Scale 	
Results					
	Expected Output	As Found Output	<u>Total</u> Calculated	Pass / Fail	
As Found Input (mA)	<u>(MGD)</u>	(MGD)	Error ±		
4.000	0.00	0.01	0.0750	PASS	
8.000	37.50	37.50	0.2625	PASS	
12.000	75.00	75.00	0.4500	PASS	
16.000	112.50	112.49	0.6375	PASS	
20.000	150.00	149.99	0.8250	PASS	
			Total		
<u>As Left Input (mA)</u>	Expected Output	1 - 1 - # Output (NOD)	Calculated	<u>Pass / Fail</u>	
4 000	(MGD)	<u>As Left Output (MGD)</u> 0.00	<u>Error ±</u> 0.0750	PASS	
4.000	0.00	0.00 37,49	0.2625	PASS	
8.000	37.50		0.2525	PASS	
12.000	75.00	75.00 112.50	0.4300	PASS	
16.000 20.000	112.50 150.00	150.00	0.8375	PASS	
Test Equipment U	sed			<u> </u>	
Manufacturers	<u></u>			Serial Numbers	- -
Fluke 744 DPC				8495027	
Emerson Hart Field	Communicator Mo	odel 375		11007890	
ADDITIONAL INFORM	ATION			Dura a a durar di	
Date		Reason For Work		Procedure #	<u></u>
5-Sep-07	,	Schedule		AO-I-01-10	J
			Testers		
		1	P.Anton		

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COUNTY	,

CALIBRATION CERTIFICATE Serial Number Tag ID FIT-503-FIN4 1101174 Fininsh Water #4 -- 72" Venturi Rosemount 3051 HART 0.075% of Span Accuracy Setup **Flow Transmitter** 4.000 0 **Output Low** Input Low 20.000 257.10 **Output High** Input High mA in of H2O **Output Units** Input Units 0.012 +/-**Square Root** Yes **Tolerance mA** +/-0.193 Tolerance inch 1.60 Dampening Seconds **On-Line** Communicator Tolerance Tolerance Tolerance Expected Output As Found Input Error Pass/ Fail Output (Ma) Tolerance Pv + <u>Pv -</u> AO+ AO-<u>(ma)</u> <u>(in H₂O)</u> 0.000 PASS 4.012 3.988 4.000 4.000 0.193 -0.193 0.00 PASS 11.995 11.971 11.983 11.983 0.000 64.193 63.807 64.00 15.333 0.000 PASS 129,193 128.807 15.345 15.321 15.333 129.00 17.863 0.000 PASS 17.863 193.193 192.807 17.875 17.851 193.00 20.009 19.985 19.997 19.998 0.001 PASS 257.193 256.807 257.00 **On-Line Communicator** Tolerance Tolerance Expected Output As Left Input (in Error Pass/ Fail Output (Ma) <u>AO+</u> AO-<u>(ma)</u> H₂O) Tolerance Pv + <u>Pv -</u> 4.000 0.000 PASS 3.988 4.000 0.00 0.193 -0.1934.012 PASS 64.193 63.807 11.995 11.971 11.983 11.983 0.000 64.00 15.333 15.333 0.000 PASS 129.193 128.807 15.345 15.321 129.00 PASS 17.851 17.863 17.863 0.000 192.807 17.875 193.00 193.193 PASS 19.985 19.997 19.998 0.001 256.807 20.009 257.00 257.193 **Test Equipment Used** Serial Numbers Manufacturers 8495027 Fluke 744 DPC 11007890 Emerson Hart Field Communicator Model 375 Ametek Pneumatic Dead Weight Tester Model PK II 85348 ADDITIONAL INFORMATION **Procedure # Reason For Work** Date AO-I-01 Schedule 6-Sep-07 Testers Comments P.Anton

Alex Orr Water Treatment Plant

Tag ID	FIR-503-FIN4			Serial Number	101655-8717
•	Finish Water #4 7	2" Venturi			
etup	Flow Recorder				
orup	Input Low	4.000		Output Low	0
	Input High	20.000		Output High	173
	Input Units	mA		Output Units	MGD
	Square Root	No			
	Tolerance 0.5 % of rea		0.005	% of Reading	
	scale	10 mg + 0.00 % Or sum	0.0005	% of Full Scale	
Results					
	Expected Output	As Found Output	Total Calculated	Pass / Fail	
As Found Input (mA)	(MGD)	(MGD)	Error ±	<u>1 433 / 1 411</u>	
4.000	0.00	0.00	0.0865	PASS	
8.000	43.25	43.24	0.3028	PASS	
	86.50	86.49	0.5190	PASS	
12.000	129.75	129.74	0.7353	PASS	
16.000	173.00	172.97	0.9515	PASS	
20.000	175.00				
			Total Calculated	Pass / Fail	
As Left Input (mA)	Expected Output (MGD)	As Left Output (MGD)	Error ±	<u>Fass/Tan</u>	
4 000	0.00	<u>As Left Output (mob)</u> 0.00	0.0865	PASS	
4.000		43.25	0.3028	PASS	
8.000	43.25	43.23 86.50	0.5190	PASS	
12.000	86.50	129.75	0.7353	PASS	
16.000	129.75	이 가슴에 물려 가지 않는 것을 수 없다. 물건을 가지 않는	0.9515	PASS	
20.000	173.00	173.00	0.9515	1400	
Test Equipment L	Jsed			Serial Numbers	
Manufacturers		-		8495027	
Fluke 744 DPC	d Communicator Mo	del 375		11007890	
Emerson Hart Fiel					
ADDITIONAL INFORM	IATION	Deepen For Mork		Procedure #	
Date		Reason For Work Schedule	<u></u>	AO-I-01-1	0
6-Sep-0	7	Schedule	;		r
Comments		_	Testers		
			P.Anton		

MIAMI-DADE	
COUNTY	-

CALIBRATION CERTIFICATE Serial Number 1101178 Tag ID FIT-504-FIN5 Rosemount HART Fininsh Water #5 -- 72" Venturi 3051 Accuracy 0.075% of Span Setup Flow Transmitter 4.000 0 Output Low Input Low 20.000 257.10 **Output High** Input High in of H2O **Output Units** mΑ Input Units +/-Square Root 0.012 Yes **Tolerance mA** 0.193 +/-**Tolerance** inch 1.60 Seconds Dampening **On-Line Communicator** Tolerance Tolerance Expected Output Tolerance As Found Input Pass/ Fail Error Output (Ma) Tolerance Pv + Pv -<u>AO+</u> <u>AO-</u> <u>(ma)</u> $(in H_2O)$ PASS 4.000 4.000 0.000 -0.193 4.012 3.988 0.193 0.00 11.984 0.001 PASS 11.971 11.983 63.807 11.995 64,193 64.00 -0.002PASS 15.333 15.331 15.321 129.00 129.193 128.807 15.345 17.863 17.860 -0.003 PASS 192.807 17.875 17.851 193.193 193.00 PASS 19.994 -0.003 256.807 20.009 19.985 19.997 257.193 257.00 **On-Line Communicator** Tolerance Tolerance Expected Output As Left Input (in Pass/ Fail Error AO+ <u>AO-</u> (ma) Output (Ma) Tolerance Pv + <u>Pv -</u> <u>H₂O)</u> 3.988 4.000 4.000 0.000 PASS 4.012 0.00 0.193 -0.193 11.984 0.001 PASS 11.995 11.971 11.983 64.193 63.807 64.00 -0.002 PASS 15.333 15.331 128.807 15.345 15.321 129,193 129.00 PASS 17.875 17.851 17.863 17.862 -0.001 192.807 193.00 193.193 -0.003 PASS 19.985 19.997 19.994 257.193 256.807 20.009 257.00 **Test Equipment Used** Serial Numbers Manufacturers 8495027 Fluke 744 DPC Emerson Hart Field Communicator Model 375 11007890 85348 Ametek Pneumatic Dead Weight Tester Model PK II ADDITIONAL INFORMATION **Procedure # Reason For Work** Date AO-I-01 Schedule 6-Sep-07 Testers Comments P.Anton

		CALIBRATION SH	IEET		
· · · ·				O - viel Newshere	404055 0747
Tag ID	FIR-504-FIN5 Finish Water #5 72	" Venturi		Serial Number	101655-8717
	Flow Recorder	Volitari			
Setup	Input Low	4.000		Output Low	0
	Input High	20.000		Output High	173
	Input Units	mA		Output Units	MGD
	-	No			
	Square Root		0.005	% of Reading	
	Tolerance 0.5 % of read	ding + 0.05% of full scale		% of Full Scale	7
Results			Tatal Calculated		
	Expected Output	As Found Output	Total Calculated Error ±	Pass / Fail	
As Found Input (mA)	(MGD)	(MGD)		PASS	
4.000	0.00	0.00	0.0865	PASS	
8.000	43.25	43.24	0.3028	PASS	
12.000	86.50	86.49	0.5190	PASS	
16.000	129.75	129.73	0.7353	PASS	
20.000	173.00	172.98	0.9515	PASS	
As Left input (mA)	Expected Output		Total Calculated	Pass / Fail	
AS Left Input (IniA)	(MGD)	As Left Output (MGD)	<u>Error ±</u>		
4.000	0.00	0,00	0.0865	PASS	
8.000	43.25	43.24	0.3028	PASS	
12.000	86.50	86.49	0.5190	PASS	
16.000	129.75	129.74	0.7353	PASS	
20.000	173.00	172.99	0.9515	PASS	
Test Equipment U	lsed	<u></u>		Serial Number	s
Manufacturers Fluke 744 DPC		_		8495027	
Fluke 744 DPC	d Communicator Mod	lel 375		11007890	
ADDITIONAL INFORM	ATION			<u></u>	
Date		Reason For Work		Procedure #	
6-Sep-0	7	Schedule		AO-I-01-	10
Comments			Testers P.Anton		

WATER REPORT

SouthWest Wellfield ASR Wells #4 & 5

FOR

September, 2007

SouthWest Wellfield -- Alexander Orr Water Treatment Plant

Tag ID	FIT-1-ASR #4				Serial Number	2124097 3/98		
Tagib	Production / Recove	ry			Rosemount	1151DP	HART	
Setup	Flow Transmitter				Accuracy	0.254019015	% of Span	
Jeruh	Input Low	0.00			Pressure Range	4	•	
	Input High	138.84			Output Low	4.000		
	Input Units	in of H2O			Output High	20.000		
	Tolerance mA	0.041	+/-		Output Units	mA		
	Tolerance inch	0.353	+/-		Square Root	Yes		
	I Olerance mon	0.000	.,		Upper Range Limit			
	Dampening	6.40	Seconds		of TX (URL)	150	" H₂O	
On-Line Com	municator							
As Found Input		Tolerance Pv		Tolerance	Expected Output		Error	Pass/ Fai
<u>(in H₂O)</u>	Tolerance Pv +	:	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)	0.000	B 4 6 6
0	0.353	-0.353	4.041	3.959	4.000	4.000	0.000	PASS
35	35.353	34.647	12.074	11.993	12.033	12.034	0.001	PASS
69	69.353	68.647	15.320	15.239	15.279	15.278	-0.001	PASS
104	104.353	103.647	17.888	17.807	17.848	17.848	0.000	PASS
139	139.353	138.647	20.050	19.969	20.009	20.009	0.000	PASS
On-Line Com	nmunicator							
<u>As Left Input (in</u>		Tolerance	Tolerance	Tolerance	Expected Output	Output (Ma)	Error	Pass/ Fa
<u>H₂O)</u>	Tolerance Pv +	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u> 4.000	4.000	0.000	PASS
0	0.353	-0.353	4.041	3.959	12.033	12.034	0.000	PASS
35	35.353	34.647	12.074	11.993		12.034	-0.001	PASS
69	69.353	68.647	15.320	15.239	15.279	그는 물건물 좀 가지지 않았다.	0.000	PASS
104	104.353	103.647	17.888	17.807	17.848	17.848 20.009	0.000	PASS
139	139.353	138.647	20.050	19.969	20.009	20.009	0.000	FAGG
Test Equipm Manufacture				·····		Serial Numb	bers	
Fluke 744 DF						8495027		
	t Field Communic	ator Model 3	75			11007890		
	imatic Dead Weig					85348		
ADDITIONAL IN	FORMATION	Reason Fo	or Work			Procedure #	¢	
Date 7-Sep-07	7	Schedule				AO-I-01		
1-0ep-01		20.2000						
Comments				Testers				



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SouthWest Wellfield -- Alexander Orr Water Treatment Plant

Tag IC	D FIT-2-ASR #4			ATION CERTI	Serial Number	2124095 3/98		
Setup	Injection / Recha Flow Transmitter Input Low	0.00			Rosemount Accuracy Pressure Range	1151DP 0.254019015 4	HART % of Span	
	Input High Input Units Tolerance mA Tolerance inch	138.84 in of H2O 0.041 0.353	+/- +/-		Output Low Output High Output Units Square Root	4.000 20.000 mA Yes		
	Dampening		Seconds		Upper Range Limit of TX (URL)	150	" H ₂ O	
	mmunicator							
As Found Inpu (in H₂O) 0 25	<u>t</u> <u>Tolerance Pv +</u> 0.353 35.353	<u>Tolerance Pv -</u> -0.353 34.647	<u>Tolerance</u> <u>AO+</u> 4.041 12.074	- <u>Tolerance AO</u> 3.959 11.993	Expected Output (ma) 4.000 12.033	<u>Output (Ma)</u> 3.990 12.034	<u>Error</u> -0.010 0.001	Pass/ Fa PASS
35 69 104 139	69.353 104.353 139.353	68.647 103.647 138.647	15.320 17.888 20.050	15.239 17.807 19.969	12.033 15.279 17.848 20.009	12.034 15.281 17.849 20.010	0.001 0.002 0.001 0.001	PASS PASS PASS PASS
	mmunicator							
<u>As Left Input (i</u> <u>H₂O)</u> 0 35 69 104 139	<u>n Tolerance Pv</u> ± 0.353 35.353 69.353 104.353 139.353	<u>Tolerance Pv</u> - -0.353 34.647 68.647 103.647 138.647	Tolerance AO+ 4.041 12.074 15.320 17.888 20.050	Tolerance AO 3.959 11.993 15.239 17.807 19.969	Expected Output (ma) 4.000 12.033 15.279 17.848 20.009	Output (Ma) 3.990 12.034 15.281 17.849 20.010	Error -0.010 0.001 0.002 0.001 0.001	Pass/ Fa PASS PASS PASS PASS PASS
	ers					Serial Numb 8495027 11007890 85348	oers	
ADDITIONAL II		Reason For	Mork			Procedure #	4	
7-Sep-0	7	Schedule	TAOLY			AO-I-01		
Comments		·····		Testers P.Anton				

SouthWest Wellfield -- Alexander Orr Water Treatment Plant

CALIBRATION CERTIFICATE

D FIT-1-ASR #5			Serial Number	2124094 3/98	\$
Production / Recov	very		Rosemount	1151DP	HART
Flow Transmitter			Accuracy	0.254019015	% of Span
Input Low	0.00		Pressure Range	4	
Input High	138.84		Output Low	4.000	
Input Units	in of H2O		Output High	20.000	
Tolerance mA	0.041	+/-	Output Units	mA	
Tolerance inch	0.353	+/-	Square Root	Yes	
			Upper Range Limit	;	
Dampening	6.40	Seconds	of TX (URL)	150	" H₂O
	Flow Transmitter Input Low Input High Input Units Tolerance mA Tolerance inch	Production / Recovery Flow Transmitter Input Low 0.00 Input High 138.84 Input Units in of H2O Tolerance mA 0.041 Tolerance inch 0.353	Production / Recovery Flow Transmitter Input Low 0.00 Input High 138.84 Input Units in of H2O Tolerance mA 0.041 +/- Tolerance inch 0.353 +/-	Production / Recovery Rosemount Flow Transmitter Accuracy Input Low 0.00 Pressure Range Input High 138.84 Output Low Input Units in of H2O Output High Tolerance mA 0.041 +/- Output Units 0.353 +/- Square Root Upper Range Limit	Production / RecoveryRosemount1151DPFlow TransmitterAccuracy0.254019015Input Low0.00Pressure Range4Input High138.84Output Low4.000Input Unitsin of H2OOutput High20.000Tolerance mA0.041+/-Output UnitsmATolerance inch0.353+/-Square RootYesUpper Range LimitOutput Low0.1010Tolerance inch0.353+/-10

On-Line Communicator

As Found			Tolerance	<u> </u>	Expected Output		Error	Pass/ Fail
Input (in H ₂ O)	<u>Tolerance Pv +</u>	Tolerance Pv -	<u>AO+</u>	Tolerance AO-	<u>(ma)</u>	Output (Ma)		
0	0.353	-0.353	4.041	3.959	4.000	4.000	0.000	PASS
35	35.353	34.647	12.074	11.993	12.033	12.034	0.001	PASS
69	69.353	68.647	15.320	15.239	15.279	15.280	0.001	PASS
104	104.353	103.647	17.888	17.807	17.848	17.847	-0.001	PASS
139	139.353	138.647	20.050	19.969	20.009	20.012	0.003	PASS

On-Line Communicator

As Left Input		<u>Tolerance</u>	<u>Tolerance</u>	_	Expected Output	<u>it</u>	Error	Pass/ Fail
(in H ₂ O)	Tolerance Pv +	<u>Pv -</u>	<u>AO+</u>	Tolerance AO-	<u>(ma)</u>	Output (Ma)		
	0.353	-0.353	4.041	3.959	4.000	4.000	0.000	PASS
35	35.353	34.647	12.074	11.993	12.033	12.034	0.001	PASS
69	69.353	68.647	15.320	15.239	15.279	15.280	0.001	PASS
104	104.353	103.647	17.888	17.807	17.848	17.847	-0.001	PASS
139	139.353	138.647	20.050	19.969	20.009	20.012	0.003	PASS

0.405007
8495027
11007890
85348

Date	Reason For Work	Procedure #
7-Sep-07	Schedule	AO-I-01

Comments

Testers P.Anton

SouthWest Wellfield -- Alexander Orr Water Treatment Plant

Tag ID	FIT-2-ASR #5			•	Serial Number	2124096 3/	98	
	Injection / Recharg	je			Rosemount	1151DP	HART	
Setup	Flow Transmitter				Accuracy	0.25401901	% of Spa	n
-	Input Low	0.00			Pressure Range	4		
	Input High	138.84			Output Low	4.000		
	Input Units	in of H2O			Output High	20.000		
	Tolerance mA	0.041	+/-		Output Units	mA		
	Tolerance inch	0.353	+/-		Square Root	Yes		
	Dampening	6.40	Seconds		Upper Range Limit of TX (URL)	150	" H₂O	
On-Line Comm								
As Found Input (in	1 Tolerance Pv +	Tolerance Pv		Tolerance	Expected Output	Output	Error	Pass
<u>H₂O)</u> 0	0.353	-0.353	<u>AO+</u> 4.041	<u>AO-</u> 3.959	<u>(ma)</u> 4.000	<u>(Ma)</u> 3.999	-0.001	<u>Fail</u> PAS
0 35	35.353	-0.333 34.647	12.074	11.993	12.033	12.035	0.002	PAS
69	69.353	68.647	15.320	15.239	15.279	15.281	0.002	PAS
09 104	104.353	103.647	17.888	17.807	17.848	17.852	0.002	PAS
139	139.353	138.647	20.050	19.969	20.009	20.017	0.008	PAS
On-Line Comm	nunicator							
As Left Input (in		Tolerance	Tolerance	Tolerance	Expected Output	Output	Error	Pass
<u>H₂O)</u>	Tolerance Pv +	<u>Pv -</u> -0.353	<u>A0+</u> 4.041	<u>AO-</u> 3.959	<u>(ma)</u> 4.000	(<u>Ma)</u>		<u>Fail</u> PAS
0 35	0.353 35.353	-0.353 34.647	4.041	3.959 11.993	12.033	4.000 12.031	0.000	PAS
	69.353	54.647 68.647	15.320	15.239	15.279	15.275	-0.002	PAS
09 104	104.353	103.647	17.888	17.807	17.848	17.845	-0.004	PAS
139	139.353	138.647	20.050	19.969	20.009	20.006	-0.003	PAS
Test Equipmer	nt lised		······		····			
Manufacturers Fluke 744 DPC						Serial Nu 8495027	mbers	
	Field Communica atic Dead Weigh					11007890 85348		
	RMATION					D	_ #	
Date	7	Reason Fo Schedule	r work			Procedur AO-I-01		
7-Sep-07	,	Schedule				AO-1-01		
Comments				Testers				
				P.Anton				

WATER REPORT

SouthWest Wellfield BA Wells Transmitters & Recorders

FOR

Sep-07



Tag ID	SW-BA-Well32				Serial Number	1411208		
	24" Venturi				Rosemount	3051	HART	
Setup	Flow Transmitter				Accuracy	0.075% of Sp	an	
-	Input Low	0.00			Output Low	4.000		
	Input High	101.68			Output High	20.000		
	Input Units	in of H2O			Output Units	mA		
	Tolerance mA	0.012	+/-		Square Root	Yes		
	Tolerance inch	0.076	+/-		-			
	Dampening	6.40	Seconds					
On-Line Con	nmunicator							
As Found Input			Tolerance		Expected Output		Error	Pass/ Fail
<u>(in H₂O)</u>	Tolerance Pv +			<u>AO-</u>	<u>(ma)</u>	<u>Output (Ma)</u>		
0.00	0.076	-0.076	4.012	3.988	4.000	4.000	0.000	PASS
25.00	25.076	24.924	11.946	11.922	11.934	11.935	0.001	PASS
51.00	51.076	50.924	15.343	15.319	15.331	15.333	0.002	PASS
76.00	76.076	75.924	17.845	17.821	17.833	17.835	0.002	PASS
102.00	102.076	101.924	20.037	20.013	20.025	20.027	0.002	PASS
On-Line Con	nmunicator							
As Left Input (ir		Tolerance	Tolerance		Expected Output		Error	Pass/ Fai
<u>H₂O)</u>	±	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)		
0.00	0.076	-0.076	4.012	3.988	4.000	4.000	0.000	PASS
25.00	25.076	24.924	11.946	11.922	11.934	11.935	0.001	PASS
51.00	51.076	50.924	15.343	15.319	15.331	15.333	0.002	PASS
76.00	76.076	75.924	17.845	17.821	17.833	17.835	0.002	PASS
102.00	102.076	101.924	20.037	20.013	20.025	20.027	0.002	PASS
Test Equipm	ont llead		<u></u>					
Manufacture					Serial Numbe	rs		
Fluke 744 DF					8495027			
	t Field Commun	icator Model	375		11007890			
	imatic Dead We				85348			
	FORMATION					<u> </u>		
Date		Reason Fo	r Work		Procedure #	_		
10-Sep-07	7	Schedule			AO-I-01	-		
Comments		<u></u>	-	Testers P.Anton				
				i .Anton				



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Tag ID	SW-BA-Well32R 24" Venturi			Serial Number	9803-81828-C4
Setup	Flow Recorder				
Octup	Input Low	4.000		Output Low	0
	Input High	20.000		Output High	16
	Input Units	mA		Output Units	MGD
	Square Root	No			
	Tolerance 0.5 % of re full scale	ading + 0.05% of		% of Reading % of Full Scale	
Results					
	Expected Output	As Found Output	otal Calculated	Pass / Fail	
As Found Input (mA)	(MGD)	(MGD)	Error ±		
4.000	0.00	0.00	0.0080	PASS	
8.000	4.00	4.00	0.0280	PASS	
12.000	8.00	8.00	0.0480	PASS	
16.000	12.00	12.00	0.0680	PASS	
20.000	16.00	16.00	0.0880	PASS	
<u>As Left Input (mA)</u>	Expected Output	As Left Output T	otal Calculated Error ±	Pass / Fail	
	(MGD)	(MGD)			
4.000	0.00	0.00	0.0080	PASS	
8.000	4.00	4.00	0.0280	PASS	
12.000	8.00	8.00	0.0480	PASS	
16.000	12.00	12.00	0.0680	PASS	
20.000	16.00	16.00	0.0880	PASS	
Test Equipment U Manufacturers	sed			Serial Number	S
Fluke 744 DPC				8495027	_
Emerson Hart Field	I Communicator Mo	odel 375		11007890	· .
	ATION				
Date		Reason For Wo	rk	Procedure #	
10-Sep-07	r	Schedule		AO-I-01-1	U
Comments			Testers		
Pen does up & dow	n erratically- Resp	ondes to F	P.Anton		



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Tag ID Setup	SW-BA-Well33 24" Venturi Flow Transmitter Input Low Input High Input Units Tolerance mA Tolerance inch Dampening	0.00 101.68 in of H2O 0.012 0.076 6.40	+/- +/- Seconds		Serial Number Rosemount Accuracy Output Low Output High Output Units Square Root	2031056 3051 0.075% of Sp 4.000 20.000 mA Yes	HART ban	
On-Line Con	nmunicator							
As Found Input (in H₂O) 0.00 25.00 51.00 76.00 102.00 On-Line Con As Left Input (in H₂O) 0.00 25.00 51.00 76.00 102.00	Tolerance Pv + 0.076 25.076 51.076 76.076 102.076 102.076	Tolerance Pv -0.076 24.924 50.924 75.924 101.924 Tolerance Pv - -0.076 24.924 50.924 75.924 101.924	Tolerance AO+ 4.012 11.946 15.343 17.845 20.037 Tolerance AO+ 4.012 11.946 15.343 17.845 20.037	Tolerance AO- 3.988 11.922 15.319 17.821 20.013 Tolerance AO- 3.988 11.922 15.319 17.821 20.013	Expected Output (ma) 4.000 11.934 15.331 17.833 20.025 Expected Output (ma) 4.000 11.934 15.331 17.833 20.025	(<u>Ma)</u> 4.000 11.937 15.333 17.834 20.027	Error 0.000 0.003 0.002 0.001 0.002 Error 0.000 0.003 0.002 0.001 0.002	Pass/ Fail PASS PASS PASS PASS PASS PASS PASS PAS
	ers PC It Field Commun Imatic Dead Wei		Model PK II o <mark>r Work</mark>	Testers P.Anton	Serial Numbe 8495027 11007890 85348 Procedure # AO-I-01			



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CALIBRATION	CERTIFICATE
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Tag ID	SW-BA-Well33R 24'' Venturi			Serial Number	9803-81829-C4
Setup	Flow Recorder Input Low Input High Input Units Square Root	4.000 20.000 mA No	0.005	Output Low Output High Output Units	0 16 MGD
	Tolerance 0.5 % of re full scale	ading + 0.05% of		% of Reading % of Full Scale	
Results					
As Found Input (mA)	Expected Output (MGD)	As Found Output (MGD)	Total Calculated Error ±	Pass / Fail	
4.000	0.00	0.00	0.0080	PASS	
8.000	4.00	4.00	0.0280	PASS	
12.000	8.00	8.00	0.0480	PASS	
16.000	12.00	12.00	0.0680	PASS	
20.000	16.00	12.00	0.0880	PASS	
<u>As Left Input (mA)</u>	Expected Output (MGD)	As Left Output (MGD)	<u>Total Calculated</u> <u>Error ±</u>	Pass / Fail	
4.000	0.00	0.00	0.0080	PASS	
8.000	4.00	4.00	0.0280	PASS	
12.000	8.00	8.00	0.0480	PASS	
16.000	12.00	12.00	0.0680	PASS	
20.000	16.00	16.00	0.0880	PASS	
Test Equipment	Used			Coriol Number	
Manufacturers		_		Serial Number	<u>></u>
Fluke 744 DPC				8495027	
Emerson Hart Fie	ld Communicator N	lodel 375		11007890	
	MATION	Reason For W	ork	Procedure #	
Date 10 See 0	7	Schedule		AO-I-01-1	0
10-Sep-07	1	Schedule		70-1-01-1	•
Comments			Testers		
Pen goes up & do	wn erratically- Res	oonds to	P.Anton		
calibration, but ref	turns to erratic beha	AVIOF.			



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Setup	SW-BA-Well34 24" Venturi					1761462		
Setup					Serial Number Rosemount	3051	HART	
Jeruh	Flow Transmitter				Accuracy	0.075% of S		
	Input Low	0.00			Output Low	4.000	pan	
	Input High	101.68			Output High	20.000		
	Input Units	in of H2O			Output High	20.000 mA		
	Tolerance mA	0.012	+/-		Square Root	Yes		
	Tolerance inch	0.072	+/-		Square Root	162		
	Dampening		Seconds					
0								
	mmunicator	Toloronao	Toloranoo	Tolerance	Expected Output	Output		
As Found Input (in H ₂ O)	<u>Tolerance Pv +</u>	<u>Tolerance</u> <u>Pv -</u>	Tolerance <u>AO+</u>	<u>AO-</u>	<u>Expected Output</u> (ma)	<u>Output</u> (<u>Ma)</u>	Error	Pass/ Fail
0.00	0.076	-0.076	4.012	3.988	4.000	3.999	-0.001	PASS
25.00	25.076	24.924	11.946	11.922	11.934	11.937	0.003	PASS
51.00	51.076	50.924	15.343	15.319	15.331	15.333	0.002	PASS
76.00	76.076	75.924	17.845	17.821	17.833	17.835	0.002	PASS
102.00	102.076	101.924	20.037	20.013	20.025	20.027	0.002	PASS
On-Line Co	mmunicator							
As Left Input	Tolerance Pv	Tolerance	Tolerance	Tolerance	Expected Output		Error	Pass/ Fail
<u>(in H₂O)</u>	<u>+</u>	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	<u>(Ma)</u>		
0.00	0.076	-0.076	4.012	3.988	4.000	3.999	-0.001	PASS
25.00	25.076	24.924	11.946	11.922	11.934	11.937	0.003	PASS
51.00	51.076	50.924	15.343	15.319	15.331	15.333	0.002	PASS
76.00	76.076	75.924	17.845	17.821	17.833	17.835	0.002	PASS
102.00	102.076	50.924	20.037	20.013	20.025	20.027	0.002	PASS
Test Equipr	nent Used							
Manufactur	ers				Serial Numbe	rs		
Fluke 744 DI	PC				8495027			
	rt Field Commu				11007890			,
Ametek Pne	umatic Dead We	eight Tester	Model PK I	l	85348			
ADDITIONAL II	NFORMATION	_			Dreedure #			
Date		Reason Fo			Procedure # AO-I-01	-		
11-Sep-07	,	Schedule			AO-1-01			
Comments				Testers				
				P.Anton				



SouthWest Wellfield -- Alexander Orr Water Treatment Plant

CALIBRATION CERTIFICATE

li Ji S T T	nput Low nput High Input Units Square Root Tolerance 0.5 % of rea full scale <u>Expected Output</u> (MGD) 0.00 4.00 8.00 12.00	As Found Output (MGD) 0.00		Output Low Output High Output Units 5 % of Reading 5 % of Full Scale	0 16 MGD
fr Results <u>As Found Input (mA)</u> 4.000 8.000 12.000 16.000 20.000	iuli scale <u>Expected Output</u> (MGD) 0.00 4.00 8.00	As Found Output (MGD) 0.00	0.0005 <u>Total</u> <u>Calculated</u>	0 % of Full Scale	
<u>As Found Input (mA)</u> 4.000 8.000 12.000 16.000 20.000	(MGD) 0.00 4.00 8.00	Output (MGD) 0.00	Calculated	D	
4.000 8.000 12.000 16.000 20.000	(MGD) 0.00 4.00 8.00	Output (MGD) 0.00	Calculated	Desa (D. 1)	
8.000 12.000 16.000 20.000	4.00 8.00			<u>Pass / Fail</u>	
8.000 12.000 16.000 20.000	8.00		0.0080	PASS	
12.000 16.000 20.000	8.00	4.00	0.0280	PASS	
16.000 20.000	12.00	7.99	0.0480	PASS	
20.000		11.99	0.0680	PASS	
<u>As Left Input (mA)</u>	16.00	15.98	0.0880	PASS	
		As Left Output	<u>Total</u> Calculated	<u>Pass / Fail</u>	
4.000	<u>(MGD)</u> 0.00	(MGD) 0.00	<u>Error ±</u> 0.0080	PASS	
8.000	4.00	4.00	0.0080	PASS	
12.000	8.00	4.00 8.00	0.0480	PASS	
16.000	12.00	11.99	0.0680	PASS	
20.000	16.00	15.98	0.0880	PASS	
Test Equipment Use Manufacturers	ed	· · · · · · · · · · · · · · · · · · ·	<u> </u>	Serial Numbers	
Fluke 744 DPC				8495027	-
Emerson Hart Field (Communicator Mo	del 375		11007890	
ADDITIONAL INFORMAT	TION	Reason For Wo	ork	Procedure #	
11-Sep-07		Schedule		AO-I-01-10	
Comments		_	Testers		
		I	P.Anton		

WATER REPORT

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West Wellfield BA Wells Transmitters & Recorders

FOR

Sep-07

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Tolerance inch Dampening 0.050 $+/$ Dampening 0.00 Second On-Line Communicator As Found Input (in H ₂ O) Tolerance Inderance Pv + Tolerance Tolerance Pv - AC 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.8 67.00 67.050 66.950 20.0 On-Line Communicator $\underline{M_2O}$ \pm $=$ \underline{AC} 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2	Tolerance Expected Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS 012 3.988 4.000 4.000 0.000 PASS 090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS erance Tolerance Expected Output (Ma) Error Pass/Fa .012 3.988 4.000 4.000 0.000 PASS .012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
input Low 0.00 Input High 66.70 Input Units in of H2O Tolerance mA 0.012 +/ Tolerance inch 0.050 +/ Dampening 0.00 Second On-Line Communicator Tolerance Pv + Tolerance Pv - AC 0.00 0.050 -0.050 4.0 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.8 67.00 67.050 66.950 20.0 Datt Input (in Tolerance Pv Tolerance Pv Toler H_2O) ± z AC 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.3 67.00 67.050 <t< th=""><th>Output Low 4.000 Output High 20.000 Output Units mA F/- Square Root Yes F/- AO- Output (ma) Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS 090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .012 3.988 4.000 4.000 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS</th></t<>	Output Low 4.000 Output High 20.000 Output Units mA F/- Square Root Yes F/- AO- Output (ma) Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS 090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .012 3.988 4.000 4.000 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS
Input High 66.70 Input Units in of H2O Tolerance mA 0.012 +/ Tolerance inch 0.050 +/ Dampening 0.00 Second On-Line Communicator Tolerance Pv + Tolerance Pv - AC 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.8 67.00 67.050 66.950 20.0 Date Tolerance Pv Tolerance Pv Mapping 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 0.0 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.3 67.00 67.050 66.9	Output High Output Units 20.000 MA Output Units mA Square Root Yes /- Square Root Yes /- AO- Output (ma) Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .012 3.988 4.000 4.000 0.000 PASS .048 20.024 20.036 20.037 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS
Input Units in of H2O Tolerance mA 0.012 +/ Tolerance inch 0.050 +/ Dampening 0.00 Second On-Line Communicator Tolerance Pv + As Found Input Tolerance Pv + (in H ₂ O) Tolerance Pv + 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.8 67.00 67.050 66.950 20.0 Danulicator Tolerance Pv Tolerance Pv Macol 17.050 16.950 12.0 33.00 33.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.1 50.00 50.050 49.950 17.3 67.00 67.050 66.950 20.0 <t< th=""><th>Output Units mA Square Root Yes /- Square Root Yes /- AO- Output (ma) Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS 090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .266 15.242 15.254</th></t<>	Output Units mA Square Root Yes /- Square Root Yes /- AO- Output (ma) Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS 090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .266 15.242 15.254
Tolerance mA 0.012 $+/$ Tolerance inch 0.050 $+/$ Dampening 0.00 Second Dn-Line Communicator Tolerance Pv + Tolerance Pv - AC $(in H_2O)$ Tolerance Pv + Tolerance Pv - AC 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.8 67.00 67.050 66.950 20.0 Dampening 1 2 A 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 H_2O \pm z A 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00	t/- Square Root Yes t/- Square Root Yes t/- AO- Output (ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS 090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .012 3.988 4.000 4.000 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS </th
Tolerance inch 0.050 $+/$ Dampening 0.00 Second On-Line Communicator Tolerance Pv + Tolerance Pv - AC As Found Input (in H ₂ O) Tolerance Pv + Tolerance Pv - AC 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.8 67.00 67.050 66.950 20.0 On-Line Communicator Tolerance Pv Tolerance Pv H_2O \pm z AC 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.3 50.00 50.050 49.950 17.3 67.00 67.050 66.950	trance Tolerance Expected Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS 090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .266 15.242 15.254 15.255 0.001 PAS
Dampening 0.00 Second Dn-Line Communicator Tolerance Pv + Tolerance Pv - AC As Found Input (in H ₂ O) Tolerance Pv + Tolerance Pv - AC 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.8 67.00 67.050 66.950 20.0 Dn-Line Communicator Tolerance Pv Tolerance Pv As Left Input (in Tolerance Pv Tolerance Pv Tolerance 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.3 67.00 67.050 66.950 20.0 17.3 67.00 67.050 66.950 20.0 17.3 67.00 67.050 66.950 <t< th=""><th>Index Tolerance Expected Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS 012 3.988 4.000 4.000 0.000 PASS 0.90 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .012 3.988 4.000 4.000 0.000 PASS .012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS</th></t<>	Index Tolerance Expected Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS 012 3.988 4.000 4.000 0.000 PASS 0.90 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS .012 3.988 4.000 4.000 0.000 PASS .012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
As Found Input Tolerance Pv + Tolerance Pv - AC 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.8 67.00 67.050 66.950 20.0 Dn-Line Communicator As Left Input (in Tolerance Pv Tolerance Pv Tolerance Pv H ₂ O) ± ± AC 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.3 67.00 67.050 66.950 20.0 Test Equipment Used Manufacturers 17.0 17.050 Fluke 744 DPC Emerson Hart Field Communicator Model 375 37.5	O+ AO- Output (ma) Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS orance Tolerance Expected Output (ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
As Found Input Tolerance Pv + Tolerance Pv - AC 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.8 67.00 67.050 66.950 20.0 Dn-Line Communicator As Left Input (in Tolerance Pv Tolerance Pv Tolerance Pv H_2O) ± ± AC 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.1 50.00 50.050 49.950 17.3 67.00 67.050 66.950 20.0 33.00 33.050 32.950 15.1 50.00 50.050 49.950 17.3 67.00 67.050 66.950 20.0 Test Equipment Used Manufacturers Fluke 744 DPC	O+ AO- Output (ma) Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS orance Tolerance Expected Output (ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.8 67.00 67.050 66.950 20.0 Dn-Line Communicator	O+ AO- Output (ma) Output (ma) Output (ma) 012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS erance Tolerance Expected Output (ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.8 67.00 67.050 66.950 20.0 On-Line Communicator As Left Input (in Tolerance Pv Toler	.090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS erance Tolerance Expected Output (ma) Output (Ma) Error Pass/Fa .012 3.988 4.000 4.000 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.8 67.00 67.050 66.950 20.0 On-Line Communicator As Left Input (in Tolerance Pv Toleran	266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS erance Tolerance Expected Output (ma) Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
50.00 50.050 49.950 17.8 67.00 67.050 66.950 20.0 On-Line Communicator As Left Input (in Tolerance Pv Toleran	.865 17.841 17.853 17.854 0.001 PASS .048 20.024 20.036 20.037 0.001 PASS erance Tolerance Expected Output (ma) Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.001 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
67.00 67.050 66.950 20.0 On-Line Communicator As Left Input (in Tolerance Pv Toler	.048 20.024 20.036 20.037 0.001 PASS erance Tolerance Expected Output (ma) Output (Ma) Error Pass/Fa 012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
Dn-Line Communicator As Left Input (in Tolerance Pv Tolerance P	trance Tolerance Expected Dutput (ma) Output (Ma) Error Pass/ Fa 012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
As Left Input (in Tolerance Pv Tolerance Tolerance <tht th="" tolerance<=""> Tolerance</tht>	AO- Output (ma) Output (Ma) Error Pass/Fr 012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
H ₂ O) ± : AC 0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.2 50.00 50.050 49.950 17.4 67.00 67.050 66.950 20.0 Test Equipment Used Manufacturers Fluke 744 DPC Emerson Hart Field Communicator Model 375	AO- Output (ma) Output (Ma) Error Pass/Fr 012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
0.00 0.050 -0.050 4.0 17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.1 50.00 50.050 49.950 17.0 67.00 67.050 66.950 20.0 Test Equipment Used Manufacturers Fluke 744 DPC Emerson Hart Field Communicator Model 375	Output (ma) Output (ma) Output (ma) 012 3.988 4.000 4.000 0.000 PASS .090 12.066 12.078 12.079 0.001 PASS .266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
17.00 17.050 16.950 12.0 33.00 33.050 32.950 15.3 50.00 50.050 49.950 17.0 67.00 67.050 66.950 20.0 Test Equipment Used Manufacturers Fluke 744 DPC Emerson Hart Field Communicator Model 375	.09012.06612.07812.0790.001PASS.26615.24215.25415.2550.001PASS.86517.84117.85317.8540.001PASS
33.00 33.050 32.950 15.1 50.00 50.050 49.950 17.3 67.00 67.050 66.950 20.0 Test Equipment Used Manufacturers Fluke 744 DPC Emerson Hart Field Communicator Model 375	.266 15.242 15.254 15.255 0.001 PASS .865 17.841 17.853 17.854 0.001 PASS
50.00 50.050 49.950 17.3 67.00 67.050 66.950 20.0 Test Equipment Used Manufacturers Fluke 744 DPC Emerson Hart Field Communicator Model 375	.865 17.841 17.853 17.854 0.001 PASS
67.00 67.050 66.950 20.0 Test Equipment Used Manufacturers Fluke 744 DPC Emerson Hart Field Communicator Model 375	
Test Equipment Used Manufacturers Fluke 744 DPC Emerson Hart Field Communicator Model 375	
Manufacturers Fluke 744 DPC Emerson Hart Field Communicator Model 375	
Manufacturers Fluke 744 DPC Emerson Hart Field Communicator Model 375	
Fluke 744 DPC Emerson Hart Field Communicator Model 375	Serial Numbers
Emerson Hart Field Communicator Model 375	8495027
	11007890
ADDITIONAL INFORMATION	
Date Reason For Work	
12-Sep-07 Schedule	AO-I-01
Comments	Testers
	Testers P.Anton



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	MARAL DA MALANA	A				4444500		
Tag ID	WW-BA-Well3	0			Serial Number	1441538		
- /	24" Venturi				Rosemount	3051	HART	
Setup	Flow Transmitter				Accuracy	0.075% of Span		
	Input Low	0.00			Output Low	4.000		
	Input High	66.70			Output High	20.000		
	Input Units	in of H2O			Output Units	mA		
	Tolerance mA	0.012	+/-		Square Root	Yes		
	Tolerance inch	0.050	+/-					
	Dampening	0.00	Seconds					
On-Line Comr	nunicator							
As Found Input (in H ₂ O)	Tolerance Pv +	<u>Tolerance</u> <u>Pv -</u>	<u>Tolerance</u> <u>AO+</u>	<u>Tolerance</u> <u>AO-</u>	Expected Output (ma)	Output (Ma)	Error	Pass/ Fail
<u>,</u>	0.050	-0.050	4.012	3.988	4.000	4.000	0.000	PASS
0.00 17.00	17.050	-0.050 16.950	4.012	12.066	12.078	4.000	0.000	PASS
33.00	33.050	32.950	15.266	15.242	15.254	15.256	0.003	PASS
			17.865	17.841	17.853	17.854	0.002	PASS
50.00	50.050	49.950			20.036	20.037	0.001	PASS
67.00	67.050	66.950	20.048	20.024	20.036	20,037	0.001	PA33
On-Line Comr	nunicator	ı						
As Left Input (in	Tolerance Pv	Tolerance	Tolerance	Tolerance	Expected Output		Error	Pass/ Fail
<u>H₂O)</u>	<u>+</u>	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	<u>Output (Ma)</u>		
0.00	0.050	-0.050	4.012	3.988	4.000	4.000	0.000	PASS
17.00	17.050	16.950	12.090	12.066	12.078	12.081	0.003	PASS
33.00	33.050	32.950	15.266	15.242	15.254	15.256	0.002	PASS
50.00	50.050	49.950	17.865	17.841	17.853	17.854	0.001	PASS
67.00	67.050	66.950	20.048	20.024	20.036	20.037	0.001	PASS
Test Equipme	nt Used	· · · · · · · · · · · · · · · · · · ·				···· "····		
Manufacturers					Serial Number	rs		
Fluke 744 DPC					8495027			
	Field Communic	ator Model	375		11007890			
	natic Dead Weig				85348			
	ORMATION							
Date		Reason Fe	or Work		Procedure #	-		
12-Sep-07	,	Schedule			AO-I-01			
•				Testers				
Comments		<u></u>		Testers		· ···		
				P.Anton				



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Setup Flow Input Input Input Input Input Input Tolera Tolera Tolera Damp On-Line Communic Tolera 0.00 Tolera 0.00 1 17.00 1 33.00 3 50.00 5 67.00 6 On-Line Communic 1 As Left Input (in H₂O) Tolera 0.00 1 33.00 3 50.00 5 67.00 6	Venturi Transmitter t Low t High t Units rance mA rance inch pening cator rance Pv + 0.050 17.050 33.050 50.050 67.050 cator	0.00 66.70 in of H2O 0.012 0.050 0.00 Tolerance Pv- -0.050 16.950 32.950 49.950 66.950 Tolerance Pv- -0.050 16.950 32.950	+/- +/- Seconds <u>Tolerance</u> <u>AO+</u> 4.012 12.090 15.266 17.865 20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090 15.266	AO- 3.988 12.066 15.242 17.841 20.024 Tolerance AO- 3.988 12.066	Serial Number Rosemount Accuracy Output Low Output High Output Units Square Root <u>Expected Output</u> (ma) 4.000 12.078 15.254 17.853 20.036 <u>Expected Output</u> (ma) 4.000 12.078	Output (Ma) 4.000 12.077 15.255 17.855 20.037	HART an Error 0.000 -0.001 0.001 0.002 0.001 Error 0.000 -0.001	Pass/ Fail PASS PASS PASS PASS PASS PASS
Setup Flow Input Input Input Input Input Input Tolera Tolera Damp Damp On-Line Communic Input (in H2O) Tolera 0.00 1 17.00 1 33.00 3 50.00 6 67.00 6 On-Line Communic Input 17.00 1 33.00 3 50.00 6 67.00 6 Manufacturers 1 Fluke 744 DPC 6 Emerson Hart Field (Input Component Use) 1 Ametek Pneumatic I 1	Transmitter t Low t High t Units rance mA rance inch pening cator rance Pv + 0.050 17.050 33.050 50.050 67.050 cator erance Pv ± 0.050 17.050 33.050 cator	0.00 66.70 in of H2O 0.012 0.050 0.00 Tolerance Pv- -0.050 16.950 32.950 49.950 66.950 Tolerance Pv- -0.050 16.950 32.950	+/- Seconds <u>Tolerance</u> <u>AO+</u> 4.012 12.090 15.266 17.865 20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090	AO- 3.988 12.066 15.242 17.841 20.024 Tolerance AO- 3.988 12.066	Accuracy Output Low Output High Output Units Square Root <u>Expected Output</u> (ma) 4.000 12.078 15.254 17.853 20.036 <u>Expected Output</u> (ma) 4.000	0.075% of Spa 4.000 20.000 mA Yes <u>Output (Ma)</u> 4.000 12.077 15.255 17.855 20.037 <u>Output (Ma)</u> 4.000	Error 0.000 -0.001 0.002 0.001 <u>Error</u> 0.000	PASS PASS PASS PASS PASS PASS
Input Input Input Input Input Input Input Tolera Damp On-Line Communic As Found Input (in H2O) Tolera 0.00 17.00 33.00 50.00 67.00 On-Line Communic As Left Input (in Toler H2O) 0.00 17.00 33.00 50.00 67.00 <td< th=""><th>t Low t High t Units rance mA rance inch pening cator rance Pv + 0.050 17.050 33.050 50.050 67.050 cator erance Pv ± 0.050 17.050 33.050</th><th>0.00 66.70 in of H2O 0.012 0.050 0.00 Tolerance Pv- -0.050 16.950 32.950 49.950 66.950 Tolerance Pv- -0.050 16.950 32.950</th><th>+/- Seconds <u>Tolerance</u> <u>AO+</u> 4.012 12.090 15.266 17.865 20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090</th><th>AO- 3.988 12.066 15.242 17.841 20.024 Tolerance AO- 3.988 12.066</th><th>Output Low Output High Output Units Square Root <u>Expected Output</u> (ma) 4.000 12.078 15.254 17.853 20.036 <u>Expected Output</u> (ma) 4.000</th><th>4.000 20.000 mA Yes 0utput (Ma) 4.000 12.077 15.255 17.855 20.037 0utput (Ma) 4.000</th><th>Error 0.000 -0.001 0.002 0.001 Error 0.000</th><th>PASS PASS PASS PASS PASS PASS</th></td<>	t Low t High t Units rance mA rance inch pening cator rance Pv + 0.050 17.050 33.050 50.050 67.050 cator erance Pv ± 0.050 17.050 33.050	0.00 66.70 in of H2O 0.012 0.050 0.00 Tolerance Pv- -0.050 16.950 32.950 49.950 66.950 Tolerance Pv- -0.050 16.950 32.950	+/- Seconds <u>Tolerance</u> <u>AO+</u> 4.012 12.090 15.266 17.865 20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090	AO- 3.988 12.066 15.242 17.841 20.024 Tolerance AO- 3.988 12.066	Output Low Output High Output Units Square Root <u>Expected Output</u> (ma) 4.000 12.078 15.254 17.853 20.036 <u>Expected Output</u> (ma) 4.000	4.000 20.000 mA Yes 0utput (Ma) 4.000 12.077 15.255 17.855 20.037 0utput (Ma) 4.000	Error 0.000 -0.001 0.002 0.001 Error 0.000	PASS PASS PASS PASS PASS PASS
Input Input Input Tolera Damp On-Line Communic As Found Input (in H ₂ O) Tolera 0.00 17.00 17.00 33.00 50.00 67.00 On-Line Communic As Left Input (in Tolera 17.00 17.00 33.00 50.00 67.00 Con-Line Communic Mas Left Input (in Tolera 17.00 33.00 50.00 67.00 67.00 67.00 67.00	t High t Units rance mA rance inch pening cator rance Pv + 0.050 17.050 33.050 50.050 67.050 cator erance Pv ± 0.050 17.050 33.050	66.70 in of H2O 0.012 0.050 0.00 Tolerance Pv- -0.050 16.950 32.950 49.950 66.950 Tolerance Pv- -0.050 16.950 32.950	+/- Seconds <u>Tolerance</u> <u>AO+</u> 4.012 12.090 15.266 17.865 20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090	AO- 3.988 12.066 15.242 17.841 20.024 Tolerance AO- 3.988 12.066	Output High Output Units Square Root <u>Expected Output</u> (ma) 4.000 12.078 15.254 17.853 20.036 <u>Expected Output</u> (ma) 4.000	20.000 mA Yes 0utput (Ma) 4.000 12.077 15.255 17.855 20.037 0utput (Ma) 4.000	0.000 -0.001 0.002 0.001 <u>Error</u> 0.000	PASS PASS PASS PASS PASS PASS
Input Tolera Tolera Damp On-Line Communic As Found Input (in H ₂ O) Tolera 0.00 1 17.00 1 33.00 3 50.00 5 67.00 6 On-Line Communic Tolera 0.00 1 17.00 1 33.00 5 67.00 6 Double Tolera 0.00 5 17.00 1 33.00 5 50.00 5 67.00 6 70.00 5 17.00 1 33.00 5 50.00 5 67.00 6 Test Equipment Us Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic D	t Units rance mA rance inch pening cator rance Pv + 0.050 17.050 33.050 50.050 67.050 cator <u>±</u> 0.050 17.050 33.050	in of H2O 0.012 0.050 0.00 Tolerance Pv- -0.050 16.950 32.950 49.950 66.950 Tolerance Pv- -0.050 16.950 32.950	+/- Seconds <u>Tolerance</u> <u>AO+</u> 4.012 12.090 15.266 17.865 20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090	AO- 3.988 12.066 15.242 17.841 20.024 Tolerance AO- 3.988 12.066	Output Units Square Root Expected Output (ma) 4.000 12.078 15.254 17.853 20.036 Expected Output (ma) 4.000	mA Yes Output (Ma) 4.000 12.077 15.255 17.855 20.037 Output (Ma) 4.000	0.000 -0.001 0.002 0.001 <u>Error</u> 0.000	PASS PASS PASS PASS PASS PASS
Tolera Tolera Damp On-Line Communic As Found Input. (in H_Q) Tolera 0.00 1 17.00 1 33.00 3 50.00 5 67.00 6 On-Line Communic Tolera As Left Input (in Tolera Tolera H_Q) 0.00 17.00 1 33.00 3 50.00 6 H_Q) 0.00 17.00 1 33.00 3 50.00 6 67.00 6 Test Equipment Us Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic D	rance mA rance inch pening cator rance Pv + 0.050 17.050 33.050 50.050 67.050 cator erance Pv ± 0.050 17.050 33.050	0.012 0.050 0.00 Tolerance Pv- -0.050 16.950 32.950 49.950 66.950 Tolerance Pv- -0.050 16.950 32.950	+/- Seconds <u>Tolerance</u> <u>AO+</u> 4.012 12.090 15.266 17.865 20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090	AO- 3.988 12.066 15.242 17.841 20.024 Tolerance AO- 3.988 12.066	Square Root <u>Expected Output</u> (ma) 4.000 12.078 15.254 17.853 20.036 <u>Expected Output</u> (ma) 4.000	Yes <u>Output (Ma)</u> 4.000 12.077 15.255 17.855 20.037 <u>Output (Ma)</u> 4.000	0.000 -0.001 0.002 0.001 <u>Error</u> 0.000	PASS PASS PASS PASS PASS PASS
Tolera Damp On-Line Communic As Found Input (in H ₂ O) Tolera 0.00 1 17.00 1 33.00 3 50.00 5 67.00 6 On-Line Communic Tolera Manufacturers 1 50.00 5 67.00 6 Domestication 1 As Left Input (in Tolera 1 H_Q) 0.00 1 0.00 1 1 33.00 5 6 50.00 6 6 67.00 6 6 Test Equipment Us 6 6 Manufacturers Fluke 744 DPC 6 Emerson Hart Field (C 6 6	rance inch pening cator rance Pv + 0.050 17.050 33.050 50.050 67.050 cator erance Pv ± 0.050 17.050 33.050	0.050 0.00 Tolerance Pv- -0.050 16.950 32.950 49.950 66.950 Tolerance Pv- -0.050 16.950 32.950	+/- Seconds <u>Tolerance</u> <u>AO+</u> 4.012 12.090 15.266 17.865 20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090	AO- 3.988 12.066 15.242 17.841 20.024 Tolerance AO- 3.988 12.066	<u>Expected Output</u> (ma) 4.000 12.078 15.254 17.853 20.036 <u>Expected Output</u> (ma) 4.000	<u>Output (Ma)</u> 4.000 12.077 15.255 17.855 20.037 <u>Output (Ma)</u> 4.000	0.000 -0.001 0.002 0.001 <u>Error</u> 0.000	PASS PASS PASS PASS PASS PASS
Damp As Found Input (in H ₂ O) Toler 0.00 1 17.00 1 33.00 3 50.00 5 67.00 6 On-Line Communic Toler Manufacturers 1 67.00 6 Damp Toler 0.00 1 33.00 5 67.00 6 Manufacturers 6 Fluke 744 DPC 1 Emerson Hart Field (1 Ametek Pneumatic D 1	pening cator rance Pv + 0.050 17.050 33.050 50.050 67.050 cator erance Pv 0.050 17.050 33.050	0.00 Tolerance Pv- -0.050 16.950 32.950 49.950 66.950 50 Tolerance Pv- -0.050 16.950 32.950	Seconds <u>Tolerance</u> <u>AO+</u> 4.012 12.090 15.266 17.865 20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090	AO- 3.988 12.066 15.242 17.841 20.024 Tolerance AO- 3.988 12.066	(<u>ma)</u> 4.000 12.078 15.254 17.853 20.036 <u>Expected Output</u> (<u>ma)</u> 4.000	Output (Ma) 4.000 12.077 15.255 17.855 20.037 Output (Ma) 4.000	0.000 -0.001 0.002 0.001 <u>Error</u> 0.000	PASS PASS PASS PASS PASS PASS
As Found Input (in H ₂ O) Tolera 0.00 1 17.00 1 33.00 3 50.00 5 67.00 6 On-Line Communic 1 As Left Input (in H ₂ O) 1 0.00 1 17.00 1 33.00 3 50.00 6 Manufacturers 6 Fluke 744 DPC 1 Emerson Hart Field (Ametek Pneumatic D 1	cator rance Pv + 0.050 17.050 33.050 50.050 67.050 cator erance Pv 17.050 33.050	Tolerance Pv- -0.050 16.950 32.950 49.950 66.950 Tolerance Pv- -0.050 16.950 32.950	Tolerance AO+ 4.012 12.090 15.266 17.865 20.048 Tolerance AO+ 4.012	AO- 3.988 12.066 15.242 17.841 20.024 Tolerance AO- 3.988 12.066	(<u>ma)</u> 4.000 12.078 15.254 17.853 20.036 <u>Expected Output</u> (<u>ma)</u> 4.000	Output (Ma) 4.000 12.077 15.255 17.855 20.037 Output (Ma) 4.000	0.000 -0.001 0.002 0.001 <u>Error</u> 0.000	PASS PASS PASS PASS PASS PASS
As Found Input (in H ₂ O) Toler 0.00 1 17.00 1 33.00 3 50.00 5 67.00 6 On-Line Communic 1 As Left Input (in Toler 1 H ₂ O) 0.00 17.00 1 33.00 3 50.00 6 67.00 6 Test Equipment Us 6 Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic D 1	rance Pv + 0.050 17.050 33.050 50.050 67.050 cator erance Pv ± 0.050 17.050 33.050	Pv- -0.050 16.950 32.950 49.950 66.950 66.950 <u>Tolerance</u> Pv- -0.050 16.950 32.950	AO+ 4.012 12.090 15.266 17.865 20.048 Tolerance AO+ 4.012 12.090	AO- 3.988 12.066 15.242 17.841 20.024 Tolerance AO- 3.988 12.066	(<u>ma)</u> 4.000 12.078 15.254 17.853 20.036 <u>Expected Output</u> (<u>ma)</u> 4.000	Output (Ma) 4.000 12.077 15.255 17.855 20.037 Output (Ma) 4.000	0.000 -0.001 0.002 0.001 <u>Error</u> 0.000	PASS PASS PASS PASS PASS PASS
(in H₂O) Tolera 0.00 1 17.00 1 33.00 3 50.00 5 67.00 6 Dn-Line Communic 1 As Left Input (in Tolera 1 H₂O) 0.00 17.00 1 33.00 3 50.00 6 67.00 6 Test Equipment Us 6 Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic D	0.050 17.050 33.050 50.050 67.050 cator <u>±</u> 0.050 17.050 33.050	Pv- -0.050 16.950 32.950 49.950 66.950 66.950 <u>Tolerance</u> Pv- -0.050 16.950 32.950	AO+ 4.012 12.090 15.266 17.865 20.048 Tolerance AO+ 4.012 12.090	AO- 3.988 12.066 15.242 17.841 20.024 Tolerance AO- 3.988 12.066	(<u>ma)</u> 4.000 12.078 15.254 17.853 20.036 <u>Expected Output</u> (<u>ma)</u> 4.000	Output (Ma) 4.000 12.077 15.255 17.855 20.037 Output (Ma) 4.000	0.000 -0.001 0.002 0.001 <u>Error</u> 0.000	PASS PASS PASS PASS PASS PASS
0.00 17.00 1 33.00 3 50.00 5 67.00 6 Dn-Line Communic As Left Input (in Tolen H₂O) 0.00 17.00 1 33.00 3 50.00 6 67.00 6 Test Equipment Us 6 Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic D	0.050 17.050 33.050 50.050 67.050 cator <u>±</u> 0.050 17.050 33.050	-0.050 16.950 32.950 49.950 66.950 Tolerance <u>Pv-</u> -0.050 16.950 32.950	4.012 12.090 15.266 17.865 20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090	3.988 12.066 15.242 17.841 20.024 <u>Tolerance</u> <u>AO-</u> 3.988 12.066	4.000 12.078 15.254 17.853 20.036 <u>Expected Output</u> (ma) 4.000	4.000 12.077 15.255 17.855 20.037 <u>Output (Ma)</u> 4.000	-0.001 0.001 0.002 0.001 <u>Error</u> 0.000	PASS PASS PASS PASS <u>Pass/ Fai</u> PASS
17.00 1 33.00 3 50.00 5 67.00 6 On-Line Communic 1 As Left Input (in Tole) 1 H_Q) 0.00 17.00 1 33.00 3 50.00 6 67.00 6 Test Equipment Us 6 Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic D 1	17.050 33.050 50.050 67.050 cator <u>t</u> 0.050 17.050 33.050	16.950 32.950 49.950 66.950 Tolerance <u>Pv -</u> -0.050 16.950 32.950	12.090 15.266 17.865 20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090	12.066 15.242 17.841 20.024 <u>Tolerance</u> <u>AO-</u> 3.988 12.066	12.078 15.254 17.853 20.036 <u>Expected Output</u> (ma) 4.000	12.077 15.255 17.855 20.037 <u>Output (Ma)</u> 4.000	-0.001 0.001 0.002 0.001 <u>Error</u> 0.000	PASS PASS PASS PASS <u>Pass/ Fail</u>
33.00 3 50.00 5 67.00 6 Dn-Line Communic 10 As Left Input (in Toles) 10 H_Q) 0.00 17.00 1 33.00 3 50.00 6 67.00 6 Fluke 744 DPC 10 Emerson Hart Field (Ametek Pneumatic D	33.050 50.050 67.050 cator <u>±</u> 0.050 17.050 33.050	32.950 49.950 66.950 Tolerance <u>Pv-</u> -0.050 16.950 32.950	15.266 17.865 20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090	15.242 17.841 20.024 <u>Tolerance</u> <u>AO-</u> 3.988 12.066	15.254 17.853 20.036 <u>Expected Output</u> <u>(ma)</u> 4.000	15.255 17.855 20.037 <u>Output (Ma)</u> 4.000	0.001 0.002 0.001 <u>Error</u> 0.000	PASS PASS PASS <u>Pass/ Fai</u> PASS
50.00 5 67.00 6 On-Line Communic As Left Input (in Toles H₂O) 0.00 17.00 1 33.00 5 50.00 6 67.00 6 Flucke 744 DPC Emerson Manufacturers Fluke Fluke 744 DPC Emerson Ametek Pneumatic	50.050 67.050 cator <u>tator</u> <u>t</u> 0.050 17.050 33.050	49.950 66.950 Tolerance Pv - -0.050 16.950 32.950	17.865 20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090	17.841 20.024 <u>Tolerance</u> <u>AO-</u> 3.988 12.066	17.853 20.036 <u>Expected Output</u> (<u>ma)</u> 4.000	17.855 20.037 <u>Output (Ma)</u> 4.000	0.002 0.001 <u>Error</u> 0.000	PASS PASS <u>Pass/ Fai</u> PASS
67.00 6 On-Line Communic <u>As Left Input (in</u> Toler <u>H₂O</u>) 0.00 17.00 7 33.00 5 50.00 5 67.00 6 Test Equipment Us Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic E	67.050 cator <u>+</u> 0.050 17.050 33.050	66.950 Tolerance <u>Pv-</u> -0.050 16.950 32.950	20.048 <u>Tolerance</u> <u>AO+</u> 4.012 12.090	20.024 <u>Tolerance</u> <u>AO-</u> 3.988 12.066	20.036 <u>Expected Output</u> (ma) 4.000	20.037 <u>Output (Ma)</u> 4.000	0.001 <u>Error</u> 0.000	PASS <u>Pass/ Fail</u> PASS
On-Line Communic As Left Input (in H ₂ Q) Tole 0.00 17.00 17.00 1 33.00 3 50.00 5 67.00 6 Test Equipment Us Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic D	cator <u>+</u> 0.050 17.050 33.050	Tolerance <u>Pv -</u> -0.050 16.950 32.950	<u>Tolerance</u> <u>AO+</u> 4.012 12.090	<u>Tolerance</u> <u>AO-</u> 3.988 12.066	<u>Expected Output</u> (ma) 4.000	<u>Output (Ma)</u> 4.000	<u>Error</u> 0.000	<u>Pass/ Fai</u> PASS
As Left Input (in Toler H₂O) 0.00 17.00 33.00 50.00 67.00 Test Equipment Us Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic E	erance Pv <u>+</u> 0.050 17.050 33.050	<u>Pv -</u> -0.050 16.950 32.950	<u>AO+</u> 4.012 12.090	<u>AO-</u> 3.988 12.066	<u>(ma)</u> 4.000	<u>Output (Ma)</u> 4.000	0.000	PASS
H₂O) 0.00 17.00 1 33.00 3 50.00 6 67.00 6 Fluke 740 DPC Emerson Hart Field (Ametek Pneumatic D	± 0.050 17.050 33.050	<u>Pv -</u> -0.050 16.950 32.950	<u>AO+</u> 4.012 12.090	<u>AO-</u> 3.988 12.066	<u>(ma)</u> 4.000	<u>Output (Ma)</u> 4.000	0.000	PASS
0.00 17.00 33.00 50.00 67.00 Fest Equipment Us Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic E	0.050 17.050 33.050	-0.050 16.950 32.950	4.012 12.090	3.988 12.066	4.000	4.000		
17.00 1 33.00 3 50.00 5 67.00 6 Fest Equipment Us Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic E	17.050 33.050	16.950 32.950	12.090	12.066		이 가장은 다른 것이 같은 것을 알았다.		
33.00 3 50.00 5 67.00 6 Fest Equipment Us Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic E	33.050	32.950			12.078	12 077	-0.001	
50.00 5 67.00 6 Test Equipment Us Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic E			15 266					PASS
67.00 6 Test Equipment Us Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic E	50.050	· 40 0E0		15.242	15.254	15.255	0.001	PASS
Test Equipment Us Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic D		49.950	17.865	17.841	17.853	17.855	0.002	PASS
Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic E	67.050	66.950	20.048	20.024	20.036	20.037	0.001	PASS
Manufacturers Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic E								
Fluke 744 DPC Emerson Hart Field (Ametek Pneumatic E	sea				Serial Numbe	rs		
Emerson Hart Field (Ametek Pneumatic I					8495027			
Ametek Pneumatic I	Communic	cator Model	375		11007890			
					85348			
	TION							·····
Date		Reason F			Procedure #	-		r
12-Sep-07		Schedule			AO-I-01			
Comments				Testers				
			-	P.Anton		<u></u>		

West Wellfield -- Alexander Orr Water Treatment Plant

CALIBRATION SHEET

<u>As of October, 2003:</u> All recorders have been removed; S.C.A.D.A. system will be powering the transmitters and recording the flow data.

WATER REPORT

West Wellfield ASR Wells #1 & #3

FOR

Sep-07



PO Box 1648, Lakeland, FL 33802 5101 Great Oak Drive, Lakeland, FL 33815 -800-881-1487 • 863-682-4500 • Fax 863-687-0077 csr@amjequipment.com

Flow Meter Verification Report

Report no 20080

Customer		Site ASR # 1	and the second statement of the se	
Miami-Dade Water &	& Sewer Department	Location Sunset & Krome	ni 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Alexander-Orr Store	es	Installation information		
6800 SW 87th Aven				
Miami		Wires in separate conduit	Yes	
	33173	Splice in wire runs	No	
Primar	y device	Proper splices	NA	
Manufacturer	Isco	Direction of flow correct	Yes	
Model no	UM14F1A1R	Non-full pipe condition	Yes	
Serial no	F03E1528	Cathodic protection	No	
Trans	mitter	Sensors orientated properly	Yes	
Manufacturer		Junction box wiring correct	Yes	
Model no	DSM110 - 4411e	Moisture around wiring	Yes	
Serial no	C05C1445	Grounding rings		
Measuring range	0 - 7.1999 MGD			
Meter factor	.2164	Straight diameters upstream	10	
C Factor		Cable length	15'	
Scale multiplier		Distance to nearest pump	20'	
Totalizer start .99	999 Totalizer stop .31 Mg	Distance to nearest valve	15'	

Resistance Measurements

Coil + -	6.0 Ohm Ref + -	Elec + -	20.4k	Shields C+R	ې د دې وړه ور و کو د ورونو و ورونو د ورونو د ورونو د	Line gnd / Coil Shd	0.6 Ohm
Coil + Shd	21.04M Ref + Shd	Elec + Sho	d <u>69.7k</u>	Shields C+E	0.7 Ohm	Line gnd / Elec Shd	0.7 Ohm
Coil - Shd	21.37M Ref - Shd	Elec - Shd	76.3k	Shields R+E	sharing and benefitiging made an administra	Line gnd / Ref Shd	

Voltage	Measurements
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Coil voltage	90Vac	Ref voltage		Elec + to Sh ac volts	0.8mV	Elec + to Sh dc volts	.052V
	40	Ref Hz		Elec - to Shd ac volts	0.22mV	Elec - to Sh dc volts	
Line voltage	120.1	Line Hz	60.	Line to Gnd	120.9	ార్	

Technician	Kris Harrelson	Arrival date 6/	6/2007 Completion	date <u>6/6/2007</u>	Total time	Barry a construction of the second office and and a second office and a second office.
Warranty se	ervice No	Follow up servi	ce required	No	Media	unan terah manan manan manan terahara kan terahar kan terahar sa terahar sa terahar sa terahar sa terahar sa t Sa
Remarks	The measured	l parameters are v	vithin manufacturers	published speci	fications.	
Customer s	ignature	· · ·				



5.80

PO Box 1648, Lakeiand, FL 33802 5101 Great Oak Drive, Lakeland, FL 33815 3-800-881-1487 • 863-682-4500 • Fax 863-687-0077 csr@amjequipment.com

Flow Meter Verification Report

Report no 20081

Customer		Site	ASR # 2		
Miami-Dade Water &	& Sewer Department	Location	Sunset & Krome	1	
Alexander-Orr Store	95	Installation	n information		
6800 SW 87th Aven		Wires in se	enarate conduit	Yes	
Miami			Wires in separate conduit		
FL	33173	Splice in w	vire runs	No	
Primar	/ device	Proper spl	ices	NA	
Manufacturer		Direction of	of flow correct	Yes	
Model no	UM14F1A1S	to American Street Stre	Non-full pipe condition		
Serial no	F02K0986	Cathodic p	Cathodic protection		
Trans	mitter	Sensors o	Sensors orientated properly		
Manufacturer	Aftco		Junction box wiring correct		
Model no	DSM110 - 4411e		-	Yes	
Serial no	C05C1442	Moisture a	round wiring	Yes	
Measuring range	0 - 7.1999 MGD	Grounding	rings	No	
Meter factor	.2155	Straight di	Straight diameters upstream		
C Factor	al fabriciona e la contente de atomana e la contente a sul Recontenti al Recontenti al Casta de casto de la co Al contente de la cont	Cable leng	th	15'	
Scale multiplier	annis Sakat a maist a tha ann a' ra fair a stadada dha a' na tar an fair a dha fair fan sa an a' an an a' an a An a' an ann ann an ann a' ann a' ann a' an ann an	Distance to	o nearest pump	20'	
Totalizer start 34.	5Mg Totalizer stop 34.71	Mg Distance to	o nearest valve	15'	

Resistance Measurements

Coil + -	6.0 Ohm	Ref + -	Elec + -	27.53k	Shields C+R		Line gnd / Coil Shd	0.3 Ohm
Coil + Shd	25.62M	Ref + Shd	Elec + Shd	11.19k	Shields C+E	1.0 Ohm	Line gnd / Elec Shd	0.3 Ohm
Coil - Shd	25.62M	Ref - Shd	Elec - Shd	16.15k	Shields R+E	energy of a set for a subscription of	Line gnd / Ref Shd	Port Phase - Autoback and the apple

Voltage Measurements

Coil voltage	91Vac	Ref voltage	THE CONTRACTOR CONTRACTOR	Elec + to Sh ac volts	8.3mV	Elec + to Sh dc volts	.077V
Coil Hz	39.98	Ref Hz		Elec - to Shd ac volts	A second state of the second sec	Elec - to Sh dc volts	.083V
Line voltage	121.72	Line Hz	60	Line to Gnd	120.97		

Technician	Kris Harrelson	Arrival date	6/6/2007 Completion	n date 6/6/2007	Total time	even lie neb unterstellaka mantaka kanatakan turun dipakateka perjenu magangan perjenu
Warranty serv	vice No	Follow up se	rvice required	No	Media	$\label{eq:states} m_{2}(r) < r > p_{1}(r) p_{2}(r) p_{2}(r) p_{3}(r) p_{3$
Remarks	The measured	parameters ar	e within manufacturers	published speci	fications.	
Customer sig	nature					jų s _i su



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> PO Box 1648, Lakeland, FL 33802 5101 Great Oak Drive, Lakeland, FL 33815 -800-881-1487 • 863-682-4500 • Fax 863-687-0077 csr@amjequipment.com 10

Flow Meter Verification Report

Report no 20082

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Customer		Site	ASR # 3	ar new language and an unit of a long and the state	
Miami-Dade Water 8	Sewer Department	Location	Sunset & Krome	- WHERE TRANSPORTED AND AND A TRANSPORTED AND AND A TRANSPORTED AND AND A TRANSPORTED AND A TRANSPORT	
Alexander-Orr Store) S 1977 - San Landon et al la composition de la composition de la composition de la composition de la composition	Installatio	Installation information		
6800 SW 87th Avenu	le	instandut	minionadon		
Miami	n de la construcción de la companya de la construcción de la construcción de la construcción de la construcción	Wires in s	separate conduit	Yes	
FL	33173	Splice in	wire runs	No	
Primary	/ device	Proper sp	olices	NA	
Manufacturer	lsco	Direction	of flow correct	Yes	
Model no	UM14FA1R-35.4	Non-full p	pipe condition	Yes	
Serial no	F03E1527	Cathodic	Cathodic protection		
Trans	mitter	Sensors	Sensors orientated properly		
Manufacturer		Junction	Junction box wiring correct		
Model no	DSM110 - 4411e		Moisture around wiring		
Serial no	C03E1527A	- 19 and 19 a		Yes	
Measuring range	0 - 7.1999 MGD	Groundin	ig rings	No	
Meter factor	.2121	Straight c	Straight diameters upstream		
		Cable len	gth	15'	
Scale multiplier	a ser a segar pella sub a si da l'effe dependente a defendar e se ser ser al ancherente a segar pella sub a se	Distance	Distance to nearest pump		
Totalizer start 37.	5Mg Totalizer	o 37.5Mg Distance	to nearest valve	15'	

Resistance Measurements

Coil + -	6.0 Ohm	Ref + -	Elec + -	26.52k	Shields C+R	Line gnd / Coil Shd	1.0 Ohm
Coil + Shd	17.5M	Ref + Shd	Elec + Shd	7.62k	Shields C+E	0.2 Ohm Line gnd / Elec Shd	0.3 Ohm
Coil - Shd	17.88M	Ref - Shd	Elec - Shd	161.1k	Shields R+E	Line gnd / Ref Shd	and a standard state of the sta
1.11.11.11.11.11.11.11.11.11.11.11.11.1	en var (gryge) og menskaret for	El academica de la materia de la caracteria de la caracteria de la caracteria.	 สามารถสารณ์สารณ์สารณ์สารณ์สารณ์สารณ์สารณ์สารณ์	ent i takken dir kan	olasion erizintensi memberika	на кала рекарали кала кала кала кала на кала кала кала к	nenan-estima daes constanta da constanti

Voltage Measurements

Coil voltage	90.7 Vac	Ref voltage		Elec + to Sh ac volts	0.8mV	Elec + to Sh dc volts	.062V
Coil Hz	40	Ref Hz		Elec - to Shd ac volts	0.8mV	Elec - to Sh dc volts	.071V
¹ Statistical and the second statistical and the second statistical statisticae statisticae statisticae statisticae statisticae stati	ora (na 1997) a tanàn dia mampi Tanàna mandritra dia mampika	ur an	nie wyska u pod się tradniczna w stała stała Bana stała	Comparison and the comparison of the second s	Systematics (seconds) without stations with a constant station of the second stations	n ann a chuireann ach ann ann an ann ann ann ann ann ann ann	k hanna a tha tha na mar a tha an
Line voltage	121.1 Vac	Line Hz	60	Line to Gnd	121.12 Vac		

Technician	Kris Harrelson	Arrival date 6/6/2007 Completion date	6/6/2007 Total time	umano amin'ny fivona mandritra dia persona dia dia dia dia dia dia dia dia dia di
Warranty se	rvice No	Follow up service required	No Media	Manageri Initian de 1990 - Legen de Manageri de Manageri de Statu de Angeli.
Remarks	The measured	parameters are within manufacturers publi	ished specifications.	
Customer si	gnature	· · · ·		

WATER REPORTS

Alex Orr In-Plant Transmitters & Recorders

FOR

Dec-07

MAM	DADE
COUNT -	

Tag	D FIT-505-RAW	1			Serial Number	1597757		
-	Raw Water #1 -	- 48" Venturi			Rosemount	3051	HART	
Setup	Flow Transmitter				Accuracy	0.075% of Spa	n	
•	Input Low	0.00			Output Low	4.000		
	Input High	282.50			Output High	20.000		
	Input Units	in of H2O			Output Units	mA		
	Tolerance mA	0.012	+/-		Square Root	Yes		
	Tolerance inch	0.212	+/-					
	Dampening	1.60	Seconds					
On-Line Co	mmunicator							
As Found Inp	<u>ut</u>		Tolerance	Tolerance	Expected Output		Error	Pass/
<u>(in H₂O)</u>	Tolerance Pv +	Tolerance Pv	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	<u>Output (Ma)</u>		<u>Fail</u>
0.00	0.212	-0.212	4.012	3.988	4.000	3.997	-0.003	PASS
71.00	71.212	70.788	12.033	12.009	12.021	12.021	0.000	PASS
141.00	141.212	140.788	15.316	15.292	15.304	15,302	-0.002	PASS
212.00	212.212	211.788	17.872	17.848	17.860	17.861	0.001	PASS
282.00	282.212	281.788	19.998	19.974	19.986	19.987	0.001	PASS
On-Line Co	mmunicator							
As Left Input (Tolerance	<u>Tolerance</u>	Tolerance	Expected Output		Error	Pass/
<u>H₂O)</u>	Tolerance Pv +		<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	<u>Output (Ma)</u>		<u>Fail</u>
0.00	0.212	-0.212	4.012	3.988	4.000	3.997	-0.003	PASS
71.00	71.212	70.788	12.033	12.009	12.021	12.021	0.000	PASS
141.00	141.212	140.788	15.316	15.292	15.304	15.302	-0.002	PASS
212.00	212.212	211.788	17.872	17.848	17.860	17.861	0.001	PASS
282.00	282.212	281.788	19.998	19.974	19.986	19.987	0.001	PASS
Test Equip	ment Used							
Manufactur	ers				Serial Number	rs		
Fluke 744 D	PC				8495027			
	art Field Commun				11007890			
Ametek Pne	eumatic Dead We	ight Tester M	odel PK II		85348			
	NFORMATION	<u> </u>						
Date		Reason For	Work		Procedure #			
1-Dec-	07	Schedule			AO-I-01			
_								
Comments		-		Testers C.Gordon/				

MAM	DADE
6.000.73	

Tag ID	FIR-505-RAW1			Serial Number	9401-28153-AO1
	Raw Water #1 48	" Venturi			
Setup	Flow Recorder				
	Input Low	4.000		Output Low	0
	Input High	20.000		Output High	100
	Input Units	mA		Output Units	MGD
	Square Root	No			
	Tolerance 0.5 % of re scale	ading + 0.05% of full		% of Reading % of Full Scale	
Results					
			Total	***	
	Expected Output	As Found Output	Calculated	<u>Pass / Fail</u>	
As Found Input (mA)	(MGD)	(<u>MGD)</u>	Error ±		
4.000	0.00	0.00	0.0500	PASS	
8.000	25.00	25.00	0.1750	PASS	
12.000	50.00	49.99	0.3000	PASS	
16.000	75.00	74.98	0.4250	PASS	
20.000	100.00	99.99 <u>4</u> 0 480	0.5500	PASS	
			<u>Total</u>		
As Left Input (mA)	Expected Output	As Loff Outsut (NCD)	Calculated	<u> Pass / Fail</u>	
4.000	<u>(MGD)</u> 0.00	As Left Output (MGD)	Error ±	DACC	
		0.00	0.0500	PASS	
8.000	25.00	25.00	0.1750	PASS	
12.000	50.00	49.99	0.3000	PASS	
16.000 20.000	75.00 100.00	74.98 99.99	0.4250 0.5500	PASS PASS	
Test Equipment U Manufacturers	sea	_		Serial Numbers	_
Fluke 744 DPC				8495027	
Emerson Hart Field	I Communicator Mo	del 375		11007890	
ADDITIONAL INFORM	ATION				
Date		Reason For Work		Procedure #	
1-Dec-07		Schedule		AO-I-01-1(0
Comments			Testers		
			C.Gordon/J.	Carvajal	



Tag	ID FIT-506-RAW	2			Serial Number	1597755		
	Raw Water #2		ri		Rosemount	3051	HART	
Setup	Flow Transmitter	•			Accuracy	0.075% of Span		
•	Input Low	0			Output Low	4.000		
	Input High	84.32			Output High	20.000		
	Input Units	in of H2O			Output Units	mA		
	Tolerance mA	0.012	+/-		Square Root	Yes		
	Tolerance inch	0.063	+/-		-			
	Dampening	1.60	Seconds					
On-Line C	ommunicator							
As Found In	put_	Tolerance	Tolerance	Tolerance	Expected Output		Error	Pass/ Fail
<u>(in H₂O)</u>	Tolerance Pv +	<u> Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)		<u>rassi rai</u>
0.00	0.063	-0.063	4.012	3.988	4.000	4.000	0.000	PASS
21.00	21.063	20.937	11.997	11.973	11.985	11.985	0.000	PASS
42.00	42.063	41.937	15.304	15.280	15.292		0.003	PASS
63.00	63.063	62.937	17.842	17.818	17.830		0.004	PASS
84.00	84.063	83.937	19.982	19.958	19.970	19.976	0.006	PASS
On-Line C	ommunicator							
As Left Input		Tolerance			Expected Output		<u>Error</u>	Pass/ Fail
<u>H₂O)</u>	Tolerance Pv +		<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)		
0.00	0.063	-0.063	4.012	3.988	4.000		0.000	PASS
21.00 42.00	21.063 42.063	20.937 41.937	11.997 15.304	11.973 15.280	11.985	이 같은 것은 것은 것은 것은 것을 가지?	0.000	PASS
42.00	63.063	41.937 62.937	17.842	15.260	15.292 17.830		0.003 0.004	PASS PASS
84.00	84.063	83.937	19.982	19.958	19.970		0.004	PASS
	oment Used				Coriol Number	-		
Manufactu Fluke 744					Serial Number 8495027	5		
	lart Field Commur	ningtor Mod	lol 275		11007890			
	eumatic Dead We			11	85348			
		agni rester		11	00040			
	INFORMATION	_						
Date		Reason F			Procedure #			
2-Dec	-07	Schedule			AO-I-01			
Comment	6			Testers				
			-		/J.Carvajal			

MIAMI-DADE

Alex Orr Water Treatment Plant

Tag ID	FIR-506-RAW2 Raw Water #2 54	" Venturi		Serial Number	9710-78075-C05
Cotum		Venturi			
Setup	Flow Recorder	4 000		.	•
	Input Low	4.000		Output Low	0
	Input High	20.000		Output High	100
	Input Units	mA		Output Units	MGD
	Square Root	No			
	Tolerance 0.5 % of reasonable scale	ading + 0.05% of full		% of Reading % of Full Scale	
Results					
	Expected Output	As Found Output	<u>Total</u> <u>Calculated</u>	Pass / Fail	
As Found Input (mA)		(MGD)	Error ±	<u>1 433 / Fall</u>	
4.000	0.00	0.00	0.0500	PASS	
8.000	25.00	25.00	0.1750	PASS	
12.000	50.00	50.00	0.3000	PASS	
16.000	75.00	75.00	0.4250	PASS	
20.000	100.00	100.00	0.5500	PASS	
20.000	100.00		0.0000	1 400	
<u>As Left Input (mA)</u>	Expected Output		<u>Total</u> <u>Calculated</u>	Bass / Esil	
AS Left input (IIIA)	(MGD)	As Left Output (MGD)	Error ±	<u>Pass / Fail</u>	
4.000	0.00	0.00	0.0500	PASS	
8.000	25.00	25.00	0.1750	PASS	
12.000	50.00	50.00	0.3000	PASS	
16.000	75.00	75.00	0.4250	PASS	
20.000	100.00	100.00	0.4250	PASS	
Test Equipment l	Jsed				
Manufacturers		_		Serial Numbers	
Fluke 744 DPC				8495027	
Emerson Hart Fiel	d Communicator M	odel 375		11007890	
	IATION				
Date		Reason For Work		Procedure #	
2-Dec-07		Schedule		AO-I-01-10)
Comments			Testers		
			C.Gordon/J.	Carvajal	



Tag II	D FIT-507-RAW	3			Serial Number	2239317		
	Raw Water #3		ri		Rosemount	3051	HART	
Setup	Flow Transmitter	,				0.075% of Span		
ootup	Input Low	0			Output Low	4.000		
	Input High	289.00			Output High	20.000		
	Input Units	in of H2O			Output Units	mA		
	Tolerance mA	0.012	+/-		Square Root	Yes		
	Tolerance inch	0.217	+/-		oquare noor	103		
	Dampening	1.60	Seconds					
	mmunicator							
As Found Inpu		Tolerance	Tolerance		Expected Output	• • • • • •	Error	Pass/ Fail
<u>(in H₂O)</u>	Tolerance Pv +	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)		
0.00	0.217	-0.217	4.012	3.988	4.000		-0.002	PASS
72.00	72.217	71.783	11.998	11.974	11.986	그는 것 이 것 같은 것은 것이 없는 것이 같이 같이 같이 같이 같이 같이 많이 많이 했다.	-0.001	PASS
145.00	145.217	144.783	15.345	15.321	15.333	15.334	0.001	PASS
217.00	217.217	216.783	17.876	17.852	17.864	17.868	0.004	PASS
289.00	289.217	288.783	20.012	19.988	20.000	20.005	0.005	PASS
On-Line Co	mmunicator	_						
As Left Input (Tolerance	Tolerance	Tolerance	Expected Output		Error	Pass/ Fail
<u>H₂O)</u>	<u>Tolerance Pv +</u>		<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	<u>Output (Ma)</u>		
0.00	0.217	-0.217	4.012	3.988	4.000	그는 것 같은 바람이 많은 것을 얻는 것을 하는 것이 없다.	-0.002	PASS
72.00	72.217	71.783	11.998	11.974	11.986	11.985	-0.001	PASS
145.00	145.217	144.783	15.345	15.321	15.333	15.334	0.001	PASS
217.00	217.217	216.783	17.876	17.852	17.864	17.868	0.004	PASS
289.00	289.217	288.783	20.012	19.988	20.000	20.005	0.005	PASS
Test Equipr	nent Used							
Manufactur	ers				Serial Number	rs		
Fluke 744 D	PC				8495027			
Emerson Ha	rt Field Commu	nicator Mod	el 375		11007890			
Ametek Pne	umatic Dead We	eight Tester	Model PK	ll	85348			
ADDITIONAL I	NFORMATION	<u></u>						
Date		Reason F			Procedure #			
5-Dec-0	17	Schedule			AO-I-01			
Comments				Testers				
	·····		-	-	/J/Carvajal			
					-			

Alex Orr Water Treatment Plant

Setup	Raw Water #3 72				
-	Flow Recorder	· ontain			
	Input Low	4.000		Output Low	0
	Input High	20.000		Output High	85
	Input Units	mA		Output Units	MGD
	Square Root	No			
	Tolerance 0.5 % of reasonable scale	ading + 0.05% of full		5 % of Reading 5 % of Full Scale	
Results					
	Expected Output	As Found Output	<u>lotal</u> Calculated	Pass / Fail	
As Found Input (mA)	<u>(MGD)</u>	<u>(MGD)</u>	Error ±	<u>1 433 / 1 411</u>	
4.000	0.00	0.00	0.0425	PASS	
8.000	21.25	21.25	0.1488	PASS	
12.000	42.50	42.49	0.2550	PASS	
16.000	63.75	63.74	0.3613	PASS	
20.000	85.00	85.00	0.4675	PASS	
<u>As Left Input (mA)</u>	Expected Output		<u>Total</u> Calculated	<u>Pass / Fail</u>	
	(MGD)	As Left Output (MGD)	Error ±	5400	
4.000	0.00	0.00	0.0425	PASS	
8.000	21.25	21.25	0.1488	PASS	
12.000	42.50	42.49	0.2550	PASS	
16.000 20.000	63.75 85.00	63.74 85.00	0.3613 0.4675	PASS PASS	
Test Equipment Us	sed				
Manufacturers		_		Serial Number	<u>s</u>
Fluke 744 DPC	0	4-1.075		8495027	
Emerson Hart Field	Communicator Mo	del 375		11007890	
	ATION				
Date		Reason For Work		Procedure #	
5-Dec-07	,	Schedule		AO-I-01-1	0
Comments			Testers		
			C.Gordon/J	.Carvajal	

Tag J	D FIT-508-RAW	4			Serial Number	1841929		
iugi	Raw Water #4		ri		Rosemount	3051	HART	
Setup	Flow Transmitte					0.075% of Span		
occup	Input Low	0			Output Low	4.000		
	Input High	263.07			Output High	20.000		
	Input Units	in of H2O			Output Units	mA		
	Tolerance mA	0.012	+/-		Square Root	Yes		
	Tolerance inch	0.197	+/-		oqualonoot			
	Dampening	1.60	Seconds					
On-Line Co	mmunicator							
As Found Inp	ut	Tolerance	Tolerance	Tolerance	Expected Output		F	D/ E-1
<u>(in H₂O)</u>	Tolerance Pv +	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)	<u>Error</u>	<u>Pass/ Fai</u>
0.00	0.197	-0.197	4.012	3.988	4.000	3.999	-0.001	PASS
66.00	66.197	65.803	12.026	12.002	12.014	12.023	0.009	PASS
132.00	132.197	131.803	15.346	15.322	15.334	15.342	0.008	PASS
197.00	197.197	196.803	17.858	17.834	17.846	17.851	0.005	PASS
263.00	263.197	262.803	20.010	19.986	19.998	20.002	0.004	PASS
On-Line Co	mmunicator							
<u>As Left Input (</u>		Tolerance			Expected Output		<u>Error</u>	<u>Pass/ Fai</u>
<u>H₂O)</u>	Tolerance Pv +		<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)		
0.00	0.197	-0.197	4.012	3.988	4.000	4.000	0.000	PASS
66.00	66.197	65.803	12.026	12.002	12.014	이 같은 것은 것을 가지 않는 것이 같아요. 것이 같아요. 이 있는 것이 같아요. 이 것이 같아요. 이 있는 것이 있는 것이 같아요. 이 있는 것이 있는 것이 있는 것이 같아요. 이 있는 것이 없는 것이 있는 것이 않는 것이 있는 것이 있는 것이 있는 것이 없는 것이 있는 것이 있 않는 것이 있는 것이 않는 것이 있는 것이 있는 것이 있는 것이 않는 것이 않는 것이 있는 것이 않는 것이 있는 것이 않는 것이 않이 않이 않이 않는 것이 않이 않. 않이 않이 않 않이 않이 않이 않이 않이 않이 않. 않이 않이 않. 않이 않 않이	-0.001	PASS
132.00	132.197	131.803	15.346	15.322	15.334	. 신성한 방법과 수상 경험을 가지 않는 것이다.	-0.001	PASS
197.00	197.197	196.803	17.858	17.834	17.846	17.849	0.003	PASS
263.00	263.197	262.803	20.010	19.986	19.998	20.001	0.003	PASS
Test Equip								
Manufactu					Serial Number	S		
Fluke 744 D					8495027			
	art Field Commu				11007890			
Ametek Pne	eumatic Dead We	eight Tester	Model PK I		85348			
ADDITIONAL I	INFORMATION	Reason F	or Work		Procedure #			
6-Dec-(18	Schedule			AO-I-01			
0-Dec-0	50	Ochedule			70-1-01			
Comments			_	Testers				
				C.gordon	/J.Carvajal			



Tag ID	FIR-508-RAW4A Raw Water #4 84	" Venturi		Serial Number	9602-58414-003
Setup	Flow Recorder Che				
octup	Input Low	4.000		Output Low	0
	Input High	20.000		Output High	175
	Input Units	mA		Output Units	MGD
	-			ouput onno	mob
	Square Root	No	0.005		
	Tolerance 0.5 % of re scale	ading + 0.05% of full		% of Reading % of Full Scale	
Results					
	Furne steed Output	As Found Output	<u>Total</u>	D	
As Found Input (mA)	Expected Output (MGD)	As Found Output (MGD)	Calculated Error ±	<u>Pass / Fail</u>	
4.000	0.00	<u>(MCD)</u> 0.00	0.0875	PASS	
8.000	43.75	43.75	0.3063	PASS	
12.000	87.50	87.50	0.5250	PASS	
16.000	131.25	131.26	0.7437	PASS	
20.000	175.00	175.00	0.9625	PASS	
			<u>Total</u>		
<u>As Left Input (mA)</u>	Expected Output		Calculated	<u> Pass / Fail</u>	
4 000	(MGD)	As Left Output (MGD)	<u>Error ±</u>	DACC	
4.000 8.000	0.00 43.75	0.00 43.75	0.0875 0.3063	PASS PASS	
12.000	43.75 87.50	43.75 87.50	0.5250	PASS	
16.000	131.25	131.26	0.3230	PASS	
20.000	175.00	175.00	0.9625	PASS	
20.000	170.00		0.0020	1,400	
Test Equipment U	sed			~ · · · ·	
Manufacturers	····	-		Serial Numbers	-
Fluke 744 DPC		dol 275		8495027	
Emerson Hart Field	I Communicator Mo	DUEI 3/5		11007890	
	ATION				
Date		Reason For Work		Procedure #	
6-Dec-07	7	Schedule		AO-I-01-10)
Comments			Testers		

Alex Orr Water Treatment Plant

Tag ID	FIR-509-RAW4B Raw Water #4 84	' Venturi		Serial Number	9401-28155-AO1
Setup	Flow Recorder Che	em. Bldg. #2			
	Input Low	4.000		Output Low	0
	Input High	20.000		Output High	175
	Input Units	mA		Output Units	MGD
	Square Root	No			
	Tolerance 0.5 % of rea		0.005	% of Reading	
	scale	ading + 0.05% of full		% of Full Scale	
Results					
	Expected Output	As Found Output	<u>Total</u> Calculated	Pass / Fail	
As Found Input (mA)	(MGD)	(MGD)	Error ±	rass / ran	
4.000	0.00	0.00	0.0875	PASS	
8.000	43.75	43.75	0.3063	PASS	
12.000	87.50	87.50	0.5250	PASS	
16.000	131.25	131.25	0.7438	PASS	
20.000	175.00	175.01	0.9625	PASS	
	Expected Output		<u>Total</u>		
As Left Input (mA)	(MGD)	As Left Output (MGD)	Calculated Error ±	<u>Pass / Fail</u>	
4.000	0.00	0.00	0.0875	PASS	
8.000	43.75	43.75	0.3063	PASS	
12.000	87.50	87.50	0.5250	PASS	
16.000	131.25	131.25	0.7438	PASS	
20.000	175.00	175.01	0.9625	PASS	
Test Equipment U	sed				
Manufacturers		-		Serial Numbers	_
Fluke 744 DPC				8495027	
Emerson Hart Field	I Communicator Mo	del 375		11007890	
Date		Reason For Work		Procedure #	
6-Dec-07	7	Schedule		AO-I-01-10)
			- .		
Comments		-	Testers C.Gordon/	J.Carvajal	
				e • • • •	

MI	AM	H-D	ADE
0.0	$\{B_{ij}\}$		

Tag ID	FIT-500-FIN1				Serial Number	1411231		
	Fininsh Water #	#1 48" Ve	nturi		Rosemount	3051	HART	
Setup	Flow Transmitter				Accuracy	0.075% of Span		
	Input Low	0			Output Low	4.000		
	Input High	265.20			Output High	20.000		
	Input Units	in of H2O			Output Units	mA		
	Tolerance mA	0.012	+/-		Square Root	Yes		
	Tolerance inch	0.199	+/-					
	Dampening	1.60	Seconds					
On-Line Con	nmunicator							
As Found Input	Tolerance Pv	<u>Tolerance</u>	Tolerance	Tolerance	Expected Output		Error	Daes/ Esil
<u>(in H₂O)</u>		<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)	<u>Error</u>	Pass/ Fail
0.00	0.199	-0.199	4.012	3.988	4.000		-0.001	PASS
66.00	66.199	65.801	11.994	11.970	11.982	11.983	0.001	PASS
133.00	133.199	132.801	15.343	15.319	15.331	15.338	0.007	PASS
199.00	199.199	198.801	17.872	17.848	17.860	17.868	800.0	PASS
265.00	265.199	264.801	20.006	19.982	19.994	20.005	0.011	PASS
On-Line Con	nmunicator							
As Left Input (ir	<u>Tolerance Pv</u>	<u>Tolerance</u>	Tolerance	Tolerance	Expected Output		Error	Dace/ Eail
<u>H₂O)</u>	±	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	<u>Output (Ma)</u>		Pass/ Fail
0.00	0.199	-0.199	4.012	3.988	4.000	4.000	0.000	PASS
66.00	66.199	65.801	11.994	11.970	11.982	11.979	-0.003	PASS
133.00	133.199	132.801	15.343	15.319	15.331	15.327	-0.004	PASS
199.00	199.199	198.801	17.872	17.848	17.860	17.856	-0.004	PASS
265.00	265.199	264.801	20.006	19.982	19.994	19.993	-0.001	PASS
Test Equipm	ent Used							
Manufacture					Serial Number	S		
Fluke 744 DF	°C				8495027			
	t Field Commur	nicator Mod	el 375		11007890			
	umatic Dead We			1	85348			
	FORMATION	_						
Date		Reason F			Procedure #			
7-Dec-07	7	Schedule			AO-I-01			
Comments				Testers				
			-	C.Gordon	/J.Carvajal			
					•			

MIAMI-DADE

Alex Orr Water Treatment Plant

Tag ID	FIR-500-FIN1	1011) (a ménumi		Serial Number	101655-001-902-8716
•	Finish Water #1 4	ið" Venturi			
Setup	Flow Recorder Input Low Input High Input Units Square Root	4.000 20.000 mA No		Output Low Output High Output Units	0 80 MGD
	Tolerance 0.5 % of rescale			% of Reading % of Full Scale	
Results					
As Found Input (mA)	Expected Output (MGD)	As Found Output (MGD)	Total Calculated	Pass / Fail	
4.000	0.00	0.00	Error ± 0.0400	PASS	
8.000	20.00	20.00	0.1400	PASS	
12.000	40.00	40.00	0.2400	PASS	
16.000	60.00	59.97	0.3400	PASS	
20.000	80.00	79.95	0.4400	PASS	
<u>As Left Input (mA)</u>	Expected Output		<u>Total</u> Calculated	Pass / Fail	
4 000	<u>(MGD)</u> 0.00	As Left Output (MGD)	Error ±	DAGO	
4.000 8.000	20.00	0.00 20.00	0.0400 0.1400	PASS PASS	
12.000	40.00	40.00	0.1400	PASS	
16.000	60.00	59.97	0.2400	PASS	
20.000	80.00	79.95	0.4400	PASS	
Test Equipment U	sed	·			
Manufacturers		_		Serial Numbers	_
Fluke 744 DPC Emerson Hart Field	Communicator Mo	dol 375		8495027 11007890	
Emerson hait Field	Communicator wo			11007090	
ADDITIONAL INFORM	TION				
Date		Reason For Work		Procedure #	
7-Dec-07		Schedule		AO-I-01-10	I
Comments			Testers C.Gordon/	J.Carvajal	
				•	



Setup	FIT-501-FIN2 Fininsh Water Flow Transmitte Input Low Input Low Input High Input Units Tolerance mA		nturi		Serial Number Rosemount	1101176 3051	HART	
Setup	Input Low Input High Input Units	0						
•	Input High Input Units				Accuracy	0.075% of Span		
	Input Units	68.90			Output Low	4.000		
	•				Output High	20.000		
	Toloronoo mA	in of H2O			Output Units	mA		
	I Ulei ance ma	0.012	+/-		Square Root	Yes		
	Tolerance inch	0.052	+/-		••••			
	Dampening	1.60	Seconds					
On-Line Com	municator	_						
As Found Input	_	Tolerance	Tolerance	Tolerance	Expected Output			Deer/ E-
<u>(in H₂O)</u>	<u>Tolerance Pv +</u>	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)	<u>Error</u>	Pass/ Fai
0.00	0.052	-0.052	4.012	3.988	4.000	3.998	-0.002	PASS
17.00	17.052	16.948	11.960	11.936	11.948	11.956	0.008	PASS
34.00	34.052	33.948	15.252	15.228	15.240	15.230	-0.010	PASS
52.00	52.052	51.948	17.912	17.888	17.900	17.896	-0.004	PASS
69.00	69.052	68.948	20.024	20.000	20.012	20.018	0.006	PASS
On-Line Corr	municator	-						
<u>As Left Input (in</u>		Tolerance			Expected Output		Error	Pass/ Fai
<u>H₂O)</u>	Tolerance Pv +	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)		
0.00	0.052	-0.052	4.012	3.988	4.000	3.998	-0.002	PASS
17.00	17.052	16.948	11.960	11.936	11.948	11.956	0.008	PASS
34.00	34.052	33.948	15.252	15.228	15.240	15.230	-0.010	PASS
52.00 69.00	52.052 69.052	51.948 68.948	17.912 20.024	17.888 20.000	17.900 20.012	17.896 20.018	-0.004 0.006	PASS PASS
Test Equipm Manufacture					Serial Number	S		
Fluke 744 DP					8495027	-		
	t Field Commu	nicator Mod	lel 375		11007890			
	matic Dead W			11	85348			
ADDITIONAL IN	FORMATION				_			
Date		Reason F			Procedure #			
8-Dec-07	,	Schedule			AO-I-01			
Comments				Testers				
Souments			-		J.Carvajal			



Tag ID	FIR-501-FIN2 Finish Water #2 6	60" Venturi		Serial Number	9602-58412C03
Setup	Flow Recorder				
	Input Low	4.000		Output Low	0
	Input High	20.000		Output High	128
	Input Units	mA		Output Units	MGD
	Square Root	No		•	No
	Tolerance 0.5 % of re	ading + 0.05% of full	0.005	% of Reading	
	scale	5	0.0005	% of Full Scale	
Results					
	Expected Output	As Found Output	Total Calculated	Pass / Fail	
As Found Input (mA)	(MGD)	(MGD)	Error ±		
4.000	0.00	0.00	0.0640	PASS	
8.000	32.00	32.00	0.2240	PASS	
12.000	64.00	64.01	0.3840	PASS	
16.000	96.00	96.01	0.5440	PASS	
20.000	128.00	128.00	0.7040	PASS	
<u>As Left Input (mA)</u>	Expected Output		Total Calculated		
	(MGD)	As Left Output (MGD)	<u>Error ±</u>	<u> </u>	
4.000	0.00	0.00	0.0640	PASS	
8.000	32.00	32.00	0.2240	PASS	
12.000	64.00	64.01	0.3840	PASS	
16.000	96.00	96.01	0.5440	PASS	
20.000	128.00	128.00	0.7040	PASS	
Test Equipment U Manufacturers	sed			Serial Numbers	
Fluke 744 DPC		-		8495027	-
	Communicator Mc	del 375		11007890	
ADDITIONAL INFORM	ATION	Reason For Work		Procedure #	
8-Dec-07	7	Schedule		AO-I-01-10)
0			Tester		
Comments		-	Testers C.Gordon/J.C	arvajal	
				/ 	



Fininsh Water #3 - 72" Venturi Rosemount 3051 HART Setup Flow Transmitter Accuracy 0.075%, of Span Output Low 4.000 Input High 193.30 Output Low 4.000 Output Low 4.000 Input High 193.30 Output Low 4.000 Output Units mA Tolerance inch 0.145 +/- Square Root Yes Yes On-Line Communicator A0± A0± A0± (ma) Output (Ma) Error Pass/F 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 48.00 48.145 47.855 11.985 11.961 11.973 11.966 -0.007 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS 193.00 193.145 192.855 15.346 15.322 15.334 15.329 -0.001 PASS	Tag ID) FIT-502-FIN3				Serial Number	1101177		
Input Low 0 Output Low 4.000 Input High 193.30 Output High 20.000 Input Units in of H2O Output High 20.000 Tolerance mA 0.012 +/- Square Root Yes Tolerance inch 0.145 +/- Square Root Yes On-Line Communicator As Found Input Tolerance Tolerance Error Pass/F As Found Input Tolerance PV + PV - AO2 (mail Output (Mail) Error Pass/F 0.00 0.145 -0.145 4.012 3.988 4.000 -0.001 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.001 PASS 0.01 Tolerance Tolerance Expected Output Error Pass/F 48.061 100 145.145 144.855 17.870 <th colspan="3">-</th> <th></th> <th></th> <th>HART</th> <th></th>	-					HART			
Input Low 0 Output Low 4.000 Input High 193.30 Output High 20.000 Input Units in of H2O Output High 20.000 Tolerance mA 0.012 +/- Square Root Yes On-Line Communicator Imput Units mA Square Root Yes As Found Input Tolerance Tolerance Tolerance Error Pass/F 0.00 0.145 +/- Dampening 1.60 Seconds Output Units Tolerance 48.00 48.145 47.855 11.985 11.961 11.973 11.966 -0.001 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.001 PASS 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 193.00 19.145	Setup	Flow Transmitte	r			Accuracy	0.075% of Spa	n	
Input High 193.30 Output High 20.000 Input Units in of H2O Output Units mA Tolerance mA 0.012 +/- Square Root Yes Tolerance inch 0.145 +/- Square Root Yes Tolerance inch 0.145 +/- Dampening 1.60 Seconds On-Line Communicator Ev- AO± AO+ Ma Output (Ma) Error Pass/F 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 48.00 48.104 47.855 11.985 15.322 15.334 15.329 -0.005 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.001 PASS 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001	-	Input Low	0			•	•		
Input Units in of H2O Output Units mA Tolerance mA 0.012 +/- Square Root Yes Tolerance inch 0.145 +/- Dampening 1.60 Seconds On-Line Communicator Interance Price AO2: Image: Communication (mail of the communicati		Input High	193.30			Output High			
Tolerance inch Dampening 0.145 1.60 +/- Seconds On-Line Communicator Tolerance Im H_OI Tolerance Tolerance Tolerance Tolerance Expected Output Mail Error Pass/F 48. Found Input 0.00 10terance Pv+ 0.00 PV+ 0.145 4.012 3.988 4.000 3.999 -0.001 PASS 48.00 48.145 47.855 11.961 11.973 11.966 -0.007 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 145.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.005 PASS 0.001 PASS On-Line Communicator Interance Tolerance Tolerance Expected Output 4.012 3.988 4.000 3.999 -0.001 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.001 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 <th></th> <th>Input Units</th> <th>in of H2O</th> <th></th> <th></th> <th>Output Units</th> <th>mA</th> <th></th> <th></th>		Input Units	in of H2O			Output Units	mA		
Dampening 1.60 Seconds On-Line Communicator Error Pass/F As Found Input (in Hs0) Tolerance PV + 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS 0.001 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS 0.001 PASS 0.003 PASS 0.003 PASS 0.003 PASS 0.003 PASS 0.003 PASS 0.000 9.988 19.988 19.988 19.985 -0.003 PASS 0.001 PASS 0.005 PASS 0.005 PASS 0.005 PASS 0.003 PASS 0.003 PASS		Tolerance mA	0.012	+/-		Square Root	Yes		
Dampening 1.60 Seconds On-Line Communicator Error Pass/F As Found Input (in Hs0) Tolerance PV + 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS 0.001 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS 0.001 PASS 0.003 PASS 0.003 PASS 0.003 PASS 0.003 PASS 0.003 PASS 0.000 9.988 19.988 19.988 19.985 -0.003 PASS 0.001 PASS 0.005 PASS 0.005 PASS 0.005 PASS 0.003 PASS 0.003 PASS		Tolerance inch	0.145	+/-					
As Found Input (in H ₂ O) Tolerance 10 erance Tolerance PV: Tolerance AO: Tolerance AO: Expected Output (ma) Error Pass/ F 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 48.00 48.145 47.855 11.965 11.961 11.973 11.966 -0.007 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS On-Line Communicator A A A A0: A0: (ma) Output (Ma) Error Pass/ F 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 97.00 97.145 96.855 15.346 15.322		Dampening		Seconds					
In H_00 Tolerance Pv + Pv : AO+ AO- (ma) Output (Ma) Error Pass/F 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 48.00 48.145 47.855 11.961 11.973 11.966 -0.007 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 145.00 145.145 144.855 17.870 17.863 17.853 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS	On-Line Cor	nmunicator							
In H_00 Tolerance Pv + Pv : AO+ AO- (ma) Output (Ma) Error Pass/F 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 48.00 48.145 47.855 11.961 11.973 11.966 -0.007 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 145.00 145.145 144.855 17.870 17.863 17.853 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS			- Tolerance	Tolerance	Tolerance	Expected Output		-	D /
0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 48.00 48.145 47.855 11.985 11.961 11.973 11.966 -0.007 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 145.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS On-Line Communicator Interance Tolerance Tolerance AQ+ AQ- (ma) Output (Ma) Error Pass/F 48.00 48.145 47.855 11.985 11.961 11.973 11.966 -0.001 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 91.00 193.145 192.855 20.000 19.976			-		-		<u>Output (Ma)</u>	Error	Pass/ Fai
97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 145.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS On-Line Communicator A0+ A0- (ma) Output (Ma) Error Pass/F H_DO) Tolerance Tolerance Tolerance Expected Output Error Pass/F 48.00 48.145 47.855 11.985 11.961 11.973 11.966 -0.007 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS Fluke 744 DPC Baterise Model 375 11007890 853	0.00	0.145	-0.145	4.012	3.988	4.000	3.999	-0.001	PASS
145.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS On-Line Communicator As Left Input (in H_0) Tolerance PV - AO+ AO- (ma) Output (Ma) Error Pass/F 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 48.00 48.145 47.855 11.985 11.961 11.973 11.966 -0.007 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 145.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS 1945.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.003	48.00	48.145	47.855	11.985	11.961	11.973	11.966	-0.007	PASS
193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS On-Line Communicator As Left Input (in H_0) Tolerance Pv + 0.00 Tolerance Pv + Pv - 0.01 Tolerance Pv + Pv - 0.045 Tolerance Pv + 0.045 Tolerance Pv + Pv - 0.045 Error Pass/F Pass/F 48.00 48.145 47.855 11.985 11.961 11.973 11.966 -0.007 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 145.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.003 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS Fluke 744 DPC Error Serial Numbers 85348 8534	97.00	97.145	96.855	15.346	15.322	15.334	15,329	-0.005	PASS
On-Line Communicator As Left Input (in H_D) Tolerance 0.00 Pv: 0.145 AO: 4.012 Spected Output AO: 4.012 Cutput (Ma) 0.00 Error 0.00 Pass/ F 48.00 48.145 47.855 11.985 11.961 11.973 11.966 -0.007 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 145.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS PASS Fist Equipment Used Manufacturers Fluke 744 DPC Serial Numbers 8495027 Emerson Hart Field Communicator Model 375 11007890 Ametek Pneumatic Dead Weight Tester Model PK II 85348 ADDITIONAL INFORMATION Date Pase Procedure # 9-Dec-07 Schedule AO-I-01	145.00	145.145	144.855	17.870	17.846	17.858	17.853	-0.005	PASS
As Left Input (in Tolerance Tolerance Tolerance Tolerance Expected Output Error Pass/ F H_OO 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 48.00 48.145 47.855 11.985 11.961 11.973 11.966 -0.007 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 145.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.003 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS Fluke 744 DPC 8495027 8495027 Emerson Hart Field Communicator Model 375 11007890 85348 45348 45348 45348 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01	193.00	193.145	192.855	20.000	19.976	19.988	19.985	-0.003	PASS
H ₂ O Tolerance Pv + AO+ AO- (ma) Output (Ma) Error Pass/F 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 48.00 48.145 47.855 11.985 11.961 11.973 11.966 -0.007 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 145.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS Fluke 744 DPC 8495027 8495027 Emerson Hart Field Communicator Model 375 11007890 85348 45348 45348 45348 4001TIONAL INFORMATION 85348 4001TIONAL INFORMATION 85348 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 40-1-01 <t< td=""><td>On-Line Cor</td><td>nmunicator</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	On-Line Cor	nmunicator							
H.O) Ioterance PV- AO+ AO- Imax Output (max) 0.00 0.145 -0.145 4.012 3.988 4.000 3.999 -0.001 PASS 48.00 48.145 47.855 11.985 11.961 11.973 11.966 -0.007 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 145.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.003 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS Fluke 744 DPC Serial Numbers Serial Numbers Serial Numbers Serial Numbers Fluke 744 DPC 8495027 State 85348 Serial Numbers Serial Numbers Ametek Pneumatic Dead Weight Tester Model PK II 85348 Serial Numbers Serial Numbers 9-Dec-07 Schedule AO-I-01 AO-I-01 AO-I-01	As Left Input (i	<u>n</u>	Tolerance	Tolerance	Tolerance	Expected Output		Error	Dace/ Eai
48.00 48.145 47.855 11.985 11.961 11.973 11.966 -0.007 PASS 97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 145.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS Test Equipment Used Manufacturers Serial Numbers Fluke 744 DPC 8495027 Emerson Hart Field Communicator Model 375 11007890 Ametek Pneumatic Dead Weight Tester Model PK II 85348 ADDITIONAL INFORMATION Date Reason For Work Procedure # 9-Dec-07 Schedule AO-I-01						<u>(ma)</u>	and the state of the		
97.00 97.145 96.855 15.346 15.322 15.334 15.329 -0.005 PASS 145.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS Test Equipment Used Manufacturers Serial Numbers Fluke 744 DPC 8495027 Emerson Hart Field Communicator Model 375 11007890 Ametek Pneumatic Dead Weight Tester Model PK II 85348 ADDITIONAL INFORMATION Date Reason For Work Procedure # 9-Dec-07 Schedule AO-I-01									PASS
145.00 145.145 144.855 17.870 17.846 17.858 17.853 -0.005 PASS 193.00 193.145 192.855 20.000 19.976 19.988 19.985 -0.003 PASS Test Equipment Used Manufacturers Serial Numbers Fluke 744 DPC 8495027 Emerson Hart Field Communicator Model 375 11007890 Ametek Pneumatic Dead Weight Tester Model PK II 85348 ADDITIONAL INFORMATION Procedure # 9-Dec-07 Schedule AO-I-01	and the second						이는 것 같은 것 같은 것이 같은 것이 없는 것이 같이 했다.		PASS
193.00193.145192.85520.00019.97619.98819.985-0.003PASSTest Equipment Used Manufacturers Fluke 744 DPCSerial Numbers 8495027Emerson Hart Field Communicator Model 37511007890 85348Ametek Pneumatic Dead Weight Tester Model PK II85348ADDITIONAL INFORMATION DateProcedure # AO-I-01							영상은 다 아랍었었었다. 아파		
Test Equipment Used Serial Numbers Manufacturers Serial Numbers Fluke 744 DPC 8495027 Emerson Hart Field Communicator Model 375 11007890 Ametek Pneumatic Dead Weight Tester Model PK II 85348 ADDITIONAL INFORMATION Procedure # 9-Dec-07 Schedule AO-I-01									
Manufacturers Serial Numbers Fluke 744 DPC 8495027 Emerson Hart Field Communicator Model 375 11007890 Ametek Pneumatic Dead Weight Tester Model PK II 85348 ADDITIONAL INFORMATION Date Reason For Work Procedure # 9-Dec-07 Schedule AO-I-01	193.00	193.145	192.855	20.000	19.976	19.988	19.985	-0.003	PASS
Manufacturers Serial Numbers Fluke 744 DPC 8495027 Emerson Hart Field Communicator Model 375 11007890 Ametek Pneumatic Dead Weight Tester Model PK II 85348 ADDITIONAL INFORMATION Procedure # 9-Dec-07 Schedule AO-I-01	Test Equips	ant llead							
Fluke 744 DPC 8495027 Emerson Hart Field Communicator Model 375 11007890 Ametek Pneumatic Dead Weight Tester Model PK II 85348 ADDITIONAL INFORMATION Procedure # 9-Dec-07 Schedule AO-I-01						Serial Number	8		
Emerson Hart Field Communicator Model 375 11007890 Ametek Pneumatic Dead Weight Tester Model PK II 85348 ADDITIONAL INFORMATION Procedure # 9-Dec-07 Schedule AO-I-01									
Ametek Pneumatic Dead Weight Tester Model PK II 85348 ADDITIONAL INFORMATION Procedure # Date Reason For Work Procedure # 9-Dec-07 Schedule AO-I-01			nicator Mod	lel 375					
DateReason For WorkProcedure #9-Dec-07ScheduleAO-I-01					11				
DateReason For WorkProcedure #9-Dec-07ScheduleAO-I-01									
9-Dec-07 Schedule AO-I-01			Reason F	or Work		Procedure #			
_		7	and the second se						
Comments Testers C.Gordon/J.Carvajal	Comments			_	Testers				

Alex Orr Water Treatment Plant

Tag II	FIR-502-FIN3 Finish Water #3 1	72" Venturi		Serial Number	9501-42407-C03
Setup	Flow Recorder				
•	Input Low	4.000		Output Low	0
	Input High	20.000		Output High	150
	Input Units	mA		Output Units	MGD
	Square Root	No		ouput onito	MOD
			0.005	% of Reading	
	Tolerance 0.5 % of re scale			% of Full Scale	
Results					
	Expected Output	As Found Output	<u>rotar</u> Calculated	Pass / Fail	
As Found Input (mA)		(MGD)	Error ±		
4.000	0.00	0.00	0.0750	PASS	
8.000	37.50	37.52	0.2625	PASS	
12.000	75.00	75.04	0.4500	PASS	
16.000	112.50	112.55	0.6375	PASS	
20.000	150.00	150.07	0.8250	PASS	
			<u>Total</u>		
As Left Input (mA)	Expected Output		Calculated	<u>Pass / Fail</u>	
	(MGD)	As Left Output (MGD)	Error ±		
4.000	0.00	0.00	0.0750	PASS	
8.000	37.50	37.52	0.2625	PASS	
12.000	75.00	75.04	0.4500	PASS	
16.000	112.50	112.55	0.6375	PASS	
20.000	150.00	150.07	0.8250	PASS	
Test Equipment L	lsed	· · · · · · · · · · · · · · · · · · ·		Sorial Numbers	
Manufacturers Fluke 744 DPC		-		Serial Numbers	_
	d Communicator Mo	dal 275		8495027	
Emerson Hart Field	a Communicator Ivic			11007890	
	ATION				
Date		Reason For Work		Procedure #	
11-Dec-08	8	Schedule		AO-I-01-10	0
Comments			Testers		
			C,Gordon/J.	Convoial	

MIAMI-DADE			
	<u>Mi/</u>	<u>\Mł-D</u>	ADE

Tag ID	FIT-503-FIN4				Serial Number	1101174		
	Fininsh Water	#4 72" Ve	nturi		Rosemount	3051	HART	
Setup	Flow Transmitter				Accuracy	0.075% of Span		
ootup	Input Low	0			Output Low	4.000		
	Input High	257.10			Output High	20.000		
	Input Units	in of H2O			Output Units	mA		
	Tolerance mA	0.012	+/-		Square Root	Yes		
	Tolerance inch	0.193	+/-					
	Dampening	1.60	Seconds					
On-Line Com	nmunicator							
As Found Input		Tolerance	Tolerance	Tolerance	Expected Output		Error	
<u>(in H₂O)</u>	Tolerance Pv +	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)	<u>Error</u>	Pass/ Fail
0.00	0.193	-0.193	4.012	3.988	4.000	같아. 그는 것같은 것 같아? 것 같아?	-0.001	PASS
64.00	64.193	63.807	11.995	11.971	11.983	11.980	-0.003	PASS
129.00	129.193	128.807	15.345	15.321	15.333	15.332	-0.001	PASS
193.00	193.193	192.807	17.875	17.851	17.863	17.863	0.000	PASS
257.00	257.193	256.807	20.009	19.985	19.997	20.002	0.005	PASS
On-Line Com	nmunicator	-						
As Left Input (in		<u>Tolerance</u>		-	Expected Output		<u>Error</u>	Pass/ Fail
<u>H,O)</u>	Tolerance Pv +		<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	<u>Output (Ma)</u>		
0.00	0.193	-0.193	4.012	3.988	4.000		-0.001	PASS
64.00	64.193	63.807	11.995	11.971	11.983	and the second	-0.003	PASS
129.00	129.193	128.807	15.345	15.321	15.333		-0.001	PASS
193.00 257.00	193.193 257.193	192.807 256.807	17.875 20.009	17.851 19.985	17.863 19.997	17.863 20.002	0.000 0.005	PASS PASS
Test Equipm Manufacture					Serial Number	\$		
Fluke 744 DPC				8495027	•			
	t Field Commur	nicator Mod	el 375		11007890			
	matic Dead We			I	85348			
ADDITIONAL IN	FORMATION							
Date		Reason F	or Work		Procedure #	_		
12-Dec-07	, <u> </u>	Schedule			AO-I-01			
Comments				Testers				
		····	-		/J.Carvajal			
				5.501401				

CALIBRATION SHEET Tag ID FIR-503-FIN4 Serial Number 101655-8717 Finish Water #4 -- 72" Venturi Setup Flow Recorder 4.000 Input Low 0 **Output Low** 20.000 **Input High** 173 **Output High** mΑ Input Units **Output Units** MGD Square Root No 0.005 % of Reading Tolerance 0.5 % of reading + 0.05% of full 0.0005 % of Full Scale scale Results Total Calculated Expected Output As Found Output <u> Pass / Fail</u> Error ± As Found Input (mA) (MGD) (MGD) 4.000 0.0865 0.00 0.00 PASS 8.000 43.25 43.26 0.3028 PASS 12.000 86.50 86.51 0.5190 PASS 16.000 129.75 129.76 0.7353 PASS 20.000 173.00 173.01 0.9515 PASS Total Calculated Expected Output As Left Input (mA) <u>Pass / Fail</u> Error ± (MGD) As Left Output (MGD) 4.000 0.00 0.00 0.0865 PASS 43.25 43.26 8.000 0.3028 PASS 12.000 86.50 86.51 0.5190 PASS 16.000 129.75 129.76 0.7353 PASS 20.000 173.01 0.9515 173.00 PASS **Test Equipment Used** Manufacturers Serial Numbers Fluke 744 DPC 8495027 **Emerson Hart Field Communicator Model 375** 11007890 ADDITIONAL INFORMATION Procedure # **Reason For Work** Date AO-I-01-10 13-Dec-07 Schedule Comments Testers C.Gordon/J.Carvajal

Tag II	D FIT-504-FIN5				Serial Number	1101178		
U	Fininsh Water	#5 72" Ve	nturi		Rosemount	3051	HART	
Setup	Flow Transmitte	r			Accuracy	0.075% of Span		
•	Input Low	0			Output Low	4.000		
	Input High	257.10			Output High	20.000		
	Input Units	in of H2O			Output Units	mA		
	Tolerance mA	0.012	+/-		Square Root	Yes		
	Tolerance inch	0.193	+/-					
	Dampening	1.60	Seconds					
On-Line Co	mmunicator	-						
As Found Inpu	<u>ıt</u>	Tolerance	Tolerance	Tolerance	Expected Output		Error	Pass/ Fai
<u>(in H₂O)</u>	Tolerance Pv +	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)		
0.00	0.193	-0.193	4.012	3.988	4.000	4.000	0.000	PASS
64.00	64.193	63.807	11.995	11.971	11.983	사실 문항을 다른 바람이었다.	-0.001	PASS
129.00	129.193	128.807	15.345	15.321	15.333	15.333	0.000	PASS
193.00	193.193	192.807	17.875	17.851	17.863	17.864	0.001	PASS
257.00	257.193	256.807	20.009	19.985	19.997	19.999	0.002	PASS
On-Line Co	mmunicator	_						
As Left Input (i		Tolerance			Expected Output		Error	Pass/ Fai
<u>H₂O)</u> 0.00	<u>Tolerance Pv +</u> 0.193	: <u>Pv -</u> -0.193	<u>AO+</u> 4.012	<u>AO-</u> 3.988	<u>(ma)</u> 4.000	Output (Ma)	0.000	DACC
64.00	64.193	-0.193 63.807	4.012	3.900 11.971	11.983	4.000 11.982	0.000 -0.001	PASS PASS
129.00	129.193	128.807	15.345	15.321	15.333	15.333	0.000	PASS
129.00	193.193	192.807	17.875	17.851	17.863	17.864	0.000	PASS
257.00	257.193	256.807	20.009	19.985	19.997	19.999	0.002	PASS
Test Equipr Manufactur					Serial Number	re.		
Fluke 744 DPC					8495027	0		
	rt Field Commu	nicator Mor	lel 375		11007890			
	umatic Dead We			11	85348			
	NFORMATION							
Date		Reason F			Procedure #			
13-Dec-0	7	Schedule			AO-I-01			
Comments				Testers				
	<u></u>		-		/J.Carvajal			

		CALIBRATION SI	HEET		
Tag ID	FIR-504-FIN5			Serial Number	101655-8717
-	Finish Water #5 72	2" Venturi			
Setup	Flow Recorder				
	Input Low	4.000		Output Low	0
	Input High	20.000		Output High	173
	Input Units	mA		Output Units	MGD
	Square Root	No			
				% of Reading	
	Tolerance 0.5 % of read	ding + 0.05% of full scale	0.0005	% of Full Scale	
Results					
	Expected Output	As Found Output	Total Calculated Error ±	Pass / Fail	
As Found Input (mA) 4.000	<u>(MGD)</u> 0.00	(<u>MGD)</u> 0.00	0.0865	DACC	
4.000 8.000	43.25	43.26	0.3028	PASS PASS	
12.000	43.25 86.50	43.20 86.53	0.5028	PASS	
16.000	129.75	129.78	0.7353	PASS	
20.000	173.00	173.03	0.9515	PASS	
As Left Input (mA)	Expected Output		Total Calculated	Pass / Fail	
<u></u>	(MGD)	As Left Output (MGD)	<u>Error ±</u>	<u></u>	
4.000	0.00	0.00	0.0865	PASS	
8.000	43.25	43.24	0.3028	PASS	
12.000	86.50	86.50	0.5190	PASS	
16.000	129.75	129.74	0.7353	PASS	
20.000	173.00	172.99	0.9515	PASS	
Fest Equipment U	sed				
Manufacturers		_		Serial Numbers 8495027	<u> </u>
	Communicator Mod	ol 275		11007890	
		er 37 5		11007090	
	ATION		<u> </u>		
Date		Reason For Work		Procedure #	
13-Dec-07	7	Schedule		AO-I-01-1	0
Comments			Testers		
	· · · · · ·		C.Gordon/J.Ca	minini	

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WATER REPORT

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SouthWest Wellfield ASR Wells #4 & 5

FOR

Dec-07

Tag ID	FIT-1-ASR #4				Serial Number	2031059		
Ū	Production / Recover	əry			Rosemount	1151DP	HART	
Setup	Flow Transmitter				Accuracy	0.254019015	% of Span	
-	Input Low	0.00			Pressure Range	4	•	
	Input High	138.84			Output Low	4.000		
	Input Units	in of H2O			Output High	20.000		
	Tolerance mA	0.041	+/-		Output Units	mA		
	Tolerance inch	0.353	+/-		Square Root	Yes		
	Dampening	6.40	Seconds		Upper Range Limit of TX (URL)	150	" H₂O	
		0.10	00001143			150	1120	
On-Line Com	····							
As Found Input	Tolerance Pv +	Tolerance Pv	Tolerance	Tolerance	Expected Output		Error	<u>Pass/ Fai</u>
<u>(in H₂O)</u> 0	0.353	-0.353	<u>AO+</u> 4.041	<u>AO-</u> 3.959	<u>(ma)</u> 4.000	<u>Output (Ma)</u> 4.000	0.000	D 4 0 0
35	35.353	-0.353 34.647	12.074	3.959 11.993			0.000	PASS
69	69.353				12.033	12.033	0.000	PASS
		68.647	15.320	15.239	15.279	15.280	0.001	PASS
104	104.353	103.647	17.888	17.807	17.848	17.849	0.001	PASS
139	139.353	138.647	20.050	19.969	20.009	20.010	0.001	PASS
On-Line Com	municator							
As Left Input (in		Tolerance	Tolerance	Tolerance	Expected Output	• • • • • •	Error	Pass/ Fai
<u>H₂O)</u>	Tolerance Pv +	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	Output (Ma)		
0	0.353	-0.353	4.041	3.959	4.000	4.000	0.000	PASS
35	35.353	34.647	12.074	11.993	12.033	12.033	0.000	PASS
69	69.353	68.647	15.320	15.239	15.279	15.280	0.001	PASS
104	104.353	103.647	17.888	17.807	17.848	17.849	0.001	PASS
139	139.353	138.647	20.050	19.969	20.009	20.010	0.001	PASS
Test Equipm Manufacture		<u></u>		<u></u>		Serial Numb		
Fluke 744 DP						8495027	613	
	t Field Communic	ator Model 37	75			11007890		
	matic Dead Weig					85348		
	FORMATION					Due carlerate #		
Date	,	Reason For	WOIK			Procedure # AO-I-01		
21-Dec-07		Schedule				AO-I-01		
Comments				Testers				
			•	C.Gordon/	J.Carvaial			



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l ag IL	FIT-2-ASR #4				Serial Number	2031058	; ···	
Setup	Injection / Recha Flow Transmitter	nge r			Rosemount Accuracy	1151DP 0.254019015	HART % of Span	
	Input Low Input High	0.00 1 38.84			Pressure Range Output Low	4 4.000		
	Input Units Tolerance mA	in of H2O 0.041	+/-		Output High Output Unit s	20.000 mA		
	Tolerance inch Dampening	0.353 6.40	+/- Seconds		Square Root Upper Range Limit of TX (URL)	Yes 150	" H₂O	
		0.10	ecconde			150	1120	
On-Line Con As Found Inpu		•	Tolerance		Expected Output			
<u>(in H₂O)</u>	Tolerance Pv +	Tolerance Pv -		– <u>Tolerance AO</u>		Output (Ma)	Error	<u>Pass/ Fai</u>
0	0.353	-0.353	4.041	3.959	4.000	4.004	0.004	PASS
35	35.353	34.647	12.074	11.993	12.033	12.056	0.023	PASS
69	69.353	68.647	15.320	15.239	15.279	15.294	0.015	PASS
104	104.353	103.647	17.888	17.807	17.848	17.858	0.010	PASS
139	139.353	138.647	20.050	19.969	20.009	20.019	0.010	PASS
On-Line Cor								
As Left Input (ii		Tolerance Pv		-	Expected Output		Error	Pass/ Fai
<u>H₂O)</u> 0	± 0.353	-0.353	<u>AO+</u> 4.041	Tolerance AO 3.959	<u>(ma)</u> 4.000	<u>Output (Ma)</u> 3.999	-0.001	
35	35.353	-0.333 34.647	12.074	11.993	12.033	12.033	0.000	PASS
69	69.353	68.647	15.320	15.239	15.279	15.280	0.000	PASS
104	104.353	103.647	17.888	17.807	17.848	17.848	0.001	PASS
139	139.353	138.647	20.050	19.969	20.009	20.008	-0.001	PASS PASS
Test Equipn	antlind							
Manufacture Fluke 744 DF	ers					Serial Numb 8495027	Ders	
Emerson Ha	rt Field Communumatic Dead We					11007890 85348		
	IFORMATION	Reason For	Mork			Procedure #	4	·
Date 22-Dec-07	7	Schedule	WOIK			AO-I-01		
Comments	<u> </u>		_	Testers	-		· · · · · ·	
				C.Gordon/J.	.Carvajal			



Tag ID	FIT-1-ASR #5				Serial Number	2124099)	
Setup	Production / Recover Flow Transmitter Input Low Input High	0.00 138.84			Rosemount Accuracy Pressure Range Output Low	1151DP 0.254019015 4 4.000	HART % of Span	
	Input Units Tolerance mA Tolerance inch	in of H2O 0.041 0.353	+/- +/-		Output High Output Units Square Root	20.000 mA Yes		
	Dampening	6.40	Seconds		Upper Range Limit of TX (URL)	150	" H₂O	
On-Line Co	nmunicator							
As Found Input (in H ₂ O)	<u>Tolerance Pv +</u>	Tolerance Pv		- <u>Tolerance AO-</u>	Expected Output_ (ma)	<u>Output (Ma)</u>	<u>Error</u>	<u>Pass/ Fai</u>
0	0.353	-0.353	4.041	3.959	4.000	4.000	0.000	PASS
35	35.353	34.647	12.074	11.993	12.033	12.034	0.001	PASS
69	69.353	68.647	15.320	15.239	15.279	15.282	0.003	PASS
104	104.353	103.647	17.888	17.807	17.848	17.849	0.001	PASS
139	139.353	138.647	20.050	19.969	20.009	20.008	-0.001	PASS
On-Line Co	mmunicator							
<u>As Left Input</u> (in H₂O)	<u>Tolerance Pv +</u>	<u>Tolerance</u> <u>Pv -</u>	<u>Tolerance</u> <u>AO+</u>	- <u>Tolerance AO-</u>	Expected Output (ma)	Output (Ma)	Error	Pass/ Fa
0	0.353	-0.353	4.041	3.959	4.000	4.000	0.000	PASS
35	35.353	34.647	12.074	11.993	12.033	12.034	0.001	PASS
69	69.353	68.647	15.320	15.239	15.279	15.282	0.003	PASS
104	104.353	103.647	17.888	17.807	17.848	17.849	0.001	PASS
139	139.353	138.647	20.050	19.969	20.009	20.008	-0.001	PASS
Test Equipr								
Manufactur						Serial Numb	bers	
Fluke 744 D		aton Madal 2	76			8495027 11007890		
	rt Field Communic umatic Dead Weig					85348		
	NFORMATION	Deeper Fr				Broadured	4	
Date 23-Dec-07	,	Reason Fo Schedule				Procedure # AO-I-01		
20 200 01								
Comments			_	Testers C.Gordon/J.(
· · · · ·								

in the t

Tag ID	FIT-2-ASR #5				Serial Number	2299718		
	Injection / Recharg	ge			Rosemount	1151DP	HART	
Setup	Flow Transmitter				Accuracy	0.25401901	% of Spa	n
	Input Low	0.00			Pressure Range	4	-	
	Input High	138.84			Output Low	4.000		
	Input Units	in of H2O			Output High	20.000		
	Tolerance mA	0.041	+/-		Output Units	mA		
	Tolerance inch	0.353	+/-		Square Root Upper Range Limit	Yes		
	Dampening	6.40	Seconds		of TX (URL)	150	" H₂O	
On-Line Comm								
<u>s Found Input (in</u> <u>H₂O)</u>	Tolerance Pv +	Tolerance Pv	Tolerance <u>AO+</u>	Tolerance	Expected Output	Output	Error	Pass/ Fa
<u>1,20)</u>	0.353	-0.353	<u>4.041</u>	<u>AO-</u> 3.959	<u>(ma)</u> 4.000	<u>(Ma)</u> 4.000		
35	35.353	-0.000 34.647	12.074	11.993	12.033	12.033	0.000 0.000	PASS PASS
69	69.353	68.647	15.320	15.239	15.279	15.285	0.000	PASS
104	104.353	103.647	17.888	17.807	17.848	17.857	0.009	PASS
139	139.353	138.647	20.050	19.969	20.009	20.020	0.003	PASS
on-Line Comm	unicator							
As Left Input (in		<u>Tolerance</u>	<u>Tolerance</u>	Tolerance	Expected Output	<u>Output</u>	Error	Pass/ Fa
<u>H₂O)</u>	Tolerance Pv +	<u>Pv -</u>	<u>AO+</u>	<u>AO-</u>	<u>(ma)</u>	<u>(Ma)</u>		
0 25	0.353	-0.353	4.041	3.959	4.000	4.000	0.000	PASS
35	35.353	34.647	12.074	11.993	12.033	12.031	-0.002	PASS
69 104	69.353 104.353	68.647	15.320	15.239	15.279	15.276	-0.003	PASS
104 139	104.353 139.353	103.647	17.888	17.807	17.848	17.847	-0.001	PASS
108	139.333	138.647	20.050	19.969	20.009	20.009	0.000	PASS
lest Equipmen	t Used							
Manufacturers						Serial Nu	nbers	
Fluke 744 DPC	ield Communica	har Madal 27	E			8495027		
	atic Dead Weigh					11007890 85348		
	RMATION	Deces 7	- 14/					
Date 26-Dec-07		Reason For	r work			Procedure	2#	
20-Dec-07		Schedule				AO-I-01		
Comments				Testers				
			•	C.Gordon/	I Carvaial			

South West Wellfield -- Alexander Or Water Treatment Plant

CALIBRATION SHEET

<u>As of October, 2003:</u> All recorders have been removed; S.C.A.D.A. system will be powering the transmitters and recording the flow data.

a (* * *

	MIAMI DADE WATER AND SEWER
	MIAMI-DADE
	COUNTY MILAN - DADE WATER AND SEWER
	Procedure# AO-I-01-0
	August 18, 2005 Procedures For Venturi Flow Transmitter Calibrations For Plant And Pay Meters
	CALIBRATIONS
	refield collibrations, ignore step 2 and 11
o a r	ressure input source at least three times more accurate than the transmitter, and allow
o inni	It pressure to stabilize for ten seconds before entering any values
e inpi	
	Inform operations and remove unit from process
	Install a temporary preconfigured transmitter if required by operations (Steps 12-16)
TEP	
1	Drain all water from transmitter (use a compressed air source to remove all water)
2	Converte transmitter on bench (do not move)
3	Connect a pressure source. HART communicator, & digital readout device to transmitter
Ŭ	(need > 250 Ohms of loop resistance for communication)
4	Establish communication between transmitter and communicator.
5	Open bleed valve on Low side, (close equalizing valve)
6	Porform a Zero Trim
7	Perform a 5 step "As Found" test by applying five pressure points and record data
'	(Apply pressures approximately 0%, 25%, 50%, 75%, 100% of span)
	(used input pressure, and analog output on digital readout for each step)
8	Compare the applied pressure to the Process Variable (PV) line on the communicator's
U	On Line Menu
	IF the PV reading on the communicator is outside the expected pressure reading,
	perform a sensor trim as follow:
	Apply a Zero pressure and Perform a Lower Sensor Trim
	Apply a Zero pressure and Perform a Lower Sensor Trim
	Apply a Zero pressure and Perform a Lower Sensor Trim
	Apply a Zero pressure and Perform a Lower Sensor Trim Apply Span pressure and Perform Upper sensor Trim Note: A full sensor trim is recommended even if unit passes test. This will ensure continous compliance with plant standards
9	Apply a Zero pressure and Perform a Lower Sensor Trim Apply Span pressure and Perform Upper sensor Trim Note: A full sensor trim is recommended even if unit passes test. This will ensure continous compliance with plant standards
9	Apply a Zero pressure and Perform a Lower Sensor Trim Apply Span pressure and Perform Upper sensor Trim Note: A full sensor trim is recommended even if unit passes test. This will ensure continous compliance with plant standards Compare the Analog Output (AO) line on the communicator on-line menu to the digital readout device
9	Apply a Zero pressure and Perform a Lower Sensor Trim Apply Span pressure and Perform Upper sensor Trim Note: A full sensor trim is recommended even if unit passes test. This will ensure continous compliance with plant standards Compare the Analog Output (AO) line on the communicator on-line menu to the digital readout device
9	Apply a Zero pressure and Perform a Lower Sensor Trim Apply Span pressure and Perform Upper sensor Trim Note: A full sensor trim is recommended even if unit passes test. This will ensure continous compliance with plant standards Compare the Analog Output (AO) line on the communicator on-line menu to the digital readout device IF the AO reading on the communicator is outside the expected analog reading,
	Apply a Zero pressure and Perform a Lower Sensor Trim Apply Span pressure and Perform Upper sensor Trim Note: A full sensor trim is recommended even if unit passes test. This will ensure continous compliance with plant standards Compare the Analog Output (AO) line on the communicator on-line menu to the digital readout device IF the AO reading on the communicator is outside the expected analog reading, perform an Output Trim Perform a 5 step "As Left" test by applying five pressure points and record data
9	Apply a Zero pressure and Perform a Lower Sensor Trim Apply Span pressure and Perform Upper sensor Trim Note: A full sensor trim is recommended even if unit passes test. This will ensure continous compliance with plant standards Compare the Analog Output (AO) line on the communicator on-line menu to the digital readout device IF the AO reading on the communicator is outside the expected analog reading, perform an Output Trim Perform a 5 step "As Left" test by applying five pressure points and record data (Apply pressures approximately 0%, 25%, 50%, 75%, 100% of span)
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10	Apply a Zero pressure and Perform a Lower Sensor Trim Apply Span pressure and Perform Upper sensor Trim Note: A full sensor trim is recommended even if unit passes test. This will ensure continous compliance with plant standards Compare the Analog Output (AO) line on the communicator on-line menu to the digital readout device IF the AO reading on the communicator is outside the expected analog reading, perform an Output Trim Perform a 5 step "As Left" test by applying five pressure points and record data (Apply pressures approximately 0%, 25%, 50%, 75%, 100% of span) (record input pressure, and analog output on digital readout for each step) Returning to process
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10 11 12	Apply a Zero pressure and Perform a Lower Sensor Trim Apply Span pressure and Perform Upper sensor Trim Note: A full sensor trim is recommended even if unit passes test. This will ensure continous compliance with plant standards Compare the Analog Output (AO) line on the communicator on-line menu to the digital readout device IF the AO reading on the communicator is outside the expected analog reading, perform an Output Trim Perform a 5 step "As Left" test by applying five pressure points and record data (Apply pressures approximately 0%, 25%, 50%, 75%, 100% of span) (record input pressure, and analog output on digital readout for each step) Returning to process Inform operations if to remove a temporary transmitter Flush out impulse lines to remove sediment and trapped air from venturi before reinstallation Reinstall transmitter back on process, attach all connections and impulse lines.
10 11 12 13	Apply a Zero pressure and Perform a Lower Sensor Trim Apply Span pressure and Perform Upper sensor Trim Note: A full sensor trim is recommended even if unit passes test. This will ensure continous compliance with plant standards Compare the Analog Output (AO) line on the communicator on-line menu to the digital readout device IF the AO reading on the communicator is outside the expected analog reading, perform an Output Trim Perform a 5 step "As Left" test by applying five pressure points and record data (Apply pressures approximately 0%, 25%, 50%, 75%, 100% of span) (record input pressure, and analog output on digital readout for each step) Returning to process Inform operations if to remove a temporary transmitter Flush out impulse lines to remove sediment and trapped air from venturi before reinstallation Reinstall transmitter back on process, attach all connections and impulse lines.
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	MIAMI DADE WATER AND SEWER
	MIAMI-DADE WATER AND SEWER MIAMI-DADE WATER AND SEWER August 18, 2005 Procedures For Flow Recorder Calibrations For Plant And Pay Meters
	CALIBRATIONS
Note:	the recorder
Use a c With H/	current input source at least three times more accurate than the recorder ART transmitters, may use the loops calibrated analog out to generate the 4-20ma test signals
	Inform operations and remove unit from process Calibration using transmitter for source ma
STEP	Connect a HART communicator, and establish communication
1	Perform a 5 point "Loop Test" by applying five current points and record data "As Found"
2	(Apply current 0%, 25%, 50%, 75%, 100%)
3	Compare the applied current to the recorder digital readout
	If recorder readings are outside the accuracy limits, perform a calibration
Note:	a company is a sinte and report out of toloropco reading to SUADA
4	Perform a recorder pen adjustment if needed
	Perform a 5 point "Loop Test" by applying five current points and record data "As Left"
1	(Apply current 0%, 25%, 50%, 75%, 100%)
5	Perform a totalizer verification by applying a known % signal and check for proper counts
	If totalizer is out of tolerance, perform necessary corrections and retest.
6	Place unit back in service. Verify reading with operations
7.	Log calibration on chart by writing the Technicians name and the words "Calibration Test"



Linear and Square Root output Calculations

Perform calculations for expected output with or without square root extraction

Transmitter accuracy on the Rosemount 1151 is [0.2 + 0.05 X URL/SPAN]% of span for a square root output transmitter on flow application URL = Upper Range Limit of Transmitter Example: URL for an 1151 transmitter range 4 is 150 inches of water column Intrument Configured 0-130" of water [0.2 + 0.05 X 150/130] =0.258 % of span + or -

Milliamp tolerance: 0.258% or .00258 X 16(ma) = +/- 0.0413 ma

Milliamp calculation for	or a given input:				
Convert input pressure to a percent of the span					
Transmitte	r configured for 0-130 in. 4-20 ma output				
	32.5 in / 130% = 25%				
· · ·	25/100=0.25				
Standard output	(0.25 X 16) + 4 = 8.00 ma				
Square root output	(0.25 Sq Root) X 16 + 4 = 12.00ma				
Oquare reer eutput					

Recorder Accuracy on 392 is 0.5% of Reading + 0.05% of full scale for recorder 1-5 volt input (4-20 ma) Example: recorder configured to 0-100 Total accuracy at 25% input is 100 X .05% = .05 + 0.5% X 25 = 0.125 Total accuracy then is + or - 0.175



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Introduction

ADS, LLC has completed Pitometer Tests on production water meters at the Alexander Orr Water Treatment Plant and well meters in the West Well field. The work consisted of the following:

- Tested, in place, for accuracy four raw water meters and five finished water meters at the Alexander Orr Water Treatment Plant
- Tested, in place, for accuracy three well meters in the West Well field.
- The preparation of this report detailing the results of the tests including velocity profiles of each of the gauging points used to test the meters.

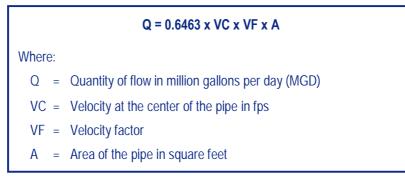
Meter Test Procedures

Master meter tests compared the registration on the meters at supply sources to Pitometer measurements. Pitometer measurements used a pitot tube that was inserted into a pipe carrying the same flow as the meter. The pitot tube had two orifices, one facing upstream and the other facing downstream. The velocity of the flowing water produced a differential pressure between the orifices. The water velocity was calculated from the following equation:

	$V = c x (2 x g x d/12)^{0.5}$							
Where:								
V	=	Velocity in feet per second (fps)						
С	=	A coefficient established by laboratory calibration						
g	=	32.174 feet per second per second						
d	=	Differential pressure in inches of water						

The flow in a pipe can be calculated from the average velocity. Average velocities were measured by conducting a traverse, in which point velocities were measured along the diameter. The measurement points were chosen such that averaging the point velocities calculated the average velocity. The average velocity was divided by the center velocity to calculate the velocity factor, a constant summarizing the shape of the profile.

Flow was calculated from center velocity measurements using the following equation:



Summary of Results

Test		Pitometer Flow	Meter Flow	Percent	
Date	Location	(MGD)	(MGD)	Accuracy	Comments
8/29/2007	ORR WTP 48 Raw Water # 1	24.62	25.47	104%	Meter registers within allowable limits of accuracy
8/29/2007	ORR WTP 54 Raw Water # 2	41.71	43.39	104%	Meter registers within allowable limits of accuracy
9/10/2007	ORR WTP 60 Finish Water # 2	40.56	38.89	96%	Meter registers within allowable limits of accuracy
8/29/2007	ORR WTP 72 Finish Water # 3	26.10	25.96	99 %	Meter registers within allowable limits of accuracy
9/5/2007	ORR WTP 72 Raw Water # 3	35.67	34.60	97%	Meter registers within allowable limits of accuracy
9/24/2007	ORR WTP 48 Finish Water # 1	30.95	30.31	102%	Meter registers within allowable limits of accuracy
9/11/2007	ORR WTP 72 Finish Water # 4 West High Service PS – West A	58.16	60.84	105%	Meter registers within allowable limits of accuracy
9/10/2007	ORR WTP 72 Finish Water # 5 West High service PS – West B	67.05	64.67	96%	Meter registers within allowable limits of accuracy
9/5/2007	ORR WTP 84 Raw Water # 4	78.59	78.76	100%	Meter registers within allowable limits of accuracy
9/21/2007	BA Well #29 @ West Well Field – GE Meter	4.19	4.60	110%	Meter is over-registering
9/21/2007	BA Well #29 @ West Well Field - TOTALIZER	4.19	3.09	74%	Meter is under-registering
8/27/2007	ASR Well #3 @West Well Field	3.84	3.88	101%	Meter registers within allowable limits of accuracy
9/24/2007	BA Well #34 @ Southwest Well Field	15.12	14.41	95%	Meter registers within allowable limits of accuracy

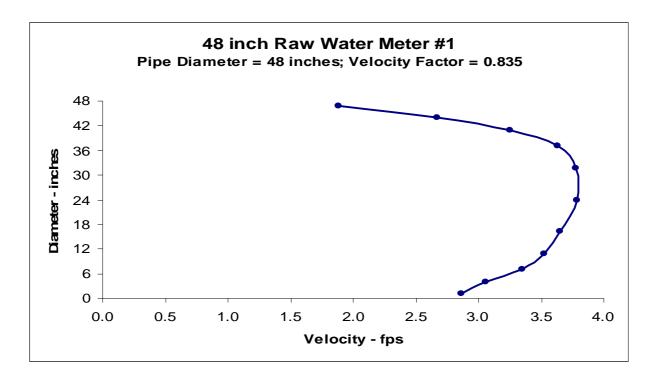
The table below summarizes the master meter test results.

Meter Tests

The following tables show the results of the individual meter tests and the velocity profile at the gauging point used to test the individual meter.

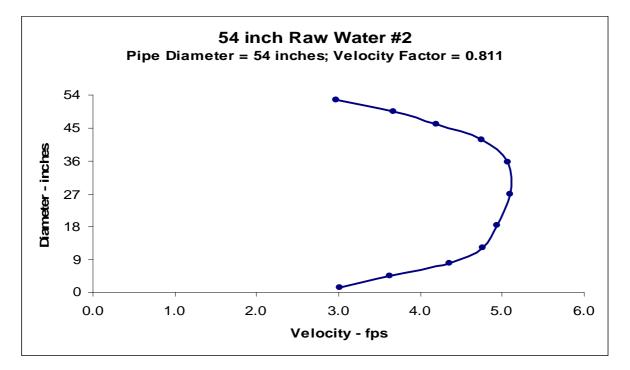
Meter Data	Make/Model	BIF
	Size of Meter	48-inch
	Serial Number	23810
	Size of Pipe at the Pitometer	48 –inch
Test No. 2 Data	Date of Test	August 29-30, 2007
	Length of Test	24 Hours
	Condition of Test	Normal operations
Results of Test No. 2	Pitometer Rate of Flow (gpd)	24,620,000 gpd
	Metered Rate of Flow (gpd)	25,474,000 gpd
	Difference (gpd)	854,000 gpd
	Percentage Difference	3.5% over-registration Meter registers within allowable limits of accuracy.

ORR WTP - 48 Raw Water #1



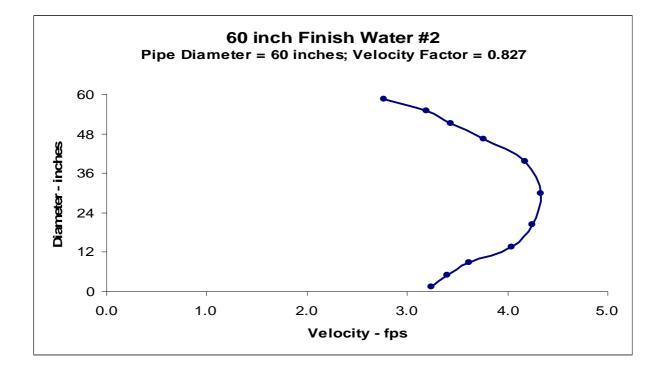
ORR WTP - 54 Raw Water # 2

Meter Data	Make/Model	BIF
	Size of Meter	54-inch
	Serial Number	34303
	Size of Pipe at the Pitometer	54 –inch
Test Data	Date of Test	September 5-6, 2007
	Length of Test	24 Hours
	Condition of Test	Normal operations
Results of Test	Pitometer Rate of Flow (gpd)	41,710,000 gpd
	Metered Rate of Flow (gpd)	43,394,000 gpd
	Difference (gpd)	1,684,000 gpd
	Percentage Difference	4% under-registration Meter registers within allowable limits of accuracy.



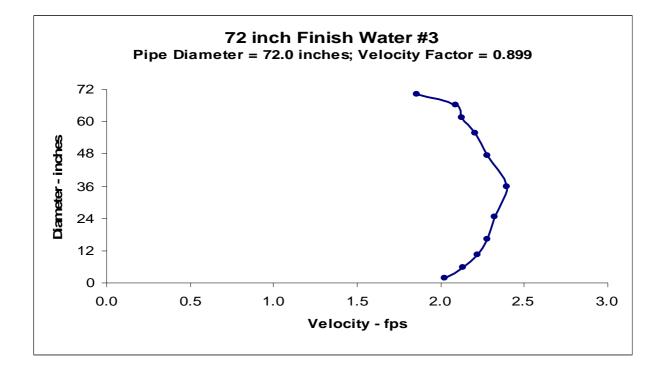
ORR WTP – 60 Finish Water # 2

Meter Data	Make/Model	BIF		
	Size of Meter	60-inch		
	Serial Number	31796		
	Size of Pipe at the Pitometer	60 –inch		
Test Data	Date of Test	September 10-11, 2007		
	Length of Test	24 Hours		
	Condition of Test	Normal operations		
Results of Test	Pitometer Rate of Flow (gpd)	40,560,000 gpd		
	Metered Rate of Flow (gpd)	38,894,000 gpd		
	Difference (gpd)	1,400,000 gpd		
	Percentage Difference	4.1% under-registration Meter registers within allowable limits of accuracy.		



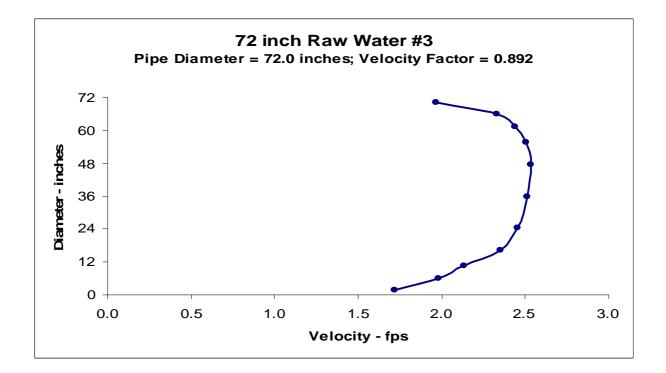
ORR WTP - 72 Finish Water # 3

Meter Data	Make/Model	Badger
	Size of Meter	72-inch
	Serial Number	960658
	Size of Pipe at the Pitometer	72 –inch
Test No. 2 Data	Date of Test	September 6-7, 2007
	Length of Test	24 Hours
	Condition of Test	Normal operations
Results of Test No. 2	Pitometer Rate of Flow (gpd)	26,100,000 gpd
	Metered Rate of Flow (gpd)	25,960,000 gpd
	Difference (gpd)	140,000 gpd
	Percentage Difference	0.5% Under-registration Meter registers within allowable limits of accuracy.



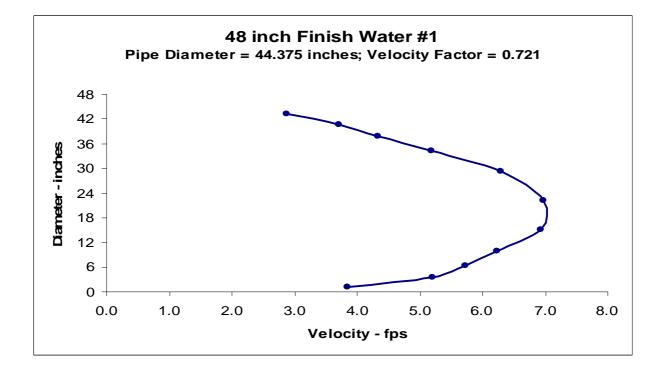
ORR WTP - 72 Raw Water # 3

Meter Data	Make/Model	Badger		
	Size of Meter	72-inch		
	Serial Number	972253		
	Size of Pipe at the Pitometer	72 –inch		
Test Data	Date of Test	September 5-6, 2007		
	Length of Test	24 Hours		
	Condition of Test	Normal operations		
Results of Test	Pitometer Rate of Flow (gpd)	35,670,000 gpd		
	Metered Rate of Flow (gpd)	34,601,000 gpd		
	Difference (gpd)	1,069,000 gpd		
	Percentage Difference	3% Under-registration Meter registers within allowable limits of accuracy.		



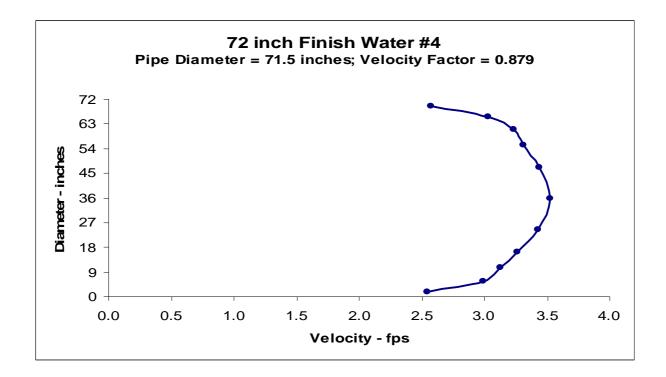
ORR WTP 48 Finish Water #1

Meter Data	Make/Model	BIF		
	Size of Meter	48-inch		
	Serial Number	26622		
	Size of Pipe at the Pitometer	44.375-inch		
Test Data	Date of Test	September 24-25 ,2007		
	Length of Test	24 Hours		
	Condition of Test	Normal operations		
Results of Test	Pitometer Rate of Flow (gpd)	30,950,000 gpd		
	Metered Rate of Flow (gpd)	30,310,000 gpd		
	Difference (gpd)	640,000 gpd		
	Percentage Difference	2.1 % under-registration		
		Meter registers within allowable limits of accuracy.		



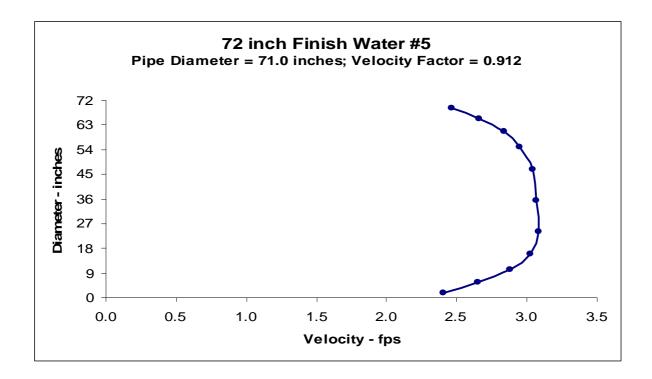
Meter Data	Make/Model	Badger		
	Size of Meter	72-inch		
	Serial Number	945303 – A		
	Size of Pipe at the Pitometer	71.5 –inch		
Test Data	Date of Test	September 11-12, 2007		
	Length of Test	24 Hours		
	Condition of Test	Normal operations; pump West -B was not running		
Results of Test	Pitometer Rate of Flow (gpd)	58,160,000 gpd		
	Metered Rate of Flow (gpd)	60,836,000 gpd		
	Difference (gpd)	2,676,,000 gpd		
	Percentage Difference	4.6% over-registration Meter registers within allowable limits of accuracy.		

ORR WTP – West High Service PS – 72 Finish Water # 4 West A



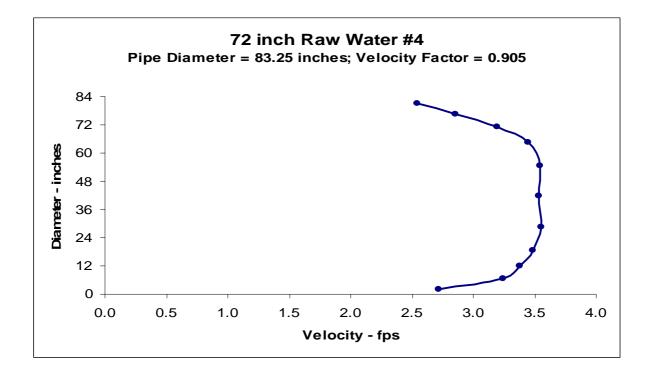
Meter Data	Make/Model	Badger		
	Size of Meter	72-inch		
	Serial Number	945303 – B		
	Size of Pipe at the Pitometer	71 –inch		
Test Data	Date of Test	September 10-11, 2007		
	Length of Test	24 Hours		
	Condition of Test	Normal operations; pump A was not running		
Results of Test	Pitometer Rate of Flow (gpd)	67,470,000 gpd		
	Metered Rate of Flow (gpd)	64,669,000 gpd		
	Difference (gpd)	2,801,000 gpd		
	Percentage Difference	4.2% under-registration Meter registers within allowable limits of accuracy.		

ORR WTP – West High Service PS – 72 Finish Water # 5 West B



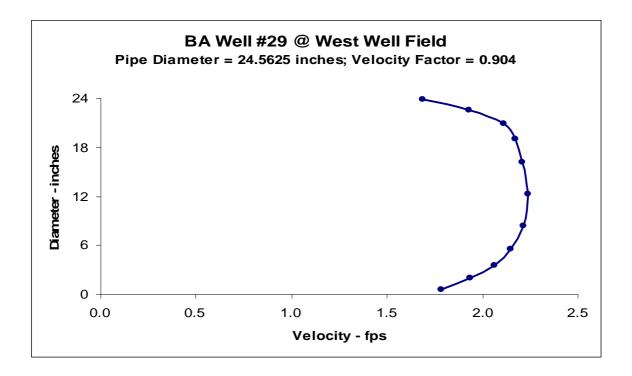
ORR WTP - 72 Raw Water #4

Meter Data	Make/Model	Badger Venturi		
	Size of Meter	72 x 35.982 - inch		
	Serial Number	928358		
	Size of Pipe at the Pitometer	83.25 –inch		
Test Data	Date of Test	September 5-6, 2007		
	Length of Test	24 Hours		
	Condition of Test	Normal operations		
Results of Test	Pitometer Rate of Flow (gpd)	77,730,000 gpd		
	Metered Rate of Flow (gpd)	78,764,000 gpd		
	Difference (gpd)	1,034,000 gpd		
	Percentage Difference	1.3 % over-registration Meter registers within allowable limits of accuracy.		



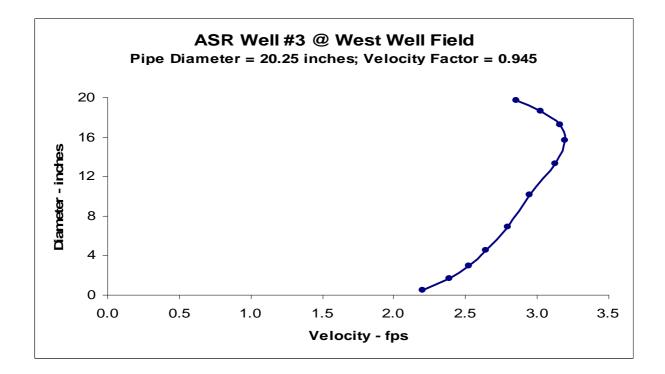
Meter Data	Make/Model	Badger - Totalizer	GE	
	Size of Meter	24- inch	24 - inch	
	Serial Number	540948-C		
	Size of Pipe at the Pitometer	24.5625 inch	24.5625 inch	
Test Data	Date of Test	September 21, 2007	September 21, 2007	
	Length of Test	30 minutes	30 minutes	
	Condition of Test	Normal	Normal	
Results of Test	Pitometer Rate of Flow (gpd)	4,190,000 gpd	4,190,000 gpd	
	Metered Rate of Flow (gpd)	3,089,000 gpd	4,600,000 gpd	
	Difference (gpd)	1,101,000 gpd	410,000 gpd	
	Percentage Difference	26% under-registration	10% over-registration	

BA Well # 29 @ West Well Field – Venturi Totalizer and GE Meters



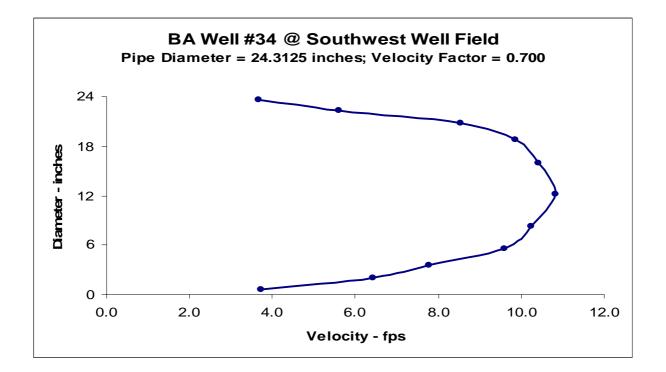
Meter Data	Make/Model	Primary Flow Signal/B HVT-BC Bi-directional Venturi		
	Size of Meter	24 x 14 inch		
	Serial Number	4453-1 and 4453-2		
	Size of Pipe at the Pitometer	20 – inch		
Test Data	Date of Test	August 27, 2007		
	Length of Test	30 minutes		
	Condition of Test	Normal operations; one pump running		
Results of Test	Pitometer Rate of Flow (gpd)	3,840,000 gpd		
	Metered Rate of Flow (gpd)	3,880,000 gpd		
	Difference (gpd)	40,000 gpd		
	Percentage Difference	1% over-registration Meter registers within allowable limits of accuracy.		

ASR Well # 3 @ West Well Field



BA Well #34 @ Southwest Well Field

Meter Data	Make/Model	Primary Flow Signal		
	Size of Meter	24.00"x14.00"		
	Serial Number	4454-2		
	Size of Pipe at the Pitometer	24.3125 – inch		
Test Data	Date of Test	September 24, 2007		
	Length of Test	25 minutes		
	Condition of Test	Normal operations; one pump running		
Results of Test	Pitometer Rate of Flow (gpd)	15,120,000 gpd		
	Metered Rate of Flow (gpd)	14,410,000 gpd		
	Difference (gpd)	710,000 gpd		
	Percentage Difference	5% under-registration Meter registers within allowable limits of accuracy.		



Analysis of Results

Each of the venturi meters at Alexander Orr were tested for a period of twenty four (24) hours while each of the west wells were tested for a thirty minute period. After the set up, Miami Dade instrumentation crew person went to the operations center and took readings of the totalizer. Stopwatches at both locations were synchronized so that readings at the totalizer and the PCR were taken during the same time period. The totalizer readings were compared to the PCR results. Visual readings were taking from the transmitter at each of the wells. The meters at Alexander Orr are registering within allowable limits of accuracy. The 48 inch finished water meter was determined to be accurate after the internal pipe diameter at the gauging point was measured to be 44³/₈ inches. Two of the West Well Field meters, West Well field No. 34 and West Well field ASR 3, were registering within allowable limits of accuracy. The GE meter is 10% over–registering when compared to the flow measured with the Pitometer while the venturi meter is 26% underregistering when compared to the flow measured with the Pitometer.

Water Use Limiting Condition Compliance Report

Comparitive of Measured Withdrawals From Wells and Surface Water Pumps

This report must be completed and submitted to the District at the address shown as required by your permit

Permit Number 13-00017-W Project Name MIAMI-DADE WATER CONSOLIDATED PWS Issued to MIAMI-DADE WATER AND SEWER DEPARTMENT Address P.O. BOX 330316 City, State, Zip: MIAMI FL 33233-0316 Phone / Fax Number: (786)552-8156 / (786)552-8647 E-mail Address: RenfrJ@miamidae.gov

Return To: South Florida Water Management District Attn: Water Use Regulation Division (4320) PO Box 24680 West Palm Beach, FL 33416 - 4680

Well/Pump Name or Number	District Identification Number	Wellhour report: FEB Year: <u>2008</u>	SCADA report: <u>FEB</u> Year: <u>2008</u>	Difference MG	Wellhour By wellfield	SCADA by Wellfield	Difference as %
West Wellfield well 29	27187	88.1	87.5	0.6			1.00716
West Wellfield well 30	27188	0.0	2.7	-2.7			0.00000
West Wellfield well 31	27189	0.0	0.0	0.0	88.1	90.1	0.00000
Orr Wellfield well 4	26304	68.2	72.2	-4.0			0.94408
Orr Wellfield well 5	26306	20.7	20.3	0.4			1.02071
Orr Wellfield well 6	26309	83.5	83.4	0.1			1.00168
Orr Wellfield well 7	26310	93.0	92.3	0.7			1.00747
Orr Wellfield well 8	26311	239.4	240.5	-1.1			0.99551
Orr Weilfield well 9	26312	0.0	0.0	0.0			0.00000
Orr Wellfield well 10	26313	0.0	0.0	0.0	714.8	719.8	0.00000

Water Withdrawals, Comparison Million Gallons

Name of Person Completing Form: Arthur Baldwin

Signature:_

Date: March 4, 2008

Form 0188-QMON (08/03)

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Well/Pump Name or Number	District Identification Number	Wellhour report: FEB Year:2008	SCADA report: <u>FEB</u> Year: <u>2008</u>	Difference MG	Wellhour By wellfield	SCADA by Wellfield	Difference as %
SW Wellfield well 18	27176	356.3	369.4	-13.1			0.96454
SW Wellfield well 19	27177	169.5	177.4	-7.9			0.95558
SW Wellfield well 20	27178	95.7	96.6	-0.9			0.99078
Snapper Creek well 21	27179	97.0	97.3	-0.3	299.4	299.3	0.99703
Snapper Creek well 22	27180	0.0	0.2	-0.2			0.00000
Snapper Creek well 23	27181	202.4	201.9	0.5			1.00264
Snapper Creek well 24	27182	0.0	0.0	0.0			0.00000
SW Wellfield well 25	27183	340.3	340.0	0.3			1.00093
SW Wellfield well 26	27184	133.5	134.2	-0.7			0.99479
SW Wellfield well 27	27185	191.9	200.8	-8.9			0.95547

Water Withdrawals, Comparison Million Gallons

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Well/Pump Name or Number	District Identification Number	Wellhour report: FEB Year: <u>2008</u>	SCADA report: <u>FEB</u> Year: <u>2008</u>	Difference MG	Wellhour By wellfield	SCADA by Wellfield	Difference as %
Floridan Withdrawal Well ASR-2W	27195	52.6	52.8	-0.1636			0.99690
ASR Injection Well ASR -2W	27195	0.0	0.1	-0.1			0.00000
ASR Withdrawal ASR-2W	27195	0.0	0.0	0.0	87.6	88.4	0.00000
Floridan Withdrawal Well ASR-4SW	27196	0.0	0.0	0.0			0.00000
ASR Injection Well ASR -4SW	27196	0.0	0.0	0.0			0.00000
ASR Withdrawal ASR-4SW	27196	0.0	0.0	0.0			0.00000
Floridan Withdrawal Well ASR-5SW	27197	0.0	0.0	0.0			0.00000
ASR Injection Well ASR -5SW	27197	0.0	0.0	0.0			0.00000
ASR Withdrawal ASR-5SW	27197	0.0	0.0	0.0	0	0	0.00000
Raw Water South Miami Heights	101047	0.0	0.0	0.0			0.00000

Water Withdrawals, Comparison Million Gallons

Name of Person Completing Form: Arthur Baldwin

Date: March 4, 2008

Form 0188-QMON (08/03)

Signature:

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Well/Pump Name or Number	District Identification Number	Wellhour report: FEB Year:2008	SCADA report: <u>FEB</u> Year: <u>2008</u>	Difference MG	Wellhour By wellfield	SCADA by Wellfield	Difference as %
Well FP1	128173	0.0	0.0	0.0			0.00000
Well CP 1	128175	0.0	0.0	0.0			0.00000
Well CP 2	128176	0.0	0.0	0.0			0.00000
Well RHP 1	128178	0.0	0.0	0.0			0.00000
Well RHP 2	128179	0.0	0.0	0.0			0.00000
Well RHP 3	128180	0.0	0.0	0.0			0.00000
Well RHP 4	128181	0.0	0.0	0.0			0.00000
Well RHP 5	128182	0.0	0.0	0.0			0.00000
Well RHP 6	128183	0.0	0.0	0.0			0.00000
Well RHP 7	128184	0.0	0.0	0.0			0.00000

Water Withdrawals, Comparison Million Gallons

Name of Person Completing Form: Arthur Baldwin

Signature:

4

Date: March 4, 2008

Water Use Limiting Condition Compliance Report

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Well/Pump Name or Number	District Identification Number	Wellhour report: FEB Year: <u>2008</u>	SCADA report: <u>FEB</u> Year: <u>2008</u>	Difference MG	Wellhour By wellfield	SCADA by Wellfield	Difference as %
Well FB2 NWWF	217721	0.0	0.0	0.0			0.00000
Well FB3 NWWF	217722	0.0	0.0	0.0	0	0	0.00000
Well RO 1 Hialeah	217724	0.0	0.0	0.0			0.00000
Well RO 2 Hialeah	217725	0.0	0.0	0.0			0.00000
Well RO 3 Hialeah	217726	0.0	0.0	0.0			0.00000
Well RO 4 Hialeah	217727	0.0	0.0	0.0			0.00000
Well RO 5 Hialeah	217728	0.0	0.0	0.0			0.00000
Well RO 6 Hialeah	217730	0.0	0.0	0.0			0.00000
Well RO 7 Hialeah	217731	0.0	0.0	0.0	0	0	0.00000
Well EVRGL 3	23821	0	0.0	0			0.00000

Water Withdrawals, Comparison Million Gallons

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Signature:_

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Well/Pump Name or Number	District Identification Number	Wellhour report: FEB Year:2008	SCADA report: <u>FEB</u> Year: <u>2008</u>	Difference MG	Wellhour By wellfield	SCADA by Wellfield	Difference as %
Well 3 MS Lower	28263	2.53	1.63	0.90	.e		1.55124
Well 4 MS Lower	28264	2.15		2.15			#DIV/0!
Well 5 MS Lower	28265	41.25	31.00	10.25			1.33054
Well 7 MS Lower	28266	18.22	14.41	3.81			1.26443
Well 8 MS Lower	28267	10.24	8.1	2.14			1.26383
Well 6 MS Lower	28268	101.05	95.32	5.73			1.06012
Well 9 MS Upper	28269	16.62	14.43	2.19			1.15195
Well 23 MS Upper	28270	40.14	32.12	8.02			1.24965
Well 14 MS Upper	28271	82.23	75.10	7.13			1.09490
Well 15 MS Upper	28272	0.61	0.97	-0.36			0.62415

Water Withdrawals, Comparison Million Gallons

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Well/Pump Name or Number	District Identification Number	Wellhour report: FEB Year: <u>2008</u>	SCADA report: <u>FEB</u> Year: <u>2008</u>	Difference MG	Wellhour By wellfield	SCADA by Wellfield	Difference as %
Well 3 Preston	28283	84.87	68.20	16.67			1.24448
Well 4 Preston	28284	198.00	129.57	68.43			1.52814
Well 5 Preston	28285	138.31	94.21	44.10			1.46810
Well 6 Preston	28286	99.85	80.51	19.34			1.24016
Well 7 Preston	28287	155.80	164.96	-9.16	948.25	712.98	0.94444
Well 11 Hialeah	28288	0.09	3.21	-3.12			0.02750
Well 12 Hialeah	28289	2.98	0.48	2.50			6.21663
Well 13 Hialeah	28290	3.22	3.82	-0.60	6.29	7.51	0.8424
Well 1 NWWF	28291	348.99	348.69	0.29			1.00084
Well 2 NWWF	28292	353.50		-9.97			0.97256

Water Withdrawals, Comparison Million Gallons

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Well/Pump Name or Number	District Identification Number	Wellhour report: FEB Year: <u>2008</u>	SCADA report: <u>FEB</u> Year: <u>2008</u>	Difference MG	Wellhour By wellfield	SCADA by Wellfield	Difference as %
Well 13 NWWF	28303	239.23	276.09	-36.86			0.86650
Well 14 NWWF	28304	55.41	35.53	19.88			1.55970
Well 15 NWWF	28305	237.75	282.47	-44.72	2459.96	2543.63	0.84168
Pump SMH recharge	217931	0.00	0.00	0.00			0.00000
Pump SWWF recharge	217932	0.00	0.00	0.00			0.00000
Pump SWWF recharge 2	217933	0.00	0.00	0.00	0	0	0.00000

Water Withdrawals, Comparison Million Gallons

Name of Person Completing Form: Arthur Baldwin

Date: March 4, 2008

Form 0188-QMON (08/03)

Signature:

Water Treatment Division Data Evaluation and Automation Project

Project Overview

This effort is a prelude to; and in support of the systems analyses leading to the development of a Sequel Server DB and associated ASP.Net application for capturing the various data fields representing the activities associated with the production of potable water. The following information is task specific, based on report development needs. ASP.Net is suggested because of its ability to provide a secure multilevel data entry/query environment for selectable data generation responsibilities and requirements. Additionally, the deployment of an application using this program provides a unique opportunity to better utilize network resources for periodic inquiries for essential process monitoring. The suggestion of Sequel Server DB is based on the need to maintain the data, from a historical perspective, in a manner which reduces problems with localized data retention/restoration requirements, and also supports multilevel secure data interrogation without the additional requirement of an interface device such as a "Citrix" server. The use of these functional programs and data storage systems does however require a software interface for report generation. In the absence of clearly focused requirements, it is suggested that "Crystal Report Writer" and "Cognos" software products be evaluated for inclusion in this project. Each of these products can translate data strings in either "Oracle" or "Microsoft SQL" formats

The present system of capturing data for reporting purposes has been developed over a number of years and has evolved into an enormous task centered on a single reporting format managed by a single individual. The absence of uniquely trained staff is a major problem area in this regard. This enormous vulnerability has, and continues, to expose the regulatory reporting process to multiple failures. Conceptually, the systems as outline above eliminate this vulnerability by automating the data capture and report generation process and allows the data entry tasks to be apportioned throughout the treatment facilities. Management reports as well as operating reports will be available to authorized on-line users using ASP.NET routines. Data integrity can be managed effectively using "scripts" programmatically assigned to specific data entry fields. This also eliminates the need for local data storage capably because validated data is stored in a database which resides on mainframe storage.

Background

The Division is required to produce and submit a number of regulatory reports monthly. These reports are commonly referred to as MOR's (Monthly Operating Reports). The agencies that receive these reports are the Florida Department of Environmental Protection (DEP), the Florida Department of Health (DOH), Miami-Dade Department of Environmental Management (DERM) and the South Florida Water Management District (SFWMD). The completion of each of these respective report formats is the basis of the design effort for this project. These reports must be submitted to the above referenced agencies by the 10th of the month following the data collection period. Additional, this data must be maintained in accordance with Florida Administrative Code (FAC) guidelines for a period of 10 years. This process also generates management data for inventory control and balancing

Backround cont:

1

equipment runtimes. The reports generated by this data are only available after all of the monthly data has been tabulated which limits its effective use for daily process management activities.

The manual collection of required reporting data is presently accomplished through a number of EXCEL spreadsheets which are included in the attached diskette. Facility specific operational data, and chemical application data, is transferred from shift operating reports directly into a preliminary MOR by senior operating staff for review by Plant Managers. Laboratory data is handled in a similar manner with the exception that this data is first entered into a spreadsheet generated by each laboratory and later transferred to the referenced preliminary MOR. The chemical application data is also used to develop additional process management reports including inventory reports in support of procurement activities. Operational data, which includes "equipment run times" and "flow rates" are manually captured by specific spreadsheets and transferred to the required multi-agency regulatory reports. The Excel Spreadsheets listed below are the actual MOR reports for December 2005 and are presently being manually produced.

<u>Folder Name: DEP MOR's</u> – Hialeah, Preston, Orr, South Dade System (5 sheets) and Parks Department Plants (5 sheets). Included in this folder is an actual copy of the completed 12-05 MOR for the Hialeah WTP

These reports are the essentially the primary reporting elements for the system. They are produced at the end of each operating month and are unique to each facility. Additionally, data for the various management reports (detailed later in this discussion) will be developed based on the data captured by the system

Folder Name: DOH MOR's - Main System (combined plant data), and Rex System (combined plant data)

Folder Name: SFWMD MOR's - Hia PP Quarterly Well Withdrawal, AO Quarterly Well Withdrawal, and Rex Quarterly Well Withdrawal.

Folder Name: ASR Reports - PDF Report format

Supporting Spreadsheets

The following spreadsheets are used to develop the data by range with the necessary calculated values for each field (column) in the associated MOR. The data is entered in the entry fields and transferred to the MOR's using cut and paste technique.

<u>Folder Name: Lab Data Reports</u> - Hia Daily Raw Water Lab Report, Hia Daily Finished Water Lab Report, PP Daily Raw Water Lab Report, PP Daily Finished Water Lab Report, AO Daily Raw and Finished Water Lab Report.

Folder Name: Well Hours - Hia PP Well Hour Report, AO Well Hour Report

Supporting Spreadsheets cont:

.

Folder Name: Pumpage Balancing Report - WTP Finished Water Balancing Report

Folder Name: Bulk Chemical Reports - Inventory Report for each WTP

Folder Name: ASR Reports - Operational data for ASR Facilities

Folder Name: Lime Plant Reports - Operational data for Lime Plants

As mentioned earlier, a number of these excel spreadsheets contain calc fields which generate data which is transfer to the actual report. At this juncture, it is anticipated that these calc fields will not be part of the MOR's reports; rather the values should be calculated programmatically, which will allow both the raw data and the calculated data to be accessed for reporting purposes. This concept includes any planned daily reports.

The MOR spreadsheets contain the name and licensing information for the plant staff at each respective WTP. For security and management purposes any data values entered for a specific operating shift should be linked to the actual personnel who reported the data. This is also true for Lab personnel, Water Administrative personnel, or other management staff that perform data entry. The application should also include a table for access authority for additional users which will be identified after the application is on-line.

The various spreadsheets which have been developed during the report generation process are also the data collection points for historical operating records mentioned earlier. This historical data must be preserved in its present "XLS" format because at this point, it appears that we will not be able to migrate or transfer this information to a Sequel Sever DB. In that regard, the data cannot be used for historical data inquiries used in the new application. This means that we must continue to store this data for future reference until it becomes historically obsolete.

The following information is a general over-view of the data generation and input process.

<u>Task 1</u>

Plant Operators record Raw Water and Finished Water totalizer readings, Filter Operational Data, Well Hour Run Time Readings, and Chemical Addition Data including inventories, on the daily reports for each facility. Data entry personnel enter the totalizer reading into a excel spreadsheet (Plant Name – Balanced Raw and Finished Readings.xls). Well Hour run time readings which are taken by Plant Shift Operators and recorded on the Daily Report. They are manually entered into an Excel spreadsheet for each Month (Plant Name month year.xls). A special note regarding these spreadsheets; it contains the SFWMD ID# for each well and also it design rated capacity in MGD, which should be included in the finished application as separate tables which reduces the need for DB "Restructures" as equipment or facilities are added to Divisional responsibilities. There are several individual data and calc fields in these files which calculate the individual well pumpage

Task 1 cont:

rates based on run time in hours x capacity. The data is summed for an accuracy check against the daily Raw Water Pumpage for each plant. These fields are transferred (copy/paste) to the main Balanced Raw and Finished Water spreadsheet mentioned under Task 3. Chemical Data is entered into the calc fields on the MOR's which are outside of the printable ranges on the spreadsheet which populate the dosage fields and pound fields on the MOR. This data is also entered on the Bulk Chemical spreadsheet for accounting purposes.

1.1.1.2

Task 2

Laboratory Data for each day is entered on a preliminary MOR in the facilities operations room. This data is later entered manually into the MOR spreadsheet for each facility.

<u>Task 3</u>

The calculated data developed by the Balanced Raw and Finished spreadsheet is transferred to the MOR Spreadsheet. This data is also used to populate the fields on the SFWMD MOR spreadsheet. Special note concerning the Balanced Spreadsheet. It must be reconciled with anticipated values to ensure accuracy. An error at this point can cause the Raw and Finished Flow ranges on all associated spreadsheets to be understated or overstated. This is a glaring mistake that undermines the integrity of the submittals.

Task 4

The Lime Reconciliation spreadsheets are used to reconcile inventories plus purchased materials with actual treated water parameters. This report component is necessary because the instrumentation used to tabulate the actual amount of chemical fed is highly inaccurate.

Task 5

Aquifer Storage and Recovery (ASR) report is a relatively new component for the divisional reporting process. Originally, the data was tabulated manually by field visits supporting operational and laboratory records. The task has become extremely protracted, taking almost 1 week of administrative time per operating month to compile into a completed report. This task should be

Task 5 cont:

automated programmatically and reduce the exorbitant administrative time presently required. The Excel spreadsheets in the attached diskette are developed from data manually extracted from the SCADA system. Laboratory data is still being compiled and entered into the finished report manually.

<u>Task 6</u>

Shift operating data is compiled manually by plant staff for inclusion into the monthly report for each plant. The associated tables use generalized calc fields to determine production rates and operational costs.

Each of the tasks mention above interacts with each other to some extent. Although extreme diligence was used in preparing this project outline, there maybe a number of areas which were not thoroughly addressed or even mistakenly omitted. In addition, there are a number of time constraints which need to be considered. This is especially true for laboratory data. Generally lab data is available by noon for the previous operating day. Weekends and holidays are a notable exception. The availability of "SCADA" data is another area which needs further study. Informational requirements for other user Divisions also have not been addressed. Presently the MOR's are circulated to these Divisions, and they use whatever data they need to generate their respective reports.

There are several areas that also need to be addressed regarding interfacing additional sources of automated data. The Department operates an extensive Supervisory Control and Data Acquisition System "SCADA" system which in addition to its primary control functionality, can alternatively provide data logs for operational equipment. Data for reports is presently collected manually because of the lack of an effective automated data interface. This system utilizes both "SQL" and "Oracle" based formats for data storage. The Departments also operates a "LIMS" system for the management of its Laboratory data. This system stores data in an "Oracle" data base format. The system functionally uses a "Citrix" server to isolate data queries form the database structure for security purposes. Both of these active systems can provide a portion of the necessary data to populate fields used to produce regulatory and management reports while enhancing overall Water Treatment management activities by providing periodic observations of process or treatment system stability.

The development of this system is not intended to eliminate daily operational logs or manual data sheets presently used by any division. It is intended to eliminate the double and triple data entry tasks the Water Production Division currently uses. The realization of this system will require involvement of Departments MIS Division and Miami Dade County's ESTD as well as divisional data and MIS specialists. Once completed, the streamlined data management process will provide a vehicle to consistently meet regulatory reporting guidelines and provide easily assessable data for needs assessment the management of treatment plant activities.

Project Scope Document

Project Name:

Monthly Operating Reports On Demand

Business Background:

The Water Production Division of the Miami-Dade Water and Sewer Department (WASD) is responsible for the safe and efficient provision of water to the Miami-Dade County populace, numbering around three million. The Division pumps water from wells and treats the water at one of three plants: Alexander Orr, Hialeah, and Preston. Various regulatory agencies, including Miami-Dade County's Health Department and Department of Environmental Resources Management, the South Florida Water Management District and the State of Florida's Department of Environmental Protection and Department of Health, require periodic reports concerning the production of water, known collectively as Monthly Operating Reports (MOR's). Most of the reports are due by the 15th of each month, although there are some that are quarterly, semi-annual or annual. WASD personnel collect data readings from all pertinent pumps, treatment devices and laboratory analyses. The readings are then entered on one or more working forms, and are combined into multiple layers of spreadsheets until a final report can be produced. Some of the data on these MOR's include: amounts of raw and treated water pumped, hours of operation of each pump, chemicals used to treat the water, and laboratory results of water analysis.

At present, all readings are either keyed in to one of dozens of spreadsheets, or handwritten on preprinted forms and later transferred to spreadsheets. It happens that an operator jots down readings on scrap paper, then transfers the entries to a paper form. Another employee transfers from the paper form to a spreadsheet, then faxes the results to another office, where the figures are transcribed from the fax to a "master" spreadsheet. In addition to the recopying of data entries, the operators who record the entries very often have to arithmetically manipulate the data from one form to another, such as reading the height of a chemical storage bin in feet, yet converting that figure and entering the amount stored in pounds.

Another example of laborious data entry is that, on many worksheets, a meter's current reading and a previous reading are both entered and the data entry person calculates the difference, which he also enters. This is repeated at each reading, so that rather than merely entering 12 two-hourly readings for the day, the existing data entry consists of 36 items, requiring 12 separate subtractions, two separate summations of the readings, and an averaging of the readings. The operator's arithmetic is simply accepted at face value, and is carried along with no verification.

The recopying and calculations by hand can have consequences beyond imposing an extra work load on the operators. Errors, whether in copying data entries or in arithmetic, may trickle through the MOR's, and may not be noticed until the middle of the next month when the reports are produced, or even later. The person responsible for the reports must examine them all for anomalies. If erroneous reports are actually filed, WASD can be subject to significant penalties. If any mistakes are found (whether before or after the reports are filed), he must work backwards to determine where errors crept in, so that he can correct them and revise the report.

Project Objectives:

This project's goal is to automate the handling of the data required for the monthly and other reports to the extent possible, to make the reports quicker and simpler to produce, and to improve the integrity of the data reporting process. A guiding principle is that no datum should be entered more than once, and any calculations should be automatically verified or flagged if seemingly incorrect. To help insure accuracy in data entry, rules are to be developed and applied specifying allowable values, indicating unexpected inputs, and providing override permission as required. In addition, the entry and modification of data should be governed by specific rights, such as who can do so and when. Any changes that are made to database entries should leave a clear audit trail as to what was done, when and by whom it was done, and require an explanation as to why it was done. Finally, to the extent practicable, data entry and retrieval should be done via a web-based front end.

Four levels of reports are required: Exceptions, Trial, Final, and Revised.

- Exceptions reports are working documents that should be produced on screen daily, showing supervisors any unexpected results that may be possible errors in the most recently entered data. By keeping current with these exceptions reports, supervisors would be able to either document the explanations for questionable data, or quickly find and correct the causes if they are actual errors.
- Trial reports are to be created as an aid to preparing the required reports to the agencies mentioned above, and also as a tool for tuning plant operations. It should not be necessary to wait for month's end to prepare these. They should be producible "on demand." That is, at any time, the current month's trial reports should be able to be produced, incorporating the data to date. On the 11th of a month, that month's report should be able to be viewed with data included through the 10th of the month, etc. This is to enable corrective action to be taken before problems can affect later operations and decisions. (For example, recordings that show a pump producing significantly less than its capacity may not be erroneous they may indicate the need for repairs.) Producing such reports on an interim basis also makes much simpler the task of discovering where the problems lie.
- Final reports, of course, can only be created when all data has been input.
- Revised reports can only be made after a final one has been prepared.

These last two types of reports are to be saved in report form for the same 10 year minimum as the raw data. Besides the Water Production personnel who create the reports, other users should be able to easily retrieve them via a web-based request. This is in contrast to the current situation wherein a user from another division has to ask Water Production for copies to be faxed, sometimes with no notice, yet with great urgency.

Justification:

• More efficient report handling

The basic aim of the project is, as the name indicates, the production of Monthly Operating Reports On Demand. The current regulatory requirements dictate the production of monthly reports. The reports are very time consuming to prepare, requiring the combined efforts of several people in order to meet the deadlines. Treatment Plant Operators (TPO's) enter the original data by pencil on dozens of disparate forms; any errors may not be noticed for weeks, or even years, when some governing agency investigates, or perhaps not ever

A tangible benefit also accrues to the Department by the avoidance of regulatory infractions. If we are found to be not in compliance with a given regulation, we can be assessed fines of up to \$100,000 per day. From a broader viewpoint, users will be able to get reports when requested, even before the end of a month. More timely preparation of reports will lead to earlier discovery of errors and will provide the lead time for corrections to the reports to be made.

• More efficient monitoring of plant operations

The data collected for the MOR's is interconnected, and the use of a relational database to store readings will enable related bits of data to be usefully combined. For example, if an operator notices the pH of the water is too high, he has many choices as to how to react. Among other choices, he can: do nothing and hope it gets better on its own, he can increase chemicals to lower the pH, or he can notice that a water pump has shut down, and then take appropriate action for it. Currently, the various bits of information are separate. By having the data automatically correlated, we will receive the earliest possible warning of problems that may occur, and be in a better position to correct them in a timely fashion, enabling the plants to be run more smoothly, efficiently, and safely.



Deliverables:

• Database

This project will ultimately provide a relational SQL database to include tables of personnel, tasks, equipment, inventory, rules and readings, from which the MOR's can be generated at will. The database will support standard production security.

• <u>Interface</u>

For most users, the primary interface will consist of a series of data entry forms, suitable for easy viewing on a tablet or laptop PC. Some of the forms/tasks would include:

- Administrative
 - adding employees
 - revising employee assignments
 - adding equipment
- Supervisory
 - modifying equipment parameters (e.g., maximum flow, acceptable temperatures, etc.)
 - preparing a MOR for review and for submittal
 - adding inventory purchases
- Operational
 - entering readings (e.g., amount of chlorine fed, pH of finished water, etc.)
 - recording inventory

The forms should have a generally uniform look and feel, and be easily navigable, such as by a "tab system" or on-screen menu boxes. They will be created in an ASP.Net framework and be available with a full screen view, on a laptop or standard desktop monitor of a PC connected to the WASD intranet. As a subsequent phase, the application can be configured to use mobile devices for data acquisition. The device will need to be wirelessly connected to the database and operate in real time, or the input will be uploaded to the database via a docking procedure (whether connected by wire or wirelessly).

LIMS Extraction Service

The laboratory staff uses a LIMS (Laboratory Information Management System) that provides for creating various forms of output. The lab personnel will produce an Excel spreadsheet via the LIMS. The MOR On Demand will provide a background service that will extract the required information from the spreadsheet for storage into the SQL database. It will not be necessary for them to incorporate a new means of data entry, and certainly will not require any cut and paste or other resending of readings.

• <u>Reports</u>

There are various reports currently being produced for the State or County agencies mentioned before that will be duplicated in an "on demand" environment. Users will be able to generate these reports during the middle of the month, rather than having to wait until the end. In addition, there will be new reports for internal use that will be created to improve the functioning of the TPO's. For example, a report will be compiled showing residual chlorine and chlorine flow - items that are currently tracked, but on different forms, perhaps in different places, and by different people. By having them on a single view, a TPO can adjust the flow to raise or lower the level of residual as necessary.

The deliverable for Reports, then, will consist of two steps. The first will deliver the report formats requested by TPO's or Water Production management. These reports will have sample (although realistic) data, and will serve to confirm the structure and handling of data for the reports. A second step will consist of the reports produced with real and current figures, which will confirm the actual gathering of data, and serve as a test of the project.

• Training sessions

Using the principle of "Train the trainers", a short series of sessions will be provided for the different levels of users:

- Liaison John Spanioli (for overall technical background and first responder support)
- Administrative functions -Jack Epaves, Ed Turner, Jon Hansen
- Report preparers Art Baldwin, Sameena Ahmed
- Treatment Plant Operators to be selected

Key Milestones:

Milestones will include:

- Acceptance of this document
- Delivery and acceptance of user interface illustrating the tasks that will able to be done
- Delivery and acceptance of standard reports that can be produced On Demand
- Walkthrough with real data (parallel to old method) producing MOR On Demand and "extra" requested reports. This will constitute the testing phase of the project and will conclude with user acceptance.
- User Training completion and project adoption

Key Resource Requirements:

The Water Production Division contacts and subject matter experts include:

- Project Sponsor: Tom Segars
- Project Manager: John Spanioli
- Subject Matter Experts
 - Report Preparers: Art Baldwin, Sameena Ahmed
 - Administrators: Jack Epaves, Ed Turner
 - Plant Supervisors: Jon Hansen, Art Baldwin

The MIS analysts that have been provided for this project are:

- Technical Lead: Yaakov Rudd
- Technical Support: Arsenio Gonzalez

NetAdvantage for .Net, from Infragistics, is a software tool that has been identified as important to the project's success. This tool will enable rapid and consistent development of the user GUI interface, and will be useful in all future .Net projects.

Schedule:

A schedule will be established to allow for the following:

- Approval to proceed
- Requirements definition
- Completion of database design
- Delivery and acceptance of user interface illustrating the tasks that will be able to be done
- Delivery and acceptance of dummy regulatory forms and additional reports (automatically filled in by sample database data)
- Testing
- User Training completion and project adoption

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• Production

Personnel Affected:

This project will impact a variety of personnel in the Water Production Division. In addition to "general" users who will have access to view data and generate their own copies of reports, etc., the following groups of individuals will be directly involved either in data entry, supervisory or administrative capacities:

- Division Chief
- Treatment Plant Chief
- Treatment Plant Supervisor
- Treatment Plant Operator II 12
- Treatment Plant Operator I 20

Constraints:

The timeframe of this project will be reduced by the use of Infragistics' NetAdvantage, a .Net development tool that assists in rapid application development. It is expected to be a re-usable part of all the .Net applications designed in WASD. Without it, the timeframe will need to be expanded to allow for in-house development of the same functions.

Assumptions:

The data that currently populates the MOR's generally comes from instrument readings, but not always. Our assumption is that the readings will be used as the source of the monthly entries, but that they may be overridden by individuals with sufficient authorization. Any overrides will need to be given a justification that will be made available for audit purposes.

There are some readings that are currently being captured by a SCADA system, especially for the Aquifer Storage and Recovery (ASR) wells. However, there was no immediate interest in trying to use these readings or to increase the equipment that is being monitored. It may be that a future follow-up project will be requested to interface with current and/or future automatic data capture. The Water Production representatives indicated they do want the ASR wells to be included, but they preferred to delay inclusion of the ASR data until a later phase of this project.

IT contract staff will be retained for the duration of the project.

Risks:

Additional equipment, such as pumps or chemical feeders, may be placed into operation, and although the database is being developed to allow for such expansion, it is possible there may be unanticipated requirements for tracking the operation of the new equipment such that the database needs to be revised. If so, a then-current analyst will need to make the appropriate modifications.

Additional reports, or modifications of existing ones, may be required by external agencies, for which new interfaces would need to be developed. If so, a then-current analyst will need to accommodate the requirements.

Inability to keep IT contract staff will delay project completion.

Concerns:

• Calculations by hand

Although most data entry consists of single readings, the current data forms also demand some calculations. All of them are able to be done by computer, and the results can be automatically filled in where needed. For example, "the rate of chemical flow times the number of hours equals the amount of chemical." Rather than automating this entirely, the management has indicated they would prefer some calculations still to be done by the Treatment Plant Operators (TPO's). Accordingly, reports that require calculated results will (in the event of miscalculations) signal the user that his results are incorrect, but will not display the correct results. This has the double benefit of helping train the user, and also catching such incorrect input as typos, forgotten decimals, etc. The computer will compare the operator-entered result with the "right" one, and signal when discrepancies occur; however, it seems a waste of the computer's usefulness to still require such tasks as performing long division by hand.

• Not making use of SCADA

Each recopying of data naturally provides more chances for entry errors, the minimization of which should be a significant goal of this project. It follows that the first transcription of a data reading creates the first opportunity for error. Some of the data is available through a SCADA system already in use. However, the Division's management prefers that even those readings be entered manually. They do, however, wish to use the SCADA data for a sort of verification, to insure readings entered by hand are "reasonable" when compared to the SCADA information. The use of SCADA to provide equipment readings would reduce the likelihood of entry errors wherever SCADA is available. If this is done, a backup method for data entry must be provided for those times when the SCADA system is not operational.

• Personnel supervision

The automation of the data collection and report preparation are the prime objectives of this project. However, the Water Production Division is asking to design the proposed solutions in such a way as to incorporate certain oversight functions, also.

For example, the division's management considers that there is a tendency for employees to assume all equipment is correctly working. At the end of a shift, readings for the entire shift might be entered all at one time, without actually having checked at the required intervals. Additionally, one employee might enter readings that his colleague should have made, "covering" for him and calling into question the integrity of the entire data collection process. To prevent those types of misconduct, management has requested that the system enforce automatic logoffs after periods of inactivity, and require periodic logins of the operators, in addition to requiring the arithmetic to be done by the operator (as mentioned before), and setting time limits as to when readings can be entered.

It's true that one can claim benefits to such an approach (beyond being likely to catch employees not performing their assigned duties appropriately): TPO's will better understand the workings of the plant and be more likely to notice anomalies; requiring the entry of quite a few data items every hour or two can simply serve to make sure the TPO stays awake throughout his shift. Nonetheless, it is hard to escape the feeling that this is a use of technology to enforce what is essentially, and more properly, a personnel supervision issue.

Current Status:

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A series of meetings have been held with key personnel from the Water Production Division in order to better understand the current processes of data collection and report preparation, and what is being requested of this project. At each meeting, Yaakov Rudd and Arsenio Gonzalez were in attendance representing the MIS Division. The main Water Production personnel interviewed at each meeting are shown

September 1	Alex Orr	Spanioli, Baldwin, Epaves, Ureña(MIS)
September 4	Alex Orr	Spanioli, Baldwin
September 12	Alex Orr	Spanioli, Meacham
September 18	Douglas	Baldwin
September 22	Hialeah	Spanioli, Baldwin, Segars, Hansen
September 27	Alex Orr	Spanioli, Baldwin
October 24	Alex Orr	Spanioli, Baldwin, Epaves, Ahmed
		•

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miamidade.gov

Electronic Correspondence/ Original via Certified Mail/ Return Receipt Requested 7003-1680-0004-5544-0331

October 23, 2007

CCN: 50401 File No.: 8DC.14.28.2

Ms. Carlyn Kowalsky, Managing Attorney Office of Counsel South Florida Water Management District P.O. Box 24680 West Palm Beach, FL 33416-4680 Email: ckowalsk@sfwmd.gov

Re: Miami-Dade County Interim Consumptive Use Authorization and Agreement (Order No. 2006-072-CO-WU). Revised Plan To Address Raw Water Flow Measuring Adjustments Table 1, Item II c

Dear Ms. Kowalsky:

Please find enclosed Miami-Dade Water and Sewer Department's (MDWASD) Revised *Plan to Address Raw Water Flow Measuring Adjustments*.

If you have any questions concerning this submittal, please contact me at 786-552-8112 or Ms. Bertha Goldenberg, P.E. at 786-552-8120.

Sincerely.

S. Burns sburns@sfwmd.gov

M. Elsner melsner@sfwmd.gov

K. Smith karsmith@sfwmd.gov

K. Guerrero kguerrer@sfwmd.gov

Rafael A. Terrero, P.E. Assistant Director

Enclosure

CC:

Property Appraiser Public Library System

Police

Public Works Safe Neighborhood Parks

Procurement Management

- Seaport
- Solid Waste Management
- Strategic Business Management
 - Team Metro
 - Transit
- Task Force on Urban Economic Revitalization
 - Vizcaya Museum And Gardens Water & Sewer

Delivering Excellence Every Day



ADA Coordination Agenda Coordination Animal Services

Art in Public Places

Aviation

Building

Audit and Management Services

Building Code Compliance

Community Action Agency

Community Relations

Emergency Management Employee Relations

Enterprise Technology Services

General Services Administration

Fair Employment Practices

Historic Preservation

Housing Finance Authority

Homeless Trust Housing Agency

Human Services Independent Review Panel International Trade Consortium Juvenile Assessment Center

Medical Examiner Metro-Miami Action Plan Metropolitan Planning Organization

Park and Recreation

Planning and Zoning

Environmental Resources Management

Empowerment Trust

Consumer Services Corrections & Rehabilitation

Cultural Affairs

Elections

Finance

Fire Rescue

Capital Improvements Construction Coordination

Citizens' Independent Transportation Trust Commission on Ethics and Public Trust

Community & Economic Development

Business Development

Communications

MIAMI-DADE WATER AND SEWER DEPARTMENT WATER USE PERMIT (10/23/2007) PLAN TO ADDRESS RAW WATER FLOW MEASURING ADJUSTMENTS (FY2008)

The following is MDWASD's plan to be undertaken during FY 2008 to reconcile raw water flow measurements in the water system. This plan is the result of new raw water well meter installations in almost 100 supply wells during FY 2007. This plan is the continuation of MDWASD's attempt to reconcile and adjust historical raw water pumpage reports and records in its water supply system. The attached Exhibit B presents the schedule of activities associated with this program.

- 1. Address comments from GE Well Water Flow Meter Installation Report. Optimize current raw water well meter installations and calibration.
- 2. Calibrate Raw and Finished water Venturi meters at the Alex Orr WTP. Submit interim report by March 15, 2008.
- 3. Perform a water audit within Alexander Orr WTP to investigate Raw to Finished water flow differences. Initiate installation, calibration, and certification of process water flow meters (including transfers of water softening residuals to calcium carbonate lagoons and recalcining kilns), as appropriate.
- 4. Revise the Oracle systems database and create the Oracle based report format to be complaint with SFWMD Water User Permit Allocation and Special Conditions submittal requirements.
- 5. Transition to all new meter reports during December 2007 using the new raw water well flow meters and reports generated by the Oracle system. Begin using the reports generated by the Oracle system meter recorded values for both FDEP and SFWMD reports on January 1, 2008.
- 6. Undertake the following tasks to analyze raw water flow measuring issues: reconciliation of raw water meter reports between FDEP Monthly Operating Reports (MOR) and Oracle system, record instantaneous well readings to verify the average pumpage of each well, compare reported versus recorded flows for raw and finished at each WTP, and develop pumpage results for each wellfield on a monthly basis for the first six months of 2008.
- 7. Summary report on flow measuring issues analysis by July 31, 2008.
- 8. Submit request for allocation adjustment to SFWMD during the third Quarter of 2008 and no later than September 30, 2008.

CDM

KM2867.doc

Exhibit B Miami-Dade Water and Sewer Department Plan to Address Raw Water Flow Measuring Adjustments 10/23/2007

	Task	Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08
1	Address Issues from GE Well Water Flow Meter Installation Report		•										
2	Calibrate Raw and Finished Venturi meters at Alex Orr WTP. Submit Interim Report			•									
3	Alexander Orr WTP Water Budget Analysis					◆							
4	Revise Oracle Report Format		•										
5	Transition reports to new recording system			•									
6	Reconciliation of Historical Records			◆									
7	Summary Report										◆◆		
8	Submit Request for Allocation Adjustment								•				