STWA

SOUTH TEXAS WATER AUTHORITY
P. O. BOX 1701
KINGSVILLE, TEXAS 78364-1701

MEMORANDUM

TO: South Texas Water Authority Board of Directors
FROM: Kathleen Lowman, President
DATE: January 16, 2018
SUBJECT: Meeting Notice and Agenda for the South Texas Water Authority

A Regular Meeting of the STWA Board of Directors is scheduled for:

Tuesday, January 23, 2018
5:30 p.m.
South Texas Water Authority
2302 East Sage Road, Kingsville, Texas

The Board will consider and act upon any lawful subject which may come before it, including among others, the following:

Agenda

1. Call to order.

2. Citizen comments. This is an opportunity for citizens to address the Board of Directors concerning an issue of community interest that is not on the agenda. Comments on the agenda items must be made when the agenda item comes before the Board. The President may place a time limit on all comments. The response of the Board to any comment under this heading is limited to making a statement of specific factual information in response to the inquiry, or, reciting existing policy in response to the inquiry. Any deliberation of the issue is limited to a proposal to place it on the agenda for a later meeting.

3. Proposed Fiscal Year 2017 Audit. (Attachment 1)

4. **Resolution 18-01**. Resolution accepting the Fiscal Year 2017 Audit prepared by John Womack & Co., P.C. of Kingsville, Texas. (Attachment 2)

5. Approval of Minutes. (Attachment 3)

6. Quarterly Report/Treasurer's Report/Payment of Bills. (Attachment 4)

7. TCEQ Enforcement Action and State Office of Administrative Hearings. (Attachment 5)

8. Assessment of STWA's 42" waterline – Russell Corrosion Projects (Attachment 6)
   - Examination of Section 0 – 5000 LF
   - Pipeline Crossings and Interference

9. Driscoll Pump Station LAS Chemical Feed System Addition. (Attachment 7)

10. Revised Water Supply Contract with the City of Bishop. (Attachment 8)

(361) 592-9323 Or (361) 692-0337 (C.C. line)
Fax: (361) 592-5965

11. Quotes and Purchase of Pipeline Locator Equipment manufactured by Vivax – Metrotech. (Attachment 9)

12. Declaration of surplus property, authorization to approve sale of surplus property to the highest bidder, declaration of unsold items as salvage property and authorization to dispose of salvage items. (Attachment 10)

13. Incremental Increase Charges for Customers without a Long-Term Contract. (Attachment 11)

14. Adjournment.

The Board may go into closed session at any time when permitted by Chapter 551, Government Code. Before going into closed session a quorum of the Board must be assembled in the meeting room, the meeting must be convened as an open meeting pursuant to proper notice, and the presiding officer must announce that a closed session will be held and must identify the sections of Chapter 551, Government Code, authorizing the closed session.

KL/CGS/fdl
Attachments

This meeting notice was posted on STWA's website, www.stwa.org, and on indoor and outdoor bulletin boards at STWA's administrative offices, 2302 East Sage Road, Kingsville, Texas at 10:30 (am)/pm on January 19, 2018

Frances De Leon
Assistant Secretary

ATTACHMENT 1

FY 2017 Audit

Memorandum

To: South Texas Water Authority Board of Directors
From: Carola G. Serrato, Executive Director
Date: January 15, 2018
Re: Fiscal Year 2017 Audit

Background:

As a governmental entity an annual audit is necessary to safeguard the Authority's funds and insure that proper record keeping and financial measures are in place. Womack and Company has examined the Authority's files and enclosed is the Fiscal Year 2017 audit. Once the audit is approved, it is provided to South Texas Water Authority's wholesale customers, the Texas Commission on Environmental Quality, Texas State Comptroller, and rating entities.

Analysis:

The FY 2017 audit has no findings of improper financial management and proper financial controls are in place. A representative of Womack and Company will be available at the meeting to present the details of the audit and answer any questions.

Staff Recommendation:

After review and the presentation, adopt the Fiscal Year 2017 audit by approving Resolution 18-01.

Board Action:

Determine whether to approve the Fiscal Year 2017 audit by adopting Resolution 18-01.

Summarization:

Jo Ella Wagner, Finance Manager, and Noemi Flores, Accountant Assistant, deserve special recognition for the continued "no findings" audits, which have occurred year after year.

ATTACHMENT 2

Resolution 18-01

SOUTH TEXAS WATER AUTHORITY

Resolution 18-01

A RESOLUTION ACCEPTING THE FISCAL YEAR 2017 AUDIT PREPARED BY JOHN WOMACK & CO., P.C. OF KINGSVILLE, TEXAS.

WHEREAS, the South Texas Water Authority is a functioning Reclamation and Conservation District established by the Texas Legislature, and

WHEREAS, the South Texas Water Authority is required to submit an annual audit in accordance with the Financing Reporting Requirements as established by the Texas Commission on Environmental Quality, and

WHEREAS, the Authority has received and reviewed the Fiscal Year 2017 Audit.

NOW, THEREFORE, BE IT RESOLVED that the South Texas Water Authority Board of Directors accepts the audit prepared by John Womack & Co., P.C. of Kingsville, Texas, for submission to the Texas Commission on Environmental Quality.

Duly adopted this 23rd day of January, 2018.

_____
KATHLEEN LOWMAN, PRESIDENT

ATTEST:

_____
RUDY GALVAN, SECRETARY/TREASURER

ATTACHMENT 3

Approval of Minutes

SOUTH TEXAS WATER AUTHORITY
Regular Board of Directors Meeting
December 5, 2017
Minutes

Board Members Present:

Kathleen Lowman
Dr. Albert Ruiz
Rudy Galvan
Lupita Perez
Patsy Rodgers
Charles Schultz
Filiberto Treviño
Steven Vaughn

Board Members Absent:

None

Staff Present:

Carola G. Serrato
Frances De Leon
Jo Ella Wagner
Jacob Hinojosa
Dony Cantu

Guests Present:

None

1. Call to Order.

Ms. Kathleen Lowman, Board President, called the Regular Meeting of the STWA Board of Directors to order at 5:35 p.m. A quorum was present.

2. Citizen Comments.

Ms. Lowman opened the floor to citizen's comments. No citizen comments were made.

3. Approval of Minutes.

Mr. Galvan made a motion to approve the minutes of the October 24, 2017 Regular Meeting as presented. Mr. Treviño seconded. The motion passed by unanimous vote.

4. Treasurer's Report/Payment of Bills.

The following reports were presented for the Board's consideration:

Updated Financial Reports for September, 2017:
Revenue Fund Income Statement for period ending September 30, 2017
Tax Fund Income Statement for period ending September 30, 2017
Special Services Income Statement for period ending September 30, 2017
STWA Revenue Fund Balance Sheet – September 30, 2017
STWA Revenue Fund GL Account Summary Report as of September 30, 2017
STWA Debt Service Fund Income Statement for period ending September 30, 2017
STWA Debt Service Fund Balance Sheet September 30, 2017

STWA Debt Service Fund GL Account Summary Report as of September 30, 2017
STWA Capital Projects Fund Income Statement for period ending September 30, 2017
STWA Capital Projects Fund Balance Sheet – September 30, 2017
STWA Capital Projects Fund GL Account Summary Report as of September 30, 2017
(The September reports were updated at the instruction of the Authority's auditor to reflect entries posted for invoices that were received after the Board approved the September Treasurer's Report.)

Treasurer's Report for period ending October 31, 2017
Revenue Fund Income Statement for period ending October 31, 2017
Tax Fund Income Statement for period ending October 31, 2017
Special Services Income Statement for period ending October 31, 2017
STWA Revenue Fund Balance Sheet – October 31, 2017
STWA Revenue Fund GL Account Summary Report as of October 31, 2017
STWA Debt Service Fund Income Statement for period ending October 31, 2017
STWA Debt Service Fund Balance Sheet October 31, 2017
STWA Debt Service Fund GL Account Summary Report as of October 31, 2017
STWA Capital Projects Fund Income Statement for period ending October 31, 2017
STWA Capital Projects Fund Balance Sheet – October 31, 2017
STWA Capital Projects Fund GL Account Summary Report as of October 31, 2017
STWA 2012 Bond Election Report
Anticipated vs. Actual Water Rate Charged
Maintenance & Technical Report from O&M Supervisor

Ms. Wagner also presented the following outstanding invoices for Board approval:

• Mercer Controls, Inc.	$ 8,825.00
• Willatt & Flickinger, PLLC	$ 797.10
• Walker Partners Engineering	$ 888.00
• City of Corpus Christi	$ 110,062.94
• Kevin Kieschnick-NC Tax Assessor	$ 8,124.55
• HDR Engineering, Inc.	$ 3,600.00
• HDR Engineering, Inc.	$ 10,260.00
• Kleberg County Appraisal District	$ 5,213.19
• Nueces County Appraisal District	$ 1,692.00
• Willatt & Flickinger, PLLC	$ 1,279.70

A motion was made by Mr. Galvan to approve the Treasurer's Report and payment of the bills as presented. Mr. Schultz seconded. The motion carried.

5. Bids for purchase of one ¾ ton truck.

Ms. Serrato reported that after providing bid packets to numerous area dealerships, only one bid was received. The bid which was submitted by Caldwell Country Chevrolet was in the amount of $36,920 for a 2018 truck meeting all of the specifications presented at the previous Board

Meeting. She added that $40,000 had been budget for purchase of the truck and recommended awarding the bid to Caldwell Country Chevrolet.

6. **Resolution 17-25.** Resolution awarding the bid for the purchase of one ¾ ton pickup truck.

Mr. Vaughn made a motion to approve Resolution 17-25 awarding the bid for the purchase of one ¾ ton 4x4 diesel pickup truck to Caldwell Country Chevrolet in the amount of $36,920. Ms. Perez seconded. All voted in favor.

7. TCEQ Enforcement Action and Update on TCEQ Approval of Kingsville Pump Station Improvements.

Ms. Serrato reported that the Quarterly Report due on November 22nd was submitted and also provided a letter from the TCEQ stating that the submitted Monitoring Plan, Nitrification Action Plan and Sample Site Plan meet the Order requirements. In addition, the TCEQ approved the design of the Kingsville PS Improvements. She also reported that there has been a delay in the construction of the Driscoll LAS improvements and TCEQ has been notified of the change in the schedule. She also reported that a letter from TCEQ approving deadline extensions for Ordering Provision Nos. 8.b, 8.e and 8.f was received on December 4th. The amended deadline for Provision Nos. 8.b and 8.e is December 7, 2017 and the amended deadline for Provision No. 8.f is January 7, 2018. She added that Aaron Archer, Walker Partners, will be submitting designs for the taps on the 42 inch waterline.

8. Assessment of STWA's 42" waterline – Internal Leak Detection Test – End of Contract 3 pipeline immediately south of the O.N. Stevens Plant.

Ms. Serrato stated that Pure Technologies personnel performed the assessment on October 18th and tested approximately 12,000 lf rather than the 7,000 lf originally proposed at no additional cost to STWA. She presented the final report indicating that no small, medium or large leaks were detected. She also presented an invoice from Pure Technologies in the amount of $45,440 for the cost of mobilization and testing and a second invoice in the amount of $10,000 for the analysis and report. She recommended approval of the report and payment of both invoices. Mr. Galvan made a motion to approve the final report and payment of the $45,440 and $10,000 invoices from Pure Technologies. Ms. Rodgers seconded. All voted in favor.

9. Assessment of STWA's 42" Waterline – Russell Corrosion Projects
   - Examination of Section 0 – 5000 LF
   - Pipeline Crossings and Interference

Ms. Serrato reported that she has been in contact with Mr. Bruce Norred, Russell Corrosion, who recommends bonding all discontinuous joints of the 42" waterline and installing anodes where there are none. She added that Russell Corrosion will return and use their VLOC locating device to confirm that it will detect broken bonds. In addition, the final interference testing has not been completed. The pipeline for the last crossing had a problem with its rectifier which still is in need of repairs but it may be completed by the end of December. She presented Invoice 0002122 in the amount of $4,168.72 for the Section 0 – 5000 project and stated that after paying this invoice

$39,121.23 remains in the contracted amount for this project. She also presented Invoice 0002123 in the amount of $4,026.81 and Invoice 0002140 in the amount of $1,356.20 for the pipeline interference testing and added that $1,446.49 in contracted funds remains on this project. Mr. Schultz made a motion to approve payment of the three invoices. Mr. Treviño seconded. All voted in favor.

10. Driscoll Pump Station LAS Chemical Feed System Addition.
    - Pay Request #4
    - Change Order #3

Ms. Serrato reported that progress continues on the construction of the Driscoll LAS station; however, Mercer was not able to meet the substantially complete date of November 28th and this information was included in the quarterly reported submitted to TCEQ. She also stated that Mercer and HDR have been working on resolving issues with the flow rate. She presented Pay Request #4 in the amount of $96,374.19. She also presented Change Order #3 in the amount of $10,650.00 for additional components which are needed to achieve the desired functionality for the chemical feed system. Ms. Rodgers made a motion to approve Pay Request #4 in the amount of $96,374.19 and Change Order #3 in the amount of $10,650.00. Mr. Treviño seconded. All voted in favor.

11. Revised Water Supply Contract with the City of Bishop.

Ms. Serrato stated that as a result the City of Bishop's request to have the same term as agreed to with the City of Kingsville, legal counsel Bill Flickinger prepared a revised contract as well as a redline version showing contract amendments including comments on items that remain outstanding. The changes include a statement giving the City the option to use the East Side Pump Station if they are unable to use the West Side Pump Station provided the City takes the financial responsibility of making any repairs to the existing pumps; reference to specific AWWA Manual M1 chapters as requested by Mr. Gerald Benadum; the City of Kingsville contract language for Section 12-Term of Contract has been substituted; and Guaranteed Purchase has been added as a new section and is based on the City of Bishop increasing their purchase by 2 ½ percent annually so that it will increase to 60% at the end of the fifth year. In addition there remains language that Mr. Benadum was to provide for Section 14, Subsection (B) Tax Exempt Bonds. Mr. Galvan made a motion to approve the contract for the City of Bishop's consideration. Dr. Ruiz seconded and all voted in favor.

12. Quotes and Purchase of Pipeline Locator Equipment manufactured by Vivax - Metrotech.

Ms. Serrato stated that Field Technicians recently viewed and participated in a pipeline locator equipment demonstration of a Vivax-Metrotech vLoc 5000 device and were impressed by the demonstration. Indepth Utility Solutions provided a quote for the vLoc 5000 in the amount of $5,675 as well as for a vLoc DM2 unit in the amount of $10,287. However, Indepth representatives indicated that the vLoc 5000 device is limited in locating discontinuous bonds and cannot be depended on to locate anodes. This information was confirmed by Mr. Bruce Norred of Russell Corrosion who also confirmed that the vLoc DM2 device will locate discontinuous bonds as well as the presence of sacrificial anodes. Ms. Serrato pointed out that $15,000 remains available from the SmartBall project since no repairs to the 42 inch waterline were necessary.

She added that Russell Corrosion should arrive on January 8th and should be able to verify that their DM2 device will actually perform as stated. Mr. Schultz made a motion to table action on this item until after Russell Corrosion's arrival. Ms. Perez seconded. All voted in favor.

13. Kleberg County Appraisal District Board of Directors election and casting of votes.

Ms. Serrato presented the ballot for casting votes for the Kleberg County Appraisal District Board of Directors. She said there are six candidates for five positions. The Authority was allotted 115 votes which can be cast for one candidate or distributed among different candidates.

14. **Resolution 17-26.** Resolution casting the South Texas Water Authority's votes for election of Kleberg County Appraisal District Board Members.

Dr. Ruiz made a motion to approve Resolution 17-26 and cast STWA's votes by distributing the 115 votes evenly among the candidates, excluding John Saenz. Mr. Vaughn seconded. All voted in favor.

15. Prosperity Bank Treasury Management Agreement.
    - **Resolution 17-27.** Treasury Management Resolution.
    - Treasury Management Services Master Agreement
    - ACH Agreement
    - Treasury Management Services Wire Transfer Services Agreement

Ms. Serrato presented Resolution 17-27 and other agreements related to Prosperity Bank's depository service for the Authority. She stated that approval and execution of the documents is required in order for the Authority to continue using Prosperity Bank as its depository. She added that if the Board wishes, staff will contact other financial institutions to inquire about serving as STWA's depository but the documents will most likely be required by them as well. Ms. Rodgers made a motion to approve Resolution 17-27 and the accompanying agreements. Mr. Treviño seconded and all voted in favor.

16. Adjournment.

With no further business to discuss, Ms. Lowman adjourned the meeting at 6:21 p.m.

Respectfully submitted,

Frances De Leon

Frances De Leon
Assistant Secretary

ATTACHMENT 4

Quarterly Report/Treasurer's Report/Payment of Bills

SOUTH TEXAS WATER AUTHORITY
INVESTMENT REPORT
FOR QUARTER ENDED DECEMBER 2017

	BEGINNING BOOK VALUE 1-Oct-17	BEGINNING MARKET VALUE 1-Oct-17	TRANSFERS FOR OCTOBER, NOVEMBER, DECEMBER	REVENUES FOR OCTOBER, NOVEMBER, DECEMBER	EXPENSES FOR OCTOBER, NOVEMBER, DECEMBER	INTEREST FOR OCTOBER, NOVEMBER, DECEMBER	ENDING BOOK VALUE 31-Dec-17	ENDING MARKET VALUE 31-Dec-17
CASH ACCOUNTS								
GENERAL ACCT - PROSPERITY BANK	379,079.22	379,079.22	155,000.00	399,133.35	769,357.19	203.49	164,058.87	164,058.87
GENERAL ACCT TEXPOOL 1371300002	1,659,102.64	1,659,152.41	(375,000.00)	396,086.69	0.00	4,645.65	1,684,834.98	1,684,700.19
GENERAL ACCT TEXSTAR 1111-000	1,317,687.11	1,317,716.10	0.00	0.00	0.00	3,651.10	1,321,338.21	1,321,367.28
PAYROLL ACCT - PROSPERITY BANK	9,982.25	9,982.25	100,000.00	0.00	89,766.40	28.26	20,244.11	20,244.11
OPERATIONS ACCT - PROSPERITY BANK	16,855.04	16,855.04	120,000.00	0.00	101,501.91	38.41	35,391.54	35,391.54
DEBT SERVICE ACCT TEXPOOL 1371300008	22,799.19	22,799.87	0.00	137,100.30	0.00	214.18	160,113.67	160,100.86
TOTAL CASH ACCOUNTS	3,405,505.45	3,405,584.90	0.00	932,320.34	960,625.50	8,781.09	3,385,981.38	3,385,862.85

	AVG. MAT. 12/31/2017	OCTOBER RATE	OCTOBER EARNING	NOVEMBER RATE	NOVEMBER EARNING	DECEMBER RATE	DECEMBER EARNING	TOTALS
GENERAL ACCT - PROSPERITY BANK	immediate	0.2500%	$74.90	0.4000%	$44.76	0.4000%	$83.83	$203.49
GENERAL ACCT TEXPOOL 1371300002	34 days	1.0318%	$1,466.58	1.0506%	$1,548.02	1.1764%	$1,631.05	$4,645.65
GENERAL ACCT TEXSTAR 1111-000	28 days	1.0482%	$1,173.06	1.0695%	$1,159.37	1.1762%	$1,318.67	$3,651.10
PAYROLL ACCT - PROSPERITY BANK	immediate	0.2500%	$7.19	0.4000%	$9.80	0.4000%	$11.27	$28.26
OPERATIONS ACCT - PROSPERITY BANK	immediate	0.2500%	$11.67	0.4000%	$12.08	0.4000%	$14.66	$38.41
DEBT SERVICE ACCT TEXPOOL 1371300008	34 days	1.0318%	$28.85	1.0506%	$63.63	1.1764%	$121.70	$214.18
TOTALS			$2,762.25		$2,837.66		$3,181.18	$8,781.09

THIS REPORT IS IN COMPLIANCE WITH THE STRATEGIES AS APPROVED AND THE PUBLIC FUNDS INVESTMENT ACT.

CO-INVESTMENT OFFICER

CO-INVESTMENT OFFICER

SOUTH TEXAS WATER AUTHORITY
Treasurer's Report
For Period Ending November 30, 2017

STWA Water Sales:

Entity	Water Usage (1,000 g)	Cost of Water from City of Corpus Christi $2.316174 per 1000 g	Handling Charge @ $0.426386/1000g	Out of District Surcharge and Pass-Thru Credit	Total Due
Kingsville	8,716	$20,187.77	$3,716.38	-$4.45	$23,899.70
Bishop	4,247	$9,836.79	$1,810.86	$0.00	$11,647.65
Agua Dulce	1,999	$4,630.56	$852.44	$0.00	$5,483.01
RWSC	7,776	$18,010.57	$3,315.58	$0.00	$21,326.15
Driscoll	3,995	$9,253.12	$1,703.41	-$42.95	$10,913.58
NCWCID #5	1,979	$4,583.85	$843.84	$731.47	$6,159.16
NWSC	12,528	$29,017.21	$5,341.80	$0.00	$34,359.01
TOTAL	41,240	$95,519.87	$17,584.32	$684.07	$113,788.26

Water Cost and Usage for Period of:	**10/31/17**	**to**	**11/30/17**
City of Corpus Christi Invoice for Cost of Water Purchased:			$87,667.19
Gallons of Water Recorded by City of Corpus Christi:			37,850,000
Gallons of Water Recorded by STWA from Customer's Master Meters:			40,432,970
Water Loss Percentage:			-6.82%

Annual Usage for FY 2018	**Annual**
Gallons of Water Recorded by City of Corpus Christi:	85,450,000
Gallons of Water Recorded by STWA from Customer's Master Meters:	88,127,570
Water Loss Percentage: (year to date)	-3.13%

REVENUE FUND
INCOME STATEMENT
FOR PERIOD ENDING NOVEMBER 30, 2017

16.39%

	MONTHLY	YEAR TO DATE	2018 ADOPTED BUDGET	% OF 2018 ADOPTED BUDGET	2017 YEAR TO DATE	2017 FINAL BUDGET
REVENUES						
Water Service Revenue	95,520	209,416	1,257,962	17%	220,255	1,240,206
Handling Charge Revenue	17,584	38,587	220,170	18%	40,717	228,517
Surcharge - Out of District	552	1,103	6,619	17%	963	5,778
Interest Income	1,615	3,175	10,000	32%	1,112	13,500
Other Revenue						
Operating & Maintenance Fees	0	0	0	0%	0	0
Miscellaneous Revenues	142	211	5,000	4%	226	6,750
TOTAL REVENUES	115,412	252,493	1,499,751	17%	263,273	1,494,751
EXPENDITURES						
Water Service Expenditures:						
Bulk Water Purchases	87,667	197,730	1,257,962	16%	230,652	1,233,414
Payroll Costs						
Salaries & Wages - Perm. Employees	22,073	47,113	328,813	14%	53,105	285,123
Salaries & Wages - Part-Time	104	210	1,607	13%	983	5,851
Overtime - NWSC	0	0	0	0%	0	0
Stand-by Pay - NWSC	0	0	0	0%	0	0
Overtime - RWSC	0	0	0	0%	0	0
Stand-by Pay - RWSC	0	0	0	0%	0	0
Overtime - STWA	937	3,788	21,000	18%	2,013	17,910
Stand-by Pay - STWA	100	200	1,300	15%	200	1,300
Employee Retirement Premiums	2,144	5,946	44,452	13%	6,773	36,612
Group Insurance Premium	12,909	24,970	169,122	15%	50,337	147,404
Unemployment Compensation	(2)	49	874	6%	132	300
Workers' Compensation	(829)	9,234	6,498	142%	504	7,252
Car Allowance	500	900	4,800	19%	800	4,800
Hospital Insurance Tax	192	451	3,757	12%	574	3,388
Supplies & Materials						
Repairs & Maintenance	3,917	10,043	80,000	13%	28,807	126,500
Meter Expense	2,250	2,250	5,000	45%	4,125	7,140
Tank Repairs	0	0	20,000	0%	0	7,800
Major Repairs	0	0	25,000	0%	0	25,000
Other Operating Expenditures:						
Professional Fees						
Legal	1,280	2,077	40,000	5%	3,649	30,000
Auditing	8,670	8,844	9,500	93%	291	9,155
Engineering	7,276	26,620	90,000	30%	0	60,000
Management & Consulting	0	278	10,000	3%	160	14,550
Inspection	0	0	5,500	0%	0	1,600
Leak Detection	10,000	55,440	75,000	74%	0	20,000
Consum Supplies/Materials						
Postage	47	263	11,500	2%	284	8,950
Printing/Office Supplies	2,483	5,234	19,000	28%	3,667	18,650
Janitorial/Site Maintenance	225	572	5,000	11%	410	4,350
Fuel/Lubricants/Repairs	1,677	3,336	33,000	10%	2,479	24,335
Chemicals/Water Samples	264	7,603	58,000	13%	8,619	49,900
Safety Equipment	0	0	1,500	0%	650	1,500
Small Tools	147	529	1,000	53%	32	1,000

16.39%

	MONTHLY	YEAR TO DATE	2018 ADOPTED BUDGET	% OF 2018 ADOPTED BUDGET	2017 YEAR TO DATE	2017 FINAL BUDGET
Recurring Operating Costs						
Telephone/Communications	2,296	4,319	21,100	20%	2,335	23,700
Utilities	9,335	12,288	115,000	11%	17,200	108,500
D & O Liability Insurance	0	1,164	3,500	33%	1,164	2,100
Property Insurance	0	33,247	33,247	100%	33,247	33,247
General Liability	0	1,247	2,750	45%	1,247	2,750
Auto Insurance	0	2,050	2,050	100%	2,050	2,050
Travel/Training/Meetings	490	776	10,000	8%	470	6,300
Rental-Equipment/Uniforms	748	700	5,000	14%	150	3,500
Dues/Subscriptions/Publication	840	1,740	15,000	12%	1,745	9,300
Pass Through Cost	47	107	500	21%	78	780
Educational Materials	0	0	660	0%	0	0
Miscellaneous						
Miscellaneous Expenditures	1,157	1,217	7,500	16%	3,381	9,000
Total Administrative & Operations Exp.	178,944	472,533	2,545,492	19%	462,314	2,355,011
Capital Outlay						
Capital Acquisition	3,060	11,885	79,000	15%	59,773	114,500
Engineering	0	0	0	0%	798	1,000
TOTAL EXPENDITURES (w/o D.S. exp.)	182,004	484,418	2,624,492	18%	522,885	2,470,511
Excess (Deficiencies) of Revenue Over Expenditures	(66,592)	(231,925)	(1,124,741)	21%	(259,612)	(975,760)
OTHER FINANCE SOURCE (USES)						
Transfer to Other Funds						
Transfer from Tax Account	0	0	(1,054,566)	0%	0	(991,729)
Extra Ordinary Income			(1,500)			
Disposition of Assets (Surplus Sale)	0	0	0	0%	0	0
TOTAL OTHER FINANCING SOURCES (USES)	0	0	(1,056,066)	0%	0	(991,729)
EXCESS (DEFICIENCES) OF REVENUES OVER OTHER SOURCES (USES)	(66,592)	(231,925)	(68,675)		(259,612)	15,969
NET INCOME	(66,592)	(231,925)	(68,675)		(259,612)	15,969

TAX FUND
INCOME STATEMENT
FOR PERIOD ENDING NOVEMBER 30, 2017

16.39%

	MONTHLY	YEAR TO DATE	2018 ADOPTED BUDGET	% OF 2018 FINAL BUDGET	2017 YEAR TO DATE	2017 FINAL BUDGET
REVENUES						
Ad-Valorem - Current	103,971	164,050	1,070,008	13%	142,382	989,500
Delinquent Tax Revenue	3,800	8,121	27,500	31%	8,625	33,850
Penalty & Interest - Tax Accounts	1,146	2,905	16,000	19%	3,096	22,050
Miscellaneous	0	0	0	0%	0	0
TOTAL TAXES & INTEREST	108,916	175,076	1,113,508	14%	154,103	1,045,400
EXPENDITURES						
Tax Collector Fees	0	24,706	37,165	69%	25,809	35,371
Appraisal Districts	0	0	21,777	17%	3,792	18,300
TOTAL EXPENDITURES	0	24,706	58,942	50%	29,601	53,671
Transfer to General Fund	0		1,054,566	0%	0	991,729
EXCESS REVENUES & OTHER FINANCING SOURCES OVER(UNDER) EXPENDITURES AND OTHER USES	108,916	150,370	0		124,503	0

SPECIAL SERVICES
INCOME STATEMENT
FOR PERIOD ENDING NOVEMBER 30, 2017

16.39%

	MONTHLY	YEAR TO DATE	2018 ADOPTED BUDGET	% OF 2017 FINAL BUDGET	2017 YEAR TO DATE	2017 FINAL BUDGET
REVENUES						
Ricardo Water Supply Corporation	18,011	39,400	293,020	13%	35,379	271,554
Nueces Water Supply Corporation	19,042	40,183	275,134	15%	38,121	250,665
TOTAL REVENUES	37,053	79,583	568,154	14%	73,500	522,219
EXPENDITURES						
Personnel	27,551	52,008	304,185	17%	41,618	288,626
Overhead	20,683	38,125	263,969	14%	30,459	233,593
TOTAL EXPENDITURES	48,234	90,132	568,154	16%	72,077	522,219
EXCESS REVENUES & OTHER FINANCING SOURCES OVER(UNDER) EXPENDITURES AND OTHER USES	(11,181)	(10,549)	0		1,423	0

South Texas Water Authority
Balance Sheet
November 30, 2017

ASSETS

Current Assets			
STWA - General	$	214,547.52	
STWA - Payroll		13,928.90	
STWA - Operations		25,941.32	
Petty Cash		150.00	
TexPool - STWA General		1,824,619.76	
Due From Capital Projects Fund		275,543.21	
Due from Debt Service Fund		5,970.04	
Due from D.S .-Collect Service		8,057.59	
Tax Accounts Receivable		165,274.52	
Allowance for Uncollect Taxes		(66,653.05)	
Service accts receivable		158,055.39	
Interlocal Rec-Ricardo		3,592.49	
Interlocal Rec-Nueces		5,749.80	
Interlocal Rec. - Tax Assessor		6,706.43	
Inventory		17,836.50	
Total Assets			**$ 2,659,320.42**

LIABILITIES AND FUNDS EQUITY

Current Liabilities			
Trade Accounts Payable	$	423,303.71	
Salaries & Wages Payable		12,703.20	
Unemployment Comp. Pbl.		363.09	
Miscellaneous Payables		1,731.24	
Compensated Absences		17,620.65	
Deferred tax revenue		98,621.47	
Total Liabilities			**554,343.36**
Fund Equity			
Unassigned Fund Balance		2,179,245.44	
Assigned Fund Bal. - Inventory		17,836.50	
Current Earning		(92,104.88)	
Total Fund Equity			**2,104,977.06**
Total Liabilities & Fund Equity			**$ 2,659,320.42**

South Texas Water Authority
Gl Account Summary Report
As of: November 30, 2017

Account Description	Beginning Balance	Debit Change	Credit Change	Net Change	Ending Balance
Current Assets					
STWA - General	93,245.44	$ 206,539.15	$ (85,237.07)	$ 121,302.08	$ 214,547.52
STWA - Payroll	43,760.85	9.80	(29,841.75)	(29,831.95)	13,928.90
STWA - Operations	33,944.73	30,277.08	(38,280.49)	(8,003.41)	25,941.32
Petty Cash	150.00	0.00	0.00	0.00	150.00
Transfers	0.00	30,000.00	(30,000.00)	0.00	0.00
TexPool - STWA General	1,711,114.09	113,505.67	0.00	113,505.67	1,824,619.76
Due From Capital Projects Fund	179,169.02	96,374.19	0.00	96,374.19	275,543.21
Due from Debt Service Fund	6,135.98	13.95	(179.89)	(165.94)	5,970.04
Due from D.S .-Collect Service	8,057.59	0.00	0.00	0.00	8,057.59
Tax Accounts Receivable	165,274.52	0.00	0.00	0.00	165,274.52
Allowance for Uncollect Taxes	(66,653.05)	0.00	0.00	0.00	(66,653.05)
Service accts receivable	204,027.47	141,864.47	(187,836.55)	(45,972.08)	158,055.39
Interlocal Rec-Ricardo	6,876.64	3,592.49	(6,876.64)	(3,284.15)	3,592.49
Interlocal Rec-Nueces	7,941.20	5,749.80	(7,941.20)	(2,191.40)	5,749.80
Interlocal Rec. - Tax Assessor	9,620.35	6,706.43	(9,620.35)	(2,913.92)	6,706.43
Miscellaneous Receivables	3,825.00	0.00	(3,825.00)	(3,825.00)	0.00
Inventory	17,836.50	0.00	0.00	0.00	17,836.50
Total Assets	**2,424,326.33**	**634,633.03**	**(399,638.94)**	**234,994.09**	**2,659,320.42**
Current Liabilities					
Trade Accounts Payable	(224,947.28)	72,242.39	(270,598.82)	(198,356.43)	(423,303.71)
Salaries & Wages Payable	(8,456.00)	8,456.00	(12,703.20)	(4,247.20)	(12,703.20)
Hospital Ins Tax Payable	0.00	1,142.46	(1,142.46)	0.00	0.00
Withholding Taxes Payable	0.00	4,159.09	(4,159.09)	0.00	0.00
Emply Retire Prem Payable	0.00	10,033.70	(10,033.70)	0.00	0.00
Unemployment Comp. Pbl.	(339.69)	0.00	(23.40)	(23.40)	(363.09)
Miscellaneous Payables	(507.18)	6,205.22	(7,429.28)	(1,224.06)	(1,731.24)
Compensated Absences	(17,620.65)	0.00	0.00	0.00	(17,620.65)
Deferred tax revenue	(98,621.47)	0.00	0.00	0.00	(98,621.47)
Total Liabilities	**(350,492.27)**	**102,238.86**	**(306,089.95)**	**(203,851.09)**	**(554,343.36)**
Fund Equity					
Unassigned Fund Balance	(2,179,245.44)	0.00	0.00	0.00	(2,179,245.44)
Assigned Fund Bal. - Inventory	(17,836.50)	0.00	0.00	0.00	(17,836.50)
Total Fund Equity	**(2,197,081.94)**	**0.00**	**0.00**	**0.00**	**(2,197,081.94)**
Totals	**(123,247.88)**	**$ 736,871.89**	**$ (705,728.89)**	**$ 31,143.00**	**$ (92,104.88)**

DEBT SERVICE FUND
INCOME STATEMENT
FOR PERIOD ENDING NOVEMBER 30, 2017

16.39%

	MONTHLY	YEAR TO DATE	2018 ADOPTED BUDGET	% OF 2018 ADOPTED BUDGET	2017 YEAR TO DATE	2017 FINAL BUDGET
REVENUES						
Ad-Valorem - Current	33,908	53,512	366,174	15%	51,003	354,529
Delinquent Tax Revenue	1,292	2,542	7,000	36%	2,696	10,400
Penalty & Interest - Tax Accounts	356	735	5,500	13%	654	5,675
Out-of-District Surcharge	180	360	2,159		345	2,070
Intererest on Temporary Investments	64	92	900	10%	26	1,450
Miscellaneous	0	0	0	0%	0	0
TOTAL TAXES & INTEREST	35,800	57,241	381,733	15%	54,724	374,124
OTHER FINANCING SOURCES						
Excess Bond Proceeds	0	0	0	0%	0	0
TOTAL OTHER FINANCE SOURCES	0	0	0		0	374,124
TOTAL REVENUE AND OTHER FINANCE SOURCES	35,800	57,241	381,733	15%	54,724	374,124
EXPENDITURES						
Fiscal Agent Fees	0	0	200	0%	0	200
Bond Interest Expense	0	0	126,750	0%	0	131,050
Bond Principal Payments	0	0	220,000	0%	0	215,000
Tax Collector Fees	0	8,058	12,121	66%	9,245	12,676
Appraisal District Fees	0	0	7,103	0%	1,358	6,555
Miscellaneous	0	0	0	0%	0	0
TOTAL EXPENDITURES	0	8,058	366,174	2%	10,603	365,481
EXCESS REVENUES OVER(UNDER) EXPENDITURES AND OTHER USES	35,800	49,184	15,559		44,121	8,643

STWA Debt Service Fund
Balance Sheet
November 30, 2017

ASSETS

Current Assets		
Debt Service Acct. - TexPool	$ 83,701.79	
Due from Other Governments	200.83	
Taxes Receivable	32,190.58	
Allowance for Uncollectibles	(8,581.46)	
Total Current Assets		**107,511.74**
Other Assets		
Total Other Assets		**0.00**
Total Assets		**$ 107,511.74**

LIABILITIES AND FUNDS EQUITY

Current Liabilities		
Deferred Tax Revenue	$ 21,610.10	
Due to General Fund	14,027.64	
Total Current Liabilities		**35,637.74**
Long-Term Liabilities		
Total Long-Term Liabilities		**0.00**
Total Liabilities		**35,637.74**
Funds Equity		
Fund Balance	22,690.35	
Net Income	49,183.65	
Total Funds Equity		**71,874.00**
Total Liabilities & Funds Equity		**$ 107,511.74**

STWA Debt Service Fund
GI Account Summary Report
As of: November 30, 2017

Account Number	Account Description	Beginning Balance	Debit Change	Credit Change	Net Change	Ending Balance
10400	Debt Service Acct. - TexPool	47,140.55	$ 36,561.24	$ 0.00	$ 36,561.24	$ 83,701.79
13100	Due from Other Government	200.83	0.00	0.00	0.00	200.83
13300	Taxes Receivable	33,118.18	2,199.85	(3,127.45)	(927.60)	32,190.58
13301	Allowance for Uncollectibles	(8,581.46)	0.00	0.00	0.00	(8,581.46)
21700	Deferred Tax Revenue	(21,610.10)	0.00	0.00	0.00	(21,610.10)
24000	Due to General Fund	(14,193.57)	179.89	(13.96)	165.93	(14,027.64)
39100	Fund Balance	(22,690.35)	0.00	0.00	0.00	(22,690.35)
	Totals	13,384.08	$ 38,940.98	$ (3,141.41)	$ 35,799.57	$ 49,183.65

CAPITAL PROJECTS FUND
INCOME STATEMENT
FOR PERIOD ENDING NOVEMBER 30, 2017

16.39%

	MONTHLY	YEAR TO DATE	2018 ADOPTED BUDGET	% OF 2018 ADOPTED BUDGET	2017 YEAR TO DATE	2017 FINAL BUDGET
REVENUES						
Bond Proceeds	0	0	0	0%	0	0
Interest Income	1,159	2,332	12,500	19%	1,285	11,750
TOTAL REVENUE AND OTHER FINANCE SOURCES	1,159	2,332	12,500	19%	1,285	11,750
EXPENDITURES						
Right of Way Acquisition	0	0	7,264	0%	0	0
Engineering Fees	0	3,600	228,320	2%	8,325	125,000
Construction Costs	96,374	160,919	643,232	25%	155,583	678,066
Pipeline Condition Assessment	0	0	194,100	0%	5,295	5,295
Legal & Administrative Fees	0	0	181,712	0%	0	0
Cost of Bond Issuance	0	0	0	0%	0	0
Miscellaneous Fees	0	0	0	0%	0	0
TOTAL EXPENDITURES	96,374	164,519	1,254,628	13%	169,203	808,361
EXCESS REVENUES OVER(UNDER) EXPENDITURES AND OTHER USES	(95,215)	(162,187)	(1,242,128)		(167,919)	(796,611)

STWA Capital Projects Fund
Balance Sheet
November 30, 2017

ASSETS

Current Assets		
TexSTAR - Construction Fund	$ 1,320,019.73	
Total Current Assets		1,320,019.73
Property and Equipment		
Total Property and Equipment		0.00
Other Assets		
Total Other Assets		0.00
Total Assets		$ 1,320,019.73

LIABILITIES AND FUNDS EQUITY

Current Liabilities		
Due to General Fund	$ 275,543.21	
Total Current Liabilities		275,543.21
Long-Term Liabilities		
Total Long-Term Liabilities		0.00
Total Liabilities		275,543.21
Fund Balance		
Fund Balance	1,206,663.20	
Net Income	(162,186.68)	
Total Fund Balance		1,044,476.52
Total Liabilities & Fund Balance		$ 1,320,019.73

STWA Capital Projects Fund
GI Account Summary Report
As of: November 30, 2017

Account Number	Account Description	Beginning Balance	Debit Change	Credit Change	Net Change	Ending Balance
11300	TexSTAR - Construction	1,318,860.36	$ 1,159.37	$ 0.00	$ 1,159.37	$ 1,320,019.73
2400	Due to General Fund	(179,169.02)	0.00	(96,374.19)	(96,374.19)	(275,543.21)
39100	Fund Balance	(1,206,663.20)	0.00	0.00	0.00	(1,206,663.20)
	Totals	(66,971.86)	$ 1,159.37	$ (96,374.19)	$ (95,214.82)	$ (162,186.68)

SOUTH TEXAS WATER AUTHORITY
Treasurer's Report
For Period Ending December 31, 2017

STWA Water Sales:

Entity	Water Usage (1,000 g)	Cost of Water from City of Corpus Christi $2.349496 per 1000 g	Handling Charge @ $0.426386/1000g	Incremental Increase @ $0.426386/1000g	Out of District Surcharge and Pass-Thru Credit	Total Due
Kingsville	6,734	$15,821.51	$2,871.28	$0.00	$0.00	$18,692.79
Bishop	4,005	$9,409.73	$1,707.68	$1,707.68	$0.00	$12,825.08
Agua Dulce	2,222	$5,220.79	$947.47	$0.00	$0.00	$6,168.26
RWSC	7,006	$16,460.57	$2,987.26	$0.00	$0.00	$19,447.83
Driscoll	3,669	$8,620.54	$1,564.45	$1,564.45	-$37.40	$11,712.04
NCWCID #5	2,034	$4,778.45	$867.19	$867.19	$731.47	$7,244.31
NWSC	11,527	$27,082.26	$4,914.88	$0.00	$0.00	$31,997.15
TOTAL	37,197	$87,393.85	$15,860.22	$4,139.32	$694.07	$108,087.46

Water Cost and Usage for Period of:	**11/30/17**	**to**	**12/31/17**
City of Corpus Christi Invoice for Cost of Water Purchased:			$86,343.97
Gallons of Water Recorded by City of Corpus Christi:			36,750,000
Gallons of Water Recorded by STWA from Customer's Master Meters:			39,787,420
Water Loss Percentage:			-8.27%

Annual Usage for FY 2018	**Annual**
Gallons of Water Recorded by City of Corpus Christi:	122,200,000
Gallons of Water Recorded by STWA from Customer's Master Meters:	127,914,990
Water Loss Percentage: (year to date)	-4.68%

REVENUE FUND
INCOME STATEMENT
FOR PERIOD ENDING DECEMBER 31, 2017

25.00%

	MONTHLY	YEAR TO DATE	2018 ADOPTED BUDGET	% OF 2018 ADOPTED BUDGET	2017 YEAR TO DATE	2017 FINAL BUDGET
REVENUES						
Water Service Revenue	87,394	296,810	1,257,962	24%	306,339	1,240,206
Handling Charge Revenue	15,860	54,447	220,170	25%	56,596	228,517
Premium Incremental Increase	4,139	4,139	0	0%	0	0
Surcharge - Out of District	552	1,655	6,619	25%	1,445	5,778
Interest Income	1,741	4,916	10,000	49%	1,758	13,500
Other Revenue						
Operating & Maintenance Fees	0	0	0	0%	0	0
Miscellaneous Revenues	427	639	5,000	13%	866	6,750
TOTAL REVENUES	110,113	362,606	1,499,751	24%	367,004	1,494,751
EXPENDITURES						
Water Service Expenditures:						
Bulk Water Purchases	86,344	284,074	1,257,962	23%	316,525	1,233,414
Payroll Costs						
Salaries & Wages - Perm. Employees	25,958	73,071	328,813	22%	79,687	285,123
Salaries & Wages - Part-Time	113	323	1,607	20%	2,103	5,851
Overtime - NWSC	0	0	0	0%	0	0
Stand-by Pay - NWSC	0	0	0	0%	0	0
Overtime - RWSC	0	0	0	0%	0	0
Stand-by Pay - RWSC	0	0	0	0%	0	0
Overtime - STWA	1,216	5,003	21,000	24%	2,996	17,910
Stand-by Pay - STWA	100	300	1,300	23%	300	1,300
Employee Retirement Premiums	5,992	11,938	44,452	27%	12,189	36,612
Group Insurance Premium	12,411	37,380	169,122	22%	40,317	147,404
Unemployment Compensation	26	75	874	9%	128	300
Workers' Compensation	(737)	8,497	6,498	131%	504	7,252
Car Allowance	500	1,400	4,800	29%	1,200	4,800
Hospital Insurance Tax	267	718	3,757	19%	846	3,388
Supplies & Materials						
Repairs & Maintenance	5,769	15,812	80,000	20%	38,631	126,500
Meter Expense	1,125	3,375	5,000	68%	4,125	7,140
Tank Repairs	0	0	20,000	0%	0	7,800
Major Repairs	0	0	25,000	0%	0	25,000
Other Operating Expenditures:						
Professional Fees						
Legal	482	2,559	40,000	6%	4,129	30,000
Auditing	0	8,844	9,500	93%	8,655	9,155
Engineering	14,673	41,292	90,000	46%	0	60,000
Management & Consulting	0	278	10,000	3%	395	14,550
Inspection	0	0	5,500	0%	0	1,600
Leak Detection	0	55,440	75,000	74%	0	20,000
Consum Supplies/Materials						
Postage	26	288	11,500	3%	2,469	8,950
Printing/Office Supplies	2,048	7,282	19,000	38%	3,811	18,650
Janitorial/Site Maintenance	420	992	5,000	20%	624	4,350
Fuel/Lubricants/Repairs	2,551	5,887	33,000	18%	3,483	24,335
Chemicals/Water Samples	1,224	8,827	58,000	15%	14,475	49,900
Safety Equipment	0	0	1,500	0%	650	1,500
Small Tools	0	529	1,000	53%	32	1,000

25.00%

	MONTHLY	YEAR TO DATE	2018 ADOPTED BUDGET	% OF 2018 ADOPTED BUDGET	2017 YEAR TO DATE	2017 FINAL BUDGET
Recurring Operating Costs						
Telephone/Communications	1,314	5,634	21,100	27%	3,362	23,700
Utilities	7,086	19,374	115,000	17%	25,794	108,500
D & O Liability Insurance	0	1,164	3,500	33%	1,164	2,100
Property Insurance	0	33,247	33,247	100%	33,247	33,247
General Liability	0	1,247	2,750	45%	1,247	2,750
Auto Insurance	0	2,050	2,050	100%	2,050	2,050
Travel/Training/Meetings	680	1,456	10,000	15%	718	6,300
Rental-Equipment/Uniforms	79	779	5,000	16%	527	3,500
Dues/Subscriptions/Publication	0	1,740	15,000	12%	2,145	9,300
Pass Through Cost	37	144	500	29%	103	780
Educational Materials	0	0	660	0%	0	0
Miscellaneous						
Miscellaneous Expenditures	771	1,989	7,500	27%	4,391	9,000
Total Administrative & Operations Exp.	170,477	643,010	2,545,492	25%	613,023	2,355,011
Capital Outlay						
Capital Acquisition	24,341	36,226	79,000	46%	72,870	114,500
Engineering	0	0	0	0%	798	1,000
TOTAL EXPENDITURES (w/o D.S. exp.)	194,818	679,236	2,624,492	26%	686,691	2,470,511
Excess (Deficiencies) of Revenue Over Expenditures	(84,705)	(316,630)	(1,124,741)	28%	(319,687)	(975,760)
OTHER FINANCE SOURCE (USES)						
Transfer to Other Funds						
Transfer from Tax Account	0	0	(1,054,566)	0%	0	(991,729)
Extra Ordinary Income			(1,500)			
Disposition of Assets (Surplus Sale)	0	0	0	0%	0	0
TOTAL OTHER FINANCING SOURCES (USES)	0	0	(1,056,066)	0%	0	(991,729)
EXCESS (DEFICIENCES) OF REVENUES OVER OTHER SOURCES (USES)	(84,705)	(316,630)	(68,675)		(319,687)	15,969
NET INCOME	(84,705)	(316,630)	(68,675)		(319,687)	15,969

TAX FUND
INCOME STATEMENT
FOR PERIOD ENDING DECEMBER 31, 2017

25.00%

	MONTHLY	YEAR TO DATE	2018 ADOPTED BUDGET	% OF 2018 FINAL BUDGET	2017 YEAR TO DATE	2017 FINAL BUDGET
REVENUES						
Ad-Valorem - Current	258,827	422,876	1,070,008	38%	402,721	989,500
Delinquent Tax Revenue	3,267	11,388	27,500	41%	11,229	33,850
Penalty & Interest - Tax Accounts	1,016	3,921	16,000	25%	3,922	22,050
Miscellaneous	0	0	0	0%	0	0
TOTAL TAXES & INTEREST	263,109	438,185	1,113,508	38%	417,872	1,045,400
EXPENDITURES						
Tax Collector Fees	1,641	26,347	37,165	75%	27,813	35,371
Appraisal Districts	5,084	0	21,777	17%	3,792	18,300
TOTAL EXPENDITURES	6,725	31,431	58,942	54%	31,605	53,671
Transfer to General Fund	0	0	1,054,566	0%	0	991,729
EXCESS REVENUES & OTHER FINANCING SOURCES OVER(UNDER) EXPENDITURES AND OTHER USES	256,384	406,754	0		386,267	0

SPECIAL SERVICES
INCOME STATEMENT
FOR PERIOD ENDING DECEMBER 31, 2017

25.00%

	MONTHLY	YEAR TO DATE	2018 ADOPTED BUDGET	% OF 2017 FINAL BUDGET	2017 YEAR TO DATE	2017 FINAL BUDGET
REVENUES						
Ricardo Water Supply Corporation	23,783	63,183	293,020	22%	58,323	271,554
Nueces Water Supply Corporation	18,381	58,564	275,134	21%	61,737	250,665
TOTAL REVENUES	42,164	121,747	568,154	21%	120,060	522,219
EXPENDITURES						
Personnel	23,673	75,681	304,185	25%	61,541	288,626
Overhead	21,547	59,672	263,969	23%	45,094	233,593
TOTAL EXPENDITURES	45,219	135,352	568,154	24%	106,635	522,219
EXCESS REVENUES & OTHER FINANCING SOURCES OVER(UNDER) EXPENDITURES AND OTHER USES	(3,055)	(13,606)	0		13,425	0

South Texas Water Authority
Balance Sheet
December 31, 2017

ASSETS

Current Assets			
STWA - General	$	164,058.87	
STWA - Payroll		20,244.10	
STWA - Operations		35,391.54	
Petty Cash		150.00	
TexPool - STWA General		1,684,834.98	
Due From Capital Projects Fund		276,443.21	
Due from Debt Service Fund		5,883.80	
Due from D.S .-Collect Service		10,466.71	
Tax Accounts Receivable		165,274.52	
Allowance for Uncollect Taxes		(66,653.05)	
Service accts receivable		282,529.15	
Interlocal Rec-Ricardo		11,828.35	
Interlocal Rec-Nueces		11,907.49	
Interlocal Rec. - Tax Assessor		36,329.99	
Inventory		17,836.50	
Total Assets			$ 2,656,526.16

LIABILITIES AND FUNDS EQUITY

Current Liabilities			
Trade Accounts Payable	$	249,945.63	
Salaries & Wages Payable		15,660.40	
Unemployment Comp. Pbl.		411.09	
Miscellaneous Payables		666.41	
Compensated Absences		17,620.65	
Deferred tax revenue		98,621.47	
Total Liabilities			382,925.65
Fund Equity			
Unassigned Fund Balance		2,179,245.44	
Assigned Fund Bal. - Inventory		17,836.50	
Current Earning		76,518.57	
Total Fund Equity			2,273,600.51
Total Liabilities & Fund Equity			$ 2,656,526.16

South Texas Water Authority
Gl Account Summary Report
As of: December 31, 2017

Account Description	Beginning Balance	Debit Change	Credit Change	Net Change	Ending Balance
Current Assets					
STWA - General	214,547.52	$ 387,716.94	$ (438,205.59)	$ (50,488.65)	$ 164,058.87
STWA - Payroll	13,928.90	35,011.27	(28,696.07)	6,315.20	20,244.10
STWA - Operations	25,941.32	40,014.66	(30,564.44)	9,450.22	35,391.54
Petty Cash	150.00	0.00	0.00	0.00	150.00
Transfers	0.00	450,000.00	(450,000.00)	0.00	0.00
TexPool - STWA General	1,824,619.76	235,215.22	(375,000.00)	(139,784.78)	1,684,834.98
Due From Capital Projects Fund	275,543.21	900.00	0.00	900.00	276,443.21
Due from Debt Service Fund	5,970.04	93.65	(179.89)	(86.24)	5,883.80
Due from D.S .-Collect Service	8,057.59	2,409.12	0.00	2,409.12	10,466.71
Tax Accounts Receivable	165,274.52	0.00	0.00	0.00	165,274.52
Allowance for Uncollect Taxes	(66,653.05)	0.00	0.00	0.00	(66,653.05)
Service accts receivable	158,055.39	136,506.55	(12,032.79)	124,473.76	282,529.15
Interlocal Rec-Ricardo	3,592.49	8,601.25	(365.39)	8,235.86	11,828.35
Interlocal Rec-Nueces	5,749.80	6,157.69	0.00	6,157.69	11,907.49
Interlocal Rec. - Tax Assessor	6,706.43	36,329.99	(6,706.43)	29,623.56	36,329.99
Inventory	17,836.50	0.00	0.00	0.00	17,836.50
Total Assets	**2,659,320.42**	**1,338,956.34**	**(1,341,750.60)**	**(2,794.26)**	**2,656,526.16**
Current Liabilities					
Trade Accounts Payable	(423,303.71)	369,614.74	(196,256.66)	173,358.08	(249,945.63)
Salaries & Wages Payable	(12,703.20)	12,703.20	(15,660.40)	(2,957.20)	(15,660.40)
Hospital Ins Tax Payable	0.00	1,188.38	(1,188.38)	0.00	0.00
Withholding Taxes Payable	0.00	4,331.07	(4,331.07)	0.00	0.00
Emply Retire Prem Payable	0.00	10,240.78	(10,240.78)	0.00	0.00
Unemployment Comp. Pbl.	(363.09)	0.00	(48.00)	(48.00)	(411.09)
Miscellaneous Payables	(1,731.24)	10,925.93	(9,861.10)	1,064.83	(666.41)
Compensated Absences	(17,620.65)	0.00	0.00	0.00	(17,620.65)
Deferred tax revenue	(98,621.47)	0.00	0.00	0.00	(98,621.47)
Total Liabilities	**(554,343.36)**	**409,004.10**	**(237,586.39)**	**171,417.71**	**(382,925.65)**
Fund Equity					
Unassigned Fund Balance	(2,179,245.44)	0.00	0.00	0.00	(2,179,245.44)
Assigned Fund Bal. - Inventory	(17,836.50)	0.00	0.00	0.00	(17,836.50)
Total Fund Equity	**(2,197,081.94)**	**0.00**	**0.00**	**0.00**	**(2,197,081.94)**
Totals	**(92,104.88)**	**$ 1,747,960.44**	**$ (1,579,336.99)**	**$ 168,623.45**	**$ 76,518.57**

DEBT SERVICE FUND
INCOME STATEMENT
FOR PERIOD ENDING DECEMBER 31, 2017

25.00%

	MONTHLY	YEAR TO DATE	2018 ADOPTED BUDGET	% OF 2018 ADOPTED BUDGET	2017 YEAR TO DATE	2017 FINAL BUDGET
REVENUES						
Ad-Valorem - Current	84,413	137,924	366,174	38%	144,260	354,529
Delinquent Tax Revenue	1,113	3,655	7,000	52%	3,513	10,400
Penalty & Interest - Tax Accounts	314	1,050	5,500	19%	870	5,675
Out-of-District Surcharge	180	540	2,159		517	2,070
Intererest on Temporary Investments	122	214	900	24%	65	1,450
Miscellaneous	0	0	0	0%	0	0
TOTAL TAXES & INTEREST	86,141	143,382	381,733	38%	149,226	374,124
OTHER FINANCING SOURCES						
Excess Bond Proceeds	0	0	0	0%	0	0
TOTAL OTHER FINANCE SOURCES	0	0	0		0	374,124
TOTAL REVENUE AND OTHER FINANCE SOURCES	86,141	143,382	381,733	38%	149,226	374,124
EXPENDITURES						
Fiscal Agent Fees	0	0	200	0%	0	200
Bond Interest Expense	0	0	126,750	0%	0	131,050
Bond Principal Payments	0	0	220,000	0%	0	215,000
Tax Collector Fees	588	8,646	12,121	71%	9,963	12,676
Appraisal District Fees	1,821	1,821	7,103	26%	1,358	6,555
Miscellaneous	0	0	0	0%	0	0
TOTAL EXPENDITURES	2,409	10,467	366,174	3%	11,321	365,481
EXCESS REVENUES OVER(UNDER) EXPENDITURES AND OTHER USES	83,732	132,916	15,559		137,904	8,643

STWA Debt Service Fund
Balance Sheet
December 31, 2017

ASSETS

Current Assets		
Debt Service Acct. - TexPool	$ 160,113.67	
Due from Other Governments	200.83	
Taxes Receivable	41,833.70	
Allowance for Uncollectibles	(8,581.46)	
Total Current Assets		**193,566.74**
Other Assets		
Total Other Assets		**0.00**
Total Assets		**$ 193,566.74**

LIABILITIES AND FUNDS EQUITY

Current Liabilities		
Deferred Tax Revenue	$ 21,610.10	
Due to General Fund	16,350.52	
Total Current Liabilities		**37,960.62**
Long-Term Liabilities		
Total Long-Term Liabilities		**0.00**
Total Liabilities		**37,960.62**
Funds Equity		
Fund Balance	22,690.35	
Net Income	132,915.77	
Total Funds Equity		**155,606.12**
Total Liabilities & Funds Equity		**$ 193,566.74**

STWA Debt Service Fund
GI Account Summary Report
As of: December 31, 2017

Account Number	Account Description	Beginning Balance	Debit Change	Credit Change	Net Change	Ending Balance
10400	Debt Service Acct. - TexPool	83,701.79	$ 76,411.88	$ 0.00	$ 76,411.88	$ 160,113.67
13100	Due from Other Government	200.83	0.00	0.00	0.00	200.83
13300	Taxes Receivable	32,190.58	11,842.97	(2,199.85)	9,643.12	41,833.70
13301	Allowance for Uncollectibles	(8,581.46)	0.00	0.00	0.00	(8,581.46)
21700	Deferred Tax Revenue	(21,610.10)	0.00	0.00	0.00	(21,610.10)
24000	Due to General Fund	(14,027.64)	179.89	(2,502.77)	(2,322.88)	(16,350.52)
39100	Fund Balance	(22,690.35)	0.00	0.00	0.00	(22,690.35)
	Totals	49,183.65	$ 88,434.74	$ (4,702.62)	$ 83,732.12	$ 132,915.77

CAPITAL PROJECTS FUND
INCOME STATEMENT
FOR PERIOD ENDING DECEMBER 31, 2017

25.00%

	MONTHLY	YEAR TO DATE	2018 ADOPTED BUDGET	% OF 2018 ADOPTED BUDGET	2017 YEAR TO DATE	2017 FINAL BUDGET
REVENUES						
Bond Proceeds	0	0	0	0%	0	0
Interest Income	1,319	3,651	12,500	29%	2,038	11,750
TOTAL REVENUE AND OTHER FINANCE SOURCES	1,319	3,651	12,500	29%	2,038	11,750
EXPENDITURES						
Right of Way Acquisition	0	0	7,264	0%	0	0
Engineering Fees	900	4,500	228,320	2%	16,650	125,000
Construction Costs	0	160,919	643,232	25%	155,583	678,066
Pipeline Condition Assessment	0	0	194,100	0%	5,295	5,295
Legal & Administrative Fees	0	0	181,712	0%	0	0
Cost of Bond Issuance	0	0	0	0%	0	0
Miscellaneous Fees	0	0	0	0%	0	0
TOTAL EXPENDITURES	900	165,419	1,254,628	13%	177,528	808,361
EXCESS REVENUES OVER(UNDER) EXPENDITURES AND OTHER USES	419	(161,768)	(1,242,128)		(175,490)	(796,611)

STWA Capital Projects Fund
Balance Sheet
December 31, 2017

ASSETS

Current Assets		
TexSTAR - Construction Fund	$ 1,321,338.40	
Total Current Assets		1,321,338.40
Property and Equipment		
Total Property and Equipment		0.00
Other Assets		
Total Other Assets		0.00
Total Assets		$ 1,321,338.40

LIABILITIES AND FUNDS EQUITY

Current Liabilities		
Due to General Fund	$ 276,443.21	
Total Current Liabilities		276,443.21
Long-Term Liabilities		
Total Long-Term Liabilities		0.00
Total Liabilities		276,443.21
Fund Balance		
Fund Balance	1,206,663.20	
Net Income	(161,768.01)	
Total Fund Balance		1,044,895.19
Total Liabilities & Fund Balance		$ 1,321,338.40

STWA Capital Projects Fund
GI Account Summary Report
As of: December 31, 2017

Account Number	Account Description	Beginning Balance	Debit Change	Credit Change	Net Change	Ending Balance
11300	TexSTAR - Construction	1,320,019.73	$ 1,318.67	$ 0.00	$ 1,318.67	$ 1,321,338.40
2400	Due to General Fund	(275,543.21)	0.00	(900.00)	(900.00)	(276,443.21)
39100	Fund Balance	(1,206,663.20)	0.00	0.00	0.00	(1,206,663.20)
	Totals	(162,186.68)	$ 1,318.67	$ (900.00)	$ 418.67	$ (161,768.01)

SOUTH TEXAS WATER AUTHORITY
2012 BOND ELECTION

Cost of Bond Issuance:	**$107,386.40**	
Proposition #1: REGIONAL WATERLINE	**$1,900,000.00**	**36.54%**
Proposition #2: KINGSVILLE PUMP STATION	**$2,925,000.00**	**56.25%**
Proposition #3: BISHOP FACILITY	**$375,000.00**	**7.21%**
TOTAL BOND PROCEEDS:	**$5,307,386.40**	**100.00%**

Cost of Bond Issuance	
Financial Advisory Fee (First Southwest)	$30,385.00
Computer Structure Fee (for bidding securities)	$6,000.00
Bond Counsel - Leroy Grawunder (MP&H)	$39,000.00
Attorney General - State Fees and Review	$5,110.00
Standard & Poor's - Rating Agency	$11,000.00
Paying Agent - Bank processing bonds/paid semi annually	$200.00
Document Preparation/Printing	$5,000.00
Miscellaneous	$1,973.90
Accrued Interest - use to make first Debt Payment	$8,717.50
TOTAL Cost of Bond Issuance	$107,386.40

Proposition #1: REGIONAL WATERLINE
36.54%

	Engineer Estimate	Contract Amount	Percent Expended	Amount Expended	Amount Remaining
TOTAL PROPOSITION #1:	$1,900,000.00				
Construction: Lewis Construction		$1,035,100.00		$1,035,100.00	
Change Order #1		$4,320.85		$4,320.85	
Change Order #2		$30,815.17		$30,815.17	
Change Order #3		-$5,100.00		-$5,100.00	
Change Order #4		$13,954.16		$13,954.16	
		$1,079,090.18	100.00%	$1,079,090.18	
ROW Acquisition:		$60,541.31	100.00%	$60,541.31	
		$1,139,631.49		$1,139,631.49	$760,368.51
HDR Pipeline Condition Assessment		$105,900.00	100.00%	$105,900.00	
HDR LAS Booster -Driscoll		$71,100.00	97.47%	$69,300.00	
LAS Booster - Construction		$369,000.00			
Change Order #1		$45,586.84			
Change Order #2		$1,705.00			
Change Order #3		$10,650.00			
		$426,941.84	84.17%	$359,377.25	
Rock Engineering		$1,051.00		$1,051.00	
Rock Engineering		$2,026.00		$2,026.00	
				$362,454.25	
Non-Construction Related Costs:		$36,076.45	100.00%	$36,076.45	$0.00
TOTAL Proposition #1	$1,900,000.00	$1,782,726.78		$1,713,362.19	$116,222.22 *

* Estimated balance after Mercer/Driscoll LAS Project @ 100%

Proposition #2: KINGSVILLE PUMP STATION
56.25%

	Engineer Estimate	Contract Amount	Percent Expended	Amount Expended	Amount Remaining
ROW Acquisition:					
Construction Related Costs:					
Ground Storage Tank - PreLoad	$1,894,460.00	$1,248,602.55 *	100.00%	$1,206,897.95	
Final - Payment #8				$41,704.60	
				$1,248,602.55	$645,857.45
New Pumps - ACP	$327,378.00	$295,000.00		$295,000.00	
Change Order #1		$12,310.75		$12,310.75	
Odessa Pumps		$20,162.00		$20,162.00	
		$327,472.75	100.00%	$327,472.75	-$94.75
Emergency Generator	$0.00	$123,586.38	100.00%	$123,586.39	-$123,586.39
Engineering Costs:	$560,500.00				
Engineering - GST*		$234,800.00	100.00%	$234,800.00	
Engineering - GST additional work by HDR		$48,000.00	100.00%	$48,000.00	
Engineering - Pump Station		$91,600.00	100.00%	$91,600.00	
Rock Engineering, Inc.				$1,121.00	
LNV - Generator		$30,000.00	100.00%	$30,000.00	
				$405,521.00	$154,979.00
Non-Construction Related Costs:	$122,500.00	$60,404.85		$60,404.85	$62,095.15
TOTAL Proposition #2	$2,904,838.00	$2,164,466.53		$2,165,587.54	$739,250.46

*Reduced by Change Order #1

Proposition #3: BISHOP FACILITY
7.21%

		Engineer Estimate	Contract Amount	Percent Expended	Amount Expended	Amount Remaining
Construction:	Mercer	$277,100.00	$109,900.00	100.00%	$117,596.50	$159,503.50
Change Order:	Painting building		$3,996.00			
	Change to WYE		$3,700.00			
			$117,596.00			
Construction Related Costs:		$69,300.00	$52,200.00	100.00%	$52,200.00	$17,100.00
LNV Engineering						
Non-Construction Related Costs:		$28,600.00	$13,330.35	100.00%	$13,330.35	$15,269.65
TOTAL Proposition #3		$375,000.00	$183,126.35		$183,126.85	$191,873.15
					TOTAL	**$1,047,345.83**

OUTSTANDING INVOICES FOR BOARD APPROVAL

INV DATE	VENDOR	INV #	DESCRIPTION	STATUS	AMOUNT
10/23/2017	Praesidium Systems, Inc.		New Firewall	pending	$2,092.99
11/3/2017	City of Corpus Christi		November water usage	pending	$87,667.19
11/25/2017	John Womack & Co., P. C.	13222	FY2017 Audit	pending	$8,670.00
11/30/2017	Walker Partners	14355	TCEQ Order	pending	$5,920.00
12/7/2017	HDR Engineering, Inc.	1200090634	Driscoll LAS System	pending	$900.00
12/7/2017	HDR Engineering, Inc.	1200090635	42" pipeline contract #3	pending	$6,840.00
12/12/2017	Kevin Kieschnick-NC Tax Assessor		November per parcel fees	pending	$2,229.29
12/29/2017	Mercer Controls	16681	Central PS Building	pending	$21,900.00
12/29/2017	Willatt & Flickinger, PLLC		December Legal	pending	$481.80
12/31/2017	Walker Partners	14527	TCEQ Order	pending	$3,800.00
1/4/2018	Russell Corrosion	2192	Corrosion Testing/ examine stations 0-5000	pending	$300.00
1/17/2018	City of Corpus Christi		December water usage	pending	$86,343.97
					$227,145.24

Praesidium Systems, Inc.

P.O. Box 6948
Corpus Christi, TX 78466-6948
www.psionsite.com
361-654-3100

Invoice

Date	Invoice #
10/23/2017	22712

Bill To

South Texas Water Authority
P O Box 1701
Kingsville TX 78364-1701

P.O. No.	Terms	Project
	Due on receipt	

Quantity	Description	Rate	Amount
1	SonicWALL TZ Firewall with Wireless-AC plus TotalSecure (3 Year) » Maximum Speed: 750 Mbps » UTM Speed: 100 Mbps » Maximum VPN Speed: 300 Mbps » Concurrent Connections: 50,000 » Site-to-Site VPN Tunnels:10 » Bundled Global VPN Client Licenses: 1 (10 Available) » SSL VPN licenses: 1 (50 Available) » Built-in 802.11a/b/g/n/ac secure wireless access » Special Services: (3) Year Subscription License gateway antivirus, content filtering, spyware protection, intrusion prevention and 24x7 technical support from Sonicwall	1,697.99	1,697.99
1	Shipping and Handling	20.00	20.00
1	New Firewall Installation and Configuration Service	375.00	375.00

Thank you for your business.

Total $2,092.99

Phone # 361-654-3100 Fax # 361-882-2280 josh@psionsite.com www.psionsite.com

Joella Wagner

From: Darlyn Belle <DarlynB@cctexas.com>
Sent: Thursday, December 21, 2017 3:16 PM
To: Joella Wagner
Subject: RE: invoice

Sure, sorry I should have included that info.
Your total gallons for this bill period was 37,850.

37,667.19 ÷
37,850. =
2.316174

Darlyn Belle
361-826-3321

2.316174

From: Joella Wagner [mailto:jwagner@stwa.org]
Sent: Thursday, December 21, 2017 3:18 PM
To: Darlyn Belle <DarlynB@cctexas.com>
Subject: RE: invoice

If that is the amount of the invoice then can you give me a total gallons usage. I take the invoice and divide it by the gallons to come up with a per 1000 gallon cost. Thanks.

From: Darlyn Belle [mailto:DarlynB@cctexas.com]
Sent: Thursday, December 21, 2017 2:58 PM
To: Joella Wagner
Subject: RE: invoice

POSTED

Hey Joella,
My apologies for not getting back to you sooner, but unfortunately we are still working on the batch runs for the bills and I am unable at this time to view the account and provide you with an amount. Based on the consumption to be billed, I have done the manual calculation and your bill should be rendered at $87667.19. The actual bills should be ready for distribution by tomorrow.

I realize this is not what you want to hear but that's all I got right now. I will email you as soon as I have the actual bill in hand(on my screen).

Thanks

Darlyn
361-826-3321

From: Joella Wagner [mailto:jwagner@stwa.org]
Sent: Thursday, December 21, 2017 2:19 PM
To: Darlyn Belle <DarlynB@cctexas.com>
Subject: invoice
Importance: High

John Womack & Co, P.C.
205 South 10th Street
Kingsville, TX 78363
Phone (361) 592-2671

South Texas Water Authority
P.O. Box 1701
Kingsville, TX 78364

Invoice#: 13222
Date: 11/25/2017

Billing of financial audit services for the year ended September 30, 2017	$8,670.00

PLEASE DETACH HERE AND RETURN WITH PAYMENT

Date: 11/25/2017 Invoice#: 13222
South Texas Water Authority

John Womack & Co, P.C.
205 South 10th Street
Kingsville, TX 78363
Phone (361) 592-2671

Balance Due: $8,670.00
Amount Enclosed: [ ]

Invoice

Walker Partners
engineers ★ surveyors
600 Austin Avenue, Suite 20
Waco, TX 76701
Phone:(254) 714-1402 / Fax:(254) 714-0402
www.walkerpartners.com
TBPE No. 8053 | TBPLS No. 10032500

RECEIVED
DEC 13 2017
SOUTH TEXAS WATER AUTHORITY

Carola Serrato
South Texas Water Authority
P. O. Box 1701
Kingsville, TX 78364

November 30, 2017
Invoice No: 0300652.00 - 14355

Project Manager: Aaron D. Archer , P.E.

Project 0300652.00 South Texas Water Authority - TCEQ Order

Engineering/Surveying Services through November 28, 2017

Phase 0000 Lump Sum Fee

Billing Phase	Lump Sum Fee	% Comp.	Earned	Prior Amount	Current Amount
30 Preliminary Design	29,600.00	50.00	14,800.00	8,880.00	5,920.00
Total Fee	29,600.00		14,800.00	8,880.00	5,920.00
	Total				**5,920.00**
			Sub-total		**$5,920.00**
			Total this Invoice		**$5,920.00**

Billings to Date

	Current	Prior	Total	Received	A/R Balance
Lump Sum Fee	5,920.00	8,880.00	14,800.00		
Totals	**5,920.00**	**8,880.00**	**14,800.00**	**7,992.00**	**6,808.00**

Authorized By: _____ Date: 12/8/17

Aaron D. Archer, P.E.

POSTED

Invoice

Please send remittance with copy of invoice to
HDR Inc/US Engineering Accounts Receivable
P.O. Box 74008202
Chicago, II 60674-8202

HDR Engineering, Inc.
Austin,TX 78741
Phone: (512) 912-5100

HDR Invoice No. 1200090634
Invoice Date 12/7/2017
Period Ending 10/29/17-11/25/17

South Texas Water Authority
P.O.Box 1701
Kingsville, Texas 78364

Project No.: **10031798** $ 900.00

Attn: Ms. Carola Serrato

Email to: JoElla Wagner <jwagner@stwa.org>

Engineering Services for Driscoll LAS System

	Lump Sum Fee	Percent Complete	Amount Earned
Design	$ 45,900.00	100.0%	$ 45,900.00
Bidding	$ 7,200.00	100.0%	$ 7,200.00
Construction	$ 18,000.00	95.0%	$ 17,100.00

Total Amount Earned to Date:	$ 70,200.00	
Total Amount Invoiced to Date:	$ 69,300.00	
Due this invoice:	$ 900.00	$ 900.00

POSTED

TOTAL DUE THIS INVOICE: **$ 900.00**

Invoice

Please send remittance with copy of invoice to
HDR Inc/US Engineering Accounts Receivable
P.O. Box 74008202
Chicago, II 60674-8202

HDR Engineering, Inc.
Austin,TX 78741
Phone: (512) 912-5100

HDR Invoice No. 1200090635
Invoice Date 12/7/2017
Period Ending 10/29/17-11/25/17

South Texas Water Authority
P.O.Box 1701
Kingsville, Texas 78364

Attn: Ms. Carola Serrato

Email to: JoElla Wagner <jwagner@stwa.org>

Project No.: 10059793 $ 6,840.00

Engineering Services Proposal for 42-IN Pipeline Contract 3 Leak Detection Services

	Lump Sum Fee	Percent Complete	Amount Earned
Task 1 and 2	$ 34,200.00	100.0%	$ 34,200.00

Total Amount Earned to Date:	$ 34,200.00	
Total Amount Invoiced to Date:	$ 27,360.00	
Due this invoice:	$ 6,840.00	$ 6,840.00

POSTED

TOTAL DUE THIS INVOICE: **$ 6,840.00**

Nueces County Courthouse
901 Leopard, Suite 301
Corpus Christi, TX 78401

Kevin Kieschnick
Assessor and Collector of Taxes

Administration
(361) 888-0307
(361) 888-0308

December 12, 2017

South Texas Water District
C/O Carola Serrato
P.O. Box 1701
Kingsville, TX 78363

Fees for Collection of Ad Valorem Taxes during the month of November 2017

Total collected parcels	1,606
Collection Fee per Parcel	$1.3881
Total for NOVEMBER	$2,229.29

Please Make Checks Payable To:
Nueces County Tax Assessor-Collector

For information contact:	*Motor Vehicle*	*Property Tax*	*Voter Registration*
voice	*(361) 888-0459*	*(361) 888-0230*	*(361) 888-0404*
fax	*(361) 888-0482*	*(361) 888-0218*	*(361) 888-0339*

Mercer Controls, Inc.
P O Box 777
Edna TX 77957

RECEIVED
JAN 05 2018
SOUTH TEXAS WATER AUTHORITY

Invoice

Date	Invoice #
12/29/2017	16681

Bill To
South Texas Water Authority P O Box 1701 Kingsville, TX 78364

P.O. No.	Terms	Project
	Due on receipt	

Quantity	Description	Rate	Amount
	Service completion to furnish material and labor to replace outer walls and roof on the Central Pump Station building. Includes repainting the existing doors and vents. Includes new roof mounted exhaust fan and thermostat.		
	DRAW #1		
1	Charges as quoted and approved	23,400.00	23,400.00
-1	Credit for new exhaust fan and thermostat installation not completed	1,500.00	-1,500.00
	NOTE: Final draw for $1,500.00 will be at the time of completion.		

POSTED

Thank you for your business. We are glad to be of service to you.

Total $21,900.00

WILLATT & FLICKINGER, PLLC
ATTORNEYS AT LAW

12912 HILL COUNTRY BLVD., SUITE F-232 · AUSTIN, TEXAS 78738 · (512) 476-6604 · FAX (512) 469-9148

December 29, 2017

Ms. Carola Serrato
Executive Director
South Texas Water Authority
P.O. Box 1701
Kingsville, Texas 78364-1701

FOR PROFESSIONAL SERVICES RENDERED since the date of last billing:

GENERAL

BILL FLICKINGER

12/06/17 Telephone conference with Carola Serrato on Bishop contract. (0.2 Hours).

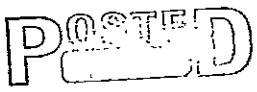
12/07/17 Receive, review and respond to email from Carola Serrato with draft letter to the Mayor of Bishop on revised wholesale water contract. (0.3 Hours).

12/13/17 Email to Carola Serrato on TCEQ conference call tomorrow and receive her response. (0.2 Hours).

12/14/17 Complete preparation for and participate in conference call with TCEQ on enforcement order deadlines and submissions. (0.7 Hours).

12/16/17 Receive and review emails from Carola Serrato and Joel Klumpp on revised certification of LAS injection points. (0.2 Hours).

Attorney BF: 1.6 Hours



Attorney BF: 1.6 Hours @ $300.00 per hour $480.00
Attorney MM: 0 Hours @ $300.00 per hour
Legal Assistant AN: 0 Hours @ $95.00 per hour

CLIENT EXPENSES

9 Photocopies @ $.20 each $1.80

Total Client Expenses $1.80

TOTAL AMOUNT DUE $481.80

g\bills\STWA-2017-12
12/29/17

Invoice

Walker Partners
engineers ★ surveyors
600 Austin Avenue, Suite 20
Waco, TX 76701
Phone:(254) 714-1402 / Fax:(254) 714-0402
www.walkerpartners.com
TBPE No. 8053 | TBPLS No. 10032500

RECEIVED
JAN 15 2018
SOUTH TEXAS WATER AUTHORITY

Carola Serrato
South Texas Water Authority
P. O. Box 1701
Kingsville, TX 78364

December 31, 2017
Invoice No: 0300652.00 - 14527

Project Manager: Aaron D. Archer , P.E.

Project 0300652.00 South Texas Water Authority - TCEQ Order

Engineering/Surveying Services through December 26, 2017

Phase 0000 Lump Sum Fee

Billing Phase	Lump Sum Fee	% Comp.	Earned	Prior Amount	Current Amount
30 Preliminary Design	29,600.00	62.8378	18,600.00	14,800.00	3,800.00
Total Fee	29,600.00		18,600.00	14,800.00	3,800.00
		Total			**3,800.00**

POSTED

Sub-total	**$3,800.00**
Total this Invoice	**$3,800.00**

Billings to Date

	Current	Prior	Total	Received	A/R Balance
Lump Sum Fee	3,800.00	14,800.00	18,600.00		
Totals	**3,800.00**	**14,800.00**	**18,600.00**	**8,880.00**	**9,720.00**

Authorized By: _____ Date: 1/10/18

Aaron D. Archer, P.E.

Invoice

RUSSELL CORROSION CONSULTANTS
A wholly owned subsidiary of EN Engineering, LLC

Russell Corrosion Consultants, LLC
Remit to: P.O. Box 6266
Carol Stream, IL 60197-6266
(P) (410) 997-4481
ACH - ABA #071925334, Acct #5741230227
Lake Forest Bank & Trust

January 4, 2018
Project No: 1795027.01
Invoice No: 0002192

Project Manager: Karl Norred
Ref. Number:
Invoice Total: $300.00

South Texas Water Authority
P.O. Box 1701
Kingsville, TX 78364

Project 1795027.01 STWA Corrosion Assessment and Testing Examin Stations 0-5000
mcgserrato@stwa.org.

Professional Services from November 26, 2017 to December 31, 2017

Professional Personnel

	Hours	Rate	Amount	
Corrosion Project Manager				
Norred, Karl	2.00	150.00	300.00	
Totals	2.00		300.00	
Total Labor				**300.00**

Billing Limits	**Current**	**Prior**	**To-Date**
Total Billings	300.00	25,878.77	26,178.77
Limit			65,000.00
Remaining			38,821.23

Total this Invoice **$300.00**

POSTED

Billing Backup

Thursday, January 4, 2018

Russell Corrosion Consultants, LLC Invoice 0002192 Dated 1/4/2018 11:25:10 AM

Project 1795027.01 STWA Corrosion Assessment and Testing Examin Stations 0-5000

Professional Personnel

			Hours	Rate	Amount	
Corrosion Project Manager						
50079	Norred, Karl	12/1/2017	2.00	150.00	300.00	
	Draft report and meeting planning					
	Totals		2.00		300.00	
	Total Labor					**300.00**

Total this Project **$300.00**

Total this Report **$300.00**

Joella Wagner

From: Darlyn Belle <DarlynB@cctexas.com>
Sent: Wednesday, January 17, 2018 1:02 PM
To: Joella Wagner
Subject: RE: water invoice

I am so proud to say that your December water invoice was processed yesterday!!

POSTED

PLEASE PAY:

2,349496

NEW CHARGES		
WATER	$	50,725.87
RWCA $0.966/TGAL	$	35,618.10
TOTAL WATER	**$**	**86,343.97**
BILLED CONSUMPTION		36750

The charges above are prorated due to rate changes effective 1/1/18(12 day
Water minimum rates changed from 728.40 to 760.50
Water rates changed from 1.331 to 1.404
RWCA rates changed from .966 to .974

The Water charge includes both water minimum and water consumption

Have a Great Day. . . . Stay Warm

Darlyn Belle
361-826-3321

From: Joella Wagner [mailto:jwagner@stwa.org]
Sent: Wednesday, January 17, 2018 10:04 AM
To: Darlyn Belle <DarlynB@cctexas.com>
Subject: water invoice

Darlyn,

Are y'all any closer to having the December water invoice ready for STWA? Remember, all I need is the December usage and the dollar amount being charged.

Thanks,
Jo Ella Wagner

ANTICIPATED (BUDGETED) vs. ACTUAL WATER RATE CHARGED

	ANTICIPATED (BUDGETED) CHARGES			ACTUAL CHARGES			Difference:
	Handling Charge	CC Cost	Total	Handling Charge	CC Cost	Total	Actual vs. Budgeted
Oct-17	$0.426386	$2.4362	$2.8626	$0.426386	$2.312247	$2.738633	-$0.1239
Nov-17	$0.426386	$2.4380	$2.8644	$0.426386	$2.316174	$2.742560	-$0.1218
Dec-17	$0.426386	$2.4383	$2.8647	$0.426386	$2.349496	$2.775882	-$0.0888
Jan-18	$0.426386	$2.4378	$2.8642	$0.426386		$0.426386	-$2.4378
Feb-18	$0.426386	$2.4398	$2.8662	$0.426386		$0.426386	-$2.4398
Mar-18	$0.426386	$2.4376	$2.8640	$0.426386		$0.426386	-$2.4376
Apr-18	$0.426386	$2.4359	$2.8623	$0.426386		$0.426386	-$2.4359
May-18	$0.426386	$2.4358	$2.8622	$0.426386		$0.426386	-$2.4358
Jun-18	$0.426386	$2.4350	$2.8614	$0.426386		$0.426386	-$2.4350
Jul-18	$0.426386	$2.4335	$2.8599	$0.426386		$0.426386	-$2.4335
Aug-18	$0.426386	$2.4330	$2.8594	$0.426386		$0.426386	-$2.4330
Sep-18	$0.426386	$2.4360	$2.8624	$0.426386		$0.426386	-$2.4360
Avg Cost	$0.426386	$2.4364	$2.8628	$0.426386	$2.325972	$2.752358	-$0.1104

ANTICIPATED (BUDGETED) vs. ACTUAL WATER USAGE

All Customers	Budgeted	Actual	Difference
Oct-17	43,106,064	49,257,770	6,151,706
Nov-17	39,010,208	41,240,370	2,230,162
Dec-17	38,272,268	37,196,850	-1,075,418
Jan-18	39,270,789	0	
Feb-18	35,570,793	0	
Mar-18	39,754,343	0	
Apr-18	43,693,987	0	
May-18	44,073,875	0	
Jun-18	46,279,865	0	
Jul-18	50,891,700	0	
Aug-18	52,856,325	0	
Sep-18	43,581,741	0	
TOTAL	516,361,957	127,694,990	7,306,450

NWSC	Budgeted	Actual	Difference
Oct-17	11,406,490	13,839,280	2,432,790
Nov-17	10,288,004	12,528,080	2,240,076
Dec-17	10,329,528	11,526,840	1,197,312
Jan-18	10,835,370	0	
Feb-18	9,334,104	0	
Mar-18	10,296,803	0	
Apr-18	11,536,949	0	
May-18	12,015,101	0	
Jun-18	12,879,697	0	
Jul-18	14,328,969	0	
Aug-18	14,308,455	0	
Sep-18	12,438,360	0	
TOTAL	139,997,830	37,894,200	5,870,178

Kingsville	Budgeted	Actual	Difference
Oct-17	10,188,919	13,323,000	3,134,081
Nov-17	10,188,919	8,716,000	-1,472,919
Dec-17	10,188,919	6,734,000	-3,454,919
Jan-18	10,188,919	0	
Feb-18	10,188,919	0	
Mar-18	10,188,919	0	
Apr-18	10,188,919	0	
May-18	10,188,919	0	
Jun-18	10,188,919	0	
Jul-18	10,188,919	0	
Aug-18	10,188,919	0	
Sep-18	10,188,919	0	
TOTAL	122,267,026	28,773,000	-1,793,756

RWSC	Budgeted	Actual	Difference
Oct-17	8,892,000	8,533,000	-359,000
Nov-17	7,675,200	7,776,000	100,800
Dec-17	7,091,800	7,006,000	-85,800
Jan-18	7,211,600	0	
Feb-18	6,276,600	0	
Mar-18	8,122,200	0	
Apr-18	9,168,400	0	
May-18	9,261,200	0	
Jun-18	10,412,600	0	
Jul-18	11,164,600	0	
Aug-18	11,785,400	0	
Sep-18	8,403,600	0	
TOTAL	105,465,200	23,315,000	-344,000

Bishop	Budgeted	Actual	Difference
Oct-17	5,417,400	5,521,000	103,600
Nov-17	4,275,800	4,247,000	-28,800
Dec-17	4,314,400	4,005,000	-309,400
Jan-18	4,635,200	0	
Feb-18	3,702,800	0	
Mar-18	4,623,400	0	
Apr-18	5,871,600	0	
May-18	5,176,600	0	
Jun-18	4,661,600	0	
Jul-18	6,609,800	0	
Aug-18	8,080,400	0	
Sep-18	5,338,000	0	
TOTAL	62,707,000	13,773,000	-234,600

Banquete	Budgeted	Actual	Difference
Oct-17	2,393,856	2,107,860	-285,996
Nov-17	2,168,468	1,979,060	-189,408
Dec-17	2,078,142	2,033,820	-44,322
Jan-18	2,037,054	0	
Feb-18	1,971,256	0	
Mar-18	2,043,050	0	
Apr-18	2,106,092	0	
May-18	2,278,536	0	
Jun-18	2,477,094	0	
Jul-18	2,533,790	0	
Aug-18	2,561,114	0	
Sep-18	2,232,010	0	
TOTAL	26,880,462	6,120,740	-519,726

Driscoll	Budgeted	Actual	Difference
Oct-17	2,440,991	3,788,900	1,347,909
Nov-17	2,318,365	3,995,000	1,676,635
Dec-17	2,240,349	3,669,100	1,428,751
Jan-18	2,422,620	0	
Feb-18	2,237,900	0	
Mar-18	2,467,160	0	
Apr-18	2,610,900	0	
May-18	2,832,220	0	
Jun-18	3,105,320	0	
Jul-18	3,369,200	0	
Aug-18	3,091,193	0	
Sep-18	2,683,790	0	
TOTAL	31,820,009	11,453,000	4,453,295

Agua Dulce	Budgeted	Actual	Difference
Oct-17	2,366,408	2,144,730	-221,678
Nov-17	2,095,452	1,999,230	-96,222
Dec-17	2,029,130	2,222,090	192,960
Jan-18	1,940,026	0	
Feb-18	1,859,214	0	
Mar-18	2,012,811	0	
Apr-18	2,211,127	0	
May-18	2,321,299	0	
Jun-18	2,554,636	0	
Jul-18	2,696,422	0	
Aug-18	2,840,844	0	
Sep-18	2,297,062	0	
TOTAL	27,224,431	6,366,050	-124,940

Kingsville Actual Usage vs. Bell Chart Volume

	Target Volume	Actual Volume	Difference
Oct-17	12,451,513	13,323,000	871,487
Nov-17	7,362,963	8,716,000	1,353,037
Dec-17	5,893,607	6,734,000	840,393
Jan-18	4,650,000	0	
Feb-18	6,760,471	0	
Mar-18	8,319,028	0	
Apr-18	10,906,161	0	
May-18	12,497,858	0	
Jun-18	14,240,055	0	
Jul-18	15,711,155	0	
Aug-18	15,911,986	0	
Sep-18	13,866,300	0	
TOTAL	128,571,097	28,773,000	3,064,917

Net Revenue per Thousand (1,000) Gallons

Kingsville	Actual	Net Rev	Per 1000g
Oct-17	13,323,000	$4,456.79	$0.3345
Nov-17	8,716,000	$2,145.93	$0.2462
Dec-17	0		#DIV/0!
Jan-18	0		#DIV/0!
Feb-18	0		#DIV/0!
Mar-18	0		#DIV/0!
Apr-18	0		#DIV/0!
May-18	0		#DIV/0!
Jun-18	0		#DIV/0!
Jul-18	0		#DIV/0!
Aug-18	0		#DIV/0!
Sep-18	0		#DIV/0!
TOTAL	22,039,000	$6,602.72	$0.2996

NWSC	Actual	Net Rev	Per 1000g
Oct-17	13,839,280	$3,919.47	$0.2832
Nov-17	12,528,080	$3,932.40	$0.3139
Dec-17	0		#DIV/0!
Jan-18	0		#DIV/0!
Feb-18	0		#DIV/0!
Mar-18	0		#DIV/0!
Apr-18	0		#DIV/0!
May-18	0		#DIV/0!
Jun-18	0		#DIV/0!
Jul-18	0		#DIV/0!
Aug-18	0		#DIV/0!
Sep-18	0		#DIV/0!
TOTAL	26,367,360	$7,851.87	$0.2978

Bishop	Actual	Net Rev	Per 1000g
Oct-17	5,521,000	$1,015.42	$0.1839
Nov-17	4,247,000	$425.49	$0.1002
Dec-17	0		#DIV/0!
Jan-18	0		#DIV/0!
Feb-18	0		#DIV/0!
Mar-18	0		#DIV/0!
Apr-18	0		#DIV/0!
May-18	0		#DIV/0!
Jun-18	0		#DIV/0!
Jul-18	0		#DIV/0!
Aug-18	0		#DIV/0!
Sep-18	0		#DIV/0!
TOTAL	9,768,000	$1,440.91	$0.1475

RWSC	Actual	Net Rev	Per 1000g
Oct-17	8,533,000	$538.11	$0.0631
Nov-17	7,776,000	$1,907.85	$0.2454
Dec-17	0		#DIV/0!
Jan-18	0		#DIV/0!
Feb-18	0		#DIV/0!
Mar-18	0		#DIV/0!
Apr-18	0		#DIV/0!
May-18	0		#DIV/0!
Jun-18	0		#DIV/0!
Jul-18	0		#DIV/0!
Aug-18	0		#DIV/0!
Sep-18	0		#DIV/0!
TOTAL	16,309,000	$2,445.96	$0.1500

Driscoll	Actual	Net Rev	Per 1000g
Oct-17	3,788,900	$847.98	$0.2238
Nov-17	3,995,000	$979.64	$0.2452
Dec-17	0		#DIV/0!
Jan-18	0		#DIV/0!
Feb-18	0		#DIV/0!
Mar-18	0		#DIV/0!
Apr-18	0		#DIV/0!
May-18	0		#DIV/0!
Jun-18	0		#DIV/0!
Jul-18	0		#DIV/0!
Aug-18	0		#DIV/0!
Sep-18	0		#DIV/0!
TOTAL	7,783,900	$1,827.62	$0.2348

Banquete	Actual	Net Rev	Per 1000g
Oct-17	2,107,860	$243.69	$0.1156
Nov-17	1,979,060	$386.16	$0.1951
Dec-17	0		#DIV/0!
Jan-18	0		#DIV/0!
Feb-18	0		#DIV/0!
Mar-18	0		#DIV/0!
Apr-18	0		#DIV/0!
May-18	0		#DIV/0!
Jun-18	0		#DIV/0!
Jul-18	0		#DIV/0!
Aug-18	0		#DIV/0!
Sep-18	0		#DIV/0!
TOTAL	4,086,920	$629.85	$0.1541

Agua Dulce	Actual	Net Rev	Per 1000g
Oct-17	2,144,730	$475.40	$0.2217
Nov-17	1,999,230	$477.13	$0.2387
Dec-17	0		#DIV/0!
Jan-18	0		#DIV/0!
Feb-18	0		#DIV/0!
Mar-18	0		#DIV/0!
Apr-18	0		#DIV/0!
May-18	0		#DIV/0!
Jun-18	0		#DIV/0!
Jul-18	0		#DIV/0!
Aug-18	0		#DIV/0!
Sep-18	0		#DIV/0!
TOTAL	4,143,960	$952.53	$0.2299

All Customers	Actual	Net Rev	Per 1000g
Oct-17	49,257,770	$11,496.86	$0.2334
Nov-17	41,240,370	$10,254.60	$0.2487
Dec-17	0		#DIV/0!
Jan-18	0		#DIV/0!
Feb-18	0		#DIV/0!
Mar-18	0		#DIV/0!
Apr-18	0		#DIV/0!
May-18	0		#DIV/0!
Jun-18	0		#DIV/0!
Jul-18	0		#DIV/0!
Aug-18	0		#DIV/0!
Sep-18	0		#DIV/0!
TOTAL	90,498,140	$21,751.46	$0.2404

INTER-OFFICE MEMO

TO: Carola G. Serrato, Executive Director
FROM: Jacob Hinojosa, O&M Supervisor
DATE: January 18, 2018
RE: Maintenance & Technical Report

During the week of November 20, 2017, the following work was completed.

- Safety Meeting for all Field Techs.
- Exercised generators.
- Downloaded GPS.
- Performed line locates.
- Took Unit #2 to Victor's glass to get a ding on the windshield repaired.
- Cut the grass in the ditch at the office.
- Company came to check the generator at Aqua Dulce Pump Station.
- Repaired chlorine injection at Kingsville Pump Station.
- Worked with Mercer Contractor on SCADA items.
- Took Unit #6 to get oil change.
- Painted meter runs at pump stations.
- Took water samples.
- Picked up brush at office.

During the week of November 27, 2017, the following work was completed.

- Safety Meeting for all Field Techs.
- Exercised generators.
- Downloaded GPS.
- Performed line locates.
- Worked on state permit for sample tap on FM 666.
- Mowed pump stations.
- Worked on new GPS units.
- Checked work done by contractors on Central Rehab project.
- Looked into possible leak on 42" line north of IES in Driscoll.
- Company came in to do repair and periodic maintenance work on the Aqua Dulce Generator.

During the week of December 4, 2017, the following work was completed.

- Safety Meeting for all Field Techs.
- Exercised generators.

- Downloaded GPS.
- Performed line locates.
- Installed and tested new VFD drive for the Kingsville Mixer.
- Mowed grass at the pump stations.
- Repaired microphone in front office.
- Dropped off Unit #4 at dealership to get repaired.
- Insulated piping at pump stations.
- Replaced relays for chlorine booster pump at Central Pump Station.
- Checked on contractors at Central Pump Station rehab project.
- Took a barrel of LAS to new LAS building in Driscoll Pump Station.
- Ordered stencils for confined space entry points.
- Took Unit #8 to get an oil change.
- Checked on Agua Dulce SCADA antenna.
- Checked on Driscoll Pump Stations power outage due to snow.
- Repaired gate at office.

During the week of December 11, 2017, the following work was completed.

- Safety Meeting for all Field Techs.
- Exercised generators.
- Downloaded GPS.
- Performed line locates.
- Employee attended a pump and pumping class in Corpus.
- Replaced lights at the shop at the Kingsville office.
- Repaired the CL17 at the Driscoll 42" booster stations.
- Picked up Unit #4 from the shop.
- Hoelscher Electric came to repair security lights at office.
- Mowed grass at office.
- Checked on Driscoll LAS project.
- Checked on Agua Dulce SCADA antenna.
- Took pictures of Central Pump Station rehab project.
- Worked on MOV with contractor from Mercer at Driscoll Pump Station.
- Participated in a conference call with TCEQ.
- Ran new cable for computer in O&M Supervisor's office.

During the week of December 18, 2017, the following work was completed.

- Safety Meeting for all Field Techs.
- Exercised generators.
- Downloaded GPS.
- Performed line locates.

- Took Unit #2 to get an oil change.
- Replaced lights at pump stations.
- Cleaned out pump stations.
- Picked up chlorine injectors from Duke Controls.
- Cleaned out chlorine at LAS buildings.
- Took water samples.
- Checked on Mercer Controls at Driscoll LAS project.
- Took tool inventory on Unit #6 and #4.
- Replaced broken pin on pulley for the gate at the office.
- Tool residuals on the 42" line.

During the week of December 25, 2017, the following work was completed.

- Safety Meeting for all Field Techs.
- Exercised generators.
- Downloaded GPS.
- Performed line locates.
- Took residuals on the 42" line.
- Had to trouble shoot chlorine at Bishop West Pump Station.
- Called in locates to schedule sample tap work on FM 666.

During the week of January 1, 2018, the following work was completed.

- Safety Meeting for all Field Techs.
- Exercised generators.
- Downloaded GPS.
- Performed line locates.
- Had to trouble shoot pressure switch for hydro tank at Central Pump Station that controls the pressure on the spur line.
- Cleaned out the chlorine and LAS buildings at the pump stations.
- Dropped off Unit #7 to dealership for repairs.
- Had to troubleshoot MOV at Central Pump Station as well as pump control panel.
- Delivered chlorine to pump stations.
- Repaired faucet at the Kingsville MR.
- Got tire replaced for Unit #4.
- Installed sample tap on FM 666 on spur line.

During the week of January 8, 2018, the following work was completed.

- Safety Meeting for all Field Techs.
- Exercised generators.

- Downloaded GPS.
- Performed line locates.
- Installed piping and faucet for tap done on FM 666.
- Installed new I/O cord for MOV at Central Pump Station. Also disconnected bad level switch on large GST.
- Put large GST at Central Pump Station online.
- Met with Russell Corrosion to test DM2 unit on 42" line.
- Took Unit #1 to get AC worked on.
- Went through Driscoll LAS project punch list.
- Took Unit #4 to shop to check on oil leak.
- Employee took CDL driving exam in Corpus Christi.
- Painted confined spaced entry label on GST manways.

ATTACHMENT 5

TCEQ Enforcement Action

Memorandum

To: South Texas Water Authority Board of Directors
From: Carola G. Serrato, Executive Director
Date: January 19, 2018
Re: Texas Commission on Environmental Quality (TCEQ) Enforcement Action

Background:

Enclosed please find the most recent correspondence on this matter including the Engineering Report which was due on January 7, 2018 and an approval letter from the TCEQ for the design of the sample sites. Staff and consultants were scheduled to have a conference call with the TCEQ the day before the Board Meeting on January 22nd. However, this morning I received a call asking for the conference call to be postponed to Thursday, January 25th. Staff feels certain that the completion of the Driscoll LAS system and whether the 42" line is having chloramines directly injected will be one of the main topics. As reported under the Driscoll LAS agenda item, Mercer Controls, Inc. was scheduled to have the system in operation and training on the system is scheduled for today, Friday, January 19th.

Analysis:

This is an update only.

Staff Recommendation:

Keep the Board updated on the TCEQ Order.

Board Action:

Provide feedback to staff and consultants.

Summarization:

Two (2) bacteriological samples are scheduled for collection this month under the new Monitoring Plan. One sample will be collected off the 42" waterline and the other off the spurline on FM 666.

cserrato@stwa.org

From: Joel Klumpp <joel.klumpp@tceq.texas.gov>
Sent: Friday, December 15, 2017 10:37 AM
To: Carola Serrato
Cc: Aaron Archer; Bill Flickinger; Dony Cantu; Frances Rosales; Jacob Hinojosa; Jo Ella Wagner; Craig Stowell; Michael Tucker
Subject: RE: Certificate of Compliance with LAS and Chlorine Injection Order

Ms. Serrato,

Thank you for this follow-up email. You have met the requirement to confirm that all LAS injection points are prior to the chlorine injection points.

Happy holidays,

Joel

Joel Klumpp | **Manager | Plan and Technical Review Section | Water Supply Division | TCEQ**

12100 Park 35 Circle, Bldg. F | Austin, Texas 78753 | ☎ (512) 239-4453 Fax: (512) 239-6050 | Joel.Klumpp@tceq.texas.gov

From: Carola Serrato [mailto:cserrato@stwa.org]
Sent: Thursday, December 14, 2017 2:50 PM
To: Michael Tucker <Michael.Tucker@tceq.texas.gov>; Joel Klumpp <joel.klumpp@tceq.texas.gov>
Cc: Aaron Archer <aarcher@walkerpartners.com>; Bill Flickinger <bflickinger@wfaustin.com>; Dony Cantu <dcantu@stwa.org>; Frances Rosales <fvrosales@stwa.org>; Jacob Hinojosa <jhinojosa@stwa.org>; Jo Ella Wagner <jwagner@stwa.org>
Subject: Certificate of Compliance with LAS and Chlorine Injection Order

Mr. Klumpp and Mr. Tucker,

Per our conference call this morning (December 14, 2017), this email is to confirm that all LAS and Chlorine Injection facilities have the LAS injection points prior to the chlorine injection points.

I certify under penalty of law that I have personally examined and am familiar with the information submitted and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information (above) is true, accurate and complete. I am aware that there are penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Carola G. Serrato
Executive Director
South Texas Water Authority
P.O. Box 1701
Kingsville, Texas 78364
cserrato@stwa.org
361-592-9323 x12

361-592-5965 fax

From: Carola Serrato [mailto:cserrato@stwa.org]
Sent: Thursday, November 16, 2017 4:51 PM
To: Michael Tucker (michael.tucker@tceq.texas.gov) <michael.tucker@tceq.texas.gov>; Joel Klumpp <joel.klumpp@tceq.texas.gov>
Cc: Aaron Archer <aarcher@walkerpartners.com>; Bill Flickinger <bflickinger@wfaustin.com>; Dony Cantu (dcantu@stwa.org) <dcantu@stwa.org>; Frances Rosales <fvrosales@stwa.org>; Jacob Hinojosa <jhinojosa@stwa.org>; Jo Ella Wagner <jwagner@stwa.org>
Subject: Certificate of Compliance with LAS and Chlorine Injection Order

Mr. Klumpp and Mr. Tucker,

Per our recent conference call, this email is to confirm that all LAS and Chlorine Injection facilities have been switched to the order as required by the TCEQ.

I certify under penalty of law that I have personally examined and am familiar with the information submitted and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information (above) is true, accurate and complete. I am aware that there are penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Carola G. Serrato
Executive Director
South Texas Water Authority
P.O. Box 1701
Kingsville, Texas 78364
cserrato@stwa.org
361-592-9323 x12
361-592-5965 fax

cserrato@stwa.org

From:	Joel Klumpp <joel.klumpp@tceq.texas.gov>
Sent:	Wednesday, December 13, 2017 1:34 PM
To:	Amanda Patel; Andrew Nidoh; Craig Stowell; David Simons; Gary Chauvin; Kenneth Dykes; Michael Tucker; Michele Risko; Patricia Wise; Vera Poe; Yadhira Resendez; Stephanie Escobar; Bill Flickinger (bflickinger@wfaustin.com); cserrato@stwa.org; aarcher@walkerpartners.com; Gary Regner
Cc:	Steven Swierenga; Kim Mann
Subject:	TCEQ/STWA Teleconference 12/14/17
Attachments:	STWA Agenda for 12-14-17 Phone Conf Meeting.docx

Please see attached for the agenda for tomorrow's teleconference. Thank you.

Joel Klumpp

Joel Klumpp | **Manager | Plan and Technical Review Section | Water Supply Division | TCEQ**

12100 Park 35 Circle, Bldg. F | Austin, Texas 78753 | ☎ (512) 239-4453 Fax: (512) 239-6050 | ✉: Joel.Klumpp@tceq.texas.gov

-----Original Appointment-----
From: Kim Mann
Sent: Wednesday, November 8, 2017 10:28 AM
To: Kim Mann; Joel Klumpp; Amanda Patel; Andrew Nidoh; Craig Stowell; David Simons; Gary Chauvin; Kenneth Dykes; Michael Tucker; Michele Risko; Patricia Wise; Vera Poe; Yadhira Resendez; Stephanie Escobar; Bill Flickinger (bflickinger@wfaustin.com); cserrato@stwa.org; aarcher@walkerpartners.com
Cc: Gary Regner; Steven Swierenga; Christina Barrera
Subject: TCEQ/STWA Teleconference
When: Thursday, December 14, 2017 9:00 AM-10:00 AM (UTC-06:00) Central Time (US & Canada).
Where: 5108

Sent on behalf of Joel Klumpp.

Participants Dialing Instructions
1. TCEQ Staff Access Number: 512-239-3446
2. Toll Free (for external customers ONLY): 844-368-7161
3. Participant's Collaboration code: 828230 #

STWA Monthly Phone Conference Agenda

Thursday, December 14, 2017 - Room 5108 9:00–10:00 a.m.

Moderator Dialing Instructions

1. Dial Austin Local Access Number: 512-239-3446
2. Enter Moderator's Collaboration code: 403500#

Participants Dialing Instructions

1. TCEQ Staff Access Number: 512-239-3446
2. Toll Free (for external customers ONLY): 844-368-7161
3. Enter Participant's Collaboration code: 828230#

1. Update on upcoming Order deadlines - Michael Tucker
   Note: Next quarterly report due 2/20/18.

2. Questions and comments on monitoring data from last quarterly report and meeting minutes - TCEQ

3. Driscoll booster station project update - STWA
   Note: - STWA extension request to 1/16/18 with substantial completion by 12/22/17.

4. Questions and comments on status of online analyzers' accuracy and calibration and revised SOP (Items 6a & 7a) - TCEQ

5. Questions and comments on status on injection taps being switched with LAS first - TCEQ
   Note: STWA (Carola Serrato) submitted written certification via email on 11/16/17 that "all LAS and Chlorine Injection facilities have been switched to the order as required by the TCEQ." We request another email to clarify that LAS injection points are prior to chlorine injection points.

6. Status of engineering package on modifications to the three agreed upon sample location (air valves) (Item 8b & e)
   Note: Submittal received on 12/7/17. Review will be expedited.

7. Status of a detailed Engineering Report describing strategies and facilities STWA intends to employ to comply with disinfection requirements (Item 8f)
   Note: Extension request to 1/7/18.

8. Wrap-up - Joel Klumpp

PWS_1370035_CO_2011220_Plan Ltr

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 20, 2017

Mr. Aaron D. Archer, P.E.
Walker Partners
804 Las Cimas Parkway, Suite 150
Austin, TX 78746

Re: South Texas Water Authority - Public Water System ID No. 1370035
Proposed New Sampling Taps
Engineer Contact Telephone: (512) 382-0021
Plan Review Log No. P-12072017-036
Kleberg County, Texas

CN600638589; RN102683323

Dear Mr. Archer:

On December 7, 2017, the Texas Commission on Environmental Quality (TCEQ) received planning material with your letter dated December 7, 2017 for the proposed New Sampling Taps. Based on our review of the information submitted, the project generally meets the minimum requirements of Title 30 Texas Administrative Code (TAC) Chapter 290 – Rules and Regulations for Public Water Systems and is **approved for construction.**

The submittal consisted of 10 sheets of engineering drawings and technical specifications. The approved project consists of:

- Installation of, or modifications to, 6 sampling taps; and
- various valves, fittings, and appurtenances.

This approval is for the construction of the above listed items only. Any wastewater components contained in this design were not considered.

The South Texas Water Authority public water supply system provides water treatment.

The project is located at the following locations in Kleberg County, Texas:

Site #1
- County Road 48 and Highway 77 (ARV vault)

Site #2
- County Road 36 and Highway 77

Site #3
- County Road 75 and Highway 77

Site #4
- Lopez ARV vault

Site #5
- County Road 4 and Highway 77 (ARV vault)

Site #6
- County Road 81 and Farm-to-Market 2826 Road.

An appointed engineer must notify the TCEQ's Region 14 Office in Corpus Christi at (361) 825-3100 when construction will start. Please keep in mind that upon completion of the water works project, the engineer or owner will notify the commission's Water Supply Division, in writing, as to its completion and attest to the fact that the completed work is substantially in accordance with the plans and change orders on file with the commission as required in 30 TAC §290.39(h)(3).

Please refer to the Plan Review Team's Log No. P-12072017-036 in all correspondence for this project.

Please Note for Future Projects: In order to determine if a new source of water or a new treatment process results in corrosive or aggressive finished water that may endanger human health, we are requesting additional sampling and analysis of lead, alkalinity (as calcium carbonate), calcium (as calcium carbonate) and sodium in addition to the required chemical test results for public water system new sources. We are requiring these additional sampling results as listed in our currently revised checklists (Public Well Completion Data Checklist for Interim Use - Step 2 and Membrane Use Checklist - Step 2) which can be found on TCEQ's website at the following address:

https://www.tceq.texas.gov/drinkingwater/udpubs.html

Please include these additional sampling results in well completion submittals, membrane use submittals, and other treatment process submittals.

New surface water sources will need to also include lead, total dissolved solids, pH, alkalinity (as calcium carbonate), chloride, sulfate, calcium (as calcium carbonate) and sodium with the analysis required in 30 TAC Section 290.41(e)(1)(F).

Please complete a copy of the most current Public Water System Plan Review Submittal form for any future submittals to TCEQ. Every blank on the form must be completed to minimize any delays in the review of your project. The document is available on TCEQ's website at the address shown below. You can also download the most current plan submittal checklists and forms from the same address.

https://www.tceq.texas.gov/drinkingwater/udpubs.html

For future reference, you can review part of the Plan Review Team's database to see if we have received your project. This is available on TCEQ's website at the following address:

https://www.tceq.texas.gov/drinkingwater/planrev.html/#status

You can download the latest revision of 30 TAC Chapter 290 - Rules and Regulations for Public Water Systems from this site.

If you have any questions concerning this letter or need further assistance, please contact Mr. Craig A. Stowell, P.E. at (512) 239-4633 or by email at Craig.Stowell@Tceq.Texas.Gov or by correspondence at the following address:

Plan Review Team, MC-159
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Sincerely,

Craig A. Stowell, P.E.
Plan Review Team
Plan and Technical Review Section
Water Supply Division
Texas Commission on Environmental Quality

Vera Poe, P.E., Team Leader
Plan Review Team
Plan and Technical Review Section
Water Supply Division
Texas Commission on Environmental Quality

VP/CAS/mw/kp

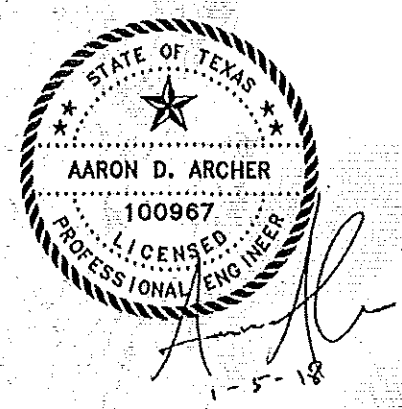
cc: Ms. Kathleen Lowman, President, South Texas Water Authority, P.O. Box 1701, Kingsville, TX 78364-1701

STWA

South Texas Water Authority

Dependable Water For South Texas

DISINFECTANT MANAGEMENT ENGINEERING REPORT



January 5, 2018

Prepared by:

Walker Partners

engineers ★ surveyors

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

The purpose of this Report is to describe strategies and facilities that the South Texas Water Authority (STWA) intends to employ now or in the future to comply with the Texas Commission on Environmental Quality (TCEQ) disinfectant residual requirements. STWA purchases water from the City of Corpus Christi O. N. Stevens Water Treatment Plant (WTP). This purchased water is delivered with chloramines, and STWA continues the use of chloramine disinfection (predominantly the preferred species – monochloramine) to continue to protect the drinking water from potential pathogenic microorganisms in the transmission system.

A number of factors lead to chloramine demand and decay in a transmission system. This Report outlines options and practices to manage and control the factors and constituents that lead to excessive chloramine decay. Management strategies to maintain a compliant chloramine residual throughout the STWA system are presented in the following principal classifications:

- Treatment process,
- Systems operation,
- Systems maintenance, and
- Infrastructure replacement.

The recommendations of this Report are developed to maximize the use and effectiveness of existing processes and infrastructure prior to implementing new improvements to promote compliance. This Report routinely references and compliments the STWA Monitoring Plan that is bound in Appendix A. Should STWA experience non-compliant disinfectant residuals, the implementation of one or more strategies may be required based on the location and nature of the problem. Consultation with a registered and qualified professional engineer may be required.

2.0 INTRODUCTION

2.1. Background and Overview

STWA was created by the Texas Legislature in 1979 and owns and operates water storage, pumping, and transmission facilities to deliver treated water to six wholesale customers in Nueces and Kleberg Counties. STWA purchases treated water from the City of Corpus Christi O. N. Stevens WTP located on Leopard Street in the Five Points Area. The secondary disinfectant at the WTP is chloramines. Water is distributed to customers through two pipelines: a 42-inch pipeline (Main Line) that runs 28 miles from Corpus Christi and a 14-inch pipeline that splits off from the Main Line and runs approximately 16.5 miles (Spur Line).

Historically, STWA wholesale customer water demands are such that the disinfectant residual declines in the transmission line from the WTP to the delivery points due to several factors that are discussed in this Report. At some locations, the disinfectant residual can fall below the minimum allowable total chlorine concentration.

STWA has been coordinating with TCEQ and evaluating alternatives to increase and maintain disinfectant residual levels since to 2009. Multiple improvements have been made to the STWA system since that time. STWA has currently entered Order No. 2011-1647-PWS-E with TCEQ to bring the system into compliance with all applicable water quality rules, including the minimum disinfectant residual requirements of TCEQ's rules. The Order is attached as Appendix B. This Report is being prepared in accordance with Ordering Provision 8(f).

2.2. Project Scope

The principal objectives of this Report are to:

- Summarize factors that may contribute to chloramine decay;
- Develop solutions to mitigate chloramine decay utilizing existing infrastructure;
- Identify solutions to mitigate chloramine decay through the development of new system improvements; and,
- Integrate the requirements and recommendations of the STWA Sampling Plan and Nitrification Action Plan into a comprehensive management strategy to comply with the disinfectant residual requirement.

3.0 CHLORAMINE DISINFECTION

The chloramine compound (combination of chlorine and ammonia) has a long history of successful application for disinfectant in drinking water distribution systems. Chloramine is generally less reactive than free chlorine thereby producing fewer disinfection by-products and persisting longer in the distribution system. However, chloramine is still inherently unstable and will decay and decompose in the distribution system over time.

The decay of chloramine in the distribution system is dependent on many factors due to bulk water reactions and pipe wall/sediment reactions. In addition, monochloramine auto-oxidizes over time with the oxidation of ammonia and reduction of free chlorine. The decomposition/degradation of chloramine also increases the amount of free ammonia which provides a substrate for ammonia-oxidizing bacteria.

The important factors that contribute to or accelerate chloramine decay include:

- A chlorine to ammonia ratio greater than 5:1 results in the conversion of monochloramine to unstable di- or trichloramine species.
- A chlorine to ammonia ratio less than 3:1 results in excess ammonia that increases the risk of nitrification.
- Low pH (below pH 7) hastens the hydrolysis of monochloramine to dichloramine.
- High temperature increases the rate of monochloramine decay.
- High alkalinity disproportionately catalyzes monochloramine due to the high concentration of carbonate.
- High natural organic matter concentrations exert an oxidant demand thereby reducing residual monochloramine.
- Nitrite accelerates monochloramine decay through the oxidation of nitrite to intermediate nitryl chloride.
- High bromide concentrations accelerate decay by oxidizing chloramines to bromamines.
- Nitrification due to high levels of free ammonia leads to biofilm growth in bulk water and on pipeline walls and subsequently increases chloramine demand.
- Increased water age allows more time for monochloramine to react with decay factor constituents and increased the auto-oxidation of monochloramine back to chlorine and ammonia elements.

More than one of these decay and decomposition factors can simultaneously exist and jointly contribute to a loss of disinfectant residual. In fact, the occurrence of some of these factors can directly lead to the subsequent occurrence of other decay factors.

4.0 MANAGEMENT STRATEGIES

The following management practices may be employed by STWA to mitigate the previously described decay factors. Management strategies to maintain a compliant chloramine residual throughout the STWA system are presented in the following categories:

- Treatment process,
- Systems operation,
- Systems maintenance, and
- Infrastructure replacement.

Selection of a particular management practice will depend on specific water quality information collected as part of the Monitoring Plan and Nitrification Action Plan which are included as Appendix A to the Report.

4.1. Treatment Processes

Treatment process management strategies are focused on addressing or modifying source water quality factors not related to chloramine chemistry.

4.1.1. Coordination with City of Corpus Christi

STWA receives treated water from the O. N. Stevens WTP and has limited ability to modify source water characteristics (e.g., organic concentrations, bromide, alkalinity, raw water nitrate, initial chlorine to ammonia ratio) without controlling the treatment practices at the O. N. Stevens WTP. Per the recommendations of the Nitrification Action Plan, STWA should contact the City of Corpus Christi to request modifications to treatment processes at the WTP whenever yellow or red flag events occur at sampling sites upstream of the City of Driscoll take-point, including the Spur Line sampling sites before chemical addition. This includes yellow flag and red flag events for total chlorine, free ammonia, nitrite, and nitrate. Additional details are included in Table 2 of the Nitrification Action Plan.

The City of Corpus Christi is currently sharing daily nitrate, nitrite, and free ammonia information with STWA. Based on recent data trendlines, it appears that the City of Corpus Christi is evaluating treatment process improvements to reduce finished water nitrate and free ammonia concentrations. Given the significant variability in nitrate entering the STWA system, entry point nitrate data provided by the City of Corpus Christi has been used to define downstream nitrate concentration yellow flag and red flag triggers in the Nitrification Action Plan. STWA will continue to request this water quality data from the City of Corpus Christi to properly implement the Nitrification Action Plan. Coordination and communication with the City of Corpus Christi to address water quality entering the STWA system is likely to benefit both STWA and the City of Corpus Christi.

4.1.2. New Treatment Processes

Should STWA not be able to maintain compliant disinfectant residuals within the STWA system, the following new treatment processes should be considered. To maximize the potential benefit of these systems, it is recommended that these systems be installed near the entry point to the STWA system. A new treatment site (land acquisition), injection point and manhole, chemical feed system, treatment building, perimeter fencing, and electrical, instrumentation and SCADA upgrades will be required to construct a new chemical delivery facility.

4.1.2.1. pH Adjustment

Nitrification most readily occurs at a pH between 6.5 and 8.5. Raising or lowering the pH outside of this optimum range can theoretically limit nitrification but has been met with mixed success (AWWA

M56 2013). However, lowering the pH in the distribution system below 6.5 may lead to other corrosion control and pipe wall scale stability issues and is not recommended.

The typical pH of water received from O. N. Stevens in around 7.6. It is recommended that the pH be increased to a range of 9.0 to 9.5 to reduce growth of nitrifying bacteria. Caustic (sodium hydroxide) is typically used for this application. In addition to reducing nitrification, elevating pH is also likely to create a more stable chloramine residual. As a downside, elevating pH reduces the rate of inactivation of chloramine (Oldenburg et al. 2002). In other words, at higher pH levels, it takes a longer period of time for the chloramine compound to inactivate microorganisms.

Should pH adjustment be utilized, STWA will need to coordinate this water quality change with its wholesale customers which blend STWA surface water with local groundwater sources. A holistic study to evaluate corrosion and deposition characteristics will be required to maintain water quality and avoid taste and odor issues within the STWA system and downstream water systems.

4.1.2.2. Sodium Chlorite

The chlorite ion has been shown to prevent nitrification by limiting the ability of nitrifying bacteria to survive in the distribution system. (McGuire et al 1999). The typical range of chlorite concentration to prevent and control nitrification is 0.2 to 0.4 mg/L (McGuire et al. 2004;). However, full-scale studies demonstrated that chlorite is not as effective in controlling areas of the distribution system where nitrification is already occurring (Zhu et al. 2010). Therefore, this strategy is more likely to be effective if implemented proactively as a management strategy rather than reactively to control an established nitrification event.

Chlorite can be produced as a byproduct of chlorine dioxide treatment or dosed as sodium chlorite. It should be noted that chlorite is a regulated disinfection by-product with a maximum contaminant level of 1.0 mg/L and maximum contaminant level goal of 0.8 mg/L. The M56 Nitrification Manual cautions utilities in adding a regulated substance to drinking water to prevent nitrification (AWWA M56 2013).

4.2. System Operations

Operational measures play an important role in maintaining a compliant disinfectant residual throughout the system. The following operational practices are recommended to promote regulatory compliance.

4.2.1. Monitoring

System-wide water quality monitoring is necessary to accurately determine water quality characteristics throughout the STWA system and to determine how water quality is changing as water age increases. The Monitoring Plan (Section D-3) and Nitrification Plan (Appendix A) detail a very specific monitoring plan that STWA will implement. The water quality monitoring plan detailed in these documents includes the collection of regulatory and non-regulatory samples at prescribed sampling locations throughout the STWA system. Implementation of the TCEQ approved monitoring plans provides the following benefits:

- Early detection of the onset of nitrification thereby allowing for early treatment and management.
- Disinfectant booster system process control monitoring to maintain a proper chlorine to ammonia ratio and optimize the chloramines boosting process.
- Identification of localized, affected areas for implementation of a targeted treatment strategy.

Proper sampling and testing methods are critical to the successful implementation of the Monitoring Plan. STWA should follow the Standard Operating Procedure included in Appendix C for calibration of its Hach colorimeters. The Hach CL 17 verification procedure detailed in Section D-3 of the

Monitoring Plan should be utilized for the online disinfectant analyzers. Data sheets for the online analyzers should include information on the colorimeter being used to verify a CL 17 and reference the appropriate colorimeter verification sheet.

An important step in the successful implementation of a monitoring plan is the regular review and evaluation of water quality data collected under the monitoring program. Proper data documentation and review is especially critical for data collected under the Nitrification Action Plan. STWA will use the data forms attached as Appendix D for implementation of the Nitrification Action Plan. The forms require that collected field data be recorded, assessed, and that any actions and responses taken as a result a yellow or red flag being triggered be documented. Nitrate, Nitrite, and free ammonia data shared by the City of Corpus Christi from the O. N. Stevens WTP should also be reviewed at a frequency no less than weekly.

4.2.2. Control Detention Time

High system detention times are a primary factor in the occurrence of nitrification and loss of disinfectant residual in distribution systems (Kirmeyer et al. 2002, EPA 2002). STWA's role as a water wholesale supplier limits the operational opportunities to control water age. The following options represent the best alternatives for STWA to increase water turnover in the system.

4.2.2.1. Flushing

Flushing is common practice to boost disinfectant residuals by disposing of long detention time water so that the fresher water can migrate to the area being flushed. Flushing can by localized or system-wide. Flushing can also be performed manually or automatically by a programmable flushing device. Higher flushing velocities promote the removal of accumulated biofilm and sediment in the pipeline that may be contributing to disinfectant loss. Dechlorination and disposal of flushed water must be coordinated in advance.

Flushing has not been demonstrated to be effective as a response measure to deal with active nitrification (AWWA M56 2013). Flushing is more effective as a preventative strategy and would be best employed to exert an artificial demand on the STWA if flows drop significantly in a portion of the STWA system due to low water use by a wholesale customer. However, flushing is not a viable long term solution to deal with excessive water age.

4.2.2.2. Water Contracts

Given the significance of water age as a contributing factor to nitrification and the loss of disinfectant residual, securing long-term contracts with STWA's wholesale customers is an important strategy to maintain compliance with TCEQ's rules. It is recommended that water contracts prescribe a stable monthly flow regime to provide some amount of base flow at all times through the STWA system.

4.2.3. Chloramine Boosting

The construction of a booster chloramination is currently being completed at the STWA Driscoll delivery facility. This booster facility allows for free ammonia in the STWA 42-inch pipeline to be recombined with chlorine and to boost the disinfectant residual with the additional of supplemental chlorine and liquid ammonium sulfate. Proper process control is required with regular upstream and downstream sampling and process control as required in the Monitoring Plan to prevent overfeeding and to maintain a proper chlorine to ammonia ratio.

The addition of more booster chloramination facilities downstream of the Driscoll facility (between the City of Driscoll and the pipeline terminus at the City of Kingsville) is feasible if maintaining a disinfectant residual in this portion of the line becomes problematic. A new booster site (land acquisition), injection point and manhole, chemical feed system, treatment building, perimeter fencing, and electrical, instrumentation and SCADA upgrades will be required to construct a new

chemical delivery facility. It is important that any future booster chloramination facilities must also include the same level of process control as the Driscoll facility.

4.2.4. Storage Tank Operations

Storage tanks with low water turnover can lead to significant increases in water age and promote nitrification. Thermal stratification can also lead to adverse impacts.

STWA has previously replaced an aging 5 million gallon at the STWA Kingsville facility tank with a 1 million gallon tank that includes a tank mixer and disinfectant booster system. STWA may employ the following operational strategies to enhance water quality in other storage facilities if needed:

- Optimize daily tank turnover through the use of deep cycling.
- Install tank mixing systems in other system tanks.
- Install disinfectant boosting systems with tank mixers to increase disinfectant levels within and existing the tanks.
- Perform temperature monitoring if stratification is suspected.
- Operate the tanks at lower water levels to shorten detention time.
- Reconfigure tank inlet and outlet piping to increase mixing and tank turnover.
- Replace aging or underutilized tanks with smaller storage tanks.
- Perform regular tank cleaning and maintenance to reduce biofilm growth and sediment deposition.

4.2.5. Temporary Disinfectant Conversion

Periodic switching from chloramines to free chlorine, also referred to as a "free chlorine burn", is a viable nitrification control measure implemented by many water utilities. STWA has previously completed a free chlorine burn (by means of breakpoint chlorination) and received water for the O. N. Stevens WTP that has been converted to free chlorine. Disinfectant switching is considered a last resort for the prevention of nitrification because nitrifying bacteria can survive in biofilm throughout the free chlorine burn process (M56, Vikesland et al. 2007, Carrico et al. 2008). Disinfectant switching is most appropriate when a widespread nitrification episode is underway and immediate control measures are required.

To maximize the potential efficacy of a free chlorine burn, it is recommended that disinfectant switching be conducted in warmer months when nitrification occurrence is more likely (AWWA M56 2013). A minimum residual of 0.5 mg/L free chlorine should be maintained throughout the system. Breakpoint chlorination may be required if the City of Corpus Christi does not participate.

In the event that a free chlorine burn is implemented, STWA should contact TCEQ to note the dates of the temporary switch and request a delay of the collection of quarterly disinfection by-product samples until after the burn has been completed. STWA must also provide a list of customers that will be affected by the conversion and inform these customers of the change in treatment. To support the conversion process, it is advisable that storage tank levels be reduced in advance of the procedure and flushing be implemented to increase pipeline water velocities to facilitate the conversion. It should be noted that taste and odor impacts and an increase in disinfection by-product concentrations is likely to occur during the temporary conversion.

4.3. System Maintenance

Routine system maintenance can remove decay factor constituents that accelerate disinfectant decay. Storage tanks and pipelines accumulate sediment and biofilm growth over time. These constituents can exert a demand on disinfectants and shield nitrifying bacteria from disinfectants

(Wolfe et al. 1990). Controlling and removing sediments and biofilm may facilitate compliance with disinfectant residual requirements.

4.3.1. Storage Tanks Inspection and Cleaning

Storage tank sediment removal and cleaning is recommended every 3 to 5 years (AWWA Standard 2004, EPA 2002). It should be noted that the storage tank must be properly disinfected prior to returning the tank to service.

4.3.2. Pipeline Pigging

Pipeline pigging is a recommended method to clean pipe walls of sediment and biofilm. A pigging program will require extensive design and construction for the inclusion of pig launching and retrieval stations. Pigging should also consider the condition of the pipeline to avoid damage to existing infrastructure. Ice pigging is a less invasive approach but the performance of ice pigging are not well quantified.

4.3.3. Corrosion Control

Effective corrosion control can reduce biofilm growth and sediment deposition thereby increasing disinfectant residuals. STWA is currently completing a condition assessment of the 42-inch main line. It is recommended that corrosion control measures be implemented as needed based on the findings of this study.

4.4. Infrastructure Replacement

The STWA regional water system is sized to convey a significant volume of water to its wholesale customers in accordance with original system planning and design that relied on STWA to be the primary regional water supplier. Use of the regional system as a secondary supply source can results in excessive water detention times thereby impacting disinfectant residual concentrations. This Report previously recommended other strategies to limit water age in the system. Another method to reduce water age is to replace all or a significant portion of the transmission line with a smaller diameter pipeline that is sized for current and future anticipated demands. Reducing the diameter of the pipeline will increase water velocity thereby reducing water age.

5.0 CONCLUSIONS

STWA has historically struggled to maintain disinfectant residuals throughout the system due to a number of contributing factors. As a result, STWA has implemented many improvements to promote compliance including:

- Free chlorine burns,
- Replacement of an oversized ground storage tank with a smaller volume tank at Kingsville,
- Installation of a tank mixing and disinfectant boosting system at Kingsville,
- Installation of a chloramines booster facility at Driscoll,
- Flushing, and
- Negotiation of new water contracts with wholesale customers that requires taking water based on a monthly flow regime.

This Report describes strategies and facilities that STWA may utilize to promote continued compliance with TCEQ's rules. It is recommended that STWA start with implementation of the following strategies:

- Monitoring (following the TCEQ approved Monitoring Plan and Nitrification Action Plan)
- Chloramine boosting using the Driscoll booster station
- Pursue advantageous water contracts with wholesale suppliers
- Perform routine maintenance of system storage tanks
- Optimize daily turnover of system storage tanks
- Implement corrosion control improvements as needed

If STWA is unable to meet the disinfectant residual requirements, the following strategies are recommended. Some of these strategies are also recommended as yellow flag and red flag action items in the Nitrification Action Plan.

- Contact the City of Corpus Christi to request modifications to upstream treatment
- Flush affected areas
- Inspect and adjust chemical doses at boosting facilities
- Perform additional sampling to determine affected areas and inspect for the occurrence of nitrification
- Perform a free chlorine burn

Additional alternatives have been included in this Report for further consideration if the aforementioned strategies fail to achieve compliance.

6.0 REFERENCES

AWWA Manual M56. Nitrification Prevention and Control in Drinking Water. Denver, Colorado. AWWA.

AWWA Standard G200-04. Distribution Systems Operation and Management. Denver, Colorado, AWWA.

Carrico, B., F. DiGiano, N.G. Love, P. Vikeland, K. Chandran, M. Fiss, A. Zaklikowski. 2008. Effectiveness of Switching Disinfectants for Nitrification Control. Journal AWWA 100:10.

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Wolfe, R.L., N.I. Lieu, G. Izaguirre, E.G. Means III. 1990. Ammonia-Oxidizing Bacteria in a Chloraminated Distribution System: Seasonal Occurrence, Distribution, and Disinfection Resistance. Appl. Environmental Microbiology 56(2)451-462.

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APPENDICES

A – STWA Monitoring Plan and Nitrification Action Plan

B – TCEQ Order 2011-1647-PWS-E

C – SOP Colorimeter Calibration

D – STWA Water Quality Data Sampling Forms

APPENDIX A

STWA MONITORING PLAN AND NITRIFICATION ACTION PLAN

Monitoring Plan
For
South Texas Water Authority
PWS #1370035

Responsible Official: Jacob Hinojosa
P.O. Box 1701, Kingsville, Texas
361-592-9323, extension 16

April 25, 2008
August 1, 2011
June 17, 2016
December 27, 2016
June 30, 2017
August 1, 2017

A. Raw Water Sampling

This system has no raw water sources.

B. In-Plant Sampling

This system does not treat water, except to maintain disinfectant

C. Entry Point Samples

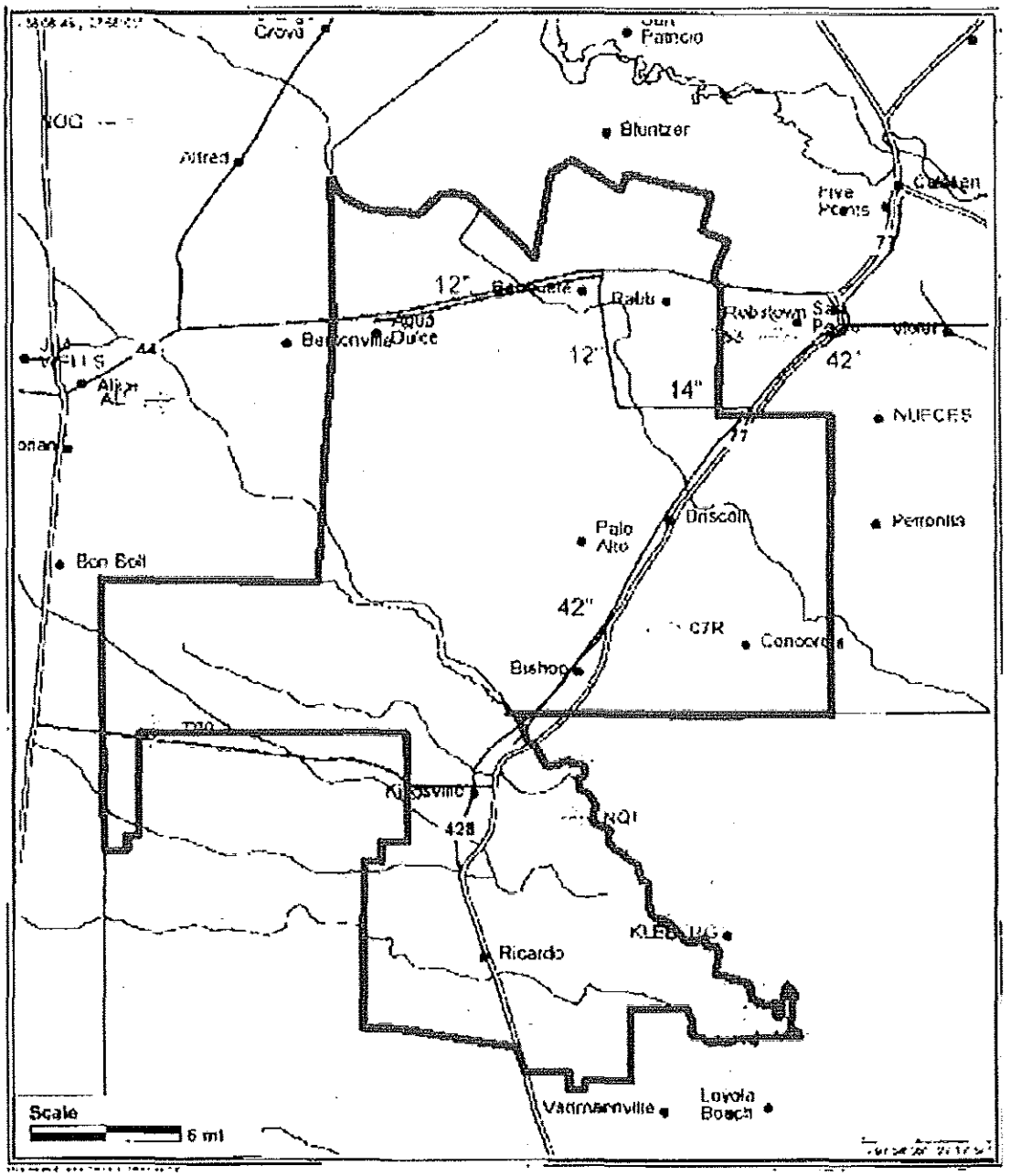
South Texas Water Authority has one (1) entry point from the seller, the City of Corpus Christi, to the buyer, South Texas Water Authority. It is located at the O.N. Stevens Plant, located on Up River Road in Calallen. With regards to the frequency, location, and method, purchased-water systems are not required to monitor disinfectant at the entry point. The disinfectant used by the City of Corpus Christi is chloramines and the system is in compliance if the total chlorine residual is over 0.5 mg/l.

D. System Sampling

South Texas Water Authority has a transmission line system and sells water to seven (7) customers which would be considered those customers' entry points. Below is a district map of STWA showing the Regional Water System's 42" waterline leaving the O.N. Stevens Plant on Up River Road and proceeding south generally paralleling US 77 to Kingsville. A 14" and 12" spurline tees off the 42" line at FM 2826 and parallels that road for several miles. The spurline located on the north side of FM 2826 then cuts across private property to service Banquete, Sablatura Park and Agua Dulce.

Attachment A includes a Lab Approval Form.

SOUTH TEXAS WATER AUTHORITY BOUNDARY MAP



Section D-1

Below is a schematic of the Regional Water System.

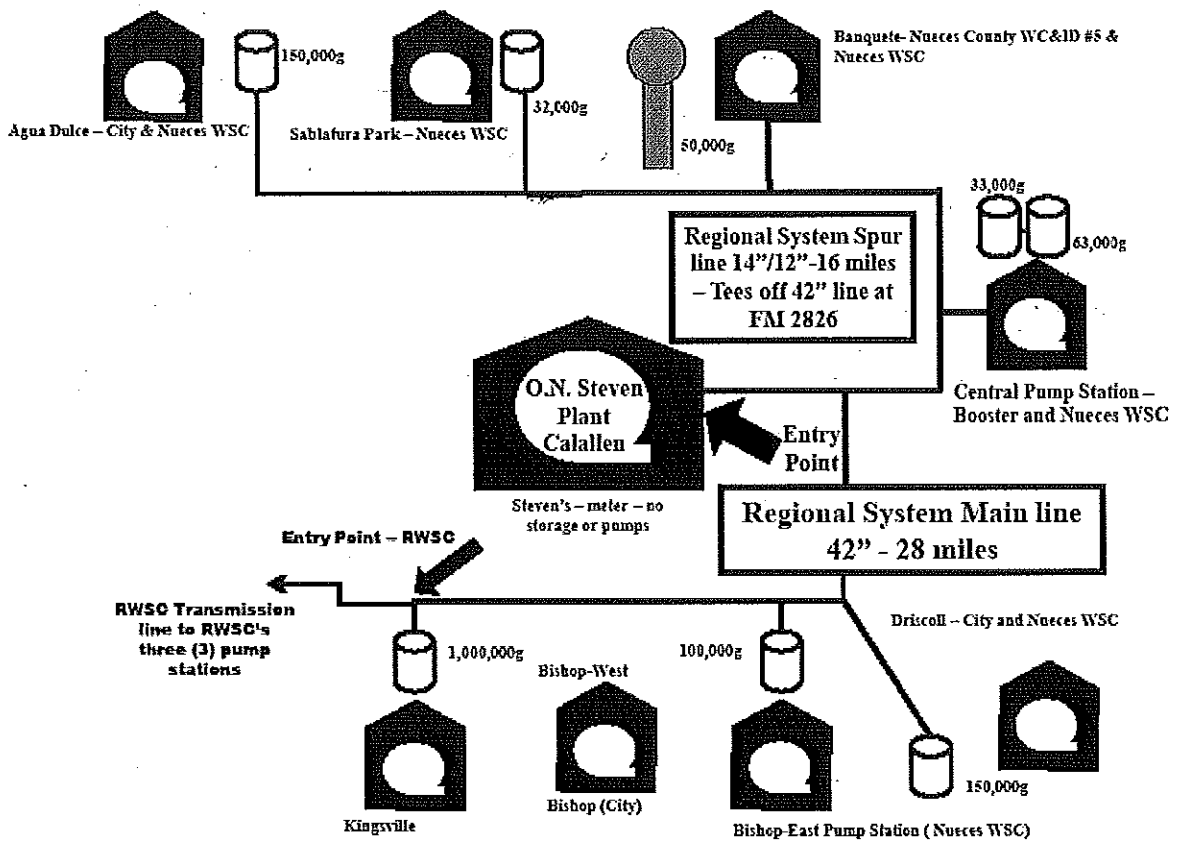


Table D-1 summarizes the system delivery points. There is only one (1) source of water for Delivery Points 1-12. Detailed schematics of the delivery points are located in ***Attachment B***. Attachment B also includes photos and descriptive maps of the delivery points and other system sampling locations.

Table D-1 Delivery Points

Delivery Point	Plant Name
1. Agua Dulce, City of	Agua Dulce Pump Station (PS)
2. Agua Dulce, NWSC Rural	Agua Dulce PS
3. Sablatura Park, NWSC Rural	Sablatura Park PS
4. Banquete District	Banquete PS
5. Banquete, NWSC Rural	Banquete PS
6. Central, NWSC Rural	Central PS
7. Driscoll, City of	Driscoll PS
8. Driscoll, NWSC Rural	Driscoll PS
9. Bishop, NWSC Rural	Bishop East-side PS
10. Bishop, City of – West	Bishop West-side PS
11. Kingsville, City of	Kingsville PS
12. Ricardo Master Meter	Kingsville Site

Section D-2 – Coliform Samples.

The Sample Siting Plan (SSP) included as ***Attachment C*** specifies the coliform sample sites and sample frequency. The routine coliform sample sites are representative of the STWA distribution system. All coliform samples will be collected prior to booster disinfection.

The samples are taken to the City of Corpus Christi Water Utilities Lab located at 13101 Leopard Street, Corpus Christi, Texas and telephone number of 361-826-1200. The laboratory accreditation is included as ***Attachment D.***

Since South Texas Water Authority collects fewer than 40 samples per month. Compliance is determined based on the following:

- No more than one routine/repeat sample is total coliform positive and none of the repeats are E. coli positive (reference 30 TAC 290.109(c) for treatment technique triggers and 30 TAC 290.109(g)(1) for E. coli MCL violation).
- No combination of an E. coli positive sample result with a routine/repeat total coliform or E. coli positive sample result exists (reference 30 TAC 290.109(g)(1)).
- Level 1 or Level 2 Assessments are conducted within 30 days of a trigger and all sanitary defects from an Assessment are corrected within 30 days or the state-approved timeframe (reference 30 TAC 290.109(g)(14) and 290.109(g)(15)).

Section D-3 – Disinfectant Residual – Chloramine – Total Chlorine

Disinfectant sample sites are detailed in Table D-3. Samples describes as "non-regulatory only" are utilized for process control or other special purposes. The disinfectant residual is measured at the same time as microbial samples are collected. South Texas Water Authority serves fewer than 250 connections. However, the disinfection residual is measured daily Monday through Friday, with the exception of Kingsville which is done seven (7) days a week, Sunday through Saturday. Residuals are also sampled by chlorine analyzers, Hach CL 17. This information is reported by the SCADA system at 9 a.m. every day. The following is a summary of the CL17 analyzer verification procedures:

- Open bypass line located on the underside of CL 17 Analyzer's outer box enclosure.
- After bypass is open, fill two (2) sample cells – either glass or plastic – to the proper measurement, either 5 ml (high range) or 10 ml (low range).
- Close the bypass line.
- Prepare the colorimeter by setting it on the proper setting of either "low range" or "high range" which will depend on the *reading* of the CL 17 Analyzer being verified.
- Using one (1) sample cell as a "blank," insert it into the colorimeter and zero out the colorimeter.
- To the other sample cell, add the contents of either one (1) total chlorine powder pillow– for a 10 ml/low range sample – or two (2) total chlorine powder pillows for a 5 ml/high range sample.
- Gently shake the sample cell for twenty (20) seconds.

- Wait for three (3) to six (6) minutes.
- Insert this second cell into the colorimeter and check the residual.
- Compare the residual result of the sample cell to the reading displayed on the CL 17 Analyzer.
- Record the CL17 Analyzer display and the sample cell residual results on the South Texas Water Authority CL 17 verification form.

Manual residual readings are obtained using the Hach Pocket Colorimeter II. The readings collected manually are used to comply with the reporting requirements for disinfectant residual by filling out Purchase Water Monthly Operating Reports every month, and providing these records to the TCEQ compliance investigator upon request and by sending in the Disinfectant Level Monthly Operating Report (DL QOR) every quarter. Two manual, regulatory samples are collected each day with one sample being taken from the Spur Line and one sample being collected from the Main Line. The sample location in each pressure plane is alternated.

The system is in compliance with the minimum residual requirement if the total chlorine residual delivered to South Texas Water Authority's customers is greater than 0.5 mg/l.

The system reports the maximum residual disinfectant level (MRDL) by submitting the MRDL Report Form to TCEQ quarterly and is in compliance with the MRDL if the running average of all samples taken in the system is less than 4.0 mg/l.

Table D-3 Disinfectant Sampling Points Summary

Sample Point	Sample Site Description	Facility/Day
	SPUR LINE	
1. Agua Dulce, City of	Spigot on MR prior to disinfection	Agua Dulce PS - Monday
2. Agua Dulce, NWSC Rural	Non-Regulatory Only	Agua Dulce PS
3. Sablatura Park, NWSC Rural	Spigot on MR prior to disinfection	Sablatura Park PS - Tuesday
4. Sablatura Pump Station (U/S of Sablatura Park)	Non-Regulatory Only	Sablatura PS
5. Banquete District	Spigot on MR prior to disinfection	Banquete PS - Wednesday
6. Banquete, NWSC Rural	Non-Regulatory Only	Banquete PS
7. West side of FM 666 (U/S of Banquete)	Non-Regulatory Only	Spur Line
8. Geo Detention Center off FM 2826 (D/S of Central)	Non-Regulatory Only	Spur Line
9. Central, NWSC Rural	Non-Regulatory Only	Central PS

Table D-3 Disinfectant Sampling Points Summary (Continued)

Sample Point	Sample Site Description	Facility/Day
	MAIN LINE	
10. Driscoll Booster Station	Non-Regulatory Only	Main Line
11. Driscoll, City of	Spigot on MR prior to disinfection	Driscoll PS - Thursday
12. Driscoll, NWSC Rural	Non-Regulatory Only	Driscoll PS
13. Lopez ARV	Non-Regulatory Only	Main Line
14. Bishop, City of – East	Spigot on MR prior to disinfection	Bishop East-side PS - Friday
15. Bishop, NWSC Rural	Non-Regulatory Only	Bishop East-side PS
16. Bishop, City of – West	Spigot on MR prior to disinfection	Bishop West-side PS - Saturday
17. CR4 ARV	Non-Regulatory Only	Main Line
18. Kingsville, City of	Spigot on MR prior to disinfection	Kingsville PS - Sunday
19. Ricardo Water Supply Corp.	Non-Regulatory Only	Ricardo Meter @ Kings. Site

Section D-4 –Disinfection Byproducts (DBPs) – TTHM and HAA5

The TCEQ's sampling contractor collects DBP samples. Samples will be collected annually during normal system operating conditions between May 1 and September 30. Samples will be collected from sample location DBP2-01 which is located prior to the meter and upstream of disinfection injection at the STWA Kingsville facility. These samples are taken to a certified lab by the TCEQ's sampling contractor. STWA is in compliance if the locational running average for each sample location is below the maximum contaminant level. The maximum contaminant level for Total Trihalomethanes is 80 ppb. The maximum contaminant level for Haloacetic Acids is 60 ppb. STWA will notify TCEQ's sampling contractor if system operating conditions are not normal and reschedule sampling for a time when normal operations have been restored.

5. **Lead and/or Copper** – South Texas Water Authority does not sample for Lead and Copper.

6. **Asbestos** – One asbestos sample in the distribution system (TCEQ Facility ID No. DS01) must be collected every nine years. The current monitoring period runs from January 1, 2014 through December 31, 2022. TCEQ's sampling contractor will collect an asbestos sample in the distribution system during this monitoring period. This sample will be taken to a certified lab by the TCEQ's sampling contractor. STWA is in compliance if the maximum contaminant level of 7 million fibers per liter (longer than 10 microns) is not exceeded. TCEQ would notify STWA if any violation occurs.

7. **Nitrate** – The TCEQ's sampling contractor collects an annual nitrate sample at the system entry point. STWA is in compliance per 30 TAC 290.106 relating to Inorganic Contaminants if nitrate is below the maximum contaminant level of 10 mg/L as Nitrogen. Additional nitrate sampling is also scheduled to occur in the STWA system per the recommendations of the Nitrification Action Plan (***Attachment D***) for the purposes of process control.

8. Attachment Summary

Attachment A – Lab Approval Form
Attachment B – Detailed Facility Schematics
Attachment C – Sample Siting Plan
Attachment D – Nitrification Action Plan

ATTACHMENT A

LAB APPROVAL FORM

Drinking Water Lab Approval Form

Laboratory or Plant Name	Regional System	Contact Name	Jacob Hinojosa
PWS ID (TCEQ issued)	1370035	E-mail	jhinojosa@stwa.org
Lab ID No		Phone	361-455-8596 (cell)
Address	PO Box 1701	Date form completed	7-28-2017
City/State	Kingsville, Texas	Does this lab perform analyses for other Public Water Systems?	☐ Yes ☒ No
Zip	78364		

Analytes and Methods

Analyte	Analytical Method [2]	Instrument Name [3]	Accuracy [4]		Calibration Frequency [5]	Calibration Method [6]	NELAP Accredited [7]	PT Study [8]
Turbidity	Not Required	Not Required	± N/R	NTU	Not Required	Not Required	No	No
pH	Not Required	Not Required	± N/R	pH unit	Not Required	Not Required	No	No
Temperature	Not Required	Not Required	± N/R	°C	Not Required	Not Required	No	
TOC	Not Required	Not Required	± N/R	mg/L	Not Required	Not Required	No	No
UV_{254}	Not Required	Not Required	± N/R	cm^{-1}	Not Required	Not Required	No	No
Alkalinity	Not Required	Not Required	± N/R	mg/L	Not Required	Not Required	No	No
Free Chlorine [9]	SM 4500-Cl G	HACH PC II Model 5953000	± 0.02	mg/L	once a month	DPD CL2 LR Sec Std Kit	No	No
Total Chlorine [9]	SM 4500-Cl G	HACH PC II Model 5953000	± 0.02	mg/L	once a month	DPD CL2 LR Sec Std Kit	No	No
Chlorine Dioxide [10]	Not Required	Not Required	± N/R	mg/L	Not Required	Not Required	No	No
POE Chlorite [10]	Not Required	Not Required	± N/R	mg/L	Not Required	Not Required	No	No
Calcium [1]	Not Required	Not Required	± N/R	mg/L	Not Required	Not Required	No	No
Phosphate [1]	Not Required	Not Required	± N/R	mg/L	Not Required	Not Required	No	No
Conductivity [1]	Not Required	Not Required	± N/R	µmho/cm	Not Required	Not Required	No	No
Silica [1]	Not Required	Not Required	± N/R	mg/L	Not Required	Not Required	No	No

Lab Analyst or Operator Validation

I certify that I am familiar with the information contained in this report and that, to the best of my knowledge, this information is true, complete and accurate.

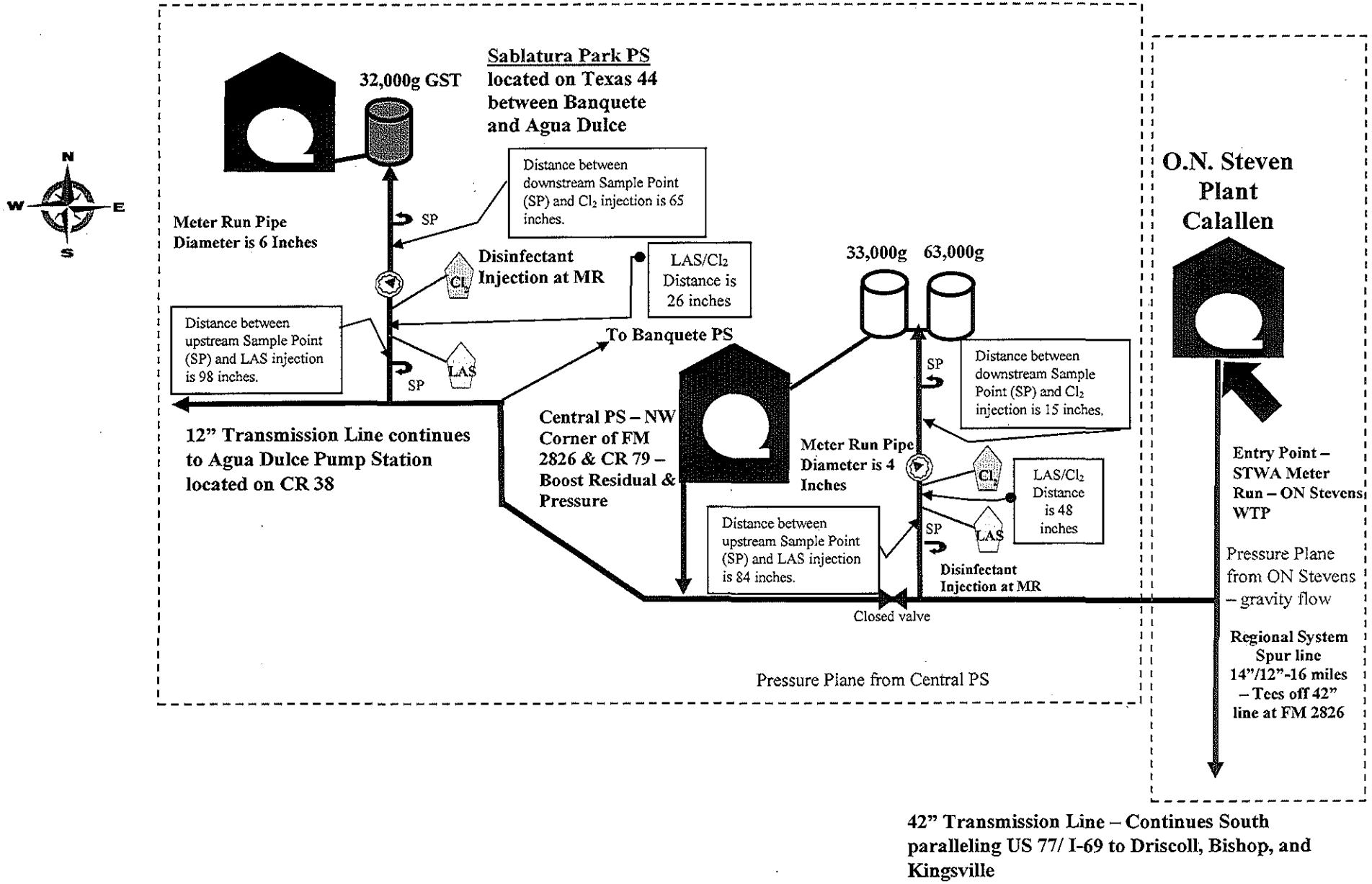
Lab Analyst or Operator's Name and Title	Jacob Hinojosa, O&M Supervisor
Lab Analyst or Operator's Signature	

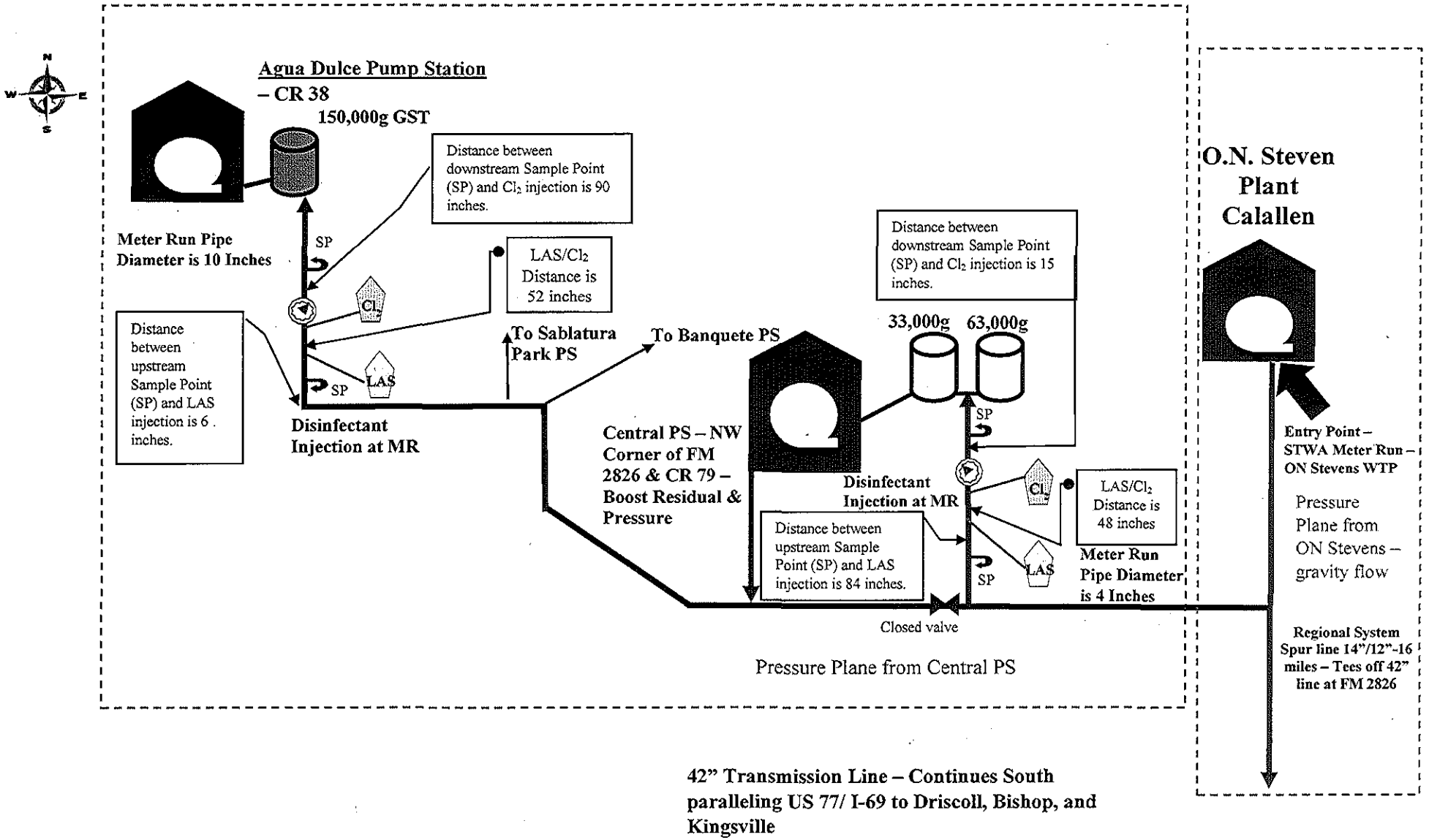
TCEQ Official Use Only

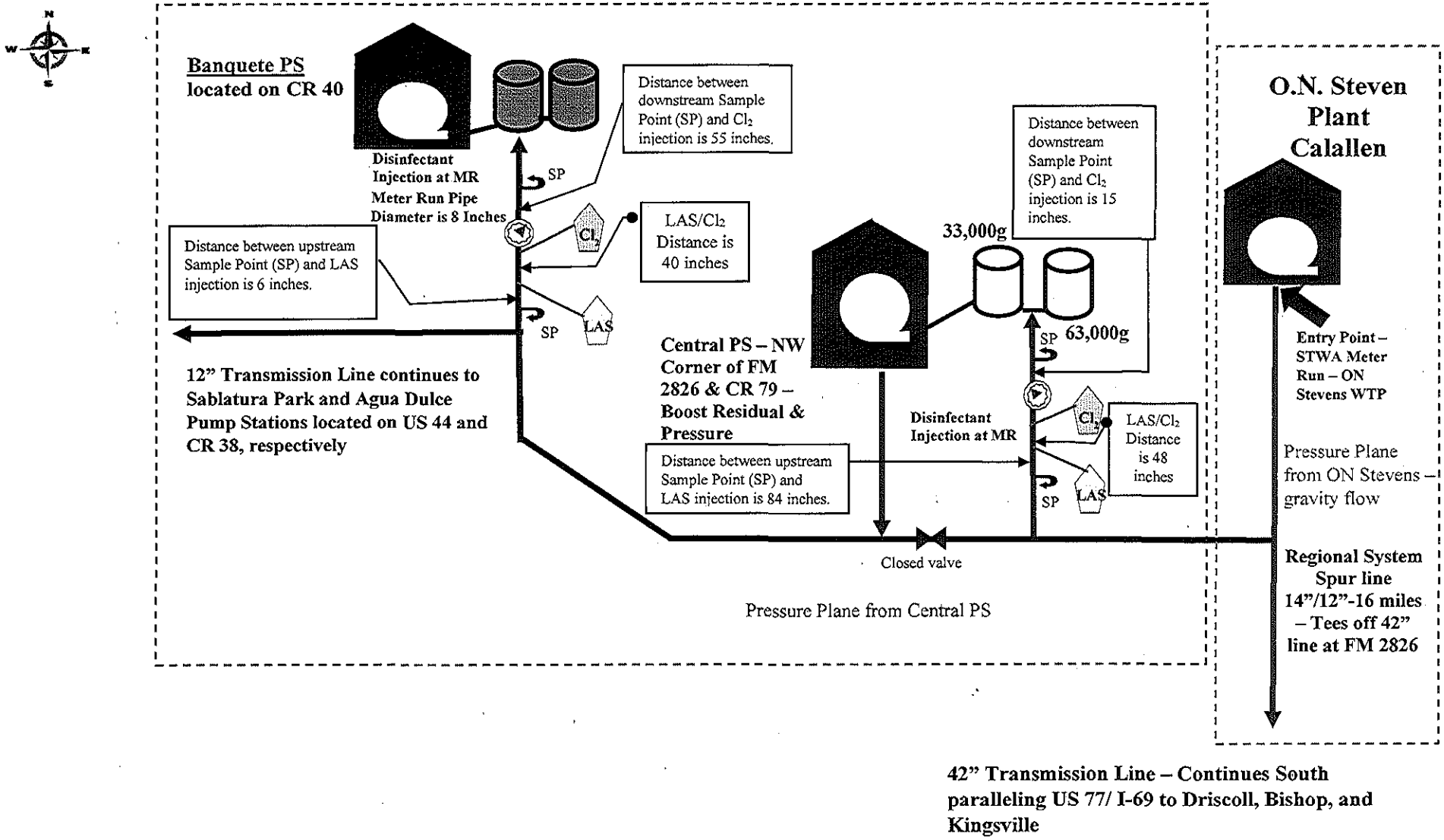
Date Received:	Reviewed by:	Lab ID No:

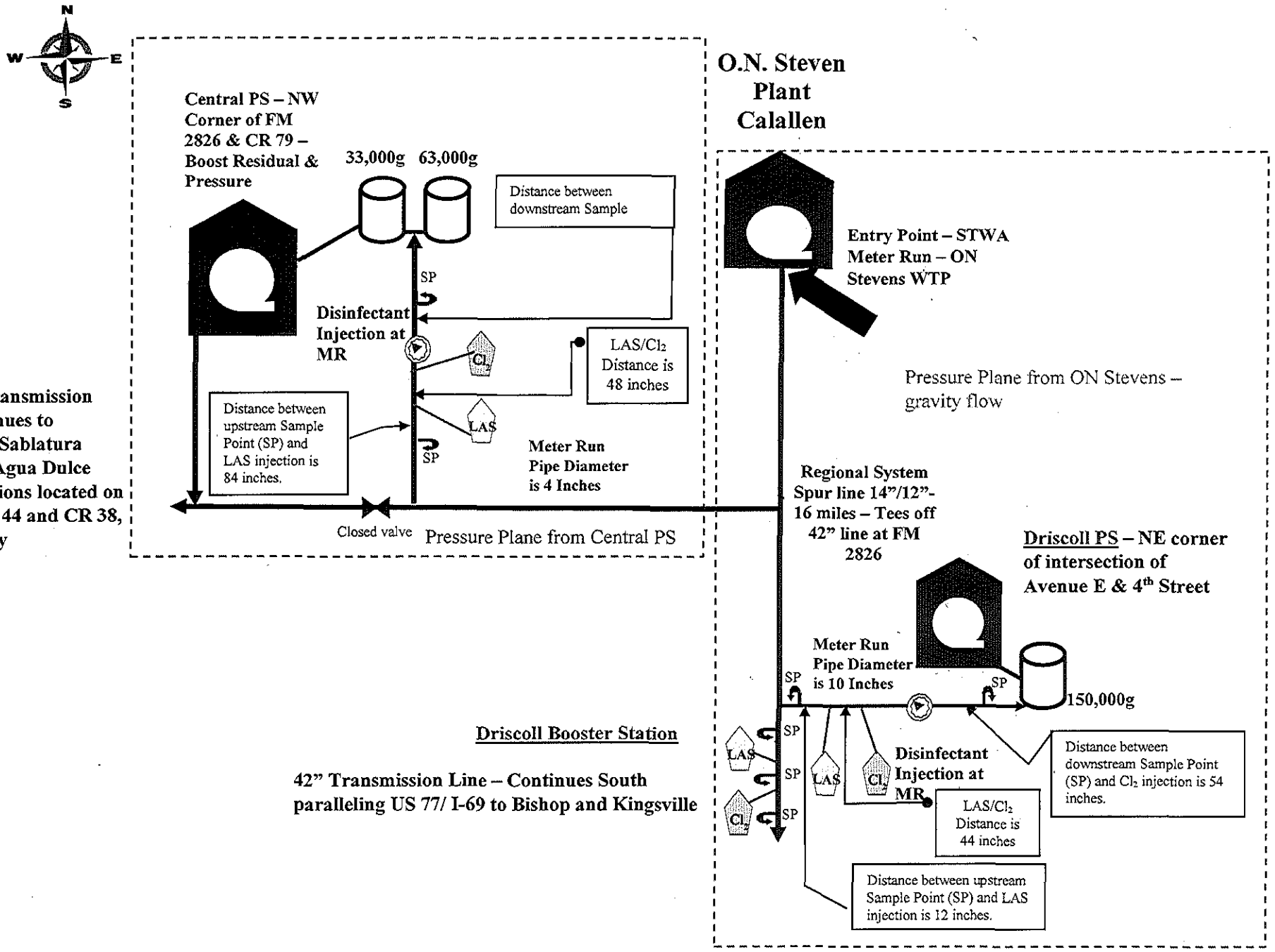
ATTACHMENT B

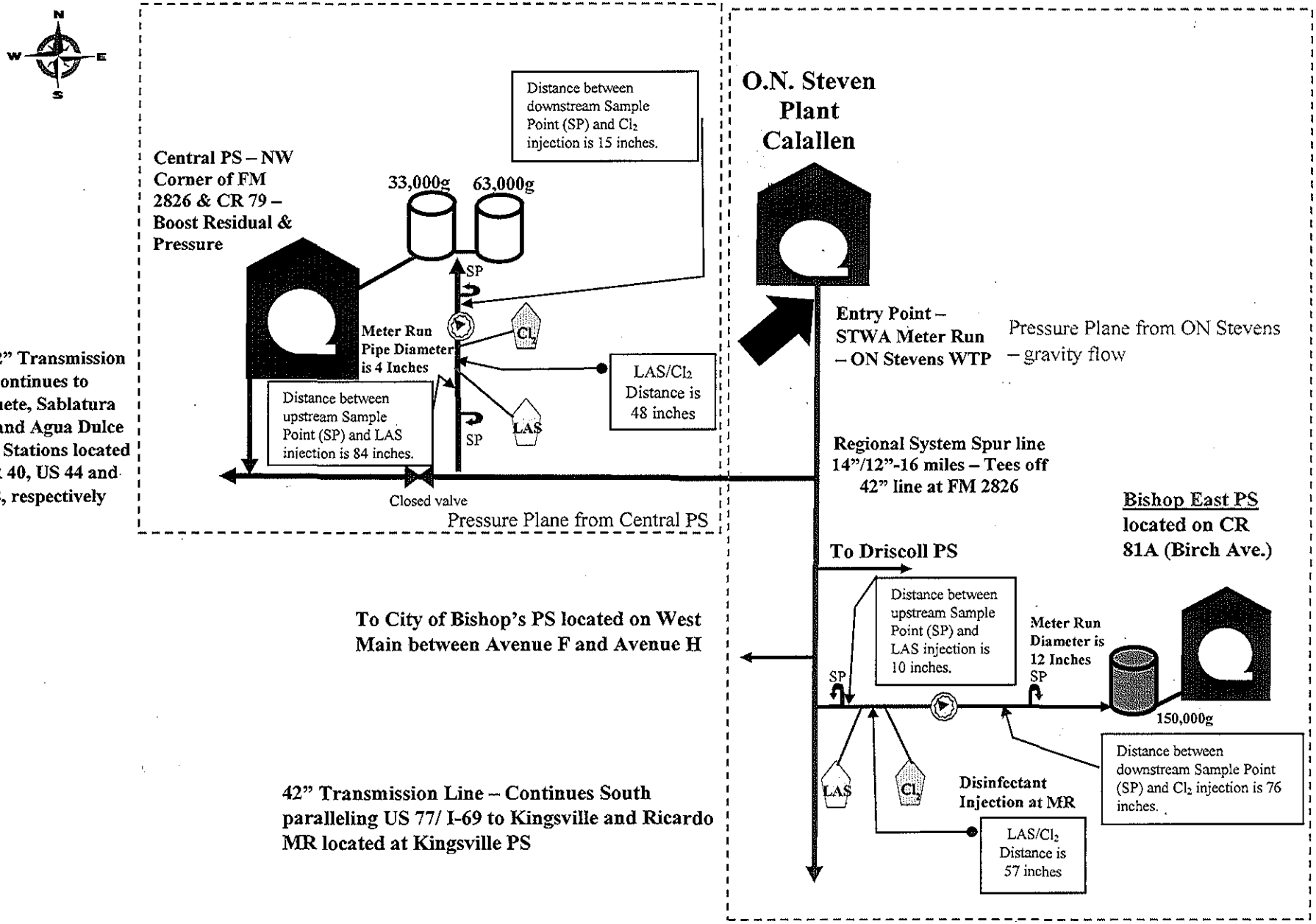
DETAILED FACILTY SCHEMATICS

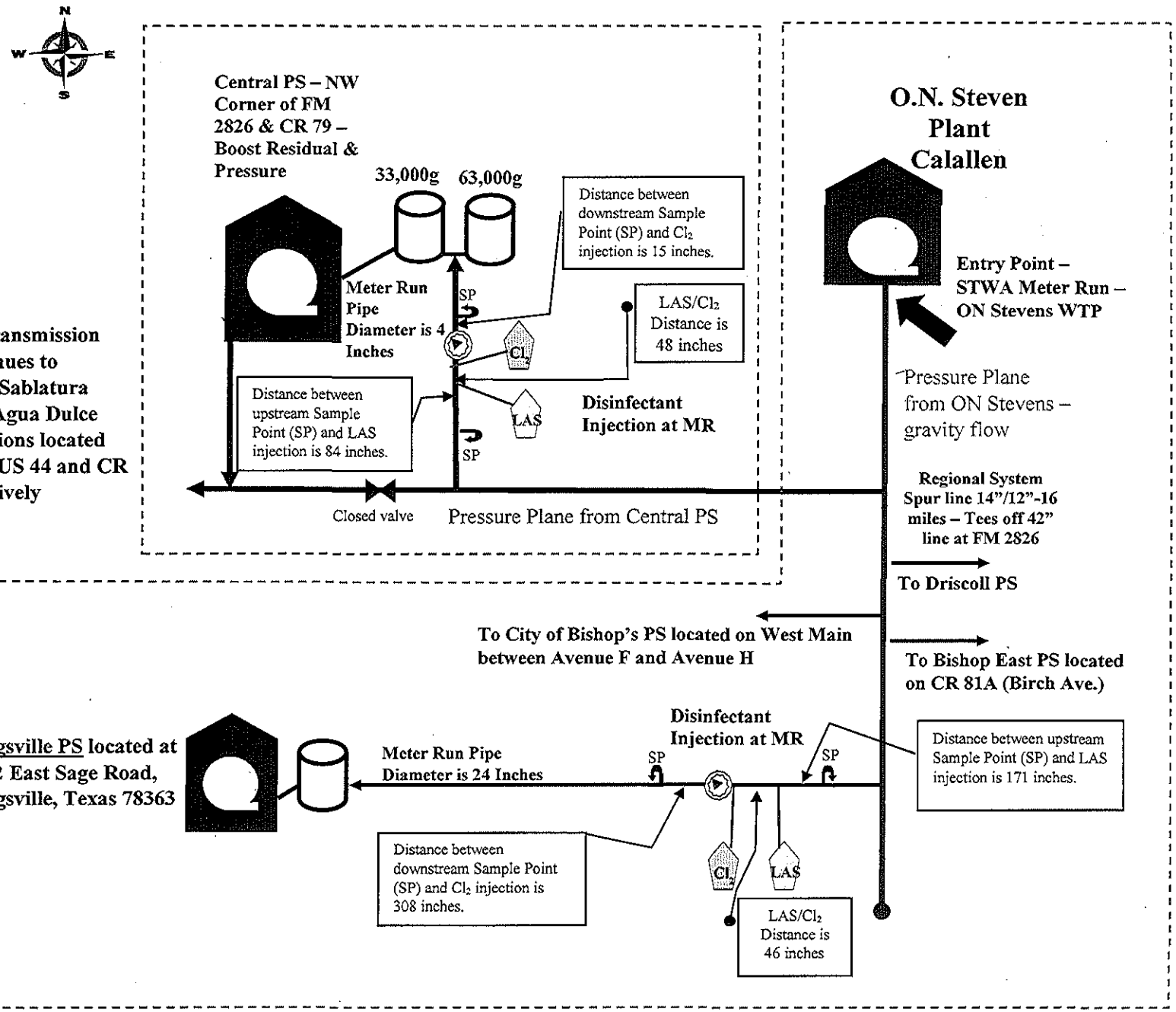

N
W
E
S
Sablatura Park PS
located on Texas 44
between Banquete
and Agua Dulce
32,000g GST
Distance between
downstream Sample Point
(SP) and Cl2 injection is 65
inches.
Meter Run Pipe
Diameter is 6 Inches
SP
Cl
Disinfectant
Injection at MR
LAS/Cl2
Distance is
26 inches
Distance between
upstream Sample Point
(SP) and LAS injection
is 98 inches.
LAS
SP
To Banquete PS
12" Transmission Line continues
to Agua Dulce Pump Station
located on CR 38
Central PS – NW
Corner of FM
2826 & CR 79 –
Boost Residual &
Pressure
33,000g
63,000g
SP
Distance between
downstream Sample
Point (SP) and Cl2
injection is 15 inches.
Meter Run Pipe
Diameter is 4
Inches
Cl
LAS/Cl2
Distance
is 48
inches
SP
LAS
Distance between
upstream Sample Point
(SP) and LAS injection
is 84 inches.
Disinfectant
Injection at MR
Closed valve
Pressure Plane from Central PS
O.N. Steven
Plant
Calallen
Entry Point –
STWA Meter
Run – ON Stevens
WTP
Pressure Plane
from ON Stevens
– gravity flow
Regional System
Spur line
14"/12"-16 miles
– Tees off 42"
line at FM 2826
42" Transmission Line – Continues South
paralleling US 77/ I-69 to Driscoll, Bishop, and
Kingsville


Agua Dulce Pump Station
– CR 38
150,000g GST
Meter Run Pipe Diameter is 10 Inches
SP
Distance between downstream Sample Point (SP) and Cl2 injection is 90 inches.
LAS/Cl2 Distance is 52 inches
Cl2
LAS
Distance between upstream Sample Point (SP) and LAS injection is 6 . inches.
Disinfectant Injection at MR
To Sablatura Park PS
To Banquete PS
Central PS – NW Corner of FM 2826 & CR 79 – Boost Residual & Pressure
Distance between downstream Sample Point (SP) and Cl2 injection is 15 inches.
33,000g
63,000g
Disinfectant Injection at MR
Distance between upstream Sample Point (SP) and LAS injection is 84 inches.
LAS/Cl2 Distance is 48 inches
Meter Run Pipe Diameter is 4 Inches
Closed valve
Pressure Plane from Central PS
O.N. Steven Plant Calallen
Entry Point – STWA Meter Run – ON Stevens WTP
Pressure Plane from ON Stevens – gravity flow
Regional System Spur line 14"/12"-16 miles – Tees off 42" line at FM 2826
42" Transmission Line – Continues South paralleling US 77/ I-69 to Driscoll, Bishop, and Kingsville


Banquete PS
located on CR 40
Disinfectant Injection at MR
Meter Run Pipe Diameter is 8 Inches
SP
Distance between downstream Sample Point (SP) and Cl2 injection is 55 inches.
Cl2
LAS/Cl2 Distance is 40 inches
Distance between upstream Sample Point (SP) and LAS injection is 6 inches.
SP
LAS
12" Transmission Line continues to Sablatura Park and Agua Dulce Pump Stations located on US 44 and CR 38, respectively
Central PS – NW Corner of FM 2826 & CR 79 – Boost Residual & Pressure
33,000g
Distance between downstream Sample Point (SP) and Cl2 injection is 15 inches.
SP
63,000g
Disinfectant Injection at MR
Cl2
LAS/Cl2 Distance is 48 inches
Distance between upstream Sample Point (SP) and LAS injection is 84 inches.
SP
LAS
Closed valve
Pressure Plane from Central PS
O.N. Steven Plant Calallen
Entry Point – STWA Meter Run – ON Stevens WTP
Pressure Plane from ON Stevens – gravity flow
Regional System Spur line 14"/12"-16 miles – Tees off 42" line at FM 2826
42" Transmission Line – Continues South paralleling US 77/ I-69 to Driscoll, Bishop, and Kingsville


N
W
E
S
Central PS – NW Corner of FM 2826 & CR 79 – Boost Residual & Pressure
33,000g
63,000g
Distance between downstream Sample
SP
Disinfectant Injection at MR
Cl
LAS/Cl2 Distance is 48 inches
LAS
Distance between upstream Sample Point (SP) and LAS injection is 84 inches.
SP
Meter Run Pipe Diameter is 4 Inches
Closed valve
Pressure Plane from Central PS
14"/12" Transmission Line continues to Banquete, Sablatura Park and Agua Dulce Pump Stations located on CR 40, US 44 and CR 38, respectively
O.N. Steven Plant Calallen
Entry Point – STWA Meter Run – ON Stevens WTP
Pressure Plane from ON Stevens – gravity flow
Regional System Spur line 14"/12"- 16 miles – Tees off 42" line at FM 2826
Driscoll PS – NE corner of intersection of Avenue E & 4th Street
Meter Run Pipe Diameter is 10 Inches
SP
SP
150,000g
SP
LAS
SP
LAS
Cl
Disinfectant Injection at MR
Cl
SP
Distance between downstream Sample Point (SP) and Cl2 injection is 54 inches.
LAS/Cl2 Distance is 44 inches
Distance between upstream Sample Point (SP) and LAS injection is 12 inches.
Driscoll Booster Station
42" Transmission Line – Continues South paralleling US 77/ I-69 to Bishop and Kingsville


N
W
E
S
Central PS – NW Corner of FM 2826 & CR 79 – Boost Residual & Pressure
33,000g
63,000g
Distance between downstream Sample Point (SP) and Cl2 injection is 15 inches.
SP
Cl2
Meter Run Pipe Diameter is 4 Inches
LAS/Cl2 Distance is 48 inches
Distance between upstream Sample Point (SP) and LAS injection is 84 inches.
SP
LAS
Closed valve
Pressure Plane from Central PS
14"/12" Transmission Line continues to Banquete, Sablatura Park and Agua Dulce Pump Stations located on CR 40, US 44 and CR 38, respectively
O.N. Steven Plant Calallen
Entry Point – STWA Meter Run – ON Stevens WTP
Pressure Plane from ON Stevens – gravity flow
Regional System Spur line 14"/12"-16 miles – Tees off 42" line at FM 2826
To Driscoll PS
Bishop East PS located on CR 81A (Birch Ave.)
To City of Bishop's PS located on West Main between Avenue F and Avenue H
Distance between upstream Sample Point (SP) and LAS injection is 10 inches.
Meter Run Diameter is 12 Inches
SP
SP
150,000g
LAS
Cl2
Disinfectant Injection at MR
Distance between downstream Sample Point (SP) and Cl2 injection is 76 inches.
LAS/Cl2 Distance is 57 inches
42" Transmission Line – Continues South paralleling US 77/ I-69 to Kingsville and Ricardo MR located at Kingsville PS


N
W
E
S
Central PS – NW Corner of FM 2826 & CR 79 – Boost Residual & Pressure
33,000g
63,000g
Meter Run Pipe Diameter is 4 Inches
SP
Cl2
LAS
Distance between downstream Sample Point (SP) and Cl2 injection is 15 inches.
LAS/Cl2 Distance is 48 inches
Disinfectant Injection at MR
Distance between upstream Sample Point (SP) and LAS injection is 84 inches.
SP
Closed valve
Pressure Plane from Central PS
O.N. Steven Plant Calallen
Entry Point – STWA Meter Run – ON Stevens WTP
Pressure Plane from ON Stevens – gravity flow
Regional System Spur line 14"/12"-16 miles – Tees off 42" line at FM 2826
To Driscoll PS
To City of Bishop's PS located on West Main between Avenue F and Avenue H
To Bishop East PS located on CR 81A (Birch Ave.)
14"/12" Transmission Line continues to Banquete, Sablatura Park and Agua Dulce Pump Stations located on CR 40, US 44 and CR 38, respectively
Kingsville PS located at 2302 East Sage Road, Kingsville, Texas 78363
Meter Run Pipe Diameter is 24 Inches
Disinfectant Injection at MR
SP
SP
Distance between upstream Sample Point (SP) and LAS injection is 171 inches.
Distance between downstream Sample Point (SP) and Cl2 injection is 308 inches.
Cl2
LAS
LAS/Cl2 Distance is 46 inches

ATTACHEMENT C

SAMPLE SITING PLAN

Public Water System Revised Total Coliform Rule Sample Siting Plan

PWS Name	South Texas Water Authority
PWS ID	1370035
Date	August 1, 2017

☐ System is submitting SOP to specify either alternative fixed locations or criteria for selecting repeat sampling sites on a situational basis other than collecting repeat samples at sites upstream and downstream of the original routine sampling site.

"I certify under penalty of law that I have personally examined and am familiar with the information submitted and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Name (Printed)	Jacob Hinojosa	Title	O&M Supervisor
Signature		Date	August 1, 2017

Introduction

Purpose of the Sample Siting Plan

As per the revisions under the Revised Total Coliform Rule (RTCR), every public water system must develop and maintain sampling sites for their routine as well as their repeat sample locations. The plan shows where a system intends to complete their repeat requirements in the event of a distribution system positive. Completing this plan will help a system to comply with the monitoring requirements of the *Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems* (30 TAC 290 Subchapter F). The plan is a system specific document which demonstrates that the monitoring performed by the system is representative of the water distributed to consumers and is consistent with regulatory requirements.

How to Use

All applicable sections in the form should be completed to reflect the water system and the monitoring conducted for compliance purposes. The form has all of the elements to create a complete sample siting plan. The form can be saved to the user's computer, and e-mailed to TCEQ once completed.

Submission to TCEQ

All public water systems must submit a copy of the sample siting plan and distribution map for review upon development and revisions.

Submit one (1) copy of the complete Sample Siting Plan to:

Texas Commission on Environmental Quality
Attn: Drinking Water Quality Team
Public Drinking Water Section, Mail Code 155
PO Box 13087
Austin, TX 78711-3087

OR

TCRDATA@tceq.texas.gov

Revisions

Be sure to submit any changes to the sample siting plan to the TCEQ. Revisions may be necessary depending on sites previously listed no longer being available to sample.

Drinking Water Watch: This database is viewable by the public and has important information pertinent to a system's Sample Siting Plan such as contact information, population served, and sample schedules. Be sure to verify that the information is correct by searching for your water system and updating TCEQ accordingly. Please contact the TCEQ inventory team if you wish to update the data:

E-mail: PWSINVEN@tceq.texas.gov
Phone: (512) 239-4691

Revised Total Coliform Rule

I. Total Coliform Sampling Protocol

It is important that systems collect samples correctly; otherwise, they may be contaminated and the results used to determine the condition of the water system could be inaccurate. The total coliform rule regulatory guidance (RG-421 '*Coliform Sampling for Public Water Systems*') includes a standard sampling protocol that every water system must adhere to when collecting samples for compliance.

II. Routine Monitoring Requirements

Minimum required number of Coliform Samples per month = 2

- ~ Systems must develop a written sample siting plan that identifies sampling sites and a sample collection schedule that are representative of water throughout the distribution system.
- ~ A public water system must collect samples at regular time intervals throughout the month, except systems using only groundwater and serving 4,900 or fewer people who may collect all required samples on a single day if they are taken from different sites. It is recommended that samples be taken early in the week and early in the month, so repeat sampling can be conducted before the end of the month.
- ~ All systems should have at least five "**routine**" (original routine (OR)) sample locations listed for rotation purposes, unless the system has less than five sample locations (e.g., some convenience stores, restaurants, and small business parks, etc.).
- ~ Sampling locations shall be representative of the entire distribution.
- ~ All public water systems must monitor the disinfectant residual concentration each time that a bacteriological sample is collected.

Mapping Requirements

Under the RTCR, all public water systems must develop a written Sample Siting Plan that identifies sampling sites and a sample collection schedule that are representative of water throughout the distribution system **not later than March 31, 2016.** The Sample Siting Plan is subject to TCEQ review and revision. In addition, Texas Administrative Code (TAC) §290.46 requires that all public water systems maintain an accurate and up-to-date map of their distribution system. To determine that sample sites are representative of water throughout the distribution system under the RTCR, all public water systems must develop a map of their distribution system and include it with their Sample Siting Plan. The RTCR distribution system map must contain the following **applicable** location information:

- **"Routine" (OR)** RTCR Sample Sites (***Repeat*** sites not required);
- **Distribution water mains and sizes;**
- **Entry Point Source Locations** *(e.g., well source and/or surface water or groundwater under the influence (GUI) water treatment entry points into the distribution system, interconnection with other systems);*
- ***Water Storage Facilities;**
- ***Pressure Plane Boundaries.**

***If a system has only one pressure plane or does not have any water storage facilities, please indicate this information on the map.**

III. Repeat Monitoring Requirements

~ The system must collect no fewer than three repeat samples for each total coliform-positive sample found. The three repeat samples are referred to as a "Repeat Sample Set".

~ Systems must collect at least one repeat sample from the sampling tap where the **original** total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections **upstream** and at least one repeat sample at a tap within five service connections **downstream** of the original sampling site.

~ If a total coliform-positive sample is at the end of the distribution system, or one service connection away from the end of the distribution system, the system must still take all required repeat samples.

~ A system may elect to specify either alternative fixed locations or criteria for selecting repeat sampling sites on a situational basis in a standard operating procedure (SOP) included with the sample siting plan.

~ Every public water system must specify and sample three repeat locations, regardless of how many routine samples are taken. Systems may specify more than three locations if approved by the TCEQ.

~ If a groundwater system serves a total of 1,000 people or less, an entry point sample can be used as the third repeat location. A triggered source monitoring (TSM) sample can double as the third repeat sample if the groundwater system only operates one well.

~ Standard Operating Procedure (SOP) Upstream/Downstream - Systems that collect repeat samples at a tap from the original total coliform-positive sample location, and at a tap within five service connections upstream, and at a tap within five service connections downstream of the original sampling site, shall sign and agree to follow the enclosed upstream and downstream SOP as described in Section VII of this sample siting plan.

~ Standard Operating Procedure (SOP) Alternative Repeat Sample Sites - A system that elects to specify either alternative fixed locations or criteria for selecting repeat sampling sites on a situational basis must develop and submit a written SOP for review and approval of alternative sample sites. (Please note: Systems that choose to pursue this repeat monitoring option must ensure that they check the "box" on the cover page of this document. TCEQ will provide written notification to the system that their SOP has been approved.)

IV. Routine and Repeat Monitoring Location Table

RTCR Sample Siting Plan

Routine and Repeat Sampling Locations*	
Original Routine (OR) Sample Site: FM 666 South of US Highway 44 & North of FM 2826	
UPSite1: Tap off 14" Spurline in vicinity of Geo Center	DNSite1: Banquete PS prior to injection
UPSite2: Central PS Downstream of Booster Pumps	DNSite2: Sablatura Park PS prior to injection
UPSite3:	DNSite3: Agua Dulce PS prior to injection
UPSite4:	DNSite4:
UPSite5:	DNSite5:

Original Routine (OR) Sample Site: Vault at FM 2826 and US 77 (I-69)	
UPSite1: CR 36 Vault	DNSite1:42" Valve Vault - West Ave G
UPSite2: CR 48 (Humming Bird Ln) & US 77 (I-69)	DNSite2:Lopez ARV - North of FM 70 on Business 77
UPSite3: ON Stevens - Downstream from Meter	DNSite3:CR 4 and Business 77
UPSite4:	DNSite4:
UPSite5:	DNSite5:
Original Routine (OR) Sample Site: Driscoll LAS/.Chlorine Booster Station Prior to Chemical Injection	
UPSite1: CR 36 Vault	DNSite1:42" Valve Vault - West Ave G
UPSite2: CR 48 (Humming Bird Ln) & US 77 (I-69)	DNSite2:Lopez ARV - North of FM 70 on Business 77
UPSite3: ON Stevens - Downstream from Meter	DNSite3:CR 4 and Business 77
UPSite4:	DNSite4:
UPSite5:	DNSite5:
Original Routine (OR) Sample Site:	
UPSite1:	DNSite1:
UPSite2:	DNSite2:
UPSite3:	DNSite3:
UPSite4:	DNSite4:
UPSite5:	DNSite5:
Original Routine (OR) Sample Site:	
UPSite1:	DNSite1:
UPSite2:	DNSite2:
UPSite3:	DNSite3:
UPSite4:	DNSite4:
UPSite5:	DNSite5:

* **Routine sample locations:**
A ***Community*** public water system must develop a list of routine sample sites that are representative of water throughout the entire distribution system. The sample sites must be identified by street **address**.
A ***Non-Transient Non-Community*** or ***Transient Non-Community*** public water system must develop a list of routine sample sites that are representative of water throughout the entire distribution system. The sample sites must be identified by **specific facility location** (i.e., outside tap west wall near front door, raw well tap, inside tap, etc..) OR **any applicable facility address**.

* **Repeat sampling locations:** A public water system must specify sampling addresses for locations within five connections upstream *and* downstream of the original sample address.

OR = original routine sample site
When a routine sample is positive, a repeat sample must be collected at the original routine sample site in addition to the upstream and downstream sample sites.
UPSite1-5 = upstream connections of original routine address
DNSite1-5 = downstream connections of original routine address

V. RTCR Sampling Schedule

~ A public water system must collect samples at regular time intervals throughout the month, except systems using only groundwater and serving 4,900 or fewer people who may collect all required samples on a single day if they are taken from different sites.

~ Please provide a written description in the text box below to explain the system's sample collection schedule (e.g., at either regular time intervals throughout the month or on a single day) which is representative of water throughout the distribution system.

VI. Groundwater Source Monitoring Sites

~ Sample locations necessary to meet the requirements of the Ground Water Rule (GWR) must be reflected in the Sample Siting Plan. Public Water Systems must include their TCEQ Assigned Well Source Identification Number (i.e., G0000000A), sample location, and whether or not the Well(s) Entry Point (treated) is used as a **repeat** monitoring location OR if the Well (raw) is used as a **repeat** location to satisfy Triggered Source Monitoring (TSM) requirements under the GWR.

Reminder: If a groundwater system serves a total of 1,000 people or less, an entry point sample can be used as the third repeat location. A triggered source monitoring (TSM) sample can double as the third repeat sample if the groundwater system only operates one well.

Groundwater Wells

Assigned Source ID	Sample Location	Used as Repeat Sample Location?

-			☐ Yes

Click here to add one additional well

Click here to add five additional wells

VII. Standard Operating Procedure (SOP) - Upstream / Downstream

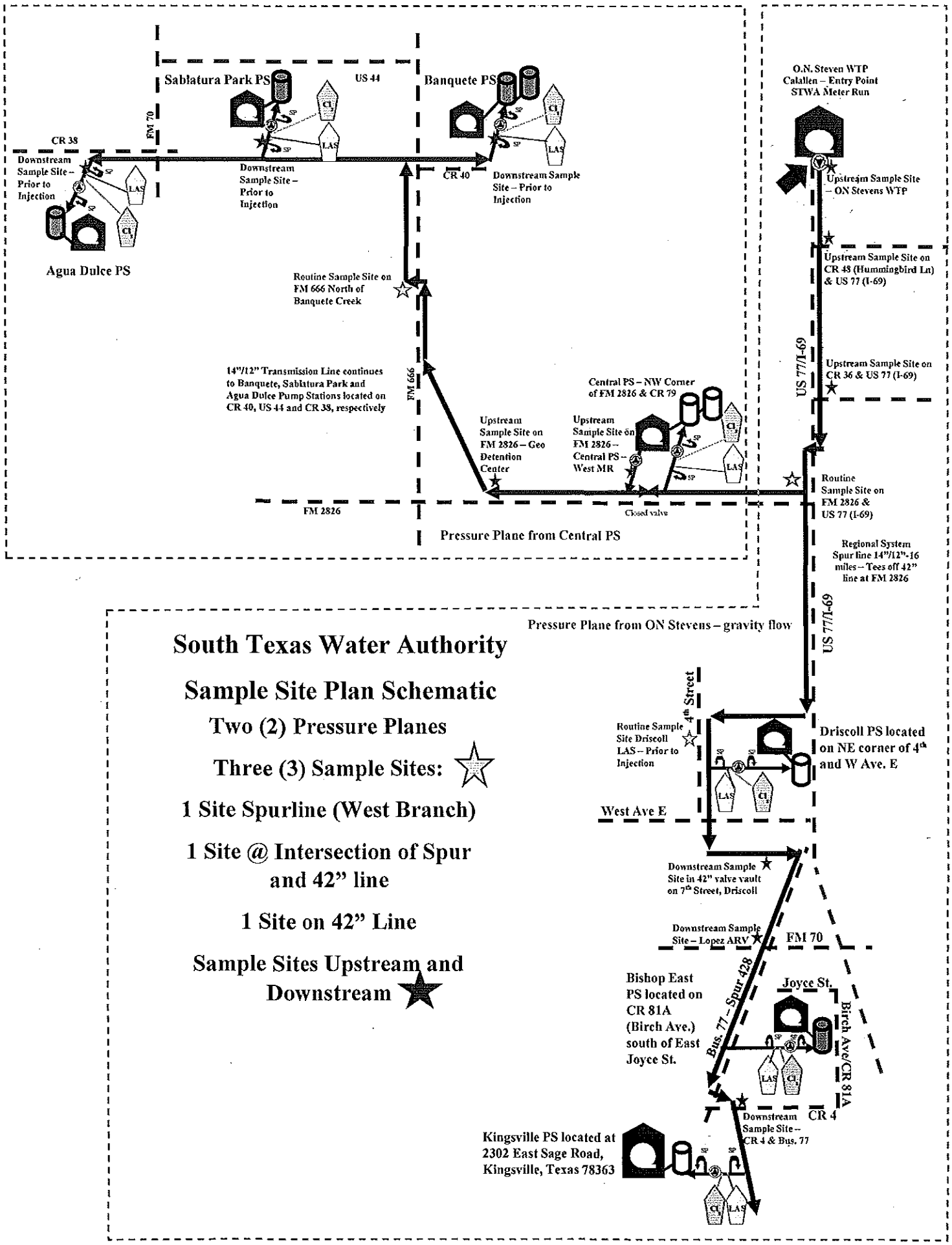
~ The following SOP is required for public water systems that include repeat samples within five service connections Upstream and Downstream of the original routine sample site in their "Repeat Sample Set".

Once a system receives a total coliform-positive (TC+) sample result from the Original Routine (OR) Sample, the system must collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site **(Repeat Sample Set)**. If a total coliform-positive sample is at the end of the distribution system, or one service connection away from the end of the distribution system, the system must still take all required repeat samples.

This SOP stipulates the repeat sampling process when conditions exist that prevent the collection of a repeat sample from one of the listed upstream or downstream sample sites. The system may collect their repeat samples at one of the alternative upstream or downstream sample sites as listed in the RTCR Sample Siting Plan. For example, when UPSite 1 or DNSite 1 is determined by the system to be unacceptable due to sample site conditions, then a sample may be collected from one of the alternative UPSite 2 - 5 or DNSite 2 - 5 sample sites.

Specifically, systems may collect their repeat samples from any of the listed UPSite 1 - 5 or DNSite 1 - 5 sample sites and are not required to select their repeat sites in sequential order. For example, systems may include in their repeat sample set a sample from UPSite 2 and DNSite 5.

By signing the cover page of this RTCR Sample Siting Plan, systems that choose to include repeat sample sites from upstream and downstream sample sites in their Repeat Sample Set agree to follow this SOP.


South Texas Water Authority
Sample Site Plan Schematic
Two (2) Pressure Planes
Three (3) Sample Sites:
1 Site Spurline (West Branch)
1 Site @ Intersection of Spur and 42" line
1 Site on 42" Line
Sample Sites Upstream and Downstream
Sablatura Park PS
US 44
Banquete PS
FM 70
CR 38
Downstream Sample Site – Prior to Injection
Downstream Sample Site – Prior to Injection
CR 40
Downstream Sample Site – Prior to Injection
Agua Dulce PS
Routine Sample Site on FM 666 North of Banquete Creek
14"/12" Transmission Line continues to Banquete, Sablatura Park and Agua Dulce Pump Stations located on CR 40, US 44 and CR 38, respectively
FM 666
Upstream Sample Site on FM 2826 – Geo Detention Center
Upstream Sample Site on FM 2826 – Central PS – West MR
Central PS – NW Corner of FM 2826 & CR 79
FM 2826
Closed valve
Pressure Plane from Central PS
O.N. Steven WTP Calallen – Entry Point STWA Meter Run
Upstream Sample Site – ON Stevens WTP
Upstream Sample Site on CR 48 (Hummingbird Ln) & US 77 (I-69)
US 77/I-69
Upstream Sample Site on CR 36 & US 77 (I-69)
Routine Sample Site on FM 2826 & US 77 (I-69)
Regional System Spur line 14"/12"-16 miles – Tees off 42" line at FM 2826
Pressure Plane from ON Stevens – gravity flow
US 77/I-69
4th Street
Routine Sample Site Driscoll LAS – Prior to Injection
Driscoll PS located on NE corner of 4th and W Ave. E
West Ave E
Downstream Sample Site in 42" valve vault on 7th Street, Driscoll
Downstream Sample Site – Lopez ARV
FM 70
Bus. 77 – Spur 428
Bishop East PS located on CR 81A (Birch Ave.) south of East Joyce St.
Joyce St.
Birch Ave/CR 81A
CR 4
Downstream Sample Site – CR 4 & Bus. 77
Kingsville PS located at 2302 East Sage Road, Kingsville, Texas 78363

ATTACHEMENT D

NITRIFICATION ACTION PLAN

A. Introduction

The South Texas Water Authority (STWA) operates a public water system that purchases chloraminated water from the City of Corpus Christi O. N. Stevens Water Treatment Plant. The purpose of this document is to provide guidance on preventing and responding to nitrification.

B. Sample Site Map and Schedule

Water from the City of Corpus Christi enters the STWA system at the entry point located on Up River Road in Calallen. The STWA system consists of a 42-inch diameter (Main Branch) and shorter 14-inch and 12-inch diameter (Spur Branch) transmission mains that convey water to seven wholesale customers. In most cases under normal operation, water is delivered to a ground storage tank and subsequently pumped to the downstream customers.

Figure 1 presents a schematic map of the STWA system. Sample sites and chemical addition locations are shown on the map. A chlorine booster station is located on the main branch at the Driscoll facility, and a LAS system is currently being designed for installation at this same location. All of the other chemical addition facilities are located on the meter runs to STWA customers. Table 1 summarizes the Nitrification Action Plan sampling plan for STWA.

Table 1: Sample Site Summary

Site	Sample Location	Sample Location	Samples Collected	Frequency
A	O.N. Steven WTP in Calallen	Entry Point	Total chlorine, monochloramine, and free ammonia Nitrite and nitrate	Weekly per monitoring plan Quarterly
B1	Central Facility	Before Chemical Addition	Total chlorine, monochloramine, and free ammonia	Weekly per monitoring plan and following a change in chemical dose
C1	Banquete Facility – Meter Run			
D1	Sablatura Park Facility – Meter Run			
E1	Agua Dulce Facility – Meter Run			
F1	Driscoll Facility – Meter Run			
G1	Driscoll Mainline Booster Station – Main Branch at Driscoll			
H1	Bishop (East) Facility – Meter Run			
I1	Kingsville Facility – Meter Run			

Table 1 (Continued): Sample Site Summary

B2	Central Facility	After Chemical Addition	Total chlorine, monochloramine, and free ammonia	Weekly per monitoring plan and following a change in chemical dose
C2	Banquete Facility – Meter Run			
D2	Sablatura Park Facility – Meter Run			
E2	Agua Dulce Facility – Meter Run			
F2	Driscoll Facility – Meter Run			
G2	Driscoll Booster Station – Main Branch at Driscoll			
H2	Bishop-East Facility – Meter Run			
I2	Kingsville Facility – Meter Run			
D1	Sablatura Park Facility – Meter Run	Average Water Age	Nitrite and nitrate	As required during an action item to determine affected area
H1	Bishop-East Facility – Meter Run			
G1	Driscoll Booster Station – Main Branch at Driscoll	Average Water Age	Nitrite and nitrate	Quarterly and as required during an action item to determine affected area
I1	Kingsville Facility – Meter Run	Maximum Water Age	Total chlorine, monochloramine, and free ammonia	Weekly per monitoring plan
E1	Agua Dulce Facility – Meter Run		Nitrite and nitrate	Quarterly
G1	Driscoll Mainline Booster Station – Main Branch at Driscoll	Critical Control Point	Nitrite and nitrate	Quarterly

Sample Site A is located at the system entry point on the meter run immediately downstream of the O. N. Stevens Water Treatment Plant.

Sample Site B1 is located upstream of the Central Pump station chemical addition point. Sample Sites C1, D1, E1, F1, G1, H1, and I1 are located upstream of chemical addition at the STWA customer delivery points in Banquete, Sablatura Park, Agua Dulce, Driscoll, Bishop (East), and Kingsville.

Sample Site B2 is located downstream of the Central Pump station chemical addition point. Sample Sites C2, D2, E2, F2, G2, H2 and I2 are located downstream of chemical addition at the STWA customer delivery points in Banquete, Sablatura Park, Agua Dulce, Driscoll, Bishop (East), and Kingsville.

Sample Sites G1 and G2 are located on the STWA 42-inch diameter main branch upstream and downstream of chemical addition near the Driscoll facility.

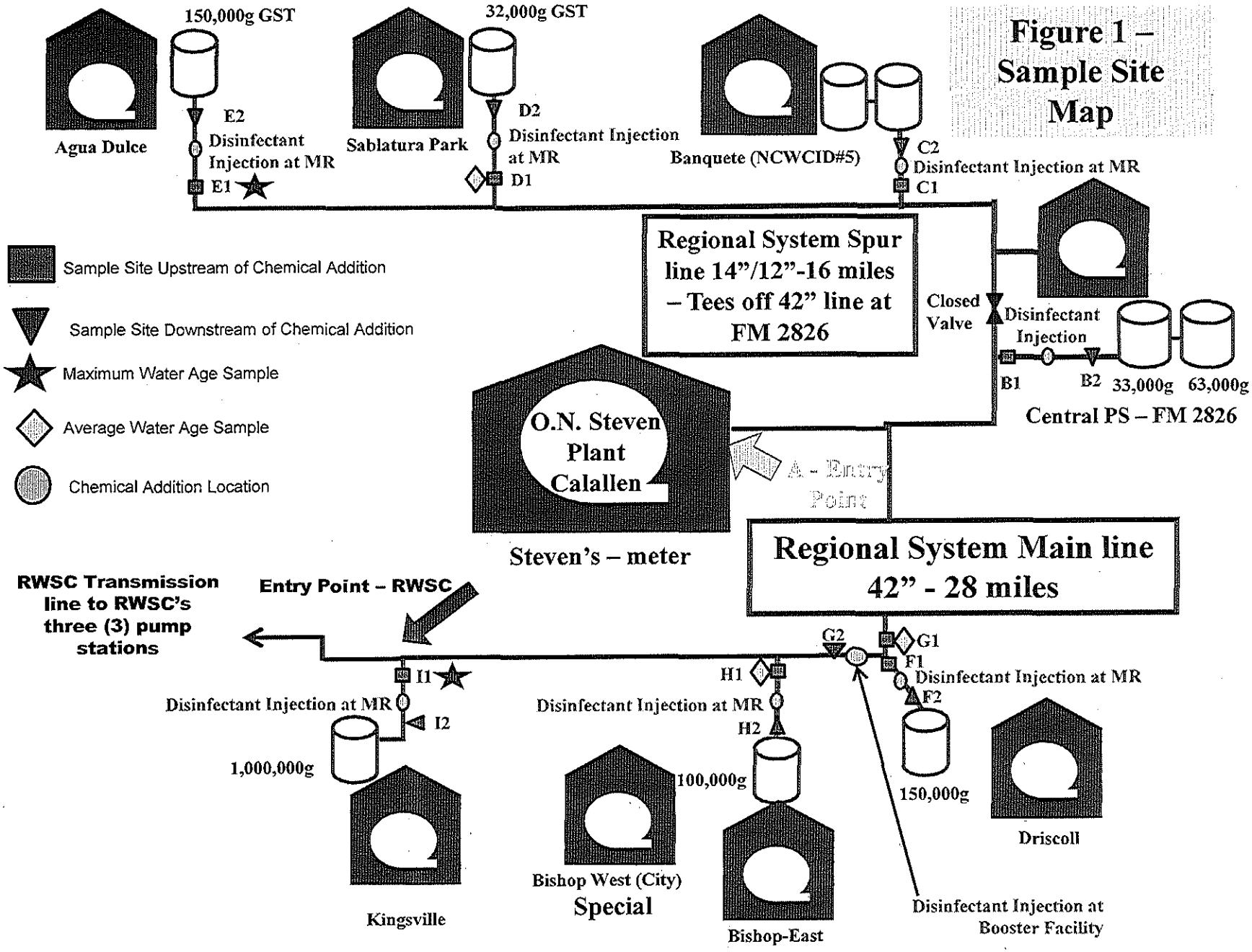
Sample Sites D1, G1, and H1 also represent average water age conditions in the STWA system and will provide locations where STWA can collect additional samples during an action item to determine the affected areas. It should be noted that routine sampling does not occur Bishop-West but can be performed to determine an affected area as required.

Sample Sites I1 and E1 are at the end of the STWA Main Branch and Spur Branch in Kingsville and Agua Dulce, respectively, and represent maximum water age sites.

The TCEQ considers that total chlorine or monochloramine, free ammonia, nitrite and nitrate are the critical control parameters for chloramination and nitrification control. STWA samples total chlorine within the system and operates chlorine and ammonia chemical delivery systems in each service area to maintain a minimum total chlorine residual of 0.5 mg/L.

Nitrite and nitrate levels within the STWA are dependent on the level in the source water provided by the City of Corpus Christi. Changes in the level of nitrite and nitrate can indicate a source water change or nitrification. Regular nitrite and nitrate sample is scheduled for Sample Sites A, E1, G1, and I1. Sample Site A is the entry point to the system. More regular nitrite and nitrate data provided by the City of Corpus Christi from the O.N. Stevens WTP is available at this location to supplement sampling at this site. Sample Sites E1 and I1 are critical control locations at the end of the Spur and Main Branches. Sample Site G1 is a critical control site at Driscoll before disinfectant boosting.

Figure 1 – Sample Site Map



C. Analytical Methods

Total chlorine, monochloramine and free ammonia are tested in the field using the Hach Pocket Colorimeter and Colorimeter II with an accuracy of plus or minus 0.1 mg/L. Nitrite and nitrate samples are analyzed at the City of Corpus Christi Water Utilities Laboratory at the O. N. Stevens Water Treatment Plant.

D. Goals, Baselines, and Action Items

Per the TCEQ Nitrification Action Plan (NAP) guidance document, a change in the ratio of total chlorine to monochloramine or a drop in chlorine levels may indicate that nitrification is occurring. Ammonia levels also decrease during nitrification, and nitrification may be occurring if ammonia is not detected. Any change in nitrite levels, either an increase or decrease, may indicate nitrification. According to the TCEQ, nitrite levels will increase during the initial stages of nitrification, and then drop as it is converted to nitrate as nitrification progresses. Likewise, nitrate increases when nitrification is an issue.

Table 2 provides the NAP plan for STWA showing the goals, baselines, and action items for each chemical. The NAP is based on data collected by STWA at sample points located at each pump station. Baseline nitrite and nitrate data is based on data provided by the City of Corpus Christi from 2012 – 2017 and additional sampling collected by NWSC from 2013 – 2017.

The concentration of nitrate entering the STWA system from O.N. Stevens WTP is highly variable and typically in excess of 0.5 mg/L. Accordingly, the designated nitrate baseline and trigger concentrations have been customized to be vary based on the relative concentration of nitrate entering the system whereby:

- The nitrate concentration entering the STWA system at Sampling Site A is a variable amount designed by $\underline{X}$ mg/L equal to the mean concentration for the prior week of nitrate sampling data provided by the City of Corpus Christi.
- A Yellow Flag Trigger is the concentration at Sampling Site A plus 0.1 mg/L, or $\underline{X} + 0.1$ mg/L.
- A Red Flag Trigger is the concentration at Sampling Site A plus 0.2 mg/L, or $\underline{X} + 0.2$ mg/L.

The Yellow and Red Flag setpoints will be updated if nitrate entering the STWA system stabilizes or can be reduced by Corpus Christi. The Yellow Flag add factor of 0.1 mg/L and the Red Flag add factor of 0.2 mg/L have been specified based on the variable nature of water entering the system and the variable residence time of the STWA system.

An exception to the above strategy is the nitrate Yellow Flag and Red Flag Triggers at Sample Site A (Entry Point). Given the variability of nitrate at this site and the use of entry point data to define downstream triggers, the triggers at the entry point have been set at concentrations higher than the normal range of nitrate entering the system to prompt a conversation with the City of Corpus Christi when nitrate levels leaving O. N. Stevens WTP are exceptionally high.

Nitrite entering the STWA system from O.N. Stevens WTP is typically non-detectable. Therefore, nitrite baseline and trigger concentrations have not been customized to vary relative to the entry concentration.

Goals, baseline and triggers will be updated on a regular basis as additional data is collected.

Table 2: Nitrification Action Plan

Chloramine-Effectiveness Sample Suite						
Site	Chemical	Goal	Yellow Flag		Red Flag	
			Trigger	Actions	Trigger	Actions
Entry Point: A – O.N. Steven WTP	Total / Mono	3.5	3.0	1. Verify results 2. Contact City of Corpus Christi to request modification to U/S chemical dosing	2.5	1. Verify results 2. Contact City of Corpus Christi to request modification to U/S chemical dosing 3. Flush affected area
	Free ammonia	0.2	+/- 50%		<0.1 or >0.5	
Spur Branch Before Chemical Addition: B1 – Central C1 – Banquete D1 – Sablatura E1 – Agua Dulce	Total / Mono	2.5	1.5		1.0	
	Free ammonia	0.2	+/- 50%		>0.5	
Main Branch Before Chemical Addition: F1 – Driscoll G1 – Driscoll Mainline BPS	Total / Mono	2.0	1.5		1.0	
	Free ammonia	0.2	+/- 50%		>0.5	
Main Branch Before Chemical Addition: H1 – Bishop (East)	Total / Mono	2.5	1.5	1. Verify results 2. Inspect and adjust chemical doses at Driscoll mainline and/or Kingsville disinfection facilities	1.0	1. Verify results 2. Inspect and adjust chemical doses at Driscoll mainline and/or Kingsville disinfection facilities 3. Identify affected area (check other sample sites) 4. Measure nitrite and nitrate 5. Flush affected area 6. Convert to free chlorine until levels return to normal[1] 7. Consult professional engineer[2]
	Free ammonia	0.3	+/- 50%		<0.1 or >0.5	
Main Branch Before Chemical Addition: I1 – Kingsville	Total / Mono	2.5	1.5		1.0	
	Free ammonia	0.2	+/- 50%		>0.5	

Table 2 (Continued): Nitrification Action Plan

Chloramine-Effectiveness Sample Suite (Continued)						
After Chemical Addition (Main and Spur Branches): B2 – Central C2 – Banquete D2 – Sablatura E2 – Agua Dulce F2 – Driscoll G2 – Driscoll Mainline BPS H2 – Bishop (East) I2 – Kingsville	Total / Mono	3.0	2.5	1. Verify results 2. Inspect and adjust chemical doses 3. Identify affected area (check other sample sites) 4. Measure nitrite and nitrate 5. Flush affected area until levels return to normal	2.0	1. Verify results 2. Inspect and adjust chemical doses 3. Identify affected area (check other sample sites) 4. Measure nitrite and nitrate 5. Flush affected area 6. Convert to free chlorine until levels return to normal[1] 7. Consult professional engineer[2]
	Free ammonia	0.2	+/- 50%		>0.5	
Max Water Age: E1 – Agua Dulce I1 – Kingsville	Total / Mono	2.5	1.5		1.0	
	Free ammonia	0.2	+/- 50%		>0.5	

Nitrite/Nitrate						
Site	Chemical	Baseline	Yellow Flag		Red Flag	
			Trigger	Actions	Trigger	Actions
Entry Point: A – O.N. Steven WTP	Nitrite	<0.02	>0.03	1. Verify results 2. Contact City of Corpus Christi to request modification to U/S chemical dosing	>0.05	1. Verify results 2.Contact City of Corpus Christi to request modification to U/S chemical dosing
	Nitrate	<0.6	>0.6		>0.7	
Supplemental Critical Control Point: G1 – Driscoll Mainline BPS	Nitrite	<0.02	>0.03	1. Verify results 2. Identify affected area (check other sample sites) 3. Flush affected area and dead ends until levels return to normal	>0.05	1. Verify results 2. Identify affected area (check other sample sites) 3. Flush affected area 4. Convert to free chlorine until levels return to normal[1] 5. Consult professional engineer[2]
	Nitrate	X	X + 0.1 mg/L		X + 0.2 mg/L	
Max Water Age: E1 – Agua Dulce I1 – Kingsville	Nitrite	<0.02	>0.03		>0.05	
	Nitrate	X	X + 0.1 mg/L		X + 0.2 mg/L	

[1]Coordinate with TCEQ prior to performing a free chlorine conversion
[2]Walker Partners, Aaron Archer, P.E., 804 Las Cimas Parkway, Suite 150, Austin, TX 78746, 512-382-0021

E. Appendices

Appendix A – Additional information from the TCEQ on NAPs

Appendix A

TCEQ Nitrification Action Plan Guidance

Nitrification Action Plan (NAP)—Summary

The Texas Commission on Environmental Quality (TCEQ) has information about nitrification on our web site at: *www.tceq.texas.gov/drinkingwater/disinfection/nitrification.html*

The TCEQ's data for Texas public water systems (PWSs) is available at: *dww2.tceq.texas.gov/DWW/*

This summary is intended to describe and supplement the rule requirements of Title 30, Texas Administrative Code (30 TAC) Chapter 290. In the event of any unintended discrepancy between the rule and this guidance, the rule language shall apply.

Purpose of NAP: The purpose of a Nitrification Action Plan (NAP) is to ensure that chloramine disinfection is successful by preventing and/or responding to nitrification.

NAP Sampling: The rule gives the minimum requirements. It may be necessary for PWSs to perform additional sampling to characterize the adequacy of disinfection in their distribution system.

Critical Control Conditions for Chloramination	
Total Chlorine	• Total chlorine is the **sum of all active chlorine species.** It is the regulated level. • The minimum allowable total chlorine residual is **0.5 mg/L** throughout the distribution. • The maximum residual disinfectant level (MRDL) for total chlorine is 4.0 mg/L based on the running annual average (RAA) of all samples collected in distribution. Maintaining a residual over the 4.0 mg/L at entry points is not a violation in and of itself. • The minimum and maximum residuals in distribution are reported on the Disinfectant Level Quarterly Operating Report (DLQOR) and the Surface Water Monthly Operating Report (SWMOR)
Mono-chloramine	• Monochloramine is the disinfecting member of the chloramine family. • Ideally, all of the total chlorine will be present as monochloramine. • Keeping track of the ratio of monochloramine to total chlorine can help alert you to possible nitrification.
Free Ammonia	• Free ammonia reacts with free chlorine to make monochloramine and other chloramines. Then, as the monochloramine decays, free ammonia is released. • Free ammonia and total ammonia may be present in source water.
Nitrite	• Nitrite is formed by ammonia-oxidizing bacteria which 'eat' ammonia. • Nitrite may be present in source water. • Nitrite has a health-based maximum contaminant level (MCL) of 1 mg/L at entry points, but is not regulated at distribution system sample sites. However, it is still a public health concern when it is over the MCL.
Nitrate	• Nitrate is formed by nitrite-oxidizing bacteria which 'eat' nitrite. • Nitrate is often present in source water, especially groundwater. • Nitrate has a MCL of 10 mg/L at entry points, but is not regulated at distribution system sample sites. However, it is still a public health concern when over the MCL.
Other process management parameters	
Free chlorine	• You are **not required to measure free chlorine**, except during a temporary conversion to free chlorine performed as a preventive or corrective action.
pH	• A **decrease in pH** can indicate nitrification. Therefore, pH measurement is recommended at systems with low alkalinity. • PWSs that use pH elevation for corrosion or nitrification control should also monitor pH in the distribution system. • Some PWSs are required to measure pH as part of the Lead and Copper Rule requirements for WQP (water quality parameter) testing.
HPC	• HPC means 'heterotrophic plate count' bacteria. • HPC can be a useful tool to measure the concentration of a broad range of bacteria. An **increase in HPC** can indicate nitrification. • PWSs are not required to measure HPC.
Other indicators	*Nitrification/denitrification indicators used in wastewater treatment, such as dissolved oxygen, alkalinity, oxidation-reduction potential may be useful for drinking water in future, but need further research.*

NAP Sample Sites

- Sample sites must **represent the distribution system and all entry points.**
- In addition to routine NAP sample sites, **additional locations will need to be sampled** when taking action to identify the area where nitrification is happening.

Storage tanks		• Storage facilities can increase water age. Consider the impact of storage when determining sample sites.
Sample Sites Before and After Chemical Injection		
Source(s)	**Ground-water**	• All wells are required to have pre-disinfection sample taps representing the raw water. • If only **one well and one entry point** are present, entry point nitrite/nitrate sample results may be used to represent source water nitrite/nitrate levels. • If more than one well feeds one entry point, **nitrite, nitrate, and free ammonia sampling must be performed at each well.**
	Surface water (and GUI)	• Surface water systems must monitor raw water for nitrite, nitrate, and free ammonia representing each raw water intake. • GUI is groundwater under the direct influence of surface water. GUI must meet the requirements for surface water.
	Purchased water	• For purchased water, the source sample site is usually the entry point sample site. • Systems that purchase and redistribute potable water must measure total chlorine, monochloramine, free ammonia, nitrite, and nitrate immediately after the water enters their system.
Entry Point(s)		• Entry points are defined as a point where **treated water enters the distribution** system. All entry points are required to have a representative sample tap. • Entry points are numbered. You can verify this number on TCEQ's web site: 'Drinking Water Watch' at *dww2.tceq.texas.gov/DWW/* • For the purposes of a NAP, entry point sampling is the same regardless of the water source type.
Sample Sites Before and After Chemical Injection		
• Sampling is required to make sure that the correct chlorine-to-ammonia (Cl:N) ratio exists. The Cl:N ratio is calculated from the mass of free chlorine to the mass of free-ammonia-nitrogen. The desired range of Cl:N is ~ 4:1 to 5:1. The range from 5:1 to 8:1 is undesirable because of di- and trichloramine formation; above 8:1 all nitrogen is lost and free chlorine is present. • PWS staff should become familiar with breakpoint chemistry. • Good mixing during treatment is very important. Poor mixing can cause ineffective disinfection.		
Order of addition		• When chlorine is injected upstream of any other disinfectant, the ammonia injection point must be downstream of the chlorine injection point. • When chlorine and ammonia are added to distribution water that has a chloramine residual, ammonia should be added first. • When chlorine and ammonia are added to distribution water that has a free chlorine residual, chlorine should be added first.
Before chemical addition		• Sampling must be performed upstream of the chlorine or ammonia chemical injection point, whichever is furthest upstream. • If free ammonia is present in the source, raw water sampling should be performed weekly. • If the source is purchased potable water--total chlorine, monochloramine, and free ammonia must be monitored at least weekly and dosing should consider influent levels.
During treatment		• Chlorine must be injected before ammonia. • Sampling must be performed downstream of all the chlorine and ammonia chemical injection points.
Booster disinfection		• The free ammonia (as nitrogen) and monochloramine residuals must all be monitored if the treatment occurs in the distribution system. The monitoring must occur at the same time as a total chlorine compliance sample. • If potable water is redisinfected, the disinfectant residual must not fall below the minimum anywhere, including right before treatment. • The residual of the chemical injected upstream should be determined to properly dose the downstream chemical.

NAP Sample Sites, continued

Distribution System Sample Sites

- **Routine coliform and/or disinfectant residual sites may be used** for NAP sample sites.
- **Sites must represent the distribution system and represent average and high water age.** Small systems may be adequately represented with two or three sites; medium and large systems will need to specify more sites to adequately detect and prevent potential nitrification. The rule does not specify the exact number of sample sites because of the diversity among PWSs.
- It is recommended that '**critical control points**' be selected. In distribution, these may be at interconnections between major mains, storage facilities, pump stations, and interconnections with other PWSs.

Average water age	• As a first estimate, average water age can be estimated from historical data as locations with average total chlorine residual. • Enough average water age sites must be selected to represent multiple pressure planes.
High water age	• High water age may occur at the far reaches of the distribution system, in under-used areas, or as a result of storage. • Sites should represent all pressure planes.

NAP Sample Frequency

Sample Frequency: The rule lists the minimum sampling requirements. It may be necessary for PWSs to perform additional sampling to characterize their distribution system.

	At or after all **Entry Point(s)**	In the **distribution system**	Before and after any **chlorine or ammonia injection points**
Total Chlorine	Weekly.	Daily/weekly.[a]	Weekly and before and after adjusting the chlorine or ammonia feed rate.
Mono-chloramine		At least weekly.[b]	
Free Ammonia			
Nitrite and Nitrate	Monthly for six (6) months, then quarterly.	At least quarterly and in response to action triggers.	Routine sampling not required.

[a] *Total chlorine must be collected weekly or daily, based on the system size, in accordance with §290.110.*

[b] *When collecting a routine sample such as a bacteriological or routine disinfectant residual sample.*

Methods

- The methods used must be accurate enough to measure changes that can indicate nitrification.
- You must document the methods and laboratories for total chlorine on your PWS Laboratory Approval Form (Form # TCEQ-10450) attached to your Monitoring Plan. The methods and/or laboratories used for monochloramine, free ammonia, nitrite and nitrate must be documented in your NAP.

	Required accuracy:	
Total Chlorine	0.1 mg/L	• Total chlorine must be analyzed in the field. • Amperometric titration, DPD ferrous titration, or DPD colorimetric are the required methods. • Check the range of your kit. If a sample is outside range, dilute and reanalyze.
Mono-chloramine	0.15 mg/L	• Monochloramine must be analyzed in the field. • Any method approved for the drinking water matrix is acceptable.
Free Ammonia (as nitrogen)	0.1 mg/L	• Free ammonia must be analyzed in the field. • Ammonia is measured as 'free available ammonia as nitrogen.' • Check the range of your kit. The most common one pegs out at 0.55 mg/L→samples over that level must be diluted and re-analyzed. • Any method approved for the drinking water matrix is acceptable.
Nitrite (as nitrogen)	0.01 mg/L	• Nitrite and nitrate may be analyzed in the field and/or in an accredited or approved lab. • If samples are analyzed at an outside approved lab, keep a copy of that lab's accreditation documents with your NAP.
Nitrate (as nitrogen)	0.1 mg/L	

More information about nitrification can be found at:
www.tceq.texas.gov/drinkingwater/disinfection/nitrification.html

Goals and Baselines

- Goals and baselines are the normal, good levels at each point in the distribution system.
  'Goals' are set for total chlorine, monochloramine, and free ammonia to make sure that disinfection is maintained correctly.
  'Baselines' are set for nitrite and nitrate, because they come from source water, and are less under a system's control.
- Initial results and historical data are used to set goals and baselines.
- Ongoing, routine sampling is used to detect potential nitrification and take appropriate action.

Total chlorine & Mono-chloramine Goals	• **Total chlorine and monochloramine should always be about the same,** so their goals can be set at the same value. • The entry point goal should be high enough so that the maximum water age site can achieve its goal over the minimum of 0.5 mg/L plus a safety factor.
Free ammonia Goal	• Ideally, water at entry points just after treatment would have zero free ammonia residual because free ammonia is 'food' for the nitrifying bacteria. • Having a trace of free ammonia shows that the water is in the monochloramine zone. • Free ammonia naturally increases with time. The free ammonia goals in average and high water age locations should represent good, normal operating conditions.
Nitrite & nitrate Baselines	• The nitrite and nitrate baselines are the concentrations in the source water. • The nitrite and nitrate in the distribution system should always be the same as the source water. • The only thing that can change them is either nitrification, backflow or cross connection, or source water changes.

Triggers: Yellow Flag Alerts, Red Flag Alarms

Yellow flag 'alert' triggers: Yellow flag levels are somewhat out of the norm, indicating that nitrification may have started. Some action to get back to normal is needed--but it is probably a routine type of action like flushing.

Red flag 'alarm' triggers: Red flag levels happen when it becomes difficult to maintain a compliant total chlorine residual, and there is a strong possibility that nitrification is the culprit. If routine actions don't get the system back to normal, more intense action will be needed.

Total chlorine	• Total chlorine is the regulated value, so most systems have more data for total chlorine than any other constituent. Therefore, PWSs should have at least a year of historical weekly or daily data to use for setting triggers. • If a nitrification event has occurred, the exact levels where nitrification took place can be used. Otherwise, yellow and red trigger levels should be estimated.
Mono-chloramine	• Ideally, 100% of the total chlorine should be present as monochloramine. • Systems may have characteristic ratios of monochloramine-to-total, for example: 80% or 90%.
Free ammonia	• Ammonia will decrease during nitrification. If ammonia is not detected, nitrification is the likely cause.
Nitrite	• Nitrite may increase or decrease during nitrification. Therefore, any significant deviation of the nitrite level could indicate nitrification. • During the initial stages of nitrification, nitrite will increase; as nitrification progresses, nitrite will drop as it is converted to nitrate.
Nitrate	• Nitrate increases when nitrification is very bad. • The only possible reasons to for nitrate to increase are (1) Nitrification, (2) Cross-connection, backflow, or backsiphonage of sewage or fertilizer, or (3) Source water contamination. Any of these is a major issue.

Actions	
Note: The TCEQ provides these examples of actions for guidance only. Each PWS that uses chloramines must select actions appropriate to its unique circumstances.	
● **Normal operations:** When disinfection is going well, preventive actions are used to keep it going that way. This is the 'green zone.'	
● **Yellow flag 'alert' actions:** When your nitrification indicators hit yellow flag levels, some action is needed to get back to normal. Often these corrective actions are similar to the preventive actions, like sampling and flushing.	
● **Red flag 'alarm' actions:** When the total chlorine residual drops to low levels, nitrification may have progressed far enough that more extreme measures are needed to get back on track. If not, there may be another problem like cross-connection or treatment failure that needs attention.	
Routine Preventive Actions / Yellow Flag Alert Corrective Actions	
Sample verification	● Before making a decision on what further action to take, it's a good idea to double-check the first measurement. ● It is a good idea to double-check accuracy routinely, to document the variability of the analysis method.
Nitrite/ nitrate sampling	● Nitrite is a key indicator of nitrification. If chloramine-effectiveness measurements are off-spec, nitrite and nitrate sampling is necessary to determine if nitrification is happening. ● Although the rule only requires 6 samples to set baselines, more nitrite and nitrate data will improve your ability to respond to potential nitrification.
Determine affected area	● Nitrification is a biological process, so it can 'bloom' in one portion of the distribution system while other areas remain okay. Determining what area is affected will allow a targeted response to effectively stop the nitrification.
Flushing	● Flushing can bring fresh water with a strong chloramine residual to a location where disinfectant levels are decreasing. However, it is only a short-term solution because of the conservation, economic, and customer relations impacts. ● Every PWS is required to flush every dead-end main (DEM) every month.
Uni-directional flushing	●● Unidirectional flushing (UDF) is a way of organizing flushing to achieve a velocity of 5 feet-per-second (FPS) in the pipe. At 5 fps, suspended sediment is effectively removed. UDF can be used to target a problem area.
Pigging	●● Pigging is the process where a cylindrical 'pig' is forced through a water main with hydraulic pressure, forcing sediment to be scraped off the walls then removed at a flush point. Pigging is best used where the system has been designed with entry and exit points for the pig. Pigging is not considered practical for old, weak pipe.
Storage tank operation	●● Storage is often a cause of increased water age. Optimizing storage tank operations means selecting the best operating levels where there is enough water for use, but not so much that it sits in the tank decaying too long.
Free chlorine conversion	●● Free chlorine conversion is often called a 'burn,' 'shock,' or 'refresh.' When free chlorine is present, it starves nitrifying bacteria. Although a free chlorine conversion is sometimes thought of as an extreme measure, there are numerous PWSs that perform routine, annual free chlorine conversion as a preventive measure. ●● E-mail the TCEQ at *DBP@tceq.texas.gov* 30 days before doing a free chlorine conversion.
Red Flag Alarm Corrective Actions	
Routine actions	●●● The same actions (listed above) that are used for preventive maintenance and yellow-flag correction may be a part of the corrective actions used for red-flag actions.
Free chlorine conversion	● Free chlorine conversion is often used to respond to nitrification. **Contact TCEQ at 512-239-4691 or *DBP@tceq.texas.gov* to discuss scheduling a free chlorine conversion.**

More information about nitrification can be found at:
www.tceq.texas.gov/drinkingwater/disinfection/nitrification.html

Actions, continued	
Seek professional help for engineered modifications	
TCEQ's Plan and Technical Review Section can assist you with questions related to the process of getting approval for engineered solutions at 512-239-4691 or on the web at: www.tceq.texas.gov/drinkingwater/planrev.html	
Looping mains	● If a PWS identifies nitrification due to dead-end mains (DEMs), it may be appropriate to perform infrastructure replacement in the problem area to manage water age. ● Every PWS is required to have a program to minimize stagnation of water due to DEMs.
Tank changes	● Tanks can be a source of major water age. In some cases, a PWS may choose to completely eliminate tanks or replace larger tanks with smaller ones. ● Some PWSs have found mixing to be helpful in eliminating chloramine residual loss due to tank stratification. ● Tanks must always have a compliant disinfectant residual.
Booster disinfection	● If the size and shape of a distribution system are very challenging, the addition of booster chloramination may be appropriate. Usually, both chlorine and ammonia injection should be at the booster station. However, if the water upstream of the booster contains free ammonia, it is possible to inject chlorine to tie up that free ammonia and form monochloramines. In that case, ammonia injection might not be needed.
pH adjustment	● Monochloramine is more stable at a higher pH. Nitrifying organisms grow more rapidly at pH 7.5 than at pH 8. For these reasons, a PWS may choose to adjust pH. If pH adjustment is used, the impact on corrosion control should be considered.
Free chlorine & aeration	● Some groundwater systems with high total organic carbon have used free chlorination followed by aeration to volatilize chloroform to make it possible to meet disinfection byproduct regulations with a free chlorine distribution system residual.
Chlorite feed	● Research shows that the presence of chlorite may slow or stop nitrification from developing. It will not necessarily work to stop nitrification that has already started. Chlorite is a regulated disinfection byproduct of chlorine dioxide. A system considering chlorite feed should be prepared to perform chlorite sampling in distribution.
Other solutions?	*Research continues on nitrification. Some new methods may be snake oil, but others may turn out to be successful. Use professional development opportunities to learn about new technology.*

This is a template for a starting a NAP. It is provided for guidance; a PWS must develop a site-specific NAP and map.

Example: Nitrification Action Plan Template

Chloramine-Effectiveness Sample Suite

Site	Chemical	Goal	Yellow Flag		Red Flag	
			Trigger	Actions	Trigger	Actions
Entry Point	Total / Mono	___ mg/L	___ mg/L		___ mg/L	
	Ammonia	___ mg/L	___ mg/L		___ mg/L	
Average water age	Total / Mono	___ mg/L	___ mg/L		___ mg/L	
	Ammonia	___ mg/L	___ mg/L		___ mg/L	
High water age	Total / Mono	___ mg/L	___ mg/L		___ mg/L	
	Ammonia	___ mg/L	___ mg/L		___ mg/L	

Nitrite/Nitrate

Site	Chemical	Baseline	Yellow Flag		Red Flag	
			Trigger	Actions	Trigger	Actions
Entry Point	Nitrite	___ mg/L	___ mg/L		___ mg/L	
	Nitrate	___ mg/L	___ mg/L		___ mg/L	
Source water(s)	Nitrite	___ mg/L	___ mg/L		___ mg/L	
	Nitrate	___ mg/L	___ mg/L		___ mg/L	
Blended water	Nitrite	___ mg/L	___ mg/L		___ mg/L	
	Nitrate	___ mg/L	___ mg/L		___ mg/L	

APPENDIX B

TCEQ ORDER 2011-1647-PWS-E

PWS_1370035_CO_
20161027_FINAL ORDER

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

AN ORDER
IN REGARD TO THE ENFORCEMENT ACTION
AGAINST SOUTH TEXAS WATER AUTHORITY NOW KNOWN AS SOUTH TEXAS WATER AUTHORITY INDUSTRIAL DEVELOPMENT CORPORATION
TCEQ DOCKET NO. 2011-1647-PWS-E,
SOAH DOCKET NO. 582-12-5353

On November 20, 2013; June 3, 2015; and October 19, 2016, the Texas Commission on Environmental Quality (TCEQ or Commission) considered the Executive Director's First Amended Report and Petition recommending that the Commission enter an order assessing administrative penalties against and requiring corrective action by South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation (STWA). A Proposal for Decision (PFD) and a Supplemental PFD on Remand have been presented by Craig R. Bennett, an Administrative Law Judge (ALJ) with the State Office of Administrative Hearings (SOAH), who conducted hearings concerning the First Amended Report and Petition on March 5-6, 2013, and December 16-17, 2015, in Austin, Texas.

After considering the ALJ's PFD and Supplemental PFD on Remand, the Commission adopts the following Findings of Fact and Conclusions of Law:

I. FINDINGS OF FACT

A. Background

1. STWA was created by the Texas legislature in 1979 as a water conservation and reclamation district designed to provide a wholesale water supply to the cities of Kingsville, Driscoll, Bishop, and Agua Dulce.

2. STWA owns and operates a wholesale water supply system located 1/2 mile west of United States Highway 77 on East County Road 2010 in Kingsville, Kleberg County, Texas.

3. STWA purchases treated water from the City of Corpus Christi and distributes the water to its customers through two pipelines: a 42-inch pipe that runs 28 miles from Corpus Christi (the Main Line), and a 14-inch pipe that splits off the Main Line and runs approximately 16.5 miles (the West Branch).

4. Currently, STWA sells potable water on a wholesale basis to six customers: Nueces Water Supply Corporation; City of Kingsville; Nueces County Water Control and Improvement District No. 5; City of Bishop; City of Driscoll; and City of Agua Dulce. These six customers of STWA then distribute the water to individuals within their communities for human consumption.

5. Each of STWA's six current customers is a public water system, as defined by the Commission's rules.

6. STWA does not currently provide direct water service to any individual, but the water STWA provides is ultimately used by approximately 37,000 individuals, who receive the water on a retail basis from STWA's six customer systems.

7. Until November 2012, STWA also served the LCS Detention Center in addition to the customers identified above. The LCS Detention Center is a private correctional facility that houses individuals. At all times STWA provided service to the LCS Detention Center, the facility had at least 25 individuals who were served directly by STWA.

8. STWA no longer provides service to the LCS Detention Center.

B. Procedural History, Notice, and Jurisdiction

9. On July 19, 2011, the TCEQ investigator Melanie Edwards investigated STWA's facilities and documented the eight violations alleged in this case.

10. On February 8, 2012, the Executive Director (ED) of the TCEQ filed his Preliminary Report and Petition, seeking penalties and corrective action against STWA.

11. On February 13, 2012, STWA filed an answer to the Preliminary Report and Petition and requested a hearing.

12. On March 16, 2012, the ED filed a letter asking the Commission's Chief Clerk to refer this case to SOAH for hearing, and the Chief Clerk referred it to SOAH on March 22, 2012.

13. On March 26, 2012, the Chief Clerk mailed a notice of hearing to STWA, the ED, and the Office of Public Interest Counsel.

14. The notice of hearing contained a statement of the time, place, and nature of the hearing; a statement of the legal authority and jurisdiction under which the hearing was to be held; a reference to the particular sections of the statutes and rules involved; and a short, plain statement of the matters asserted.

15. A preliminary hearing convened before SOAH ALJ Penny Wilkov on April 26, 2012.

16. On September 25, 2012, the ED filed a First Amended Preliminary Report and Petition, which is the current pleading in this case.

17. An initial evidentiary hearing on the merits was conducted on March 5-6, 2013, with ALJ Craig R. Bennett presiding. The ED appeared through attorneys Jennifer Cook and Peipey Tang. STWA appeared through attorneys Mike Willatt and Bill Flickinger. The record initially closed on May 24, 2013, after written closing arguments were filed.

18. In July 2013, the ALJ issued his initial PFD in this case.

19. On November 20, 2013, the Commission considered the initial PFD and continued deliberation of the matter without issuing a final decision to allow the ED to work with STWA to come up with solutions that would allow STWA to comply with the rules in a cost-effective, feasible manner.

20. The TCEQ has a team of engineers, water chemists, and other experts within its Water Supply Division known as the Texas Optimization Program (TOP). The TOP team's responsibilities include training water suppliers to properly treat water and diagnose problems in water supplies.

21. The TOP team studied STWA's system for five weeks in September and October 2014 and prepared a Distribution System Evaluation report that was delivered to STWA in May 2015.

22. The ED subsequently requested that this case be remanded to SOAH for an additional limited evidentiary hearing regarding possible corrective actions.

23. On June 4, 2015, the Commission issued an order remanding the case back to SOAH to take additional evidence related to the cost-effective options for STWA to comply with the Commission's minimum disinfectant residual level requirements.

24. After the matter was remanded to SOAH, the ALJ conducted an additional evidentiary hearing on December 16-17, 2015. The parties submitted additional briefing on the issues, and the record closed on May 20, 2016.

C. The Violations

25. STWA uses chloramine as a disinfectant in its water system.

26. Field tests conducted on STWA's pipeline in 2011 showed chloramine levels below 0.5 mg/L on numerous occasions in 2011. Specifically, the following chloramine levels (expressed in mg/L) were observed at different locations along the pipeline: 0.27, 0.20, 0.28, 0.40, 0.25, 0.31, and 0.21.

27. In 2011, STWA's chemical and microbiological monitoring plan was missing required data, including information on the sampling frequency, the analytical procedures used, and a written description of the methods used to calculate compliance. After the ED's investigation, the monitoring plan was updated to include the missing information.

28. In 2011, STWA failed to have required paperwork showing it was using an approved laboratory for analyzing its samples for the maximum residual disinfectant levels.

29. In 2011, STWA employees were running their own samples to determine compliance with the maximum residual disinfectant levels.

30. In 2011, STWA was sampling six pump stations, five times per week, which would have resulted in a monthly total of approximately 120 samples (*i.e.*, 30 per week); however, STWA had less than 40 samples per month included in its Disinfectant Level Quarterly Operating Reports (DLQORs).

31. STWA was previously granted an exception by the ED to convert from the use of a chlorine disinfectant to a chloramine disinfectant. As part of that exception, the ED required that STWA monitor and record free ammonia levels.

32. In 2011, STWA was not monitoring or recording free ammonia levels as required by the ED's exception.

33. In 2011, STWA's continuous disinfectant residual analyzers were not being calibrated.

34. In 2011, STWA used a sight glass on the 2,500-gallon tank at its Bishop Eastside Pump Station to comply with the TCEQ's requirement that all pressure tanks with a capacity

greater than 1,000 gallons must be fitted with a device to readily determine the air-water-volume.

35. In 2011, the sight glass on the 2,500-gallon tank at STWA's Bishop Eastside Pump Station was inoperable.

36. In 2011, STWA was monitoring the chloramine disinfectant residual after booster disinfection at pump stations, which did not provide a representative sample of the disinfectant residual throughout the 42-inch pipe from the water treatment plant to the City of Kingsville's pump station.

37. When samples were collected in 2011 from locations prior to STWA's booster locations, these samples reflected disinfectant levels below the required minimum residual level.

D. STWA's System

38. The average water age in STWA's Main Line over the 4-year time period studied by the TOP team was approximately 20 days. If the 5-month period during which Kingsville took no water was excluded, the average dropped to 10 days. However, while the "averages" were low, there were periods and locations where the water age was more than 150 days when Kingsville was not taking water for an extended period of time.

39. STWA does not sample the water in its system at any point along the Main Line after it accepts it from the City of Corpus Christi. Rather, it simply boosts the water with disinfectant at the Driscoll Booster Station and then again at chloramine boosting stations at the customer delivery points.

40. STWA is not able to properly manage the water chemistry in its system because it does not have enough representative sampling points so that it can make water chemistry adjustments as needed throughout the system.

41. STWA's system needs to be sampled at more points so that tailored boosting can occur, based upon the actual water chemistry.

42. Currently, STWA lacks the ability to add ammonia to the Main Line at the Driscoll Booster Station.

43. Ammonia boosting capabilities at the Driscoll Booster Station would allow STWA to better maintain a compliant minimum disinfectant level as the water travels the rest of the way through the pipe to the City of Kingsville and other users.

44. The cost to add ammonia boosting facilities at the Driscoll Booster Station is estimated at between $100,000 and $150,000.

II. CONCLUSIONS OF LAW

A. Procedural History, Notice, and Jurisdiction

1. The Commission has jurisdiction in this case pursuant to Texas Water Code chapter 7 and Texas Health & Safety Code chapter 341.

2. Under Texas Health and Safety Code § 341.049, the Commission may assess an administrative penalty against any person who violates chapter 341, subchapter C of the Texas Health and Safety Code, or of any rule or order adopted or issued thereunder.

3. Under Texas Health and Safety Code § 341.049, the penalty may not exceed $1,000 per violation, per day, for each of the violations at issue in this case.

4. In determining the administrative penalty, Texas Health and Safety Code § 341.049 requires the Commission to consider several factors, and the Commission's Penalty Policy implements those factors.

5. SOAH has jurisdiction over matters related to the hearing in this case, including the authority to issue a PFD with findings of fact and conclusions of law. Tex. Gov't Code ch. 2003.

6. The ED has the burden of proof in this case by a preponderance of the evidence. 30 Tex. Admin. Code § 80.17(d).

7. STWA was notified of the First Amended Report and Petition and of the opportunity to request a hearing on the alleged violations, penalties, and corrective actions proposed therein. 30 Tex. Admin. Code §§ 1.11 and 70.104.

8. STWA was adequately notified of the hearing on the alleged violations and the proposed penalties and corrective actions. Tex. Gov't Code §§ 2001.051(1) and 2001.052; 1 Tex. Admin. Code § 155.401; and 30 Tex. Admin. Code §§ 1.11, 1.12, 39.25, 70.104, and 80.6(b)(3).

B. STWA's Status as a Public Water System

9. STWA is a public water system. 30 Tex. Admin. Code § 290.38(66).

C. The Violations

10. The TCEQ's rules require the residual disinfectant concentration of the water within a public water system's distribution system to be at least 0.5 mg/L of chloramine (if chloramine is used instead of free chlorine). 30 Tex. Admin. Code §§ 290.110(b)(4) and 290.46(d)(2)(B).

11. In 2011, STWA violated 30 Texas Administrative Code §§ 290.110(b)(4) and 290.46(d)(2)(B) because it failed to maintain minimum chloramine levels throughout the system.

12. The TCEQ's rules require that all public water systems maintain an up-to-date chemical and microbiological monitoring plan. 30 Tex. Admin. Code § 290.121.

13. In 2011, STWA violated 30 Texas Administrative Code § 290.121 because its monitoring plan data was missing some of the required information.

14. The TCEQ's rules require that an approved laboratory be used to analyze samples to determine compliance with maximum residual disinfectant levels. 30 Tex. Admin. Code § 290.119(a)(2)(D).

15. In 2011, STWA violated 30 Texas Administrative Code § 290.119(a)(2)(D) by failing to use an approved laboratory to analyze samples to determine compliance with maximum residual disinfectant levels.

16. The TCEQ's rules require that public water systems submit DLQORs showing samples taken to demonstrate compliance with the TCEQ's disinfectant level requirements, and that all samples taken must be included in the analysis. 30 Tex. Admin. Code § 290.110(f)(1).

17. In 2011, STWA violated 30 Texas Administrative Code § 290.110(f)(1) by failing to include all samples in its compliance analysis.

18. The TCEQ's rules allow the ED to grant exceptions to certain requirements of the Commission's rules provided that the water system complies with all requirements imposed by the ED in the exception. 30 Tex. Admin. Code § 290.39(l).

19. In 2011, STWA violated 30 Texas Administrative Code § 290.39(l) by failing to comply with a requirement of the ED to monitor and record free ammonia levels as a condition of the exception granted to STWA to convert from the use of a chlorine disinfectant to a chloramine disinfectant.

20. The TCEQ's rules require that continuous disinfectant residual analyzers be calibrated every 90 days using chlorine solutions of known concentrations. 30 Tex. Admin. Code § 290.46(s)(2)(C)(i).

21. In 2011, STWA violated 30 Texas Administrative Code § 290.46(s)(2)(C)(i) by failing to calibrate its continuous disinfectant residual analyzers every 90 days.

22. The TCEQ's rules require that all pressure tanks with a capacity greater than 1,000 gallons must be fitted with a device to readily determine the air-water-volume. 30 Tex. Admin. Code § 290.43(d)(3).

23. In 2011, STWA violated 30 Texas Administrative Code § 290.43(d)(3) by failing to have an operable device on its 2,500-gallon storage tank at the Bishop Eastside Pump Station that could readily determine the air-water-volume.

24. The TCEQ's rules require that public water systems monitor the disinfectant residual at various representative locations throughout the distribution system. 30 Tex. Admin. Code § 290.110(c)(4).

25. In 2011, STWA violated 30 Texas Administrative Code § 290.110(c)(4) because it was not monitoring the disinfectant residual levels at representative locations throughout its distribution system.

26. The penalty that the ED proposes for STWA's violations considered in this case conform to the requirements of the Texas Health and Safety Code § 341.049 and the Commission's Penalty Policy.

27. STWA should be assessed a total administrative penalty of $2,443 for the violations considered in this case.

28. STWA should be required to take corrective actions to bring its water system into compliance with all applicable water quality rules, including the minimum disinfectant residual requirements of the TCEQ's rules.

III. EXPLANATION OF CHANGES

The Commission amended the ALJ's Proposed Order by making the corrections recommended by the Executive Director in his Exceptions filed on July 20, 2016. By letter dated September 30, 2016, the ALJ agreed that the Executive Director's corrections were appropriate. The Commission also determined to amend the ALJ's Proposed Order by adding an ordering provision, as requested by STWA in its Reply to Exceptions filed on August 1, 2016, that gives the ED authority to grant extensions of deadlines in the Final Order. The provision provides that the Executive Director may grant an extension of any deadline in this Order or in any plan, report, or other document submitted pursuant to this Order, upon a written and substantiated showing of good cause, and that the determination of what constitutes good cause rests solely with the Executive Director. The Commission also revised the ALJ's Proposed Order to include the words, "now known as South Texas Water Authority Industrial Development Corporation" as appropriate within the Order to reflect STWA's name and identification.

IV. ORDERING PROVISIONS

NOW, THEREFORE, BE IT ORDERED BY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY, IN ACCORDANCE WITH THESE FINDINGS OF FACT AND CONCLUSIONS OF LAW, THAT:

1. Within 30 days after the effective date of this Commission Order, South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation shall pay an administrative penalty in the amount of $2,443 for its violations of the Commission's rules as noted above and considered in this case.

2. Checks rendered to pay penalties imposed by this Order shall be made out to "TCEQ." Administrative penalty payments shall be sent with the notation "Re: South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation, TCEQ Docket No. 2011-1647-PWS-E" to:

   Financial Administration Division, Revenues Section
   Attention: Cashier's Office, MC 214
   Texas Commission on Environmental Quality
   P.O. Box 13088
   Austin, Texas 78711-3088

3. The payment of the administrative penalty listed herein and South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation's compliance with all the terms and conditions set forth in this Order will completely resolve the past violations set forth by this Order. However, the Commission shall not be constrained in any manner from requiring corrective actions or penalties for other violations that are not raised here.

4. The Executive Director may refer this matter to the Office of the Attorney General of the State of Texas for further enforcement proceedings without notice to South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation if the Executive Director determines that South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation has not complied with one or more of the terms or conditions in this Order.

5. Immediately upon the effective date of this Commission Order, South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation shall:

   a. Begin providing access to the Facility to allow entry to employees and agents of the TCEQ for the purpose of inspecting and investigating conditions related to the Facility, in accordance with 30 Texas Administrative Code § 290.46(a); and

   b. Respond completely and adequately, as determined by the Executive Director, to all requests for information regarding these Ordering Provisions within 15 days

after the date of such request or otherwise specified in writing by the Executive Director, provided that no other applicable response deadline is set out elsewhere in this Commission Order.

6. Within 30 days after the effective date of the Commission Order, South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation shall:

   a. Check the accuracy of the continuous disinfectant analyzers using chlorine solutions of known concentrations or by comparing the results from the on-line analyzer with the results of an approved benchtop method at least once every seven (7) days and properly verify the analyzers used to determine the effectiveness of chloramination every ninety (90) days, in accordance with 30 Texas Administrative Code § 290.46(s)(2);

   b. Locate, uncover, mark, document, and create a complete inventory of all existing sampling points, valves, and mains on all water lines, including the west branch, in accordance with 30 Texas Administrative Code § 290.46(n); and

   c. Submit an up-to-date map of the Facility and as-built drawings of the chloramination facilities, in accordance with 30 Texas Administrative Code § 290.46(n).

7. Within 45 days after the effective date of the Commission Order, South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation shall:

   a. Submit written certification in accordance with Ordering Provision No. 11 below, to demonstrate compliance with Ordering Provision No. 6.a.;

   b. Submit an updated monitoring plan for the system, including an updated sampling plan, in accordance with 30 Texas Administrative Code § 290.121. The monitoring plan shall include the complete inventory created pursuant to Ordering Provision No. 6.b. above, including documentation showing the location of all existing sampling points, valves, and mains on all water lines, including the west branch; and

   c. Submit a Nitrification Action Plan ("NAP"), in accordance with 30 Texas Administrative Code § 290.46(z), as well as Standard Operating Procedures for implementing the NAP and ensuring the sampling and monitoring plans referenced in Ordering Provision No. 7.b. are properly implemented.

8. Within 90 days after the effective date of this Commission Order, South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation shall:

a. Submit a progress report for the preceding 90-day period, and for each quarter thereafter, which shall include the following:

i. A brief summary of all actions taken and the results thereof during the preceding 90-day period, including implementation of the most recent monitoring plan and efforts made to maintain compliance with disinfectant residual levels; and
ii. All sampling data gathered during the preceding 90-day period.

All quarterly progress reports shall be submitted to the TCEQ no later than the fifteenth (15) day after the end of each quarter. South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation shall continue to submit quarterly progress reports to the TCEQ until it can demonstrate at least 12 consecutive months of compliance with the disinfectant residual requirements.

b. Submit documentation demonstrating the installation of any additional sampling taps and valves, in accordance with 30 Texas Administrative Code § 290.39;

c. Submit an updated monitoring plan, including an updated sampling plan, reflecting the installation of any additional sampling taps and valves, in accordance with 30 Texas Administrative Code § 290.121;

d. Submit for approval all plans and specifications to add ammonia boosting capabilities at the Driscoll Booster Station, in accordance with 30 Texas Administrative Code § 290.39. The plans and specifications shall be submitted to:

Plan Review Team, MC 159
Water Supply Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

e. Submit, to the address listed in Ordering Provision No. 8.d. above, engineering plans, specifications, maps, and other pertinent information for proposed additional sampling points and valves, including the west branch, pursuant to 30 Texas Administrative Code § 290.46(n); and

f. Submit, to the address listed in Ordering Provision No. 8.d. above, a detailed engineering report that describes the strategies and facilities Respondent intends to employ to comply with the disinfectant residual requirement.

9. Within 180 days after the effective date of this Commission Order, South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation shall:

a. Submit documentation demonstrating the installation of ammonia boosting capabilities at the Driscoll Booster Station, in accordance with 30 Texas Administrative Code §§ 290.39 and 290.110; and

b. Submit an updated monitoring plan, including an updated sampling plan, reflecting the installation of ammonia boosting capabilities at the Driscoll Booster Station, in accordance with 30 Texas Administrative Code § 290.121.

10. Within 730 days after the effective date of this Commission Order, South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation shall submit documentation demonstrating at least 12 consecutive months of compliance with the disinfectant residual requirements, in accordance with 30 Texas Administrative Code §§ 290.110 and 290.46.

11. All documents, reports, plans and other correspondence and information required to be submitted under these Ordering Provisions shall be accompanied by detailed supporting documentation, including photographs, receipts, and/ or other records, shall be signed by Respondent, and shall include the following certification language:

> "I certify under penalty of law that I have personally examined and am familiar with the information submitted and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Unless otherwise indicated, all documents, reports, plans, correspondence, information, supporting documents and certifications shall be submitted to:

Water Supply Division, MC 154
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

and:

Order Compliance Team
Texas Commission on Environmental Quality
Enforcement Division, MC 149A
P.O. Box 13087
Austin, Texas 78711-3087

12. The Executive Director may grant an extension of any deadline in this Order or in any plan, report, or other document submitted pursuant to this Order, upon a written and substantiated showing of good cause. All requests for extensions by Respondent shall be

made in writing to the Executive Director. Extensions are not effective until Respondent receives written approval from the Executive Director. The determination of what constitutes good cause rests solely with the Executive Director. Extension requests shall be sent to the Order Compliance Team at the address listed above.

13. All other motions, requests for entry of specific findings of fact or conclusions of law, and any other requests for general or specific relief, if not expressly granted herein, are hereby denied.

14. The effective date of this Order is the date the Order is final. Tex. Gov't Code §2001.144 and 30 Tex. Admin. Code §80.273.

15. The Commission's Chief Clerk shall forward a copy of this Order to South Texas Water Authority now known as South Texas Water Authority Industrial Development Corporation.

16. If any provision, sentence, clause, or phrase of this Order is for any reason held to be invalid, the invalidity of any provision shall not affect the validity of the remaining portions of this Order.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Bryan W Shaw

Bryan W Shaw, Ph.D., P.E., Chairman

October 26, 2016

Date Signed

APPENDIX C

SOP COLORIMETER CALIBRATION

South Texas Water Authority
Standard Operating Procedures (SOP) – Monthly Checks of Colorimeters

Scope and Application - This SOP will outline the steps and materials needed to perform monthly calibration checks of Pocket Colorimeters. These checks ensure all instruments are performing correctly.

Required Materials/Equipment:

- Hach Pocket Colorimeter II
- Deionized (DI) Water
- Four (4) 10 ml glass sample cells
- 1000 µl pipette with tips
- 10 ml pipette with tips
- Lab Notebook
- Three (3) 100 ml volumetric flasks
- Three (3) 50-75 mg/l Chlorine Solution Ampule (10 ml volume)
- DPD Total Chlorine Reagent Powder Pillow, 25 ml

Step 1 - Mix Standards - Make chlorine standards using the following steps:

a. Determine the Expected Standard Concentration by checking the chlorine ampule packaging for the concentration of the Stock Solution. It will read "Free Chlorine at time of fill: *"Ave* _ ± _ mg/l." The first number is your Stock Standard Concentration.
b. To make Standard 1, pipette 0.3 ml of standard into a 100 ml volumetric flask labeled "Std 1." Using DI water, bring up to the 100 ml mark, place stopper and invert to mix.
c. Calculate the Expected Standard Concentration in mg/l by multiplying the Stock Standard Concentration by standard volume and dividing by total volume ((Stock Standard Concentration x 0.3)/100)
d. To make Standard 2, pipette 1.4 ml of standard into 100 ml volumetric flask labeled "Std 2." Using DI water, bring up to the 100 ml mark, place stopper and invert to mix.
e. Calculate the Expected Standard Concentration in mg/l by multiplying the Stock Standard Concentration by standard volume and dividing by total volume ((Stock Standard Concentration x 1.4)/100)
f. To make Standard 3, pipette 2.5 ml of standard into 100 ml volumetric flask labeled "Std 3." Using DI water, bring up to the 100 ml mark, place stopper and invert to mix.
g. Calculate the Expected Standard Concentration in mg/l by multiplying the Stock Standard Concentration by standard volume and dividing by total volume ((Stock Standard Concentration x 2.5)/100)

Step 2 – Pocket Colorimeter II – Check Instrument

a) Power on colorimeter.
b) Pipette 10 ml of standard 1 into a 10 ml glass sample cell with the cap marked "1"
c) Pipette 10 ml of standard 2 into a 10 ml glass sample cell with the cap marked "2"
d) Pipette 10 ml of standard 3 into a 10 ml glass sample cell with the cap marked "3"
e) Add 1 DPD packet to cells 1, 2, & 3, place stoppers, invert to mix and allow a 1- minute reaction time for free chlorine; if testing for total chlorine allow a 3- minute reaction time.
f) While standards are processing, fill a 10 ml glass sample cell with DI water and use as a blank and manually zero out all instruments being checked.
g) Once the reaction time is complete (1 minute for free chlorine or 3-minute reaction time for total chlorine), read results of the standards 1, 2 and 3 in all colorimeters.
h) Log each result into Lab Notebook.

Step 3 – Calculate Percent Recovery for each result. Use the following calculations:

a. Percentage (%) = (Observed Standard Concentration/Expected Standard Concentration) x 100
b. Percent Recovery must fall between eighty percent (80%) and one-hundred and twenty percent (120%) of the calculated Expected Standard (the value) to pass.
c. If any instrument does not pass, recalibrate and repeat steps b through h. An instrument is considered as a "not pass" if any one (1) of the three (3) results is not between the 80% - 120% range. If an instrument is a "not pass" after repeating Step 2 b through h (second check), the instrument will be sent to manufacturer for repair, if possible, or replaced.

Step 4 – Once all colorimeters pass checks, record in lab notebook.

APPENDIX D

STWA WATER QUALITY DATA SAMPLING FORMS

SOUTH TEXAS WATER AUTHORITY DAILY DISINFECTANT RESIDUAL WORKSHEET

PWS # 1370035

Month: ____________ Year: ____________

Date	Weekday	Site	Total Chloramines
	Monday	A. Dulce PS MR Spigot - prior to injection	
	Tuesday	Sablatura Park MR PS Spigot - prior to injection	
	Wednesday	Banquete PS MR Spigot - prior to injection	
	Thursday	Driscoll PS MR Spigot - prior to injection	
	Friday	Bishop East PS MR Spigot - prior to injection	
	Saturday	Bishop West PS MR Spigot - prior to injection	
	Sunday	Kingsville PS MR Spigot - prior to injection	
	Monday	A. Dulce PS MR Spigot - prior to injection	
	Tuesday	Sablatura Park MR PS Spigot - prior to injection	
	Wednesday	Banquete PS MR Spigot - prior to injection	
	Thursday	Driscoll PS MR Spigot - prior to injection	
	Friday	Bishop East PS MR Spigot - prior to injection	
	Saturday	Bishop West PS MR Spigot - prior to injection	
	Sunday	Kingsville PS MR Spigot - prior to injection	
	Monday	A. Dulce PS MR Spigot - prior to injection	
	Tuesday	Sablatura Park MR PS Spigot - prior to injection	
	Wednesday	Banquete PS MR Spigot - prior to injection	
	Thursday	Driscoll PS MR Spigot - prior to injection	
	Friday	Bishop East PS MR Spigot - prior to injection	
	Saturday	Bishop West PS MR Spigot - prior to injection	
	Sunday	Kingsville PS MR Spigot - prior to injection	
	Monday	A. Dulce PS MR Spigot - prior to injection	
	Tuesday	Sablatura Park MR PS Spigot - prior to injection	
	Wednesday	Banquete PS MR Spigot - prior to injection	
	Thursday	Driscoll PS MR Spigot - prior to injection	
	Friday	Bishop East PS MR Spigot - prior to injection	
	Saturday	Bishop West PS MR Spigot - prior to injection	
	Sunday	Kingsville PS MR Spigot - prior to injection	
	Monday	A. Dulce PS MR Spigot - prior to injection	
	Tuesday	Sablatura Park MR PS Spigot - prior to injection	
	Wednesday	Banquete PS MR Spigot - prior to injection	
	Thursday	Driscoll PS MR Spigot - prior to injection	
	Friday	Bishop East PS MR Spigot - prior to injection	
	Saturday	Bishop West PS MR Spigot - prior to injection	
	Sunday	Kingsville PS MR Spigot - prior to injection	
	Monday	A. Dulce PS MR Spigot - prior to injection	
	Tuesday	Sablatura Park MR PS Spigot - prior to injection	

SOUTH TEXAS WATER AUTHORITY WEEKLY NAP FORM

Date:

		Goal/Baseline	3.5		3.5	0.2			
		Yellow	3.0		3.0	0.1,0.3			
		Red	2.5		2.5	<0.1 or >0.5			
ENTRY			Total	Free	Mono	FAA	Nitrite	Nitrate	Action
A - STEVENS - MR	NR								

		Goal/Baseline	2.5		2.5	0.2			
		Yellow	1.5		1.5	0.1, 0.3			
		Red	1.0		1.0	>0.5			
SPURLINE - WEST BRANCH	R/NR		Total	Free	Mono	FAA	Nitrite	Nitrate	Action
B1 - CENTRAL - BEFORE	NR								
C1 - BANQUETE - BEFORE	R								
D1 - SABLATURA PARK - BEFORE	R								
E1 - AGUA DULCE - BEFORE	R								

		Goal/Baseline	2.0		2.0	0.2			
		Yellow	1.5		1.5	0.1, 0.3			
		Red	1.0		1.0	>0.5			
MAIN LINE - 42" LINE			Total	Free	Mono	FAA	Nitrite	Nitrate	Action
F1 - DRISCOLL - BEFORE	R								
G1 - DRISCOLL BOOSTER - BEFORE	NR								

		Goal/Baseline	2.5		2.5	0.3			
		Yellow	1.5		1.5	0.15, 0.45			
		Red	1.0		1.0	<0.1, >0.5			
			Total	Free	Mono	FAA	Nitrite	Nitrate	Action
H1 - BISHOP EAST - BEFORE	R								

		Goal/Baseline	2.5		2.5	0.2			
		Yellow	1.5		1.5	0.1, 0.3			
		Red	1.0		1.0	>0.5			
			Total	Free	Mono	FAA	Nitrite	Nitrate	Action
I1 - KINGSVILLE - BYPASS - BEFORE	R								

		Goal/Baseline	3.0		3.0	0.2			
		Yellow	2.5		2.5	0.1, 0.3			
		Red	2.0		2.0	>0.5			
			Total	Free	Mono	FAA	Nitrite	Nitrate	Action
B2 - CENTRAL - AFTER	NR								
C2 - BANQUETE - AFTER	R								
D2 - SABLATURA PARK - AFTER	R								
E2 - AGUA DULCE - AFTER	R								
F2 - DRISCOLL - AFTER	R								
G2 - DRISCOLL BOOSTER - AFTER	NR								
H2 - BISHOP EAST- AFTER	R								
I2 - KINGSVILLE - BYPASS - AFTER	R								

		Total	Free	Mono	FAA	Nitrite	Nitrate	Action
BISHOP WEST - BEFORE	R							
BISHOP WEST- AFTER	R							
CENTRAL - WEST - MR	NR							

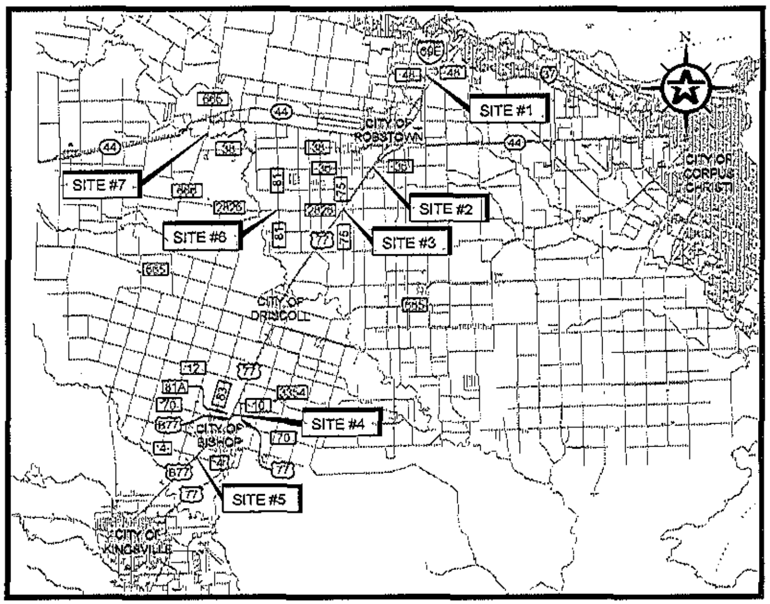
DRAFTED 09282017

DRAWINGS

for

SOUTH TEXAS WATER AUTHORITY

SAMPLE TAPS



GRAPHIC SCALE IN FEET

INDEX OF DRAWINGS

GPS COORDINATES TABLE

SITE	NAME	LATITUDE	LONGITUDE
1	CR 48 ARV	[illegible]	[illegible]
2	CR 36 & HWY 77	[illegible]	[illegible]
3	CR 75 & HWY 77	[illegible]	[illegible]
4	LOPEZ ARV	[illegible]	[illegible]
5	CR 4 ARV	[illegible]	[illegible]
6	NSWC GEO TAP	[illegible]	[illegible]
7	FM 666	[illegible]	[illegible]

3-00652 - SOUTH TEXAS- SAMPLE TAPS

Walker Partners
engineers ★ surveyors

PRELIMINARY
FOR REVIEW ONLY

T.B.P.E. REGISTRATION NO. [illegible]

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF PROFESSIONAL ENGINEER ERIC L. NELSON [illegible] ON THE DATE SHOWN ON THE DATE STAMP. IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.

GENERAL CONSTRUCTION NOTES:

1. THIS WATER DISTRIBUTION SYSTEM MUST BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS 30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 290 SUBCHAPTER D. WHEN CONFLICTS ARE NOTED WITH LOCAL STANDARDS, THE MORE STRINGENT REQUIREMENT SHALL BE APPLIED. CONSTRUCTION FOR PUBLIC WATER SYSTEMS MUST ALWAYS, AT A MINIMUM, MEET TCEQ'S "RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS.

2. AN APPOINTED ENGINEER SHALL NOTIFY IN WRITING THE LOCAL TCEQ'S REGIONAL OFFICE WHEN CONSTRUCTION WILL START. PLEASE KEEP IN MIND THAT UPON COMPLETION OF THE WATER WORKS PROJECT, THE ENGINEER OR OWNER SHALL NOTIFY THE COMMISSION'S WATER SUPPLY DIVISION, IN WRITING, AS TO ITS COMPLETION AND ATTEST TO THE FACT THAT THE WORK HAS BEEN COMPLETED ESSENTIALLY ACCORDING TO THE PLANS AND CHANGE ORDERS ON FILE WITH THE COMMISSION AS REQUIRED IN 30 TAC §290.39(H)(3).

3. ALL NEWLY INSTALLED PIPES AND RELATED PRODUCTS MUST CONFORM TO AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)/NSF INTERNATIONAL STANDARD 61 AND MUST BE CERTIFIED BY AN ORGANIZATION ACCREDITED BY ANSI, AS REQUIRED BY 30 TAC §290.44(A)(1).

4. PLASTIC PIPE FOR USE IN PUBLIC WATER SYSTEMS MUST BEAR THE NSF INTERNATIONAL SEAL OF APPROVAL (NSF-PW) AND HAVE AN ASTM DESIGN PRESSURE RATING OF AT LEAST 150 PSI OR A STANDARD DIMENSION RATIO OF 26 OR LESS, AS REQUIRED BY 30 TAC §290.44(A)(2).

5. NO PIPE WHICH HAS BEEN USED FOR ANY PURPOSE OTHER THAN THE CONVEYANCE OF DRINKING WATER SHALL BE ACCEPTED OR RELOCATED FOR USE IN ANY PUBLIC DRINKING WATER SUPPLY, AS REQUIRED BY 30 TAC §290.44(A)(3).

6. WATER TRANSMISSION AND DISTRIBUTION LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. HOWEVER, THE TOP OF THE WATER LINE MUST BE LOCATED BELOW THE FROST LINE AND IN NO CASE SHALL THE TOP OF THE WATER LINE BE LESS THAN 24 INCHES BELOW GROUND SURFACE, AS REQUIRED BY 30 TAC §290.44(A)(4).

7. THE MAXIMUM ALLOWABLE LEAD CONTENT OF PIPES, PIPE FITTINGS, PLUMBING FITTINGS, AND FIXTURES TO 0.25 PERCENT.

8. THE CONTRACTOR SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE IN ALL DIRECTIONS OF NINE FEET BETWEEN THE PROPOSED WATERLINE AND WASTEWATER COLLECTION FACILITIES INCLUDING MANHOLES AND SEPTIC TANK DRAINFIELDS. IF THIS DISTANCE CANNOT BE MAINTAINED, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE PROJECT ENGINEER FOR FURTHER DIRECTION. SEPARATION DISTANCES, INSTALLATION METHODS, AND MATERIALS UTILIZED MUST MEET 30 TAC §290.44(E)(1-4) OF THE CURRENT RULES.

9. PURSUANT TO 30 TAC §290.44(E)(5), THE SEPARATION DISTANCE FROM A POTABLE WATERLINE TO A WASTEWATER MAIN OR LATERAL MANHOLE OR CLEANOUT SHALL BE A MINIMUM OF NINE FEET. WHERE THE NINE-FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE POTABLE WATERLINE SHALL BE ENCASED IN A JOINT OF AT LEAST 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THAN THE NEW CONVEYANCE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE-FOOT INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. THE ENCASEMENT PIPE SHALL BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR MANUFACTURED SEALANT.

10. PURSUANT TO 30 TAC §290.44(E)(6), FIRE HYDRANTS SHALL NOT BE INSTALLED WITHIN NINE FEET VERTICALLY OR HORIZONTALLY OF ANY WASTEWATER LINE, WASTEWATER LATERAL, OR WASTEWATER SERVICE LINE REGARDLESS OF CONSTRUCTION.

11. PURSUANT TO 30 TAC §290.44(E)(8), WATERLINES SHALL NOT BE INSTALLED CLOSER THAN TEN FEET TO SEPTIC TANK DRAINFIELDS.

12. PURSUANT TO 30 TAC §290.44(F)(1), THE CONTRACTOR SHALL NOT PLACE THE PIPE IN WATER OR WHERE IT CAN BE FLOODED WITH WATER OR SEWAGE DURING ITS STORAGE OR INSTALLATION.

13. THE CONTRACTOR SHALL DISINFECT THE NEW WATER MAINS IN ACCORDANCE WITH AWWA STANDARD C-651 AND THEN FLUSH AND SAMPLE THE LINES BEFORE BEING PLACED INTO SERVICE. SAMPLES SHALL BE COLLECTED FOR MICROBIOLOGICAL ANALYSIS TO CHECK THE EFFECTIVENESS OF THE DISINFECTION PROCEDURE WHICH SHALL BE REPEATED IF CONTAMINATION PERSISTS. A MINIMUM OF ONE SAMPLE FOR EACH 1,000 FEET OF COMPLETED WATER LINE WILL BE REQUIRED OR AT THE NEXT AVAILABLE SAMPLING POINT BEYOND 1,000 FEET AS DESIGNATED BY THE DESIGN ENGINEER, IN ACCORDANCE WITH 30 TAC §290.44(F)(3).

14. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE TESTED UPON INSTALLATION BY A LICENSED BACKFLOW PREVENTION ASSEMBLY TESTER AND CERTIFIED TO BE OPERATING WITHIN SPECIFICATIONS. BACKFLOW PREVENTION ASSEMBLIES WHICH ARE INSTALLED TO PROVIDE PROTECTION AGAINST HEALTH HAZARDS MUST ALSO BE TESTED AND CERTIFIED TO BE OPERATING WITHIN SPECIFICATIONS AT LEAST ANNUALLY BY A LICENSED BACKFLOW PREVENTION ASSEMBLY TESTER.

15. BACKFLOW PREVENTION ASSEMBLY TESTERS SHALL HAVE COMPLETED A TCEQ EXECUTIVE DIRECTOR-APPROVED COURSE ON CROSS-CONNECTION CONTROL AND BACKFLOW PREVENTION ASSEMBLY TESTING, PASS AN EXAMINATION ADMINISTERED BY THE TCEQ EXECUTIVE DIRECTOR, AND HOLD A CURRENT LICENSE AS A BACKFLOW PREVENTION ASSEMBLY TESTER.

16. GAUGES USED IN THE TESTING OF BACKFLOW PREVENTION ASSEMBLIES SHALL BE TESTED FOR ACCURACY ANNUALLY IN ACCORDANCE WITH THE UNIVERSITY OF SOUTHERN CALIFORNIA'S MANUAL OF CROSS-CONNECTION CONTROL OR THE AWWA'S RECOMMENDED PRACTICE FOR BACKFLOW PREVENTION AND CROSS-CONNECTION CONTROL (AWWA MANUAL M14). TESTERS SHALL INCLUDE TEST GAUGE SERIAL NUMBERS ON THE BACKFLOW PREVENTION ASSEMBLY TEST AND MAINTENANCE REPORT (COMMISSION FORM 20700) AND PROVIDE DOCUMENTATION OF GAUGE TESTING FREQUENCY.

17. A TEST REPORT MUST BE COMPLETED BY THE RECOGNIZED BACKFLOW PREVENTION ASSEMBLY TESTER FOR EACH ASSEMBLY TESTED. THE SIGNED AND DATED ORIGINAL MUST BE SUBMITTED TO THE OWNER FOR RECORDKEEPING PURPOSES. ANY FORM WHICH VARIES FROM THE FORMAT SPECIFIED IN COMMISSION FORM 20700 MUST BE APPROVED BY THE TCEQ EXECUTIVE DIRECTOR PRIOR TO BEING PLACED IN USE.

ITEM NO. 3000 HANDLING ASBESTOS CEMENT PIPE

3000.1 INTRODUCTION

THIS ITEM SHALL GOVERN THE UNCOVERING, DISLODGING, HANDLING, REMOVING, TRANSPORTING, AND DISPOSING OF ASBESTOS CEMENT (AC) PIPE AND OTHER ASBESTOS CONTAINING MATERIALS (ACM). AC PIPE IS ALSO KNOWN AS TRANSITE PIPE. AC PIPE TYPICALLY CONTAINS FROM 15% TO 20% CHRYSOTILE AND CROCIDOLITE ASBESTOS AND IS CONSIDERED TO BE AN ASBESTOS-CONTAINING MATERIAL. THE DISTURBANCE AND/OR REMOVAL OF THIS MATERIAL IS GOVERNED BY THE NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP) 40 CODE OF FEDERAL REGULATIONS (CFR) 61; BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) 29 CFR 1926.1101; THE STATE OF TEXAS OCCUPATION CODE, CHAPTER 1954 AND HEALTH AND SAFETY CODE CHAPTERS 361 AND 363; AND THE TEXAS ADMINISTRATIVE CODE (TAC), 25 TAC CHAPTER 295 AND 30 TAC CHAPTER 330.3 AND 330.171. THE MATERIAL IS CLASSIFIED BY DEFINITION UNDER 40 CFR 61, SUBPART M, SECTION 61.141 AS CATEGORY II, NON-FRIABLE ACM, UNLESS, WHEN DRY, IT CAN BE CRUMBLED, PULVERIZED, OR REDUCED TO POWDER BY HAND PRESSURE. AT THAT TIME, IT BECOMES CLASSIFIED AS REGULATED ACM (RACM) AND SUBJECT TO REGULATION UNDER SUBPART M. IT IS THE INTENT OF THIS SPECIFICATION TO DEFINE PROCEDURES THAT MAINTAIN THE AC PIPE IN AN INTACT STATE. PROCEDURES SHALL NOT BE USED THAT SUBJECT THE AC PIPE TO FORCES THAT WILL CRUMBLE, PULVERIZE, OR REDUCE TO POWDER THE AC PIPE. BY USING PROCEDURES THAT HAVE A LOW TO NO PROBABILITY OF FIBER RELEASE, THE PIPE RETAINS ITS CLASSIFICATION AS CATEGORY II, NON-FRIABLE ACM. THESE PROCEDURES WILL PROTECT WORKERS FROM THE HEALTH RISK ASSOCIATED WITH AIRBORNE ASBESTOS.

3000.2 APPLICABLE STANDARDS AND GUIDELINES

ALL WORK UNDER THESE SPECIFICATIONS SHALL BE DONE IN STRICT ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS, STANDARDS, AND CODES GOVERNING ASBESTOS DISTURBANCE, HANDLING, REMOVAL AND DISPOSAL. THE MOST RECENT EDITION OF ANY RELEVANT REGULATION, STANDARD, OR CODE SHALL BE IN EFFECT. WHERE THERE IS A CONFLICT BETWEEN THE REGULATIONS, STANDARDS, CODES, AND/OR THESE SPECIFICATIONS, THE MOST STRINGENT REQUIREMENTS SHALL APPLY. AS A MINIMUM, THE STWA SHALL COMPLY WITH THE APPLICABLE PORTIONS OF THE FOLLOWING:

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) INCLUDING BUT NOT LIMITED TO:

TITLE 29 CODE OF FEDERAL REGULATIONS (CFR) SECTION 1926 – SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

TITLE 29 CFR SECTION 1926.1101 – SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION – ASBESTOS.

TITLE 29 CFR SECTION 1910.134 – OCCUPATIONAL HEALTH AND SAFETY STANDARDS – RESPIRATORY PROTECTION.

TITLE 29 CFR SECTION 1910.1020 – OCCUPATIONAL HEALTH AND SAFETY STANDARDS – ACCESS TO EMPLOYEE EXPOSURE AND MEDICAL RECORDS.

TITLE 29 CFR SECTION 1910.1200 – OCCUPATIONAL HEALTH AND SAFETY STANDARDS – HAZARD COMMUNICATION.

ENVIRONMENTAL PROTECTION AGENCY (EPA) INCLUDING BUT NOT LIMITED TO:

TITLE 40 CODE OF FEDERAL REGULATIONS PART 61 SUBPART M – NATIONAL EMISSION STANDARD FOR ASBESTOS.

TEXAS STATUTES, INCLUDING BUT NOT LIMITED TO:

OCCUPATION CODE, CHAPTER 1954, ASBESTOS HEALTH PROTECTION

HEALTH AND SAFETY CODE CHAPTERS 361 AND 363, SOLID WASTE

TEXAS ADMINISTRATIVE CODE INCLUDING BUT NOT LIMITED TO:

DEPARTMENT OF STATE HEALTH SERVICES, TITLE 25, CHAPTER 295, SUBCHAPTER C – TEXAS ASBESTOS HEALTH PROTECTION.

TEXAS ADMINISTRATIVE CODE, TITLE 30, CHAPTER 330 MUNICIPAL SOLID WASTE.

DEPARTMENT OF TRANSPORTATION – HAZARDOUS MATERIALS REGULATIONS 49 CFR, PARTS 170 – 180.

3000.3 DESCRIPTION

THIS ITEM SHALL CONSIST OF THE UNCOVERING, DISLODGING, HANDLING, REMOVING, TRANSPORTING, AND DISPOSING OF AC PIPE, JOINTS, WRAPPINGS AND OTHER ACM. TO COMPLY WITH NESHAP AND OSHA REQUIREMENTS, THIS PROJECT WILL REQUIRE WORKERS TRAINED IN USING WET TECHNIQUE PROCEDURES TO DISLODGE AND REMOVE AC PIPE, AC PIPE JOINTS, VALVES (ANY TYPE) CONTAINING ACM, AND ANY SURROUNDING SOILS THAT MAY CONTAIN ACM.

STWA SHALL DEVELOP AN ASBESTOS REMOVAL WORK PLAN, HEREIN REFERRED TO AS "THE PLAN THAT PROVIDES SPECIFIC AND DETAILED PROCEDURES THEY AND/OR ANY OF THEIR SUBCONTRACTORS WILL FOLLOW TO MAINTAIN THE AC PIPE IN AN INTACT STATE. THE PLAN SHALL SPECIFY THE WET TECHNIQUES TO BE FOLLOWED WHEN THE PIPE COLLARS ARE DISLODGED. THE PLAN SHALL INCLUDE PROCEDURES/ACTIONS TO BE FOLLOWED IF THE INTACT AC PIPE BECOMES BROKEN AND THE POSSIBILITY EXISTS OF ASBESTOS FIBERS BECOMING AIRBORNE. BY REGULATORY DEFINITION, IF AND WHEN THE PIPE AND/OR COLLAR ARE BROKEN, THEY BECOME A REGULATED ACM (RACM) AND SUBJECT TO NESHAP. THE PLAN SHALL STATE OR REFERENCE PROCEDURES IN THE STWA'S SAFETY AND HEALTH PROGRAM DOCUMENT THAT THEY WILL FOLLOW TO COMPLY WITH THE FEDERAL OSHA ASBESTOS STANDARD. FINALLY, THE PLAN SHALL CONTAIN PROVISIONS FOR THE ENVIRONMENTALLY COMPLIANT DISPOSAL OF THE INTACT AC PIPE AND ANY RACM CREATED DURING THE REMOVAL PROCESS.

TO MEET AND/OR EXCEED NESHAP AND OSHA GUIDELINES, THE STWA MAY SUBCONTRACT THE AC PIPE HANDLING PLAN AND WORK TO AN ENVIRONMENTAL PROTECTION AGENCY (EPA) ACCREDITED AND TEXAS DEPARTMENT OF STATE HEALTH SERVICES (DSHS) LICENSED ASBESTOS ABATEMENT STWA, DSHS LICENSED ASBESTOS CONSULTANT, AND DSHS AIR MONITORING TECHNICIAN.

NESHAP GUIDELINES APPLY TO FACILITY PROJECTS IN WHICH THE COMBINED AMOUNT OF REGULATED ASBESTOS CONTAINING MATERIAL (RACM) IS AT LEAST 260 LINEAR FEET (LF) OR 35 CUBIC FEET OR 160 SQUARE FEET. THIS MEANS THAT IF THE COMBINED AMOUNT OF RACM IS AT LEAST 260 LINEAR FEET OF THE AC PIPE, INCLUDING AC COLLARS, AND IT IS EXPECTED TO BECOME OR BECOMES CRUMBLED, PULVERIZED, OR REDUCED TO POWDER, THEN THE PROJECT IS SUBJECT TO THE NESHAP PROVISIONS OF REPORTING AND ASBESTOS EMISSION CONTROL PARAGRAPHS IN 40 CFR SECTION 61.145. IF THE DSHS RACM LIMIT OF 260 LF IS EXCEEDED, THE STWA IS RESPONSIBLE FOR ANY DSHS ADMINISTRATIVE FEES AND FINES.

IF THE SCOPE OF THE PROJECT MAY INVOLVE THE THRESHOLD AMOUNT (260 LINEAR FEET OR GREATER), A DEMOLITION/RENOVATION NOTIFICATION FORM WILL BE SENT TO DSHS BY THE STWA. THIS FORM SHALL BE POST-MARKED NO LATER THAN 10 WORKING DAYS PRIOR TO THE START OF ANY ASBESTOS HANDLING WORK.

ALL PROJECTS INVOLVING AC PIPE REQUIRE THAT NESHAP AND OSHA STANDARDS ARE MET AND/OR EXCEEDED. THE STWA SHALL PERFORM ALL WORK IN A MANNER THAT MEETS OR EXCEEDS THOSE STANDARDS. THE STWA SHALL HAVE AND FOLLOW A WRITTEN PLAN THAT DESCRIBES THEIR DETAILED HANDLING AND DISPOSAL PROCEDURES OF THE AC PIPE. OSHA REQUIRES THAT DURING ANY ACM DISTURBANCE, REGARDLESS OF AMOUNT, THE ASBESTOS WORKER(S) SHALL BE PROTECTED FROM POTENTIAL AIRBORNE ASBESTOS EXPOSURE IN EXCESS OF THE PERMISSIBLE EXPOSURE LIMIT OR EXCURSION LIMIT AS STIPULATED IN 29 CFR 1926.1101.

3000.4 CONSTRUCTION REQUIREMENTS

THE STWA SHALL REMOVE AND DOUBLE BAG WITH 6-MIL POLYETHYLENE SHEETING TO YIELD A TOTAL OF AT LEAST 12-MIL, THE ASBESTOS PIPE IN THE TRENCH OR IMMEDIATELY WHEN IT COMES OUT OF THE TRENCH, SEAL, LABEL, TRANSPORT, AND DISPOSE OF ALL CATEGORY II NON- FRIABLE ACM AND RACM IN COMPLIANCE WITH APPLICABLE CURRENT FEDERAL, STATE AND LOCAL REGULATIONS, LAWS, ORDINANCES, RULES, STANDARDS AND REGULATORY AGENCY RECOMMENDED REQUIREMENTS.

ALL NOTIFICATIONS REQUIRED TO STATE REGULATORY AGENCIES WILL BE MADE BY THE STWA, INCLUDING BUT NOT LIMITED TO THE DSHS DEMOLITION/RENOVATION NOTIFICATION FORM. IF 260 LINEAR FEET OR GREATER OF RACM PIPE WILL BECOME CRUMBLED, PULVERIZED, OR REDUCED TO POWDER, THE PROJECT IS SUBJECT TO NESHAP REGULATIONS AND A DEMOLITION/RENOVATION NOTIFICATION FORM WILL BE SENT TO DSHS BY THE STWA. THIS FORM WILL NEED TO BE POST-MARKED NO LATER THAN 10 WORKING DAYS PRIOR TO THE START OF ANY ASBESTOS DISTURBANCE.

THE STWA SHALL HAVE AN ON-SITE SUPERVISOR, WHO IS AN OSHA COMPETENT PERSON, PRESENT ON THE JOB SITE AT ALL TIMES THAT THE AC PIPE WORK IS IN PROGRESS. THIS SUPERVISOR SHALL BE THOROUGHLY FAMILIAR WITH AND EXPERIENCED AT ASBESTOS PIPE HANDING USING WET TECHNIQUES AND SHALL BE FAMILIAR WITH AND SHALL ENFORCE THE USE OF ALL SAFETY PROCEDURES AND EQUIPMENT. HE/SHE SHALL BE KNOWLEDGEABLE OF ALL APPLICABLE EPA, OSHA, AND DSHS ASBESTOS REQUIREMENTS AND GUIDELINES.

THE STWA SHALL BE RESPONSIBLE FOR SITE SAFETY AND FOR TAKING ALL NECESSARY PRECAUTIONS TO PROTECT THE STWA'S PERSONNEL AND THE PUBLIC FROM AIRBORNE ASBESTOS EXPOSURE AND/OR INJURY. THE STWA SHALL BE RESPONSIBLE FOR MAINTAINING THE INTEGRITY OF THE WORK AREA.

THE STWA SHALL CONFINE OPERATIONS AT THE SITE TO THE AREA REQUIRING INTERFACE WITH THE AC PIPE AND THE GENERAL SITE AREA IN CLOSE PROXIMITY TO THE PROJECT. THE STWA WILL NOT UNREASONABLY ENCUMBER THE SITE WITH MATERIALS OR EQUIPMENT. IF ACWMS ARE REQUIRED TO BE STORED OVERNIGHT IN A SECURED AREA, THE WASTE MATERIAL AND WASTE CONTAINERS SHALL BE LABELED ACCORDING TO OSHA AND EPA, AND THE STATE OF TEXAS REQUIREMENTS, & CONTAINERIZED TO PRECLUDE UNAUTHORIZED DISTURBANCE OF THE ACWMS.

THE STWA SHALL BE RESPONSIBLE FOR OBTAINING AND COORDINATING WASTE DISPOSAL AND TRANSPORT OF ACWM TO A TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) PERMITTED ASBESTOS WASTE LANDFILL. WASTE MANIFESTS SHALL BE GENERATED FOR THE TRANSPORT OF THE AC PIPE AND ACWMS FROM THE PROJECT SITE TO THE LANDFILL DISPOSAL SITE AND RETAINED BY THE STWA.

3000.5 SITE SECURITY

THE STWA SHALL DEMARCATE THE AREA OF AC PIPE INTERFACE ("REGULATED AREA") WITH BARRIER TAPE AND WARNING SIGNS, PER OSHA REGULATION 29 CFR 1926.1101. ACCESS TO THE REGULATED AREA WILL BE LIMITED TO AUTHORIZED PERSONNEL AND AUTHORIZED VISITORS

3000.6 AC PIPE HANDLING

GENERAL: ANY PROJECT INVOLVING AC PIPE, THE STWA SHALL COMPLY WITH OSHA . THE STWA SHALL UNCOVER, DISLODGE, HANDLE, REMOVE, TRANSPORT, AND DISPOSE OF ALL AC PIPE SPECIFIED IN THE CONTRACT DOCUMENTS FOR THIS PROJECT USING WET TECHNIQUE PROCEDURES. ALL WORK INVOLVING AC PIPE AND OTHER ACM PRODUCTS MUST BE ADDRESSED IN THE PLAN. THE STWA SHALL TAKE PRECAUTIONS TO PREVENT DAMAGE TO ADJACENT STRUCTURES AND MATERIAL/FINISHED MATERIAL NOT REQUIRED FOR AC PIPE HANDLING.

PROHIBITED WORK PRACTICES AND ENGINEERING CONTROLS: STWA SHALL NOT USE PROCEDURES THAT SUBJECT THE AC PIPE TO FORCES THAT WILL CRUMBLE, PULVERIZE, OR REDUCE TO POWDER THE AC PIPE. THE FOLLOWING WORK PRACTICES AND ENGINEERING CONTROLS SHALL NOT BE USED FOR WORK RELATED TO AC PIPE OR FOR WORK WHICH DISTURBS ACM, REGARDLESS OF ASBESTOS EXPOSURE OR THE RESULTS OF INITIAL EXPOSURE ASSESSMENTS:

HIGH-SPEED ABRASIVE DISC SAWS AND SANDERS NOT EQUIPPED WITH POINT OF CUT VENTILATOR OR ENCLOSURES WITH HEPA FILTERED EXHAUST AIR;

CARBIDE-TIPPED CUTTING BLADES;

ELECTRICAL DRILLS, CHISELS, AND RASPS USED TO MAKE FIELD CONNECTIONS IN AC PIPE;

SHELL CUTTERS USED TO CUT ENTRY HOLES IN AC PIPE;

A HAMMER AND CHISEL WITHOUT USING WET TECHNIQUES TO REMOVE PIPE CONNECTIONS;

COMPRESSED AIR USED TO REMOVE ASBESTOS OR MATERIAL CONTAINING ASBESTOS;

DRY SWEEPING, DRY SHOVELING, OR OTHER DRY CLEAN-UP OF DUST AND ACM DEBRIS;

EMPLOYEE ROTATION AS A MEANS OF REDUCING EMPLOYEE EXPOSURE TO ASBESTOS;

GENERAL REMOVAL WORK PRACTICES: DISPOSAL BAGS FOR RACM SHALL BE 6-MIL POLYETHYLENE AND LABELED AS REQUIRED BY EPA REGULATION 40 CFR 61.150 (A)(1)(IV) OR OSHA REQUIREMENT 29 CFR 1926.1101(K)(8). STICK-ON LABELS IDENTIFYING THE GENERATOR'S NAME (STWA) AND ADDRESS AND THE PROJECT SITE LOCATION SHALL BE APPLIED TO ANY ASBESTOS WASTE DISPOSAL BAG THAT CONTAINS RACM, AS PER EPA OR OSHA AND DEPARTMENT OF TRANSPORTATION REQUIREMENTS.

DISPOSAL PROCEDURES: STWA SHALL RETAIN ALL TRANSPORT MANIFESTS, TRIP TICKETS, AND DISPOSAL RECEIPTS FOR ALL ASBESTOS WASTE MATERIALS REMOVED FROM THE WORK AREA DURING THE PROJECT.

3000.7 STANDARD PLAN NOTE

ASBESTOS CEMENT (AC) PIPE, ALSO KNOWN AS TRANSITE PIPE, CONTAINS ASBESTOS-CONTAINING MATERIAL (ACM) AND IS LOCATED WITHIN THE PROJECT LIMITS. SPECIAL WASTE MANAGEMENT PROCEDURES AND HEALTH AND SAFETY REQUIREMENTS ARE APPLICABLE WHEN HANDLING, REMOVING, AND DISPOSING OF THIS PIPE.

Texas 811
Know what's below. Call before you dig.

REV.	DESCRIPTION	DATE

Walker Partners
engineers ★ surveyors

SOUTH TEXAS WATER AUTHORITY

SAMPLE TAPS

PROJECT NOTES

PRELIMINARY FOR REVIEW ONLY

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	LLN
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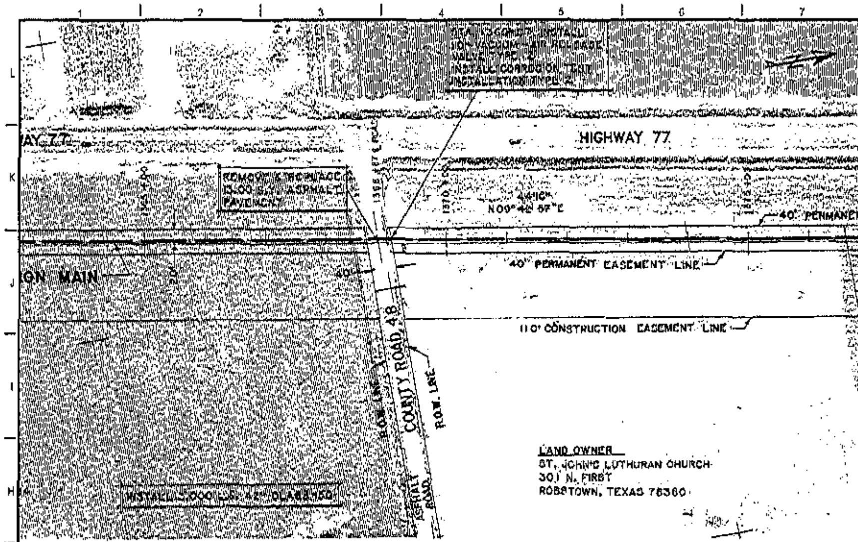
	RC
	ELN
	3-00052

DRAWING NO. C001



AS-BUILT PLAN & PROFILE FOR REFERENCE ONLY
SCALE: NOT TO SCALE

CR 48 ARV VAULT
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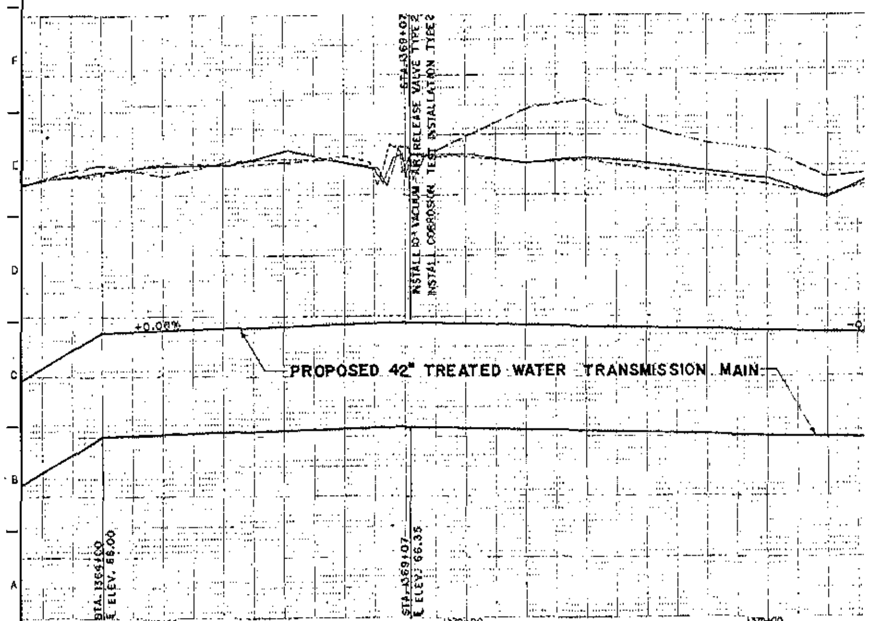
LONG: -97.633857



NOTES:

1. ISOLATE EXISTING AIR VALVE WITH EXISTING HAND WHEEL GATE VALVE. OPEN GATE VALVE TO AIR VALVE AFTER SAMPLE TAP BALL VALVE IS INSTALLED AND CLOSED.
2. REMOVE EXISTING HOSE BIBB FROM AIR VALVE PIPE PLUG.
3. INSTALL TYPE 2 SAMPLE TAP (DETAIL C7/C200).
4. DISINFECT AND FLUSH NEW SAMPLE TAP IN ACCORDANCE WITH AWWA STANDARD C-651.
5. BACKFLOW PREVENTION ASSEMBLY SHALL BE TESTED UPON INSTALLATION BY A LICENSED BACKFLOW PREVENTION ASSEMBLY TESTER AND CERTIFIED TO BE OPERATING WITHIN SPECIFICATIONS.

REV.	DESCRIPTION	DATE

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SAMPLE TAPS

SITE #1 (CR 48 ARV PLAN & PROFILE)

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ELN
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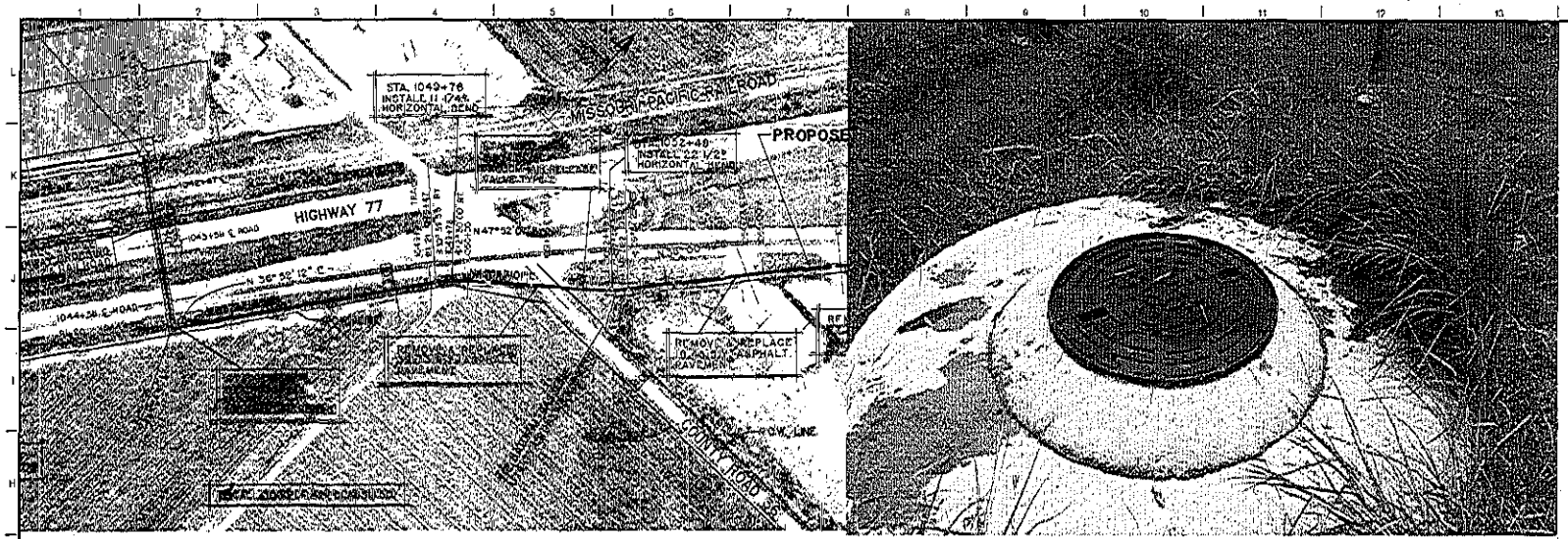
ELN
3-00352

DRAWING NO.
C100



AS-BUILT PLAN & PROFILE FOR REFERENCE ONLY
SCALE: NOT TO SCALE

CR 36 & HWY 77
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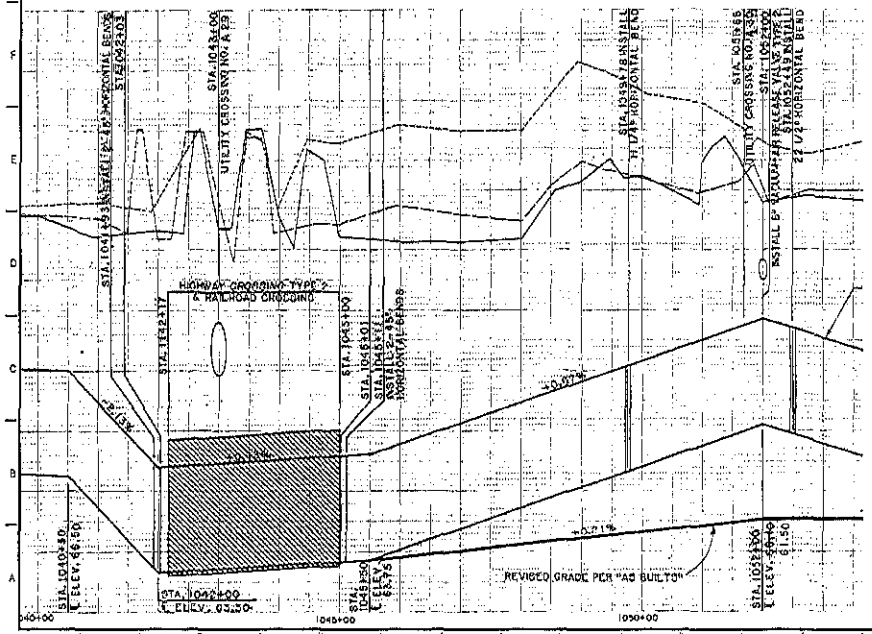
LONG: -97.67592



NOTES:

1. INSTALL TYPE 3 SAMPLE TAP (DETAIL A1/C200).
2. DISINFECT AND FLUSH NEW SAMPLE TAP IN ACCORDANCE WITH AWWA STANDARD C-651.
3. BACKFLOW PREVENTION ASSEMBLY SHALL BE TESTED UPON INSTALLATION BY A LICENSED BACKFLOW PREVENTION ASSEMBLY TESTER AND CERTIFIED TO BE OPERATING WITHIN SPECIFICATIONS.

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SAMPLE TAPS

SITE #2 (CR 36 & HWY 77 PLAN & PROFILE)

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DRAWN	ELN
CHECKED	ELN
SUBMITTED	RC
APPROVED	ELN
PROJECT NO.	3-00050

DRAWING NO.
C101

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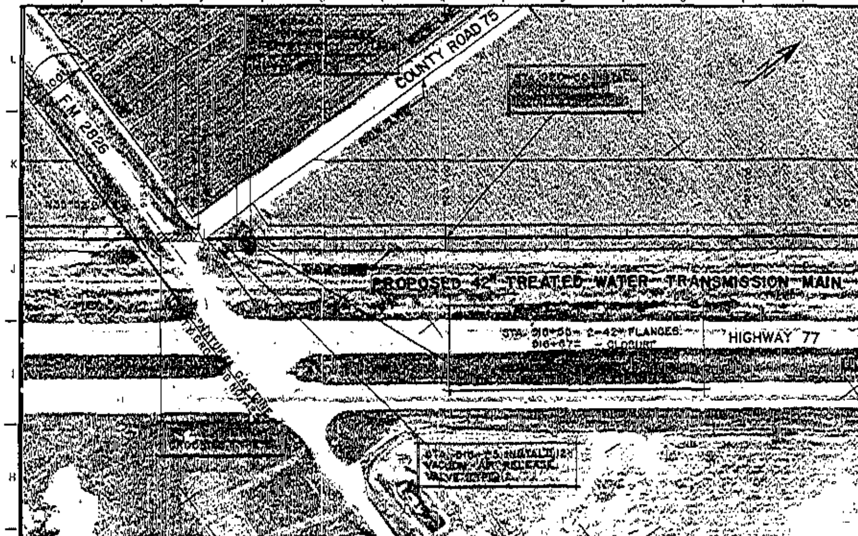
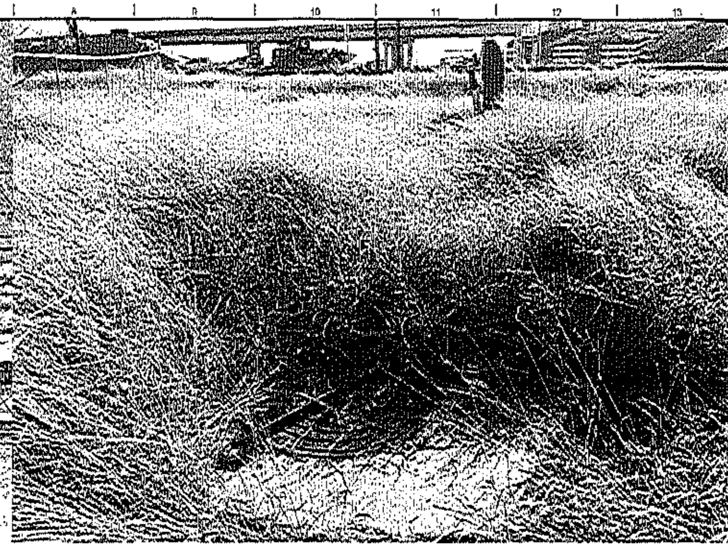


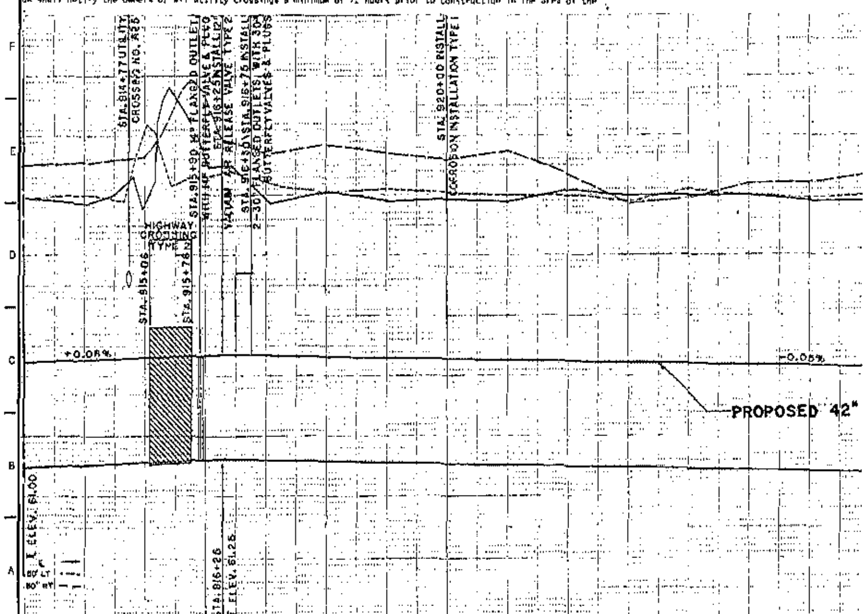


AS-BUILT PLAN & PROFILE FOR REFERENCE ONLY
SCALE: NOT TO SCALE

...ACTOR shall be responsible for the removal and replacement of all existing pavements, curbs, driveways, sidewalks, roadways, pipe culverts, culvert headwalls, fences, power line and telephone poles, bill boards, and miscellaneous ...quired to complete the construction operation.

...OR shall field verify the location and depth of all utility crossings prior to construction in order to adjust pipe ... necessary.

...OR shall notify the owners of all utility crossings a minimum of 72 hours prior to construction in the area of the



CR 75 & HWY 77
LAT: 27.740137
LONG: -97.701019

Texas 811
Know what's below. Call before you dig.

NOTES:

1. ISOLATE EXISTING AIR VALVE WITH EXISTING HAND WHEEL GATE VALVE. OPEN GATE VALVE TO AIR VALVE AFTER SAMPLE TAP BALL VALVE IS INSTALLED AND CLOSED.
2. REMOVE EXISTING HOSE BIBB FROM AIR VALVE PIPE PLUG.
3. INSTALL TYPE 2 SAMPLE TAP (DETAIL C7/C200).
4. DISINFECT AND FLUSH NEW SAMPLE TAP IN ACCORDANCE WITH AWWA STANDARD C-651.
5. BACKFLOW PREVENTION ASSEMBLY SHALL BE TESTED UPON INSTALLATION BY A LICENSED BACKFLOW PREVENTION ASSEMBLY TESTER AND CERTIFIED TO BE OPERATING WITHIN SPECIFICATIONS.

REV.	DESCRIPTION	DATE

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SAMPLE TAPS

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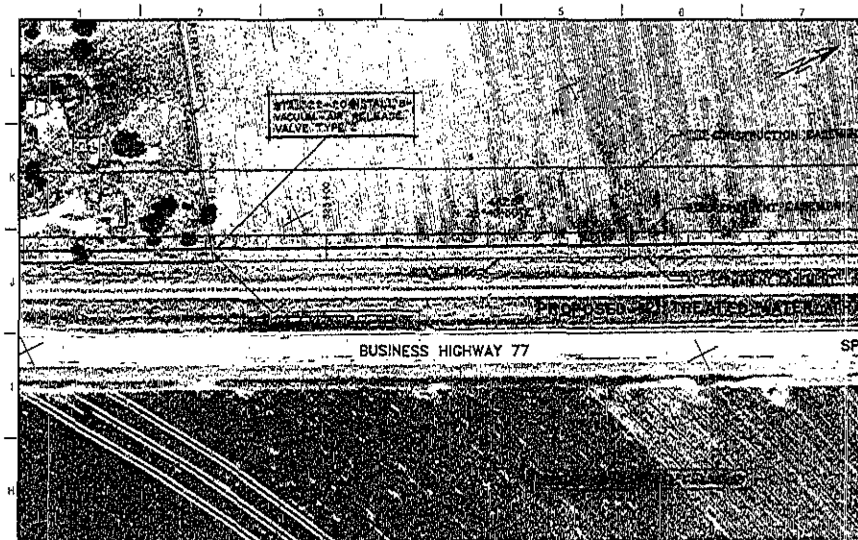
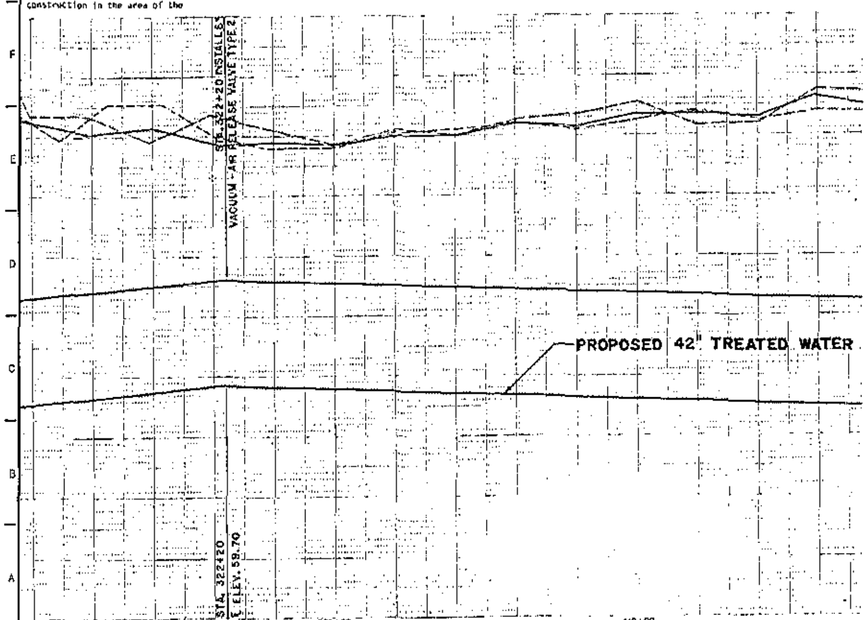
	RC
	ELN
	3-00632

DRAWING NO.
C102



AS-BUILT PLAN & PROFILE FOR REFERENCE ONLY
SCALE: NOT TO SCALE



LOPEZ ARV VAULT
LAT: 27.599521
LONG: -97.789368

Texas 811 — Know what's below. Call before you dig.

NOTES:

1. ISOLATE EXISTING AIR VALVE WITH EXISTING HAND WHEEL GATE VALVE. OPEN GATE VALVE TO AIR VALVE AFTER SAMPLE TAP BALL VALVE IS INSTALLED AND CLOSED.
2. REMOVE EXISTING HOSE BIBB FROM AIR VALVE PIPE PLUG.
3. INSTALL TYPE 2 SAMPLE TAP (DETAIL G7/C200).
4. DISINFECT AND FLUSH NEW SAMPLE TAP IN ACCORDANCE WITH AWWA STANDARD C-651.
5. BACKFLOW PREVENTION ASSEMBLY SHALL BE TESTED UPON INSTALLATION BY A LICENSED BACKFLOW PREVENTION ASSEMBLY TESTER AND CERTIFIED TO BE OPERATING WITHIN SPECIFICATIONS.

REV.	DESCRIPTION	DATE

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SAMPLE TAPS

SITE #4 (LOPEZ ARV PLAN & PROFILE)

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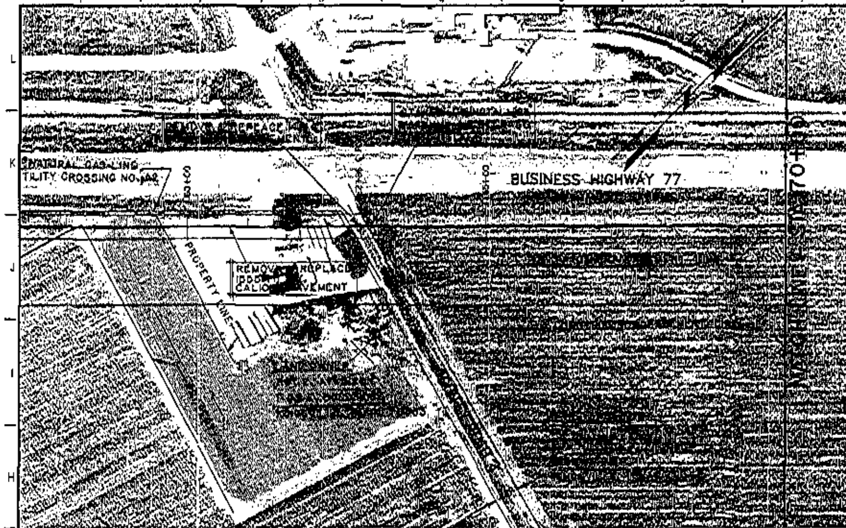
	ELN
	ELN
	RC
	ELN
	3-00057

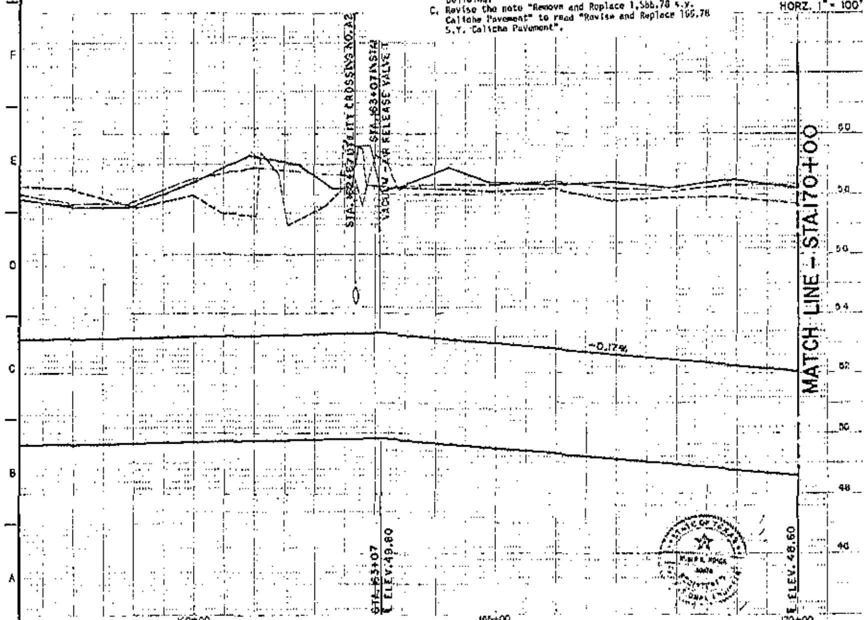
DRAWING NO.
C103



AS-BUILT PLAN & PROFILE FOR REFERENCE ONLY
SCALE: NOT TO SCALE

ITEM 3. On Sheet No. 8, change the following:
A. From STA 159+81 to STA 162+85, change the Construction Easement width from 110 feet to 70 feet.
B. Add the following note to the property owned by Roy Atkinson "Remove and Reinstall the chain link fence around the building. Remove and Reinstall office building."
C. Revise the note "Remove and Replace 1,566.78 S.Y. Caliche Pavement" to read "Revise and Replace 166.78 S.Y. Caliche Pavement".

SCALE
VERT. 1" = 2'
HORZ. 1" = 100'



CR 4 ARV
LAT: 27.571605
LONG: -97.815745

Texas 811
Know what's below. Call before you dig.

NOTES:

1. ISOLATE EXISTING AIR VALVE WITH EXISTING HAND WHEEL GATE VALVE. OPEN GATE VALVE TO AIR VALVE AFTER SAMPLE TAP BALL VALVE IS INSTALLED AND CLOSED.
2. REMOVE EXISTING HOSE BIBB FROM AIR VALVE PIPE PLUG.
3. INSTALL TYPE 2 SAMPLE TAP (DETAIL 07/C200).
4. DISINFECT AND FLUSH NEW SAMPLE TAP IN ACCORDANCE WITH AWWA STANDARD C-651.
5. BACKFLOW PREVENTION ASSEMBLY SHALL BE TESTED UPON INSTALLATION BY A LICENSED BACKFLOW PREVENTION ASSEMBLY TESTER AND CERTIFIED TO BE OPERATING WITHIN SPECIFICATIONS.

REV.	DESCRIPTION	DATE

Walker Partners
engineers ★ surveyors

SOUTH TEXAS WATER AUTHORITY

SAMPLE TAPS

SITE #5 (CR 4 ARV PLAN & PROFILE)

PRELIMINARY FOR REVIEW ONLY

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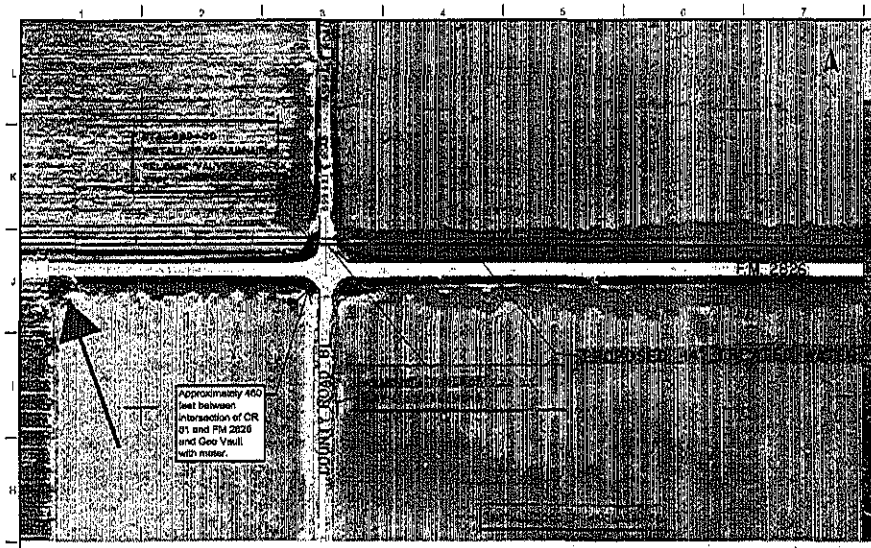
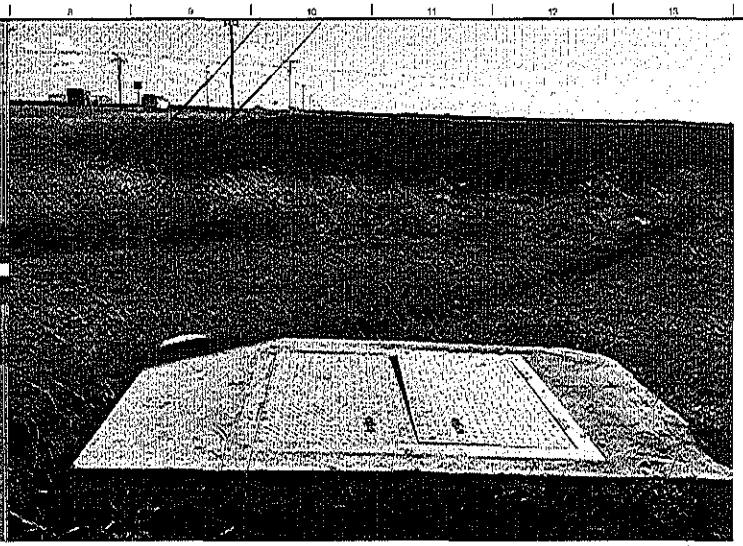
	ELN
	ELN
	RC
	ELN
	3-00657

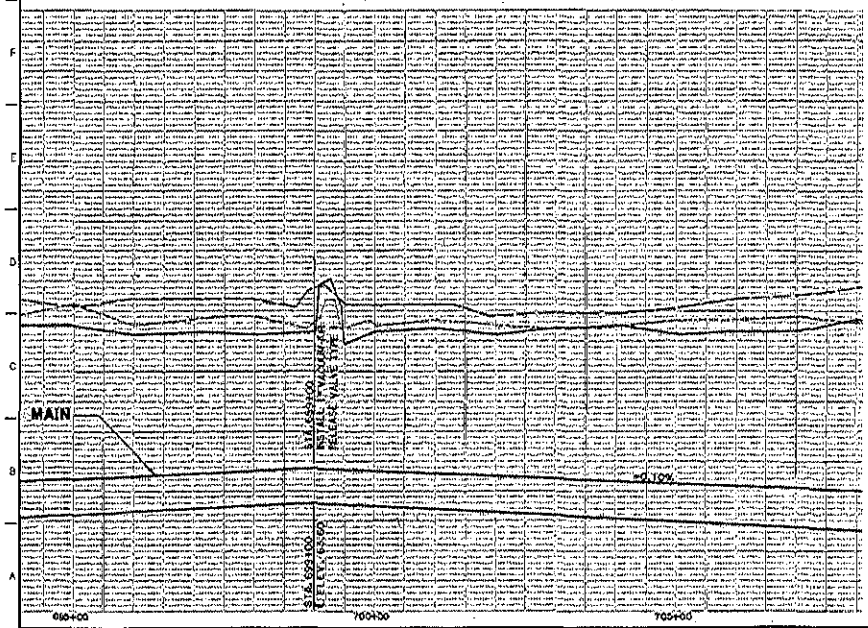
DRAWING NO.
C104





AS-BUILT PLAN & PROFILE FOR REFERENCE ONLY
SCALE: NOT TO SCALE

NSWC GEO TAP
LAT: 27.739539
LONG: -97.751440



NOTES:

1. INSTALL TYPE 4 SAMPLE TAP (DETAIL A7/C200).
2. DISINFECT AND FLUSH NEW SAMPLE TAP IN ACCORDANCE WITH AWWA STANDARD C-651.
3. BACKFLOW PREVENTION ASSEMBLY SHALL BE TESTED UPON INSTALLATION BY A LICENSED BACKFLOW PREVENTION ASSEMBLY TESTER AND CERTIFIED TO BE OPERATING WITHIN SPECIFICATIONS.

REV.	DESCRIPTION	DATE

Walker Partners engineers * surveyors

SOUTH TEXAS WATER AUTHORITY

SAMPLE TAPS

SITE #6 (NSWC GEO TAP PLAN & PROFILE)

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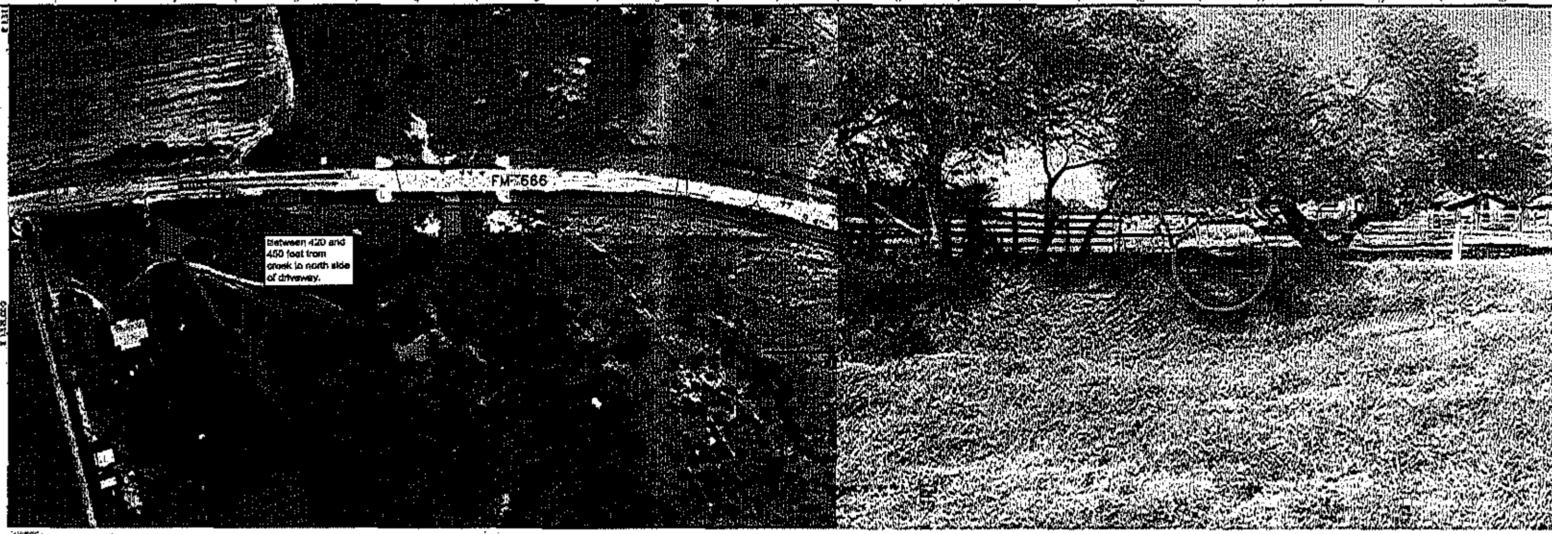
DES.	LLN
DRAWN BY	ELN
CHECK BY	HC
APPR. BY	ELN
PROJECT NO.	3-00620

DRAWING NO.
C105

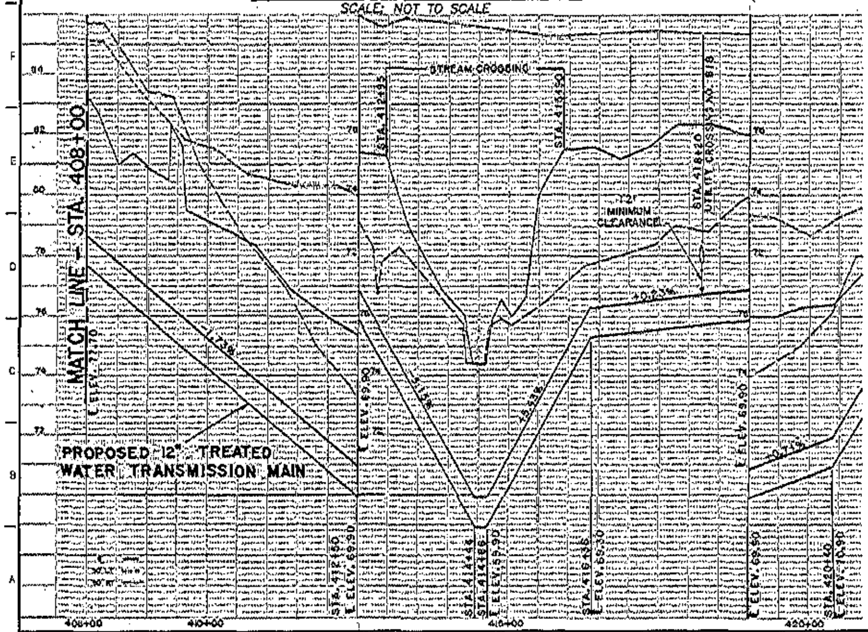
G:\PROJECTS\3-00620\DESIGN\2D DGN\2-00620 PLAN & PROFILE.DGN, C105 SITE #6 (NSWC GEO TAP PLAN & PROFILE), 11/20/2017 3:48:38 PM, rodar



NOTES:

1. The CONTRACTOR shall be responsible for the removal and replacement of all existing pavements, curbs, driveways, sidewalks, gravel roadways, pipe culverts, culvert headwalls, fences, power line and telephone poles, bill boards, and miscellaneous where required to complete the construction operation.
2. CONTRACTOR shall field verify the location and depth of all utility crossings prior to construction in order to adjust pipe grade if necessary.
3. CONTRACTOR shall notify the owners of all utility crossings a minimum of 72 hours prior to construction in the area of the crossing.

AS-BUILT PLAN & PROFILE FOR REFERENCE ONLY
SCALE: NOT TO SCALE



FM 666
LAT: 27.794333
LONG: -97.803437

Texas 811
Know what's below. Call before you dig.

NOTES:

1. INSTALL TYPE 1 SAMPLE TAP (DETAIL 01/C200). LOCATE HYDRANT AT EDGE OF RIGHT-OF-WAY NEXT TO EXISTING FENCE.
2. DISINFECT AND FLUSH NEW SAMPLE TAP IN ACCORDANCE WITH AWWA STANDARD C-651.
3. BACKFLOW PREVENTION ASSEMBLY SHALL BE TESTED UPON INSTALLATION BY A LICENSED BACKFLOW PREVENTION ASSEMBLY TESTER AND CERTIFIED TO BE OPERATING WITHIN SPECIFICATIONS.

REV.	DESCRIPTION	DATE

Walker Partners
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SOUTH TEXAS WATER AUTHORITY

SAMPLE TAPS

SITE #7 (FM 666 PLAN & PROFILE)

PRELIMINARY
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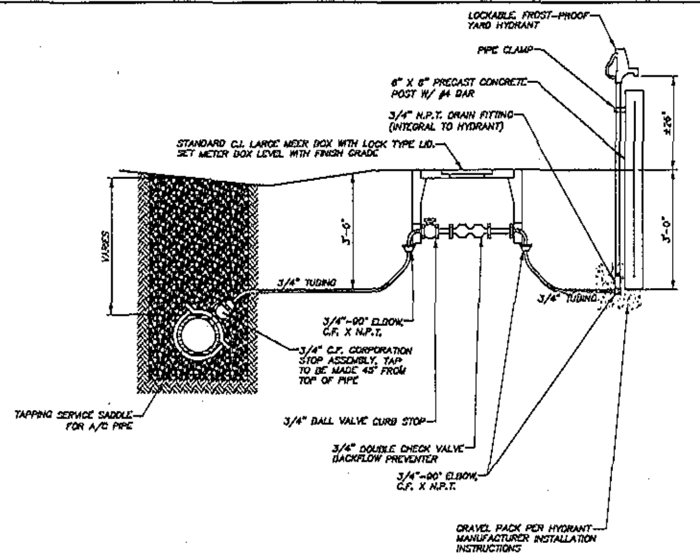
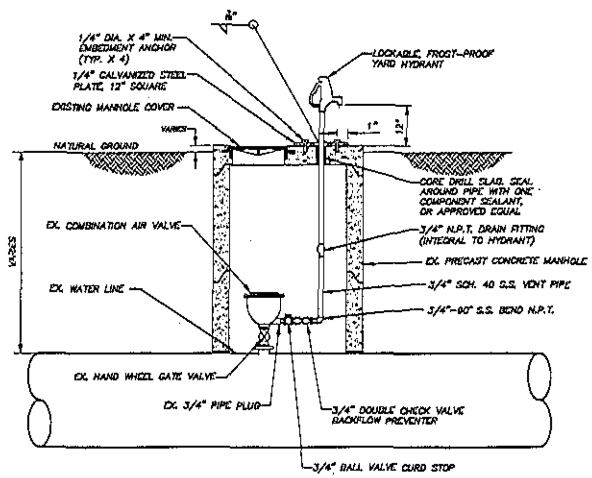
	LLN
DESIGNED	ELN
DRAWN	RC
CHECKED	ELN
PROJECT NO.	3-00652
DRAWING NO.	C106



G1 TYPE 1 SAMPLE TAP DETAIL

SCALE: N.T.S.

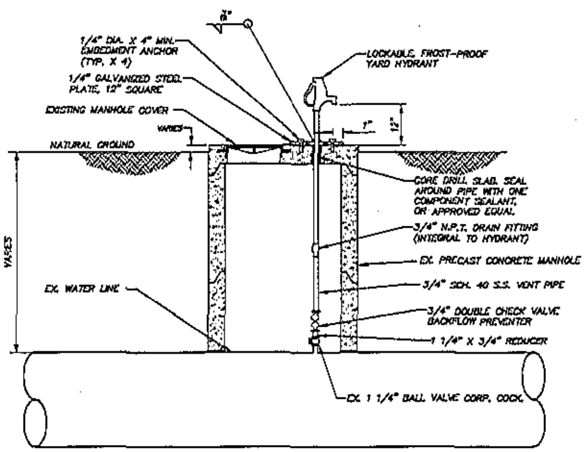


NOTES:

1. USE NON-SHRINK GROUT UNDER STEEL PLATE, AS NEEDED, TO LEVEL PLATE.

G7 TYPE 2 SAMPLE TAP DETAIL

SCALE: N.T.S.

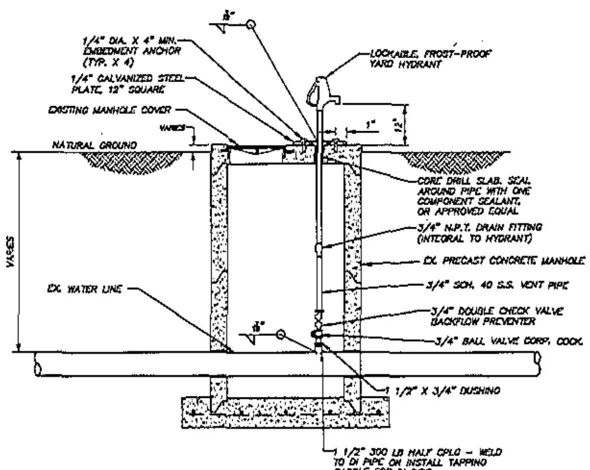


NOTES:

1. USE NON-SHRINK GROUT UNDER STEEL PLATE, AS NEEDED, TO LEVEL PLATE.

A1 TYPE 3 SAMPLE TAP DETAIL

SCALE: N.T.S.



NOTES:

1. USE NON-SHRINK GROUT UNDER STEEL PLATE, AS NEEDED, TO LEVEL PLATE.

A7 TYPE 4 SAMPLE TAP DETAIL

SCALE: N.T.S.

Texas 811 Know what's below. Call before you dig.

REV.	DESCRIPTION	DATE

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engineers ★ surveyors

SOUTH TEXAS WATER AUTHORITY

SAMPLE TAPS

DETAILS

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	ELN
	ELN
	RC
	ELN
	3-00b52

DRAWING NO. C200

G:\PROJECTS\3-00052 DESIGN\2.8 CAD\3-00052 DETAILS.DWG, C200 DETAILS, 11/07/2013 3:46:48 PM, ecole

ATTACHMENT 6

Assessment of 42" Waterline – Russell Corrosion Projects

Memorandum

To: South Texas Water Authority Board of Directors
From: Carola G. Serrato, Executive Director
Date: January 18, 2018
Re: EN Engineering/Russell Corrosion Consultants, LLC (Russell) Services for Examination of Section 0 – 5000 LF and Pipeline Interference

Background:

Enclosed is Invoice 0002192 for the Section 0 – 5000 LF project in the amount of $300

During the last meeting, staff reported that the company owning the two (2) remaining pipelines had a problem with their rectifier. On January 8, 2018, a field crew with Russell arrived and used their own equipment to generate the necessary charge to test for interference. This was necessary despite the pipeline company stating that their rectifier was repaired. Mr. Matt Maynard, Russell Senior Corrosion Technician, indicated that there was no interference detected. Enclosed is Russell's final report on pipeline interference.

With regards to the 0-5000 LF station project, a technical memorandum has not been received. However, some additional information was recorded by the Russell field crew on January 9th. Enclosed is my email to Mr. Bruce Norred inquiring about the remaining work, if any, and the anticipated receipt of the technical memorandum. Mr. Norred has responded that the report may be available by the end of January.

Analysis:

Last month staff presented three (3) invoices for the two (2) remaining projects. In addition, staff reported that the Section 0 – 5000 LF project had $39,121.23 remaining in unspent funds and pipeline interference testing had $1,446.49 in remaining funds.

Jacob Hinojosa, O&M Supervisor and I met with Russell field personnel on January 9th. During that meeting I inquired whether there were any anticipated excavations. There was not. I asked whether the field personnel had completed their testing. Mr. Maynard indicated it had been completed. Invoices for the January work have not been received.

Staff Recommendations:

Keep the Board updated on these projects. Approve Invoice 0002192 for the Stations 0 – 5000 LF Project.

Board Action:

Provide feedback to staff. Determine whether to approve Invoice 0002192.

Summarization:

Next month, staff anticipates that the entire amount of the remaining funds for the interference project will be billed. However, the remaining balance on the Section 0 – 5000 LF of $38,821.23 (the previous balance less the enclosed $300 invoice) will require revisiting the subject with Russell and the Board once the technical memorandum is received.

Invoice

Russell Corrosion Consultants, LLC
Remit to: P.O. Box 6266
Carol Stream, IL 60197-6266
(P) (410) 997-4481
ACH - ABA #071925334, Acct #5741230227
Lake Forest Bank & Trust

January 4, 2018
Project No: 1795027.01
Invoice No: 0002192

Project Manager: Karl Norred
Ref. Number:
Invoice Total: $300.00

South Texas Water Authority
P.O. Box 1701
Kingsville, TX 78364

Project 1795027.01 STWA Corrosion Assessment and Testing Examin Stations 0-5000
mcgserrato@stwa.org.

Professional Services from November 26, 2017 to December 31, 2017

Professional Personnel

	Hours	Rate	Amount	
Corrosion Project Manager				
Norred, Karl	2.00	150.00	300.00	
Totals	2.00		300.00	
Total Labor				**300.00**

Billing Limits	**Current**	**Prior**	**To-Date**	
Total Billings	300.00	25,878.77	26,178.77	
Limit			65,000.00	
Remaining			38,821.23	
		Total this Invoice		**$300.00**

Billing Backup

Thursday, January 4, 2018

Russell Corrosion Consultants, LLC Invoice 0002192 Dated 1/4/2018 11:25:10 AM

Project 1795027.01 STWA Corrosion Assessment and Testing Examin Stations 0-5000

Professional Personnel

			Hours	Rate	Amount	
Corrosion Project Manager						
50079	Norred, Karl	12/1/2017	2.00	150.00	300.00	
	Draft report and meeting planning					
	Totals		2.00		300.00	
	Total Labor					**300.00**

Total this Project **$300.00**

Total this Report **$300.00**

mcgserrato@stwa.org

From: Bruce Norred <bnorred@enengineering.com>
Sent: Thursday, January 18, 2018 1:02 PM
To: mcgserrato@stwa.org
Cc: Matthew Maynard; Dony Cantu; Frances Rosales; Jacob Hinojosa; Jo Ella Wagner
Subject: RE: Invoices, Field Work and Technical Memorandum
Attachments: STWA_Stray_Current_Evaluation_011818_final.pdf

Carola,

I am attaching the final report for the Interference test. That task is complete with no evidence found of the oil and gas lines causing interference on STWA 42" waterline.

The second report is being compiled and will be forwarded to Mr. Szeliga for his review and any additional recommendations. At this time we are not recommending any digs in the 0 to 5000 sections. As part of Michael's previous recommendations from 2007, we will be recommending that the work should be done to help correct that area.

I am pretty sure we will not have that report and recommendation to you for your meeting next week, but we will push to try and get it out by the end of January.

Any other questions, please don't hesitate to let us know.

Thanks,

K. Bruce Norred
Project Manager
Corrosion Engineering Services
EN Engineering LLC

(C)307-389-7479
(O)346-772-2092
bnorred@enengineering.com

NACE Institute No. 6707 & 18514
Certified Cathodic Protection Technician
Certified Senior Corrosion Technologist
Certified Coating Inspector Level 2
Confirm Certification at www.naceinstitute.org

EN Engineering
9801 Westheimer Rd
Suite 1000
Houston, TX 77042

Russell Corrosion Consultants is a wholly owned subsidiary of EN Engineering LLC.
WWW.enengineering.com
WWW.russellcorrosion.com

From: mcgserrato@stwa.org [mailto:mcgserrato@stwa.org]
Sent: Monday, January 15, 2018 3:01 PM

To: Bruce Norred <bnorred@enengineering.com>
Cc: Matthew Maynard <mmaynard@enengineering.com>; Mallory Beavers <mbeavers@enengineering.com>; Rhonda Houdek <rhoudek@enengineering.com>; Dony Cantu <dcantu@stwa.org>; Frances Rosales <fvrosales@stwa.org>; Jacob Hinojosa <jhinojosa@stwa.org>; Jo Ella Wagner <jwagner@stwa.org>
Subject: Invoices, Field Work and Technical Memorandum

Good Afternoon Bruce,

This week is the time frame for STWA to prepare the Agenda and Agenda Packet for next week's STWA Board meeting on Tuesday, January 23rd.

Our office has received Invoice 0002192 on the Section 0 – 5000LF project in the amount of $300. Will there be any additional invoices available by Thursday (1/18/2018) afternoon on that project or the interference one?

Last week, Matt reported that the interference testing had been completed and there was not any evidence of a problem where the last 2 pipelines crossed STWA's 42" line.

I asked Matt if the testing on the 0-5000 LF was complete and if any excavations would be required. He thought the testing was finished and did not think any excavations would be requested. I also asked who would be compiling the report (Technical Memorandum) and he thought you and he would be working on this.

At this juncture, I have reported to the Board that the likely recommendation from Russell will be to have STWA go back and install anodes at every joint instead of the current situation which is every two out of three joints. At the same time, the bond between the joints would be either established for the first time (since we know for a fact that the bonds were not properly installed during the original construction) or re-established.

Please let me know when STWA can expect the Technical Memorandum, which is part of the Scope of Services in the engineering agreement and, according to STWA's records, the signed engineering agreement was sent to Russell at the end of May.

Carola G. Serrato
Executive Director
South Texas Water Authority
PO Box 1701
Kingsville, Texas 78364
361-592-9323 x112

CATHODIC PROTECTION SYSTEM SURVEY

Stray Current Evaluation
Ref. – Stray Current Evaluation in Bishop/Driscoll Area
Quote# 174971.03
Final Report

Prepared for:

Ms. Carola G. Serrato
Executive Director
South Texas Water Authority
P.O. Box 1701
Kingsville, Texas 78364

Reference:

RCC Project Number: 1795027.03

Prepared by:

RUSSELL CORROSION CONSULTANTS, LLC.

Table of Contents Page

Stray Current Evaluation
Ref. – Stray Current Evaluation in Bishop/Driscoll Area
Quote# 174971.03
Final Report

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1. EXECUTIVE SUMMARY

1.1 Background

Russell Corrosion Consultants, Inc. (RCC) was contracted to perform a Stray Current Evaluation in the Bishop/Driscoll Area where possible stray current could be influencing the CP protection levels of the 42-Inch Concrete Pressure Pipe Water Line.

The 42-Inch Concrete Pressure Pipe Water Line is approximately 28 miles in length and installed in 1983. The 42-Inch Concrete Pressure Pipeline is cathodically protected by both Galvanic systems and Impressed Current Cathodic Protection (ICCP) systems and includes (CP) test stations.

The scope of services discussed in this report addresses the possible stray current from the oil or gas lines noted in previous reports and surveys. The latest report from HDR listed six (6) locations that could be affected and should be evaluated. Included in this report one will find differentially corrected, sub-meter accurate global positioning system (GPS) coordinates of geo-features included in the tested area. See Appendix C.

1.2 Summary of Evaluations

The first step was to go through the area in question and identify all potential metallic line crossings. The list of foreign operators with telephone numbers is a part of this report. Of the six (6) test stations listed on the HDR report only five (5) could be located. One additional test location was used because there was a crossing close to the location. The five (5) test stations were at stations 926+47, 981+47, 993+47, 1391+34 and 1406+70. There were five (5) operators identified and calls were made to schedule testing. Only three (3) of the operators responded and were able to interrupt their CP systems so that testing could be done. We installed chart recorders at each of the five (5) test stations to monitor the potentials of the water line with the foreign operators systems being interrupted. Since we were unable to see the influence of the two operators that did not respond, we had to reschedule with them for a later time. The remaining two operators were contacted and RCC was able to monitor those test stations in the vicinity during a

second site visit. The other issue is that the chart recorder that was installed at TS 1405+93 was stolen and required us to try to have all the operators' interrupter their systems again. The testing was completed at the five (5) locations, and no evidence of stray current that would be causing an issue with the water line was identified. All five (5) test station locations were monitored with the foreign operators being interrupted.

1.2.1 Stray Current Evaluations

The data graphs, which are included in Appendix B, show that the potential shifts from the five (5) foreign operators that were tested was minimal. This shows that the foreign pipelines in the vicinity does not influence the STWA 42in water line. See Appendix A for the List of Foreign Operators.

2. Recommendations

2.1 General

While testing for stray current, RCC observed lower readings at multiple test stations indicating the pipe may not be cathodically protected. Additional anodes should to be installed at these locations to raise the potentials. The test stations with below adequate protection are as follows:

Test Station @ 926+47
Test Station @ 981+47
Test Station @ 993+47
Test Station @ 1406+70- Wires may be broken

APPENDIX A

List of foreign operators

South Texas Water Authority
Foreign Operators

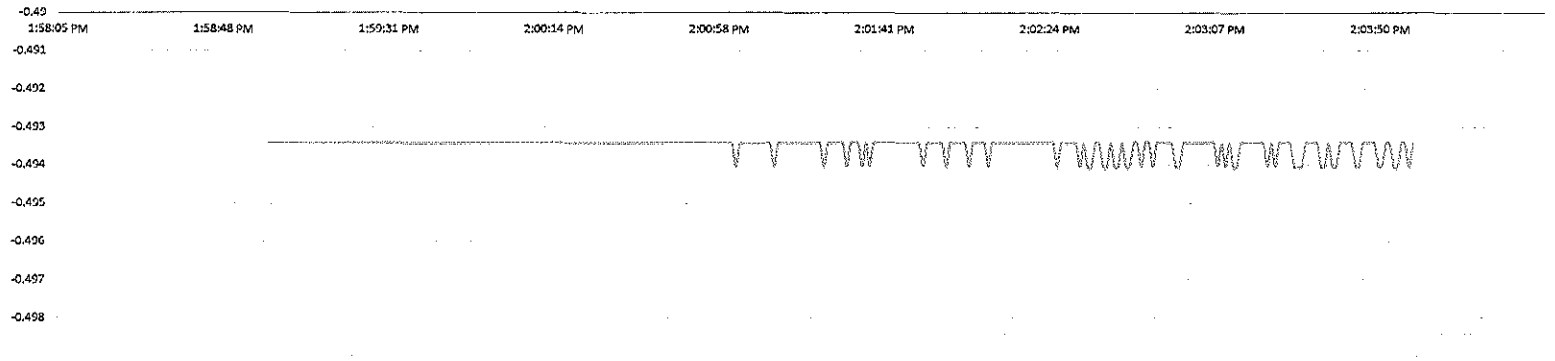
Operator	Latitude	Longitude	Address
Air Liquide 1-800-364-7378	27.843554352	-97.631885069	301 Hereford Rd, Corpus Christi, TX 78408
Celanese, Inc. 361-584-6301	27.756701669	-97.687031672	5738 Co Rd 4, Bishop, TX 78343
Celanese, Inc. 361-584-6301	27.717557959	-97.718731939	
Celanese, Inc. 361-584-6301	27.753930129	-97.689286189	
Celanese, Inc. 361-584-6301	27.750385541	-97.692140951	
Celanese, Inc. 361-584-6301	27.745125408	-97.696351611	
Celanese, Inc. 361-584-6301	27.743058789	-97.698056694	
DCP Midstream 1-888-204-1781	27.714980498	-97.720007839	7202 Co Rd 16, Bishop, TX 78343
Enerfin field services 1-361-887-5321	27.754479955	-97.689136546	103 Farm to Market Rd 2441, Woodsboro, TX 78393
Enerfin field services 1-361-887-5321	27.754454704	-97.689154394	2441, 103 Farm to Market Rd 1360, Woodsboro, TX 78393
Enterprise Products Operating L.P. 1-800-644-4773	27.843060511	-97.631985785	500 N Shoreline Blvd, Corpus Christi, TX 78401
Enterprise Products Operating L.P. 1-800-644-4773	27.750274245	-97.692562785	
Enterprise Products Operating L.P. 1-800-895-2396	27.842931187	-97.632009486	
Enterprise Products Operating L.P. 1-800-895-2396	27.842890619	-97.632016123	
Enterprise Products Operating L.P. 1-800-895-2396	27.715122076	-97.719898086	

APPENDIX B

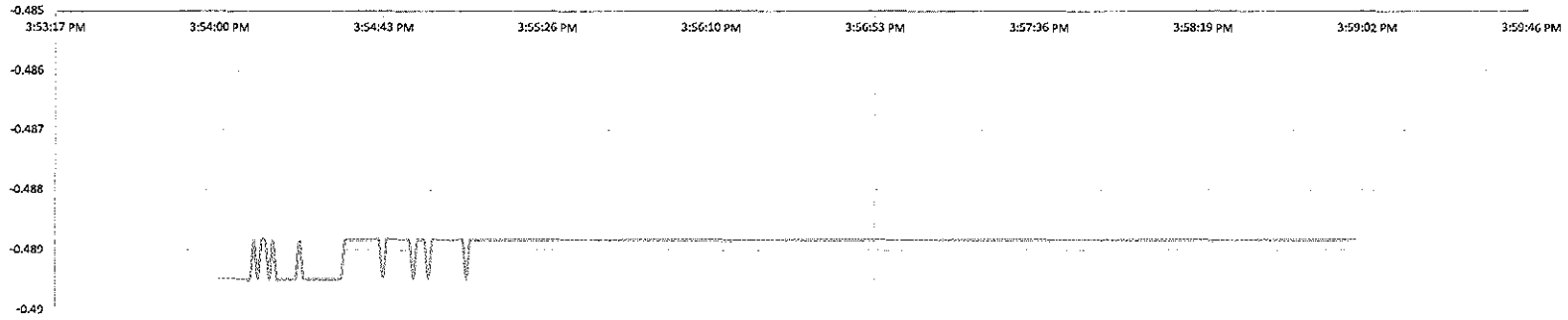
Graphs of Stray Current Testing

South Texas Water Authority
Test Station @926+47

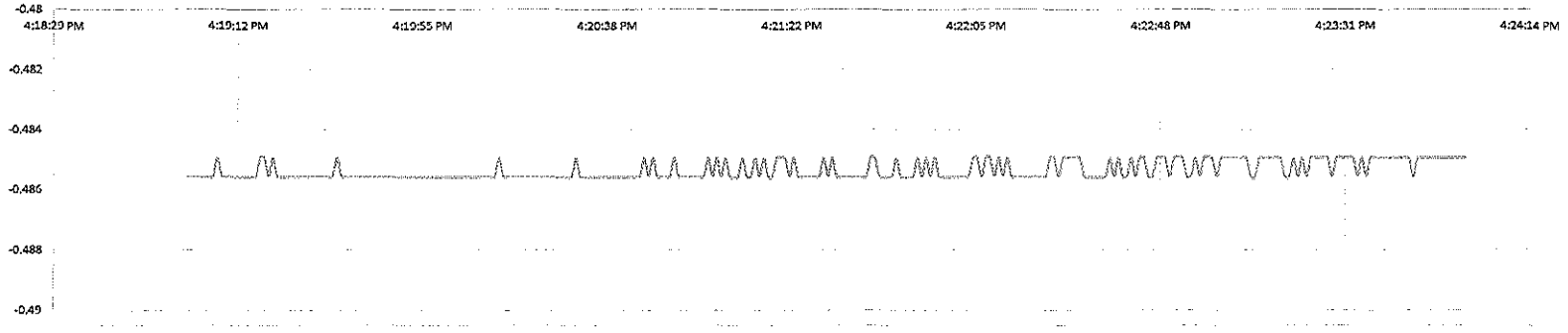
Air Liquide 4.9 Amps Time 14:01 2017-08-07



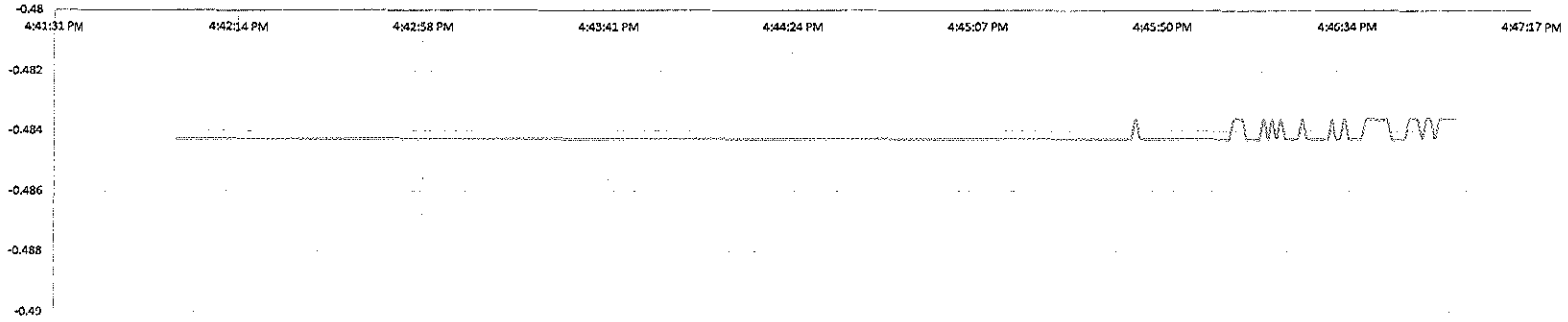
Enterprise 50 Amp Time 15:46 2017-08-07



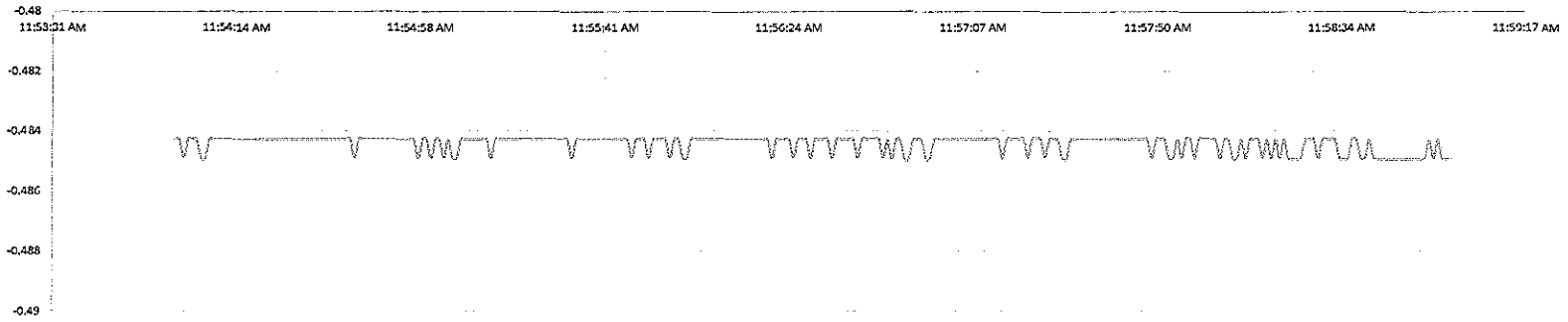
Enterprise 19 Amps Time 16:21 2017-08-07



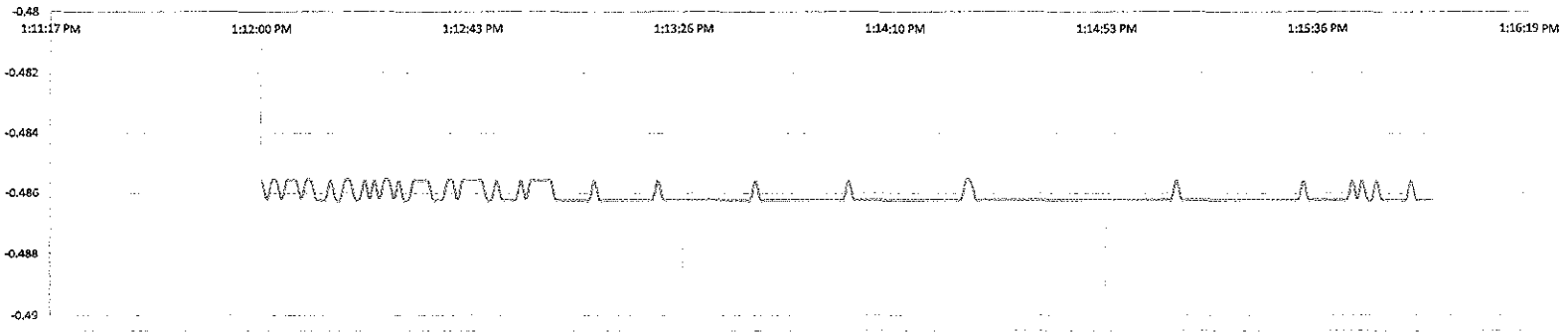
Enterprise 130 Amp Time 16:45 2017-08-07



DCP Midstream 9 Amps 11:56 2017-08-07

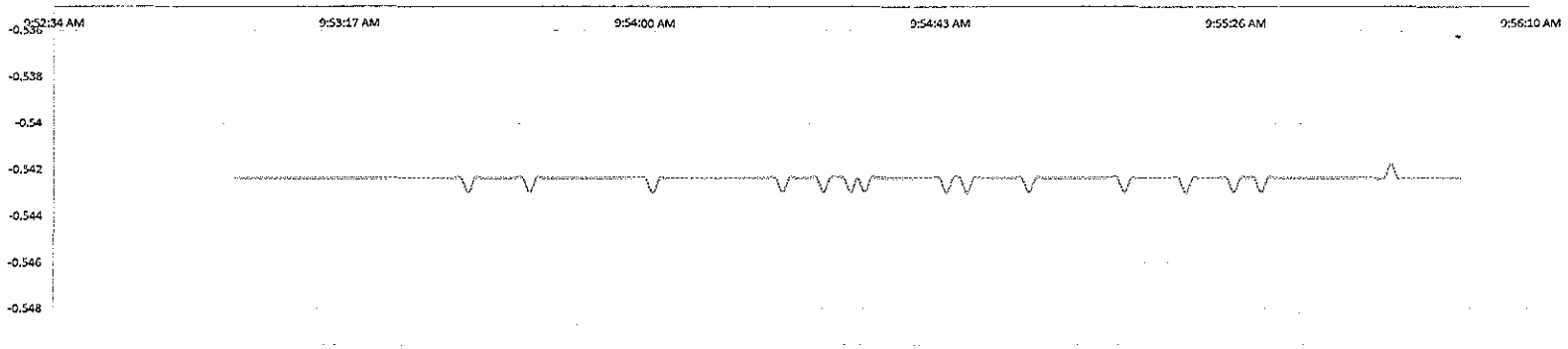


Enterprise Unk Amps Time 13:14 2017-08-07

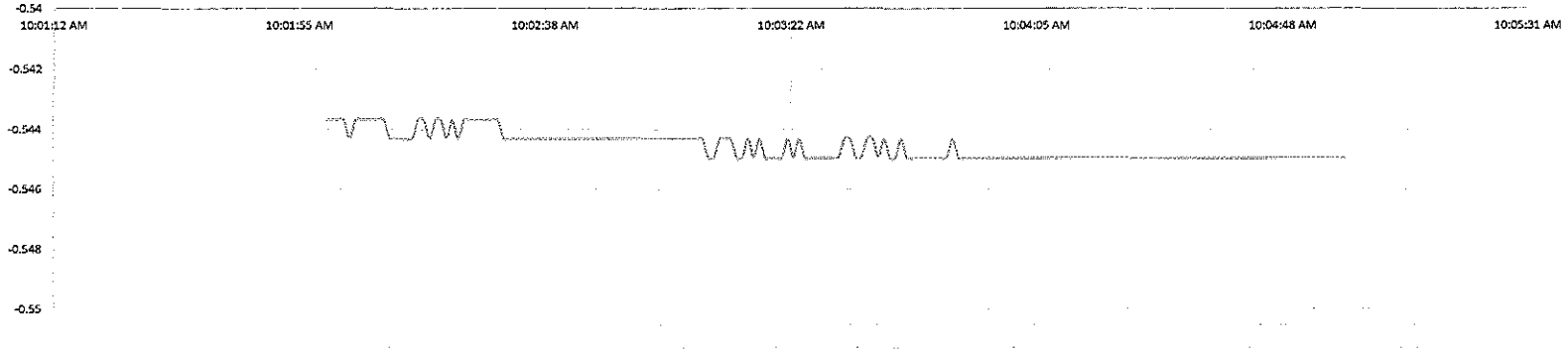


South Texas Water Authority
Test Station @ 926+47

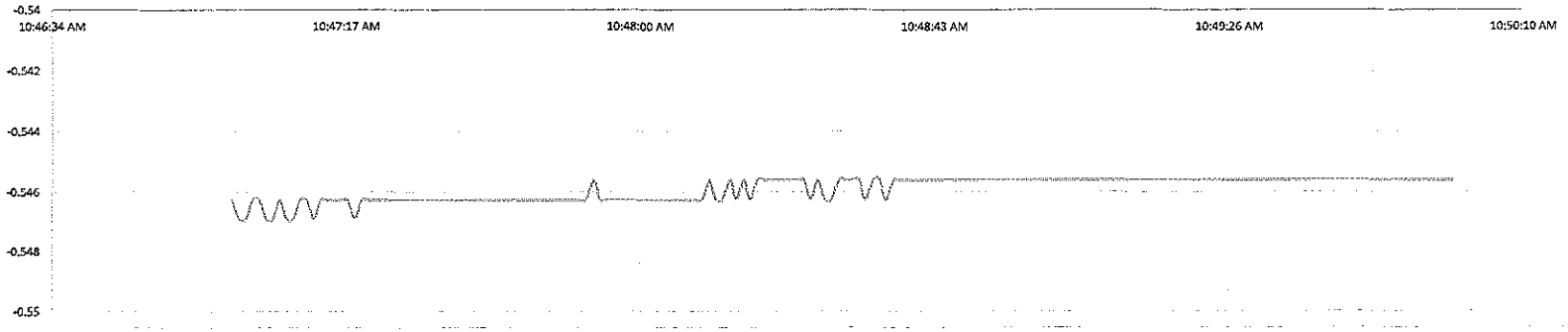
Air Liquide TR-10, 4.8A, 9:53-9:55 2017-10-10



Enterprise SN831216, 34.8A, 10:02-10:04 2017-10-10

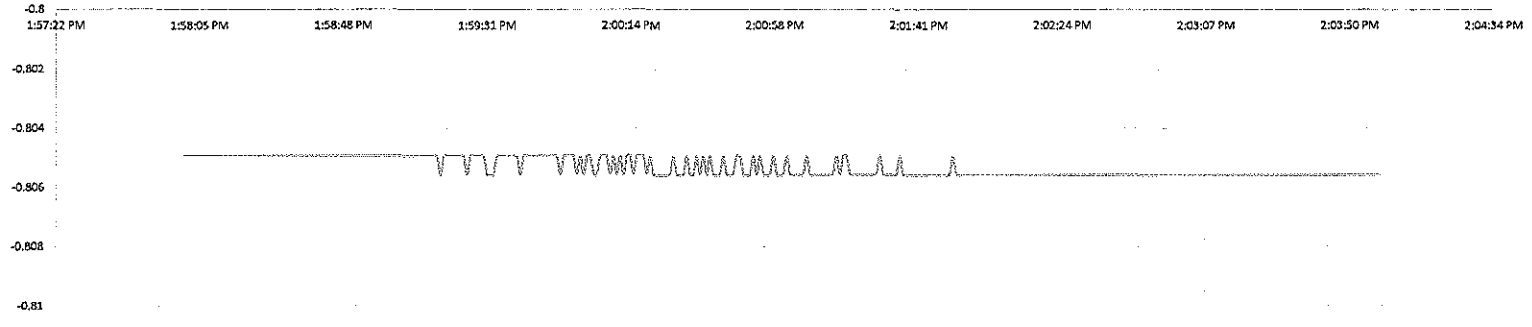


Celanese, 28.5 A, 10:47-10:49 2017-10-10

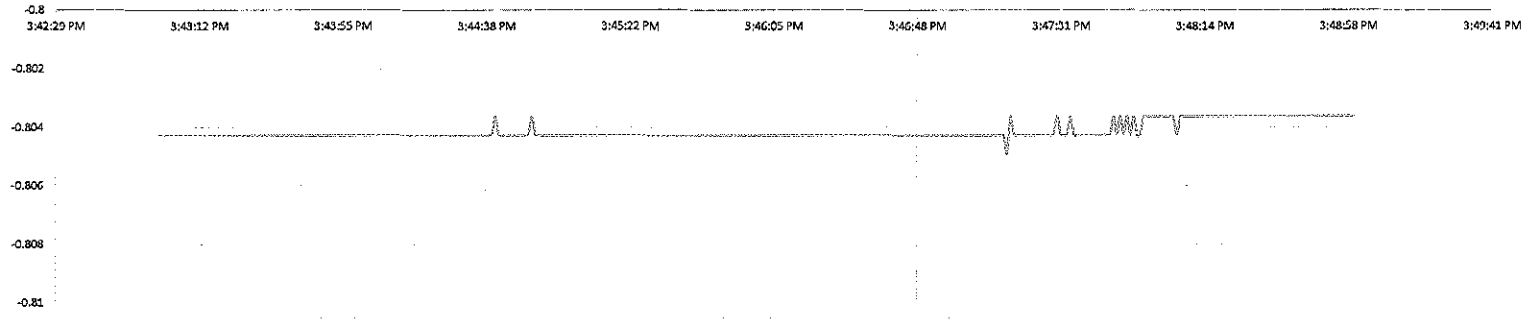


South Texas Water Authority
Test Station @ 981+47

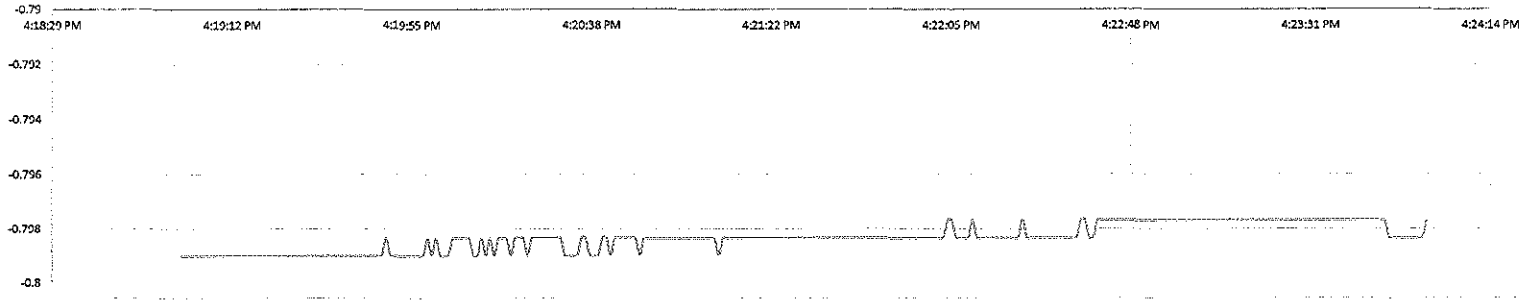
Air Liquide 4.9 Amps Time 14:01 2017-08-07



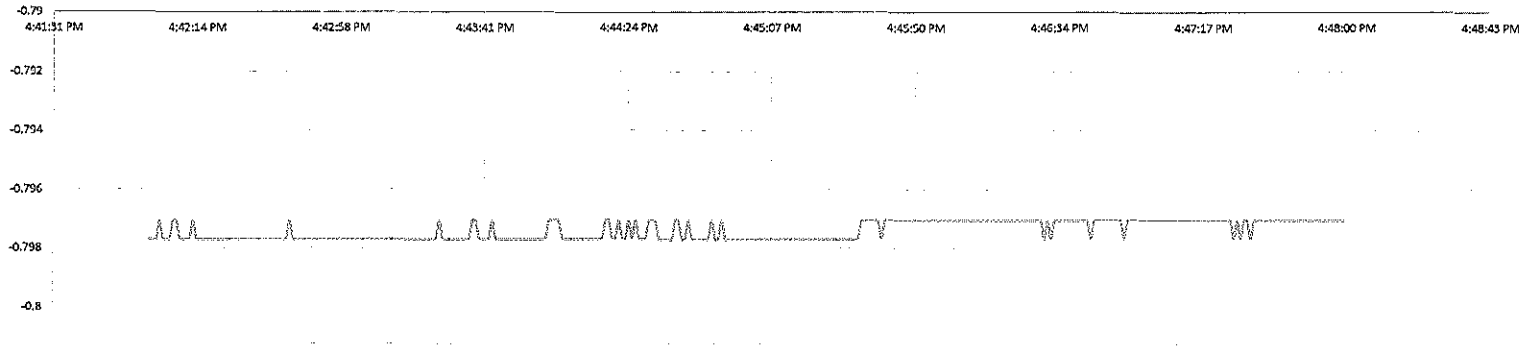
Enterprise 50 Amps Time 15:46 2017-08-07



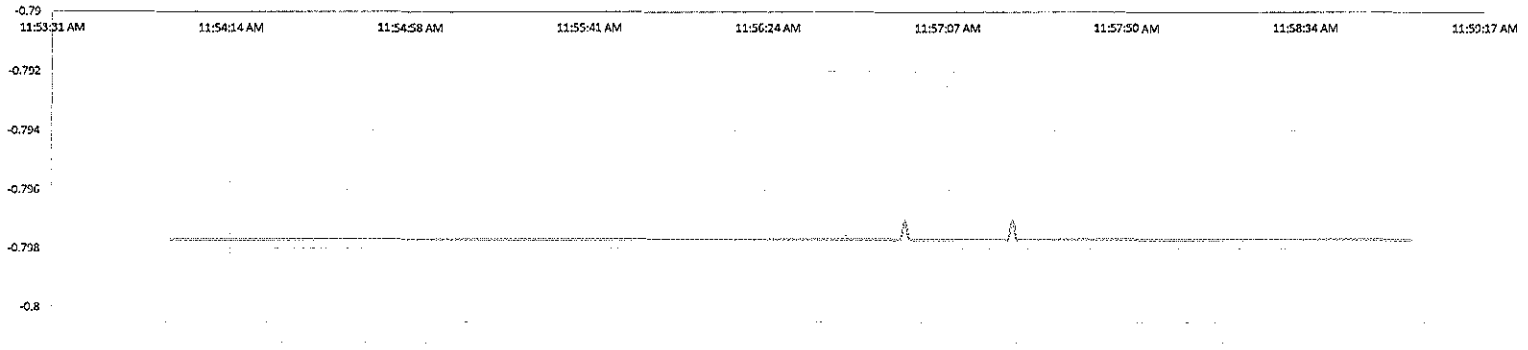
Enterprise 19 Amps Time 16:21 2017-08-07



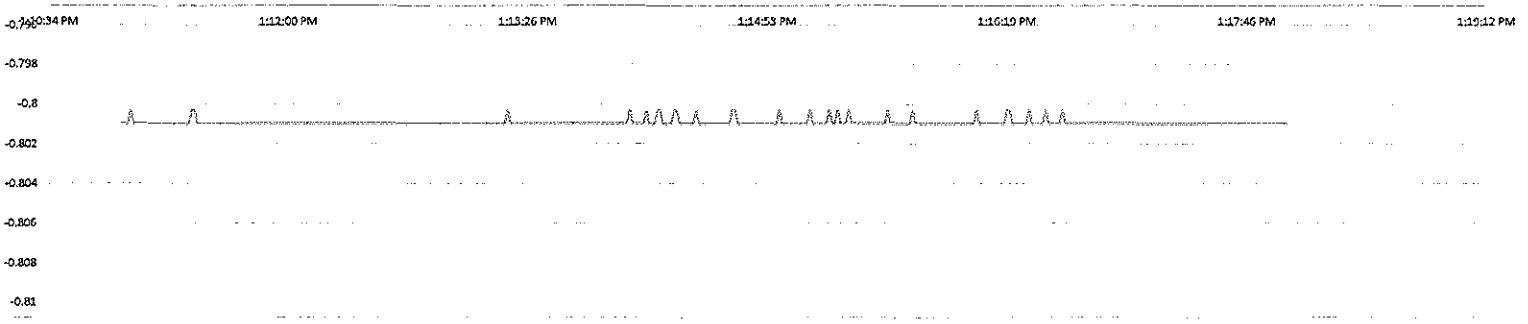
Enterprise 130 Amps Time 16:45 2017-08-07



DCP Midstream 9 Amps 8-9-17 Time 11:56 2017-08-07

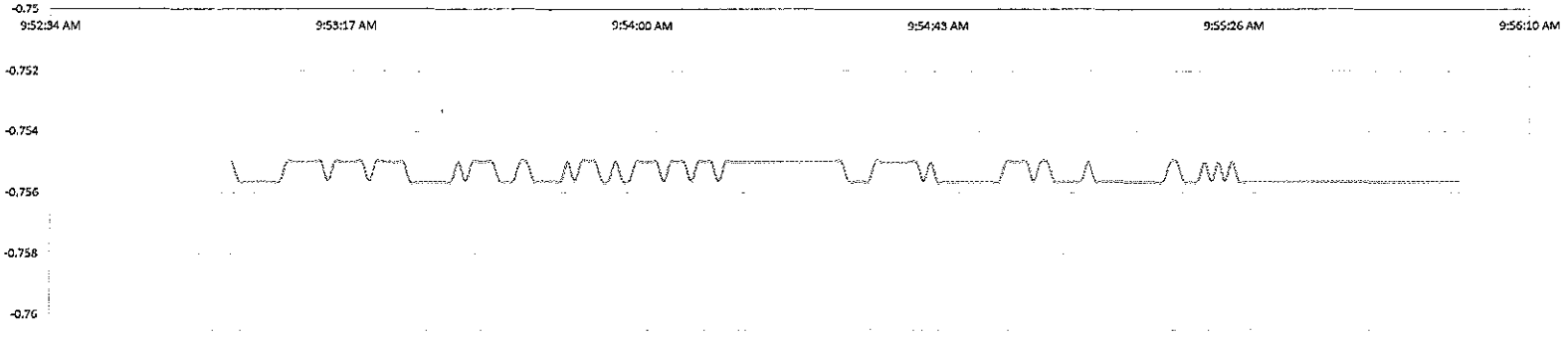


Enterprise Ukn Amps Time 13:14 2017-08-07

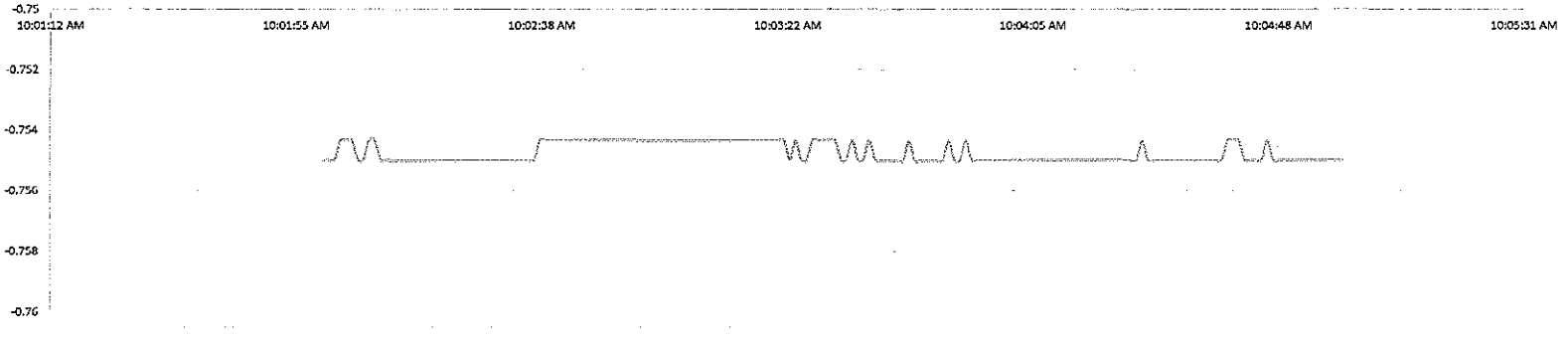


South Texas Water Authority
Test Station @ 981+47

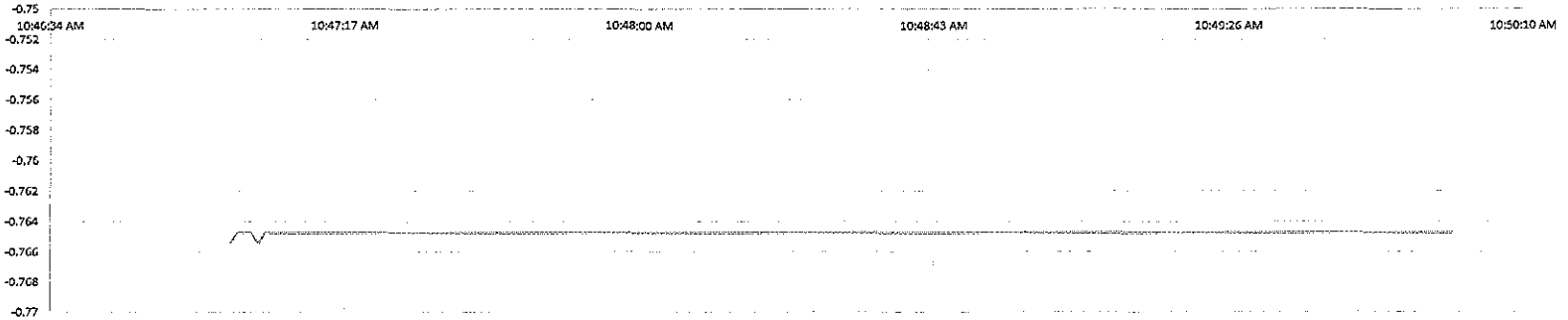
Air Liquide TR-10, 4.8A, 9:53-9:55 2017-10-10



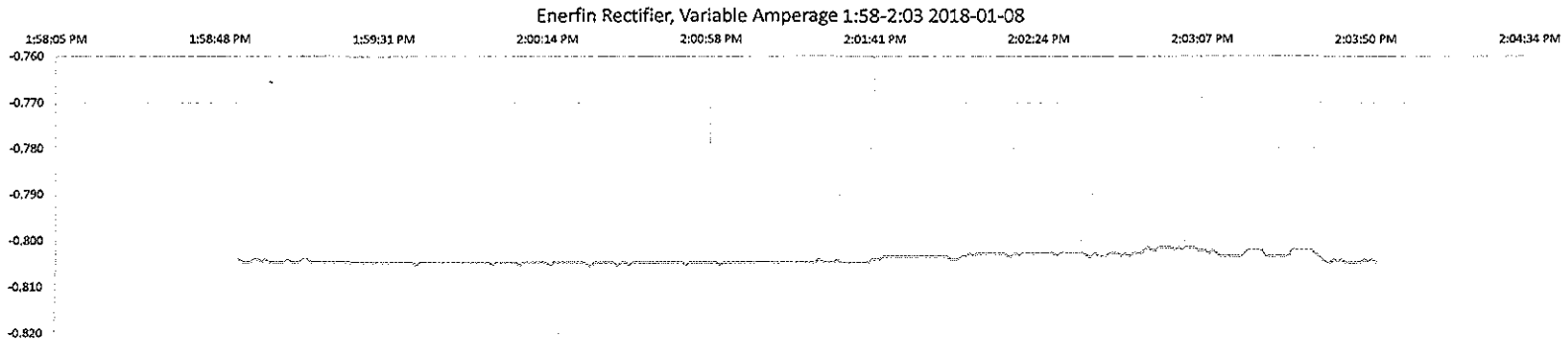
Enterprise SN 831216, 34.8A, 10:02-10:04 2017-10-10



Celanese, 28.5A, 10:47-10:49 2017-10-10

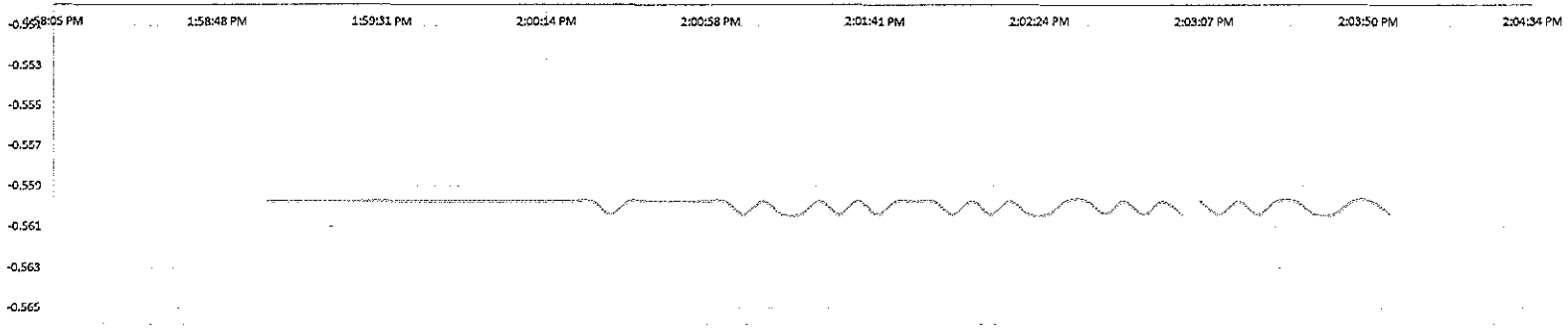


South Texas Water Authority
Test Station @ 981+47

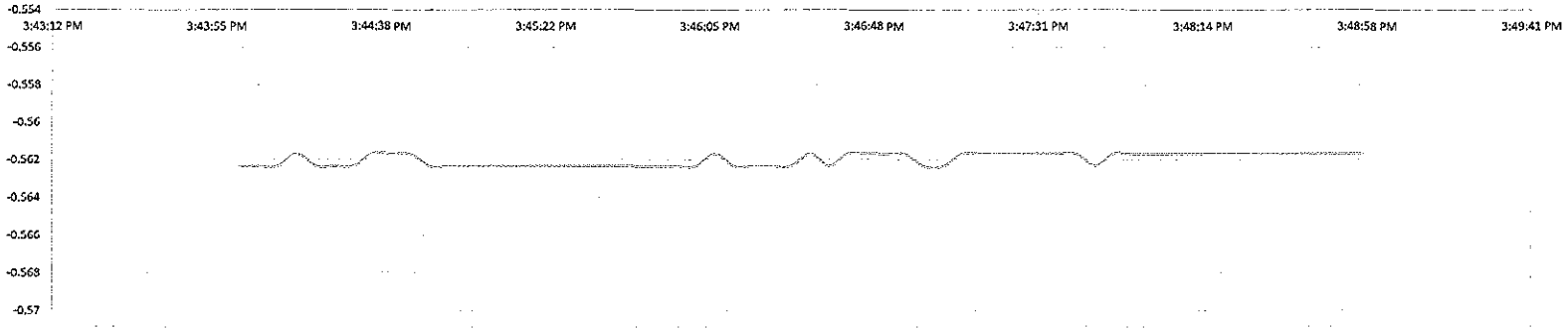


South Texas Water Authority
Test Station @ 993+47

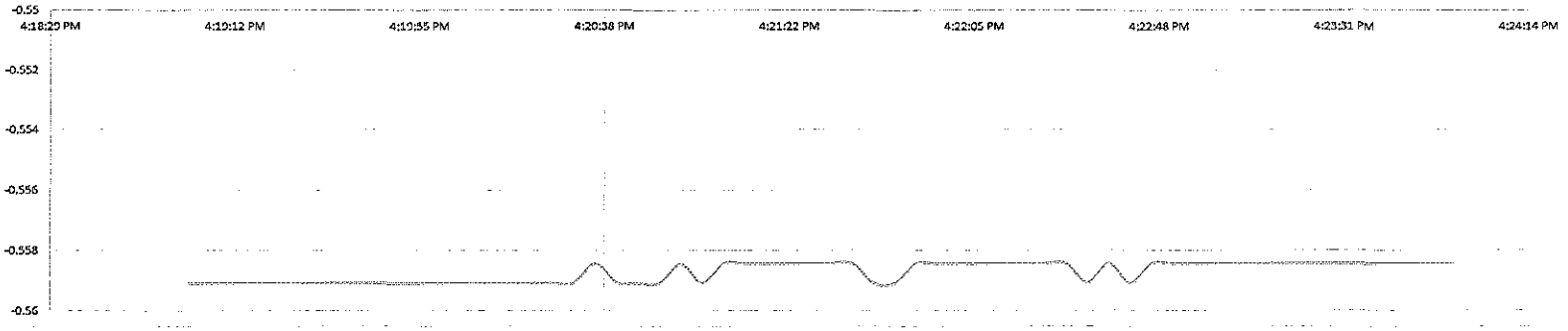
Air Liquide 4.9 Amps Time 14:01 2017-08-07



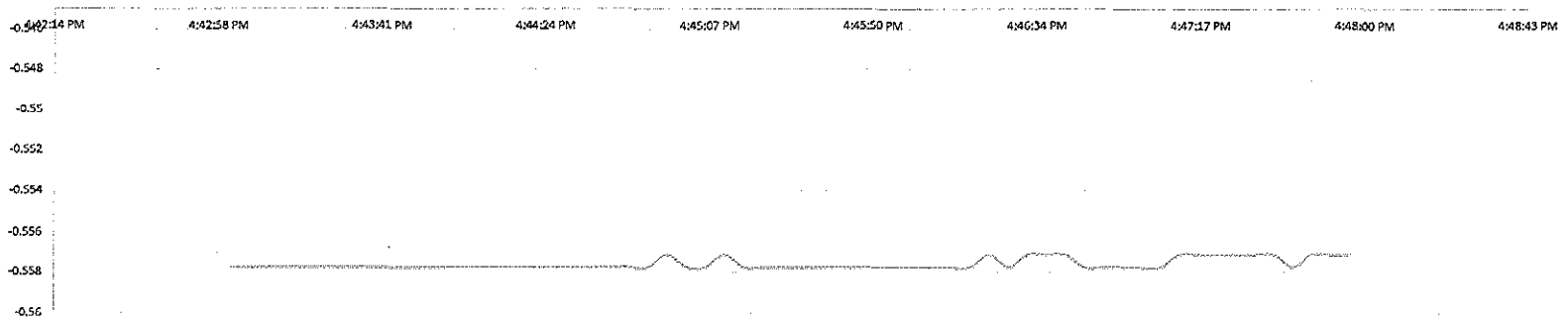
Enterprise 50 Amps Time 15:46 2017-08-07



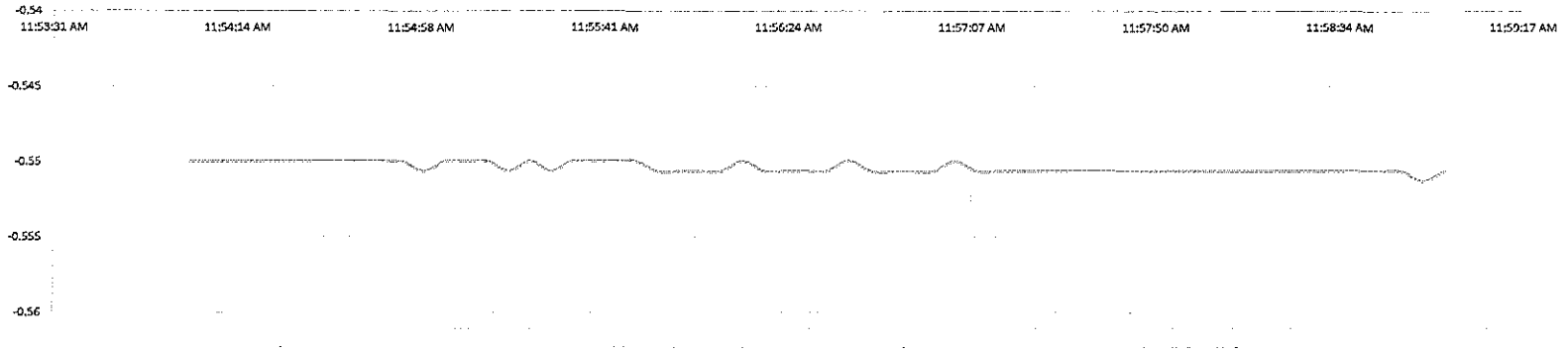
Enterprise 19 Amps Time 16:21 2017-08-07



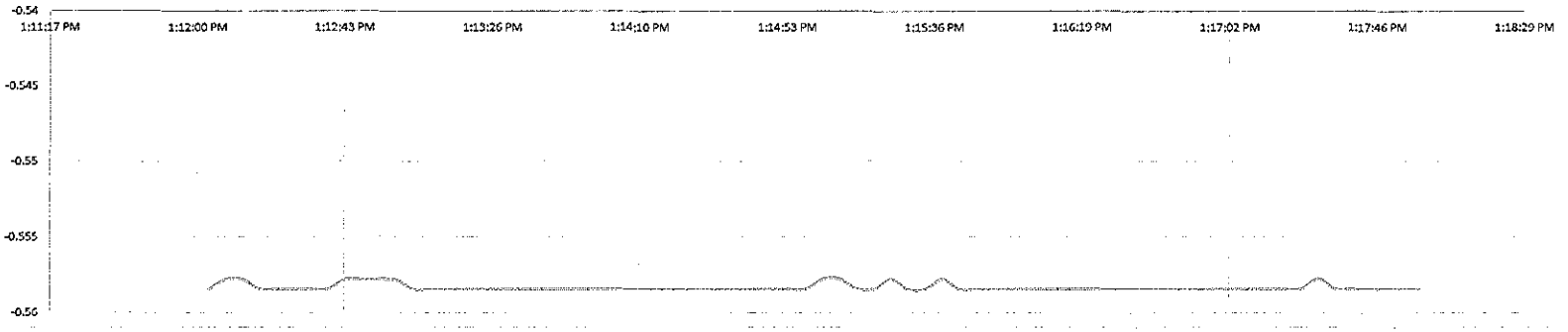
Enterprise 130 Amps Time 16:45 2017-08-07



DCP Midstream 9 Amps Time 11:56 2017-08-07

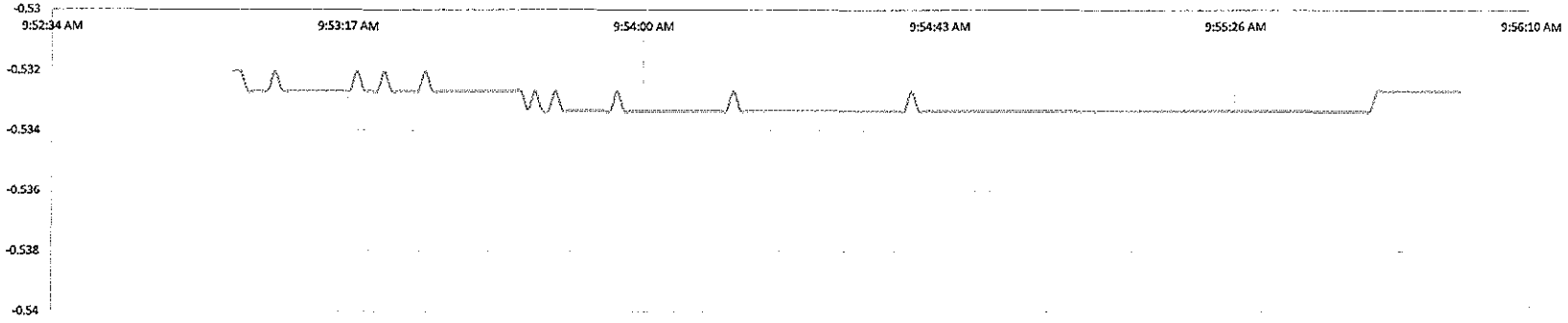


Enterprise Unk Amps Time 13:14 2017-08-07

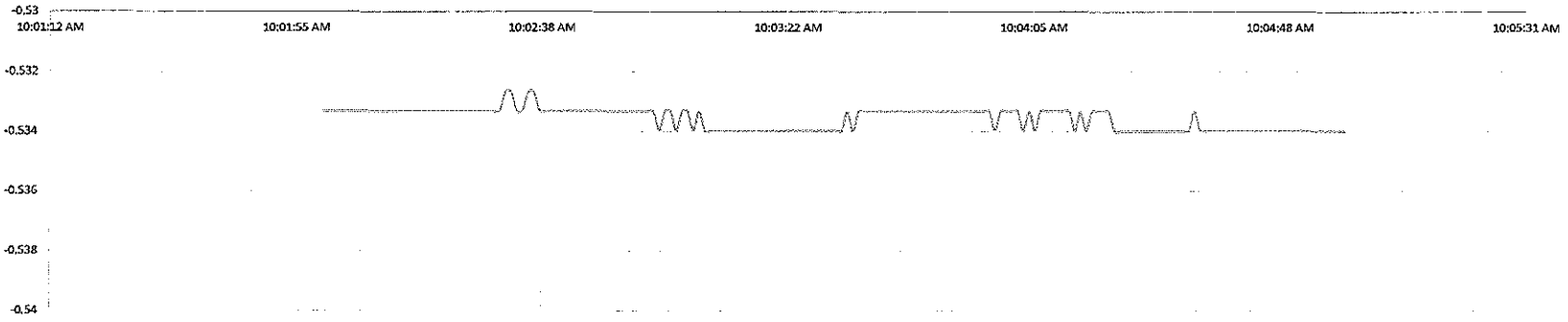


South Texas Water Authority
Test Station @ 993+47

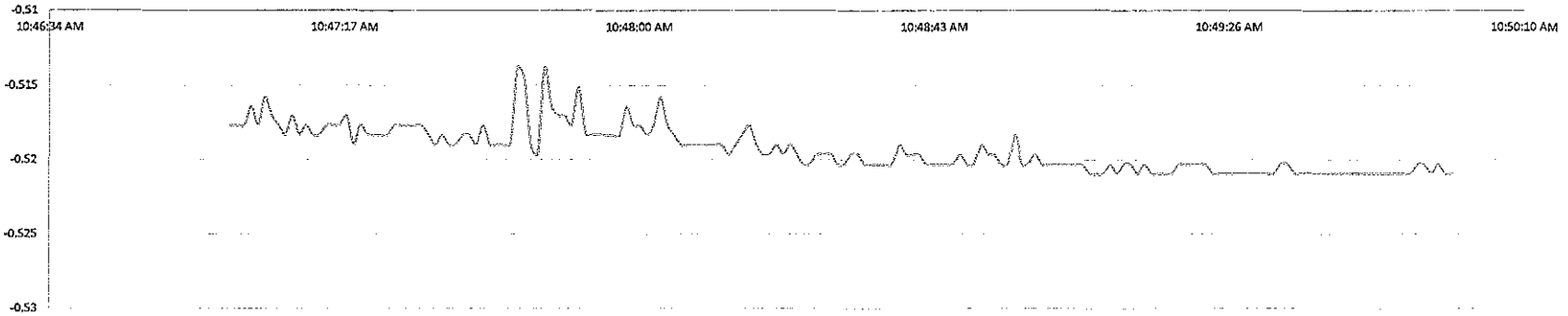
Air Liquide TR-10, 4.8A, 9:53-9:55 2017-10-10



Enterprise SN831216, 34.8A, 10:02-10:04 2017-10-10

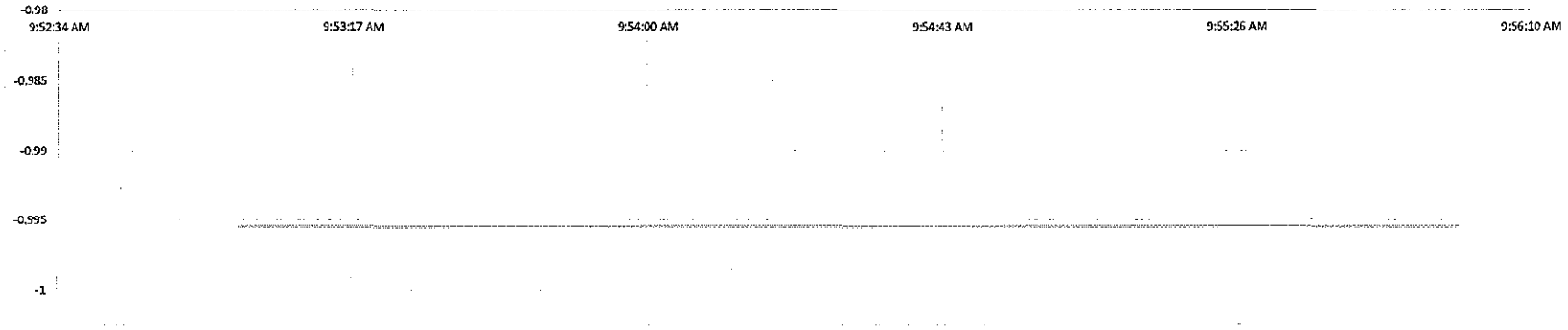


Celanese, 28.5A, 10:47-10:49 2017-10-10

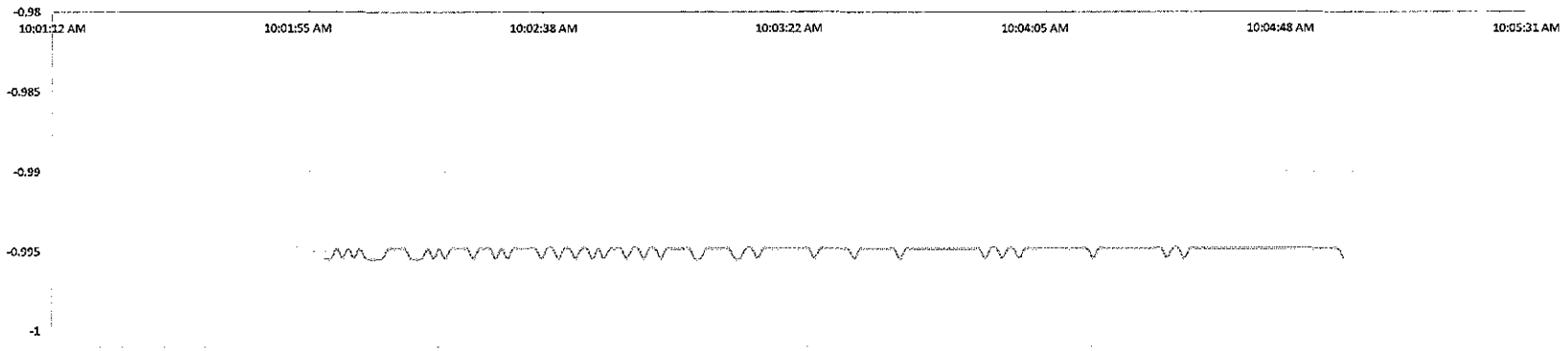


South Texas Water Authority
Test Station at 1391+34

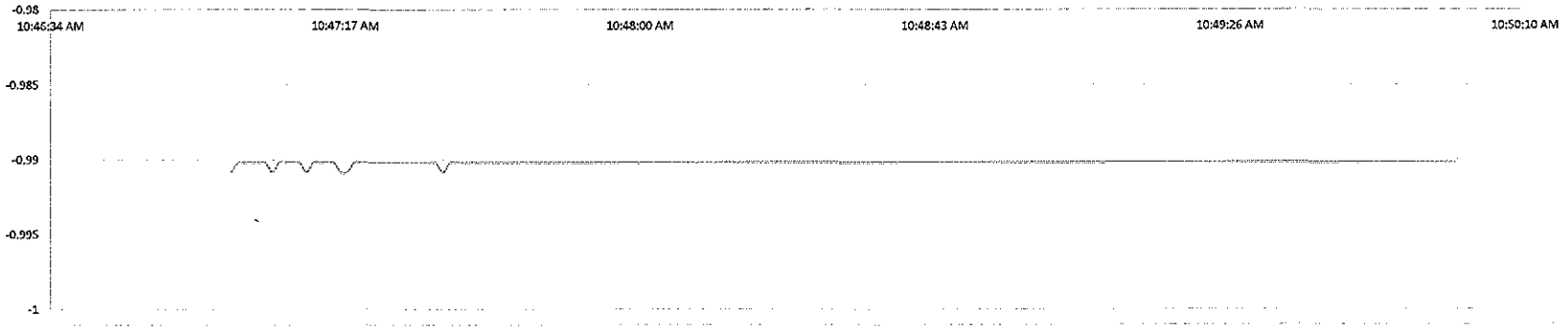
Air Liquide TR-10, 4.8A, 9:53-9:55 2017-10-10



Enterprise SN831216, 34.8A, 10:02-10:04 2017-10-10

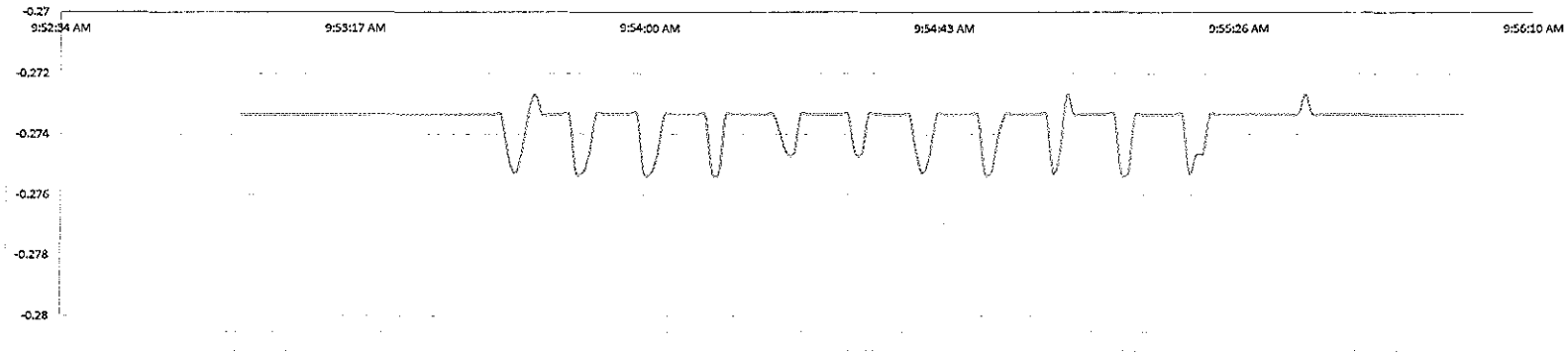


Celanese, 28.5A, 10:47-10:49 2017-10-10

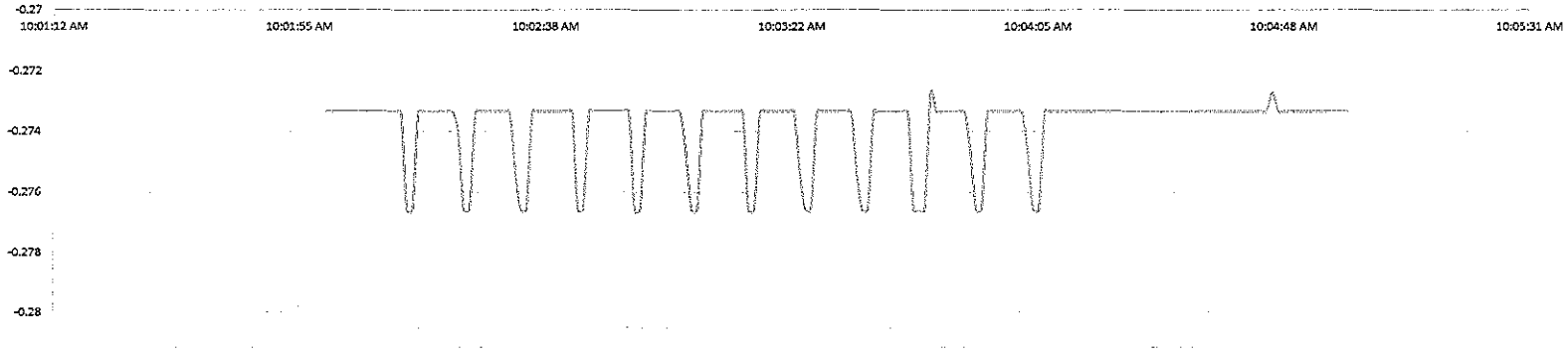


South Texas Water Authority
Test Station @ 1406+70

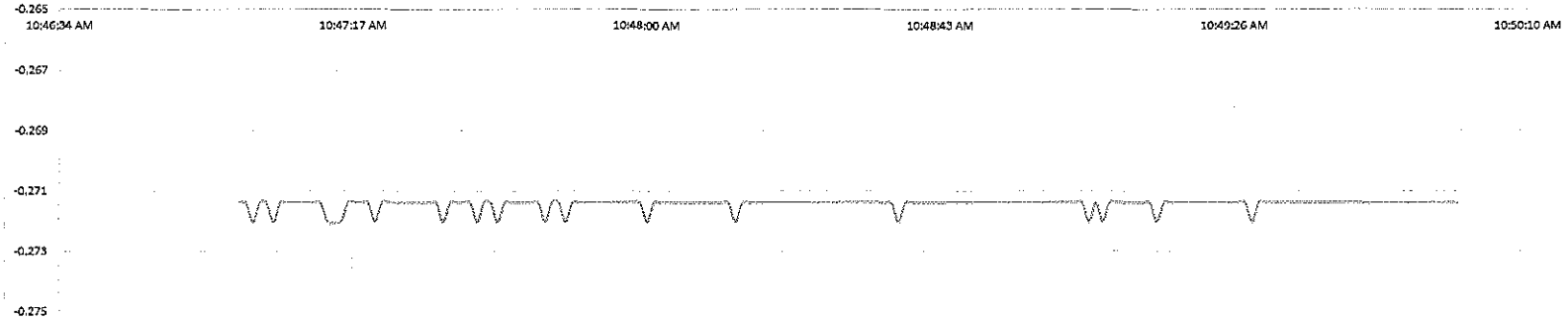
Air Liquide TR-10, 4.8A, 9:53-9:55 2017-10-10



Enterprise SN831216, 34.8A, 10:02-10:04 2017-10-10



Celanese, 28.5A, 10:47-10:49 2017-10-10



APPENDIX C

Aerial of Test Area


Air Liquide rectifier TR 10
Enterprise SN. 831216- 29 Amps
1406+70
1391+34
anquete
Banquete
Rabb
North San Pedro
Celanese rectifier Robstown
Robstown
Violet
993+47
Enerfin rectifier C-438A
981+47
926+47
Enterprise- 50 Amps
DCP Midstream
Tierra Grande
Driscoll
Petronila
© 2018 Google
Google earth

ATTACHMENT 7

Driscoll LAS Project

Memorandum

To: South Texas Water Authority Board of Directors
From: Carola G. Serrato, Executive Director
Date: January 19, 2018
Re: Driscoll Disinfection Booster Station – Conversion to Chloramination System

Background:

Enclosed is the latest information on the construction of the Driscoll LAS station. As of the 10th of January, there were a number of items on the attached Punch List that still needed to be corrected. Information was provided to Ms. Shay Roalson, HDR Engineering Inc. (HDR). Attached is a Notification of Delay to Mr. Sherrell Mercer, Mercer Controls, Inc. (Mercer). However, on January 15th, the LAS system was in operation. Mr. Jacob Hinojosa, O&M Supervisor, reviewed facilities several more times during the week of January 15th. Unfortunately, by Thursday, January 18th, the system again was not operational which staff believes is as a result of problems with tube fittings. Attached is the updated Punch List and email to Ms. Roalson. Field personnel should receive training on the system today, Friday, January 19th.

During the last meeting, the Board approved Pay Request #4 in the amount of $96,374.19 and Change Order #3 in the amount of $10,650.00 with an additional fourteen (14) contract days.

Analysis:

Last month staff reported that Mercer was unable to meet the substantially complete date and that this information was conveyed to the TCEQ. Staff and consultants will be reviewing the status of this project with TCEQ representatives on Monday, January 22nd.

Also enclosed are emails to Ms. Roalson regarding the timeline for submission of paperwork to STWA for approval during the January Board Meeting as well as my response to the latest correspondence from Mr. Mercer and the problem with the fittings.

Staff Recommendation:

At this time, this item is an update only. Staff doubts that any close-out paperwork will be available for approval by the Board meeting. Staff also doubts that a pay request will be submitted; however, in the event that occurs and with necessary approvals, this agenda item will allow for the Board to consider the matter.

Board Action:

Provide feedback to staff.

Summarization:

Staff is looking forward to this project being complete and fully operational. I had hoped that there would not be any issues requiring liquidated damages as mentioned in Ms. Roalson's notification letter. However, with the reoccurrence of the same problem, this issue may be an item for February's Board meeting.

mcgserrato@stwa.org

From:	Roalson, Shay <Shay.Roalson@hdrinc.com>
Sent:	Monday, January 15, 2018 3:10 PM
To:	mcgserrato@stwa.org
Cc:	Beroset, Shaun D.; Singer, Lisa; Dony Cantu; Frances Rosales; Jacob Hinojosa; Jo Ella Wagner
Subject:	RE: STWA Board Agenda - Mercer Pay Requests, Punch List, etc.

Thanks for the heads up, Carola.

I have reached out to Mr. Mercer and will let you know his response.

Shay Ralls Roalson, PE
D 512.912.5106 M 512.426.9847

Texas TBPE Firm No. F-754

From: mcgserrato@stwa.org [mailto:mcgserrato@stwa.org]
Sent: Monday, January 15, 2018 3:10 PM
To: Roalson, Shay
Cc: Beroset, Shaun D.; Singer, Lisa; Dony Cantu; Frances Rosales; Jacob Hinojosa; Jo Ella Wagner
Subject: STWA Board Agenda - Mercer Pay Requests, Punch List, etc.

Good Afternoon Shay,

This week is the time frame for STWA to prepare the Agenda and Agenda Packet for next week's STWA Board meeting on Tuesday, January 23rd.

I am wondering if any paperwork on the Driscoll LAS will be submitted by **Thursday afternoon** in time for the posting on Friday, January 19th.

STWA's next meeting is not until February 27th with information needed by Thursday afternoon, February 22nd.

Carola G. Serrato
Executive Director
South Texas Water Authority
PO Box 1701
Kingsville, Texas 78364
361-592-9323 x112

mcgserrato@stwa.org

From:	Roalson, Shay <Shay.Roalson@hdrinc.com>
Sent:	Thursday, January 11, 2018 5:06 PM
To:	mercercontrols@aol.com; s.gabrysch@mercercontrols.com; a.garza@mercercontrols.com
Cc:	Beroset, Shaun D.; Singer, Lisa; mcgserrato@stwa.org; jhinojosa@stwa.org; 'Dony Cantu'; 'Frances Rosales'; 'Jo Ella Wagner'
Subject:	RE: Punch List
Attachments:	STWA - Driscoll PS LAS - Notice of Delay.pdf

Sherrel –

As we discussed this afternoon, the substantial completion date for this project was December 24, 2017 and the final completion date is January 23, 2018. STWA has a call with TCEQ on January 22, and must be able to report that the system is fully functional.

Please see the attached notice of delay letter and advise on the specific steps Mercer will take to complete the project.

Thanks,
Shay

Shay Ralls Roalson, PE
D 512.912.5106 M 512.426.9847

Texas TBPE Firm No. F-754

From: mercercontrols@aol.com [mailto:mercercontrols@aol.com]
Sent: Monday, January 08, 2018 4:16 PM
To: Roalson, Shay; Beroset, Shaun D.; Singer, Lisa; mcgserrato@stwa.org; jhinojosa@stwa.org
Cc: s.gabrysch@mercercontrols.com; a.garza@mercercontrols.com; rickcornejo@me.com
Subject: Punch List

To all:

Punch list is in process, approximately 25% complete.

Subcontractor was on vacation over the holidays, but he is on site today.

The adapters to solve the leaks on the LAS hose arrived but incorrect on Thursday of last week, and the correct ones (we hope!) are to be arriving tomorrow and immediately be installed.

The electrician and his helper were out one week with the flu, and he is to be on site Thursday or Friday.

Pavement contractor has been limited by the weather, but will start as soon as possible.

On one of my own trips to the site I will provide added training to the STWA staff on the operation of the system.

We believe that the programming for the LAS system is complete; however, we would like to know from Jacob Hinojosa if the system was actively boosting the chlorine residual after we left the site two weeks ago.

Other miscellaneous items are on order, and we hope to finish by Friday of this week.

MERCER CONTROLS INC./S. A. Mercer Pres.

HDR

January 11, 2018

Mr. S.A. Mercer, President
Mercer Controls, Inc.
804 Apollo Drive
Edna, TX 77957

RE: South Texas Water Authority
Driscoll Pump Station LAS Chemical Feed System Addition
Notification of Delay

Dear Mr. Mercer:

According to the Notice to Proceed and subsequent change orders for the referenced Project, the Substantial and Final Completion dates are December 24, 2017 and January 23, 2018, respectively. At the present time, the Project has not reached Substantial Completion.

As you know, this project is the result of a TCEQ Order, and must be completed within the contractual time limits. The contractual liquidated damages per Section 00500 are $250 per day for each day that expires after the dates of both Substantial and Final Completion. Mercer Controls is hereby notified that the Authority reserves the right to assess liquidated damages for each day that the work is not completed in order to recover additional expenses.

To facilitate successful Project completion, please prepare and submit a revised Project Schedule to completion. The revised Project Schedule should include accurate dates for both Substantial and Final Completion to the best of the Contractor's current knowledge, including sufficient time for inspection of the work, punch list and project closeout.

Please call me at 512-912-5106 if you have any questions.

Sincerely,
HDR Engineering, Inc.

Shay Ralls Roalson

Shay Ralls Roalson, PE
Vice President

cc: Carola Serrato, Executive Director, South Texas Water Authority

hdrinc.com

4401 West Gate Blvd., Suite 400, Austin, TX 78745,
Suite 400, Austin, TX 78745-1469
T 512.912.5100 F 512.912.5158(512) 912-5100

Texas Registered Engineering Firm F-754

mcgserrato@stwa.org

From: Roalson, Shay <Shay.Roalson@hdrinc.com>
Sent: Thursday, January 11, 2018 4:47 PM
To: mcgserrato@stwa.org
Cc: Beroset, Shaun D.; Singer, Lisa; 'Dony Cantu'; 'Frances Rosales'; 'Jacob Hinojosa'; 'Jo Ella Wagner'
Subject: RE: Mercer Punch List

Carola –

I double-checked the agreement and it states $250 per day. I will add the language about the TCEQ Order.

I just got off the phone with Mr. Mercer. I informed him that we would be sending a notice of delay letter. He stated that the LAS system is ready to be put on-line now. If that's not the case (based on the pictures Jacob emailed me this afternoon), we may need a call with Mercer tomorrow to hash through the punch list. Sherrel assured me that they are diligently working to complete the punch list, and he will respond promptly to the delay letter.

Regarding HDR additional work, Mercer has required more involvement from us throughout the project than we budgeted, but we do not intend to ask STWA for additional funding.

Thanks,
Shay

Shay Ralls Roalson, PE
D 512.912.5106 M 512.426.9847

Texas TBPE Firm No. F-754

From: mcgserrato@stwa.org [mailto:mcgserrato@stwa.org]
Sent: Thursday, January 11, 2018 3:27 PM
To: Roalson, Shay
Cc: Beroset, Shaun D.; Singer, Lisa; 'Dony Cantu'; 'Frances Rosales'; 'Jacob Hinojosa'; 'Jo Ella Wagner'
Subject: RE: Mercer Punch List

Shay,

Double-checking – is it $250 or $500 per day? Also, it may be appropriate to point out the fact that Mr. Mercer is aware that this project is as a result of the TCEQ Order.

I also don't want to get into a situation as with the Driscoll PS expansion project when HDR felt it had additional work as a result of going over the deadline. Mr. Mercer was not charged LD's then; but, I believe the STWA Board will not be accommodating again.

Otherwise, the letter looks fine.

Carola

Carola G. Serrato
Executive Director
South Texas Water Authority
PO Box 1701

Kingsville, Texas 78364
361-592-9323 x112

From: Roalson, Shay [mailto:Shay.Roalson@hdrinc.com]
Sent: Thursday, January 11, 2018 2:48 PM
To: mcgserrato@stwa.org
Cc: Beroset, Shaun D. <Shaun.Beroset@hdrinc.com>; Singer, Lisa <Lisa.Singer@hdrinc.com>; Dony Cantu <dcantu@stwa.org>; Frances Rosales <fvrosales@stwa.org>; Jacob Hinojosa <jhinojosa@stwa.org>; Jo Ella Wagner <jwagner@stwa.org>
Subject: RE: Mercer Punch List

Carola –

Thanks for the follow up. Per Change Order No. 3, the final completion deadline is January 23, but the substantial completion deadline was December 24. I have drafted the attached notice of delay letter. With your approval, I will call Mr. Mercer to let him know it is coming, then sign and send it.

LDs to date would be $4,500 if STWA chose to assess them.

Thanks,
Shay

Shay Ralls Roalson, PE
D 512.912.5106 M 512.426.9847

Texas TBPE Firm No. F-754

From: mcgserrato@stwa.org [mailto:mcgserrato@stwa.org]
Sent: Thursday, January 11, 2018 1:56 PM
To: Roalson, Shay
Cc: Beroset, Shaun D.; Singer, Lisa; Dony Cantu; Frances Rosales; Jacob Hinojosa; Jo Ella Wagner
Subject: Mercer Punch List

Shay,

Just a quick follow-up on the Driscoll LAS project. Since our last conversation, there still are quite a few items that are not addressed, most important is that the LAS system is still not operating.

Attached is the Punch list with Jacob's signature on the six (6) out of thirty-two (32) items that have been addressed. Although Item 15 is actually not operating as it should.

I believe the deadline is January 16th. Do we need to begin discussions about LD's?

BTW, our next conference call with the TCEQ on the Enforcement Order is January 22 at 10 a.m.

Carola

Carola G. Serrato
Executive Director
South Texas Water Authority
PO Box 1701

Punch List

Owner:	**South Texas Water Authority**	Date:	**December 18, 2017**
Project Name:	**Driscoll Pump Station LAS Improvements**	Contractor:	**Mercer Controls**
Individuals Present:	**Shay Roalson (HDR), Jacob Hinojosa (STWA), Dony Cantu (STWA), Sherrel Mercer (Mercer), John Gross**	HDR Project No.:	**10031798**

On December 18, 2017, a walk through was conducted at the Driscoll Pump Station. The following punch list was developed as a result of that walk through. This is not an exhaustive list of items to be completed, and items may be added to this list if deemed necessary in the future.

Location	Item No.	Action Required	Signed Off Name/Date	Remarks
LAS Building	1	Install phenolic labels on LAS pumps, adjacent to injection tubing and on exterior electrical boxes	1-10-18	
LAS Building	2	Replace crimped hose.		
LAS Building	3	Tighten piping/tubing connections to stop leaks		
LAS Building	4	Complete the connections to the LAS drum		
LAS Building	5	Cut down the legs on the ramp to match the drum height	1-10-18	
LAS Building	6	Remove and dispose of trash		
LAS Building	7	Fill eyewash and remove and dispose of plastic cover	1-10-18	
LAS Building	8	Provide training on LAS system operation		
Chlorine one-ton cylinder	9	Complete installation of regulator vent tubing – coordinate with Owner		
Chlorine one-ton cylinder	10	Fabricate and install cover over regulator – coordinate with Owner		
Chlorine one-ton cylinder	11	Adjust cover and/or scale installation to provide 12 inches overhang on either end of the cylinder		
Chlorine one-ton cylinder	12	Furnish and install FRP sun screen over scale indicator		
Chlorine one-ton cylinder	13	Adjust unistrut installation so bollards protect scale indicator and piping.		
Chlorine one-ton cylinder	14	Protect heater power cord and chlorine gas tubing		

Location	Item No.	Action Required	Signed Off Name/Date	Remarks
Control panel	15	Adjust readout to provide 2 digits after the decimal for the ammonia concentration	1-10-18	Does have 2 digits but always goes back to .00
Control panel	16	Use consistent units throughout (eg, use mg/L in place of PPM)	1-10-18	
Control panel	17	Make tabs at the top of each screen consistent between screens	1-10-18	
Control panel	18	Provide training on controls system		
Site	19	Remove and dispose of trash		
Site	20	Complete pavement repair		
Site	21	Provide keys to yard hydrants		
Vault 1	22	Install brass plug for unused tap		
Vault 2	23	Tidy and band cables for flow meter, remove extra cables		
Vault 2	24	Cap unused conduit, both ends		
Vault 3	25	Install brass plug for unused tap		
Vault 3	26	Replace "Sewer" manhole cover with "Water" manhole cover		
Off-site Vault	27	Seal core drilled hole in vault slab per CPR 1-REV		
Off-site Vault	28	Securely mount pipe inside vault to vault wall		
Off-site Vault	29	Replace any schedule 40 PVC pipe with schedule 80 PVC pipe		
Off-site Vault	30	Confirm backflow preventer is properly installed inside vault		
Off-Site Vault	31	Adjust yard hydrant so discharge is 12 inches above the slab		
Off-Site Vault	32	Complete pavement repair		

Checked on 1-10-18.

MERCER CONTROLS, INC.

804 Apollo Drive/P O Box 777
Edna, Texas 77957-0777
Phone: 361 782-7168 Fax: 782-7706

S. A. Mercer, P. E.
361 782-5678

January 17, 2018

South Texas Water Authority
c/o HDR Incorporated
4401 West Gate Blvd Suite 400
Austin, TX 78745

Attn: Shay Ralls Roalson, P.E.

Re: Driscoll LAS Project

Mercer Controls has received your letter of January 11, 2018, in which we were notified that the point of substantial completion on the project has not yet been reached. The targeted date for substantial completion was December 24, 2017.

As of December 19, 2018, all critical functions of the system were operational and demonstrated. However, there was a problem with the fittings that were used to connect some of the hoses carrying the liquid ammonium sulphate (LAS). It was impossible to seal the fittings and stop leaks of chemical, and the system operator stopped the feeding of LAS within 48 hours.

12th. Replacement fittings were ordered–twice–and installed finally on Wednesday January 10, 2018. Availability of the replacement fittings was affected by the extended holiday period. After checking for leaks over a two-day period, our subcontractor identified to the staff of the STWA on Friday January 14 that he was placing the LAS feed system in automatic operation. The system has operated without any adverse events since then.

The date of substantial completion may defined either as December 19 or January 12.

Please note that the LAS and chlorine feed systems must rely on information received from the Hach CL-17 automatic chlorine analyzer that is located within the building that contains the mainline chlorine feed equipment. If the analyzer is not working, the calculated dosage added to the stream of water flow will be incorrect. There have been periods of time when the analyzer was not giving correct information.

As of the date of this letter, only minor cosmetic items remain to be done. A separate list will be forwarded to you. The list includes items that were not on the "punch list" but which we feel are necesssary for the completion of the project.

We also will provide a final Project Schedule.

We acknowledge the authority of the STWA to invoke the penalty clause if appropriate.

Respectfully submitted:

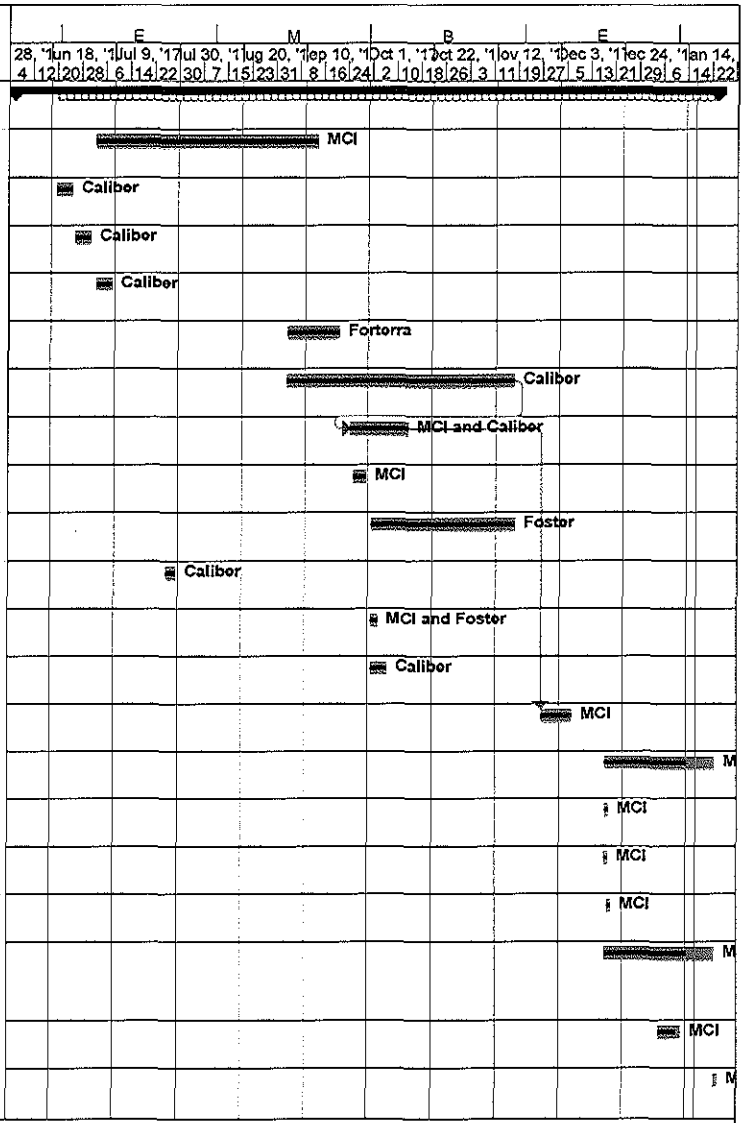
MERCER CONTROLS INC.

SAMercer

S. A. Mercer Pres.

cc: Carola Serrato, STWA

ID	Task Name	Duration	Start	Finish	Predecess	Resource Names
1	**Driscoll Pump Station Expansion**	**232 days**	**Tue 6/6/17**	**Tue 1/23/18**		
2	Submittal Processing Time	73 days	Mon 7/3/17	Wed 9/13/17		MCI
3	Chlorination Building Slab	5 days	Tue 6/20/17	Sat 6/24/17		Caliber
4	1 Ton Clorine and Cover Slab	5 days	Mon 6/26/17	Fri 6/30/17		Caliber
5	Temporary Fencing	5 days	Mon 7/3/17	Fri 7/7/17		Caliber
6	Tap Saddle and Hot Tapping	17 days	Mon 9/4/17	Wed 9/20/17		Forterra
7	Installations and Relocations of Vaults	75 days	Mon 9/4/17	Fri 11/17/17		Caliber
8	Installation of Chlorine Building	19 days	Mon 9/25/17	Fri 10/13/17	7	MCI and Caliber
9	Booster Pump Installation	4 days	Tue 9/26/17	Fri 9/29/17		MCI
10	Electrical to Pump and Control Panel	47 days	Mon 10/2/17	Fri 11/17/17		Foster
11	Sidewalk and Track Installation	3 days	Wed 7/26/17	Fri 7/28/17		Caliber
12	Control Panel Installation	2 days	Mon 10/2/17	Tue 10/3/17		MCI and Foster
13	Permanent Fencing	5 days	Mon 10/2/17	Fri 10/6/17		Caliber
14	Chlorination Building Startup and Commissioning	10 days	Mon 11/27/17	Wed 12/6/17	8	MCI
15	Startup and Training	36 days	Mon 12/18/17	Mon 1/22/18		MCI
16	Performance Verification	1 day	Mon 12/18/17	Mon 12/18/17		MCI
17	Inspection	1 day	Mon 12/18/17	Mon 12/18/17		MCI
18	Substantial Completion	1 day	Tue 12/19/17	Tue 12/19/17		MCI
19	Punch List (Auto Dialer, 1-Ton Cover Door, Pavement as of 1-17-2018)	36 days	Mon 12/18/17	Mon 1/22/18		MCI
20	O&M Manual	7 days	Fri 1/5/18	Thu 1/11/18		MCI
21	**Final Completion**	1 day	Tue 1/23/18	Tue 1/23/18		MCI



Project: Driscoll Pump Station Exp.	Task	External Tasks	Duration-only	External Tasks	
Date: Wed 1/17/18	Split	External Milestone	Manual Summary Rollup	External Milestone	
	Milestone	Inactive Milestone	Manual Summary	Progress	
	Summary	Inactive Summary	Start-only	Deadline	
	Project Summary	Manual Task	Finish-only		

Note: Time for purchasing is accomplished before stated installation time.

mcgserrato@stwa.org

From:	mcgserrato@stwa.org
Sent:	Thursday, January 18, 2018 4:25 PM
To:	Roalson, Shay
Cc:	Singer, Lisa; Beroset, Shaun D.; Dony Cantu (dcantu@stwa.org); Frances Rosales; Jacob Hinojosa; Jo Ella Wagner
Subject:	FW: Driscoll Punch List 1-18-18
Attachments:	Driscoll Punch List 01182018.pdf
Importance:	High

Tracking:

Recipient	Read
Roalson, Shay	Read: 1/18/2018 6:57 PM
Singer, Lisa	
Beroset, Shaun D.	
Dony Cantu (dcantu@stwa.org)	
Frances Rosales	
Jacob Hinojosa	
Jo Ella Wagner	
Frances Rosales-De Leon	Read: 1/18/2018 5:04 PM

Shay,

Per my voice mail message earlier, attached is an updated Driscoll LAS Project Punch list. You will note that the system is not working again due to the same problem as before, namely the fittings do not appear to be providing a proper seal.

As I mentioned in my voice mail, I take exception to Mr. Mercer's comment in his letter of 1-17-2018 in which he states that STWA received notice on Friday, January 14 [sic] that the system was operating. STWA did not receive notice on Friday January 12th nor Saturday January 14th.

Additionally, there are Mercer employees in our office this afternoon indicating that they have until tomorrow to install equipment that is needed for a dedicated telephone line which we believe is for some type of auto-dialer. STWA was not informed that we needed to make arrangements for a telephone line.

Carola

Carola G. Serrato
Executive Director
South Texas Water Authority
PO Box 1701
Kingsville, Texas 78364
361-592-9323 x112

From: Jacob Hinojosa [mailto:jhinojosa@stwa.org]
Sent: Thursday, January 18, 2018 4:11 PM

To: mcgserrato@stwa.org
Subject: Driscoll Punch List 1-18-18

Punch List

Owner:	**South Texas Water Authority**	Date:	**December 18, 2017**
Project Name:	**Driscoll Pump Station LAS Improvements**	Contractor:	**Mercer Controls**
Individuals Present:	**Shay Roalson (HDR), Jacob Hinojosa (STWA), Dony Cantu (STWA), Sherrel Mercer (Mercer), John Gross**	HDR Project No.:	**10031798**

On December 18, 2017, a walk through was conducted at the Driscoll Pump Station. The following punch list was developed as a result of that walk through. This is not an exhaustive list of items to be completed, and items may be added to this list if deemed necessary in the future.

Location	Item No.	Action Required	Signed Off Name/Date	Remarks
LAS Building	1	Install phenolic labels on LAS pumps, adjacent to injection tubing and on exterior electrical boxes	1-10-18	
LAS Building	2	Replace crimped hose.	1-18-18	
LAS Building	3	Tighten piping/tubing connections to stop leaks	1-18-18	Fittings have been replaced but leak has not been addressed. 1-18-18
LAS Building	4	Complete the connections to the LAS drum		This connection is getting air - 1-18-18 — Turned off
LAS Building	5	Cut down the legs on the ramp to match the drum height	1-10-18	
LAS Building	6	Remove and dispose of trash	1-18-18	
LAS Building	7	Fill eyewash and remove and dispose of plastic cover	1-10-18	
LAS Building	8	Provide training on LAS system operation		Scheduled on Fri 1-19-18
Chlorine one-ton cylinder	9	Complete installation of regulator vent tubing – coordinate with Owner	1-18-18	Mercer mentions a pin or same sort to keep hose in place.
Chlorine one-ton cylinder	10	Fabricate and install cover over regulator – coordinate with Owner		Broken?
Chlorine one-ton cylinder	11	Adjust cover and/or scale installation to provide 12 inches overhang on either end of the cylinder		
Chlorine one-ton cylinder	12	Furnish and install FRP sun screen over scale indicator	1-18-18	
Chlorine one-ton cylinder	13	Adjust unistrut installation so bollards protect scale indicator and piping.	1-18-18	scale w. piping?
Chlorine one-ton cylinder	14	Protect heater power cord and chlorine gas tubing	1-18-18	is more needed?

Location	Item No.	Action Required	Signed Off Name/Date	Remarks
Control panel	15	Adjust readout to provide 2 digits after the decimal for the ammonia concentration	1-10-18	Does have 2 digits but always goes back to .00
Control panel	16	Use consistent units throughout (eg, use mg/L in place of PPM)	1-10-18	
Control panel	17	Make tabs at the top of each screen consistent between screens	1-10-18	
Control panel	18	Provide training on controls system		
Site	19	Remove and dispose of trash	1-18-18	
Site	20	Complete pavement repair		
Site	21	Provide keys to yard hydrants		
Vault 1	22	Install brass plug for unused tap		PVC? 1-18-18
Vault 2	23	Tidy and band cables for flow meter, remove extra cables	1-18-18	
Vault 2	24	Cap unused conduit, both ends		
Vault 3	25	Install brass plug for unused tap		PVC? 1-18-18
Vault 3	26	Replace "Sewer" manhole cover with "Water" manhole cover	1-18-18	Has no labeling.
Off-site Vault	27	Seal core drilled hole in vault slab per CPR 1-REV	1-18-18	
Off-site Vault	28	Securely mount pipe inside vault to vault wall	1-18-18	
Off-site Vault	29	Replace any schedule 40 PVC pipe with schedule 80 PVC pipe	1-18-18	
Off-site Vault	30	Confirm backflow preventer is properly installed inside vault	1-18-18	Has (2) in line checks.
Off-Site Vault	31	Adjust yard hydrant so discharge is 12 inches above the slab	1-18-18	
Off-Site Vault	32	Complete pavement repair		

Checked on 1-10-18.
Checked on 1-18-18

mcgserrato@stwa.org

From:	mercercontrols@aol.com
Sent:	Friday, January 19, 2018 11:47 AM
To:	Shay.Roalson@hdrinc.com; a.garza@mercercontrols.com; s.gabrysch@mercercontrols.com
Cc:	Lisa.Singer@hdrinc.com; Shaun.Beroset@hdrinc.com; jhinojosa@stwa.org; rickcornejo@me.com; mcgserrato@stwa.org
Subject:	Re: RE: 1-17-18 Driscoll Schedule and Driscoll LAS Substantial Completion

Shay:

When the leaks were fixed on the LAS piping on Wednesday January 10, the subcontractor declined to place the chemical feed system in operation because the STWA had no representative on site. On Friday, when the subcontractor was back on site, he checked for leaks again, and found none. We are fully aware of the imperative that the Engineer and/or the Owner must be notified before placing the system in operation, as I discussed with you on the telephone late last week. The subcontractor told STWA operator Dony on site on Friday January 12 that he was going to place the system in operation. I confirmed this to you on the telephone on Tuesday after I had been on site on Monday January 15. The system was working and functioning properly on Tuesday January 16. I personally cleaned all of the leaked dried LAS when I was there on Tuesday.

Any system containing water can be expected to gasify when there is any negative pressure, such as from a peristaltic pump. When I was there, there was one small bubble in the line leaving one of the LAS pumps. I flushed the system and removed the bubble. I am concerned now about the presence of a large amount of air or water vapor. The subcontractor as I am writing this is trying to locate the leak, and hopefully will have it solved within the hour. We agree that gasification or suction of air to the point that the pump loses prime is not acceptable. One thing that concerns me is that the hose required for the connections on the peristaltic pumps does NOT have an available connector available that is made to connect to domestic piping. The connector that we were sold by the Watson-Marlow vendor is actually made for 0.625" o.d. tubing, otherwise known as 5/8-inch domestic sizing. The 16mm metric hose supplied by Watson-Marlow is 0.630 o.d. It is a tight fit, it seems to work, but it will have to be watched. A set of adapters was given for each of the connections on the pumps to connect to the 16mm o.d. hose.

Concerning the telephone line: In correspondence as far back as six months we noted that the SCADA system that we are installing for Ricardo Water Supply Corporation would need to have access to the existing automatic dialer currently being used for notification of problems for STWA. We discovered that there was no existing automatic dialer. The proposal we then issued on July 3 for supplying the RTU extension panel and other modifications to the existing SCADA plainly shows that we would be installing one new RACO Verbatim automatic dialer. The STWA verified that they were in the past receiving actual telephone alarms in case of failure. We verified that their old processor incorporated a Windows-based dial-out program which could only function with a dedicated telephone line at the operator console. In my conversations with the staff at the STWA office, I pointed out that we would be installing the automatic dialer. I worked at one time for Southwestern Bell (MANY years ago) and I would like to go to Kingsville today to find the telephone line for connection to the new dialer.

Adrian will submit today an update on the punch list items.

Mercer Controls Inc./S. A. Mercer Pres.

* * *

In a message dated 1/19/2018 9:00:32 AM Central Standard Time, Shay.Roalson@hdrinc.com writes:

> Sherrel and Adrian –

Neither HDR nor STWA was notified on Friday, January 12 that the system was in operation. Placing the system into operation without notifying the Engineer or Owner is not acceptable.

The system is not currently operating. When Jacob checked on it yesterday, there was no LAS in the tubing leaving the drum – it was full of air and the pumps had lost prime. Since the system has not yet worked consistently, the project has not yet reached substantial completion.

Finally, Mercer employees in the STWA office yesterday told STWA staff that a dedicated telephone line is required, and needed by today. Neither HDR nor STWA was previously informed that STWA needed to make arrangements for a telephone line.

The current punch list is attached for your reference.

Please respond to the above items and provide an update on the incomplete punch list items today.

Shay Ralls Roalson, PE

D 512.912.5106 M 512.426.9847

Texas TBPE Firm No. F-754

From: Adrian Garza [mailto:a.garza@mercercontrols.com]
Sent: Wednesday, January 17, 2018 4:39 PM
To: Roalson, Shay
Cc: Singer, Lisa; Beroset, Shaun D.; Carola Serrato; jhinojosa; s gabrysch; MERCERCONTROLS; Rick Cornejo
Subject: 1-17-18 Driscoll Schedule and Driscoll LAS Substantial Completion

Hello,

Attached is the Driscoll LAS Substantial Completion document as well as the Driscoll LAS Schedule.

Thank you,

Adrian Garza

Adrian Garza
Electrical Engineer EIT
a.garza@mercercontrols.com

Since 1992
MERCER CONTROLS, INC.

Physical Address: 804 Apollo Drive
Billing Address: PO Box 777
Edna, TX 77957

(361) 782-7168 -Office
(361) 782-7706 -Fax

mcgserrato@stwa.org

From: mcgserrato@stwa.org
Sent: Friday, January 19, 2018 10:03 AM
To: Roalson, Shay
Subject: RE: 1-17-18 Driscoll Schedule and Driscoll LAS Substantial Completion

Shay,

Thank-you for following up on this. BTW, I think you are still using my old email address.

Carola

Carola G. Serrato
Executive Director
South Texas Water Authority
PO Box 1701
Kingsville, Texas 78364
361-592-9323 x112

From: Carola G. Serrato [mailto:cserrato@stwa.org]
Sent: Friday, January 19, 2018 9:56 AM
To: mcgserrato@stwa.org
Subject: Fwd: 1-17-18 Driscoll Schedule and Driscoll LAS Substantial Completion

Sent from my iPhone

Begin forwarded message:

From: "Roalson, Shay" <Shay.Roalson@hdrinc.com>
Date: January 19, 2018 at 9:00:14 AM CST
To: Adrian Garza <a.garza@mercercontrols.com>, MERCERCONTROLS <MERCERCONTROLS@aol.com>, s gabrysch <s.gabrysch@mercercontrols.com>
Cc: "Singer, Lisa" <Lisa.Singer@hdrinc.com>, "Beroset, Shaun D." <Shaun.Beroset@hdrinc.com>, Carola Serrato <cserrato@stwa.org>, jhinojosa <jhinojosa@stwa.org>, Rick Cornejo <rickcornejo@me.com>
Subject: RE: 1-17-18 Driscoll Schedule and Driscoll LAS Substantial Completion

Sherrel and Adrian –

Neither HDR nor STWA was notified on Friday, January 12 that the system was in operation. Placing the system into operation without notifying the Engineer or Owner is not acceptable.

The system is not currently operating. When Jacob checked on it yesterday, there was no LAS in the tubing leaving the drum – it was full of air and the pumps had lost prime. Since the system has not yet worked consistently, the project has not yet reached substantial completion.

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Shay Ralls Roalson, PE
D 512.912.5106 M 512.426.9847

Texas TBPE Firm No. F-754

From: Adrian Garza [mailto:a.garza@mercercontrols.com]
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To: Roalson, Shay
Cc: Singer, Lisa; Beroset, Shaun D.; Carola Serrato; jhinojosa; s gabrysch; MERCERCONTROLS; Rick Cornejo
Subject: 1-17-18 Driscoll Schedule and Driscoll LAS Substantial Completion

Hello,

Attached is the Driscoll LAS Substantial Completion document as well as the Driscoll LAS Schedule.

Thank you,

Adrian Garza

Adrian Garza
Electrical Engineer EIT
a.garza@mercercontrols.com

ATTACHMENT 8

City of Bishop Water Supply Contract

Memorandum

To: South Texas Water Authority Board of Directors
From: Carola G. Serrato, Executive Director
Date: January 16, 2018
Re: City of Bishop - Revised Wholesale Water Supply Contract

Background:

Our office has not been contacted by the City regarding the revised Wholesale Water Supply Contract. Enclosed is a copy of the cover letter which was attached to the revised contract approved by the Board at the last meeting

Today, however, I called Ms. Cynthia Contreras, City Secretary, to inquire about the January 17th City Council meeting described in a recent Kingsville Record – Bishop News article. Ms. Contreras indicated that there was not an item related to South Texas Water Authority. Further, she stated that an item would likely be on the City Council's February agenda in part due to the City's legal counsel dealing with a medical issue that will preclude his involvement until next month. I indicated that I would check back with her in February.

Analysis:

This item was placed on the agenda in the event some type of response is received from the City of Bishop.

Staff Recommendation:

Determine if staff or legal counsel need to take any additional action regarding the offered Wholesale Water Supply Contract.

Board Action:

Provide feedback to staff and/or legal counsel.

Summarization:

Although the offered contract is not identical to the Wholesale Water Supply Contract between STWA and the City of Kingsville, there are many similarities including the term of the contract and the commitment of the City to purchase more water from STWA over the initial five (5) year period. Staff is of the opinion that the additional annual cost of purchasing more water (see quoted paragraph below) is far less than paying the incremental increase as a result of not having a long-term contract.

Page 8: Guaranteed Purchase is a new section which is very similar to the City of Kingsville's contract. There are three subsections. Sections B and C are identical to the City of Kingsville's contract. Section A is based on the City of Bishop increasing their purchase by a ***percentage*** *amount as compared to the City of Kingsville's contract which is based on a* ***dollar*** *amount. The percentage increase over the 5-year period is ten (10) percent – or 2 ½ percent each year. At this time, the City's 5-year running average for water purchased is 62,707,000 gallons. In Year 2, the estimated additional volume required would be 1,567,675 gallons (62,707,000 x 2.5%). The* ***annual*** *cost of that additional water is $4,483.55 (1,567.68 x $2.86).*

STWA

SOUTH TEXAS WATER AUTHORITY

P. O. BOX 1701

KINGSVILLE, TEXAS 78364-1701

December 7, 2017

Honorable Tem Miller
City of Bishop
P.O. Box 356
Bishop, Texas 78343

Re: Revised Wholesale Water Supply Contract

Dear Mayor Miller:

On behalf of the South Texas Water Authority (STWA) Board, I am contacting the governing body of the City of Bishop to provide a revised Wholesale Water Supply Contract. The South Texas Water Authority Board met on December 5, 2017 during a duly posted and open meeting and considered the enclosed, revised contract. The Board unanimously (eight out of eight directors) approved the content of the revised contract and authorized staff to provide it to the City for its consideration. For ease of comparison, also enclosed is a red-line version of the contract showing the amendments, which are as follows:

Page 3: The City of Bishop has previously questioned whether the use of the East Side Pump Station will still be available in the event that the City is unable to accept water delivery at its West Side Pump Station. A sentence has been added in paragraph 5 indicating that this option is available provided the City takes the financial responsibility of making any repairs or replacements to the existing pumps. I would take this opportunity to remind the City that STWA used bond funds to replace the City's pumps at its Westside station. I would add STWA has previously reminded the City that the Eastside Pump Station pumps must be exercised to stay in working order.

Page 5: Specific chapters in the AWWA Manual M1 have been listed per the request of Mr. Gerald Benadum.

Page 8: The exact language for Section 12. Term of Contract that is in the City of Kingsville's contract has been substituted.

Page 8: Guaranteed Purchase is a new section which is very similar to the City of Kingsville's contract. There are three subsections. Sections B and C are identical to the City of Kingsville's contract. Section A is based on the City of Bishop increasing their purchase by a ***percentage*** amount as compared to the City of Kingsville's contract which is based on a ***dollar*** amount. The percentage increase over the 5 year period is ten (10) percent – or 2 ½ percent each year. At this time, the City's 5-year running average for water purchased is 62,707,000 gallons. In Year 2, the estimated additional volume required would be 1,567,675 gallons (62,707,000 x 2.5%). The ***annual*** cost of that additional water is $4,483.55 (1,567.68 x $2.86).

This new section will require STWA staff to create a bell shaped curve and volume schedule similar to the City of Kingsville's, which will assist in keeping a steady flow of water through the 42" waterline.

Page 10: There remains language that Mr. Benadum has indicated he would provide in Section 14, Subsection (B) Tax Exempt Bonds. STWA asks that this information be provided for consideration.

In conclusion, I have included the recent email correspondence in which I initially notified you that STWA's legal counsel would be drafting this revised contract. I trust that the information in the email and this letter provides sufficient details for the Council to consider this contract in an upcoming meeting. However, please contact me if you have any questions or require any additional information.

Sincerely,

Carola G. Serrato
Executive Director

CGS//
Enclosures
cc: City of Bishop Council Members
Ms. Cynthia Contreras, Bishop City Secretary
STWA Board of Directors
Mr. Gerald Benadum, Legal Counsel – City of Bishop
Mr. Bill Flickinger, Willatt and Flickinger, PLLC

ATTACHMENT 9

Vivax Metrotech Pipeline Locator Equipment

Memorandum

To: South Texas Water Authority Board of Directors
From: Carola G. Serrato, Executive Director
Date: January 15, 2018
Re: Quotes and Purchase of Pipeline Locator Equipment manufactured by Vivax – Metrotech

Background:

During the December 5, 2017 meeting, the Board reviewed information on Vivax – Metrotech (VM) devices. Two (2) quotes from Indepth Utility Solutions (Indepth), in the amount of $5,675 for the vLoc 5000 and for the vLoc DM2 unit in the amount of $10,287 were considered. Management reported that field personnel were impressed with the less expensive VLoc 5000 which was demonstrated for all field personnel. Information from Russell Corrosion was requested on their experience with the more expensive vLoc DM 2 unit, which has some added functions pertaining to cathodic protection tasks.

It was determined that STWA field personnel should verify the claims that the DM 2 unit can locate bar wrapped steel reinforced concrete cylinder pipe as well as locate broken bonds and buried anodes. Since Russell Corrosion would be returning in early January and the company uses that device, the Board tabled purchase of any equipment until those field tests could be performed.

Analysis:

Russell Corrosion arrived on Monday, January 8th and met with Jacob Hinojosa, O&M Supervisor, the following day to perform additional tests on the 0-5000 LF section of Contract 1 north of the Kingsville site. The following day, Mr. Hinojosa and I met with Matt Maynard, Senior Corrosion Technician, who confirmed that the device located anodes and either broken bonds or poorly connected bonds.

As a follow-up, I spoke with Mr. Keith Dillon, Indepth Utility Solutions, and he confirmed that the DM 2 device can be used as a pipe locator (which is the function of the vLoc 5000) by the induction method when using the smaller Loc-T10x transmitter. When finding broken bonds and buried anodes, the direct connect method is utilized using the larger transmitter. The quotes provided show the cost for both the smaller and larger transmitters.

Finally, both devices have the capability of adding a GPS/Bluetooth component that will send mapping data to a smart phone which can be emailed and used to create an overlay with the Google Earth application.

Staff Recommendation:

As reported last month, since the SmartBall test did not result in any leak repairs, approximately $15,400 budgeted for HDR Engineering, Inc. services will not be spent. Staff believes that purchase of the DM 2 device is worth considering.

Board Action:

Determine whether to approve the purchase of the vLoc DM2 device with accessories.

Summarization:

Staff continues to believe that the vLoc DM 2 will assist field personnel for day to day line locates and will be a great asset for cathodic protection work on the 42" line. Greater accuracy of excavation location should also translate into smaller excavations and smaller crop damage payments.

ATTACHMENT 10

Surplus Property Sale

Memorandum

To: South Texas Water Authority Board of Directors
From: Carola G. Serrato, Executive Director
Date: January 15, 2018
Re: Surplus Property Sale and Declaration of Salvage Property

Background:

The last time the Board considered a Surplus Property Sale was in April of 2015. Staff inquired with legal counsel whether this process could be conducted with one Board meeting whereby the Board declares the items on the attached list as surplus, authorizes sale of the attached list, approves the sale to the highest bidder, declares any items not receiving a bid as salvage property and instructs staff to dispose of those salvage items.

Analysis:

Staff believes this streamline process is more efficient and still provides the same opportunity for the public to bid on items. In addition, these types of sales are a necessary type of proper housekeeping.

Staff Recommendation:

Approve a motion to declare the items on the attached list as surplus, authorize sale of the attached list, approve the sale to the highest bidder, declare any items not receiving a bid as salvage property and instruct staff to dispose of salvage items.

Board Action:

Determine whether to approve a motion to declare the items on the attached list as surplus, authorize sale of the attached list, approve the sale to the highest bidder, declare any items not receiving a bid as salvage property and instruct staff to dispose of salvage items.

Summary:

A follow-up report on the sale will be posted as an agenda item after the property has been advertised, bids opened, and either sold or salvage disposed.

Surplus Property Sale Items

1 One (1) white 2009 Ford F150 Extended Cab Pickup Truck
2 Scag 61" Turf Tiger Model SMT 61A mower
3 Hobart portable welder 305 cc
4 Mi-T-M 3000psi pressure washer
5 Proxima Ultralight LSI Projector
6 Dell Latitude CPX Laptop
7 Victor 1240-2 Calculator
8 Hewlett Packard DeskJet 932C Printer
9 Epson LX-300 Printer
10 Acer Extensa 4620-4908 Laptop
11 HP Color LaserJet 3600n Printer
12 Lexmark T632 Printer
13 Two (2) HP Probook 4710S notebooks
14 Two (2) HP Color LaserJet 2025 printers
15 Brother IntelliFax 2820 Fax machine
16 Sharp Linytron TV
17 Sharp VC-A205 VCR
18 Three (3) Intel i3-3220 CPU 3.30GHz computers, 4.00 GB RAM, DVD
19 SCADA desktop (need description)
20 Two (2) Dell Monitors
21 HP OfficeJet K80xi All-in-one printer/fax/scanner/copier
22 Dell Dimension 2400 Desktop Computer
23 Motorola Radio Radius M1225/Astron Model RS-12B radio
24 Polaroid Camera
25 3M 9700 overhead projector
26 Philips Magnavox VHS VCR plus
27 Tripp-Lite Smart 1300 LCDT UPS

ATTACHMENT 11

Incremental Increase Charges for Customers without a Long-Term Contract

Memorandum

To: South Texas Water Authority Board of Directors
From: Carola G. Serrato, Executive Director
Date: January 18, 2018
Re: Incremental Increase Charges for Customers without a Long-Term Contract

Background:

As the Board is aware, during the October 24, 2017 meeting, the Board adopted an Order establishing an Incremental Increase (premium charge) for customers without a long-term contract to be effective as of December 1, 2017. STWA currently has three (3) customers, the City of Bishop, the City of Driscoll, and the Nueces County Water Control and Improvement District #5 (Banquete) that have not entered into a long-term contract. The Board determined that the Incremental Increase Charge would be $0.426386.

Under most circumstances, STWA's invoices for December's usage would be complete by around the 10th to 12th of the month. However, last month, there was a delay in receipt of the City of Corpus Christi's wholesale invoice as a result of the City implementing a new billing program. It is anticipated that there will be a delay in receipt of that invoice for the next two (2) months. Please see the enclosed email from Ms. Darlyn Belle, City of Corpus Christi.

Analysis:

The wholesale invoices will be mailed by tomorrow, January 19th. However, it is possible that the three (3) customers will not have received the December usage bill by the Board meeting. Therefore, this item will be placed on the February agenda as well. The December usage for Bishop, Driscoll and Banquete, is listed below with the calculated Incremental Increase Charge:

Entity	2017 December Usage	Incremental Increase Charge
City of Bishop	4,005,000	$1,707.68
City of Driscoll	3,669,100	$1,564.45
NCWCID #5	2,033,820	$867.19

Attached is a spreadsheet showing estimated Incremental Increase Charges based on the 5-year average (FY 13 – FY 17) usage for October through September.

Staff Recommendation:

Keep the Board updated on any communication from these wholesale customers. Provide feedback to staff.

Board Action:

Determine if any additional information is needed or action by the Board.

Summarization:

Staff anticipates additional information will be available upon receipt of the first invoice that includes the incremental increase charge.

Five Year Avg FY 13 - FY 17	Bishop GALLONS USAGE	Driscoll GALLONS USAGE	NWC&ID #5 GALLONS USAGE	Bishop Incremental Increase	Driscoll Incremental Increase	NWC&ID #5 Incremental Increase
October	4,397,600	2,674,051	2,263,070	$ 1,875.08	$ 1,140.18	$ 964.94
November	3,711,000	2,604,305	2,054,046	$ 1,582.32	$ 1,110.44	$ 875.82
December	4,234,000	2,527,969	2,024,012	$ 1,805.32	$ 1,077.89	$ 863.01
January	4,464,400	2,753,560	2,028,542	$ 1,903.56	$ 1,174.08	$ 864.94
February	3,550,000	2,533,000	1,932,604	$ 1,513.67	$ 1,080.04	$ 824.04
March	4,585,400	2,802,440	1,964,422	$ 1,955.15	$ 1,194.92	$ 837.60
April	4,559,600	2,893,740	2,101,106	$ 1,944.15	$ 1,233.85	$ 895.88
May	4,897,600	3,100,100	2,222,884	$ 2,088.27	$ 1,321.84	$ 947.81
June	4,629,400	3,149,760	2,274,290	$ 1,973.91	$ 1,343.01	$ 969.73
July	7,354,800	3,656,300	2,533,618	$ 3,135.98	$ 1,559.00	$ 1,080.30
August	7,643,200	3,340,813	2,501,660	$ 3,258.95	$ 1,424.48	$ 1,066.67
September	5,273,400	2,935,040	2,139,458	$ 2,248.50	$ 1,251.46	$ 912.23
	59,300,400	34,971,079	26,039,712	$ 25,284.86	$ 14,911.18	$ 11,102.97

Joella Wagner

From: Darlyn Belle <DarlynB@cctexas.com>
Sent: Monday, January 08, 2018 2:07 PM
To: Joella Wagner
Subject: RE: DEC UTILITY BILL

Yes ma'am, that is correct.
We will begin processing your bill for the December usage next week. It is our goal to be back to our normal billing cycle dates within the next 2 months.

Thanks,

Darlyn Belle
361-826-3321

From: Joella Wagner [mailto:jwagner@stwa.org]
Sent: Monday, January 08, 2018 1:55 PM
To: Darlyn Belle <DarlynB@cctexas.com>
Subject: RE: DEC UTILITY BILL

Darlyn,

This was the December invoice for November water usage, correct?

Any idea when the invoice will be ready for the December usage?

Thanks in advance, Jo Ella

From: Darlyn Belle [mailto:DarlynB@cctexas.com]
Sent: Friday, January 05, 2018 5:56 PM
To: Joella Wagner (jwagner@stwa.org)
Subject: DEC UTILITY BILL

Joella,
Your December bill was delayed from the City of Corpus Christi due to our transitioning to a new billing system.
Your bill for your previous Acct# 6123-5880 was processed but unfortunately it calculated your charges at an incorrect rate. You will received that incorrect bill via mail but we have already recalculated your correct charges. Please pay the amount listed below, there will be an adjustment amount posted to your account for the difference.

PLEASE PAY:

NEW CHARGES		
WATER	$	51,104.09
RWCA $0.966/TGAL	$	36,563.10

TOTAL WATER	**$**	**87,667.19**
BILLED CONSUMPTION		37850

THIS IS BASED ON ACTUAL CONSUMPTION OF 37850, 30 DAYS

Please note, there will be no late fees accessed on your account during our transition period.

You have been assigned a new account number.
Your old account number was: 6123-5880
Your new account number is: 20004093

I have included the PDF attachment with the incorrect charges for reference.

Thank you for your patience during our transition,

Darlyn Belle
Customer Service Rep
UBO Billing
361-826-3321
DarlynB@cctexas.com

FOR YOUR INFORMATION

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 10, 2018

Ms. Kathleen Lowman
President
South Texas Water Authority
PO Box 1701
Kingsville, Texas 78364-1701

Re: Notice of Compliance with Notice of Violation (NOV) dated *July 14, 2017:*
South Texas Water Authority, 111 East Sage Road, Kingsville (Kleberg County), Texas
Regulated Entity No.:102683323; TCEQ ID No.: 1370035; Investigation No. 1454004

Dear Ms. Lowman:

This letter is to inform you that the Texas Commission on Environmental Quality (TCEQ) Corpus Christi Regional Office has received adequate compliance documentation on August 4, November 8, November 9, and November 20, 2017 to resolve the alleged violations documented during the investigation of the above-referenced regulated entity conducted on May 18 and 19, 2017. Based on the information submitted, no further action is required concerning this investigation.

The Texas Commission on Environmental Quality appreciates your assistance in this matter and your compliance efforts to ensure protection of the State's environment. If you or members of your staff have any questions, please feel free to contact Kelli Holt at the Corpus Christi Regional Office at (361) 825-3100.

Sincerely,

Melanie Edwards
Water Section Manager
Corpus Christi Regional Office

ME/KH/mjc