

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Donald J. Petry

Question:

60. Did the Company include in its case any expenses associated with community outreach and initiatives (Reference Allen direct testimony, page 14-22)? If so, itemize and explain the rationale for including these expenses in regulated operations.

Response:

It appears that TAW included \$2,000 of expense in the test year related to community outreach and initiatives in the Miscellaneous Expense Exhibit that were incorrectly charged to Community Relations rather than Charitable Contributions. This included a \$1,000 donation to Friends of the Festival and \$1,000 for Junior Achievement support. These should not have been included in the expenses in regulated operations.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Linda C. Bridwell

Question:

61. For the test period ended December 2011, provide the total number of employee hours, labor dollars and overhead dollars billed to TAWC by AWWSC for the preparation of this rate filing.

Response:

There are none.

**TRA 01-062TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Linda Bridwell

Question:

62. Provide a schedule showing actual Tennessee Support Service Fees by function, business unit and object account excluding capital costs for each month of the test year ended December 2011.

Response:

Please see attached.

Tennessee American Service Company Expenses (O&M Only)
By Function, Business Unit and Object Account
For the 12 months Ending December 2011

Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Admin	032010	CORP-Balance Sheet	534998	Benefit Overhead	-	(5)	-	-	5	-	-	-	-	-	-	-	0
			534999	General Overhead	-	5	-	-	-	(5)	-	-	-	-	-	-	(0)
	032021	CORP-Finance Pass Thru	575640	Penalties Nondeductible	-	-	-	-	-	-	-	-	-	-	-	-	-
			501200	Labor	-	-	17	63	1	-	-	-	-	(18)	(81)	-	(0)
			501711	Incentive Plan-Off-Annual	-	-	5	13	0	-	-	-	-	-	-	-	-
			504670	Training	-	-	-	-	-	-	-	-	-	-	-	3	3
			507100	401k	-	-	1	3	0	0	-	-	-	(3)	-	-	-
			508101	Defined Contribution Plan	-	-	1	3	0	0	-	-	-	(5)	-	-	-
			533000	Contract Services-Legal	-	-	(3)	3	0	-	-	-	-	-	-	-	-
			534998	Benefit Overhead	77	58	-	40	47	32	46	50	52	37	10	138	777
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			575350	Meals Deduct	-	-	-	1	(0)	-	-	2	-	-	9	2	15
			575351	Meals Non Deduct	-	-	-	1	(0)	-	-	2	-	-	-	-	3
			575740	Telephone	-	-	-	-	-	-	-	-	-	-	-	-	-
			501200	Labor	-	-	-	-	-	-	-	-	-	-	533	579	1,112
			501210	Labor Non Scheduled Overtime	-	-	-	-	-	-	-	-	-	-	24	26	49
			504100	Group Ins Maintenance	-	-	-	-	-	-	-	-	-	-	82	93	175
			505100	PBOP	-	-	-	-	-	-	-	-	-	-	26	31	57
			506100	Pension	-	-	-	-	-	-	-	-	-	-	82	95	176
			507100	401k	-	-	-	-	-	-	-	-	-	-	13	3	16
	032070	CORP-Shared Bus Services Admin	534998	Benefit Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			550000	Transportation IT-Admin	-	-	-	-	-	-	-	-	-	-	-	-	-
			550005	Mileage Reimbursement Personal Vehicle	-	-	-	-	-	-	-	-	-	-	-	-	-
			558000	Insurance Work Comp	-	-	-	-	-	-	-	-	-	-	-	-	-
			575340	Employee Expense	-	-	-	-	-	-	-	-	-	-	-	-	-
			504610	Employee Awards	-	-	-	-	-	-	-	-	-	-	-	-	-
			534998	Benefit Overhead	284	224	199	163	225	111	189	206	194	153	72	409	2,429
			575000	Miscellaneous	-	-	-	-	-	-	-	-	-	-	-	-	-
			575740	Telephone	1	(1)	(0)	0	1	0	(0)	2	0	(0)	0	(0)	2
			575998	PCard Undistributed	-	-	-	15	34	(48)	-	-	-	-	-	-	0
			501200	Labor	-	-	-	-	-	-	-	-	-	-	-	-	-
			504500	Other Welfare Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-
			508200	Employee Stock Purchase Plan	-	-	-	-	-	-	-	-	-	-	-	-	-
			534998	Benefit Overhead	(0)	(38)	(763)	(1,010)	(24)	15	(8)	(4)	(1,309)	(237)	(118)	(587)	(4,084)
	032089	CORP-AWE Pass-Thru	534999	General Overhead	753	790	3,182	(935)	919	811	(2,423)	957	790	383	297	2,692	8,217
			550005	Mileage Reimbursement Personal Vehicle	-	-	-	-	-	-	-	-	-	-	-	-	-
			570100	Uncollectible Accounts	-	-	(17)	12	29	73	15	119	(13)	145	90	146	599
			575000	Miscellaneous	-	-	-	-	-	7	-	-	-	-	-	-	-
			575340	Employee Expense	-	-	-	-	-	-	73	-	-	-	-	-	-
			575350	Meals Deduct	-	-	-	-	-	-	2	-	-	-	-	-	-
			575351	Meals Non Deduct	-	-	-	-	-	-	2	-	-	-	-	-	-
			575620	Office & Admin Supplies	-	-	(1,402)	-	-	-	-	-	-	-	-	-	-
			575640	Penalties Nondeductible	-	-	-	-	-	-	-	-	-	-	-	-	-
			575740	Telephone	1	1	(1)	0	1	0	(0)	-	-	-	-	-	-
			722306	Gains Other Non-OR	1,320	556	784	(6)	1,154	(123)	(400)	(15)	(1,317)	(1,905)	2,074	(431)	1,692
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
	032098	CORP-Non-Departmental Costs	534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
Admin Total	Audit	CORP-Audit	501200	Labor	2,729	1,888	2,473	(1,351)	2,670	5,255	(331)	1,825	(1,202)	(963)	3,534	7,315	23,843
			501711	Incentive Plan-Off-Annual	1,233	1,128	985	891	795	409	986	1,174	782	648	863	1,033	10,926
			501716	Compensation Exp-Options	220	253	148	163	144	194	177	182	158	136	264	189	2,228
			501718	Compensation Exp-Restricted Stock Units	24	24	27	24	24	29	25	25	30	25	25	34	316
			501718	Compensation Exp-Restricted Stock Units	48	53	49	49	49	61	50	50	63	51	51	203	778

Tennessee American Water Company
Tennessee Regulatory Authority
Response to TRA 01-062
Docket No. 12-00049
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Tennessee American Service Company Expenses (O&M Only)
By Function, Business Unit and Object Account
For the 12 months Ending December 2011

Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Benefit Svc Ctr	032014	CORP-Benefits Service Center	504500	Other Welfare Maintenance	42		6										48
			504610	Employee Awards				1									3
			504660	Tuition Aid	37	7								2			37
			507100	401k		35	37	26	20	22	15	15	12	19	(0)	109	162
			508101	Defined Contribution Plan		54	61	35	37	32	44	39	44	35	27	23	18
			534998	Benefit Overhead	476	310	526	229	248	197	231	237	258	221	195	55	257
			534999	General Overhead	145	114	121	108	62	83	62	95	77	213	195	692	3,819
			535000	Contract Services-Other	315	117	(114)							3,045	1,386	1,045	1,343
			535001	Contract Services-Temp Employee													5,794
			541400	Rents-Equipment	2		2				2				253	245	498
			550005	Mileage Reimbursement Personal Vehicle			1		1								10
			575002	Misc General Office													4
			575340	Employee Expense	71	34	(41)	40	115	(106)	(6)	19	16	5	3	67	217
			575350	Meals Deduct	0	2	1	1	2	0			0	9	1	9	51
			575351	Meals Non Deduct	0	2	1	1	2	0			0	9		26	15
			575487	Hiring-App'l Travel										8	0		8
			575620	Office & Admin Supplies	3	13	14	8	(8)	11	3	2	0	21	14	12	93
			575670	Relocation Expenses	(57)	68	6	0							57	513	587
			575715	Software Licenses & Support			34				(0)		0				34
			575740	Telephone	0	0	0	0	1	1	(0)		0	1	1	2	7
			575741	Cell Phone	27	(9)	8	6		(0)	10	7	7		7		82
			575998	PCard Undistributed	(49)												
			Audit Total		2,628	2,216	1,836	1,608	1,488	954	1,591	1,851	1,467	4,338	3,419	4,377	27,773
Benefit Svc Ctr Total	032020	CORP-Corporate Bus Development	501200	Labor	1,353	1,324	1,520	1,388	1,417	1,557	1,507	1,698	1,447	1,417	1,739	1,484	17,850
			501711	Incentive Plan-Off-Annual	89	86	90	90	90	135	90	127	101	83	124	83	1,188
			504500	Other Welfare Maintenance													
			504610	Employee Awards	2		3	21	(9)	52	30	2	(0)		0	2	11
			504670	Tuition Aid													179
			506700	Training											3		22
			507100	401k	30	27	27	30	30	45	30	28	30	29	45	29	382
			508101	Defined Contribution Plan	16	16	16	16	16	30	26	26	26	26	39	26	279
			534998	Benefit Overhead	914	768	716	695	647	527	704	704	698	666	704	1,383	9,125
			534999	General Overhead	38	34	37	34	36	27	29	22	30	31	34	34	386
			535001	Contract Services-Temp Employee													25
			550005	Mileage Reimbursement Personal Vehicle													5
			575000	Miscellaneous	12						0	4		1		0	12
			575340	Employee Expense							15	10	(4)	6	(5)	1	23
			575342	Employee Exp Conf/Registration													4
			575350	Meals Deduct				6	0	3	10	1	0	6	13	4	45
			575351	Meals Non Deduct				6	0	3	10	1	0				21
			575484	Hiring-Background							2						2
			575485	Hiring-Drug Screen													1
			575620	Office & Admin Supplies	(1)	17	15	6	23	17	(5)	18	45	10	525	170	840
			575660	Postage			(3)	0	(0)	0	0	0	12	(8)	5	2	530
			575740	Telephone	0	8	2	2				(2)					16
			575741	Cell Phone	3	2	2	2		3	10		2	2	4	3	31
			Benefit Svc Ctr Total		2,444	2,292	2,425	2,294	2,252	2,400	2,478	2,639	2,389	2,539	3,579	3,256	30,988
Business Development	032020	CORP-Corporate Bus Development	501200	Labor	536	841	1,011	863	1,016	978	1,062	1,292	1,162	1,058	981	1,123	11,922
			501711	Incentive Plan-Off-Annual	232	216	216	209	205	408	271	278	277	276	413	276	3,276
			501716	Compensation Exp-Options													
			501718	Compensation Exp-Restricted Stock Units	84	83	80	82	82	108	102	102	104	103	103	106	1,139
			504500	Other Welfare Maintenance	120	123	103	118	118	320	146	146	153	147	147	481	2,121
			504610	Employee Awards						4		(269)					(265)
			504620	Employee Physical Exam				13							3		3
			504660	Tuition Aid													13
			504670	Training			22	(22)		8							16
			507100	401k	19	16	16	11	5	27	21	19	13	8	12	8	165
Contract Services-Legal	032020	CORP-Corporate Bus Development	508101	Defined Contribution Plan	33	29	29	29	29	61	40	40	40	40	60	28	458
			533000	Contract Services-Legal	17	17		70	33	(103)							17
			534998	Benefit Overhead	758	839	807	511	569	343	588	582	555	491	260	1,076	7,380

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By Function, Business Unit and Object Account
For the 12 months Ending December 2011

Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	
			534999	General Overhead	144	139	151	146	144	180	137	142	133	138	78	102	1,633	
			535000	Contract Services-Other	27	20	67	452	326	134	357	372	208	123	549	142	2,777	
			541001	Rents-Real Property Intercompany	3	3	3	3	3	-	-	-	-	-	-	-	-	13
			550005	Mileage Reimbursement Personal Vehicle	0	0	1	12	(35)	0	1	12	11	4	9	50	50	421
			575000	Miscellaneous	37	0	37	0	0	0	0	0	134	285	421	285	421	
			575130	Brochures and Handouts	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			575132	Business Development	54	202	9	93	104	49	33	171	115	134	100	170	1,234	
			575340	Employee Expense	0	0	9	37	12	8	6	15	12	5	3	12	112	
			575342	Employee Exp Conf/Registration	3	10	9	17	12	9	6	15	12	5	3	12	112	
			575350	Meals Deduct	3	10	9	17	12	9	6	15	12	5	3	12	112	
			575351	Meals Non Deduct	6	2	1	5	5	(3)	3	-	3	(0)	1	1	25	
			575620	Office & Admin Supplies	61	4	61	4	4	4	4	4	4	4	4	4	65	
			575623	Outplacement	0	0	0	0	0	0	0	0	0	0	0	0	2	
			575710	Security Service	0	0	0	0	0	0	0	0	0	0	0	0	0	
			575715	Software Licenses & Support	13	14	7	3	13	6	19	7	11	9	8	10	120	
			575740	Telephone	0	0	0	0	0	0	0	0	0	0	0	0	0	
			575741	Cell Phone	0	0	0	0	0	0	0	0	0	0	0	0	0	
			501200	Labor	0	0	0	0	0	0	0	0	0	0	0	0	0	
			534998	Benefit Overhead	0	0	0	0	0	0	0	0	0	0	0	0	0	
			534999	General Overhead	0	0	0	0	0	0	0	0	0	0	0	0	0	
			501200	Labor	0	0	0	0	0	0	0	0	0	0	0	0	0	
			534998	Benefit Overhead	0	0	0	0	0	0	0	0	0	0	0	0	0	
			534999	General Overhead	0	0	0	0	0	0	0	0	0	0	0	0	0	
575740	Telephone	6,086	4,090	4,862	3,518	7,826	2,354	1,068	1,578	599	410	(318)	160	32,233				
			501200	Labor	812	894	737	222	626	198	285	67	72	19	10	4,943		
			501711	Incentive Plan-Off-Annual	27	213	26	26	32	27	27	33	27	27	37	502		
			501716	Compensation Exp-Options	74	561	53	54	67	54	55	69	56	56	223	1,321		
			501718	Compensation Exp-Restricted Stock Units	149	116	138	149	28	79	25	36	12	9	2	1	745	
			507100	401k	255	201	216	190	190	753	848	727	824	792	520	1,137		
			508101	Defined Contribution Plan	1,595	1,327	2,183	992	1,362	753	848	727	824	792	520	1,137		
			534998	Benefit Overhead	129	137	172	99	212	1	63	(576)	94	104	73	75		
			534999	General Overhead	193	175	206	185	185	1	63	(576)	94	104	73	75		
			541001	Rents-Real Property Intercompany	15	15	15	15	15	15	15	15	15	15	15	15		
			575000	Miscellaneous	490	500	500	1	188	809	313	356	114	10	252	2,668		
			575340	Employee Expense	87	87	52	2	17	17	43	21	21	1	240	401		
			575342	Employee Exp Conf/Registration	87	87	52	2	17	17	43	21	21	1	240	401		
			575350	Meals Deduct	87	87	52	2	17	17	43	21	21	1	240	401		
			575351	Meals Non Deduct	87	87	52	2	17	17	43	21	21	1	240	401		
			575620	Office & Admin Supplies	0	0	0	0	0	0	0	0	0	0	0	0	2	
			575623	Outplacement	1	1	(2)	0	(0)	34	34	34	34	34	34	34	514	
			575740	Telephone	7	20	3	10	9	12	9	9	9	10	9	10	119	
			575741	Cell Phone	0	0	1	1	1	1	2	(0)	1	0	0	(2)	5	
			534998	Benefit Overhead	0	0	0	0	0	0	1	(0)	1	0	0	1	4	
			534999	General Overhead	0	0	0	0	0	0	1	(0)	1	0	0	1	4	
			575340	Employee Expense	4	4	(4)	4	4	(4)	(4)	(4)	(4)	(4)	(4)	(4)	-	
			575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96	
						501200	Labor	12,129	9,548	12,747	8,718	13,226	7,388	5,502	5,586	4,662	4,045	3,359
501711	Incentive Plan-Off-Annual	4				(4)	(4)	(4)	(4)	0	(0)	-	(0)	(0)	(0)	0	0	
504500	Other Welfare Maintenance	24				(24)	(24)	(24)	(24)	0	-	0	(0)	0	(0)	-	0	
504610	Employee Awards	0				0	0	0	0	0	-	-	-	-	-	-	0	
507100	401k	1				(1)	(1)	(1)	(1)	0	-	-	-	(0)	-	-	0	
508101	Defined Contribution Plan	1				(1)	(1)	(1)	(1)	0	-	-	-	(0)	-	-	0	
534998	Benefit Overhead	9				(9)	(9)	(9)	(9)	0	-	-	-	0	-	-	0	
534999	General Overhead	33				(33)	(33)	(33)	(33)	-	-	-	-	-	-	-	4	
535000	Contract Services-Other	(0)				(0)	(0)	(0)	(0)	-	-	-	-	-	-	-	(66)	
550005	Mileage Reimbursement Personal Vehicle	0				0	0	0	0	0	0	0	0	0	0	0	0	
575000	Miscellaneous	0				0	0	0	0	0	0	0	0	0	0	0	0	
575340	Employee Expense	0				0	0	0	0	0	0	0	0	0	0	0	0	
575342	Employee Exp Conf/Registration	0				0	0	0	0	0	0	0	0	0	0	0	0	
575998	PCard Undistributed	96				96	96	96	96	96	96	96	96	96	96	96	96	
575999	PCard Undistributed	96				96	96	96	96	96	96	96	96	96	96	96	96	
575998	PCard Undistributed	96				96	96	96	96	96	96	96	96	96	96	96	96	
575999	PCard Undistributed	96				96	96	96	96	96	96	96	96	96	96	96	96	
575998	PCard Undistributed	96				96	96	96	96	96	96	96	96	96	96	96	96	
575999	PCard Undistributed	96				96	96	96	96	96	96	96	96	96	96	96	96	
575998	PCard Undistributed	96				96	96	96	96	96	96	96	96	96	96	96	96	
575999	PCard Undistributed	96				96	96	96	96	96	96	96	96	96	96	96	96	
575998	PCard Undistributed	96				96	96	96	96	96	96	96	96	96	96	96	96	
575999	PCard Undistributed	96				96	96	96	96	96	96	96	96	96	96	96	96	
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575999	PCard Undistributed	96	96	96	96	96	96	96	96	96	96	96	96	96				
575998	PCard Undistributed	96	96	9														

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
032051	CORP-Bns Trans-Procure To Pay		575350	Meals Deduct	0	0	13	(29)	0	-	-	(13)	-	-	-	-	(30)
			575351	Meals Non Deduct			13	4				13					30
			575461	Hiring-Ads													-
			575484	Hiring-Background													-
			575485	Hiring-Drug Screen		0				(0)							0
			575487	Hiring-App'l Travel			2	(2)									-
			575620	Office & Admin Supplies			7	(7)									-
			575740	Telephone													-
			575998	PCard Undistributed													-
			501200	Labor			96	(96)									-
			504660	Tuition Aid													-
			504670	Training		-											-
			507100	401k			1	(1)									-
			533000	Contract Services-Legal													-
			534998	Benefit Overhead	-		2	(3)	-	-	-	-	-	-	-	-	(0)
			534999	General Overhead	-		0	(0)	-	-	-	-	-	-	-	-	-
			575000	Miscellaneous	-				-	-	-	-	-	-	-	-	-
			575340	Employee Expense	-		(0)		-	(0)	-	-	-	-	-	-	(0)
			575350	Meals Deduct	-				(0)	(0)	-	-	-	-	-	-	(0)
			575484	Hiring-Background	-	-	0				-	-	-	-	-	-	0
			575620	Office & Admin Supplies	-						-	-	-	-	-	-	-
			575740	Telephone	24	(24)					-	-	(0)	-	-	-	-
			575998	PCard Undistributed	-						-	-	-	-	-	-	-
032052	CORP-Bns Trans-Recruit To Ret		501200	Labor	-						-	-	-	-	-	-	-
			501711	Incentive Plan-Off-Annual	-						-	-	-	-	-	-	-
			504610	Employee Awards	-						-	-	-	-	-	-	-
			504660	Tuition Aid	-					-	-	-	-	-	-	-	-
			507100	401k	-						-	-	-	-	-	-	-
			508101	Defined Contribution Plan	-						-	(0)	-	-	-	-	(0)
			534998	Benefit Overhead	-		5	(4)	-	-	-	-	-	-	-	-	1
			534999	General Overhead	-		0	(0)	-	-	-	-	-	-	-	-	(0)
			575000	Miscellaneous	-					-	-	-	-	-	-	-	-
			575340	Employee Expense	-				0	(0)	(0)	-	0	-	1	(1)	(0)
			575350	Meals Deduct	-		4	(4)	(0)	(2)	2	(0)	1	-	-	-	(2)
			575351	Meals Non Deduct	-		4	(3)	-	2	-	0	(1)	-	-	-	2
			575620	Office & Admin Supplies	-				-	-	-	(0)	-	-	-	-	(0)
			575667	Printing	-				-	-	-	-	-	-	-	-	-
			575741	Cell Phone	-				-	-	-	-	-	-	-	-	-
			575998	PCard Undistributed	-				-	-	-	-	-	-	-	-	-
			501200	Labor	-				-	-	(0)	-	-	(0)	0	-	0
			501711	Incentive Plan-Off-Annual	-				-	0	(0)	-	-	-	-	-	0
			504610	Employee Awards	-				-	0	-	-	-	-	-	-	0
			504670	Training	-				-	-	-	-	-	-	-	-	-
			507100	401k	-				-	-	-	-	-	-	-	-	-
			508101	Defined Contribution Plan	-				-	(0)	-	-	-	-	-	-	(0)
			534998	Benefit Overhead	-		5	(3)	-	-	-	-	-	-	-	-	1
			534999	General Overhead	-		0	(0)	-	-	-	-	-	-	-	-	(0)
032053	CORP-Bns Trans-Record To Rpt		535000	Contract Services-Other	-				-	-	-	-	-	-	-	-	-
			575340	Employee Expense	-		0	(0)	-	-	-	-	-	-	-	-	(0)
			575342	Employee Exp Conf/Registration	-				-	-	-	-	-	-	-	-	-
			575350	Meals Deduct	-				-	-	-	(1)	-	-	-	-	-
			575351	Meals Non Deduct	-				-	(0)	-	1	-	-	-	-	(1)
			501200	Labor	-				-	-	-	-	-	-	-	-	-
			501711	Incentive Plan-Off-Annual	-				-	-	-	-	-	-	-	-	-
			504610	Employee Awards	-		(0)		-	(0)	-	-	-	-	-	-	(0)
			507100	401k	-				-	-	-	-	-	-	-	-	-
			508101	Defined Contribution Plan	-				-	-	-	-	-	-	-	-	-
			534998	Benefit Overhead	-		4	(4)	-	-	-	-	-	-	-	-	(0)
			534999	General Overhead	-		0	(0)	-	-	-	-	-	-	-	-	-
			535000	Contract Services-Other	-				-	-	-	-	-	-	-	-	-
			575340	Employee Expense	-		0	(0)	-	-	-	-	-	-	-	-	-
			575342	Employee Exp Conf/Registration	-				-	-	-	-	-	-	-	-	-
			575350	Meals Deduct	-				-	-	-	(1)	-	-	-	-	-
			575351	Meals Non Deduct	-				-	(0)	-	1	-	-	-	-	1
			501200	Labor	-				-	-	-	-	-	-	-	-	-
			501711	Incentive Plan-Off-Annual	-				-	-	-	-	-	-	-	-	-
			504610	Employee Awards	-		(0)		-	(0)	-	-	-	-	-	-	-
			507100	401k	-				-	-	-	-	-	-	-	-	-
			508101	Defined Contribution Plan	-				-	-	-	-	-	-	-	-	-
			534998	Benefit Overhead	-		4	(4)	-	-	-	-	-	-	-	-	(0)
032054	CORP-Bns Trans-Order To Cash		534999	General Overhead	-		0	(0)	-	0	-	-	-	-	-	-	-
			575340	Employee Expense	(0)	0	(0)	(0)	0	(0)	(0)	-	-	-	37	(37)	0
			575350	Meals Deduct	-	-	(0)	(0)	0	(0)	-	(1)	-	-	-	-	(1)

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total		
Customer Call Center (CSC)	032055	CORP-Bns Trans-Plan, Bld, Ret	575351	Meals Non Deduct				0				1					1		
			575998	PCard Undistributed				7	(7)	0						(0)		0	
			501200	Incentive Plan-Off-Annual													(0)		-
			504610	Employee Awards															-
			507100	401k						(0)									(0)
			508101	Defined Contribution Plan						0									0
			534998	Benefit Overhead			3	(3)											0
			534999	General Overhead			0	(0)											0
			575340	Employee Expense	0				(0)										(0)
			575350	Meals Deduct	(0)										(0)				(0)
			575351	Meals Non Deduct										0					0
			575485	Hiring-Drug Screen							(0)								(0)
			575740	Telephone															-
			575741	Cell Phone		1	0	(2)						(0)					0
			501200	Labor															-
			501711	Incentive Plan-Off-Annual															-
			507100	401k															-
			508101	Defined Contribution Plan															-
			534998	Benefit Overhead					4	(3)									1
			534999	General Overhead					0	(0)									-
			550005	Mileage Reimbursement Personal Vehicle															-
			575340	Employee Expense							(0)			(0)					(0)
			575350	Meals Deduct								0			(1)				(1)
			575351	Meals Non Deduct											1				1
			575485	Hiring-Drug Screen							0								0
			534998	Benefit Overhead															-
			534999	General Overhead															-
			534998	Benefit Overhead															-
			534999	General Overhead															-
Business Transformation Total					24	(22)	240	(301)	(0)	(0)	(0)	0	(0)	(0)	(69)	564	436		
Customer Call Center (CSC)	034005	CCA-Administration	501200	Labor	540	322	431	338	392	284	631	734	718	608	408	611	6,017		
			501711	Incentive Plan-Off-Annual	129	95	95	90	95	141	95	147	146	148	207	147	1,533		
			501716	Compensation Exp-Options	40	40	50	40	40	48	41	41	48	42	42	50	523		
			501718	Compensation Exp-Restricted Stock Units	54	59	63	55	55	70	56	56	71	58	57	212	865		
			504500	Other Welfare Maintenance	(103)	184	41	37	29	27	76	83	44	1	1	4	423		
			504610	Employee Awards	177	(158)	(17)	19	28	1	38	128	1	39	2	259			
			504620	Employee Physical Exam			44	35	140	(1)	308	376	144	130	118	331	1,624		
			504660	Tuition Aid	79	92	343	78	252	123	196	152	84	217	70	518	2,204		
			504670	Training								0						0	
			507100	401k	11	8					11	11	11	11	15	10	76	105	
			508101	Defined Contribution Plan	10	2					14	14	14	14	20	14	105	14	-
			531000	Contract Services-Engineering									3	55	(55)	6	(6)		-
			533000	Contract Services-Legal															-
			534998	Benefit Overhead	539	518	428	390	413	337	454	498	534	485	485	458	877	593	531
			534999	General Overhead	4,045	4,091	4,100	4,073	3,331	3,397	3,220	3,224	3,204	3,028	2,063	2,063	3,447	41,221	5,931
			535000	Contract Services-Other						853	116	312	(7)			1,497	(172)	2,598	2,598
			535001	Contract Services-Temp Employee							83	59	46	88		46	71	395	395
			550005	Mileage Reimbursement Personal Vehicle	8		8			9		2				13		40	40
			575000	Miscellaneous														12	12
			575340	Employee Expense	57	97	47	(4)	98	128	58	122	94	59	62	60	876	876	876
			575342	Employee Exp Conf/Registration											4				4
			575350	Meals Deduct	(8)	8	4	14	11	62	(17)	13	23	20	27	31	188	31	188
			575351	Meals Non Deduct	(8)	8	4	14	11	62	(17)	13	23	20	27	31	188	31	188
			575620	Office & Admin Supplies	0	0	12	1	1	117	(113)	2	4	8	18	2	52	2	52
			575670	Relocation Expenses	53	(0)	105	53	(0)	187	124	132	(132)	540	2	0	1,064	2	1,064
			575740	Telephone	(0)	1	0	1	1	0	0	1	1	1	1	1	0	1	8
			575741	Cell Phone	11	(7)		8	(3)		6	0	2	2	2	2	(1)	2	18
			575998	PCard Undistributed														5	(5)
			721304	Gains/(losses) NUP Disposals															566

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
034070	CCA Call Handling		501200	Labor	9,259	7,951	9,492	8,256	8,872	8,789	8,846	9,337	11,727	9,154	9,308	9,151	110,144
			501211	Labor Overtime	1,121	1,038	945	1,060	912	1,356	847	663	967	1,116	1,343	436	11,804
			501711	Incentive Plan-Off-Annual	81	80	85	91	91	138	95	94	98	100	154	103	1,209
			504100	Group Ins Maintenance	233	246	224	225	220	319	172	147	210	240	304	104	2,644
			504500	Other Welfare Maintenance	11	12	13	155	12	12	12	14	12	8	8	20	288
			504610	Employee Awards	(52)	59	8	(4)	4	125	23	91	11	2	111	46	424
			504620	Employee Physical Exam	78	(62)	41	(17)	83	45	14	0	5	50	150	5	394
			504670	Training			6			5							11
			507100	401k	52	46	52	54	55	83	61	52	54	57	82	55	704
			508101	Defined Contribution Plan	5	7	12	13	13	24	27	28	37	38	58	39	301
			533000	Contract Services-Legal			1										1
			534998	Benefit Overhead	5,949	5,505	4,166	5,139	5,227	4,503	5,326	5,356	5,681	5,040	4,839	8,386	65,119
			534999	General Overhead	208	199	216	208	201	201	205	205	259	221	207	206	2,536
			535000	Contract Services-Other													2
			535001	Contract Services-Temp Employee													
			550005	Mileage Reimbursement Personal Vehicle				2	832	766	1,140	2,878	248	(216)	(6)		5,642
			575000	Miscellaneous													2
			575340	Employee Expense	(24)	(58)	7	(2)		20	8	22	30	26	17	4	1
			575342	Employee Exp Conf/Registration	3	(3)											0
			575350	Meals Deduct	4	6	1	1		7	7	3	9	11	8	29	87
			575351	Meals Non Deduct	4	6	1	1		7	7	3	9	11	8	29	87
			575620	Office & Admin Supplies	0	1	(1)	2	0	1	1	0	1	1	1		7
			575740	Telephone	0	0	0	1	0	0	1	0	0	0	0	8	19
			575741	Cell Phone	17	2	2	5	17	7	2	6	6	5	6	7	80
			575998	PCard Undistributed													
034071	CCA-Billing		501200	Labor	7,051	7,437	7,618	7,027	7,193	6,791	7,663	8,229	7,396	6,922	6,787	7,231	87,346
			501211	Labor Overtime	332	414	642	988	319	436	336	328	328	425	302	642	283
			501711	Incentive Plan-Off-Annual	54	52	53	56	58	84	65	64	65	60	78	54	741
			504100	Group Ins Maintenance	117	124	167	240	84	126	87	97	89	115	163	84	1,493
			504500	Other Welfare Maintenance						38	42						79
			504610	Employee Awards	56	1	25	71	11	48	23	6	47	35	78	78	477
			507100	401k	65	64	68	69	69	106	76	77	73	68	102	90	902
			534998	Benefit Overhead	5,292	5,026	4,144	4,867	4,927	4,246	4,947	5,371	5,424	5,017	4,774	7,587	61,622
			534999	General Overhead	177	180	191	181	177	176	181	181	180	177	180	178	2,160
			550005	Mileage Reimbursement Personal Vehicle													
			575340	Employee Expense	(21)		75	(30)		144	273	62	16	4	1	42	566
			575350	Meals Deduct	(22)	1	2	(0)	3	14	21	3	6	4	2	8	41
			575351	Meals Non Deduct	(22)	1	2	(0)	3	14	21	3	6	4	2	8	41
			575620	Office & Admin Supplies	(1)		2	(1)									2
			575740	Telephone	2	(3)				1						1	2
			575741	Cell Phone	9	4	2	11	6	6	7	7	10	16	16	1	(2)
			575998	PCard Undistributed	(1)	19	(19)										
034072	CCA-Collections		501200	Labor	1,834	1,973	2,057	2,096	2,236	2,169	2,177	2,229	2,150	2,046	2,079	2,164	25,212
			501211	Labor Overtime	142	123	80	63	1	0	5	1	2		1	9	428
			501711	Incentive Plan-Off-Annual	17	16	16	17	17	59	40	40	40	40	59	40	399
			504100	Group Ins Maintenance	40	34	21	18	0	0	1	0	1	1	1	2	119
			504500	Other Welfare Maintenance						2							3
			504610	Employee Awards	23	2	53	(39)	5	22	14	11	8	2	7	16	124
			504620	Employee Physical Exam						1	(1)						
			504670	Training	0		2	(0)		59		0		0	2	34	99
			507100	401k	18	18	17	18	17	33	20	19	21	21	32	21	255
			508101	Defined Contribution Plan	5	4	5	5	11	19	13	13	13	13	19	13	131
			534998	Benefit Overhead	1,495	1,427	1,133	1,351	1,407	1,213	1,419	1,426	1,466	1,347	1,275	2,203	17,161
			534999	General Overhead	53	56	56	56	55	53	55	55	56	55	55	55	660
			535000	Contract Services-Other	89	-	72	2,709		82	1	-	80				3,033
			575340	Employee Expense	(58)	18	5	44	(11)	84	31	42	37	14	19	34	259
			575342	Employee Exp Conf/Registration	-					14	-		5	-		2	21
			575350	Meals Deduct	(0)		2	5	1	5	1	2		6	3	4	30
			575351	Meals Non Deduct	(0)		2	5	1	5	1	2					16
			575620	Office & Admin Supplies	-												
			575740	Telephone	1	(1)	(0)	(0)	13	(2)	2	3	2	2	2	3	25

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
034073	CCA-Operations & Performance		575741	Cell Phone	7	(7)		0	(0)								-
			575998	PCard Undistributed			1										-
			675250	Comp Equip Hardware	903	775	963	904	964	2,298	898	1,048	963	995	873	981	12,567
			501200	Labor												3	3
			501211	Labor Overtime													
			501711	Incentive Plan-Off-Annual	64	57	58	61	41	56	38	38	35	38	57	1	1
			504100	Group Ins Maintenance													
			504500	Other Welfare Maintenance		(4)											(4)
			504610	Employee Awards			2	2		3	3		7	0		38	55
			504670	Training													65
			507100	401k	15	13	14	17	16	21	13	(0)			31	26	213
			508101	Defined Contribution Plan		4	4	4	4	6	4	4		4	6	4	51
			531000	Contract Services-Engineering	(0)												
			534998	Benefit Overhead	617	-	504	522	559	467	557	573	592	541	8	(10)	142
			534999	General Overhead	4,435	3,414	4,723	(669)	3,805	3,366	4,645	4,194	4,247	4,745	4,209	511	7,135
			535000	Contract Services-Other	32	88	(86)	6	57	(77)	11	(19)	41	(25)	46	(55)	43,921
			541000	Rents-Real Property	1,211	1,211	1,236	1,240	1,240	1,235	1,240	1,240	1,246	1,246	1,246		19
			550005	Mileage Reimbursement Personal Vehicle			1	1				1					14,839
			575000	Miscellaneous	6	(3)	(5)	1	(1)	(1)			15	9	(20)	49	52
			575320	Electricity	226	257	227	233	220	304	344	538	263	166	218	145	3,139
			575340	Employee Expense	3	53	(36)	(8)	(11)	(11)	21	(8)	0	(0)	19	33	78
			575350	Meals Deduct		1	(0)	(1)		0		1		1		2	3
			575351	Meals Non Deduct													
			575480	Heat - Oil/Gas			1	(0)	(1)								1
			575620	Office & Admin Supplies	101	93	58	20	6	53	17	13	39	20	252	(56)	616
			575625	Overnight Shipping				0	1	1	1						3
			575740	Telephone	(125)	12	41	27	26	26	26	26	26	26	27	3,025	-
			575741	Cell Phone	16	(16)	10	(2)	2	2	2	2	2	2	2	2	22
			675250	Comp Equip Hardware													6
			721304	Gains/(losses) NUP Disposals													102
			501200	Labor	1,238	999	1,344	1,251	1,354	1,304	1,793	1,912	1,845	1,798	2,125	1,798	566
			501211	Labor Overtime	46	57	12	105	112	158	136	160	161	161	241	153	115
			501711	Incentive Plan-Off-Annual	103	100	105	106									1,694
			504100	Group Ins Maintenance	11	18	5										34
			504610	Employee Awards	(3)	10	(5)	7	9	2	4	3	2	1	3	-	32
			507100	401k	22	21	23	23	24	34	23	23	23	23	34	22	294
			508101	Defined Contribution Plan													
			534998	Benefit Overhead	859	784	614	632	675	580	680	694	710	652	613	1,216	8,709
			534999	General Overhead	31	67	49	39	40	39	44	42	41	46	41	42	523
			550005	Mileage Reimbursement Personal Vehicle						1	1						3
			575340	Employee Expense	14	46	(46)	77	(1)	103	(15)	81	26	5	35	46	372
			575350	Meals Deduct	1	2	2	6	11	7	(2)	4	5	7	8	2	53
			575351	Meals Non Deduct			2		6	11	7	(2)	4				36
			575620	Office & Admin Supplies				1						1			2
			575740	Telephone	3	(6)											(3)
			575741	Cell Phone	24	(24)											-
			501200	Labor	705	604	530	513	488	431	504	569	545	531	603	552	6,575
			501211	Labor Overtime			6	3		5	24	1		4	4	1	47
			501711	Incentive Plan-Off-Annual	27	21	22	23	23	33	23	23	23	23	34	23	296
			504100	Group Ins Maintenance			2	1			6	0		1	0		11
			504610	Employee Awards	185	198	20	165	225	118	284	750	251	238	2	613	3,049
			504670	Training	171	(35)	171	(13)	44	4	0	2	92	144	73	52	609
			507100	401k	13	12	12	11	9	12	9	10	9	8	12	7	124
			508101	Defined Contribution Plan	6	4	4	2							4	5	28
			534998	Benefit Overhead	426	389	329	293	299	228	286	298	308	278	275	517	3,928
			534999	General Overhead	12	16	15	14	168	14	14	12	14	15	14	14	220
			535000	Contract Services-Other				1	(1)								-
			575130	Brochures and Handouts			8	30	43		-			25	25	-	132
			575340	Employee Expense	26	44	90	1	17	86	54	27	54	(0)	(5)	30	423
			575350	Meals Deduct	2	4	16	3	2	10	8	4		0		4	66
			575351	Meals Non Deduct		4	16	3	2	10	8	4	9				57

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
					(46)		22	(22)									(46)
			575620	Office & Admin Supplies							15	(11)					4
			575625	Overnight Shipping													4
			575740	Telephone	0	(0)			0	(0)		(0)	1	(0)	0	(0)	1
			575741	Cell Phone	3	(3)											-
			575998	PCard Undistributed													-
034076	CCA-Quality & Reporting		501200	Labor	1,021	1,758	1,554	1,428	951	1,953	1,466	1,529	1,492	1,429	1,464	1,475	17,519
			501211	Labor Overtime	1		1		8		1	7	8	2	0	0	27
			501711	Incentive Plan-Off-Annual	13	21	21	21	21	30	22	17	20	21	29	19	255
			504100	Group Ins Maintenance	0	(1)	0	0	2		0	3	2	0	0	0	7
			504500	Other Welfare Maintenance			24										24
			504610	Employee Awards	7	11	4		6	13	4	2	1	3	7	26	83
			504670	Training	2	0											2
			507100	401k	10	13	14	14	14	17	14	14	14	14	18	12	169
			508101	Defined Contribution Plan	2	3	3	3		3	5	4	4	4	5	4	43
			534998	Benefit Overhead	368	391	681	799	814	303	735	838	864	794	752	1,388	8,727
			534999	General Overhead	32	31	33	32	34	32	34	33	33	34	34	34	396
			550005	Mileage Reimbursement Personal Vehicle						1	1						1
			575130	Brochures and Handouts					1						0		1
			575340	Employee Expense				29	7	0				18			53
			575350	Meals Deduct		4	2	(1)	0	1	0	(0)	7	(4)	(2)	0	7
			575351	Meals Non Deduct		4	2	(1)	0	1	0	(0)	7				13
			575620	Office & Admin Supplies						0							0
			575741	Cell Phone													9
037005	CCP-Administration		501200	Labor	71	62	84	68	76	37	133	187	180	108	187	118	1,311
			504500	Other Welfare Maintenance													-
			504610	Employee Awards		1	(1)			1	0	2	17	(17)	(2)	(0)	(0)
			507100	401k	2	2	2	2	2	4	2	2	2	3	3	5	34
			508101	Defined Contribution Plan	3	3	3	3	3	5	7	8	8	8	12	6	70
			534998	Benefit Overhead	80	75	55	69	73	61	76	86	126	112	92	145	1,049
			534999	General Overhead	1,447	1,446	1,005	1,005	1,007	1,020	994	1,000	991	992	1,022	994	12,923
			575350	Meals Deduct	0												1
			721304	Gains/(Losses) NUP Disposals													158
037070	CCP-Call Handling		501200	Labor	12,396	12,687	12,249	10,738	12,121	11,432	10,043	11,680	11,886	11,520	11,378	10,760	138,889
			501211	Labor Overtime	1,057	1,334	1,182	1,561	1,323	2,005	1,214	1,129	1,224	1,376	1,785	631	15,821
			501711	Incentive Plan-Off-Annual	117	120	118	119	118	175	112	133	120	120	179	119	1,549
			504100	Group Ins Maintenance	227	279	262	300	257	459	257	261	284	282	441	150	3,459
			504500	Other Welfare Maintenance								17					17
			504610	Employee Awards	(79)	34	(4)	27	145	(84)	50	34	52	30	59	68	334
			504620	Employee Physical Exam	15	105	(105)	(0)	98	61	84	9	38	58	0	364	364
			507100	401k	55	54	51	53	55	85	56	56	55	53	76	49	697
			508101	Defined Contribution Plan	26	28	27	27	30	52	37	38	44	39	58	41	447
			534998	Benefit Overhead	8,117	7,661	5,628	6,338	6,478	5,655	6,528	6,170	6,417	5,945	5,619	10,174	80,730
			534999	General Overhead	537	526	548	272	268	269	269	274	269	270	270	270	4,042
			535000	Contract Services-Other													1
			535001	Miscellaneous					1,089	2,708	2,123	686	1,165	-	2,188	2,769	12,728
			575000	Employee Expense				(0)						5			5
			575340	Meals Deduct	1	1	1	10	3	6	(2)	1	1	1	9	(10)	12
			575350	Meals Deduct	1	1	1	10	3	6	(2)	1	1		6	7	43
			575351	Meals Non Deduct					(78)	(36)							21
			575485	Hiring Drug Screen													0
			575620	Office & Admin Supplies	0	(0)			0	(0)	(0)	0	(0)	0	0	(0)	0
			575740	Telephone													1
			575741	Cell Phone	16	12	7	7	7	8	8	19	3	8		8	111
037073	CCP-Operations and Support		721304	Gains/(Losses) NUP Disposals													158
			501200	Labor	177	154	203	168	183	103	168	198	276	231	103	179	2,144
			501211	Labor Overtime													158
			504100	Group Ins Maintenance						0	3	4	3	5	20	12	47
			504610	Employee Awards						0	2	1	1	2	5	4	14
			504620	Employee Physical Exam					61	22	(84)						1
			507100	401k						1	0			0	1	0	(0)
			508101	Defined Contribution Plan						1	0			2	3	5	13

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037075	CCP-Education & Development		534998	Benefit Overhead	248	230	182	208	218	193	218	222	233	216	204	373	2,744	
			534999	General Overhead	4,947	5,297	4,609	4,681	4,604	4,938	3,213	4,951	4,620	4,776	4,393	5,432	56,460	
			575320	Electricity	307	283	322	314	325	338	383	371	262	408	338	392	4,044	
			575340	Employee Expense		5	(5)			6	(5)	(1)	1	(1)		5	5	
			575620	Office & Admin Supplies														
			575740	Telephone	(31)											0	1	1
			575741	Cell Phone	6	(6)					(2)		6	6	6	6	(9)	
			721304	Gains/(Losses) NUP Disposals														
			501200	Labor	730	(197)	491	356	1,034	(231)	328	406	353	357	316	945	945	
			501211	Labor Overtime					4	7	3	0		0	7	0	21	
			501711	Incentive Plan-Off-Annual	15	10	10	10	10	14	10	10	10	10	15	10	131	
			504100	Group Ins Maintenance				0	0	1	0	0		0	1	0	3	
			504610	Employee Awards	(0)				14	0	2			1			16	
			504670	Training						25	(25)						-	
			507100	401k	10	6	8	8	8	12	8	8	8	8	11	7	103	
			508101	Defined Contribution Plan	4	4	4	4	4	6	4	4	4	4	4	4	46	
			534998	Benefit Overhead	760	649	62	163	183	631	301	208	213	199	195	241	3,806	
			534999	General Overhead	7	14	11	9	6	7	7	7	7	8	7	7	96	
			550005	Mileage Reimbursement Personal Vehicle						1							1	
			575340	Employee Expense	7		8							37	(37)	8	23	
			575342	Employee Exp Conf/Registration							1	(1)						
			575350	Meals Deduct	(0)	(3)					0					1	(2)	
			575351	Meals Non Deduct	(0)	(3)					0						(3)	
			575740	Telephone	0	(1)											(0)	
			575741	Cell Phone	4	(4)							(9)					(9)
			501200	Labor	144	250	220	201	96	300	196	214	238	203	213	213	241	2,487
			501211	Labor Overtime						1	0	2						3
504100	Group Ins Maintenance						0		0						1			
504610	Employee Awards														1			
504680	Referral Bonus	6													6			
507100	401k	1	1	1	1	1	1	1	0	1	0	0	0	0	8			
534998	Benefit Overhead	92	92	124	144	149	69	121	123	128	119	114	259	1,535				
534999	General Overhead	4	4	4	4	4	4	4	4	4	4	4	4	4	48			
575350	Meals Deduct						0								0			
575351	Meals Non Deduct						0								0			
Customer Call Center (CSC) Total					83,700	80,756	78,130	72,461	82,562	81,987	80,678	86,527	85,345	79,904	81,508	98,725	992,682	
032022	CORP-Government Affairs		501200	Labor	246	233	268	245	256	255	245	268	256	245	256	256	3,030	
			501711	Incentive Plan-Off-Annual	70	70	70	70	70	104	70	70	70	70	105	70	908	
			501716	Compensation Exp-Options	30	30	37	30	30	36	30	30	35	31	31	37	388	
			501718	Compensation Exp-Restricted Stock Units	40	44	47	40	41	52	41	41	52	42	42	156	638	
			504610	Employee Awards													6	
			504670	Training														
			507100	401k	6	6	6	6	6	9	6	6	6	6	126	-	126	
			533000	Contract Services-Legal														
			534998	Benefit Overhead	115	112	145	74	81	57	79	83	81	75	36	217	(217)	
			534999	General Overhead	7	7	8	7	7	7	7	7	7	7	4	6	80	
			535000	Contract Services-Other	338	338	338	338	338	336	400	686	454	454	454	460	4,933	
			550005	Mileage Reimbursement Personal Vehicle													30	
			575000	Miscellaneous			5	-				202	-			10	217	
			575340	Employee Expense	97	52	69	54	22	28	36	50	39	81	45	(3)	570	
			575342	Employee Exp Conf/Registration	10	-	13	-	4	0	0			(19)	-		8	
			575350	Meals Deduct	1	0	2	0	0	0	0	1	1	2	(0)	26	35	
			575351	Meals Non Deduct	1		2	0	0	0	0	1	1				7	
			575715	Software Licenses & Support							83						83	
			575741	Cell Phone	3	1	1	2	2	2	2	1	1	1	1	2	19	
			575998	PCard Undistributed	(26)												(26)	
032025	CORP-External Affairs		501200	Labor	(941)	-	89	30	59	(236)	(7)	757	43	48	(117)	43	(232)	
			501711	Incentive Plan-Off-Annual														
			501716	Compensation Exp-Options	35	49	(84)	-	-	0	(0)	185	-		(0)	26	16	
			501718	Compensation Exp-Restricted Stock Units	0	4	(14)	52	(52)	0	(0)	0	-	(0)	0	26	16	
			504670	Training													-	

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032068	CORP-Marketing		507100	401k	348	162	344	91	240	(154)	66	15	(42)	1	1	229	1,430
			534998	Benefit Overhead	119	124	116	124	119	167	125	136	111	91	62	101	1,396
			535000	Contract Services-Other	791	-	69	-	5	478	(4)	-	-	-	33	-	1,372
			575000	Miscellaneous	-	-	1	-	12	(2)	(2)	-	-	1	-	-	13
			575320	Electricity	(4)	-	-	-	-	-	-	-	-	-	-	-	(4)
			575340	Employee Expense	8	-	-	-	-	-	1	1	1	-	-	372	372
			575342	Employee Exp Conf/Registration	-	-	-	-	-	-	-	-	-	-	-	-	10
			575350	Meals Deduct	1	12	(12)	(1)	5	(0)	1	0	(1)	-	-	13	19
			575351	Meals Non Deduct	1	12	(12)	(1)	5	(0)	1	0	(1)	-	-	6	6
			575620	Office & Admin Supplies	-	-	-	-	1	(0)	-	-	-	-	-	-	7
			575623	Outplacement	-	-	6	203	14	-	-	-	-	-	-	-	217
			575740	Telephone	3	(6)	(3)	5	0	-	-	-	-	-	-	-	(1)
			575741	Cell Phone	5	2	(1)	(2)	-	-	-	-	-	-	-	-	4
			501200	Labor	857	523	434	290	244	154	129	205	205	205	308	205	3,761
			501711	Incentive Plan-Off-Annual	134	108	46	33	23	35	23	23	23	23	35	23	531
			501716	Compensation Exp-Options	28	11	(33)	-	-	3	0	0	0	0	0	1	13
			501718	Compensation Exp-Restricted Stock Units	38	(6)	(257)	(0)	-	4	-	0	2	0	-	8	(211)
			504100	Group Ins Maintenance	13	-	-	-	-	-	-	-	-	-	-	-	13
			504500	Other Welfare Maintenance	95	7	-	-	-	-	-	-	-	-	-	-	101
			507100	401k	27	23	9	4	1	1	1	1	1	1	1	1	69
			508101	Defined Contribution Plan	40	34	19	14	11	16	11	11	11	11	16	11	204
			534998	Benefit Overhead	328	434	307	246	207	146	123	50	38	30	28	104	2,041
			534999	General Overhead	91	90	95	110	90	85	88	91	84	86	47	76	1,034
			535000	Contract Services-Other	935	647	350	231	178	300	19	158	79	137	73	195	3,302
			575000	Miscellaneous	0	2	0	-	4	(4)	-	-	-	-	0	172	175
			575030	Advertising	24	24	288	44	-	-	-	-	-	-	-	119	479
			575130	Brochures and Handouts	-	-	628	44	-	-	-	-	-	-	-	672	-
			575275	Discounts Available	36	0	46	7	32	(10)	21	0	20	(15)	(5)	3	134
			575340	Employee Expense	2	0	3	-	-	1	1	-	1	(2)	1	1	8
			575350	Meals Deduct	2	0	0	-	-	-	-	-	-	-	-	-	7
			575351	Meals Non Deduct	11	7	28	25	25	1	1	-	1	-	-	-	70
			575620	Office & Admin Supplies	-	-	-	-	-	-	-	-	-	-	-	-	286
			575623	Outplacement	-	-	113	162	11	-	-	-	-	-	-	-	1
			575625	Overnight Shipping	1	-	-	-	-	-	-	-	-	-	-	-	-
			575715	Software Licenses & Support	11	(11)	(11)	0	0	(0)	1	(0)	1	0	0	0	4
			575740	Telephone	1	(0)	0	(10)	3	2	2	2	43	18	2	2	45
			575741	Cell Phone	356	100	-	243	3	-	-	-	-	-	-	-	765
			575775	Trade Shows	443	419	482	440	461	500	712	842	717	799	745	857	7,418
032085	CORP-External Communications		501200	Labor	87	86	86	86	86	138	122	140	122	159	321	219	1,653
			501711	Incentive Plan-Off-Annual	27	27	33	27	33	27	32	27	32	28	27	33	344
			501716	Compensation Exp-Options	36	39	42	36	36	46	37	37	47	38	37	139	570
			501718	Compensation Exp-Restricted Stock Units	11	11	11	11	11	17	17	22	18	23	33	23	209
			507100	401k	11	11	11	11	11	17	17	24	18	24	33	24	210
			508101	Defined Contribution Plan	146	134	184	102	105	68	120	181	185	156	71	421	1,873
			534998	Benefit Overhead	9	9	10	9	9	8	9	9	8	9	5	8	101
			534999	General Overhead	434	435	507	418	418	450	510	546	544	536	522	551	5,870
			535000	Contract Services-Other	-	-	-	-	-	-	-	-	-	-	-	-	6
			550005	Mileage Reimbursement Personal Vehicle	6	2	537	8	8	4	4	72	4	5	2	2	645
			575000	Miscellaneous	49	(14)	32	25	23	(12)	(6)	(19)	76	55	4	32	247
			575340	Employee Expense	-	-	0	-	-	-	7	-	-	-	-	-	8
			575342	Employee Exp Conf/Registration	-	-	2	-	1	0	-	1	1	2	-	-	6
			575350	Meals Deduct	-	-	2	-	1	0	-	-	-	-	-	-	4
032086	CORP-Internal Communications		575351	Meals Non Deduct	19	4	2	1	1	2	0	1	1	2	3	1	32
			575620	Office & Admin Supplies	1	1	0	1	(0)	2	0	2	0	0	1	0	7
			575740	Telephone	10	4	6	6	6	5	5	5	5	8	6	7	71
			575741	Cell Phone	-	-	-	-	-	-	-	-	-	-	-	-	-
			575998	PCard Undistributed	363	296	369	324	346	270	362	392	276	324	270	347	3,937
			501200	Labor	76	74	74	74	110	74	74	74	74	74	111	74	958
			501711	Incentive Plan-Off-Annual	24	24	30	24	24	29	25	25	29	25	25	30	316
			501716	Compensation Exp-Options	-	-	-	-	-	-	-	-	-	-	-	-	-

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032087	CORP-Corp Social Resp		501718	Compensation Exp-Restricted Stock Units	33	36	38	33	33	42	34	34	43	35	34	127	521
			504500	Other Welfare Maintenance	0	0	-	20	4	31	10	(20)	227	2	19	74	377
			504670	Training	8	7	8	8	8	11	8	4	15	16	24	16	61
			507100	401k	16	16	16	16	16	24	16	16	15	16	24	16	205
			508101	Defined Contribution Plan	124	105	215	84	98	84	89	124	120	99	58	148	1,347
			534998	Benefit Overhead	12	11	13	12	11	11	11	12	11	11	6	10	130
			534999	General Overhead	12	22	420	(217)	88	138	63	187	25	420	25	337	1,519
			535000	Contract Services-Other	38	1	(3)	0	2	(0)			0				38
			575000	Miscellaneous	(74)	62	(7)	(3)	2	7	16	(2)	10	(3)	(4)	24	28
			575340	Employee Expense	34		6	3									34
			575342	Employee Exp Conf/Registration													
			575350	Meals Deduct			4	0			0	-		13	10	-	56
			575351	Meals Non Deduct			4				0				10	1	15
			575484	Hiring-Background		4				16	0	3	1		0	5	2
			575620	Office & Admin Supplies	1	6	(1)	9	0	8	2	1	2	7	1	7	43
			575740	Telephone	5	2	1	3	3	2	3	3	3	3	6	1	36
			575741	Cell Phone													
			575998	PCard Undistributed	195	185	212	194	203	202	194	212	203	194	203	203	2,401
			501200	Labor	28	28	28	28	28	41	28	28	28	28	42	28	360
			501711	Incentive Plan-Off-Annual	18	18	16	16	16	33	13	6	36	11	-	2	135
			504500	Other Welfare Maintenance	108	89	99	88	93	76	91	95	89	76	37	132	1,072
			534998	Benefit Overhead	6	6	7	6	6	6	6	6	6	6	3	5	69
			535000	Contract Services-Other	129	121	183	259	598	428	303	61	885	0	(17)	121	3,071
			575000	Miscellaneous	2	7							14	2			24
			575130	Brochures and Handouts	88		6								69		163
			575340	Employee Expense	(53)	46	6	25	17	32	(3)	21	68	119	59	(8)	329
			575342	Employee Exp Conf/Registration			37				36		23	23	17		113
			575350	Meals Deduct	1	(0)	10	2	-	(0)			11	2		7	33
			575351	Meals Non Deduct	1		10	2		(0)			11				23
			575620	Office & Admin Supplies	0	-								2			2
033025	WE-External Affairs		575741	Cell Phone	3	3	(0)	3	2	0	2	4	1	2	1	2	23
			575741	Benefit Overhead	-	-											-
			534998	Telephone	-	-											-
			575740	Telephone	-	-											-
			501200	Labor	-	-	0										0
033525	CE-External Affairs		504610	Employee Awards	-	-											-
			534999	General Overhead	-	-											-
			575998	PCard Undistributed	-	-											-
			501200	Labor	-	0											0
			504610	Employee Awards	-	-											-
035525	ED-External Affairs		575340	Employee Expense	-	-											-
			575342	Employee Exp Conf/Registration	-	-											-
			575740	Telephone	-	-											-
			575741	Cell Phone	-	-											-
			575998	PCard Undistributed	-	-											-
			501200	Labor	2,687	1,402	1,450	860	405	335	653	789	721	653	335	721	11,022
			501711	Incentive Plan-Off-Annual	386	303	175	110	88	132	88	88	88	88	132	88	1,764
			501716	Compensation Exp-Options	6	6	(12)	-	-	0			-	0			0
			501718	Compensation Exp-Restricted Stock Units	0	-	-	0	-	0			0			0	0
			504100	Group Ins Maintenance		58											58
			504500	Other Welfare Maintenance	270	270				68	127						465
			504610	Employee Awards	9	-	-										9
			504670	Training											3		3
			507100	401k	69	64	47	29	23	35	23	23	23	23	35	23	420
			508101	Defined Contribution Plan	107	92	61	55	14	46	31	31	31	31	46	31	575
			534998	Benefit Overhead	1,503	2,011	1,664	823	1,121	820	729	787	825	792	519	1,064	12,659
			534999	General Overhead	109	229	270	154	170	115	150	163	181	184	128	119	1,971
			541001	Rents-Real Property Intercompany	168												168
			575340	Employee Expense	51	3	47	74	72	53	158	4	203	35	95	185	980
			575342	Employee Exp Conf/Registration	-	2		1	15		2		1	4	6		31
			575350	Meals Deduct													

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036025	WD-External Affairs		575351	Meals Non Deduct	2			1	15		2		1				21	
			575620	Office & Admin Supplies	4				9		57						70	
			575670	Relocation Expenses						142	845	(927)	(60)	70	0	0	70	
			575715	Software Licenses & Support	(5)												(5)	
			575740	Telephone	4	1	(6)										(1)	
			575741	Cell Phone	37	52	(1)	(13)	(4)								71	
			575998	PCard Undistributed	(12)												(12)	
			501200	Labor				6									6	
			501711	Incentive Plan-Off-Annual				1									1	
			504500	Other Welfare Maintenance						11	(11)						-	
			504610	Employee Awards		2	2		23	36							5	
			504670	Training													23	
			508101	Defined Contribution Plan				0									0	
			534998	Benefit Overhead	3	7	6	7	17	16	26	(4)	8	6	7	46	145	
			534999	General Overhead	1	2	1	2	4	6	4	(0)	1	0	1	2	23	
			550000	Transportation IT-Admin							3	(3)					-	
			575000	Miscellaneous					42	(39)	(3)						0	
			575340	Employee Expense	(2)	1	34		1,187	(1,029)	33	(187)				1,347	-	1,383
			575350	Meals Deduct	0		3		18	2	6	(25)				118	-	120
			575351	Meals Non Deduct	0		3		18	2	6	(25)						3
			575620	Office & Admin Supplies			(0)	(0)	3	(3)							(0)	(0)
			575660	Postage	3	(2)												0
			575740	Telephone	4													0
			575741	Cell Phone														4
			575998	PCard Undistributed	0	(0)					32	(32)						-
External Affairs/Communication Total					11,831	10,251	10,805	7,363	8,240	5,386	7,492	7,046	7,646	6,668	7,608	8,984	99,318	
032007	CORP-Finance		501200	Labor	2,602	2,430	2,657	2,546	2,667	2,619	2,822	3,682	3,180	3,066	3,203	3,231	34,705	
			501711	Incentive Plan-Off-Annual	486	484	468	471	480	725	505	630	600	611	920	614	6,993	
			501716	Compensation Exp-Options	159	156	174	158	158	171	159	159	171	161	160	175	1,959	
			501718	Compensation Exp-Restricted Stock Units	225	235	220	224	224	250	226	225	252	229	227	794	3,331	
			504500	Other Welfare Maintenance					17								17	
			504610	Employee Awards							13						13	
			507100	401k	84	83	78	77	80	86	61	76	68	64	97	61	915	
			508101	Defined Contribution Plan	82	79	74	71	73	114	76	77	76	76	115	76	989	
			534998	Benefit Overhead	947	896	1,081	606	842	502	647	736	580	403	516	1,525	9,282	
			534999	General Overhead	133	130	140	132	130	159	127	131	121	124	88	110	1,524	
			535000	Contract Services-Other	711	1,484	1,134	0	3,426	2,479				(1,909)	(6,679)		646	
			541000	Rents-Real Property		31	15	15	16	16		32	16	22	29	24	216	
			550005	Mileage Reimbursement Personal Vehicle					1			1					2	
			575002	Misc General Office											121		121	
			575340	Employee Expense	(9)	37	26	6	6	40	113	5	89	46	47	68	473	
575342	Employee Exp Conf/Registration	3			2	-								7	12			

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032047	CORP-Income Tax		508101	Defined Contribution Plan	131	134	132	132	141	200	140	133	133	(167)	121	87	1,318
			533000	Contract Services-Legal				140		9		42	20		33	-	244
			534998	Benefit Overhead	755	623	727	500	552	364	527	544	504	432	312	542	6,382
			534999	General Overhead	56	54	59	56	54	51	53	55	50	52	58	46	615
			535000	Contract Services-Other	4,598	3,616	2,987	1,171	6,698	1,265	3,858	11,771	9,045	(26,006)	7,058	2,574	28,634
			535001	Contract Services-Temp Employee												1,145	
			550005	Mileage Reimbursement Personal Vehicle										(6)	-	1	2
			575002	Misc General Office	2	-	333	78	113	206	115	171	255	(1,182)	226	397	1,231
			575340	Employee Expense	191	326											5
			575342	Employee Exp Conf/Registration	39	4				8	-	4	(0)	4	9	53	119
			575350	Meals Deduct	30	39	20	17	9	22	17	26	9	(118)	(4)	(5)	62
			575351	Meals Non Deduct	30	39	20	17	9	22	17	26	9	(136)			53
			575481	Hiring-Ads						79	-						79
			575484	Hiring-Background													2
			575620	Office & Admin Supplies	0	0	0	(0)	2	(2)	2	9			1	11	11
			575623	Outplacement	131											131	131
			575660	Postage													9
			575670	Relocation Expenses	29	31	45	8	0	0	-						113
			575715	Software Licenses & Support	2												2
			575740	Telephone	0	6	0	8	1	1	3	(1)	2	2	3	1	27
			575741	Cell Phone													
			501200	Labor	1,255	1,190	1,366	1,280	1,372	1,383	1,489	2,017	1,589	1,315	2,341	1,571	18,168
			501201	Labor Non Scheduled Overtime													29
			501711	Incentive Plan-Off-Annual	155	152	152	152	152	246	166	166	183	180	375	195	2,272
			501716	Compensation Exp-Options	6	6	1	4	4	5	4	4	5	4	4	6	54
			501718	Compensation Exp-Restricted Stock Units	11	12	11	11	11	13	11	11	14	12	12	54	183
			504100	Group Ins Maintenance	0		0	0	-			0	0	0			0
			504610	Employee Awards											3		3
			507100	401k	41	41	41	41	41	62	42	42	37	33	91	37	550
			508101	Defined Contribution Plan	54	54	54	54	54	82	61	70	65	63	109	64	782
			532000	Contract Services-Accounting	5,878	4,995	1,454	1,581	2,121	5,310	1,061	(207)	(560)				21,633
			533000	Contract Services-Legal										25	-		134
			534998	Benefit Overhead	464	375	425	305	318	215	303	375	381	315	305	1,121	4,900
			534999	General Overhead	68	60	67	60	51	49	52	54	52	56	61	60	689
			535000	Contract Services-Other									2		622	(33)	591
			550005	Mileage Reimbursement Personal Vehicle			2	0									0
			575000	Miscellaneous									2		8	0	11
			575340	Employee Expense			28	68	4	88	7	9	18	26	42	4	296
			575342	Employee Exp Conf/Registration	32								15	48	4	6	104
			575350	Meals Deduct	1	(0)	2	5	7	(5)	0	5	7	(5)	12	4	34
			575351	Meals Non Deduct	1	(0)	2	4	7	(5)	0	5	7				23
			575483	Hiring-Assessments													7
			575484	Hiring-Background						7	0	2					5
			575485	Hiring-Drug Screen							3	2					3
			575620	Office & Admin Supplies	3	18	4	2	(1)	3	9	4	1	(0)	0	(0)	43
			575715	Software Licenses & Support							6	2	64	(17)			55
			575740	Telephone	0	4	1	(0)	(0)	0	(0)	0	(0)		(0)	0	5
			575741	Cell Phone	8	3	3	5	5	4	10	9	6	8	7	2	70
			501200	Labor	2,387	1,900	2,693	2,568	2,836	2,197	2,232	2,587	2,432	2,302	2,787	2,628	29,549
			501201	Labor Non Scheduled Overtime					48	17							65
			501711	Incentive Plan-Off-Annual	476	425	438	458	467	656	442	441	441	448	746	469	5,907
			501716	Compensation Exp-Options	55	57	32	47	47	50	47	47	51	48	48	53	581
			501718	Compensation Exp-Restricted Stock Units	107	120	114	112	112	119	113	113	121	114	113	467	1,724
			504500	Other Welfare Maintenance	90	8	156	225	199	295	85	19	5	5	5		1,092
			504610	Employee Awards											2		17
			504660	Tuition Aid	3					8		1	3				87
			504670	Training								18	1			68	17
			507100	401k	78	68	69	71	73	95	64	65	58	58	10	5	866
			508101	Defined Contribution Plan	79	72	65	81	87	114	76	77	77	76	152	82	844
			533000	Contract Services-Legal	3	-			7	16	14	(11)					1038
			534998	Benefit Overhead	987	880	1,023	824	886	632	786	841	832	747	387	1,558	10,383

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033007 033507 035007	WE-Finance CE-Finance SE-Finance		534999	General Overhead	55	52	58	55	53	50	52	53	49	51	28	45	599
			535000	Contract Services-Other	148	2,665	1,652	1,056	716	(30)	355	178	1	1	503	888	8,133
			550005	Mileage Reimbursement Personal Vehicle	2	1	2	1	1	6	1	8	1	2	4	2	30
			575000	Miscellaneous						153	139	139	139	139	139	986	4
			575002	Misc General Office								4					
			575320	Electricity	164	117	422	125	79	64	75	476	(160)	221	202	(41)	1,744
			575340	Employee Expense	6	9	27	14	9	1	1	48	15	2	9	18	158
			575350	Meals Deduct	6	9	27	14	9	1	1	48	15	2	9	18	129
			575351	Meals Non Deduct													7
			575481	Hiring-Jobs													10
			575484	Hiring-Background							2	8					1
			575485	Hiring-Drug Screen							1						7
			575620	Office & Admin Supplies	4	4	1								1	1	1
			575670	Relocation Expenses	(98)	343	166	172	61	(37)	(88)	227	1	(244)	1	10	513
			575740	Telephone	(0)	2	(0)	0	0	1	1	1	2	0	(0)	0	8
			575741	Cell Phone	34	11	2	21	14	19	16	17	24	14	17	19	207
			575790	Trustee Fees						73	77	184	138	49	30	60	610
			575998	PCard Undistributed								3	(3)				(3)
			534998	Benefit Overhead	-												-
			534998	Benefit Overhead	-												-
			501200	Labor	-												-
035507	ED-Finance		504660	Tuition Aid	-												-
			575340	Employee Expense	-												-
			575350	Meals Deduct	-												-
			575740	Telephone	-												-
			501200	Labor	14,346	23,890	26,623	13,789	12,976	7,107	11,697	9,509	12,101	10,123	7,535	6,244	155,939
			501210	Labor Non Scheduled Overtime	6	60									212		278
			501711	Incentive Plan-Off-Annual	2,298	4,119	4,238	2,096	1,673	1,762	1,532	1,252	1,654	1,480	1,830	873	24,806
			501716	Compensation Exp-Options	222	223	(16)	204	(39)	193	158	158	191	162	160	205	1,820
			501718	Compensation Exp-Restricted Stock Units	326	360	(31)	325	(402)	336	263	263	339	271	269	1,054	3,373
			504100	Group Ins Maintenance	1	16									61		78
			504500	Other Welfare Maintenance													
			504610	Employee Awards					14			10	29	344		100	444
			504660	Tuition Aid	1,389						118		233				53
			504670	Training	301							53	(26)				2,515
036007	WD-Finance		507100	401k	369	644	637	330	311	336	317	248	329	288	355	161	4,324
			508101	Defined Contribution Plan	148	282	406	306	305	374	262	198	251	218	250	138	3,137
			533000	Contract Services-Legal	3	(3)	3		59	(58)							4
			534998	Benefit Overhead	5,521	5,498	6,859	4,357	4,571	2,678	4,132	4,609	4,899	4,743	3,212	7,383	58,463
			534999	General Overhead	658	851	890	696	654	549	572	592	598	658	612	480	7,811
			541001	Rents-Real Property Intercompany	122	110	161	145	141	159	346	369	309	312	312	349	2,835
			541400	Rents-Equipment									47				47
			550000	Transportation Tr-Admin											2		2
			550002	Transportation Lease Fuel						7					16	20	26
			550005	Mileage Reimbursement Personal Vehicle					4			0		10			30
			575000	Miscellaneous	11				225		144	114			52		546
			575002	Misc General Office				3	11	5	(0)						18
			575340	Employee Expense	381	888	1,623	2,376	142	756	612	222	1,714	288	509	2,416	11,926
			575350	Meals Deduct	97	64	143	725	19	206	67	15	59	36	115	139	1,686
			575351	Meals Non Deduct	97	64	143	725	19	206	67	15	59	36	115	139	1,396
			575620	Office & Admin Supplies				228	5	18	55	30	62	29	92	(66)	1,034
			575625	Overnight Shipping	1	1		2		4	1		4	0	13	3	28
			575670	Relocation Expenses													
			575715	Software Licenses & Support					22	232	(207)	343	75	44	(127)	143	503
			575740	Telephone	3	5	2	21	(1)	1	3	(2)			2	0	36
			575741	Cell Phone	41	79	25	69	36	88	82	14	38	75	54	28	630
			575998	PCard Undistributed	-			15	18	(32)		0		14	59	(74)	(1)
036007	WD-Finance		501200	Labor	36	36	53	89	29	382	487	(189)	52	13	31	61	1,044
			501711	Incentive Plan-Off-Annual	5	8	8	14	4	96	133	(1)	7	2	5	8	282
			504100	Group Ins Maintenance		13											13
			504610	Employee Awards				6									6

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Human Resources	032002	CORP-HR Comp/Benefits	504670	Training	3	(1)											
			507100	401k	1	2	4	1	11	13	(3)	2	2	1	1	2	36
			508101	Defined Contribution Plan	2	3	5	1	4	5	5	3	3	1	2	2	33
			534998	Benefit Overhead	5	11	8	10	23	21	38	(6)	12	8	12	92	234
			534999	General Overhead	1	3	2	4	6	11	(2)	3	3	3	6	15	69
			535000	Contract Services-Other						(6)							-
			541400	Rents-Equipment								10	10		10	10	38
			575340	Employee Expense	6		2		465	(464)	(0)	0	78	(78)			8
			575342	Employee Exp Conf/Registration	3												3
			575350	Meals Deduct	4		0		199	(196)	(3)	(0)	2	(4)	70	(70)	2
			575351	Meals Non Deduct	4		0		199	(196)	(3)	(0)	2				6
			575620	Office & Admin Supplies	5				2	(2)							5
			575740	Telephone	3	(3)											-
			575741	Cell Phone	4				37	(37)							4
			575998	PCard Undistributed		0											-
			501200	Labor	-	0											0
			533000	Contract Services-Legal	54,087	65,632	67,083	45,698	51,675	40,878	42,734	49,075	48,439	3,591	27,933	42,559	539,384
			501200	Labor	715	669	801	731	691	651	734	778	791	625	449	647	8,283
			501711	Incentive Plan-Off-Annual	138	137	140	142	144	187	149	135	112	126	172	126	1,708
			501716	Compensation Exp-Options	38	38	47	38	38	45	38	38	45	39	39	47	488
			501718	Compensation Exp-Restricted Stock Units	50	55	59	51	51	65	52	52	66	54	53	196	804
			504100	Group Ins Maintenance	0												0
			507100	401k	20	20	14	21	21	28	21	15	9	14	21	13	216
			508101	Defined Contribution Plan	12	12	12	12	12	19	13	12	13	9	15	8	148
			533000	Contract Services-Legal	174	118	173	281	(11)	(56)	39	878	837	201	(106)	315	2,843
			534998	Benefit Overhead	375	326	333	248	271	173	239	251	252	225	133	418	3,244
			534999	General Overhead	94	93	96	92	92	123	91	94	86	89	68	80	1,100
			535000	Contract Services-Other	1,305	(1,039)	(0)	(1,861)	(0)	(220)	(4)	29	4	2	1	2	(1,806)
			535001	Contract Services-Temp Employee													39
			535003	Cont Svc-Benefit Adm	1,657	814	269	1,215	459	832	1,013	417	623	830	1,928	10,057	
			535005	Contr Svc-Comp Admin			82	239	(238)	334	57	181	48	405	93	1,201	
			550005	Mileage Reimbursement Personal Vehicle	1						2		2	2	3		9
			575340	Employee Expense	38	(15)	7	8	140	29	34	(2)	(6)	21	11	(15)	251
			575342	Employee Exp Conf/Registration		2	3					5		-	(2)		7
			575350	Meals Deduct	-	0	0	-		1	34	1	0	6	6	(0)	50
			575351	Meals Non Deduct	0	0	0			1	34	1	0				38
			575481	Hiring-Ads					8								8
			575620	Office & Admin Supplies	2		-	(0)						0	2	3	12
			575740	Telephone	1	(1)	2			1	5	(1)	0	0	2	8	107
			575741	Cell Phone	11	10	3	7	20	4	9	10	9	7	8	8	107
Human Resources	032003	CORP-HR Talent Development	501200	Labor	663	359	498	440	467	333	434	452	434	357	207	443	5,087
			501711	Incentive Plan-Off-Annual	139	101	97	97	97	145	97	87	76	80	130	91	1,237
			501716	Compensation Exp-Options	19	19	21	19	19	23	19	19	23	20	20	27	249
			501718	Compensation Exp-Restricted Stock Units	38	42	39	38	39	48	39	39	50	40	40	160	612
			504100	Group Ins Maintenance	12												12
			504670	Training	37	494	13	(311)				15	-		3	5	257
			507100	401k	13	9	8	8	8						1	1	49
			508101	Defined Contribution Plan	19	18	19	19	19	28	19	16	15	15	24	18	227
			520100	Materials & Supplies Operations								1	-		0		1
			534998	Benefit Overhead	388	674	337	375	291	287	292	252	215	503	511	4,616	
			534999	General Overhead	34	39	34	31	25	24	26	26	31	30	31	359	
			535000	Contract Services-Other	-	-	-	-	-	16	-	-	-	3			19
			535001	Contract Services-Temp Employee			35	236	221	208	253	(0)	-				953
			550005	Mileage Reimbursement Personal Vehicle	8							4					12
			575002	Misc General Office											1		1
Human Resources			575125	Books & Publications			8	-	-	0							0
			575130	Brochures and Handouts													0
			575340	Employee Expense	61	124	74	27	17	26	82	41	5	(14)	62	(7)	498
			575342	Employee Exp Conf/Registration	2	-	3	46	(9)	(6)	4	6	3	3	2		43
			575350	Meals Deduct	(0)	2	9	3	9	(6)	4	6	3	3	2		35

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			575351	Meals Non Deduct			2	9	3	9	(6)	4	6	3			30
			575360	Meeting Room Rental													9
			575461	Hiring-Ads				4		1	0						4
			575485	Hiring-Drug Screen						8							1
			575620	Office & Admin Supplies													8
			575715	Software Licenses & Support				15									15
			575740	Telephone	(2)	7	4	(2)	1	1	2	11	0	1	1	(1)	24
			575741	Cell Phone	10	(1)		3	2	7	3	3	3	2	3	3	40
			575998	PCard Undistributed			46	(46)									-
	032004	CORP-HR Labor Relations	501200	Labor	296	276	328	293	311	268	300	328	311	293	277	311	3,592
			501711	Incentive Plan-Off-Annual	84	83	83	83	83	122	85	83	83	83	124	83	1,078
			501716	Compensation Exp-Options	35	36	44	36	36	42	36	36	42	37	37	44	461
			501718	Compensation Exp-Restricted Stock Units	48	52	56		48	61	49	49	62	50	50	185	757
			504610	Employee Awards				1							2		3
			504670	Training										25		7	32
			507100	401k	11	11	11		11	16	7			-			78
			508101	Defined Contribution Plan	15	15	15	15	15	15	15	15	15	15	22	15	188
			533000	Contract Services-Legal	0	0	381	(424)	127	(126)							(42)
			534998	Benefit Overhead	184	159	252	77	105	103	66	68	43	19	143	246	1,467
			534999	General Overhead	107	212	105	98	87	115	87	91	85	92	141	97	1,318
			535004	Contr Svc-Labor Relations			5	127	600	264	463	334	4	72	(500)	148	1,537
			550005	Mileage Reimbursement Personal Vehicle	6	2	1							4			14
			575002	Misc General Office													1
			575340	Employee Expense	38	61	6	45	12	88	13	25	35	124	61	(4)	503
			575350	Meals Deduct	0	1	5	-	2	2	2	3	7	(4)	11	14	40
			575351	Meals Non Deduct	0	1	5		2					7			19
			575360	Meeting Room Rental													
			575715	Software Licenses & Support	1	-	8	(21)	5	3	13	10	7	8	(3)		14
			575740	Telephone	5	6	4	2	6	5	4	5	4	4	5	4	42
			575741	Cell Phone	8	4											55
			575998	PCard Undistributed										1	(1)		-
	032006	CORP-Business Center HR	501200	Labor	738	652	969	838	968	858	902	1,007	864	809	1,121	990	10,718
			501711	Incentive Plan-Off-Annual	93	122	157	152	142	238	158	161	162	154	226	163	1,929
			501716	Compensation Exp-Options	33	13	(20)	16	16	23	16	16	22	17	17	23	192
			501718	Compensation Exp-Restricted Stock Units	45	(7)	(268)	31	31	42	31	31	42	33	32	145	189
			504500	Other Welfare Maintenance	1												14
			504610	Employee Awards	2	1	3		(2)					14	1		14
			504620	Employee Physical Exam		0											7
			504660	Tuition Aid													0
			504670	Training	46	(1)	(46)	69			16			18			34
			507100	401k	17	14	18	17	16	32	23	24	22	0	14		138
			508101	Defined Contribution Plan	9	18	22	22	23	39	26	29	27	25	28	13	245
			533000	Contract Services-Legal							50	(50)			38	31	309
			534998	Benefit Overhead	472	410	648	360	346	244	346	352	371	344	344	888	5,135
			534999	General Overhead	137	170	239	235	118	118	102	116	143	127	315	242	2,062
			535000	Contract Services-Other	(59)	2	136		73	73			109				262
			535001	Contract Services-Temp Employee	50	100	108	89	213	144	129	470	160	296	53	433	2,246
			550005	Mileage Reimbursement Personal Vehicle	(1)			3	(2)		6	5				2	14
			575030	Advertising	-	101	(101)						60	53	-		113
			575125	Books & Publications	3	-	-	0	6	2	14	1	1	7			35
			575130	Brochures and Handouts	-	-	8	5	-	1							13
			575250	Condemnation Costs							0						0
			575340	Employee Expense	33	(6)	75	(14)	26	3	93	(38)	69	59	10	10	319
			575342	Employee Exp Conf/Registration	25	-	4		4	29	-		25	19	(18)	-	83
			575350	Meals Deduct	0	4	5	4	6	7	23	11	1	1	18	4	(7)
			575351	Meals Non Deduct	0	4	5	4	4	6	7	23	11	1			78
			575481	Hiring-Ads					38					-			39
			575620	Office & Admin Supplies							10	2			5		17
			575667	Printing					17			3					20
			575670	Relocation Expenses	0	-	0										0
			575710	Security Service		1											1

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	032013	CORP-HR Systems & Processes	575715	Software Licenses & Support	133	133	133	144	133	132	133	157	182	157	157	157	1,752
			575740	Telephone	3	(5)	(1)	(1)	2	3	0	1	2	1	(0)	0	2
			575741	Cell Phone	10	2	20	13	29	10	16	16	16	17	16	17	182
			575775	Trade Shows	-	-	-	(10)	-	-	-	5	-	-	-	-	(5)
			575998	PCard Undistributed	(3)	-	-	-	-	-	-	-	-	-	-	-	(3)
			675250	Comp Equip Hardware	-	-	-	-	-	0	(0)	-	-	-	-	-	-
			501200	Labor	(34)	34	-	-	-	-	-	-	-	-	-	-	-
			501711	Incentive Plan-Off-Annual	21	(21)	-	-	-	-	-	-	-	-	-	-	(0)
			504670	Training	2	(2)	-	-	-	-	-	-	-	-	-	-	-
			508101	Defined Contribution Plan	7	(7)	-	-	-	-	-	-	-	-	-	-	-
			534998	Benefit Overhead	(1)	1	-	-	-	-	-	-	-	-	-	-	0
			535000	Contract Services-Other	-	-	-	-	-	-	-	-	-	-	-	-	(0)
			575340	Employee Expense	2	(2)	-	-	-	-	-	-	-	-	-	-	-
			575740	Telephone	0	(0)	-	-	-	-	-	-	-	-	-	-	-
			575741	Cell Phone	4	(4)	-	-	-	-	-	-	-	-	-	-	-
			501200	Labor	379	353	363	376	399	343	376	422	381	376	(43)	205	3,927
			501711	Incentive Plan-Off-Annual	194	176	165	176	176	263	176	176	167	176	97	97	1,943
			501716	Compensation Exp-Options	118	114	116	116	116	116	116	116	116	116	(1,161)	(0)	(1)
			501718	Compensation Exp-Restricted Stock Units	171	174	144	168	169	168	169	169	169	169	(2,612)	22	(921)
			504500	Other Welfare Maintenance	120	60	-	96	-	10	0	-	-	-	-	-	286
			504620	Employee Physical Exam	(6)	-	12	-	51	(23)	23	-	-	-	-	-	0
			504660	Tuition Aid	-	-	-	-	-	-	-	-	-	-	-	-	-
			504670	Training	15	13	12	26	13	20	12	-	-	16	47	119	430
			507100	401k	18	18	18	18	18	26	18	18	17	18	10	-	99
			508101	Defined Contribution Plan	1	1	2	-	17	447	1,097	132	694	(383)	991	12	49
			520100	Materials & Supplies Operations	147	-	1,626	680	680	52	26	24	(65)	(105)	161	120	5,144
			533000	Contract Services-Legal	256	97	159	61	128	52	26	24	(65)	(105)	161	120	915
			534998	Benefit Overhead	(85)	(169)	636	(110)	(103)	(50)	(103)	(115)	1,194	119	84	108	1,404
			534999	General Overhead	2	12	432	73	73	386	643	31	710	6,938	3,678	3,966	16,871
			535000	Contract Services-Other	0	145	(145)	-	-	-	-	-	-	-	-	-	-
			535001	Contract Services-Temp Employee	193	350	691	567	604	437	256	533	201	209	115	139	4,295
			535003	Contr Svc-Benefit Adm	611	341	607	(1,310)	(204)	(45)	-	-	-	-	7	14	0
			535004	Contr Svc-Labor Relations	3	-	-	-	-	3	-	-	-	-	-	-	-
			550005	Mileage Reimbursement Personal Vehicle	-	-	-	-	-	-	-	-	-	-	-	-	-
			575000	Miscellaneous	(84)	60	(15)	16	20	9	110	(34)	55	29	2	(21)	5
			575340	Employee Expense	-	-	-	-	-	-	-	-	-	-	-	-	-
			575342	Employee Exp Conf/Registration	-	-	-	-	-	-	-	-	-	-	-	-	-
			575350	Meals Deduct	69	8	32	21	46	6	10	35	30	35	(0)	10	281
			575351	Meals Non Deduct	69	8	32	21	46	6	10	35	30	35	(0)	10	302
			575360	Meeting Room Rental	-	3	-	4	-	-	-	-	2	7	-	-	16
			575461	Hiring Ads	-	-	-	-	-	-	-	-	-	74	5	-	78
			575482	Hiring-Agency	-	-	-	-	-	-	-	-	-	-	-	-	-
			575620	Office & Admin Supplies	8	38	35	13	11	17	2	21	38	9	1	4	197
			575625	Overnight Shipping	2	3	-	-	-	-	-	-	-	-	-	-	5
			575667	Printing	1	0	122	168	1	1	12	0	1,022	1	1	(1)	306
			575670	Relocation Expenses	107	(106)	-	-	-	-	-	-	-	-	-	-	1
			575715	Software Licenses & Support	-	-	-	-	-	-	-	-	-	-	-	-	-
			575740	Telephone	3	(11)	3	2	(0)	(0)	1	1	5	1	1	(0)	1,022
			575741	Cell Phone	3	1	1	1	2	2	2	2	4	1	1	(2)	18
			675000	Misc Maintenance	1	1	1	1	200	227	214	214	214	214	213	216	1,719
032028	CORP-ED Human Resources	Labor	501200	Labor	2,795	1,399	1,812	1,487	1,629	1,930	1,831	2,374	2,938	4,882	1,285	1,215	25,575
			501711	Incentive Plan-Off-Annual	417	316	326	316	316	474	316	368	447	609	474	213	4,593
			501716	Compensation Exp-Options	81	82	92	81	81	98	83	83	100	84	84	113	1,062
			501718	Compensation Exp-Restricted Stock Units	162	180	166	164	165	205	168	167	213	171	171	684	2,617
			504610	Employee Awards	-	-	-	-	-	-	-	-	-	-	-	-	-
			504670	Training	-	-	-	-	-	-	-	-	-	-	-	-	-
			507100	401k	87	56	55	54	54	85	56	56	67	133	83	32	258
			508101	Defined Contribution Plan	73	73	68	70	71	152	94	94	136	249	124	66	817
			520100	Materials & Supplies Operations	-	-	-	-	-	-	-	-	-	-	-	-	-
			534998	Benefit Overhead	204	994	1,811	789	856	507	722	763	794	761	506	1,013	1,270
			534999	General Overhead	12	70	83	63	61	41	53	57	58	64	45	46	9,721

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032038	CORP-WD Human Resources		535000	Contract Services-Other	125	113	133	119	116	131	188	201	168	231	-	-	666
			541001	Rentals-Real Property/Intercompany					2				7	170	170	(57)	1,578
			550000	Transportation Tr-Admin	2												11
			550005	Mileage Reimbursement Personal Vehicle								8		16	8	16	54
			575000	Miscellaneous					11	10		35	7			2	84
			575002	Misc General Office			10	9									21
			575340	Employee Exp Conf/Registration	198	136	253	61	125	287	556	490	1,088	2,046	414	(88)	5,566
			575342	Employee Expense					11				53				84
			575350	Meals Deduct	3	20	74	(40)	15	48	15	86	94	203	16	18	549
			575351	Meals Non Deduct	3	17	74	(40)	15	48	15	86	94				313
			575620	Office & Admin Supplies	108	29	116	57	51	81	25	62	26	33	24	6	618
			575625	Overnight Shipping	6	(1)	1	5		6		0	3	1			21
			575670	Relocation Expenses						29							29
			575740	Telephone							0					0	1
			575741	Cell Phone	32	8	8	19	17	18	38	10	19	19	7	13	208
			575998	PCard Undistributed	(1)			-	4	(4)				-	(1)		(2)
			675250	Comp Equip Hardware			6		10	0							16
			675450	Office Equipment													31
			501200	Labor	13	19										361	361
			501711	Incentive Plan-Off-Annual								9				91	91
			504610	Employee Awards	2												11
			507100	401k													9
			534998	Benefit Overhead	637	7	5	7	15	16	26	(4)	8	6	8	54	783
			534999	General Overhead	158	2	1	2	4	7	8	(1)	0	0	0	2	186
			535000	Contract Services-Other								7	-	(7)			-
			575000	Miscellaneous			8			(110)	(9)	23			94	67	16
			575340	Employee Expense	37	(31)	29		129	(110)	(9)			1			228
			575350	Meals Deduct	2	4	4		5	1	(1)	2		1	4	8	29
			575351	Meals Non Deduct	2	4	4		5	1	(1)	2		1			17
			575620	Office & Admin Supplies					2	(2)							0
			575741	Cell Phone				(15)					1	(1)		1	1
			575998	PCard Undistributed	(3)	(1)	15										(4)
			501200	Labor	0	0	0	0	-	(0)	0	-	0	0	0	0	0
			501711	Incentive Plan-Off-Annual	-	0	0	0	0	0	0	0	0	0	0	0	0
			504500	Other Welfare Maintenance		(0)	0	(0)	0	(0)	0	-	-	-	0	0	0
			507100	401k	-	-	-	-	-	-	-	-	-	-	-	-	0
			508101	Defined Contribution Plan	-	-	-	-	-	-	-	-	-	-	-	-	(0)
			534998	Benefit Overhead	-	0	(0)	-	-	-	-	-	-	-	-	-	0
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			535000	Contract Services-Other	-	-	(0)	-	-	-	-	(0)	0	-	-	-	(0)
			535003	Contr Svc-Benefit Adm	-	-	0	0	0	0	0	-	-	-	0	(0)	0
			575340	Employee Expense	-	-	-	-	-	-	-	-	(0)	-	-	0	0
			575342	Employee Exp Conf/Registration	-	-	-	-	-	-	(0)	-	-	-	(0)	-	(0)
			575660	Postage	0	0				-				0	0	-	0
			575740	Telephone	0	1	(1)	0	(0)	(0)	0	-			0	-	0
			575741	Cell Phone	-	4	(4)	0	-	(0)	0	-			0	(0)	0
032058	CORP-HR Admin & Gen		575350	Meals Deduct	275	138	8										668
			575351	Meals Non Deduct	4	(4)	16										16
			501200	Labor	890	848	965	878	926	908	789	849	817	837	849	840	10,396
			501211	Labor Overtime	9	3	6	11	4	11	3	13	3	3	11	11	96
			501711	Incentive Plan-Off-Annual	94	94	94	92	94	137	85	82	83	83	125	83	1,145
			501716	Compensation Exp-Options	6	6	7	6	6	6	6	6	8	7	7	9	83
			501718	Compensation Exp-Restricted Stock Units			13	13	13	13	13	13	17	13	14	54	206
			504100	Group Ins Maintenance	2	1	4	3	1	2	1	2	1	2	3	2	22
			504500	Other Welfare Maintenance	56	14	(22)	-	2	5	6	5	2	72	58	14	210
			504610	Employee Awards	121	(96)	45	35	69	105	0	(252)	1	1	8		0
034018	CCA-Human Resources		504620	Employee Physical Exam													
			504660	Tuition Aid	28	(22)	3	(28)		1						(56)	(17)
			504670	Training	20	2	-	(1)	1	39	1	17					77
			507100	401k	11	15	15	15	15	26	15	13	14	15	22	14	189

Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total					
Investor Relations	CORP-BAD-Business Analysis Grp		508101	Defined Contribution Plan	22	22	22	22	23	31	20	17	17	17	26	17	259					
			533000	Contract Services-Legal	22	(0)	128	285	232	388	150	595	155	(175)	(8)			1,772				
			533001	Contract Services-Utigation															-			
			534098	Benefit Overhead	464	408	421	378	406	326	393	359	374	344	315	665	4,855					
			534099	General Overhead	31	36	23	42	22	57	29	23	22	27	23	26	360					
			535000	Contract Services-Other	1	-		1											2			
			535001	Contract Services-Temp Employee	152	107	95	84	-	100	78	140	82	45	(7)	77	953	8				
			535004	Contr Svc-Labor Relations					8										8			
			575030	Advertising			1	-		(1)						44	23	-	67			
			575125	Books & Publications					11									3	3			
			575130	Brochures and Handouts					1										11			
			575340	Employee Expense	31	20	72	85	(25)	185	82	47	64	195	122	169	1,048					
			575342	Employee Exp Conf/Registration		33	4	7		33						41	100	218				
			575350	Meals Deduct	16	10	12	9	3	15	18	(5)	25	(25)	31	32	138					
			575351	Meals Non Deduct	16	10	12	9	3	15	18	(5)	25	(25)	31	32	100					
			575620	Office & Admin Supplies	8	-	0	2	1		1		0	0	13	11	2	38				
			575715	Software Licenses & Support	29	0	(0)												29			
			575740	Telephone	0	(0)												(0)				
			575741	Cell Phone	9	(9)																
			675450	Office Equipment	-	-													-			
			Human Resources Total			16,890	13,232	17,643	11,174	15,903	14,321	13,321	16,240	16,611	20,679	26,069	14,363	20,571	20,697	3,261		
			Investor Relations	CORP-BAD-Business Analysis Grp		501200	Labor	284	251	342	280	310	139	280	340	306	280	139	310	306	3,261	
						501711	Incentive Plan-Off-Annual	60	59	59	59	59	88	59	88	59	58	59	89	59	59	767
						501716	Compensation Exp-Options	44	44	54	44	44	52	44	44	44	52	45	45	54	566	
						501718	Compensation Exp-Restricted Stock Units	59	63	68	59	76	60	60	76	62	61	227	930			
						507100	401k	6	6	6	6	10	14	10	10	9	8	5	3	95	3	
						508101	Defined Contribution Plan	13	13	13	13	13	19	13	13	12	13	13	19	13	165	
534098	Benefit Overhead	237				194	262	99	159	65	88	89	48	10	117	253	1,621					
534999	General Overhead	57				67	66	58	57	75	80	59	53	55	42	48	717					
535000	Contract Services-Temp Employee	480				152	428	(45)	971	(345)	253	199	28	459	81	161	2,820					
535001	Contract Services-Other																		26			
550005	Mileage Reimbursement Personal Vehicle								8								8	5	20			
575000	Miscellaneous							35		778									813			
575340	Employee Expense	147				303	64	(139)	215	31	(87)	88	71	216	(54)	363	1,218					
575342	Employee Exp Conf/Registration	2				-	88	35	47	36	27	30	89	(0)	52	89	495					
575350	Meals Deduct	1				0	30	1	0	3	6	3	7	7	6	2	67					
575351	Meals Non Deduct	1				0	30	1	0	3	6	3	7	7	6	2	67					
575620	Office & Admin Supplies	2				-	65	1	1	0	3	6	3	7	6	2	67					
575660	Postage	1				154	3	3	197	19	19	30	5	2	0	4	437					
575740	Telephone	-				0	1	(0)	(0)	(0)	(0)								1			
575741	Cell Phone	16				7	1	13	4	7	9	9	12	29	(4)	8	110					
575988	PCard Undistributed	10				(12)	0	12	(12)	-									(1)			
Investor Relations Total						1,419	1,303	1,581	534	2,141	1,086	884	1,061	842	1,256	606	1,603	1,431	14,316	3,058		
ITS	CORP-BAD-Business Analysis Grp					501200	Labor							332	556	534	438	531	666	3,058		
						501711	Incentive Plan-Off-Annual														402	
						504670	Training															3
						507100	401k															3
						508101	Defined Contribution Plan															3
			534098	Benefit Overhead															3			
			535000	Contract Services-Other															3			
			535001	Contract Services-Temp Employee															3			
			575000	Miscellaneous															3			
			575340	Employee Expense															3			
			575342	Employee Exp Conf/Registration															3			
			575350	Meals Deduct															3			
575351	Meals Non Deduct															3						
575740	Telephone															3						
575741	Cell Phone															3						
501200	Labor	248	225	258	225	248	224	225	285	265	217	235	252	2,908								
501711	Incentive Plan-Off-Annual	48	45	43	42	44	66	42	48	47	41	68	45	579								
501716	Compensation Exp-Options	11	11	13	11	11	13	11	13	11	13	11	14	139								

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
032031	CORP-Service Desk		501718	Compensation Exp-Restricted Stock Units	15	16	17	15	15	19	15	15	20	16	16	59	239
			507100	401k	6	6	5	5	6	8	5	6	5				52
			534998	Benefit Overhead	117	103	130	93	107	83	87	86	86	76	60	166	1,194
			534999	General Overhead	5	5	7		5	5	5	5	4	4	4	4	58
			535000	Contract Services-Other										429	417	1,889	2,735
			535001	Contract Services-Temp Employee	(10)										(0)	(0)	(10)
			541001	Rents-Real Property Intercompany		7	8	7	7	8							37
			550005	Mileage Reimbursement Personal Vehicle													3
			575340	Employee Expense	27	70	(34)	20	24	8	29	(4)	59	93	(28)	(23)	241
			575342	Employee Exp Conf/Registration			49	-		16					7		72
			575350	Meals Deduct	1	7	3	2	9	20	8	7	0	1	55	16	130
			575351	Meals Non Deduct	1	7	3	2	9	20	8	7	0				57
			575620	Office & Admin Supplies	2	(5)	19	(0)							3	22	3
			575740	Telephone	5	2	3	2	2	9	6	3	8	3	7	(1)	39
			575741	Cell Phone											3		33
			501200	Labor	1,077	952	1,072	1,050	1,149	1,016	953	1,023	1,133	1,083	1,040	1,120	12,668
			501210	Labor Non Scheduled Overtime	16	20	16	35	26	28	45	35	16	51	184	110	583
			501711	Incentive Plan-Off-Annual	45	31	21	39	49	67	38	44	42	45	66	45	530
			504100	Group Ins Maintenance	2	4	3	7	7	7	7	5	2	8	11	5	68
			504660	Tuition Aid							(1)				51		50
			507100	401k	7	8	9	12	13	18	11	10	13	13	26	16	156
			508101	Defined Contribution Plan	26	26	26	26	26	37	23	20	24	27	44	30	337
			534998	Benefit Overhead	428	359	348	360	406	359	376	406	396	319	269	680	4,706
			534999	General Overhead	22	21	25	22	27	21	21	20	19	19	17	19	252
			535000	Contract Services-Other	46	8	-				(14)						40
			535001	Contract Services-Temp Employee	343	36	0	61	187	279	256	122	(0)	4	(4)		1,284
			550005	Mileage Reimbursement Personal Vehicle			0			3		5			5		13
			575000	Miscellaneous	1	4	80	(16)	30	18	53	(6)	35	12	6	13	21
			575340	Employee Expense	5	58									4	128	347
			575342	Employee Exp Conf/Registration											7		58
			575350	Meals Deduct	8	1	5	3	6	18	(9)	4	3	12	7	9	66
			575351	Meals Non Deduct	8	1	5	3	6	18	(9)	4	3				38
			575620	Office & Admin Supplies					1						3		7
			575740	Telephone	1	(2)	(1)	(0)	(0)	10	3	10	3	(1)	(0)	1	24
			575741	Cell Phone	20	9	0	12	7	12	11	11	7	9	8	21	127
032032	CORP-ITS-BAD-Core Shared		501200	Labor	1,760	1,745	2,105	2,022	2,222	2,106	2,087	2,213	2,058	2,012	1,900	1,932	24,162
			501711	Incentive Plan-Off-Annual	217	212	198	224	250	350	224	229	225	231	344	212	2,916
			504500	Other Welfare Maintenance										101	0		101
			507100	401k	33	39	45	48	48	70	50	55	48	50	71	38	595
			508101	Defined Contribution Plan	80	78	86	94	98	143	99	92	89	98	139	88	1,184
			534998	Benefit Overhead	451	345	479	310	415	271	410	419	429	336	254	1,019	5,140
			534999	General Overhead	1,323	1,367	1,434	844	297	561	1,065	548	507	496	31	653	9,127
			535000	Contract Services-Other	1,502	928	2,122	439	353	(159)	709	499	533	801	586	1,820	10,132
			550005	Mileage Reimbursement Personal Vehicle			5			17	5						17
			575000	Miscellaneous	-	(2)	6	6									38
			575340	Employee Expense	11	37	57	46	(13)	59	(16)	73	198	(55)	5	(65)	337
			575350	Meals Deduct	3	7	16	4	7	7	9	9	8	26	13	21	130
			575351	Meals Non Deduct	3	7	16	4	7	7	9	9	8				69
			575620	Office & Admin Supplies						2						6	8
			575715	Software Licenses & Support	161												161
			575740	Telephone	(5)	20	3	8	6	4	4	2	5	7	13	19	86
			575741	Cell Phone	22	10	(1)	15	10	9	10	10	11	11	10	18	135
			675000	Misc Maintenance	1	-		0									1
032033	Chg Ctrl & Desktop Automation		501200	Labor	293	266	290	283	300	284	286	308	283	275	276	300	3,443
			501711	Incentive Plan-Off-Annual	46	43	37	43	44	66	43	42	41	42	64	43	553
			507100	401k	7	7	6	7	7	10	7	7	6	6	10	7	86
			534998	Benefit Overhead	148	133	170	122	135	111	129	128	126	105	85	206	1,599
			534999	General Overhead	9	8	10	9	9	8	8	8	8	7	7	7	98
			550005	Mileage Reimbursement Personal Vehicle	0	(0)		3	(0)	2	0	8	6	4	(1)		23
			575000	Miscellaneous	1	-											1
			575400	Employee Expense	12	(0)	5	(0)	(0)	15	16	14	21	7	(0)	-	90

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
032036	CORP-ITS Bsns Transformation	CORP-ITS Admin	575350	Meals Deduct	0	0	0	0	0	0	0	0	1	1	1	(0)	5
			575351	Meals Non Deduct	0	0	0	0	0	0	0	0	1	1	0	1	3
			575620	Office & Admin Supplies	1	2	4	1	4	5	7	5	5	6	8	2	8
			575740	Telephone	6	3	2	4	4	4	3	4	4	4	4	0	41
			575741	Cell Phone	36	35	40	36	36	35	35	34	32	31	28	31	409
			534999	General Overhead	514	436	583	434	421	499	515	568	545	533	584	1,125	8,697
			535000	Contract Services-Other	201	177	192	156	121	297	189	177	187	215	332	730	6,488
			501200	Labor	99	96	98	98	98	98	98	98	98	98	98	98	2,463
			501711	Incentive Plan-Off-Annual	147	151	135	145	146	145	146	145	146	146	146	146	1,175
			501716	Compensation Exp-Options	1,611	(17)	285	109	72	401	49	106	1,448	237	(288)	1,303	2,072
			501718	Compensation Exp-Restricted Stock Units	71	169	54	54	111	217	66	15	-	-	11	(140)	655
			504500	Other Welfare Maintenance	222	(0)	224	683	184	804	174	77	272	193	542	4,002	7,378
			504610	Employee Awards	507100	401k	17	15	17	14	13	26	16	16	11	6	3
			504660	Tuition Aid	508101	Defined Contribution Plan	23	20	22	18	16	34	21	21	22	24	28
			504670	Training	534998	Benefit Overhead	(377)	340	345	75	359	(6)	(39)	(68)	(506)	624	(343)
			507100	401k	534999	General Overhead	216	164	124	101	153	121	111	99	76	30	16
			508101	Defined Contribution Plan	535000	Contract Services-Other	3,009	1,900	2,759	1,957	1,922	1,929	1,983	924	3,964	3,705	13,322
			508101	Defined Contribution Plan	550005	Mileage Reimbursement Personal Vehicle	23	(0)	0	0	0	0	0	0	0	0	29,507
			508101	Defined Contribution Plan	575000	Miscellaneous	23	(0)	0	0	0	0	0	0	0	0	4
			575002	Misc General Office	575320	Electricity	23	(0)	0	0	0	0	0	0	0	0	23
			575320	Electricity	575340	Employee Expense	(13)	39	(32)	18	56	6	44	214	(51)	453	36
			575340	Employee Expense	575342	Employee Exp Conf/Registration	(13)	39	(32)	18	56	6	44	214	(51)	453	1,156
			575342	Employee Exp Conf/Registration	575350	Meals Deduct	26	10	6	2	11	6	3	10	27	(14)	392
			575350	Meals Deduct	575351	Meals Non Deduct	26	10	6	2	11	6	3	10	27	(14)	301
			575351	Meals Non Deduct	575480	Heat - Oil/Gas	62	0	4	(4)	0	0	0	0	0	0	100
			575480	Heat - Oil/Gas	575484	Hiring-Background	62	0	4	(4)	0	0	0	0	0	0	-
			575484	Hiring-Background	575485	Hiring-Drug Screen	1	1	1	1	1	1	1	1	1	1	63
			575485	Hiring-Drug Screen	575620	Office & Admin Supplies	48	16	34	19	31	96	37	0	8	1	6
			575620	Office & Admin Supplies	575625	Overnight Shipping	48	16	34	19	31	96	37	0	8	1	294
			575625	Overnight Shipping	575670	Relocation Expenses	24	(14)	16	14	18	19	14	33	7	16	177
			575670	Relocation Expenses	575740	Telephone	6	9	6	5	4	4	6	4	4	5	17
			575740	Telephone	575741	Cell Phone	6	9	6	5	4	4	6	4	4	5	33
			575741	Cell Phone	575998	PCard Undistributed	768	805	1,211	1,239	1,215	1,072	1,052	927	741	286	104
032072	CORP-ITS PMO	CORP-ITS Admin	575998	PCard Undistributed	501200	Labor	2	4	1	4	8	-	1,004	927	741	286	11,097
			501200	Labor	501210	Labor Non-Scheduled Overtime	2	4	1	4	8	-	1,004	927	741	286	20
			501210	Labor Non-Scheduled Overtime	501711	Incentive Plan-Off-Annual	171	115	144	134	182	296	170	112	108	170	1,828
			501711	Incentive Plan-Off-Annual	501716	Compensation Exp-Options	11	11	13	11	11	13	11	13	11	11	14
			501716	Compensation Exp-Options	501718	Compensation Exp-Restricted Stock Units	15	16	17	15	15	15	15	19	16	16	236
			501718	Compensation Exp-Restricted Stock Units	504100	Group Ins Maintenance	0	0	2	1	1	3	2	2	2	2	7
			504100	Group Ins Maintenance	504500	Other Welfare Maintenance	0	0	8	2	0	0	0	0	0	0	613
			504500	Other Welfare Maintenance	504610	Employee Awards	0	0	0	0	0	0	0	0	0	0	3
			504610	Employee Awards	504670	Training	0	0	0	0	0	0	0	0	0	0	3
			504670	Training	504680	Referral Bonus	0	0	0	0	0	0	0	0	0	0	3
			504680	Referral Bonus	507100	401k	19	18	23	22	31	52	25	17	13	10	23
			507100	401k	508101	Defined Contribution Plan	29	22	27	40	44	67	35	22	18	16	13
			508101	Defined Contribution Plan	534998	Benefit Overhead	632	561	615	528	686	389	580	571	610	514	260
			534998	Benefit Overhead	534999	General Overhead	51	33	82	255	86	44	85	62	81	74	14
			534999	General Overhead	535000	Contract Services-Other	714	2,676	2,032	953	(47)	2,683	1,082	722	4,085	3,970	359
			535000	Contract Services-Other	535001	Contract Services-Temp Employee	67	38	252	1,276	2,998	(59)	222	480	97	218	7,226
			535001	Contract Services-Temp Employee	550005	Mileage Reimbursement Personal Vehicle	2	6	8	8	2	2	2	2	2	2	9
			550005	Mileage Reimbursement Personal Vehicle	575000	Miscellaneous	2	6	(1)	8	-	6	9	46	6	13	434
			575000	Miscellaneous	575340	Employee Expense	6	26	33	(54)	42	93	15	67	3	8	31
			575340	Employee Expense	575342	Employee Exp Conf/Registration	6	26	33	(54)	42	93	15	67	3	8	9
			575342	Employee Exp Conf/Registration	575350	Meals Deduct	10	6	14	31	6	28	22	12	8	11	209
			575350	Meals Deduct	575351	Meals Non Deduct	10	6	14	31	6	28	22	12	8	11	(4)
			575351	Meals Non Deduct	575620	Office & Admin Supplies	6	19	23	3	6	28	22	12	8	11	27
			575620	Office & Admin Supplies	575715	Software Licenses & Support	5	-	0	0	0	0	0	0	0	0	20
			575715	Software Licenses & Support													135
																	66
																	5

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Tennessee Regulatory Authority
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Docket No. 12-00049
Response to TRA 01-062

Tennessee American Service Company Expenses (O&M Only)
By Function, Business Unit and Object Account
For the 12 months Ending December 2011

Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
032073	CORP-ITS Infra/Oper Admin		575740	Telephone	17	(11)	22	29	37	32	38	49	61	54	56	50	435
			575741	Cell Phone	44	(16)	12	14	23	18	19	21	24	30	17	29	235
			575742	Data Lines		17	19	(36)									-
			575998	PCard Undistributed													-
			501200	Labor	242	272	361	317	483	568	582	616	595	502	576	537	5,653
			501711	Incentive Plan-Off-Annual	39	39	43	44	47	118	84	79	80	73	116	69	831
			501716	Compensation Exp-Options	12	12	14	12	14	12	14	12	14	12	14	150	141
			501718	Compensation Exp-Restricted Stock Units	15	17	18	16	16	20	16	16	20	16	16	60	246
			504500	Other Welfare Maintenance											6		6
			504610	Employee Awards													
			507100	401k	7	7	8	7	8	25	17	13	11	8	-	12	135
			508101	Defined Contribution Plan			1			17	11	11	11	9	16	10	86
			534998	Benefit Overhead	171	157	171	133	148	117	156	156	147	125	97	317	1,894
			534999	General Overhead	11	10	23	11	11	10	10	10	10	11	13	12	141
			550005	Mileage Reimbursement Personal Vehicle			2					2			6		4
			575000	Miscellaneous													
			575002	Misc General Office	0									4			4
			575125	Books & Publications													0
			575340	Employee Expense	14	15	18	16	8	32	34	29	0	17	17	29	230
			575342	Employee Exp Conf/Registration	115	(0)											189
			575350	Meals Deduct	2	2	0	2	0	2	4	8	0	8	4	5	38
			575351	Meals Non Deduct	2	2	0	2	0	2	4	8	0	8	4	5	38
			575620	Office & Admin Supplies	0	5	10	6	18	7	16	1	4	2	11	9	89
			575740	Telephone	1	7	2	1	3	1	3	2	2	11	(0)	2	34
			575741	Cell Phone	7	(1)	2	2	2	2	2	2	2	3	4	2	30
032074	CORP-ITS Production		575741	PCard Undistributed													
			575998	Labor	726	686	794	720	755	767	736	806	771	735	777	771	9,044
			501200	Labor	32	11	11	23	17	19	38	40	25	26	21	33	295
			501210	Labor Non Scheduled Overtime													
			501211	Labor Overtime	6	4	4	4	5	4	13	6	4	4	8	60	60
			501711	Incentive Plan-Off-Annual	11	11	11	11	11	18	12	12	12	12	18	12	150
			504100	Group Ins Maintenance	5	2	2	3	4	4	7	8	4	4	4	5	52
			507100	401k	9	9	9	9	9	14	9	9	9	9	14	9	120
			508101	Defined Contribution Plan	4	4	4	4	4	6	4	4	4	4	6	4	51
			534998	Benefit Overhead	389	339	261	299	336	273	323	322	312	278	239	520	3,890
			534999	General Overhead	43,963	35,447	37,926	34,851	35,824	37,754	35,573	34,505	32,028	31,917	28,845	31,670	420,304
			541000	Rents-Real Property	244	244	244	244	244	243	244	244	244	244	244	244	2,928
			550005	Mileage Reimbursement Personal Vehicle	4	2	2	0	3	3	4	4	5	5	5	3	28
			575000	Miscellaneous													
			575340	Employee Expense	4	8	4	(4)	4	14	2	2	3	(1)	2	15	51
			575350	Meals Deduct	3	0	0	2	1	1	0	0	4	4	2	6	19
			575351	Meals Non Deduct	3	0	0	2	1	1	0	0	0	0	0	0	7
			575480	Heat - Oil/Gas													
			575620	Office & Admin Supplies	28	(5)	5	0	37	12	7	10	16	35	1	2	149
			575625	Overnight Shipping	5	(1)	1	10	1	1	4	15	9	4	4	5	58
			575740	Telephone	0	(0)	(0)	0	0	-	(0)	(0)	0	0	(0)	0	1
			575741	Cell Phone	15	22	(5)	9	7	3	5	5	7	5	5	5	82
			575780	Trash Removal													
			721304	Gains/(losses) NUP Disposals													
032075	CORP-Enterprise Server		501200	Labor	3,387	3,170	3,709	3,106	3,595	3,422	3,046	3,223	2,956	2,744	2,649	(471)	(471)
			501210	Labor Non Scheduled Overtime	121	124	111	73	143	318	225	124	125	173	244	144	2,989
			501711	Incentive Plan-Off-Annual	42	34	35	40	45	67	45	39	35	35	52	34	1,923
			504100	Group Ins Maintenance	16	17	17	9	19	40	24	17	16	21	29	12	236
			504500	Other Welfare Maintenance	45							5					
			504610	Employee Awards			3	2		3							
			504680	Referral Bonus													
			507100	401k	74	77	78	76	91	135	79	71	69	68	105	72	83
			508101	Defined Contribution Plan	122	121	123	110	122	192	118	117	110	108	165	115	995
			534998	Benefit Overhead	1,233	957	662	881	1,025	783	873	865	870	745	633	1,149	1,524
			534999	General Overhead	4,665	5,183	6,171	5,623	6,064	4,284	5,037	4,408	5,365	4,165	3,255	5,050	59,268
			555000	Contract Services-Other	182	50	14	18	144	5	88	8				74	575
			550005	Mileage Reimbursement Personal Vehicle	3	2	14	1	5	4	4		3	10	9	6	69

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
			575000	Miscellaneous		12	(12)				4			4	5	0	14
			575002	Misc General Office	35	196	58	(9)	80	67	84	218	(76)	(37)	297	(155)	80
			575340	Employee Expense			45	(45)	81								759
			575342	Employee Exp Conf/Registration	7	4	5	6	10	6	4	12	4	31	9	12	-
			575350	Meals Deduct	7	4	5	6	10	6	4	12	4	31	9	12	109
			575351	Meals Non Deduct	7	4	5	6	10	6	4	12	4	31	9	12	57
			575620	Office & Admin Supplies	23	89	0			4	7	1	12	6	8	2	152
			575710	Security Service	5												5
			575740	Telephone	3	2	7	8	5	11	19	(2)	9	9	7	8	85
			575741	Cell Phone	35	16	4	31	23	47	5	29	22	20	22	18	272
			575780	Trash Removal													-
	032076	CORP-Communications	501200	Labor	825	758	871	730	715	891	989	1,243	1,214	1,008	965	1,083	11,292
			501210	Labor Non Scheduled Overtime	48	57	45	54	93	73	78	79	63	107	113	77	886
			501711	Incentive Plan-Off-Annual	30	29	28	27	28	52	36	25	26	23	36	23	361
			504100	Group Ins Maintenance	5	8		7	9	9	9	11	9	13	14	10	108
			504500	Other Welfare Maintenance			19	-						(35)			(16)
			504610	Employee Awards	3	0											3
			504660	Tuition Aid	-												-
			507100	401k	6	6	6	6	5	9	26	27	27	27	36	24	222
			508101	Defined Contribution Plan	24	24	23	21	19	36	24	26	27	27	25	30	299
			534998	Benefit Overhead	321	241	210	224	265	203	364	369	363	320	247	611	3,738
			534999	General Overhead	4,652	4,268	5,027	5,123	4,419	4,411	4,217	4,341	3,826	3,965	3,425	4,562	52,237
			535000	Contract Services-Other	1,809	1,693	1,789	1,788	2,129	1,877	1,749	1,815	1,811	1,663	1,826	1,810	21,758
			535001	Contract Services-Temp Employee	73	72	73	76	69	83	65	80	76	104	252	282	1,304
			550005	Mileage Reimbursement Personal Vehicle						10					11	0	21
			575340	Employee Expense	45	66	17	53	33	22	77	49	25	27	14	5	434
			575342	Employee Exp Conf/Registration						15	(16)						(0)
			575350	Meals Deduct	2	4	3	4	7	3	2	4	-	52	4	1	88
			575351	Meals Non Deduct	2	4	3	4	7	3	2	4					30
			575620	Office & Admin Supplies						2	2		21	17			52
			575740	Telephone	5	1	2	3	3	2	2	4	3	8	6	(2)	39
			575741	Cell Phone	10	4	8	13	13	24	35	32	30	25	37	29	262
			575742	Data Lines	116	31	762	765	686	580	667	615	615	667	604	680	6,789
			675000	Misc Maintenance	417												417
032077	CORP-ITS Security Operations		501200	Labor	1,195	1,113	1,266	1,063	1,033	941	808	1,032	601	492	402	403	10,348
			501210	Labor Non Scheduled Overtime	6	1	2	2	6								13
			501711	Incentive Plan-Off-Annual	148	149	144	143	138	200	118	136	93	76	76	52	1,474
			504100	Group Ins Maintenance		1	0	0	1								2
			504500	Other Welfare Maintenance	47										(0)		47
			504660	Tuition Aid													-
			507100	401k	13	13	13	12	16	19	12	13	8	9	12	10	151
			508101	Defined Contribution Plan	30	29	28	27	26	36	24	23	21	10	19	12	285
			534998	Benefit Overhead	445	382	440	345	353	247	303	297	282	255	209	272	3,831
			534999	General Overhead	26	36	32	25	26	25	24	167	110	37	20	22	548
			535000	Contract Services-Other	0					1,678	281	281	281	324	787	431	4,062
			535001	Contract Services-Temp Employee	344	(0)	414	(17)	43					112	121	168	1,185
			550005	Mileage Reimbursement Personal Vehicle	2	14	12	6	7	6	2	6	8	6	2	2	72
			575000	Miscellaneous	-	39	6	1	3	2	5	4	-	3	1	1	67
			575340	Employee Expense	53	110	46	22	38	31	67	91	11	(7)	(54)	13	421
032078	CORP-ITS Adm Business Appl Dev		575342	Employee Exp Conf/Registration						1	(1)						239
			575350	Meals Deduct	2	3	8	3	12	(3)	2	10	2	8	7	1	53
			575351	Meals Non Deduct	2	3	8	3	12	(3)	2	10	2	8	7	1	37
			575620	Office & Admin Supplies				1									4
			575710	Security Service					0		44	-	-	5	-	3	50
			575715	Software Licenses & Support	581	1,143	738	403	570	520	831	885	834	851	870	1,032	9,255
			575740	Telephone	3	(1)	15	6	9	8	8	3	6	5	1	(1)	63
			575741	Cell Phone	27	9	18	16	11	14	14	14	14	19	6	6	170
			501200	Labor	666	727	983	763	811	723	832	637	630	571	685	584	8,612
			501711	Incentive Plan-Off-Annual	138	133	144	143	143	206	163	146	148	131	225	146	1,866
			501716	Compensation Exp-Options	13	14	17	14	14	16	14	16	14	14	14	17	175
			501718	Compensation Exp-Restricted Stock Units	19	20	21	19	19	24	19	19	24	20	19	73	296

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			504500	Other Welfare Maintenance	-	(0)											(0)
			507100	401k	24	23	26	26	26	37	23	19	20	17	28	14	284
			508101	Defined Contribution Plan	25	24	34	27	27	40	23	19	20	19	36	22	317
			534998	Benefit Overhead	214	184	369	146	177	133	147	109	109	83	54	325	2,051
			534999	General Overhead	20	19	25	20	20	19	19	19	18	17	16	17	230
			535000	Contract Services-Other	-	(26)											-
			535001	Contract Services-Temp Employee													(26)
			535005	Mileage Reimbursement Personal Vehicle								1	3				4
			575000	Miscellaneous	9	3	21	43	-	7	-	(139)	(3)	45	32	168	83
			575340	Employee Expense	45	16	149	145	176	166	255						1,056
			575342	Employee Exp Conf/Registration		43	2	6		13							63
			575350	Meals Deduct	(14)	12	40	15	21	17	22	73	5	7	62	28	288
			575351	Meals Non Deduct	(14)	12	40	15	21	17	22	73	5	7	62	28	288
			575620	Office & Admin Supplies	8	6	3	17	5	1	(0)	116	37	8	39	37	190
			575625	Overnight Shipping	1	5	-	-	6								12
			575740	Telephone	4	(5)	7	9	2	3	5	6	5	1	5	5	46
			575741	Cell Phone	22	2	44	29	13	55	4	0	8	3	5	10	195
			501200	Labor	850	834	952	856	1,136	953	992	1,080	694	764	664	664	10,439
			501711	Incentive Plan-Off-Annual	121	105	102	102	126	167	116	110	87	94	141	84	1,355
			504500	Other Welfare Maintenance			19	-									28
			504610	Employee Awards	2												2
			507100	401k	21	20	19	19	26	34	23	22	17	19	27	9	258
			508101	Defined Contribution Plan	14	14	14	14	13	17	13	10	9	7	12	6	143
			534998	Benefit Overhead	427	327	296	315	363	131	370	314	353	295	238	536	3,964
			534999	General Overhead	28	27	34	184	29	27	27	27	25	24	22	24	479
			535000	Contract Services-Other	2,633	2,753	2,753	2,753	(1,099)	1,950	1,618	1,799	1,636	1,636	1,737	1,406	21,589
			535001	Contract Services-Temp Employee													9,410
			535005	Mileage Reimbursement Personal Vehicle	13	12	3	7	32	2	2	8	(4)	1	3	5	80
			575000	Miscellaneous	2		-								7	-	9
			575002	Misc General Office	1												1
			575340	Employee Expense	(79)	68	37	95	(40)	26	40	9	40	20	13	20	249
			575350	Meals Deduct	(0)	0	1	3	2	4	1	1	2	6	4	9	33
			575351	Meals Non Deduct	(0)	0	1	3	2	4	1	1	2				14
			575620	Office & Admin Supplies	7												7
			575740	Telephone	4	(1)	11	2	6	7	2	9	6	6	15	13	80
			575741	Cell Phone	8	4	0	6	6	4	5	5	5	4	4	5	56
			675000	Misc Maintenance	128	128	128	128	128	136	137	137	137	137	137	137	1,596
			501200	Labor	1,668	1,457	1,608	1,480	1,498	1,569	1,450	1,273	1,145	1,057	987	990	16,181
			501711	Incentive Plan-Off-Annual	222	178	173	195	193	292	179	153	131	116	183	114	2,131
			504500	Other Welfare Maintenance													7
			504610	Employee Awards	3		4	2	1	(1)					4		2
			504670	Training													-
			504680	Referral Bonus	180	-		(7)	1								180
			507100	401k	43	40	34	37	45	68	42	38	34	26	42	27	475
			508101	Defined Contribution Plan	63	57	61	59	57	92	57	51	44	39	66	41	688
			534998	Benefit Overhead	567	498	513	414	469	333	424	396	362	311	266	778	5,330
			534999	General Overhead	1,647	1,193	1,464	1,175	1,587	1,652	1,905	1,478	1,392	1,920	1,235	800	17,448
			535000	Contract Services-Other	985	(429)	1,264	518	330	696	360	28	2				3,755
			535001	Contract Services-Temp Employee													2,888
			535005	Mileage Reimbursement Personal Vehicle	2	2	2	2	680	283	549	58	317	374	216	(7)	10
			575000	Miscellaneous	8	2	-	2	2	6	10	(1)			5		33
			575340	Employee Expense	2	17	30	12	28	33	49	(36)	6	94	(21)	25	240
			575342	Employee Exp Conf/Registration											28		28
			575350	Meals Deduct	0	4	4	3	1	3	3	1	-		5	0	24
			575351	Meals Non Deduct	0	4	4	3	1	3	3	1					18
			575620	Office & Admin Supplies													1
			575740	Telephone	3	1	1	2	3	1	2	3	2	1	1	3	23
			575741	Cell Phone	43	14	(6)	19	11	12	13	12	12	27	8	11	175
			501200	Labor	1,417	1,397	1,483	1,264	1,356	1,512	1,420	1,406	1,095	964	800	970	15,083
			501711	Incentive Plan-Off-Annual	141	145	142	135	138	247	161	149	129	116	152	105	1,760
			504500	Other Welfare Maintenance	4												4
032079		CORP-ITS-BAD-Middle Office App															
032080		CORP-ITS-BAD-Back Office Apps															
032081		CORP-ITS-BAD-Quality&Methodlog															

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032082	CORP-ITS-BAD-Customer Facing		507100	401k	40	42	37	35	37	65	42	38	33	30	40	29	468
			508101	Defined Contribution Plan	59	61	55	50	52	91	59	56	50	46	56	38	671
			534998	Benefit Overhead	475	390	474	355	406	288	377	376	338	276	222	548	4,523
			534999	General Overhead	226	209	238	530	207	198	198	193	182	178	161	492	3,012
			535000	Contract Services-Other												1,046	1,046
			550005	Mileage Reimbursement Personal Vehicle											6		7
			575000	Miscellaneous	1		1	0			0	7					11
			575340	Employee Expense	(1)	78	(31)	18	21	122	56	(57)	5	-	(1)	2	210
			575342	Employee Exp Conf/Registration			76										76
			575350	Meals Deduct	0	5	2	1	1	4	1	1	10	0	-	8	33
			575351	Meals Non Deduct	0	5	2	1	1	4	1	1	11				26
			575620	Office & Admin Supplies	0					1	1	1	1	2	(1)	1	9
			575740	Telephone	0	(0)	1	3	(1)	1	1	1	1	2	(1)	1	9
			575741	Cell Phone	13	3	5	6	10	6	9	6	7	6	18	(0)	90
			575998	PCard Undistributed													
			501200	Labor	928	874	946	1,538	1,465	1,460	1,337	1,281	1,362	1,334	979	1,002	14,506
			501711	Incentive Plan-Off-Annual	138	112	86	160	179	281	187	162	149	190	208	117	1,967
			504500	Other Welfare Maintenance				32	31	-	(5)	10		66	85	33	185
			504660	Tuition Aid													66
			504670	Training													
			507100	401k	42	34	25	36	50	80	52	44	34	32	43	29	504
			508101	Defined Contribution Plan	59	46	40	65	68	109	68	59	59	67	83	47	770
			534998	Benefit Overhead	266	206	393	232	280	164	246	181	213	160	138	516	2,996
			534999	General Overhead	50	37	47	39	39	37	37	36	34	34	30	33	455
			535000	Contract Services-Other	906	1,935	1,487	577	989	546	424	(436)	83	97	185	626	7,420
			535001	Contract Services-Temp Employee	1,338	710	963	512	177	(56)							3,644
			550005	Mileage Reimbursement Personal Vehicle	11	4			1		1	2	3		2	5	29
			575000	Miscellaneous	5			18			10	101	60	(1)	24	8	225
			575002	Misc General Office	(8)	83							(169)				(94)
			575340	Employee Expense	10	83	78	(23)	104	232	(50)	152	235	172	68	249	1,312
			575342	Employee Exp Conf/Registration	13	2		52		(15)	113		18			197	380
			575350	Meals Deduct	9	2	2	1	4	5	8	18	11	26	2	25	114
			575351	Meals Non Deduct	9	2	2	1	4	5	8	18	11				60
			575620	Office & Admin Supplies	(28)	167	(1)	286	(1)	(9)	(479)			9	18	1	(36)
			575625	Overnight Shipping									1				1
			575715	Software Licenses & Support	16			64	-	-	(64)						16
			575740	Telephone	238	79	(10)	33	52	41	33	31	(95)	67	(40)	58	487
			575741	Cell Phone	67	7	21	16	21	19	21	19	20	44	40	4	299
			501200	Labor	1,840	1,678	1,701	1,558	1,813	1,544	1,687	1,819	1,860	1,526	1,535	1,705	20,267
			501711	Incentive Plan-Off-Annual	246	223	175	196	193	292	212	210	220	191	311	206	2,673
			504500	Other Welfare Maintenance							4						4
			504610	Employee Awards	3												3
			507100	401k	61	57	46	48	47	72	54	53	56	48	79	50	672
			508101	Defined Contribution Plan	78	76	60	63	66	109	73	76	75	67	112	72	928
			534998	Benefit Overhead	547	414	594	338	390	285	361	371	384	310	245	982	5,220
			534999	General Overhead	1,965	3,008	1,494	2,071	2,275	2,236	2,174	2,189	2,154	2,232	1,997	1,845	25,642
			535000	Contract Services-Other	1,056	(23)	1,231	73	(116)	313	512	435	248	404	313	2,556	7,002
			535001	Contract Services-Temp Employee			472	1,017	518								2,007
			550005	Mileage Reimbursement Personal Vehicle	0				0			3					4
			575000	Miscellaneous													
			575340	Employee Expense	28	17	58	12	90	56	59	48	15	68	(14)	19	456
			575342	Employee Exp Conf/Registration					31					18			18
			575350	Meals Deduct	1	3	4	1	3	2	9	0	3	4	3	2	34
			575351	Meals Non Deduct	1	3	4	1	3	2	9	0	3				26
			575715	Software Licenses & Support								18				165	184
			575740	Telephone	4	5	7	18	8	10	12	8	8	9	6	11	106
			575741	Cell Phone	17	2	4	15	6	10	9	9	12	9	10	11	116
			575998	PCard Undistributed													
032093	CORP-ITS-Architecture		501200	Labor	653	864	889	759	791	589	836	798	702	601	568	674	8,723
			501711	Incentive Plan-Off-Annual	182	158	128	91	132	199	148	135	117	108	175	115	1,706
			507100	401k	26	24	20	16	22	26	23	20	16	14	24	15	246

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total			
Laboratory	033531	CE-Western CS & S	508101	Defined Contribution Plan	46	41	33	32	40	62	37	39	32	29	49	33	474			
			534998	Benefit Overhead	346	287	461	251	299	195	196	184	186	155	121	408	3,090			
			534999	General Overhead	37	47	58	49	7	48	48	59	44	414	39	42	892			
			535000	Contract Services-Other	447	455	558	861	224	471	800	429	459	520	2	(642)	4,584			
			535001	Contract Services-Temp Employee																
			550005	Mileage Reimbursement Personal Vehicle	3		4		6	1	1	6					5	26		
			575000	Miscellaneous	29	2	(2)			37	57	5	(7)					37		
			575340	Employee Expense	(35)	10	25	45	37	57	5	108	52	7	7		7	325		
			575342	Employee Exp Conf/Registration	85			40	32			54						156	368	
			575350	Meals Deduct	(0)	(0)	2	4	5	3	3	5	4	1	2	3	32	3	22	
			575351	Meals Non Deduct	(4)	(0)	2	4	5	3	3	5	4					22	3	
			575740	Telephone	7	(4)	25	15	21	18	30	20	22	46	27	19	244		8468	
			575741	Cell Phone	41	(27)	15	11	8	12	14	11	11	21	10	8	137		26	
			575998	PCard Undistributed																
			675000	Misc Maintenance	1	(1)														0
			501200	Labor	2,937	3,028	6,098	3,661	4,699	4,836	4,077	4,218	3,456	3,212	2,855	3,432	46,507			46,507
			501210	Labor Non Scheduled Overtime	65	59	48	81	88	96	92	102	137	108	154	159	1,190			1,190
			501711	Incentive Plan-Off-Annual	166	156	405	203	359	529	313	268	200	218	285	167	3,269			3,269
			504100	Group Ins Maintenance	10	9	8	14	14	14	18	19	18	26	19	29	214			214
			504500	Other Welfare Maintenance							12	7					133			133
			504610	Employee Awards			3	3			2	1					114			9
			504660	Tuition Aid													37			37
			504670	Training																
			507100	401k	46	54	114	57	79	134	79	71	60	62	90	52	898			898
			508101	Defined Contribution Plan	41	43	48	52	61	101	60	60	56	41	68	55	686			686
			534998	Benefit Overhead	1,861	1,635	1,530	1,551	1,804	1,463	1,646	1,639	1,646	1,416	1,206	2,864	20,260			20,260
			534999	General Overhead	2,969	2,755	2,755	3,276	3,803	3,024	3,241	3,236	3,059	3,315	3,653	4,529	39,616			39,616
			535000	Contract Services-Other				1,700	(157)							259	1,803			1,803
			535001	Contract Services-Temp Employee			14	(14)	43	234	216	238	205	582	344	792	2,654			2,654
			541000	Rents-Real Property							8	(8)								
			541001	Rents-Real Property Intercompany																
			550000	Transportation IT-Admin	0															
			550002	Transportation Lease Fuel					1											
			550005	Mileage Reimbursement Personal Vehicle	4		4	5	4	8										
			575000	Miscellaneous	48	72	70	5	54	23	(4)	69	9	19	20	33	418			418
			575340	Employee Expense	174	408	1,250	100	282	1,203	480	1	499	274	544	350	5,565			5,565
			575342	Employee Exp Conf/Registration			21													
			575350	Meals Deduct	27	29	108	(3)	26	56	49	18	15	172	(93)	51	456			456
			575351	Meals Non Deduct	27	29	108	(3)	26	56	49	18	15							325
			575620	Office & Admin Supplies	9	1	15	2	0	1	1									
			575715	Software Licenses & Support																
			575740	Telephone	5	9	25	9	(1)	8	10	(0)	8	12	22	26	133			133
			575741	Cell Phone	95	56	94	62	102	61	78	72	63	91	107	66	947			947
			575998	PCard Undistributed	(0)	3	(3)													
			675000	Misc Maintenance																
			675250	Comp Equip Hardware																
			534999	General Overhead																
ITS Total					117,729	104,100	120,636	107,378	113,128	113,115	107,249	104,974	102,938	105,367	90,916	130,425	1,317,956			
Laboratory	034517	BVLAB-Water Quality	501200	Labor	3,307	3,176	3,877	3,472	3,669	3,591	3,445	3,629	3,414	3,369	3,554	3,501	42,002			
			501711	Incentive Plan-Off-Annual	217	211	211	211	212	315	219	219	218	219	328	219	2,799			
			501716	Compensation Exp-Options	12	12	15	12	12	14	12	12	14	12	12	15	154			
			501718	Compensation Exp-Restricted Stock Units	16	18	19	16	16	21	17	17	21	17	17	63	257			
			504500	Other Welfare Maintenance				4	5	17	9	15	4	3	56	3	56			
			504610	Employee Awards	8	7	4	1	5	1	22	3	9	21	65	145	8			
			504620	Employee Physical Exam																
			504670	Training	6			4	1											
			507100	401k	69	69	72	65	72	106	72	70	65	61	94	63	879		85	
			508101	Defined Contribution Plan	60	61	67	69	70	103	69	69	64	63	98	65	857		857	
534998	Benefit Overhead	1,761	1,602	1,376	1,504	1,609	1,329	1,571	1,587	1,597	1,450	1,360	2,779	19,524		19,524				
534999	General Overhead	2,422	2,137	2,171	2,167	2,279	2,434	2,191	2,416	2,402	2,120	966	2,292	25,998		25,998				
535000	Contract Service-Other	(48)	(8)	13	33	24	6	3	8	6	20	260	76	392		392				

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Legal	032015	CORP-Legal	535001	Contract Services-Temp Employee	(319)	(508)	(878)	(702)	(403)	(578)	(700)	(503)	(377)	(310)	(95)	(649)	186				
			536000	Contract Services-Lab Testing	8	8	10	19	19	9	9	10	10	10	10	10	18	121			
			541000	Rents-Real Property	13	55	12	13	47	47	36	36	24	12	11	49	309	1			
			541400	Rents-Equipment																	
			550002	Transportation Lease Fuel																	
			550005	Mileage Reimbursement Personal Vehicle																	
			575000	Miscellaneous	3	14	15	19	20	5	7	33	7	33	7	29	29	6	14	172	
			575002	Misc General Office	296	190	35	170	328	2	504	199	507	(229)	620	3	2,624	3	2,624	3	
			575340	Employee Expense	(24)	102	4	(17)	(15)	66	196	(171)	23	21	31	(29)	186				
			575342	Employee Exp Conf/Registration	9		3			13											
			575350	Meals Deduct	2	15	(2)	6	9	5	0	3	4	30	8	2	84				
			575351	Meals Non Deduct	2	15	(2)	6	9	5	0	3	4								
			575460	Janitorial	6	33		7	7												
			575500	Grounds Keeping	39		39	39	78	39	39	39	39	78	-	39	466				
			575545	Lab Supplies	741	2,021	2,205	851	2,322	1,381	2,139	2,228	1,023	1,347	928	1,300	18,486				
			575620	Office & Admin Supplies	31	19	161	(65)	5	88	88	58	20	72	76	109	662				
			575625	Overnight Shipping	158	209	257	371	166	262	271	196	250	122	184	247	2,692				
			575660	Postage	0	5	0	6	5	7	3	5	5	4	4	4	45				
			575710	Security Service				372			5						377				
			575715	Software Licenses & Support	14	208	30	83	3	3	18	69	39	(30)	3	9	449				
			575740	Telephone	38	6	54	3	38	35	52	46	42	47	791	417	1,568				
			575741	Cell Phone	5	2	1	5	3	4	3	4	3	4	4	4	41				
			575780	Trash Removal	15	11	11	15	12	15	11	10	14	10	10	14	148				
			675000	Misc Maintenance	375	334	337	537	(149)	255	452	724	711	270	269	421	4,536				
			675250	Comp Equip Hardware				30	4					12		2	49				
			675350	HVAC Equipment	-			47	217		21	5	107				120			517	
			Laboratory Total					9,243	10,027	10,121	9,365	10,731	9,592	10,850	11,092	10,288	8,864	9,670	11,239	121,083	
			Legal	032015	CORP-Legal	501200	Labor	2,043	1,623	1,948	2,085	1,843	1,370	1,666	1,888	2,310	1,924	1,693	2,097	22,489	
						501210	Labor Non Scheduled Overtime						4	3						7	
						501711	Incentive Plan-Off Annual	576	573	490	601	535	737	503	506	506	551	842	563	6,983	
						501716	Compensation Exp-Options	296	313	316	327	327	129	292	292	307	294	293	311	3,498	
						501718	Compensation Exp-Restricted Stock Units	488	581	567	592	593	33	544	544	575	548	546	1,976	7,586	
						504100	Group Ins Maintenance						1	1						2	
						504500	Other Welfare Maintenance									90	44	52	1	187	
504610						Employee Awards				26	-			2	(2)		0		0		
504620	Employee Physical Exam																26				
504670	Training											8	-	935	(935)		8				
507100	401k	56				53	18	27	21	26	13	13	13	18	20	13	291				
508101	Defined Contribution Plan	79				79	69	69	70	105	71	71	49	55	82	55	854				
533000	Contract Services-Legal	319				1,221	304	702	179	1,354	(304)	469	2,089	128	231	1,378	8,070				
534998	Benefit Overhead	750				685	959	462	522	335	447	441	485	355	225	1,214	6,878				
534999	General Overhead	402				398	414	404	410	649	450	375	310	249	292	292	4,646				
535000	Contract Services-Other	564				201	185	309	378	724	271	1,039	665	(266)	870	428	5,369				
535001	Contract Services-Temp Employee																316				
550005	Mileage Reimbursement Personal Vehicle												1				3				
575000	Miscellaneous	(8)				42	88	92	61	223	(94)	192	249	261	123	401	1,630				
575340	Employee Expense	39				0	16	12	9	989	103	55	484	(392)	42	(667)	690				
575342	Employee Exp Conf/Registration	2				0	0	0	10	61	(52)	5		60	18	(21)	83				
575350	Meals Deduct	2				0	0	0	10	61	(52)	5					26				
575351	Meals Non Deduct																110				
575420	Forms						21	56									33				
575485	Hiring-Drug Screen											1		1			1				
575620	Office & Admin Supplies	0				25	3	10	10	(0)	22	1	2	0	23	40	126				
575623	Outplacement					58											58				
575625	Overnight Shipping																22				
575670	Relocation Expenses																193				
575715	Software Licenses & Support																540				
575740	Telephone	27				(52)	1	1	1	1	8	1	0	1	5	3	(4)				
575741	Cell Phone	19				35	15	9	8	9	14	13	22	21	25	(2)	190				
575998	PCard Undistributed	(0)					18	(18)	9	(9)	-						(0)				
534999	General Overhead																-				
033515						CE-Legal															

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035015	SE-Legal	575740	Telephone	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
		534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		535000	Contract Services-Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		575340	Employee Expense	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		575740	Telephone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		575741	Cell Phone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		575998	PCard Undistributed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
		501200	Labor	2,907	1,741	2,321	1,936	3,419	2,895	4,275	9,221	5,480	8,384	6,809	7,814	57,202	83			
		501210	Labor Non Scheduled Overtime	6	21	15	20	22											83	
		501711	Incentive Plan-Off-Annual	427	427	427	427	814	1,283	720	1,241	838	2,052	2,114	1,818	12,590	781			
	501716	Compensation Exp-Options	129	263	(659)	104	104	129	106	106	136	111	108	145	781	2527	8			
	501718	Compensation Exp-Restricted Stock Units	81	455	(1,097)	232	232	277	236	236	306	246	243	1,079	2,527	68				
	504100	Group Ins Maintenance	1	2	1	2	2											68		
	504500	Other Welfare Maintenance	68															68		
	508101	Defined Contribution Plan	91	91	91	91	159	230	208	370	263	428	433	374	2,830	765	12,126			
	533000	Contract Services-Legal																		
	534998	Benefit Overhead	1,132	1,079	1,543	809	900	343	766	892	1,055	878	475	2,255	12,126	410	11,511			
	534999	General Overhead	149	168	192	148	144	346	486	508	502	543	555	410	4,151	622	622			
	535000	Contract Services-Other	24	73	49	49	49	49	68	49	49	49	49	68	622	2	(2)	-		
	535001	Contract Services-Temp Employee																		
036015	WD-Legal	541001	Rents-Real Property Intercompany	384	304	357	321	312	352	389	326	329	329	(161)	3,606	138	122	2,428		
		550005	Mileage Reimbursement Personal Vehicle																	
		575000	Miscellaneous	24	-	64	(67)		101	653	126	849	65	135	532	(22)	14	10	171	
		575340	Employee Expense	111	(70)	136	(136)	50	653	126	849	65	135	532	(22)	14	10	171	135	
		575342	Employee Exp Conf/Registration																	
		575350	Meals Deduct			50	(50)	1	99	7	43	(15)	11	14	10	171	135	1,784		
		575351	Meals Non Deduct			50	(50)		1	99	7	43	(15)							
		575482	Hiring-Agency					1,784												
		575620	Office & Admin Supplies	3	1	1		74	98	(35)		35	14	5	(0)	196	34	1	458	
		575625	Overnight Shipping	8	4	3		9	2	2	4									
	575670	Relocation Expenses	39	1	1						21	366	24	1	458	33	0	33		
	575740	Telephone	3	(3)	13	(1)	6	1	3	7	0	0	4	0	33	468	(3)	(3)		
	575741	Cell Phone	17	27	7	18	25	8	118	12	37	199	(127)	127	468	874	15	61		
	575998	PCard Undistributed	(0)	(3)	381	(381)														
	501200	Labor			9	14	274	63	52	55	52	79	75	201	874	4	15	61		
	501711	Incentive Plan-Off-Annual			2							10		4	15	61	7	17		
	504670	Training																		
	507100	401k						2	1	1	1	1	1	2	7	17	6	6		
	508101	Defined Contribution Plan																		
	533000	Contract Services-Legal																		
534998	Benefit Overhead	4	10	6	10	24	18	34	(5)	10	8	9	72	199	403	136	403			
534999	General Overhead	1	1	0	1	2	2	3	(0)	1	1	1	3	15	3	15	15			
575000	Miscellaneous	6																6		
575340	Employee Expense	2		6		3	113	(104)	(11)	95	(89)		8	24	95	95	(33)	33		
575342	Employee Exp Conf/Registration					50	(38)	82												
575350	Meals Deduct			0		0	13	13	(1)	8	(66)									
575351	Meals Non Deduct			0		0	13	13	(1)	8										
575620	Office & Admin Supplies			6		9	(11)	(8)			6		21	34	34	33	33	33		
575740	Telephone	1	(0)	1	1	2	4	0	5	6	(1)	3	3	25	3	25	25	2		
575998	PCard Undistributed			0		25	(25)													
Legal Total					11,271	10,449	9,445	9,204	13,494	13,986	12,859	20,236	17,619	18,790	16,490	22,275	176,118			
Operation Services	032011	CORP-Chief Operating Officer	501200	Labor	577	408	493	437	458	346	434	495	457	438	371	468	5,382	765		
			501711	Incentive Plan-Off-Annual	282	108	100	101	98	143	100	100	99	101	151	101	1,485	781	12,590	
			501716	Compensation Exp-Options	863	(681)	91	91	91	91	91	91	91	91	91	91	1,093	781	2,527	
			501718	Compensation Exp-Restricted Stock Units	137	157	47	135	135	134	135	135	135	135	135	574	1,993	68	68	
			504610	Employee Awards				2	-											
			504670	Training				76	(70)											
			507100	401k	17	10	10	10	10	9	3									
			508101	Defined Contribution Plan		3														
			534998	Benefit Overhead	415	1,108	354	239	309	159	206	240	211	190	128	373	3,933	765	12,126	
			534999	General Overhead				13	13	12	12	12	12	12	6	10	141	135	1,784	

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			530000	Contract Services-Other	2		6							5			11
			550005	Mileage Reimbursement Personal Vehicle	19	40	42	9	64	33	(27)	18	72	38	18	22	13
			575340	Employee Expense	13		6			21					13		348
			575342	Employee Exp Conf/Registration	0	26	2	4	3	3	3	7	1	14	2	1	67
			575350	Meals Deduct	0	26	2	4	3	2	3	7	1				54
			575351	Meals Non Deduct	0	26	2	4	3	2	3	7	1				50
			575620	Office & Admin Supplies		6		2		1	0		0				9
			575740	Telephone	1	(1)	1	2	2	(1)	5	(1)	3	2	5	(1)	16
			575741	Cell Phone	12	3	(1)	2	(0)	3	2	2	2	2	2		31
	032016	CORP-Maintenance Services	575741	Labor	478	276	373	309	284	177	354	350	352	320	261	426	3,961
			501200	Incentive Plan-Off-Annual	94	86	88	85	70	108	90	83	68	85	124	91	1,071
			501711	Compensation Exp-Options	35	35	(24)	36	36	43	36	36	42	37	37	45	393
			501716	Compensation Exp-Restricted Stock Units	49	54	(43)	50	50	64	51	51	65	52	52	194	688
			504610	Employee Awards													9
			507100	401k	9	7	8	7	6	5	2				4	2	50
			508101	Defined Contribution Plan	5		1		0	2	2				3	2	16
			534998	Benefit Overhead	101	78	112	77	77	47	76	78	84	81	60	198	1,069
			534999	General Overhead	32	(8)	28	38	41	28	57	58	56	57	45	54	487
			535000	Contract Services-Other										1			1
			550005	Mileage Reimbursement Personal Vehicle			3	1	5	9			4	6	3		30
			575002	Misc General Office							115		4				119
			575340	Employee Expense		9	0	47	37	(49)	(1)	19	(2)	39	107	(128)	78
			575350	Meals Deduct		1	0	2	(1)	1				1	(1)	3	8
			575351	Meals Non Deduct		1	0	2	(1)	1							4
			575620	Office & Admin Supplies	2	2		4			1					24	34
			575715	Software Licenses & Support			23								23		23
			575740	Telephone	5	(5)	0	(0)			0	(0)	0		(0)	0	1
			575741	Cell Phone	2	2	2	1	2	1	2	2	2	2	2	2	20
			575998	PCard Undistributed													
			501200	Labor	544	845	689	702	688	371	620	808	410	633	205	487	7,014
			501711	Incentive Plan-Off-Annual	114	155	119	103	126	136	101	114	59	72	120	66	1,285
			501716	Compensation Exp-Options	38	38	38	38	38	45	38	38	45	39	39	47	488
			501718	Compensation Exp-Restricted Stock Units	50	55	59	51	51	65	52	60	66	54	53	196	805
			504660	Tuition Aid	31	17	58	82	82	18		60	124		55	444	55
			504670	Training											62		62
			507100	401k	15	25	14	14	14	22	16	18	9	13	16	6	181
			508101	Defined Contribution Plan	14	21	8	16	10	17	6	14	7	10	13	8	145
			534998	Benefit Overhead	444	363	449	315	351	254	327	343	314	281	171	562	4,174
			534999	General Overhead	96	95	104	108	103	122	95	99	65	43	49	54	1,034
			535000	Contract Services-Other			(511)							470	8	264	243
			550005	Mileage Reimbursement Personal Vehicle	8			0	2	5	8	18	3	9	13	65	243
			575125	Books & Publications													
			575340	Employee Expense	(58)	107	(18)	119	106	107	156	413	126	133	150	177	1,517
			575342	Employee Exp Conf/Registration		9			32	(16)	23	25		(5)			68
			575350	Meals Deduct	2	13	1	9	8	2	60	15	2	198	91	9	410
			575351	Meals Non Deduct	2	13	1	9	8	2	60	15	2				112
			575620	Office & Admin Supplies	5	7	5	7	(0)	51	(37)	3		(1)	12	1	53
			575625	Overnight Shipping	7	4	2	3	3	28	5	5	14	7	4	4	87
			575710	Security Service	(220)	131	(56)	55	43	182	8	5	3	1	2	552	705
			575715	Software Licenses & Support	33	33	489	(99)								839	1,326
			575740	Telephone	11	(9)	3	10	8	3	3	3	10	(0)	8	9	59
			575741	Cell Phone	44	10	15	31	15	16	21	24	22	30	29	25	283
			575742	Data Lines	4	2	2	2	2	2	2	2	2	2	2	2	23
			575998	PCard Undistributed	5	(5)	34		(9)	(24)	29	25	22	(22)	(8)		(25)
032065	CORP-Asset Management		501200	Labor	23	18	17	65	(11)	(11)	29	25	22	66	96	58	408
			501711	Incentive Plan-Off-Annual													
			504610	Employee Awards	2	2	2	1	6	(1)	2	3	3	9	12	7	45
			504660	Tuition Aid													
			507100	401k													
			508101	Defined Contribution Plan	335	274	377	254	293	172	300	297	304	265	186	600	3,657
			534998	Benefit Overhead													

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032066	CORP-Innov & Env Stewardship		534999	General Overhead	19	16	23	17	18	13	18	17	17	17	14	17	206
			535000	Contract Services-Other													1
			550005	Mileage Reimbursement Personal Vehicle												0	0
			575002	Misc General Office			3										3
			575340	Employee Expense	19		28	(26)	154	(141)		16	5	18		3	78
			575350	Meals Deduct	0				4	(3)		2	0	0			4
			575351	Meals Non Deduct	0				4	(3)		2	0				3
			575484	Hiring-Background			2					1					3
			575485	Hiring-Drug Screen								1					4
			575487	Hiring-April Travel	9	1	0	1	1			1					9
			575620	Office & Admin Supplies					22	(22)							0
			575670	Relocation Expenses		10	57	4									71
			575715	Software Licenses & Support													-
			575740	Telephone	1	0	(1)	(0)	1	0	1	2	2	2	(0)	0	3
			575741	Cell Phone		17	8	7	8	7	7	7	9	9	5	8	92
			575998	PCard Undistributed	(37)												(37)
			501200	Labor	2,120	1,783	2,639	1,961	3,638	1,816	1,967	2,089	2,027	1,784	1,311	1,842	24,975
			501711	Incentive Plan-Off-Annual	275	245	312	244	401	386	252	243	241	247	370	234	3,451
			501716	Compensation Exp-Options	37	37	46	38	37	45	38	38	44	39	39	47	485
			501718	Compensation Exp-Restricted Stock Units	50	55	59	51	51	65	52	52	66	53	53	196	801
			504500	Other Welfare Maintenance			4	4	4		2		2	2	2		20
			504610	Employee Awards		2				1			5	0	7		16
			504660	Tuition Aid				118									118
			504670	Training		5	46										51
			507100	401k	40	34	44	36	35	46	29	23	25	24	38	21	393
			508101	Defined Contribution Plan	30	31	31	22	99	46	21	14	20	14	35	17	380
			520100	Materials & Supplies Operations		5											5
			533000	Contract Services-Legal	20	-		7	189	58	(23)						261
			534998	Benefit Overhead	639	465	634	421	515	266	454	456	408	345	376	914	5,895
			534999	General Overhead	96	103	116	97	102	86	103	102	187	46	98	109	1,245
			535000	Contract Services-Other	28	5	167	936	12	1,168	385	385	976	659	659	110	4,446
			541001	Rents-Real Property Intercompany		155	78	78	78	77	78	78	78	78	78	931	78
			541400	Rents-Equipment	117		59		17	6	54	35	3	0	14	4	319
			550000	Transportation Tr-Admin			1										1
			550001	Transportation Lease Cost			3		2								5
			550005	Mileage Reimbursement Personal Vehicle		7	2	0		8	11	5	3	9	15	9	76
			575000	Miscellaneous	(1,481)	(2,009)	(567)	(1,011)	(1,215)	(1,034)	(2,260)	(1,231)	(2,633)	(3,114)	(460)	(849)	(17,864)
			575130	Brochures and Handouts								141					141
			575340	Employee Expense	73	185	431	92	909	63	95	152	45	269	112	140	2,566
			575342	Employee Exp Conf/Registration			18	41	22	47	-	40	11	30		1	209
			575350	Meals Deduct	15	19	1	3	182	7	1	5	17	(4)	63	27	335
			575351	Meals Non Deduct	15	19	1	3	182	7	1	5	17				249
			575485	Hiring-Drug Screen							1	1					3
			575620	Office & Admin Supplies	117	177	324	279	197	226	227	491	254	130	140	215	2,779
			575625	Overnight Shipping	16	13	11	5	21	24	21	31	13	9	9	10	185
			575660	Postage					(0)	-						(0)	
			575670	Relocation Expenses	7	0	14	0	0	15	3	1	4	3	4	3	56
			575715	Software Licenses & Support		11		6									240
			575740	Telephone	6	(2)	9	10	3	7	5	19	11	2	6	8	83
			575741	Cell Phone	18	9	5	12	14	22	9	13	10	18	13	13	157
			810300	Interest Cap Lease-Outside	1	1	1	0									3
			534998	Benefit Overhead	142	142	145	143	142	134	139	143	132	136	74	120	1,593
			534999	General Overhead	11	10	12	11	10	10	10	10	10	10	5	9	117
			575740	Telephone			(0)	1	1	8	(3)	0	8	(1)	5	4	25
			575741	Cell Phone		7	2	2	(0)	5	2	2	3	2	2	2	28
			575740	Telephone													-
			534999	General Overhead													-
			575740	Telephone													-
			534999	General Overhead													-
			575740	Telephone													-
			501200	Labor													-
032067	CORP-Operational Services		033019	WE-Operational Risk													-
			033516	CE-Maintenance													-
			033519	CE-Operational Risk													-
			035016	SE-Maintenance													-
																	-

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	035019	SE-Operational Risk	534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			575340	Employee Expense	-	-	-	-	-	-	-	-	-	-	-	-	-
			575620	Office & Admin Supplies	-	-	-	-	-	-	-	-	-	-	-	-	-
			501200	Labor	-	-	-	-	-	-	-	-	-	-	-	-	-
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			575340	Employee Expense	-	-	-	-	-	-	-	-	-	-	-	-	-
			501200	Labor	-	-	-	-	-	-	-	-	-	-	-	-	-
			501711	Incentive Plan-Off-Annual	4,651	5,308	2,392	4,402	312	1,311	1,311		2,888	3,871	2,634	2,158	29,928
			504610	Employee Awards			46	438	27	159			265	385	292	218	1,830
			504680	Referral Bonus	2		2,924										2
			507100	401k	133	133	58	109	7	40			66	96	71	53	2,924
			534998	Benefit Overhead	1,070	1,014	1,066	828	849	561	574	623	657	717	497	923	765
			534999	General Overhead	277	263	262	392	164	82	(151)	142	203	219	207	169	937
			550005	Mileage Reimbursement													2,228
			575000	Personal Vehicle	(0)	(1)											141
			575340	Employee Expense	(1)			1					54	186	(5)	115	9
			575350	Meals Deduct			4	(3)						4	4	5	10
			575351	Meals Non Deduct			4	(3)									14
			575620	Office & Admin Supplies	-									2			1
	035519	ED-Operational Risk	575740	Telephone	(2)												2
			575741	Cell Phone	60	17	(36)	79	48	(53)							(2)
			575998	PCard Undistributed			282	(280)									114
			501200	Labor	1,276	1,985	953	1,400	1,401	636	1,499	1,209	998	2,320	561	(80)	16
			501711	Incentive Plan-Off-Annual	143	375	123	188	206	194	198	152	122	357	180	995	15,233
			504610	Employee Awards		189	(70)									149	2,388
			504670	Training												10	128
			507100	401k	22	50	17	33	32	38	37	25	21	58	36	6	9
			508101	Defined Contribution Plan	7					4	10	1	3	6	6	4	375
			534998	Benefit Overhead	1,039	1,116	1,094	834	909	513	783	872	923	927	606	1,311	45
			534999	General Overhead	39	63	77	106	61	53	75	122	68	(3)	52	32	10,927
			575000	Miscellaneous	19												745
			575130	Brochures and Handouts													19
			575340	Employee Expense	(38)	(20)	58	(58)		107	(35)	166	90	88	64	(86)	9
			575350	Meals Deduct	2	-			0		4		1		19	(8)	337
			575351	Meals Non Deduct	2	-			0		4		1				17
			575620	Office & Admin Supplies	2	-			0								7
			575660	Postage	2	-						5					7
	036016	WD-Maintenance Services	575715	Software Licenses & Support	2	-											2
			575740	Telephone	1	(1)	1	0	0	0	0	0	1	0	0	113	113
			575741	Cell Phone	6	40	14	22	21	19	21	21	20				4
			575998	PCard Undistributed	52	(52)					-						4
			501200	Labor	1,039	96	216	7,258	68	2,773	1,995	3,769	1,544	1,670	2,803	46	251
			501711	Incentive Plan-Off-Annual					140	298	190	231	162	130	312	(61)	(15)
			504670	Training					163	(49)	368	74	80				27,306
			507100	401k	31	31	62	261	(12)	77	53	101	43	44	76	49	636
			508101	Defined Contribution Plan	16	11	279	(46)	(46)	48	23	103	18	43	36	12	785
			520100	Materials & Supplies Operations	3	47	1	24	40	4	106	(34)	93	11	25	543	18
			534998	Benefit Overhead	3	7	4	7	16	17	28	(4)	9	6	8	53	320
			534999	General Overhead	0	1	1	1	4	4	7	(1)	2	1	2	9	154
			550000	Transportation IT-Admin													31
			550005	Mileage Reimbursement	19	61	5		6	21	1	24	32	1	3	17	4
			575000	Personal Vehicle					19								190
			575340	Employee Expense	2	147	618	1,553	637	525	(575)	1,888	596	(150)	(113)	291	19
			575342	Employee Exp Conf/Registration		478	290	209		218	114	-				5,418	1,309
			575350	Meals Deduct			69	255	42	(10)	(6)	87	2	55	77	110	680
			575351	Meals Non Deduct			63	255	42	(10)	(6)	87	2				439
	575620	Office & Admin Supplies	575620	Overnight Shipping			30	4	43	1	7	6	44	41	3	11	191
			575625	Postage													14
			575660	Software Licenses & Support											3		13
			575740	Telephone	(1)					(1)	-	3		7			10

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			575741	Cell Phone	45												45
			575998	PCard Undistributed			0										0
			501200	Labor	49	6	21	31	52	(94)	5	23	9		554	953	1,608
		036019	WD-Operational Risk	Incentive Plan-Off-Annual	3	1	3	4	10	7	0	2	1			84	263
			504610	Employee Awards	199						9				1		209
			504660	Tuition Aid			51	-	11								62
			507100	401k	0	0	0	0	1	0					9	18	29
			508101	Defined Contribution Plan								2	1		4	11	20
			534998	Benefit Overhead	2	6	4	6	14	14	23	(3)	7	5	7	51	137
			534999	General Overhead	0	1	0	1	1	2	2	(0)	0	1	1	2	10
			541400	Rents-Equipment												36	36
			550003	Transportation Lease Maintenance		0							3				3
			575002	Misc General Office					9	(9)							-
			575340	Employee Expense	7	(5)	0	7	860	(752)	16	(28)	31	7	(25)	47	165
			575350	Meals Deduct	2		1		2	(1)			3	0	3	21	28
			575351	Meals Non Deduct			1		2	(1)			3				4
			575620	Office & Admin Supplies												1	1
			575715	Software Licenses & Support												113	113
			575740	Telephone	(0)	(1)											(1)
			575741	Cell Phone	8	11	3	4	4	2	3	8	8	4	7	0	61
		036516	NE-Maintenance	General Overhead													-
			534999	Telephone	-												-
			575740	Labor	62	86	95	86	122	178	188	149	200	361	269	132	1,928
		036550	CORP-COE-Engineering	Incentive Plan-Off-Annual	9	16	16	15	21	28	33	24	34	62	44	21	322
			504610	Employee Awards	2	3	3	3	4	5	4	4	6	9	6	3	52
			507100	401k	2	3	3	3	4	5	6	6	6	11	7	4	58
			508101	Defined Contribution Plan	250	202	278	183	210	121	202	208	211	190	130	375	2,560
			534998	Benefit Overhead	31	44	55	57	46	39	35	19	44	32	29	29	461
			534999	General Overhead	(1)												(1)
			535000	Contract Services-Other													
			550003	Transportation Lease Maintenance					7	(7)							-
			550005	Mileage Reimbursement Personal Vehicle		0		-		0	4				4	0	8
			575340	Employee Expense	0	0		0	416	(415)			7	13	4	0	25
			575350	Meals Deduct											1		1
			575484	Hiring-Background													1
			575485	Hiring-Drug Screen	1												1
			575620	Office & Admin Supplies			1					1				1	3
			575740	Telephone		0	0	(0)	0	25	(25)				0		-
			575741	Cell Phone	5	(3)	1	1	(1)	2	1	1	(0)	0	0	0	2
			501200	Labor	133	109	155	113	198	205	147	222	74	201	335	33	1,925
			501711	Incentive Plan-Off-Annual	25	18	27	18	31	34	28	36	15	35	55	7	329
			504500	Other Welfare Maintenance						24						(24)	(0)
			504610	Employee Awards											8		8
			507100	401k	3	2	3	2	3	4	3	5	2	4	7	1	40
			508101	Defined Contribution Plan	0	1	0	1	0	0	0	2	0	0	0	1	7
			533000	Contract Services-Legal			5	-			92	-			98	-	196
			534998	Benefit Overhead	347	277	369	263	298	168	300	312	302	270	191	521	3,618
			534999	General Overhead	25	18	22	19	15	14	19	19	19	20	16	20	226
			550005	Mileage Reimbursement Personal Vehicle	0	0	0	0	460	(460)	0	0			0	0	1
			575340	Employee Expense	0	0	4			2					43	0	48
			575350	Meals Deduct				-		(2)	0				2		2
			575351	Meals Non Deduct				-		(2)	1				1		1
			575481	Hiring-Ads	7												7
			575485	Hiring-Drug Screen													1
			575487	Hiring-App'l Travel													1
			575620	Office & Admin Supplies													27
			575670	Relocation Expenses				27	25	(25)					1		-
			575715	Software Licenses & Support													-
			575740	Telephone	331						84	7	205	1	1	0	298
																	331
Operation Services Total					17,403	18,673	22,635	26,852	17,693	11,950	12,604	18,415	14,523	18,089	16,472	21,375	216,684
Procurement	036010	CORP-Supply Chain-Sourcing	501200	Labor	1,946	1,817	2,365	2,012	2,310	1,996	2,296	2,587	2,399	2,077	1,555	2,292	25,252

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			501711	Incentive Plan-Off-Annual	202	199	206	201	210	320	217	228	236	212	323	228	2,784		
			501716	Compensation Exp-Options	35	35	44	35	35	42	36	36	42	37	36	44	457		
			501718	Compensation Exp-Restricted Stock Units	48	52	55	48	48	61	49	62	50	50	50	185	758		
			504500	Other Welfare Maintenance		2	-	2	2	1	14	1	2		2	12	36		
			504610	Employee Awards	8								6		2	0	3	2	20
			504660	Tuition Aid	118	93	29	48	93						28	26	(8)	10	436
			504670	Training															
			507100	401k	43	47	49	48	53	73	49	48	48	47	67	43	614		
			508101	Defined Contribution Plan	25	22	24	22	27	45	35	29	35	29	50	32	375		
			534998	Benefit Overhead	684	557	701	520	595	346	579	599	602	537	420	971	7,110		
			534999	General Overhead	31	32	35	28	29	35	29	29	28	28	44	27	377		
			535000	Contract Services-Other	(3)	1	-												
			535001	Contract Services-Temp Employee	109	268	217	156	102					144		1		2,160	13,466
			550005	Mileage Reimbursement Personal Vehicle			1	16	1	1	1	1	1	(23)				0	(0)
			575000	Miscellaneous	3	3	2											6	1
			575340	Employee Expense	66	73	45	(1)	41	52	130	(84)	82	88	(25)	93	561		
			575342	Employee Exp Conf/Registration		16			(29)	28				22	(10)		27		
			575350	Meals Deduct	3	13	8	4	6	1	2	5	6	23	18	8	97		
			575351	Meals Non Deduct	3	13	8	4	6	1	2	5	6				48	7	
			575484	Hiring Background							7								
			575485	Hiring-Drug Screen									1	1				2	
			575620	Office & Admin Supplies	1	2	13	36	19	(1)	20	4	13	16	20	70	213		
			575640	Penalties Nondeductible															
			575740	Telephone	5	12	9	23	7	10	18		18	36	401	(112)	437		
			575741	Cell Phone	55	(1)	20	21	13	23	22	20	22	24	18	13	251		
			504660	Tuition Aid	-	-													-
			501200	Labor															-
			575740	Telephone	-	433	551	474	513	346	474	551	513	474	346	513	5,515		
			501200	Labor															
			501711	Incentive Plan-Off-Annual	59	46	62	69	65	92	69	65	56	65	95	56	797		
			507100	401k	10	8	11	11	11	16	11	11	11	11	16	11	138		
			534998	Benefit Overhead	530	501	590	416	447	258	383	425	448	433	251	567	5,249		
			534999	General Overhead	28	8	24	18	17	12	15	16	17	18	13	13	199		
			550005	Mileage Reimbursement Personal Vehicle															
			575340	Employee Expense	8	10	1	12	41	10	15	1	47	74	40	56	315		
			575350	Meals Deduct		2	2	2	5	2	2	1	4	5	15	9	45		
			575351	Meals Non Deduct		2	(1)	(0)	0	0	0	0	0	0	0	0	16		
			575740	Telephone	0	1	(1)	(0)	0	0	(0)	0	0	0	0	35	35		
			575741	Cell Phone		14	(2)	8	5	5	5	5	5	5	6	6	61		
			504610	Employee Awards							2						2		
			504660	Tuition Aid	(9)														
			534998	Benefit Overhead	1	2	1	2	5	5	8	(1)	3	2	2	16	45		
			534999	General Overhead	0	0	0	0	0	0	0	0	0	0	0	1	2		
			575340	Employee Expense	8	-	3	3	9	(9)							11		
			575342	Employee Exp Conf/Registration			5										5		
			575350	Meals Deduct			0										0		
			575351	Meals Non Deduct			0										0		
Procurement Total					4,450	4,177	5,078	4,235	4,691	3,396	4,605	4,654	4,736	4,349	5,909	18,718	68,997		
Property	032042	CORP-1000 Voorhees Building	534999	General Overhead	1,532	1,625	1,811	2,256	3,914	(677)	1,786	1,740	1,625	1,578	1,418	1,604	20,212		
			575740	Telephone															
			534999	General Overhead															
			575620	Office & Admin Supplies	1,170	920	1,107	954	1,008	740	1,111	871	659	805	655	766	10,767		
			575740	Telephone		34				22						3	(3)	56	
			501200	Labor															
			504610	Employee Awards															
			507100	401k															
			534998	Benefit Overhead		145	130	141	152	130	145	149	130	124	65	225	1,691		
			534999	General Overhead	9,212	8,556	9,519	8,727	8,733	8,119	8,460	8,429	7,008	6,208	3,844	5,955	92,770		
			575620	Office & Admin Supplies			0									0			
			575998	PCard Undistributed	10	(15)	7	(7)	1	(1)							(5)		
						69									69				

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total		
032063	CORP-Building Services Woodcre	534998	Benefit Overhead		219	185	131	168	158	127	159	165	173	157	157	322	2,122		
		534999	General Overhead		7,648	6,115	6,880	5,484	5,068	4,516	4,697	4,769	4,778	5,079	5,654	5,657	66,345		
		535000	Contract Services-Other														9		
		575620	Office & Admin Supplies														9		
		Property Total		1	2	(1)									3	0	6		
		19,948	17,636	19,585	17,722	19,034	12,979	16,361	16,120	14,383	13,951	11,800	14,526	14,526	194,045				
		032023	CORP-Eastern Division Ops	501200	Labor		1,626	2,257	5,452	4,278	2,488	2,394	2,287	2,595	3,821	2,370	1,179	1,321	32,068
				501711	Incentive Plan-Off-Annual		582	923	2,187	1,972	1,338	1,338	877	923	1,592	923	813	459	13,511
				501716	Compensation Exp-Options		600	584	592	592	592	592	592	592	592	592	592	592	7,107
				501718	Compensation Exp-Restricted Stock Units		878	910	750	874	875	875	875	875	875	875	875	875	2,915
504620	Employee Physical Exam																408		
507100	401k				37	56	10	104	56	82	54	56	90	56	33	6	642		
534998	Benefit Overhead				1,154	1,357	1,229	831	921	351	787	877	943	933	745	1,513	11,641		
534999	General Overhead				52	142	184	145	609	207	239	225	237	235	205	113	2,593		
541001	Rents-Real Property Intercompany				183	166	195	175	170	192	199	212	178	180	180	201	2,232		
550000	Transportation Tr-Admin				7		1			1	2	-					10		
032024	Corp-Western Division Ops	550001	Transportation Lease Cost		58	58	115	-	57	91	57	57	57	57	57	722	2,722		
		550002	Transportation Lease Fuel		15		26	34	18	25	16	14	15	32	28	36	258		
		550003	Transportation Lease Maintenance		0	0	0	0	5	0	0			9	0	1	19		
		550005	Mileage Reimbursement Personal Vehicle				9										9		
		575000	Miscellaneous					36	0						3		39		
		575002	Misc General Office						13	39							52		
		575340	Employee Expense						275	135							3,519		
		575342	Employee Exp Conf/Registration		68	119	437	450	275	135							164	334	
		575350	Meals Deduct		21	95	346	278	21	13							64	204	
		575351	Meals Non Deduct		21	95	346	278	21	13							125	285	
032026	CORP-Regulated Ops	575420	Forms														996		
		575620	Office & Admin Supplies		1	46	2	(0)	32	9		1	6	4	(0)	(0)	99	91	
		575625	Overnight Shipping				15		0								15	15	
		575740	Telephone		2	(0)	9	6	0	7	4	5	4	(4)	7	2	42	107	
		575741	Cell Phone		17	(17)			17	7	7	10	9	10	19	22	12	107	
		575998	PCard Undistributed		(157)		143	(143)						1	1	(1)	(157)	(157)	
		760200	Other Income Deductions														5	5	
		760500	Non-Op Employee Exp Deduct							11			23					34	
		760600	Non-Op Employee Exp Nondeductible										15			7	(7)	15	
		501716	Compensation Exp-Options							165	165	165	165	165	165	165	165	1,819	
032026	CORP-Regulated Ops	501718	Compensation Exp-Restricted Stock Units														2,622		
		534998	Benefit Overhead		1	3	1	2	6	5	8	(1)	2	1	4	20	52	20	
		534999	General Overhead		1	4	2	3	6	9	10	(2)	6	0	4	11	53	53	
		575002	Misc General Office														7	7	
		575340	Employee Expense						49	(49)					583	(583)	0	0	
		575350	Meals Deduct						115	(115)							1	1	
		575351	Meals Non Deduct						115	(115)								56	
		575620	Office & Admin Supplies		0				13	(13)								26	
		575667	Printing															79	
		575740	Telephone															0	
032026	CORP-Regulated Ops	575998	PCard Undistributed														0		
		501200	Labor		897	848	992	896	944	883	896	992	944	896	887	944	11,022	11,022	
		501711	Incentive Plan-Off-Annual		506	509	509	509	509	509	760	509	509	509	509	763	509	6,609	
		501716	Compensation Exp-Options		523	504	513	513	513	511	513	513	513	513	513	513	513	6,158	
		501718	Compensation Exp-Restricted Stock Units		785	801	662	774	776	772	775	775	775	775	776	775	2,591	11,038	
		504610	Employee Awards															2	
		504670	Training							900								1,125	
		507100	401k		20	20												40	
		534998	Benefit Overhead		528	527	417	278	446	200	253	256	86	24	302	525	3,841	3,841	
		534999	General Overhead		126	129	127	127	130	164	118	131	126	119	93	110	1,499	1,499	
032026	CORP-Regulated Ops	535000	Contract Services-Other		1,226	(205)	23										1,044		
		550005	Mileage Reimbursement Personal Vehicle				1		2								10	10	
		575000	Miscellaneous		-	12	9	6	-	59	6	1	1	45	41	37	218	218	
		575320	Electricity														3	3	
		575340	Employee Expense		25	105	132	98	52	(57)	45	257	(3)	192	(2)	14	858	858	
		575342	Employee Exp Conf/Registration		-	(9)	18	11			(9)	21	16				11	60	

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total			
			575350	Meals Deduct	13	2	15	5	5	1	0	11	14	25	76	11	178			
			575351	Meals Non Deduct	13	2	15	5	5	1	0	11	14					66		
			575620	Office & Admin Supplies	4	2	18	1	4	-			27	(0)			24	1	80	
			575740	Telephone		1		2	2	1	1	2	1	2	1	1	2	1	16	
			575741	Cell Phone	6	3	4	2	3	15	3	2	4	4	3	3	3	52		
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			575740	Telephone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			534998	Benefit Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			575740	Telephone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
			575740	Telephone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			575740	Telephone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			534998	Benefit Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			501200	Labor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			575998	PCard Undistributed	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			501200	Labor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			501200	Labor	48	-	127	42	85	(340)	42	127	(154)	19	(149)	37	(114)	2	3,593	
			504610	Employee Awards								2							2	
			534998	Benefit Overhead	354	354	334	281	329	167	282	307	326	286	188	387	353	3,593		
			534999	General Overhead	60	42	4	20	19	13	16	18	20	14	15	259	-	-		
			575340	Employee Expense					0									0	0	
			575350	Meals Deduct					0									0	0	
			575351	Meals Non Deduct															0	
			575620	Office & Admin Supplies	20	(20)				267	12	(279)						-	-	
			575741	Cell Phone															-	
			575998	PCard Undistributed	255	(255)	98	(98)				-	47	(47)				-	-	
			501200	Labor	11,977	9,371	13,745	10,473	9,314	9,071	8,713	9,527	9,314	8,296	8,531	8,891	117,224	6,092	6,092	
			501711	Incentive Plan-Off-Annual	886	444	1,036	576	408	531	339	357	368	328	492	328	160	160	160	
			504500	Other Welfare Maintenance						(24)	91	3	90						23	
			504610	Employee Awards	218	388	475	(26)	154	1	269	8	278						1,757	
			504660	Tuition Aid														64		
			504670	Training	3	3	-										5		64	
			507100	401k	262	189	314	219	173	239	160	147	150	141	201	135	2,329	2,329	2,329	
			508101	Defined Contribution Plan	516	409	636	442	374	506	319	325	338	319	469	313	4,965	4,965	4,965	
			534998	Benefit Overhead	4,348	4,463	3,637	3,357	3,525	1,872	3,161	3,411	3,668	3,558	2,355	5,329	42,684	42,684	42,684	
			534999	General Overhead	360	406	632	319	342	231	192	192	212	266	189	193	3,534	3,534	3,534	
			541001	Rents-Real Property Intercompany	1,252	1,133	1,333	1,196	1,165	1,312	1,347	1,435	1,204	1,214	1,214	1,360	15,163	15,163	15,163	
			541400	Rents-Equipment				61				72	138			70	73	414	414	
			550005	Mileage Reimbursement Personal Vehicle	146	(17)	(9)	3	35	(35)	107	18	103	(91)	151	(256)	36	44	155	
			575000	Miscellaneous	(111)	202	79	519	19	(31)	845	(49)	49	127	139	174	1,961	1,961	1,961	
			575340	Employee Expense																140
			575342	Employee Exp Conf/Registration	3	16	15	116	21	9	64	15	17	19	115	62	471	276		
			575350	Meals Deduct	3	16	15	116	21	9	64	15	17	19	115	62	471	276	276	
			575351	Meals Non Deduct	3	16	15	116	21	9	64	15	17	19	115	62	471	276	276	
			575420	Forms															16	
			575620	Office & Admin Supplies	113	7	169	49	42	191	94	99	87	64	39	38	993	993	993	
			575625	Overnight Shipping		6	1				7	2				1	15	15	15	
			575670	Relocation Expenses	2	12	1	10	18	1	2	2	5	1	3	20	77	77	77	
			575740	Telephone	36	152	22	22	22	33	53	29	37	70	41	25	544	544	544	
			575741	Cell Phone	50	(49)		7	(7)										1	
			575998	PCard Undistributed	192	-	506	169	337	(1,350)	169	506	337	169	(1,350)	337	24	24	24	
			501200	Labor	145	149	174	147	147	176	149	149	178	153	152	193	1,913	1,913	1,913	
			501716	Compensation Exp-Options	237	270	263	244	245	308	249	316	256	254	990	3,879	3,879	3,879		
			501718	Compensation Exp-Restricted Stock Units	1,955	2,123	2,749	1,571	1,709	900	1,406	1,554	1,604	1,611	1,022	2,362	20,565	20,565	20,565	
			534998	Benefit Overhead	8,250	9,381	10,175	8,375	7,885	5,181	6,771	6,933	7,487	8,221	5,654	5,433	89,747	89,747	89,747	
			534999	General Overhead																
			541000	Rents-Real Property																
			550002	Transportation Lease Fuel																
																				4
																				4
																				4
																				4
																				4

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			575340	Employee Expense	226	(226)				3	(3)						-
			575350	Meals Deduct	1	(1)				6	(6)						-
			575351	Meals Non Deduct	1	(1)				6	(6)						-
			575620	Office & Admin Supplies					3								3
			575625	Overnight Shipping													
			575998	PCard Undistributed	(223)				(162)				1				(223)
	035514	ED-Engineering	501200	Labor	95		2	160									
			501716	Compensation Exp-Options	35	35	238	79	159	(634)	79	238	159	79	(634)	159	16
			501718	Compensation Exp-Restricted Stock Units	48	54	43	35	49	42	36	36	42	37	36	44	456
			534998	Benefit Overhead	889	947	1,330	744	808	466	646	709	751	711	52	51	777
			534999	General Overhead	36	41	48	36	35	24	30	33	33	37	26	446	9,537
			575340	Employee Expense													406
			575998	PCard Undistributed										8			8
	036002	WD-Network	534998	Benefit Overhead	1	1	71	(71)		3	5	(1)	2	1	1	11	29
			534999	General Overhead	0	0	0	0	0	0	1	(0)	0	0	0	0	2
			575340	Employee Expense					97	(97)							-
			575350	Meals Deduct			0	0	9	(9)	0						1
			575351	Meals Non Deduct			0	0	9	(9)	0						1
	036003	WD-Customer Relations	501200	Labor			2										2
			504610	Employee Awards					11	2	2						2
			534998	Benefit Overhead	6	15	9	15	33	32	55	(8)	17	13	16	108	311
			534999	General Overhead	1	4	3	4	9	12	17	(2)	5	4	6	18	82
			575340	Employee Expense					88	(88)							-
			575350	Meals Deduct					1	(1)							-
			575351	Meals Non Deduct					1	(1)							-
			575620	Office & Admin Supplies	1												1
			575740	Telephone	0	2											3
	036005	WD-Administration	504500	Other Welfare Maintenance													-
			504610	Employee Awards			2								2,668	(2,668)	2
			504670	Training	52												52
			534998	Benefit Overhead	2	4	3	4	12	8	14	(2)	3	2	5	29	83
			534999	General Overhead	11	22	11	25	48	49	69	(10)	19	16	21	76	358
			541000	Rents-Real Property						141	141	(281)					-
			550000	Transportation Tr-Admin	1						2						3
			575000	Miscellaneous	10												10
			575340	Employee Expense					179	(179)	4	(4)		8	(8)	1	(1)
			575350	Meals Deduct			0										0
			575351	Meals Non Deduct			0										0
			575620	Office & Admin Supplies			5										5
			575740	Telephone	(1)												(1)
			575998	PCard Undistributed					42	(42)							-
	036011	WD-Environmental Mgmt	534998	Benefit Overhead	0	1	1	1	2	2	3	(0)	1	1	1	9	22
			534999	General Overhead	0	0	0	0	0	0	0	(0)	0	0	0	0	1
	036014	WD-Engineering	504610	Employee Awards							6	1			2		9
			534998	Benefit Overhead	4	9	7	9	20	20	35	(5)	11	8	10	76	203
			534999	General Overhead	0	0	0	1	1	1	2	(0)	1	1	1	2	10
			575340	Employee Expense					191	(191)							-
			575350	Meals Deduct					2	(2)							-
			575351	Meals Non Deduct					2	(2)							-
			575740	Telephone													-
	036501	NE-Production	575998	PCard Undistributed	0	(1)											(0)
			501200	Labor	0				219	(219)							-
Regulated Operations Total					42,599	40,592	54,171	43,122	40,432	28,782	36,371	37,502	40,072	38,327	30,565	41,263	473,797
Regulatory Services																	
	032069	CORP-Regulatory UFS	501200	Labor	358	334	398	356	343	331	356	398	375	356	333	377	4,314
			501711	Incentive Plan-Off-Annual	101	100	100	100	90	100	100	100	100	100	100	151	1,293
			501716	Compensation Exp-Options	43	43	53	43	43	51	44	44	51	45	44	54	558
			501718	Compensation Exp-Restricted Stock Units	58	63	67	58	58	74	59	59	75	61	60	224	917
			504610	Employee Awards											2		2
			534998	Benefit Overhead	240	187	215	128	175	80	110	116	59	28	114	225	1,676
			534999	General Overhead	92	91	94	92	91	126	89	92	81	87	69	77	1,082
			535000	Contract Services-Other	540	540	540	540	540	538	270	270	315	315	315	315	5,038

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
SSC	032017	CORP-Planning & Reporting	550005	Mileage Reimbursement Personal Vehicle			6				6	5	2			5	25
			575000	Miscellaneous					1				(1)				-
			575320	Electricity	26	90	95	58	175	7	62	3	22	76	75	(16)	673
			575340	Employee Expense			18	25	12	13			39	0			119
			575342	Employee Exp Conf/Registration			0	1	8	2	0	14	5	2	6	(3)	51
			575350	Meals Deduct	0	1	8	2	0	14	5	2	2				35
			575351	Meals Non Deduct	0	1	8	2	0	14	5	2	2				35
			575620	Office & Admin Supplies					1			1					1
			575715	Software Licenses & Support				8									8
			575740	Telephone			0	(0)	(0)	0	0	1	1	0	0	(0)	2
			575741	Cell Phone	5	4	0	4	3	3	3	3	3	3	3	3	36
			575998	Card Undistributed				18	(18)								-
			501200	Labor	1,463	1,454	1,603	1,434	1,513	1,409	1,108	1,089	1,127	1,078	1,163	1,389	15,830
			501711	Incentive Plan-Off-Annual	308	311	532	497	465	509	300	535	521	502	510	499	5,489
			501716	Compensation Exp-Options	35	31	47	64	58	89	38	55	61	62	93	59	693
			501718	Compensation Exp-Restricted Stock Units	6	6	(12)	(0)							(0)		(0)
			504500	Other Welfare Maintenance	0	-	-	-	-	0				0	(0)	0	0
			504610	Employee Awards			30	79	116	31	3	15					274
			504670	Training	(6)										3	(3)	-
			507100	401k	10	9	9	11	13	19	9	14	15	15	22	14	161
			508101	Defined Contribution Plan	5	5	6	6	6	9	6	11	12	12	16	11	105
			534998	Benefit Overhead	477	354	325	349	356	176	241	262	209	185	422	504	3,859
			534999	General Overhead	31	32	28	27	23	24	23	28	22	25	33	25	322
			535000	Contract Services-Other	-	160	(160)					45	(45)				-
			535001	Contract Services-Temp Employee	178	179	191	173	163	180	210	194	174	166	(50)	348	2,107
			575340	Employee Expense	2	-	1	2	2	(2)	3	31	9	1	8	27	84
			575350	Meals Deduct	-	0	2	(0)	1	2	9	2	1	1	12	(7)	25
			575351	Meals Non Deduct	0	0	2	(0)	1	3	9	2	1	1			25
			575620	Office & Admin Supplies													1
			575670	Relocation Expenses			167	36	602	232	247	(141)	(69)	72	11	1	1,159
			575715	Software Licenses & Support													2
			575740	Telephone	1	(0)	1	4	(1)	1	1	(0)	0	6	(1)	0	12
			575741	Cell Phone	11	2	5	12	(4)	2	2	2	2	7	3	4	46
032084	SSC-Accounts Payable	Labor Non Scheduled Overtime	501200	Labor	1,423	1,636	2,086	1,850	2,109	2,148	1,980	2,236	2,434	1,916	1,711	1,850	23,379
			501210	Incentive Plan-Off-Annual	15	2	2	36	43	68	44	44	43	40	47	32	505
			501711	Group Ins Maintenance	37	34	37	36	0	2	3	2	1	1	4	2	20
			504100	Other Welfare Maintenance	4	1											-
			504500	Employee Awards			2	0	(2)	(0)	1		0		5	(5)	1
			504610	Training	(0)		2	6	7	22	11	0	4	11	-	(8)	56
			504670	Referral Bonus				10									10
			507100	401k	30	31	31	30	35	58	35	36	40	27	44	32	429
			508101	Defined Contribution Plan	44	38	40	39	37	69	38	41	39	46	76	55	563
			534998	Benefit Overhead	889	710	481	644	665	487	645	674	696	615	604	1,395	8,506
			534999	General Overhead													-
			535000	Contract Services-Other	1,152	331	280	523	270	312	338	332	359	228	506	332	4,964
			535001	Contract Services-Temp Employee			14	158	165	114	73	(11)	147	123	221	154	1,378
			550005	Mileage Reimbursement Personal Vehicle	(205)	(647)	(508)	(555)	(772)	(453)	(980)	(766)	(928)	(667)	(1,982)	(1,290)	(9,752)
			575000	Miscellaneous			7	(4)	0	7	-	-	3	2	0	6	20
			575002	Misc General Office				12	(2)	1	-		1	20	0	2	34
			575340	Employee Expense													-
			575342	Employee Exp Conf/Registration			5	4	5	71	4	5	6	4	13	8	116
			575350	Meals Deduct	5	4	5	71	(14)	4	5	6	4				91
			575351	Meals Non Deduct	5	4	17	(2)	(15)	1	-	8	0	0			10
			575620	Office & Admin Supplies													9
			575715	Software Licenses & Support													0
			575740	Telephone	0	(0)	0	(0)	0	(0)	0	(0)	0	0	(0)		0
			675250	Comp Equip Hardware	(5)		30	-	15	4	-	(0)					(5)
			675450	Office Equipment													49
			501200	Labor	2,051	1,285	1,576	1,718	1,728	1,531	1,609	1,792	1,617	1,531	1,443	1,788	19,668

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Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
032570	SSC-General Accounting		501711	Incentive Plan-Off-Annual	438	287	297	337	336	504	338	334	317	321	492	354	4,353
			501716	Compensation Exp-Options	86	87	106	87	87	103	88	88	103	90	89	110	1,124
			501718	Compensation Exp-Restricted Stock Units	125	138	142	127	127	161	129	129	164	133	132	486	2,001
			504500	Other Welfare Maintenance										15	8	18	83
			504610	Employee Awards		8	19	1	16	10	1		18		1	36	112
			504660	Tuition Aid													
			504670	Training		58	25		67	93	77	282	244	(8)		65	1,578
			507100	401k		36	23	42	43	64	42	40	40	320	120	3	1,024
			508101	Defined Contribution Plan		54	36	23	42	64	42	40	40	40	62	41	529
			534998	Benefit Overhead	13	12	12	22	23	35	23	23	22	23	34	23	264
			534999	General Overhead	3,227	2,879	3,022	2,657	2,383	2,093	2,355	2,401	2,462	2,521	2,691	3,526	32,218
			535000	Contract Services-Other	702	690	702	640	565	599	555	563	599	596	755	723	7,691
			535001	Contract Services-Temp Employee		27	(23)	1		3			40			48	
			536000	Contract Services-Lab Testing			1			1	(1)					0	
			550005	Mileage Reimbursement Personal Vehicle					1	5	1	4		1	1	8	28
			575000	Miscellaneous	10		6										6
			575002	Misc General Office	136	3	5	143	30	15	156	3	0	146		3	641
			575340	Employee Expense	(24)	47	15	40	(15)	44	47	111	5	50	56	120	598
			575342	Employee Exp Conf/Registration								7					50
			575350	Meals Deduct	4	30	17	25	20	34	21	20	34	36	45	78	364
			575351	Meals Non Deduct	4	30	17	25	20	34	21	20	34				205
			575464	Hiring Background			2	2			1	4		1	4		8
			575620	Office & Admin Supplies	(8)	(8)	29	(5)	8	30	(1)	50	1	1	4		101
			575670	Relocation Expenses										0			30
			575715	Software Licenses & Support													
			575740	Telephone	5	7	1	9	1	1	5	1	2	4	4	3	42
			575741	Cell Phone	60	28	22	42	38	42	51	43	37	50	42	40	495
			575998	PCard Undistributed			(0)										(0)
			501200	Labor	4,938	6,822	4,920	5,068	3,439	1,572	3,092	3,616	4,412	4,660	4,794	3,844	51,176
			501711	Incentive Plan-Off-Annual	535	729	377	444	368	387	360	408	354	420	521	330	5,234
			504500	Other Welfare Maintenance						20		0					20
			504610	Employee Awards						2	2		(2)	0			4
			504670	Training	4	4	3								1	14	27
			507100	401k	138	173	91	96	100	111	102	116	74	89	98	54	1,243
			508101	Defined Contribution Plan	198	383	207	236	154	152	123	171	207	191	307	189	2,519
			534998	Benefit Overhead	995	813	999	773	747	496	711	740	801	690	625	1,958	10,349
			534999	General Overhead			4										4
			535000	Contract Services-Other													
			535001	Contract Services-Temp Employee	204		52	94	3,354	2,880	(1,735)	4,309	157	189	226	1,997	11,726
			550005	Mileage Reimbursement Personal Vehicle													
			575000	Miscellaneous	4	(4)							2	0	4	24	28
			575340	Employee Expense	(5)	(12)	19	3	34	131	1	25	15	6	17	109	342
			575342	Employee Exp Conf/Registration			21	11									33
			575350	Meals Deduct	9	3	3			7	7	8	(13)	11	20	44	99
			575351	Meals Non Deduct	9	3	3			7	7	19	(13)			35	35
			575620	Office & Admin Supplies											2	3	11
			575740	Telephone	5	2	1	7	1	4	3	2	6	4	8	25	68
			501200	Labor	1,220	1,242	2,324	1,177	549	503	715	944	752	944	1,686	3,503	15,561
			501210	Labor Non-Scheduled Overtime													124
			501711	Incentive Plan-Off-Annual	92	105	188	124	96	56	56	53	56	77	203	332	1,344
			504100	Group Ins Maintenance													15
			504610	Employee Awards													
			504670	Training		2						4	(4)		6	(6)	
			507100	401k	28	38	78	39	12	30	20	25	20	25	42	98	456
			508101	Defined Contribution Plan	51	59	85	51	16	41	26	46	33	42	76	101	628
			534998	Benefit Overhead	456	367	441	265	252	173	249	239	257	225	229	602	3,755
			534999	General Overhead		1	9	8		206	143	(44)					20
			535001	Contract Services-Temp Employee						130	206	(44)	184	199	221	1,754	2,995
			575000	Miscellaneous	18	13	7	203	34	(33)	1		0		0		9
			575340	Employee Expense			(23)	12	(11)	10	15	19	(2)	19	(7)	5	67
			575350	Meals Deduct			5	0		1	4	4	5	2	20	37	78

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			575351	Meals Non Deduct	-	-	5	0	-	1	4	-	4	5	-	-	19
			575715	Software Licenses & Support	-	-	-	-	-	-	-	-	-	-	-	(38)	(38)
			575740	Telephone	-	-	-	-	-	-	0	2	-	2	(2)	-	2
			685430	PCard Undistributed	-	-	-	-	-	-	-	-	-	-	-	-	-
			501200	Other Taxes and Licenses	1,731	1,849	2,174	2,019	2,255	3,283	2,184	2,223	2,090	1,743	2,014	1,760	25,326
	032572	SSC-Business Support Services	501210	Labor Non Scheduled Overtime	-	-	-	-	-	5	1	-	-	-	-	-	13
			501211	Labor Overtime	-	-	-	-	-	17	-	-	-	-	-	-	17
			501211	Incentive Plan-Off-Annual	143	166	161	172	162	418	215	193	177	144	291	138	2,381
			504100	Group Ins Maintenance	-	2	2	-	-	-	-	-	-	-	2	1	13
			504500	Other Welfare Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-
			504610	Employee Awards	-	-	-	-	-	-	-	2	-	0	-	-	0
			504670	Training	46	29	251	25	77	13	54	51	23	234	26	186	1,015
			507100	401k	44	46	50	50	52	111	58	50	48	41	73	37	661
			508101	Defined Contribution Plan	41	48	49	48	50	93	66	64	60	48	101	37	705
			534998	Benefit Overhead	619	491	487	400	406	269	372	391	463	410	548	1,120	5,975
			534999	General Overhead	0	12	-	0	3	10	10	0	3	0	4	29	71
			535000	Contract Services-Other	-	-	-	-	-	-	-	-	-	-	-	-	-
			535001	Contract Services-Temp Employee	-	-	-	-	23	(23)	-	-	-	-	-	-	0
			550005	Mileage Reimbursement Personal Vehicle	-	-	0	-	-	-	-	-	-	-	2	-	3
			575340	Employee Expense	4	5	261	232	9	915	150	(96)	14	98	12	23	1,625
			575342	Employee Exp Conf/Registration	-	-	36	-	-	-	-	-	-	-	-	-	-
			575350	Meals Deduct	15	(12)	6	19	(4)	105	45	(15)	(21)	13	9	36	195
			575351	Meals Non Deduct	15	(12)	6	19	(4)	105	45	(15)	(21)	-	-	-	137
			575500	Janitorial	-	-	-	-	-	-	-	-	-	-	-	-	0
			575620	Office & Admin Supplies	-	-	-	-	-	-	-	-	-	-	-	-	0
			575740	Telephone	-	-	-	-	-	-	-	-	-	-	-	-	0
			685325	FICA	-	-	-	-	-	-	-	-	-	-	-	-	0
			685350	SUTA	-	-	-	-	-	-	-	-	-	-	-	-	0
	032574	SSC-Rates & Regulation	501200	Labor	6,432	1,551	3,437	1,322	1,401	257	794	817	1,017	1,106	833	1,402	20,369
			501711	Incentive Plan-Off-Annual	971	288	739	127	142	123	71	67	92	87	168	135	3,012
			504500	Other Welfare Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-
			504610	Employee Awards	-	-	-	-	-	2	-	-	-	-	-	-	2
			504670	Training	-	-	-	-	-	-	-	-	-	-	-	-	-
			507100	401k	141	47	79	29	29	26	17	14	18	26	39	-	43
			508101	Defined Contribution Plan	5	0	0	0	1	1	0	-	0	12	4	2	26
			534998	Benefit Overhead	675	480	541	395	400	296	374	360	357	311	290	1,256	5,736
			535000	Contract Services-Other	-	-	-	-	-	-	-	(95)	95	(95)	-	-	-
			550005	Mileage Reimbursement Personal Vehicle	-	-	-	-	-	0	1	-	-	-	3	4	9
			575002	Misc General Office	-	-	-	-	6	(6)	-	-	-	-	-	-	0
			575340	Employee Expense	(16)	20	1	87	(86)	47	(43)	1	37	28	(35)	45	86
			575350	Meals Deduct	-	1	3	-	1	5	-	-	-	5	0	-	16
			575351	Meals Non Deduct	-	1	6	1	1	5	-	3	-	-	-	-	17
			575620	Office & Admin Supplies	-	-	3	-	4	-	-	-	-	-	-	-	5
			575623	Outplacement	-	-	-	-	-	-	-	-	-	-	-	-	-
	032575	SSC-Cash Operations	501200	Labor	1,865	2,297	2,547	3,206	2,667	2,705	2,350	2,186	1,532	2,072	2,701	2,035	28,162
			501210	Labor Non Scheduled Overtime	-	-	-	-	-	-	-	-	-	-	-	-	-
			501711	Incentive Plan-Off-Annual	130	152	118	196	135	214	160	124	106	165	228	54	700
			504100	Group Ins Maintenance	12	9	13	11	12	16	12	11	14	7	10	12	1872
			504500	Other Welfare Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-
			504610	Employee Awards	-	-	6	1	(5)	(9)	1	1	-	-	-	-	(7)
			504670	Training	-	-	-	-	-	-	1	-	-	-	-	-	3
			507100	401k	31	29	37	42	36	48	41	31	20	37	63	41	455
			508101	Defined Contribution Plan	19	22	46	66	41	61	55	33	32	58	76	42	552
			534998	Benefit Overhead	642	564	491	523	498	375	486	503	513	446	452	1,053	6,546
			534999	General Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-
			535000	Contract Services-Other	-	-	-	-	-	-	-	-	-	-	-	-	-
			535001	Contract Services-Temp Employee	-	-	-	-	-	-	-	-	-	-	-	-	-
			575100	Bank Service Charges	41	94	99	90	109	158	39	182	184	131	87	226	1,438
			575340	Employee Expense	13	3	(11)	-	-	4	1	0	10	12	(8)	18	41
			575342	Employee Exp Conf/Registration	-	-	-	-	-	15	-	-	-	(15)	-	-	(15)

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032577	SSC-Utility Plant Accounting		575350	Meals Deduct	1	1	2	2	1	2	9	4	3	1	4	8	16	52					
			575351	Meals Non Deduct	1	1	2	1	2	9	4	3	1					23	23				
			575485	Hiring-Drug Screen																1			
			575620	Office & Admin Supplies			(0)	1									236	94	330				
			575623	Outplacement												54	(54)		-				
			675450	Office Equipment	77														77	77			
			501200	Labor	2,401	1,620	3,623	2,970	2,931	3,436	2,902	3,277	2,818	3,099	3,578	3,160	3,160	3,160	35,814	35,814			
			501210	Labor Non-Scheduled Overtime	33	7	13	16	11	5		5				19	22	22	131	131			
			501711	Incentive Plan-Off-Annual	72	64	94	86	70	126	79	99	76	103	127	79	79	1076	1,076	1,076			
			504100	Group Ins Maintenance	2	1	3	3	2	2		1			4	4			22	22			
			504500	Other Welfare Maintenance			3		(3)										-	-			
			504610	Employee Awards			1				1									4	4		
			504670	Training																10	10		
			507100	401k	30	31	39	37	31	53	33	38	34	43	52	34	34	52	34	454	454		
			508101	Defined Contribution Plan	100	73	126	137	130	208	139	147	126	148	196	137	137	166	137	1,666	1,666		
			534998	Benefit Overhead	706	585	587	461	456	313	445	462	493	451	443	1,362	443	1,362	6,764	6,764	6,764		
			534999	General Overhead																-	-		
			535001	Contract Services-Temp Employee			117	156	147	319	217	112	191	85	67	166	67	166	1577	1,577	1,577		
			550005	Mileage Reimbursement Personal Vehicle							1				1			1	3	6	6	6	
			575000	Miscellaneous	3	26	(25)	0	1	6	15	0	(19)		3			3					
			575340	Employee Expense																			
			575342	Employee Exp Conf/Registration																			
			575350	Meals Deduct	1	3	5			1	2	1	5	20	21	12	71	19	12	71	71	71	
			575351	Meals Non Deduct	1	3	5			1	2	1		2	1	5				19	19	19	
			501200	Labor	105	(53)	(51)										(1)	(10)	(10)	(0)	(0)	(0)	
501711	Incentive Plan-Off-Annual	10																					
507100	401k	0																					
534998	Benefit Overhead	66	72	70	(3)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(3)	(3)	(146)	(146)	(0)	(0)	(0)				
032578	SSC-Project Management		501200	Labor	1,598	1,632	1,803	1,474	1,560	1,728	1,516	1,529	1,467	1,553	1,911	1,512	1,512	19,284	19,284	19,284			
			501210	Labor Non-Scheduled Overtime	148	(13)	59	206	29			24	15	7	18	7	7	499	7	499	499		
			501711	Incentive Plan-Off-Annual	61	53	54	55	51	90	57	54	51	51	82	53	713	51	82	713	713		
			504100	Group Ins Maintenance	19	12	10	48	8			6	3	1	4	3	114	4	3	114	114		
			504500	Other Welfare Maintenance	10	-	(10)		34	(34)		9	(9)		20		20		20	20	20		
			504610	Employee Awards		1	7		(8)					1					1	1	1		
			504670	Training																			
			507100	401k	48	51	48	52	46	69	43	43	39	40	53	33	33	565	33	565	565		
			508101	Defined Contribution Plan	56	68	69	67	60	81	55	55	50	51	62	39	39	713	62	713	713		
			534998	Benefit Overhead	785	29	468	484	462	369	461	471	449	403	388	1,043	388	1,043	5,812	5,812	5,812		
			534999	General Overhead	598		-													598	598	598	
			535000	Contract Services-Other	534	672	765	402	955	7	401	349	471	(17)	1,061	459	1,061	459	6,059	6,059	6,059		
			535001	Contract Services-Temp Employee	99	122	26	70	44	(10)	7	12	15	29	(62)	41	393	(62)	41	393	393		
			550005	Mileage Reimbursement Personal Vehicle					2	(1)								0		4	4	4	
			575340	Employee Expense	11	(3)	16	(14)	2	17	2	8	(4)	14	(0)	11			11	59	59	59	
			575342	Employee Exp Conf/Registration				15															
			575350	Meals Deduct	(15)	9	0	0	1														
			575351	Meals Non Deduct	(10)	-	(5)	(0)	1														
			575620	Office & Admin Supplies	(79)	-		(0)	3	45	3												
			575625	Overnight Shipping	86	86	(173)																
			575740	Telephone	0	(0)	0	0	0	(0)													
			575998	PCard Undistributed	3	(3)																	
			032580	SSC-AWE		501200	Labor		4			7	7	34	18						69	69	69
						501711	Incentive Plan-Off-Annual					1	1	4							7	7	7
						504610	Employee Awards																
507100	401k								0	0	1								2	2	2		
508101	Defined Contribution Plan					0				0	0												
534998	Benefit Overhead																						
534999	General Overhead																						
535000	Contract Services-Other																						
575340	Employee Expense																						
575350	Meals Deduct					0	(0)																
575351	Meals Non Deduct					0	(0)																

Tennessee American Water Company
Tennessee Regulatory Authority
Response to TRA 01-062

Docket No. 12-00049
Response to TRA 01-062

Tennessee American Service Company Expenses (O&M Only)
By Function, Business Unit and Object Account
For the 12 months Ending December 2011

Function	Business Unit	Business Unit Name	Object Account	Object Account Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
SSC Total					42,682	33,547	39,649	35,051	34,834	33,323	27,169	35,186	30,399	31,079	33,981	45,743	422,643
Grand Total					454,667	427,752	477,884	402,561	436,109	388,185	386,445	421,488	406,354	367,239	362,806	500,388	5,031,978

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Linda Bridwell

Question:

63. Does the test period Support Service Fee amount of \$5,081,165 include Incentive Plan pay? If the answer is "yes", please explain the purpose of Incentive Plan and how the amount is calculated. Provide the amounts by function, business unit, JDE and NARUC accounts for long term incentive plan and annual incentive plan for the test years ended December 2011.

Response:

Yes, the test period Support Service Fee amount of \$5,081,165 includes Incentive Plan pay. The purpose of Incentive Plan and how the amount is calculated is provided in the response to TRA Request No. 34. Please see attachment which provides the long term incentive plan and annual incentive plan expense for the test year ended December 31, 2011. See below for the JDE and NARUC accounts charged.

Account Description	JDE	NARUC
Annual Incentive Plan Expense	501711	601.8
Compensation Expense - Options	501716	601.8
Compensation Expense - PSU's	501718	601.8

Tennessee American Water Company
TAW_R_TRADR1#063 Attachment
Incentive Plan Expense Included in Support Service Fee

BU	Business Unit	AIP	LTIP - Options	LTIP - PSU's	Total
032002	COE-HR Comp/Benefits	\$1,987	\$488	\$804	\$3,279
032003	COE-HR Talent Development	1,462	249	612	2,323
032004	CORP-HR Labor Relations	1,222	461	757	2,440
032006	CORP-Business Center HR	2,405	192	189	2,786
032007	CORP-Finance	8,216	1,959	3,331	13,506
032010	COE-Supply Chain	6,048	457	758	7,263
032011	Corp-Operation Services	2,433	1,093	1,993	5,518
032013	CORP-HR Systems & Processes	0			0
032014	CORP-Benefits Service Center	1,753			1,753
032015	CORP-Legal	7,975	3,498	7,586	19,059
032016	CORP-Maintenance Services	1,324	393	688	2,406
032017	CORP-Svc Co FP&A	877	0	0	877
032018	CORP-Human Resources	2,054	-1	-921	1,132
032019	COE-Operational Risk	2,235	488	805	3,528
032020	CORP-Corporate Bus Development	4,067	1,139	2,121	7,326
032021	CORP-Finance Pass thru	124	0	0	124
032022	CORP-Government Affairs	1,005	388	638	2,031
032023	CORP-Eastern Division Ops	14,393	7,107	12,452	33,952
032024	Corp-Western Division Ops	0	1,819	2,622	4,441
032025	CORP-External Affairs	406	0	16	422
032026	CORP-Regulated Ops	6,956	6,158	11,038	24,152
032027	CORP-Reporting & Compliance	4,262	192	257	4,711
032028	CORP-ED Human Resources	5,132	1,062	2,617	8,811
032029	CORP-BAD-Business Analysis Grp	748			748
032030	CORP-ITS Client Rel Admin	673	139	239	1,051
032031	CORP-Service Desk	914			914
032032	CORP-ITS-BAD-Core Shared	3,658			3,658
032033	Chg Ctrl & Desktop Automation	661			661
032037	CORP-Investor Relations	1,003	566	930	2,498
032038	CORP-WD Human Resources	104	0	0	104
032040	CORP-Business Transformation	8,803	1,430	2,577	12,810
032047	CORP-Income Tax	2,878	54	183	3,114
032048	CORP-HR Health & Wellness	0			0
032051	CORP-Bsns Trans-Procure To Pay	5,572			5,572
032052	CORP-Bsns Trans-Recruit To Ret	9,028	820	1,282	11,130
032053	CORP-Bsns Trans-Record To Rpt	8,035	324	541	8,900
032054	CORP-Bsns Trans-Order To Cash	5,299			5,299
032055	CORP-Bsns Trans-Plan, Bld, Ret	7,244			7,244
032056	CORP-Bsns Trans-Ord To Compl	2,752	564	931	4,247
032057	CORP-Treasury	6,974	581	1,724	9,279
032060	CORP-Audit	2,631	316	778	3,724
032062	CORP-Voorhees Building	316			316
032063	CORP-Woodcrest Building	128			128
032065	CORP-Engineering	3,894	495	815	5,204
032066	COE-Innov & Env Stewardship	5,337	485	801	6,623
032068	CORP-Marketing	582	13	-211	384
032069	CORP-Regulatory UFS	1,500	558	917	2,975
032070	CORP-Business Services	241			241
032071	CORP-ITS Admin	2,710	1,175	2,071	5,957

Tennessee American Water Company
TAW_R_TRADR1#063 Attachment
Incentive Plan Expense Included in Support Service Fee

BU	Business Unit	AIP	LTIP - Options	LTIP - PSU's	Total
032072	CORP-ITS PMO	2,489	141	236	2,866
032073	CORP-ITS Infra/Oper Admin	1,042	150	246	1,438
032074	CORP-ITS Production	403			403
032075	CORP-Enterprise Server	1,546			1,546
032076	CORP-Communications	778			778
032077	CORP-ITS Security Operations	1,589			1,589
032078	CORP-ITS Adm Business Appl Dev	2,108	175	296	2,578
032079	CORP-ITS-BAD-Middle Office App	1,656			1,656
032080	CORP-ITS-BAD-Back Office Apps	2,556			2,556
032081	CORP-ITS-BAD-Quality&Methodlgy	2,091			2,091
032082	CORP-ITS-BAD-Customer Facing	2,304			2,304
032083	CORP-ITS-BAD-Field Svc Apps	3,399			3,399
032084	SSC-Accounts Payable	1,258			1,258
032085	CORP-External Communications	2,048	344	570	2,962
032086	CORP-Internal Communications	1,078	316	521	1,916
032087	CORP-Corp Social Resp	437			437
032089	CORP-AWE Pass-Thru	356	0	0	356
032093	CORP-ITS-Architecture	1,990			1,990
032098	CORP-Non-Departmental Costs	0	-501	-678	-1,179
032102	CORP-BT-OTHER-Procure to Pay	417			417
032103	CORP-BT-OTHER-Recruit To Ret	331			331
032104	CORP-BT-OTHER-Record To Rpt	617			617
032105	CORP-BT-OTHER-Order To Cash	459			459
032106	CORP-BT-OTHER-Plan to Build	287			287
032505	SSC-Administration	5,036	1,124	2,001	8,160
032570	SSC-Accounting & Reporting	6,288			6,288
032571	SSC-General Tax	1,639			1,639
032572	SSC-Business Systems Support	2,986			2,986
032574	Regulatory Reporting	3,676			3,676
032575	SSC-Cash Operations	2,400			2,400
032577	SSC-Utility Plant Accounting	1,862			1,862
032578	SSC-Project Management	0			0
032579	SSC-Employee Services	1,198			1,198
032580	SSC-AWE	5			5
033531	Corp-ITS Technology Products	5,300			5,300
034005	CCA-Administration	1,905	523	865	3,294
034018	CCA-Human Resources	1,419	83	206	1,708
034070	CCA-Call Handling	4,261			4,261
034071	CCA-Billing	3,100			3,100
034072	CCA-Collections	1,107			1,107
034073	CCA-Operations & Performance	1,062			1,062
034074	CCA-Business Services	2,170			2,170
034075	CCA-Education & Development	479			479
034076	CCA-Quality & Reporting	728			728
034517	CORP-Central Laboratory	4,098	154	257	4,510
035502	ED-Network	153			153
035503	ED-Customer Relations	8,904			8,904
035505	ED-Administration	1,202	1,913	3,879	6,995
035507	ED-Finance	28,604	1,820	3,373	33,797

Tennessee American Water Company
TAW_R_TRADR1#063 Attachment
Incentive Plan Expense Included in Support Service Fee

BU	Business Unit	AIP	LTIP - Options	LTIP - PSU's	Total
035510	ED-Supply Chain	1,521			1,521
035514	ED-Engineering	568	456	777	1,801
035515	ED-Legal	14,274	781	2,527	17,581
035516	ED-Maintenance Services	2,677			2,677
035519	ED-Operational Risk	3,051			3,051
035520	ED-Business Development	5,234	502	1,321	7,057
035525	ED-External Affairs	2,225	0	0	2,226
036002	WD-Network	0	0	0	0
036003	WD-Customer Relations	0			0
036005	WD-Administration	0	0	0	0
036007	WD-Finance	282	0	0	282
036010	WD-Supply Chain	1			1
036011	WD-Environmental Mgmt	0			0
036014	WD-Engineering	0	0	0	0
036015	WD-Legal	19	0	0	19
036016	WD-Maintenance Services	2,268			2,268
036019	WD-Operational Risk	263			263
036020	WD-Business Development	0			0
036025	WD-External Affairs	1	0	0	1
036550	COE-Construction Management	3,210	132	220	3,562
036551	COE-Technical Services	2,574	130	217	2,921
037005	CCP-Administration	62			62
037070	CCP-Call Handling	4,999			4,999
037073	CCP-Operations and Support	236			236
037075	CCP-Education & Development	237			237
037076	CCP-Quality & Reporting	67			67
039998	Benefits OH Clearing	0			0
Total		\$322,609	\$42,905	\$78,774	\$444,288

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Linda Bridwell

Question:

64. Regarding the Support Service Fee, explain the Company's rationale for increasing the normalized test period amount by \$27,755 for BT Related Labor Expected in 2013, \$260,087 for additional Depreciation, interest, and BT Maintenance & Consulting through 2012, and \$326,940 for additional Depreciation, interest, and BT Maintenance & Consulting through 2013. Provide a schedule(s) showing how these amounts were calculated. (See TRA_R_TRAFAQ_13, Petitioner's Exhibit EXP-6-Support Services-LCB, Support Service Expense page 1of 7.)

Response:

The Company used actual 2011 costs as the basis for projecting Support Services costs. The rationale for increasing the normalized test period Support Services fees by the amounts listed was based on forecasted costs for additional ITS Business Transformation costs including consulting, maintenance and labor, as well as depreciation and interest costs not included in the base year 2011 figures.

The costs for ITS Business Transformation, depreciation and Interest were provided at the total Service Company level and Tennessee American's share of the costs was calculated by applying their adjusted 2010 customer percentage of 2.38% to the total Service Company figures. The figures were also adjusted down by inflation and the merit increases applied in the pro forma file to avoid doubling their effects.

See attached for the calculation for the ITS Business Transformation, depreciation and Interest costs.

TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY

TAW_R_TRADR1#64

ITS BT Labor

2013 Forecasted Service Company	\$1,321,000	
<i>Tennessee American's 2.38% Share</i>		31,440
<i>Adjusted for pro forma period end November</i>		91.51%
<i>Less 2012 merit increase %</i>	1.65%	
<i>Less 2013 merit increase %</i>	2.01%	
	3.66%	
Total share of Support fee to Tennessee		<u>\$27,754</u>

Adjust for Additional Depreciation, Interest, and BT Maintenance & Consulting, through 2012

2012 Forecasted Service Company -Consulting	\$5,470,000	
2012 Forecasted Service Company -Maintenance	775,000	
2012 Forecasted Service Company -Depreciation	4,234,340	
2012 Forecasted Service Company -Interest	590,748	
Total Service Company	<u>11,070,088</u>	
<i>Tennessee American's 2.38% Share</i>		263,468
<i>Less 2012 inflation increase %</i>		1.30%
Total share of Support fee to Tennessee		<u>\$260,087</u>

Adjust for Additional Depreciation, Interest, and BT Maintenance & Consulting through 2013

2013 Forecasted Pro forma Service Company -Consulting	\$9,816,855	
2013 Forecasted Pro forma Service Company -Maintenance	1,667,255	
2013 Forecasted Service Company -Depreciation	7,436,015	
2013 Forecasted Service Company -Interest	981,693	
Total Service Company	<u>19,901,817</u>	
<i>Tennessee American's 2.38% Share</i>		473,663
<i>Adjust Consulting and Maintenance for 2012 costs</i>	(146,724)	
	(146,724)	
Total share of Support fee to Tennessee		<u>\$326,940</u>

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Gary M. VerDouw

Question:

65. Table 2 on page 39 of Gary M. VerDouw's testimony details BT expenditures by year from 2009 through 2014. Identify the accounts that these expenditures were booked in 2009, 2010, 2011 and 2012. Were any of these amounts included in the rate case filed Docket No. 10-00189. If so, were they expensed?

Response:

The BT charges are being booked to accounts 105270 CWIP, 105350 CWIP AFUDC-Debt, and CWIP AFUDC-Equity 105375.

Yes, the expenses were included in the rate case file Docket No. 10-00189.

No, they were not expensed.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Lew Keathley

Question:

66. Describe the Company's process of purchasing chemicals:

- a. Does the Company issue RFPs? If yes, how does the Company select the chemicals it buys? If no, explain the alternative methods the Company uses to purchase chemicals.
- b. Does AWWC buy the chemicals? If not, please explain why the parent does not.
- c. How does the Company utilize its economies of scale to purchase chemicals?
- d. Does the Company have a purchasing team that analyzes the chemical market and negotiates contracts with suppliers?
- e. Are there indexes associated with the chemicals that the Company buys?

Response:

- a. American Water uses a bid process each year for chemicals. The criteria that is used is based on response to the RFP, price, reliability, financial stability of the supplier, quality of product, delivery capabilities and NSF (National Sanitation Foundation) certification.
- b. American Water corporate buys the chemicals used in its operation.
- c. American Water uses its total volume of chemicals when completing its RFP's.
- d. American Water does have a corporate procurement team that analyzes the chemical market as well as negotiates its terms and conditions.
- e. American Water does not use indexes when completing its chemical pricing.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Lew Keathley

Question:

67. Explain how the Company accounts for inventory:

- a. What type of inventory system does the Company maintain?
- b. How does the Company determine when and what quantity of chemicals to reorder?
- c. Does the Company have a real time inventory system that accounts for chemicals purchased, on hand, and used?

Response:

- a. Most chemicals are liquids and stored in bulk storage tanks. Those tanks have level sensors that are tied into the SCADA system. Chemical inventory levels are recorded at midnight by the process technicians.

Chlorine inventory is also recorded daily with the number of empty/full chlorine cylinders and the remaining pounds of chlorine for the cylinder in use.

Filter aid is purchased in 55 lb bags and tracked by counting full/partial bags.

Powdered activated carbon is stored as a slurry, and those levels are tracked by tank level and slurry percentage.

- b. Reorder point is based upon current usage rate, anticipated future usage rate and storage capacity, and is tracked via an excel spreadsheet. For efficiency, full chemical loads per shipment are desirable thus it is important to time the receipt date at an inventory level to accommodate a full load.
- c. Currently, the inventory process is not fully automated. It is anticipated that when SAP is fully implemented, real time inventory tracking will be available.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Gary M. VerDouw

Question:

68. If a tracker is approved for chemicals, please explain what incentive(s) that the Company has to purchase chemicals prudently.

Response:

Under the Company's proposal for a PPACC Tariff Rider, the burden remains on the Company to demonstrate that its expenditures were reasonable and prudent. Conversely, the Authority will continue to have oversight into the prudence of the Company's expenditures on its chemical purchases. The Company purchases only those chemicals necessary to adhere to all water quality standards and is always incentivized to purchase at the least cost possible in an effort to control and wherever possible to lower overall operating and maintenance costs. Likewise, the Company is always incentivized to keep its customer rates as low as possible and given the pressure on rates from needed capital expenditures, controlling operating and maintenance costs is extremely important.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness:

Question:

69. Does the Company have registered lobbyists in Tennessee other than Kino Becton? If yes, provide a detailed list inclusive of employee number, job description and what percentage of their time is spent on lobbying activities.

Response:

No, Kino Becton is the only employee of Tennessee American Water Company registered as lobbyist in Tennessee. However, Tennessee American Water Company hired Adams & Reese Law firm to take on the majority of lobbying activities.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Linda C. Bridwell

Question:

70. Provide a monthly itemized breakdown (project, date, and amount) of the proposed capital construction expenditures for each of the four (4) budgeted projects listed in Linda Bridwell direct testimony, page 25, totaling \$14,293,911 for 2012 and \$14,592,032 for 2013.

Response:

Please refer to the attachment, which is a summary of Schedule RB 3.1 in the workpapers.

Tennessee American Water
Capital Expenditures by Month 2012-2013

Funding Project Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total 2012
RP-26-A Mains - New	\$ -	\$ 1,500	\$ 3,000	\$ 15,000	\$ 25,000	\$ 21,000	\$ 16,000	\$ 8,500	\$ 3,500	\$ 1,728	\$ 1,500	\$ -	\$ 96,728
RP-26-B Mains - Replaced/Restored	\$ -	\$ 3,000	\$ 26,000	\$ 65,000	\$ 85,000	\$ 185,000	\$ 225,000	\$ 225,000	\$ 225,000	\$ 225,000	\$ 150,000	\$ -	\$ 1,450,000
RP-26-C Mains - Unscheduled	\$ 29,973	\$ 32,257	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 27,770	\$ 360,000
RP-26-D Mains - Relocated	\$ 64,167	\$ 64,167	\$ 64,167	\$ 64,167	\$ 64,167	\$ 64,167	\$ 64,167	\$ 64,167	\$ 64,167	\$ 64,167	\$ 64,167	\$ 64,167	\$ 770,000
RP-26-E Hydrants, Valves, and Manholes - New	\$ -	\$ -	\$ -	\$ 1,908	\$ 5,724	\$ 7,632	\$ 9,541	\$ 7,632	\$ 3,816	\$ 1,908	\$ -	\$ 0	\$ 38,162
RP-26-F Hydrants, Valves, and Manholes - Replaced	\$ 90,833	\$ 90,833	\$ 90,833	\$ 90,833	\$ 90,833	\$ 90,833	\$ 90,833	\$ 90,833	\$ 90,833	\$ 90,833	\$ 90,833	\$ 90,833	\$ 1,090,000
RP-26-G Services and Laterals - New	\$ 27,000	\$ 36,000	\$ 36,000	\$ 31,500	\$ 31,500	\$ 40,500	\$ 36,000	\$ 40,500	\$ 31,500	\$ 31,500	\$ 49,500	\$ 58,500	\$ 450,000
RP-26-H Services and Laterals - Replaced	\$ 28,296	\$ 28,296	\$ 28,296	\$ 28,296	\$ 28,296	\$ 28,296	\$ 28,296	\$ 28,296	\$ 28,296	\$ 28,296	\$ 42,444	\$ 42,444	\$ 382,000
RP-26-I Meters - New	\$ 29,100	\$ 38,800	\$ 38,800	\$ 33,950	\$ 33,950	\$ 43,950	\$ 38,800	\$ 43,950	\$ 33,950	\$ 33,950	\$ 53,350	\$ 63,050	\$ 485,000
RP-26-J Meters - Replaced	\$ 23,310	\$ 62,160	\$ 77,700	\$ 85,470	\$ 62,160	\$ 93,240	\$ 69,930	\$ 69,930	\$ 69,930	\$ 46,620	\$ 54,390	\$ 62,160	\$ 777,000
RP-26-K ITS Equipment and Systems	\$ -	\$ -	\$ 32,775	\$ 14,100	\$ 49,700	\$ 21,100	\$ 84,000	\$ 14,100	\$ -	\$ -	\$ -	\$ -	\$ 215,775
RP-26-L SCADA Equipment and Systems	\$ -	\$ -	\$ -	\$ 25,000	\$ -	\$ 25,000	\$ -	\$ 20,000	\$ -	\$ -	\$ -	\$ -	\$ 70,000
RP-26-M Security Equipment and Systems	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 6,667	\$ 80,000
RP-26-N Offices and Operations Centers	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,500	\$ 2,500	\$ 13,100	\$ 3,500	\$ -	\$ -	\$ -	\$ 20,600
RP-26-O Tools and Equipment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 30,000	\$ 90,000	\$ 40,000	\$ 25,000	\$ 100,000	\$ 50,000	\$ -	\$ 335,000
RP-26-P Process Plant Facilities and Equipment	\$ 12,817	\$ 40,731	\$ 25,000	\$ -	\$ -	\$ 8,000	\$ 10,000	\$ 2,600	\$ 5,000	\$ 3,000	\$ 3,000	\$ 4,400	\$ 36,000
RP-26-Q Capitalized Tank Rehabilitation/Painting	\$ 72,505	\$ 72,505	\$ 72,505	\$ 72,505	\$ 72,505	\$ 72,505	\$ 72,505	\$ 72,505	\$ 72,505	\$ 150,000	\$ 100,000	\$ 334	\$ 1,075,882
RP-26-R Engineering Studies	\$ 3,474	\$ 3,474	\$ 6,947	\$ 6,947	\$ 6,947	\$ 6,947	\$ 6,947	\$ 6,947	\$ 6,947	\$ 6,947	\$ 72,505	\$ 72,505	\$ 870,064
Recurring Projects Sub-Total	\$ 388,142	\$ 480,390	\$ 538,690	\$ 602,343	\$ 652,450	\$ 951,038	\$ 1,156,186	\$ 889,428	\$ 801,612	\$ 907,270	\$ 771,830	\$ 532,304	\$ 8,671,681
DV-26 PROJECTS FUNDED BY OTHERS	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 2,000,000
Developer Funded Project Sub-Total	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 2,000,000
IP-2602-16 Meter Shop Building Additions	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
IP-2602-18 Electrical Motor Efficiency Enhance	\$ 8,333	\$ 8,333	\$ 8,333	\$ 8,333	\$ 8,333	\$ 8,333	\$ 8,333	\$ 8,333	\$ 8,333	\$ 8,333	\$ 8,333	\$ 8,333	\$ 100,000
IP-2602-19 NRW Pressure Reduction	\$ 48,735	\$ 55,055	\$ 250,000	\$ 56,328	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 410,118
IP-2602-35 Replace Roof, Citico Filter Hse # 2	\$ -	\$ -	\$ -	\$ 4,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 175,000
IP-2602-22 TAW GIS Data Conversion	\$ -	\$ -	\$ -	\$ -	\$ 10,000	\$ 15,000	\$ 50,000	\$ 40,000	\$ 52,000	\$ 1,000	\$ 1,500	\$ 1,500	\$ 32,500
IP-2602-25 Post Acquisition BD CapEx	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
IP-2602-26 Install New Hill City Pumps	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
IP-2602-29 Install 5,700' of 16"- East Braine	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
IP-2602-30 5800'-16" Main in Navajo Dr.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
IP-2602-31 Construct 1.0MG Tank & 2500'-16" ER	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
IP-2602-34 Citico Plant Improvements Phase 1B	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
IP-2602-4 5933 ft of 20" Ringgold Rd. at I-75	\$ 22,917	\$ 22,917	\$ 22,917	\$ 22,917	\$ 22,917	\$ 22,917	\$ 22,917	\$ 22,917	\$ 22,917	\$ 22,917	\$ 22,917	\$ 22,917	\$ 275,000
IP-2602-6 Wastewater Treatm't & Handling Impr	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
IP-2602-7 Convert ER Reservoir to Pump Storag	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
IP-2602-8 3000'-24" Tennessee River Crossin	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
IP-2602-9 Repl Ukout Mtn Pump#4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Investment Project Sub-Total	\$ 79,985	\$ 86,305	\$ 281,250	\$ 91,578	\$ 41,250	\$ 46,250	\$ 81,250	\$ 71,250	\$ 83,250	\$ 32,250	\$ 40,250	\$ 57,750	\$ 992,818
CS-2602-3 Business Transformation	\$ 373,684	\$ 243,220	\$ 306,469	\$ 245,220	\$ 277,964	\$ 215,795	\$ 178,191	\$ 190,633	\$ 140,767	\$ 138,001	\$ 139,633	\$ 123,239	\$ 2,572,816
CS-2602-4 Business Transformation - Other	\$ 4,694	\$ 4,722	\$ 4,749	\$ 4,777	\$ 4,804	\$ 4,833	\$ 4,860	\$ 4,888	\$ 4,571	\$ 4,585	\$ 4,599	\$ 4,614	\$ 56,696
Central Sponsored Project Sub-Total	\$ 378,378	\$ 247,942	\$ 311,218	\$ 249,997	\$ 282,768	\$ 220,628	\$ 183,051	\$ 195,521	\$ 145,338	\$ 142,586	\$ 144,232	\$ 127,853	\$ 2,629,512
Capital Expenditure Total	\$ 1,013,171	\$ 981,303	\$ 1,297,825	\$ 1,110,585	\$ 1,143,134	\$ 1,384,562	\$ 1,587,154	\$ 1,322,865	\$ 1,196,866	\$ 1,248,772	\$ 1,122,979	\$ 884,574	\$ 14,293,811

Tennessee American Water
Capital Expenditures by Month 2012-2013

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total 2013
Funding Project Description													
RP-26-A Mains - New	\$ -	\$ 9,500	\$ 12,500	\$ 11,070	\$ 11,200	\$ 11,400	\$ 13,600	\$ 9,083	\$ 6,297	\$ 1,273	\$ -	\$ -	\$ 85,933
RP-26-B Mains - Replaced/Restored	\$ 105,500	\$ 185,000	\$ 195,000	\$ 265,000	\$ 285,000	\$ 285,000	\$ 185,000	\$ 125,000	\$ 63,000	\$ 15,000	\$ 10,000	\$ 36,000	\$ 1,754,500
RP-26-C Mains - Unscheduled	\$ 10,200	\$ 5,500	\$ 15,000	\$ 17,000	\$ 7,000	\$ 15,000	\$ 15,000	\$ 25,000	\$ 19,435	\$ 10,000	\$ 10,000	\$ 10,000	\$ 159,135
RP-26-D Mains - Relocated	\$ 41,667	\$ 41,667	\$ 41,667	\$ 41,667	\$ 41,667	\$ 41,667	\$ 41,667	\$ 41,667	\$ 41,667	\$ 41,667	\$ 41,667	\$ 41,667	\$ 500,000
RP-26-E Hydrants, Valves, and Manholes - New	\$ -	\$ -	\$ -	\$ 1,965	\$ 5,896	\$ 7,862	\$ 9,827	\$ 7,862	\$ 3,931	\$ 1,965	\$ -	\$ -	\$ 38,309
RP-26-F Hydrants, Valves, and Manholes - Replaced	\$ 7,750	\$ 7,750	\$ 7,750	\$ 7,750	\$ 7,750	\$ 7,750	\$ 7,750	\$ 7,750	\$ 7,750	\$ 7,750	\$ 7,750	\$ 7,750	\$ 93,000
RP-26-G Services and Laterals - New	\$ 37,440	\$ 49,920	\$ 49,920	\$ 43,680	\$ 43,680	\$ 56,160	\$ 49,920	\$ 56,160	\$ 43,680	\$ 43,680	\$ 68,640	\$ 81,120	\$ 624,000
RP-26-H Services and Laterals - Replaced	\$ 17,185	\$ 17,185	\$ 17,185	\$ 17,185	\$ 17,185	\$ 17,185	\$ 17,185	\$ 17,185	\$ 17,185	\$ 25,778	\$ 25,778	\$ 25,778	\$ 232,000
RP-26-I Meters - New	\$ 30,000	\$ 40,000	\$ 40,000	\$ 35,000	\$ 35,000	\$ 45,000	\$ 40,000	\$ 45,000	\$ 35,000	\$ 35,000	\$ 55,000	\$ 65,000	\$ 500,000
RP-26-J Meters - Replaced	\$ 18,630	\$ 49,680	\$ 62,100	\$ 68,310	\$ 49,680	\$ 74,520	\$ 55,890	\$ 55,890	\$ 55,890	\$ 37,260	\$ 43,470	\$ 49,680	\$ 621,000
RP-26-K ITS Equipment and Systems	\$ -	\$ -	\$ 60,000	\$ 7,950	\$ 13,100	\$ 13,000	\$ 12,000	\$ 9,500	\$ -	\$ -	\$ -	\$ -	\$ 115,550
RP-26-L SCADA Equipment and Systems	\$ -	\$ -	\$ -	\$ 25,000	\$ -	\$ 25,000	\$ -	\$ 20,000	\$ -	\$ -	\$ -	\$ -	\$ 70,000
RP-26-M Security Equipment and Systems	\$ 5,833	\$ 5,833	\$ 5,833	\$ 5,833	\$ 5,833	\$ 5,833	\$ 5,833	\$ 5,833	\$ 5,833	\$ 5,833	\$ 5,833	\$ 5,833	\$ 70,000
RP-26-N Offices and Operations Centers	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,500	\$ 5,397	\$ 5,362	\$ 5,362	\$ 2,864	\$ 1,563	\$ 23,047
RP-26-O Tools and Equipment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 30,000	\$ 90,000	\$ 40,000	\$ 25,000	\$ 100,000	\$ 50,000	\$ 41,000	\$ 376,000
RP-26-P Process Plant Facilities and Equipment	\$ -	\$ -	\$ -	\$ -	\$ 1,600	\$ 8,000	\$ 10,000	\$ 2,600	\$ 5,000	\$ 3,000	\$ 3,000	\$ 4,400	\$ 37,600
RP-26-Q Capitalized Tank Rehabilitation/Painting	\$ 145,750	\$ 145,750	\$ 145,750	\$ 145,750	\$ 145,750	\$ 145,750	\$ 145,750	\$ 145,750	\$ 145,750	\$ 145,750	\$ 145,750	\$ 145,750	\$ 1,748,000
RP-26-R Engineering Studies	\$ 3,474	\$ 3,474	\$ 6,947	\$ 6,947	\$ 6,947	\$ 6,947	\$ 6,947	\$ 6,947	\$ 6,947	\$ 6,947	\$ 3,474	\$ 3,473	\$ 69,470
Recurring Projects Sub-Total	\$ 307,729	\$ 366,259	\$ 462,152	\$ 432,038	\$ 434,089	\$ 559,674	\$ 570,269	\$ 572,541	\$ 499,895	\$ 631,622	\$ 553,225	\$ 473,014	\$ 5,862,606
DV-26 PROJECTS FUNDED BY OTHERS	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 2,000,000
Developer Funded Project Sub-Total	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 166,667	\$ 2,000,000
JP-2602-16 Meter Shop Building Additions	\$ 250,000	\$ 250,000	\$ 250,000	\$ 3,867	\$ 3,867	\$ 3,867	\$ 3,867	\$ 3,867	\$ 3,867	\$ 3,867	\$ 3,867	\$ 3,867	\$ 750,000
JP-2602-18 Electrical Motor Efficiency Enhance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 46,408
JP-2602-19 NRW Pressure Reduction	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
JP-2602-35 Replace Roof, Citico Filter Hse # 2	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
JP-2602-22 TAW GIS Data Conversion	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
JP-2602-25 Post Acquisition BD CapEx	\$ 25,000	\$ 7,830	\$ 7,830	\$ 7,830	\$ 7,830	\$ 7,830	\$ 7,830	\$ 7,830	\$ 7,830	\$ 9,330	\$ 11,460	\$ 11,458	\$ 119,888
JP-2602-26 Install New Hill City Pumps	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
JP-2602-29 Install 5,700' of 16"- East Braine	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
JP-2602-30 5800'-16" Main in Navajo Dr.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
JP-2602-31 Construct 1.0MG Tank & 2500'-16" ER	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
JP-2602-34 Citico Plant Improvements Phase 1B	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 5,000	\$ 5,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 180,000
JP-2602-4 5933 ft of 20" Ringgold Rd. at I-75	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 1,800,000
JP-2602-6 Wastewater Treatm't & Handling Impr	\$ 50,474	\$ 2,676	\$ 2,684	\$ 2,711	\$ 2,730	\$ 321,841	\$ 2,766	\$ 2,785	\$ 2,803	\$ 2,822	\$ 2,841	\$ 2,860	\$ 400,000
JP-2602-7 Convert ER Reservoir to Pump Storag	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 250,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 250,000
JP-2602-8 3000'-24" Tennessee River Crossin	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
JP-2602-9 Repl Ukout Mtn Pump#4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Investment Project Sub-Total	\$ 509,341	\$ 444,373	\$ 444,391	\$ 194,409	\$ 164,427	\$ 738,538	\$ 169,463	\$ 174,482	\$ 174,500	\$ 176,019	\$ 178,168	\$ 178,185	\$ 3,546,296
CS-2602-3 Business Transformation	\$ 169,287	\$ 190,408	\$ 94,365	\$ 93,285	\$ 85,488	\$ 84,641	\$ 96,645	\$ 94,406	\$ 91,180	\$ 83,844	\$ 41,503	\$ 40,652	\$ 1,165,704
CS-2602-4 Business Transformation - Other	\$ 4,873	\$ 4,885	\$ 4,900	\$ 457	\$ 457	\$ 457	\$ 457	\$ 457	\$ 457	\$ 457	\$ -	\$ -	\$ 17,857
Central Sponsored Project Sub-Total	\$ 174,160	\$ 195,293	\$ 99,265	\$ 93,742	\$ 85,945	\$ 85,098	\$ 97,102	\$ 94,863	\$ 91,637	\$ 84,301	\$ 41,503	\$ 40,652	\$ 1,183,561
Capital Expenditure Total	\$ 1,273,596	\$ 1,372,591	\$ 1,394,975	\$ 1,179,925	\$ 1,154,327	\$ 1,861,377	\$ 1,217,101	\$ 1,167,645	\$ 1,021,531	\$ 1,084,882	\$ 959,562	\$ 904,518	\$ 14,592,032

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Linda Bridwell

Question:

71. Provide CWIP balances from January 2012 through May 30, 2012.

Response:

Please see attached.

Tennessee American Water Company
TRA 1-71
CWIP Balances

Jan-12	\$4,319,233
Feb-12	\$4,496,274
Mar-12	\$5,041,966
Apr-12	\$5,390,169
May-12	\$6,394,029

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness:

Question:

72. Provide a schedule by month, including amounts by project, of all plant additions from January 2012 through May 2012

Response:

Please see attached.

Sum of activity_cost	gl_posting_m AddlRet	1/1/2012 0:00	2/1/2012 0:00	3/1/2012 0:00	4/1/2012 0:00	5/1/2012 0:00	Grand Total
Funding Project	External As Plant Acc	Addition	Retirement	Addition	Retirement	Addition	Retirement
00000026 - Conversion Funding Project	260205	340100	(32,776.06)				(32,776.06)
		340220	(30,139.49)				(30,139.49)
		340320	(16,659.42)				(16,659.42)
		340500	(984.40)				(984.40)
		343000	(648.20)				(648.20)
		346100	(552.25)				(552.25)
		346200	(16,743.08)				(16,743.08)
DV-2602-1 - Projects Funded by Others	260205	304200	0.00	527.15	24,791.33	1,038.76	25,318.48
		331100		449.44	476.76		1,978.16
		331210	27,382.10	13.20	54.34	192,219.83	189,741.11
		331350	0.60	(30,062.81)	147.65	373,782.18	373,782.18
		333000	(2,671.02)	(26,400.81)	(977.92)	404,623.40	55,319.25
		335000	1,303.37	263.87	3,019.81	54,752.82	20,036.29
IP-2602-35 - Replace Roof, Citico Filter Hse # 2	260205	304300		5,808.21	1,279.08	12,081.51	551,765.30
RP-2602-A1 - Mains - New	260205	331100	4,825.00	4,003.21	551,765.30		8,828.21
		331210	3,649.51	101.21	138.73	224.25	4,113.70
		333000		5.24	7.20	11.63	24.07
RP-2602-B1 - Mains - Replaced / Restored	260205	331100	73,849.86	0.00	(318.83)	403.99	25,545.42
		331210	151,663.73	(84,449.47)	2,598.00	25,727.70	16,402.69
		333000	1,397.84	21,242.82	359.38	218.80	3,942.10
		335000	6,997.78	1,121.35	11.99	24.85	6,208.98
RP-2602-C1 - Mains - Unscheduled	260205	331100	21,546.33	(83.81)	(8,796.36)	71,025.03	139,629.90
		331210	10,654.16	5,670.17	10,109.20	(1,880.62)	13,872.08
		331350	2,340.71	6,962.13	3,790.86	(1,880.62)	0.00
		333000	2,901.56	(5,670.17)	(6,555.41)	170.66	13,127.73
RP-2602-D1 - Mains - Relocated	260205	331210	1,044.86	1,787.41	141.10	4,248.88	4,318.50
		331350	2,901.56	1,787.47	0.19	170.66	7,780.31
		333000	19.06	34.51	4.26	5.16	43.93
RP-2602-E1 - Hydrants, Valves, and Manholes-New	260205	331100	96.24	759.64	0.85	0.86	800.81
		331210	(96.24)	445.69	2,642.70	1,827.81	1,827.81
		331350	(96.26)	164.38	(1,838.78)	989.00	85.29
		335000	0.00	(3,753.39)	10.97		(3,753.39)
RP-2602-F1 - Hydrants, Valves, and Manholes-Rep	260205	331100	(1,110.19)	0.00	0.00	329.29	14,364.11
		331210	15,392.36	(125.16)	0.00	22,874.43	43,186.92
		331350	2,019.15	0.00	0.00	0.00	2,019.15
		335000	3,997.37	(6,937.87)	0.00	14,896.95	22,172.70
RP-2602-G1 - Services and Laterals - New	260205	333000	93,996.99	89,880.04	51,213.84	52,402.38	287,737.28
RP-2602-H1 - Services and Laterals - Replaced	260205	331100	40,071.93	0.00	0.00	0.00	0.00
RP-2602-I1 - Meters - New	260205	333000	1,569.58	26,031.10	124,941.71	15,620.78	201,991.98
		334100	12,079.82	5,878.29	(11,764.00)	8,588.65	10,158.24
		334200	25,556.04	20,029.96	10,991.46	8,734.30	48,299.37
		334300	2,777.15	29,720.84	11,799.65	17,989.14	103,306.19
RP-2602-J1 - Meters - Replaced	260205	333000	(21.40)	0.00	(228.20)	174.26	0.00
		334100	50,540.56	56,148.51	13,085.44	61,701.33	246,664.20
		334200	47,905.80	40,494.53	1,950.37	(56,565.58)	32,054.56
RP-2602-K1 - ITS Equipment and Systems	260205	340220	85.00	(65.81)	(0.00)	27,193.57	75,847.69
RP-2602-L1 - SCADA Equipment and Systems	260205	304200	2,777.15	45,537.26	4,060.94	29,894.00	34,039.94
		304300			0.00		48,314.41
RP-2602-M1 - Security Equipment and Systems	260205	304500	74,112.93		0.00	5,438.07	79,551.00
RP-2602-N1 - Offices and Operations Centers	260205	304500	4,359.83			0.00	4,359.83
		304700	(5,520.31)	719.05	(5,351.97)		(5,520.31)
		304800					23,453.19
RP-2602-O1 - Vehicles	260205	340100	0.00				(5,351.97)
		341100	(26,687.17)				0.00
RP-2602-P1 - Tools and Equipment	260205	341200	8,735.11	46,608.63	30,669.23	0.00	(52,948.85)
		340210	1,807.62	1,807.62	0.00	0.00	55,343.74
		340310	425.12	425.12	765.68	0.00	5,063.38
							1,190.80

Tennessee American Water Company
January - May 2012 Plant Activity

Sum of activity cost		gl_posting_m		1/1/2012 0:00		2/1/2012 0:00		3/1/2012 0:00		4/1/2012 0:00		5/1/2012 0:00		Grand Total	
Funding Project	External As: Plant Acc	Addition	Retirement	Addition	Retirement	Addition	Retirement	Addition	Retirement	Addition	Retirement	Addition	Retirement		
RP-2602-P1 - Tools and Equipment	260205	343000		2,695.99				29,405.06				0.00		30,038.00	
RP-2602-Q1 - Process Plant - Facilities and Equi	260205	304100		7,011.79				38,642.11		0.00		0.00		44,705.40	
		304200				(948.50)									
		304500						0.00						0.00	
		304800												(538.41)	
		310000						(17,179.76)						(17,179.76)	
		311200						(1,034.37)						(1,034.37)	
		311520		2,519.95				0.00						2,519.95	
		320100		216.78	(2,851.54)			0.00						(1,903.39)	
		320200		379.29	(6,762.08)			0.00	0.00			731.37		(8,138.33)	
		330200						0.00						0.00	
		331001						(27.50)						(27.50)	
		331350			(542.59)			(2,899.79)						(2,899.79)	
RP-2602-R1 - Capitalized Tank Rehabilitation / P	260205	344000						0.00						(542.59)	
		330000		(220,408.40)				0.00		(0.07)		0.40		(220,408.00)	
RP-2603-G1 - Services and Laterals - New	260305	330003		(373.23)		0.00		0.00		0.00		0.07		(373.23)	
RP-2603-P1 - Tools and Equipment	260205	333000		0.00		0.00		1,184.06		0.00				1,184.06	
		344000												(746.37)	
RP-2603-Q1 - Process Plant - Facilities and Equi	260305	343000				0.00								0.00	
		304300												0.00	
		320200												0.00	
RP-2604-G1 - Services and Laterals - New	260405	333000		251.97		770.00		(16.00)		0.00		0.00		1,005.97	
Grand Total				365,569.88	(22,878.96)	396,498.68	(30,543.99)	308,510.22	(98,731.10)	651,914.66	(73,814.57)	966,687.87	(2,797.76)	2,460,414.93	

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Linda Bridwell

Question:

73. Reconcile the following CWIP balances for January 2012:

Line				WP Reference
1	December 2011 Balance	Chattanooga	4,118,034.46	RB-3-CWIP
2		Suck Creek	13,285.46	
3		Lone Oak	251.97	
4	Total		4,131,571.90	RB-3-CWIP
5	Capital Additions	January 2012	1,082,990.37	RB-3.1
6	Placed in Service	January 2012	1,100,522.35	RB-2.1
7	Net Additions	January 2012	-17,531.98	
8	Dec. 2011 + Jan. 2012 Net Additions		4,114,039.92	
9	Grand Total CWIP	January 2012	4,114,291.89	RB-3-CWIP
10	Difference		251.97	

Response:

This appears to be an error. The \$251.97 difference relates to assets that were in CWIP in December 2011 for Lone Oak, project number RP-2604-G1, Services and Laterals. They were placed in service and added to UPIS in January of 2012, but the CWIP balance was not reduced to reflect this. This would result in an overstatement of CWIP for the attrition year in the amount of \$251.97.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Linda C. Bridwell

Question:

74. Project IP 2602-4 is projected to spend \$275,000 in 2012 and \$1,800,000 in 2013 for a total cost of \$2,100,538 (Bridwell direct testimony, page 32). Since \$275,000 plus \$1,800,000 totals \$2,075,000, please explain the difference/additional amount of \$25,538.

Response:

The additional \$25,538 is prior year expenditures as of December 31, 2011. Please refer to Schedule RB 3.1.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Linda C. Bridwell

Question:

75. Provide copies of all RFPs sent out for all projects covered within the CWIP testimony, all proposals that were returned and indicate which proposals were accepted.

Response:

In addition to the response to Item 76 of this same data request, TAW has located one RFP for project 2602-4 which is attached. There were no RFP's sent out on this project. A sole source proposal was requested from CTI because they provided the services for the Catoosa Utility District service improvement study, had an in-depth understanding of the TAW system and expectation, and had a good understanding of the project deliverables as well as the work experience in carrying out projects of this nature.

We believe that additional information may be in the files and the response will be supplemented when it is located.



**PROPOSAL FOR
PRELIMINARY ENGINEERING SERVICES
RINGGOLD ROAD I-75-SCRUGGS ROAD WATER LINE**



CONSOLIDATED TECHNOLOGIES, INC.
ENGINEERS IN WATER AND EARTH SCIENCES



December 17, 2007

Mr. John Watson
Vice President and General Manager
Tennessee American Water
P.O. Box 6338
1101 Broad Street
Chattanooga, TN 37401-6338

Subject: Request for Preliminary Engineering Services
Ringgold Road - I-75-Scruggs Road Water Line
CTI Proposal No. CP7105

Dear Mr. Watson:

Enclosed are an original and two copies of our proposal for preliminary engineering services on the subject project. Our qualifications include extensive experience in the planning, design, and construction of water distribution system improvements including lines, tanks, pumping stations, and treatment plants.

We are very familiar with project requirements due to our recent completion of the study of Catoosa Utility District service improvements, which included hydraulic modeling and cost estimating. We have performed similar tasks on other projects for TAW, such as the Mountain Creek tank and Walden's Ridge pumping station and lines. Based on our knowledge of this project and TAW's entire network, we believe that we are very qualified to perform the engineering services you require.

We have the staff available to provide the required services in the time allowed, and our hourly rates are competitive. Our engineers are also very familiar with the project site, and we can drive to the project site or TAW's office within minutes.

We appreciate the opportunity to submit this proposal. Please contact us if you have any questions.

Sincerely,

Jerry D. Hightower, P.E.
Senior Project Manager

Allen D. Stephens, P.E.
Executive Vice President

JDH/pm
Enclosures

cc: Randy Taylor
Kate Nartey

S:\PROPOSALS\2007\cp7105\aw ringgold rd to scruggs rd i75 water line\trans 11-17-07

AN EMPLOYEE-OWNED COMPANY

**FEES****TAW NETWORK IMPROVEMENTS
NEW LINE FROM RINGGOLD ROAD ACROSS I-75 TO SCRUGGS ROAD METER****PRELIMINARY ENGINEERING COSTS**

Description	Fee	Fee Basis
Preliminary Design	\$12,500	LS
Surveys for Design, Easements, and Permits	\$20,800	CP
Easement Drawing and Document Preparation	\$12,500	CP
Discussions with Property Owners Regarding Easement Acquisition	\$4,000	CP
Permits:		
COE Section 404/TVA Section 26A	\$2,500	CP
TDEC ARAP	\$2,000	CP
Hamilton County - Storm Water	\$2,500	CP
TDOT	\$2,000	CP
Gasoline Pipeline	\$1,500	CP
Geotechnical Report	\$4,000	CP
Preliminary Engineering Costs	\$64,300	



PROJECT UNDERSTANDING

PROJECT SUMMARY

The proposed project consists of the construction of approximately 5,200 linear feet of 20-inch or 24-inch water line beginning at Ringgold Road near McDonald Road, crossing I-75 and West Chickamauga Creek, and ending with a connection to the TAW Scruggs Road meter box. CTI proposes to provide preliminary design; route selection; surveying for design and easements; preparation of easement drawings and documents; preparation of permit applications; geotechnical investigation for design; assistance with easement acquisitions, including initial discussions with property owners; and coordination with TAW and all other regulatory and/or permitting agencies.

PRELIMINARY DESIGN

1. Attend two meetings at TAW and prepare minutes of meetings.
2. Coordinate with TAW in the selection of the preliminary preferred route for the water line.
3. Determine location of existing utilities that may affect construction of water line.
4. Determine location of existing property parcels.
5. Field-select and stake preliminary route for water line.
6. Prepare drawing(s) of preliminary water line route.
7. Prepare updated opinion of construction and project costs (not including TAW costs) based on surveyed route of water line.

DESIGN AND EASEMENT SURVEYS

1. Field-survey selected route of water line, including:
 - a. Research and field survey necessary to determine TN/GA state line within proposed project limits.
 - b. Establish Tennessee State Plane control and mean sea level elevation; set temporary benchmarks no more than 1,000 feet apart along proposed route.
 - c. Determine rights-of-way of the following: Ringgold Road/Highway 41, McDonald Road, Stateline Road, I-75 from the intersection with Highway 41 southward to the TN/GA state line, and Scruggs Road from the Georgia state line to end of proposed project area.
 - d. 50-foot strip topo with any obvious property corners found from point of beginning along marked field alignment as designated by CTI (includes CAD work).
 - e. Topographical mapping of I-75 crossing,



PROJECT UNDERSTANDING

- f. Topographical and hydrographical surveys of lake at Shipp's RV and West Chickamauga Creek, crossing unnamed tributary to West Chickamauga Creek at state line.
- g. Mapping of all MARKED underground utilities; location of overhead utilities within topographical mapped limits.
- h. Generate profile from topographical survey data at location specified by CTI (one time only).
- i. Provide current aerial photography as obtained from Hamilton County GIS Department.

PERMANENT AND TEMPORARY EASEMENT DRAWINGS AND DOCUMENTS

- 1. Determine where permanent and temporary easements will be required for construction of water line.
- 2. Provide drawings suitable for recording of temporary and permanent easements for water line.
- 3. Provide easement metes and bounds descriptions.
- 4. Assist TAW in easement acquisition for selected easement route by meeting with property owners on project site to discuss proposed water line route, easements, and construction.

PERMITS

- 1. Determine requirements and prepare applications for local, state, and federal permits, including those listed elsewhere in this proposal.

DELIVERABLES

- 1. Project Management
 - a. Meeting minutes.
 - b. Monthly project status updates.
 - c. Monthly project invoices.
- 2. Preliminary Design
 - a. Preliminary design based on aerial and field surveys.
 - b. Drawing(s) of selected preliminary water line route.
 - c. Updated opinion of construction and project costs (not including TAW costs) based on surveyed route of water line.
- 3. Design and Easement Surveys
 - a. Drawing of survey-selected route of water line.



PROJECT UNDERSTANDING

4. Permanent and Temporary Easements
 - a. Drawings suitable for recording of temporary and permanent easements for water line.
 - b. Easement metes and bounds descriptions.
 - c. Assistance to TAW in easement acquisition for easements required for selected water line route.
5. Permits
 - a. Copies of all required federal, state, and local permits.
6. Geotechnical Services
 - a. Geotechnical drilling and report for design of crossing of I-75 and West Chickamauga Creek.



GEOTECHNICAL SERVICES

Geotechnical services will include drilling and a report for design of the crossing of I-75 and West Chickamauga Creek. These services will be provided by subcontractor Qore.



EASEMENT DRAWINGS AND DOCUMENTS

Permanent and temporary easement drawings and documents will include the following services:

1. Determine where permanent and temporary easements will be required for construction of water line.
2. Provide drawings suitable for recording of temporary and permanent easements for water line.
3. Provide easement metes and bounds descriptions.
4. Assist TAW in easement acquisition for selected route by meeting with property owners on project site to discuss proposed water line, easements, and construction.

**PERMITS**

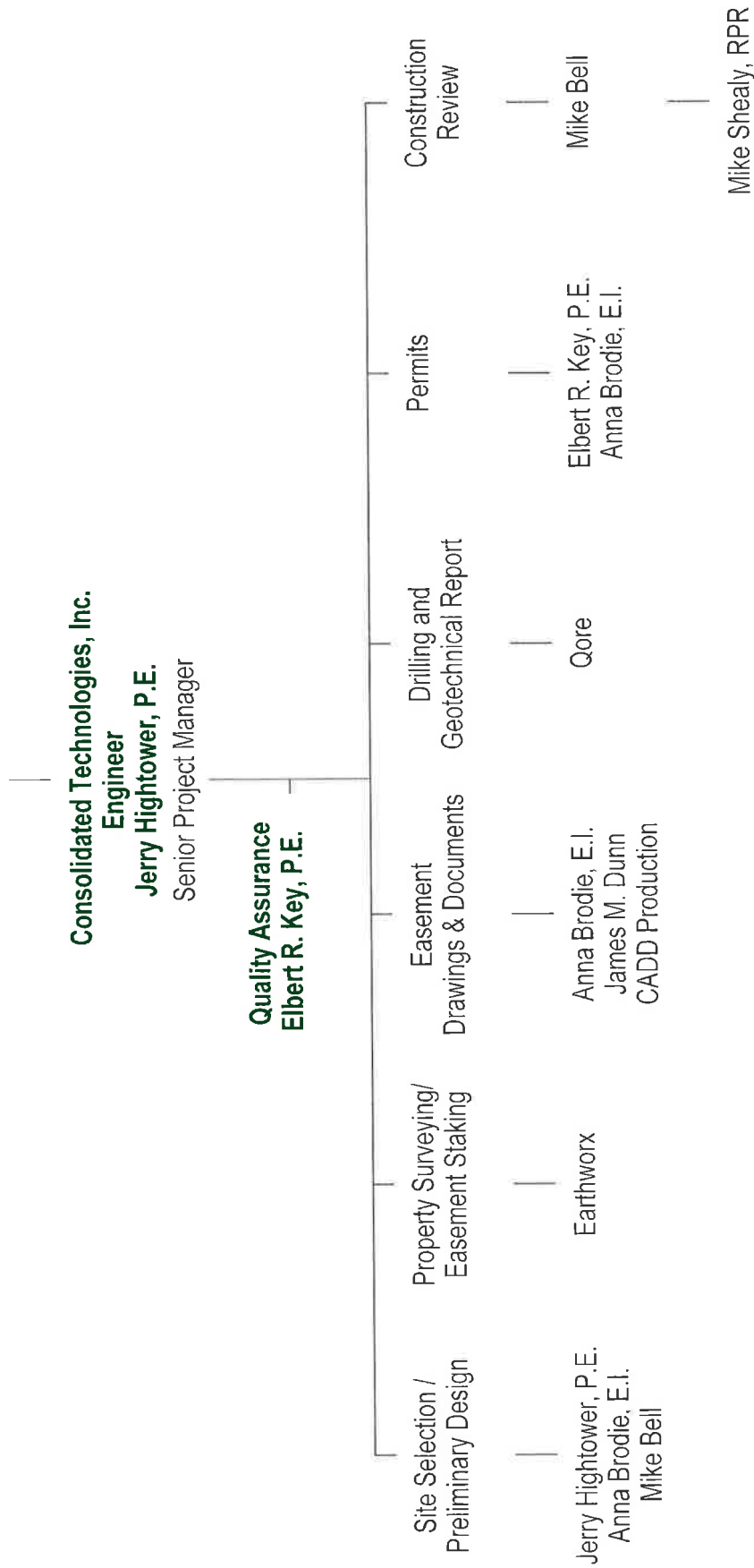
Following is a list of permits required for preliminary design and property/easement acquisition, along with a proposed schedule for their acquisition:

Permit and Agency	Review by Agency
Federal	
Tennessee Valley Authority - 26A	3 months
U.S. Army Corps of Engineers - Section 404	3 months
State	
Tennessee Department of Environment and Conservation Notice of Intent/Storm Water Pollution Prevention Plan	1 month
Aquatic Resource Alteration Permit (ARAP)	1 month
Tennessee Department of Transportation	2 months
Local	
Hamilton County - Storm Water Permit	1 month

TENNESSEE AMERICAN WATER

RINGGOLD ROAD - I-75 - SCRUGGS ROAD WATER LINE

ORGANIZATIONAL CHART





JERRY D. HIGHTOWER, P.E.
Senior Project Manager

SUMMARY

Mr. Hightower is a civil engineer with over 35 years of experience in planning, design, and construction phase services for water and wastewater facilities. His responsibilities have included the management of major projects involving water treatment plants, storage tanks, computer hydraulic modeling, distribution systems, wastewater interceptors, collection systems, and pumping stations.



EDUCATION

1971, B.C.E., Civil Engineering, Georgia Institute of Technology, Atlanta
1976-81, Graduate Study in Environmental Engineering, University of Tennessee, Knoxville

YEARS OF EXPERIENCE

Other Firms: 20

This Firm: 15

PROFESSIONAL REGISTRATIONS

Professional Engineer - Tennessee, Georgia, Kentucky, Ohio, North Carolina

PROFESSIONAL EXPERIENCE

- **1991-Present: Consolidated Technologies, Inc., Chattanooga, Tennessee**
Senior Project Manager.
- **1971-1991: Hensley-Schmidt, Inc., Chattanooga, Tennessee**
Served as Project Engineer, Project Manager, and Design Section Manager.
- **1967-1970: Tennessee Valley Authority, Chattanooga, Tennessee**
Served as Survey Crew Member.

PROFESSIONAL ASSOCIATIONS

American Water Works Association
Kentucky-Tennessee Section, AWWA, Past Chairman, 2004 George Warren Fuller Award

AWARDS

2004 Kentucky-Tennessee Section of American Waterworks Association's George Warren Fuller Award for "Distinguished service in the water supply field." The award is in recognition of "engineering skill, diplomatic talent, and leadership."

PRESENTATIONS

Instructor for Tennessee Department of Environment and Conservation's "Low Pressure Membrane Filtration" courses for Water Treatment Plant operators, 2005/2006.
"2,800 gpm of Water Pumped at 650 psi up 1,350 Vertical Feet Present Difficult Challenges for Design and Construction," KY-TN WEA and AWWA Water Professionals Conference, July 2006.
"Membrane Filtration Plus GAC: Duck River Utility Commission Water Treatment Plant Expands for the Future," KY-TN Joint AWWA/WEA Water Professionals Conference, 2004.
"Designing A Membrane Pilot Study," Georgia Water Pollution Control Federation, November 2004.
"Design and Construction of a Chemical Storage Facility Focused on Safety and Security," KY-TN Joint Water Professionals Conference, July 2004.
"Why Consider Membrane Filtration?" Membrane Filtration Seminar, 2000.



JERRY D. HIGHTOWER, P.E. (Continued)

"Pilot Study of Membrane Filtration at Duck River Utility Commission," Tennessee Water-Wastewater Association, 1999.

"Impact of Changing Drinking Water Regulations," Tennessee Water Quality Management Association, 1997.

"Computer Hydraulic Analysis of Water Systems," Tennessee Water-Wastewater Association, 1994.

WATER STORAGE TANKS

Cleveland Utilities

Design and construction phase services for two 1.5-mg prestressed concrete tanks with baffles, one for disinfection contact at CU's water treatment plant, the other for disinfection contact and storage in the Waterville Springs area.

Cleveland Utilities

Specifications for painting of steel water tank, including lead abatement. Design and construction management for 3.5-mg steel water tank. Design and construction management for repainting two 1-mg steel water tanks.

Cleveland, Tennessee

Design and construction phase services for 500,000-gallon prestressed concrete tank. Computer modeling of location and life-cycle analysis of concrete versus steel tanks.

Hiwassee Utilities Commission, Charleston, Tennessee

Specifications and construction phase services for interior sandblasting and repaint; exterior pressure washing, spot-blasting, and paint encapsulation; and roof jacking to reach inaccessible areas of 1,750,000-gallon steel clearwell.

Hixson Utility District

Design and construction services for 1.5-mg prestressed concrete disinfection contact tank at water treatment facility. Design included unique PVC baffle design and life-cycle analysis of various types of tanks.

Jasper, Tennessee

Design and construction services for 750,000-gallon prestressed concrete water tank and supply line for new industry. Pre-maintenance inspections and reports for steel water tanks.

Kentucky-American Water Company

Manager of maintenance inspection and evaluation of tanks, treatment units, and pumping station, with recommendations for cleaning and painting.

Savannah Valley Utility District

Hamilton County, Tennessee

Design of 2-mgd pressure filtration facilities, well pump replacements, and new 2-mg prestressed concrete storage tank.



JERRY D. HIGHTOWER, P.E. (Continued)

Southern Cellulose

Inspection, report, and design of improvements to 50,000-gallon elevated tank, including painting and structural improvements.

Tennessee American Water

Project manager for design and construction of 1.0-mg prestressed concrete tank, with 1,100-foot access road, and supply piping on side of Signal Mountain.

Tennessee American Water

Manager of annual pre-maintenance inspections from 1989 through 1996 for steel water tanks, including preparation of inspection reports and management of quality assurance inspection services.

WATER SYSTEMS

Allardt, Tennessee

Design and construction management for 50,000-gallon elevated water storage tank and 4 miles of water lines.

Chattanooga, Tennessee

Water distribution system analysis for 18,000-customer utility district near the city. Computer modeling including normal and fire demand analysis, and master planning of system improvements.

Chattanooga, Tennessee

Hydraulic and cost analyses, report preparation, and construction plans and specifications for a 1-mile private industrial water supply line.

Cleveland, Tennessee

Design and construction management for 0.5-mg water tank, two booster stations, and linework.

Cleveland, Tennessee

Computer modeling hydraulic analyses for a 20,000-customer water distribution system, including long-range planning for system improvements.

Cleveland, Tennessee

Design and construction management for 3.5-mg steel water tank.

Cleveland, Tennessee

Renovation of 7-mgd water treatment plant for Cleveland Utilities, including addition of microprocessor-controlled automatic backwash system; upgrade of SCADA system; and replacement of filter media, agitators, and valves.

Cleveland Utilities

Alum sludge disposal project for a 7-mgd water treatment plant in Cleveland, Tennessee, including structural and hydraulic design of reinforced concrete tanks, pumping chambers, pumps, valving, and associated facilities.



JERRY D. HIGHTOWER, P.E. (Continued)

Decatur, Tennessee

Design and construction management for springs development and pumping facility.

Hamilton County, Tennessee

Design of 2-mgd pressure filtration facilities, well pump replacements, and new 2-mg storage tank.

Marion County, Tennessee

Design of iron and manganese removal pressure filtration system from well supply, including all pumping, distribution, and storage facilities.

Oakdale, Tennessee

Design and construction management for replacement of 5 miles of water lines and two 30,000-gallon water tanks.

Polk County, Tennessee

0.8-mgd water treatment plant and raw water pumping facility, including the design of all necessary equipment for a complete water treatment plant.

WATER DISTRIBUTION SYSTEMS

Allardt, Tennessee

50,000-gallon elevated water storage tank and 4 miles of water lines.

Cleveland Utilities

Computer hydraulic analyses for a 22,000-customer water distribution system, including long-range planning and design for improvements to tanks, lines, and pumping facilities.

Cleveland Utilities

Design and computer modeling for 0.5-mg water tank, two booster stations, and line work.

Duck River Utility Commission

Computer hydraulic modeling for line extension to Arnold Engineering Development Center.

Hallsdale-Powell Utility District

Master Plan for distribution system improvements including development of hydraulic model for 22,000-connection system. Identified measures for system simplification (reducing number of pressure zones, improving system hydraulics, and providing new water supply on north end of system). Digitized all HPUD water system maps and linked this information to GIS mapping. Applied the data to hydraulic model with digital demand information, also linked to GIS. Scanned valve reference cards and linked to water maps and GIS.

Hallsdale-Powell Utility District

Assisted HPUD with various system pressure problems using the WaterCAD model and prepared design of 24-inch water main to improve overall system service.

Hixson, Tennessee

Redeveloped model for over 20,000-customer system. Provided geographical interface model of system with GIS and digital customer demand information.



JERRY D. HIGHTOWER, P.E. (Continued)

Hixson, Tennessee

Computer modeling hydraulic analyses for a 19,000-customer water distribution system, including normal and fire demand analysis, long-range planning for system improvements.

Oakdale, Tennessee

Replacement of 5 miles of water lines and two 30,000-gallon water tanks.

Oakdale, Tennessee/Wolfe Branch Utility District

Design of CDBG-funded replacement of 100,000 linear feet of polyvinyl chloride and ductile iron water distribution lines for Phase III; design of ARC/FmHA-funded project with 51,000 linear feet of polyvinyl chloride and ductile iron water lines and a 50-gpm booster pump station to serve new customers; design of 8,000 linear feet of 6-inch water line to connect two pressure zones.

Tennessee American Water

Preparation of computer hydraulic model for US EPA IDSE compliance. Project included input of over 14,000 pipes, 17,000 nodes, and 74,000 customer connections which were geocoded. Utilized ARC GIS based maps and Bentley WaterGEMS software.

Tennessee American Water

Design and construction of 4-mgd, 650-psi pumping station, 3,300 feet of 16-inch welded steel pipe, and 15,000 feet of 16-inch and 12-inch ductile iron pipe for interconnection with Walden's Ridge Utility District.

Tennessee American Water

Route design and permit preparation for 16,000 linear feet of 16-inch water transmission main, including creek crossing and aerial railroad crossing.

Tennessee American Water

Design services for relocation of 980 feet of 12-inch water line to replace 12-inch and 10-inch water line in conflict with a TDOT road project.

Tennessee American Water

Design of 3,940 feet of new 12-inch-diameter of ductile iron water line, including a creek and railroad crossing, all permit applications, and CADD drawings for construction and easements.

WATER DISTRIBUTION HYDRAULIC ANALYSIS COMPUTER MODELING AND PLANNING FOR
VARIOUS MUNICIPAL AND INDUSTRIAL CLIENTS RANGING FROM 500 TO 74,000
CONNECTIONS

Alexian Village - Signal Mountain, Tennessee
Allardt, Tennessee
Blue Ridge, Georgia
Cleveland Utilities
Decatur, Tennessee
Duck River Utility District
Dunlap, Tennessee
Hallsdale-Powell Utility District
Hixson Utility District

Jasper, Tennessee
Ocoee Utility District
Prospect-McDonald Utility District
Savannah Valley Utility District
Tellico Reservoir Development Agency
Tennessee American Water
Wolfe Branch Utility District
Etowah Utilities Department



JERRY D. HIGHTOWER, P.E. (Continued)

WATER TREATMENT PLANTS

American Water Works Service Company/Tennessee-American Water Company

Design of filter-to-waste piping improvements for 24-mgd portion of 65-mgd water treatment plant.

Blue Ridge, Georgia

Engineering report and design for addition of membrane filtration to increase capacity of 1.0-mgd conventional WTP to 3.0 mgd.

Bowater Incorporated, Southern Division

Study of improvements to 40-mgd water treatment plant for compliance with new drinking water regulations, including CT compliance calculations.

Bowater Newsprint

Study and design of 250,000-gpd capacity membrane filtration packaged water treatment plant, including new chemical feed equipment and high-service pumps.

Town of Chapel Hill

Analysis of filtration alternatives, including pressure filtration, cartridge filtration, and ultrafiltration to eliminate surface influence of ground water source (well). Design of packaged treatment plant with pressure filtration alternative, initial plant capacity of 200,000 gpd, expansion capability to 400,000 gpd, raw water and high service pumping, chemical feed systems, and metal building. Construction administration and project representation. CDBG-funded.

City of Chickamauga

Design and construction phase services for well supply to replace Crawfish Springs, including well, pumps, piping and instrumentation.

City of Chickamauga

Study of alternatives for new water supply and treatment. Design of new well supply facilities including 1-mgd well, pump, piping, instrumentation, and variable speed drive.

Cleveland Utilities

Preliminary engineering report for addition of membrane filtration to 1.5-mgd Waterville Springs facility.

Cleveland Utilities

Renovation of 7-mgd water treatment plant for Cleveland Utilities, including addition of microprocessor-controlled automatic backwash system; upgrade of SCADA system; and replacement of filter media, agitators, and valves.

Cleveland Utilities

Alum sludge disposal project for a 7-mgd water treatment plant in Cleveland, Tennessee, including structural and hydraulic design of reinforced concrete tanks, pumping chambers, pumps, valving, and associated facilities.



JERRY D. HIGHTOWER, P.E. (Continued)

Cleveland Utilities

Design development report, design, and construction phase services for expansion of water treatment plant from 7 to 10 mgd. Project included 1.5-mg CT disinfection contact tank; 10-mgd high service pump with VFD; and improvements to instrumentation, sedimentation, and building (including additional offices, laboratory control area, HVAC, lighting, electrical, emergency power generation, etc.).

Decatur, Tennessee

Springs development and pumping facility.

Duck River Utility Commission

Master plan for water treatment plant expansion.

Duck River Utility Commission

Engineering study to identify needs and to prepare cost estimates to expand existing 7.5-mgd water treatment plant in two phases to a total capacity of 22.5 mgd.

Duck River Utility Commission

Planning, design, and construction phase services for new chemical building, including gaseous chlorine and chlorine dioxide storage and feed, and liquid chemical storage and feed for alum, caustic, fluoride, polyphosphate, and sodium chlorite. Facilities were sized for 22.5 mgd.

Duck River Utility Commission

Design and construction phase services for water treatment plant expansion from 7.5 to 15 mgd with membrane ultrafiltration and granular activated carbon contactors upgrade of mixing, flocculation and sedimentation; raw water pump and high service pump upgrade.

Etowah Water Treatment Plant and Water System Improvements

Analysis, planning, design, and construction services for treatment plant and distribution system improvements. Comprehensive study to identify short- and long-term system needs, including a computerized hydraulic analysis. Preparation of plans and specifications and construction inspection of new raw water intake pumps; water treatment plant expansion from 2.1 to 4.2 mgd, with new flash mix, new flocculators, retrofitting sedimentation basins with tube settlers, new clearwell, new high service pumping facilities, upgrading sand filters, and new instrumentation telemetry system; and 14,000 linear feet of 6- and 8-inch water lines.

Hallsdale-Powell Utility District

Design of Melton Hill Water Treatment Plant Chemical Building upgrade, including building expansion and replacement of all disinfection equipment. Modeling and design of upgrade to high service pumping facilities at Melton Hill Water Treatment Plant. Manager of pilot study for evaluation of membrane filtration for expansion of WTP to 12.0 MGD.

Hallsdale-Powell Utility District

Hydraulic analysis of 22,000-customer utility district using Haestad's CYBERNET (WaterCAD software). Study included investigation of impacts of expanding the existing water plant or constructing an additional plant at a new location. Calibration of hydraulic model by use of portable flow measuring device. Development of a 5-year capital improvement program.



JERRY D. HIGHTOWER, P.E. (Continued)

Hixson Utility District

Water distribution system analysis for 19,000-customer utility district near Chattanooga, Tennessee. Computer modeling including normal and fire demand analysis, master planning of system improvements, and design of new 8-mgd high service pumping facility.

Hixson Utility District

Engineering study, design, and construction phase services for 8-mg design capacity, well-fed, treatment facilities, including pumping, chemical feed, disinfection contract facilities.

Hiwassee Utilities Commission, Charleston, Tennessee

Engineering study, design, and construction phase services for filtration modifications at treatment plant. Included filter media sieve analysis, specification of media improvements, and recommendations for operational improvements to eliminate air in backwash.

Town of Jasper

Expansion from 0.62- to 1.58-mgd water treatment plant, including additional filtration, clearwell, high service pumping, and backwash holding and return facilities; 15,800 linear feet of 12-inch water line; and 1-mg reservoir.

Town of Jasper

CT analysis of entire treatment plant to determine CT compliance and make recommendations for improvements.

City of Maryville

Water filtration plant evaluation, including optimization of existing water treatment processes, jar testing, and treatability studies.

Polk County, Tennessee

0.8-mgd water treatment plant and raw water pumping facility, including the design of all necessary equipment for a complete water treatment plant.

Suck Creek Utility District

Design of iron and manganese removal pressure filtration system from well supply, including all pumping, distribution, and storage facilities.

Sweetwater Utilities

Design of 1.3-mgd raw water pumping station for spring supply; including end suction pumps, piping, valves, controls, electrical service, and building.

Tennessee American Water

Study and report on low-service pumping improvements to plant with 90-mgd pump capacity.

Walker County, Georgia

Process design manager for pilot study to evaluate membrane filtration for WTP expansion to 12.0 MGD.



ELBERT R. (RON) KEY, P.E.
Senior Project Manager



SUMMARY

Mr. Key is a civil engineer with over 30 years of experience in environmental engineering. His responsibilities include water and wastewater facilities planning; design and specifications for water, drainage, landfill, roadway, and sewerage systems, including alternative wastewater collection and disposal; inspection of hazardous waste treatment, storage, and disposal facilities; and assistance with sanitary landfill operation and regulatory compliance.

EDUCATION

1971, B.S., Civil Engineering, Tennessee Technological University, Cookeville

YEARS OF EXPERIENCE

Other Firms: 20
This Firm: 15

PROFESSIONAL REGISTRATIONS

Professional Engineer - Tennessee

PROFESSIONAL EXPERIENCE

- **1991-Present: Consolidated Technologies, Inc., Chattanooga, Tennessee**
Project Manager.
- **1980-1991: Hensley-Schmidt, Inc., Chattanooga, Tennessee**
Project Manager.
- **1978-1979: Stanford and Associates, Franklin, Tennessee**
Project Engineer.
- **1971-1978: Tennessee Department of Public Health, Nashville, Tennessee**
Permits Section Chief, Technical Review Engineer, and Field Engineer.

AWARDS

Kentucky-Tennessee Section of American Waterworks Association's Award of Excellence for Water Plant Operations in the <5MGD Category.

PROFESSIONAL ASSOCIATIONS

American Water Works Association
Water Environment Federation

WATER DISTRIBUTION SYSTEMS

Benton, Tennessee

Participated in preparation of engineering study for water system improvements.

Calhoun-Charleston Utility District

Preliminary engineering and design of 55,200 LF of 2- and 6-inch water line to serve 66 customers in the Claxton Community and in downtown Calhoun. Funded by CDBG.



ELBERT R. (RON) KEY, P.E. (Continued)

Calhoun-Charleston Utility District

Design and construction phase services for 18,400 linear feet of 4- through 8-inch water line extension and 260,000-gallon prestressed concrete storage tank. Funded by CDBG.

Cleveland Utilities

Preliminary engineering and design of 39,000 linear feet of 2- through 8-inch water line to serve 130 LMI customers in the south Bradley County. Funded by CDBG.

Cleveland Utilities

Design of over 206,000 linear feet of 6-inch and 8-inch PVC water lines for extension to South Bradley County.

Cleveland Utilities

Detailed hydraulic analysis of 20-inch cast iron transmission main including alternatives for rehabilitation.

City of Cookeville

Assisted with design of 18,000 linear feet of 6- and 8-inch water line relocation in urbanized area due to widening of North Washington Avenue.

Dade County Water And Sewer Authority

Preliminary engineering report identifying short- and long-term system needs; computerized hydraulic analysis; plans, specifications, and construction phase services for water booster pumping station, interstate highway crossing, water storage standpipe, and several miles of water line extension in Dade County, Georgia.

Decatur, Tennessee

Participated in design of high service pumping facility.

Dunlap, Tennessee

Design, bid, construction phase, and permitting services for raw water lines, consisting of 4,600 LF of 16-inch ductile iron pipe, in conjunction with a \$4,000,000 water treatment plant project.

Dunlap, Tennessee

Design, bid, and construction phase services for 1,900 LF of 8-inch PVC, 6,900 LF of 6-inch PVC, and 5 taps to existing mains. The line extensions, combined with two new booster stations, were identified by CTI to better utilize existing storage tanks and increase existing system pressures.

Dunlap, Tennessee

Planning and design phase services including 7,600 LF of 12-inch ductile iron pipe, a 400-gpm water booster station, and a 1.0 MG prestressed concrete storage tank.

Dunlap, Tennessee

Design and construction phase services for 500,000-gallon clearwell.

Dunlap, Tennessee

Design of 1,000,000-gallon Blue Sewanee Tank, 400-gpm booster pumping station and 8,000 feet of 12-inch transmission main.



ELBERT R. (RON) KEY, P.E. (Continued)

Dunlap, Tennessee

Design and construction services for 11,000 linear feet of 10- and 12-inch water main from the water treatment plant through downtown Dunlap to the Sequatchie County Industrial Park.

Dunlap, Tennessee

Computer modeling to locate pressure-reducing valves and design of 6,000 linear feet of line relocation for road reconstruction, design of 25,000 linear feet of 8-inch water line, and specifications for painting and lead abatement of 850,000-gallon water storage tank.

Dunlap, Tennessee

Plans, specifications, and computerized system analysis for water system expansion.

Dunlap, Tennessee

Design of 1,000,000-gallon Central Water Storage Tank. CDBG-funded.

Dunlap, Tennessee

Plans, specifications, and construction phase services for 10,000 linear feet of 10- and 12-inch ductile iron pipe with highway crossing to serve industrial expansion. Funded by TIIP.

Dunlap, Tennessee

Design of water and sewer line relocations at the intersection of Highway 111 and U.S. Highway 127.

Town of Englewood

Design and construction phase services for 80,000 feet of 6- and 8-inch water line for the Zion Hill area and Cumberland Heights water line extension (funded by CDBG and RD).

Erwin, Tennessee

Preliminary engineering report; computerized system hydraulic analysis; plans, specifications, and construction phase services for four water supply wells and 634,000-gallon water storage standpipe; and design of new high service pumps.

Etowah Utilities Department

Preliminary engineering and design of 46,200 linear feet of 2- through 8-inch water line and booster pumping station, with major highway, creek, and railroad crossings, to serve 64 LMI customers in the Mecca Pike area east of Etowah. Funded by CDBG.

Etowah Utilities Department

Design of 2,000-gpm upgrade with variable frequency drive motors to existing 2,000-gpm pumping station and design of 4,400-gpm industrial booster pumping station with complex control system.

Etowah Utilities Department

Design of 4,800 linear feet of 16-inch-diameter water main adjacent to existing 12-inch main to upgrade emergency feed supply to 6,000 gpm for major industry. Funded by TIIP.

Etowah Utilities Department

Design of 24,200 feet of 2- through 24-inch water line relocation from Hiwassee River to Cambria Road along Highway 411 South.



ELBERT R. (RON) KEY, P.E. (Continued)

Etowah Utilities Department

Design and construction phase services for 800,000-gallon clearwell, 4-million-gallon Parkstown Tank, and 3-million-gallon East View Tank.

Etowah Utilities Department

Design of 32,000 feet of 2- through 18-inch water line relocation from Cambria Road to 9th Street along Highway 411 South, including two creek crossings and a railroad crossing.

Etowah Utilities Department

Design and construction phase services for 37,600 linear feet of 12-inch, 16-inch, and 18-inch ductile iron pipe to serve two new storage tanks in conjunction with construction of two new industries for the Parkstown area and North Industrial Park area water line extensions. Project funded by EDA/ARC.

Etowah Utilities Department

Design and construction phase services for 3,300 linear feet of 12-inch ductile iron pipe to serve new industry for the Con-Met water line extension. Project funded by TIIP.

Etowah Utilities Department

Plans and specifications for 7,500 linear feet of 8-inch water line replacement along East Etowah Road.

Etowah Utilities Department

Computerized hydraulic model and design services for 11,700 feet of 8-inch and 4,000 feet of 6-inch pipe to serve Eagle Glen subdivision and rural area northeast of Etowah.

Etowah Utilities Department

Design of Etowah-Englewood transmission main, with 13,000 feet of 12-inch and 1,000 feet of 8-inch transmission main. Included design of meter pit with chlorine residual analyzer and two creek crossings. Funded by CDBG and RD.

Etowah Utilities Department

Design of Cambria Road extension, including computer hydraulic analysis and design of 700 feet of 2-inch pipe, 4,500 feet of 6-inch water main, and railroad crossing to provide water service and fire protection.

Etowah Utilities Department

Computerized hydraulic analysis and design of County Road 561/County Road 550 water line extension, with 24,600 feet of 8-inch transmission main in rural area to provide strategic loops in the distribution system.

Etowah Utilities Department

Computerized hydraulic analysis and design of 6,300 feet of 2- through 8-inch, 2,400 feet of 16-inch, and 13,500 feet of 24-inch high service water main to accommodate widening of Highway 411 South (Hiwassee River to Cambria Road).

Etowah Utilities Department

Comprehensive analysis to identify short- and long-term system needs; computerized hydraulic analysis; preparation of plans and specifications for water storage standpipe, new raw water intake



ELBERT R. (RON) KEY, P.E. (Continued)

pumps, water treatment plant, reconditioning of water storage tank, water booster pumping station, and water lines.

Etowah Utilities Department

Plans, specifications, and construction services for water system expansion into the Delano Community in Etowah, Tennessee.

Etowah Utilities Department

Plans, specifications, and construction services for water, sewer, and gas pipeline relocation along Highway 411 North, including 16,800 linear feet of 2- through 16-inch water line, 1,800 feet of sewer line, and 13,200 feet of 2- through 6-inch gas line replacement.

Fannin County, Georgia

Construction phase services for 100,000-gallon elevated water storage tank at the McCaysville Industrial Park. EDA-funded.

Foothills Retirement Development, Inc.

Plans, specifications, and construction services for water system expansion to serve 180 residential customers in Loudon County, Tennessee.

Hamilton County, Tennessee

Engineering report for water line extension to serve rural community of Signal Mountain.

Hargis Estates Subdivision

Computerized hydraulic analysis and plans and specifications for 60-unit subdivision in Sequatchie County, Tennessee.

Hiwassee Water Cooperative

Design and construction phase services for 8,500 feet of 2- through 8-inch and 600 feet of 12-inch water main, including crossing of Hiwassee River, for utility relocation due to widening of Highway 411 from Boyd Road to the Hiwassee River.

Hutchens Company, Inc.

Plans and specifications for fire pump system and fire storage tank to serve Wal-Mart, Inc., in Ashland City, Tennessee.

Leonard Kinsey and Associates

Master plan, computerized system hydraulic analysis, and plans and specifications for water facilities to serve 440 residential customers at the Council Fire Golf and Country Club development in Hamilton County, Tennessee, and Catoosa County, Georgia.

Marble Community, North Carolina

Plans, specifications, and construction services for water system expansion.

McMinn County, Tennessee

Project director for CDBG-funded project serving portions of both the Niota water system and the Athens water system, with each system using its own engineer. Preliminary engineering and design of 18,300 linear feet of 2- and 6-inch water line with booster pumping station to serve 57 LMI customers near McMinn Central High School.



ELBERT R. (RON) KEY, P.E. (Continued)

Monteagle, Tennessee

Participated in funding feasibility analysis, including computerized system hydraulic analysis, siting of new storage facilities, water treatment plant improvements, and stabilization of water impoundment reservoir.

Ocoee Utility District

Plans and specifications for water system expansion to improve distribution system pressures in Polk County, Tennessee.

Tennessee-American Water Company

Computerized hydraulic analysis for 2,100-gpm pump station and 9,000 LF of 16-inch steel and ductile iron pipeline up Signal Mountain to serve rural utility district.

Towns County Water and Sewerage Authority

Design of 10,500 linear feet of 2- through 8-inch water line relocation for widening of U.S. Highway 76.

Tracy City, Tennessee

Computerized system hydraulic analysis, plans, and specifications for high service pump, chlorination system, water booster pump, and well system.

Walden, Tennessee

Assisted with location of fire hydrants, including computerized hydraulic analysis.

Walden's Ridge Utility District

Water system master plan, including evaluation of existing source, treatment, pumping, and storage and distribution system, to determine current and future needs. Mapping and computerized hydraulic analysis of water system.

Walden's Ridge Utility District

Design and construction phase services for 21,700 linear feet of 12-inch and 1,600 linear feet of 6-inch ductile iron pipeline in mountainous terrain from Hollister Road to Forrest Park Road, and 750,000-gallon elevated water storage tank (149-foot-tall spheroid).

Walden's Ridge Utility District

Design and construction phase services on three phases of Shackleford Ridge Road area improvements, a joint project partnered with Hamilton County, Tennessee. Included 5,100 linear feet of 12-inch ductile iron transmission main, 4,200 linear feet of 10-inch transmission main, 6,300 linear feet of 8-inch transmission main, and 9,600 linear feet of 6-inch distribution piping to serve expanding mountain community, two new Hamilton County Schools, a new Hamilton County Park, a church campground, and a low-income residential neighborhood of 53 houses. Funded by CDBG and Hamilton County.

Walden's Ridge Utility District

Computerized hydraulic analysis and design services for water line extensions for five subdivisions in mountainous terrain.



ELBERT R. (RON) KEY, P.E. (Continued)

WATER DISTRIBUTION COMPUTER MODELING FOR MUNICIPAL AND INDUSTRIAL CLIENTS RANGING FROM 800 TO 22,000 CONNECTIONS

Ashland City, Tennessee
Calhoun-Charleston Utility District
Cleveland Utilities
Dade County, Georgia
Decatur, Tennessee
Dunlap, Tennessee
Englewood, Tennessee
Erwin, Tennessee
Etowah Utilities Department
Foothills Retirement Development, Inc.

Grundy County High School
Hiwassee Water Cooperative
Hargis Estate Subdivision
Hutchens Company, Inc.
Leonard Kinsey and Associates
Monteagle, Tennessee
Tracy City, Tennessee
Walden, Tennessee
Walden's Ridge Utility District

WATER TREATMENT PLANTS

Ashland City, Tennessee

Design and construction services to expand water treatment plant from 0.62- to 1.24-mgd, including replacement of raw water pumps; new flash mix, new flocculators; refurbishment of existing flocculators; repair of spalled areas of existing sedimentation basins and sealing of leaks in common wall between sedimentation basins and pipe gallery; new tube settlers; new clearwell; new high service pumps; new telemetry, chemical feed, and chlorination systems; enclosing and refurbishing of filters; replacement of filter media; new sludge storage and disposal system; and miscellaneous improvements to relieve bottlenecks within the distribution and pumping system.

Decatur, Tennessee

Design of new finished water disinfection and pumping facility for spring source.

Dunlap, Tennessee

Project manager for new 2.0-mgd water treatment plant, including services for design through construction phase, on three contracts: 500,000-gallon clearwell; procurement of treatment equipment and granular activated carbon contactors; and construction of new raw water intake with screens and pumping equipment, 16-inch-diameter ductile iron transmission main, 7.5 million-gallon pre-sedimentation storage basin, treatment/office building, chemical feed system, sludge thickening/disposal system, two booster pumping stations with associated piping, and plant/system-wide SCADA system.

Etowah Utilities Department

Project Manager for design services to expand 2.1-mgd water treatment plant to 5.5 mgd. Work included new raw water pumps, new flash mix, new flocculators, structural repairs to existing sedimentation basins, new tube settlers, filter media replacement, new clearwell, and new high service pumps.

Johnson City and Erwin, Tennessee

Phase II and Phase III evaluation of the abandoned North Indian Creek Water Treatment Plant, including development of salvage value and rehabilitation costs to enable Erwin to purchase facility from Johnson City.



ANNA BRODIE, E.I.
Engineer Intern

SUMMARY

Ms. Brodie has a bachelors degree in civil and environmental engineering. Her experience includes hydrologic watershed modeling and assessment as well as water quality monitoring.

EDUCATION

2003, B.S., Civil and Environmental Engineering, Tennessee Technological University
2003-Present, Graduate Studies in Civil and Environmental Engineering, Tennessee Technological University

PROFESSIONAL REGISTRATION

Fundamentals of Engineering Exam, April 2003.

YEARS OF EXPERIENCE: 6

PROFESSIONAL EXPERIENCE

- **Present: Consolidated Technologies, Inc., Chattanooga, Tennessee**
Engineer Intern.
- **2000-2006: Tennessee Valley Authority, Chattanooga, Tennessee**
Student Intern with Environmental Engineering Services.

PROFESSIONAL ASSOCIATIONS

American Society of Civil Engineers

PROJECT EXPERIENCE

- Development of Chattanooga distribution system for Tennessee American Water converting Kentucky Pipes Model to Haestad Model in preparation for Initial Distribution System Evaluation (IDES).
- Model development and calibration of the hydrologic watershed model, HSPF for the Oostanaula Creek in Athens, TN.
- Prepared and conducted storm stage water sampling project and watershed investigation of Oostanaula Creek watershed in Athens, TN, to incorporate in modeling data.
- Ground water well site assessment for placement of additional slurry pond storage at Kingston Fossil Plant.
- Detailed runoff source analysis for Jackson Plaza area in Cookeville, TN using ArcMap 9.0 of ESRI's ArcGIS.
- Watershed model comparison of the EPA's BASINS and the EPRI's WARMF watershed models (both of which are now available from the EPA).
- NPDES monitoring events for permit renewal at TVA power plants: Widows Creek and Watts Bar.
- Water quality monitoring for regulatory research in TVA's river systems and fossil plants.
- Master's thesis on modeling of hydrology and suspended sediments in a small impervious watershed.
- Compiled wastewater operating data for analysis of Etowah, Tennessee, wastewater treatment plant.



MICHAEL A. BELL
Field Services Supervisor

SUMMARY

Mr. Bell is a senior resident project representative (RPR) with over 20 years of supervisory and management experience in the grading and utility construction business. Mr. Bell's current duties include coordination and management of the field RPRs, project development, and site plan preparation. Other duties include coordination of shop drawings; on-site observation of work in progress; communication with property owners, residents, and contractors; maintaining job site files and daily reports; review of payment requests; monitoring performance tests; conducting final inspections; and project closeout.

EDUCATION

1980, B.S., Business, University of Tennessee at Chattanooga

TRAINING

Level I Erosion and Sediment Control Certification, Georgia Erosion and Sedimentation Training Institute

YEARS OF EXPERIENCE

Other Firms: 18
This Firm: 8

EMPLOYMENT HISTORY

- **2000-Present: ConTec Services, Inc., Chattanooga, Tennessee**
Manager, Resident Project Representative Services.
 - **1998-2000: Consolidated Technologies, Inc., Chattanooga, Tennessee**
Resident Project Representative.
 - **1996-1998: Marion Environmental, Inc., Chattanooga, Tennessee**
Project Manager - Soil and Site Remediation.
 - **1995-1996: JWT, Inc., Chattanooga, Tennessee**
Project Superintendent - Storm Water and Sewer Projects.
 - **1993-1995: Self-Employed, Chattanooga, Tennessee**
Independent Construction Services - Grading, Utilities, and Contract Inspection.
 - **1985-1993: Jerry Bell Construction, Inc., Chattanooga, Tennessee**
Vice President of Operations - Grading and Utilities.
 - **1980-1985: Jerry Bell Construction, Inc., Chattanooga, Tennessee**
Supervisor/General Manager - Grading and Utilities.
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EXPERIENCE

SUPERVISOR/COORDINATOR

- Erosion control inspections for site development and pipeline construction:
 - Dade County Sewer, Dade County, Georgia
 - Stateline Pump Station, Walker County, Georgia
 - Tennessee-American Water Line, Chattanooga, Tennessee



MICHAEL A. BELL (Continued)

- Soddy-Daisy Site Development, Hamilton County, Tennessee
 - Lookout Mountain Sewer, Lookout Mountain, Georgia
 - Surveys and field studies to obtain data for site development projects and sewer line rehabilitation project.
 - Water and sewer line installation for new subdivision developments; contract inspection services for Hamilton County Engineering Department.
 - Management of field operations for underground utility projects, remediation projects, and underground storage tank removal and disposal. Preparation of cost analysis, project development, bid proposals, billing, and closure documentation for each project.
 - Project supervision of storm water management construction contract for City of Chattanooga.
 - Scheduling and supervising all areas of construction business; marketing and project development; preparation and production of job cost estimates; supervision and management of laborers, equipment operators, and subcontractors.
 - Supervision of construction projects and laborers; preparation of estimates for project development.
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RESIDENT PROJECT REPRESENTATIVE

- RPR coordinator for several water storage tanks and water line projects. RPR on Citico Sewer Pump Station Upgrade. RPR on Chickamauga Coke Oven Pump House.
- RPR for complete sanitary low pressure sewer system for Lookout Mountain, Georgia.
- RPR for several gravity and force main sewer projects.
- RPR for Central Avenue CSO site piping. Duties included on-site observation of installation of large diameter concrete pipe, tunnel installation, concrete structures, and joint testing.
- RPR for several sewer pump station installations. RPR for sewer line rehabilitation project (cured-in-place lining) - East Ridge Sewer System - Germantown Road.
- RPR coordination for contract inspection for subdivision development in Walker County, Georgia.
- RPR for Tennessee American Water's Mountain Creek water storage tank and water line.
- RPR management for Walker County's Lakeview low pressure sewer system.



J. MICHAEL SHEALY, E.I.
RPR/Engineer Intern

SUMMARY

Mr. Shealy is a project representative with a degree in civil engineering and over 20 years of experience in field construction. Mr. Shealy has had responsibility for data collection, field engineering, coordination, and on-site inspection of civil, concrete/steel structures, water tanks, and solid waste projects.

EDUCATION

1985, B.S., Engineering (Structural), University of Tennessee at Chattanooga

YEARS OF EXPERIENCE

Other Firms: 9
This Firm: 12

PROFESSIONAL EXPERIENCE

- **1994-Present: Consolidated Technologies, Inc., Chattanooga, Tennessee**
Project Representative.
 - **1993: Watkins Engineers & Construction, Augusta, Georgia**
Civil/Structural Planner.
 - **1991-92: SCI Services Group, Inc., Carrollton, Georgia**
Staff Engineering Assistant.
 - **1990-91: Corotech, Inc., Spring Lake, Michigan**
Field Engineering Assistant.
 - **1988-89: Bechtel Construction Company, Calhoun, TN**
Construction Inspector.
 - **1985-88: Miller-McCoy, Inc., Chattanooga, TN**
Junior Engineering Assistant.
 - **1982-85: Duncan Electric Company, Chattanooga, TN**
Electrician's Helper (during college).
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PROJECT EXPERIENCE

City of Chattanooga

RPR during construction of 0.7-mg (Carter Street) and 7.0-mg (Central Avenue) CSO control facilities.

City of Chattanooga

RPR during construction of a 13,000-square-foot warehouse at the Moccasin Bend Wastewater Treatment Plant.

Tennessee-American Water Company

Maintenance inspections and reports for blasting and repainting of steel water tanks. Quality assurance inspection services during painting of tanks.

Cleveland Utilities

RPR on water treatment plant renovation and improvements, including new 1.5-mg prestressed concrete tank.

J. MICHAEL SHEALY, E.I. (Continued)

Walden's Ridge Utility District

QA/QC inspections during repainting of two water distribution system standpipes.

Cleveland Utilities (Waterville Springs)

RPR on construction of new 1.5-mg prestressed concrete disinfection contact tank and installation of 7,000 feet of 14-inch ductile iron pipe.

Tennessee-American Water Company

RPR during structural repairs, blasting, and repainting of exterior and interior coating system for steel water storage tanks.

Hiwassee Utility Commission

RPR during blasting and repainting of interior coating system of 1.75-mg clearwell. Project required roof jacking for access.

Cleveland, Tennessee

RPR on Cleveland Utilities Wastewater Treatment Plant sludge handling facilities.

Cleveland, Tennessee

Inspection of concrete restoration for spring box facility at Waterville Springs.

Calhoun, Tennessee

Assistance with data collection for Title V air permitting and industrial landfill closure at pulp/paper mill.

Augusta, Georgia

Construction engineer during major plant expansion. Planning and execution of civil/structural activities.

Southeastern States

Design and field duties for shoring schemes to repair concrete and steel structures at chemical and paper industries.

Savannah, Georgia

Field engineering assistant for tile tank and chest contractor during major paper machine expansion. Duties included estimating, daily reports, scheduling, change orders, and quality control inspection.

Calhoun, Tennessee

Construction engineer during major pulp mill expansion. Inspector on pile driving, tile tank and chest, and carbon and stainless steel tank erection.



JAMES M. DUNN, JR.
Engineering Technician/CADD Coordinator

SUMMARY

Mr. Dunn is an engineering technician with experience in computer-aided drafting and design, preparation of engineering drawings, inspection, and field data collection.

EDUCATION

1971, Diploma, Drafting and Design Technology, Northwestern Technical College

YEARS OF EXPERIENCE

Other Firms: 21

This Firm: 15

PROFESSIONAL EXPERIENCE

- **1992-Present: Consolidated Technologies, Inc., Chattanooga, Tennessee**
Currently serves as Engineering Technician and CADD Coordinator.
 - **1986-1992: Campbell & Associates, Inc., Chattanooga, Tennessee**
Served as Civil and Plumbing Designer/Project Manager.
 - **1981-1986: Hensley-Schmidt, Inc., Chattanooga, Tennessee**
Served as Drafter/Technician with the Environmental Department.
 - **1978-1981: Cummings and McCrady, Inc., Charleston, South Carolina**
Served as Engineering Technician and Survey Party Chief.
 - **1971-1978: Hensley-Schmidt, Inc., Chattanooga, Tennessee**
Served as Draftsman in the Highway Department.
-

CADD EXPERIENCE

Over 26 years of experience with CADD systems beginning with Pioneer Wang 2000. 6 years of experience with Intergraph mainframe. 7 years of experience with AutoCad. 16 years of experience with Intergraph MicroStation.

Systems Manager for CTI computers, with responsibility for troubleshooting, training, installation, maintenance, and analysis of network and stand-alone terminals.

Supervises and coordinates the preparation of CADD drawings to ensure conformance to client deadlines and standards.

Assists in preparation of civil engineering designs.

Preparation of CADD drawings for 23rd Street Pump Station Upgrade, Showboat Suites Resort development, Hamilton County Landfill, and Grundy County Spray Irrigation System.



e a r t h w o r x

earthworx, llc

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e-mail: earthworx@earthworxLLC.com

January 30, 2007

Earthworx, LLC, formerly Brackett Construction Services/Southern Surveying, was started in August of 1986. Earthworx, LLC is a multifaceted firm bringing together the disciplines of engineering, surveying, biology, physics, geology, GIS and computer-aided design. Our specialties include architectural/engineering design mapping, civil site/stormwater engineering, engineering route design, geographic information system development and facility management, global positioning system (GPS) and geographical information system (GIS) mapping, construction field engineering, construction field inspection, and wetlands delineation and mitigation design.

Our company was primarily founded to assist in site preparation for construction projects. We have compiled over 136 years (collectively) of experience in Boundary, Topographic, Hydrographic, and Construction surveys. Site grading and stormwater, erosion control, site remediation, wetland delineation, bank stabilization, and stream relocation are also disciplines which we have strong experience. We have worked with the U.S. Army Corps of Engineers, the Tennessee Department of Environment and Conservation, City of Chattanooga, Hamilton County government, and other local jurisdictional authorities on a wide variety of projects. We are confident with our experience, methods, and decisions.

In addition to producing precise and accurate planimetric, topographic, hydrographic, and geologic maps, we customize the product to each client's specifications. Your detail specifications become our priorities. It is our mission to make your project and our data work seamlessly.

Attached are resumes of key personnel who are experienced with engineering, surveying, and GIS projects.

Thank you for consideration in any future projects in which we can assist.

Respectfully,

Dixon G. Brackett, RLS, PG
President

Mailing Address: Earthworx, LLC, PO Box 91522, East Ridge, TN 37412

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e a r t h w o r x

Dixon G. Brackett, PG, RLS

President/Chief Manager

EDUCATION

B.A., Geology (Engineering Geology concentration), University of Tennessee - 1980

OSHA Hazardous Materials and Waste Operations 40-Hour Worker Certification

OSHA Hazardous Materials and Waste Operations Supervisor Certification

PROFESSIONAL REGISTRATIONS AND ASSOCIATIONS

Professional Geologist, State of Tennessee – License No: 246

Registered Land Surveyor, State of Tennessee - License No: 2494

American Congress on Surveying and Mapping

Association of Engineering Geologists

Association of Ground Water Scientists & Engineers

EXPERIENCE

1998-Present	Earthworx, L.L.C. President/Chief Manager
1986-1998	Brackett Construction Services/Southern Surveying Principal-In-Charge
1980-1986	Hensley-Schmidt Inc. Engineering Geologist
1980	U.S. Department of Energy, University of Tennessee, Chattanooga Research Assistant
1979	University of Tennessee, Chattanooga Optical Mineralogy Instructor

Ms. Brackett has served as Project Manager, Project Geologist, or Principle-In-Charge on a variety of surveying and engineering projects, including the following:

Associated Tennessee-American Water Company (TAWC) Projects

- Ryall Springs Water Tank Survey
- Bonny Oaks Drive at Industry Drive Waterline Project
- Hitchcock Road Waterline Extension
- Walden's Ridge Waterline Project
- Martha Avenue Waterline Project
- TAWC Walker County Easement Survey
- Bonny Oaks Drive Waterline Project
- Lee Highway Waterline Project
- CMAA- Airport Road Waterline Location
- Walden's Ridge Utility District Waterline Project
- CMAA West Airfield Road Waterline Project
- TAWC Cravens Terrace Waterline and Boundary Survey
- TAWC Sarato Road Waterline Easement
- US EXPRESS Waterline Easement Survey
- TAWC Page Road Waterline Easement Survey

Associated Projects

- TVA Widows Creek Plant - Topographic & Construction Surveys for Underground Coal Conveyor System
- TVA Sequoyah Nuclear Plant – HazMat Topographic Surveys for Underground Storage Tank Remediation
- TVA Sequoyah Nuclear Plant - Topographic & Construction Surveys for Field Services Facility Building
- U.S. Army Corps of Engineers- Ross's Landing Park/Bank Stabilization - Field Engineering, Construction Surveys
- Boise-Cascade Bridgeport Inland Docks – Hydrographic & Topographic Surveys for Docking Cells
- City of Chattanooga - Hydrographic Survey of Tennessee River for Ross's Landing/Riverfront Project
- Bowater, Inc. - Hydrographic Survey & Hydrographic Construction Survey of Hiwassee River Docking Facilities
- Bowater, Inc. - Hydrographic Survey of Wastewater Treatment Ponds
- Grace Chemical - Hydrographic Survey of Radioactive Phosphate and Thorium Ponds
- Southern Marine Construction - Ross's Landing Docking Facilities - Field Engineering and Construction Surveys
- Inland Container Corp. - Hydrographic Survey of Wastewater Treatment Ponds
- Southern Marine Construction - Ross's Landing Docking Facilities – Hydrographic Construction Surveys and Field Engineering
- Jones Brothers Construction – I-75/Hwy. 153 Interchange Bridge Field Engineering and Construction Layout
- Jones Brothers Construction – Tennessee River Olgiati Bridge Field Engineering and Construction Layout
- City of Chattanooga Public Works Dept./ Chattanooga Parks and Recreation Dept. – Montague Park - Topographic Survey for Engineering and Environmental Design
- City of Chattanooga Parks and Recreation Dept. - Greenway Farm - Architectural Design Topographic Survey
- City of Chattanooga Parks and Recreation Dept. -Warner Park - Architectural Design
- City of Chattanooga Parks and Recreation Dept. - Carver Recreation Center - Location survey for Architectural reference
- City of Chattanooga - Tennessee Aquarium/Ross's Landing Plaza - Construction surveys and engineering geology
- City of Chattanooga - Coolidge Park - Construction Field Engineering
- City of Chattanooga Public Works Dept. – Geographical Information System Design and Mapping of 172 square mile area of city-wide Stormwater system
- Frank McDonald Architects, Inc. - Tennessee River Park Phase IV - Architectural Design Survey
- Wheland Foundry Recreation Park - Engineering Design Topographic Survey, Construction Field Engineering
- Chattanooga Nature Center - Boundary and Wetlands Survey
- Chattanooga Christian School - Track and Soccer Field - Survey, Design, Construction Field Engineering
- Sequatchie County Board of Education - Track and Football Field - Survey and Design
- CBS Construction Co. - Camp Jordan Soccer Fields - Construction Surveys
- Rowlett Construction Inc. - Dade County High School and Recreation Area -Construction Surveys
- Turner Construction Inc. - Chattanooga Visitors Center - Construction Surveys
- Wheland Foundry Drainage Mapping

- Ross's Landing CSO – Construction Survey
- Incline Railway GPS Control Survey
- GPS Control for Georgia Department of Natural Resources
- Tennessee River Park Wetland Delineation
- Hamilton County Government Mt. Shadows and Port Serena GPS Control
- CBL and Associates - Architectural/Engineering Design Survey, Wetland delineation and mitigation design, Gunbarrel Road, Chattanooga
- Hamilton County Engineering Dept. - Global Positioning System Aerial control survey for Collegedale/Apison area
- Hamilton County Engineering Dept. - Global Positioning System Aerial control survey for Waconda Bay Project
- CBS Construction Co. - Camp Jordan Soccer Fields - Construction Surveys
- Rowlett Construction Inc. - Dade County High School and Recreation Area -Construction Surveys
- Turner Construction Inc. - Chattanooga Visitors Center - Construction Surveys
- Chattanooga State Technical Community College- Topographic Survey
- Southern Adventists University - Topographic Mapping, Field Engineering, and Construction Surveys
- Watt & Estes, Inc. - Federal Department of Transportation - Incline Railway Control Survey
- Turner Construction/Soloff Construction – Tennessee Aquarium – Field Engineering, Construction Surveys
- CBL and Associates - Hamilton Place Mall - Topographic Mapping, Field Engineering, and Construction Surveys
- EMJ Corporation – US Express Corporate Headquarters – Topographic Mapping, Field Engineering, and Construction Surveys
- Consolidated Technologies Inc. - Volunteer Army Ammunition Plant - Topographic Surveys, Monitoring Well Locations

Recent GIS/GPS Mapping Projects:

- City of Chattanooga – As-Found GIS Project Phases I , II, III, and IV
- City of Chattanooga – Contract No: 01-A
- East Tennessee Grading – Falmouth Street – Contract No: 01-A
- East Tennessee Grading – Sidney Street - Contract No: 01-A
- East Tennessee Grading – Roanoke Street - Contract No: 01-A
- East Tennessee Grading – 3rd @ Kelly Street - Contract No: 01-A
- East Tennessee Grading – Frazier Avenue - Contract No: 01-A
- East Tennessee Grading – Moccasin Bend - Contract No: 01-A
- East Tennessee Grading – Hickory Valley Road - Contract No: 01-A
- East Tennessee Grading – Douglas Street - Contract No: 01-A
- East Tennessee Grading – East 35th Street - Contract No: 01-A
- Mayse Construction Company – Country Side Road – Contract No: 01-A
- Mayse Construction Company – Grace Avenue – Contract No: 01-A
- Mayse Construction Company – Bennett Street – Contract No: 01-A
- Mayse Construction Company – Riverview Road – Contract No: 01-A
- Mayse Construction Company – Glenn Road – Contract No: 01-A
- Mayse Construction Company – Edgewood Lane – Contract No: 01-A
- Mayse Construction Company – Edgewood Circle – Contract No: 01-A
- Mayse Construction Company – Lawrence Road – Contract No: 01-A
- Mayse Construction Company – Lexington Road – Contract No: 01



earthworx

earthworx, llc

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Chattanooga, Tennessee 37421
423-892-4780 423-954-9743 Fax
e-mail: earthworx@earthworxLLC.com

References

Randy Taylor, PE
Tennessee American Water Company – Engineering
1101 Broad Street
Chattanooga, Tennessee 37402
(423) 755-7627

Ron Littlefield
Mayor of Chattanooga
City of Chattanooga – Mayor's Office
101 East 11th Street
Chattanooga, Tennessee 37402
(423) 425-7811

Steve Leach
Director of Public Works
City of Chattanooga
1250 Market Street
Chattanooga, Tennessee 37402
(423) 757-4870

Project References

PROJECT NAME	CONTACT
Oostanaula Waste Water Treatment Plant Athens Utilities Board 100 Inglewood Road Athens, TN 37371-0689	Ms. Jill Davis, P.E. 423-745-4501
Water Tank, Athens Utilities Board Barge, Waggoner, Sumner and Cannon, Inc. 10133 Sherrill Boulevard, Suite 200 Knoxville, TN 37932	Ms. John Burris, P.E. 865-637-2810
Linsdale Community Water Storage Tank GRW Elrod Dunson, Inc. Post Office Box 10725 Knoxville, TN 37939	Mr. John Burris, P.E. 865-588-4166
Copper Hill Water Tank GRW Elrod Dunson, Inc. 404 BNA Drive, Suite 201 Nashville, TN 37217	Mr. Ken Stewart 615-366-1600
Mountain Creek Water Storage Tank Consolidated Technologies, Inc. 1122 Riverfront Parkway Chattanooga, TN 37402	Mr. Jerry D. Hightower, P.E. 423-267-7613

GEOTECHNICAL SERVICES



- *Subsurface Exploration with Boring or In-situ Equipment*
- *Foundations, Earthwork, Stabilization Feasibility Evaluations*
- *Siting Evaluations*
- *Consultation & Forensic Evaluations*
- *Laboratory Testing to Determine Classification, Strength, Compressibility, & Permeability*
- *Construction Quality Assurance & Quality Control*

QORE'S COMPLETE LINE OF SERVICES INCLUDES:

GEOTECHNICAL

**ENVIRONMENTAL
SERVICES**

**ENVIRONMENTAL
STUDIES &
PERMITTING**

**CONSTRUCTION
MATERIALS TESTING**

FACILITIES

DRILLING

Sound geotechnical engineering practice blends science, art and business sense. Too much bias toward pure science overlooks the need for creativity. Too great an emphasis on art ignores the need for careful scientific deliberation. Failure to pay proper attention to the business aspects of a project can drive costs out of control.

At QORE Property Sciences, we blend the right mix of science, art and business in geotechnical engineering. Clients depend on us for recommendations that have solid scientific basis, that are creative in design and scope, and that they can afford to implement.

As scientists and engineers, we place high value on technical aptitude, knowledge and experience. But we add a strong dose of common sense to everything we do. The key is a willingness to recognize that alternatives exist and an eagerness to explore those alternatives. In over three decades of providing high quality geotechnical engineering services, we've learned there is rarely only one way to approach a project.

At QORE we believe that our recommendations can only be as good as the data used in our evaluations. QORE owns and operates a fleet of modern drill rigs equipped with state of practice tools and in-situ testing equipment. Our laboratories are also state of practice, with quality control procedures, personnel and apparatus accepted and approved by nuclear regulatory agencies (NQA-I certified).



Q O R ETM
PROPERTY SCIENCES

Oostanaula Waste Water Treatment Plant

Athens, Tennessee

Geotechnical Engineering Construction Testing and Monitoring Services

CLIENT: Athens Utility Board
100 Englewood Road
Post Office Box 689
Athens, TN 37371-0689

CONTACT: Ms. Jill Davis, P.E.
423.745.4501

QORE FEES: \$115,000

COMPLETION DATE: 2006



QORE provided geotechnical and construction testing and monitoring services for this very challenging engineering project located in Athens, Tennessee. The project consisted of the construction of the following components:

- New sledge dewatering building
- New headwork structure
- Two oxidation ditches
- New blower building
- New clarifiers
- Conversion of two existing aeration basins to aerobic digesters
- New electrical building
- Plant drain pump station and renovation of existing pump station
- Conversion of rectangular clarifier to a new tertiary filtered chemical facility
- Renovation of existing clarifiers

Our geotechnical services included drilling and laboratory testing to provide recommendations for the foundation design and construction of the above listed components to the waste water treatment plant. The project was complicated by about 75 years of past construction with associated fill, debris and remnants of abandoned structures.

Portions of the project site are located adjacent to Oostanaula Creek. Therefore, beneath a significant fill

interval that covered a large percentage of the site, soft alluvial soils were encountered complicating foundation system analyses.

During construction, QORE provided engineering consulting, testing and monitoring, and value engineering services. Our services primarily consisted of evaluating foundation bearing conditions for the proposed waste water treatment plant components and concrete testing. We were also actively involved in the evaluation of concrete quality related issues that could have impacted the project schedule and budget if it were not for QORE's rapid notification and response when problems were discovered.

James P. McGirl, P.E.
Senior Engineer

Jamie M. Hudson, P.E.
Project Engineer



WATER TRANSMISSION AND DISTRIBUTION LINES

Representative Experience

Alexian Village

Signal Mountain, Tennessee

***Fire Flow Investigation**

Computer hydraulic analysis for fire flow design, including field testing of fire hydrant flow, preparation of computer model, investigation of fire flow problems, and planning of improvements to distribution system to correct problems. Report included recommendations, cost analysis, and predicted results to improve maximum fire flow to serve large retirement/nursing home.

City of Allardt

Allardt, Tennessee

***Water System Improvements**

CDBG-funded project, including 4 miles of water line extensions in mountainous terrain and 50,000-gallon elevated storage tank. Engineering services from design through construction management.

Town of Ashland City

Ashland City, Tennessee

***Water System Improvements**

Preliminary engineering report, including computerized system hydraulic analysis, and plans, and specifications for 11,000 linear feet of 6-inch water line master meter connection with Metropolitan Nashville-Davidson County Water System, altitude valves, water booster pump, and pressure-reducing valves to regulate system pressures and maximize utilization of water storage capacity. Work included contract negotiation with Nashville for system interconnection.

Town of Benton

Benton, Tennessee

Water System Rehabilitation

Design of 38,000 linear feet of 6-inch water line replacement, repair and repainting of 150,000-gallon steel reservoir, new 200,000-gallon reservoir, and installation of surge control system for high service pump station, funded by ARC and FmHA.

Town of Benton

Benton, Tennessee

Water Line Relocation

Design and construction phase services for the replacement of 8,500 linear feet of 6-inch water line in connection with Highway 411 widening.

Bledsoe County, Tennessee

Pikeville, Tennessee

***Water System Improvements**

Approximately 11 miles of 8- through 2-inch water lines funded by CDBG. Engineering services from design, including computer modeling, through construction.

Calhoun-Charleston Utility District

Calhoun, Tennessee

Water Line Extension and Storage Tank

Design and construction phase services for 18,400 linear feet of 4- through 8-inch water line extension and 260,000-gallon prestressed concrete storage tank. Funded by CDBG.



WATER TRANSMISSION AND DISTRIBUTION LINES (Continued)

Calhoun-Charleston Utility District
Calhoun, Tennessee

Piney Grove, Claxton Area Water Line Extensions
Design and construction phase services for 55,200 linear feet of 2- and 6-inch water line to serve 66 LMI households. CDBG funded.

Village of Carey
Carey, Ohio

***Investigation and Report**
Report to investigate and correct sources of "red water" in water distribution system.

Cherokee County
Murphy, North Carolina

Texana Water System
Approximately 14,000 feet of water line. Engineering services from design through construction. CDBG-funded.

Cherokee County
Murphy, North Carolina

Gentex Water Line Extension
Design and construction services for 6-inch water line extension to serve new industry. Funded by state industrial infrastructure grant.

Cherokee County
Murphy, North Carolina

Comprehensive Water Study
Planning study for phased development of county-wide water system, including new water plant and distribution lines.

City of Chickamauga
Chickamauga, Georgia

Water Source
Development of a new 1,500-gpm well water source, including disinfection, chemical and pumping facilities.

City of Chickamauga
Chickamauga, Georgia

Jones Lake Water Line
Design through construction services for 7,000 feet of water line.

City of Chickamauga
Chickamauga, Georgia

Water and Fire Service to Shopping Center
Design through construction services for more than 7,000 feet of 8-inch PVC and ductile iron pipe. Joint service project between Walker County and City of Chickamauga.

City of Chickamauga
Chickamauga, Georgia

Miscellaneous Line Extensions
Review layouts, prepare environmental applications, and perform design calculations for line extensions to numerous subdivisions to ensure compliance with State and City requirements.

Cleveland Utilities
Cleveland, Tennessee

Old Alabama Road Area Water Line Extension
Detailed drawings and bid documents for 39,000 linear feet of 8-inch and 6-inch water lines to serve 130 LMI customers. CDBG funded.

Cleveland Utilities
Cleveland, Tennessee

South Bradley County Water Line Extension
Design of over 206,000 linear feet of 6-inch and 8-inch PVC water lines for extension to South Bradley County.



WATER TRANSMISSION AND DISTRIBUTION LINES (Continued)

Cleveland Utilities
Cleveland, Tennessee

Transmission Main Analysis

Detailed hydraulic analysis of 20-inch cast iron transmission main including alternatives for rehabilitation.

Cleveland Utilities
Cleveland, Tennessee

***Annexation Area Services**

Approximately 18,000 feet of water lines. Engineering services from design through construction.

Cleveland Utilities
Cleveland, Tennessee

***Computer Modeling of Distribution System**

Computer modeling hydraulic analysis for a 22,000-customer water distribution system, including long-range planning, design for improvements to tanks, lines, and pumping facilities.

City of Cookeville
Cookeville, Tennessee

Analysis

Hydraulic analysis of a portion of the distribution system to determine future line sizes and resolve a storage tank water quality issue.

City of Cookeville
Cookeville, Tennessee

North Washington Avenue Utility Relocation

Design of 18,000 linear feet of 6- and 8-inch water line relocation in urbanized area for highway widening.

Copper Basin Utility District
Ducktown, Tennessee

***Water Supply System**

Approximately 106,400 linear feet of 2- to 8-inch water lines, 0.5-mgd water treatment plant, and 500,000-gallon storage reservoir. Engineering services from design through construction.

Cuyahoga County
Cuyahoga County, Ohio

***Water Line Design**

Design of 13,000 feet of 8- and 12-inch water line along Lewis Road, Memory Lane, and Rainbow Drive in Olmsted Township. This project was accelerated to meet critical State Issue 2 funding agency requirements.

Dade County Water and Sewer Authority
Trenton, Georgia

***Water System Improvements**

Preliminary engineering report identifying short- and long-term system needs, including computerized system hydraulic analysis, and plans, specifications, and construction phase services for water booster pumping station, interstate highway crossing, water storage standpipe, and several miles of water line extension in Dade County, Georgia.

Town of Decatur
Decatur, Tennessee

***Water Line Extension**

Approximately 16,000-linear-foot water supply line to industrial park. Engineering services from design through construction.



WATER TRANSMISSION AND DISTRIBUTION LINES (Continued)

Fred and Amy Decosimo
Signal Mountain, Tennessee

Water Line Extension
Computerized hydraulic analysis and design of 5,000 linear feet of 6-inch water line with fire flow capabilities.

**Duck River Utility
Commission**
Tullahoma, Tennessee

Water Line Extension
Computer hydraulic modeling for line extension to Arnold Engineering Development Center.

City of Dunlap
Dunlap, Tennessee

Water Line Extension
Component of a \$5,350,000 water treatment plant and distribution system improvement project. Services for the line extensions include design, bid, and construction phase for 4,600 LF of 16-inch-diameter DIP raw water transmission main, 1,900 LF of 8-inch PVC, 6,900 LF of 6-inch PVC and 5 taps to existing mains. The line extensions, combined with two new booster stations were identified by CTI to better utilize existing storage tanks and increase existing system pressures.

City of Dunlap
Dunlap, Tennessee

Dunlap-Pikeville Connection
Design and construction services for 1-million-gallon Blue Sewanee water storage tank, 400-gpm booster pumping station, and 8,100 linear feet of 12-inch water main to provide water to Pikeville. Funded by Rural Development, CDBG Imminent Threat, and EPA.

City of Dunlap
Dunlap, Tennessee

***Water System Improvements**
Approximately 27,000 linear feet of 6- to 8-inch water lines, modifications to water plant, and 500,000-gallon storage tank. Engineering services from design, including computer modeling, through construction.

City of Dunlap
Dunlap, Tennessee

Water Main Extension to Industrial Park
Design and construction services for 10,000 linear feet of 10- and 12-inch water main from the water treatment plant through downtown Dunlap to the Sequatchie County Industrial Park. Funded by Tennessee Industrial Infrastructure Program.

City of Dunlap
Dunlap, Tennessee

West Valley Road Water Line Extension and Tram Trail Water Line Relocation
Computer modeling, design, and construction services for 28,000 linear feet of 8-inch and 6-inch water line extension on West Valley Road and 6,000 linear feet of water line replacement on Tram Trail for road reconstruction and specifications for repainting and lead abatement of 850,000-gallon water storage tank.



WATER TRANSMISSION AND DISTRIBUTION LINES **(Continued)**

City of Dunlap

Dunlap, Tennessee

Distribution System Mapping

Extended period computer modeling using Kentucky Pipes for 1,900-customer system with 210 pipes and 158 junction nodes. Digital mapping services included colorized system maps to display in city hall and at water treatment plant and map showing fire hydrant locations.

City of Dunlap

Dunlap, Tennessee

Utility Relocations

Design of water and sewer line relocations at the intersection of Highway 111 and U.S. Highway 127.

Eagle Crest, LLC

Signal Mountain, Tennessee

Falcon Bluffs Subdivision Water Line Extension

Computerized hydraulic analysis for fire flow and residential demand. Design services for Phase I and II of proposed 300-lot subdivision. Included 1,100 linear feet of 12-inch ductile iron and 3,500 linear feet of 8-inch ductile iron transmission main to the subdivision and 4,600 linear feet of 8-inch and 6-inch ductile iron distribution piping inside the subdivision.

Eagle Nest Subdivision

Blue Ridge, Georgia

Water System Improvements

Water lines computer analysis and design of pneumatic tank to serve new residential development.

Town of Englewood

Englewood, Tennessee

Water System Improvements

Hydraulic computer modeling (PIPE 2000) of water distribution system. Design, bid, and construction phase services for repainting a 75,000-gallon elevated potable water tank. Design of 500,000-gallon distribution system water tank, 200-gpm booster pumping station, and approximately 20 miles of new 6- and 8-inch PVC water line. Design of approximately 10 miles of 6- and 8-inch water line extensions. Pre-maintenance inspections of two water distribution system standpipes (including quality assurance monitoring of underwater inspections.) Design specifications, drawings, and construction phase engineering for relocation and rehabilitation of gas, water, and sewer facilities due to widening of major highway by TDOT.

Town of Englewood

Englewood, Tennessee

Highway 411, Water and Gas Relocations and Sewer Modification

Design and construction phase services for relocation of approximately 8,000 feet of 8-inch water line and 6,000 feet of 2-inch gas line and modifications to approximately 30 sewer manholes.



WATER TRANSMISSION AND DISTRIBUTION LINES (Continued)

Town of Englewood
Englewood, Tennessee

Highway 411 South, Water Line Relocation
Design and construction phase services for 3,000 feet of 6- and 8-inch water line relocation along Highway 411 South.

Town of Englewood
Englewood, Tennessee

Water System Rehabilitation
Design and construction phase services for 30,000 linear feet of replacement of small-diameter water line with 6-, 8-, and 12-inch water line, CDBG funded.

Town of Englewood
Englewood, Tennessee

Zion Hill Area and Cumberland Heights Water Line Extension
Design and construction phase services for 107,000 linear feet of 6- and 8-inch water line (funded by CDBG and RD) and one 500,000-gallon concrete water storage tank.

Etowah Utilities Department
Etowah, Tennessee

Highway 411 (South Polk County Line to 9th Street) Relocation
Design of 5,300 linear feet of 18-inch, 10,800 linear feet of 16-inch, 2,700 linear feet of 12-inch, and 2,500 linear feet of 8-inch; 3,700 linear feet of 8-inch gravity sewer; and 1,000 linear feet of sewage force main along Highway 411. Project included railroad crossing, three creek crossings, and several highway crossings.

Etowah Utilities Department
Etowah, Tennessee

Bledsoe Road Water Line Replacement
Design of 3,200 feet of 6-inch and 8-inch water line to replace existing 2-inch water line.

Etowah Utilities Department
Etowah, Tennessee

Cambria Road Extension
Computer hydraulic analysis and design of 700 feet of 2-inch and 4,500 feet of 6-inch water main with railroad crossing to provide water service and fire protection to a church and rural neighborhood; included railroad crossing.

Etowah Utilities Department
Etowah, Tennessee

Con-Met Water Line Extension
Design and construction phase services for 3,300 linear feet of 12-inch ductile iron pipe to serve new industry. Funded by TIIP.

Etowah Utilities Department
Etowah, Tennessee

County Road 561/County Road 550 Water Line Extension
Computerized hydraulic analysis and design of 24,600 feet of 8-inch transmission main in rural area to provide strategic loops in the distribution system.

Etowah Utilities Department
Etowah, Tennessee

Cybernet Distribution Mapping
Developed colorized distribution system maps to accompany Cybernet analysis.



WATER TRANSMISSION AND DISTRIBUTION LINES (Continued)

Etowah Utilities Department
Etowah, Tennessee

***Delano Community Water System Expansion**

Approximately 5,000 linear feet of 6-inch water line with two highway crossings. Engineering services from design through construction.

Etowah Utilities Department
Etowah, Tennessee

Eagle Glen Subdivision Water Line Extension

Design of 16,500 linear feet of 8-inch and 6-inch water line, including railroad crossing, to serve new subdivision.

Etowah Utilities Department
Etowah, Tennessee

***East Etowah Water Line**

Design of 7,000 linear feet of 8-inch water line, including railroad crossing.

Etowah Utilities Department
Etowah, Tennessee

Etowah-Englewood Transmission Main

Design of 14,000 feet of 12-inch and 8-inch transmission main including design of meter pit with chlorine residual analyzer and two creek crossings. CDBG and RD funded.

Etowah Utilities Department
Etowah, Tennessee

Highway 411 North, Utility Relocation

Design and construction management for water, sewer, and gas line relocations along Highway 411 North, including 14,500 linear feet of 2- through 16-inch water line with highway, railroad, and creek crossings.

Etowah Utilities Department
Etowah, Tennessee

Highway 411 South (Hiwassee River to Cambria Road)

Computerized hydraulic analysis and design of 6,300 feet of 2- through 8-inch, 2,400 feet of 16-inch, and 13,500 feet of 24-inch high service water main design to accommodate highway widening project.

Etowah Utilities Department
Etowah, Tennessee

Highway 411 South (Cambria Road to Twelfth Street)

Design and construction phase services for water, sewer, and gas line relocation along 27,000 feet of highway.

Etowah Utilities Department
Etowah, Tennessee

Hydraulic Analysis of Water Distribution System

Analysis using HAESTAD's "Cybernet" computer software to model system with 3,100 customers, 698 pipes, and 743 junctions. Modeling to design high service pumps for water treatment plant upgrade, new storage tanks, and new transmission main.

Etowah Utilities Department
Etowah, Tennessee

Mecca Pike Water Line Extension

Design and construction phase services for 46,200 linear feet of 2- through 8-inch water line extension, including four highway crossings, railroad crossing, and major creek crossing to serve 64 LMI households. CDBG funded.



WATER TRANSMISSION AND DISTRIBUTION LINES **(Continued)**

Etowah Utilities Department
Etowah, Tennessee

Parkstown Area and North Industrial Park Area Water Line Extensions

Design and construction phase services for 37,600 linear feet of 12-inch, 16-inch, and 18-inch ductile iron pipe to serve two new storage tanks in conjunction with construction of two new industries. Funded by EDA/ARC.

Fannin County Industrial Park
McCaysville, Georgia

***Water Storage and Distribution System**

Design and construction phase services for 2,500 linear feet of 6- and 8-inch water line, pressure reducing valve/master meter system, and 100-gallon elevated water storage tank for industrial park. Funded by Economic Development Administration.

Firefly Communities, LLC
Walker County, Georgia

Cloudland Station Development, Phase I Water Systems

Basis of design report, fire flow test reports, engineering calculations, KYPipe 2000 modeling, plans and specifications for approximately 11,200 feet of 2-inch through 8-inch PVC water main, a 40,000-gallon water storage tank, and service connections to 62 future residential customers.

Foothills Pointe Retirement Development, Inc.
Greenback, Tennessee

Water Line Design

Design and construction phase management, including computerized hydraulic analysis, for 30-lot, 12-lot, and 25-lot subdivision expansions in subdivision with ultimately 300 units.

Foothills Retirement Development, Inc.
Loudon County, Tennessee

***Water System Improvements**

Plans, specifications, and construction services, including computerized system hydraulic analysis, for water system expansion to serve 180 residential customers in Foothills Pointe Community.

Hallsdale-Powell Utility District
Knoxville, Tennessee

High Pressure Lines

Planning, design, and construction phase services for 12,500 linear feet of 24-inch high pressure ductile iron pipe. Hydraulic analysis by CTI demonstrated that the pipe would correct pressure problems and eliminate the need for numerous booster stations throughout the system.



WATER TRANSMISSION AND DISTRIBUTION LINES (Continued)

**Hallsdale-Powell Utility
District**
Knoxville, Tennessee

Master Plan and Hydraulic Modeling

Master plan for distribution system improvements including development of hydraulic model for 22,000 connection system. Identified system simplification measures such as reducing number of pressure zones, improving system hydraulics, and new water supply on north end of system. Digitized all HPUD water system maps and linked information to GIS mapping. Applied the data to hydraulic model with digital demand information, also linked to GIS, resulting in a very accurate model. Scanned valve reference cards and linked to water maps and GIS.

**Hallsdale-Powell Utility
District**
Knoxville, Tennessee

Water Line Extension

Design and construction services for 6,500 linear feet of 8-inch water line.

Hamilton County
Chattanooga, Tennessee

Water Line Extension

Engineering report for water line extension to serve rural community on Signal Mountain. CDBG-funded.

**Hargis Estates
Subdivision**
Sequatchie County,
Tennessee

***Water Distribution System**

Plans and specifications, including computerized system hydraulic analysis, for 6,000 linear feet of 4-, 6-, and 8-inch water line for 60-lot residential subdivision.

**Hiwassee Utilities
Commission**
Charleston, Tennessee

Water Line Cleaning

Preparation of cost estimate for cleaning of 7 miles of 20-inch water line.

Hiwassee Water Cooperative
Benton, Tennessee

Water Main (Boyd Road to Hiwassee River)

Design and construction phase services for 7,400 feet of 2-through 8-inch and 1,900 feet of 12-inch water main, including directional drilling crossing of Hiwassee River, for utility relocation due to widening of Highway 411.

Hixson Utility District
Chattanooga, Tennessee

Distribution System Master Plan and Computer Hydraulic Model

Redeveloped model for over 20,000 customer system. Provided "state-of-the-art" geographical interface model of system with GIS and digital customer demand information.

Hixson Utility District
Chattanooga, Tennessee

***Water System Improvements**

Design services for 8-inch lines to improve services to low pressure areas, including computer modeling of entire system serving over 19,000 customers, CADD drawings, and permit applications for highway and railroad crossings.



WATER TRANSMISSION AND DISTRIBUTION LINES (Continued)

Hixson Utility District
Chattanooga, Tennessee

Water System Improvements

Design services for 8- through 12-inch lines to improve service to certain low pressure areas, including computer modeling of entire system serving over 19,000 customers, CADD drawings, and permit applications.

Hixson Utility District
Chattanooga, Tennessee

Water Distribution System

Water distribution system analysis for 19,000-customer utility district. Computer modeling included normal and fire demand analysis and master planning of system improvements, including design of new 8-mgd high service pumping facility.

Ingles Market Development
Blue Ridge, Georgia

***Blue Ridge Shopping Center**

Design services for 8-inch line to serve Ingles Market Shopping Center, including drawings, permit applications, and easements.

Town of Jasper
Jasper, Tennessee

Water Line Extension

Design of 48,000 linear feet of 6-, 8-, and 12-inch water line extension with river crossing and a 500-gpm booster pumping station.

Town of Jasper
Jasper, Tennessee

Water System Improvements for Variform, Inc.

Design and construction phase services for 5,600 feet of 12-inch water line and 750,000-gallon water storage tank to provide fire protection and improve service to industrial area. Services included computer modeling of system for design purposes. (Project funded by TIIP)

Town of Jasper
Jasper, Tennessee

Water Line Extension for Rock-Tenn Company

Design of 4,500 feet of 10-inch water line, with railroad crossing, to provide fire protection to new industry.

Town of Jasper
Jasper, Tennessee

Downtown Main Improvements

Computerized analysis to optimize size and length of water main and design of 6,100 feet of 12-inch and 2,000 feet of 6-inch main to relieve bottlenecks in existing 8-inch and 6-inch mains.

City of Kent
Kent, Ohio

***Line Investigation**

Investigation of red water in water distribution lines on Harvey Street and Wilson Avenue, including development of questionnaire, interviews of affected water customers, and water quality and electrical conductivity testing.



WATER TRANSMISSION AND DISTRIBUTION LINES (Continued)

City of Kent

Kent, Ohio

***Water Line Rehabilitation**

Design of rehabilitation of the existing cast iron water lines through relining with cement mortar to prevent red water problems in Wilson/Harvey area.

City of Lakesite

Lakesite, Tennessee

Water Line Improvements

In a joint effort to improve service and safety for customers in the Lakesite area, Hixson Utility District and the City of Lakesite recently completed water line improvements along Dallas Point Road, Driftwood Road, Wood Lane, and Glengerrie Drive. These streets have aging water lines that are adequate to supply potable water to existing customers, but cannot provide the fire flows needed to meet state insurance requirements. To correct this problem, nearly 7,000 linear feet of new 8-inch-diameter lines were installed parallel to the existing 2- to 4-inch-diameter lines. Service will be shifted from the old lines to the new lines. HUD provided approximately 20 percent of the cost of these improvements and provided construction inspection services.

Leonard Kinsey and Associates

Chattanooga, Tennessee

***Council Fire Golf and Country Club**

Computerized hydraulic analysis and design of approximately 12,000 linear feet of 6-, 8-, and 12-inch water lines to provide fire protection and water to 440 residential water customers at the Council Fire Golf and Country Club development in Hamilton County, Tennessee, and Catoosa County, Georgia.

Lose and Associates

Nashville, Tennessee

Greenway Farms Design

Design of site utilities for environmental resource center.

Lynchburg/Metro Moore County Metropolitan Government

Lynchburg, TN

***County-Wide System Master Plan**

Comprehensive study of raw water source, water treatment plant, water storage system, water distribution system, and fire protection to determine measures needed to expand and improve service.

McMinn County Government

Athens, Tennessee

Water System Improvements for Etowah, Niota, and Athens

Coordination of activities in three distinct areas for the county using three different engineers. Design and construction phase services for Etowah portion consisting of 18,300 linear feet of 6-inch and 2-inch piping, booster pumping station and service to 57 LMI households. CDBG funded.



WATER TRANSMISSION AND DISTRIBUTION LINES (Continued)

Polk County
Copperhill, Tennessee

Industrial Water Line Extension

Design through construction services for 6,500 linear feet of 6-inch PVC and ductile iron pipe. Included truss bridge creek crossing. CDBG-funded.

**Prospect-McDonald
Utility District**
Bradley County, Tennessee

***Computer Modeling and Line Extension**

Hydraulic analysis of distribution system for long-range planning in 2,500-customer district. Design of line extensions and storage tanks.

City of Rittman
Rittman, Ohio

***Distribution System Improvements**

Backflow prevention and cross-connection control program for the City's water distribution system.

**Savannah Valley Utility
District**
Ooltewah, Tennessee

***Savannah Valley Water System Expansion**

Water system expansion. Engineering services from design, including computer modeling analysis, through construction.

**Signal Forest Subdivision,
LLC**
Walden's Ridge, Tennessee

Site Design

Design of 12-inch-diameter ductile iron transmission main and site water for 175-lot Signal Forest subdivision.

City of Sparta
Sparta, Tennessee

Water System Modeling

Water system hydraulic modeling for current and future water demands, including fire protection, planning, design, and construction administration of water improvements and line projects ranging in size from 6-inch to 14-inch.

Stark County
Stark County, Ohio

***Water Treatment and Distribution Facilities**

Construction services for new water treatment, distribution, and fire protection facilities for the Molly Stark Hospital/Nist Geriatric Center Complex.

Suck Creek Utility District
Marion County, Tennessee

***Water Distribution System**

Design services, including computer modeling, for an all new distribution system, including 30,000 linear feet of 6- and 2-inch lines, elevated storage tank, well supply, and iron and manganese removing pressure filtration system.

Sweetwater Utilities
Sweetwater, Tennessee

Utility Relocation

Design and construction phase services for relocation of water, sewer, and gas utility lines, including 12,500 feet of 6- through 12-inch water line, 5,200 feet of 2- through 6-inch gas line, and 5,000 feet of 8- through 24-inch sewer line for Highway 322 widening project.



WATER TRANSMISSION AND DISTRIBUTION LINES (Continued)

**Tellico Reservoir
Development Authority**
Monroe County, Tennessee

***Tellico Reservoir Industrial Park**

Site studies, design, and construction phase services of 20,000 feet of water lines, 2 miles of roads, wastewater treatment plant, pumping stations, and other utilities for industrial park development.

**Tellico Reservoir
Development Authority**
Monroe County, Tennessee

***Tellico Reservoir Industrial Park**

Approximately 2,400 feet of 12-inch water lines and 10-inch sewer lines. Engineering services from design through construction services met an international industry's critical schedule.

Tennessee American Water
Chattanooga, Tennessee

Connection to Walden's Ridge Utility District

Design and construction services for 18,300 feet of 16-inch ductile iron pipe, 16-inch welded steel pipe, and 12-inch ductile iron pipe; including a unique section attached to the mountain escarpment; 4-mgd, 650-psi prefabricated pumping station.

Tennessee American Water
Chattanooga, Tennessee

Mountain Creek Storage Tank

Design and construction services for a 1-mg prestressed concrete storage tank and 1,300 feet of 16-inch ductile iron pipe.

Tennessee American Water
Chattanooga, Tennessee

***Bonny Oaks Transmission Main**

Design services for 10,000 linear feet of new 20-inch transmission main to improve service to large area, including aerial crossing of railroad, submerged crossing of creek, permit applications, and CADD drawings for construction and easements.

Tennessee American Water
Chattanooga, Tennessee

Jenkins Road Connector Water Line Relocation

Design services for relocation of 980 feet of 12-inch water line to replace 12-inch and 10-inch water line in conflict with a TDOT road project.

Tennessee American Water
Chattanooga, Tennessee

Hickory Valley 16-inch Transmission Main

Design services for 10,000 linear feet of new 16-inch transmission main, including creek and railroad crossings, permit applications, and CADD drawings for construction and easements.

Tennessee American Water
Chattanooga, Tennessee

Martha Avenue/Sanctuary Road Water Line Extension

Design of 3,940 feet of new 12-inch-diameter ductile iron water line, including creek and railroad crossings, all permit applications, and CADD drawings for construction and easements.



WATER TRANSMISSION AND DISTRIBUTION LINES **(Continued)**

Tennessee American Water
Chattanooga, Tennessee

Read's Lake Road Pump Station and Transmission Main

Preliminary design and preparation of plans and details for 4-mgd high head pump station and 3,500 linear feet of 16-inch-diameter welded steel and 8,000 linear feet of 16-inch ductile iron transmission main from Read's Lake Road to Taft Highway to feed Walden's Ridge Utility District. Provided assistance with obtaining contractor pricing for negotiations with WRUD. Project included design of pipe coating system, cathodic protection system, and anchoring pipeline to vertical rock face at mountain top.

Towns County Water and Sewerage Authority
Young Harris, Georgia

Water Line Relocation

Design of relocation of 4 miles of 8-inch water line due to highway widening.

Towns County Water and Sewerage Authority
Young Harris, Georgia

Water Distribution System

Design through construction services of a 450-gpm booster pump station and altitude valve pits to serve the western half of water system.

Towns County Water and Sewerage Authority
Young Harris, Georgia

Water Distribution System

Design through construction phase services for the replacement of over 60,000 linear feet of water line and three booster pumping stations in the Bald Mountain Community. A "Water 2000" Project.

Towns County Water and Sewerage Authority
Hiawassee, Georgia

Fodder Creek Area and Highway 17/75 Area

Design, construction phase, and RPR services for 25 miles of 2-through 12-inch water line, four water booster pumping stations, and two water storage tanks. Project also involved extensive permitting to cross trout streams. Rural Development-funded.

Towns County Water and Sewerage Authority
Hiawassee, Georgia

Water Line Relocation

Design of 10,500 feet of 2- through 8-inch water line relocation for widening of U.S. Highway 72.

Wal-Mart Shopping Center
Garden City, Kansas

***Site Water System**

Design of approximately 2,000 linear feet of 2-, 6-, and 8-inch water line to serve 28-acre shopping center development.



WATER TRANSMISSION AND DISTRIBUTION LINES (Continued)

**Walden's Ridge Utility
District**
Signal Mountain, Tennessee

Master Plan
Water system master plan, including evaluation of existing source, treatment, pumping, storage, and distribution system, to determine current and future needs. Water system mapping and computerized hydraulic analysis of water system.

**Walden's Ridge Utility
District**
Signal Mountain, Tennessee

Edwards Point Community
Design and construction phase services for 17,500 linear feet of 8-inch and 6-inch water line through county park to serve church campground and 40-house low-income area. Financed through CDBG and supplemental grant from Hamilton County.

**Walden's Ridge Utility
District**
Signal Mountain, Tennessee

Hollister Road to Forrest Park Road
Design and construction phase services for 21,700 linear feet of 12-inch and 1,600 linear feet of 6-inch ductile iron pipeline in mountainous terrain with tight working conditions in residential areas.

**Walden's Ridge Utility
District**
Signal Mountain, Tennessee

Hydraulic Analysis
Computerized hydraulic analysis and design services for water line extensions for five subdivisions in mountainous terrain.

**Walden's Ridge Utility
District**
Signal Mountain, Tennessee

Shackleford Ridge Road Area Improvements
Design and construction phase services on three phases of a joint project partnered with Hamilton County, Tennessee, including 5,100 linear feet of 12-inch ductile iron transmission main, 4,200 linear feet of 10-inch transmission main, 6,300 linear feet of 8-inch transmission main, and 9,600 linear feet of 6-inch distribution piping to serve expanding mountain community, two new Hamilton County Schools, a new Hamilton County Park, a church campground, and a low-income residential neighborhood of 53 houses. (Partially funded by CDBG)

**Government of the Virgin
Islands**
St. Croix, U.S. Virgin Islands

***Water Line Design**
Design of new water lines to serve the Paradise Housing Project. Project required separating water supply lines from leaking sanitary sewers and cistern lines.

**Government of the Virgin
Islands
Cruz Bay**
St. John, U.S. Virgin Islands

***Water Distribution System**
Design of a potable water distribution system for the Virgin Islands Water and Power Authority to connect with existing systems. Project involved hydraulic analysis, aerial mapping, and traffic control during construction.



WATER TRANSMISSION AND DISTRIBUTION LINES **(Continued)**

**Government of the Virgin
Islands**

St. Thomas, U.S. Virgin Islands

***Water Line**

*Design of 3,100 linear feet of 12-inch-diameter water line
from Havensight Mall entrance to Bolongo Bay Road for the
Virgin Islands Water and Power Authority.*

*Experience of individual CTI employees.



Memorandum

To: John Watson, President
From: Kate Narthey, E.I.
Date: February 4, 2008
RE: Ringgold Road Under I-75 – Preliminary Design and Easement Acquisition Phase

Proposal for Preliminary Design and Easement Acquisition Phase for the referenced project dated December 17, 2007 was received from Consolidated Technologies Inc. A sole source proposal was deemed acceptable on the project because CTI is familiar with the project requirement and scope. This is due to their recent completion of the Catoosa Utility District service improvements study which is a continuation of engineering services to design, acquire easements and construct a waterline under I-75 to improve service to Catoosa Utility District. After a follow-up conversation with CTI on the project schedule which was not part of their proposal, they provided a schedule as a supplementary to the proposal. The attached proposed not-to-exceed engineering services cost compares favorably with the anticipated cost.

I have also attached the agreement for engineering services between CTI Inc. and TAWC. Please complete the enclosed agreement on behalf of TAWC and enter the dates of execution in the space provided and marked with a tab. Also attached is a contract approval form for your signature.

Please contact me if you have any questions.

Kate Narthey.

cc: Randy Taylor

Tennessee American Water
1101 Broad Street
Post Office Box 6338
Chattanooga, TN 37401
USA

T 423-755-7603
F 423-755-9308
C 423-667-7518
E kate.narthey@amwater.com

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Gary M. VerDouw

Question:

76. For each of the Centrally Sponsored Projects (CS 2602-1, CS 2602-3 and CS 2602-4 - Business Transformation Project ("BTP")), provide the amount(s) expended since inception to January 2013, (approximately \$7.8 million). Complete the following spreadsheet demonstrating expenditures for BTP recorded to CWIP, completion of phase and removal from CWIP:

CWIP

<u>Date</u>	<u>Description</u>	<u>Amount</u>

PLANT IN SERVICE (PIS) (This should demonstrate completion and movement to PIS)

<u>Date</u>	<u>Description</u>	<u>Amount</u>

Ensure that the spreadsheet reflects all of the below, or answer in text format any of the following questions that don't fit the spreadsheet.

- a. List the component parts of each project, by project number.
- b. Detail the costs, by month and year and component part, reconciling the total to \$7.8 million and any amounts remaining in CWIP.
- c. The name of each system/product as it applies to Tennessee American.
- d. The date of inception and completion for each system applicable to Tennessee American.
- e. The function of each part of the system as it applies to Tennessee American.
- f. Provide approval (sign off) documentation related to the Business Transformation Projects. Provide all documentation that covers the five stage process as discussed in Linda Bridwell's Testimony, pp. 23-24. (The Company's response to MFG #53 did not include this documentation.)

RESPONSE

- a. Please refer to the confidential attachment that is provided under separate cover.
- b. Please refer to the response to part a above.
- c. Please refer to the response to part a above.
- d. Please refer to the response to part a above.
- e. Please see the direct testimony of Gary VerDouw p . 27(lines 21-24); p. 28 (lines 1-9); p. 29 (lines (1-6); pp. 35 – 37.
- f. Please refer to the response to part a above.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Gary VerDouw

Question:

77. Provide a copy of the Master Service Agreement with Accenture associated with the Business Transformation Project.

RESPONSE

The attachment to this response is confidential and provided under separate seal.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Gary VerDouw6

Question:

78. Provide a schedule that shows total Business Transformation Project costs allocated to each state. This schedule should provide all numbers and calculations made to arrive at the 2.42% allocation factor to Tennessee American Water Company as provided by Mr. VerDouw in his Pre-filed Direct Testimony, pp. 28, 37 & 38.

RESPONSE

See Confidential Attachment.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Gary VerDouw

Question:

79. Provide support for TAWC's allocation percentages of BT costs for the years 2009 through 2014 as referenced on page 38 of Mr. VerDouw's Pre-filed Direct Testimony. Include total customers by state by year including assumptions used in forecasting customers beyond historical data.

RESPONSE

See Confidential Attachment.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Gary VerDouw

Question:

80. Will the ECIS system be sold? What is the salvage value of ECIS?

RESPONSE

No. ECIS will remain as a repository for historical information.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Kevin Rogers

Question:

81. Provide the following regarding Special Project IP-2602-4 (6000 linear feet of 24" Ringold Rd. under I-75 Water Main): (MFG No. 53 provides information (Funding Project Justification-IP-2602-4) for this project, pp. 45-50.)
- a. Provide copies of permits obtained from TDOT for the project. If the Company does not have permits, explain the reason, since the critical date for completion of this project is listed as December 31, 2008. (MFG No. 53 pg. 45.)
 - b. Explain why the critical date of installation of December 31, 2008 has not been met.
 - c. Provide copies of easements, or in the alternative, provide any documentation obtained to determine if easements can be obtained for the proposed waterline.
 - d. Provide current documentation from CCUD requesting renegotiations of the existing bulk water sales agreement from 1.674 mgd to 2.5 mgd. (as stated in the Funding Project Justification-IP-2602-4) worksheet provided as MFG No. 53, pg. 45.
 - e. Provide a current CTI Engineering Study recommending that the immediate need to increase in usage to 2.5 mgd will be resolved with the installation of approximately 5,933 feet of minimum 20" south of Ringgold Rd. under I-75 to Scruggs Rd. Or in the alternative, advise where the study document (noted as attached) on the project worksheet (pg. 54 of AW_R_TRAFAQ_53_Attachment) under recommended solution can be found.
 - f. Provide current costs estimates for all expenditures associated with this project.
 - g. Has CCUD continued to restrict water usage since 2008, as stated in the project worksheet? How has this restriction affected the "public need"? Has the Company received any customer complaints?

- h. Provide a recent signed authorization by the CIMC and/or Board of Directors for this project.

Response:

- a. TAW is in the easement acquisition and preliminary design phase of this project hence permits have not been obtained yet.
- b. The critical date was not met because of funding constraints. The company made the decision to defer the project and elected to reforecast the project funds to meet unanticipated needs related to water main relocation projects and other unanticipated repairs and replacement.
- c. Easements have not been obtained yet. CTI engineers, the project consultant, sent introductory letters to all 12 property owners to initiate property acquisition process. Attached is a copy of the letters for your reference. Attached also is an easement datasheet on progress of the acquisition for your reference.
- d. Renegotiation of existing contract started but was deferred.
- e. Please refer to the attachment – CTI Engineering Study Report
- f. Please refer to the attachment – Opinion of Costs
- g. During the summer of 2011, TAW was working with CCUD engineer, Bobby Nolan concerning their continual interest in purchasing additional water through the Scruggs Road and Lakeview meter connections. Please refer to the attachment concerning their interest. As demonstrated in the correspondence, it is apparent CCUD is in need of additional sources of water supply to relieve the burden on its raw water springs, parts of which caved in during the severe drought in 2008.

Yes, Tennessee American Water has received low pressure complaints during the peak summer months along Buelah Dr and Roselawn Ave. areas in the East Ridge zone.
- h. Please refer to the attachment.

Lakeview Meter and Proposed Pumping Station

Bobby Nolen

to:

Kate Nartey

07/13/2011 11:59 AM

Cc:

randyt

Show Details

History: This message has been forwarded.

Dear Ms. Nartey:

To further enhance the District's ability to provide additional water from other sources and relieve stress on its spring source, it proposes to install a pumping station at the Lakeview meter connection with Tennessee-American. Based upon modeling using the hydrant flow information dated October 1, 2008, that TN-AM provided for Hydrant H-4617, a pumping station with a capacity of 400 gpm would lower the pressure at the meter about 7 psi (from 118 psi to 111 psi). Yet, the additional 570,000 gallons per day would provide crucial supplemental supply to the District.

Presently, the District's system pressure at the meter is higher than TN-AM's pressure, so operating a pumping station is the only way the District can get significant supply from TN-AM at the Lakeview meter.

I respectfully request that TN-AM would review this proposal and comment on its implementation. Mr. Randy Thomason, the District's operations manager, and I would gladly meet with you to discuss this proposal. Please let me know your thoughts.

Thanks.

Respectfully,

Bobby Nolen

Nolen Engineering Group LLC

P. O. Box 382813

Birmingham, Alabama 35238

ph: (205) 529-3390

e-mail: reepicheep@charter.net

Catoosa Utility District - Scruggs Road Pumping Station

Bobby Nolen

to:

Kate Nartey

06/24/2011 04:21 PM

Cc:

randyt

Show Details

History: This message has been forwarded.

Dear Ms. Nartey:

I appreciate your meeting with me yesterday and providing hydrant test flow data and a sheet of the distribution drawings. The Catoosa Utility District is considering increasing the pumping capacity at its Scruggs Road pumping station by replacing the existing pump with one using the untrimmed size of the existing horizontal split case pump impeller. This would allow the District to use the existing 100 h.p. motors. Please review the attached analysis and let me know Tennessee-American's comments on the District's intentions to increase the pumping station capacity.

The attached table summarizes the pertinent model results showing the effects of increasing the pump capacity. Initial conditions in the model included using the District's present system average demand and placing tank initial water surface elevations at the average low water level. The model included a segment of the TN-AM system to hydrant H-7097 where the hydrant flow test was performed, so the station's suction side conditions reflect the flow test results.

The first data row in the table shows data with the pumping station off to establish base line performance of the other system components. There are also two data sets within the table. One set is for the existing pump, and the other set shows data for the pump with the untrimmed impeller. Each depicts model results for various combinations of tank and pumping station operation. The critical data points are in the second column (TN-AM Res. Press @ H-7097 (psi)) and last column (Scruggs Rd PS (gpm)).

As you see, for the stated conditions, the existing pump's capacity would range from 949 gpm to 1227 gpm. The larger impeller correspondingly would deliver from 1279 gpm to 1510 gpm, or about a 25% increase in capacity. For a "static" pressure of 119 psi at hydrant H-7097, the residual pressure during pump operation under existing conditions would range from 101 psi to 104 psi. If the "static" pressure dropped to 100 psi with the same flow characteristics, the lowest residual pressure would be 89 psi.

For the larger impeller, residual pressures at hydrant H-7097 would range from 92 to 96 psi. For the condition of 100 psi "static" pressure, the lowest residual pressure would be 80 psi.

Please let me know if you have any questions.

Thanks.

Respectfully,

Bobby Nolen

Nolen Engineering Group LLC

P. O. Box 382813

Birmingham, Alabama 35238

ph: (205) 529-3390

e-mail: reepicheep@charter.net



Kate Nartey - Quaye
COPY

CTI Engineers, Inc.
1122 Riverfront Parkway
Chattanooga, TN 37402
Phone 423.267.7613
Fax 423.267.0603
www.ctiengr.com

June 28, 2012

Fincher Real Estate Investors
3570 Keith Street
Cleveland, TN 37312

Subject: Tennessee American Water
Ringgold Road to Scruggs Road Water Line Improvements
Parcel No. 170P A 0018.02
Property Address: 6614 Ringgold Road, East Ridge, TN 37412

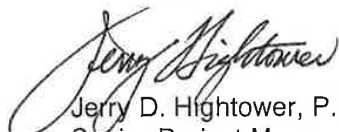
Dear Property Owner:

Tennessee American Water (TAW) retained CTI Engineers, Inc. (CTI) to evaluate possible routes for a new water main which will connect the existing water distribution system on Ringgold Road west of I-24 to a water line on Scruggs Road. This water main will increase capacity and improve water service for the East Ridge and Catoosa County, Georgia areas. Many of you have been contacted in the past during the evaluation of these routes, and we appreciate your input and cooperation.

After thorough evaluation, TAW has identified a preferred route and has asked CTI to contact property owners along this route to discuss the project and the nature of any water line easements that may be needed along the interstate right-of-way and Ringgold Road between McDonald Road and Scruggs Road. Please call Mike Bell at (423) 596-5270 to schedule a meeting within the next two weeks to discuss the project.

Your cooperation is appreciated. If you have any questions, please do not hesitate to contact me at (423) 267-7613.

Sincerely,


Jerry D. Hightower, P.E.
Senior Project Manager

cc: Ms. Kate Nartey-Quaye, P.E.

C08004 TAW Ringgold Rd rev property owner merged ltr.wpd

TAW - SCRUGGS ROAD WATER LINE

WATER LINE EASEMENTS

CTI Project No.

		Sale						Response	Offer	Signed		
Parcel	Sale	Page	Property	Property	Property Owner	Contact Person	Phone	Contact	Letter to	Easement	Easement	Notes
No.	Book	No.	Address	Owner/Owners	Mailing Address		No.	Made	Owner	to TAW	Recorded	Comments
170P A 0018.02	9034	593	6614 Ringgold Road, East Ridge, TN 37412	Fincher Real Estate Investors	3570 Keith Street, Cleveland, TN 37312	Scott Gouch	423-472-9585	yes				Old Wendy's Rest., install along I-75 ROW fence
170 P A 0018	5102	447	6616 Ringgold Road, East Ridge, TN 37412	East Ridge Retirement Investors	3570 Keith Street, Cleveland, TN 37312	Scott Gouch	423-472-9585	yes				Life Care Center, install along I-75 ROW fence
170P A 005	8384	468	6633 Hilton Drive, East Ridge, TN 37412	Justin Clark	6633 Hilton Drive, East Ridge, TN 37412	Justin / Amber Clark	423-894-0811					Residential property, trees, replace buffer, sewer li
1701-C-001	6965	994	6650 Ringgold Road, East Ridge, TN 37412	Priya Partnership	6650 Ringgold Road, East Ridge, TN 37412							Small crossing in rear of property
1701-C-002	9591	427	6700 Ringgold Road, East Ridge, TN 37142	Community National Bank	316 Chickamauga Avenue, Rossville, GA 30741							Motel parking lot replacement
1701-C-003	7063	526	6708 Ringgold Road, East Ridge, TN 37412	PATCO Investments	P.O. Box 22726, Chattanooga, TN 37422							Convenience Store
1701-C-004.02	5883	595	6712 Ringgold Road, East Ridge, TN 37412	PS Tennessee LP, Dept. PT-TN 27902	P.O. Box 25025, Glendale, CA 91201	Carolynn Ruth	818-244-8080, ext. 1410	yes				Public Storage facility, concrete driveway
1701-C-004.01	9613	649	6710 Ringgold Road, East Ridge, TN 37412	HEMDEV Lodging Group	1441 N. Smith Road, Chattanooga, TN 37412							Hotel, landscaping, asphalt entrance, sign
1701-C-004.03	9522	57	6726 Ringgold Road, East Ridge, TN 37412	Clyde Jeffrey Locke/ Edward Cochran	1579 Lafayette Road, Rossville, GA 30741							New fireworks store, new concrete drive
1701-C-004	7231	388	6728 Ringgold Road, East Ridge, TN 37412	Shipp Family Realty LLC	6728 Ringgold Road, East Ridge, TN 37412							Shipp's RV, slope issues, fence, utilites
1701-C-007	2962	751	6750 Ringgold Road, East Ridge, TN 37412	Community Baptist Church	6750 Ringgold Road, East Ridge, TN 37412	Milton	423855-1767	yes				Existing water line, colonial pipeline crossing
1701-C-008.1	6158	497	421 Scruggs Road, Chattanooga, TN 37412	Heritage Hosiery Inc.	421 Scruggs Road, Chattanooga, TN 37412							Lots of existing utilities, drainage ditch

Parcel Number	Property Address	Easement Required	Property owner Name or Contact Person	Contact Person Phone Number
	200 Edison Dr.		Charles Crowley	
	201 Edison Dr.		Feagan	
	168 Edison Dr.		Landon Strickland	
	124 Edison Dr.			
	88 Edison Dr.		Kirk Anderson	
	82 Edison Dr.		Ann Lyons	
	173 Edison Dr.			
	129 Edison Dr			
	83 Edison Dr		Greene	
	61 Edison Dr		Walter Sheldon	
	2729 Cloud Springs Rd.		Robbie Christian	
	222 Clara Lee Dr.		W L Blevins	
	202 Clara Lee Dr.		Scoggins	
	186 Clara Lee Dr.		Dale Shiveley	
	168 Clara Lee Dr.			
	150 Clara Lee Dr			
	132 Clara Lee Dr.		Randall L. Gilbert	
	114 Clara Lee Dr.			
	94 Clara Lee Dr.			
	76 Clara Lee Dr.			
	54 Clara Lee Dr.			
	36 Clara Lee Dr.		Knight	
	221 Clara Lee Dr.		Shericki	
	191 Clara Lee Dr.		Moody	
	161 Clara Lee Dr.		Tim/Genia Shaver	
11C-031	147 Clara Lee Dr.	1	Milton B. Quarles	
11C-032	129 Clara Lee Drive	1	Grover L. & Etheline Verhine	
11C-033	109 Clara Lee Dr.		Allen K. & Michelle Ann Broom	
11C-034	91 Clara Lee Dr.		Annette Delaney	
11C-035	73 Clara Lee Dr.	1	John R. & Joan S. Eldridge	
11C-037	35 Clara Lee Dr.	1	Sueni Jean & Cornelius D. Sanders	
	222 Roy Dr.		Eugene Bradford	
	185 Roy		Vicky Young	
	134 Roy Lane			
	112 Roy Lane		Helen Green	
	96 Roy Lane			
	74 Roy Lane			
	9 Roy Lane			
11C-040	36 Roy Lane		Linda P. Thrower	
	45 Roy Lane		Usery	
11C-052	95 Roy Lane		Doris L. Pickens	
	121 Roy Lane		James Lee	
	243 Ann Dr.		Kenneth Lockhart	
	53 Ann Dr.		Janice Goff	
	42 Ann Dr.			
	41 Elizabeth Dr.			
	394 Elizabeth Dr.		Bobby Riddle	
	397 Elizabeth Dr.		Leon Gibson	

	201 Lillian Dr.		Raymond Nix	
	183 Lillian Dr.			
	163 Lillian Dr.			
	145 Lillian Dr.		Larry Burrows	
	129 Lillian Dr.			
	111 Lillian Dr.		Anthony Richardson	
	87 Lillian Dr.			
	69 Lillian Dr.			
	49 Lillian Dr.			
	222 Lillian Dr.		James Costlow	
	202 Lillian Dr.		Ron Langford	
	182 Lillian Dr.		Walker	
	162 Lillian Dr.			
	144 Lillian Dr.			
	124 Lillian Dr.		Larry Vanfossen	
	108 Lillian Dr.		Rebecca Long	
	92 Lillian Dr.			
	72 Lillian Dr.			
	52 Lillian Dr.		Grady Hodge	
	30 Lillian Dr.		James Lowery	
	365 North Ave.		Tom Carter	
	363 North Ave.			
	331 North Ave.		Houston Baker	
	307 North Ave.		Houston Baker	
	215 North Ave.		Houston Baker	
	Flag Lot		Houston Baker	
	391 Sutton Ave.			
	363 Sutton Ave.		Debbie Bumloy	
	345 Sutton Ave.			
	311 Sutton Ave.			
	271 Sutton Ave.		James E Blackburn	
	240 Sutton Ave.		James E Blackburn	
	237 Sutton Ave.		Kenneth Stewart	
	193 Sutton Ave.			
	149 Sutton Ave.		Tim Harrison	
	51 Sutton Ave.		Betty Shropshire	
	116 Sutton Ave.		Amber Wright	
	146 Sutton Ave.		Rhonda Editt	
11C-74	208 Sutton Ave.	1	James T. Hayes	
	294 Sutton Ave.			
	320 Sutton Ave.			
	48 Terri Lane			
	31 Terri Lane		Elizabeth Brinck	
	34 Terri Lane			
	18 Terri Lane			
11C-75B	107 Jimmie Lane	1	Edward & Elizabeth Hayes	
11C-75A	69 Jimmie Lane	1	James Hayes	
11C-75	31 Jimmie Lane	1	Jimmie Lou Wooden & Lloyd E. Hayes	
11C-71	271 Sutton Ave.		Jesse John Blackburn	
11C-72A	58 Adams Run Lane		Jesse J. & Susan A. Blackburn	
11C-72C	271 Sutton Ave.	1	Jessie John Blackburn	

11C-72	194 Adams Run Lane	1	Darrell & Donna C. Owens	
11C-72B	176 Adams Run Lane	1	Doris E. Owens	
11A-71	792 Mack Smith Rd.		Ronald E. & Charlotte Ann Flannigan	
11A-72	766 Mack Smith Rd.	1	Rick & Linda Sigette	
11A-70	Mack Smith Road		Charles K. Defoor, Sr.	
	2424 Mack Smith Rd.			
	89 Susan Lane		Ailey Bates	
	66 Susan Lane			
	46 Susan Lane			
	18 Susan Lane			
	549 Mack Smith Rd.		Carl Whitesel	
	533 Mack Smith Rd.		John Capps	
	463 Mack Smith Rd.			
	407 Mack Smith Rd.		Kim Erwin	
	383 Mack Smith Rd.		Kim Erwin	
	? Mack Smith Rd.		Kim Erwin	
	219 Mack Smith Rd.		Larry Hendrix	
	123 Mack Smith Rd.		Ronald Vann	
	95 Mack Smith Rd.			
	70 Mack Smith Rd.		Lila Davis	
	48 Mack Smith Rd.		Phil Davis	
	64 Mack Smith Rd.		Bowers	
11C-96	67 Mack Smith Road		Harold F. & Evelyn C. Keith	
	90 Mack Smith Rd.		Janet Ray	
	104 Mack Smith Rd.			
	132 Mack Smith Rd.		Catoosa County Storage	
	148 Mack Smith Rd.		Jim Gant	
	166 Mack Smith Rd.			
11C-001 lot 1	184 Mack Smith Rd.		Paul S., JR. & Joy G. Caylor	
	432 Mack Smith Rd.		Temple of Praise	
	? Mack Smith Rd.			
	510 Mack Smith Rd.			
	574 Mack Smith Rd.			
	602 Mack Smith Rd.		Kelly Street	
	604 Mack Smith Rd.		Harold McCormick	
	686 Mack Smith Rd.		William Sisk	
	No Number Mack Smith Rd.			
	2221 Cloud Springs Rd		Al Smith	
	2237 Cloud Springs Rd		Mary Smith	
11C-90	2267 Cloud Springs Rd		Randy & Annette Yates	
	2100 Cloud Springs Rd			
11C-91	2281 Cloud Springs Road		James W. Blaylock	
	2329 Cloud Springs Rd		Kenneth Fowler	
	2327 Cloud Springs Rd		Kenneth Fowler	
	2403 Cloud Springs Rd		Keith Mann	
	2443 Cloud Springs Rd		Gentry	
	2445 Cloud Springs Rd		Gentry	
	2497 Cloud Springs Rd		Freddie Payne	
	2501 Cloud Springs Rd		Freddie Payne	

	2505 Cloud Springs Rd		Freddie Payne	
	2513 Cloud Springs Rd		Freddie Payne	
	2517 Cloud Springs Rd		Freddie Payne	
	2519 Cloud Springs Rd		Freddie Payne	
	2521 Cloud Springs Rd		Freddie Payne	
	2525 Cloud Springs Rd		Freddie Payne	
	2547 Cloud Springs Rd		Freddie Payne	
	30 Zackery Lane		Freddie Payne	
	36 Zackery Lane		Freddie Payne	
	38 Zackery Lane		Freddie Payne	
	40 Zackery Lane		Freddie Payne	
	42 Zackery Lane		Freddie Payne	
	44 Zackery Lane		Freddie Payne	
	46 Zackery Lane		Freddie Payne	
	48 Zackery Lane		Freddie Payne	
	50 Zackery Lane		Freddie Payne	

TENNESSEE AMERICAN WATER

CATOOSA UTILITY DISTRICT SERVICE IMPROVEMENT STUDY



CONSOLIDATED TECHNOLOGIES, INC.
ENGINEERS IN WATER AND EARTH SCIENCES



MONDAY MORNING
PICK UP 7/18/11

CTI Engineers, Inc.
1122 Riverfront Parkway
Chattanooga, TN 37402
Phone 423.267.7613
Fax 423.267.0603
www.ctiengr.com

LETTER OF TRANSMITTAL

TO: KATE NARTEY
TENNESSEE AMERICAN WATER

Date: <u>7/18/11</u>	Account No. <u>CD5009-12</u>
Attention: <u>KATE NARTEY</u>	
Regarding: <u>CATOOSA Util. District</u> <u>SERVICE Imp. Study</u>	

WE ARE SENDING YOU ☒ Attached ☐ Under Separate Cover Via _____
☒ Report(s) ☐ Drawings ☐ Contracts ☐ Shop Drawings ☐ Specifications
☐ Copy of Letter ☐ Change Order ☐ Forms ☐ _____

Copies	Description
<u>1</u>	<u>CATOOSA SERVICE IMPROVEMENT STUDY</u>
<u>1</u>	<u>" " " " " REPORT REVISIONS</u>
	<u>AND ADDITIONS</u>

THESE ARE TRANSMITTED ☐ Sign, Date, Return ☐ Reviewed
☐ For Your Approval ☐ Sign, Date, Forward ☐ Exceptions as Noted
☒ As Requested ☐ For Review, Comment ☐ Revise and Resubmit
☒ For Your Information ☒ For Your Use ☐ Rejected

REMARKS

COPY TO: FILE, JDH

SIGNED JERRY Hightower, P.E.
SENIOR PROJECT Mgr. (BY EDP)

IF ENCLOSURES ARE NOT AS NOTED, PLEASE NOTIFY US AT ONCE!

**CATOOSA UTILITY DISTRICT
SERVICE IMPROVEMENT STUDY**

Tennessee American Water

Prepared by:

CONSOLIDATED TECHNOLOGIES, INC.
Engineers in Water and Earth Sciences
Chattanooga, Tennessee
CTI Project No. C05009-12

October 2007

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BACKGROUND

The following information was obtained from the Owner's RFP for the project:

The Catoosa County Water District approached Tennessee American Water (TAW) about entering into a bulk water sales agreement, which will increase their demand from their current purchase amount from TAW. Historically, Catoosa Co. has purchased an annual average of approximately 0.80 MGD. Recently per Catoosa Co.'s request for an increase in supply, TAW began to sell approximately 2.5 MGD to Catoosa Co, which they observe is their current maximum capacity. The requested additional demands are for up to 5 mgd within 3 years, up to 7 mgd within 7-10 years, and ultimately 10 MGD beyond 10 years. Prior to supplying additional service to Catoosa County, it is necessary to evaluate TAW's current capacity.

SCOPE OF STUDY

The following items were evaluated utilizing the hydraulic model developed by CTI for TAW to confirm that the Citico high service pumps and the distribution system have sufficient capacity to meet the increased demands:

- High Service Capacity at Citico WTP
- Distribution System Capacity
 - Identify affected pressure zones.
 - Identify Booster Stations that contribute to supply to Catoosa.
 - Identify Booster Stations that are affected on suction side by additional demand.
 - Evaluate system capacity to Catoosa County.
 - Evaluate benefits of additional storage as part of an economical solution for meeting supply needs.
 - Determine improvements required to meet the Catoosa UD demand and system demand [see section entitled "Demand Rates"].

TAW requested that the following potential improvements be considered, along with other cost-effective solutions, to provide more capacity for Catoosa County:

- Increase pumping operations at existing Citico, New York booster, and East Ridge booster.
- Increase capacity and expand East Ridge booster station.
- Increase capacity and expand New York booster station.
- Connect 12-inch segments along Ringgold Road, Frawley Road, and Gunbarrel Road with 16-inch or larger.
- Provide new large main to route from East Ridge booster to Scruggs Road meter location.
- Provide new large main to route from East Ridge booster to Rossville booster to Chickamauga Avenue meter location.
- Provide storage tank near Catoosa County.

TAW provided the following guidelines governing the modeling for all demand scenarios:

- The model developed for the IDSE requirements shall be used as a basis for these simulations.
- Base demands within the model shall be increased by a global demand factor to account for the maximum day demand in August 2006, and this maximum day shall be used for all scenarios.
- EPS simulations shall be conducted for each demand scenario to assess tank fluctuation and system pressures.
- Compare tank behaviors, specifically in Missionary Ridge, East Ridge, Rossville, and Ryall Springs pressure zones including the new Jenkins Road tank.
- Compare booster station behaviors in Missionary Ridge, East Ridge, Rossville, and Ryall Springs pressure zones.
- Compare Max/Min pressures in Missionary Ridge, East Ridge, Rossville, and Ryall Springs pressure zones.
- Check Min pressures at pressure-sensitive areas such as: Beulah Dr near Camp Jordan, Roselawn Dr, Skyline Dr at Igou Gap Rd, and Ryall Springs Booster suction.

- Minimum pressures to be maintained at the Catoosa Co connection points are the following: 40 psi at Scruggs Rd, 70 psi at Ringgold Rd and 100 psi at Lakeview Dr.
- Check fire flow capacity in lowest pressure areas.

Demand rates (discussed below) were used in the hydraulic model in order to determine the improvements to the TAW system needed to achieve the desired level of service. The necessary improvements were identified and prioritized, and an opinion of project cost for these measures was then prepared. Phase 1 improvements are needed immediately to meet Catoosa's demand of 4.5 mgd. Phase 2 will be needed when Catoosa's demand approaches 6 mgd (approximately 2009) and Phase 3 improvements are expected when Catoosa's demand reaches 9.0 mgd ($\approx$ 2012).

CUSTOMER DEMAND RATES UTILIZED IN STUDY

The following demand rates served as the basis of the hydraulic analyses performed for this study. These rates were developed from the TAW "Request for Proposal" and from discussions (email, phone conversations, etc.) with TAW personnel.

Phase 1 (Immediate Catoosa demand = 4.5 MGD):

TAW total system demand = 54.826 MGD:

This demand number is based on a 2007 TAW peak demand of 52.0 mgd, which includes the 1.674 mgd actually used at Catoosa in 2007, plus the additional amount needed to achieve a desired total Catoosa demand of 4.5 mgd ($52.0 + (4.5 - 1.674) = 54.826$ mgd). The desired distribution of Catoosa's demand is:

1. 2.5 mgd at Scruggs Road at 76 psi
2. 1.0 mgd at Lakeview Road
3. 1.0 mgd at Chickamauga (Cloud Springs)

Phase 2 (2009 Catoosa demand = 6.0 mgd):

TAW total system demand = $56.17 + (6.0 - 1.0) = 61.17$ mgd. 1.0 MGD Catoosa UD demand was apparently used in previous TAW planning studies and is, therefore, used in this study. The desired distribution of Catoosa's demand is:

1. 4.0 mgd at Scruggs Road at 76 psi

2. 1.0 mgd at Lakeview Road
3. 1.0 mgd at Chickamauga (Cloud Springs)

Phase 3 (2012 Catoosa demand = 9.0 mgd):

TAW base demand = $56.72 + (9 - 1.0) = 64.72$ mgd

The desired distribution of Catoosa demand is:

1. 7.0 mgd at Scruggs Road at 76 psi
2. 1.0 mgd at Lakeview Road
3. 1.0 mgd at Chickamauga (Cloud Springs)

Determination of Demand by Phase in the TAW System and East Ridge Pressure Zone

The baseline demand in the model which was developed by CTI for TAW for use in EPA IDSE compliance was 43.0 mgd, which was the average total TAW demand in August 2006. In order to utilize the hydraulic model and the projected demands, it was necessary to expand the desired demands from the baseline demand used in the hydraulic model by developing a "global factor for demand adjustment" for each demand phase (see Table 1). The average demand in each major pressure zone during August 2006, including the East Ridge zone, is shown in Table 2. The demand in the East Ridge zone was projected by using the global factor for demand adjustment calculated for the entire TAW system, and then multiplying that factor by the average East Ridge demand in the model. Lastly, the additional planning demand for Catoosa UD was added, as shown in Table 1.

These calculations were useful in checking the model to verify that the desired demand was input into the model while verifying the performance of the various improvements. It should be noted, however, that the global factors are approximate and provide only a starting place for adjustment to obtain more exact results.

TABLE 1

**TAW Catoosa Utility District Service Improvements Study
East Ridge Pressure Zone Demand Calculations**

Approximate Global Factor Calculation for Hydraulic Model for Total System Demand

	TAW Base Demand* (mgd)	Global Factor for Demand Adjustment
Average Demand in August 2006	43.000	1.000
Phase 1 Demand: Peak Day in 2007	52.000	1.209
Phase 2 Demand: Peak Day in 2009	56.170	1.306
Phase 3 Demand: Peak Day in 2012	56.720	1.319

* Not including additional Catoosa UD demand

East Ridge Pressure Zone Demand Calculations

	Base ER Demand	Base Catoosa Demand (mgd)	Global Factor for Demand Adjustment	East Ridge PZ Demand (mgd)	Additional Catoosa Demand (mgd)	Total ER Demand (mgd)
Average Demand in August 2006	12.000	1.000	1.000	12.000	0.000	12.000
Phase 1 Demand: Peak Day in 2007	12.000	1.674	1.209	14.512	2.826	17.338
Phase 2 Demand: Peak Day in 2009	12.000	1.000	1.306	15.675	5.000	20.675
Phase 3 Demand: Peak Day in 2012	12.000	1.000	1.319	15.829	8.000	23.829

STATIC AND RESIDUAL PRESSURE TESTING

Concurrent with the development of the desired demands and global factors to be used in the model, testing of static and residual pressures was performed in the TAW system near the key Catoosa UD meters on Scruggs Road where most of the future Catoosa demand is desired. Three locations were selected for testing:

1. Ringgold Road and Scruggs Road intersection.
2. Ringgold Road and Mack Smith Road intersection.
3. Brainerd Road near the East Brainerd Road intersection.

Fire flow testing was performed by TAW and CTI personnel. Additionally, electronic pressure recorders were placed at key locations in the general vicinity of the fire flow tests in order to verify that the static and residual pressures recorded in those areas were similar to results predicted by the hydraulic model. In general, the results found were reasonably close to those predicted by the model, when taking into account that system demands, tank levels, and operational conditions had to be adjusted for the actual conditions found in the TAW system on that day. Therefore, no additional calibration of the model was necessary for purposes of this report. The results of the testing are provided in Appendix C.

RECENT OR CURRENTLY PROPOSED PIPING IMPROVEMENTS

Based on instructions by TAW personnel, the following distribution piping improvements which were recently installed or will soon be installed were assumed to be in place for the purposes of this study:

1. Frawley Road - 12-inch DIP from Ringgold Road to Martha Avenue.
2. Tyner Road - 16-inch DIP from Lee Highway to existing 16-inch in Hickory Valley Road.
3. East Brainerd Road - 16-inch DIP from Brainerd Road to Vance Road.

STUDY FINDINGS

Following the development of the desired demands and global factors to be used in the model and verification of the suitability of the model for the study, the model was run under numerous scenarios in order to determine what improvements to the TAW system, particularly distribution lines, pumps, and tanks, are needed in order to achieve the previously stated goals.

The spreadsheet found in Appendix B entitled "Comparison of Performance of Improvements Projects for Various Demands" lists the findings of 19 different scenarios of various system

demands and system improvements that were studied in order to determine recommendations for each phase. In addition to the results listed in the spreadsheet, another 20+ scenarios were examined, in which details were varied such as piping configurations, pump controls, tank levels, which pumps were operating, and for how long, etc. The results of the scenario configurations which did not provide satisfactory (or at least marginal) service were not reported.

Results of the study include the following:

General Findings

1. The most significant finding is the importance of the difference in the operating HGL of the East Ridge Pump Station (ER PS) and Reservoir compared to that of the New York Avenue Pumping Station (NY PS). The NY PS appears to be operating at a 54-foot higher HGL with the ER PS on, versus a 72-foot higher HGL with the ER PS off.
2. In our opinion, this difference in HGL is causing an underutilization of the ER PS and the 16-inch line that ties the station into a 12-inch line in Brainerd Road.
3. The fact that the ER PS is operating based on the ER Reservoir levels affects utilization of the ER pumps as well.
4. The HGL difference between the ER PS and NY PS explains why NY PS is not only attempting to fill the Jenkins Road tank, but also supply water to Catoosa Utility District. In other words, the HGL of the East Ridge pressure zone slopes from north to south.
5. According to SCADA and hydraulic model information, the NY PS currently pumps approximately 57 percent of the flow to the East Ridge pressure zone, while East Ridge pumps approximately 43 percent of the flow. However, the NY PS has three pumps rated at 3.0, 4.0, and 6.0 mgd, for a total rated capacity (not considering redundancy) of 13.1 mgd, whereas ER PS has four pumps rated at 3.0, 4.3, 4.5, and 4.5 mgd for a total rated capacity of 16.4 mgd. Theoretically ER PS should be pumping 55.6 percent of the flow and NY PS should be pumping 44.4 percent of the flow. Therefore, the current utilization of these two stations is almost exactly reversed from what it should be. It is recommended that the ER PS be upgraded to provide more flow at a higher HGL, which will also better balance the distribution of water in this pressure zone.

6. Very early in the study, it became evident that in order to deliver higher flows to the Catoosa UD Scruggs Road meters, the distribution lines following Ringgold Road would need to be significantly upgraded. Phase 3 demand rates indicate that a 20-inch DIP line will be necessary, although for the purpose of meeting the Phase 1 demand, a 16-inch DIP across I-75 from Ringgold Road to Scruggs Road would be sufficient. It would be logical to size the line for the Phase 3 demands by installing a parallel 20-inch line from near the East Ridge pumping station to the Scruggs Road meter box.
7. The average demand for the East Ridge pressure zone in August 2006 was 12.0 mgd, while the future projected demand for this zone is 23.8 mgd with the additional Catoosa UD demand. The current average storage in the zone, including the East Ridge Reservoir, East Brainerd, and Jenkins Road, is only 2.8 mg; and the Jenkins Road storage is not currently being fully utilized.

Additional storage is needed for stabilizing pressures in certain parts of the zone:

- a. Current East Ridge Reservoir Site - 2 mg ground storage.
- b. Current East Brainerd Tank Site - 2 mg ground storage plus new pumping station.
- c. Beulah Road Area of East Ridge - 2 mg tank.

All three storage projects improved the consistency of service (pressure), but were not found to be essential to providing the minimum demand in each phase. The elevated tank had difficulty filling and being useful until all of the recommended distribution line improvements and the upgrade of the East Ridge pumping station were in place. Several overflow elevations for the elevated tank were examined; it finally performed satisfactorily at an overflow elevation equal to that of the Jenkins Road tank. The Jenkins Road tank began to perform adequately with the upgrade of the East Ridge pumping station.

8. New York Pumping Station - If the ER PS is upgraded as recommended, then no improvements to the NY PS will be required to achieve the goals of this study.
9. Citico High Service Pumping - The Citico WTP high service pumps were a very important consideration during this study. The pumps required to supply the total TAW system demand in each phase of the study were closely monitored and adjusted as needed. Following is a list of the existing high service pumps at Citico WTP.

Pump No.	Capacity (gpm)	Capacity (mgd)
11	14,236	20.48
16	9,028	13.00
17	9,028	13.00
18	5,972	8.59
19	5,972	8.59
20	3,888	5.59
21	10,000	14.39

The pumps currently used on an average day are Nos. 11, 16, 19. The same pumps plus No. 20 are used on peak days.

- Pumps Required for Phase 1 Demand: 11, 16, 19, and 20, all running continuously.
- Pumps Required for Phase 2 Demand: 11, 16, 17, 19, 21 running continuously, plus No. 20 running on Mission Ridge Tank controls.
- Pumps Required for Phase 3 Demand: 11, 16, 17, 19, 20, 21, all running continuously.

For reliability purposes, it is recommended that some of the smaller pumps be replaced with larger ones with VFD's at about the time that the Phase 2 demand is needed.

10. The scope for this study included the evaluation of the system's ability to provide fire flow for each phase of demand. The following results were obtained when the recommended improvements were included in the model:

Fire Flow Results - Phase 1: Using 500 gpm

@ Skyline → 41.6 psi static, 33.6 psi residual

@ Ryall Springs Suction → 55.1 psi static, 40.0 psi residual (with pump on @ Ryall Springs)

@ Roselawn/Marijon → 46.2 psi/38.3 psi static, 40.5 psi/30.3 psi residual

@ Beulah → 37.0 psi static, 23.3 psi residual

Fire Flow Results - Phase 2: Using 500 gpm

@ Skyline → 39.2 psi static, 33.4 psi residual

@ Ryall Springs Suction → 52.5 psi static, 39.2 psi residual (with pump on @ Ryall Springs)

@ Roselawn/Marijon → 40.1 psi/31.6 psi static, 38.3 psi/27.3 psi residual

@ Beulah → 37.6 psi static, 26.0 psi residual

Fire Flow Results - Phase 3: Using 500 gpm

@ Skyline → 43.5 psi static, 38.5 psi residual

@ Ryall Springs Suction → 59.1 psi static, 46.0 psi residual (with pump on)

@ Roselawn/Marijon → 41.1 psi/32.2 psi static, 39.5 psi/28.1 psi residual (with fire flow at Marijon)

@ Beulah → 57.9 psi static, 52.0 psi residual

The following is a summary list of improvement projects considered in this study

(Note: The priority of the improvements is not as listed below)

Project No.	Description	Construction Cost	Project Cost
1	New Line from Ringgold Road to Scruggs Road Meter 5,933 feet of 20-inch DIP	\$1,520,000	\$1,760,000
2	New Line from Brainerd Road to Frawley Road 12,345 feet of 20-inch DIP	\$2,250,000	\$2,540,000
3	New Line from Upper Ringgold Road to McBrien Road 14,250 feet of 20-inch DIP 2,027 feet of 16-inch DIP 560 feet of 12-inch DIP	\$2,630,000	\$2,940,000
4	New Ground Storage Tank and Pumping Station at East Brainerd Site 2-MG tank, new prefab pump station	\$1,980,000	\$2,270,000
5	New Ground Storage Reservoir at East Ridge Reservoir Site 2-MG tank, retaining wall, road on existing TAW site	\$1,470,000	\$1,650,000
6	New Line at Ringgold Road from McBrien Road to McDonald Road 8,650 feet of 20-inch DIP	\$1,580,000	\$1,810,000
7	East Ridge Reservoir Altitude Valve (If Project is Done Separately from New Tank)	\$170,000	\$220,000

8	New Elevated Storage Tank in East Ridge 2.0-MG elevated tank	\$3,260,000	\$3,620,000
9	East Ridge Pump Station Upgrade 2,900 feet of 20-inch DIP	\$720,000	\$820,000

RECOMMENDATIONS

Recommendations are listed below in order of priority:

Phase 1

1. The improvements that should be considered first are the installation of an altitude valve at the East Ridge Reservoir (\$220,000, see Opinion of Costs in Appendix A) and the revision of controls for the ER PS. Controls should be changed to pressure switches with Citico WTP operator override capability. The model shows that these improvements provide only a minor increase in pressure (6 psi) near the Scruggs Road meter under average demands; however, in our opinion, they are important for delivering additional flow from the ER PS when demand is higher. With this improvement, model shows that the new Jenkins Road tank begins to be utilized. This indicates that the ER PS is also starting to send some flow toward Hamilton Place.
2. The second most important improvement, in our opinion, is the 16- or 20-inch line from Ringgold Road across I-75 to the Scruggs Road meter (\$1,400,000 for 16 inches or \$1,690,000 for 20 inches, see Opinion of Costs). Although a 16-inch DIP for this project provides adequate service for Phase 1, a 20-inch DIP is needed to supply Phase 3. Therefore, the 20-inch is recommended. This line alone should increase the pressure at the Scruggs Road meter by over 40 psi at a 2.5-mgd flow rate to that metering station.

Phase 2

1. Upgrade East Ridge Pumping Station with three larger pumps and VFD's. Install a 20-inch line to connect an existing 20-inch line and the East Ridge Reservoir. This project greatly improves the overall operation of the East Ridge pressure zone. The opinion of cost is \$720,000 for construction and \$820,000 for the total project. Additional costs for the pump station upgrade will likely be required, including a building extension and electrical service upgrade.

More information about the existing pump station is required to provide a more complete opinion of cost for this project.

2. Install a new 20-inch DIP (14,250 feet) from the East Ridge Reservoir to McBrien Road. Install 16-inch and 12-inch DIP on side streets to improve overall distribution.

Phase 3

1. Install a new 20-inch DIP from McBrien Road to McDonald Drive to complete the 20-inch line from the East Ridge Reservoir to the Scruggs Road meters. This project reduces the pipe friction energy loss sufficiently to provide the additional demand required.

The following is a summary of the recommended improvements by phase.

Project No.	Description	Construction Cost	Project Cost
First Demand Phase: TAW Total Demand: 54.826 MGD, Catoosa UD Demand: 4.5 MGD			
1	New Line from Ringgold Road to Scruggs Road Meter 5,933 feet of 20-inch DIP	\$1,520,000	\$1,760,000
7	East Ridge Reservoir Altitude Valve (If Project is Done Separately from New Tank)	\$170,000	\$220,000
Second Demand Phase: TAW Total Demand: 61.17 MGD, Catoosa UD Demand: 6.0 MGD			
3	New Line from Upper Ringgold Road to McBrien Road 14,250 feet of 20-inch DIP 2,027 feet of 16-inch DIP 560 feet of 12-inch DIP	\$2,630,000	\$2,940,000
9	East Ridge Pump Station Upgrade (Pumps and VFD's only); plus 2900 feet of 20-inch DIP to E. Ridge Reservoir	\$720,000	\$820,000
Third Demand Phase: TAW Total Demand: 64.72 MGD, Catoosa UD Demand: 9.0 MGD			
6	New Line at Ringgold Road from McBrien Road to McDonald Road	\$1,580,000	\$1,810,000

APPENDIX A
Opinion of Cost

**OPINION OF COSTS FOR TAW SYSTEM IMPROVEMENTS OF
SERVICE TO CATOOSA UTILITY DISTRICT
NEW LINE FROM RINGGOLD ROAD TO SCRUGGS ROAD METER**

Item No.	Description	Unit	No. of Units	Unit Price	Item Total
	Mobilization and Bonding	LS	1	\$2,500.00	\$2,500.00
	Traffic Control	LS	1	\$5,000.00	\$5,000.00
02200a	Crushed Stone Backfill in Trench	LF	540	\$7.65	\$4,131.00
02200d	Final Grading and Cleanup	LF	4,373	\$1.55	\$6,778.15
2270	Temporary Silt Fence	LF	4,373	\$1.50	\$6,559.50
2280	Crossing of West Chickamauga Creek by Directional Bore (20")	LF	350	\$1,094.00	\$382,900.00
02280a	Crossing of West Chickamauga Creek by Directional Bore (16")	LF	350	\$75.00	\$26,250.00
	Installation of 16" DIP in Directional Bore				
02280a	Crossing of Interstate 75 By Bore and Jack (20" Carrier Pipe plus 24" Casing Pipe)	LF	450	\$500.00	\$225,000.00
02280c	Seeding and Mulch	LF	4,373	\$1.10	\$4,810.30
2500	8-Inch Class A Concrete for Roadways	LF	80	\$33.35	\$2,668.00
02500a	4-Inch Type B Modified Asphalt Binder in Driveways	LF	461	\$14.90	\$6,868.90
15062a-20	20-Inch DI Pipe, Pressure Class 350	LF	5,133	\$125.00	\$641,625.00
15062a-16	DI Fittings	LB	2,860	\$2.95	\$8,437.00
15062c	20-Inch DI Pipe Restrained Joints at MJ Fittings	EA	6	\$225.00	\$1,350.00
15062d-20	20-Inch DI Pipe Restrained Joints at Bell Joints	EA	12	\$375.00	\$4,500.00
15062	Connect New 20" to Existing 12"	EA	2	\$16,870.00	\$33,740.00
15101	20-Inch Butterfly Valve, Including Valve Box	EA	4	\$2,893.00	\$11,572.00
15109	Install New Fire Hydrant Assembly	EA	1	\$3,103.30	\$3,103.30
	SUBTOTAL CONSTRUCTION COSTS				\$1,377,793
	CONSTRUCTION CONTINGENCIES (10%)				\$142,207
	TOTAL CONSTRUCTION COSTS				\$1,520,000
OTHER PROJECT COSTS					
	ENGINEERING				
	Design			\$64,798	
	Bid Services			\$9,257	
	Construction Phase Services			\$13,885	
	Record Drawings			\$4,628	
	Engineering Subtotal				\$92,568
	RPR (16 weeks Construction)				\$32,000
	Surveys				\$7,000
	Easements - Drawings & Document Preparation				\$10,000
	Easement Acquisition				\$40,000
	Army Corps/TVA permit				\$3,500
	TDOT Permit				\$2,500
	Storm Water Permit				\$2,500
	Geotechnical Report				\$4,000
	Construction Testing				\$2,000
	SUBTOTAL ENGINEERING				\$196,068
	PLAN REVIEW & ADVERTISEMENTS				\$1,000
	SUBTOTAL PROJECT COSTS				\$1,717,068
	PROJECT CONTINGENCIES (2%)				\$42,932
	TOTAL PROJECT COSTS				\$1,760,000

Source: Consolidated Technologies Inc.

OPINION OF COSTS FOR TAW SYSTEM IMPROVEMENTS OF SERVICE TO CATOOSA UTILITY DISTRICT NEW LINE FROM BRAINERD ROAD TO FRAWLEY ROAD					
Item No.	Description	Unit	No. of Units	Unit Price	Item Total
	Mobilization and Bonding	LS	1	\$2,500.00	\$2,500.00
	Traffic Control	LS	1	\$5,000.00	\$5,000.00
02200a	Crushed Stone Backfill	LF	788	\$7.65	\$6,028.20
02200d	Final Grading and Cleanup	LF	8,895	\$1.55	\$13,787.25
02270a	Temporary Silt Fence	LF	1,500	\$1.50	\$2,250.00
02270b	Straw Bales	EA	25	\$10.80	\$270.00
02280a	Crossing of S. Chickamauga Creek by Directional Bore(20")	LF	300	\$1,094.00	\$328,200.00
	20" DIP Installed in Directional Bore	LF	300	\$75.00	\$22,500.00
02280c	Crossing of Lee Highway By Bore and Jack(20" Carrier Pipe plus 24" Casing Pipe and Spacers)	LF	160	\$500.00	\$80,000.00
2485	Seeding and Mulch	LF	6,694	\$1.10	\$7,363.40
2485a	Replacement Sod for Brown Acres Golf Course	LF	2,201	\$2.66	\$5,854.66
02500a	8-Inch Class A Concrete for Roadways	LF	100	\$33.35	\$3,335.00
02500a	4-Inch Type B Modified Asphalt Binder in Driveways	LF	688	\$14.90	\$10,251.20
03300b	Class B Concrete	CY	10	\$132.85	\$1,328.50
15062a-16	20-Inch DI Pipe, Pressure Class 350	LF	11,885	\$125.00	\$1,485,625.00
15062b	DI Fittings	LB	3,000	\$2.95	\$8,850.00
15062c-20a	20-Inch DI Pipe Restrained Joints at MJ Fittings	EA	8	\$215.00	\$1,720.00
15062c-16b	20-Inch DI Pipe Restrained Joints at Bell Joints	EA	20	\$375.00	\$7,500.00
15062d-20.16	Connect New 20" to Existing 16"	EA	1	\$18,000.00	\$18,000.00
15062e-12.12	Connect New 20" to Existing 12"	EA	1	\$5,000.00	\$5,000.00
15101a	20-Inch Butterfly Valve	EA	4	\$5,000.00	\$20,000.00
15109a	Install New Fire Hydrant	EA	1	\$3,103.30	\$3,103.30
	SUBTOTAL CONSTRUCTION COSTS				\$2,038,467
	CONSTRUCTION CONTINGENCIES (10%)				\$211,533
	TOTAL CONSTRUCTION COSTS				\$2,250,000
OTHER PROJECT COSTS					
	ENGINEERING				
	Design			\$91,822	
	Bid Services			\$13,117	
	Construction Phase Services			\$19,676	
	Record Drawings			\$6,559	
	Engineering Subtotal				\$131,175
	RPR (16 weeks Construction)				\$32,000
	Surveys				\$10,000
	Easements - Drawings & Document Preparation				\$10,000
	Easements Acquisition				\$40,000
	Army Corp/TVA permit				\$3,500
	TDOT Permit				\$2,500
	Storm Water Permit				\$2,500
	Geotechnical Report				\$4,000
	Construction Testing				\$2,000
	SUBTOTAL ENGINEERING				\$237,675
	PLAN REVIEW & ADVERTISEMENTS				\$1,000
	SUBTOTAL PROJECT COSTS				\$2,488,675
	PROJECT CONTINGENCIES (2%)				\$51,325
	TOTAL PROJECT COSTS				\$2,540,000
Source: Consolidated Technologies Inc.					

**OPINION OF COSTS FOR TAW SYSTEM IMPROVEMENTS OF
SERVICE TO CATOOSA UTILITY DISTRICT
NEW LINE FROM UPPER RINGGOLD ROAD TO McBRIEN ROAD**

Item No.	Description	Unit	No. of Units	Unit Price	Item Total
	Mobilization and Bonding	LS	1	\$2,500.00	\$2,500.00
	Traffic Control	LS	1	\$47,000.00	\$47,000.00
02200a	Crushed Stone Backfill	LF	8,572	\$7.65	\$65,575.80
02200d	Final Grading and Cleanup	LF	13,078	\$1.55	\$20,270.90
2485	Seeding and Mulch	LF	13,078	\$1.10	\$14,385.80
02500a	8-Inch Class A Concrete for Roadways	LF	1,000	\$33.35	\$33,350.00
02500a	4-Inch Type B Modified Asphalt Binder in Driveways, Parking Lots, and Streets	LF	5,000	\$14.90	\$74,500.00
03300b	Class B Concrete	CY	50	\$132.85	\$6,642.50
15062a-20	20-Inch DI Pipe, Pressure Class 350	LF	14,250	\$125.00	\$1,781,250.00
15062a-16	16-Inch DI Pipe, Pressure Class 350	LF	2,027	\$100.00	\$202,700.00
15062a-12	12-Inch DI Pipe, Pressure Class 350	LF	560	\$41.10	\$23,016.00
15062b	DI Fittings	LB	2,000	\$2.95	\$5,900.00
15062c-20a	20-Inch DI Pipe Restrained Joints	EA	17	\$213.00	\$3,621.00
15062c-12a	12-Inch DI Pipe Restrained Joints	EA	4	\$129.05	\$516.20
15062c-20b	20-Inch DI Pipe Restrained Joints	EA	15	\$375.00	\$5,625.00
15062c-12b	12-Inch DI Pipe Restrained Joints	EA	6	\$225.00	\$1,350.00
15062d-16.16	Connect New 20" to Existing 16", Wet Tap	EA	1	\$13,470.00	\$13,470.00
15062d-16.16	Connect New 20" to Existing 12", Wet Tap	EA	1	\$13,470.00	\$13,470.00
15062d-16.16	Connect New 16" to Existing 16", Wet Tap	EA	1	\$13,470.00	\$13,470.00
15062d-16.12	Connect New 16" to Existing 12", Wet Tap	EA	1	\$13,470.00	\$13,470.00
15062e-16.12	Connect New 16" to Existing 12", Wet Tap	EA	2	\$3,400.00	\$6,800.00
15101a	20-Inch Butterfly Valve	EA	3	\$5,000.00	\$15,000.00
15101a	16-Inch Gate Valve	EA	3	\$4,900.00	\$14,700.00
15101b	12-Inch Gate Valve	EA	2	\$1,845.35	\$3,690.70
15109a	Install New Fire Hydrant Assembly	EA	2	\$3,103.30	\$6,206.60
	SUBTOTAL CONSTRUCTION COSTS				\$2,388,480
	CONSTRUCTION CONTINGENCIES (10%)				\$241,519
	TOTAL CONSTRUCTION COSTS				\$2,630,000
OTHER PROJECT COSTS					
	ENGINEERING				
	Design		\$105,121		
	Bid Services		\$15,017		
	Construction Phase Services		\$22,526		
	Record Drawings		\$7,509		
	Engineering Subtotal			\$150,173	
	RPR (16 weeks Construction)			\$32,000	
	Surveys			\$7,000	
	Easements - Drawings & Document Preparation			\$10,000	
	Easements Acquisition			\$40,000	
	TDOT Permit			\$2,500	
	Stormwater Permit			\$2,500	
	Construction Testing			\$1,000	
	SUBTOTAL ENGINEERING				\$245,173
	PLAN REVIEW & ADVERTISEMENTS				\$1,000
	SUBTOTAL PROJECT COSTS				\$2,876,173
	PROJECT CONTINGENCIES (2%)				\$63,827
	TOTAL PROJECT COSTS				\$2,940,000

Source: Consolidated Technologies Inc.

**OPINION OF COSTS FOR TAW SYSTEM IMPROVEMENTS OF
SERVICE TO CATOOSA UTILITY DISTRICT
NEW GROUND STORAGE TANK AND PUMPING STATION AT EAST BRAINERD SITE**

STORAGE TANK

Item No.	Description	Unit	Est. No. of Units	Unit Price	Item Total
1c	2.0-MG Prestressed Concrete Tank and	LS	1	\$755,000.00	\$755,000.00
2	Ductile Iron Piping Installed in Trench	LS	1	\$59,000.00	\$59,000.00
3a	Altitude Valve Box Including Concrete Box, Access	LS	1	\$131,120.00	\$131,120.00
4	Miscellaneous Items	LS	1	\$54,000.00	\$54,000.00
5	Electrical Service	LS	1	\$10,000.00	\$10,000.00
Subtotal Tank Construction Cost					\$1,009,120.00

PUMPING STATION, WATER LINES, AND OTHER ITEMS NEEDED WITH TANK

Item No.	Description	Unit	Est. No. of Units	Unit Price	Item Total
02200a	Crushed Stone Backfill	LF	25	\$15.00	\$375.00
02200b	Crushed Rock or Sand Bedding	CY	50	\$30.00	\$1,500.00
02200c	Final Grading and Cleanup	LF	500	\$1.00	\$500.00
02270a	Temporary Silt Fence	LF	200	\$3.00	\$600.00
02270b	Straw Bales	EA	10	\$6.00	\$60.00
2485	Seeding and Mulch	LF	500	\$0.75	\$375.00
02930a	Riprap	CY	10	\$36.00	\$360.00
3300	Cast-In-Place Concrete	CY	5	\$150.00	\$750.00
11000	Prefab. Booster Pump Station (incl concrete slab)	LS	1	\$600,000.00	\$600,000.00
	Generator for New Pump Station	LS	1	\$160,000.00	\$160,000.00
15062a	Ductile Iron (DI) Fittings	LB	1,000	\$2.00	\$2,000.00
15062b-20	20-Inch DI Pipe (Pressure Class 350)	LF	100	\$100.00	\$10,000.00
15062b-20	20-Inch DI Restrained Joints	EA	10	\$300.00	\$3,000.00
15101a	20-Inch Butterfly Valve	EA	2	\$3,500.00	\$7,000.00
15101b	Air Release Valve	EA	1	\$1,500.00	\$1,500.00
Subtotal Tank Construction Cost					\$788,020.00

SUBTOTAL CONSTRUCTION COSTS	\$1,797,140
CONSTRUCTION CONTINGENCIES (10%)	\$182,860
TOTAL CONSTRUCTION COSTS	\$1,980,000

OTHER PROJECT COSTS

ENGINEERING		
Design	\$94,387	
Bid Services	\$11,702	
Construction Phase Services	\$20,226	
Record Drawings	\$6,742	
Engineering Subtotal		\$133,056
RPR (16 weeks Construction)		\$32,000
Surveys		\$10,000
Easements - Drawings & Document Preparation		\$10,000
Easement Acquisition		\$40,000
FAA Permit		\$3,500
Stormwater Permit		\$2,500
Geotechnical Report		\$4,000
Construction Testing		\$4,000
SUBTOTAL ENGINEERING		\$239,056
PLAN REVIEW & ADVERTISEMENTS		\$1,000
SUBTOTAL PROJECT COSTS		\$2,220,056
PROJECT CONTINGENCIES (2%)		\$49,944
TOTAL PROJECT COSTS		\$2,270,000

Source: Consolidated Technologies Inc.

**OPINION OF COSTS FOR TAW SYSTEM IMPROVEMENTS OF
SERVICE TO CATOOSA UTILITY DISTRICT
NEW GROUND STORAGE RESERVOIR AT EAST RIDGE RESERVOIR SITE**

STORAGE TANK

Item No.	Description	Unit	Est. No. of Units	Unit Price	Item Total
1c	2.0-MG Prestressed Concrete Tank and Appurtenances	LS	1	\$755,000.00	\$755,000.00
2	Ductile Iron Piping Installed in Trench	LS	1	\$59,000.00	\$59,000.00
3a	Altitude Valve Box	LS	1	\$131,120.00	\$131,120.00
4	Miscellaneous Items	LS	1	\$144,000.00	\$144,000.00
5	Cast-In-Place Concrete Retaining Wall	LS	1	\$150,000.00	\$150,000.00
6	Electrical Service Allowance	LS	1	\$13,500.00	\$13,500.00
Subtotal Tank Construction Cost					\$1,252,620.00

WATER LINES AND OTHER ITEMS NEEDED WITH TANK

Item No.	Description	Unit	Est. No. of Units	Unit Price	Item Total
02200a	Crushed Stone Backfill in Trench	LF	25	\$15.00	\$375.00
02200b	Crushed Rock or Sand Bedding Material	CY	50	\$30.00	\$1,500.00
02200c	Final Grading and Cleanup	LF	500	\$1.00	\$500.00
02270a	Temporary Silt Fence	LF	200	\$3.00	\$600.00
02270b	Straw Bales	EA	10	\$6.00	\$60.00
2485	Seeding and Mulch	LF	500	\$0.75	\$375.00
02930a	Riprap	CY	10	\$36.00	\$360.00
3300	Cast-In-Place Concrete	CY	5	\$150.00	\$750.00
15062a	Ductile Iron (DI) Fittings	LB	2,000	\$2.00	\$4,000.00
15062b-20	20-Inch DI Pipe (Pressure Class 350)	LF	530	\$100.00	\$53,000.00
15062b-20	20-Inch DI Restrained Joints	EA	10	\$300.00	\$3,000.00
15101a	20-Inch Butterfly Valve	EA	2	\$3,500.00	\$7,000.00
15101b	Air Release Valve	EA	1	\$1,500.00	\$1,500.00
15109	Fire Hydrant Assemblies	EA	1	\$4,000.00	\$4,000.00
Subtotal Tank Construction Cost					\$77,020.00

SUBTOTAL CONSTRUCTION COSTS	\$1,329,640
CONSTRUCTION CONTINGENCIES (10%)	\$140,360
TOTAL CONSTRUCTION COSTS	\$1,470,000

OTHER PROJECT COSTS

ENGINEERING	
Design	\$62,872
Bid Services	\$8,982
Construction Phase Services	\$13,473
Record Drawings	\$4,491
Engineering Subtotal	\$89,817
RPR (16 weeks Construction)	\$32,000
Surveys	\$5,000
National Park Service Permit	\$3,000
Stormwater Permit	\$2,500
Geotechnical Report	\$4,000
Construction Testing	\$4,000
SUBTOTAL ENGINEERING	\$140,317
PLAN REVIEW & ADVERTISEMENTS	\$1,000
SUBTOTAL PROJECT COSTS	\$1,611,317
PROJECT CONTINGENCIES (2%)	\$38,683
TOTAL PROJECT COSTS	\$1,650,000

Source: Consolidated Technologies Inc.

**OPINION OF COSTS FOR TAW SYSTEM IMPROVEMENTS OF
SERVICE TO CATOOSA UTILITY DISTRICT
NEW LINE FROM RINGGOLD ROAD McBRIEN ROAD TO MCDONALD ROAD**

Item No.	Description	Unit	No. Units	Unit Price	Item Total
	Mobilization and Bonding	LS	1	\$2,500.00	\$2,500.00
	Traffic Control	LS	1	47,000.00	\$47,000.00
2200	Earthwork				
02200a	Crushed Stone Backfill in Trench for Water Lines in Streets and Driveways from Top of Bedding to Finished Grade	LF	8,650	7.65	\$66,172.50
02200d	Final Grading and Cleanup (Not Including Grassing and Mulch)	LF	200	1.55	\$310.00
2280	Utility Line Crossings of Streams				
02280b	Crossing of Spring Creek by Open Cut(20")	LF	35	1094	\$38,290.00
2485	Seeding. Seeding and Mulch Including Topsoil, Seed, Fertilizer, Limestone Mulch, and Water	LF	200	1.1	\$220.00
2500	Replacement Paving, Pavement Replacement for Streets and Driveways				
02500a	8-Inch Class A Concrete for Roadways	LF	386	33.35	\$12,873.10
02500a	4-Inch Type B Modified Asphalt Binder in Driveways, Parking Lots, and Streets	LF	8,099	14.9	\$120,675.10
15062	Ductile Iron (DI) Pipe and Fittings				
15062a	DI Pipe, Push-On, O-ring, Gasket Joint, Installed in Trench				
15062a-20	20-Inch DI Pipe, Pressure Class 350	LF	8650	125	\$1,081,250.00
15062b	DI Fittings	LB	2000	2.95	\$5,900.00
15062c	Restrained Joints for DI Pipe				
15062c-20a	20-Inch DI Pipe Restrained Joints at MJ Fittings	EA	4	213	\$852.00
15062c-20b	20-Inch DI Pipe Restrained Joints at Bell Joints	EA	8	\$375.00	\$3,000.00
15062d-16.16	Connect New 20" to Existing 20"	EA	2	13470.00	\$26,940.00
15101	Valves				
15101a	20-Inch Butterfly Valve, Including Valve Box, Cover, Restrained Joint Couplings, Thrust Block, and Extensions as Required	EA	4	5000	\$20,000.00
15109	Hydrants				
15109a	Install New Fire Hydrant Assembly, Including Excavation and Backfill, Piping, Thrust Block, etc.	EA	2	3,103.30	\$6,206.60
	SUBTOTAL CONSTRUCTION COSTS				\$1,432,189.30
	SUBTOTAL CONSTRUCTION COSTS				\$1,432,189
	CONSTRUCTION CONTINGENCIES (10%)				\$147,811
	TOTAL CONSTRUCTION COSTS				\$1,580,000
OTHER PROJECT COSTS					
	ENGINEERING				
	Design			\$67,134	
	Bid Services			\$9,591	
	Construction Phase Services			\$14,386	
	Record Drawings			\$4,795	
	Engineering Subtotal				\$95,906
	RPR (16 weeks Construction)				\$32,000
	Surveys				\$7,000
	Easements - Drawings & Document Preparation				\$10,000
	Easements Acquisition				\$40,000
	TDOT Permit				\$2,500
	Storm Water Permit				\$2,500
	Construction Testing				\$1,000
	SUBTOTAL ENGINEERING				\$190,906
	PLAN REVIEW & ADVERTISEMENTS				\$1,000
	SUBTOTAL PROJECT COSTS				\$1,771,906
	PROJECT CONTINGENCIES (2%)				\$38,094
	TOTAL PROJECT COSTS				\$1,810,000

Source: Consolidated Technologies Inc.

**OPINION OF COSTS FOR TAW SYSTEM IMPROVEMENTS OF
SERVICE TO CATOOSA UTILITY DISTRICT
EAST RIDGE RESERVOIR ALTITUDE VALVE
(IF PROJECT IS DONE SEPARATELY FROM NEW TANK)**

ALTITUDE VALVE

Item No.	Description	Unit	Est. No. of Units	Unit Price	Item Total
1	Crushed Stone for Road (Including Material and Labor)	Ton	100	\$70.40	\$7,040.00
2	Chain Link Fence	LF	200	\$38.50	\$7,700.00
3	Concrete Vault Including Hatches	LS	1	\$48,620.00	\$48,620.00
4	Valves, Piping, Fittings and Accessories	LS	1	\$73,040.00	\$73,040.00
5	Electrical Work	LS	1	\$9,460.00	\$9,460.00
Subtotal Altitude Valve and Vault Construction Cost					\$145,860.00
SUBTOTAL CONSTRUCTION COSTS					\$145,860
CONSTRUCTION CONTINGENCIES (10%)					\$14,586
TOTAL CONSTRUCTION COSTS					\$170,000

OTHER PROJECT COSTS

ENGINEERING

Design	\$15,079	
Bid Services	\$10,555	
Construction Phase Services	\$1,508	
Record Drawings	\$2,262	
Engineering Subtotal		\$29,404
RPR (4 weeks Construction)		\$8,000
Surveys		\$3,000
Construction Testing		\$500
SUBTOTAL ENGINEERING		\$40,904
PLAN REVIEW & ADVERTISEMENTS		\$1,000
SUBTOTAL PROJECT COSTS		\$211,904
PROJECT CONTINGENCIES (2%)		\$8,096
TOTAL PROJECT COSTS		\$220,000

Source: Consolidated Technologies Inc.

**OPINION OF COSTS FOR TAW SYSTEM IMPROVEMENTS OF
SERVICE TO CATOOSA UTILITY DISTRICT
NEW ELEVATED STORAGE TANK IN EAST RIDGE**

STORAGE TANK

Item No.	Description	Unit	Est. No. of Units	Unit Price	Item Total
1	2.0-MG Elevated Steel Tank and Appurtenances	LS	1	\$2,600,000.00	\$2,600,000.00
2	Ductile Iron Piping Installed in Trench	LS	1	\$59,000.00	\$59,000.00
3	Control Valve Box	LS	1	\$94,600.00	\$94,600.00
4	Miscellaneous Items	LS	1	\$90,000.00	\$90,000.00
5	Electrical Service Allowance	LS	1	\$10,000.00	\$10,000.00
6	Property Acquisition	LS	1	\$35,000.00	\$35,000.00

Subtotal Tank Construction Cost \$2,888,600

WATER LINES AND OTHER ITEMS NEEDED WITH TANK

Item No.	Description	Unit	Est. No. of Units	Unit Price	Item Total
02200a	Crushed Stone Backfill in Trench	LF	25	\$15.00	\$375.00
02200b	Crushed Rock or Sand Bedding Material for Rock Trench Bedding	CY	50	\$30.00	\$1,500.00
02200c	Final Grading and Cleanup	LF	500	\$1.00	\$500.00
2270	Slope Protection and Erosion Control				
02270a	Temporary Silt Fence	LF	200	\$3.00	\$600.00
02270b	Straw Bales	EA	10	\$6.00	\$60.00
2485	Seeding and Mulch	LF	500	\$0.75	\$375.00
02930a	Riprap	CY	10	\$36.00	\$360.00
3300	Cast-In-Place Concrete, Class B Concrete	CY	5	\$150.00	\$750.00
15062a	Ductile Iron (DI) Fittings	LB	1,000	\$2.00	\$2,000.00
15062b-20	20-Inch DI Pipe (Pressure Class 350)	LF	500	\$100.00	\$50,000.00
15062b-20	20-Inch DI Restrained Joints	EA	10	\$300.00	\$3,000.00
15101a	20-Inch Butterfly Valve Required	EA	2	\$3,500.00	\$7,000.00
15101b	Air Release Valve	EA	1	\$1,500.00	\$1,500.00
15109	Fire Hydrant Assemblies	EA	1	\$4,000.00	\$4,000.00

Subtotal Tank Construction Costs \$72,020

SUBTOTAL CONSTRUCTION COSTS

\$2,960,620

CONSTRUCTION CONTINGENCIES (10%)

\$299,380

TOTAL CONSTRUCTION COSTS

\$3,260,000

OTHER PROJECT COSTS**ENGINEERING**

Design	\$147,189	
Bid Services	\$21,027	
Construction Phase Services	\$31,540	
Record Drawings	\$10,513	
Engineering Subtotal		\$210,270
RPR (16 weeks Construction)		\$32,000
Surveys		\$5,000
Easements - Drawings & Document Preparation		\$10,000
Easements Acquisition		\$10,000
FAA Permit		\$3,500
Stormwater Permit		\$2,500
Geotechnical Report		\$5,000
Construction Testing		\$2,000

SUBTOTAL ENGINEERING \$280,270

PLAN REVIEW & ADVERTISEMENTS

\$1,000

SUBTOTAL PROJECT COSTS

\$3,541,270

PROJECT CONTINGENCIES (2%)

\$78,730

TOTAL PROJECT COSTS

\$3,620,000

Source: Consolidated Technologies Inc.

**OPINION OF COSTS FOR TAW SYSTEM IMPROVEMENTS OF
SERVICE TO CATOOSA UTILITY DISTRICT
EAST RIDGE PUMP STATION UPGRADE**

Item No.	Description	Unit	No. Units	Unit Price	Item Total
Pump Station Upgrade Costs:					
	Mobilization and Bonding	LS	1	\$2,500.00	\$2,500.00
	350 HP High Service Pumps	EA	3	23,993.00	\$71,979.00
	350 HP Variable Frequency Drive Units	EA	3	41,333.00	\$123,999.00
	Labor, Material and Installation	LS	1	39,195.60	\$39,195.60
	10% Tax	LS			\$4,169.56
20-Inch Line to East Ridge Reservoir Costs:					
02500a	4-Inch Type B Modified Asphalt Binder in D	LF	1,000	\$14.90	\$14,900.00
15062a-20	20-Inch DI Pipe, Pressure Class 350	LF	2,900	\$125.00	\$362,500.00
15062c-20a	20-Inch DI Pipe Restrained Joints at MJ Fitting	EA	10	\$213.00	\$2,130.00
15062d-16.16	Connect New 20-Inch to Existing 16-Inch	EA	2	\$13,470.00	\$26,940.00
	SUBTOTAL CONSTRUCTION COSTS				\$648,313.16
	SUBTOTAL CONSTRUCTION COSTS				\$648,313
	CONSTRUCTION CONTINGENCIES (10%)				\$71,687
	TOTAL CONSTRUCTION COSTS				\$720,000
OTHER PROJECT COSTS					
	ENGINEERING				
	Design			\$39,715	
	Bid Services			\$5,674	
	Construction Phase Services			\$8,510	
	Record Drawings			\$2,837	
	Engineering Subtotal				\$56,736
	RPR (4 weeks Construction)				\$8,000
	Surveys				\$7,000
	Easements - Drawings & Document Preparation				\$2,500
	Construction Testing				\$1,000
	SUBTOTAL ENGINEERING				\$75,236
	PLAN REVIEW & ADVERTISEMENTS				\$1,000
	SUBTOTAL PROJECT COSTS				\$796,236
	PROJECT CONTINGENCIES (2%)				\$23,764
	TOTAL PROJECT COSTS				\$820,000

Source: Consolidated Technologies Inc.

APPENDIX B

Comparison of Results of Hydraulic Analysis Using Various Improvements and Demands

APPENDIX C

System Pressure Testing Results



FIRE HYDRANT FLOW TEST REPORT
Consolidated Technologies, Inc.
1122 Riverfront Parkway
Chattanooga, Tennessee 37402
Phone 423/267-7613 - FAX No. 423/267-0603

CTI Project
No. C05009-12
Test Report
No. 01-B

Test Hydrant No. H2258

Date 9/20/07 Day Thursday Time 9:25 AM
PM

Location Michelle Drive @ Martha Ave - East Ridge

Make Mueller Model 4 1/2 Year 1974

Valve Location _____ Make _____ Model _____

Main Size _____ Elevation 776

Remarks East Ridge Reservoir Elevation 13.1'; New York pump station discharge pressure
82 psi, rate of 5.9 mgd; Catoosa pump station, one pump on 800 gpm

Test Results: P_s = Static Pressure 65 PSI P_t = Residual Pressure 62 PSI

Flow Hydrant No. H64348

Elevation 700

Location Ringgold Road- East Ridge

Pitot Pressure 80 PSI

Q_t = Flow 1499 GPM

Length of Flushing 2.5 Min.

Estimated Volume Water 3747 Gal.

Final chlorine Residual N/A PPM

Fire hydrant nozzle diameter 2.5 in.

Q_t = Flow at 20 PSI 6470 GPM

$$Q_f = Q_t \left(\frac{P_s - 20}{P_s - P_t} \right)^{0.54}$$

Color Code:

Blue (>1500) _____

Orange (500-999) _____

Green (1000-1499) _____

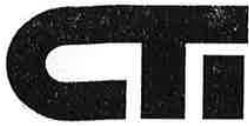
Red (<500) _____

Color Code Change _____

Painted _____

Testers Bell, Suter, Shealy

SKETCH SYSTEM SHOWING RELATIONSHIP OF RESIDUAL AND TEST HYDRANT TO DISTRIBUTION SYSTEM



FIRE HYDRANT FLOW TEST REPORT

Consolidated Technologies, Inc.
1122 Riverfront Parkway
Chattanooga, Tennessee 37402
Phone 423/267-7613 - FAX No. 423/267-0603

CTI Project
No. C05009-12
Test Report
No. 01-A

Test Hydrant No. H3290

Date 9/20/07 Day Thursday Time 9:25 AM
PM

Location Ringgold Road @ McDonalds

Make Mueller Model 4 1/2 Year 1980

Valve Location Make Model

Main Size 12" Elevation 688.4

Remarks East Ridge Reservoir Elevation 13.1'; New York pump station discharge pressure
82 psi, rate of 5.9 mgd; Catoosa pump station, one pump on 800 gpm

Test Results: P_s = Static Pressure 118 PSI P_t = Residual Pressure 95 PSI

Flow Hydrant No. H64348 Elevation 700

Location Ringgold Road- East Ridge

Pitot Pressure 80 PSI Q_t = Flow 1499 GPM

Length of Flushing 2.5 Min. Estimated Volume Water 3747 Gal.

Final chlorine Residual N/A PPM Fire hydrant nozzle diameter 2.5 in.

$Q_f = Q_t \left(\frac{P_s - 20}{P_s - P_t} \right)^{0.54}$

Q_f = Flow at 20 PSI 3279 GPM

Color Code:

Blue (>1500)	<u> </u>	Orange (500-999)	<u> </u>
Green (1000-1499)	<u> </u>	Red (<500)	<u> </u>
Color Code Change	<u> </u>	Painted	<u> </u>

Testers Bell, Suter, Shealy

SKETCH SYSTEM SHOWING RELATIONSHIP OF RESIDUAL AND TEST HYDRANT TO DISTRIBUTION SYSTEM

Site Sketch



FIRE HYDRANT FLOW TEST REPORT
Consolidated Technologies, Inc.
1122 Riverfront Parkway
Chattanooga, Tennessee 37402
Phone 423/267-7613 - FAX No. 423/267-0603

CTI Project
No. C05009-12
Test Report
No. 02-A

Test Hydrant No. H830

Date 9/20/07 Day Thursday Time 10:30 AM
PM

Location Lee Highway @ Aiken Road

Make Mueller Model 4 1/2 Year 1996

Valve Location Make Model

Main Size 12" Elevation 689.4

Remarks East Ridge Reservoir Elevation 12.2'; New York pump station discharge pressure
81 psi, rate of 5.971 mgd

Test Results: P_s = Static Pressure 112 PSI P_t = Residual Pressure 100 PSI

Flow Hydrant No. H4860 Elevation 670

Location Lee Highway

Pitot Pressure 95 PSI Q_t = Flow 1634 GPM

Length of Flushing 2 Min. Estimated Volume Water 3268 Gal.

Final chlorine Residual N/A PPM Fire hydrant nozzle diameter 2.5 in.

Q_t = Flow at 20 PSI 4908 GPM

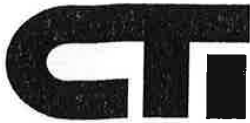
$$Q_f = Q_t \left(\frac{P_s - 20}{P_s - P_t} \right)^{0.54}$$

Color Code:

Blue (>1500)	<u> </u>	Orange (500-999)	<u> </u>
Green (1000-1499)	<u> </u>	Red (<500)	<u> </u>
Color Code Change	<u> </u>	Painted	<u> </u>

Testers Bell, Suter, Shealy

SKETCH SYSTEM SHOWING RELATIONSHIP OF RESIDUAL AND TEST HYDRANT TO DISTRIBUTION SYSTEM



FIRE HYDRANT FLOW TEST REPORT
Consolidated Technologies, Inc.
1122 Riverfront Parkway
Chattanooga, Tennessee 37402
Phone 423/267-7613 - FAX No. 423/267-0603

CTI Project
No. C05009-12
Test Report
No. 02-B

Test Hydrant No. H862

Date 9/20/07 Day Thursday Time 10:30 AM
PM

Location Marijon Drive @ Marimont Drive

Make Mueller Model 4 1/2 Year 1959

Valve Location _____ Make _____ Model _____

Main Size 6" Elevation 847.6

Remarks East Ridge Reservoir Elevation 12.2'; New York pump station discharge pressure
81 psi, rate of 5.971 mgd High Point

Test Results: P_s = Static Pressure 50 PSI P_t = Residual Pressure 38 PSI

Flow Hydrant No. H4860

Elevation 670

Location Lee Highway

Pitot Pressure 95 PSI

Q_t = Flow 1634 GPM

Length of Flushing 2 Min.

Estimated Volume Water 3268 Gal.

Final chlorine Residual N/A PPM

Fire hydrant nozzle diameter 2.5 in.

Q_r = Flow at 20 PSI 2680 GPM

$$Q_r = Q_t \left(\frac{P_s - 20}{P_s - P_t} \right)^{0.54}$$

Color Code:

Blue (>1500) _____

Orange (500-999) _____

Green (1000-1499) _____

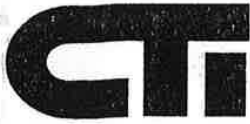
Red (<500) _____

Color Code Change _____

Painted _____

Testers Bell, Suter, Shealy

SKETCH SYSTEM SHOWING RELATIONSHIP OF RESIDUAL AND TEST HYDRANT TO DISTRIBUTION SYSTEM



FIRE HYDRANT FLOW TEST REPORT
Consolidated Technologies, Inc.
1122 Riverfront Parkway
Chattanooga, Tennessee 37402
Phone 423/267-7613 - FAX No. 423/267-0603

CTI Project
No. C05009-12
Test Report
No. 1

Test Hydrant No. New

Date 10/5/07 Day Friday Time 10:09 AM
Location Ringgold Road @ Scruggs Road
Make U.S. Pipe Model 5 1/4 Year 2005
Valve Location _____ Make _____ Model _____
Main Size 12" Elevation _____
Remarks _____

Test Results: P_s = Static Pressure 94 PSI P_t = Residual Pressure 78 PSI

Flow Hydrant No. H5046 Elevation _____

Location Ringgold Road- East Ridge
Pitot Pressure 53 PSI Q_t = Flow 1220 GPM
Length of Flushing 3 Min. Estimated Volume Water 3660 Gal.
Final chlorine Residual N/A PPM Fire hydrant nozzle diameter 2.5 in.

Q_f = Flow at 20 PSI 2789 GPM

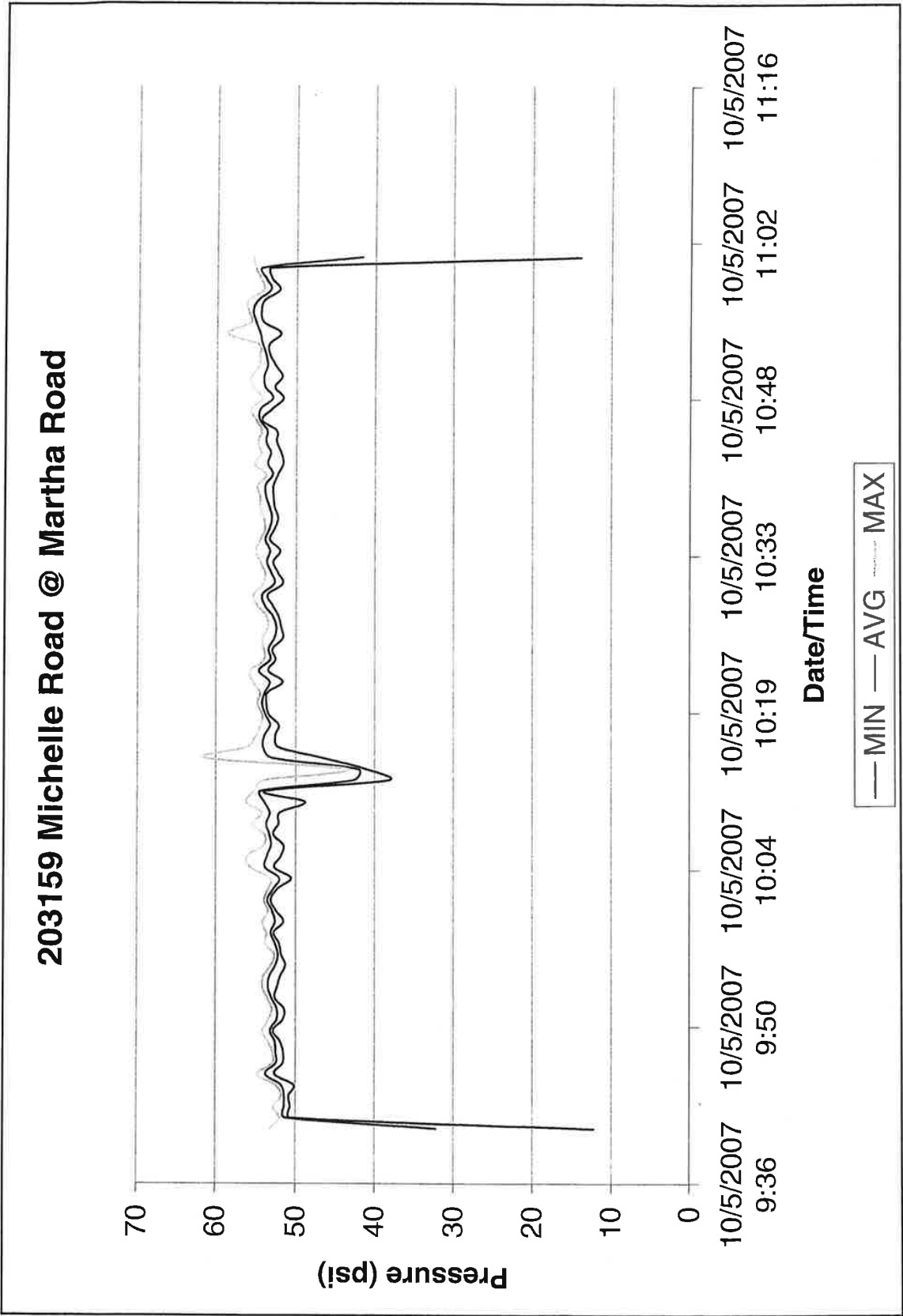
$$Q_f = Q_t \left(\frac{P_s - 20}{P_s - P_t} \right)^{0.54}$$

Color Code:

Blue (>1500)	_____	Orange (500-999)	_____
Green (1000-1499)	_____	Red (<500)	_____
Color Code Change	_____	Painted	_____

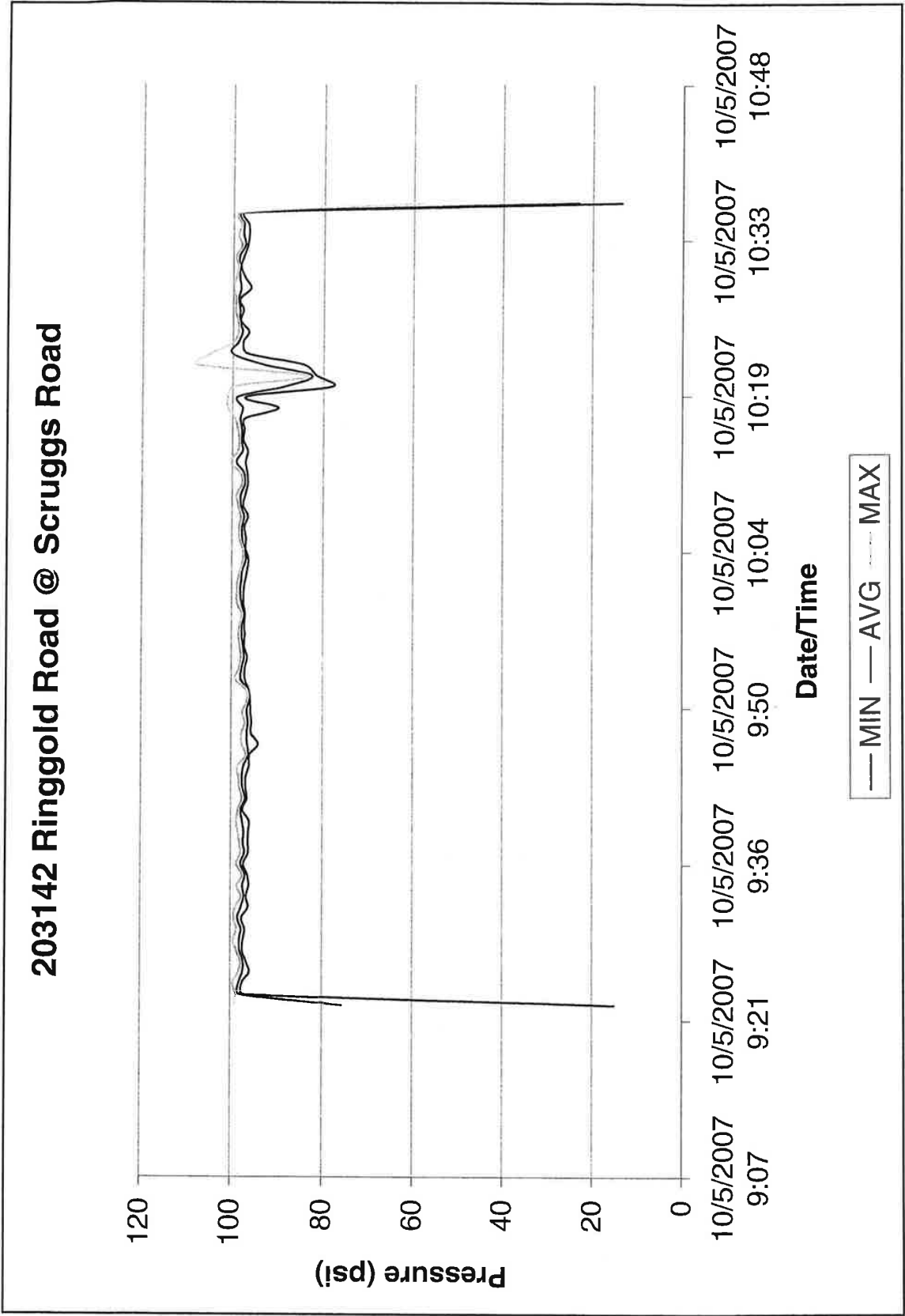
Testers Bell, Suter

SKETCH SYSTEM SHOWING RELATIONSHIP OF RESIDUAL AND TEST HYDRANT TO DISTRIBUTION SYSTEM



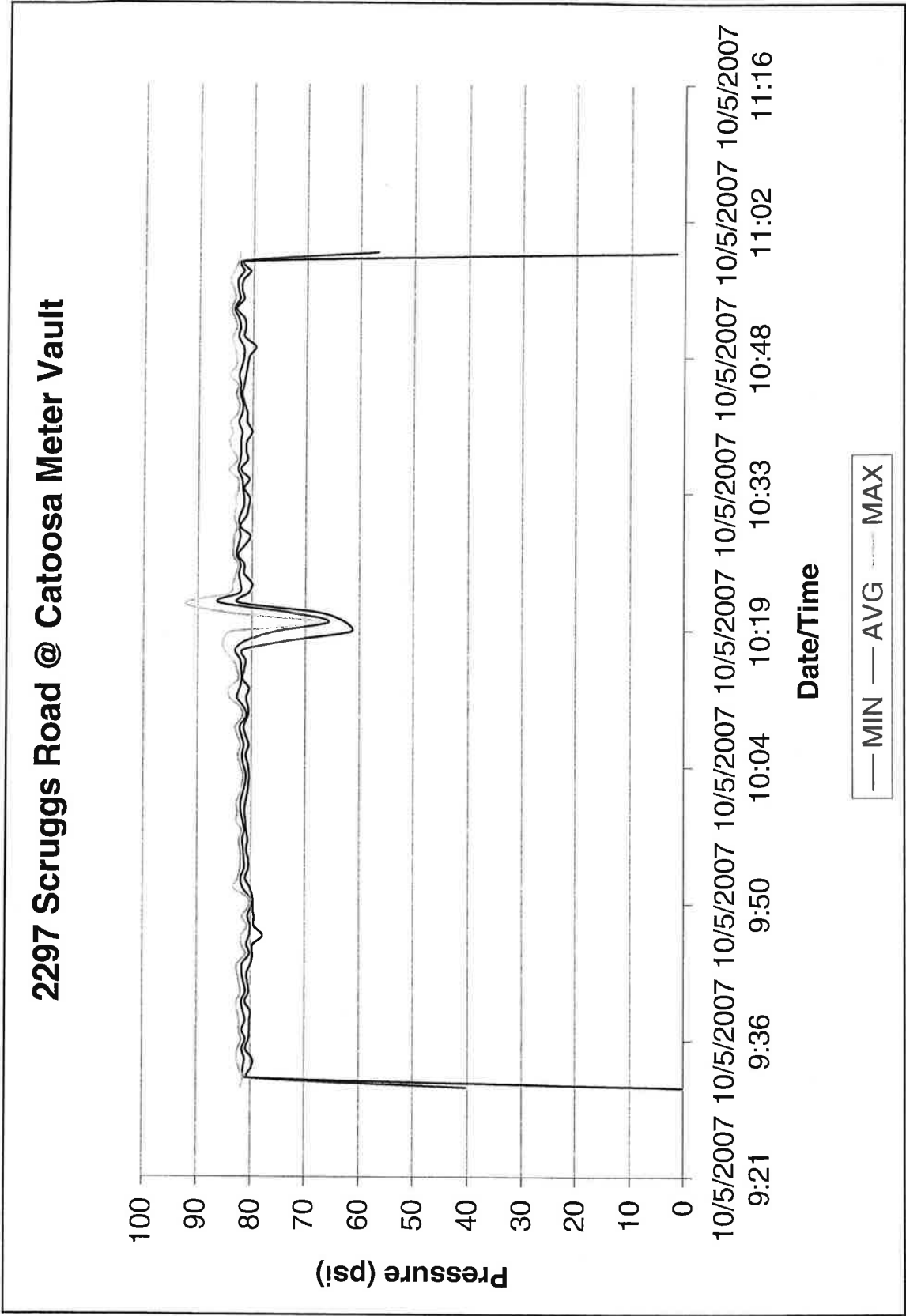
CTI PROJECT NUMBER: C05009-12								
PRESSURE ZONE: TAWC-Catoosa								
LOCATION: Michele Road @ Martha Road, East Ridge								
TELOG ID NUMBER: 203159								
HYDRANT NUMBER: H2258								
ELEVATION: 776								
Date/Time	MIN	AVG	MAX					
10/5/07 9:41	12.161	32.234	53.187					
10/5/07 9:42	50.623	51.282	52.015					
10/5/07 9:43	50.623	51.429	52.747					
10/5/07 9:44	50.842	51.429	51.795					
10/5/07 9:45	50.183	51.795	52.454					
10/5/07 9:46	52.601	53.773	54.725					
10/5/07 9:47	51.575	52.454	52.894					
10/5/07 9:48	51.502	52.527	52.821					
10/5/07 9:49	51.941	52.601	53.48					
10/5/07 9:50	52.821	53.187	54.139					
10/5/07 9:51	51.575	52.381	53.407					
10/5/07 9:52	51.429	52.381	52.967					
10/5/07 9:53	52.601	53.04	53.553					
10/5/07 9:54	52.308	53.48	54.139					
10/5/07 9:55	51.941	53.26	54.066					
10/5/07 9:56	51.282	52.527	53.114					
10/5/07 9:57	51.795	52.234	52.674					
10/5/07 9:58	52.088	52.601	53.773					
10/5/07 9:59	52.747	53.114	53.7					
10/5/07 10:00	51.502	52.601	54.139					
10/5/07 10:01	52.454	52.967	53.48					
10/5/07 10:02	53.114	53.553	53.993					
10/5/07 10:03	52.308	52.821	53.48					
10/5/07 10:04	50.549	52.088	53.187					
10/5/07 10:05	52.674	53.846	55.531					
10/5/07 10:06	51.868	53.626	56.044					
10/5/07 10:07	51.502	53.114	54.066					
10/5/07 10:08	52.821	53.333	53.919					
10/5/07 10:09	52.161	53.7	55.385					
10/5/07 10:10	52.015	53.26	54.212					
10/5/07 10:11	48.791	53.993	56.117					
10/5/07 10:12	53.7	54.359	55.238					
10/5/07 10:13	38.242	42.711	53.993					
10/5/07 10:14	41.026	42.125	43.37					
10/5/07 10:15	46.447	53.04	61.099					
10/5/07 10:16	52.161	54.139	56.19					
10/5/07 10:17	52.601	53.993	55.018					
10/5/07 10:18	52.161	53.26	54.432					
10/5/07 10:19	53.407	53.846	54.212					
10/5/07 10:20	53.7	54.286	54.799					
10/5/07 10:21	53.553	53.919	54.506					
10/5/07 10:22	51.648	53.333	55.311					

CTI PROJECT NUMBER: C05009-12								
PRESSURE ZONE: TAWC-Catoosa								
LOCATION: Michele Road @ Martha Road, East Ridge								
TELOG ID NUMBER: 203159								
HYDRANT NUMBER: H2258								
ELEVATION: 776								
Date/Time	MIN	AVG	MAX					
10/5/07 10:23	53.48	54.652	55.751					
10/5/07 10:24	52.601	53.26	54.066					
10/5/07 10:25	52.967	53.48	54.066					
10/5/07 10:26	51.648	52.747	54.212					
10/5/07 10:27	51.868	52.527	53.553					
10/5/07 10:28	52.234	52.967	53.7					
10/5/07 10:29	52.967	53.993	54.799					
10/5/07 10:30	53.553	54.286	55.311					
10/5/07 10:31	51.648	52.747	54.139					
10/5/07 10:32	52.308	53.187	53.919					
10/5/07 10:33	52.894	53.7	54.506					
10/5/07 10:34	52.015	53.333	55.018					
10/5/07 10:35	53.333	53.919	54.579					
10/5/07 10:36	52.747	53.407	53.993					
10/5/07 10:37	52.308	53.114	54.066					
10/5/07 10:38	52.747	53.407	54.579					
10/5/07 10:39	52.894	53.846	54.579					
10/5/07 10:40	52.894	53.919	54.872					
10/5/07 10:41	52.308	53.04	53.846					
10/5/07 10:42	51.648	53.626	55.238					
10/5/07 10:43	51.941	53.26	54.432					
10/5/07 10:44	52.527	53.846	54.872					
10/5/07 10:45	52.527	53.7	54.432					
10/5/07 10:46	54.359	54.652	55.092					
10/5/07 10:47	53.114	54.579	55.678					
10/5/07 10:48	51.648	53.04	54.359					
10/5/07 10:49	52.747	53.993	55.385					
10/5/07 10:50	51.795	54.139	55.678					
10/5/07 10:51	52.674	53.7	54.725					
10/5/07 10:52	53.407	53.919	54.652					
10/5/07 10:53	53.48	54.359	54.799					
10/5/07 10:54	52.015	54.652	58.608					
10/5/07 10:55	54.212	55.165	55.751					
10/5/07 10:56	54.506	55.531	56.117					
10/5/07 10:57	54.139	54.945	56.117					
10/5/07 10:58	52.161	53.333	54.212					
10/5/07 10:59	53.187	53.919	54.579					
10/5/07 11:00	53.26	54.359	55.238					
10/5/07 11:01	13.919	41.685	55.458					



CTI PROJECT NUMBER: C05009-12								
PRESSURE ZONE: TAWC-Catoosa								
LOCATION: Ringgold Road @ Scruggs Road, East Ridge								
TELOG ID NUMBER: 203142								
HYDRANT NUMBER: New								
ELEVATION:								
Date/Time	MIN	AVG	MAX					
10/5/07 9:23	14.9451	75.6044	98.9744					
10/5/07 9:24	96.9963	97.9487	98.8278					
10/5/07 9:25	97.3626	98.0953	99.4872					
10/5/07 9:26	95.8242	97.2894	98.2418					
10/5/07 9:27	96.5568	97.2161	97.7289					
10/5/07 9:28	97.3626	97.9487	98.6813					
10/5/07 9:29	97.1429	98.022	99.4139					
10/5/07 9:30	96.8498	97.6557	98.6813					
10/5/07 9:31	97.5092	98.4615	99.3407					
10/5/07 9:32	96.1172	97.6557	99.0476					
10/5/07 9:33	96.5568	97.0696	97.6557					
10/5/07 9:34	95.9707	97.3626	98.6081					
10/5/07 9:35	96.2637	96.8498	97.3626					
10/5/07 9:36	97.1429	97.8022	98.7546					
10/5/07 9:37	96.1172	96.9963	97.8755					
10/5/07 9:38	96.1905	97.2894	98.022					
10/5/07 9:39	96.044	97.1429	98.4615					
10/5/07 9:40	95.9707	97.5092	98.7546					
10/5/07 9:41	97.3626	97.8022	98.3883					
10/5/07 9:42	96.4103	96.8498	97.5824					
10/5/07 9:43	96.7033	97.4359	98.022					
10/5/07 9:44	96.7033	97.5824	98.315					
10/5/07 9:45	95.9707	97.2161	98.6081					
10/5/07 9:46	95.8974	96.1905	96.7033					
10/5/07 9:47	93.9927	96.4103	97.5824					
10/5/07 9:48	95.5311	96.5568	97.7289					
10/5/07 9:49	95.4579	96.2637	96.9231					
10/5/07 9:50	95.6777	96.5568	97.5092					
10/5/07 9:51	95.7509	96.1172	96.4103					
10/5/07 9:52	96.044	96.337	96.63					
10/5/07 9:53	96.9231	97.9487	99.1209					
10/5/07 9:54	96.9231	97.6557	98.2418					
10/5/07 9:55	96.4835	97.2161	97.9487					
10/5/07 9:56	97.1429	97.4359	98.0953					
10/5/07 9:57	96.9963	97.7289	98.4615					
10/5/07 9:58	97.1429	97.6557	98.1685					
10/5/07 9:59	96.9963	97.3626	97.6557					
10/5/07 10:00	97.3626	97.8022	98.8278					
10/5/07 10:01	97.2894	98.0953	98.8278					
10/5/07 10:02	96.9963	97.8755	98.7546					
10/5/07 10:03	96.5568	97.6557	98.022					
10/5/07 10:04	96.2637	96.8498	97.5092					

[illegible]



CTI PROJECT NUMBER: C05009-12								
PRESSURE ZONE: TAWC-Catoosa								
LOCATION: Scruggs Road @ Catoosa Co. Meter Vault								
TELOG ID NUMBER: 2297								
HYDRANT NUMBER: New								
ELEVATION:								
Date/Time	MIN	AVG	MAX					
10/5/07 9:31	0	40.293	81.9048					
10/5/07 9:32	80.3663	80.9524	81.3919					
10/5/07 9:33	79.7802	81.3187	82.1245					
10/5/07 9:34	79.6337	81.0989	82.5641					
10/5/07 9:35	80.8791	81.6117	82.4908					
10/5/07 9:36	80.2931	80.9524	81.7583					
10/5/07 9:37	80.1465	81.6117	82.1978					
10/5/07 9:38	80.1465	81.0256	82.1978					
10/5/07 9:39	80	81.3919	82.4176					
10/5/07 9:40	81.0256	81.685	82.6374					
10/5/07 9:41	80.2931	80.9524	81.9048					
10/5/07 9:42	80.5128	81.2454	82.1978					
10/5/07 9:43	80.6594	81.6117	82.4908					
10/5/07 9:44	79.9267	81.5385	82.5641					
10/5/07 9:45	79.6337	80.2198	80.9524					
10/5/07 9:46	79.6337	80.8059	81.685					
10/5/07 9:47	77.8022	80.2198	81.7583					
10/5/07 9:48	79.3407	80.1465	80.6594					
10/5/07 9:49	79.4139	80.5861	81.6117					
10/5/07 9:50	79.6337	80.0733	80.3663					
10/5/07 9:51	79.6337	80.2931	80.5128					
10/5/07 9:52	80.1465	81.5385	83.2235					
10/5/07 9:53	81.0256	81.9048	82.4176					
10/5/07 9:54	80.4396	81.2454	82.0513					
10/5/07 9:55	80.4396	81.3187	81.9048					
10/5/07 9:56	80.8791	81.3919	81.978					
10/5/07 9:57	80.5861	81.6117	82.2711					
10/5/07 9:58	80.8791	81.2454	81.6117					
10/5/07 9:59	81.0256	81.5385	82.7839					
10/5/07 10:00	81.1722	81.9048	82.5641					
10/5/07 10:01	81.0256	81.978	82.7839					
10/5/07 10:02	80.6594	81.5385	81.978					
10/5/07 10:03	80.4396	81.0989	81.6117					
10/5/07 10:04	80.3663	81.0256	81.4652					
10/5/07 10:05	80.5861	81.4652	81.978					
10/5/07 10:06	81.0256	81.685	82.5641					
10/5/07 10:07	80.4396	81.3919	81.978					
10/5/07 10:08	81.0256	81.8315	82.5641					
10/5/07 10:09	81.3919	82.1245	83.0037					
10/5/07 10:10	80.6594	80.9524	81.685					
10/5/07 10:11	80.5861	81.3919	81.9048					
10/5/07 10:12	80.9524	82.7106	84.0293					

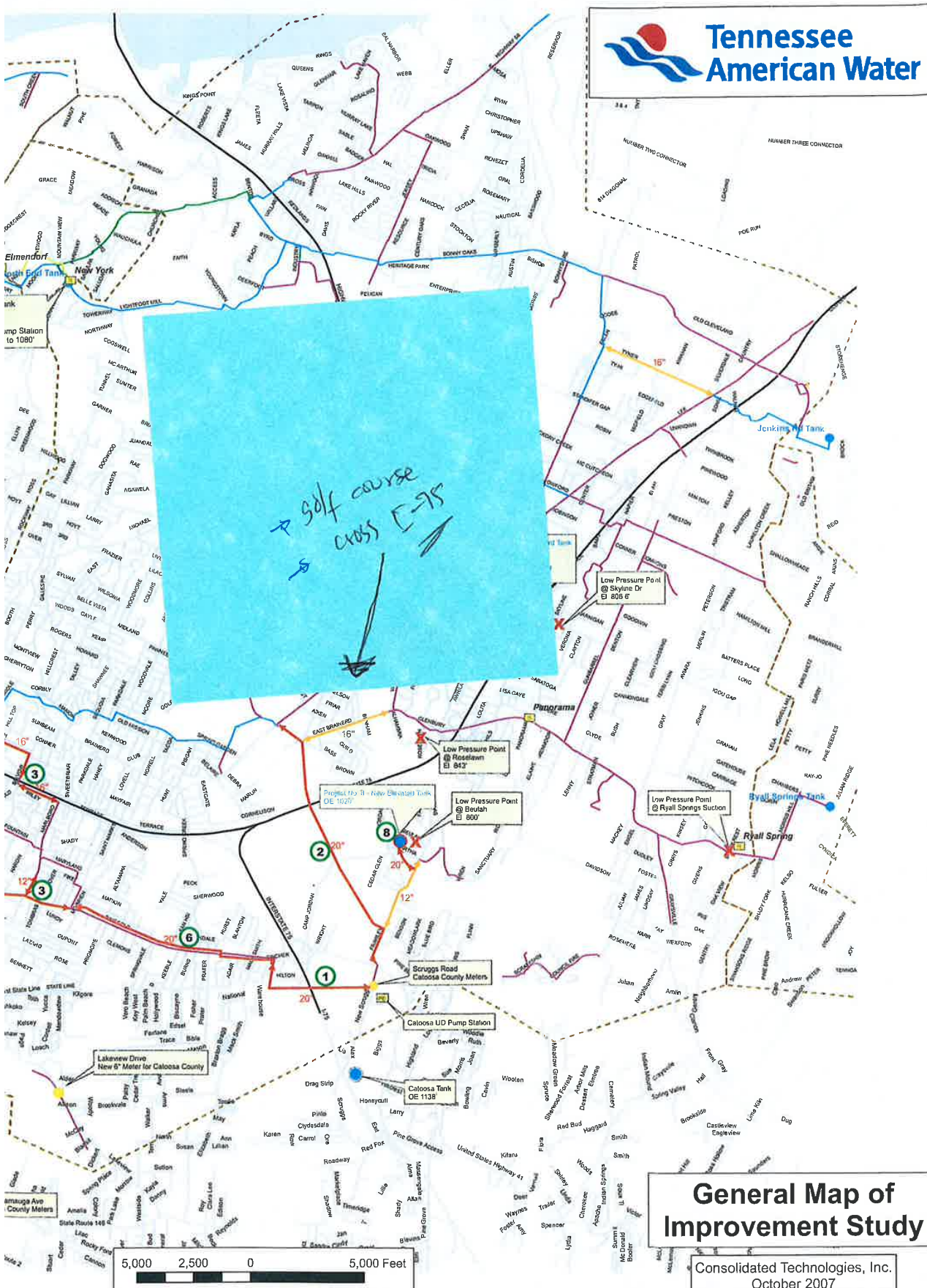
TAW Catoosa UD Service Improvements Study - CTI Project No. C05009-12

Scenario #	Piping Configuration	Global factor	Demanded Flow	Total System Flow from CITICO (mgd)	Demand (mgd) @ Catoosa UD			Pressure (psi) (fixed demand)						Lowest Points in Area						Lowest Tank Levels							
					Lakeview	Chickamauga	Scruggs	Min Press Lakeview Meter	Min Press Chickamauga Meter	Min Press Scruggs Rd Meter	Avg Press Lakeview Meter	Avg Press Chickamauga Meter	Avg Press Scruggs Rd Meter	Min Beulah (psi)	Min Roselawn (psi)	Avg Beulah (psi)	Avg Roselawn (psi)	Beulah (Elev)	Roselawn (Elev)	South Mission Ridge Tank	Missionary Ridge Stand Pipe	Mission Ridge Triple Tanks	Jenkins Road Tank	North End Tank	East Ridge Reservoir	Ryall Springs Tank	East Brainerd Tank
1	current (Jenkins Tank off)	1.035		45.8 *Peak day plus new Catoosa Demand *three pumps on at Chico continuous (20 on press controls)	0.085	0.1512	1.11		149.8	81.54	127.70	153.11	102.51	41.5	35.9	64.90	61.16	800	843.3	61.50	80.40	26.00	0.00	19.40	10.70	31.90	32.2
2	current (Jenkins Tank off)	1.035		48.07 *Peak day plus new Catoosa Demand *three pumps on at Chico continuous (20 on press controls)	1	1	2.5		129	25.94	100.41	136.39	44.55	10.40	33.78	31.45	53.47	800	843.3	61.40	80.10	25.50	0.00	17.60	10.60	32.00	30
3	*with altitude valve at East Ridge Res. *ER 7 to HGL of 1038R (Jenkins Tank off)	1.035		48.43 *Peak day plus new Catoosa Demand *three pumps on at Chico continuous (20 on press controls)	1	1	2.4		129	26.14	100.74	136.37	44.86	10.6	34.2	31.74	53.75	800	843.3	61.4	80.6	25.7	0	18.2	10.5	32	30
4	*with altitude valve at East Ridge Res. *Extra pump at ER (#6) to peak time controls (Jenkins Tank off)	1.035	48.15	48.45 *Peak day plus new Catoosa Demand *three pumps on at Chico continuous (20 on press controls)	1	1	2.5	88.5	131.5	37.66	105.73	136.57	62.27	6.1	33.9	31.15	57.57	800	843.3	61.4	80.7	25.7	0	19.4	10.9	31.9	29.4
5	*with altitude valve at East Ridge Res. *Extra pump at ER (#6) to peak time controls (Jenkins Tank ON)	1.035	48.15	48.45 *Peak day plus new Catoosa Demand *three pumps on at Chico continuous (20 on press controls)	1	1	2.5	90.8	131.3	43.48	103.88	136.56	59.87	12.2	34	28.70	54.78	800	843.3	61.5	80.6	25.9	0	19.4	10.9	32	29.4
6	*with altitude valve at East Ridge Res. *Extra pump at ER (#6) to peak time controls *Jenkins Tank ON (starting at 0') *12" at Frawley *16" at Tyner *16" at Ringgold/Hwy75	1.035	48.15	48.75 *Peak day plus new Catoosa Demand *three pumps on at Chico continuous (20 on press controls)	1	1	2.5	86.5	131.3	74.08	101.65	136.31	89.21	38.6	35.1	54.08	57.42	800	843.3	61.5	80.1	25	0	17.1	10.8	31.9	30
7	*with altitude valve at East Ridge Res. *Extra pump at ER (#6) to peak time controls *Jenkins Tank ON (starting at 0') *12" at Frawley *16" at Tyner *16" at Ringgold/Hwy75	1.21	54.26	54 *Peak day plus new Catoosa Demand *4 Chico pumps on continuously	1	1	2.5	76.8	131.2	61.69	90.44	136.20	78.04	25.7	31.7	42.52	47.01	800	843.3	61.5	80.6	25.9	0	19.4	10.2	31.9	29.4
8	*with altitude valve at East Ridge Res. *Extra pump at ER (#6) to peak time controls *Jenkins Tank ON (starting at 0') *12" at Frawley *16" at Tyner *20" from Brainerd Rd to Frawley *16" at Ringgold/Hwy75	1.21	54.26	54.5 *Peak day plus new Catoosa Demand *4 Chico pumps on continuously	1	1	2.5	86.5	131.2	87.36	99.33	136.17	100.95	50.2	30.6	64.56	45.93	800	843.3	61.4	80.4	26	0	19.4	10.1	31.9	29.4
9	*with altitude valve at East Ridge Res. *Extra pump at ER (#6) CONTINUOUS *Jenkins Tank ON (starting at 0') *12" at Frawley *16" at Tyner *16" at Ringgold/Hwy75 *20" Upper Ringgold Rd	1.21	54.26	54.5 *Peak day plus new Catoosa Demand *4 Chico pumps on continuously	1	1	2.5	106	131.2	89.30	115.15	136.28	99.12	52.7	36.9	62.72	57.05	800	843.3	61.5	80.2	25.6	0	19.4	8.3	31.9	29.4
10	*with altitude valve at East Ridge Res. *THREE big pumps on at East Ridge CONTINUOUSLY, and one BIG pump on Reservoir controls *Two pumps at New York CONTINUOUSLY *Jenkins Tank ON (starting at 0') *12" at Frawley *16" at Tyner *16" at Ringgold/Hwy75 *20" Upper Ringgold Rd AND *20" from Brainerd to Frawley	1.37	61.37	59.91 *Peak day plus new Catoosa Demand *4 Chico pumps on continuously	1	1	4	106.7	130.9	79.60	112.20	135.97	90.00	53.1	31.4	64.58	44.69	800	843.3	61.4	80.4	23.1	0	22.8	5.3	31.9	29.3
11	*with altitude valve at East Ridge Res. *THREE big pumps on at East Ridge CONTINUOUSLY, and one BIG pump on Reservoir controls *Two pumps at New York CONTINUOUSLY *Jenkins Tank ON (starting at 0') *12" at Frawley *16" at Tyner *16" at Ringgold/Hwy75 *20" Upper Ringgold Rd *20" from Brainerd to Frawley *small improvements: 16" on E.Brainerd Rd, 16" connect from Oriole to Marlboro *filling/emptying E. Brainerd Tank once during the day	1.38	64.76	64.7 *Peak day plus new Catoosa Demand *4 Chico pumps on continuously and 20 on Mission Triple Tank Controls	1	1	7	105.6	130.9	23.76	112.88	136.20	99.47	38.5	22.8	55.42	39.89	800	843.3	61.4	80.4	25.0	0	19.6	10.2	31.9	28.8
12	*with altitude valve at East Ridge Res. *THREE big pumps on at East Ridge CONTINUOUSLY, and one BIG pump on Reservoir controls *Two pumps at New York CONTINUOUSLY *Jenkins Tank ON (starting at 0') *12" at Frawley *16" at Tyner *20" at Ringgold/Hwy75 *20" Upper Ringgold Rd AND Middle Ringgold Rd *20" from Brainerd to Frawley *small improvements: 16" on E.Brainerd Rd, 16" connect from Oriole to Marlboro *New tank at East Brainerd, tanks filling/emptying	1.38	64.77	64.48 *Peak day plus new Catoosa Demand *4 Chico pumps on continuously and 20 on Mission Triple Tank Controls	1	1	7	100.3	130.9	40.80	111.41	136.22	98.39	50.3	28.9	69.76	51.10	800	843.3	61.3	80.1	25.9	0	19.7	3.3	31.9	9.8
13	*with altitude valve at East Ridge Res. *New Bigger pumps on at East Ridge both on CONTINUOUSLY, and ER 7 on Reservoir controls *Two pumps at New York CONTINUOUSLY *Jenkins Tank ON (starting at 0') *12" at Frawley *16" at Tyner *20" at Ringgold/Hwy75 *20" Upper Ringgold Rd AND Middle Ringgold Rd *small improvements: 16" on E.Brainerd Rd, 16" connect from Oriole to Marlboro *New tank at East Brainerd, tanks filling/emptying	1.38	64.74	64.8 *Peak day plus new Catoosa Demand *21.11 16.17 19 Chico Bumps on continuously and 420 on Mission Triple Tank control	1	1	7	103	130.6	102.90	109.06	136.25	110.66	53	38.3	61.34	57.01	800	843.3	61.4	80	23.9	0	19.5	7.1	31.9	29.5

119.92	60.2	42.9	70.26	62.98	800	843.3	61.4	80.1	21.3	0	19.5	28.3	31.9	29.7
120.32	60.1	39.8	70.88	64.28	800	843.3	61.4	80.2	21	0	19.5	29.8	31.9	32.5
52.78	-4.7	-31.4	8.98	58.07	800	843.3								
110.39	52.4	35.1	61.05	55.98	800	843.3	61.4	80.1	23.8	0	19.5	10.9	31.9	29.7
135.46	84	48.4	65.72	66.90	800	843.3	61.3	80.1	24.7	25.1	19.7	14	31.9	31.8 10.8
107.63	40.9	38	58.69	67.49	800	843.3	61.4	80.2	25.7	26	19.5	14	31.9	38.3

oosa side of meter box This indicates th
g of Phase 2

"Where indicated in "Piping Configuration" column, the East Ridge
Reservoir is the new tank minimum level



TAW/CATOOSA CO. STUDY
CTI # C05009-12

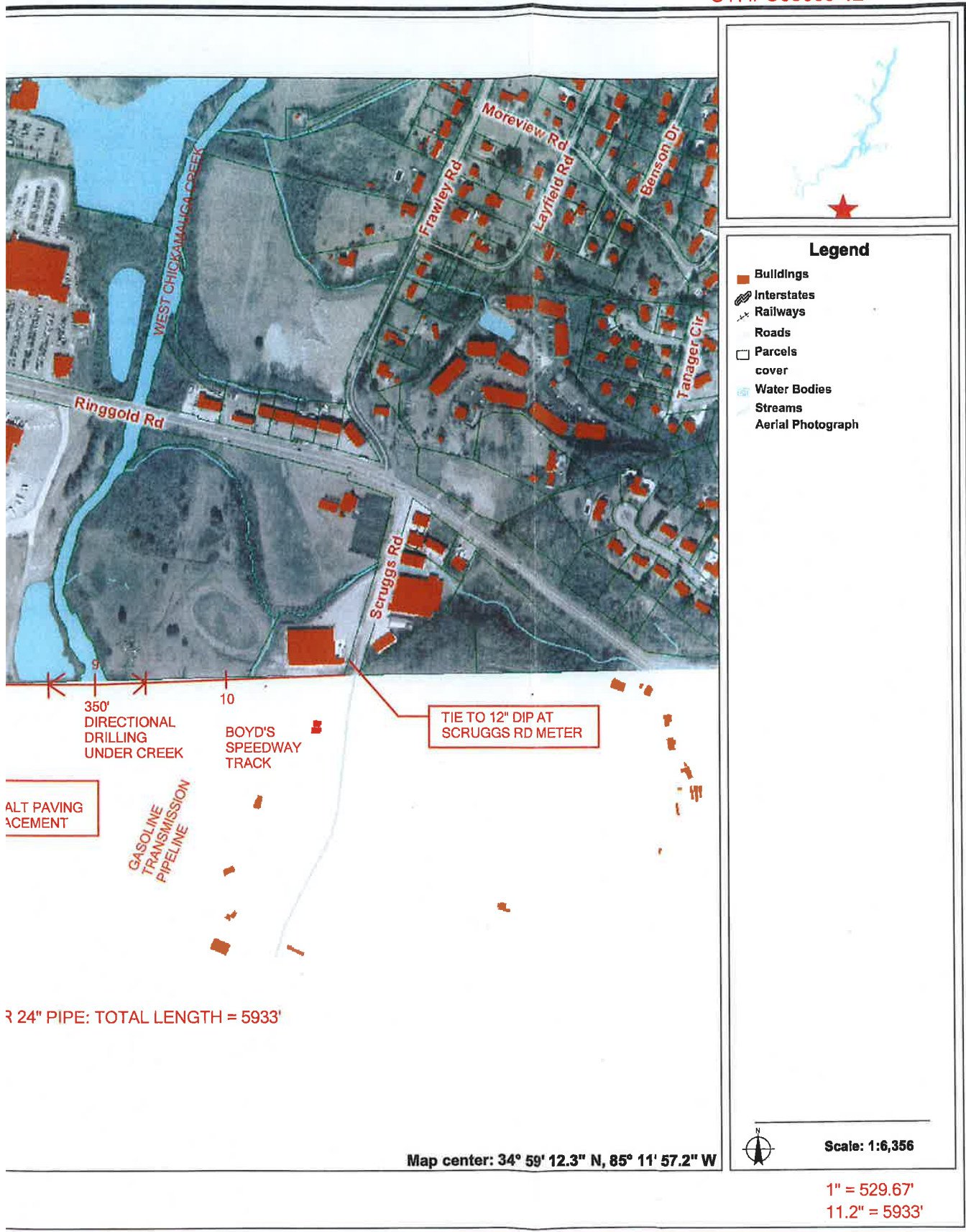


FIGURE 1

TAW/CATOOSA CO. STUDY
CTI # C05009-12

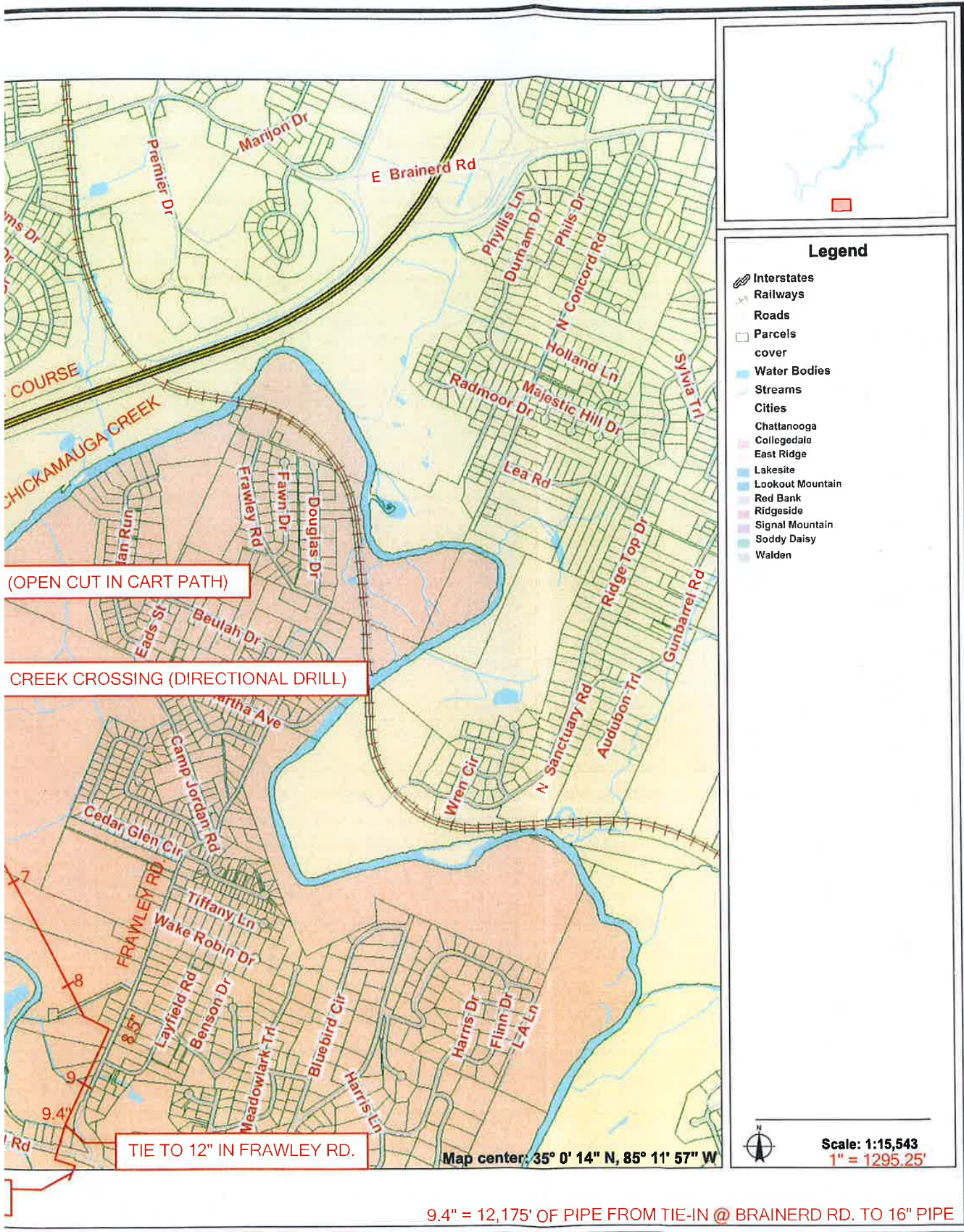


FIGURE 2

TAW/CATOOSA CO. STUDY
CTI # C05009-12

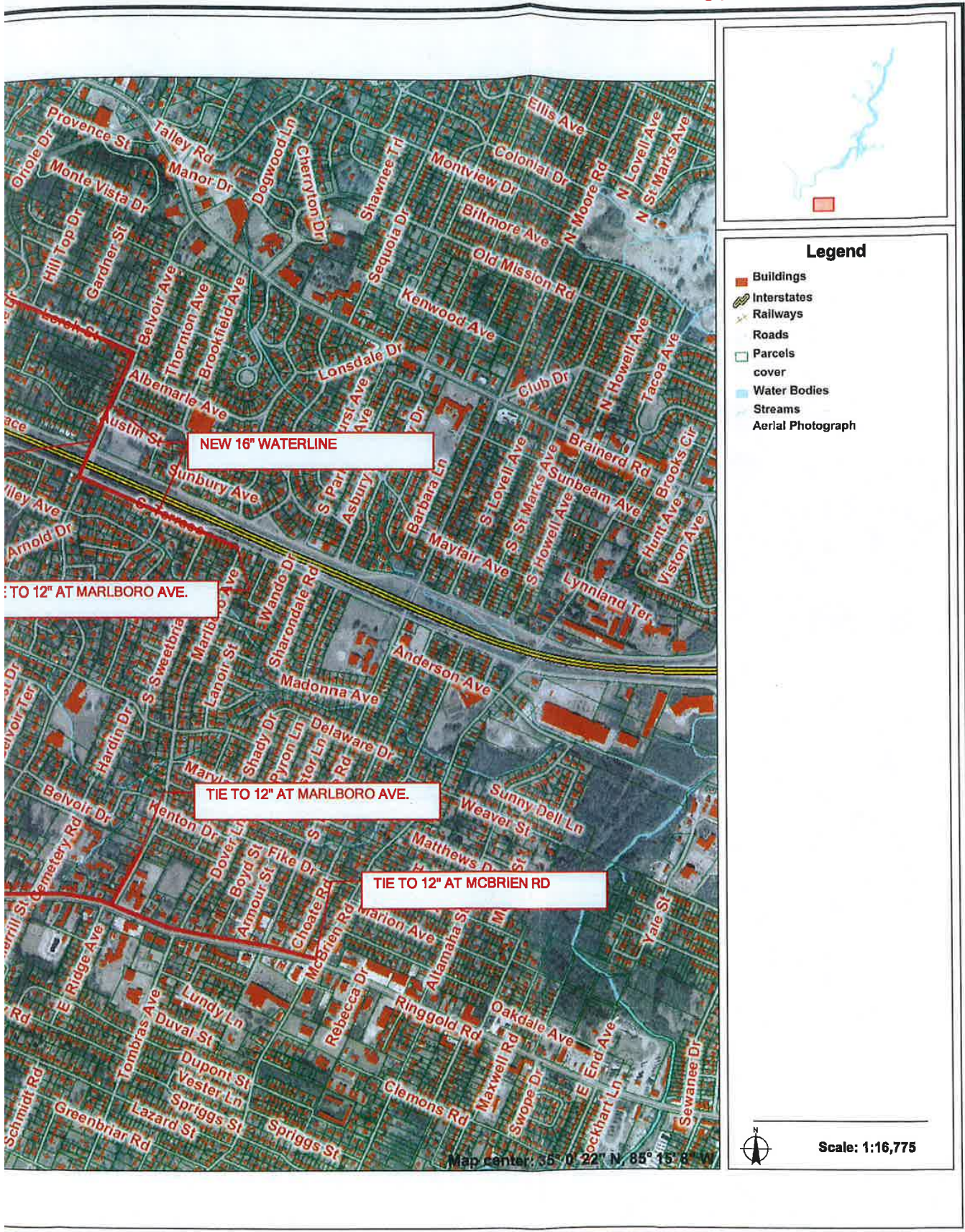
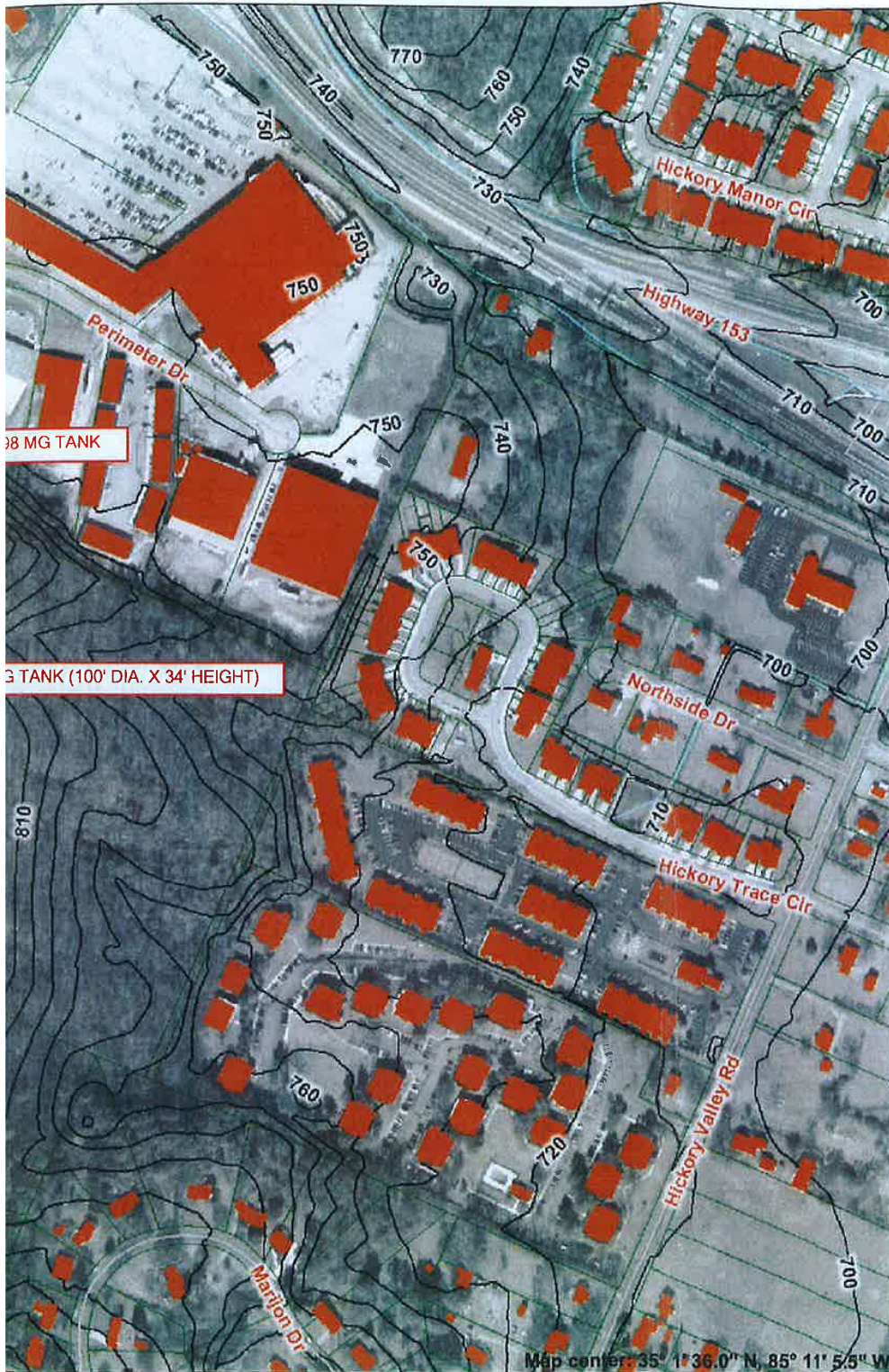


FIGURE 3

TAW/CATOOSA CO. STUDY
CTI # C05009-12



Legend

- Buildings
- Interstates
- Railways
- Roads
- 10ft Contour Lines
- Contour Labels
- Parcels
- cover
- Water Bodies
- Streams
- Aerial Photograph



Scale: 1:4,196

Map center: 35° 11' 36.0" N, 85° 11' 5.5" W

FIGURE 4

TAW/CATOOSA CO. STUDY
CTI # C05009-12

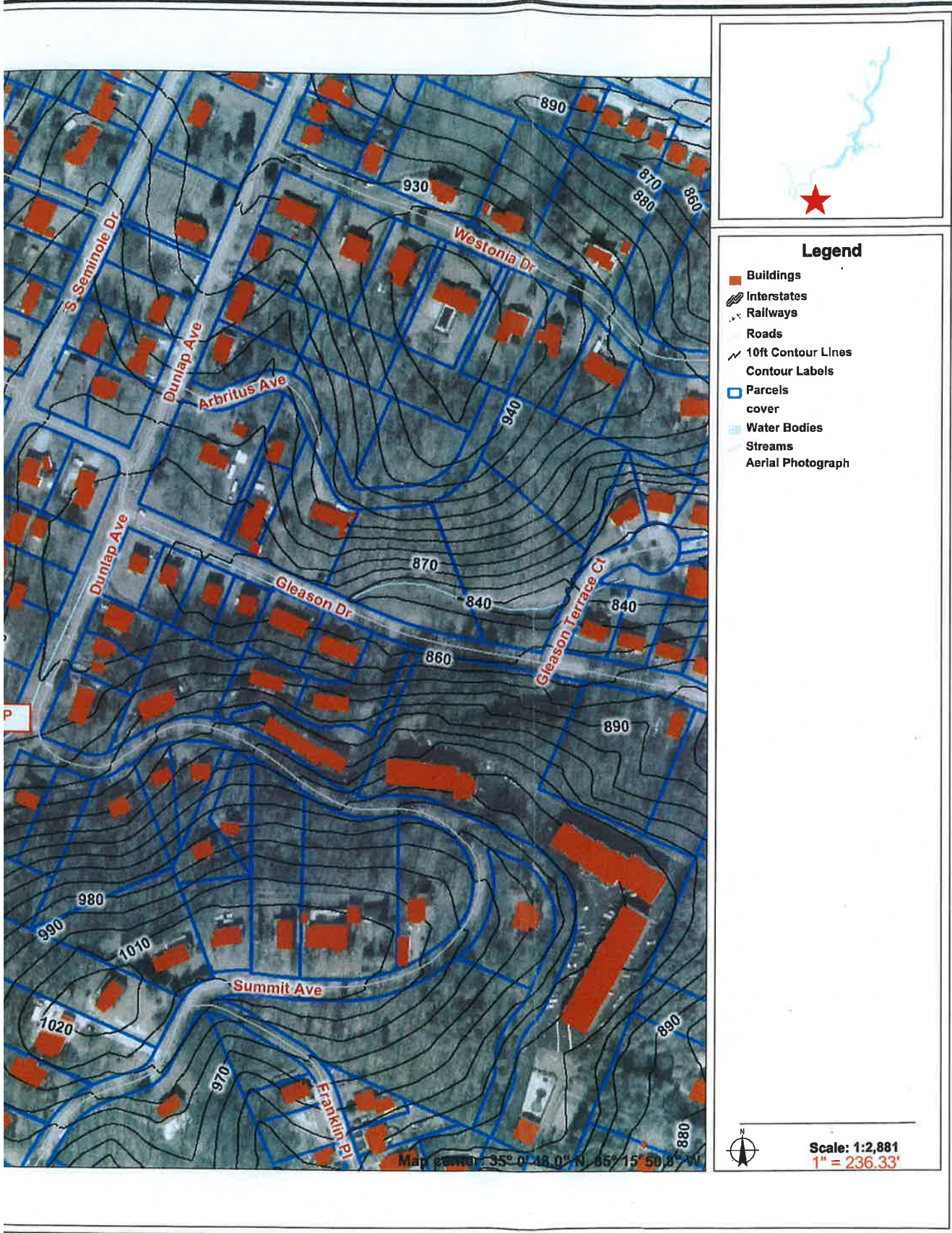


FIGURE 5

TAW/CATOOSA CO. STUDY
CTI # C05009-12

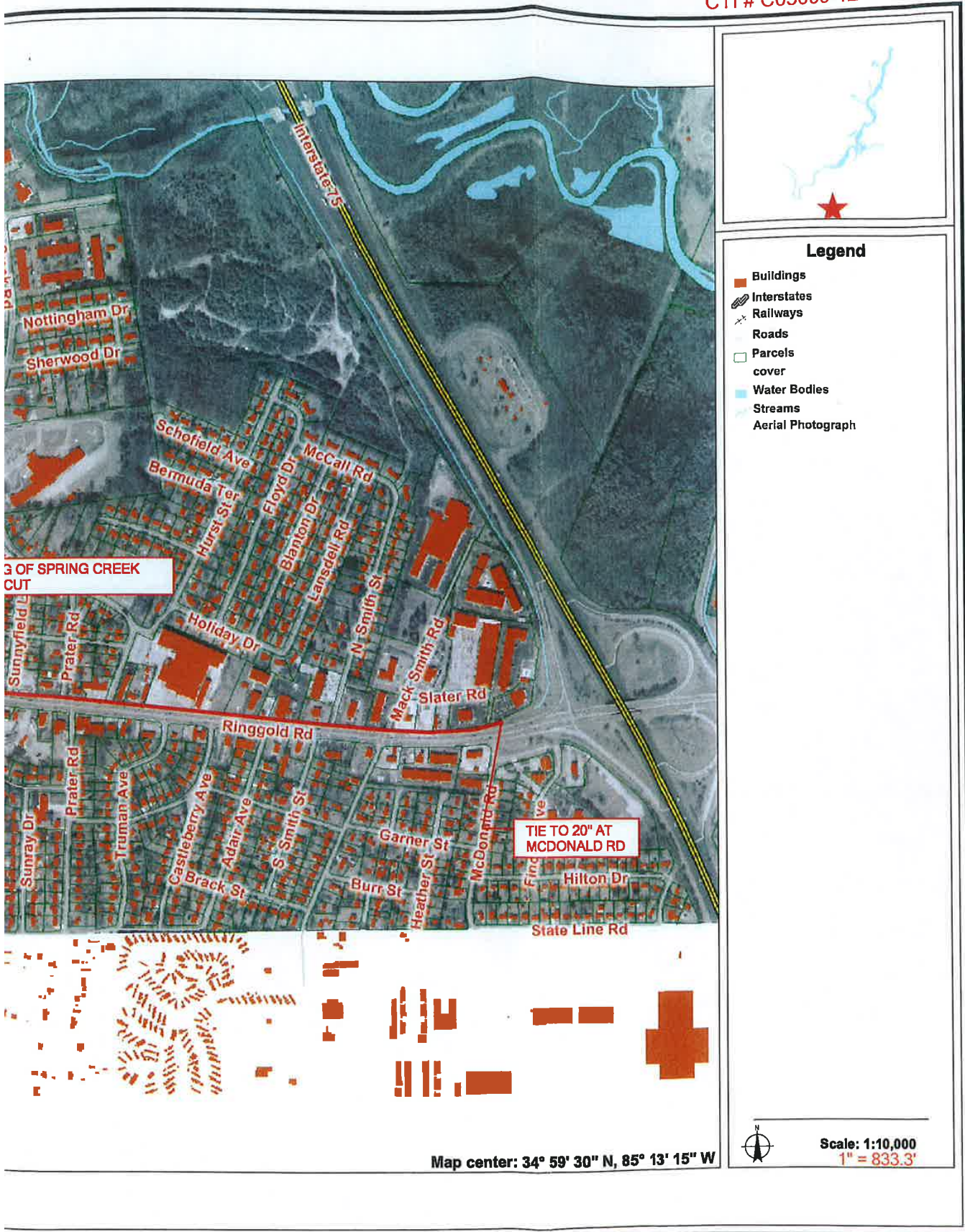
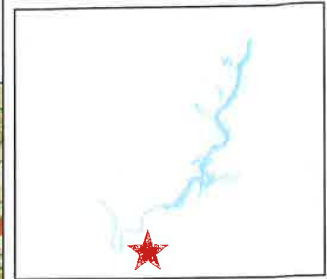


FIGURE 6

TAW/CATOOSA CO. STUDY
CTI # C05009-12

voir



Legend

- Buildings
- Interstates
- Railways
- Roads
- Parcels
- Water Bodies
- Streams
- Cities
- Chattanooga
- Collegedale
- East Ridge
- Lakesite
- Lookout Mountain
- Red Bank
- Ridgeside
- Signal Mountain
- Soddy Daisy
- Walden
- Aerial Photograph



Scale: 1:6,330

1" = 527.5'
6.5" = 3429'

FIGURE 7

TAW Catoosa UD Service Improvements Study - CTI Project No. C05009-12

Global factor	Demanded Flow	Total System Flow from CITICO (mgd)	Demand (mgd) @ Catoosa UD			Pressure (psi) (fixed demand)						Lowest Points in Area						Lowest Tank Levels									
			Lakeview	Chickamauga	Scruggs	Min Press Lakeview Meter	Min Press Chickamauga Meter	Min Press Scruggs Rd Meter	Avg Press Lakeview Meter	Avg Press Chickamauga Meter	Avg Press Scruggs Rd Meter	Min Beulah (psi)	Min Roselawn (psi)	Avg Beulah (psi)	Avg Roselawn (psi)	Beulah (Elev)	Roselawn (Elev)	South Mission Ridge Tank	Missionary Ridge Stand Pipe	Mission Ridge Triple Tanks	Jenkins Road Tank	North End Tank	East Ridge Reservoir	Ryall Springs Tank	East Brainerd Tank	New Elevated Tank in East Ridge	
1.035		45.8 *Sept 20 Catoosa Demand	0.065	0.1512	1.15			149.8	81.54	127.70	153.11	102.51	41.5	35.9	64.90	61.16	800	843.3	61.50	80.40	26.00	0.00	19.40	10.70	31.90	32.2	
1.035		46.02 *Sept 20 plus new Catoosa Demand	1	1	2.5			129	25.94	100.41	136.39	44.55	10.40	33.70	31.45	53.47	800	843.3	61.40	80.10	25.50	0.00	17.50	10.60	32.00	30	
		46.07 *Sept 20 plus new Catoosa Demand Three pumps on at Cato continuous (20 on press controls)																									
1.035		46.42 *Sept 20 plus new Catoosa Demand Three pumps on at Cato continuous (20 on press controls)	1	1	2.5			129	26.18	100.74	136.37	44.66	10.8	34.2	31.74	53.75	800	843.3	61.4	80.6	25.7	0	18.2	10.6	32	30	
		46.45 *Sept 20 plus new Catoosa Demand Three pumps on at Cato continuous (20 on press controls)																									
1.035	48.15	46.75 *Sept 20 plus new Catoosa Demand Three pumps on at Cato continuous (20 on press controls)	1	1	2.5	88.5	131.5	37.60	105.73	136.57	62.27	6.1	33.8	31.15	57.57	800	843.3	61.4	80.7	25.7	0	18.4	10.8	31.9	29.4		
		46.75 *Sept 20 plus new Catoosa Demand Three pumps on at Cato continuous (20 on press controls)																									
1.035	48.15	46.75 *Sept 20 plus new Catoosa Demand Three pumps on at Cato continuous (20 on press controls)	1	1	2.5	90.8	131.3	43.48	103.88	136.56	59.87	12.2	34	28.70	54.78	800	843.3	61.5	80.6	25.9	0	19.4	10.8	32	29.4		
		46.75 *Sept 20 plus new Catoosa Demand Three pumps on at Cato continuous (20 on press controls)																									
1.035	48.15	46.75 *Sept 20 plus new Catoosa Demand Three pumps on at Cato continuous (20 on press controls)	1	1	2.5	88.3	131.3	74.08	101.65	136.31	89.21	38.6	35.1	54.08	57.42	800	843.3	61.5	80.1	25	0	17.1	10.8	31.9	30		
		54 *Peak day plus new Catoosa Demand 14 Cato pumps on continuously																									
1.21	54.26	54 *Peak day plus new Catoosa Demand 14 Cato pumps on continuously	1	1	2.5	76.8	131.2	61.60	90.44	136.20	78.04	25.7	31.7	42.50	47.01	800	843.3	61.5	80.6	25.9	0	19.4	10.2	31.9	29.4		
		54.5 *Peak day plus new Catoosa Demand 14 Cato pumps on continuously																									
1.21	54.26	54.5 *Peak day plus new Catoosa Demand 14 Cato pumps on continuously	1	1	2.5	88.8	131.2	87.30	99.33	136.17	100.95	50.2	30.6	64.56	45.93	800	843.3	61.4	80.4	26	0	19.4	10.1	31.9	29.4		
		54.5 *Peak day plus new Catoosa Demand 14 Cato pumps on continuously																									
1.21	54.26	54.5 *Peak day plus new Catoosa Demand 14 Cato pumps on continuously	1	1	2.5	106	131.2	89.30	115.15	136.28	99.12	52.7	36.5	62.72	57.05	800	843.3	61.5	80.2	25.8	0	19.4	8.3	31.9	29.4		
		59.91 *Peak day plus new Catoosa Demand 14 Cato pumps on continuously																									
1.37	61.37	59.91 *Peak day plus new Catoosa Demand 14 Cato pumps on continuously	1	1	4	106.7	130.9	79.60	112.20	135.92	90.00	53.1	31.4	64.58	44.69	800	843.3	61.4	80.4	23.1	0	22.6	5.3	31.9	29.3		
		64.7 *Peak day plus new Catoosa Demand 15 Cato pumps on continuously and 20 on Mission Triple Tank Controls																									
1.38	64.70	64.7 *Peak day plus new Catoosa Demand 15 Cato pumps on continuously and 20 on Mission Triple Tank Controls	1	1	7	105.6	130.9	23.75	112.88	136.20	39.47	38.9	22.8	55.42	39.88	800	843.3	61.4	80.4	25.9	0	19.8	10.2	31.9	28.8		
		64.48 *Peak day plus new Catoosa Demand 15 Cato pumps on continuously and 20 on Mission Triple Tank Controls																									
1.38	64.77	64.48 *Peak day plus new Catoosa Demand 15 Cato pumps on continuously and 20 on Mission Triple Tank Controls	1	1	7	100.3	130.9	40.80	111.41	136.22	58.39	50.3	28.9	69.76	51.10	800	843.3	61.3	80.1	25.9	0	19.7	3.3	31.9	9.8		

cto	1.38	64.69	64.64 *Peak dry plus new Caloosa Demand 21,11,16,17,19 Caloosa pumps on continuously and #20 on Mission Tingle Tank control	1	1	7	111.8	130.9	110.78	119.16	136.24	119.92	60.2	42.9	70.26	62.98	800	843.3	61.4	80.1	21.3	0	19.5	29.3	31.9	29.7	
cto	1.38	65.77	64.77 *Peak dry plus new Caloosa Demand 21,11,16,17,19 Caloosa pumps on continuously and #20 on Mission Tingle Tank control	1	1	7	111.6	130.9	110.58	119.08	136.24	120.32	60.1	39.9	70.88	64.28	800	843.3	61.4	80.2	21	0	19.5	29.6	31.9	32.5	
cto	1.38	64.78	65.12 *Peak dry plus new Caloosa Demand 21,11,16,17,19 Caloosa pumps on continuously and #20 on Mission Tingle Tank control	1	1	7	113	130.9	39.68	118.79	136.24	52.78	-4.7	31.4	6.98	58.07	800	843.3									
cto	1.38	64.77	64.87 *Peak dry plus new Caloosa Demand 21,11,16,17,19 Caloosa pumps on continuously and #20 on Mission Tingle Tank control	1	1	7	102	130.9	102.98	108.64	136.24	110.39	52.4	35.1	61.05	55.98	800	843.3	61.4	80.1	23.8	0	19.5	10.9	31.9	29.7	
cto	1.38	64.77	64.38 *Peak dry plus new Caloosa Demand 21,11,16,17,19 Caloosa pumps on continuously and #20 on Mission Tingle Tank control	1	1	7	116.1	130.9	122.98	126.85	136.24	135.46	84	48.4	85.72	66.90	800	843.3	61.3	80.1	24.7	25.1	19.7	14	31.9	31.8	10.8
cto	1.37	61.37	61.93 *Peak dry plus new Caloosa Demand 21,11,16,17,19 Caloosa pumps on continuously and #20 on Mission Tingle Tank control	1	1	6	113.3	130.9	90.58	126.90	136.26	107.63	47.0	38	58.68	67.49	800	843.3	61.4	80.2	25.7	26	19.5	14	31.9	36.3	

*The first 12 scenarios show minimum pressure at Caloosa side of meter box. This indicates in the meter box will need to be upgraded at the beginning of Phase 2.

*Where indicated in "Piping Configuration" column, the East Ridge Reservoir is the new tank minimum level.

TRICT IMPROVEMENTS STUDY
PROJECTS CONSIDERED IN STUDY

Improvements are not as listed below)

Description

Cruggs Road Meter

Rawley Road

Ad to McBrien Road

Mapping Station at East Brainerd Site
on

East Ridge Reservoir Site
existing TAW site

McBrien Road to McDonald Road

East Ridge (If Project is Done Separately from New Tank)

East Ridge

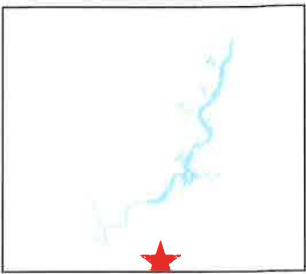
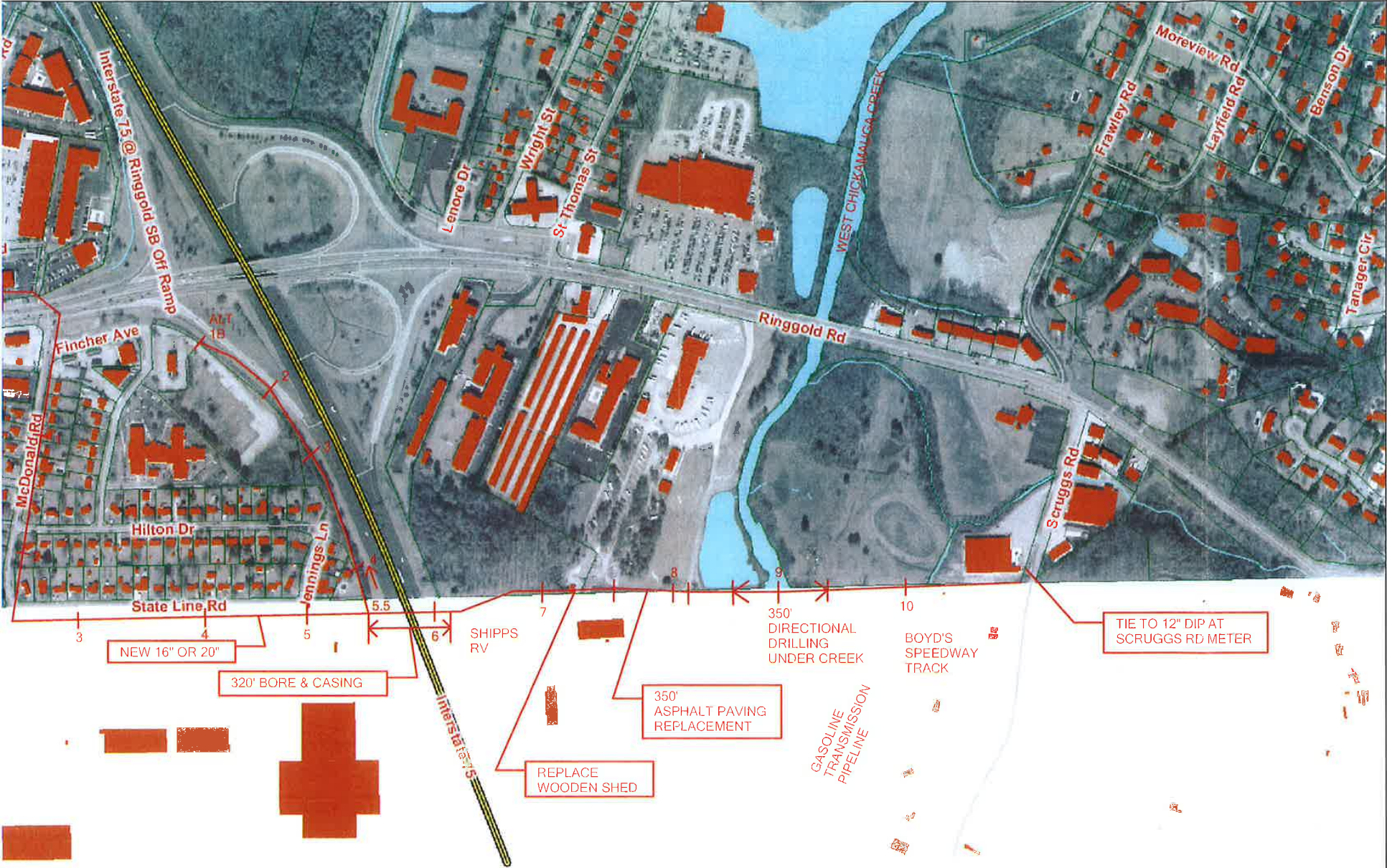
2inch&LargerMains
Diameter

- 12
- 14
- 16



TAW/CATOOSA CO. STUDY
CTI # C05009-12

Id Road to Scruggs Road Waterline

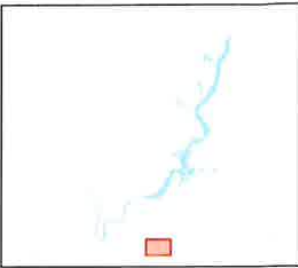
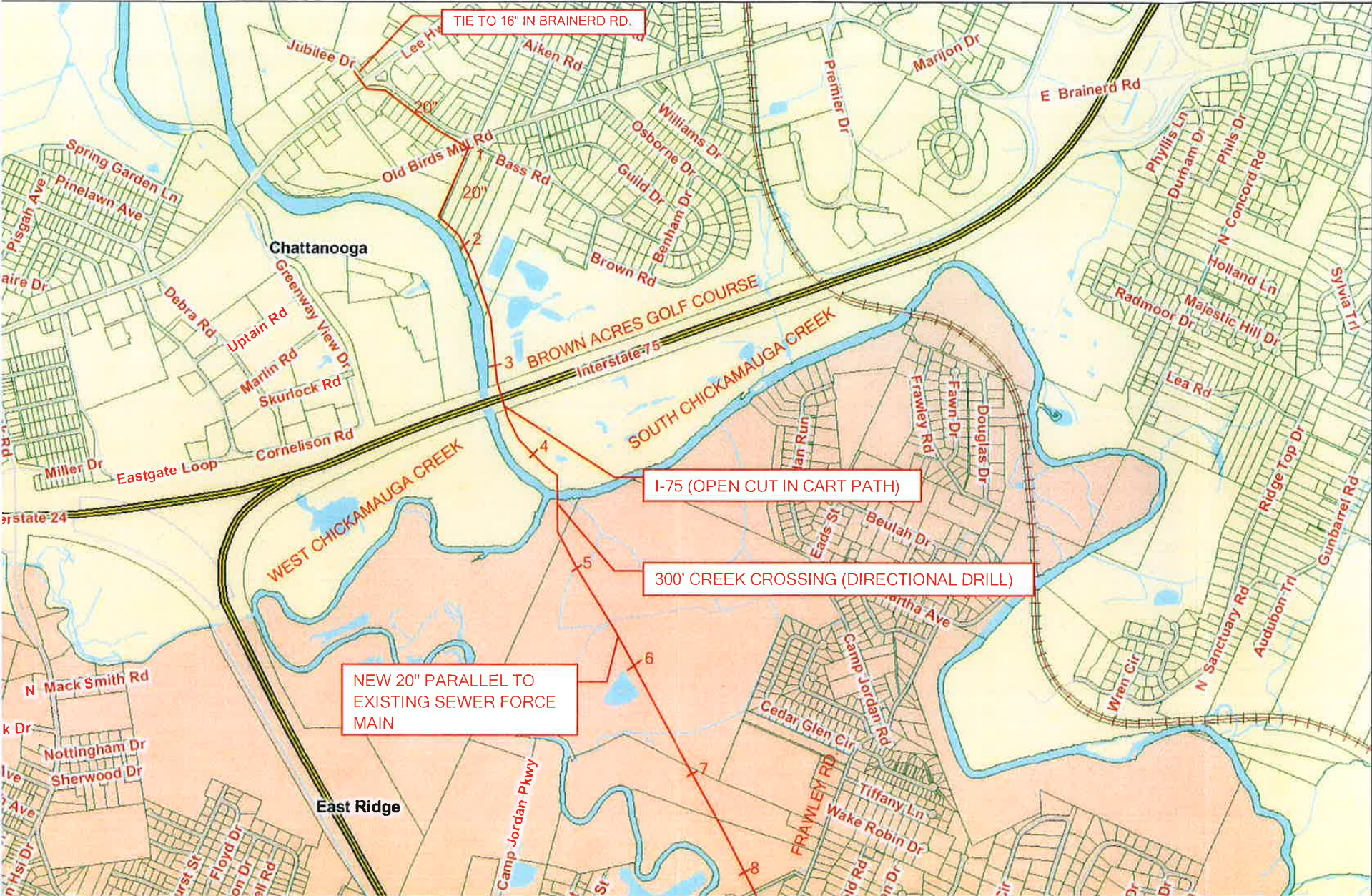


Legend

- Buildings
- Interstates
- Railways
- Roads
- Parcels
- cover
- Water Bodies
- Streams
- Aerial Photograph

TAW/CATOOSA CO. STUDY
CTI # C05009-12

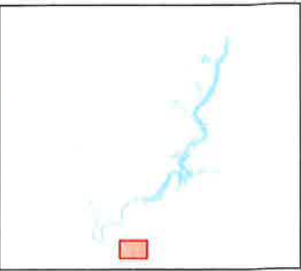
Rd Road to Frawley Road Waterline



Legend

- Interstates
- Railways
- Roads
- Parcels
- cover
- Water Bodies
- Streams
- Cities
- Chattanooga
- Collegedale
- East Ridge
- Lakesite
- Lookout Mountain
- Red Bank
- Ridgeside
- Signal Mountain
- Soddy Daisy
- Walden

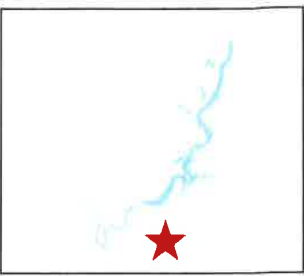
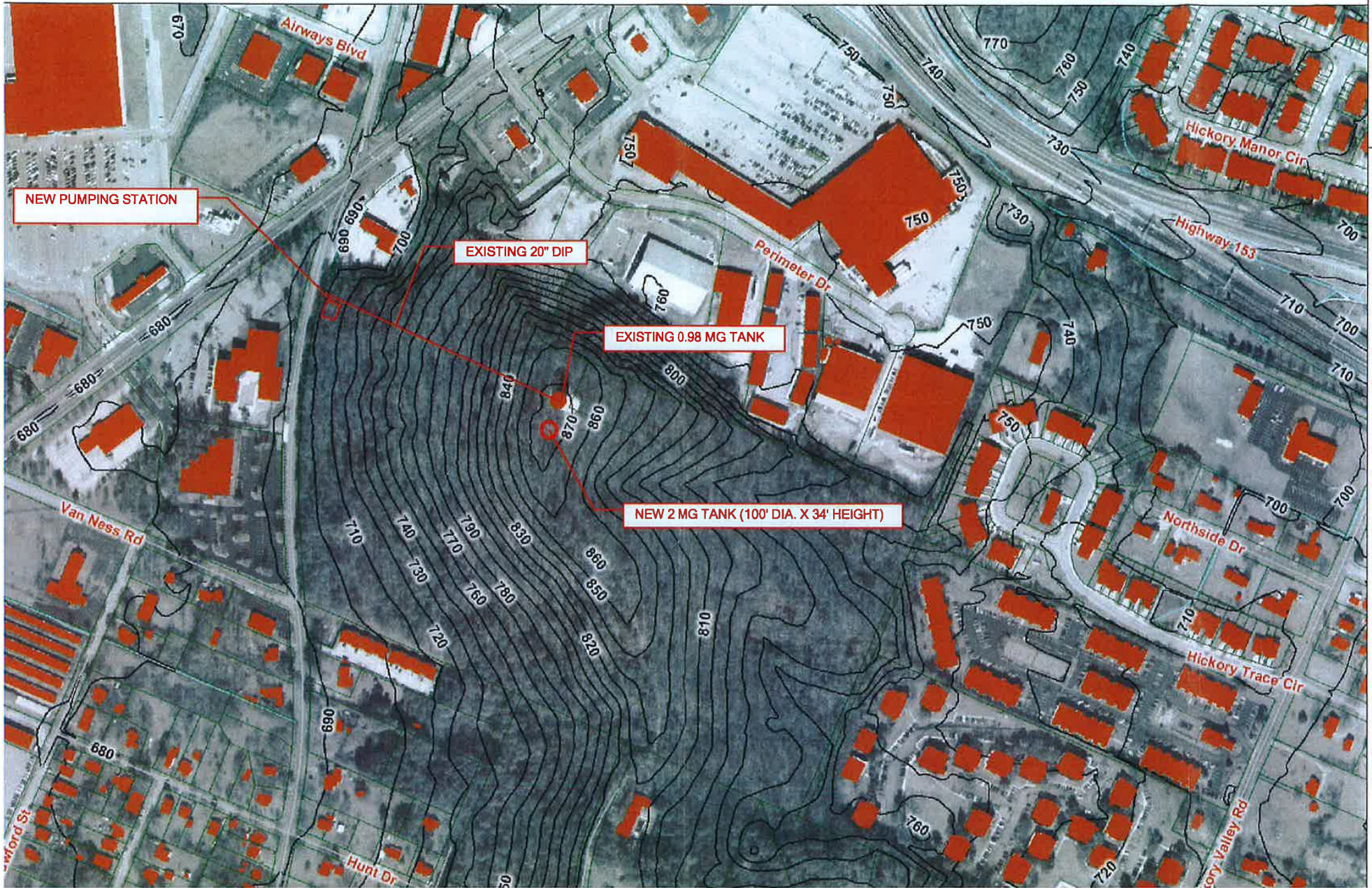
Id Rd to McBrien Rd Waterline



Legend

- Buildings
- Interstates
- Railways
- Roads
- Parcels
- cover
- Water Bodies
- Streams
- Aerial Photograph

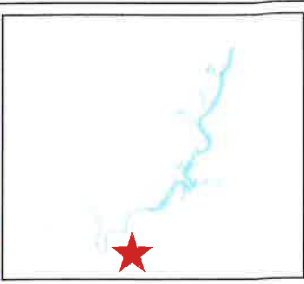
II. Brainerd Tank and Pumping Station



Legend

- Buildings
- Interstates
- Railways
- Roads
- 10ft Contour Lines
- Contour Labels
- Parcels
- cover
- Water Bodies
- Streams
- Aerial Photograph

Water Pumping Station and New 20" Line to E. Ridge Reservoir



Legend

- Buildings
- Interstates
- Railways
- Roads
- Parcels
- cover
- Water Bodies
- Streams
- Cities
- Chattanooga
- Collegedale
- East Ridge
- Lakesite
- Lookout Mountain
- Red Bank
- Ridgeside
- Signal Mountain
- Soddy Daisy
- Walden
- Aerial Photograph

CTI PROJECT NUMBER: C05009-12								
PRESSURE ZONE: TAWC-Catoosa								
LOCATION: Scruggs Road @ Catoosa Co. Meter Vault								
TELOG ID NUMBER: 2297								
HYDRANT NUMBER: New								
ELEVATION:								
Date/Time	MIN	AVG	MAX					
10/5/07 10:13	80.4396	82.1978	84.1758					
10/5/07 10:14	81.6117	81.8315	82.4908					
10/5/07 10:15	81.3187	81.9048	82.7839					
10/5/07 10:16	81.0989	82.1245	83.37					
10/5/07 10:17	81.6117	83.0769	84.9817					
10/5/07 10:18	73.6264	81.0256	85.348					
10/5/07 10:19	61.6117	75.6044	83.8095					
10/5/07 10:20	62.6374	65.641	67.1795					
10/5/07 10:21	67.3993	73.1868	84.3956					
10/5/07 10:22	82.5641	86.2271	92.2344					
10/5/07 10:23	80.5861	82.2711	84.1758					
10/5/07 10:24	79.9267	82.1245	83.5897					
10/5/07 10:25	81.3919	82.4176	82.9304					
10/5/07 10:26	81.3919	82.1245	82.4908					
10/5/07 10:27	82.5641	82.8572	83.5165					
10/5/07 10:28	81.3187	82.5641	83.4432					
10/5/07 10:29	80.2931	82.1245	83.37					
10/5/07 10:30	82.1978	82.4908	82.7106					
10/5/07 10:31	81.0989	82.3443	83.37					
10/5/07 10:32	80.6594	81.6117	83.0037					
10/5/07 10:33	80.4396	81.5385	83.0769					
10/5/07 10:34	81.4652	81.7583	82.5641					
10/5/07 10:35	80.5861	81.9048	82.7106					
10/5/07 10:36	82.1245	82.6374	84.3224					
10/5/07 10:37	80.8791	82.2711	82.7839					
10/5/07 10:38	81.1722	82.1978	83.663					
10/5/07 10:39	81.0256	82.1978	84.3224					
10/5/07 10:40	80.0733	81.978	83.663					
10/5/07 10:41	81.0256	82.5641	84.1758					
10/5/07 10:42	81.0256	81.978	82.7839					
10/5/07 10:43	81.5385	81.8315	82.4908					
10/5/07 10:44	81.978	82.3443	83.1502					
10/5/07 10:45	81.6117	82.2711	82.7106					
10/5/07 10:46	81.3187	82.5641	84.3224					
10/5/07 10:47	81.0256	82.0513	83.1502					
10/5/07 10:48	80.6594	81.685	83.1502					
10/5/07 10:49	79.4872	81.7583	83.37					
10/5/07 10:50	81.5385	82.7106	83.8828					
10/5/07 10:51	81.3919	82.3443	83.0769					
10/5/07 10:52	81.6117	82.7106	83.4432					
10/5/07 10:53	83.0769	83.5165	84.1026					
10/5/07 10:54	81.7583	82.4908	83.4432					

APPENDIX D

Figures

TENNESSEE AMERICAN WATER

CATOOSA UTILITY DISTRICT SERVICE IMPROVEMENT STUDY

REPORT REVISIONS AND ADDITIONS TAW TASK ORDER NO. TN-07-CTI-02



CONSOLIDATED TECHNOLOGIES, INC.
ENGINEERS IN WATER AND EARTH SCIENCES



November 30, 2007

Ms. Shannyn C. Walker, Engineer
Kentucky-American Water Company
2300 Richmond Rd
Lexington, KY 40502

Subject: TAW/Catoosa Utility District Study
Report Revisions and Additions
TAW Task Order No. TN-07-CTI-02
CTI Project No. C05009-12

Dear Shannyn:

This letter is a summary of the requested revisions and additional information related to the subject report. The items requested were also listed in my letter dated October 24, 2007. Most of the information has already been sent to you electronically via email dated November 9th through 21st in .pdf and Excel files; copies of those items and the remaining items are included with this letter.

The result of our additional study and modeling is that our recommendations generally remain the same for all three phases of improvements; however, we now have more supporting information for your review. Additionally, there has been discussion within TAW regarding the benefits of increasing the size of the new pipeline from 20-inch to 24-inch from the East Ridge Pumping Station to the Scruggs Road Metering Station. We concur that it be logical and wise to install a 24-inch in lieu of a 20-inch. Our previous recommendations were based specifically on the question "What are the minimum improvements necessary to meet the specified demands?"

The following is our summary of the requested information:

1. For existing, Phase 1, Phase 2, and Phase 3, compare discharge pressure at the East Ridge booster: Hard copies of discharge pressure Extended Period Simulation (EPS) graphs for the Citico, East Ridge, and New York Pumping Station are found in Appendix 1.
2. For existing, Phase 1, Phase 2, and Phase 3, compare East Ridge reservoir operation and turnover. Address how East Ridge reservoir should be operated with future recommended projects: Tank level EPS graphs for existing Phase 1, Phase 2, and Phase 3 improvement scenarios are found in Appendix 2.
3. For existing, Phase 1, Phase 2, and Phase 3, compare Jenkins Road tank operation and turnover: These comparisons are found in Appendix 2.
4. For existing, Phase 1, Phase 2, and Phase 3, compare maximum pressures: These comparisons are found in Appendix 3.
5. Check that results and recommendations do not change with the cancellation of the Tyner Road and East Brainerd Road improvements. If these projects are necessary, add to recommendations: No revisions in CTIs recommended improvements were made necessary by the deletion of these projects.

AN EMPLOYEE-OWNED COMPANY

PHONE 423/267-7613 1122 RIVERFRONT PARKWAY CHATTANOOGA, TN 37402-4926 FAX 423/267-0603

Ms. Shannyn C. Walker, Engineer
November 30, 2007
Page 2

6. Compare fire flow in entire system for existing conditions and Phase 3: Fire flow results for existing and Phase 3 scenarios for the East Ridge Zone, including high demand areas of Hamilton Place, East Ridge Hospital, and East Ridge High School are found in Appendix 4.
7. Make an estimation (i.e., 3.5 percent increase in construction costs per year) for project cost estimates in future years: Phase 1 is an immediate need therefore, no adjustment is needed for it. The Phases 2 and 3 costs inflated to 2009 dollars are:

Description	Construction Cost in 2007	Construction Cost in 2009	Project Cost in 2007	Project Cost in 2009
Phase 2 Improvements				
Ringgold Road to McBrien Road	\$2,630,000	\$2,817,322	\$2,940,000	\$3,149,401
East Ridge Pumping Station Upgrade	\$720,000	\$771,282	\$820,000	\$878,404
Phase 3 Improvements				
McBrien Road to McDonald Road	\$2,630,000	\$3,123,615	\$2,940,000	\$3,491,798

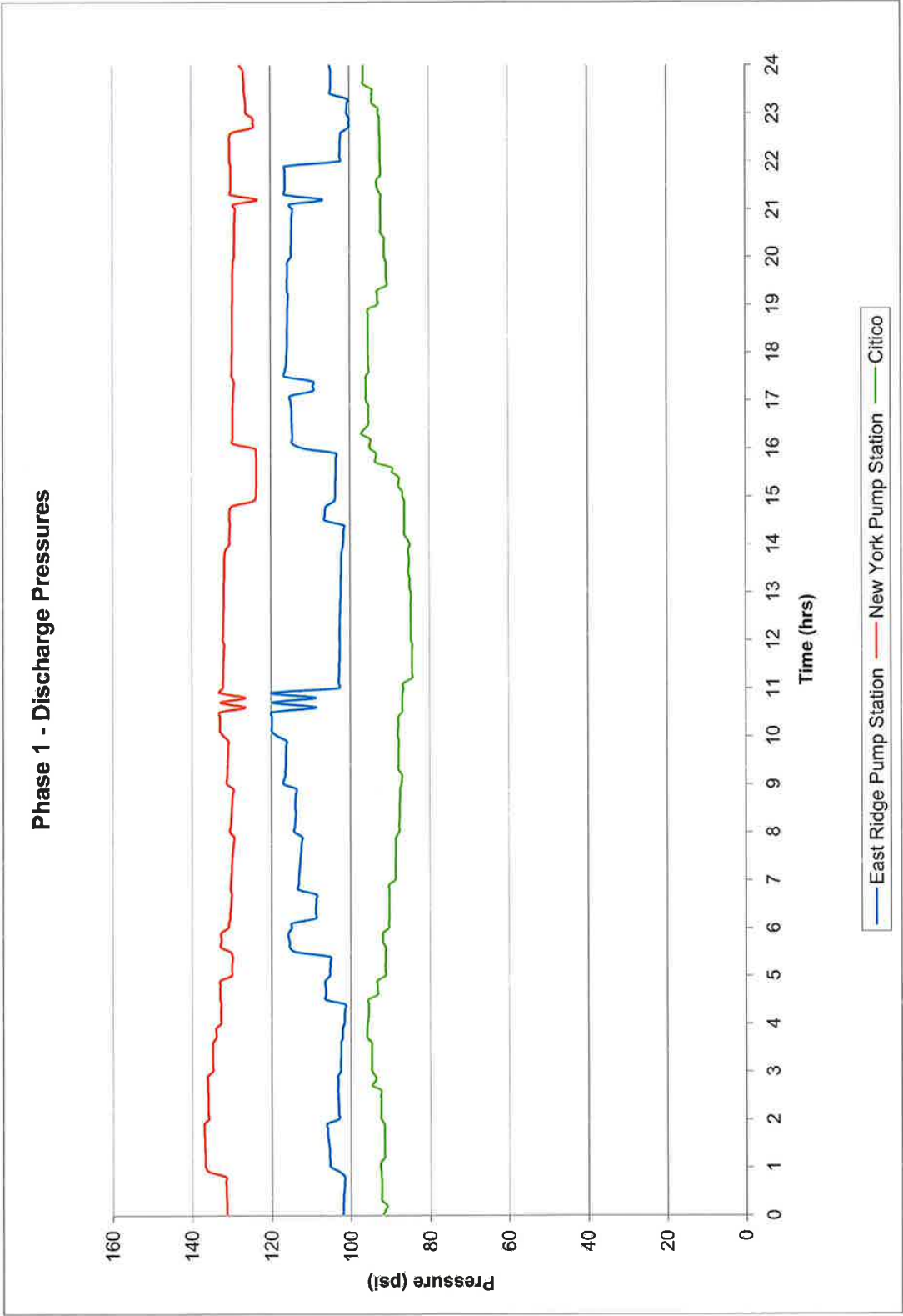
8. Verify how Catoosa County demand was modeled. Was it a constant average load for a 24-hour period or was a diurnal curve applied?: The Catoosa demand at the Scruggs Meter was assumed to be a constant average for each 24-hour period because Catoosa U.D.'s constant speed pumps to deliver water from the Scruggs Road meter.
9. In addition to Item No. 6 above, check specifically a fire flow demand of 1,500 gpm at each of the following locations:
 - a. East Ridge Hospital on Spring Creek Road,
 - b. Hamilton Place Mall on Shallowford Road at Gunbarrel Road, and
 - c. East Ridge High School on Bennett Road.

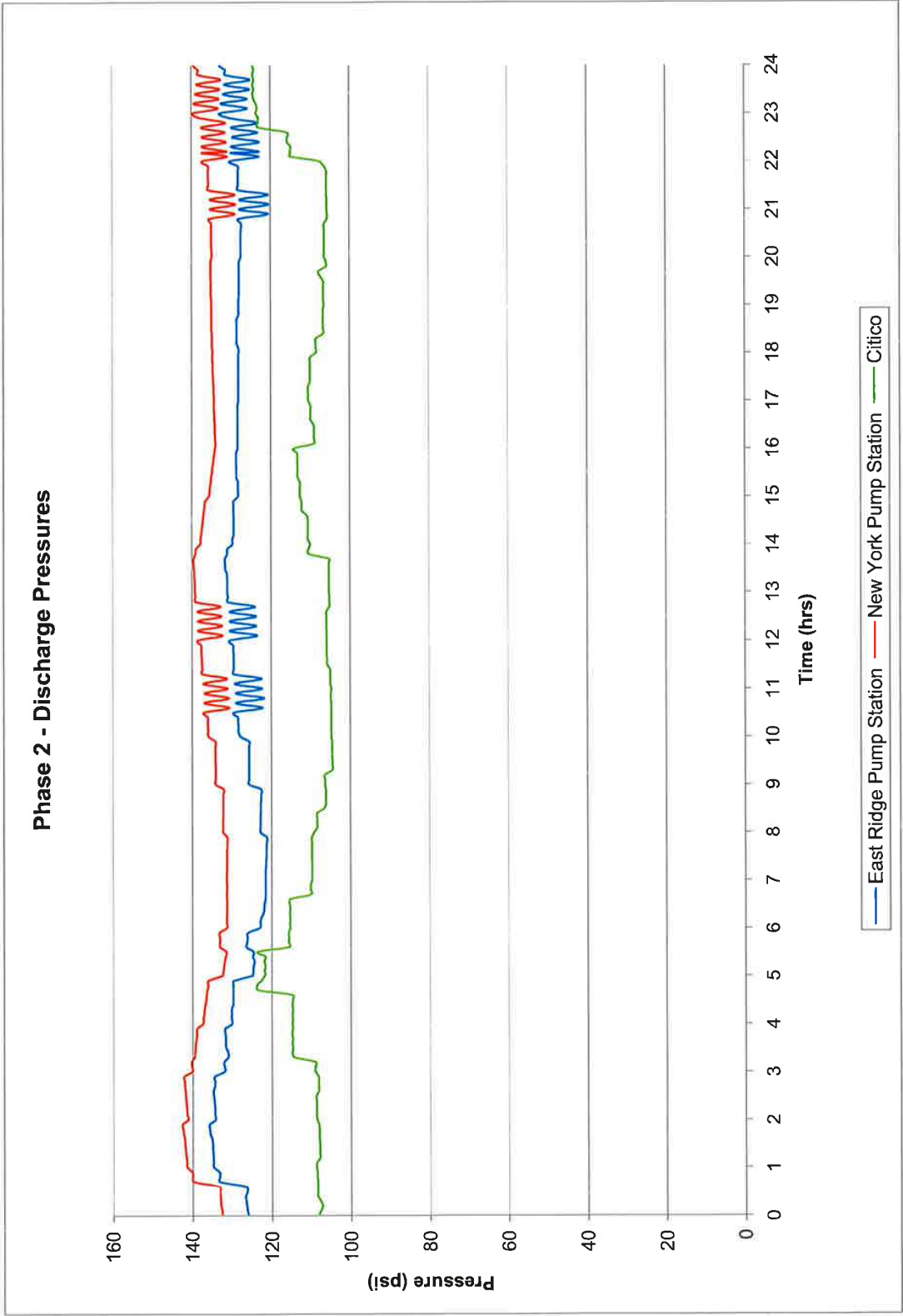
The results of these modeled fire demands can be found in Appendix 4. The hydraulic model results indicate that these demands can be met in all phases with no loss of residual pressure that would be produced under existing conditions.

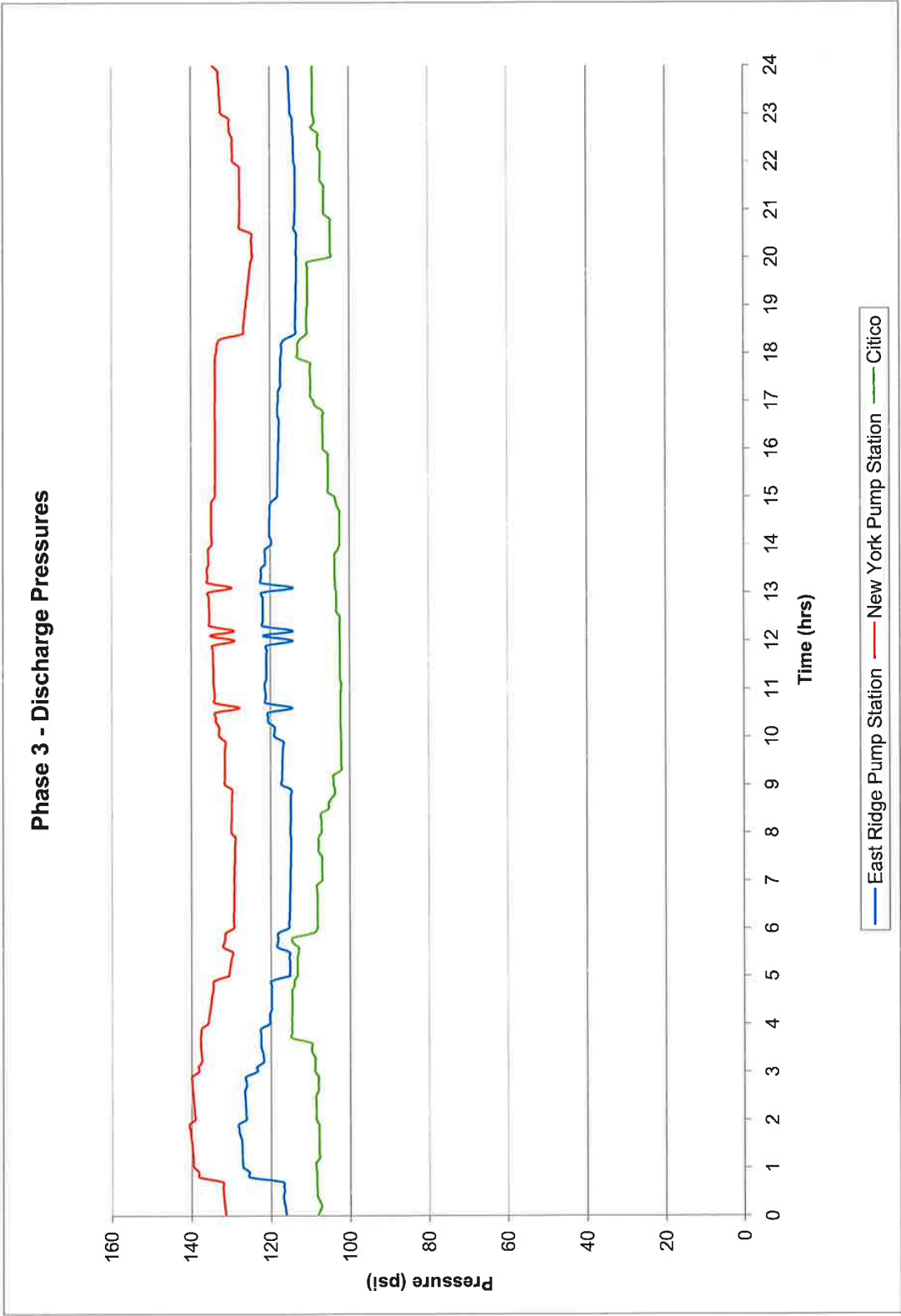
10. CTI was also requested to recommend an operational strategy for the East Ridge reservoir with future proposed projects. It appears that this tank operates adequately with the Phase 1 Improvements. In Phase 2, the East Ridge Pumping Station is upgraded with larger pumps which produce additional flow and head. At this point the pumps will need to be turned off during a portion of the day in order to allow the East Ridge Reservoir to be utilized. This is similar to the required operation for the White Oak Tank in the Hill City zone. However, when TAW system demand is increased during Phase 3, the East Ridge Reservoir tank starts to turn over again. The slight negative effect of Phase 2 on

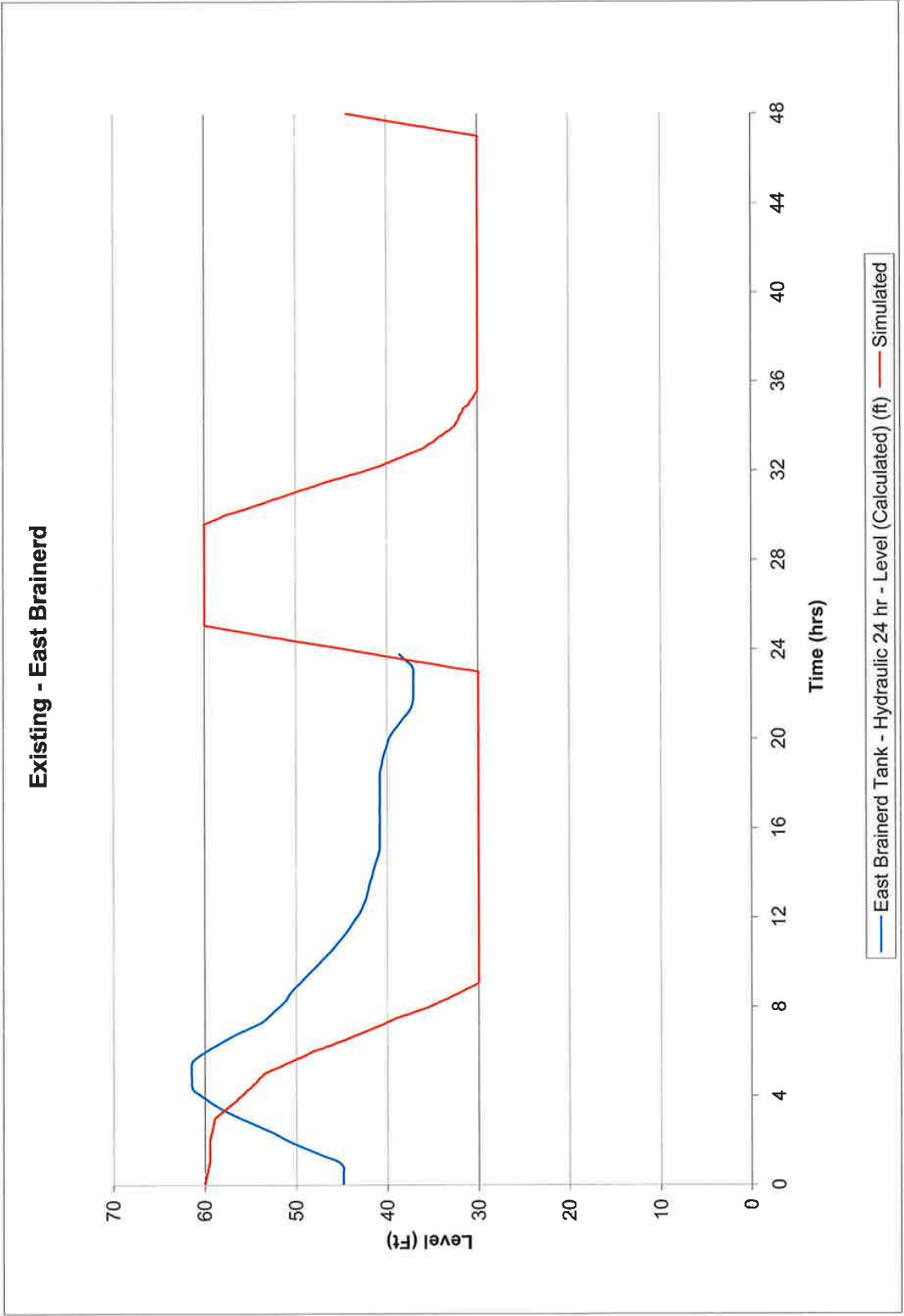
LIST OF APPENDICES

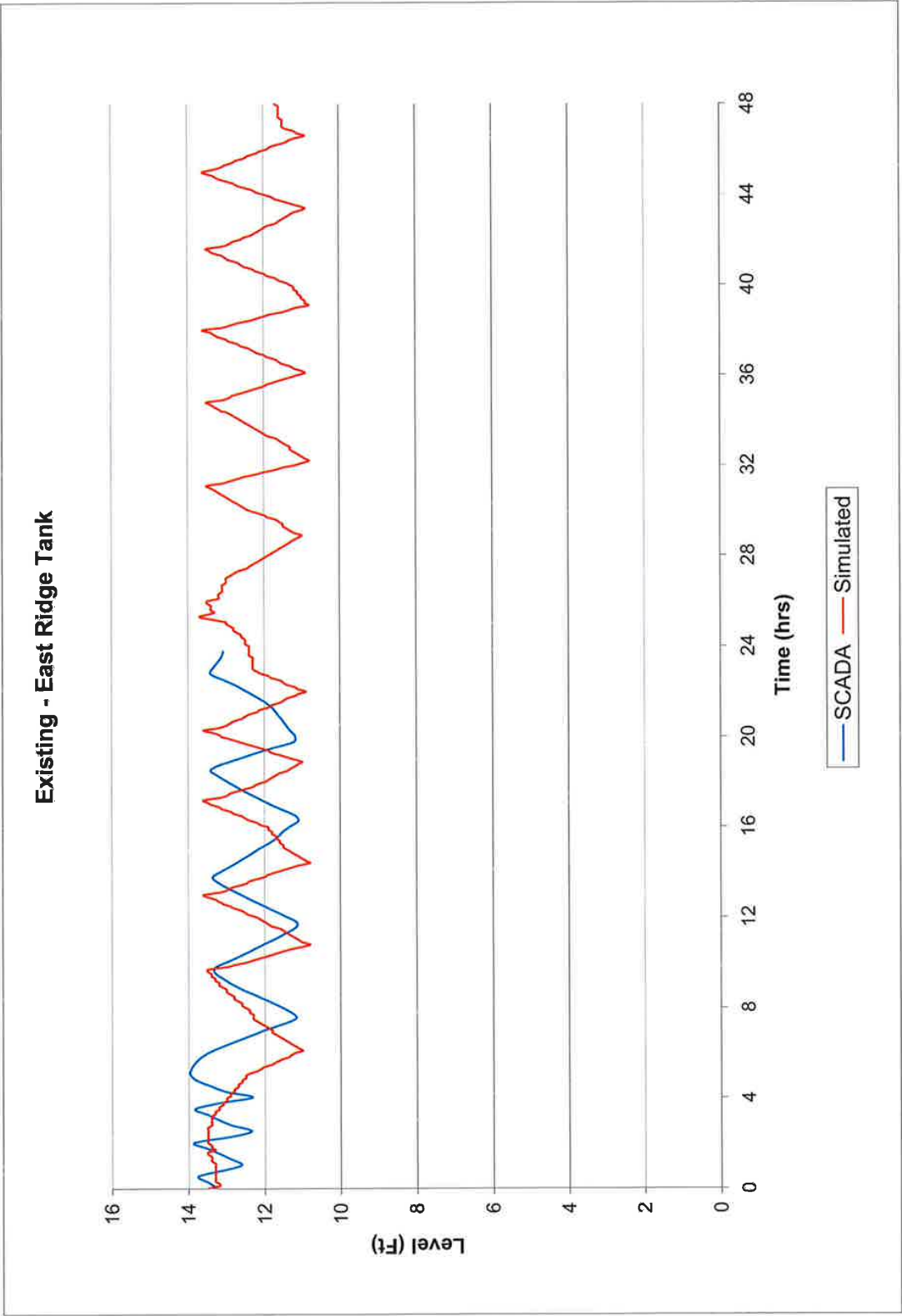
No.	Description
1.	Comparison of discharge pressure at the Citico, East Ridge, and New York Pumping Station for Phases 1, 2, and 3.
2.	Tank level graphs during extended period simulation for existing Phase 1, 2, and 3 improvements.
3.	Maximum, average, and minimum pressure in the East Ridge zone during existing Phase 1, 2, and 3 scenarios.
4.	Comparison of fire flow capabilities in the East Ridge zone during existing and 3 scenarios. Comparison of fire flow capabilities at Hamilton Place Mall, East Ridge Hospital, and East Ridge High School during existing and Phase 3 scenarios.
5.	Comparison of results of separation (isolation) of the East Ridge zone into northern/southern sections. Pumping Station discharge pressures, tank levels, and system maximum/minimum pressures.

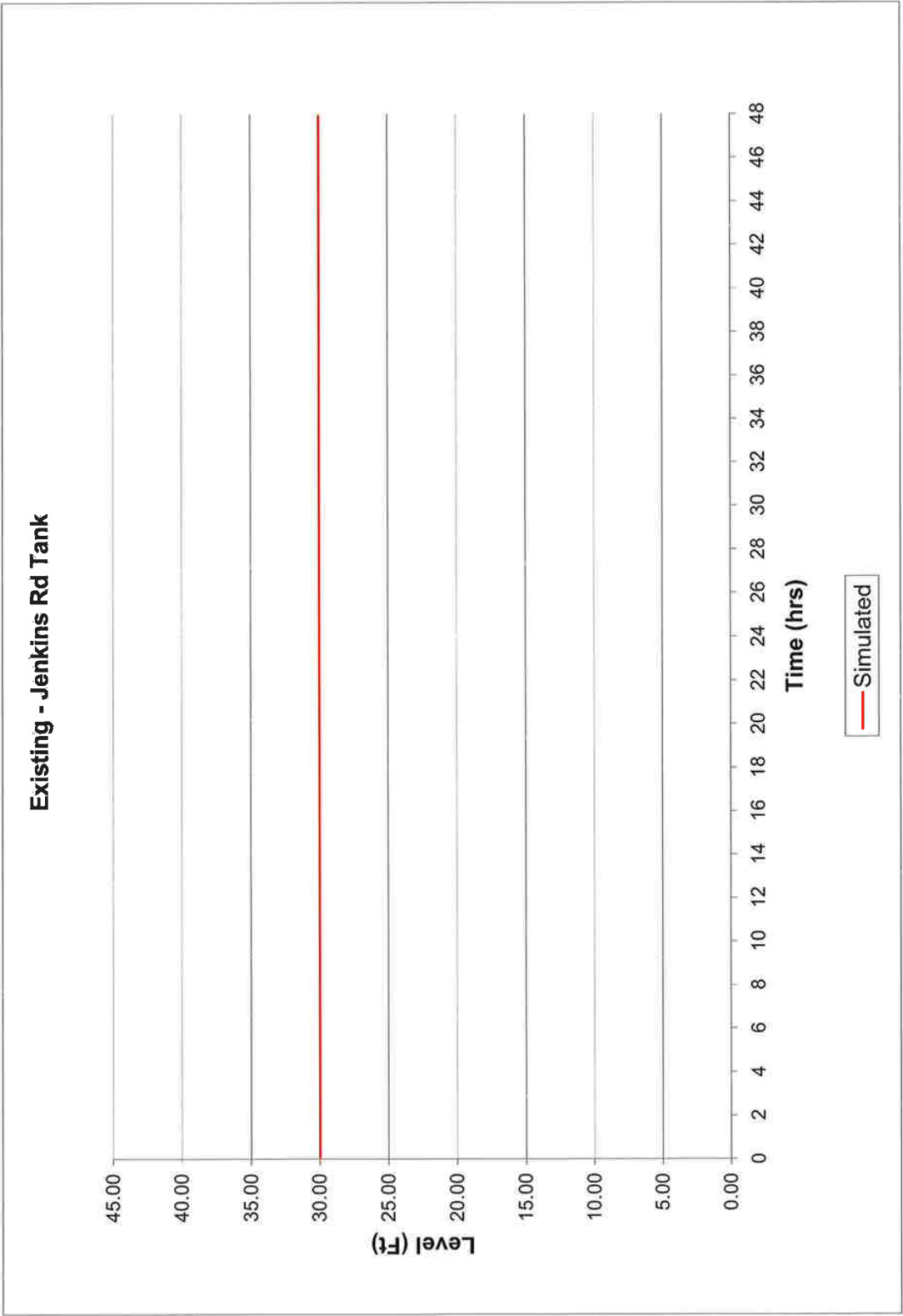


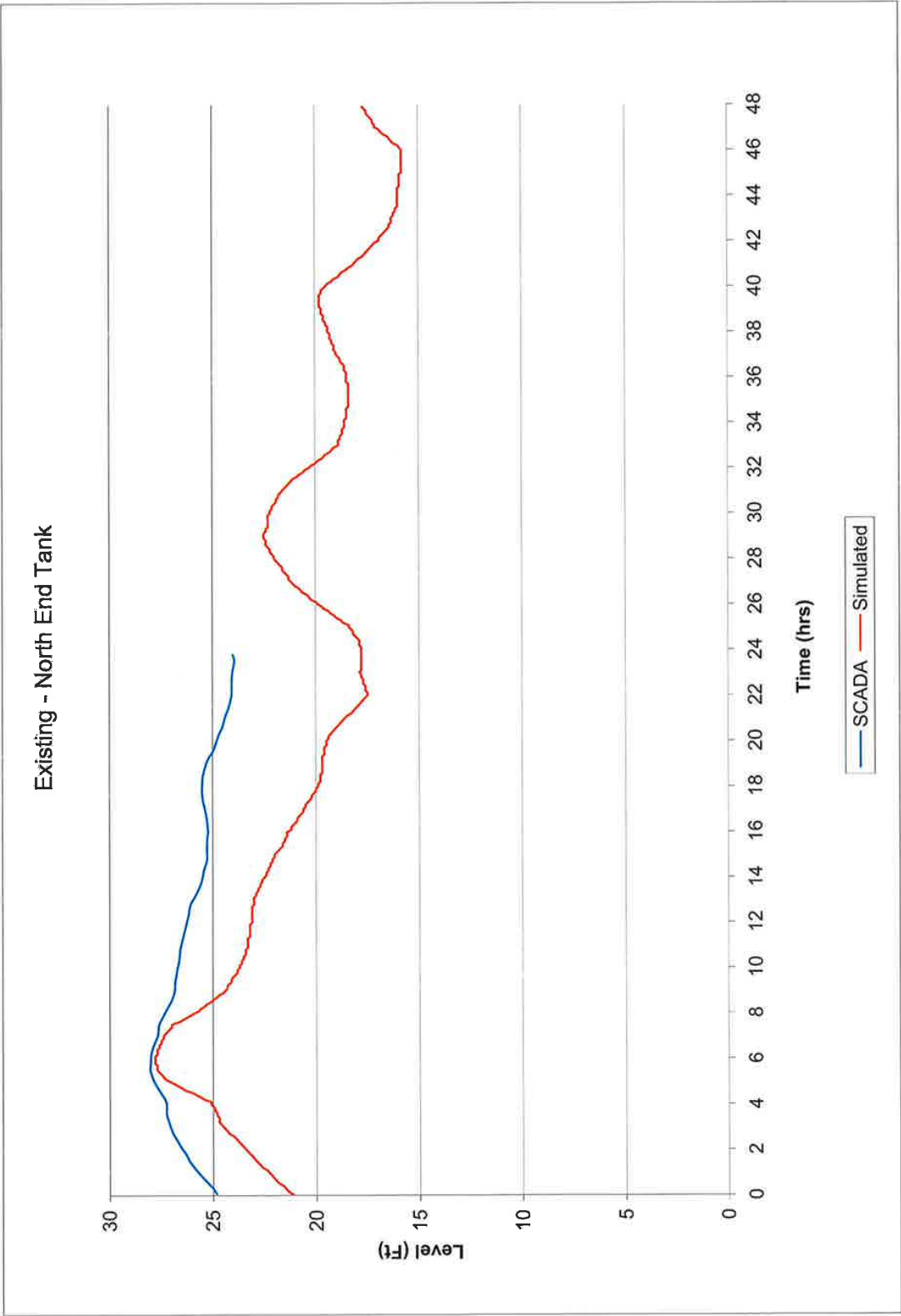


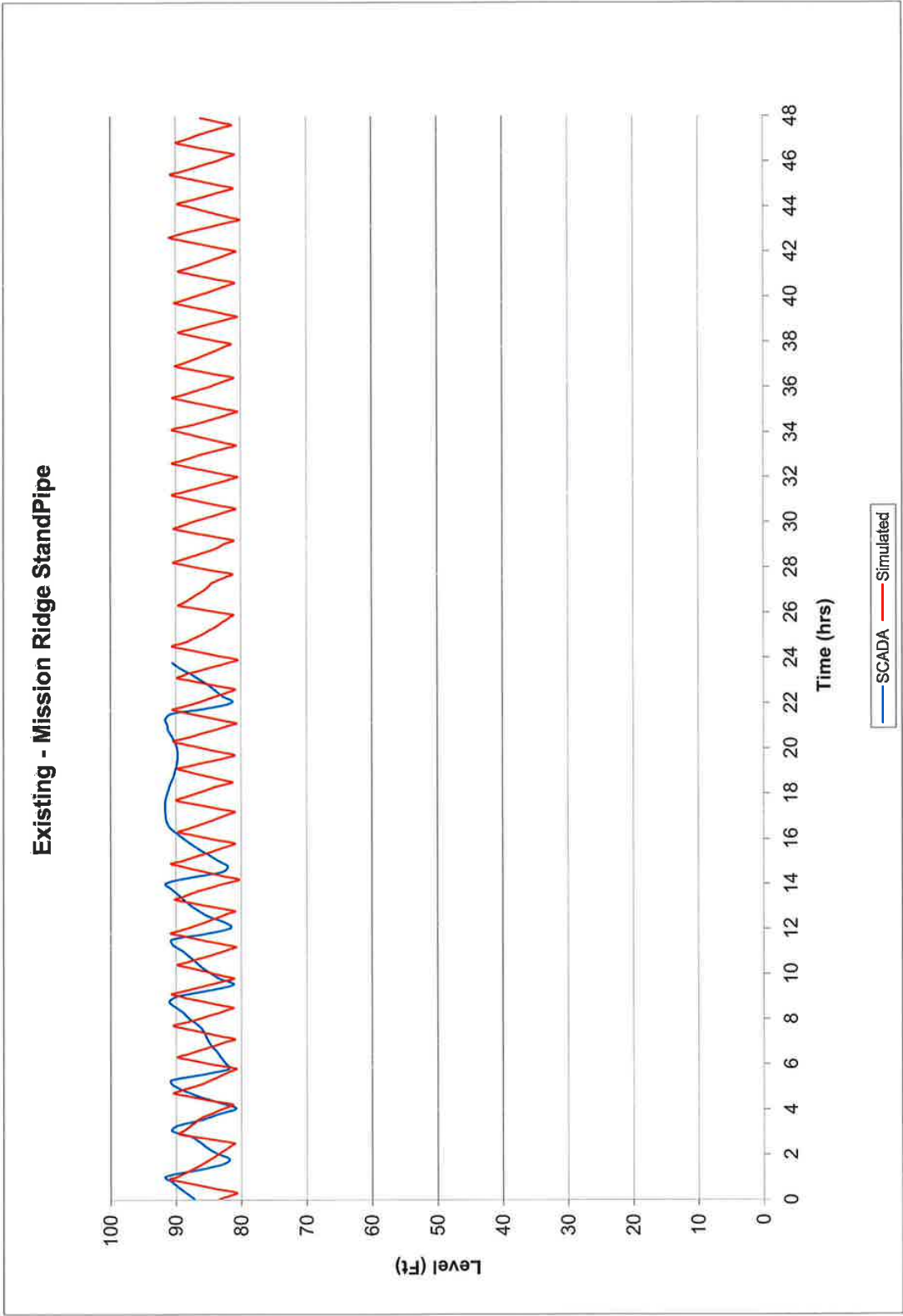


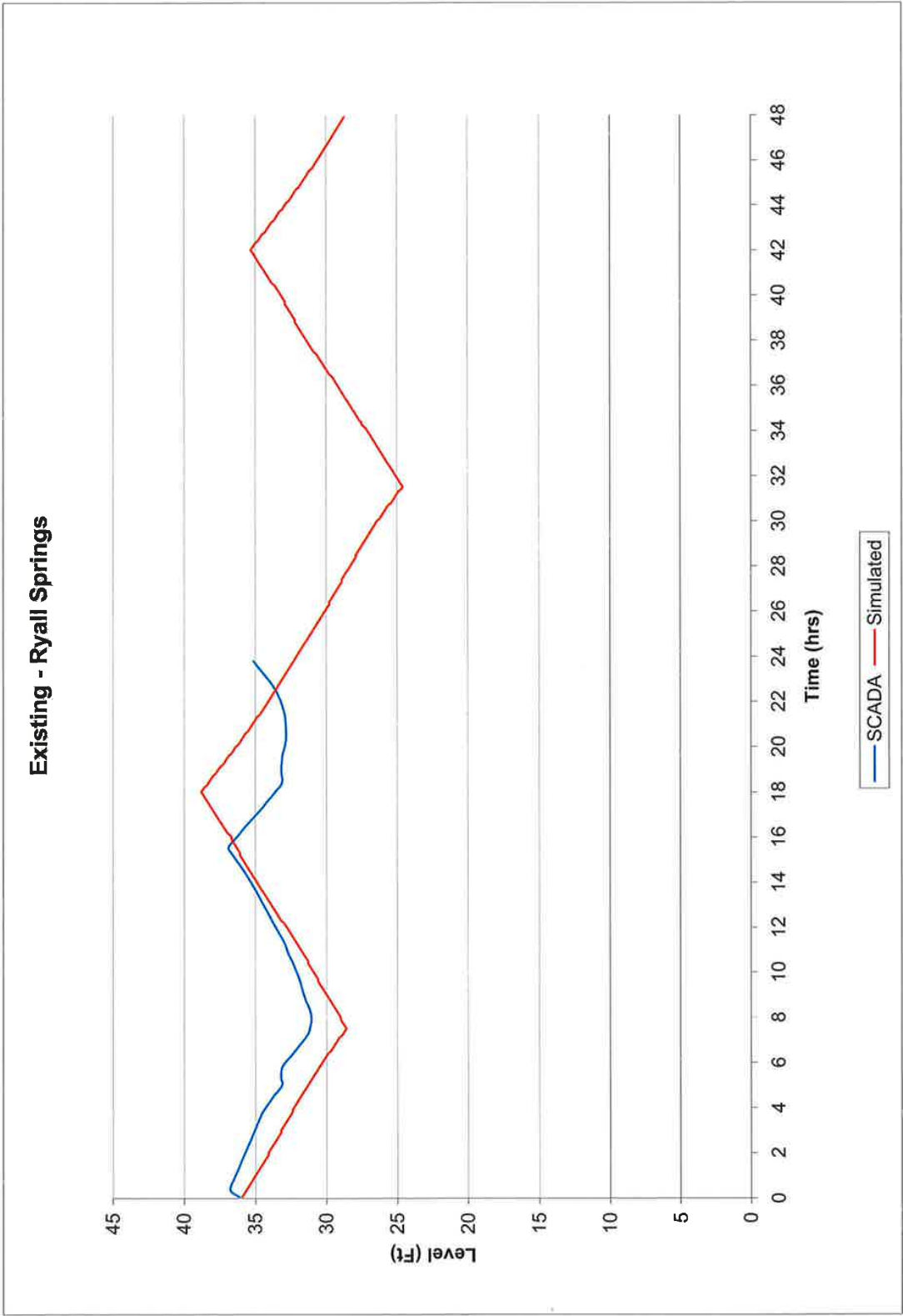


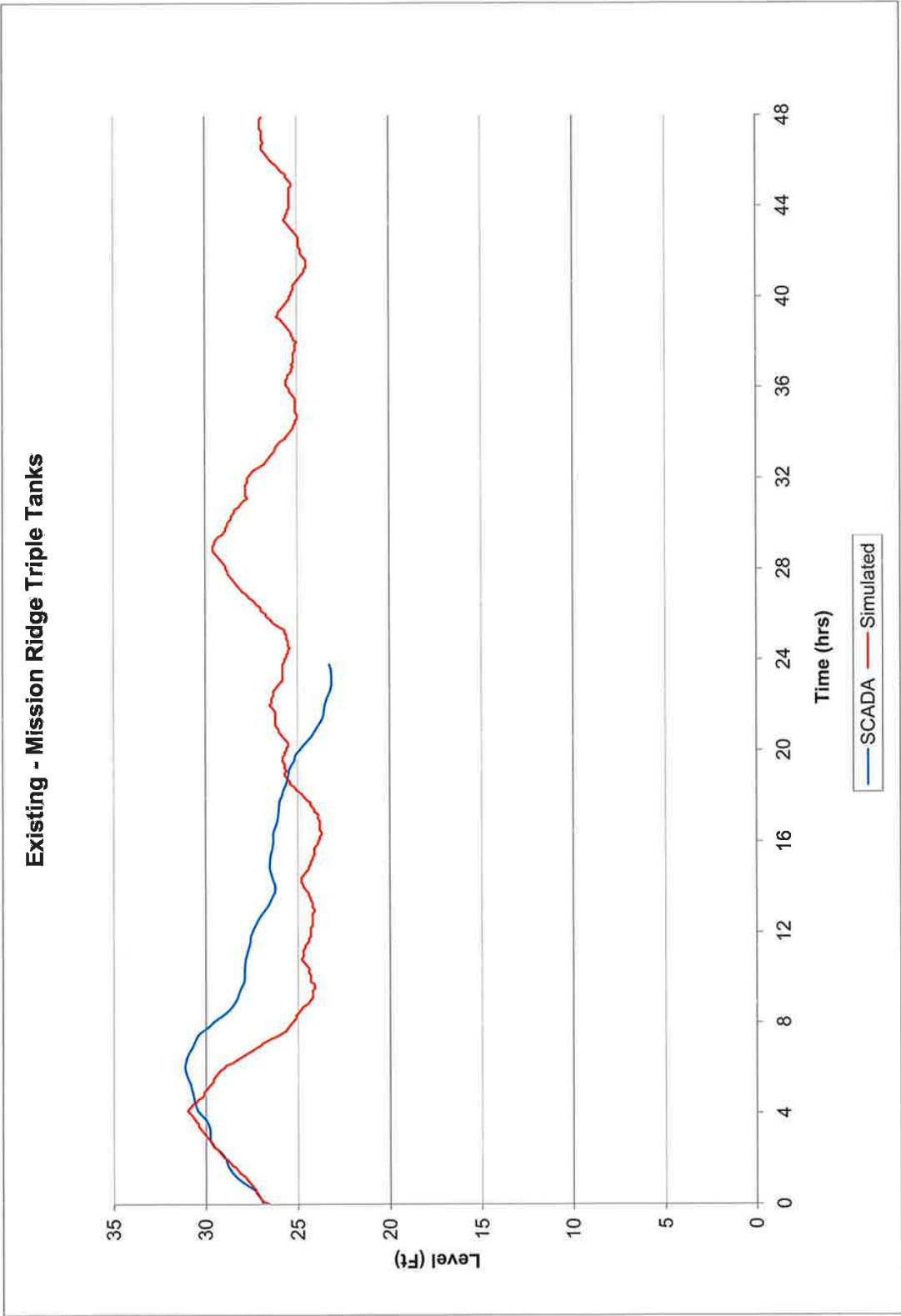


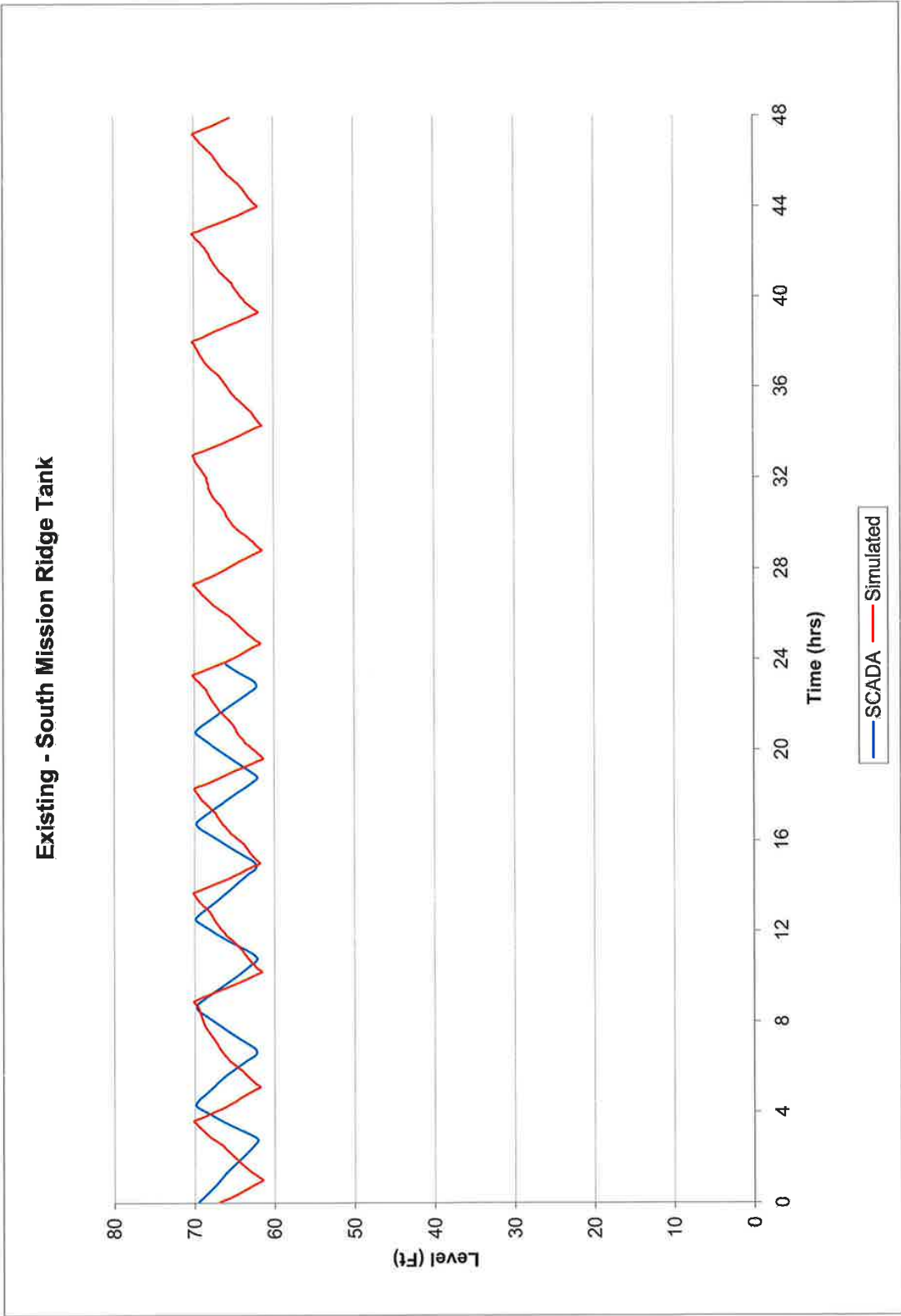


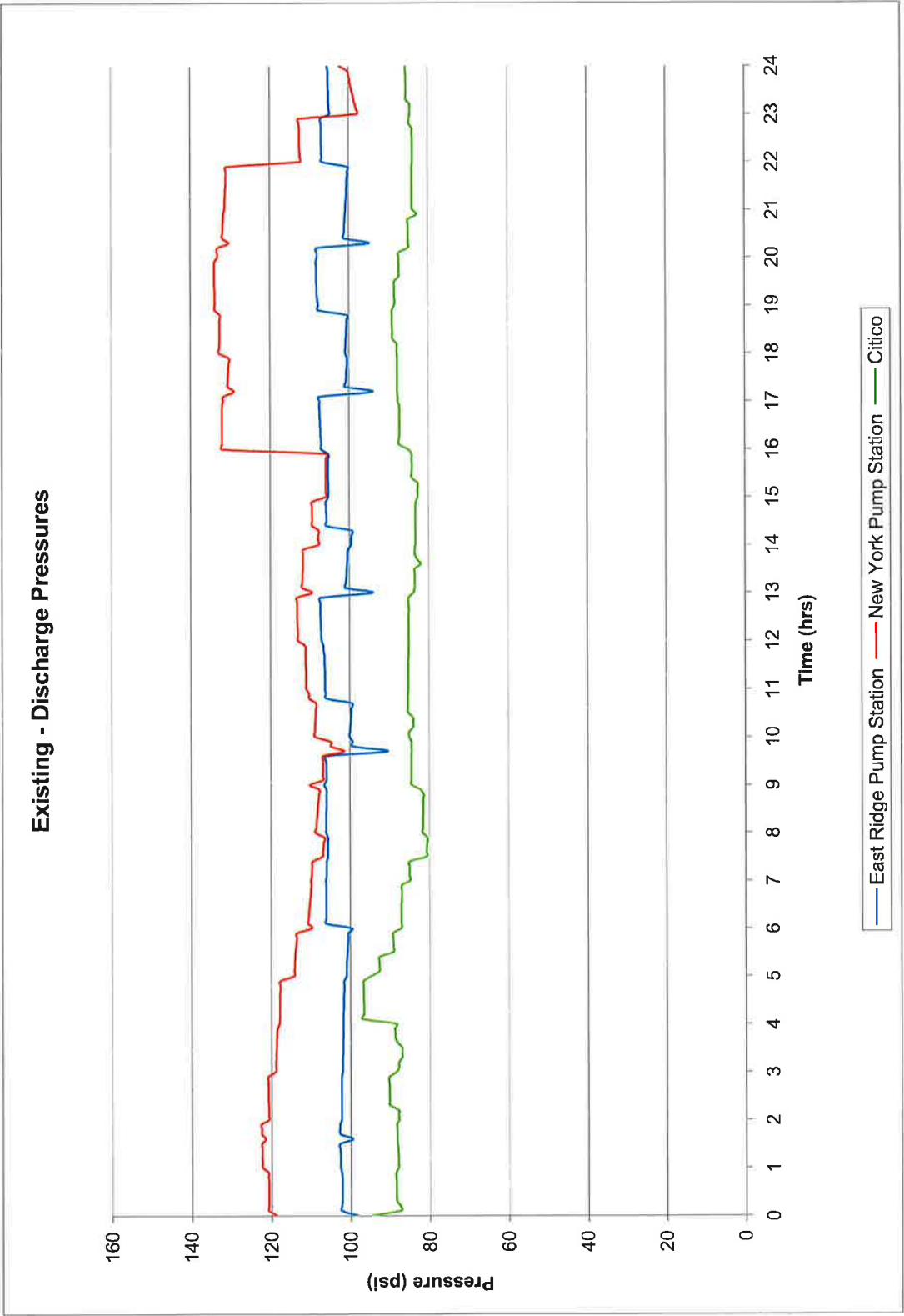


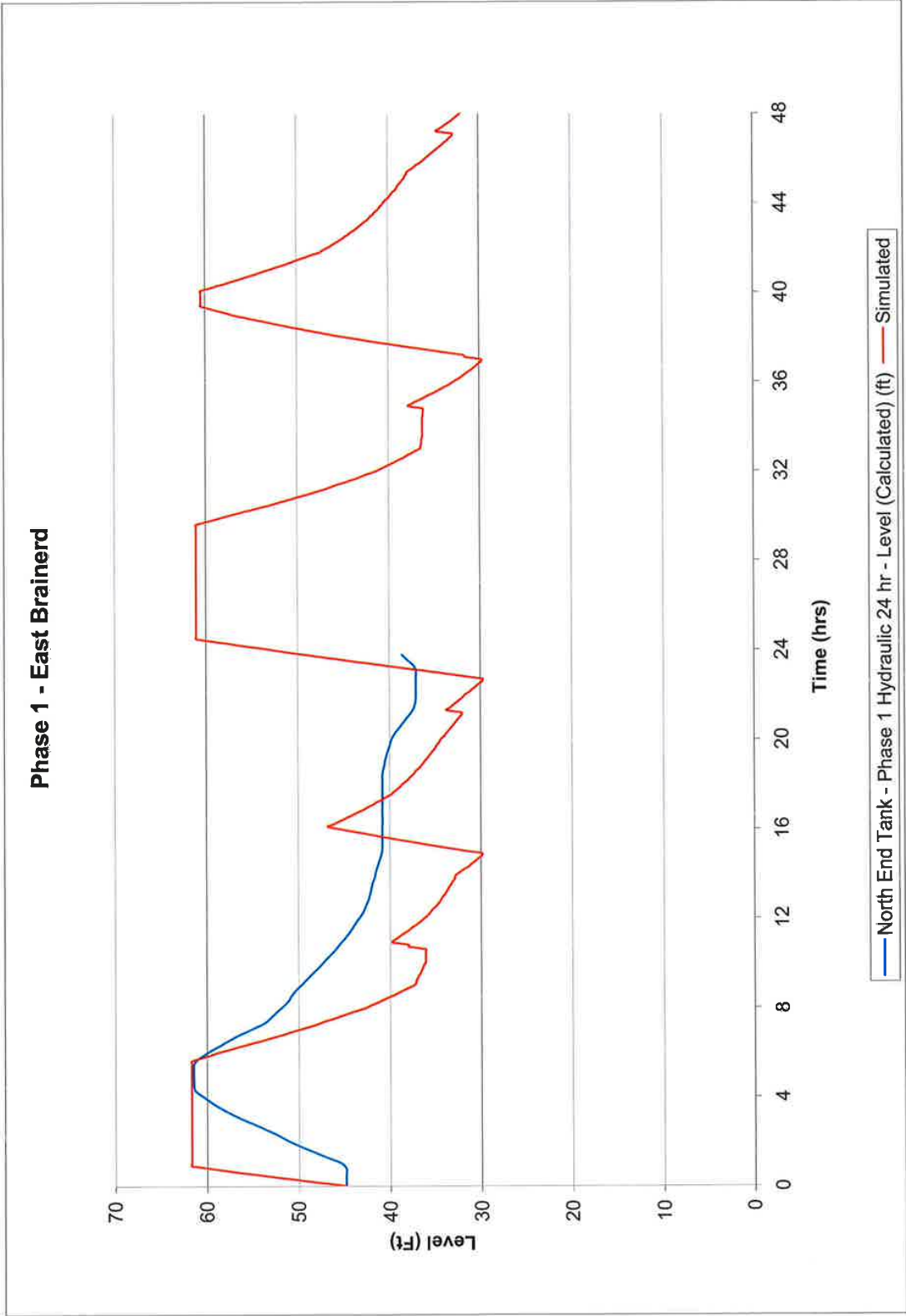


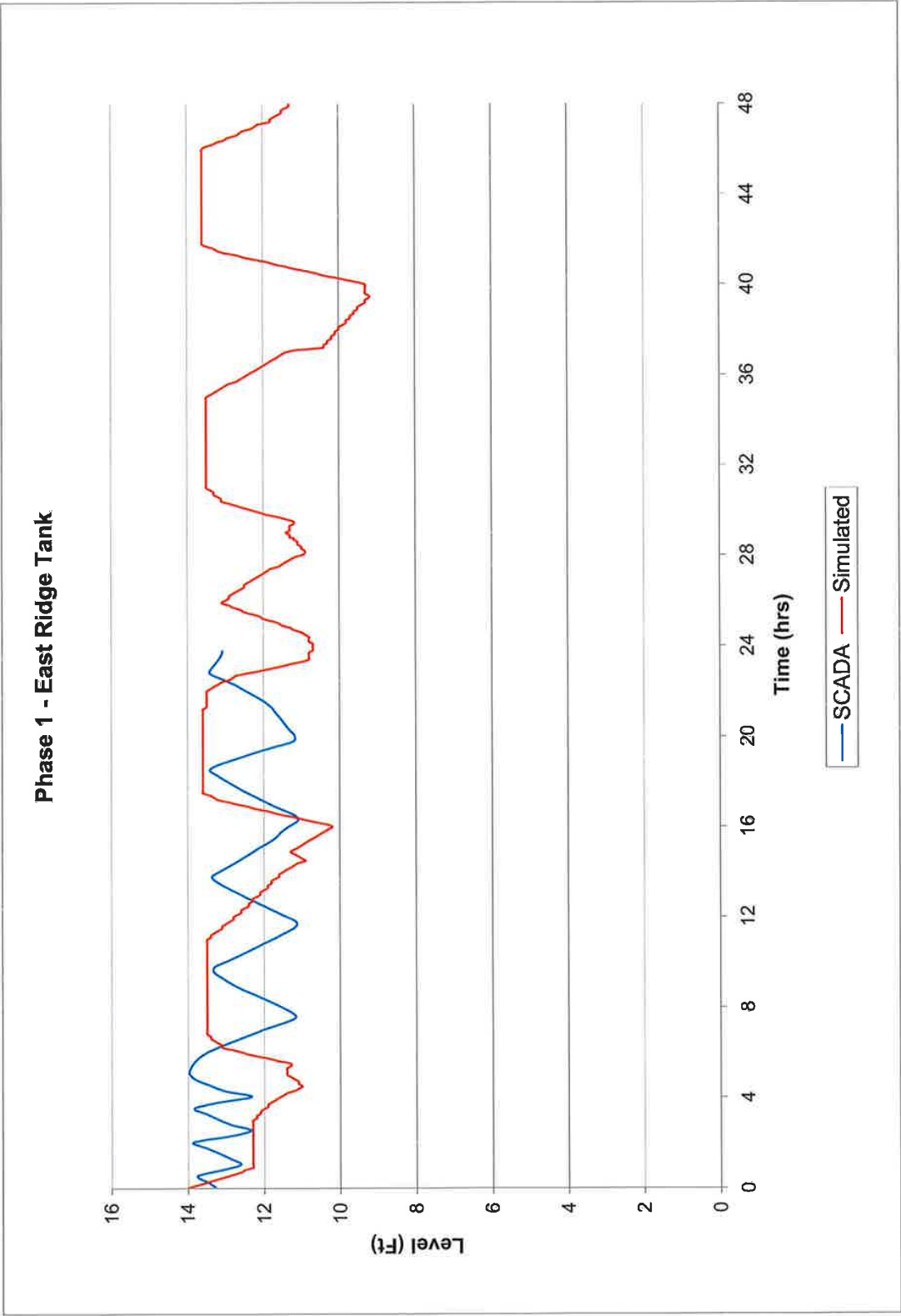




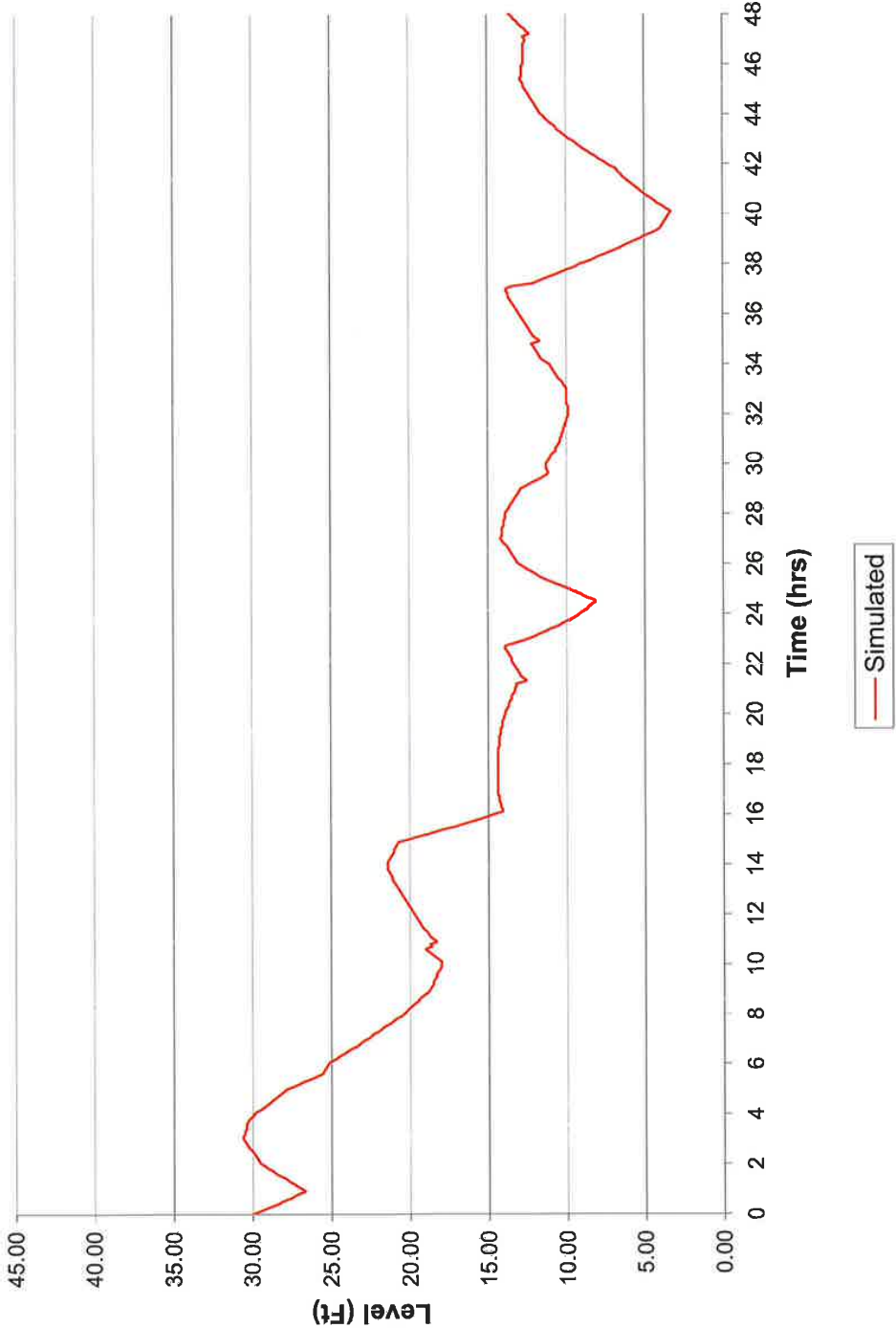


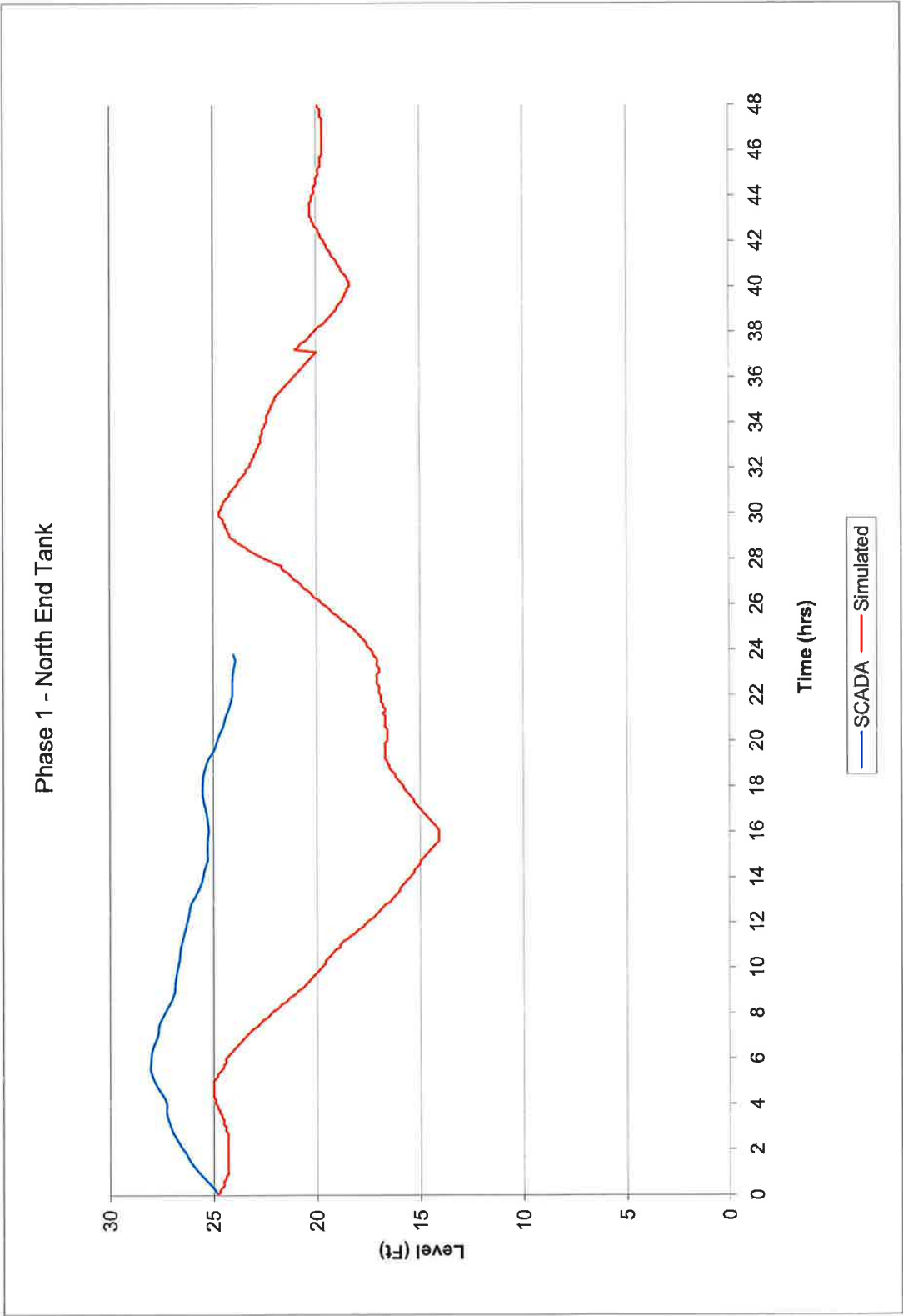


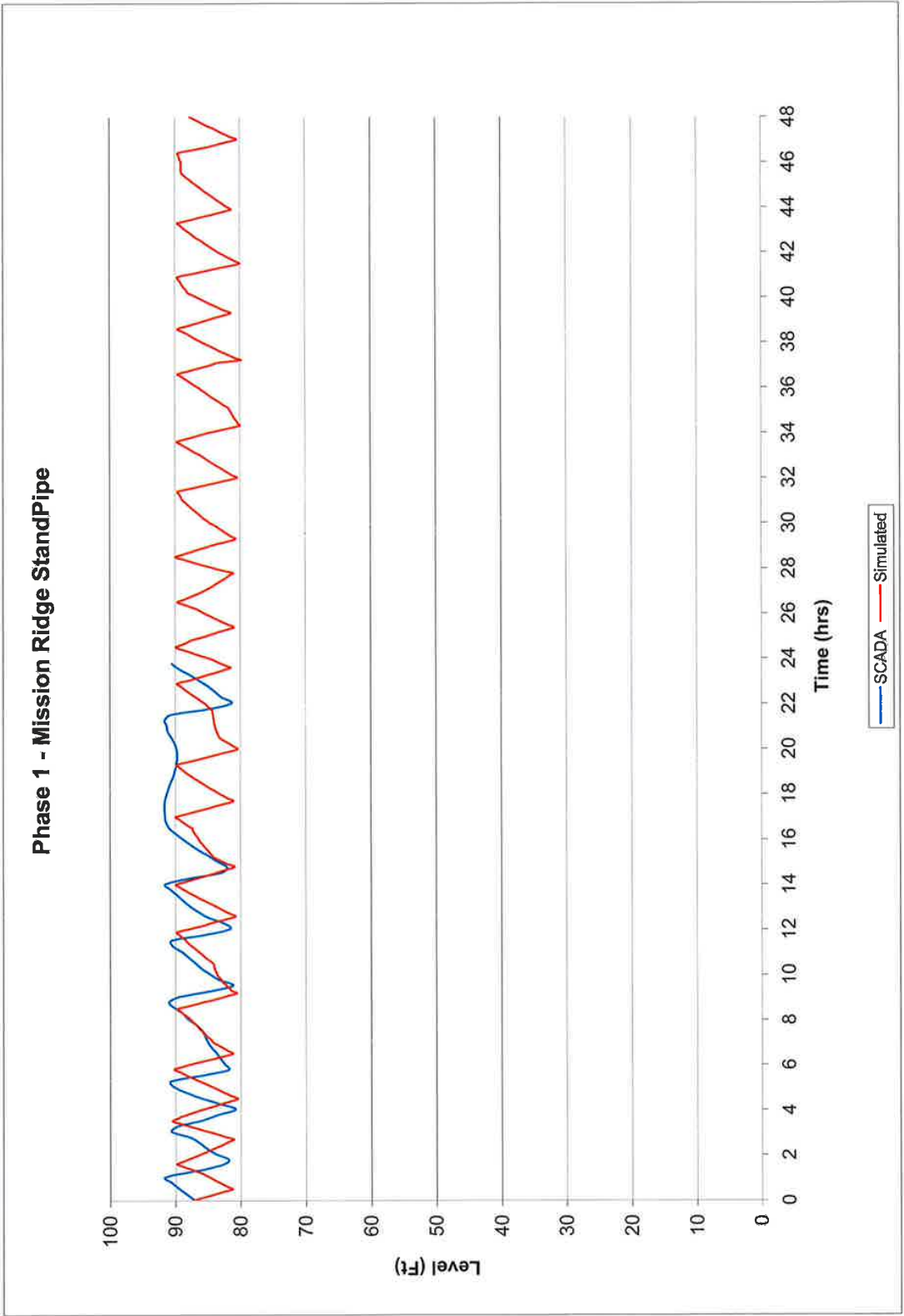


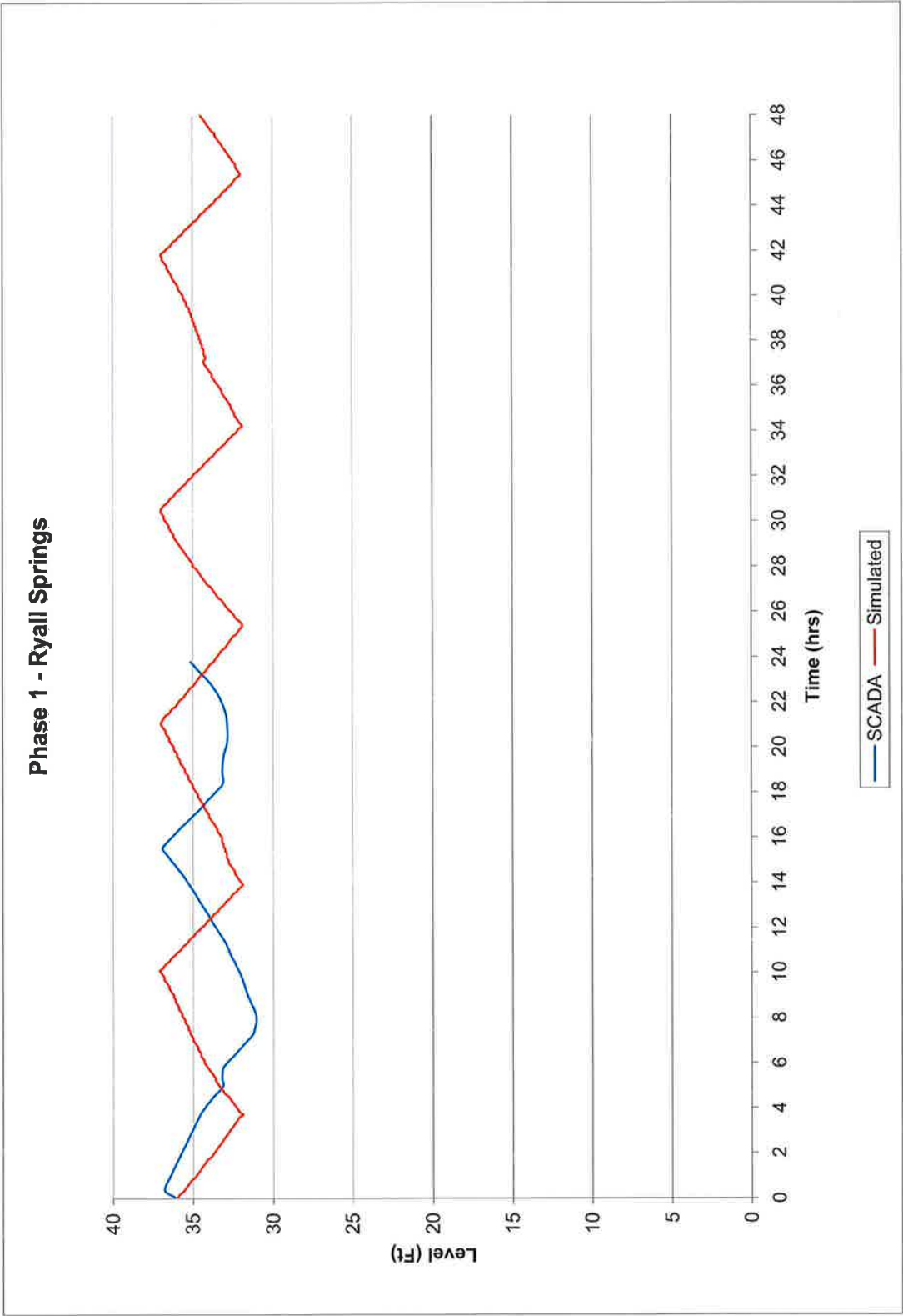


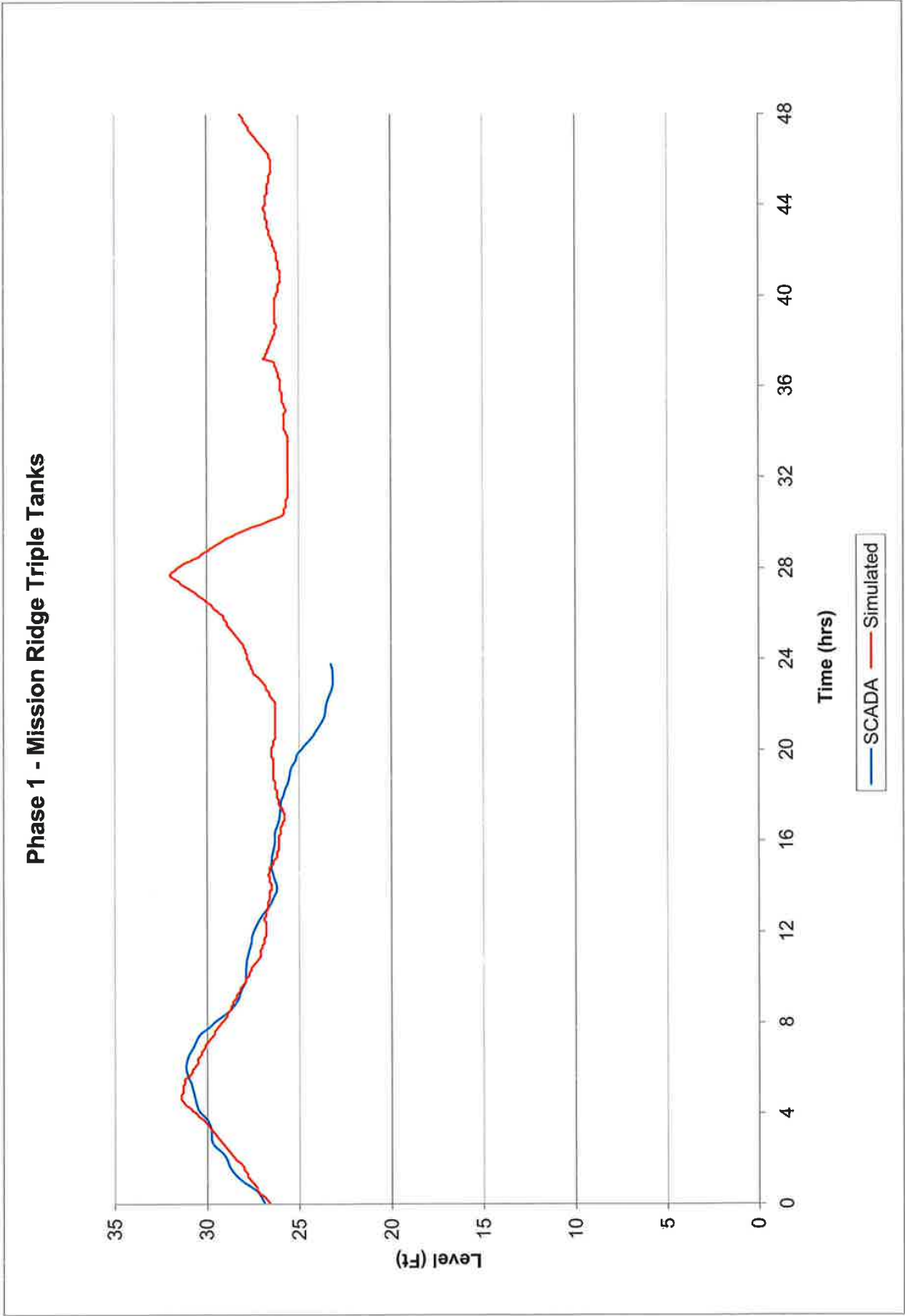
Phase 1 - Jenkins Rd Tank

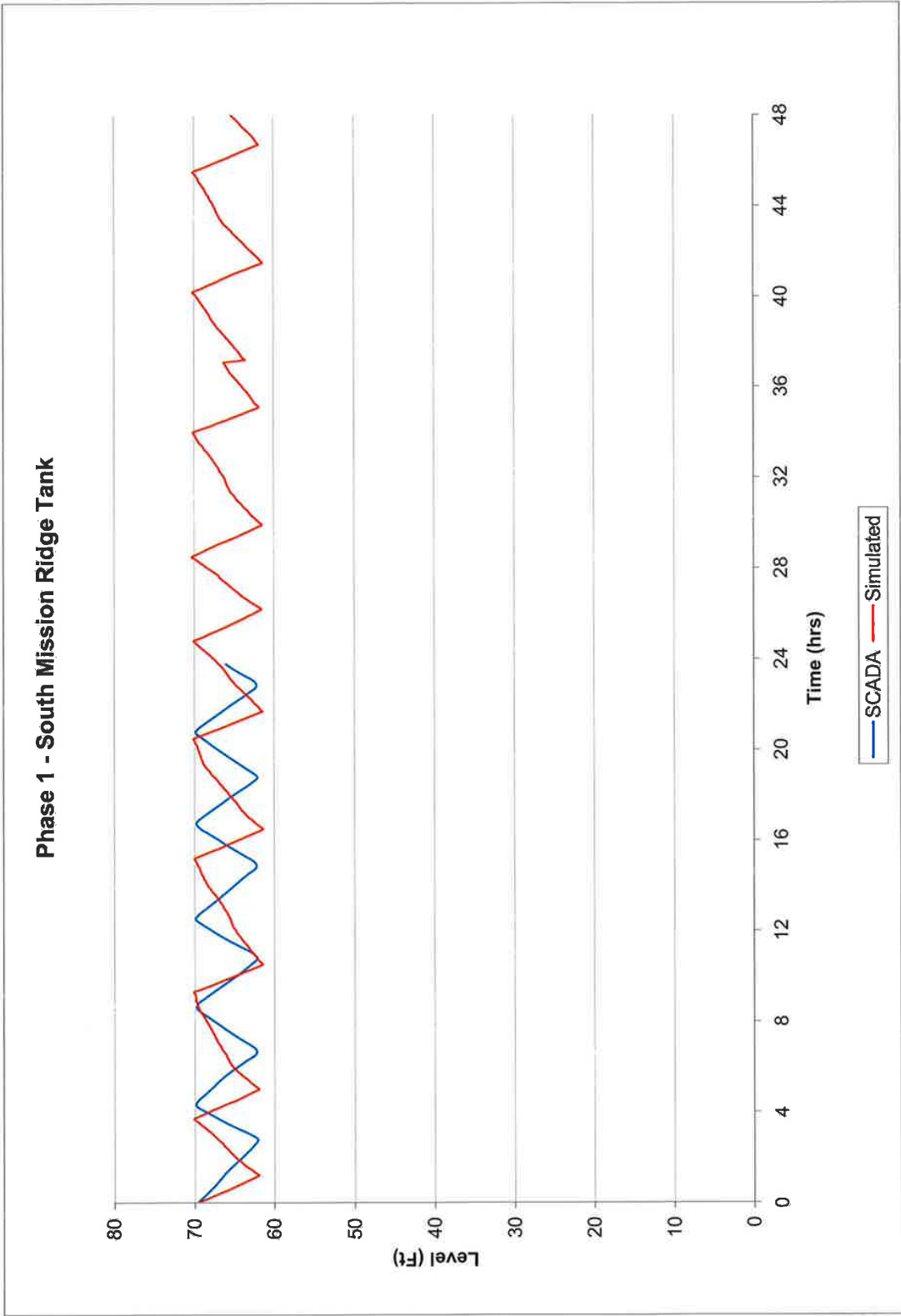


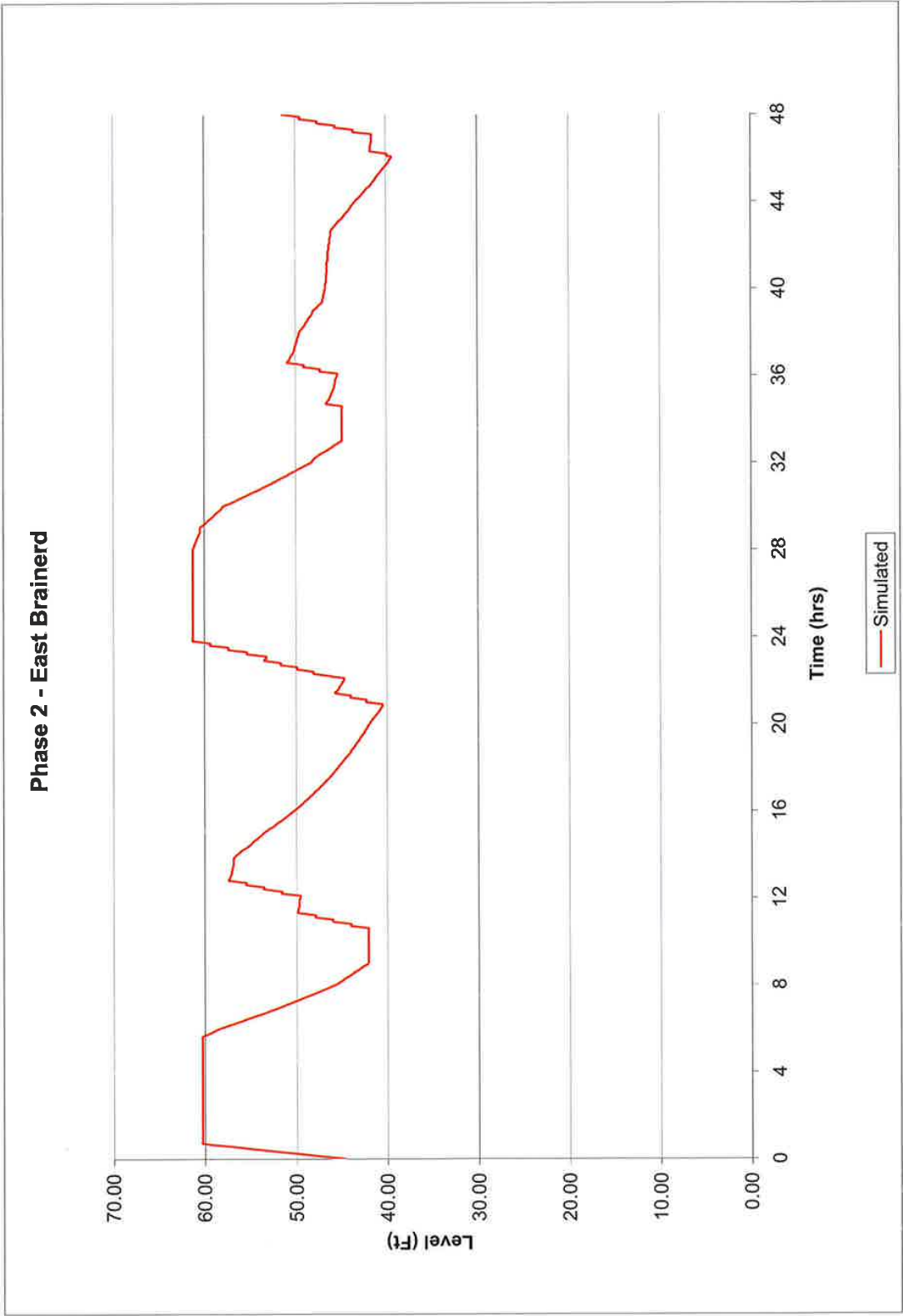


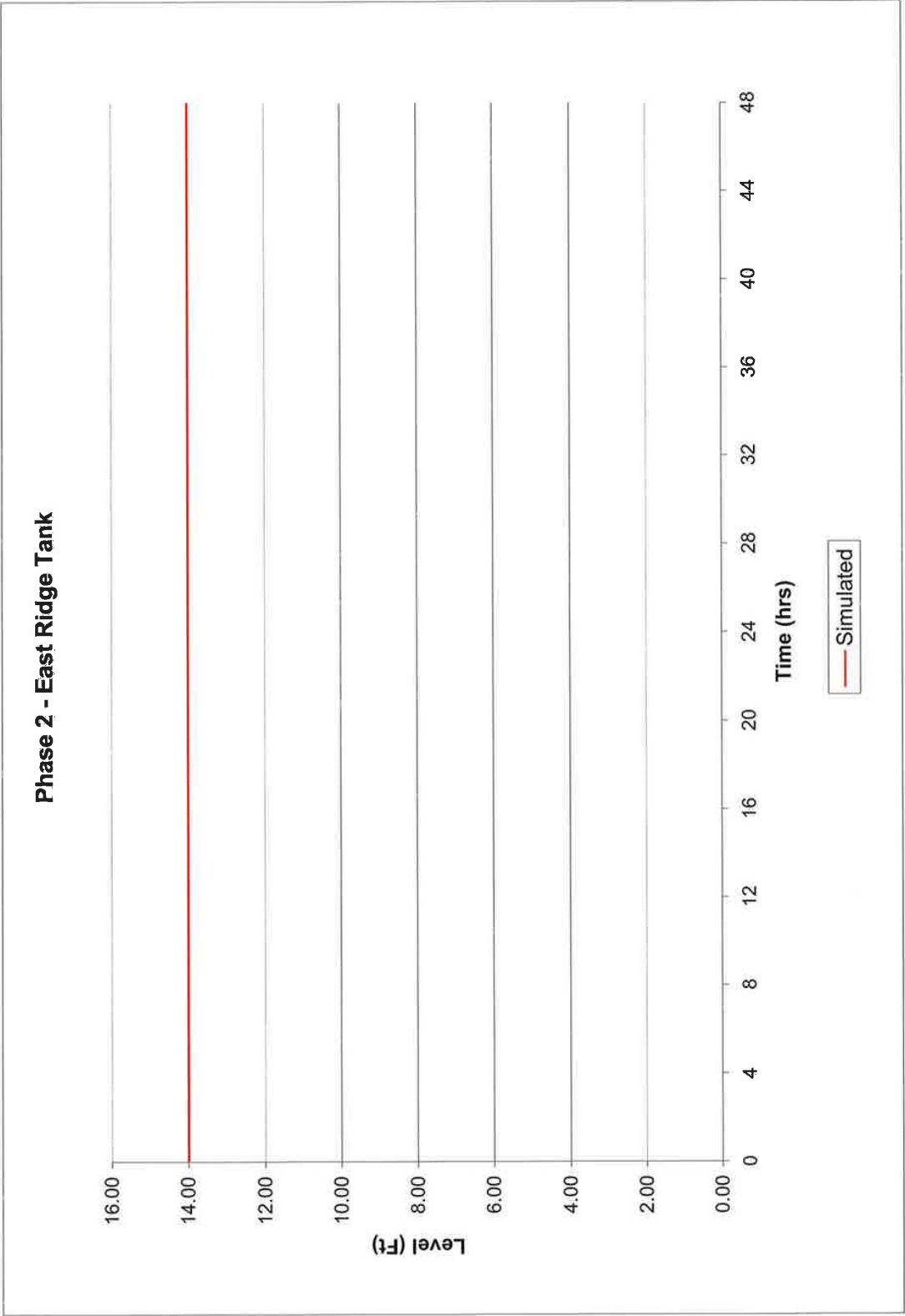


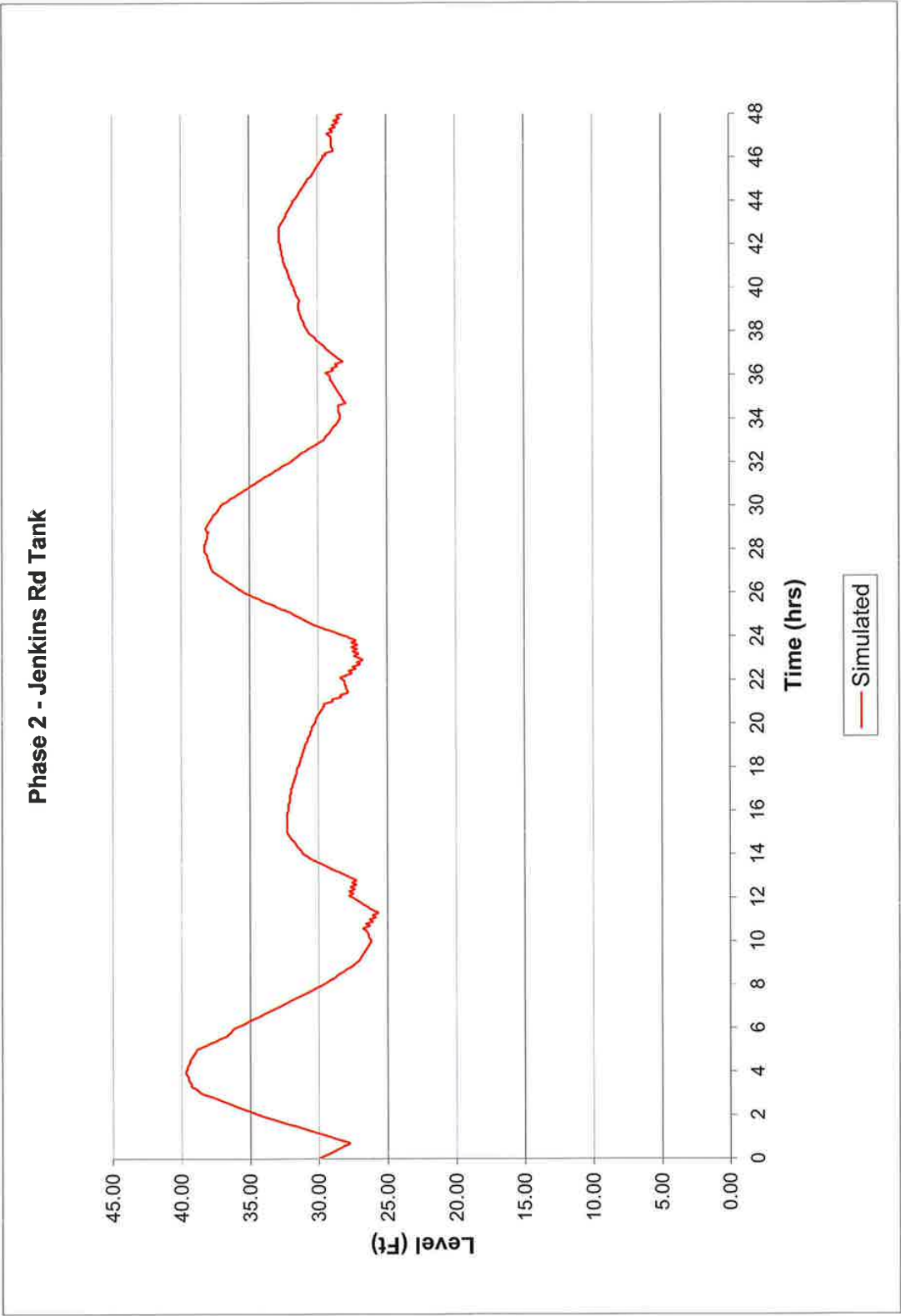


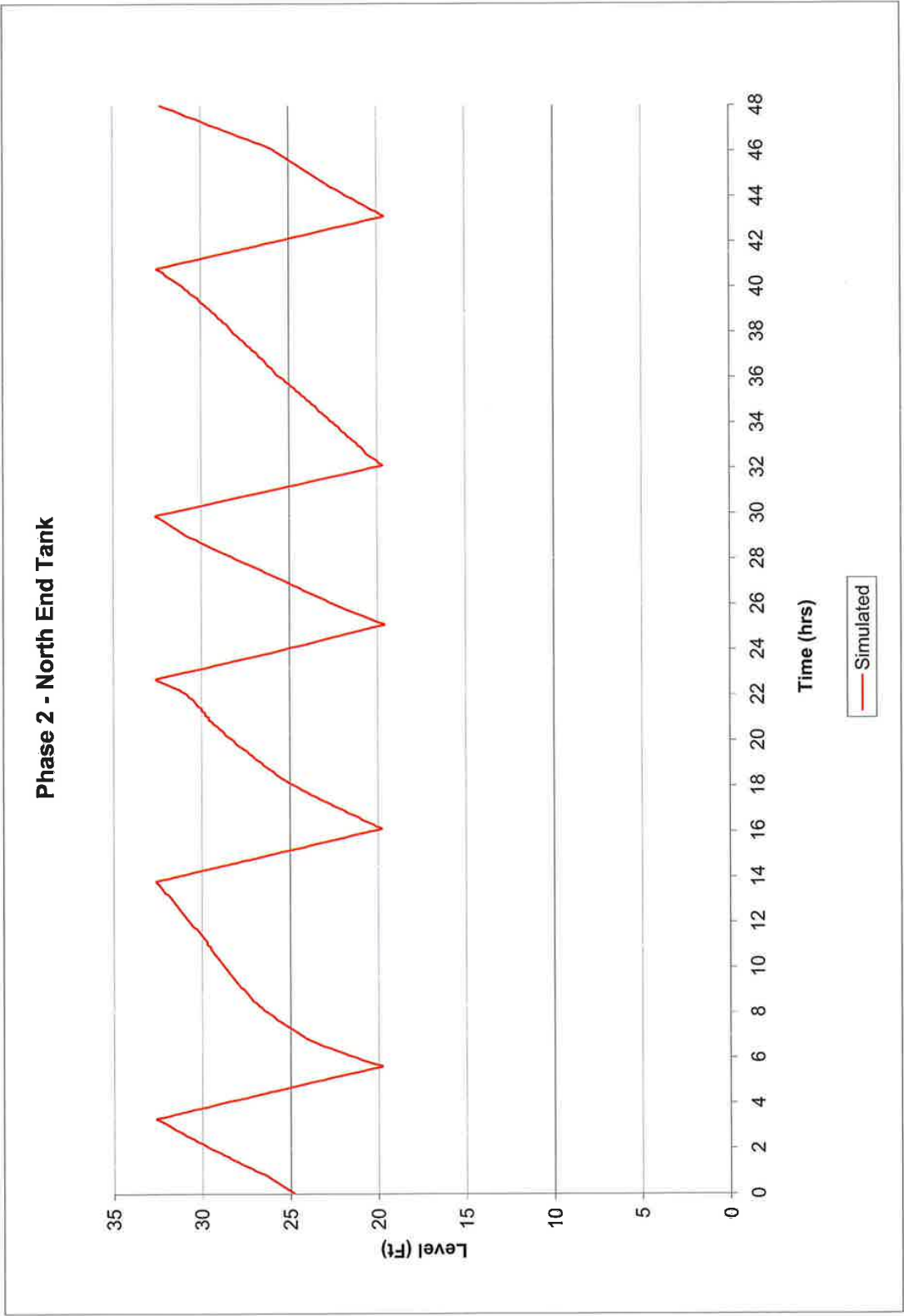


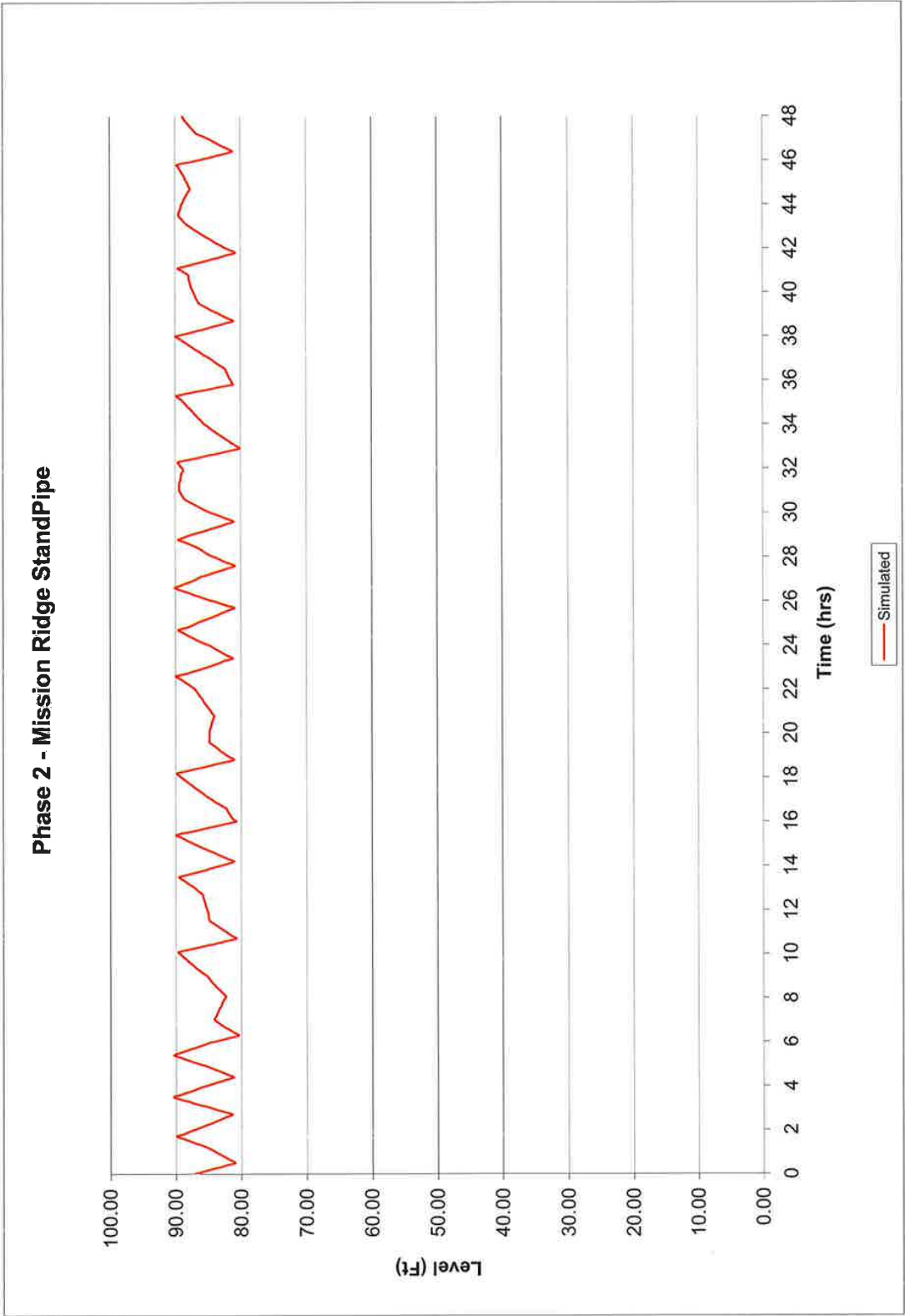


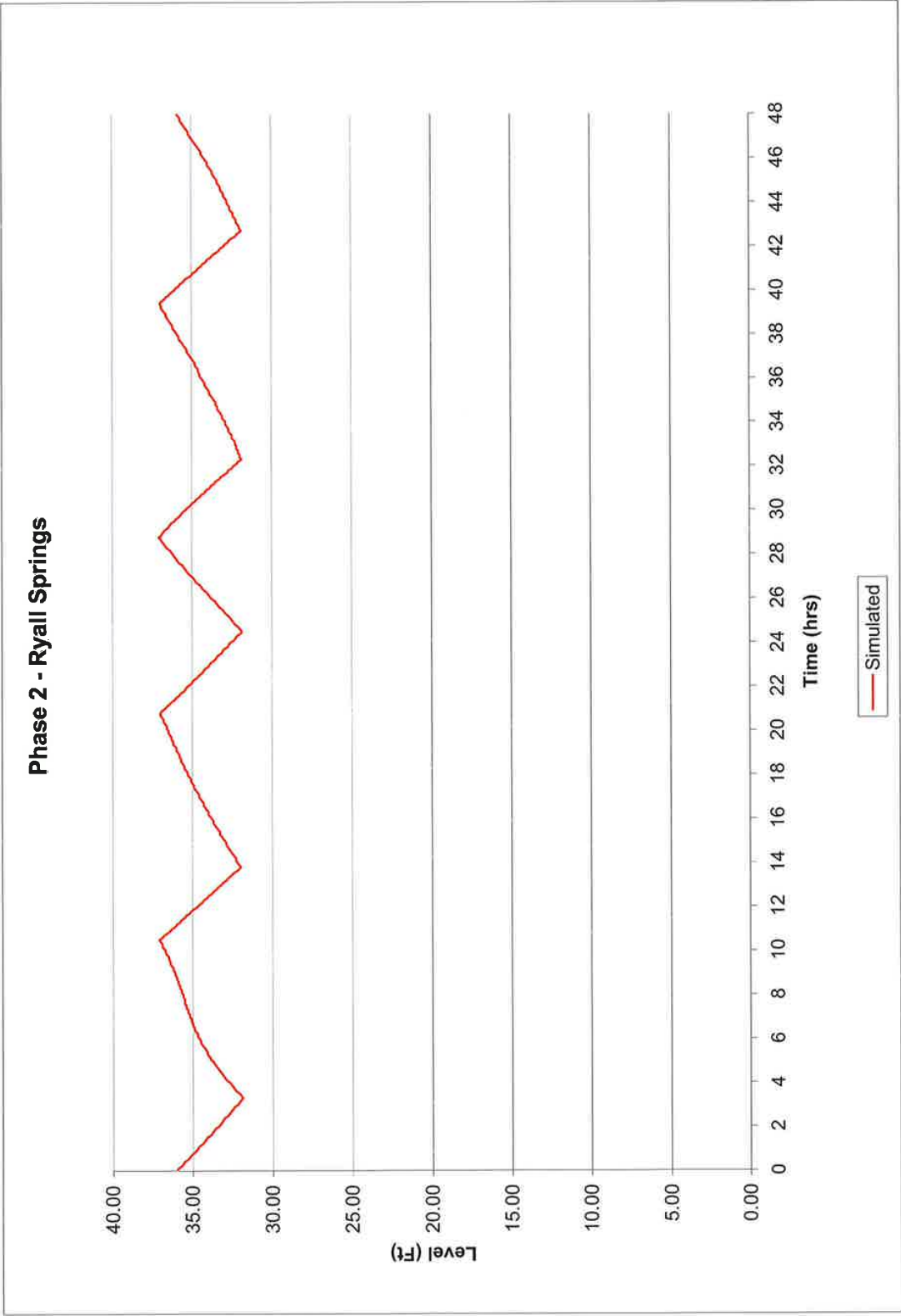


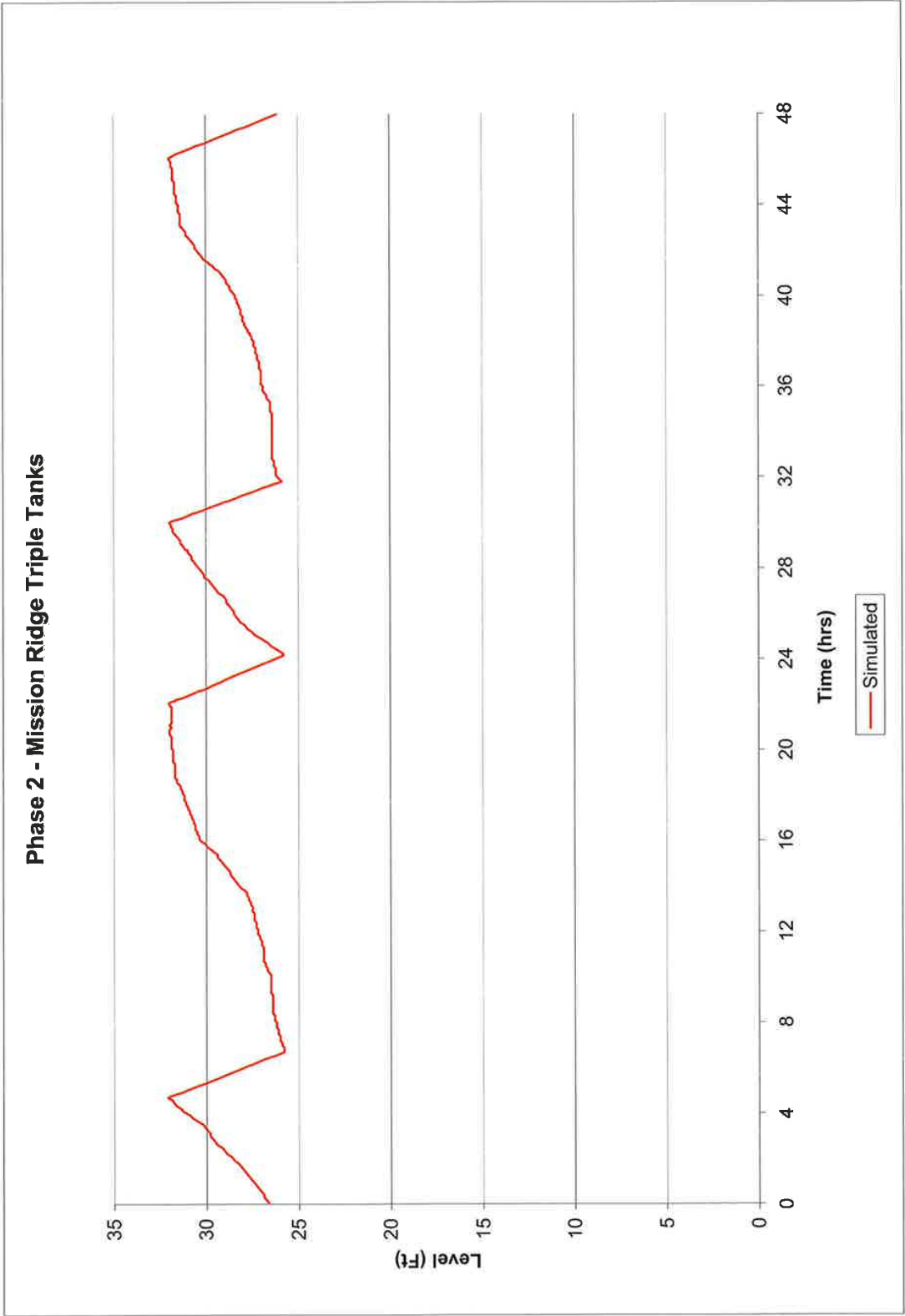


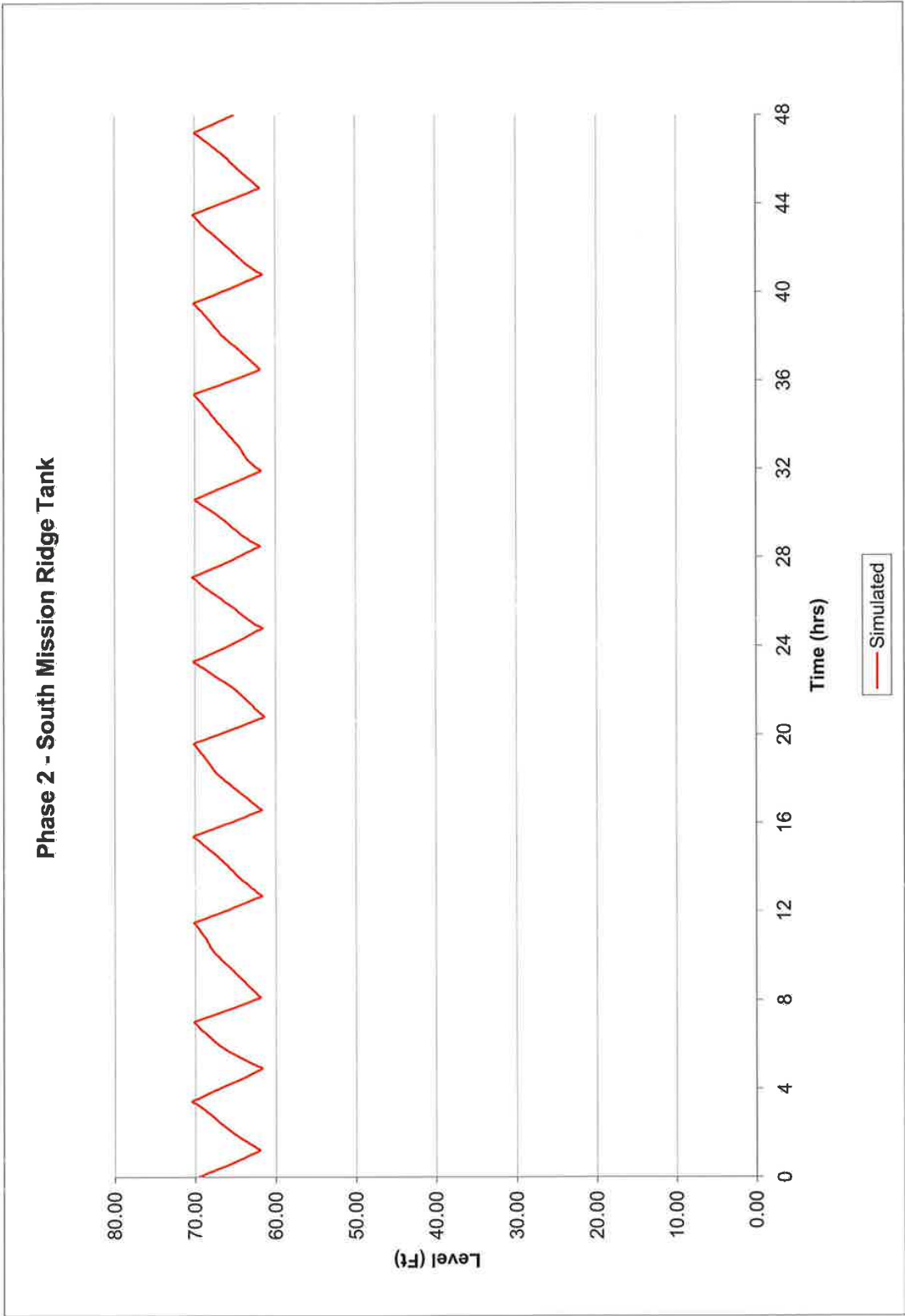


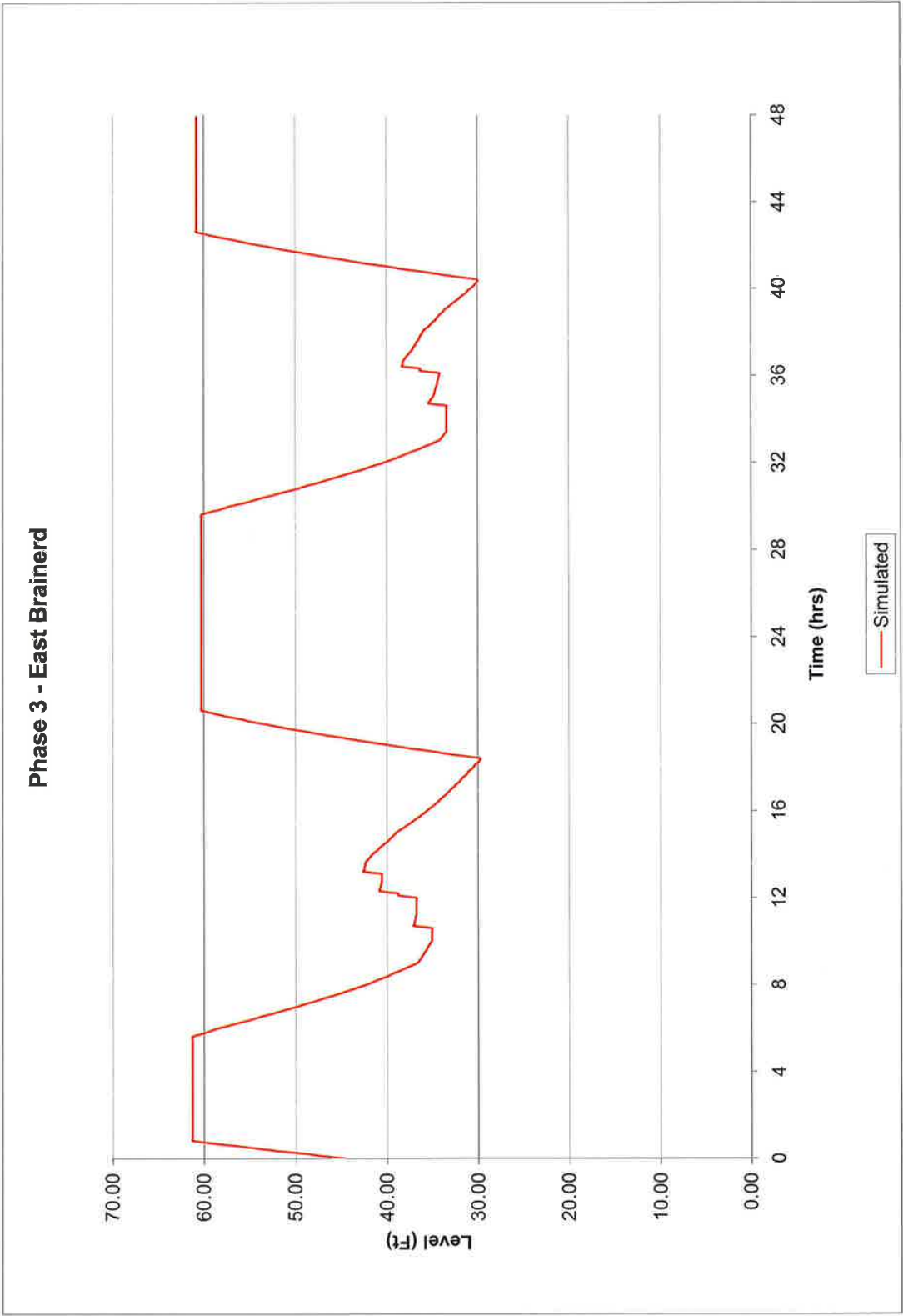


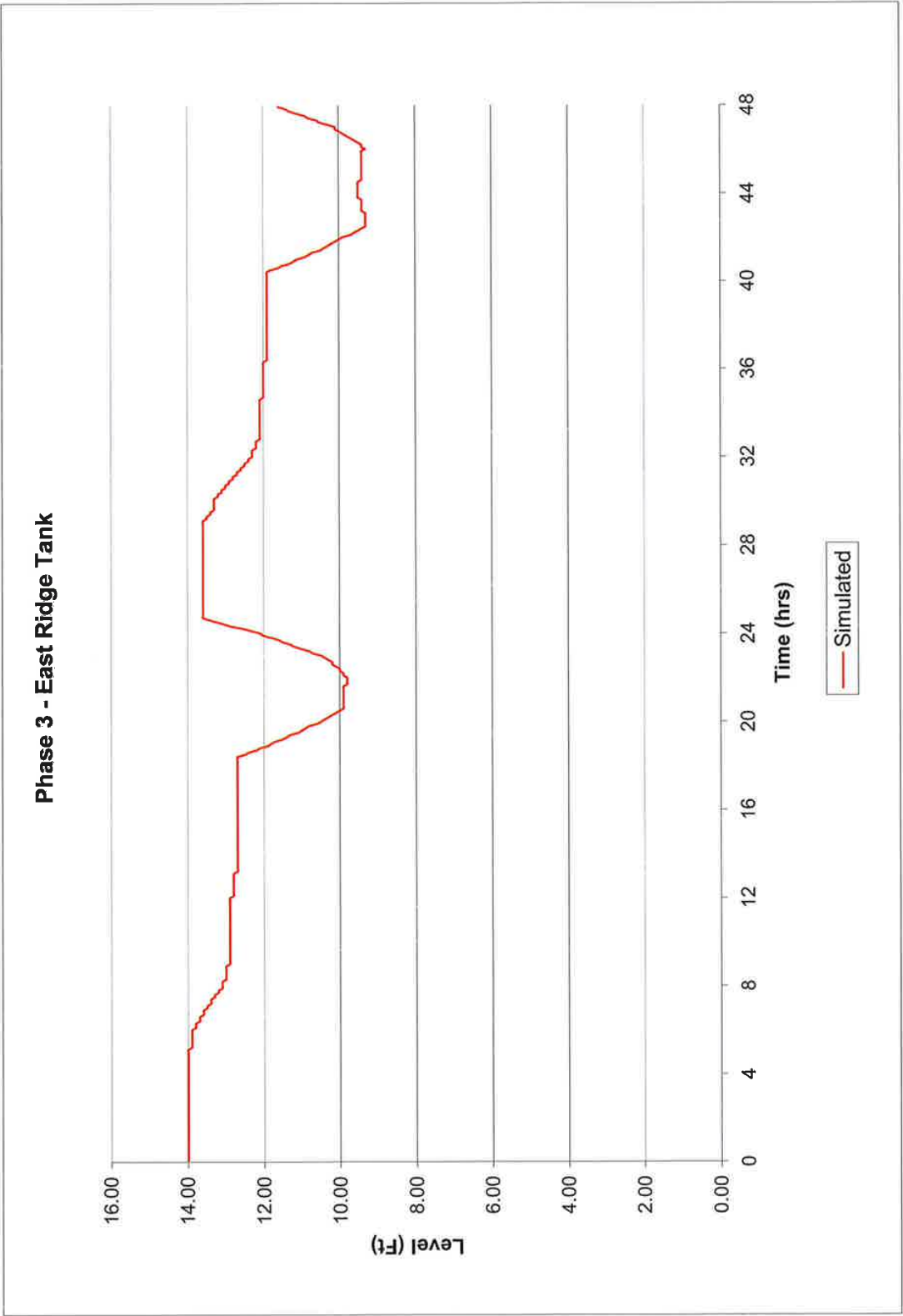




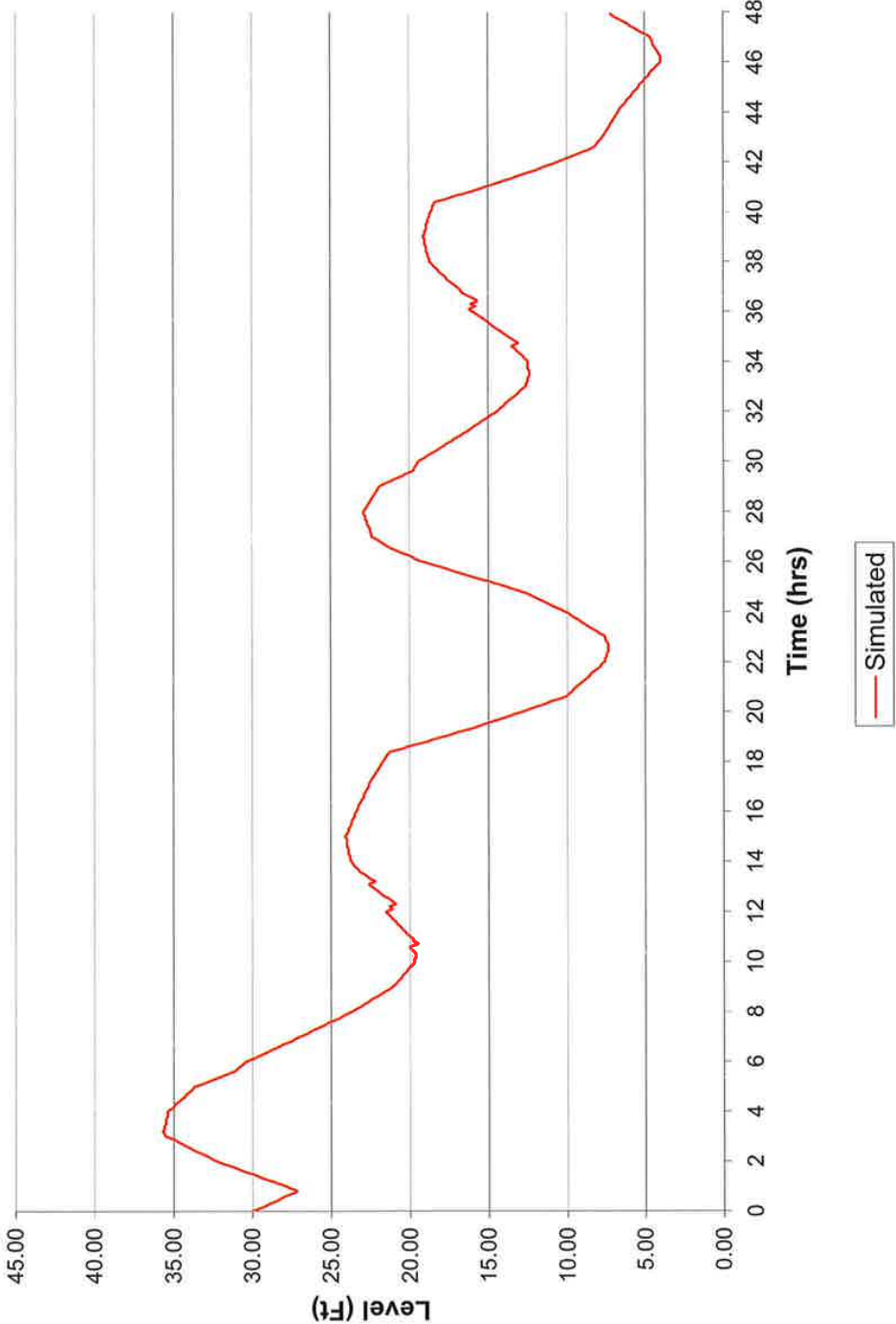


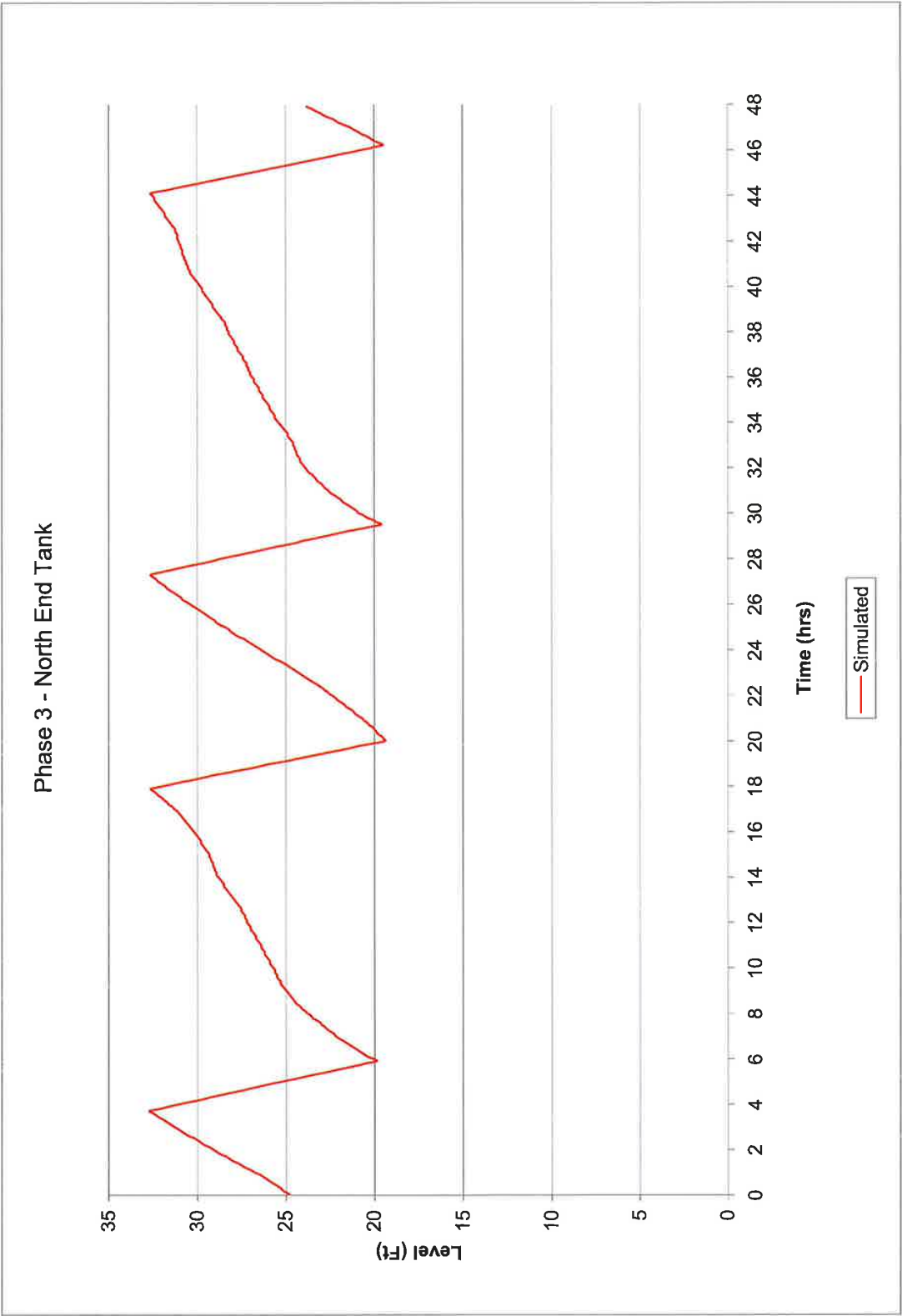


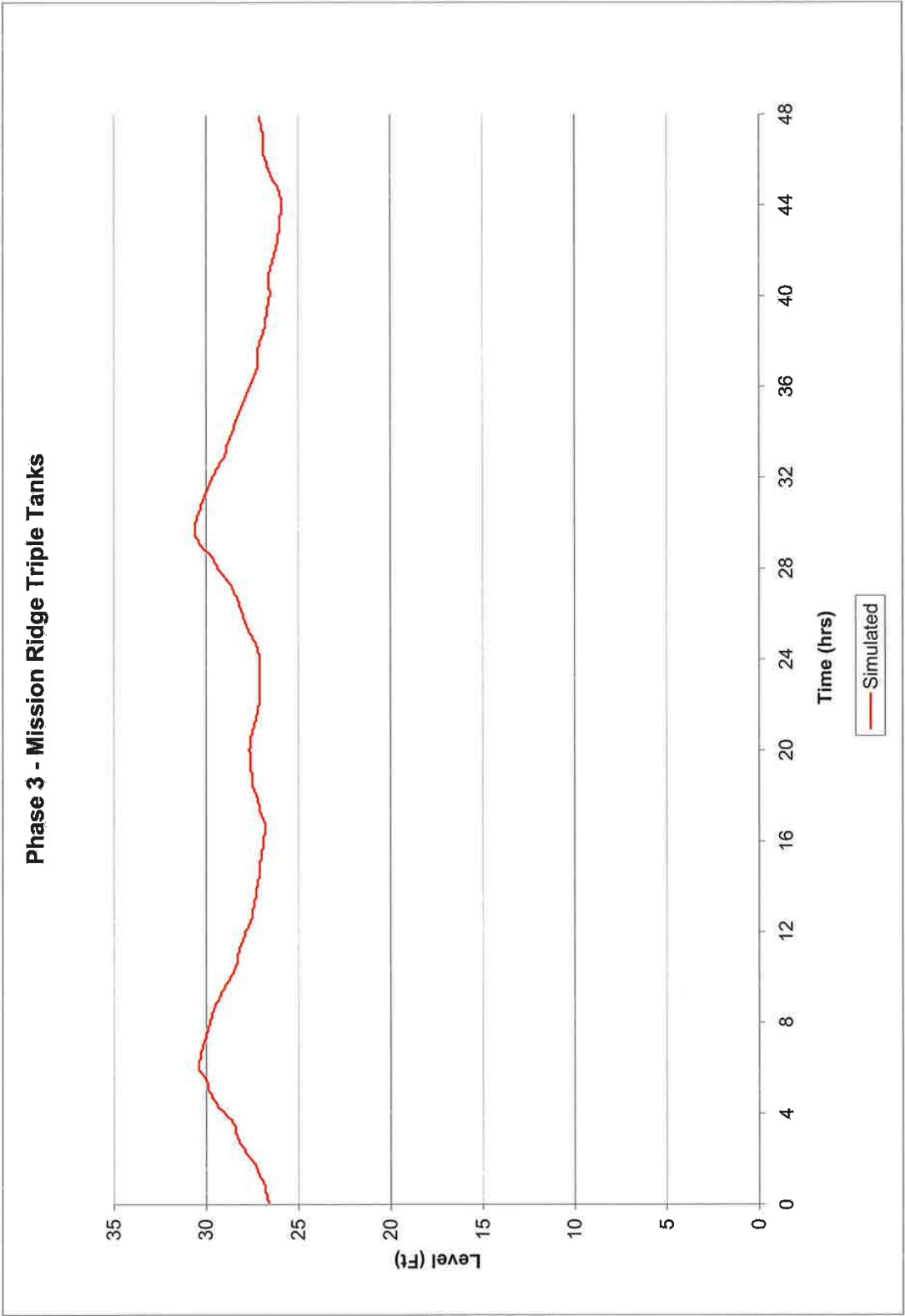


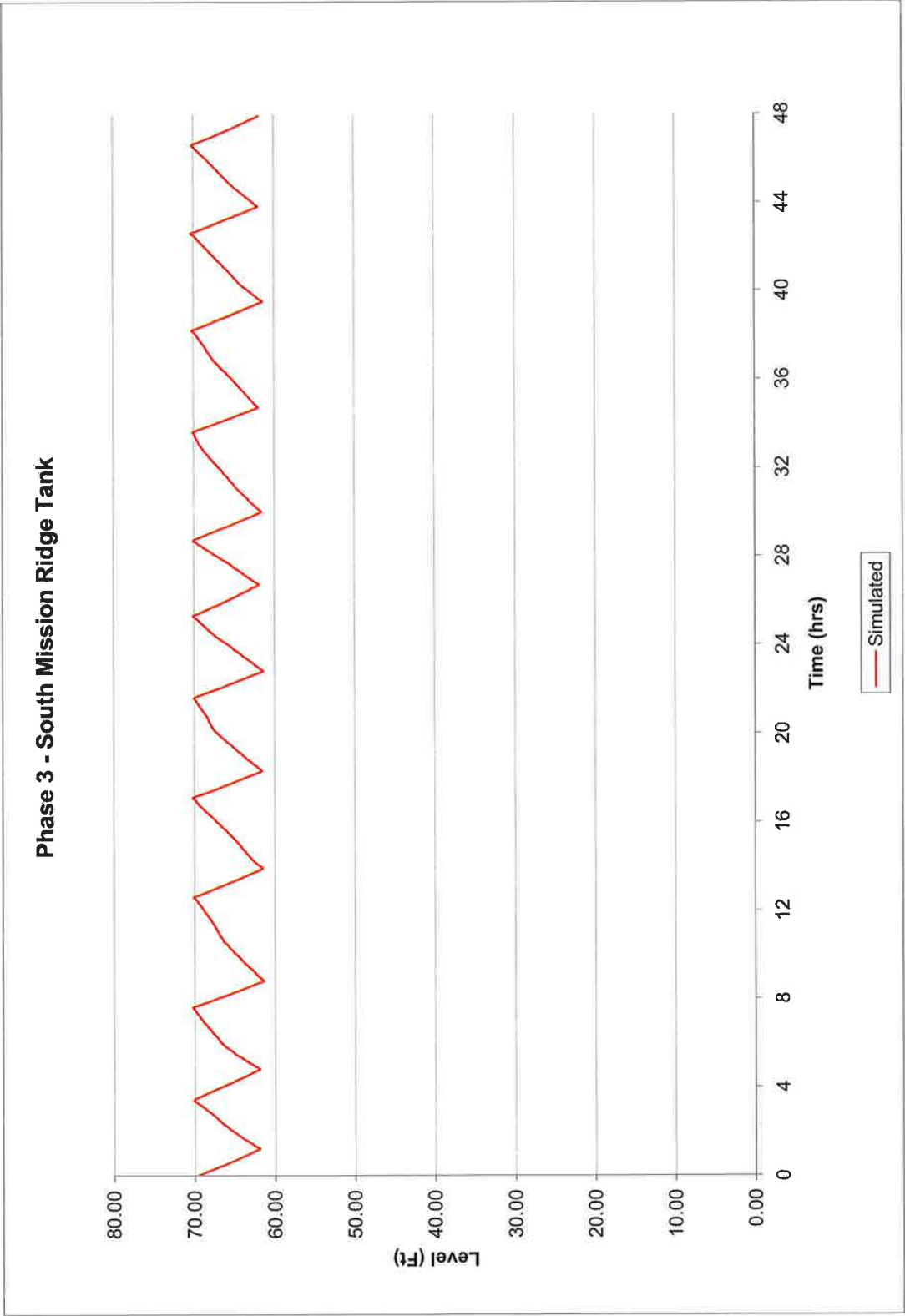


Phase 3 - Jenkins Rd Tank









TAW Catoosa UD Improvements Study - Max, Min, and Avg Pressure Results
CTI Project No. C05009-12a

Location	Catoosa Meters			Low Pressure Points		High Pressure Points	
	Lakeview	Chickamauga	Scruggs	Beulah	Roselawn	Youngstown @ Lightfoot	Forrest Acres
Elevation (ft)	690	758.6**	683.7	800	843.3	650	660
Existing Pressure Results							
Min	112.40	145.60	93.90	45.80	30.00	147.60	137.90
Average	125.78	149.39	112.49	66.36	58.07	166.88	157.36
Max	138.70	155.20	134.10	85.80	77.40	182.50	171.70
Phase #1 Pressure Results							
Min	86.30	127.60	85.60	36.10	28.80	169.60	157.00
Average	100.83	138.19	103.11	54.46	56.36	178.44	167.01
Max	112.90	146.50	118.60	70.60	70.50	185.80	175.70
Phase #2 Pressure Results							
Min	118.60	133.90	94.60	45.30	35.20	175.20	162.30
Average	132.37	138.81	112.48	63.62	65.15	183.94	172.43
Max	146.50	146.30	132.40	84.10	82.70	192.30	182.60
Phase #2 Isolation Pressure Results							
Min	110.80	133.90	72.90	22.70	33.80	178.10	165.20
Average	118.77	138.81	84.52	34.34	60.66	183.75	172.30
Max	131.30	146.30	98.00	47.80	71.20	188.70	178.60
Phase #3 Pressure Results							
Min	105.00	133.90	102.80	52.10	30.60	170.70	157.80
Average	115.45	138.76	116.54	67.31	58.87	180.08	168.15
Max	133.00	146.30	135.20	86.70	78.10	189.70	179.60
Phase #3 Isolation Pressure Results							
Min	104.00	133.90	103.70	54.10	30.40	177.70	164.60
Average	109.87	138.76	109.61	59.98	53.08	183.08	171.41
Max	128.00	146.30	127.80	78.30	76.50	190.50	180.40

** Chickamauga meters are in Rossville Pressure Zone, not East Ridge Pressure Zone.

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
9668 Hamilton Place	TRUE	500	3,500.00	20	58.5	21.3	3903: 16538	TRUE
9648 Hamilton Place	TRUE	500	3,500.00	20	36.4	21.6	3903: 16538	TRUE
9575 Hamilton Place	TRUE	500	3,500.00	20	39.1	21.4	23299: J-52	TRUE
9530 Hamilton Place	TRUE	500	3,500.00	20	55.6	21.7	3903: 16538	TRUE
9477 Hamilton Place	TRUE	500	3,500.00	20	60.5	21.5	3903: 16538	TRUE
9399 Hamilton Place	TRUE	500	3,500.00	20	31.4	21.7	3903: 16538	TRUE
11408 Hamilton Place	TRUE	500	3,500.00	20	48.5	19.7	23299: J-52	TRUE
11185 Hamilton Place	TRUE	500	3,500.00	20	55.9	20.2	3903: 16538	TRUE
10996 Hamilton Place	TRUE	500	3,500.00	20	55.5	20.3	3903: 16538	TRUE
10767 Hamilton Place	TRUE	500	1,905.70	20	20	29.9	3240: 13280	TRUE
10643 Hamilton Place	TRUE	500	3,500.00	20	56.3	20.6	23299: J-52	TRUE
10446 Hamilton Place	TRUE	500	3,500.00	20	51.4	20.8	3903: 16538	TRUE
10420 Hamilton Place	TRUE	500	3,500.00	20	60.4	20.8	3903: 16538	TRUE
10192 Hamilton Place	TRUE	500	3,500.00	20	54.6	21.1	3903: 16538	TRUE
10161 Hamilton Place	TRUE	500	3,500.00	20	57.2	20.9	3903: 16538	TRUE
20735 East Ridge High School	TRUE	500	3,187.85	20	20	24	4855: 21277	TRUE
20265 East Ridge High School	TRUE	500	3,500.00	20	29.6	24.4	3240: 13280	TRUE
20179 East Ridge High School	TRUE	500	3,500.00	20	28	24.4	3240: 13280	TRUE
19957 East Ridge High School	TRUE	500	3,268.50	20	20	25.2	3240: 13280	TRUE
18474 East Ridge Hospital	TRUE	500	2,672.30	20	20	27.1	3240: 13280	TRUE
18261 East Ridge Hospital	TRUE	500	2,711.05	20	20	26.7	4192: 18088 s	TRUE
18099 East Ridge Hospital	TRUE	500	2,345.89	20	20	28.1	3240: 13280	TRUE
18088 East Ridge Hospital	TRUE	500	2,554.10	20	20	27.5	3240: 13280	TRUE
18045 East Ridge Hospital	TRUE	500	2,514.75	20	20	27.6	3240: 13280	TRUE
14083	FALSE	500	73.80	20	20.3	33.8	3240: 13280	TRUE
9962	FALSE	500	86.86	20	21.3	33.8	3240: 13280	TRUE
12460	FALSE	500	118	20	20.1	33.7	3240: 13280	TRUE
13941	FALSE	500	150.86	20	20	20.8	3275: 13439	TRUE
13439	FALSE	500	151.4	20	20	19.6	3363: 13941	TRUE
13092	FALSE	500	461.55	20	20	33	3240: 13280	TRUE
13280	TRUE	500	500	20	20	33	3248: 13306	TRUE
15033	TRUE	500	550.88	20	20	31.2	3621: 15198	TRUE
15198	TRUE	500	616.61	20	20	15	3584: 15033	TRUE
12714	TRUE	500	648.43	20	20	32.5	3240: 13280	TRUE
18110	TRUE	500	732.56	20	20	32.4	3240: 13280	TRUE
13306	TRUE	500	763.07	20	20	10.4	3240: 13280	TRUE
15985	TRUE	500	847.82	20	20	32.3	3240: 13280	TRUE
17565	TRUE	500	1,029.92	20	20	31.7	3240: 13280	TRUE
3086	TRUE	500	1,035.35	20	20	32.1	3240: 13280	TRUE
2344	TRUE	500	1,070.98	20	20	32.3	3240: 13280	TRUE
2393	TRUE	500	1,138.48	20	20	25	762: 2344	TRUE
1915	TRUE	500	1,154.02	20	20	26.6	652: 1931	TRUE
16466	TRUE	500	1,154.08	20	20	31.5	3240: 13280	TRUE
16538	TRUE	500	1161.01	20	20	21.1	23299: J-52	TRUE
18780	TRUE	500	1,179.18	20	20	31.3	3240: 13280	TRUE
19328	TRUE	500	1,196.09	20	20	31.5	3240: 13280	TRUE
1706	TRUE	500	1,196.56	20	20	29.4	631: 1845	TRUE
1931	TRUE	500	1,199.19	20	20	32.1	3240: 13280	TRUE
16984	TRUE	500	1,205.81	20	20	31.5	3240: 13280	TRUE
18640	TRUE	500	1,210.21	20	20	31.4	3240: 13280	TRUE
2249	TRUE	500	1,213.29	20	20	26.4	779: 2393	TRUE
17073	TRUE	500	1,230.61	20	20	31.5	3240: 13280	TRUE
1845	TRUE	500	1,259.05	20	20	25.2	592: 1706	TRUE
19209	TRUE	500	1,264.92	20	20	31.1	3240: 13280	TRUE
3374	TRUE	500	1,272.00	20	20	26.7	958: 3086	TRUE
19729	TRUE	500	1,294.48	20	20	31.3	3240: 13280	TRUE
19656	TRUE	500	1,295.34	20	20	31.3	3240: 13280	TRUE
7639	TRUE	500	1,306.06	20	20	30.9	3240: 13280	TRUE
4155	TRUE	500	1,310.09	20	20	31.9	3240: 13280	TRUE
2628	TRUE	500	1,315.70	20	20	31.9	3240: 13280	TRUE
16539	TRUE	500	1,316.72	20	20	19.5	3890: 16466	TRUE
2211	TRUE	500	1,332.77	20	20	15.2	779: 2393	TRUE
17118	TRUE	500	1,337.32	20	20	25.2	3986: 16949	TRUE
14905	TRUE	500	1,347.60	20	20	31.2	3240: 13280	TRUE
19448	TRUE	500	1,352.63	20	20	31	3240: 13280	TRUE
18962	TRUE	500	1,365.31	20	20	30.8	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
16949	TRUE	500	1,366.59	20	20	23.5	4024: 17118	TRUE
2263	TRUE	500	1,375.23	20	20	31.8	3240: 13280	TRUE
17890	TRUE	500	1,385.71	20	20	30.8	3240: 13280	TRUE
6557	TRUE	500	1,396.89	20	20	31.3	3240: 13280	TRUE
2006	TRUE	500	1,398.03	20	20	27.8	631: 1845	TRUE
1261	TRUE	500	1,400.64	20	20	31.7	3240: 13280	TRUE
2120	TRUE	500	1,411.12	20	20	31.7	3240: 13280	TRUE
18112	TRUE	500	1,416.05	20	20	19.5	4198: 18110	TRUE
18815	TRUE	500	1,419.45	20	20	28.5	4024: 17118	TRUE
9484	TRUE	500	1,420.35	20	20	31.1	3240: 13280	TRUE
2294	TRUE	500	1,423.35	20	20	31.7	3240: 13280	TRUE
17829	TRUE	500	1,425.75	20	20	22	4024: 17118	TRUE
2446	TRUE	500	1,428.91	20	20	17.8	779: 2393	TRUE
17545	TRUE	500	1,432.46	20	20	20	4024: 17118	TRUE
1801	TRUE	500	1,434.61	20	20	31.6	3240: 13280	TRUE
7332	TRUE	500	1,435.09	20	20	22.3	24284: J-93	TRUE
2048	TRUE	500	1,438.85	20	20	31.6	3240: 13280	TRUE
1939	TRUE	500	1,440.60	20	20	15.1	631: 1845	TRUE
2555	TRUE	500	1,445.90	20	20	18.5	779: 2393	TRUE
16528	TRUE	500	1,461.65	20	20	0.3	3890: 16466	TRUE
5607	TRUE	500	1,462.39	20	20	31.1	3240: 13280	TRUE
20499	TRUE	500	1,467.52	20	20	30.9	3240: 13280	TRUE
17889	TRUE	500	1,469.49	20	20	20	4158: 17890	TRUE
7895	TRUE	500	1,469.74	20	20	31	3240: 13280	TRUE
2575	TRUE	500	1,470.02	20	20	18.9	779: 2393	TRUE
3825	TRUE	500	1,470.97	20	20	9.7	1217: 4155	TRUE
2601	TRUE	500	1,472.33	20	20	31.6	3240: 13280	TRUE
6548	TRUE	500	1,473.46	20	20	24.3	1758: 6557	TRUE
6360	TRUE	500	1,475.59	20	20	30.5	3240: 13280	TRUE
7663	TRUE	500	1,484.76	20	20	31	3240: 13280	TRUE
13448	TRUE	500	1,485.54	20	20	30.9	3240: 13280	TRUE
19949	TRUE	500	1,488.93	20	20	22.4	4537: 19729	TRUE
10368	TRUE	500	1,495.65	20	20	30.9	3240: 13280	TRUE
19071	TRUE	500	1,501.42	20	20	25.9	4454: 19328	TRUE
17428	TRUE	500	1,502.30	20	20	22.6	3986: 16949	TRUE
18985	TRUE	500	1,503.93	20	20	13.6	4426: 19209	TRUE
2195	TRUE	500	1,504.19	20	20	25.5	707: 2120	TRUE
1569	TRUE	500	1,504.88	20	20	31.5	3240: 13280	TRUE
16376	TRUE	500	1,513.16	20	20	6.1	3903: 16538	TRUE
19111	TRUE	500	1,521.61	20	20	25.9	4379: 18962	TRUE
1774	TRUE	500	1,522.49	20	20	31.3	3240: 13280	TRUE
9318	TRUE	500	1,530.22	20	20	30.3	3240: 13280	TRUE
9186	TRUE	500	1,540.00	20	20	30.8	3240: 13280	TRUE
1715	TRUE	500	1,545.99	20	20	31.4	3240: 13280	TRUE
1953	TRUE	500	1,546.39	20	20	31.4	3240: 13280	TRUE
1966	TRUE	500	1,549.71	20	20	31.4	3240: 13280	TRUE
16948	TRUE	500	1,550.54	20	20.8	0	3890: 16466	TRUE
11154	TRUE	500	1,553.66	20	20	30.8	3240: 13280	TRUE
6628	TRUE	500	1,555.09	20	20	30.8	3240: 13280	TRUE
1853	TRUE	500	1,565.49	20	20	28.6	608: 1774	TRUE
2937	TRUE	500	1,566.87	20	20	31.2	3240: 13280	TRUE
3655	TRUE	500	1,568.29	20	20	31.5	3240: 13280	TRUE
6568	TRUE	500	1,583.95	20	20	30.2	3240: 13280	TRUE
2635	TRUE	500	1,586.10	20	20	31.2	3240: 13280	TRUE
17588	TRUE	500	1,588.71	20	20	30.4	3240: 13280	TRUE
2337	TRUE	500	1,596.58	20	20	31.3	3240: 13280	TRUE
12788	TRUE	500	1,597.18	20	20	30	3240: 13280	TRUE
1886	TRUE	500	1,600.38	20	20	30	608: 1774	TRUE
17286	TRUE	500	1,607.87	20	20	6.4	4024: 17118	TRUE
6482	TRUE	500	1,609.02	20	20	30.1	3240: 13280	TRUE
16447	TRUE	500	1,612.45	20	20	10.4	3986: 16949	TRUE
20779	TRUE	500	1,612.98	20	20	30.6	3240: 13280	TRUE
1708	TRUE	500	1,616.79	20	20	31.3	3240: 13280	TRUE
1945	TRUE	500	1,626.70	20	20	31.3	3240: 13280	TRUE
10377	TRUE	500	1,632.21	20	20	20.3	2624: 10368	TRUE
16161	TRUE	500	1,635.83	20	20	28.8	3792: 15969	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
8247	TRUE	500	1,636.31	20	20	28.2	2194: 8546	TRUE
13218	TRUE	500	1,649.57	20	20	29.9	3240: 13280	TRUE
3182	TRUE	500	1,654.88	20	20	31.2	3240: 13280	TRUE
17369	TRUE	500	1,666.50	20	20	24	23453: J-59	TRUE
2762	TRUE	500	1,667.11	20	20	14.3	779: 2393	TRUE
14010	TRUE	500	1,674.38	20	28	0	31755: J-141	TRUE
19531	TRUE	500	1,674.90	20	20	30	3240: 13280	TRUE
5661	TRUE	500	1,676.08	20	20	29.9	3240: 13280	TRUE
8546	TRUE	500	1,677.90	20	20	28.4	2121: 8247	TRUE
6441	TRUE	500	1,678.35	20	20	28.2	1768: 6595	TRUE
17461	TRUE	500	1,678.73	20	20	21.3	4158: 17890	TRUE
6802	TRUE	500	1,680.81	20	20	22.4	1777: 6628	TRUE
16713	TRUE	500	1,685.35	20	20	30.4	3240: 13280	TRUE
15969	TRUE	500	1,687.67	20	20	25.2	3828: 16161	TRUE
18098	TRUE	500	1,692.31	20	20	27.2	4078: 17428	TRUE
17726	TRUE	500	1,695.21	20	20	20.5	4158: 17890	TRUE
6167	TRUE	500	1,698.73	20	20	29.9	3240: 13280	TRUE
6595	TRUE	500	1,701.11	20	20	26	1727: 6441	TRUE
2588	TRUE	500	1,703.11	20	20	31.2	3240: 13280	TRUE
21273	TRUE	500	1,703.38	20	20	30	3240: 13280	TRUE
3510	TRUE	500	1,709.37	20	20	30.8	3240: 13280	TRUE
20560	TRUE	500	1,711.59	20	20	29.9	3240: 13280	TRUE
9813	TRUE	500	1,714.94	20	20	16.9	2624: 10368	TRUE
2439	TRUE	500	1,719.15	20	20	31.1	3240: 13280	TRUE
2598	TRUE	500	1,725.01	20	20	31.1	3240: 13280	TRUE
1772	TRUE	500	1,725.75	20	20	24.7	608: 1774	TRUE
19276	TRUE	500	1,728.32	20	20	30	3240: 13280	TRUE
2926	TRUE	500	1,732.19	20	20	31	3240: 13280	TRUE
20512	TRUE	500	1,735.22	20	20	16.6	4478: 19448	TRUE
18697	TRUE	500	1,736.50	20	20	6	4345: 18815	TRUE
15740	TRUE	500	1,737.58	20	20	27.5	3792: 15969	TRUE
18100	TRUE	500	1,738.97	20	20	29.9	3240: 13280	TRUE
1581	TRUE	500	1,740.17	20	20	31.1	3240: 13280	TRUE
14760	TRUE	500	1,740.24	20	20	24.8	3396: 14083	TRUE
3295	TRUE	500	1,742.69	20	20	5	1217: 4155	TRUE
6587	TRUE	500	1,748.19	20	20	19.4	1727: 6441	TRUE
4543	TRUE	500	1,748.47	20	20	30.7	3240: 13280	TRUE
20715	TRUE	500	1,757.69	20	20	16.7	4758: 20779	TRUE
10011	TRUE	500	1,758.81	20	20	10.6	2624: 10368	TRUE
16404	TRUE	500	1,759.98	20	20	29.6	3240: 13280	TRUE
2093	TRUE	500	1,760.93	20	20	31	3240: 13280	TRUE
2556	TRUE	500	1,761.73	20	20	31	3240: 13280	TRUE
21572	TRUE	500	1,763.45	20	20	27.3	22235: 22184	TRUE
18175	TRUE	500	1,766.52	20	20	29.8	3240: 13280	TRUE
5838	TRUE	500	1,766.72	20	20	23.4	1551: 5661	TRUE
8548	TRUE	500	1,769.00	20	20	17.9	2194: 8546	TRUE
6499	TRUE	500	1,769.88	20	20	30.4	3240: 13280	TRUE
16934	TRUE	500	1,770.84	20	27.1	0	3986: 16949	TRUE
14992	TRUE	500	1,772.68	20	20	31.3	3240: 13280	TRUE
12467	TRUE	500	1,773.84	20	20	29.6	3240: 13280	TRUE
2731	TRUE	500	1,778.59	20	20	29.8	831: 2598	TRUE
12881	TRUE	500	1,779.96	20	20	30.2	3240: 13280	TRUE
2287	TRUE	500	1,781.69	20	20	31	3240: 13280	TRUE
12140	TRUE	500	1,783.03	20	20	28.4	3040: 12324	TRUE
21652	TRUE	500	1,787.96	20	20	25.1	22235: 22184	TRUE
20164	TRUE	500	1,789.90	20	20	13.2	4478: 19448	TRUE
19018	TRUE	500	1,792.04	20	20	30.2	3240: 13280	TRUE
16105	TRUE	500	1,792.43	20	20	29.6	3240: 13280	TRUE
18357	TRUE	500	1,796.68	20	20	30.2	3240: 13280	TRUE
18414	TRUE	500	1,797.74	20	20	11.9	4198: 18110	TRUE
10618	TRUE	500	1,797.74	20	20	29.5	3240: 13280	TRUE
1816	TRUE	500	1,798.43	20	20	25.6	555: 1569	TRUE
12324	TRUE	500	1,798.47	20	20	27.6	3000: 12140	TRUE
18255	TRUE	500	1,802.25	20	20	1.7	4024: 17118	TRUE
20337	TRUE	500	1,803.72	20	20	27.2	4701: 20480	TRUE
2119	TRUE	500	1,804.18	20	20	30.4	750: 2287	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
14461	TRUE	500	1,804.55	20	20	16.1	3396: 14083	TRUE
19533	TRUE	500	1,805.19	20	20	5.4	4478: 19448	TRUE
17293	TRUE	500	1,806.12	20	24.9	0	3986: 16949	TRUE
20640	TRUE	500	1,807.96	20	20	19.8	4758: 20779	TRUE
8303	TRUE	500	1,811.33	20	20	7.8	2121: 8247	TRUE
9971	TRUE	500	1,818.33	20	20	30.1	3240: 13280	TRUE
19240	TRUE	500	1,818.52	20	22.9	0	4478: 19448	TRUE
12429	TRUE	500	1,818.55	20	20	30.1	3240: 13280	TRUE
15536	TRUE	500	1,822.52	20	20	31.2	3240: 13280	TRUE
6154	TRUE	500	1,826.79	20	20	30.1	3240: 13280	TRUE
2143	TRUE	500	1,827.32	20	20	30.9	3240: 13280	TRUE
21511	TRUE	500	1,828.15	20	20	29.6	3240: 13280	TRUE
20539	TRUE	500	1,828.68	20	20	29.6	3240: 13280	TRUE
20480	TRUE	500	1,828.95	20	20	27	4672: 20337	TRUE
2236	TRUE	500	1,830.79	20	20	30.5	697: 2093	TRUE
20100	TRUE	500	1,833.90	20	20	11.7	4478: 19448	TRUE
9853	TRUE	500	1,836.36	20	20	4.5	2624: 10368	TRUE
10100	TRUE	500	1,837.77	20	20	2.2	2624: 10368	TRUE
12628	TRUE	500	1,839.35	20	20	24.4	3000: 12140	TRUE
8124	TRUE	500	1,839.65	20	20	30.2	3240: 13280	TRUE
7718	TRUE	500	1,839.71	20	20	29.5	3240: 13280	TRUE
7474	TRUE	500	1,843.74	20	20	30.2	3240: 13280	TRUE
12277	TRUE	500	1,844.12	20	20	26.6	3040: 12324	TRUE
19232	TRUE	500	1,845.62	20	20	30.1	3240: 13280	TRUE
6105	TRUE	500	1,851.05	20	20	30	3240: 13280	TRUE
15450	TRUE	500	1,851.09	20	20	30.1	3240: 13280	TRUE
2490	TRUE	500	1,851.94	20	20	23	838: 2635	TRUE
10493	TRUE	500	1,852.27	20	20	30.1	3240: 13280	TRUE
20107	TRUE	500	1,854.39	20	20	30	3240: 13280	TRUE
18792	TRUE	500	1,856.05	20	20	3.3	4478: 19448	TRUE
18133	TRUE	500	1,857.17	20	22.4	0	4024: 17118	TRUE
17861	TRUE	500	1,857.77	20	21.6	0	4024: 17118	TRUE
17932	TRUE	500	1,858.92	20	23.2	0	4024: 17118	TRUE
13378	TRUE	500	1,861.62	20	20	30	3240: 13280	TRUE
18286	TRUE	500	1,861.69	20	23.1	0	4024: 17118	TRUE
16243	TRUE	500	1,863.31	20	31.6	0	3903: 16538	TRUE
6245	TRUE	500	1,866.69	20	20	22.9	1727: 6441	TRUE
4989	TRUE	500	1,873.08	20	20	30.7	3240: 13280	TRUE
18467	TRUE	500	1,874.48	20	22.4	0	4024: 17118	TRUE
13493	TRUE	500	1,878.26	20	20	30	3240: 13280	TRUE
21319	TRUE	500	1,881.63	20	20	27.3	4854: 21273	TRUE
2521	TRUE	500	1,881.86	20	20	30.8	3240: 13280	TRUE
20648	TRUE	500	1,884.46	20	20	29.5	3240: 13280	TRUE
6205	TRUE	500	1,885.82	20	20	24.9	1656: 6154	TRUE
20361	TRUE	500	1,890.09	20	20	29.5	3240: 13280	TRUE
16396	TRUE	500	1,894.97	20	20	28.5	3886: 16441	TRUE
17302	TRUE	500	1,895.20	20	20	29.6	3240: 13280	TRUE
20281	TRUE	500	1,898.84	20	20	29.9	3240: 13280	TRUE
6411	TRUE	500	1,901.86	20	20	14.6	1727: 6441	TRUE
19120	TRUE	500	1,903.80	20	20	29.9	3240: 13280	TRUE
6354	TRUE	500	1,912.69	20	20	30.1	3240: 13280	TRUE
21459	TRUE	500	1,915.30	20	20	22.8	4866: 21319	TRUE
6399	TRUE	500	1,919.93	20	20	16.2	1727: 6441	TRUE
13134	TRUE	500	1,923.39	20	20	29.9	3240: 13280	TRUE
4207	TRUE	500	1,924.71	20	20	30.3	3240: 13280	TRUE
1920	TRUE	500	1,926.80	20	20	30.7	3240: 13280	TRUE
6155	TRUE	500	1,934.77	20	20	18.9	1727: 6441	TRUE
10526	TRUE	500	1,935.22	20	20	29.2	3240: 13280	TRUE
19650	TRUE	500	1,935.35	20	20	20.9	4701: 20480	TRUE
15322	TRUE	500	1,937.02	20	20	23.7	3677: 15450	TRUE
19585	TRUE	500	1,939.21	20	20	29.8	3240: 13280	TRUE
16441	TRUE	500	1,943.34	20	20	23.4	3876: 16396	TRUE
18121	TRUE	500	1,946.64	20	20	9	4078: 17428	TRUE
19288	TRUE	500	1,947.05	20	20	29.8	3240: 13280	TRUE
6889	TRUE	500	1,950.02	20	20	18.6	1777: 6628	TRUE
2744	TRUE	500	1,951.21	20	20	30.5	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
19784	TRUE	500	1,951.42	20	20	29.8	3240: 13280	TRUE
13491	TRUE	500	1,953.52	20	20	29.1	3240: 13280	TRUE
12951	TRUE	500	1,954.85	20	20	29.1	3240: 13280	TRUE
20475	TRUE	500	1,958.03	20	20	19.7	4701: 20480	TRUE
2059	TRUE	500	1,958.69	20	20	30.5	3240: 13280	TRUE
15811	TRUE	500	1,958.70	20	20	29.8	3240: 13280	TRUE
13221	TRUE	500	1,960.20	20	20	26.9	3172: 12951	TRUE
18960	TRUE	500	1,960.85	20	20	29.2	3240: 13280	TRUE
2159	TRUE	500	1,962.31	20	20	30.5	3240: 13280	TRUE
11232	TRUE	500	1,962.76	20	20	29.8	3240: 13280	TRUE
9522	TRUE	500	1,966.20	20	27.7	0	2624: 10368	TRUE
2242	TRUE	500	1,966.27	20	20	21.9	750: 2287	TRUE
19654	TRUE	500	1,967.05	20	20	29.3	3240: 13280	TRUE
7344	TRUE	500	1,967.26	20	20	15.2	24187: J-90	TRUE
20047	TRUE	500	1,967.29	20	20	12.4	4478: 19448	TRUE
21385	TRUE	500	1,967.96	20	20	21.6	22235: 22184	TRUE
21512	TRUE	500	1,970.15	20	20	17.7	22235: 22184	TRUE
12012	TRUE	500	1,974.91	20	20	26.5	3070: 12460	TRUE
13936	TRUE	500	1,977.28	20	20	29.7	3240: 13280	TRUE
7970	TRUE	500	1,978.08	20	20	29.1	3240: 13280	TRUE
6259	TRUE	500	1,979.71	20	20	15	1664: 6167	TRUE
15904	TRUE	500	1,980.09	20	20	29	3240: 13280	TRUE
1134	TRUE	500	1,980.32	20	27.2	0	477: 1261	TRUE
10984	TRUE	500	1,981.10	20	20	29.8	3240: 13280	TRUE
17028	TRUE	500	1,982.61	20	20	29.3	3240: 13280	TRUE
12423	TRUE	500	1,990.35	20	20	27.9	3263: 13378	TRUE
18738	TRUE	500	1,993.02	20	20	29.7	3240: 13280	TRUE
18930	TRUE	500	1,993.77	20	20	29.7	3240: 13280	TRUE
7631	TRUE	500	1,994.55	20	20	29	3240: 13280	TRUE
2974	TRUE	500	2,002.41	20	20	22.1	838: 2635	TRUE
7077	TRUE	500	2,004.94	20	20	29	3240: 13280	TRUE
21279	TRUE	500	2,007.04	20	20	22.5	22235: 22184	TRUE
3375	TRUE	500	2,010.21	20	20	15.9	1062: 3510	TRUE
6246	TRUE	500	2,014.21	20	20	24.5	1646: 6105	TRUE
2904	TRUE	500	2,014.60	20	20	30.3	3240: 13280	TRUE
17256	TRUE	500	2,016.40	20	20	29.2	3240: 13280	TRUE
19938	TRUE	500	2,016.73	20	20	14.2	4701: 20480	TRUE
20284	TRUE	500	2,020.08	20	20	13.6	4701: 20480	TRUE
20222	TRUE	500	2,021.32	20	20	29.6	3240: 13280	TRUE
19711	TRUE	500	2,021.47	20	20	29.6	3240: 13280	TRUE
14250	TRUE	500	2,027.76	20	20	20.1	3396: 14083	TRUE
19793	TRUE	500	2,029.82	20	20	13.2	4701: 20480	TRUE
20150	TRUE	500	2,031.15	20	20	28.6	4521: 19648	TRUE
8635	TRUE	500	2,032.41	20	20	28.2	2624: 10368	TRUE
20199	TRUE	500	2,034.14	20	20	16.4	4701: 20480	TRUE
2572	TRUE	500	2,037.37	20	20	27.9	827: 2588	TRUE
17498	TRUE	500	2,038.83	20	41.8	0	4078: 17428	TRUE
17967	TRUE	500	2,039.08	20	20	25.5	4212: 18175	TRUE
20076	TRUE	500	2,040.16	20	20	12.8	4701: 20480	TRUE
5988	TRUE	500	2,042.03	20	20	29.8	3240: 13280	TRUE
12904	TRUE	500	2,042.96	20	20	29.6	3240: 13280	TRUE
9562	TRUE	500	2,044.32	20	20	22.5	2346: 9186	TRUE
16592	TRUE	500	2,047.57	20	20	29.2	3240: 13280	TRUE
19980	TRUE	500	2,049.37	20	20	10.9	4478: 19448	TRUE
20526	TRUE	500	2,050.55	20	20	29	3240: 13280	TRUE
1995	TRUE	500	2,051.21	20	20	30.3	3240: 13280	TRUE
5942	TRUE	500	2,053.21	20	20	29.5	3240: 13280	TRUE
19648	TRUE	500	2,054.41	20	20	27.5	4623: 20107	TRUE
12272	TRUE	500	2,056.76	20	20	21.1	3063: 12423	TRUE
5702	TRUE	500	2,057.88	20	20	29.8	3240: 13280	TRUE
3177	TRUE	500	2,069.22	20	20	30	1062: 3510	TRUE
2638	TRUE	500	2,072.27	20	20	27.1	827: 2588	TRUE
3219	TRUE	500	2,072.91	20	20	30.1	3240: 13280	TRUE
2334	TRUE	500	2,074.15	20	20	30.2	3240: 13280	TRUE
17533	TRUE	500	2,074.62	20	20	18.1	4194: 18098	TRUE
12023	TRUE	500	2,076.86	20	20	29.5	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
12085	TRUE	500	2,080.97	20	20	16.2	3040: 12324	TRUE
9871	TRUE	500	2,085.10	20	20	29.6	3240: 13280	TRUE
20158	TRUE	500	2,086.30	20	20	29.5	3240: 13280	TRUE
15435	TRUE	500	2,088.56	20	20	29.4	3240: 13280	TRUE
19928	TRUE	500	2,092.80	20	20	13.9	4478: 19448	TRUE
9329	TRUE	500	2,096.90	20	20	28.7	3240: 13280	TRUE
2649	TRUE	500	2,097.45	20	20	30.2	3240: 13280	TRUE
9559	TRUE	500	2,098.26	20	20	29.5	3240: 13280	TRUE
3317	TRUE	500	2,100.95	20	20	30.4	3240: 13280	TRUE
19713	TRUE	500	2,102.13	20	20	23.4	4478: 19448	TRUE
5485	TRUE	500	2,104.11	20	20	29.7	3240: 13280	TRUE
2457	TRUE	500	2,105.96	20	20	27.4	827: 2588	TRUE
17590	TRUE	500	2,107.30	20	20	29	3240: 13280	TRUE
4892	TRUE	500	2,109.75	20	20	25.2	1405: 4989	TRUE
8501	TRUE	500	2,116.59	20	20	29.5	3240: 13280	TRUE
1617	TRUE	500	2,118.13	20	20	28.7	593: 1708	TRUE
20646	TRUE	500	2,124.26	20	20	24	4736: 20648	TRUE
17131	TRUE	500	2,128.18	20	20	29.4	3240: 13280	TRUE
9544	TRUE	500	2,128.72	20	20	29.5	3240: 13280	TRUE
2288	TRUE	500	2,131.49	20	20	30.1	3240: 13280	TRUE
19956	TRUE	500	2,132.32	20	20	15	4701: 20480	TRUE
15103	TRUE	500	2,132.36	20	20	28.6	3677: 15450	TRUE
19398	TRUE	500	2,132.92	20	20	24.4	4521: 19648	TRUE
3126	TRUE	500	2,138.15	20	20	30.4	3240: 13280	TRUE
11621	TRUE	500	2,139.72	20	20	29.4	3240: 13280	TRUE
18545	TRUE	500	2,142.30	20	20	22.2	4244: 18357	TRUE
7152	TRUE	500	2,143.62	20	20	25.1	24284: J-93	TRUE
15935	TRUE	500	2,145.56	20	52.3	0	3903: 16538	TRUE
20745	TRUE	500	2,150.43	20	20	28.7	3240: 13280	TRUE
21277	TRUE	500	2,153.73	20	20	28.7	3240: 13280	TRUE
8771	TRUE	500	2,156.06	20	20	29.4	3240: 13280	TRUE
11416	TRUE	500	2,156.66	20	20	29.4	3240: 13280	TRUE
2099	TRUE	500	2,159.11	20	20	23	697: 2093	TRUE
7130	TRUE	500	2,159.71	20	20	23.7	2005: 7718	TRUE
3285	TRUE	500	2,160.62	20	20	29.9	3240: 13280	TRUE
16264	TRUE	500	2,164.08	20	20	27.1	3876: 16396	TRUE
19725	TRUE	500	2,165.35	20	20	26.8	4636: 20158	TRUE
15459	TRUE	500	2,165.90	20	20	29.2	3240: 13280	TRUE
2620	TRUE	500	2,166.94	20	20	24.1	827: 2588	TRUE
6049	TRUE	500	2,167.99	20	20	28.6	1614: 5942	TRUE
6196	TRUE	500	2,169.89	20	20	29.3	3240: 13280	TRUE
15966	TRUE	500	2,172.43	20	41.2	0	23299: J-52	TRUE
20897	TRUE	500	2,173.09	20	20	28.7	3240: 13280	TRUE
12354	TRUE	500	2,176.23	20	20	28.4	3240: 13280	TRUE
11440	TRUE	500	2,180.40	20	20	27.5	2807: 11232	TRUE
13057	TRUE	500	2,184.07	20	20	29.3	3240: 13280	TRUE
19369	TRUE	500	2,187.65	20	20	28.6	3240: 13280	TRUE
4626	TRUE	500	2,191.24	20	20	30	3240: 13280	TRUE
19866	TRUE	500	2,191.65	20	20	16.1	4478: 19448	TRUE
4607	TRUE	500	2,193.68	20	20	29.7	3240: 13280	TRUE
2727	TRUE	500	2,194.74	20	20	17.9	827: 2588	TRUE
13207	TRUE	500	2,195.94	20	20	12	3263: 13378	TRUE
19890	TRUE	500	2,196.33	20	20	6.9	4701: 20480	TRUE
16010	TRUE	500	2,196.74	20	20	28.3	3240: 13280	TRUE
7302	TRUE	500	2,197.45	20	20	28.5	3240: 13280	TRUE
19604	TRUE	500	2,197.58	20	20	22.4	4531: 19711	TRUE
9062	TRUE	500	2,200.66	20	27.3	0	2624: 10368	TRUE
13764	TRUE	500	2,205.87	20	20	0.8	31755: J-141	TRUE
9167	TRUE	500	2,207.61	20	20	29.3	3240: 13280	TRUE
2885	TRUE	500	2,208.26	20	20	30.1	3240: 13280	TRUE
5508	TRUE	500	2,209.97	20	20	6.7	1537: 5607	TRUE
19105	TRUE	500	2,212.90	20	20	16.6	4429: 19232	TRUE
13845	TRUE	500	2,215.27	20	20	28	3240: 13280	TRUE
18493	TRUE	500	2,217.64	20	20	29.2	3240: 13280	TRUE
13111	TRUE	500	2,219.28	20	20	29.2	3240: 13280	TRUE
4516	TRUE	500	2,220.02	20	20	29.6	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12									
Existing Fire Flow Results									
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?	
2395	TRUE	500	2,222.62	20	20	30.1	3240: 13280	TRUE	
2678	TRUE	500	2,224.77	20	20	24.1	827: 2588	TRUE	
2061	TRUE	500	2,225.19	20	20	30.1	3240: 13280	TRUE	
2864	TRUE	500	2,225.55	20	20	29.9	3240: 13280	TRUE	
2647	TRUE	500	2,228.40	20	20	19.6	827: 2588	TRUE	
6905	TRUE	500	2,231.01	20	20	28.3	3240: 13280	TRUE	
4284	TRUE	500	2,233.25	20	20	30.2	3240: 13280	TRUE	
14733	TRUE	500	2,238.68	20	20	22.4	23299: J-52	TRUE	
16204	TRUE	500	2,239.41	20	20	29	3240: 13280	TRUE	
15710	TRUE	500	2,240.46	20	65.7	0	23299: J-52	TRUE	
18784	TRUE	500	2,242.97	20	20	29.1	3240: 13280	TRUE	
12347	TRUE	500	2,246.46	20	20	16.1	31622: J-140	TRUE	
9485	TRUE	500	2,246.61	20	20	29.2	3240: 13280	TRUE	
18060	TRUE	500	2,247.06	20	20	29.1	3240: 13280	TRUE	
14122	TRUE	500	2,247.57	20	20	29.1	3240: 13280	TRUE	
3367	TRUE	500	2,249.65	20	20	23.2	1013: 3317	TRUE	
19612	TRUE	500	2,252.96	20	20	29.1	3240: 13280	TRUE	
7685	TRUE	500	2,262.19	20	20	20.1	2040: 7895	TRUE	
9110	TRUE	500	2,262.51	20	20	28.2	3240: 13280	TRUE	
2923	TRUE	500	2,264.01	20	20	30.1	3240: 13280	TRUE	
2426	TRUE	500	2,265.22	20	20	20.8	827: 2588	TRUE	
10209	TRUE	500	2,269.37	20	20	28.2	3240: 13280	TRUE	
7370	TRUE	500	2,269.69	20	20	14.8	2005: 7718	TRUE	
6570	TRUE	500	2,269.76	20	20	13.3	1727: 6441	TRUE	
15622	TRUE	500	2,270.30	20	49.5	0	23299: J-52	TRUE	
20688	TRUE	500	2,271.50	20	20	28.3	3240: 13280	TRUE	
18683	TRUE	500	2,271.58	20	20	28.4	3240: 13280	TRUE	
14327	TRUE	500	2,271.79	20	20	23.1	3263: 13378	TRUE	
18583	TRUE	500	2,275.18	20	20	26.4	4274: 18493	TRUE	
13968	TRUE	500	2,275.46	20	20	29	3240: 13280	TRUE	
10829	TRUE	500	2,277.97	20	20	28.1	3240: 13280	TRUE	
17948	TRUE	500	2,279.26	20	20	5.5	4158: 17890	TRUE	
17270	TRUE	500	2,279.28	20	20	28.5	3240: 13280	TRUE	
17034	TRUE	500	2,282.54	20	20	28.5	3240: 13280	TRUE	
8023	TRUE	500	2,283.09	20	20	25.1	2624: 10368	TRUE	
15286	TRUE	500	2,283.43	20	20	28.2	3240: 13280	TRUE	
2553	TRUE	500	2,283.56	20	20	19.4	827: 2588	TRUE	
20257	TRUE	500	2,286.44	20	20	28.3	3240: 13280	TRUE	
6068	TRUE	500	2,287.39	20	20	29	3240: 13280	TRUE	
9017	TRUE	500	2,288.74	20	20	29.1	3240: 13280	TRUE	
19244	TRUE	500	2,288.87	20	20	20.4	4429: 19232	TRUE	
13326	TRUE	500	2,290.83	20	20	25.1	3289: 13491	TRUE	
9864	TRUE	500	2,291.41	20	20	28.1	3240: 13280	TRUE	
19927	TRUE	500	2,294.14	20	20	28.3	3240: 13280	TRUE	
4027	TRUE	500	2,296.52	20	20	30.1	3240: 13280	TRUE	
6598	TRUE	500	2,302.04	20	20	28.5	3240: 13280	TRUE	
5760	TRUE	500	2,304.79	20	20	25.4	1557: 5702	TRUE	
6286	TRUE	500	2,309.16	20	20	27.4	1656: 6154	TRUE	
10911	TRUE	500	2,311.89	20	20	10	2678: 10618	TRUE	
12269	TRUE	500	2,320.84	20	20	28.2	3081: 12508	TRUE	
1820	TRUE	500	2,321.68	20	20	28.2	622: 1816	TRUE	
3111	TRUE	500	2,323.56	20	20	14.7	978: 3182	TRUE	
12508	TRUE	500	2,325.29	20	20	28.5	3025: 12269	TRUE	
1868	TRUE	500	2,327.55	20	20	28.5	686: 2048	TRUE	
19451	TRUE	500	2,328.83	20	20	28.9	3240: 13280	TRUE	
12331	TRUE	500	2,330.09	20	20	27.8	3240: 13280	TRUE	
12580	TRUE	500	2,333.20	20	20	11.4	3063: 12423	TRUE	
5326	TRUE	500	2,333.78	20	20	29.2	3240: 13280	TRUE	
7528	TRUE	500	2,334.20	20	20	6.7	2005: 7718	TRUE	
7050	TRUE	500	2,334.55	20	20	28.2	3240: 13280	TRUE	
8539	TRUE	500	2,338.90	20	20	29	3240: 13280	TRUE	
12059	TRUE	500	2,339.15	20	20	28.6	3240: 13280	TRUE	
18220	TRUE	500	2,340.23	20	20	7.8	4198: 18110	TRUE	
17756	TRUE	500	2,342.00	20	20	22.3	4158: 17890	TRUE	
16075	TRUE	500	2,343.59	20	20	14	3796: 15985	TRUE	
2459	TRUE	500	2,344.12	20	20	22	752: 2294	TRUE	

Catoosa Co. Connection Improvements - CTI Project No. C05009-12									
Existing Fire Flow Results									
Label		Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
	20581	TRUE	500	2,347.87	20	20	28.1	3240: 13280	TRUE
	15608	TRUE	500	2,348.08	20	20	28.8	3240: 13280	TRUE
	14891	TRUE	500	2,350.21	20	20	23.2	3675: 15435	TRUE
	19941	TRUE	500	2,350.70	20	20	28.1	3240: 13280	TRUE
	18303	TRUE	500	2,355.85	20	20	21.4	4158: 17890	TRUE
	7266	TRUE	500	2,357.04	20	20	25.9	1990: 7639	TRUE
	15761	TRUE	500	2,359.66	20	20	28	3240: 13280	TRUE
	4496	TRUE	500	2,360.18	20	20	30	3240: 13280	TRUE
	14088	TRUE	500	2,361.57	20	20	28.8	3240: 13280	TRUE
	7434	TRUE	500	2,362.59	20	20	29	3240: 13280	TRUE
	18680	TRUE	500	2,363.61	20	20	27.5	4337: 18784	TRUE
	17225	TRUE	500	2,364.62	20	20	28.1	3240: 13280	TRUE
	6309	TRUE	500	2,365.50	20	20	28.8	3240: 13280	TRUE
	12733	TRUE	500	2,367.28	20	20	12.5	3263: 13378	TRUE
	17976	TRUE	500	2,368.89	20	20	16.7	4158: 17890	TRUE
	7333	TRUE	500	2,369.60	20	20	29	3240: 13280	TRUE
	1331	TRUE	500	2,374.36	20	20	28.2	477: 1261	TRUE
	3580	TRUE	500	2,374.76	20	20	29.9	3240: 13280	TRUE
	4592	TRUE	500	2,376.62	20	20	29.3	3240: 13280	TRUE
	3728	TRUE	500	2,377.24	20	20	29.7	3240: 13280	TRUE
	11117	TRUE	500	2,378.53	20	20	27.9	3240: 13280	TRUE
	5446	TRUE	500	2,378.65	20	20	29	3240: 13280	TRUE
	8437	TRUE	500	2,380.94	20	20	28.9	3240: 13280	TRUE
	6873	TRUE	500	2,383.66	20	20	27.3	1866: 7050	TRUE
	6183	TRUE	500	2,384.27	20	20	29	3240: 13280	TRUE
	13319	TRUE	500	2,388.61	20	20	27.8	3240: 13280	TRUE
	17315	TRUE	500	2,389.01	20	20	23	4055: 17302	TRUE
	11734	TRUE	500	2,389.03	20	20	28.5	3240: 13280	TRUE
	16831	TRUE	500	2,393.72	20	20	28.2	3240: 13280	TRUE
	6048	TRUE	500	2,397.18	20	20	29	3240: 13280	TRUE
	2769	TRUE	500	2,401.95	20	20	29.7	3240: 13280	TRUE
	8445	TRUE	500	2,402.20	20	20.9	0	2624: 10368	TRUE
	3783	TRUE	500	2,409.04	20	20	29.3	3240: 13280	TRUE
	14186	TRUE	500	2,416.10	20	20	27.8	3240: 13280	TRUE
	8930	TRUE	500	2,416.33	20	20	24.9	2303: 9017	TRUE
	1089	TRUE	500	2,419.27	20	30.9	0	477: 1261	TRUE
	11929	TRUE	500	2,419.99	20	20	27	2982: 12059	TRUE
	13386	TRUE	500	2,420.48	20	20	28.7	3240: 13280	TRUE
	3486	TRUE	500	2,423.88	20	20	29.8	3240: 13280	TRUE
	13595	TRUE	500	2,425.72	20	23.3	0	31755: J-141	TRUE
	6182	TRUE	500	2,425.81	20	20	28.6	3240: 13280	TRUE
	14966	TRUE	500	2,426.05	20	20	25.4	3600: 15103	TRUE
	11829	TRUE	500	2,427.96	20	20	27.7	3240: 13280	TRUE
	2309	TRUE	500	2,436.14	20	20	29.6	3240: 13280	TRUE
	2178	TRUE	500	2,439.03	20	20	28.4	670: 1995	TRUE
	17550	TRUE	500	2,439.44	20	20	28.6	3240: 13280	TRUE
	2088	TRUE	500	2,441.62	20	20	22.6	713: 2143	TRUE
	3243	TRUE	500	2,445.46	20	20	29.7	3240: 13280	TRUE
	3642	TRUE	500	2,449.91	20	20	16.5	1062: 3510	TRUE
	5637	TRUE	500	2,453.24	20	20	23.2	1511: 5485	TRUE
	12731	TRUE	500	2,455.95	20	20	27.6	3240: 13280	TRUE
	15929	TRUE	500	2,457.01	20	20	19.7	3886: 16441	TRUE
	17277	TRUE	500	2,458.77	20	20	22.2	4001: 17028	TRUE
	13736	TRUE	500	2,460.39	20	20	27.6	3240: 13280	TRUE
	10252	TRUE	500	2,461.48	20	20	28.5	3240: 13280	TRUE
	17931	TRUE	500	2,464.83	20	20	13.7	4158: 17890	TRUE
	12581	TRUE	500	2,465.26	20	20	27.6	3081: 12508	TRUE
	15733	TRUE	500	2,465.34	20	20	27.5	3240: 13280	TRUE
	11259	TRUE	500	2,467.36	20	20	28.3	3240: 13280	TRUE
	16017	TRUE	500	2,469.28	20	20	5.4	3773: 15904	TRUE
	3040	TRUE	500	2,470.41	20	20	29.3	3240: 13280	TRUE
	6579	TRUE	500	2,470.75	20	20	28.8	3240: 13280	TRUE
	11535	TRUE	500	2,471.06	20	20	28.6	3240: 13280	TRUE
	7407	TRUE	500	2,472.29	20	20	25.4	1866: 7050	TRUE
	14624	TRUE	500	2,472.47	20	20	28.5	3240: 13280	TRUE
	10130	TRUE	500	2,473.85	20	20	24.2	2529: 9971	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
3323	TRUE	500	2,474.66	20	20	27.5	978: 3182	TRUE
12737	TRUE	500	2,475.53	20	20	27.5	3240: 13280	TRUE
15747	TRUE	500	2,476.13	20	20	26.4	3710: 15608	TRUE
18411	TRUE	500	2,476.32	20	20	28.5	3240: 13280	TRUE
12258	TRUE	500	2,482.81	20	20	7.4	3263: 13378	TRUE
6664	TRUE	500	2,482.96	20	20	12.4	2005: 7718	TRUE
3928	TRUE	500	2,487.80	20	20	26.7	1078: 3580	TRUE
19691	TRUE	500	2,488.18	20	20	27.7	3240: 13280	TRUE
15274	TRUE	500	2,489.36	20	56.8	0	23299: J-52	TRUE
18389	TRUE	500	2,490.66	20	20	25.3	4244: 18357	TRUE
15157	TRUE	500	2,491.17	20	20	20.2	3675: 15435	TRUE
14027	TRUE	500	2,492.44	20	21.4	0	31755: J-141	TRUE
5852	TRUE	500	2,496.58	20	20	28.8	3240: 13280	TRUE
11058	TRUE	500	2,497.91	20	20	27.3	3240: 13280	TRUE
7616	TRUE	500	2,502.39	20	20	25.9	1957: 7474	TRUE
15190	TRUE	500	2,508.27	20	20	13.2	3675: 15435	TRUE
17536	TRUE	500	2,510.53	20	20	18	4158: 17890	TRUE
14809	TRUE	500	2,513.09	20	20	28.4	3240: 13280	TRUE
15374	TRUE	500	2,513.30	20	34.9	0	3903: 16538	TRUE
14576	TRUE	500	2,516.90	20	20	27	3240: 13280	TRUE
13989	TRUE	500	2,517.35	20	20	28.1	3240: 13280	TRUE
15247	TRUE	500	2,519.62	20	20	12.4	3675: 15435	TRUE
14069	TRUE	500	2,519.96	20	20	8.3	3263: 13378	TRUE
3627	TRUE	500	2,521.33	20	20	29.4	3240: 13280	TRUE
15254	TRUE	500	2,526.27	20	20	28.4	3240: 13280	TRUE
2489	TRUE	500	2,527.49	20	20	28.1	697: 2093	TRUE
10919	TRUE	500	2,539.55	20	20	23.6	2722: 10829	TRUE
19404	TRUE	500	2,543.22	20	20	25.5	4531: 19711	TRUE
12500	TRUE	500	2,543.50	20	20	4.7	3263: 13378	TRUE
2307	TRUE	500	2,544.92	20	20	26.2	697: 2093	TRUE
11866	TRUE	500	2,545.27	20	20	28.4	3240: 13280	TRUE
10770	TRUE	500	2,545.81	20	20	21	2722: 10829	TRUE
7210	TRUE	500	2,553.84	20	20	15.1	1866: 7050	TRUE
8146	TRUE	500	2,554.75	20	23.2	0	2624: 10368	TRUE
19368	TRUE	500	2,556.51	20	20	14.7	4701: 20480	TRUE
3891	TRUE	500	2,557.49	20	20	23.3	1078: 3580	TRUE
6965	TRUE	500	2,557.76	20	20	27.5	3240: 13280	TRUE
20528	TRUE	500	2,559.60	20	20	27.5	3240: 13280	TRUE
18886	TRUE	500	2,560.38	20	20	18.7	4274: 18493	TRUE
14827	TRUE	500	2,563.05	20	20	28.3	3240: 13280	TRUE
17436	TRUE	500	2,565.19	20	20	3.5	4194: 18098	TRUE
3211	TRUE	500	2,566.27	20	20	29.5	3240: 13280	TRUE
13206	TRUE	500	2,566.85	20	20	26.7	3240: 13280	TRUE
9213	TRUE	500	2,569.39	20	20	28.4	3240: 13280	TRUE
13010	TRUE	500	2,569.86	20	20	27.2	3240: 13280	TRUE
9297	TRUE	500	2,572.73	20	20	16.7	2381: 9329	TRUE
6296	TRUE	500	2,573.50	20	20	26.8	1707: 6354	TRUE
14390	TRUE	500	2,573.57	20	20	26.8	3240: 13280	TRUE
12612	TRUE	500	2,575.75	20	20	3.2	3263: 13378	TRUE
9155	TRUE	500	2,575.79	20	20	15.3	2325: 9110	TRUE
7182	TRUE	500	2,581.32	20	20.7	0	2005: 7718	TRUE
7312	TRUE	500	2,581.42	20	20	0.5	2005: 7718	TRUE
2596	TRUE	500	2,582.38	20	20	29.3	3240: 13280	TRUE
4745	TRUE	500	2,583.46	20	20	25.4	1405: 4989	TRUE
13278	TRUE	500	2,584.59	20	20	2.8	3263: 13378	TRUE
13014	TRUE	500	2,585.41	20	20	2.7	3263: 13378	TRUE
13821	TRUE	500	2,588.72	20	20	1.8	3263: 13378	TRUE
2808	TRUE	500	2,593.45	20	20	29.2	3240: 13280	TRUE
1807	TRUE	500	2,597.36	20	20	29.3	3240: 13280	TRUE
19306	TRUE	500	2,600.16	20	20	27.4	3240: 13280	TRUE
11911	TRUE	500	2,601.32	20	20	27.9	3240: 13280	TRUE
4914	TRUE	500	2,603.00	20	20	21.2	1302: 4543	TRUE
5339	TRUE	500	2,603.03	20	20	28.7	3240: 13280	TRUE
18906	TRUE	500	2,603.32	20	20	27.3	3240: 13280	TRUE
9149	TRUE	500	2,606.39	20	20	28.3	3240: 13280	TRUE
18345	TRUE	500	2,606.51	20	20	28.2	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
15051	TRUE	500	2,609.69	20	20	8.4	3903: 16538	TRUE
15711	TRUE	500	2,613.81	20	20	27.4	3240: 13280	TRUE
6906	TRUE	500	2,614.81	20	20	2.2	2005: 7718	TRUE
18479	TRUE	500	2,615.44	20	20	21.6	4158: 17890	TRUE
4973	TRUE	500	2,615.79	20	20	28.1	1302: 4543	TRUE
20331	TRUE	500	2,616.15	20	20	25.3	4736: 20648	TRUE
2091	TRUE	500	2,617.25	20	20	16.3	745: 2263	TRUE
9925	TRUE	500	2,617.54	20	20	28.2	3240: 13280	TRUE
19968	TRUE	500	2,619.27	20	20	27.3	3240: 13280	TRUE
1831	TRUE	500	2,626.94	20	20	18.6	697: 2093	TRUE
11360	TRUE	500	2,627.84	20	20	27.9	2813: 11259	TRUE
1466	TRUE	500	2,628.67	20	20	29.2	3240: 13280	TRUE
19034	TRUE	500	2,630.15	20	20	9.3	4429: 19232	TRUE
5046	TRUE	500	2,630.15	20	20	28.5	3240: 13280	TRUE
20521	TRUE	500	2,630.59	20	20	27.3	3240: 13280	TRUE
15651	TRUE	500	2,631.30	20	20	26.7	3739: 15733	TRUE
2737	TRUE	500	2,636.58	20	20	23.8	818: 2556	TRUE
6830	TRUE	500	2,636.96	20	20	28.3	3240: 13280	TRUE
13640	TRUE	500	2,639.42	20	20	0.2	3263: 13378	TRUE
9765	TRUE	500	2,642.21	20	20	23	2325: 9110	TRUE
18671	TRUE	500	2,642.90	20	20	27.2	3240: 13280	TRUE
18228	TRUE	500	2,647.95	20	20	28.1	3240: 13280	TRUE
6477	TRUE	500	2,648.60	20	20	25.6	1707: 6354	TRUE
7959	TRUE	500	2,649.83	20	25.3	0	2624: 10368	TRUE
9038	TRUE	500	2,653.74	20	20	28.2	3240: 13280	TRUE
2262	TRUE	500	2,653.85	20	20	23.8	697: 2093	TRUE
20548	TRUE	500	2,654.15	20	20	27.2	3240: 13280	TRUE
1937	TRUE	500	2,657.50	20	20	12.8	697: 2093	TRUE
3739	TRUE	500	2,658.98	20	20	18.8	1078: 3580	TRUE
2369	TRUE	500	2,659.79	20	20	23.7	697: 2093	TRUE
6500	TRUE	500	2,659.86	20	20	26.3	1707: 6354	TRUE
11834	TRUE	500	2,664.92	20	20	14.8	3040: 12324	TRUE
6235	TRUE	500	2,665.95	20	20	28.3	3240: 13280	TRUE
9310	TRUE	500	2,666.97	20	20	28.1	3240: 13280	TRUE
4732	TRUE	500	2,669.01	20	20	28.4	3240: 13280	TRUE
4978	TRUE	500	2,671.45	20	20	28.6	3240: 13280	TRUE
5897	TRUE	500	2,673.42	20	20	28.3	3240: 13280	TRUE
12107	TRUE	500	2,673.62	20	20	28	3240: 13280	TRUE
6897	TRUE	500	2,676.40	20	20	28.2	3240: 13280	TRUE
19476	TRUE	500	2,682.66	20	20	25.2	4528: 19691	TRUE
13704	TRUE	500	2,682.83	20	20	26.7	3240: 13280	TRUE
11329	TRUE	500	2,685.30	20	20	26.9	3240: 13280	TRUE
6293	TRUE	500	2,686.09	20	20	28	3240: 13280	TRUE
10572	TRUE	500	2,686.35	20	20	28	3240: 13280	TRUE
7926	TRUE	500	2,686.77	20	20	17.8	2005: 7718	TRUE
2796	TRUE	500	2,689.26	20	20	29.2	3240: 13280	TRUE
8898	TRUE	500	2,690.74	20	20	28	3240: 13280	TRUE
11849	TRUE	500	2,696.03	20	20	28	3240: 13280	TRUE
2801	TRUE	500	2,702.74	20	20	29.1	3240: 13280	TRUE
11868	TRUE	500	2,706.67	20	20	26.7	3240: 13280	TRUE
2403	TRUE	500	2,709.95	20	20	28.8	3240: 13280	TRUE
20227	TRUE	500	2,713.26	20	20	27	3240: 13280	TRUE
12054	TRUE	500	2,713.64	20	20	27.9	3240: 13280	TRUE
6485	TRUE	500	2,715.90	20	20	28.1	3240: 13280	TRUE
8567	TRUE	500	2,716.06	20	20	28	3240: 13280	TRUE
2644	TRUE	500	2,720.18	20	20	29	3240: 13280	TRUE
8611	TRUE	500	2,720.72	20	20	23.8	2303: 9017	TRUE
10901	TRUE	500	2,725.58	20	20	28	3240: 13280	TRUE
3013	TRUE	500	2,726.02	20	20	29	3240: 13280	TRUE
20244	TRUE	500	2,737.59	20	20	27	3240: 13280	TRUE
18025	TRUE	500	2,739.00	20	22.1	0	4158: 17890	TRUE
3290	TRUE	500	2,739.44	20	20	28.6	3240: 13280	TRUE
3962	TRUE	500	2,743.74	20	20	28.4	3240: 13280	TRUE
16680	TRUE	500	2,748.03	20	20	26.9	3240: 13280	TRUE
12936	TRUE	500	2,748.17	20	20	26.6	3240: 13280	TRUE
14351	TRUE	500	2,750.16	20	20	27.8	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12									
Existing Fire Flow Results									
Label		Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
	4453	TRUE	500	2,750.29	20	20	29.2	3240: 13280	TRUE
	11914	TRUE	500	2,752.05	20	20	27.5	3240: 13280	TRUE
	21097	TRUE	500	2,753.06	20	20	26.9	3240: 13280	TRUE
	15936	TRUE	500	2,754.86	20	20	23.9	3710: 15608	TRUE
	13352	TRUE	500	2,760.58	20	20	26.6	3240: 13280	TRUE
	14424	TRUE	500	2,761.81	20	20	26.3	3240: 13280	TRUE
	3724	TRUE	500	2,762.78	20	20	28.6	3240: 13280	TRUE
	3120	TRUE	500	2,764.55	20	20	28.6	3240: 13280	TRUE
	8785	TRUE	500	2,765.06	20	20	27.9	3240: 13280	TRUE
	11774	TRUE	500	2,771.44	20	20	24	2940: 11866	TRUE
	19181	TRUE	500	2,773.84	20	20	18.7	4701: 20480	TRUE
	2479	TRUE	500	2,774.13	20	20	17	838: 2635	TRUE
	14931	TRUE	500	2,775.49	20	20	22.1	3675: 15435	TRUE
	5267	TRUE	500	2,775.57	20	20	28.1	3240: 13280	TRUE
	19152	TRUE	500	2,777.35	20	20	26.8	3240: 13280	TRUE
	14935	TRUE	500	2,778.55	20	39.7	0	3903: 16538	TRUE
	12304	TRUE	500	2,781.96	20	20	26.5	3240: 13280	TRUE
	2791	TRUE	500	2,785.27	20	20	22.2	838: 2635	TRUE
	11792	TRUE	500	2,787.31	20	20	26.4	3240: 13280	TRUE
	19453	TRUE	500	2,788.07	20	20	26.8	3240: 13280	TRUE
	11731	TRUE	500	2,790.93	20	20	21.6	3040: 12324	TRUE
	17078	TRUE	500	2,791.20	20	20	26.7	3240: 13280	TRUE
	18905	TRUE	500	2,791.38	20	20	27.7	3240: 13280	TRUE
	20684	TRUE	500	2,795.39	20	20	26.8	3240: 13280	TRUE
	19135	TRUE	500	2,796.58	20	20	27.7	3240: 13280	TRUE
	20799	TRUE	500	2,797.07	20	20	23.2	4751: 20745	TRUE
	5232	TRUE	500	2,797.23	20	20	25.8	1302: 4543	TRUE
	1782	TRUE	500	2,798.03	20	20	26.6	697: 2093	TRUE
	7805	TRUE	500	2,804.57	20	22.7	0	2624: 10368	TRUE
	7044	TRUE	500	2,810.80	20	20	27.9	3240: 13280	TRUE
	20428	TRUE	500	2,812.42	20	20	25.3	4654: 20257	TRUE
	2392	TRUE	500	2,819.32	20	20	28.6	3240: 13280	TRUE
	4032	TRUE	500	2,820.10	20	20	19.4	1078: 3580	TRUE
	6481	TRUE	500	2,821.02	20	20	27.1	3240: 13280	TRUE
	12856	TRUE	500	2,821.34	20	20	27.6	3240: 13280	TRUE
	13033	TRUE	500	2,822.24	20	20	27.6	3240: 13280	TRUE
	1355	TRUE	500	2,823.64	20	20	12.6	477: 1261	TRUE
	12575	TRUE	500	2,824.08	20	20	17.3	3141: 12788	TRUE
	2570	TRUE	500	2,827.96	20	20	13.4	838: 2635	TRUE
	14952	TRUE	500	2,828.59	20	20	27.6	3240: 13280	TRUE
	13185	TRUE	500	2,829.15	20	20	19	3279: 13448	TRUE
	13253	TRUE	500	2,829.67	20	20	17.9	31755: J-141	TRUE
	15850	TRUE	500	2,831.17	20	20	27.6	3240: 13280	TRUE
	4508	TRUE	500	2,831.57	20	20	28.3	3240: 13280	TRUE
	12190	TRUE	500	2,833.63	20	20	27.6	3240: 13280	TRUE
	19172	TRUE	500	2,836.22	20	20	26.7	3240: 13280	TRUE
	9198	TRUE	500	2,837.81	20	20	27.7	3240: 13280	TRUE
	9132	TRUE	500	2,838.44	20	20	27.5	3240: 13280	TRUE
	4349	TRUE	500	2,840.94	20	20	28.2	3240: 13280	TRUE
	12980	TRUE	500	2,844.41	20	20	25.9	3141: 12788	TRUE
	16114	TRUE	500	2,845.27	20	20	6	3773: 15904	TRUE
	9701	TRUE	500	2,845.31	20	20	26.4	3240: 13280	TRUE
	8699	TRUE	500	2,846.35	20	20	27.6	3240: 13280	TRUE
	17294	TRUE	500	2,846.87	20	20	26.5	3240: 13280	TRUE
	3312	TRUE	500	2,850.60	20	20	28.4	3240: 13280	TRUE
	11067	TRUE	500	2,850.94	20	20	26.3	3240: 13280	TRUE
	8331	TRUE	500	2,851.75	20	20	27.7	3240: 13280	TRUE
	16061	TRUE	500	2,852.34	20	20	3.2	3821: 16105	TRUE
	12511	TRUE	500	2,858.10	20	20	27.1	3903: 16538	TRUE
	4244	TRUE	500	2,858.38	20	20	28.1	3240: 13280	TRUE
	8801	TRUE	500	2,858.70	20	20	27.7	3240: 13280	TRUE
	14740	TRUE	500	2,861.25	20	20	6.5	3903: 16538	TRUE
	13441	TRUE	500	2,866.02	20	20	26.3	3240: 13280	TRUE
	8971	TRUE	500	2,869.05	20	20	27.6	3240: 13280	TRUE
	6474	TRUE	500	2,871.61	20	20	27.8	3240: 13280	TRUE
	2971	TRUE	500	2,875.23	20	20	26.1	697: 2093	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
4287	TRUE	500	2,875.63	20	20	28.9	3240: 13280	TRUE
18724	TRUE	500	2,881.64	20	20	19.3	4158: 17890	TRUE
20621	TRUE	500	2,888.54	20	20	26.5	3240: 13280	TRUE
18874	TRUE	500	2,889.71	20	20	16.7	4429: 19232	TRUE
7497	TRUE	500	2,890.20	20	20	25.4	2040: 7895	TRUE
14120	TRUE	500	2,891.86	20	20	25.9	3240: 13280	TRUE
8469	TRUE	500	2,898.50	20	20	27.5	3240: 13280	TRUE
9196	TRUE	500	2,899.28	20	20	26.2	3240: 13280	TRUE
15668	TRUE	500	2,902.69	20	20	27.1	3903: 16538	TRUE
8970	TRUE	500	2,902.89	20	20	27.5	3240: 13280	TRUE
16716	TRUE	500	2,904.98	20	20	26.3	3240: 13280	TRUE
3058	TRUE	500	2,910.61	20	20	28.6	3240: 13280	TRUE
1673	TRUE	500	2,912.87	20	20	28.6	3240: 13280	TRUE
2434	TRUE	500	2,914.40	20	20	18.8	697: 2093	TRUE
19254	TRUE	500	2,917.33	20	20	26.4	3240: 13280	TRUE
3298	TRUE	500	2,919.00	20	20	28.3	3240: 13280	TRUE
13728	TRUE	500	2,919.65	20	20	18.8	3368: 13968	TRUE
18421	TRUE	500	2,921.96	20	20	26.3	3240: 13280	TRUE
2712	TRUE	500	2,922.41	20	20	28.6	3240: 13280	TRUE
14016	TRUE	500	2,924.05	20	20	26.9	3368: 13968	TRUE
3041	TRUE	500	2,928.96	20	20	28.5	3240: 13280	TRUE
11515	TRUE	500	2,930.42	20	20	25.9	3240: 13280	TRUE
20643	TRUE	500	2,930.58	20	20	26.3	3240: 13280	TRUE
14143	TRUE	500	2,931.95	20	20	27.2	3903: 16538	TRUE
13484	TRUE	500	2,932.94	20	20	27.3	3240: 13280	TRUE
21123	TRUE	500	2,933.09	20	20	26.3	3240: 13280	TRUE
8467	TRUE	500	2,938.34	20	20	27.5	3240: 13280	TRUE
21161	TRUE	500	2,940.90	20	20	11.6	4855: 21277	TRUE
19489	TRUE	500	2,941.03	20	20	26.3	3240: 13280	TRUE
20142	TRUE	500	2,945.33	20	20	26.3	3240: 13280	TRUE
2042	TRUE	500	2,948.94	20	20	0.6	750: 2287	TRUE
18511	TRUE	500	2,950.01	20	20	26.1	3903: 16538	TRUE
7108	TRUE	500	2,952.28	20	20	27.5	3240: 13280	TRUE
10436	TRUE	500	2,954.97	20	20	14.3	2722: 10829	TRUE
8195	TRUE	500	2,957.12	20	20	27.4	3240: 13280	TRUE
14680	TRUE	500	2,962.00	20	20	25.8	3600: 15103	TRUE
3537	TRUE	500	2,962.08	20	20	19.3	1062: 3510	TRUE
3971	TRUE	500	2,962.26	20	20	28	3240: 13280	TRUE
20078	TRUE	500	2,965.05	20	20	26.2	3240: 13280	TRUE
11226	TRUE	500	2,965.29	20	20	25.8	3240: 13280	TRUE
3830	TRUE	500	2,967.25	20	20	28.7	3240: 13280	TRUE
4831	TRUE	500	2,967.97	20	20	25.9	1302: 4543	TRUE
3812	TRUE	500	2,968.46	20	20	28.1	3240: 13280	TRUE
12833	TRUE	500	2,971.27	20	20	26.9	3240: 13280	TRUE
17799	TRUE	500	2,972.69	20	20	25.9	3903: 16538	TRUE
20375	TRUE	500	2,974.41	20	20	26.2	3240: 13280	TRUE
4628	TRUE	500	2,976.93	20	20	26.7	1405: 4989	TRUE
2686	TRUE	500	2,977.09	20	20	18.2	919: 2923	TRUE
8819	TRUE	500	2,977.22	20	20	22.1	2325: 9110	TRUE
16710	TRUE	500	2,978.97	20	20	26.1	3240: 13280	TRUE
2721	TRUE	500	2,979.72	20	20	15.9	919: 2923	TRUE
15469	TRUE	500	2,980.31	20	20	26.5	3240: 13280	TRUE
11233	TRUE	500	2,981.63	20	20	27.2	3240: 13280	TRUE
12010	TRUE	500	2,985.26	20	20	27.1	3240: 13280	TRUE
9551	TRUE	500	2,986.65	20	20	25.8	2722: 10829	TRUE
3496	TRUE	500	2,986.79	20	20	28.4	3240: 13280	TRUE
20768	TRUE	500	2,987.56	20	20	26.1	3240: 13280	TRUE
3965	TRUE	500	2,989.47	20	20	28.1	3240: 13280	TRUE
3427	TRUE	500	2,990.67	20	20	28.4	3240: 13280	TRUE
2803	TRUE	500	2,992.28	20	20	28.4	3240: 13280	TRUE
9010	TRUE	500	2,992.29	20	20	27.2	3240: 13280	TRUE
9872	TRUE	500	2,992.74	20	20	27.3	3240: 13280	TRUE
19567	TRUE	500	2,992.91	20	20	26.2	3240: 13280	TRUE
15951	TRUE	500	2,996.17	20	20	26.1	3240: 13280	TRUE
6701	TRUE	500	2,998.97	20	20	27.4	3240: 13280	TRUE
19068	TRUE	500	2,999.19	20	20	26.1	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
21051	TRUE	500	3,000.05	20	20	12.9	4855: 21277	TRUE
8890	TRUE	500	3,000.95	20	20	27.2	3240: 13280	TRUE
2887	TRUE	500	3,005.07	20	20	16.8	919: 2923	TRUE
14984	TRUE	500	3,007.93	20	20	23.2	23299: J-52	TRUE
8802	TRUE	500	3,008.07	20	20	27.2	3240: 13280	TRUE
16740	TRUE	500	3,009.20	20	20	26.4	3240: 13280	TRUE
3154	TRUE	500	3,009.63	20	20	28.4	3240: 13280	TRUE
6872	TRUE	500	3,010.22	20	20	27.4	3240: 13280	TRUE
2321	TRUE	500	3,013.59	20	20	20.9	697: 2093	TRUE
3498	TRUE	500	3,013.61	20	20	28.4	3240: 13280	TRUE
11137	TRUE	500	3,015.17	20	20	24.9	2722: 10829	TRUE
9479	TRUE	500	3,017.57	20	20	27	3240: 13280	TRUE
18684	TRUE	500	3,019.00	20	20	25	3903: 16538	TRUE
12124	TRUE	500	3,021.23	20	20	25.7	3240: 13280	TRUE
16200	TRUE	500	3,023.08	20	20	26.6	3240: 13280	TRUE
8502	TRUE	500	3,025.53	20	20	27.2	3240: 13280	TRUE
20105	TRUE	500	3,026.10	20	20	26	3240: 13280	TRUE
5193	TRUE	500	3,026.44	20	20	22.1	1302: 4543	TRUE
18848	TRUE	500	3,027.65	20	20	26	3240: 13280	TRUE
9355	TRUE	500	3,030.57	20	20	25	2722: 10829	TRUE
3022	TRUE	500	3,037.73	20	20	28	3240: 13280	TRUE
9330	TRUE	500	3,038.59	20	20	27.1	3240: 13280	TRUE
6800	TRUE	500	3,040.21	20	20	20.3	1866: 7050	TRUE
1646	TRUE	500	3,043.06	20	20	26.9	697: 2093	TRUE
19496	TRUE	500	3,044.39	20	20	26	3240: 13280	TRUE
1551	TRUE	500	3,044.85	20	20	28.3	3240: 13280	TRUE
20564	TRUE	500	3,045.31	20	20	26	3240: 13280	TRUE
4140	TRUE	500	3,052.44	20	20	28.5	3240: 13280	TRUE
11582	TRUE	500	3,058.41	20	20	25.6	3240: 13280	TRUE
5670	TRUE	500	3,061.15	20	20	24.2	1511: 5485	TRUE
8842	TRUE	500	3,061.45	20	20	27.1	3240: 13280	TRUE
7369	TRUE	500	3,067.82	20	20	25.9	3240: 13280	TRUE
14192	TRUE	500	3,070.07	20	20	25.3	3240: 13280	TRUE
15250	TRUE	500	3,070.20	20	20	25.3	3240: 13280	TRUE
9257	TRUE	500	3,070.22	20	20	26.9	3240: 13280	TRUE
20279	TRUE	500	3,072.09	20	20	25.9	3240: 13280	TRUE
12356	TRUE	500	3,073.03	20	20	25.6	3240: 13280	TRUE
9075	TRUE	500	3,077.21	20	20	27	3240: 13280	TRUE
6287	TRUE	500	3,081.17	20	20	27.3	3240: 13280	TRUE
1739	TRUE	500	3,086.40	20	20	12	697: 2093	TRUE
2363	TRUE	500	3,088.15	20	20	26.1	838: 2635	TRUE
19935	TRUE	500	3,092.78	20	20	18.1	4478: 19448	TRUE
13811	TRUE	500	3,093.34	20	20	24.4	3903: 16538	TRUE
10170	TRUE	500	3,097.54	20	20	23.3	2722: 10829	TRUE
8686	TRUE	500	3,099.44	20	20	27	3240: 13280	TRUE
15193	TRUE	500	3,101.80	20	20	22.1	3903: 16538	TRUE
14717	TRUE	500	3,106.70	20	20	22.9	3675: 15435	TRUE
3553	TRUE	500	3,112.34	20	20	18.6	1013: 3317	TRUE
7322	TRUE	500	3,114.50	20	20	27.1	3240: 13280	TRUE
19783	TRUE	500	3,115.10	20	20	25.7	3240: 13280	TRUE
4103	TRUE	500	3,115.21	20	20	27.5	3240: 13280	TRUE
15997	TRUE	500	3,116.50	20	20	7	3773: 15904	TRUE
9554	TRUE	500	3,117.65	20	20	19.3	2325: 9110	TRUE
17417	TRUE	500	3,122.27	20	20	25.6	3240: 13280	TRUE
12177	TRUE	500	3,127.09	20	20	14.1	3041: 12331	TRUE
3159	TRUE	500	3,128.92	20	20	28.2	3240: 13280	TRUE
17592	TRUE	500	3,130.94	20	20	25.7	3240: 13280	TRUE
14447	TRUE	500	3,132.22	20	20	26.3	3240: 13280	TRUE
5519	TRUE	500	3,135.30	20	20	27.2	3240: 13280	TRUE
15780	TRUE	500	3,135.74	20	20	25.3	3240: 13280	TRUE
2232	TRUE	500	3,137.80	20	20	10.2	697: 2093	TRUE
20458	TRUE	500	3,139.96	20	20	25.7	3240: 13280	TRUE
12459	TRUE	500	3,141.36	20	20	21.9	3903: 16538	TRUE
8487	TRUE	500	3,143.95	20	20	21.4	2325: 9110	TRUE
12719	TRUE	500	3,148.46	20	20	24.4	3903: 16538	TRUE
16920	TRUE	500	3,151.03	20	20	22.8	3903: 16538	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12									
Existing Fire Flow Results									
Label		Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
	14957	TRUE	500	3,153.43	20	20	26.2	3240: 13280	TRUE
	10543	TRUE	500	3,153.64	20	20	22.2	2722: 10829	TRUE
	13618	TRUE	500	3,153.93	20	20	25.1	3240: 13280	TRUE
	19665	TRUE	500	3,156.02	20	20	25.6	3240: 13280	TRUE
	3145	TRUE	500	3,158.31	20	20	25.8	838: 2635	TRUE
	6805	TRUE	500	3,160.67	20	20	27	3240: 13280	TRUE
	4494	TRUE	500	3,163.11	20	20	28	3240: 13280	TRUE
	8281	TRUE	500	3,163.26	20	20	16.7	2005: 7718	TRUE
	6751	TRUE	500	3,164.32	20	20	27	3240: 13280	TRUE
	1571	TRUE	500	3,166.52	20	20	28	3240: 13280	TRUE
	18129	TRUE	500	3,167.81	20	20	22.6	23299: J-52	TRUE
	10437	TRUE	500	3,170.94	20	20	26.6	3240: 13280	TRUE
	3422	TRUE	500	3,172.32	20	20	27.6	3240: 13280	TRUE
	16724	TRUE	500	3,173.77	20	20	25.4	3240: 13280	TRUE
	11224	TRUE	500	3,174.44	20	20	26.8	3240: 13280	TRUE
	14611	TRUE	500	3,174.91	20	20	24.8	3240: 13280	TRUE
	19879	TRUE	500	3,176.13	20	20	25.6	3240: 13280	TRUE
	9670	TRUE	500	3,184.66	20	20	22.7	2722: 10829	TRUE
	18867	TRUE	500	3,186.82	20	20	25.5	3240: 13280	TRUE
	18333	TRUE	500	3,187.44	20	20	25.6	3240: 13280	TRUE
	15906	TRUE	500	3,188.23	20	20	3.1	3821: 16105	TRUE
	4066	TRUE	500	3,199.68	20	20	27.6	3240: 13280	TRUE
	3043	TRUE	500	3,203.13	20	20	28	3240: 13280	TRUE
	4056	TRUE	500	3,203.28	20	20	27.6	3240: 13280	TRUE
	16978	TRUE	500	3,203.72	20	20	25.4	3240: 13280	TRUE
	13095	TRUE	500	3,203.95	20	20	25	3240: 13280	TRUE
	19733	TRUE	500	3,204.59	20	20	25.5	3240: 13280	TRUE
	19512	TRUE	500	3,206.73	20	20	25.4	3240: 13280	TRUE
	15220	TRUE	500	3,206.99	20	20	21	3903: 16538	TRUE
	14000	TRUE	500	3,209.72	20	20	24.6	3240: 13280	TRUE
	2346	TRUE	500	3,209.74	20	20	18.4	722: 2178	TRUE
	16430	TRUE	500	3,211.22	20	20	21.9	3903: 16538	TRUE
	8889	TRUE	500	3,213.06	20	20	26.7	3240: 13280	TRUE
	14517	TRUE	500	3,213.56	20	20	22.4	3903: 16538	TRUE
	13780	TRUE	500	3,217.75	20	20	26.7	3240: 13280	TRUE
	9567	TRUE	500	3,218.40	20	20	26.5	3240: 13280	TRUE
	18655	TRUE	500	3,219.91	20	20	25.4	3240: 13280	TRUE
	7048	TRUE	500	3,220.54	20	20	25.5	3240: 13280	TRUE
	11620	TRUE	500	3,227.12	20	20	12.8	2873: 11535	TRUE
	18470	TRUE	500	3,227.98	20	20	25.4	3240: 13280	TRUE
	2667	TRUE	500	3,228.80	20	20	27.8	3240: 13280	TRUE
	8326	TRUE	500	3,230.25	20	20	23	2185: 8437	TRUE
	17880	TRUE	500	3,232.74	20	20	21.4	3903: 16538	TRUE
	7299	TRUE	500	3,233.31	20	20	25.4	3240: 13280	TRUE
	1913	TRUE	500	3,233.56	20	20	20.2	697: 2093	TRUE
	15809	TRUE	500	3,234.08	20	20	20.2	3903: 16538	TRUE
	13078	TRUE	500	3,236.06	20	20	24.9	3240: 13280	TRUE
	13714	TRUE	500	3,237.36	20	20	24.8	3240: 13280	TRUE
	13584	TRUE	500	3,239.10	20	34.5	0	31755: J-141	TRUE
	17040	TRUE	500	3,240.15	20	24.7	0	4194: 18098	TRUE
	12174	TRUE	500	3,241.75	20	20	22.1	2950: 11911	TRUE
	18616	TRUE	500	3,241.87	20	20	11.5	4158: 17890	TRUE
	11745	TRUE	500	3,241.92	20	20	25	3240: 13280	TRUE
	15233	TRUE	500	3,245.45	20	20	21.9	3903: 16538	TRUE
	6486	TRUE	500	3,250.87	20	20	26.7	3240: 13280	TRUE
	18034	TRUE	500	3,252.15	20	20	21.7	3903: 16538	TRUE
	11824	TRUE	500	3,252.70	20	20	24.9	3240: 13280	TRUE
	18726	TRUE	500	3,252.74	20	20	33.9	3240: 13280	TRUE
	5293	TRUE	500	3,253.92	20	20	26.8	3240: 13280	TRUE
	10835	TRUE	500	3,255.88	20	20	26.6	3240: 13280	TRUE
	8773	TRUE	500	3,257.75	20	20	16.2	2325: 9110	TRUE
	15512	TRUE	500	3,259.68	20	20	25.9	3240: 13280	TRUE
	18314	TRUE	500	3,260.19	20	20	21.2	23299: J-52	TRUE
	11227	TRUE	500	3,260.27	20	20	26.6	3240: 13280	TRUE
	1955	TRUE	500	3,261.55	20	24.2	0	697: 2093	TRUE
	2100	TRUE	500	3,265.18	20	20	3.1	697: 2093	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12									
Existing Fire Flow Results									
Label		Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
	10757	TRUE	500	3,265.97	20	20	23.7	3903: 16538	TRUE
	8234	TRUE	500	3,267.62	20	20	14.2	2005: 7718	TRUE
	18420	TRUE	500	3,271.90	20	20	25.2	3240: 13280	TRUE
	12664	TRUE	500	3,272.43	20	20	24.9	3240: 13280	TRUE
	12163	TRUE	500	3,273.58	20	21.8	0	31622: J-140	TRUE
	14408	TRUE	500	3,274.83	20	20	25.9	3240: 13280	TRUE
	16737	TRUE	500	3,275.28	20	20	6.6	4194: 18098	TRUE
	6786	TRUE	500	3,276.00	20	20	26.7	3240: 13280	TRUE
	12668	TRUE	500	3,277.78	20	20	24.9	3240: 13280	TRUE
	14979	TRUE	500	3,277.79	20	20	25.4	3240: 13280	TRUE
	13285	TRUE	500	3,278.52	20	20	21.6	23299: J-52	TRUE
	13545	TRUE	500	3,279.49	20	20	19.9	3903: 16538	TRUE
	13667	TRUE	500	3,280.81	20	20	19.8	23299: J-52	TRUE
	4687	TRUE	500	3,282.97	20	20	28	3240: 13280	TRUE
	6330	TRUE	500	3,285.02	20	20	26.8	3240: 13280	TRUE
	11816	TRUE	500	3,285.63	20	20	24.9	3240: 13280	TRUE
	16880	TRUE	500	3,286.42	20	20	25.5	3240: 13280	TRUE
	14060	TRUE	500	3,286.94	20	20	19.6	3903: 16538	TRUE
	18790	TRUE	500	3,287.78	20	20	20.5	3903: 16538	TRUE
	4437	TRUE	500	3,291.88	20	20	27.2	3240: 13280	TRUE
	6640	TRUE	500	3,299.75	20	20	26.7	3240: 13280	TRUE
	9049	TRUE	500	3,300.34	20	20	8.1	2381: 9329	TRUE
	4016	TRUE	500	3,300.46	20	20	27.3	3240: 13280	TRUE
	10989	TRUE	500	3,300.56	20	20	19.8	2722: 10829	TRUE
	11660	TRUE	500	3,303.99	20	20	23.4	2722: 10829	TRUE
	11295	TRUE	500	3,305.05	20	20	21.5	2722: 10829	TRUE
	18651	TRUE	500	3,306.01	20	20	27.7	4323: 18726	TRUE
	13340	TRUE	500	3,309.85	20	20	25.7	3240: 13280	TRUE
	8407	TRUE	500	3,310.21	20	20	26.5	3240: 13280	TRUE
	8484	TRUE	500	3,314.05	20	20	10.9	2194: 8546	TRUE
	9003	TRUE	500	3,316.23	20	20	4.3	2325: 9110	TRUE
	2695	TRUE	500	3,317.51	20	20	27.7	3240: 13280	TRUE
	10606	TRUE	500	3,318.98	20	20.4	0	2678: 10618	TRUE
	6164	TRUE	500	3,320.96	20	20	26.7	3240: 13280	TRUE
	17263	TRUE	500	3,323.35	20	20	3.4	4194: 18098	TRUE
	7906	TRUE	500	3,330.43	20	20	26.5	3240: 13280	TRUE
	13766	TRUE	500	3,332.10	20	20	18.9	3903: 16538	TRUE
	15991	TRUE	500	3,335.73	20	20	25.1	3240: 13280	TRUE
	10824	TRUE	500	3,342.32	20	20	26.1	3240: 13280	TRUE
	10630	TRUE	500	3,343.23	20	20	22.6	3903: 16538	TRUE
	8884	TRUE	500	3,348.85	20	20	7.3	2194: 8546	TRUE
	16019	TRUE	500	3,350.81	20	20	19.8	23299: J-52	TRUE
	16386	TRUE	500	3,351.65	20	20	24.9	3240: 13280	TRUE
	17629	TRUE	500	3,353.90	20	20	14.3	4194: 18098	TRUE
	16431	TRUE	500	3,355.02	20	20	11.5	4194: 18098	TRUE
	1869	TRUE	500	3,355.73	20	20	18.5	697: 2093	TRUE
	8735	TRUE	500	3,357.02	20	20	2	2194: 8546	TRUE
	12314	TRUE	500	3,357.65	20	20	5.5	31622: J-140	TRUE
	19972	TRUE	500	3,358.57	20	20	24.9	3240: 13280	TRUE
	8744	TRUE	500	3,359.78	20	20	21.8	2722: 10829	TRUE
	12585	TRUE	500	3,362.67	20	20	23.7	3127: 12737	TRUE
	1669	TRUE	500	3,367.45	20	20	14.2	697: 2093	TRUE
	15912	TRUE	500	3,367.95	20	20	19.6	3903: 16538	TRUE
	9020	TRUE	500	3,368.12	20	20	26.4	3240: 13280	TRUE
	13192	TRUE	500	3,368.34	20	26.9	0	31755: J-141	TRUE
	12948	TRUE	500	3,370.76	20	20	25.7	3240: 13280	TRUE
	12591	TRUE	500	3,377.22	20	20	8.3	31622: J-140	TRUE
	11987	TRUE	500	3,378.80	20	20	11.3	2940: 11866	TRUE
	17045	TRUE	500	3,382.21	20	20	24.7	3240: 13280	TRUE
	8952	TRUE	500	3,382.87	20	20	23.5	3903: 16538	TRUE
	11645	TRUE	500	3,384.21	20	20	10	2940: 11866	TRUE
	17084	TRUE	500	3,390.32	20	20	18.9	23299: J-52	TRUE
	15716	TRUE	500	3,392.61	20	20	24.7	3240: 13280	TRUE
	14210	TRUE	500	3,393.72	20	20	17.7	3903: 16538	TRUE
	14533	TRUE	500	3,396.24	20	20	24.3	3240: 13280	TRUE
	18688	TRUE	500	3,398.79	20	20	24.8	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
2682	TRUE	500	3,407.42	20	20	22.9	838: 2635	TRUE
18974	TRUE	500	3,408.80	20	20	24.8	3240: 13280	TRUE
1674	TRUE	500	3,411.68	20	20	11.7	697: 2093	TRUE
14894	TRUE	500	3,413.21	20	20	25.4	3240: 13280	TRUE
9941	TRUE	500	3,416.45	20	20	7.2	2325: 9110	TRUE
11710	TRUE	500	3,417.94	20	20	24.1	3240: 13280	TRUE
17581	TRUE	500	3,421.42	20	20	18.4	3903: 16538	TRUE
16977	TRUE	500	3,424.09	20	20	18.3	3903: 16538	TRUE
13669	TRUE	500	3,425.90	20	20	23.8	3240: 13280	TRUE
5851	TRUE	500	3,429.95	20	20	26.4	3240: 13280	TRUE
19438	TRUE	500	3,432.43	20	20	24.7	3240: 13280	TRUE
16766	TRUE	500	3,433.08	20	20	24.9	3240: 13280	TRUE
3352	TRUE	500	3,442.36	20	20	27	3240: 13280	TRUE
7209	TRUE	500	3,444.28	20	20	26.2	3240: 13280	TRUE
8545	TRUE	500	3,445.32	20	20	26.2	3240: 13280	TRUE
14792	TRUE	500	3,445.92	20	20	24.9	3240: 13280	TRUE
11112	TRUE	500	3,450.17	20	20	21.7	2722: 10829	TRUE
1724	TRUE	500	3,451.73	20	20	8.5	697: 2093	TRUE
13831	TRUE	500	3,452.49	20	20	17.2	3903: 16538	TRUE
11615	TRUE	500	3,453.62	20	20	26.3	3240: 13280	TRUE
10653	TRUE	500	3,454.08	20	20	17.4	2722: 10829	TRUE
18696	TRUE	500	3,456.40	20	20	24.6	3240: 13280	TRUE
12167	TRUE	500	3,459.48	20	20	24.1	3240: 13280	TRUE
10766	TRUE	500	3,460.66	20	20	26.3	3240: 13280	TRUE
15404	TRUE	500	3,461.80	20	20	24.6	3240: 13280	TRUE
13828	TRUE	500	3,464.62	20	20	25.6	3362: 13936	TRUE
19270	TRUE	500	3,465.12	20	20	24.6	3240: 13280	TRUE
13332	TRUE	500	3,465.40	20	20	17.2	3903: 16538	TRUE
4650	TRUE	500	3,466.50	20	20	27.1	3240: 13280	TRUE
2602	TRUE	500	3,466.94	20	20	17.9	838: 2635	TRUE
13178	TRUE	500	3,468.79	20	20	24.3	3240: 13280	TRUE
15238	TRUE	500	3,468.84	20	20	24.8	3240: 13280	TRUE
16074	TRUE	500	3,470.60	20	20	14.3	4194: 18098	TRUE
16588	TRUE	500	3,475.20	20	20	24.4	3240: 13280	TRUE
12912	TRUE	500	3,475.31	20	20	1.3	31755: J-141	TRUE
3402	TRUE	500	3,475.91	20	20	26.9	3240: 13280	TRUE
17044	TRUE	500	3,477.18	20	20	17.5	3903: 16538	TRUE
7457	TRUE	500	3,479.60	20	20	26.1	3240: 13280	TRUE
3340	TRUE	500	3,481.69	20	20	26.9	3240: 13280	TRUE
3789	TRUE	500	3,482.02	20	20	26.9	3240: 13280	TRUE
14036	TRUE	500	3,484.80	20	31.4	0	31755: J-141	TRUE
2675	TRUE	500	3,486.44	20	20	14.6	838: 2635	TRUE
12398	TRUE	500	3,486.79	20	20	24	3240: 13280	TRUE
18728	TRUE	500	3,490.00	20	20	15.6	4429: 19232	TRUE
7512	TRUE	500	3,494.33	20	20	26.1	3240: 13280	TRUE
17942	TRUE	500	3,495.42	20	20	17.4	3903: 16538	TRUE
12872	TRUE	500	3,498.32	20	20	23.1	3185: 13010	TRUE
20541	TRUE	500	3,500.00	20	35.7	24.4	3240: 13280	TRUE
20305	TRUE	500	3,500.00	20	28.1	24.4	3240: 13280	TRUE
20209	TRUE	500	3,500.00	20	41.4	24.4	3240: 13280	TRUE
19969	TRUE	500	3,500.00	20	33.5	24.4	3240: 13280	TRUE
19962	TRUE	500	3,500.00	20	40.4	24.4	3240: 13280	TRUE
19886	TRUE	500	3,500.00	20	22.4	24.5	3240: 13280	TRUE
19880	TRUE	500	3,500.00	20	33.9	24.5	3240: 13280	TRUE
19837	TRUE	500	3,500.00	20	39.3	24.5	3240: 13280	TRUE
19812	TRUE	500	3,500.00	20	23.2	24.5	3240: 13280	TRUE
19808	TRUE	500	3,500.00	20	41	24.5	3240: 13280	TRUE
19781	TRUE	500	3,500.00	20	45.9	24.5	3240: 13280	TRUE
19775	TRUE	500	3,500.00	20	26.4	24.4	3240: 13280	TRUE
19732	TRUE	500	3,500.00	20	49.7	24.5	3240: 13280	TRUE
19706	TRUE	500	3,500.00	20	34.7	24.4	3240: 13280	TRUE
19627	TRUE	500	3,500.00	20	52.5	24.5	3240: 13280	TRUE
19594	TRUE	500	3,500.00	20	46.2	24.4	3240: 13280	TRUE
19555	TRUE	500	3,500.00	20	59.1	24.4	3240: 13280	TRUE
19490	TRUE	500	3,500.00	20	37.4	24.4	3240: 13280	TRUE
19477	TRUE	500	3,500.00	20	50.1	24.4	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12									
Existing Fire Flow Results									
Label		Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
	19417	TRUE	500	3,500.00	20	57.8	24.4	3240: 13280	TRUE
	19380	TRUE	500	3,500.00	20	62.5	24.4	3240: 13280	TRUE
	19352	TRUE	500	3,500.00	20	47.7	24.5	3240: 13280	TRUE
	19294	TRUE	500	3,500.00	20	69	24.4	3240: 13280	TRUE
	19211	TRUE	500	3,500.00	20	62.8	24.4	3240: 13280	TRUE
	19170	TRUE	500	3,500.00	20	57.2	24.4	3240: 13280	TRUE
	19169	TRUE	500	3,500.00	20	28.7	24.5	3240: 13280	TRUE
	19128	TRUE	500	3,500.00	20	37.7	24.4	3240: 13280	TRUE
	19094	TRUE	500	3,500.00	20	69.7	24.4	3240: 13280	TRUE
	19046	TRUE	500	3,500.00	20	64.7	24.4	3240: 13280	TRUE
	19035	TRUE	500	3,500.00	20	53.7	24.4	3240: 13280	TRUE
	18984	TRUE	500	3,500.00	20	63.6	24.4	3240: 13280	TRUE
	18929	TRUE	500	3,500.00	20	69.3	24.4	3240: 13280	TRUE
	18887	TRUE	500	3,500.00	20	51.1	24.4	3240: 13280	TRUE
	18821	TRUE	500	3,500.00	20	66.8	24.4	3240: 13280	TRUE
	18794	TRUE	500	3,500.00	20	32	24.4	3240: 13280	TRUE
	18761	TRUE	500	3,500.00	20	22.8	24.4	3240: 13280	TRUE
	18743	TRUE	500	3,500.00	20	24.7	24.5	3240: 13280	TRUE
	18737	TRUE	500	3,500.00	20	60.5	24.4	3240: 13280	TRUE
	18718	TRUE	500	3,500.00	20	59.2	24.4	3240: 13280	TRUE
	18700	TRUE	500	3,500.00	20	35.4	24.4	3240: 13280	TRUE
	18575	TRUE	500	3,500.00	20	55.4	24.4	3240: 13280	TRUE
	18539	TRUE	500	3,500.00	20	54.5	24.4	3240: 13280	TRUE
	18412	TRUE	500	3,500.00	20	38.9	24.4	3240: 13280	TRUE
	18370	TRUE	500	3,500.00	20	67.4	24.4	3240: 13280	TRUE
	18233	TRUE	500	3,500.00	20	55.2	24.4	3240: 13280	TRUE
	18192	TRUE	500	3,500.00	20	23	17.3	3903: 16538	TRUE
	18163	TRUE	500	3,500.00	20	55.2	24.4	3240: 13280	TRUE
	18111	TRUE	500	3,500.00	20	73.9	24.4	3240: 13280	TRUE
	18096	TRUE	500	3,500.00	20	41.3	24.4	3240: 13280	TRUE
	17975	TRUE	500	3,500.00	20	20.5	24.5	3240: 13280	TRUE
	17963	TRUE	500	3,500.00	20	51.6	24.4	3240: 13280	TRUE
	17922	TRUE	500	3,500.00	20	21.4	18.3	3903: 16538	TRUE
	17887	TRUE	500	3,500.00	20	69.2	24.4	3240: 13280	TRUE
	17800	TRUE	500	3,500.00	20	67.4	24.4	3240: 13280	TRUE
	17796	TRUE	500	3,500.00	20	30.8	17.3	3903: 16538	TRUE
	17766	TRUE	500	3,500.00	20	73.2	24.4	3240: 13280	TRUE
	17572	TRUE	500	3,500.00	20	42.1	24.5	3240: 13280	TRUE
	17443	TRUE	500	3,500.00	20	34	17.3	3903: 16538	TRUE
	17437	TRUE	500	3,500.00	20	24.5	17.3	23299: J-52	TRUE
	17420	TRUE	500	3,500.00	20	75.5	24.4	3240: 13280	TRUE
	17400	TRUE	500	3,500.00	20	21.8	17.4	3903: 16538	TRUE
	17318	TRUE	500	3,500.00	20	63	24.4	3240: 13280	TRUE
	17250	TRUE	500	3,500.00	20	24.1	17.3	3903: 16538	TRUE
	17226	TRUE	500	3,500.00	20	64.7	24.4	3240: 13280	TRUE
	17214	TRUE	500	3,500.00	20	36.1	17.3	3903: 16538	TRUE
	17212	TRUE	500	3,500.00	20	24.7	17.3	23299: J-52	TRUE
	17184	TRUE	500	3,500.00	20	48.1	24.5	3240: 13280	TRUE
	17164	TRUE	500	3,500.00	20	24.6	17.3	3903: 16538	TRUE
	17117	TRUE	500	3,500.00	20	33.2	24.3	3240: 13280	TRUE
	17109	TRUE	500	3,500.00	20	71.7	24.5	3240: 13280	TRUE
	17105	TRUE	500	3,500.00	20	32.7	17.3	3903: 16538	TRUE
	17081	TRUE	500	3,500.00	20	34.4	17.3	3903: 16538	TRUE
	17072	TRUE	500	3,500.00	20	68.9	24.3	3240: 13280	TRUE
	17026	TRUE	500	3,500.00	20	48.1	24.3	3240: 13280	TRUE
	16952	TRUE	500	3,500.00	20	61.3	24.3	3240: 13280	TRUE
	16913	TRUE	500	3,500.00	20	34.4	17.3	3903: 16538	TRUE
	16886	TRUE	500	3,500.00	20	49.9	24.3	3240: 13280	TRUE
	16869	TRUE	500	3,500.00	20	47.8	24.6	3240: 13280	TRUE
	16848	TRUE	500	3,500.00	20	69.8	24.4	3240: 13280	TRUE
	16733	TRUE	500	3,500.00	20	38.7	17.2	3903: 16538	TRUE
	16627	TRUE	500	3,500.00	20	52.5	24.3	3240: 13280	TRUE
	16611	TRUE	500	3,500.00	20	36.4	24.3	3240: 13280	TRUE
	16607	TRUE	500	3,500.00	20	58.8	24.4	3240: 13280	TRUE
	16526	TRUE	500	3,500.00	20	41.6	24.3	3240: 13280	TRUE
	16508	TRUE	500	3,500.00	20	79.4	24.3	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12 Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
16471	TRUE	500	3,500.00	20	84.6	24.3	3240: 13280	TRUE
16417	TRUE	500	3,500.00	20	82.8	24.3	3240: 13280	TRUE
16409	TRUE	500	3,500.00	20	51.7	24.8	3240: 13280	TRUE
16360	TRUE	500	3,500.00	20	76.7	24.4	3240: 13280	TRUE
16359	TRUE	500	3,500.00	20	56.1	24.3	3240: 13280	TRUE
16309	TRUE	500	3,500.00	20	40.3	24.3	3240: 13280	TRUE
16294	TRUE	500	3,500.00	20	64.2	24.3	3240: 13280	TRUE
16247	TRUE	500	3,500.00	20	60.3	24.3	3240: 13280	TRUE
16230	TRUE	500	3,500.00	20	51.4	17	3903: 16538	TRUE
16228	TRUE	500	3,500.00	20	62.6	24.3	3240: 13280	TRUE
16168	TRUE	500	3,500.00	20	75.8	24.3	3240: 13280	TRUE
16167	TRUE	500	3,500.00	20	40.3	24.9	3240: 13280	TRUE
16154	TRUE	500	3,500.00	20	57	24.3	3240: 13280	TRUE
16142	TRUE	500	3,500.00	20	42.4	24.3	3240: 13280	TRUE
16066	TRUE	500	3,500.00	20	45	16.9	3903: 16538	TRUE
16045	TRUE	500	3,500.00	20	63.9	24.2	3240: 13280	TRUE
15967	TRUE	500	3,500.00	20	38.4	17.4	23299: J-52	TRUE
15962	TRUE	500	3,500.00	20	59.9	24.3	3240: 13280	TRUE
15955	TRUE	500	3,500.00	20	66.6	24.1	3240: 13280	TRUE
15921	TRUE	500	3,500.00	20	35.7	25.2	3240: 13280	TRUE
15919	TRUE	500	3,500.00	20	68.6	24.3	3240: 13280	TRUE
15908	TRUE	500	3,500.00	20	46.5	16.8	3903: 16538	TRUE
15897	TRUE	500	3,500.00	20	47.2	24.2	3240: 13280	TRUE
15852	TRUE	500	3,500.00	20	25.4	16.2	23299: J-52	TRUE
15849	TRUE	500	3,500.00	20	35.7	24	3240: 13280	TRUE
15814	TRUE	500	3,500.00	20	60.4	24.6	3240: 13280	TRUE
15788	TRUE	500	3,500.00	20	35.2	17.6	3903: 16538	TRUE
15785	TRUE	500	3,500.00	20	24.7	18	3903: 16538	TRUE
15781	TRUE	500	3,500.00	20	45.9	16.7	23299: J-52	TRUE
15691	TRUE	500	3,500.00	20	61.3	16.6	23299: J-52	TRUE
15681	TRUE	500	3,500.00	20	65.9	24.3	3240: 13280	TRUE
15673	TRUE	500	3,500.00	20	87.6	24.6	3240: 13280	TRUE
15667	TRUE	500	3,500.00	20	91.9	24.6	3240: 13280	TRUE
15661	TRUE	500	3,500.00	20	31.7	25.2	3240: 13280	TRUE
15659	TRUE	500	3,500.00	20	74.4	24.2	3240: 13280	TRUE
15658	TRUE	500	3,500.00	20	33.8	24.9	3240: 13280	TRUE
15656	TRUE	500	3,500.00	20	30	17.9	23299: J-52	TRUE
15616	TRUE	500	3,500.00	20	72.3	24.3	3240: 13280	TRUE
15615	TRUE	500	3,500.00	20	58.5	16.5	3903: 16538	TRUE
15607	TRUE	500	3,500.00	20	55.9	24	3240: 13280	TRUE
15590	TRUE	500	3,500.00	20	30.8	26	3240: 13280	TRUE
15582	TRUE	500	3,500.00	20	46.4	23.9	3240: 13280	TRUE
15566	TRUE	500	3,500.00	20	21.2	25.2	3240: 13280	TRUE
15558	TRUE	500	3,500.00	20	69.7	24	3240: 13280	TRUE
15548	TRUE	500	3,500.00	20	21.8	31.2	3240: 13280	TRUE
15542	TRUE	500	3,500.00	20	31.8	17.2	3903: 16538	TRUE
15524	TRUE	500	3,500.00	20	74.8	24.3	3240: 13280	TRUE
15503	TRUE	500	3,500.00	20	37.4	23.8	3240: 13280	TRUE
15496	TRUE	500	3,500.00	20	28.9	26.5	3240: 13280	TRUE
15483	TRUE	500	3,500.00	20	64.6	24.2	3240: 13280	TRUE
15466	TRUE	500	3,500.00	20	70.1	24.4	3240: 13280	TRUE
15454	TRUE	500	3,500.00	20	64.5	23.9	3240: 13280	TRUE
15440	TRUE	500	3,500.00	20	37.1	17.9	3903: 16538	TRUE
15417	TRUE	500	3,500.00	20	57.7	24	3240: 13280	TRUE
15412	TRUE	500	3,500.00	20	33.5	16.5	3903: 16538	TRUE
15410	TRUE	500	3,500.00	20	58.9	16.2	3903: 16538	TRUE
15398	TRUE	500	3,500.00	20	54.1	24.1	3240: 13280	TRUE
15384	TRUE	500	3,500.00	20	42.7	24.3	3240: 13280	TRUE
15366	TRUE	500	3,500.00	20	27.8	26.5	3240: 13280	TRUE
15362	TRUE	500	3,500.00	20	29.9	25.2	3240: 13280	TRUE
15344	TRUE	500	3,500.00	20	36.2	27.5	3240: 13280	TRUE
15325	TRUE	500	3,500.00	20	66	24	3240: 13280	TRUE
15321	TRUE	500	3,500.00	20	101.8	24.6	3240: 13280	TRUE
15316	TRUE	500	3,500.00	20	42.4	16.2	23299: J-52	TRUE
15308	TRUE	500	3,500.00	20	27.1	23.9	3240: 13280	TRUE
15299	TRUE	500	3,500.00	20	63.4	24.1	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12 Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
15266	TRUE	500	3,500.00	20	30.9	25.2	3240: 13280	TRUE
15221	TRUE	500	3,500.00	20	55.6	24	3240: 13280	TRUE
15217	TRUE	500	3,500.00	20	70.4	24.5	3240: 13280	TRUE
15206	TRUE	500	3,500.00	20	34.4	25.2	3240: 13280	TRUE
15202	TRUE	500	3,500.00	20	51.6	15.9	3903: 16538	TRUE
15200	TRUE	500	3,500.00	20	21.7	24.4	3240: 13280	TRUE
15191	TRUE	500	3,500.00	20	83.7	24.6	3240: 13280	TRUE
15169	TRUE	500	3,500.00	20	56.2	24.1	3240: 13280	TRUE
15165	TRUE	500	3,500.00	20	63.9	23.9	3240: 13280	TRUE
15147	TRUE	500	3,500.00	20	43.7	25.2	3240: 13280	TRUE
15135	TRUE	500	3,500.00	20	28.6	27.7	3240: 13280	TRUE
15132	TRUE	500	3,500.00	20	53.3	15.9	3903: 16538	TRUE
15131	TRUE	500	3,500.00	20	51.8	23.6	3240: 13280	TRUE
15130	TRUE	500	3,500.00	20	51.3	23.9	3240: 13280	TRUE
15112	TRUE	500	3,500.00	20	58.6	15.7	3903: 16538	TRUE
15108	TRUE	500	3,500.00	20	77.1	24.5	3240: 13280	TRUE
15071	TRUE	500	3,500.00	20	42.7	25.2	3240: 13280	TRUE
15063	TRUE	500	3,500.00	20	52.4	24.4	3240: 13280	TRUE
15047	TRUE	500	3,500.00	20	70.6	24	3240: 13280	TRUE
15043	TRUE	500	3,500.00	20	75.9	24.2	3240: 13280	TRUE
15041	TRUE	500	3,500.00	20	65.5	23.9	3240: 13280	TRUE
15000	TRUE	500	3,500.00	20	21.8	16.1	3903: 16538	TRUE
14994	TRUE	500	3,500.00	20	44.1	24	3240: 13280	TRUE
14968	TRUE	500	3,500.00	20	26.4	23.6	3240: 13280	TRUE
14954	TRUE	500	3,500.00	20	59.8	23.9	3240: 13280	TRUE
14933	TRUE	500	3,500.00	20	47.3	24.3	3240: 13280	TRUE
14932	TRUE	500	3,500.00	20	61.7	15.2	3903: 16538	TRUE
14927	TRUE	500	3,500.00	20	70.5	24	3240: 13280	TRUE
14923	TRUE	500	3,500.00	20	71.4	24.2	3240: 13280	TRUE
14851	TRUE	500	3,500.00	20	63.7	24.2	3240: 13280	TRUE
14846	TRUE	500	3,500.00	20	85.8	24.3	3240: 13280	TRUE
14842	TRUE	500	3,500.00	20	28.1	25.2	3240: 13280	TRUE
14819	TRUE	500	3,500.00	20	64	23.2	3240: 13280	TRUE
14816	TRUE	500	3,500.00	20	60.4	23.4	3240: 13280	TRUE
14815	TRUE	500	3,500.00	20	42.9	25.2	3240: 13280	TRUE
14784	TRUE	500	3,500.00	20	37.9	16.5	23299: J-52	TRUE
14783	TRUE	500	3,500.00	20	65.6	24	3240: 13280	TRUE
14724	TRUE	500	3,500.00	20	54.4	14.4	23299: J-52	TRUE
14715	TRUE	500	3,500.00	20	34.7	25.2	3240: 13280	TRUE
14712	TRUE	500	3,500.00	20	63.9	24.2	3240: 13280	TRUE
14671	TRUE	500	3,500.00	20	65.3	15.7	3903: 16538	TRUE
14635	TRUE	500	3,500.00	20	66.3	23.9	3240: 13280	TRUE
14625	TRUE	500	3,500.00	20	66.1	23.9	3240: 13280	TRUE
14621	TRUE	500	3,500.00	20	48.1	25.2	3240: 13280	TRUE
14580	TRUE	500	3,500.00	20	83.7	24.9	3240: 13280	TRUE
14546	TRUE	500	3,500.00	20	20.7	25.2	3240: 13280	TRUE
14545	TRUE	500	3,500.00	20	33.3	16.6	23299: J-52	TRUE
14525	TRUE	500	3,500.00	20	66.9	23.4	3240: 13280	TRUE
14515	TRUE	500	3,500.00	20	30.3	13.7	3903: 16538	TRUE
14514	TRUE	500	3,500.00	20	22	21.9	3903: 16538	TRUE
14455	TRUE	500	3,500.00	20	42.7	22.5	3240: 13280	TRUE
14442	TRUE	500	3,500.00	20	38.1	1	3903: 16538	TRUE
14425	TRUE	500	3,500.00	20	58.5	24.2	3240: 13280	TRUE
14422	TRUE	500	3,500.00	20	92.4	24.3	3240: 13280	TRUE
14413	TRUE	500	3,500.00	20	48.2	24.2	23299: J-52	TRUE
14407	TRUE	500	3,500.00	20	35.4	12.7	23299: J-52	TRUE
14388	TRUE	500	3,500.00	20	50.1	16	3903: 16538	TRUE
14385	TRUE	500	3,500.00	20	23.2	21.2	3362: 13936	TRUE
14384	TRUE	500	3,500.00	20	21.4	23.8	3240: 13280	TRUE
14359	TRUE	500	3,500.00	20	100.1	24.2	3240: 13280	TRUE
14357	TRUE	500	3,500.00	20	61.7	12.4	3903: 16538	TRUE
14350	TRUE	500	3,500.00	20	71.4	23.9	3240: 13280	TRUE
14348	TRUE	500	3,500.00	20	39	22.1	3240: 13280	TRUE
14346	TRUE	500	3,500.00	20	55.4	11.1	3903: 16538	TRUE
14280	TRUE	500	3,500.00	20	53.5	16.1	3903: 16538	TRUE
14269	TRUE	500	3,500.00	20	100	25	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12									
Existing Fire Flow Results									
Label		Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
	14258	TRUE	500	3,500.00	20	75.9	24.2	3240: 13280	TRUE
	14214	TRUE	500	3,500.00	20	63.6	25.2	3240: 13280	TRUE
	14203	TRUE	500	3,500.00	20	51.2	25.2	3240: 13280	TRUE
	14173	TRUE	500	3,500.00	20	81.1	24.2	3240: 13280	TRUE
	14172	TRUE	500	3,500.00	20	31.7	21.5	3240: 13280	TRUE
	14161	TRUE	500	3,500.00	20	62.3	23.5	3240: 13280	TRUE
	14145	TRUE	500	3,500.00	20	68.5	24.2	3240: 13280	TRUE
	14129	TRUE	500	3,500.00	20	38.2	16.5	3903: 16538	TRUE
	14104	TRUE	500	3,500.00	20	49.3	23.9	3240: 13280	TRUE
	14086	TRUE	500	3,500.00	20	48.2	24.3	3903: 16538	TRUE
	14078	TRUE	500	3,500.00	20	83	24.2	3240: 13280	TRUE
	14072	TRUE	500	3,500.00	20	90.3	25.1	3240: 13280	TRUE
	14061	TRUE	500	3,500.00	20	41.2	23.7	3240: 13280	TRUE
	14025	TRUE	500	3,500.00	20	63.1	24.2	3240: 13280	TRUE
	14019	TRUE	500	3,500.00	20	49.5	16.5	3903: 16538	TRUE
	13982	TRUE	500	3,500.00	20	79.7	23.9	3240: 13280	TRUE
	13931	TRUE	500	3,500.00	20	68.3	25.2	3240: 13280	TRUE
	13920	TRUE	500	3,500.00	20	34.7	22.1	3185: 13010	TRUE
	13894	TRUE	500	3,500.00	20	69.3	23.6	3240: 13280	TRUE
	13887	TRUE	500	3,500.00	20	59.5	16.5	3903: 16538	TRUE
	13840	TRUE	500	3,500.00	20	67.2	24.2	3240: 13280	TRUE
	13767	TRUE	500	3,500.00	20	54.6	24.1	3240: 13280	TRUE
	13760	TRUE	500	3,500.00	20	55.4	25.3	3240: 13280	TRUE
	13757	TRUE	500	3,500.00	20	89.8	25.2	3240: 13280	TRUE
	13756	TRUE	500	3,500.00	20	80.5	23.9	3240: 13280	TRUE
	13754	TRUE	500	3,500.00	20	75.5	24.2	3240: 13280	TRUE
	13685	TRUE	500	3,500.00	20	72.6	24.2	3240: 13280	TRUE
	13683	TRUE	500	3,500.00	20	42.9	23.6	3240: 13280	TRUE
	13619	TRUE	500	3,500.00	20	64.5	24.2	3240: 13280	TRUE
	13601	TRUE	500	3,500.00	20	35.6	25.3	3240: 13280	TRUE
	13564	TRUE	500	3,500.00	20	56.4	24.1	3240: 13280	TRUE
	13547	TRUE	500	3,500.00	20	96.1	25.2	3240: 13280	TRUE
	13518	TRUE	500	3,500.00	20	64.2	25.3	3240: 13280	TRUE
	13490	TRUE	500	3,500.00	20	75.9	26.5	3240: 13280	TRUE
	13489	TRUE	500	3,500.00	20	57.6	16.8	3903: 16538	TRUE
	13464	TRUE	500	3,500.00	20	57.4	24.2	3240: 13280	TRUE
	13396	TRUE	500	3,500.00	20	23.5	25.8	3240: 13280	TRUE
	13389	TRUE	500	3,500.00	20	67.4	24.1	3240: 13280	TRUE
	13388	TRUE	500	3,500.00	20	55.6	23.7	3240: 13280	TRUE
	13381	TRUE	500	3,500.00	20	67	24.2	3240: 13280	TRUE
	13369	TRUE	500	3,500.00	20	61.2	24.2	3240: 13280	TRUE
	13361	TRUE	500	3,500.00	20	61.4	23.8	3240: 13280	TRUE
	13314	TRUE	500	3,500.00	20	70	25.3	3240: 13280	TRUE
	13291	TRUE	500	3,500.00	20	58.8	23.6	3240: 13280	TRUE
	13247	TRUE	500	3,500.00	20	37.9	24.2	3240: 13280	TRUE
	13220	TRUE	500	3,500.00	20	48.3	26.6	3240: 13280	TRUE
	13180	TRUE	500	3,500.00	20	50.9	25.8	3240: 13280	TRUE
	13163	TRUE	500	3,500.00	20	41.8	24.2	3240: 13280	TRUE
	13158	TRUE	500	3,500.00	20	67.9	23.8	3240: 13280	TRUE
	13102	TRUE	500	3,500.00	20	42.1	17	23299: J-52	TRUE
	13101	TRUE	500	3,500.00	20	95	25.5	3240: 13280	TRUE
	13047	TRUE	500	3,500.00	20	60.8	25.3	3240: 13280	TRUE
	12997	TRUE	500	3,500.00	20	71.3	26.6	3240: 13280	TRUE
	12977	TRUE	500	3,500.00	20	33.5	16.9	23299: J-52	TRUE
	12932	TRUE	500	3,500.00	20	46.9	24.2	3240: 13280	TRUE
	12929	TRUE	500	3,500.00	20	63.2	24.1	3240: 13280	TRUE
	12893	TRUE	500	3,500.00	20	55.8	23.7	3240: 13280	TRUE
	12845	TRUE	500	3,500.00	20	47.5	24.1	3240: 13280	TRUE
	12826	TRUE	500	3,500.00	20	50.1	17.1	3903: 16538	TRUE
	12789	TRUE	500	3,500.00	20	59.2	23.9	3240: 13280	TRUE
	12765	TRUE	500	3,500.00	20	81.2	26.6	3240: 13280	TRUE
	12759	TRUE	500	3,500.00	20	33.3	13.5	3141: 12788	TRUE
	12755	TRUE	500	3,500.00	20	75.8	25.9	3240: 13280	TRUE
	12736	TRUE	500	3,500.00	20	28.6	17.1	23299: J-52	TRUE
	12640	TRUE	500	3,500.00	20	86.3	26.7	3240: 13280	TRUE
	12567	TRUE	500	3,500.00	20	52.7	24.1	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12									
Existing Fire Flow Results									
Label		Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
	12518	TRUE	500	3,500.00	20	33.9	17.1	3903: 16538	TRUE
	12507	TRUE	500	3,500.00	20	43.4	17.3	23299: J-52	TRUE
	12492	TRUE	500	3,500.00	20	50.5	25.4	3240: 13280	TRUE
	12441	TRUE	500	3,500.00	20	47.9	24.1	3240: 13280	TRUE
	12411	TRUE	500	3,500.00	20	49	24.1	3240: 13280	TRUE
	12377	TRUE	500	3,500.00	20	92.8	26.5	3240: 13280	TRUE
	12372	TRUE	500	3,500.00	20	91.4	26.4	3240: 13280	TRUE
	12348	TRUE	500	3,500.00	20	39.3	17.4	3903: 16538	TRUE
	12333	TRUE	500	3,500.00	20	47.6	23.4	2722: 10829	TRUE
	12305	TRUE	500	3,500.00	20	20.5	15.5	2980: 12054	TRUE
	12295	TRUE	500	3,500.00	20	28.8	24	3240: 13280	TRUE
	12270	TRUE	500	3,500.00	20	42.5	24.1	3240: 13280	TRUE
	12232	TRUE	500	3,500.00	20	38.1	18.2	3041: 12331	TRUE
	12229	TRUE	500	3,500.00	20	24.1	24	2722: 10829	TRUE
	12218	TRUE	500	3,500.00	20	42.5	17	3903: 16538	TRUE
	12149	TRUE	500	3,500.00	20	42.5	16.8	3903: 16538	TRUE
	12138	TRUE	500	3,500.00	20	53.1	23.7	2722: 10829	TRUE
	12108	TRUE	500	3,500.00	20	57.8	26.4	3240: 13280	TRUE
	12095	TRUE	500	3,500.00	20	38.8	23.2	2722: 10829	TRUE
	12088	TRUE	500	3,500.00	20	35.8	17.3	3041: 12331	TRUE
	12064	TRUE	500	3,500.00	20	22.8	23.8	2722: 10829	TRUE
	12000	TRUE	500	3,500.00	20	20.3	19.8	3903: 16538	TRUE
	11993	TRUE	500	3,500.00	20	37.7	18	3903: 16538	TRUE
	11964	TRUE	500	3,500.00	20	92.2	27	3240: 13280	TRUE
	11951	TRUE	500	3,500.00	20	29.2	23.7	2722: 10829	TRUE
	11937	TRUE	500	3,500.00	20	63.6	21.4	2722: 10829	TRUE
	11926	TRUE	500	3,500.00	20	30.5	7.6	31622: J-140	TRUE
	11916	TRUE	500	3,500.00	20	37.6	25.4	3240: 13280	TRUE
	11880	TRUE	500	3,500.00	20	29.5	19.7	3903: 16538	TRUE
	11874	TRUE	500	3,500.00	20	44.6	26.8	3240: 13280	TRUE
	11871	TRUE	500	3,500.00	20	29.8	17.7	3903: 16538	TRUE
	11856	TRUE	500	3,500.00	20	30.7	26.8	3240: 13280	TRUE
	11832	TRUE	500	3,500.00	20	37.3	26.3	3240: 13280	TRUE
	11793	TRUE	500	3,500.00	20	65	20.7	2722: 10829	TRUE
	11771	TRUE	500	3,500.00	20	37.2	23.8	2722: 10829	TRUE
	11770	TRUE	500	3,500.00	20	53.3	26.3	3240: 13280	TRUE
	11737	TRUE	500	3,500.00	20	75.1	26.8	3240: 13280	TRUE
	11719	TRUE	500	3,500.00	20	39.1	25.5	3240: 13280	TRUE
	11676	TRUE	500	3,500.00	20	59.8	20.2	2722: 10829	TRUE
	11672	TRUE	500	3,500.00	20	64.8	26.3	3240: 13280	TRUE
	11668	TRUE	500	3,500.00	20	37.2	26.3	3240: 13280	TRUE
	11665	TRUE	500	3,500.00	20	76.2	26.7	3240: 13280	TRUE
	11619	TRUE	500	3,500.00	20	51.8	19.2	3903: 16538	TRUE
	11609	TRUE	500	3,500.00	20	80	26.8	3240: 13280	TRUE
	11538	TRUE	500	3,500.00	20	83.1	26.7	3240: 13280	TRUE
	11528	TRUE	500	3,500.00	20	65.1	26.7	3240: 13280	TRUE
	11524	TRUE	500	3,500.00	20	33	26.8	3240: 13280	TRUE
	11519	TRUE	500	3,500.00	20	21	23.8	2722: 10829	TRUE
	11506	TRUE	500	3,500.00	20	27.9	26.3	3240: 13280	TRUE
	11461	TRUE	500	3,500.00	20	50	26.7	3240: 13280	TRUE
	11373	TRUE	500	3,500.00	20	53.7	18.6	2722: 10829	TRUE
	11352	TRUE	500	3,500.00	20	28.2	17	2722: 10829	TRUE
	11347	TRUE	500	3,500.00	20	23.8	23.9	3240: 13280	TRUE
	11325	TRUE	500	3,500.00	20	82.8	26.6	3240: 13280	TRUE
	11324	TRUE	500	3,500.00	20	78.5	26.3	3240: 13280	TRUE
	11315	TRUE	500	3,500.00	20	29	15.7	2722: 10829	TRUE
	11309	TRUE	500	3,500.00	20	31.5	26.7	3240: 13280	TRUE
	11279	TRUE	500	3,500.00	20	45.8	26.2	3240: 13280	TRUE
	11272	TRUE	500	3,500.00	20	60.2	17.3	2722: 10829	TRUE
	11222	TRUE	500	3,500.00	20	45.4	17.4	2722: 10829	TRUE
	11197	TRUE	500	3,500.00	20	62.8	25.1	3240: 13280	TRUE
	11164	TRUE	500	3,500.00	20	70.4	26.3	3240: 13280	TRUE
	11159	TRUE	500	3,500.00	20	62.2	26.3	3240: 13280	TRUE
	11150	TRUE	500	3,500.00	20	31	20.8	3903: 16538	TRUE
	11116	TRUE	500	3,500.00	20	28	13.3	2722: 10829	TRUE
	11027	TRUE	500	3,500.00	20	58	26.3	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12									
Existing Fire Flow Results									
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?	
	11023	TRUE	500	3,500.00	20	52	16.4	2722: 10829	TRUE
	10995	TRUE	500	3,500.00	20	43.6	16.7	2722: 10829	TRUE
	10972	TRUE	500	3,500.00	20	77.1	26.4	3240: 13280	TRUE
	10929	TRUE	500	3,500.00	20	26.7	16.5	2722: 10829	TRUE
	10922	TRUE	500	3,500.00	20	44.2	26.2	3240: 13280	TRUE
	10921	TRUE	500	3,500.00	20	40.7	26.6	3240: 13280	TRUE
	10909	TRUE	500	3,500.00	20	43.7	26.4	3240: 13280	TRUE
	10879	TRUE	500	3,500.00	20	38.4	26.3	3240: 13280	TRUE
	10868	TRUE	500	3,500.00	20	25.9	17.6	2722: 10829	TRUE
	10800	TRUE	500	3,500.00	20	31.7	20.8	3903: 16538	TRUE
	10763	TRUE	500	3,500.00	20	85.4	26.3	3240: 13280	TRUE
	10722	TRUE	500	3,500.00	20	62.2	16.4	2722: 10829	TRUE
	10706	TRUE	500	3,500.00	20	31.7	26.5	3240: 13280	TRUE
	10699	TRUE	500	3,500.00	20	34	26.2	3240: 13280	TRUE
	10698	TRUE	500	3,500.00	20	27	26.4	3240: 13280	TRUE
	10681	TRUE	500	3,500.00	20	35.5	26.2	3240: 13280	TRUE
	10670	TRUE	500	3,500.00	20	39.7	26	3240: 13280	TRUE
	10638	TRUE	500	3,500.00	20	41.3	16.5	2722: 10829	TRUE
	10598	TRUE	500	3,500.00	20	84.8	26.3	3240: 13280	TRUE
	10597	TRUE	500	3,500.00	20	40.8	18.8	2722: 10829	TRUE
	10576	TRUE	500	3,500.00	20	72	26.2	3240: 13280	TRUE
	10532	TRUE	500	3,500.00	20	43.5	20.8	3903: 16538	TRUE
	10515	TRUE	500	3,500.00	20	57.9	25.9	3240: 13280	TRUE
	10514	TRUE	500	3,500.00	20	43.5	17.8	2722: 10829	TRUE
	10513	TRUE	500	3,500.00	20	63.2	26	3240: 13280	TRUE
	10476	TRUE	500	3,500.00	20	63.5	26	3240: 13280	TRUE
	10470	TRUE	500	3,500.00	20	44.4	14.1	2722: 10829	TRUE
	10434	TRUE	500	3,500.00	20	42.2	21	3903: 16538	TRUE
	10433	TRUE	500	3,500.00	20	26.7	16.6	2722: 10829	TRUE
	10367	TRUE	500	3,500.00	20	52.9	16.3	2722: 10829	TRUE
	10364	TRUE	500	3,500.00	20	45.2	26.2	3240: 13280	TRUE
	10356	TRUE	500	3,500.00	20	56.3	26.5	3240: 13280	TRUE
	10349	TRUE	500	3,500.00	20	60	26.1	3240: 13280	TRUE
	10346	TRUE	500	3,500.00	20	24	15.2	2722: 10829	TRUE
	10331	TRUE	500	3,500.00	20	53.4	16.6	2722: 10829	TRUE
	10321	TRUE	500	3,500.00	20	22.2	7.6	2722: 10829	TRUE
	10304	TRUE	500	3,500.00	20	56.7	25.1	3240: 13280	TRUE
	10301	TRUE	500	3,500.00	20	43	18.1	2722: 10829	TRUE
	10295	TRUE	500	3,500.00	20	51	25.8	3240: 13280	TRUE
	10275	TRUE	500	3,500.00	20	34.6	21.1	23299: J-52	TRUE
	10267	TRUE	500	3,500.00	20	49.5	17.9	2722: 10829	TRUE
	10173	TRUE	500	3,500.00	20	51.1	26.2	3240: 13280	TRUE
	10171	TRUE	500	3,500.00	20	64.7	26.4	3240: 13280	TRUE
	10160	TRUE	500	3,500.00	20	47.6	17.6	2722: 10829	TRUE
	10119	TRUE	500	3,500.00	20	44.2	21.1	3903: 16538	TRUE
	10099	TRUE	500	3,500.00	20	51	17.5	2722: 10829	TRUE
	10091	TRUE	500	3,500.00	20	87.1	25.6	3240: 13280	TRUE
	10078	TRUE	500	3,500.00	20	37.5	26.2	3240: 13280	TRUE
	10046	TRUE	500	3,500.00	20	35.3	16.5	2722: 10829	TRUE
	10041	TRUE	500	3,500.00	20	61.4	16.4	2722: 10829	TRUE
	10035	TRUE	500	3,500.00	20	49.3	17.3	2722: 10829	TRUE
	10012	TRUE	500	3,500.00	20	77.7	26	3240: 13280	TRUE
	10004	TRUE	500	3,500.00	20	80.1	25.8	3240: 13280	TRUE
	9996	TRUE	500	3,500.00	20	70.6	26.2	3240: 13280	TRUE
	9992	TRUE	500	3,500.00	20	65.2	26.4	3240: 13280	TRUE
	9969	TRUE	500	3,500.00	20	87.2	25.9	3240: 13280	TRUE
	9946	TRUE	500	3,500.00	20	66.3	16.4	2722: 10829	TRUE
	9943	TRUE	500	3,500.00	20	77.3	25.6	3240: 13280	TRUE
	9904	TRUE	500	3,500.00	20	66.2	16	2722: 10829	TRUE
	9819	TRUE	500	3,500.00	20	75	26	3240: 13280	TRUE
	9809	TRUE	500	3,500.00	20	52.2	21.1	23299: J-52	TRUE
	9806	TRUE	500	3,500.00	20	67.2	25.5	3240: 13280	TRUE
	9781	TRUE	500	3,500.00	20	49.2	25.8	3240: 13280	TRUE
	9774	TRUE	500	3,500.00	20	67.4	25.1	3240: 13280	TRUE
	9752	TRUE	500	3,500.00	20	65.9	26.2	3240: 13280	TRUE
	9747	TRUE	500	3,500.00	20	93	26	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12									
Existing Fire Flow Results									
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?	
	9739	TRUE	500	3,500.00	20	23.1	8.9	2325: 9110	TRUE
	9721	TRUE	500	3,500.00	20	79	25.7	3240: 13280	TRUE
	9702	TRUE	500	3,500.00	20	75.2	26.2	3240: 13280	TRUE
	9698	TRUE	500	3,500.00	20	55.6	16.6	2722: 10829	TRUE
	9657	TRUE	500	3,500.00	20	79.3	26	3240: 13280	TRUE
	9642	TRUE	500	3,500.00	20	40.6	26	3240: 13280	TRUE
	9617	TRUE	500	3,500.00	20	58.2	17	2722: 10829	TRUE
	9552	TRUE	500	3,500.00	20	61.6	26.4	3240: 13280	TRUE
	9507	TRUE	500	3,500.00	20	64.4	26	3240: 13280	TRUE
	9498	TRUE	500	3,500.00	20	38.4	17.4	2722: 10829	TRUE
	9496	TRUE	500	3,500.00	20	44.6	26.2	3240: 13280	TRUE
	9491	TRUE	500	3,500.00	20	43.3	26.3	3240: 13280	TRUE
	9480	TRUE	500	3,500.00	20	81.5	25.8	3240: 13280	TRUE
	9472	TRUE	500	3,500.00	20	20.2	12.4	2325: 9110	TRUE
	9432	TRUE	500	3,500.00	20	73.9	26.2	3240: 13280	TRUE
	9280	TRUE	500	3,500.00	20	27.3	17.5	2722: 10829	TRUE
	9258	TRUE	500	3,500.00	20	25.6	7.6	2325: 9110	TRUE
	9255	TRUE	500	3,500.00	20	85.2	25.8	3240: 13280	TRUE
	9253	TRUE	500	3,500.00	20	62.3	26.2	3240: 13280	TRUE
	9225	TRUE	500	3,500.00	20	74.4	26.2	3240: 13280	TRUE
	9218	TRUE	500	3,500.00	20	42.8	17.8	2722: 10829	TRUE
	9202	TRUE	500	3,500.00	20	46.9	26.3	3240: 13280	TRUE
	9189	TRUE	500	3,500.00	20	39	26.2	3240: 13280	TRUE
	9133	TRUE	500	3,500.00	20	52.3	17.6	2722: 10829	TRUE
	9119	TRUE	500	3,500.00	20	62.8	25.4	3903: 16538	TRUE
	9108	TRUE	500	3,500.00	20	58.9	26.2	3240: 13280	TRUE
	9095	TRUE	500	3,500.00	20	54	18.2	2722: 10829	TRUE
	9086	TRUE	500	3,500.00	20	93	25.8	3240: 13280	TRUE
	8988	TRUE	500	3,500.00	20	77	26.2	3240: 13280	TRUE
	8968	TRUE	500	3,500.00	20	45.1	25.3	3240: 13280	TRUE
	8964	TRUE	500	3,500.00	20	62.7	26.1	3240: 13280	TRUE
	8963	TRUE	500	3,500.00	20	88.3	25.8	3240: 13280	TRUE
	8946	TRUE	500	3,500.00	20	60.4	26.1	3240: 13280	TRUE
	8937	TRUE	500	3,500.00	20	89.6	25.8	3240: 13280	TRUE
	8896	TRUE	500	3,500.00	20	66.5	26.1	3240: 13280	TRUE
	8878	TRUE	500	3,500.00	20	94.8	25.8	3240: 13280	TRUE
	8862	TRUE	500	3,500.00	20	92.9	25.8	3240: 13280	TRUE
	8845	TRUE	500	3,500.00	20	80.3	26.2	3240: 13280	TRUE
	8839	TRUE	500	3,500.00	20	93	25.8	3240: 13280	TRUE
	8770	TRUE	500	3,500.00	20	54	26.1	3240: 13280	TRUE
	8768	TRUE	500	3,500.00	20	95.2	25.9	3240: 13280	TRUE
	8742	TRUE	500	3,500.00	20	58.1	26.2	3240: 13280	TRUE
	8709	TRUE	500	3,500.00	20	48.8	25.1	3240: 13280	TRUE
	8674	TRUE	500	3,500.00	20	52.3	25.1	3240: 13280	TRUE
	8660	TRUE	500	3,500.00	20	89.9	25.8	3240: 13280	TRUE
	8654	TRUE	500	3,500.00	20	83.4	26.2	3240: 13280	TRUE
	8536	TRUE	500	3,500.00	20	64.1	26.1	3240: 13280	TRUE
	8519	TRUE	500	3,500.00	20	37.1	26.1	3240: 13280	TRUE
	8427	TRUE	500	3,500.00	20	77.4	26.1	3240: 13280	TRUE
	8356	TRUE	500	3,500.00	20	78	26.2	3240: 13280	TRUE
	8349	TRUE	500	3,500.00	20	28.6	26.2	3240: 13280	TRUE
	8244	TRUE	500	3,500.00	20	92	25.8	3240: 13280	TRUE
	8215	TRUE	500	3,500.00	20	21.7	26.1	3240: 13280	TRUE
	8172	TRUE	500	3,500.00	20	71.5	26.1	3240: 13280	TRUE
	8148	TRUE	500	3,500.00	20	77.5	26.1	3240: 13280	TRUE
	8087	TRUE	500	3,500.00	20	51.8	26.1	3240: 13280	TRUE
	8004	TRUE	500	3,500.00	20	75.5	26.1	3240: 13280	TRUE
	7987	TRUE	500	3,500.00	20	38.3	26.2	3240: 13280	TRUE
	7919	TRUE	500	3,500.00	20	24.9	26.1	3240: 13280	TRUE
	7896	TRUE	500	3,500.00	20	24.1	26.1	3240: 13280	TRUE
	7870	TRUE	500	3,500.00	20	73.7	26.1	3240: 13280	TRUE
	7857	TRUE	500	3,500.00	20	43.8	26.1	3240: 13280	TRUE
	7770	TRUE	500	3,500.00	20	23.9	26.1	3240: 13280	TRUE
	7742	TRUE	500	3,500.00	20	46.9	26.1	3240: 13280	TRUE
	7721	TRUE	500	3,500.00	20	43.8	26.1	3240: 13280	TRUE
	7676	TRUE	500	3,500.00	20	75.6	26.1	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Existing Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
7673	TRUE	500	3,500.00	20	82.8	25.9	3240: 13280	TRUE
7628	TRUE	500	3,500.00	20	71	26.1	3240: 13280	TRUE
7620	TRUE	500	3,500.00	20	79.5	26.1	3240: 13280	TRUE
7579	TRUE	500	3,500.00	20	57.5	26.1	3240: 13280	TRUE
7455	TRUE	500	3,500.00	20	66.5	26.1	3240: 13280	TRUE
7431	TRUE	500	3,500.00	20	82.2	26.1	3240: 13280	TRUE
7430	TRUE	500	3,500.00	20	32	13.1	2624: 10368	TRUE
7427	TRUE	500	3,500.00	20	95.1	26	3240: 13280	TRUE
7401	TRUE	500	3,500.00	20	45.9	26.1	3240: 13280	TRUE
7324	TRUE	500	3,500.00	20	65.6	26.1	3240: 13280	TRUE
7256	TRUE	500	3,500.00	20	40.1	26.1	3240: 13280	TRUE
7252	TRUE	500	3,500.00	20	93.9	26.1	3240: 13280	TRUE
7251	TRUE	500	3,500.00	20	66.1	26.1	3240: 13280	TRUE
7218	TRUE	500	3,500.00	20	81.3	25.9	3240: 13280	TRUE
7191	TRUE	500	3,500.00	20	55.9	26.1	3240: 13280	TRUE
7187	TRUE	500	3,500.00	20	77.4	26.1	3240: 13280	TRUE
7154	TRUE	500	3,500.00	20	34.4	26.1	3240: 13280	TRUE
7129	TRUE	500	3,500.00	20	83.2	26	3240: 13280	TRUE
7118	TRUE	500	3,500.00	20	20	26.1	3240: 13280	TRUE
7111	TRUE	500	3,500.00	20	55.7	26.1	3240: 13280	TRUE
7067	TRUE	500	3,500.00	20	94.8	26	3240: 13280	TRUE
7060	TRUE	500	3,500.00	20	90.8	26	3240: 13280	TRUE
7053	TRUE	500	3,500.00	20	85.3	26	3240: 13280	TRUE
7032	TRUE	500	3,500.00	20	62.8	26.1	3240: 13280	TRUE
7031	TRUE	500	3,500.00	20	59.7	26	3240: 13280	TRUE
7020	TRUE	500	3,500.00	20	89.1	26	3240: 13280	TRUE
7016	TRUE	500	3,500.00	20	61.8	26.1	3240: 13280	TRUE
6997	TRUE	500	3,500.00	20	46.5	26.1	3240: 13280	TRUE
6993	TRUE	500	3,500.00	20	55.4	26	3240: 13280	TRUE
6981	TRUE	500	3,500.00	20	85.8	26	3240: 13280	TRUE
6936	TRUE	500	3,500.00	20	74.2	26	3240: 13280	TRUE
6875	TRUE	500	3,500.00	20	85.1	26	3240: 13280	TRUE
6864	TRUE	500	3,500.00	20	45.3	26.1	3240: 13280	TRUE
6853	TRUE	500	3,500.00	20	77.8	26.1	3240: 13280	TRUE
6814	TRUE	500	3,500.00	20	73.7	26	3240: 13280	TRUE
6812	TRUE	500	3,500.00	20	77	26.1	3240: 13280	TRUE
6804	TRUE	500	3,500.00	20	35.7	26.1	3240: 13280	TRUE
6775	TRUE	500	3,500.00	20	46.7	26.1	3240: 13280	TRUE
6772	TRUE	500	3,500.00	20	57.6	26	3240: 13280	TRUE
6745	TRUE	500	3,500.00	20	56.1	26	3240: 13280	TRUE
6739	TRUE	500	3,500.00	20	42.4	26.1	3240: 13280	TRUE
6722	TRUE	500	3,500.00	20	69.4	26	3240: 13280	TRUE
6712	TRUE	500	3,500.00	20	54.8	26.1	3240: 13280	TRUE
6665	TRUE	500	3,500.00	20	50.9	25.8	3240: 13280	TRUE
6659	TRUE	500	3,500.00	20	53.8	26.2	3240: 13280	TRUE
6648	TRUE	500	3,500.00	20	57.9	26	3240: 13280	TRUE
6626	TRUE	500	3,500.00	20	22.5	26.2	3240: 13280	TRUE
6614	TRUE	500	3,500.00	20	37.6	26.1	3240: 13280	TRUE
6603	TRUE	500	3,500.00	20	81.6	26.1	3240: 13280	TRUE
6601	TRUE	500	3,500.00	20	70.4	26.2	3240: 13280	TRUE
6589	TRUE	500	3,500.00	20	52	25.8	3240: 13280	TRUE
6558	TRUE	500	3,500.00	20	36.8	26.2	3240: 13280	TRUE
6527	TRUE	500	3,500.00	20	68	26.2	3240: 13280	TRUE
6515	TRUE	500	3,500.00	20	60.5	26.1	3240: 13280	TRUE
6497	TRUE	500	3,500.00	20	27.4	26.2	3240: 13280	TRUE
6483	TRUE	500	3,500.00	20	53.4	25.8	3240: 13280	TRUE
6475	TRUE	500	3,500.00	20	76.7	26.1	3240: 13280	TRUE
6444	TRUE	500	3,500.00	20	40.3	26.2	3240: 13280	TRUE
6438	TRUE	500	3,500.00	20	76.1	26.2	3240: 13280	TRUE
6414	TRUE	500	3,500.00	20	89.7	26.1	3240: 13280	TRUE
6400	TRUE	500	3,500.00	20	55.6	26.2	3240: 13280	TRUE
6329	TRUE	500	3,500.00	20	27.9	26.2	3240: 13280	TRUE
6317	TRUE	500	3,500.00	20	72.3	26.1	3240: 13280	TRUE
6299	TRUE	500	3,500.00	20	45.8	26.2	3240: 13280	TRUE
6272	TRUE	500	3,500.00	20	88	26.1	3240: 13280	TRUE
6270	TRUE	500	3,500.00	20	63.6	26.2	3240: 13280	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12									
Existing Fire Flow Results									
Label		Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
	2491	TRUE	500	3,500.00	20	64.2	26.8	697: 2093	TRUE
	2463	TRUE	500	3,500.00	20	65.3	27.2	3240: 13280	TRUE
	2394	TRUE	500	3,500.00	20	61.7	27.2	3240: 13280	TRUE
	2382	TRUE	500	3,500.00	20	52.3	25.7	697: 2093	TRUE
	2351	TRUE	500	3,500.00	20	67.9	27.2	3240: 13280	TRUE
	2273	TRUE	500	3,500.00	20	24.4	24.7	697: 2093	TRUE
	2251	TRUE	500	3,500.00	20	41.6	24.4	697: 2093	TRUE
	2165	TRUE	500	3,500.00	20	33.5	23.5	697: 2093	TRUE
	2135	TRUE	500	3,500.00	20	22.8	8.4	713: 2143	TRUE
	2032	TRUE	500	3,500.00	20	29.6	27.2	3240: 13280	TRUE
	2001	TRUE	500	3,500.00	20	29.3	22	697: 2093	TRUE
	1825	TRUE	500	3,500.00	20	20.8	21.3	697: 2093	TRUE
	1822	TRUE	500	3,500.00	20	26.4	20.6	697: 2093	TRUE
	1756	TRUE	500	3,500.00	20	60.5	14.6	697: 2093	TRUE
	1746	TRUE	500	3,500.00	20	25.2	19.6	697: 2093	TRUE
	1697	TRUE	500	3,500.00	20	27	12.9	697: 2093	TRUE
	1667	TRUE	500	3,500.00	20	46.3	21.5	697: 2093	TRUE
	1539	TRUE	500	3,500.00	20	46.3	19.3	697: 2093	TRUE
	1477	TRUE	500	3,500.00	20	33.7	19.8	697: 2093	TRUE
	1475	TRUE	500	3,500.00	20	36.9	20.3	697: 2093	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
9668 Hamilton Place	TRUE	500	3,500.00	20	67.8	27.4	3903: 16538	TRUE
9648 Hamilton Place	TRUE	500	3,500.00	20	45.5	27.7	3903: 16538	TRUE
9575 Hamilton Place	TRUE	500	3,500.00	20	48.5	27.5	3903: 16538	TRUE
9530 Hamilton Place	TRUE	500	3,500.00	20	64.7	27.8	3903: 16538	TRUE
9477 Hamilton Place	TRUE	500	3,500.00	20	69.8	27.6	23299: J-52	TRUE
9399 Hamilton Place	TRUE	500	3,500.00	20	40.6	27.8	3903: 16538	TRUE
11408 Hamilton Place	TRUE	500	3,500.00	20	57.8	25.9	23299: J-52	TRUE
11185 Hamilton Place	TRUE	500	3,500.00	20	65.2	26.3	3903: 16538	TRUE
10996 Hamilton Place	TRUE	500	3,500.00	20	64.8	26.4	3903: 16538	TRUE
10767 Hamilton Place	TRUE	500	1,797.59	20	20	33.8	23299: J-52	TRUE
10643 Hamilton Place	TRUE	500	3,500.00	20	65.6	26.7	23299: J-52	TRUE
10446 Hamilton Place	TRUE	500	3,500.00	20	60.7	27	23299: J-52	TRUE
10420 Hamilton Place	TRUE	500	3,500.00	20	69.7	26.9	23299: J-52	TRUE
10192 Hamilton Place	TRUE	500	3,500.00	20	63.8	27.2	3903: 16538	TRUE
10161 Hamilton Place	TRUE	500	3,500.00	20	66.5	27	3903: 16538	TRUE
20735 East Ridge High School	TRUE	500	3,285.13	20	20	19.4	4855: 21277	TRUE
20265 East Ridge High School	TRUE	500	3,500.00	20	45.6	37.5	3903: 16538	TRUE
20179 East Ridge High School	TRUE	500	3,500.00	20	44.4	37.5	3903: 16538	TRUE
19957 East Ridge High School	TRUE	500	3,500.00	20	24.4	37.5	3903: 16538	TRUE
18474 East Ridge Hospital	TRUE	500	2,998.07	20	20	37.2	3903: 16538	TRUE
18261 East Ridge Hospital	TRUE	500	3,042.81	20	20	28.4	4192: 18088 e	TRUE
18099 East Ridge Hospital	TRUE	500	2,567.14	20	20	37.6	3903: 16538	TRUE
18088 East Ridge Hospital	TRUE	500	2,826.64	20	20	35.7	4187: 18045 e	TRUE
18045 East Ridge Hospital	TRUE	500	2,782.39	20	20	31.6	4195: 18099 e	TRUE
14083	FALSE	500	62.81	20	20.5	40.2	3362: 13936	TRUE
9962	FALSE	500	81.04	20	21.1	40.2	3362: 13936	TRUE
13941	FALSE	500	152.78	20	20	20.8	3275: 13439	TRUE
13439	FALSE	500	153.51	20	20	19.6	3363: 13941	TRUE
13092	FALSE	500	443.16	20	20	39.1	3580: 14992	TRUE
15033	TRUE	500	622.24	20	20	32.7	3621: 15198	TRUE
13280	TRUE	500	685.07	20	20	35.3	3248: 13306	TRUE
15198	TRUE	500	706.86	20	20	15.1	3584: 15033	TRUE
12714	TRUE	500	713.18	20	20	39	3580: 14992	TRUE
18110	TRUE	500	720.79	20	20	39	3580: 14992	TRUE
16538	TRUE	500	833.66	20	20	20.6	23299: J-52	TRUE
15985	TRUE	500	853.46	20	20	38.8	3580: 14992	TRUE
13306	TRUE	500	942.79	20	20	10.6	3240: 13280	TRUE
3086	TRUE	500	1,058.81	20	20.1	39.6	3362: 13936	TRUE
2344	TRUE	500	1,102.15	20	20	35.9	779: 2393	TRUE
19328	TRUE	500	1,103.38	20	20	36.2	3903: 16538	TRUE
16984	TRUE	500	1,109.43	20	20	36.2	3903: 16538	TRUE
17073	TRUE	500	1,127.94	20	20	31.6	23453: J-59	TRUE
14905	TRUE	500	1,142.03	20	20	34.3	3903: 16538	TRUE
17565	TRUE	500	1,150.87	20	20	39	3580: 14992	TRUE
2393	TRUE	500	1,173.56	20	20	25.1	762: 2344	TRUE
19729	TRUE	500	1,193.47	20	20	32.2	4525: 19656	TRUE
19656	TRUE	500	1,196.35	20	20	30.3	4537: 19729	TRUE
18780	TRUE	500	1,199.33	20	20	38.9	3580: 14992	TRUE
1915	TRUE	500	1,234.01	20	20	29.1	652: 1931	TRUE
2249	TRUE	500	1,250.62	20	20	27	779: 2393	TRUE
1706	TRUE	500	1,259.84	20	20	30.6	631: 1845	TRUE
7639	TRUE	500	1,272.96	20	20	38.9	3580: 14992	TRUE
16376	TRUE	500	1,287.72	20	20	5.5	3903: 16538	TRUE
19209	TRUE	500	1,290.49	20	20	38.9	3580: 14992	TRUE
1931	TRUE	500	1,306.79	20	20	36.2	648: 1915	TRUE
3374	TRUE	500	1,312.90	20	20	26.9	958: 3086	TRUE
9484	TRUE	500	1,317.65	20	20	36.4	3903: 16538	TRUE
1845	TRUE	500	1,330.17	20	20	25.5	592: 1706	TRUE
20499	TRUE	500	1,362.90	20	20	35.4	3903: 16538	TRUE
4155	TRUE	500	1,370.75	20	20	39.5	3362: 13936	TRUE
2211	TRUE	500	1,374.98	20	20	15.3	779: 2393	TRUE
13448	TRUE	500	1,385.22	20	20	35.5	3903: 16538	TRUE
19949	TRUE	500	1,388.18	20	20	22.1	4537: 19729	TRUE
2628	TRUE	500	1,390.42	20	20	39.5	3362: 13936	TRUE
21572	TRUE	500	1,394.15	20	20	21.1	22235: 22184	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
11154	TRUE	500	1,399.82	20	20	35.4	23299: J-52	TRUE
19071	TRUE	500	1,407.14	20	20	25.6	4454: 19328	TRUE
18962	TRUE	500	1,408.86	20	20	38.7	3903: 16538	TRUE
21273	TRUE	500	1,410.36	20	20	31.8	22235: 22184	TRUE
21652	TRUE	500	1,419.06	20	20	19	22235: 22184	TRUE
10368	TRUE	500	1,424.91	20	20	36.8	2626: 10377	TRUE
17890	TRUE	500	1,426.83	20	20	38.8	4124: 17726	TRUE
9186	TRUE	500	1,437.52	20	20	34.6	2411: 9484	TRUE
6557	TRUE	500	1,443.93	20	20	39.3	1757: 6548	TRUE
6360	TRUE	500	1,445.51	20	20	38.9	3362: 13936	TRUE
2263	TRUE	500	1,447.89	20	20	39.4	3362: 13936	TRUE
18112	TRUE	500	1,448.10	20	20	19.6	4198: 18110	TRUE
13936	TRUE	500	1,467.92	20	20	36.7	3903: 16538	TRUE
2006	TRUE	500	1,470.56	20	20	29.7	631: 1845	TRUE
2446	TRUE	500	1,478.12	20	20	17.9	779: 2393	TRUE
7895	TRUE	500	1,479.92	20	20	38.8	3362: 13936	TRUE
7332	TRUE	500	1,482.54	20	20	22.5	24284: J-93	TRUE
2120	TRUE	500	1,483.77	20	20	39.4	3362: 13936	TRUE
6628	TRUE	500	1,484.56	20	20	38.3	3362: 13936	TRUE
1261	TRUE	500	1,487.87	20	20	39.4	3362: 13936	TRUE
5607	TRUE	500	1,488.96	20	20	39.1	3362: 13936	TRUE
2555	TRUE	500	1,495.37	20	20	18.9	779: 2393	TRUE
7663	TRUE	500	1,497.27	20	20	38.8	3362: 13936	TRUE
13378	TRUE	500	1,499.89	20	20	27.6	3362: 13936	TRUE
17889	TRUE	500	1,500.98	20	20	20.9	4158: 17890	TRUE
20779	TRUE	500	1,510.30	20	20	34.2	4745: 20715	TRUE
9318	TRUE	500	1,511.47	20	20	31.3	22386: J-5	TRUE
2294	TRUE	500	1,514.83	20	20	39.4	3362: 13936	TRUE
1939	TRUE	500	1,516.97	20	20	15.9	631: 1845	TRUE
21511	TRUE	500	1,517.47	20	20	22.9	22235: 22184	TRUE
14010	TRUE	500	1,519.85	20	28.4	0	31755: J-141	TRUE
2575	TRUE	500	1,522.24	20	20	19.1	779: 2393	TRUE
1801	TRUE	500	1,524.30	20	20	35.1	631: 1845	TRUE
6548	TRUE	500	1,525.46	20	20	25	1758: 6557	TRUE
2048	TRUE	500	1,529.02	20	20	39.4	3362: 13936	TRUE
3825	TRUE	500	1,535.08	20	20	10.1	1217: 4155	TRUE
21319	TRUE	500	1,540.95	20	20	21.8	22235: 22184	TRUE
18985	TRUE	500	1,550.22	20	20	13.9	4426: 19209	TRUE
16161	TRUE	500	1,554.85	20	20	27.9	3792: 15969	TRUE
6568	TRUE	500	1,555.37	20	20	38.8	3362: 13936	TRUE
2601	TRUE	500	1,556.02	20	20	39.4	3362: 13936	TRUE
17369	TRUE	500	1,556.29	20	20	23.4	23453: J-59	TRUE
12788	TRUE	500	1,558.72	20	20	38.8	3580: 14992	TRUE
10377	TRUE	500	1,568.04	20	20	19.8	2624: 10368	TRUE
6482	TRUE	500	1,577.50	20	20	34.2	1711: 6360	TRUE
2195	TRUE	500	1,577.66	20	20	26.9	707: 2120	TRUE
21459	TRUE	500	1,578.96	20	20	18.5	22235: 22184	TRUE
19111	TRUE	500	1,579.12	20	20	26.3	4379: 18962	TRUE
21512	TRUE	500	1,583.08	20	20	13.4	22235: 22184	TRUE
21385	TRUE	500	1,589.39	20	20	16.8	22235: 22184	TRUE
8247	TRUE	500	1,600.68	20	20	27.8	2194: 8546	TRUE
16713	TRUE	500	1,602.76	20	20	34.4	3903: 16538	TRUE
1569	TRUE	500	1,603.81	20	20	39.3	3362: 13936	TRUE
15969	TRUE	500	1,607.16	20	20	24.9	3828: 16161	TRUE
1774	TRUE	500	1,612.40	20	20	39.3	3362: 13936	TRUE
6802	TRUE	500	1,623.57	20	20	21.4	1777: 6628	TRUE
13218	TRUE	500	1,629.87	20	20	38.8	3580: 14992	TRUE
17588	TRUE	500	1,631.49	20	20	38.7	3580: 14992	TRUE
12881	TRUE	500	1,634.93	20	20	25.1	3263: 13378	TRUE
2937	TRUE	500	1,635.67	20	20	39.2	3362: 13936	TRUE
8546	TRUE	500	1,641.20	20	20	28.2	2121: 8247	TRUE
1715	TRUE	500	1,641.91	20	20	39.3	3362: 13936	TRUE
21279	TRUE	500	1,642.45	20	20	16.9	22235: 22184	TRUE
6441	TRUE	500	1,645.47	20	20	27.9	1768: 6595	TRUE
1853	TRUE	500	1,645.64	20	20	30.7	608: 1774	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12									
Phase 3 Fire Flow Results									
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?	
5661	TRUE	500	1,647.58	20	20	32.7	1588: 5838	TRUE	
1953	TRUE	500	1,650.60	20	20	39.3	3362: 13936	TRUE	
9813	TRUE	500	1,657.14	20	20	16.4	2624: 10368	TRUE	
15740	TRUE	500	1,657.51	20	20	27.1	3792: 15969	TRUE	
14760	TRUE	500	1,658.83	20	20	23.4	3396: 14083	TRUE	
12429	TRUE	500	1,662.13	20	20	24.5	3263: 13378	TRUE	
12140	TRUE	500	1,664.17	20	20	27.4	3040: 12324	TRUE	
20715	TRUE	500	1,665.93	20	20	16.5	4758: 20779	TRUE	
6167	TRUE	500	1,667.32	20	20	38.7	3362: 13936	TRUE	
16243	TRUE	500	1,667.82	20	32.4	0	3903: 16538	TRUE	
6595	TRUE	500	1,668.24	20	20	25.8	1727: 6441	TRUE	
2337	TRUE	500	1,680.57	20	20	39.3	3362: 13936	TRUE	
12324	TRUE	500	1,680.80	20	20	26.7	3000: 12140	TRUE	
16466	TRUE	500	1,680.98	20	20	36.9	3903: 16538	TRUE	
3655	TRUE	500	1,684.81	20	20	39.3	3362: 13936	TRUE	
19018	TRUE	500	1,685.48	20	20	34.1	3903: 16538	TRUE	
1966	TRUE	500	1,686.91	20	20	39.3	3362: 13936	TRUE	
1886	TRUE	500	1,689.03	20	20	32	608: 1774	TRUE	
18640	TRUE	500	1,693.67	20	20	37	3903: 16538	TRUE	
10011	TRUE	500	1,703.87	20	20	10.3	2624: 10368	TRUE	
18357	TRUE	500	1,705.52	20	20	34	3903: 16538	TRUE	
20337	TRUE	500	1,706.85	20	20	26.3	4701: 20480	TRUE	
2635	TRUE	500	1,707.70	20	20	39.2	3362: 13936	TRUE	
9971	TRUE	500	1,714.12	20	20	37.8	3362: 13936	TRUE	
20640	TRUE	500	1,715.36	20	20	19.5	4758: 20779	TRUE	
6587	TRUE	500	1,717.66	20	20	19.2	1727: 6441	TRUE	
1945	TRUE	500	1,722.52	20	20	39.2	3362: 13936	TRUE	
14461	TRUE	500	1,724.42	20	20	15.7	3396: 14083	TRUE	
1708	TRUE	500	1,728.32	20	20	33.5	616: 1801	TRUE	
12277	TRUE	500	1,730.66	20	20	25.8	3040: 12324	TRUE	
2762	TRUE	500	1,730.67	20	20	14.5	779: 2393	TRUE	
20480	TRUE	500	1,731.07	20	20	26.5	4672: 20337	TRUE	
12628	TRUE	500	1,731.72	20	20	23.6	3000: 12140	TRUE	
5838	TRUE	500	1,738.37	20	20	23.3	1551: 5661	TRUE	
8548	TRUE	500	1,739.61	20	20	17.6	2194: 8546	TRUE	
12467	TRUE	500	1,740.70	20	20	38.6	3362: 13936	TRUE	
6499	TRUE	500	1,741.39	20	20	38.1	3362: 13936	TRUE	
19232	TRUE	500	1,742.11	20	20	32.6	4391: 19018	TRUE	
17461	TRUE	500	1,742.63	20	20	22.5	4158: 17890	TRUE	
10618	TRUE	500	1,748.21	20	20	38.6	3362: 13936	TRUE	
19531	TRUE	500	1,749.88	20	20	38.3	23299: J-52	TRUE	
16404	TRUE	500	1,755.17	20	20	38.7	3362: 13936	TRUE	
15450	TRUE	500	1,769.99	20	20	31.5	3651: 15322	TRUE	
20107	TRUE	500	1,775.45	20	20	33.7	23299: J-52	TRUE	
17726	TRUE	500	1,776.98	20	20	21.1	4158: 17890	TRUE	
3182	TRUE	500	1,782.56	20	20	39.2	3362: 13936	TRUE	
10493	TRUE	500	1,783.37	20	20	37.8	3362: 13936	TRUE	
12460	TRUE	500	1,784.97	20	20	34.4	3903: 16538	TRUE	
8124	TRUE	500	1,785.24	20	20	37.9	3903: 16538	TRUE	
8303	TRUE	500	1,787.50	20	20	7.5	2121: 8247	TRUE	
9853	TRUE	500	1,788.39	20	20	4.2	2624: 10368	TRUE	
10100	TRUE	500	1,789.99	20	20	2	2624: 10368	TRUE	
20560	TRUE	500	1,790.37	20	20	38.3	3903: 16538	TRUE	
7718	TRUE	500	1,796.84	20	20	38.6	3362: 13936	TRUE	
13493	TRUE	500	1,797.22	20	20	33.9	3903: 16538	TRUE	
12423	TRUE	500	1,799.61	20	20	20.8	3263: 13378	TRUE	
6154	TRUE	500	1,800.56	20	20	31	1673: 6205	TRUE	
7474	TRUE	500	1,803.80	20	20	37.8	3903: 16538	TRUE	
18100	TRUE	500	1,806.87	20	20	38.8	3580: 14992	TRUE	
2439	TRUE	500	1,814.92	20	20	35.8	761: 2337	TRUE	
3510	TRUE	500	1,819.60	20	20	39	3362: 13936	TRUE	
2926	TRUE	500	1,820.36	20	20	39.1	3362: 13936	TRUE	
20281	TRUE	500	1,820.90	20	20	30.5	4701: 20480	TRUE	
3295	TRUE	500	1,822.15	20	20	5.6	1217: 4155	TRUE	
16396	TRUE	500	1,824.46	20	20	27.9	3886: 16441	TRUE	

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
19120	TRUE	500	1,824.55	20	20	33.5	3903: 16538	TRUE
6105	TRUE	500	1,824.75	20	20	38.4	3362: 13936	TRUE
21277	TRUE	500	1,835.39	20	20	28.6	22235: 22184	TRUE
13134	TRUE	500	1,837.45	20	20	33.4	23299: J-52	TRUE
6245	TRUE	500	1,838.76	20	20	22.4	1727: 6441	TRUE
20539	TRUE	500	1,840.58	20	20	38.8	3580: 14992	TRUE
1772	TRUE	500	1,842.65	20	20	25.3	608: 1774	TRUE
1581	TRUE	500	1,851.80	20	20	39.1	3362: 13936	TRUE
4543	TRUE	500	1,857.10	20	20	38.8	3362: 13936	TRUE
19650	TRUE	500	1,858.06	20	20	19.9	4701: 20480	TRUE
18175	TRUE	500	1,858.25	20	20	38.8	3362: 13936	TRUE
6205	TRUE	500	1,859.46	20	20	24.7	1656: 6154	TRUE
15322	TRUE	500	1,864.40	20	20	23.3	3677: 15450	TRUE
19585	TRUE	500	1,869.11	20	20	31.5	4521: 19648	TRUE
16441	TRUE	500	1,872.15	20	20	23.2	3876: 16396	TRUE
18414	TRUE	500	1,872.21	20	20	12.2	4198: 18110	TRUE
20475	TRUE	500	1,873.87	20	20	19.4	4701: 20480	TRUE
6411	TRUE	500	1,873.87	20	20	14.4	1727: 6441	TRUE
19288	TRUE	500	1,876.49	20	20	33.2	3903: 16538	TRUE
12272	TRUE	500	1,880.72	20	20	18.6	3263: 13378	TRUE
19784	TRUE	500	1,889.49	20	20	31.4	4531: 19711	TRUE
6399	TRUE	500	1,892.19	20	20	16	1727: 6441	TRUE
11232	TRUE	500	1,893.39	20	20	34.2	3903: 16538	TRUE
6354	TRUE	500	1,901.63	20	20	38	3362: 13936	TRUE
10526	TRUE	500	1,901.88	20	20	28.7	2678: 10618	TRUE
6889	TRUE	500	1,901.96	20	20	18.3	1777: 6628	TRUE
2556	TRUE	500	1,904.54	20	20	39.1	3362: 13936	TRUE
15435	TRUE	500	1,905.03	20	20	33.3	3362: 13936	TRUE
6155	TRUE	500	1,907.47	20	20	18.6	1727: 6441	TRUE
10984	TRUE	500	1,909.67	20	20	34.2	3903: 16538	TRUE
2598	TRUE	500	1,913.71	20	20	37	827: 2588	TRUE
18738	TRUE	500	1,918.40	20	20	29.7	4429: 19232	TRUE
2119	TRUE	500	1,923.25	20	20	36.5	750: 2287	TRUE
9522	TRUE	500	1,923.50	20	28	0	2624: 10368	TRUE
12951	TRUE	500	1,925.34	20	20	31.1	3227: 13221	TRUE
16105	TRUE	500	1,927.94	20	20	38.6	3580: 14992	TRUE
18930	TRUE	500	1,927.97	20	20	33	23299: J-52	TRUE
13221	TRUE	500	1,931.79	20	20	26.6	3172: 12951	TRUE
7344	TRUE	500	1,934.70	20	20	15.1	24187: J-90	TRUE
1816	TRUE	500	1,935.26	20	20	26.4	555: 1569	TRUE
15536	TRUE	500	1,936.85	20	20	37	3580: 14992	TRUE
15811	TRUE	500	1,943.58	20	20	33.1	3903: 16538	TRUE
12012	TRUE	500	1,944.60	20	20	34	3903: 16538	TRUE
19938	TRUE	500	1,944.98	20	20	13.8	4701: 20480	TRUE
13491	TRUE	500	1,946.47	20	20	38.3	3362: 13936	TRUE
20284	TRUE	500	1,947.09	20	20	13.3	4701: 20480	TRUE
7970	TRUE	500	1,947.22	20	20	38.3	2722: 10829	TRUE
6259	TRUE	500	1,952.52	20	20	14.8	1664: 6167	TRUE
2588	TRUE	500	1,956.71	20	20	39.1	3362: 13936	TRUE
4989	TRUE	500	1,956.99	20	20	39	3362: 13936	TRUE
12904	TRUE	500	1,958.80	20	20	32.8	3903: 16538	TRUE
20199	TRUE	500	1,958.92	20	20	16.2	4701: 20480	TRUE
19711	TRUE	500	1,958.97	20	20	32.8	3903: 16538	TRUE
19793	TRUE	500	1,959.00	20	20	12.8	4701: 20480	TRUE
20222	TRUE	500	1,960.00	20	20	32.8	3903: 16538	TRUE
2731	TRUE	500	1,962.52	20	20	32.6	831: 2598	TRUE
13207	TRUE	500	1,964.87	20	20	9.9	3263: 13378	TRUE
7631	TRUE	500	1,966.09	20	20	36.2	2056: 7970	TRUE
14250	TRUE	500	1,967.07	20	20	19.6	3396: 14083	TRUE
20150	TRUE	500	1,967.39	20	20	27.9	4521: 19648	TRUE
20076	TRUE	500	1,968.97	20	20	12.5	4701: 20480	TRUE
9562	TRUE	500	1,976.16	20	20	22.1	2346: 9186	TRUE
7077	TRUE	500	1,978.36	20	20	38.2	2722: 10829	TRUE
15904	TRUE	500	1,983.36	20	20	38.5	3362: 13936	TRUE
15935	TRUE	500	1,984.56	20	54.3	0	3903: 16538	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
16539	TRUE	500	1,987.39	20	20	31.4	3890: 16466	TRUE
2287	TRUE	500	1,988.11	20	20	39	3362: 13936	TRUE
6246	TRUE	500	1,988.40	20	20	24.4	1673: 6205	TRUE
19648	TRUE	500	1,989.31	20	20	27.3	4623: 20107	TRUE
2490	TRUE	500	1,992.67	20	20	25	838: 2635	TRUE
2521	TRUE	500	1,992.68	20	20	33.8	791: 2439	TRUE
8635	TRUE	500	1,996.71	20	20	27.1	2624: 10368	TRUE
17302	TRUE	500	1,998.60	20	20	38.5	3580: 14992	TRUE
20648	TRUE	500	2,001.42	20	20	38.1	3903: 16538	TRUE
12085	TRUE	500	2,007.90	20	20	15.8	3040: 12324	TRUE
12023	TRUE	500	2,011.21	20	20	33.6	3903: 16538	TRUE
15966	TRUE	500	2,016.32	20	43.4	0	3903: 16538	TRUE
2143	TRUE	500	2,019.21	20	20	39	3362: 13936	TRUE
2093	TRUE	500	2,024.67	20	20	39	3362: 13936	TRUE
20158	TRUE	500	2,024.74	20	20	31.4	4536: 19725	TRUE
5942	TRUE	500	2,028.06	20	20	38.2	3362: 13936	TRUE
14992	TRUE	500	2,037.72	20	20	39.8	3362: 13936	TRUE
9871	TRUE	500	2,048.39	20	20	34.9	3903: 16538	TRUE
9559	TRUE	500	2,056.13	20	20	34.7	23299: J-52	TRUE
1920	TRUE	500	2,057.05	20	20	38	658: 1945	TRUE
4207	TRUE	500	2,058.95	20	20	36	1302: 4543	TRUE
2236	TRUE	500	2,061.03	20	20	35.2	697: 2093	TRUE
8501	TRUE	500	2,061.16	20	20	34.4	3903: 16538	TRUE
2744	TRUE	500	2,071.00	20	20	38.9	3362: 13936	TRUE
19956	TRUE	500	2,072.48	20	20	14.6	4701: 20480	TRUE
9329	TRUE	500	2,073.20	20	20	37	2722: 10829	TRUE
15103	TRUE	500	2,074.32	20	20	28.4	3677: 15450	TRUE
19398	TRUE	500	2,078.15	20	20	24.1	4521: 19648	TRUE
18960	TRUE	500	2,084.21	20	20	38	3903: 16538	TRUE
18545	TRUE	500	2,088.77	20	20	22.1	4244: 18357	TRUE
17028	TRUE	500	2,090.45	20	20	38.5	3580: 14992	TRUE
17131	TRUE	500	2,092.81	20	20	32.2	3903: 16538	TRUE
16264	TRUE	500	2,093.17	20	20	26.5	3876: 16396	TRUE
9544	TRUE	500	2,097.54	20	20	34.7	23299: J-52	TRUE
15710	TRUE	500	2,097.55	20	66.4	0	23299: J-52	TRUE
14327	TRUE	500	2,097.97	20	20	17.9	3263: 13378	TRUE
13057	TRUE	500	2,099.87	20	20	31.5	3903: 16538	TRUE
2159	TRUE	500	2,107.13	20	20	38.9	3362: 13936	TRUE
11621	TRUE	500	2,107.14	20	20	33.2	2972: 12012	TRUE
1134	TRUE	500	2,107.63	20	26.4	0	477: 1261	TRUE
11416	TRUE	500	2,112.47	20	20	32.7	2750: 10984	TRUE
19725	TRUE	500	2,113.04	20	20	26.6	4636: 20158	TRUE
3375	TRUE	500	2,119.55	20	20	18.2	1062: 3510	TRUE
13764	TRUE	500	2,121.25	20	21.6	0	31755: J-141	TRUE
2059	TRUE	500	2,122.36	20	20	38.9	3362: 13936	TRUE
17256	TRUE	500	2,126.74	20	20	38.5	3580: 14992	TRUE
15622	TRUE	500	2,133.39	20	51.9	0	23299: J-52	TRUE
7130	TRUE	500	2,135.57	20	20	23	2005: 7718	TRUE
8771	TRUE	500	2,138.45	20	20	34.5	2303: 9017	TRUE
2974	TRUE	500	2,141.05	20	20	25.6	838: 2635	TRUE
19890	TRUE	500	2,144.32	20	20	6.7	4701: 20480	TRUE
6049	TRUE	500	2,144.68	20	20	28.5	1614: 5942	TRUE
11440	TRUE	500	2,144.81	20	20	27.1	2807: 11232	TRUE
6196	TRUE	500	2,146.49	20	20	34.6	1656: 6154	TRUE
16528	TRUE	500	2,155.59	20	20	8.7	3890: 16466	TRUE
20361	TRUE	500	2,155.76	20	20	37.6	3903: 16538	TRUE
16592	TRUE	500	2,157.96	20	20	38.4	3580: 14992	TRUE
19604	TRUE	500	2,158.02	20	20	22.2	4531: 19711	TRUE
5988	TRUE	500	2,158.18	20	20	38.7	3362: 13936	TRUE
20745	TRUE	500	2,160.32	20	20	38.5	3903: 16538	TRUE
2242	TRUE	500	2,161.40	20	20	24.8	750: 2287	TRUE
12347	TRUE	500	2,163.39	20	20	15.7	31622: J-140	TRUE
19105	TRUE	500	2,166.53	20	20	16.3	4429: 19232	TRUE
5702	TRUE	500	2,167.18	20	20	38.7	3362: 13936	TRUE
18493	TRUE	500	2,170.96	20	20	31.8	23299: J-52	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
12354	TRUE	500	2,172.41	20	20	38.2	3362: 13936	TRUE
9082	TRUE	500	2,173.41	20	27.5	0	2624: 10368	TRUE
14733	TRUE	500	2,176.64	20	20	18.6	3903: 16538	TRUE
13111	TRUE	500	2,177.88	20	20	31.7	23299: J-52	TRUE
3177	TRUE	500	2,180.12	20	20	34.1	1062: 3510	TRUE
17967	TRUE	500	2,180.95	20	20	26.2	4212: 18175	TRUE
7302	TRUE	500	2,182.08	20	20	37.1	2722: 10829	TRUE
2904	TRUE	500	2,187.17	20	20	35.7	838: 2635	TRUE
12580	TRUE	500	2,187.90	20	20	9.4	3263: 13378	TRUE
15459	TRUE	500	2,189.64	20	20	31.8	3903: 16538	TRUE
9167	TRUE	500	2,192.91	20	20	34.5	3903: 16538	TRUE
18784	TRUE	500	2,205.15	20	20	31.6	3903: 16538	TRUE
3219	TRUE	500	2,205.22	20	20	38.8	3362: 13936	TRUE
14122	TRUE	500	2,205.40	20	20	30.9	3368: 13968	TRUE
16010	TRUE	500	2,206.58	20	20	38.4	3362: 13936	TRUE
19612	TRUE	500	2,207.56	20	20	30.1	4701: 20480	TRUE
6905	TRUE	500	2,210.64	20	20	35.9	2722: 10829	TRUE
18060	TRUE	500	2,210.84	20	20	31.6	3903: 16538	TRUE
4892	TRUE	500	2,212.45	20	20	26	1405: 4989	TRUE
17590	TRUE	500	2,214.48	20	20	36	4001: 17028	TRUE
2572	TRUE	500	2,216.14	20	20	35.3	827: 2588	TRUE
9110	TRUE	500	2,224.31	20	20	35.5	2722: 10829	TRUE
12733	TRUE	500	2,230.35	20	20	8	3263: 13378	TRUE
10829	TRUE	500	2,230.40	20	20	34.2	2738: 10919	TRUE
9485	TRUE	500	2,231.32	20	20	31.6	2425: 9544	TRUE
1995	TRUE	500	2,232.08	20	20	33.2	608: 1774	TRUE
14891	TRUE	500	2,232.90	20	20	20.3	3675: 15435	TRUE
13968	TRUE	500	2,236.46	20	20	29	3396: 14083	TRUE
18583	TRUE	500	2,241.11	20	20	26	4274: 18493	TRUE
7370	TRUE	500	2,243.02	20	20	14.6	2005: 7718	TRUE
19276	TRUE	500	2,243.69	20	20	37.1	3903: 16538	TRUE
12059	TRUE	500	2,243.88	20	20	31.7	2957: 11929	TRUE
6570	TRUE	500	2,247.85	20	20	13.2	1727: 6441	TRUE
13845	TRUE	500	2,249.51	20	20	38.6	3580: 14992	TRUE
19244	TRUE	500	2,253.66	20	20	20.2	4429: 19232	TRUE
14809	TRUE	500	2,255.47	20	20	30.8	3362: 13936	TRUE
10209	TRUE	500	2,255.98	20	20	34.5	2722: 10829	TRUE
2638	TRUE	500	2,256.07	20	20	34.6	827: 2588	TRUE
15286	TRUE	500	2,259.99	20	20	37.9	3362: 13936	TRUE
2334	TRUE	500	2,262.50	20	20	38.7	3362: 13936	TRUE
8023	TRUE	500	2,265.49	20	20	24.6	2624: 10368	TRUE
9864	TRUE	500	2,266.02	20	20	34.9	2722: 10829	TRUE
6068	TRUE	500	2,267.15	20	20	31	1614: 5942	TRUE
2649	TRUE	500	2,277.93	20	20	37	838: 2635	TRUE
3285	TRUE	500	2,280.11	20	20	35.1	977: 3177	TRUE
10911	TRUE	500	2,286.99	20	20	9.9	2678: 10618	TRUE
6286	TRUE	500	2,289.49	20	20	27.3	1656: 6154	TRUE
12269	TRUE	500	2,290.41	20	20	28	3081: 12508	TRUE
13326	TRUE	500	2,291.04	20	20	25.2	3289: 13491	TRUE
1617	TRUE	500	2,293.61	20	20	30.6	593: 1708	TRUE
12508	TRUE	500	2,295.22	20	20	28.3	3025: 12269	TRUE
19451	TRUE	500	2,295.61	20	20	31.2	3903: 16538	TRUE
11734	TRUE	500	2,296.44	20	20	36.1	3362: 13936	TRUE
9017	TRUE	500	2,296.62	20	20	30.4	2237: 8771	TRUE
3126	TRUE	500	2,297.86	20	20	38.9	3362: 13936	TRUE
4626	TRUE	500	2,298.81	20	20	34.2	1405: 4989	TRUE
6598	TRUE	500	2,299.77	20	20	38.1	3362: 13936	TRUE
5508	TRUE	500	2,300.16	20	20	7.1	1537: 5607	TRUE
19369	TRUE	500	2,301.63	20	20	38.4	3903: 16538	TRUE
20646	TRUE	500	2,305.42	20	20	24.8	4736: 20648	TRUE
7152	TRUE	500	2,305.84	20	20	25.9	24284: J-93	TRUE
16204	TRUE	500	2,307.19	20	20	31.4	3903: 16538	TRUE
3317	TRUE	500	2,310.87	20	20	36.2	1026: 3367	TRUE
7528	TRUE	500	2,311.69	20	20	6.6	2005: 7718	TRUE
2288	TRUE	500	2,312.64	20	20	38.7	3362: 13936	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
15608	TRUE	500	2,322.93	20	20	31.2	3903: 16538	TRUE
16447	TRUE	500	2,323.14	20	20	36	3903: 16538	TRUE
11929	TRUE	500	2,326.02	20	20	26.6	2982: 12059	TRUE
7050	TRUE	500	2,327.21	20	20	35.7	1831: 6873	TRUE
15761	TRUE	500	2,331.50	20	20	37.5	3362: 13936	TRUE
12331	TRUE	500	2,338.64	20	20	33.7	3141: 12788	TRUE
14088	TRUE	500	2,339.63	20	20	30.5	3903: 16538	TRUE
20257	TRUE	500	2,342.44	20	20	38.4	23299: J-52	TRUE
7266	TRUE	500	2,343.02	20	20	25.7	1990: 7639	TRUE
4607	TRUE	500	2,343.73	20	20	38.4	3362: 13936	TRUE
18680	TRUE	500	2,345.50	20	20	27.4	4337: 18784	TRUE
6309	TRUE	500	2,347.98	20	20	37.9	3362: 13936	TRUE
8437	TRUE	500	2,350.38	20	20	37.1	3903: 16538	TRUE
12258	TRUE	500	2,357.55	20	20	3.9	3263: 13378	TRUE
15157	TRUE	500	2,359.16	20	20	19.3	3675: 15435	TRUE
8539	TRUE	500	2,359.75	20	20	30.2	2303: 9017	TRUE
4516	TRUE	500	2,362.29	20	20	38.4	3362: 13936	TRUE
5485	TRUE	500	2,364.58	20	20	39.1	3362: 13936	TRUE
2885	TRUE	500	2,365.95	20	20	38.7	3362: 13936	TRUE
13595	TRUE	500	2,367.86	20	24.1	0	31755: J-141	TRUE
10252	TRUE	500	2,371.34	20	20	36.9	3362: 13936	TRUE
13319	TRUE	500	2,372.06	20	20	38	3362: 13936	TRUE
7685	TRUE	500	2,377.59	20	20	20.6	2040: 7895	TRUE
11117	TRUE	500	2,378.24	20	20	33.1	2722: 10829	TRUE
6873	TRUE	500	2,378.41	20	20	27.2	1866: 7050	TRUE
2620	TRUE	500	2,378.53	20	20	30.9	827: 2588	TRUE
14069	TRUE	500	2,378.84	20	20	5.5	3263: 13378	TRUE
2061	TRUE	500	2,381.71	20	20	38.8	3362: 13936	TRUE
20526	TRUE	500	2,383.37	20	20	37.4	3903: 16538	TRUE
10130	TRUE	500	2,384.15	20	20	23.8	2529: 9971	TRUE
2864	TRUE	500	2,386.43	20	20	35.3	923: 2937	TRUE
11259	TRUE	500	2,388.28	20	20	36.1	3362: 13936	TRUE
15929	TRUE	500	2,389.19	20	20	19.3	3886: 16441	TRUE
8445	TRUE	500	2,393.14	20	21.1	0	2624: 10368	TRUE
20688	TRUE	500	2,395.71	20	20	38.3	3903: 16538	TRUE
14186	TRUE	500	2,396.61	20	20	37.8	3362: 13936	TRUE
2395	TRUE	500	2,398.91	20	20	38.8	3362: 13936	TRUE
13989	TRUE	500	2,400.45	20	20	35.3	3362: 13936	TRUE
15190	TRUE	500	2,404.35	20	20	11.5	3675: 15435	TRUE
13386	TRUE	500	2,404.99	20	20	30.5	3903: 16538	TRUE
2923	TRUE	500	2,407.83	20	20	38.8	3362: 13936	TRUE
15247	TRUE	500	2,408.05	20	20	11.3	3675: 15435	TRUE
15274	TRUE	500	2,409.22	20	57.3	0	3903: 16538	TRUE
2457	TRUE	500	2,409.86	20	20	32.2	827: 2588	TRUE
6182	TRUE	500	2,410.79	20	20	32.5	1614: 5942	TRUE
11829	TRUE	500	2,410.91	20	20	37.9	3362: 13936	TRUE
14966	TRUE	500	2,412.77	20	20	25.4	3600: 15103	TRUE
17270	TRUE	500	2,417.99	20	20	32.7	4046: 17256	TRUE
12500	TRUE	500	2,422.01	20	20	1.7	3263: 13378	TRUE
6183	TRUE	500	2,427.04	20	20	35.5	1707: 6354	TRUE
18683	TRUE	500	2,433.07	20	20	38.4	3903: 16538	TRUE
17550	TRUE	500	2,436.43	20	20	30.4	23299: J-52	TRUE
12731	TRUE	500	2,439.13	20	20	37.9	3362: 13936	TRUE
15374	TRUE	500	2,440.45	20	36.7	0	23299: J-52	TRUE
11535	TRUE	500	2,443.83	20	20	30.5	3903: 16538	TRUE
4284	TRUE	500	2,444.52	20	20	38.8	3362: 13936	TRUE
17948	TRUE	500	2,444.85	20	20	6.2	4158: 17890	TRUE
13821	TRUE	500	2,450.35	20	20.4	0	3263: 13378	TRUE
14027	TRUE	500	2,451.04	20	21.8	0	31755: J-141	TRUE
8930	TRUE	500	2,453.51	20	20	25.1	2303: 9017	TRUE
13736	TRUE	500	2,454.68	20	20	37.8	3362: 13936	TRUE
2678	TRUE	500	2,456.08	20	20	30.9	827: 2588	TRUE
12581	TRUE	500	2,456.94	20	20	27.6	3081: 12508	TRUE
5760	TRUE	500	2,459.14	20	20	25.8	1557: 5702	TRUE
13278	TRUE	500	2,461.89	20	20	0.3	3263: 13378	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
12612	TRUE	500	2,465.51	20	20	0.2	3263: 13378	TRUE
14624	TRUE	500	2,466.03	20	20	30	3903: 16538	TRUE
13014	TRUE	500	2,466.59	20	20	0.2	3263: 13378	TRUE
6664	TRUE	500	2,467.47	20	20	12.1	2005: 7718	TRUE
13640	TRUE	500	2,471.34	20	23	0	3263: 13378	TRUE
12737	TRUE	500	2,471.53	20	20	36.7	2722: 10829	TRUE
7407	TRUE	500	2,471.60	20	20	25.4	1866: 7050	TRUE
17034	TRUE	500	2,472.86	20	20	37	4158: 17890	TRUE
15747	TRUE	500	2,473.86	20	20	26.4	3710: 15608	TRUE
4027	TRUE	500	2,474.39	20	20	38.8	3362: 13936	TRUE
3367	TRUE	500	2,476.92	20	20	24.4	1013: 3317	TRUE
18220	TRUE	500	2,480.55	20	20	9.5	4198: 18110	TRUE
18411	TRUE	500	2,481.78	20	20	30.2	3903: 16538	TRUE
17118	TRUE	500	2,488.13	20	20	33.1	3986: 16949	TRUE
15733	TRUE	500	2,489.03	20	20	27.8	3799: 16010	TRUE
2727	TRUE	500	2,489.16	20	20	21.1	827: 2588	TRUE
2426	TRUE	500	2,489.99	20	20	27.4	827: 2588	TRUE
16075	TRUE	500	2,490.80	20	20	14.9	3796: 15985	TRUE
16017	TRUE	500	2,494.88	20	20	5.6	3773: 15904	TRUE
18303	TRUE	500	2,495.14	20	20	25.7	4158: 17890	TRUE
18389	TRUE	500	2,496.72	20	20	25.3	4244: 18357	TRUE
17756	TRUE	500	2,498.56	20	20	25.5	4158: 17890	TRUE
11058	TRUE	500	2,504.42	20	20	37.6	2722: 10829	TRUE
3111	TRUE	500	2,507.49	20	20	17	978: 3182	TRUE
7616	TRUE	500	2,510.04	20	20	25.9	1957: 7474	TRUE
11911	TRUE	500	2,511.70	20	20	35	2907: 11734	TRUE
12107	TRUE	500	2,511.97	20	20	36.7	3362: 13936	TRUE
4592	TRUE	500	2,513.51	20	20	38.3	3362: 13936	TRUE
2099	TRUE	500	2,513.64	20	20	25.4	697: 2093	TRUE
2647	TRUE	500	2,515.51	20	20	23.8	827: 2588	TRUE
3728	TRUE	500	2,522.06	20	20	38.6	3362: 13936	TRUE
17976	TRUE	500	2,522.75	20	20	19.7	4158: 17890	TRUE
10919	TRUE	500	2,525.18	20	20	23.5	2722: 10829	TRUE
2553	TRUE	500	2,526.90	20	20	25.4	827: 2588	TRUE
1331	TRUE	500	2,527.13	20	20	33.5	477: 1261	TRUE
17225	TRUE	500	2,527.33	20	20	38.5	3362: 13936	TRUE
17315	TRUE	500	2,530.22	20	20	25.9	4055: 17302	TRUE
16949	TRUE	500	2,531.95	20	20	32.4	4024: 17118	TRUE
15254	TRUE	500	2,532.59	20	20	30.4	3903: 16538	TRUE
10770	TRUE	500	2,533.34	20	20	20.9	2722: 10829	TRUE
11866	TRUE	500	2,534.44	20	20	29.6	3903: 16538	TRUE
1868	TRUE	500	2,541.48	20	20	30.7	686: 2048	TRUE
7333	TRUE	500	2,541.73	20	20	37.5	3903: 16538	TRUE
1820	TRUE	500	2,544.86	20	20	29.7	622: 1816	TRUE
2459	TRUE	500	2,549.10	20	20	23.8	752: 2294	TRUE
20897	TRUE	500	2,552.93	20	20	37.2	3903: 16538	TRUE
13010	TRUE	500	2,553.62	20	20	37.8	3362: 13936	TRUE
11360	TRUE	500	2,557.25	20	20	27.5	2813: 11259	TRUE
7210	TRUE	500	2,557.36	20	20	15.1	1866: 7050	TRUE
19404	TRUE	500	2,558.20	20	20	25.6	4531: 19711	TRUE
16831	TRUE	500	2,559.18	20	20	38.3	3580: 14992	TRUE
19368	TRUE	500	2,559.72	20	20	14.6	4701: 20480	TRUE
6965	TRUE	500	2,559.92	20	20	34.6	2722: 10829	TRUE
8146	TRUE	500	2,562.65	20	23.2	0	2624: 10368	TRUE
9155	TRUE	500	2,564.84	20	20	15.2	2325: 9110	TRUE
7182	TRUE	500	2,567.73	20	20.8	0	2005: 7718	TRUE
9297	TRUE	500	2,568.46	20	20	16.7	2381: 9329	TRUE
7312	TRUE	500	2,569.71	20	20	0.4	2005: 7718	TRUE
18815	TRUE	500	2,572.30	20	20	35.8	23299: J-52	TRUE
18886	TRUE	500	2,572.40	20	20	18.7	4274: 18493	TRUE
14827	TRUE	500	2,573.12	20	20	29.4	3903: 16538	TRUE
6579	TRUE	500	2,576.84	20	20	37.4	23299: J-52	TRUE
4496	TRUE	500	2,582.26	20	20	38.7	3362: 13936	TRUE
5852	TRUE	500	2,582.92	20	20	37.5	3903: 16538	TRUE
6048	TRUE	500	2,587.83	20	20	38.4	3362: 13936	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
15051	TRUE	500	2,588.65	20	20	7.8	3903: 16538	TRUE
16948	TRUE	500	2,594.64	20	20	3.3	3890: 16466	TRUE
6906	TRUE	500	2,604.38	20	20	2.1	2005: 7718	TRUE
1089	TRUE	500	2,604.95	20	28.7	0	477: 1261	TRUE
5326	TRUE	500	2,605.46	20	20	38.7	3362: 13936	TRUE
3243	TRUE	500	2,610.97	20	20	38.7	3362: 13936	TRUE
2769	TRUE	500	2,611.76	20	20	38.6	3362: 13936	TRUE
14390	TRUE	500	2,616.96	20	20	38.4	3362: 13936	TRUE
10572	TRUE	500	2,621.81	20	20	36.6	3362: 13936	TRUE
13206	TRUE	500	2,627.84	20	20	38.2	3362: 13936	TRUE
19927	TRUE	500	2,631.02	20	20	37.3	3903: 16538	TRUE
17931	TRUE	500	2,635.99	20	20	16.7	4158: 17890	TRUE
9765	TRUE	500	2,636.27	20	20	22.9	2325: 9110	TRUE
18345	TRUE	500	2,638.09	20	20	29.3	3903: 16538	TRUE
3040	TRUE	500	2,641.63	20	20	35.3	914: 2904	TRUE
2088	TRUE	500	2,644.39	20	20	28.5	713: 2143	TRUE
17277	TRUE	500	2,645.00	20	20	23.5	4001: 17028	TRUE
3642	TRUE	500	2,650.06	20	20	19	1062: 3510	TRUE
9213	TRUE	500	2,650.94	20	20	33.6	23299: J-52	TRUE
3580	TRUE	500	2,653.13	20	20	38.7	3362: 13936	TRUE
9925	TRUE	500	2,654.73	20	20	32.1	3903: 16538	TRUE
19034	TRUE	500	2,661.29	20	20	9.4	4429: 19232	TRUE
15651	TRUE	500	2,665.95	20	20	26.8	3739: 15733	TRUE
3783	TRUE	500	2,667.89	20	20	38.3	3362: 13936	TRUE
6296	TRUE	500	2,669.33	20	20	28	1707: 6354	TRUE
7959	TRUE	500	2,669.56	20	25.2	0	2624: 10368	TRUE
11914	TRUE	500	2,672.40	20	20	27.6	2950: 11911	TRUE
3486	TRUE	500	2,672.51	20	20	38.6	3362: 13936	TRUE
11329	TRUE	500	2,676.86	20	20	36.7	2722: 10829	TRUE
18098	TRUE	500	2,677.13	20	20	34.3	23299: J-52	TRUE
7926	TRUE	500	2,680.47	20	20	17.7	2005: 7718	TRUE
14931	TRUE	500	2,683.14	20	20	21.5	3675: 15435	TRUE
19448	TRUE	500	2,684.27	20	20	36	3903: 16538	TRUE
6293	TRUE	500	2,687.42	20	20	35.8	1673: 6205	TRUE
2489	TRUE	500	2,689.27	20	20	38.6	3362: 13936	TRUE
21097	TRUE	500	2,691.13	20	20	22	4855: 21277	TRUE
18228	TRUE	500	2,691.35	20	20	29	23299: J-52	TRUE
9149	TRUE	500	2,696.79	20	20	33.4	3903: 16538	TRUE
3627	TRUE	500	2,699.09	20	20	38.5	3362: 13936	TRUE
11834	TRUE	500	2,699.26	20	20	15.1	3040: 12324	TRUE
17536	TRUE	500	2,702.99	20	20	21.2	4158: 17890	TRUE
3323	TRUE	500	2,703.71	20	20	31.3	978: 3182	TRUE
2178	TRUE	500	2,703.87	20	20	30.1	670: 1995	TRUE
5446	TRUE	500	2,705.63	20	20	38.8	3362: 13936	TRUE
15711	TRUE	500	2,709.36	20	20	38	3580: 14992	TRUE
13704	TRUE	500	2,709.40	20	20	38	3362: 13936	TRUE
2307	TRUE	500	2,717.41	20	20	36.5	697: 2093	TRUE
19691	TRUE	500	2,717.88	20	20	37.8	3903: 16538	TRUE
6477	TRUE	500	2,722.00	20	20	28.4	1707: 6354	TRUE
10901	TRUE	500	2,723.76	20	20	36.5	3903: 16538	TRUE
11868	TRUE	500	2,724.69	20	20	34	2722: 10829	TRUE
19941	TRUE	500	2,725.28	20	20	37.2	3903: 16538	TRUE
2309	TRUE	500	2,726.32	20	20	38.5	3362: 13936	TRUE
7434	TRUE	500	2,729.91	20	20	39.2	3362: 13936	TRUE
8898	TRUE	500	2,731.92	20	20	31.6	3903: 16538	TRUE
17428	TRUE	500	2,738.11	20	20	35.3	3986: 16949	TRUE
4745	TRUE	500	2,739.59	20	20	26.5	1405: 4989	TRUE
6897	TRUE	500	2,740.17	20	20	36.4	3903: 16538	TRUE
11849	TRUE	500	2,740.47	20	20	29.5	3040: 12324	TRUE
20521	TRUE	500	2,748.70	20	20	29.8	4710: 20539	TRUE
9038	TRUE	500	2,752.09	20	20	33.2	3903: 16538	TRUE
6500	TRUE	500	2,753.76	20	20	28.7	1707: 6354	TRUE
20548	TRUE	500	2,753.98	20	20	36.8	4654: 20257	TRUE
20581	TRUE	500	2,755.87	20	20	37.1	3903: 16538	TRUE
3928	TRUE	500	2,756.18	20	20	29.9	1078: 3580	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
13484	TRUE	500	2,758.85	20	20	26.2	3362: 13936	TRUE
13352	TRUE	500	2,760.04	20	20	26.7	3185: 13010	TRUE
12936	TRUE	500	2,760.10	20	20	34.3	2722: 10829	TRUE
9310	TRUE	500	2,771.68	20	20	33.2	3903: 16538	TRUE
12054	TRUE	500	2,775.44	20	20	28.2	3903: 16538	TRUE
5339	TRUE	500	2,777.05	20	20	38	3362: 13936	TRUE
2808	TRUE	500	2,777.58	20	20	38.5	3362: 13936	TRUE
6830	TRUE	500	2,778.08	20	20	37.1	3903: 16538	TRUE
9132	TRUE	500	2,790.66	20	20	36.3	3362: 13936	TRUE
14351	TRUE	500	2,798.77	20	20	28.1	23299: J-52	TRUE
18479	TRUE	500	2,799.58	20	20	27.4	4158: 17890	TRUE
14935	TRUE	500	2,806.41	20	39.6	0	3903: 16538	TRUE
15936	TRUE	500	2,811.24	20	20	24.2	3710: 15608	TRUE
12304	TRUE	500	2,811.60	20	20	32.4	3127: 12737	TRUE
2091	TRUE	500	2,817.04	20	20	17.8	745: 2263	TRUE
2596	TRUE	500	2,819.66	20	20	38.5	3362: 13936	TRUE
6485	TRUE	500	2,820.76	20	20	36.5	3903: 16538	TRUE
5046	TRUE	500	2,821.66	20	20	37.9	3903: 16538	TRUE
19181	TRUE	500	2,825.40	20	20	18.9	4701: 20480	TRUE
5637	TRUE	500	2,825.68	20	20	25.6	1511: 5485	TRUE
8567	TRUE	500	2,825.82	20	20	32.9	3903: 16538	TRUE
2262	TRUE	500	2,829.09	20	20	26.9	754: 2307	TRUE
11774	TRUE	500	2,829.72	20	20	24.9	2940: 11866	TRUE
1466	TRUE	500	2,831.82	20	20	38.4	3362: 13936	TRUE
20684	TRUE	500	2,833.25	20	20	34.8	4855: 21277	TRUE
11792	TRUE	500	2,834.43	20	20	36.5	2722: 10829	TRUE
6481	TRUE	500	2,838.93	20	20	37.6	3362: 13936	TRUE
2369	TRUE	500	2,840.48	20	20	25.9	754: 2307	TRUE
8611	TRUE	500	2,842.79	20	20	24.3	2303: 9017	TRUE
4978	TRUE	500	2,845.98	20	20	38	3903: 16538	TRUE
7805	TRUE	500	2,846.48	20	22.4	0	2624: 10368	TRUE
3891	TRUE	500	2,846.79	20	20	25.6	1078: 3580	TRUE
4973	TRUE	500	2,848.00	20	20	34.3	1302: 4543	TRUE
21161	TRUE	500	2,849.68	20	20	8.4	4855: 21277	TRUE
9701	TRUE	500	2,853.14	20	20	28.4	2722: 10829	TRUE
2796	TRUE	500	2,860.72	20	20	38.5	3362: 13936	TRUE
18906	TRUE	500	2,863.73	20	20	37.9	3903: 16538	TRUE
18905	TRUE	500	2,865.00	20	20	28	3903: 16538	TRUE
4914	TRUE	500	2,866.02	20	20	25.2	1302: 4543	TRUE
11731	TRUE	500	2,866.97	20	20	22.1	3040: 12324	TRUE
19135	TRUE	500	2,869.98	20	20	28	23299: J-52	TRUE
11067	TRUE	500	2,871.46	20	20	28.1	2722: 10829	TRUE
13253	TRUE	500	2,872.34	20	20	19	31755: J-141	TRUE
13441	TRUE	500	2,873.64	20	20	28.5	3185: 13010	TRUE
12575	TRUE	500	2,874.20	20	20	18	3141: 12788	TRUE
3211	TRUE	500	2,878.04	20	20	38.5	3362: 13936	TRUE
12010	TRUE	500	2,878.43	20	20	30.5	2992: 12107	TRUE
12856	TRUE	500	2,881.89	20	20	28	3903: 16538	TRUE
2737	TRUE	500	2,883.23	20	20	27.8	818: 2556	TRUE
19654	TRUE	500	2,883.50	20	20	36.4	23299: J-52	TRUE
13033	TRUE	500	2,886.72	20	20	28.1	3903: 16538	TRUE
14740	TRUE	500	2,889.55	20	20	7.4	23299: J-52	TRUE
12980	TRUE	500	2,892.65	20	20	26.8	3141: 12788	TRUE
14952	TRUE	500	2,896.49	20	20	28.4	3903: 16538	TRUE
16114	TRUE	500	2,897.18	20	20	6.3	3773: 15904	TRUE
12833	TRUE	500	2,898.44	20	20	34.7	3362: 13936	TRUE
1807	TRUE	500	2,898.90	20	20	38.4	3362: 13936	TRUE
13185	TRUE	500	2,901.98	20	20	19.6	3279: 13448	TRUE
15850	TRUE	500	2,903.99	20	20	28.1	3903: 16538	TRUE
14424	TRUE	500	2,905.22	20	20	38.1	3362: 13936	TRUE
20799	TRUE	500	2,906.79	20	20	23.6	4751: 20745	TRUE
8801	TRUE	500	2,909.77	20	20	36.1	3903: 16538	TRUE
8785	TRUE	500	2,912.69	20	20	32.9	3903: 16538	TRUE
9196	TRUE	500	2,913.04	20	20	27.7	2722: 10829	TRUE
4732	TRUE	500	2,913.08	20	20	37.9	3903: 16538	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
17533	TRUE	500	2,914.18	20	20	24.2	22550: J-12	TRUE
5897	TRUE	500	2,917.74	20	20	37.9	3903: 16538	TRUE
12190	TRUE	500	2,917.76	20	20	29.3	3903: 16538	TRUE
12511	TRUE	500	2,928.34	20	20	27.6	23299: J-52	TRUE
16716	TRUE	500	2,929.66	20	20	37.2	3362: 13936	TRUE
8699	TRUE	500	2,934.43	20	20	30.8	3903: 16538	TRUE
2644	TRUE	500	2,936.08	20	20	38.4	3362: 13936	TRUE
7044	TRUE	500	2,937.43	20	20	36.6	3903: 16538	TRUE
3739	TRUE	500	2,938.00	20	20	21.7	1078: 3580	TRUE
21051	TRUE	500	2,944.18	20	20	8.4	4855: 21277	TRUE
21123	TRUE	500	2,945.02	20	20	22.3	4855: 21277	TRUE
6235	TRUE	500	2,950.12	20	20	32.1	1758: 6557	TRUE
20428	TRUE	500	2,954.40	20	20	26.5	4654: 20257	TRUE
8970	TRUE	500	2,964.69	20	20	36.1	3903: 16538	TRUE
1831	TRUE	500	2,967.51	20	20	24.9	697: 2093	TRUE
17078	TRUE	500	2,969.00	20	20	37.7	3903: 16538	TRUE
3013	TRUE	500	2,972.89	20	20	38.3	3362: 13936	TRUE
19476	TRUE	500	2,975.15	20	20	26.4	4528: 19691	TRUE
11515	TRUE	500	2,975.47	20	20	34.9	2722: 10829	TRUE
18671	TRUE	500	2,981.65	20	20	37.2	3903: 16538	TRUE
5267	TRUE	500	2,981.95	20	20	37.7	3903: 16538	TRUE
2801	TRUE	500	2,983.69	20	20	38.4	3362: 13936	TRUE
10436	TRUE	500	2,986.52	20	20	14.7	2722: 10829	TRUE
9479	TRUE	500	2,986.57	20	20	36.1	3362: 13936	TRUE
9198	TRUE	500	2,989.75	20	20	32.3	2374: 9310	TRUE
15668	TRUE	500	2,992.08	20	20	27.6	3903: 16538	TRUE
20331	TRUE	500	2,994.09	20	20	27.7	4736: 20648	TRUE
3120	TRUE	500	2,994.73	20	20	38.2	3362: 13936	TRUE
2403	TRUE	500	2,994.94	20	20	38.2	3362: 13936	TRUE
8819	TRUE	500	2,997.67	20	20	22.5	2325: 9110	TRUE
3290	TRUE	500	2,997.74	20	20	38.2	3362: 13936	TRUE
15951	TRUE	500	2,997.77	20	20	36.8	3362: 13936	TRUE
16680	TRUE	500	2,998.16	20	20	38.2	23299: J-52	TRUE
18874	TRUE	500	3,000.28	20	20	17.1	4429: 19232	TRUE
8467	TRUE	500	3,001.42	20	20	36	23299: J-52	TRUE
3724	TRUE	500	3,008.54	20	20	38.1	3362: 13936	TRUE
9551	TRUE	500	3,010.36	20	20	26.6	2722: 10829	TRUE
11226	TRUE	500	3,010.99	20	20	33.8	2722: 10829	TRUE
13728	TRUE	500	3,021.04	20	20	19.4	3368: 13968	TRUE
4453	TRUE	500	3,025.00	20	20	38.4	3362: 13936	TRUE
14016	TRUE	500	3,026.90	20	20	28	3903: 16538	TRUE
18025	TRUE	500	3,027.74	20	20	0.1	4158: 17890	TRUE
8331	TRUE	500	3,029.87	20	20	32.7	3903: 16538	TRUE
8971	TRUE	500	3,032.31	20	20	29.2	2338: 9149	TRUE
11137	TRUE	500	3,036.43	20	20	25.9	2722: 10829	TRUE
14143	TRUE	500	3,037.65	20	20	27.9	3903: 16538	TRUE
9872	TRUE	500	3,045.59	20	20	35.7	3903: 16538	TRUE
1355	TRUE	500	3,045.99	20	20	16.7	477: 1261	TRUE
9257	TRUE	500	3,046.33	20	20	36	3362: 13936	TRUE
9355	TRUE	500	3,050.14	20	20	26.1	2722: 10829	TRUE
4508	TRUE	500	3,050.47	20	20	37.9	23299: J-52	TRUE
1937	TRUE	500	3,051.84	20	20	16.4	697: 2093	TRUE
14120	TRUE	500	3,054.92	20	20	37.9	3362: 13936	TRUE
5232	TRUE	500	3,056.13	20	20	33.3	1302: 4543	TRUE
12124	TRUE	500	3,059.69	20	20	31.5	2722: 10829	TRUE
20768	TRUE	500	3,063.41	20	20	28.3	4855: 21277	TRUE
2479	TRUE	500	3,065.52	20	20	21	838: 2635	TRUE
14680	TRUE	500	3,069.29	20	20	26.7	3600: 15103	TRUE
6800	TRUE	500	3,069.33	20	20	20.6	1866: 7050	TRUE
16934	TRUE	500	3,069.90	20	20	19.5	3986: 16949	TRUE
18511	TRUE	500	3,070.40	20	20	26.7	3903: 16538	TRUE
2791	TRUE	500	3,071.47	20	20	27.5	838: 2635	TRUE
14447	TRUE	500	3,076.38	20	20	29.6	3372: 13989	TRUE
4244	TRUE	500	3,077.99	20	20	37.7	23299: J-52	TRUE
2971	TRUE	500	3,078.24	20	20	34.5	1217: 4155	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
3962	TRUE	500	3,079.77	20	20	37.8	23299: J-52	TRUE
12356	TRUE	500	3,080.34	20	20	29.5	2930: 11829	TRUE
3312	TRUE	500	3,086.63	20	20	38.1	3362: 13936	TRUE
8469	TRUE	500	3,091.01	20	20	31.7	2303: 9017	TRUE
14957	TRUE	500	3,091.49	20	20	34.1	3362: 13936	TRUE
4349	TRUE	500	3,092.67	20	20	33.4	1297: 4516	TRUE
14717	TRUE	500	3,094.60	20	20	22.8	3675: 15435	TRUE
7369	TRUE	500	3,096.58	20	20	29.5	2722: 10829	TRUE
17799	TRUE	500	3,098.17	20	20	26.6	3903: 16538	TRUE
9330	TRUE	500	3,103.78	20	20	36	3362: 13936	TRUE
7108	TRUE	500	3,105.44	20	20	35.9	1864: 7044	TRUE
11582	TRUE	500	3,108.68	20	20	26.3	2722: 10829	TRUE
17294	TRUE	500	3,110.42	20	20	37.7	3903: 16538	TRUE
10170	TRUE	500	3,118.83	20	20	24.5	2722: 10829	TRUE
11233	TRUE	500	3,120.01	20	20	28.7	3903: 16538	TRUE
9010	TRUE	500	3,124.07	20	20	29.8	3903: 16538	TRUE
11224	TRUE	500	3,124.33	20	20	36.2	3362: 13936	TRUE
2392	TRUE	500	3,125.28	20	20	32.2	751: 2288	TRUE
19172	TRUE	500	3,126.90	20	20	37.9	3903: 16538	TRUE
2434	TRUE	500	3,129.82	20	20	30.1	697: 2093	TRUE
1782	TRUE	500	3,130.28	20	20	36.6	697: 2093	TRUE
17286	TRUE	500	3,130.85	20	20	18.1	3890: 16466	TRUE
2570	TRUE	500	3,134.37	20	20	16.7	838: 2635	TRUE
15469	TRUE	500	3,137.65	20	20	37.8	3580: 14992	TRUE
9554	TRUE	500	3,148.01	20	20	19.9	2325: 9110	TRUE
18684	TRUE	500	3,151.19	20	20	26.3	23299: J-52	TRUE
14984	TRUE	500	3,151.97	20	20	25.1	23299: J-52	TRUE
8842	TRUE	500	3,153.69	20	20	35.6	3903: 16538	TRUE
4032	TRUE	500	3,155.88	20	20	21.8	1078: 3580	TRUE
8890	TRUE	500	3,156.23	20	20	30.8	3903: 16538	TRUE
3298	TRUE	500	3,159.54	20	20	38.1	3362: 13936	TRUE
8195	TRUE	500	3,160.26	20	20	32.4	3903: 16538	TRUE
10437	TRUE	500	3,169.40	20	20	35.9	3362: 13936	TRUE
8487	TRUE	500	3,173.08	20	20	22.2	2325: 9110	TRUE
4287	TRUE	500	3,174.03	20	20	35.9	1244: 4284	TRUE
7497	TRUE	500	3,175.61	20	20	28.6	2040: 7895	TRUE
13780	TRUE	500	3,180.19	20	20	30.2	3362: 13936	TRUE
10543	TRUE	500	3,188.25	20	20	23.4	2722: 10829	TRUE
2042	TRUE	500	3,191.73	20	20	7.2	750: 2287	TRUE
20078	TRUE	500	3,192.37	20	20	33.4	4654: 20257	TRUE
15997	TRUE	500	3,193.16	20	20	7.5	3773: 15904	TRUE
8281	TRUE	500	3,193.72	20	20	16.9	2005: 7718	TRUE
2686	TRUE	500	3,194.00	20	20	20.4	919: 2923	TRUE
3058	TRUE	500	3,194.27	20	20	38.2	3362: 13936	TRUE
2721	TRUE	500	3,195.65	20	20	17.8	919: 2923	TRUE
8802	TRUE	500	3,199.34	20	20	29.7	2197: 8567	TRUE
16061	TRUE	500	3,200.59	20	20	5.5	3821: 16105	TRUE
4628	TRUE	500	3,200.93	20	20	27.8	1405: 4989	TRUE
15512	TRUE	500	3,201.07	20	20	33.9	3362: 13936	TRUE
12177	TRUE	500	3,208.46	20	20	15	3041: 12331	TRUE
3041	TRUE	500	3,211.46	20	20	38.2	3362: 13936	TRUE
13618	TRUE	500	3,213.83	20	20	30.3	3326: 13704	TRUE
19152	TRUE	500	3,214.65	20	20	37	3903: 16538	TRUE
9567	TRUE	500	3,214.67	20	20	35.8	3362: 13936	TRUE
15780	TRUE	500	3,215.44	20	20	27.6	3773: 15904	TRUE
12174	TRUE	500	3,216.21	20	20	21.9	2950: 11911	TRUE
2887	TRUE	500	3,216.94	20	20	19.3	919: 2923	TRUE
18724	TRUE	500	3,219.73	20	20	24.8	4158: 17890	TRUE
16724	TRUE	500	3,220.04	20	20	36.9	3362: 13936	TRUE
2712	TRUE	500	3,225.12	20	20	38.2	3362: 13936	TRUE
9670	TRUE	500	3,227.65	20	20	23.9	2722: 10829	TRUE
19306	TRUE	500	3,228.57	20	20	36.6	3903: 16538	TRUE
14192	TRUE	500	3,230.78	20	20	30.8	3403: 14120	TRUE
3537	TRUE	500	3,232.05	20	20	25.1	1062: 3510	TRUE
18726	TRUE	500	3,233.50	20	20	35.9	4305: 18651	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
19453	TRUE	500	3,235.65	20	20	32.3	4498: 19531	TRUE
6872	TRUE	500	3,236.07	20	20	36.4	23299: J-52	TRUE
4831	TRUE	500	3,236.28	20	20	34.6	1302: 4543	TRUE
14408	TRUE	500	3,237.51	20	20	33.8	3362: 13936	TRUE
9075	TRUE	500	3,237.60	20	20	29.8	3903: 16538	TRUE
8502	TRUE	500	3,238.29	20	20	31.4	23299: J-52	TRUE
14979	TRUE	500	3,240.53	20	20	35.8	3362: 13936	TRUE
3965	TRUE	500	3,245.25	20	20	37.9	3903: 16538	TRUE
17829	TRUE	500	3,246.76	20	20	29.6	4078: 17428	TRUE
13811	TRUE	500	3,250.41	20	20	26.5	3903: 16538	TRUE
15250	TRUE	500	3,254.35	20	20	38.1	3362: 13936	TRUE
19713	TRUE	500	3,257.76	20	20	36.1	3903: 16538	TRUE
3812	TRUE	500	3,259.73	20	20	37.9	3903: 16538	TRUE
11227	TRUE	500	3,261.11	20	20	36	3362: 13936	TRUE
7048	TRUE	500	3,262.29	20	20	28.6	1866: 7050	TRUE
11745	TRUE	500	3,265.19	20	20	29.8	2722: 10829	TRUE
13340	TRUE	500	3,271.33	20	20	34.1	3362: 13936	TRUE
1673	TRUE	500	3,274.35	20	20	38.1	3362: 13936	TRUE
7299	TRUE	500	3,274.64	20	20	28.2	2722: 10829	TRUE
5193	TRUE	500	3,277.93	20	20	32	1302: 4543	TRUE
16710	TRUE	500	3,278.55	20	20	38	3903: 16538	TRUE
2803	TRUE	500	3,278.83	20	20	38.1	3362: 13936	TRUE
3427	TRUE	500	3,280.00	20	20	38.1	3362: 13936	TRUE
18421	TRUE	500	3,281.22	20	20	37.6	23299: J-52	TRUE
15193	TRUE	500	3,281.60	20	20	24.4	3903: 16538	TRUE
13095	TRUE	500	3,282.02	20	20	30.8	2722: 10829	TRUE
19968	TRUE	500	3,282.93	20	20	36.6	3903: 16538	TRUE
12459	TRUE	500	3,283.39	20	20	25	3903: 16538	TRUE
20528	TRUE	500	3,284.57	20	20	32.6	4779: 20897	TRUE
13714	TRUE	500	3,285.06	20	20	30.8	3225: 13218	TRUE
3496	TRUE	500	3,286.59	20	20	38.1	3362: 13936	TRUE
18651	TRUE	500	3,286.88	20	20	27.6	4323: 18726	TRUE
8773	TRUE	500	3,296.97	20	20	17.1	2325: 9110	TRUE
20279	TRUE	500	3,297.03	20	20	34.1	4616: 20078	TRUE
11824	TRUE	500	3,299.18	20	20	27.8	2722: 10829	TRUE
12668	TRUE	500	3,300.39	20	20	33.1	2722: 10829	TRUE
11816	TRUE	500	3,305.33	20	20	31.8	2722: 10829	TRUE
8234	TRUE	500	3,306.81	20	20	14.5	2005: 7718	TRUE
3022	TRUE	500	3,310.93	20	20	37.9	838: 2635	TRUE
17545	TRUE	500	3,314.67	20	20	27.3	4078: 17428	TRUE
13078	TRUE	500	3,318.92	20	20	30.7	2722: 10829	TRUE
8686	TRUE	500	3,320.60	20	20	31.2	23299: J-52	TRUE
7322	TRUE	500	3,321.61	20	20	35.9	23299: J-52	TRUE
12664	TRUE	500	3,322.09	20	20	29.3	2722: 10829	TRUE
16740	TRUE	500	3,324.02	20	20	36.4	3916: 16592	TRUE
1646	TRUE	500	3,328.82	20	20	38.1	3362: 13936	TRUE
12719	TRUE	500	3,329.11	20	20	26.8	3903: 16538	TRUE
14000	TRUE	500	3,329.46	20	20	33	3356: 13845	TRUE
16920	TRUE	500	3,329.66	20	20	25.1	3903: 16538	TRUE
3154	TRUE	500	3,330.35	20	20	38.1	3362: 13936	TRUE
3498	TRUE	500	3,334.90	20	20	38.1	3362: 13936	TRUE
9049	TRUE	500	3,339.32	20	20	8.5	2381: 9329	TRUE
3971	TRUE	500	3,340.86	20	20	37.6	3903: 16538	TRUE
8889	TRUE	500	3,340.89	20	20	34.4	3903: 16538	TRUE
20564	TRUE	500	3,341.70	20	20	37.5	3903: 16538	TRUE
10835	TRUE	500	3,349.25	20	20	35.7	3362: 13936	TRUE
11660	TRUE	500	3,350.18	20	20	25.1	2722: 10829	TRUE
10989	TRUE	500	3,352.56	20	20	21.3	2722: 10829	TRUE
18129	TRUE	500	3,353.19	20	20	24.9	3903: 16538	TRUE
12948	TRUE	500	3,353.55	20	20	31.3	3146: 12833	TRUE
8484	TRUE	500	3,356.08	20	20	11.3	2194: 8546	TRUE
6474	TRUE	500	3,356.10	20	20	38.1	3903: 16538	TRUE
1551	TRUE	500	3,357.83	20	20	38.1	3362: 13936	TRUE
15991	TRUE	500	3,359.13	20	20	36	3362: 13936	TRUE
9003	TRUE	500	3,364.84	20	20	4.9	2325: 9110	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12									
Phase 3 Fire Flow Results									
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?	
10824	TRUE	500	3,369.79	20	20	35.6	3362: 13936	TRUE	
8326	TRUE	500	3,373.85	20	20	24.4	2165: 8437	TRUE	
19783	TRUE	500	3,374.64	20	20	37.6	3903: 16538	TRUE	
10606	TRUE	500	3,375.03	20	20	0	2678: 10618	TRUE	
15220	TRUE	500	3,375.89	20	20	24.4	3903: 16538	TRUE	
14611	TRUE	500	3,385.69	20	20	28.4	3466: 14424	TRUE	
14517	TRUE	500	3,389.54	20	20	25.5	23299: J-52	TRUE	
8884	TRUE	500	3,389.86	20	20	7.8	2194: 8546	TRUE	
3830	TRUE	500	3,390.02	20	20	38.2	3362: 13936	TRUE	
6287	TRUE	500	3,390.08	20	20	36.7	3903: 16538	TRUE	
11295	TRUE	500	3,392.68	20	20	22.5	2722: 10829	TRUE	
16430	TRUE	500	3,394.69	20	20	24.8	3903: 16538	TRUE	
14894	TRUE	500	3,394.87	20	20	34.1	3362: 13936	TRUE	
15809	TRUE	500	3,396.27	20	20	24.1	3903: 16538	TRUE	
2232	TRUE	500	3,398.55	20	20	18.9	745: 2263	TRUE	
8744	TRUE	500	3,399.95	20	20	23.8	2722: 10829	TRUE	
8735	TRUE	500	3,400.95	20	20	2.4	2194: 8546	TRUE	
2321	TRUE	500	3,402.17	20	20	27.4	713: 2143	TRUE	
5519	TRUE	500	3,402.95	20	20	37.1	3903: 16538	TRUE	
4103	TRUE	500	3,403.82	20	20	37.4	3903: 16538	TRUE	
19254	TRUE	500	3,409.67	20	20	36.8	3903: 16538	TRUE	
19068	TRUE	500	3,411.33	20	20	37.7	3903: 16538	TRUE	
14792	TRUE	500	3,420.03	20	20	35.4	3362: 13936	TRUE	
6751	TRUE	500	3,420.41	20	20	36.2	23299: J-52	TRUE	
1739	TRUE	500	3,423.61	20	20	21.4	697: 2093	TRUE	
15716	TRUE	500	3,423.88	20	20	32	3786: 15951	TRUE	
15233	TRUE	500	3,431.93	20	20	24.6	3638: 15254	TRUE	
11620	TRUE	500	3,433.05	20	20	14.6	2873: 11535	TRUE	
4140	TRUE	500	3,433.58	20	20	34.3	1078: 3580	TRUE	
13828	TRUE	500	3,437.93	20	20	25.8	3362: 13936	TRUE	
6786	TRUE	500	3,438.57	20	20	35.5	3903: 16538	TRUE	
16200	TRUE	500	3,438.83	20	20	37.3	3796: 15985	TRUE	
3159	TRUE	500	3,439.59	20	20	35.3	972: 3154	TRUE	
20458	TRUE	500	3,442.53	20	20	37.5	23299: J-52	TRUE	
20244	TRUE	500	3,444.26	20	20	31.7	4719: 20581	TRUE	
15238	TRUE	500	3,447.85	20	20	35.6	3362: 13936	TRUE	
17417	TRUE	500	3,454.44	20	20	34.3	4053: 17294	TRUE	
17880	TRUE	500	3,454.73	20	20	24.3	3903: 16538	TRUE	
17592	TRUE	500	3,464.49	20	20	37.8	3903: 16538	TRUE	
14060	TRUE	500	3,465.71	20	20	23.8	3903: 16538	TRUE	
4494	TRUE	500	3,466.29	20	20	38	3362: 13936	TRUE	
3422	TRUE	500	3,466.77	20	20	37.7	3903: 16538	TRUE	
2363	TRUE	500	3,467.87	20	20	33.1	838: 2635	TRUE	
20621	TRUE	500	3,472.54	20	20	36.6	23299: J-52	TRUE	
9941	TRUE	500	3,476.48	20	20	7.8	2325: 9110	TRUE	
3553	TRUE	500	3,479.23	20	20	22.3	1013: 3317	TRUE	
13667	TRUE	500	3,480.98	20	20	23.7	3903: 16538	TRUE	
3145	TRUE	500	3,481.22	20	20	35	838: 2635	TRUE	
9020	TRUE	500	3,482.83	20	20	35.5	3362: 13936	TRUE	
12585	TRUE	500	3,483.48	20	20	24.5	3127: 12737	TRUE	
8407	TRUE	500	3,484.60	20	20	33.1	3903: 16538	TRUE	
13285	TRUE	500	3,487.34	20	20	25.2	3903: 16538	TRUE	
13545	TRUE	500	3,489.44	20	20	23.7	3903: 16538	TRUE	
13584	TRUE	500	3,489.84	20	31.1	0	31755: J-141	TRUE	
14533	TRUE	500	3,490.56	20	20	37.2	3362: 13936	TRUE	
17436	TRUE	500	3,490.69	20	20	15	22550: J-12	TRUE	
4066	TRUE	500	3,490.75	20	20	37.7	3903: 16538	TRUE	
12163	TRUE	500	3,494.57	20	20.7	0	31622: J-140	TRUE	
13178	TRUE	500	3,498.18	20	20	33.8	2722: 10829	TRUE	
19972	TRUE	500	3,499.69	20	27.9	35.7	4616: 20078	TRUE	
20643	TRUE	500	3,500.00	20	20.8	36.6	3903: 16538	TRUE	
20541	TRUE	500	3,500.00	20	57.6	37.4	3903: 16538	TRUE	
20512	TRUE	500	3,500.00	20	71.3	35.7	3903: 16538	TRUE	
20375	TRUE	500	3,500.00	20	24.2	36.6	23299: J-52	TRUE	
20305	TRUE	500	3,500.00	20	47.5	37.4	3903: 16538	TRUE	

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
20227	TRUE	500	3,500.00	20	25	36.4	3903: 16538	TRUE
20209	TRUE	500	3,500.00	20	64.6	37.3	3903: 16538	TRUE
20164	TRUE	500	3,500.00	20	71.9	35.5	3903: 16538	TRUE
20142	TRUE	500	3,500.00	20	22.6	36.6	3903: 16538	TRUE
20105	TRUE	500	3,500.00	20	41.5	36.5	3903: 16538	TRUE
20100	TRUE	500	3,500.00	20	64.4	35.5	23299: J-52	TRUE
20047	TRUE	500	3,500.00	20	34	35.7	3903: 16538	TRUE
19980	TRUE	500	3,500.00	20	39.1	35.7	3903: 16538	TRUE
19969	TRUE	500	3,500.00	20	57.6	37.3	3903: 16538	TRUE
19962	TRUE	500	3,500.00	20	59.5	37.5	3903: 16538	TRUE
19935	TRUE	500	3,500.00	20	61	36.1	3903: 16538	TRUE
19928	TRUE	500	3,500.00	20	31.1	35.8	23299: J-52	TRUE
19886	TRUE	500	3,500.00	20	76.7	36.4	3903: 16538	TRUE
19880	TRUE	500	3,500.00	20	79.5	36.5	3903: 16538	TRUE
19879	TRUE	500	3,500.00	20	62.6	36.3	3903: 16538	TRUE
19866	TRUE	500	3,500.00	20	28.3	35.8	23299: J-52	TRUE
19837	TRUE	500	3,500.00	20	81.2	36.6	23299: J-52	TRUE
19812	TRUE	500	3,500.00	20	71.5	36.5	3903: 16538	TRUE
19808	TRUE	500	3,500.00	20	80.1	36.6	3903: 16538	TRUE
19781	TRUE	500	3,500.00	20	83.7	36.6	3903: 16538	TRUE
19775	TRUE	500	3,500.00	20	44.3	37.5	23299: J-52	TRUE
19733	TRUE	500	3,500.00	20	57	36.4	23299: J-52	TRUE
19732	TRUE	500	3,500.00	20	85.5	36.7	3903: 16538	TRUE
19706	TRUE	500	3,500.00	20	56	37.4	23299: J-52	TRUE
19665	TRUE	500	3,500.00	20	23	37.4	3903: 16538	TRUE
19627	TRUE	500	3,500.00	20	88.2	36.7	23299: J-52	TRUE
19594	TRUE	500	3,500.00	20	65	37.5	23299: J-52	TRUE
19567	TRUE	500	3,500.00	20	43.9	36.4	23299: J-52	TRUE
19555	TRUE	500	3,500.00	20	91.1	36.8	3903: 16538	TRUE
19533	TRUE	500	3,500.00	20	62.7	35.2	3903: 16538	TRUE
19512	TRUE	500	3,500.00	20	20.4	36.6	4616: 20078	TRUE
19496	TRUE	500	3,500.00	20	26.9	36.7	3903: 16538	TRUE
19490	TRUE	500	3,500.00	20	60.2	37.4	3903: 16538	TRUE
19489	TRUE	500	3,500.00	20	27.4	36.5	3903: 16538	TRUE
19477	TRUE	500	3,500.00	20	75.9	37.3	23299: J-52	TRUE
19438	TRUE	500	3,500.00	20	42	37.3	3903: 16538	TRUE
19417	TRUE	500	3,500.00	20	88.1	36.9	23299: J-52	TRUE
19380	TRUE	500	3,500.00	20	92.1	36.9	23299: J-52	TRUE
19352	TRUE	500	3,500.00	20	67.6	37.5	23299: J-52	TRUE
19294	TRUE	500	3,500.00	20	97.8	37	3903: 16538	TRUE
19270	TRUE	500	3,500.00	20	43.2	37.4	23299: J-52	TRUE
19240	TRUE	500	3,500.00	20	64.9	35.1	3903: 16538	TRUE
19211	TRUE	500	3,500.00	20	90.8	37.1	3903: 16538	TRUE
19170	TRUE	500	3,500.00	20	85.7	37	3903: 16538	TRUE
19169	TRUE	500	3,500.00	20	47.8	37.6	23299: J-52	TRUE
19128	TRUE	500	3,500.00	20	58.8	37.5	23299: J-52	TRUE
19094	TRUE	500	3,500.00	20	97.3	37.2	23299: J-52	TRUE
19046	TRUE	500	3,500.00	20	92.6	37.1	23299: J-52	TRUE
19035	TRUE	500	3,500.00	20	79.9	37.4	3903: 16538	TRUE
18984	TRUE	500	3,500.00	20	91.6	37.2	3903: 16538	TRUE
18974	TRUE	500	3,500.00	20	35.1	37.6	3903: 16538	TRUE
18929	TRUE	500	3,500.00	20	97.8	37.3	3903: 16538	TRUE
18887	TRUE	500	3,500.00	20	78.5	37.2	23299: J-52	TRUE
18867	TRUE	500	3,500.00	20	32	36.8	3903: 16538	TRUE
18848	TRUE	500	3,500.00	20	24	36.8	3903: 16538	TRUE
18821	TRUE	500	3,500.00	20	98	37.4	3903: 16538	TRUE
18794	TRUE	500	3,500.00	20	54	37.5	3903: 16538	TRUE
18792	TRUE	500	3,500.00	20	54.3	32.2	4078: 17428	TRUE
18790	TRUE	500	3,500.00	20	20.7	24	23299: J-52	TRUE
18761	TRUE	500	3,500.00	20	48.3	37.4	3903: 16538	TRUE
18743	TRUE	500	3,500.00	20	43.3	37.6	3903: 16538	TRUE
18737	TRUE	500	3,500.00	20	92.3	37.4	3903: 16538	TRUE
18728	TRUE	500	3,500.00	20	30	24	3903: 16538	TRUE
18718	TRUE	500	3,500.00	20	86.3	37.1	3903: 16538	TRUE
18700	TRUE	500	3,500.00	20	61.5	37.4	3903: 16538	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
18697	TRUE	500	3,500.00	20	24.9	19.7	4345: 18815	TRUE
18696	TRUE	500	3,500.00	20	41	37.5	3903: 16538	TRUE
18688	TRUE	500	3,500.00	20	43.8	36.9	3903: 16538	TRUE
18655	TRUE	500	3,500.00	20	27	37.6	3903: 16538	TRUE
18616	TRUE	500	3,500.00	20	24.5	20.5	4158: 17890	TRUE
18575	TRUE	500	3,500.00	20	83	37.3	3903: 16538	TRUE
18539	TRUE	500	3,500.00	20	81.4	37.1	3903: 16538	TRUE
18470	TRUE	500	3,500.00	20	25.6	37.6	3903: 16538	TRUE
18467	TRUE	500	3,500.00	20	52.6	28.6	4078: 17428	TRUE
18420	TRUE	500	3,500.00	20	30.2	37.6	3903: 16538	TRUE
18412	TRUE	500	3,500.00	20	64.2	37.7	3903: 16538	TRUE
18370	TRUE	500	3,500.00	20	95.1	37.4	23299: J-52	TRUE
18333	TRUE	500	3,500.00	20	22.3	36.8	4158: 17890	TRUE
18314	TRUE	500	3,500.00	20	20.4	24	3903: 16538	TRUE
18286	TRUE	500	3,500.00	20	38.7	28.1	4078: 17428	TRUE
18255	TRUE	500	3,500.00	20	42.9	26.4	4078: 17428	TRUE
18233	TRUE	500	3,500.00	20	81.3	37.1	3903: 16538	TRUE
18192	TRUE	500	3,500.00	20	33.4	24	23299: J-52	TRUE
18163	TRUE	500	3,500.00	20	84.9	37.7	3903: 16538	TRUE
18133	TRUE	500	3,500.00	20	34.1	27.9	4078: 17428	TRUE
18121	TRUE	500	3,500.00	20	20.1	19.3	4194: 18098	TRUE
18111	TRUE	500	3,500.00	20	100.3	37.3	3903: 16538	TRUE
18096	TRUE	500	3,500.00	20	68.3	37.4	3903: 16538	TRUE
18034	TRUE	500	3,500.00	20	20.5	24.2	3903: 16538	TRUE
17975	TRUE	500	3,500.00	20	38.2	37.8	3903: 16538	TRUE
17963	TRUE	500	3,500.00	20	76.4	37.2	3903: 16538	TRUE
17942	TRUE	500	3,500.00	20	30.5	24	3903: 16538	TRUE
17932	TRUE	500	3,500.00	20	31.1	28.1	4078: 17428	TRUE
17922	TRUE	500	3,500.00	20	36.5	24.7	3903: 16538	TRUE
17887	TRUE	500	3,500.00	20	96.7	37.7	3903: 16538	TRUE
17861	TRUE	500	3,500.00	20	30.5	28	4078: 17428	TRUE
17800	TRUE	500	3,500.00	20	91	37.2	3903: 16538	TRUE
17796	TRUE	500	3,500.00	20	41.2	24	23299: J-52	TRUE
17766	TRUE	500	3,500.00	20	98.5	37.6	3903: 16538	TRUE
17629	TRUE	500	3,500.00	20	32	25.4	23299: J-52	TRUE
17581	TRUE	500	3,500.00	20	27.7	24	3903: 16538	TRUE
17572	TRUE	500	3,500.00	20	60.3	37.8	23299: J-52	TRUE
17498	TRUE	500	3,500.00	20	53.5	24.8	4078: 17428	TRUE
17443	TRUE	500	3,500.00	20	44.5	24	3903: 16538	TRUE
17437	TRUE	500	3,500.00	20	34.9	24	3903: 16538	TRUE
17420	TRUE	500	3,500.00	20	98.6	37.8	3903: 16538	TRUE
17400	TRUE	500	3,500.00	20	33.1	24	3903: 16538	TRUE
17318	TRUE	500	3,500.00	20	82.5	37.2	3903: 16538	TRUE
17293	TRUE	500	3,500.00	20	23.2	11.9	3986: 16949	TRUE
17263	TRUE	500	3,500.00	20	37.9	26.5	23299: J-52	TRUE
17250	TRUE	500	3,500.00	20	34.5	24	3903: 16538	TRUE
17226	TRUE	500	3,500.00	20	85.6	37.8	23299: J-52	TRUE
17214	TRUE	500	3,500.00	20	46.5	24	3903: 16538	TRUE
17212	TRUE	500	3,500.00	20	35.1	24	3903: 16538	TRUE
17184	TRUE	500	3,500.00	20	66.3	37.8	3903: 16538	TRUE
17164	TRUE	500	3,500.00	20	34.9	24	3903: 16538	TRUE
17117	TRUE	500	3,500.00	20	53.5	37.4	3903: 16538	TRUE
17109	TRUE	500	3,500.00	20	90.8	37.9	3903: 16538	TRUE
17105	TRUE	500	3,500.00	20	43.1	24	3903: 16538	TRUE
17084	TRUE	500	3,500.00	20	26.6	23.9	23299: J-52	TRUE
17081	TRUE	500	3,500.00	20	44.8	24	3903: 16538	TRUE
17072	TRUE	500	3,500.00	20	85.1	37.2	3903: 16538	TRUE
17045	TRUE	500	3,500.00	20	30.8	37.2	3903: 16538	TRUE
17044	TRUE	500	3,500.00	20	30	23.9	3903: 16538	TRUE
17040	TRUE	500	3,500.00	20	44.7	27.1	3903: 16538	TRUE
17026	TRUE	500	3,500.00	20	65.9	37.2	23299: J-52	TRUE
16978	TRUE	500	3,500.00	20	24.6	37.6	23299: J-52	TRUE
16977	TRUE	500	3,500.00	20	27.2	24	23299: J-52	TRUE
16952	TRUE	500	3,500.00	20	78.6	37.3	3903: 16538	TRUE
16913	TRUE	500	3,500.00	20	44.9	23.9	3903: 16538	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
16886	TRUE	500	3,500.00	20	68.6	37.4	3903: 16538	TRUE
16880	TRUE	500	3,500.00	20	23.9	37.4	4002: 17034	TRUE
16869	TRUE	500	3,500.00	20	62.7	38	3580: 14992	TRUE
16848	TRUE	500	3,500.00	20	94.3	37.8	3903: 16538	TRUE
16766	TRUE	500	3,500.00	20	31.1	37.9	3580: 14992	TRUE
16737	TRUE	500	3,500.00	20	35.3	26.1	3903: 16538	TRUE
16733	TRUE	500	3,500.00	20	49.1	23.9	3903: 16538	TRUE
16627	TRUE	500	3,500.00	20	56.5	36.5	3362: 13936	TRUE
16611	TRUE	500	3,500.00	20	51.9	37.9	23299: J-52	TRUE
16607	TRUE	500	3,500.00	20	80.6	37.5	3903: 16538	TRUE
16588	TRUE	500	3,500.00	20	22.8	36.6	3362: 13936	TRUE
16526	TRUE	500	3,500.00	20	45.6	36.5	3362: 13936	TRUE
16508	TRUE	500	3,500.00	20	84.9	36.7	3362: 13936	TRUE
16471	TRUE	500	3,500.00	20	90.8	36.8	3362: 13936	TRUE
16431	TRUE	500	3,500.00	20	34.7	25.3	3903: 16538	TRUE
16417	TRUE	500	3,500.00	20	88.2	36.8	3362: 13936	TRUE
16409	TRUE	500	3,500.00	20	64.3	37.8	3580: 14992	TRUE
16386	TRUE	500	3,500.00	20	30.8	37.9	3903: 16538	TRUE
16360	TRUE	500	3,500.00	20	104.8	37.9	3903: 16538	TRUE
16359	TRUE	500	3,500.00	20	60.1	36.5	3362: 13936	TRUE
16309	TRUE	500	3,500.00	20	56.1	37.9	3903: 16538	TRUE
16294	TRUE	500	3,500.00	20	68.8	36.7	3362: 13936	TRUE
16247	TRUE	500	3,500.00	20	64.4	36.5	3362: 13936	TRUE
16230	TRUE	500	3,500.00	20	61.5	23.8	23299: J-52	TRUE
16228	TRUE	500	3,500.00	20	66.8	36.6	3362: 13936	TRUE
16168	TRUE	500	3,500.00	20	80.3	36.6	3362: 13936	TRUE
16167	TRUE	500	3,500.00	20	52.1	37.7	3580: 14992	TRUE
16154	TRUE	500	3,500.00	20	75.5	37.9	3903: 16538	TRUE
16142	TRUE	500	3,500.00	20	46.5	36.5	3362: 13936	TRUE
16074	TRUE	500	3,500.00	20	37	24.6	3903: 16538	TRUE
16066	TRUE	500	3,500.00	20	55.1	23.8	3903: 16538	TRUE
16045	TRUE	500	3,500.00	20	68.9	36.7	3362: 13936	TRUE
16019	TRUE	500	3,500.00	20	23.2	24.4	23299: J-52	TRUE
15967	TRUE	500	3,500.00	20	48.4	24.1	23299: J-52	TRUE
15962	TRUE	500	3,500.00	20	63.6	36.6	3362: 13936	TRUE
15955	TRUE	500	3,500.00	20	84.9	37.9	23299: J-52	TRUE
15921	TRUE	500	3,500.00	20	46	37.5	3580: 14992	TRUE
15919	TRUE	500	3,500.00	20	72.5	36.5	3362: 13936	TRUE
15912	TRUE	500	3,500.00	20	24	24.5	3903: 16538	TRUE
15908	TRUE	500	3,500.00	20	56.6	23.7	3903: 16538	TRUE
15906	TRUE	500	3,500.00	20	26.2	11.3	3821: 16105	TRUE
15897	TRUE	500	3,500.00	20	52.4	36.7	3362: 13936	TRUE
15852	TRUE	500	3,500.00	20	35.4	23.3	3903: 16538	TRUE
15849	TRUE	500	3,500.00	20	41.9	32.1	3773: 15904	TRUE
15814	TRUE	500	3,500.00	20	60.6	35.7	3362: 13936	TRUE
15788	TRUE	500	3,500.00	20	45.2	24.2	3903: 16538	TRUE
15785	TRUE	500	3,500.00	20	34.5	24.5	3903: 16538	TRUE
15781	TRUE	500	3,500.00	20	56	23.6	3903: 16538	TRUE
15691	TRUE	500	3,500.00	20	71.4	23.6	23299: J-52	TRUE
15681	TRUE	500	3,500.00	20	70.3	36.6	3362: 13936	TRUE
15673	TRUE	500	3,500.00	20	87	35.7	3362: 13936	TRUE
15667	TRUE	500	3,500.00	20	91.5	35.7	3362: 13936	TRUE
15661	TRUE	500	3,500.00	20	31.9	30	3689: 15512	TRUE
15659	TRUE	500	3,500.00	20	79.1	36.7	3362: 13936	TRUE
15658	TRUE	500	3,500.00	20	42	37.6	3580: 14992	TRUE
15656	TRUE	500	3,500.00	20	39.8	24.5	3903: 16538	TRUE
15616	TRUE	500	3,500.00	20	75.4	36.4	3362: 13936	TRUE
15615	TRUE	500	3,500.00	20	68.5	23.5	23299: J-52	TRUE
15607	TRUE	500	3,500.00	20	69.5	37.8	3362: 13936	TRUE
15590	TRUE	500	3,500.00	20	38.6	36.8	3580: 14992	TRUE
15582	TRUE	500	3,500.00	20	53.1	37.5	3362: 13936	TRUE
15566	TRUE	500	3,500.00	20	21.3	31.2	3689: 15512	TRUE
15558	TRUE	500	3,500.00	20	75.7	37.3	3362: 13936	TRUE
15548	TRUE	500	3,500.00	20	25.2	38.8	3580: 14992	TRUE
15542	TRUE	500	3,500.00	20	46.9	23.9	23299: J-52	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
15524	TRUE	500	3,500.00	20	77.2	36.3	3362: 13936	TRUE
15503	TRUE	500	3,500.00	20	46.8	38	3362: 13936	TRUE
15496	TRUE	500	3,500.00	20	35.6	36.2	3580: 14992	TRUE
15483	TRUE	500	3,500.00	20	69.4	36.8	3362: 13936	TRUE
15466	TRUE	500	3,500.00	20	71.4	36.1	3362: 13936	TRUE
15454	TRUE	500	3,500.00	20	71.1	37.5	3362: 13936	TRUE
15440	TRUE	500	3,500.00	20	47	24.5	3903: 16538	TRUE
15417	TRUE	500	3,500.00	20	67.4	37.7	3362: 13936	TRUE
15412	TRUE	500	3,500.00	20	43.5	23.5	3903: 16538	TRUE
15410	TRUE	500	3,500.00	20	68.9	23.3	3903: 16538	TRUE
15404	TRUE	500	3,500.00	20	25.9	37.7	3580: 14992	TRUE
15398	TRUE	500	3,500.00	20	59	36.9	3362: 13936	TRUE
15384	TRUE	500	3,500.00	20	44.8	36.6	3362: 13936	TRUE
15366	TRUE	500	3,500.00	20	34.4	36.1	3580: 14992	TRUE
15362	TRUE	500	3,500.00	20	30	31.5	3689: 15512	TRUE
15344	TRUE	500	3,500.00	20	42.6	34.7	3580: 14992	TRUE
15325	TRUE	500	3,500.00	20	71.8	37.3	3362: 13936	TRUE
15321	TRUE	500	3,500.00	20	101.1	35.7	3362: 13936	TRUE
15316	TRUE	500	3,500.00	20	54.9	23.2	3903: 16538	TRUE
15308	TRUE	500	3,500.00	20	33.7	37.5	3362: 13936	TRUE
15299	TRUE	500	3,500.00	20	68.5	36.9	3362: 13936	TRUE
15266	TRUE	500	3,500.00	20	31.1	30.5	3689: 15512	TRUE
15221	TRUE	500	3,500.00	20	61.3	37.2	3362: 13936	TRUE
15217	TRUE	500	3,500.00	20	70.7	35.9	3362: 13936	TRUE
15206	TRUE	500	3,500.00	20	34.6	32	3689: 15512	TRUE
15202	TRUE	500	3,500.00	20	61.6	23.1	3903: 16538	TRUE
15200	TRUE	500	3,500.00	20	23.6	36.2	3362: 13936	TRUE
15191	TRUE	500	3,500.00	20	82.9	35.7	3362: 13936	TRUE
15169	TRUE	500	3,500.00	20	61.4	37	3362: 13936	TRUE
15165	TRUE	500	3,500.00	20	70.6	37.6	3362: 13936	TRUE
15147	TRUE	500	3,500.00	20	43.8	33.4	3362: 13936	TRUE
15135	TRUE	500	3,500.00	20	36.7	38.1	3580: 14992	TRUE
15132	TRUE	500	3,500.00	20	64.6	23	3903: 16538	TRUE
15131	TRUE	500	3,500.00	20	59	38	3362: 13936	TRUE
15130	TRUE	500	3,500.00	20	57.9	37.5	3362: 13936	TRUE
15112	TRUE	500	3,500.00	20	68.6	22.9	3903: 16538	TRUE
15108	TRUE	500	3,500.00	20	77.7	36	3362: 13936	TRUE
15071	TRUE	500	3,500.00	20	42.8	33.2	3689: 15512	TRUE
15063	TRUE	500	3,500.00	20	53.8	36.2	3362: 13936	TRUE
15047	TRUE	500	3,500.00	20	75.9	37.1	3362: 13936	TRUE
15043	TRUE	500	3,500.00	20	78.1	36.7	3362: 13936	TRUE
15041	TRUE	500	3,500.00	20	72	37.5	3362: 13936	TRUE
15000	TRUE	500	3,500.00	20	31.8	23.2	3903: 16538	TRUE
14994	TRUE	500	3,500.00	20	50.7	37.8	3580: 14992	TRUE
14968	TRUE	500	3,500.00	20	32.2	37.7	3362: 13936	TRUE
14954	TRUE	500	3,500.00	20	66.2	37.5	3362: 13936	TRUE
14933	TRUE	500	3,500.00	20	49.2	36.4	3362: 13936	TRUE
14932	TRUE	500	3,500.00	20	71.6	22.5	23299: J-52	TRUE
14927	TRUE	500	3,500.00	20	75.9	37.2	3362: 13936	TRUE
14923	TRUE	500	3,500.00	20	73.6	36.7	3362: 13936	TRUE
14851	TRUE	500	3,500.00	20	65.9	36.7	3362: 13936	TRUE
14846	TRUE	500	3,500.00	20	87.7	36.5	3362: 13936	TRUE
14842	TRUE	500	3,500.00	20	28.4	33.3	3362: 13936	TRUE
14819	TRUE	500	3,500.00	20	71	38.1	3362: 13936	TRUE
14816	TRUE	500	3,500.00	20	66.6	37.9	3362: 13936	TRUE
14815	TRUE	500	3,500.00	20	42.9	33.6	3362: 13936	TRUE
14784	TRUE	500	3,500.00	20	47.6	23.4	3903: 16538	TRUE
14783	TRUE	500	3,500.00	20	70.9	37.2	3362: 13936	TRUE
14724	TRUE	500	3,500.00	20	63.8	21.7	3903: 16538	TRUE
14715	TRUE	500	3,500.00	20	35	33.4	3362: 13936	TRUE
14712	TRUE	500	3,500.00	20	66.1	36.7	3362: 13936	TRUE
14671	TRUE	500	3,500.00	20	75.1	22.8	23299: J-52	TRUE
14635	TRUE	500	3,500.00	20	71.5	37.3	3362: 13936	TRUE
14625	TRUE	500	3,500.00	20	71.6	37.5	3362: 13936	TRUE
14621	TRUE	500	3,500.00	20	48.3	33.3	3362: 13936	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
14580	TRUE	500	3,500.00	20	82.5	35	3362: 13936	TRUE
14576	TRUE	500	3,500.00	20	21.1	38.1	3580: 14992	TRUE
14546	TRUE	500	3,500.00	20	21.1	33.3	3362: 13936	TRUE
14545	TRUE	500	3,500.00	20	43	23.5	3903: 16538	TRUE
14525	TRUE	500	3,500.00	20	73.1	38	3362: 13936	TRUE
14515	TRUE	500	3,500.00	20	39.3	20.9	3903: 16538	TRUE
14514	TRUE	500	3,500.00	20	24.3	23.3	3362: 13936	TRUE
14455	TRUE	500	3,500.00	20	52.3	38.1	3580: 14992	TRUE
14442	TRUE	500	3,500.00	20	45.5	8.2	3903: 16538	TRUE
14425	TRUE	500	3,500.00	20	60.2	36.8	3362: 13936	TRUE
14422	TRUE	500	3,500.00	20	93.8	36.5	3362: 13936	TRUE
14413	TRUE	500	3,500.00	20	49.4	26.7	3362: 13936	TRUE
14407	TRUE	500	3,500.00	20	43.8	19.8	3903: 16538	TRUE
14388	TRUE	500	3,500.00	20	59.8	23	23299: J-52	TRUE
14385	TRUE	500	3,500.00	20	25.3	22.9	3362: 13936	TRUE
14384	TRUE	500	3,500.00	20	26.5	34.9	3403: 14120	TRUE
14359	TRUE	500	3,500.00	20	101.3	36.6	3362: 13936	TRUE
14357	TRUE	500	3,500.00	20	68.7	19.7	3903: 16538	TRUE
14350	TRUE	500	3,500.00	20	76.4	37.3	3362: 13936	TRUE
14348	TRUE	500	3,500.00	20	50.3	38.1	3580: 14992	TRUE
14346	TRUE	500	3,500.00	20	62.8	18.4	3903: 16538	TRUE
14280	TRUE	500	3,500.00	20	63.2	23.1	3903: 16538	TRUE
14269	TRUE	500	3,500.00	20	99.1	34.2	3362: 13936	TRUE
14258	TRUE	500	3,500.00	20	77.9	36.8	3362: 13936	TRUE
14214	TRUE	500	3,500.00	20	63.7	33.3	3362: 13936	TRUE
14210	TRUE	500	3,500.00	20	25.4	23.5	3903: 16538	TRUE
14203	TRUE	500	3,500.00	20	51.5	33.2	3362: 13936	TRUE
14173	TRUE	500	3,500.00	20	82.8	36.8	3362: 13936	TRUE
14172	TRUE	500	3,500.00	20	45.4	38.1	3580: 14992	TRUE
14161	TRUE	500	3,500.00	20	67.8	37.8	3362: 13936	TRUE
14145	TRUE	500	3,500.00	20	70.3	36.6	2722: 10829	TRUE
14129	TRUE	500	3,500.00	20	47.8	23.3	3903: 16538	TRUE
14104	TRUE	500	3,500.00	20	53.2	37.3	3362: 13936	TRUE
14086	TRUE	500	3,500.00	20	49.5	26.7	3362: 13936	TRUE
14078	TRUE	500	3,500.00	20	84.7	36.3	2722: 10829	TRUE
14072	TRUE	500	3,500.00	20	89.9	33.8	3362: 13936	TRUE
14061	TRUE	500	3,500.00	20	45.6	36.3	3403: 14120	TRUE
14036	TRUE	500	3,500.00	20	38.5	7.5	31755: J-141	TRUE
14025	TRUE	500	3,500.00	20	64.9	36.3	2722: 10829	TRUE
14019	TRUE	500	3,500.00	20	59.1	23.3	3903: 16538	TRUE
13982	TRUE	500	3,500.00	20	83.4	37.3	3362: 13936	TRUE
13931	TRUE	500	3,500.00	20	68.4	33.3	3362: 13936	TRUE
13920	TRUE	500	3,500.00	20	37.1	24.5	3185: 13010	TRUE
13894	TRUE	500	3,500.00	20	74.2	37.7	3362: 13936	TRUE
13887	TRUE	500	3,500.00	20	69.1	23.3	3903: 16538	TRUE
13840	TRUE	500	3,500.00	20	69.2	35.9	2722: 10829	TRUE
13831	TRUE	500	3,500.00	20	27.7	23.6	3903: 16538	TRUE
13767	TRUE	500	3,500.00	20	56.8	36.6	2722: 10829	TRUE
13766	TRUE	500	3,500.00	20	22.4	23.6	3903: 16538	TRUE
13760	TRUE	500	3,500.00	20	56	33.2	3362: 13936	TRUE
13757	TRUE	500	3,500.00	20	89.8	33.4	3362: 13936	TRUE
13756	TRUE	500	3,500.00	20	83.9	37.3	3362: 13936	TRUE
13754	TRUE	500	3,500.00	20	77.4	35.3	2722: 10829	TRUE
13685	TRUE	500	3,500.00	20	74.7	35.2	2722: 10829	TRUE
13683	TRUE	500	3,500.00	20	47.6	37.7	3362: 13936	TRUE
13669	TRUE	500	3,500.00	20	22.5	27.4	3356: 13845	TRUE
13619	TRUE	500	3,500.00	20	66.4	35.5	2722: 10829	TRUE
13601	TRUE	500	3,500.00	20	36.3	33.1	3362: 13936	TRUE
13564	TRUE	500	3,500.00	20	58.6	35.1	2722: 10829	TRUE
13547	TRUE	500	3,500.00	20	96.3	33.2	3362: 13936	TRUE
13518	TRUE	500	3,500.00	20	64.9	33.1	3362: 13936	TRUE
13490	TRUE	500	3,500.00	20	75.9	29.1	3362: 13936	TRUE
13489	TRUE	500	3,500.00	20	67	23.5	23299: J-52	TRUE
13464	TRUE	500	3,500.00	20	59.4	35.5	2722: 10829	TRUE
13396	TRUE	500	3,500.00	20	23.5	33	3362: 13936	TRUE

Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
13389	TRUE	500	3,500.00	20	69.7	34.3	2722: 10829	TRUE
13388	TRUE	500	3,500.00	20	60	37.4	3362: 13936	TRUE
13381	TRUE	500	3,500.00	20	69	35.5	2722: 10829	TRUE
13369	TRUE	500	3,500.00	20	63	33.8	2722: 10829	TRUE
13361	TRUE	500	3,500.00	20	65.2	37.3	3362: 13936	TRUE
13332	TRUE	500	3,500.00	20	28.2	23.6	3903: 16538	TRUE
13314	TRUE	500	3,500.00	20	70.3	33.4	3362: 13936	TRUE
13291	TRUE	500	3,500.00	20	63.5	37.5	3362: 13936	TRUE
13247	TRUE	500	3,500.00	20	40	35.5	2722: 10829	TRUE
13220	TRUE	500	3,500.00	20	47.5	28.9	3362: 13936	TRUE
13192	TRUE	500	3,500.00	20	29.3	4.6	31755: J-141	TRUE
13180	TRUE	500	3,500.00	20	50.9	33	3362: 13936	TRUE
13163	TRUE	500	3,500.00	20	43.9	33.1	2722: 10829	TRUE
13158	TRUE	500	3,500.00	20	72	35.8	2722: 10829	TRUE
13102	TRUE	500	3,500.00	20	51.5	23.7	3903: 16538	TRUE
13101	TRUE	500	3,500.00	20	95.3	33	3362: 13936	TRUE
13047	TRUE	500	3,500.00	20	61.1	33.6	3362: 13936	TRUE
12997	TRUE	500	3,500.00	20	69.9	30.9	3362: 13936	TRUE
12977	TRUE	500	3,500.00	20	42.8	23.6	3903: 16538	TRUE
12932	TRUE	500	3,500.00	20	48.8	32.7	2722: 10829	TRUE
12929	TRUE	500	3,500.00	20	65.6	32.8	2722: 10829	TRUE
12912	TRUE	500	3,500.00	20	27	8.6	31755: J-141	TRUE
12893	TRUE	500	3,500.00	20	60	33.5	3141: 12788	TRUE
12872	TRUE	500	3,500.00	20	22.4	25.5	3185: 13010	TRUE
12845	TRUE	500	3,500.00	20	49.5	31.8	2722: 10829	TRUE
12826	TRUE	500	3,500.00	20	59.5	23.8	3903: 16538	TRUE
12789	TRUE	500	3,500.00	20	62.8	30.1	2722: 10829	TRUE
12765	TRUE	500	3,500.00	20	79.5	32.3	3362: 13936	TRUE
12759	TRUE	500	3,500.00	20	37.4	17.5	3141: 12788	TRUE
12755	TRUE	500	3,500.00	20	75.8	33	3362: 13936	TRUE
12736	TRUE	500	3,500.00	20	38.1	23.8	3903: 16538	TRUE
12640	TRUE	500	3,500.00	20	84.5	32.3	3362: 13936	TRUE
12591	TRUE	500	3,500.00	20	22.8	13.5	31622: J-140	TRUE
12567	TRUE	500	3,500.00	20	55.3	30.1	2722: 10829	TRUE
12518	TRUE	500	3,500.00	20	43.3	23.8	3903: 16538	TRUE
12507	TRUE	500	3,500.00	20	52.8	23.9	23299: J-52	TRUE
12492	TRUE	500	3,500.00	20	51	33.9	3362: 13936	TRUE
12441	TRUE	500	3,500.00	20	50.8	27.4	2722: 10829	TRUE
12411	TRUE	500	3,500.00	20	51.1	30.1	2722: 10829	TRUE
12398	TRUE	500	3,500.00	20	22.9	28.4	2722: 10829	TRUE
12377	TRUE	500	3,500.00	20	91.5	32.7	3362: 13936	TRUE
12372	TRUE	500	3,500.00	20	90.3	32.7	3362: 13936	TRUE
12348	TRUE	500	3,500.00	20	48.6	24	3903: 16538	TRUE
12333	TRUE	500	3,500.00	20	50.6	26.4	2722: 10829	TRUE
12314	TRUE	500	3,500.00	20	22	9.7	31622: J-140	TRUE
12305	TRUE	500	3,500.00	20	29.3	23.4	3903: 16538	TRUE
12295	TRUE	500	3,500.00	20	32	27.6	2722: 10829	TRUE
12270	TRUE	500	3,500.00	20	44.9	27.5	2722: 10829	TRUE
12232	TRUE	500	3,500.00	20	42.2	22.3	3041: 12331	TRUE
12229	TRUE	500	3,500.00	20	27.1	27	2722: 10829	TRUE
12218	TRUE	500	3,500.00	20	51.7	23.7	3903: 16538	TRUE
12167	TRUE	500	3,500.00	20	22.1	27.6	2722: 10829	TRUE
12149	TRUE	500	3,500.00	20	51.5	23.6	3903: 16538	TRUE
12138	TRUE	500	3,500.00	20	55.5	26.8	2722: 10829	TRUE
12108	TRUE	500	3,500.00	20	56.7	32.7	3362: 13936	TRUE
12095	TRUE	500	3,500.00	20	41.6	26.3	2722: 10829	TRUE
12088	TRUE	500	3,500.00	20	39.8	21.5	3041: 12331	TRUE
12064	TRUE	500	3,500.00	20	25.9	26.7	2722: 10829	TRUE
12000	TRUE	500	3,500.00	20	29.5	26	3903: 16538	TRUE
11993	TRUE	500	3,500.00	20	47	24.5	3903: 16538	TRUE
11987	TRUE	500	3,500.00	20	24.8	17.2	2940: 11866	TRUE
11964	TRUE	500	3,500.00	20	88.5	36.3	3362: 13936	TRUE
11951	TRUE	500	3,500.00	20	32.4	26.5	2722: 10829	TRUE
11937	TRUE	500	3,500.00	20	66.3	24.4	2722: 10829	TRUE
11926	TRUE	500	3,500.00	20	38.9	15.7	31622: J-140	TRUE

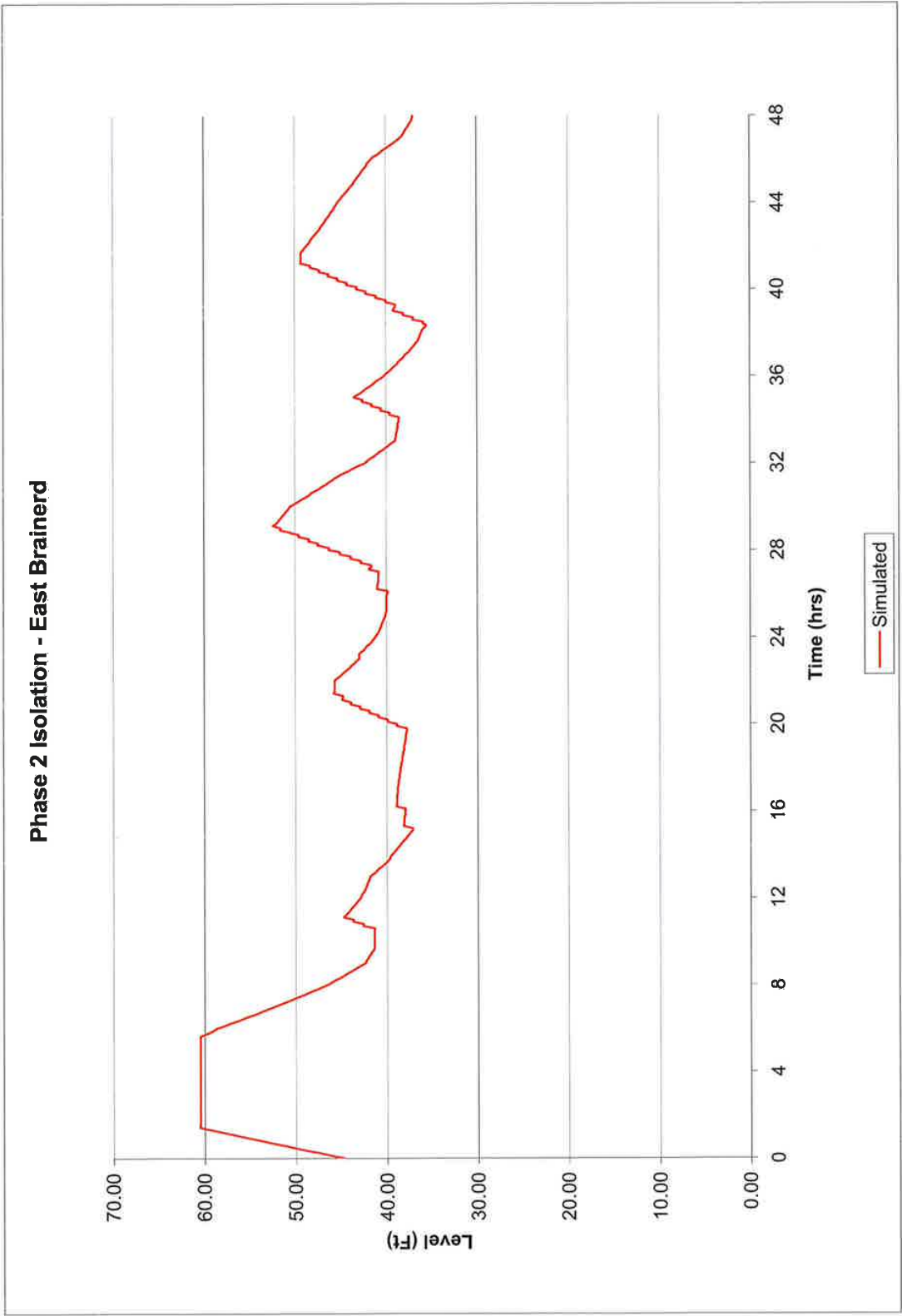
Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
11916	TRUE	500	3,500.00	20	38.6	34.2	3362: 13936	TRUE
11880	TRUE	500	3,500.00	20	38.8	25.9	3903: 16538	TRUE
11874	TRUE	500	3,500.00	20	41.9	36	3362: 13936	TRUE
11871	TRUE	500	3,500.00	20	38.9	24.3	3903: 16538	TRUE
11856	TRUE	500	3,500.00	20	28	36	3362: 13936	TRUE
11832	TRUE	500	3,500.00	20	43.3	35.4	3903: 16538	TRUE
11793	TRUE	500	3,500.00	20	67.8	23.6	2722: 10829	TRUE
11771	TRUE	500	3,500.00	20	40.4	26.6	2722: 10829	TRUE
11770	TRUE	500	3,500.00	20	59.4	35.4	3903: 16538	TRUE
11737	TRUE	500	3,500.00	20	72.5	36	3362: 13936	TRUE
11719	TRUE	500	3,500.00	20	40.2	34.3	3362: 13936	TRUE
11710	TRUE	500	3,500.00	20	20.9	27.6	2921: 11792	TRUE
11676	TRUE	500	3,500.00	20	62.5	23.1	2722: 10829	TRUE
11672	TRUE	500	3,500.00	20	70.9	35.4	3903: 16538	TRUE
11668	TRUE	500	3,500.00	20	43.2	35.4	3903: 16538	TRUE
11665	TRUE	500	3,500.00	20	73.8	36	3362: 13936	TRUE
11645	TRUE	500	3,500.00	20	24.2	16.1	2940: 11866	TRUE
11619	TRUE	500	3,500.00	20	61.1	25.5	3903: 16538	TRUE
11615	TRUE	500	3,500.00	20	24.3	35.4	3903: 16538	TRUE
11609	TRUE	500	3,500.00	20	77.4	36	3362: 13936	TRUE
11538	TRUE	500	3,500.00	20	81.1	36	3362: 13936	TRUE
11528	TRUE	500	3,500.00	20	62.7	36	3362: 13936	TRUE
11524	TRUE	500	3,500.00	20	30.3	36	3362: 13936	TRUE
11519	TRUE	500	3,500.00	20	24.3	26.6	2722: 10829	TRUE
11506	TRUE	500	3,500.00	20	33.9	35.4	3903: 16538	TRUE
11461	TRUE	500	3,500.00	20	47.5	36	3362: 13936	TRUE
11373	TRUE	500	3,500.00	20	56.5	21.5	2722: 10829	TRUE
11352	TRUE	500	3,500.00	20	31	19.9	2722: 10829	TRUE
11347	TRUE	500	3,500.00	20	27.4	28.6	2722: 10829	TRUE
11325	TRUE	500	3,500.00	20	81.3	35.9	3362: 13936	TRUE
11324	TRUE	500	3,500.00	20	84.6	35.4	3903: 16538	TRUE
11315	TRUE	500	3,500.00	20	31.9	18.4	2722: 10829	TRUE
11309	TRUE	500	3,500.00	20	29	36	3362: 13936	TRUE
11279	TRUE	500	3,500.00	20	52.2	35.3	3903: 16538	TRUE
11272	TRUE	500	3,500.00	20	63	20.1	2722: 10829	TRUE
11222	TRUE	500	3,500.00	20	48.2	20.3	2722: 10829	TRUE
11197	TRUE	500	3,500.00	20	63.1	35.3	3362: 13936	TRUE
11164	TRUE	500	3,500.00	20	76.5	35.4	3903: 16538	TRUE
11159	TRUE	500	3,500.00	20	68.6	35.3	3903: 16538	TRUE
11150	TRUE	500	3,500.00	20	40.3	27	3903: 16538	TRUE
11116	TRUE	500	3,500.00	20	30.8	16.1	2722: 10829	TRUE
11112	TRUE	500	3,500.00	20	21.5	23.7	2722: 10829	TRUE
11027	TRUE	500	3,500.00	20	62.4	35.5	3362: 13936	TRUE
11023	TRUE	500	3,500.00	20	54.7	19.3	2722: 10829	TRUE
10995	TRUE	500	3,500.00	20	46.3	19.5	2722: 10829	TRUE
10972	TRUE	500	3,500.00	20	76.7	35.8	3362: 13936	TRUE
10929	TRUE	500	3,500.00	20	29.3	19.3	2722: 10829	TRUE
10922	TRUE	500	3,500.00	20	50.7	35.2	3903: 16538	TRUE
10921	TRUE	500	3,500.00	20	41.4	35.8	3362: 13936	TRUE
10909	TRUE	500	3,500.00	20	43.3	35.8	3362: 13936	TRUE
10879	TRUE	500	3,500.00	20	39	35.6	3362: 13936	TRUE
10868	TRUE	500	3,500.00	20	28.7	20.4	2722: 10829	TRUE
10800	TRUE	500	3,500.00	20	41	27	23299: J-52	TRUE
10766	TRUE	500	3,500.00	20	23.5	35.5	3362: 13936	TRUE
10763	TRUE	500	3,500.00	20	85.5	35.7	3362: 13936	TRUE
10757	TRUE	500	3,500.00	20	21.4	27	3903: 16538	TRUE
10722	TRUE	500	3,500.00	20	64.9	19.2	2722: 10829	TRUE
10706	TRUE	500	3,500.00	20	33.1	35.8	3362: 13936	TRUE
10699	TRUE	500	3,500.00	20	34.5	35.6	3362: 13936	TRUE
10698	TRUE	500	3,500.00	20	26.5	35.8	3362: 13936	TRUE
10681	TRUE	500	3,500.00	20	42.4	35.1	3903: 16538	TRUE
10670	TRUE	500	3,500.00	20	41.4	35.4	3362: 13936	TRUE
10653	TRUE	500	3,500.00	20	20.1	19.4	2722: 10829	TRUE
10638	TRUE	500	3,500.00	20	44	19.4	2722: 10829	TRUE
10630	TRUE	500	3,500.00	20	23.8	27.1	3903: 16538	TRUE

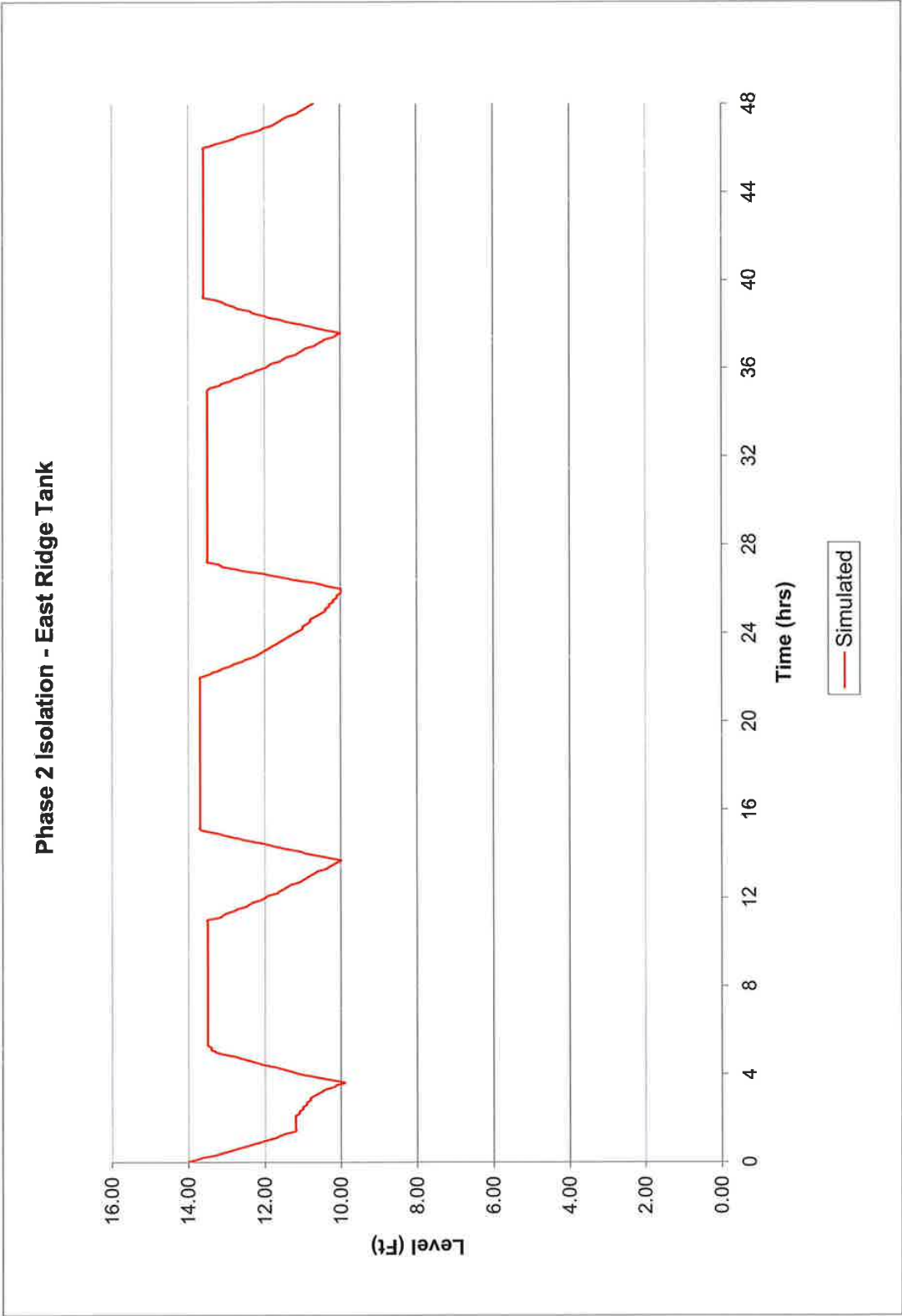
Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
10598	TRUE	500	3,500.00	20	85.4	35.6	3362: 13936	TRUE
10597	TRUE	500	3,500.00	20	43.6	21.5	2722: 10829	TRUE
10576	TRUE	500	3,500.00	20	78.5	35.3	23299: J-52	TRUE
10532	TRUE	500	3,500.00	20	52.8	27	23299: J-52	TRUE
10515	TRUE	500	3,500.00	20	59.7	35.4	3362: 13936	TRUE
10514	TRUE	500	3,500.00	20	46.3	20.6	2722: 10829	TRUE
10513	TRUE	500	3,500.00	20	65	35.4	3362: 13936	TRUE
10476	TRUE	500	3,500.00	20	65.1	35.4	3362: 13936	TRUE
10470	TRUE	500	3,500.00	20	47.2	16.9	2722: 10829	TRUE
10434	TRUE	500	3,500.00	20	51.6	27.2	3903: 16538	TRUE
10433	TRUE	500	3,500.00	20	29.6	19.4	2722: 10829	TRUE
10367	TRUE	500	3,500.00	20	55.6	19.2	2722: 10829	TRUE
10364	TRUE	500	3,500.00	20	52.1	35	3903: 16538	TRUE
10356	TRUE	500	3,500.00	20	58.6	35.7	3362: 13936	TRUE
10349	TRUE	500	3,500.00	20	61.3	35.5	3362: 13936	TRUE
10346	TRUE	500	3,500.00	20	26.8	18	2722: 10829	TRUE
10331	TRUE	500	3,500.00	20	56.1	19.4	2722: 10829	TRUE
10321	TRUE	500	3,500.00	20	24.9	10.4	2722: 10829	TRUE
10304	TRUE	500	3,500.00	20	57.3	35.3	3362: 13936	TRUE
10301	TRUE	500	3,500.00	20	45.7	20.9	2722: 10829	TRUE
10295	TRUE	500	3,500.00	20	53.2	35.4	3362: 13936	TRUE
10275	TRUE	500	3,500.00	20	44	27.3	3903: 16538	TRUE
10267	TRUE	500	3,500.00	20	52.2	20.7	2722: 10829	TRUE
10173	TRUE	500	3,500.00	20	57.8	35.1	3903: 16538	TRUE
10171	TRUE	500	3,500.00	20	67.3	35.7	3362: 13936	TRUE
10160	TRUE	500	3,500.00	20	50.3	20.4	2722: 10829	TRUE
10119	TRUE	500	3,500.00	20	53.6	27.3	3903: 16538	TRUE
10099	TRUE	500	3,500.00	20	53.7	20.4	2722: 10829	TRUE
10091	TRUE	500	3,500.00	20	89.7	35.3	3362: 13936	TRUE
10078	TRUE	500	3,500.00	20	44.5	35	3903: 16538	TRUE
10046	TRUE	500	3,500.00	20	38	19.3	2722: 10829	TRUE
10041	TRUE	500	3,500.00	20	64.1	19.2	2722: 10829	TRUE
10035	TRUE	500	3,500.00	20	52	20.1	2722: 10829	TRUE
10012	TRUE	500	3,500.00	20	79.8	35.5	3362: 13936	TRUE
10004	TRUE	500	3,500.00	20	81.9	35.4	3362: 13936	TRUE
9996	TRUE	500	3,500.00	20	77.4	35.1	3903: 16538	TRUE
9992	TRUE	500	3,500.00	20	68	35.6	3362: 13936	TRUE
9969	TRUE	500	3,500.00	20	89.3	35.4	3362: 13936	TRUE
9946	TRUE	500	3,500.00	20	69	19.3	2722: 10829	TRUE
9943	TRUE	500	3,500.00	20	80.5	35.4	3362: 13936	TRUE
9904	TRUE	500	3,500.00	20	68.9	18.8	2722: 10829	TRUE
9819	TRUE	500	3,500.00	20	77.1	35.5	3362: 13936	TRUE
9809	TRUE	500	3,500.00	20	61.6	27.3	3903: 16538	TRUE
9806	TRUE	500	3,500.00	20	69.6	35.3	3362: 13936	TRUE
9781	TRUE	500	3,500.00	20	51.1	35.4	3362: 13936	TRUE
9774	TRUE	500	3,500.00	20	68	35.3	3362: 13936	TRUE
9752	TRUE	500	3,500.00	20	72.7	35.1	3903: 16538	TRUE
9747	TRUE	500	3,500.00	20	95.2	35.5	3362: 13936	TRUE
9739	TRUE	500	3,500.00	20	25.7	11.5	2325: 9110	TRUE
9721	TRUE	500	3,500.00	20	82.5	35.5	3362: 13936	TRUE
9702	TRUE	500	3,500.00	20	82	35	3903: 16538	TRUE
9698	TRUE	500	3,500.00	20	58.3	19.4	2722: 10829	TRUE
9657	TRUE	500	3,500.00	20	81.4	35.5	3362: 13936	TRUE
9642	TRUE	500	3,500.00	20	42.8	35.5	3362: 13936	TRUE
9617	TRUE	500	3,500.00	20	60.9	19.9	2722: 10829	TRUE
9552	TRUE	500	3,500.00	20	65.8	35.5	3362: 13936	TRUE
9507	TRUE	500	3,500.00	20	66.4	35.5	3362: 13936	TRUE
9498	TRUE	500	3,500.00	20	41.1	20.3	2722: 10829	TRUE
9496	TRUE	500	3,500.00	20	51.6	34.9	3903: 16538	TRUE
9491	TRUE	500	3,500.00	20	48	35.5	3362: 13936	TRUE
9480	TRUE	500	3,500.00	20	85.1	35.5	3362: 13936	TRUE
9472	TRUE	500	3,500.00	20	22.8	14.9	2325: 9110	TRUE
9432	TRUE	500	3,500.00	20	80.8	34.9	3903: 16538	TRUE
9280	TRUE	500	3,500.00	20	30.1	20.4	2722: 10829	TRUE
9258	TRUE	500	3,500.00	20	28.1	10.1	2325: 9110	TRUE

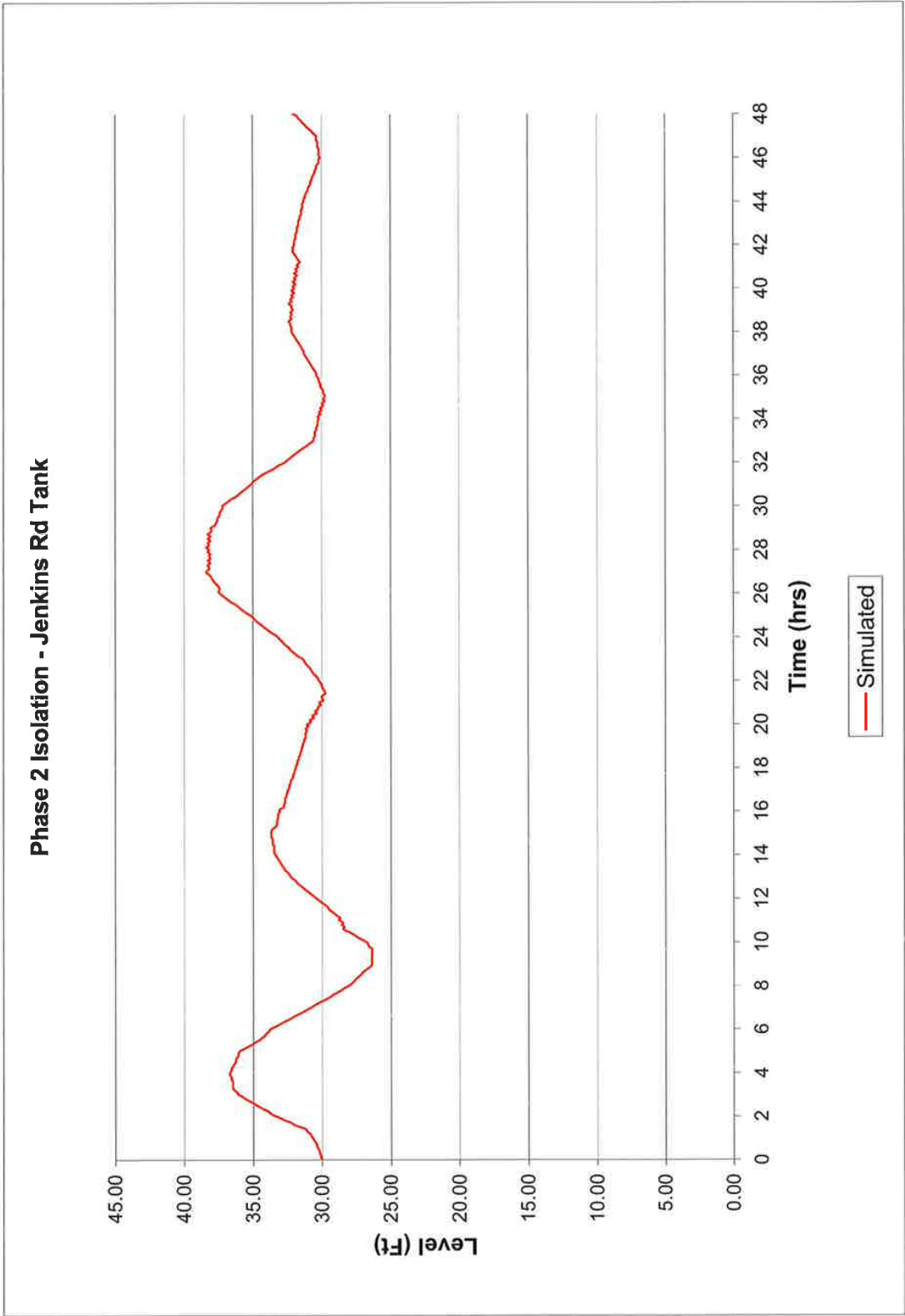
Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
9255	TRUE	500	3,500.00	20	88.8	35.6	3362: 13936	TRUE
9253	TRUE	500	3,500.00	20	69.4	34.9	23299: J-52	TRUE
9225	TRUE	500	3,500.00	20	81.7	34.8	23299: J-52	TRUE
9218	TRUE	500	3,500.00	20	45.6	20.7	2722: 10829	TRUE
9202	TRUE	500	3,500.00	20	51.7	35.5	3362: 13936	TRUE
9189	TRUE	500	3,500.00	20	46.7	34.8	3903: 16538	TRUE
9133	TRUE	500	3,500.00	20	55.1	20.5	2722: 10829	TRUE
9119	TRUE	500	3,500.00	20	71.4	31.2	3903: 16538	TRUE
9108	TRUE	500	3,500.00	20	66.2	34.9	3903: 16538	TRUE
9095	TRUE	500	3,500.00	20	56.9	21.1	2722: 10829	TRUE
9086	TRUE	500	3,500.00	20	96.6	35.6	3362: 13936	TRUE
8988	TRUE	500	3,500.00	20	84.8	34.8	3903: 16538	TRUE
8968	TRUE	500	3,500.00	20	47.1	35.3	3362: 13936	TRUE
8964	TRUE	500	3,500.00	20	71.1	32.6	23299: J-52	TRUE
8963	TRUE	500	3,500.00	20	92	35.6	3362: 13936	TRUE
8952	TRUE	500	3,500.00	20	26.1	28.6	3903: 16538	TRUE
8946	TRUE	500	3,500.00	20	68.9	32.2	3903: 16538	TRUE
8937	TRUE	500	3,500.00	20	93.4	35.6	3362: 13936	TRUE
8896	TRUE	500	3,500.00	20	74.9	33.2	3903: 16538	TRUE
8878	TRUE	500	3,500.00	20	98.7	35.6	3362: 13936	TRUE
8862	TRUE	500	3,500.00	20	96.7	35.6	3362: 13936	TRUE
8845	TRUE	500	3,500.00	20	88.5	34.7	23299: J-52	TRUE
8839	TRUE	500	3,500.00	20	96.8	35.6	3362: 13936	TRUE
8770	TRUE	500	3,500.00	20	62.5	32.6	3903: 16538	TRUE
8768	TRUE	500	3,500.00	20	98.7	35.6	3362: 13936	TRUE
8742	TRUE	500	3,500.00	20	65.9	34.8	23299: J-52	TRUE
8709	TRUE	500	3,500.00	20	49.9	35.3	3362: 13936	TRUE
8674	TRUE	500	3,500.00	20	53.4	35.3	3362: 13936	TRUE
8660	TRUE	500	3,500.00	20	94	35.6	3362: 13936	TRUE
8654	TRUE	500	3,500.00	20	92.2	34.6	3903: 16538	TRUE
8545	TRUE	500	3,500.00	20	26.8	33.9	23299: J-52	TRUE
8536	TRUE	500	3,500.00	20	73	34.6	3903: 16538	TRUE
8519	TRUE	500	3,500.00	20	45.7	33	3903: 16538	TRUE
8427	TRUE	500	3,500.00	20	87	34.6	3903: 16538	TRUE
8356	TRUE	500	3,500.00	20	86.6	34.7	3903: 16538	TRUE
8349	TRUE	500	3,500.00	20	37	34.9	3903: 16538	TRUE
8244	TRUE	500	3,500.00	20	96.5	35.7	3362: 13936	TRUE
8215	TRUE	500	3,500.00	20	31.2	33.8	3903: 16538	TRUE
8172	TRUE	500	3,500.00	20	81.8	34.6	3903: 16538	TRUE
8148	TRUE	500	3,500.00	20	86.1	34.8	3903: 16538	TRUE
8087	TRUE	500	3,500.00	20	60.5	34.8	3903: 16538	TRUE
8004	TRUE	500	3,500.00	20	86.6	34.6	3903: 16538	TRUE
7987	TRUE	500	3,500.00	20	47.1	34.6	23299: J-52	TRUE
7919	TRUE	500	3,500.00	20	33.5	34.8	23299: J-52	TRUE
7906	TRUE	500	3,500.00	20	20.3	34.7	3903: 16538	TRUE
7896	TRUE	500	3,500.00	20	32.9	34.8	3903: 16538	TRUE
7870	TRUE	500	3,500.00	20	85.9	34.7	23299: J-52	TRUE
7857	TRUE	500	3,500.00	20	52.5	34.8	3903: 16538	TRUE
7770	TRUE	500	3,500.00	20	32.5	34.8	3903: 16538	TRUE
7742	TRUE	500	3,500.00	20	58.3	35	3903: 16538	TRUE
7721	TRUE	500	3,500.00	20	52.5	34.9	3903: 16538	TRUE
7676	TRUE	500	3,500.00	20	87	35	3903: 16538	TRUE
7673	TRUE	500	3,500.00	20	88	35.8	3362: 13936	TRUE
7628	TRUE	500	3,500.00	20	85.4	35	3903: 16538	TRUE
7620	TRUE	500	3,500.00	20	91	35	23299: J-52	TRUE
7579	TRUE	500	3,500.00	20	69	35.1	3903: 16538	TRUE
7512	TRUE	500	3,500.00	20	28.7	34.9	3903: 16538	TRUE
7457	TRUE	500	3,500.00	20	28.3	35	3903: 16538	TRUE
7455	TRUE	500	3,500.00	20	82.7	35.3	3903: 16538	TRUE
7431	TRUE	500	3,500.00	20	94.2	35.1	3903: 16538	TRUE
7430	TRUE	500	3,500.00	20	40.3	21.4	2624: 10368	TRUE
7427	TRUE	500	3,500.00	20	102.2	35.5	3903: 16538	TRUE
7401	TRUE	500	3,500.00	20	57.5	35.1	3903: 16538	TRUE
7324	TRUE	500	3,500.00	20	82.8	35.5	3903: 16538	TRUE
7256	TRUE	500	3,500.00	20	52	35.1	3903: 16538	TRUE

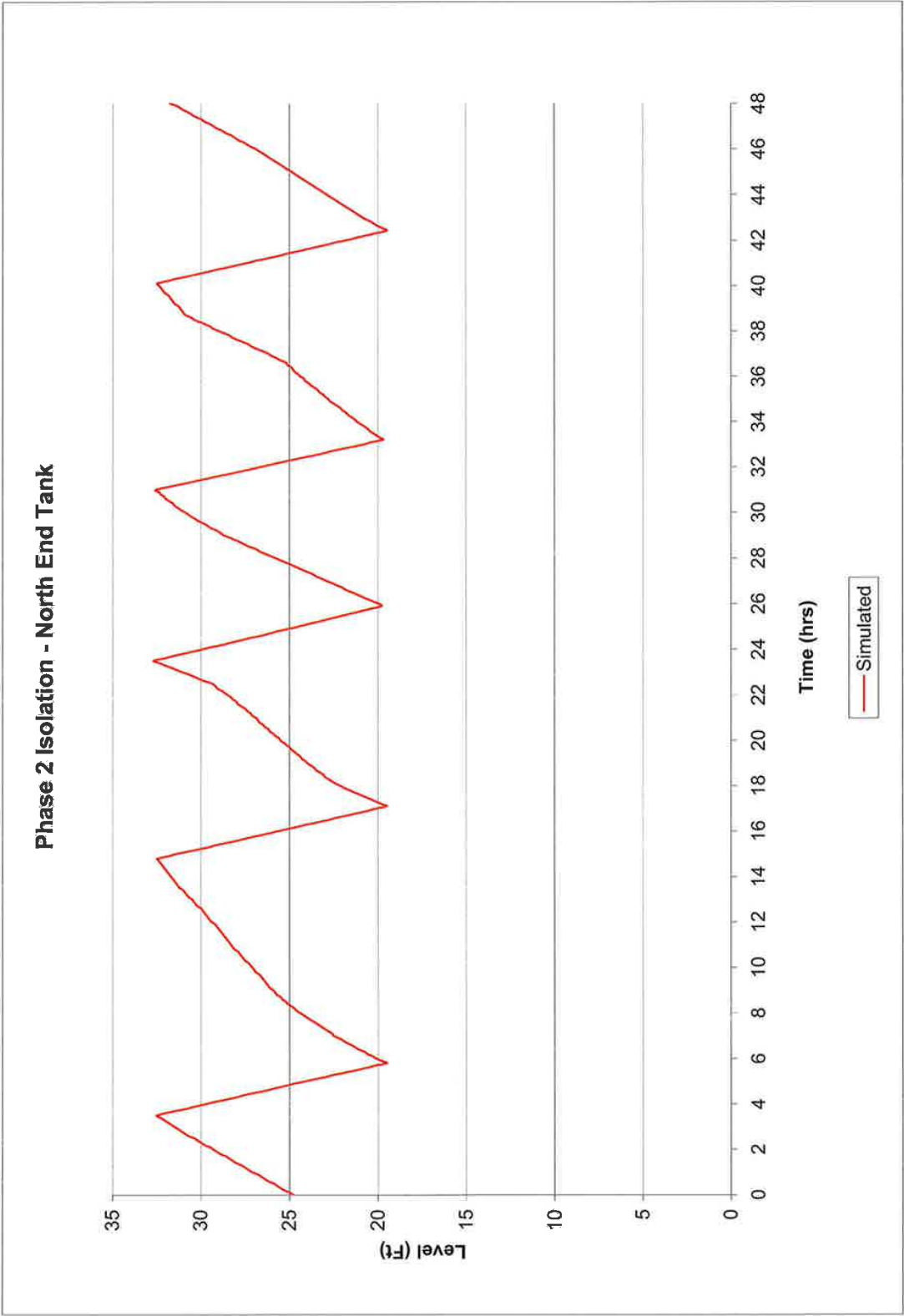
Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
7252	TRUE	500	3,500.00	20	106.8	35.3	3903: 16538	TRUE
7251	TRUE	500	3,500.00	20	77.9	35.1	3903: 16538	TRUE
7218	TRUE	500	3,500.00	20	87.3	35.9	3362: 13936	TRUE
7209	TRUE	500	3,500.00	20	27	35	3903: 16538	TRUE
7191	TRUE	500	3,500.00	20	74.2	35.6	3903: 16538	TRUE
7187	TRUE	500	3,500.00	20	86.3	35	3903: 16538	TRUE
7154	TRUE	500	3,500.00	20	46	35.1	23299: J-52	TRUE
7129	TRUE	500	3,500.00	20	91.7	35.2	3903: 16538	TRUE
7118	TRUE	500	3,500.00	20	38.7	35.5	3903: 16538	TRUE
7111	TRUE	500	3,500.00	20	67.5	35.1	23299: J-52	TRUE
7067	TRUE	500	3,500.00	20	103	35.3	3903: 16538	TRUE
7080	TRUE	500	3,500.00	20	98.9	35.4	3903: 16538	TRUE
7053	TRUE	500	3,500.00	20	91.6	36	3362: 13936	TRUE
7032	TRUE	500	3,500.00	20	73	35.2	23299: J-52	TRUE
7031	TRUE	500	3,500.00	20	66.3	36	3362: 13936	TRUE
7020	TRUE	500	3,500.00	20	97.7	35.4	3903: 16538	TRUE
7016	TRUE	500	3,500.00	20	82	35.8	3903: 16538	TRUE
6997	TRUE	500	3,500.00	20	63.5	36	3903: 16538	TRUE
6993	TRUE	500	3,500.00	20	62	36	3362: 13936	TRUE
6981	TRUE	500	3,500.00	20	94.7	35.5	23299: J-52	TRUE
6936	TRUE	500	3,500.00	20	82.9	35.5	3903: 16538	TRUE
6875	TRUE	500	3,500.00	20	91.7	36	3362: 13936	TRUE
6864	TRUE	500	3,500.00	20	61.8	36.1	3903: 16538	TRUE
6853	TRUE	500	3,500.00	20	91.7	35.7	23299: J-52	TRUE
6814	TRUE	500	3,500.00	20	80.3	36	3362: 13936	TRUE
6812	TRUE	500	3,500.00	20	86.1	35.5	3903: 16538	TRUE
6805	TRUE	500	3,500.00	20	36.1	37.8	3903: 16538	TRUE
6804	TRUE	500	3,500.00	20	51.8	36.2	3903: 16538	TRUE
6775	TRUE	500	3,500.00	20	62.8	36.2	3903: 16538	TRUE
6772	TRUE	500	3,500.00	20	64.2	36	3362: 13936	TRUE
6745	TRUE	500	3,500.00	20	64.9	35.5	3903: 16538	TRUE
6739	TRUE	500	3,500.00	20	53.7	35.3	3903: 16538	TRUE
6722	TRUE	500	3,500.00	20	78.2	35.5	23299: J-52	TRUE
6712	TRUE	500	3,500.00	20	80.3	36.6	3903: 16538	TRUE
6701	TRUE	500	3,500.00	20	23.3	37.9	3903: 16538	TRUE
6665	TRUE	500	3,500.00	20	57	36.6	3362: 13936	TRUE
6659	TRUE	500	3,500.00	20	81.6	37.1	3903: 16538	TRUE
6648	TRUE	500	3,500.00	20	66.7	35.5	23299: J-52	TRUE
6640	TRUE	500	3,500.00	20	24.5	36.1	3903: 16538	TRUE
6626	TRUE	500	3,500.00	20	58.3	38.3	3903: 16538	TRUE
6614	TRUE	500	3,500.00	20	49.6	35.4	3903: 16538	TRUE
6603	TRUE	500	3,500.00	20	90.8	35.5	3903: 16538	TRUE
6601	TRUE	500	3,500.00	20	85.7	36.3	23299: J-52	TRUE
6589	TRUE	500	3,500.00	20	58	36.6	3362: 13936	TRUE
6558	TRUE	500	3,500.00	20	69.5	38	3903: 16538	TRUE
6527	TRUE	500	3,500.00	20	83.8	36.4	23299: J-52	TRUE
6515	TRUE	500	3,500.00	20	75.1	35.9	3903: 16538	TRUE
6497	TRUE	500	3,500.00	20	63.5	38.3	3903: 16538	TRUE
6486	TRUE	500	3,500.00	20	21.1	35.4	3903: 16538	TRUE
6483	TRUE	500	3,500.00	20	59.5	36.6	3362: 13936	TRUE
6475	TRUE	500	3,500.00	20	86.1	35.5	3903: 16538	TRUE
6444	TRUE	500	3,500.00	20	75.6	38.3	3903: 16538	TRUE
6438	TRUE	500	3,500.00	20	91.7	36.4	3903: 16538	TRUE
6414	TRUE	500	3,500.00	20	97.5	36.3	3362: 13936	TRUE
6400	TRUE	500	3,500.00	20	91.5	38.3	3903: 16538	TRUE
6330	TRUE	500	3,500.00	20	37.8	37.8	3903: 16538	TRUE
6329	TRUE	500	3,500.00	20	64	38.3	3903: 16538	TRUE
6317	TRUE	500	3,500.00	20	82	35.6	3903: 16538	TRUE
6299	TRUE	500	3,500.00	20	81.9	38.3	3903: 16538	TRUE
6272	TRUE	500	3,500.00	20	95.9	36.3	3362: 13936	TRUE
6270	TRUE	500	3,500.00	20	79.5	36.4	3903: 16538	TRUE
6268	TRUE	500	3,500.00	20	65.7	36.6	3362: 13936	TRUE
6217	TRUE	500	3,500.00	20	80.6	36.4	3903: 16538	TRUE
6179	TRUE	500	3,500.00	20	65.7	35.6	3903: 16538	TRUE
6169	TRUE	500	3,500.00	20	77.3	35.6	23299: J-52	TRUE

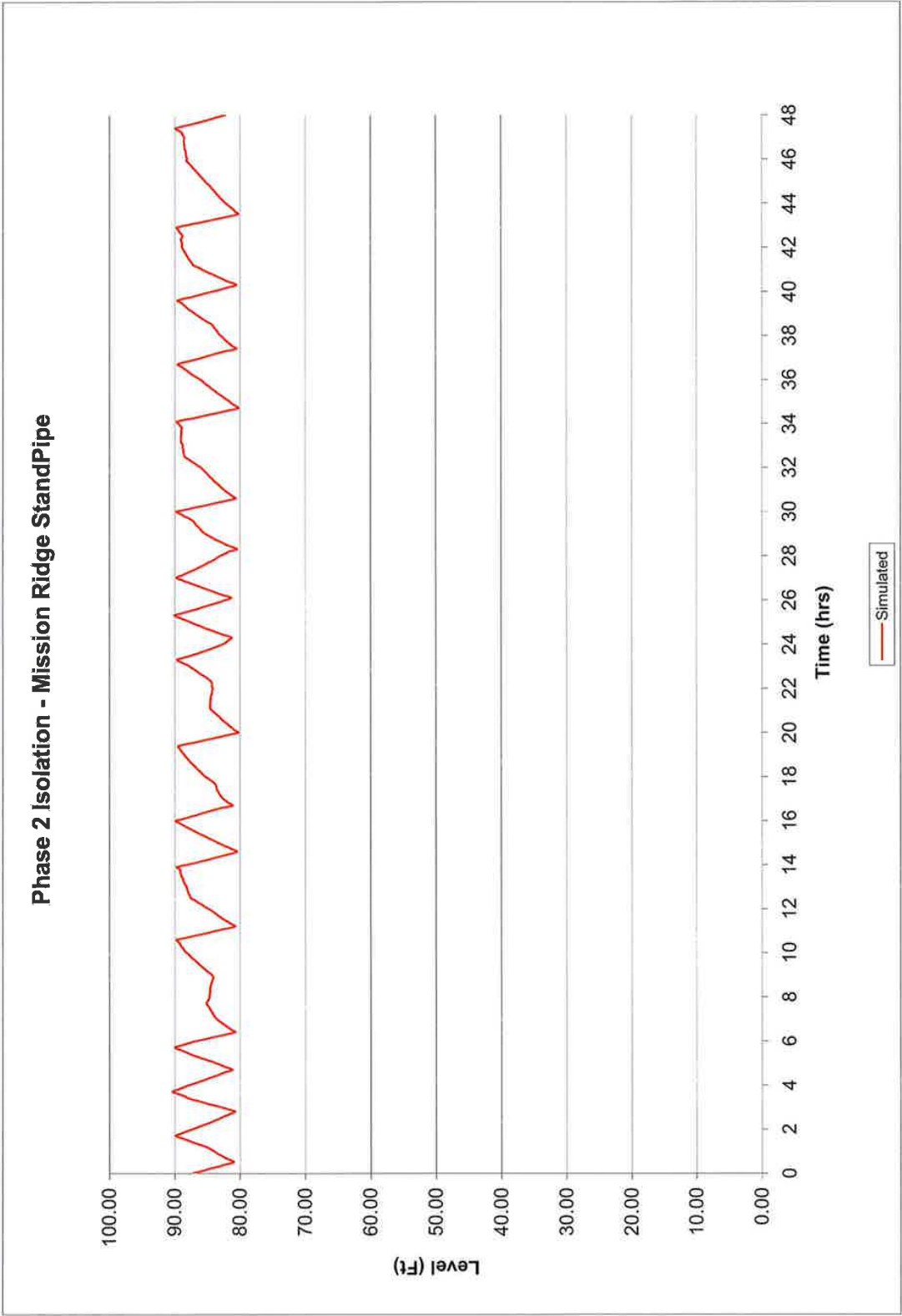
Catoosa Co. Connection Improvements - CTI Project No. C05009-12								
Phase 3 Fire Flow Results								
Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual Lower Limit) (psi)	Calculated Minimum Zone Pressure (psi)	Junction w/Minimum Pressure (Zone)	Is Fire Flow Run Balanced?
2884	TRUE	500	3,500.00	20	72.1	38	3362: 13936	TRUE
2866	TRUE	500	3,500.00	20	82.6	38	3362: 13936	TRUE
2844	TRUE	500	3,500.00	20	86.5	38	3362: 13936	TRUE
2830	TRUE	500	3,500.00	20	68.5	38	3362: 13936	TRUE
2819	TRUE	500	3,500.00	20	85.4	38	3362: 13936	TRUE
2790	TRUE	500	3,500.00	20	39.2	38	3362: 13936	TRUE
2702	TRUE	500	3,500.00	20	76.1	37.9	3362: 13936	TRUE
2695	TRUE	500	3,500.00	20	29.8	38	3362: 13936	TRUE
2682	TRUE	500	3,500.00	20	34.3	37.8	3903: 16538	TRUE
2675	TRUE	500	3,500.00	20	38	32.7	838: 2635	TRUE
2667	TRUE	500	3,500.00	20	24.5	37.9	3362: 13936	TRUE
2602	TRUE	500	3,500.00	20	37.2	35.4	838: 2635	TRUE
2589	TRUE	500	3,500.00	20	43.3	37.8	23299: J-52	TRUE
2581	TRUE	500	3,500.00	20	79.8	38	3362: 13936	TRUE
2579	TRUE	500	3,500.00	20	76	37.9	3362: 13936	TRUE
2571	TRUE	500	3,500.00	20	65.5	38	3362: 13936	TRUE
2497	TRUE	500	3,500.00	20	52.3	37.9	3362: 13936	TRUE
2491	TRUE	500	3,500.00	20	83.2	38	3362: 13936	TRUE
2463	TRUE	500	3,500.00	20	84.2	37.9	3362: 13936	TRUE
2394	TRUE	500	3,500.00	20	80.5	37.9	3362: 13936	TRUE
2382	TRUE	500	3,500.00	20	71.2	38	3362: 13936	TRUE
2351	TRUE	500	3,500.00	20	86.8	37.9	3362: 13936	TRUE
2346	TRUE	500	3,500.00	20	24.4	25.8	722: 2178	TRUE
2273	TRUE	500	3,500.00	20	43.4	38	3362: 13936	TRUE
2251	TRUE	500	3,500.00	20	60.5	38	3362: 13936	TRUE
2165	TRUE	500	3,500.00	20	52.5	38	3362: 13936	TRUE
2135	TRUE	500	3,500.00	20	41.9	27.5	713: 2143	TRUE
2100	TRUE	500	3,500.00	20	23.5	14.8	697: 2093	TRUE
2032	TRUE	500	3,500.00	20	48.5	38	3362: 13936	TRUE
2001	TRUE	500	3,500.00	20	48.2	38	3362: 13936	TRUE
1955	TRUE	500	3,500.00	20	28.6	11.1	697: 2093	TRUE
1913	TRUE	500	3,500.00	20	27.4	33.9	697: 2093	TRUE
1869	TRUE	500	3,500.00	20	33	34.8	697: 2093	TRUE
1825	TRUE	500	3,500.00	20	39.6	38	3362: 13936	TRUE
1822	TRUE	500	3,500.00	20	45.3	38	3362: 13936	TRUE
1756	TRUE	500	3,500.00	20	79.4	33.8	697: 2093	TRUE
1746	TRUE	500	3,500.00	20	44.1	38	3362: 13936	TRUE
1724	TRUE	500	3,500.00	20	36.1	26.4	697: 2093	TRUE
1697	TRUE	500	3,500.00	20	45.8	32	697: 2093	TRUE
1674	TRUE	500	3,500.00	20	33.7	28.7	697: 2093	TRUE
1669	TRUE	500	3,500.00	20	31.6	30.3	697: 2093	TRUE
1667	TRUE	500	3,500.00	20	65.1	38	3362: 13936	TRUE
1571	TRUE	500	3,500.00	20	20.4	38	3362: 13936	TRUE
1539	TRUE	500	3,500.00	20	65.1	38	3362: 13936	TRUE
1477	TRUE	500	3,500.00	20	52.6	38	3362: 13936	TRUE
1475	TRUE	500	3,500.00	20	55.8	38	3362: 13936	TRUE

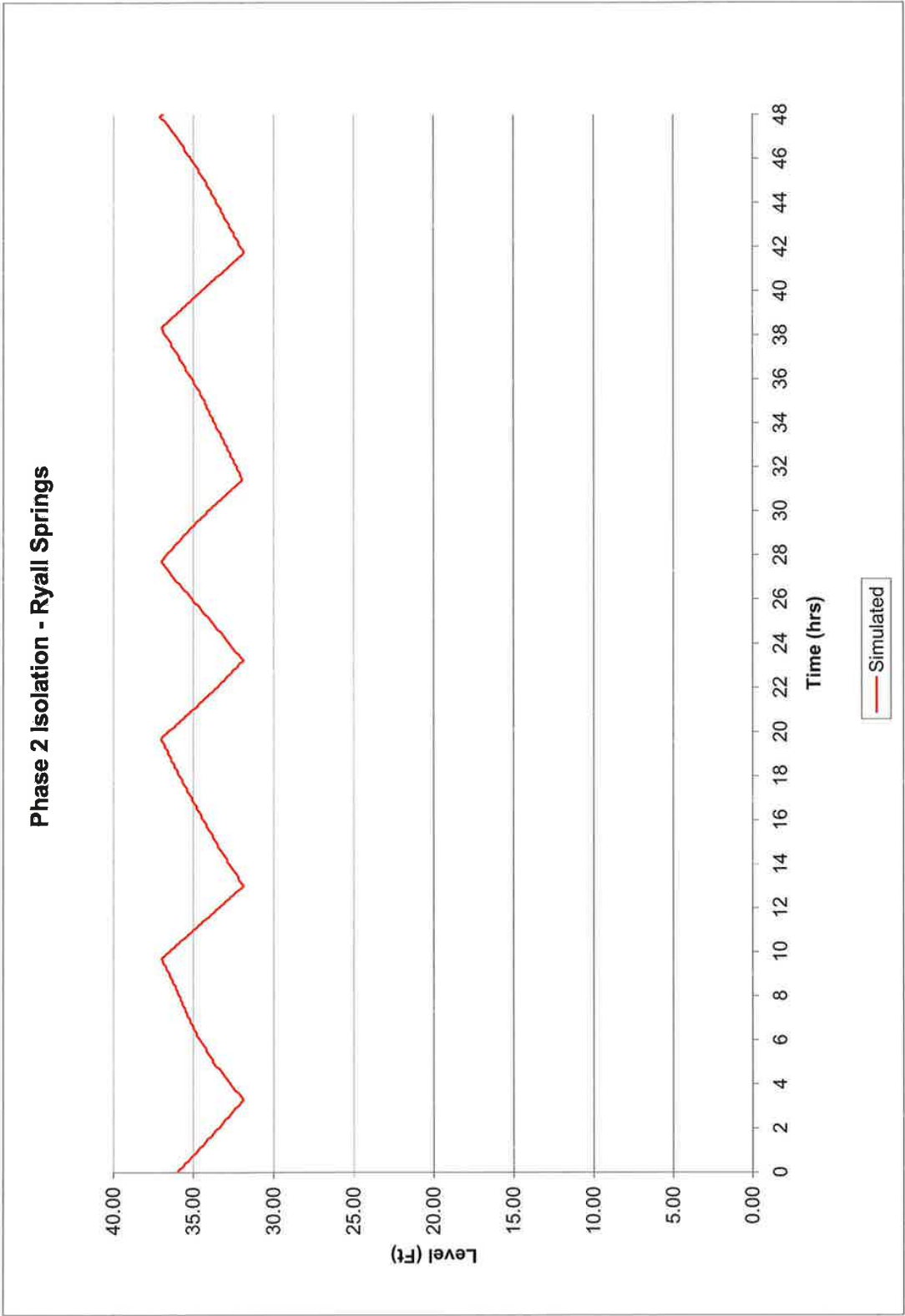


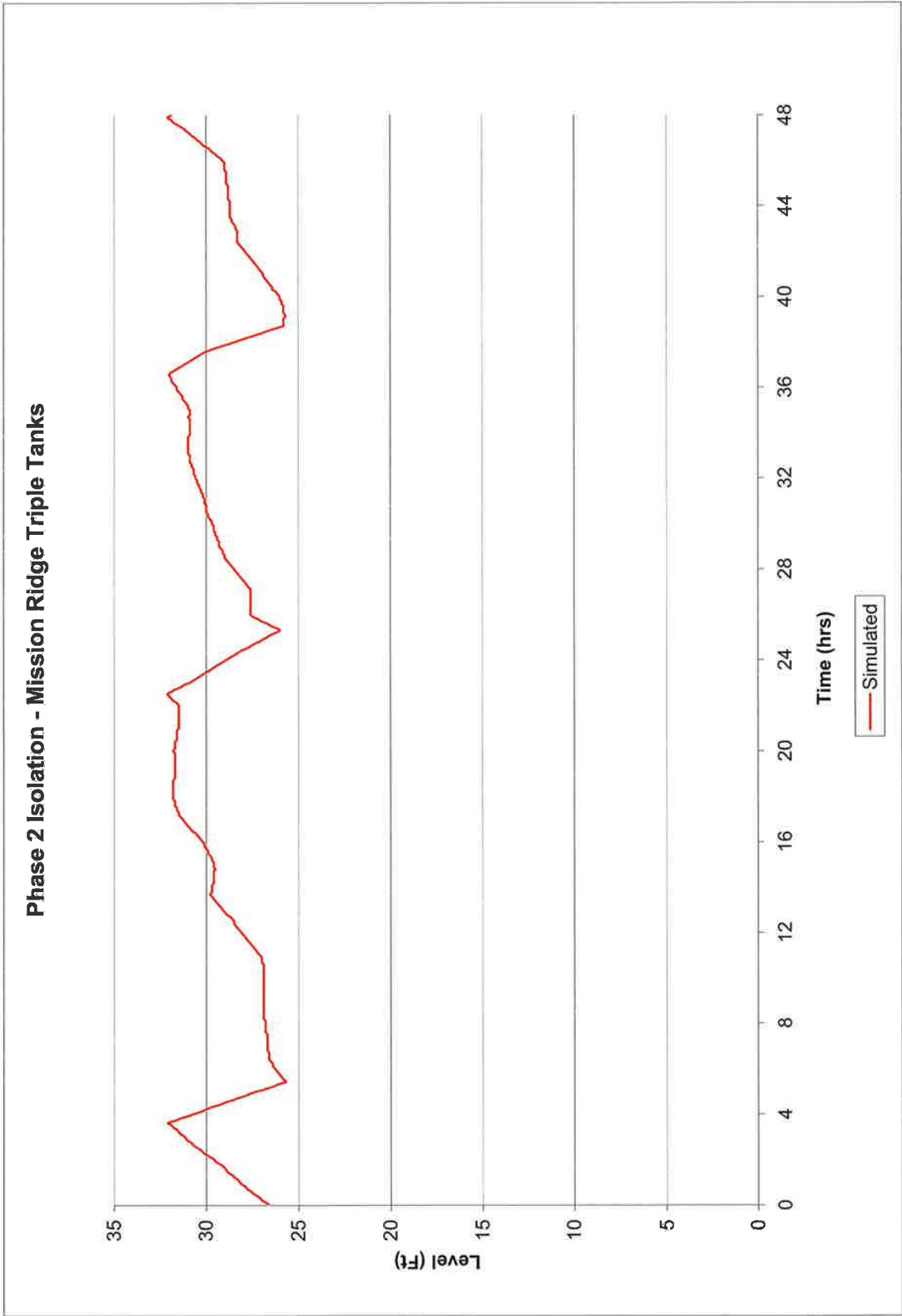


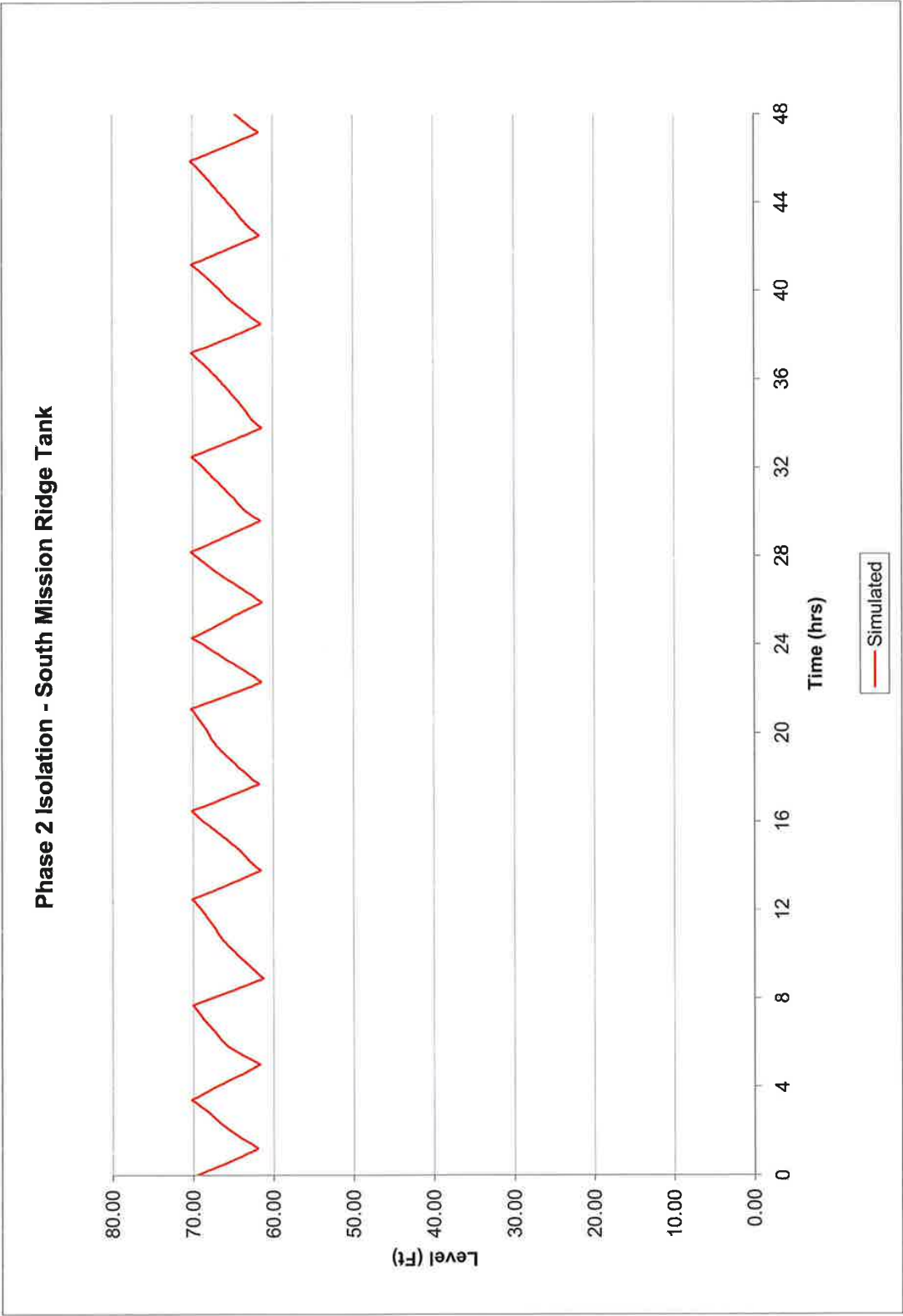


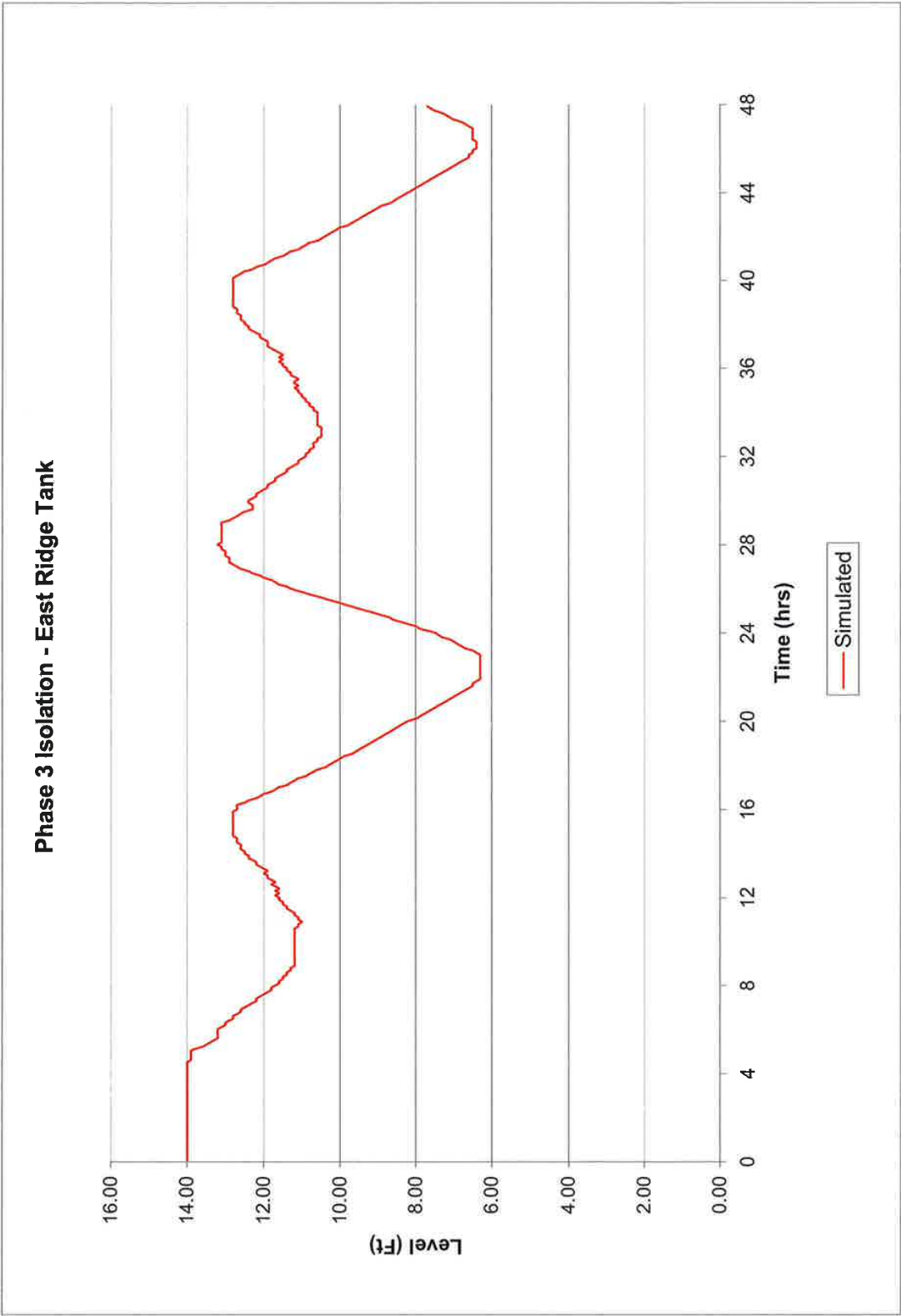


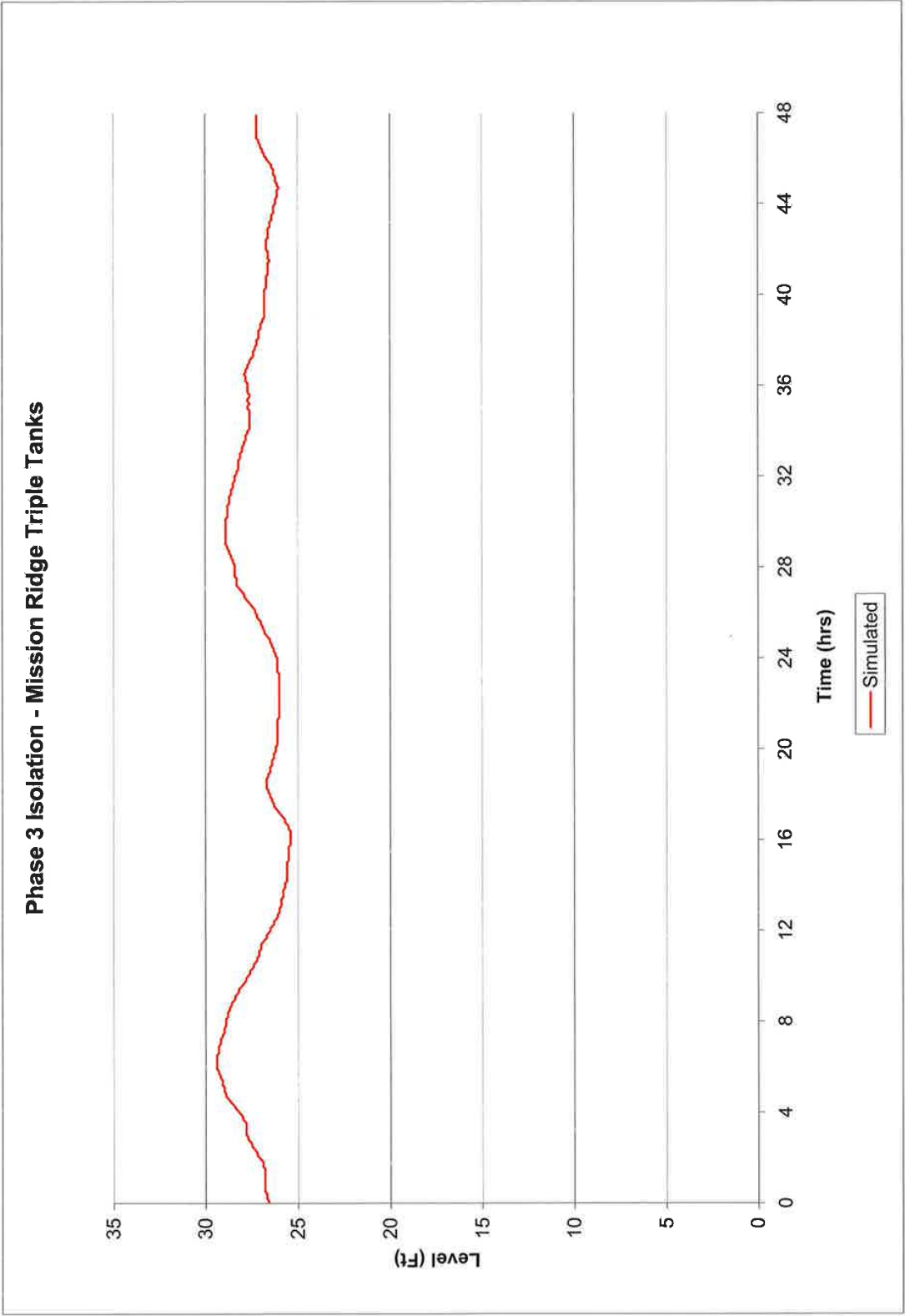


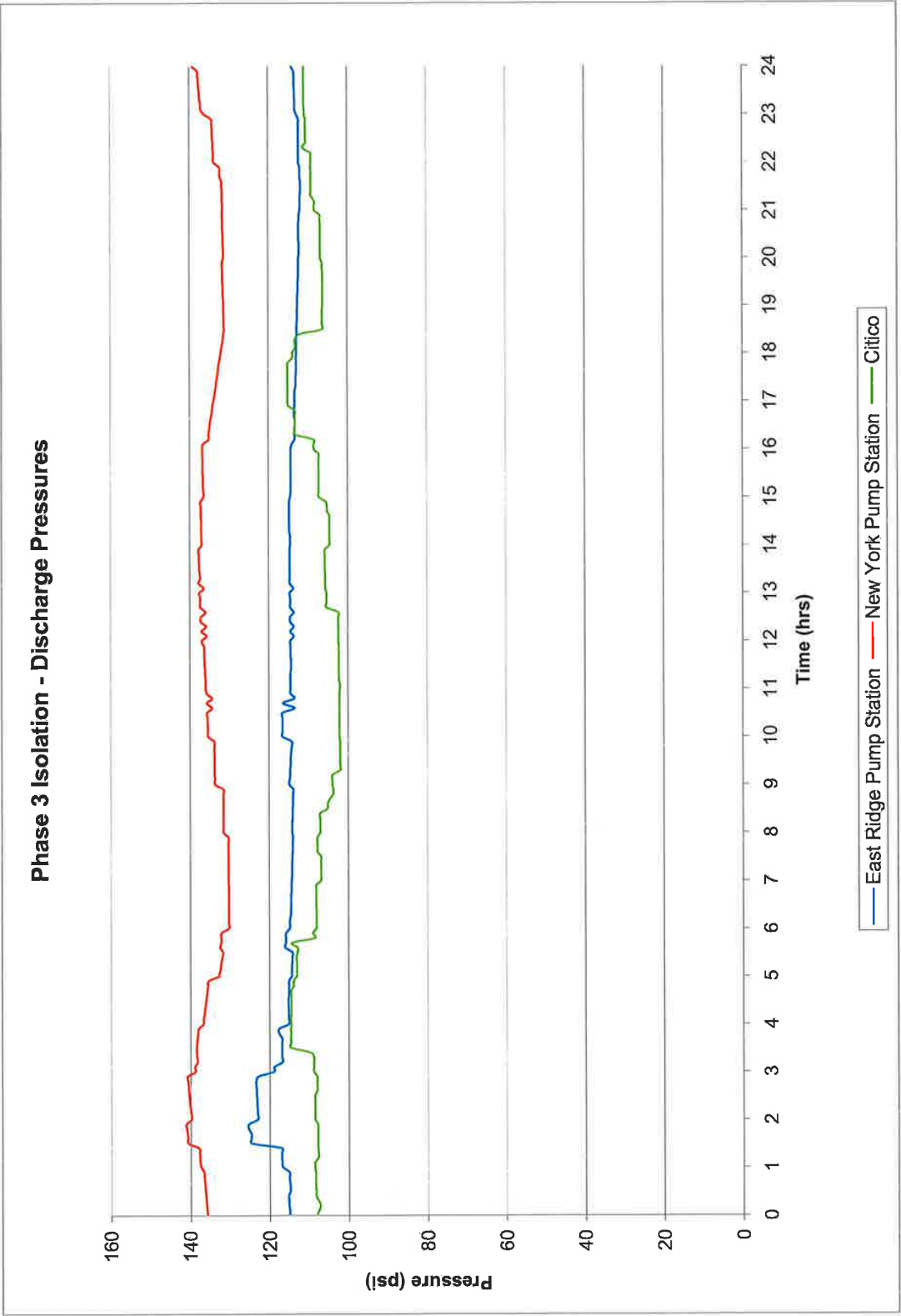












APPENDIX A

Opinion of Cost

OPINION OF COSTS FOR TAW SYSTEM IMPROVEMENTS OF SERVICE TO CATOOSA UTILITY DISTRICT NEW LINE FROM RINGGOLD ROAD TO SCRUGGS ROAD METER					
Item No.	Description	Unit	No. of Units	Unit Price	Item Total
	Mobilization and Bonding	LS	1	\$2,500.00	\$2,500.00
	Traffic Control	LS	1	\$5,000.00	\$5,000.00
02200a	Crushed Stone Backfill in Trench	LF	540	\$7.65	\$4,131.00
02200d	Final Grading and Cleanup	LF	4,373	\$1.55	\$6,778.15
2270	Temporary Silt Fence	LF	4,373	\$1.50	\$6,559.50
2280	Crossing of West Chickamauga Creek by Directional Bore (20")	LF	350	\$1,094.00	\$382,900.00
02280a	Crossing of West Chickamauga Creek by Directional Bore (16")	LF	350	\$75.00	\$26,250.00
	Installation of 16" DIP in Directional Bore				
02280a	Crossing of Interstate 75 By Bore and Jack (20" Carrier Pipe plus 24" Casing Pipe)	LF	450	\$500.00	\$225,000.00
02280c	Seeding and Mulch	LF	4,373	\$1.10	\$4,810.30
2500	8-Inch Class A Concrete for Roadways	LF	80	\$33.35	\$2,668.00
02500a	4-Inch Type B Modified Asphalt Binder in Driveways	LF	461	\$14.90	\$6,868.90
15062a-20	20-Inch DI Pipe, Pressure Class 350	LF	5,133	\$125.00	\$641,625.00
15062a-16	DI Fittings	LB	2,860	\$2.95	\$8,437.00
15062c	20-Inch DI Pipe Restrained Joints at MJ Fittings	EA	6	\$225.00	\$1,350.00
15062d-20	20-Inch DI Pipe Restrained Joints at Bell Joints	EA	12	\$375.00	\$4,500.00
15062	Connect New 20" to Existing 12"	EA	2	\$16,870.00	\$33,740.00
15101	20-Inch Butterfly Valve, Including Valve Box	EA	4	\$2,893.00	\$11,572.00
15109	Install New Fire Hydrant Assembly	EA	1	\$3,103.30	\$3,103.30
	SUBTOTAL CONSTRUCTION COSTS				\$1,377,793
	CONSTRUCTION CONTINGENCIES - +/- 10%				\$142,207
	TOTAL CONSTRUCTION COSTS				\$1,520,000
OTHER PROJECT COSTS					
	ENGINEERING				
	Design			\$64,798	
	Bid Services			\$9,257	
	Construction Phase Services			\$13,885	
	Record Drawings			\$4,628	
	Engineering Subtotal			\$92,568	
	RPR (16 weeks Construction)			\$32,000	
	Surveys			\$7,000	
	Easements - Drawings & Document Preparation			\$10,000	
	Easement Acquisition			\$40,000	
	Army Corps/TVA permit			\$3,500	
	TDOT Permit			\$2,500	
	Storm Water Permit			\$2,500	
	Geotechnical Report			\$4,000	
	Construction Testing			\$2,000	
	SUBTOTAL ENGINEERING				\$196,068
	PLAN REVIEW & ADVERTISEMENTS				\$1,000
	SUBTOTAL PROJECT COSTS				\$1,717,068
	PROJECT CONTINGENCIES +or - 2%				\$42,932
	TOTAL PROJECT COSTS				\$1,760,000
Source: Consolidated Technologies Inc					

Approved Time Period: 07/01/2007 to 07/01/2012

Company	District	Funding Project Number - Description	Approving User	Approved Date	Project Stage	Approved Preliminary Cost	Approved Total Project Cost
26-Tennessee American Water Co							
2602-TN-Chattanooga		26020503 - Citico WTP Improve Phase 1A	STATE-Brian J. Markham CORPORATE-David E. Leach	12/05/2011 12/05/2011	Implementation		\$6,384,143
2602-TN-Chattanooga		26029804 - CHAT-Replace Lkt Mtn Supp Mai	STATE-Brian J. Markham CORPORATE-David E. Leach	09/16/2010 09/16/2010	Implementation		\$1,799,300
2602-TN-Chattanooga		IP-2602-4 - 5933 If of 20" Ringgold Rd. at I-75	STATE-Bruce Juergens CORPORATE-Douglas E. Potts	01/10/2008 01/11/2008	Preliminary	\$211,200	\$2,284,346
2602-TN-Chattanooga		IP-2602-10 - Rehab of Aldrich Units #3 and #4	STATE- CORPORATE-Irene M. Babst		Direct		\$877,669
2602-TN-Chattanooga		CS-2602-1 - Business Transformation CPS	STATE-Randal Taylor CORPORATE-Irene M. Babst	06/03/2009 06/03/2009	Direct		\$157,184
2602-TN-Chattanooga		IP-2602-22 - TAW GIS Data Conversion	STATE-Kate Nartey-Quaye CORPORATE-Irene M. Babst	06/07/2012 06/07/2012	Direct		\$175,000
2602-TN-Chattanooga		IP-2602-24 - Unallocated Indirect Overhead	STATE-Brian J. Markham CORPORATE-	06/15/2011	Direct		\$0
2602-TN-Chattanooga		CS-2602-3 - Business Transformation	STATE-Brian J. Markham CORPORATE-David E. Leach	10/06/2011 10/07/2011	Direct		\$6,957,623
2602-TN-Chattanooga		CS-2602-4 - Business Transformation - Other	STATE-Kate Nartey-Quaye CORPORATE-David E. Leach	02/21/2012 02/21/2012	Direct		\$488,470
2602-TN-Chattanooga		IP-2602-35 - Replace Roof, Citico Filter Hse # 2	STATE-Brian J. Markham CORPORATE-David E. Leach	12/15/2011 12/15/2011	Direct		\$629,285
26-Tennessee American Water Co Total:						\$211,200	\$19,753,019
Grand Total:						\$211,200	\$19,753,019

CAPITAL INVESTMENT MANAGEMENT COMMITTEE

ISSUE DRAFT 0.1

Business Unit: Southeast Region

Project number and title: N/A

Minutes of Meeting held on: December 17, 2007

Time start and finish: 3:30- 4:30pm

At Hershey Corporate Office

Attendance	Initials
Kathy Pape(via phone) Rochelle Kowalski Linda Bridwell (via phone) Randy Taylor (via phone) Mark Sankoff (via phone) Mike Youshock(via phone) Dave Kaufman Bruce Juergens Lisa Bohanick	

Apologies	Initials
Walter Lynch Nick Rowe Wayne Morgan William Walsh Doug Potts	

Distribution	Initials
Walter Lynch Kathy Pape Nick Rowe John Watson Wayne Morgan William Walsh Rochelle Kowalski Mike Miller Steve Klick Dave Kaufman Bruce Juergens Gary Naumick Doug Potts	

Item

1.0 **Review Previous Month's Meeting Minutes and Action Items:**

- Meeting Minutes were reviewed and approved
- Reviewed Projects Submitted and Approved for last month's meeting report AWF-0003
- Action Items:
 - None
 -

2.0 **Review of Capital Program Progress:**

- Reviewed Period 11 Capex Results

3.0 **Key Projects – Review Progress Report**

- PAWC – Coatesville Water Supply
 - o Downingtown Interconnect
 - o Hibernia Pump Station
 - o Coatesville Water Plant
 - o PAWC - NE Dam Improvements

CAPITAL INVESTMENT MANAGEMENT COMMITTEE

ISSUE DRAFT 0.1

Item

- KAWC - Rockwell Village
- KAWC - Source of Supply

4.0 **Review of Projects Submitted for Approval**

- IP-2471-1 Lewisburg 0.5MG Tank; This PNI requests \$121,859 for the development of this project, the Total Estimated Project Cost is \$2,569,884. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded
- IP-2411-9 48" Main –Aldrich to Shire Oaks; This PNI requests \$112,266 for the development of this project, the Total Estimated Project Cost is \$4,940,000. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded
- IP-2411-11 42" Parallel Raw Main Aldrich; This PNI requests \$87,510 for the development of this project, the Total Estimated Project Cost is \$2,600,000. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded
- IP-2445-1 Clarendon Acquisition Improvements; This PNI requests \$75,300 for the development of this project, the Total Estimated Project Cost is \$2,058,488. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded
- IP-2431-1 New Castle Filter to Waste; This PNI requests \$54,930 for the development of this project, the Total Estimated Project Cost is \$600,035. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded
- IP-2400-99 Claysville Wastewater System Improvements; This PNI requests \$83,000 for the development of this project, the Total Estimated Project Cost is \$1,526,002. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded
- IP-2422-2 Monongahela Fisher Heights; This PNI requests \$150,002 for the development of this project, the Total Estimated Project Cost is \$2,650,000. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded
- IP-2411-7 Pittsburgh East Meter Zone; This PNI requests \$74,888 for the development of this project, the Total Estimated Project Cost is \$950,008. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded
- IP-2461-1 SS WTP New Clearwell-; This PNI requests \$63,349 for the development of this project, the Total Estimated Project Cost is \$1,050,665. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded
- IP-2433-2 Lake Oneida Dam Rehab; This PNI requests \$84,815 for the development of this project, the Total Estimated Project Cost is \$7,801,666. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded
- IP-2454-1 Convent Street Tank Replacement; This PNI requests \$194,716 for the development of this project, the Total Estimated Project Cost is \$1,304,244. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded
- IP-2491-1 Main St. Taylor Improvements; This PNI requests \$138,186 for the development of this project, the Total Estimated Project Cost is \$1,706,818. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded
- IP-1202-5 Nth Broadway Main replacement; This PNI requests \$120,566 for the development of this project, the Total Estimated Project Cost is \$2,850,037. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded
- IP-1232-1 Owenton Post Acquisition Phase 2; This PNI requests \$76,000 for the development of this project, the Total Estimated Project Cost is \$824,804. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded.*it was not approved during Dec. CIRC
- IP-2602-4 Ringgold Rd at I-75; This PNI requests \$247,974 for the development of this project, the Total Estimated Project Cost is \$2,284,345. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded

STANDARD AGENDA AND MINUTES
CAPITAL INVESTMENT MANAGEMENT COMMITTEE

AW/CMF5.15
ISSUE DRAFT 0.1

Item

- 24110607 –Construct New Becks Run Pump Station: This PNR requests \$949,683 for the development of this project, with a revised total project spend of \$29,163,521. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded.
- 24110513 Chemical Improvements at Pittsburgh: This PNR requests \$1,034,116 for the development of this project, with a revised total project spend of \$23,598,033. It has been reviewed by the CIMC and is sent to the CIRC with a recommendation that it be funded.
- 2008 RP's: Budgets were submitted by District by RP for all states, All were Reviewed by the CIMC and were sent to the CIRC with a recommendation that they be funded. Please See attached All in one RP spreadsheet for detailed listing of budgets.

5.0 **Review of Flagged Projects**

- Coatesville Wastewater
- Clarion Wastewater
- High Service Storage & Pumping

6.0 **Any Other Business:**

- none

Action Items

7.0

Date of Next Meeting

February 18, 2008

Author: Lisa M. Bohenick

Date: January 18, 2007

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Linda Bridwell

Question:

82. Regarding Special Project IP-2602-16 (Metershop Building Additions):
- a. Provide funding justification.
 - b. Has land been purchased or will the structure be built on TAWC property that already exists?
 - c. Has the Company issued any RFPs for this project?
 - d. If so, provide copies of RFPs and any responses.
 - e. Provide cost estimates for the project.
 - f. Provide "sign-off" approval(s) for the project.

Response:

- a. The project justification has not been completed yet. An architectural firm has been retained to develop the schematic layout of the new additions and a confirmation of the cost estimate. The justification documentation is being developed and can be provided when completed.
- b. Existing Tennessee American Water property on 101 Weihl Street, Chattanooga, TN will be utilized.
- c. An RFP was not issued on the project because of time constraints related to final project completion.
- d. N/A
- e. Tennessee American Water preliminary cost estimate was \$750,000.
- f. A formal approval will be obtained after the schematic design plans have been developed for formal Notice to Proceed with development of civil, mechanical, and electrical plans production, bidding and construction.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Linda Bridwell

Question:

83. Explain the methodology used by TAWC to arrive at the amount used for monthly retirement activity during the attrition period of \$34,549.27. (See Schedule RB 2.2.)

Response:

Tennessee American arrived at the average amount of monthly retirement activity of \$34,549.27, by summing all 2010 and 2011 retirements by plant account, then dividing by 24 to arrive at a monthly amount for each plant account. One account had a positive balance of \$4.52 per month, which was excluded.

Please see Schedule RB-2.2, for calculation in the original filing. It is found in the original filing in the "Exhibit Support – TN Capital through 3-31-14.final", on tab "RB2.2 WP.2 Hist Retire '10-'11.

Tennessee American Water
Two Year Retirement History By Account
Exhibit RB-2-UPIS-LCB
Schedule RB-2.2 and also RB-6.2
WP.2

Description	Plant Account	Two Years	(Two Years / 24) Monthly Amount
304200-Struct & Imp-Pumping	304200	(31,066.85)	(1,294.45)
304300-Struct & Imp-Treatment	304300	(27,199.45)	(1,133.31)
304600-Struct & Imp-Offices	304600	(2,410.00)	(100.42)
311000-Pumping Equipment	311000	(13,267.34)	(552.81)
311200-Pump Eqp Electric	311200	(29,622.60)	(1,234.28)
311500-Pump Eqp Other	311500	(6,199.01)	(258.29)
320100-WT Equip Non-Media	320100	(111,277.73)	(4,636.57)
320200-WT Equip Filter Media	320200	0.00	0.00
330000-Dist Reservoirs & Standpipes	330000	108.48	4.52
331001-T&D Mains	331001	(68,792.81)	(2,866.37)
333000-Services	333000	(47,597.55)	(1,983.23)
334100-Meters	334100	(10,058.18)	(419.09)
334200-Meter Installations	334200	(193,599.32)	(8,066.64)
335000-Hydrants	335000	(7,347.08)	(306.13)
340100-Office Furniture & Equip	340100	(14,158.46)	(589.94)
340200-Comp & Periph Equip	340200	(200,314.58)	(8,346.44)
340300-Computer Software	340300	(17,199.02)	(716.63)
340500-Other Office Equipment	340500	(13,376.01)	(557.33)
341100-Trans Equip Lt Duty Trks	341100	(13,886.46)	(578.60)
341200-Trans Equip Hvy Duty Trks	341200	(16,466.60)	(686.11)
344000-Laboratory Equipment	344000	(2,620.00)	(109.17)
346100-Comm Equip Non-Telephone	346100	(697.12)	(29.05)
347000-Misc Equipment	347000	(2,026.19)	(84.42)
Sum		(829,073.88)	(34,544.75)

Average Per Year \$ (414,536.94)

*** Asset 1201 PowerPlant report.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Gary VerDouw

Question:

84. Does the Shared Services allocation include Tennessee American Water's portion of the hardware for the Business Transformation Project?

RESPONSE

A portion of the charges for hardware (e.g., servers) that is used to support the Business Transformation program is allocated to all of the regulated public utility affiliates through depreciation charges from American Water Service Company.

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Gary M. VerDouw

Question:

85. Update MFG Number 066 to reflect the consolidated capital structure of American Water Works Company.

Response:

Please see attached.

Tennessee American Water Company
Docket No. 12 -00049
Tennessee Regulatory Authority Staff Data Request No. 01, Q. 85

Cost of Capital – (Dollars in thousands)

	Tennessee American Water Company (TAWC)						
	2011	2010	2009	2008	2007		
Short-term Debt	\$379	\$0	0.00%	\$2,347	2.14%	\$10,092	9.35%
Long-term Debt, includes current portion	63,078	64,342	55.15%	55,563	50.57%	53,741	49.80%
Preferred Stock, without mandatory redemption	1,382	1,382	1.18%	1,382	1.26%	1,382	1.28%
Common Equity	51,778	50,939	43.66%	50,586	46.04%	42,704	39.57%
	\$116,617	\$116,662	100.00%	\$109,877	100.00%	\$107,919	100.00%

	American Water Works Company, Inc. (AWK_PARENT STANDALONE)									
	2011	2010		2009	2008	2007				
Short-term Debt	\$241,803	4.40%	\$50,923	0.95%	\$19,488	0.38%	\$28,288	0.53%	\$0	0.00%
Long-term Debt, includes current portion	1,014,550	18.46%	1,170,260	21.86%	1,170,260	22.53%	1,176,270	22.15%	1,188,250	20.72%
Preferred Stock, without mandatory redemption	4,547	0.08%	4,547	0.08%	4,557	0.09%	4,557	0.09%	4,568	0.08%
Common Equity	4,235,837	77.06%	4,127,725	77.10%	4,000,859	77.01%	4,102,001	77.23%	4,542,046	79.20%
	\$5,496,737	100.00%	\$5,353,456	100.00%	\$5,195,164	100.00%	\$5,311,116	100.00%	\$5,734,864	100.00%

	American Water Works Company, Inc. (AWK_CONSOLIDATED)									
	2011		2010		2009		2008		2007	
Short-term Debt	\$515,050	5.08%	\$228,905	2.33%	\$119,497	1.26%	\$479,010	5.09%	\$220,514	2.31%
Long-term Debt, includes current portion	5,368,805	52.92%	5,430,227	55.33%	5,342,248	56.29%	4,799,885	51.01%	4,771,292	49.89%
Preferred Stock, with mandatory redemption	21,137	0.21%	22,135	0.23%	23,946	0.25%	24,150	0.26%	24,296	0.25%
Preferred Stock, without mandatory redemption	4,547	0.04%	4,547	0.05%	4,557	0.05%	4,557	0.05%	4,568	0.05%
Common Stockholders' Equity	4,235,837	41.75%	4,127,725	42.06%	4,000,859	42.15%	4,102,001	43.59%	4,542,046	47.50%
	\$10,145,376	100.00%	\$9,813,539	100.00%	\$9,491,107	100.00%	\$9,409,603	100.00%	\$9,562,716	100.00%

**TENNESSEE AMERICAN WATER COMPANY
DOCKET NO. 12-00049
FIRST DISCOVERY REQUEST OF THE
TENNESSEE REGULATORY AUTHORITY**

Responsible Witness: Gary M. VerDouw

Question:

86. In response to Staff Data Request Number 1, Question 82 in Docket No. 10-00189, the company indicated that it will issue \$0.622 million in equity in 2011. Provide all documentation, including general ledger entries and bank statements, related to the equity issuance. Has the \$2.5 million equity issuance referenced in response to Question 82 in the instant docket for 2012 occurred? If yes, please provide all documentation, including general ledger entries and bank statements, related to the equity issuance. If no, please indicate when the equity issuance will occur.

Response:

The \$0.622 million equity infusion planned for 2011 did not occur. However, the \$2.5 million equity issuance is still scheduled for December 2012. This will be booked to TAWC's paid-in capital account.