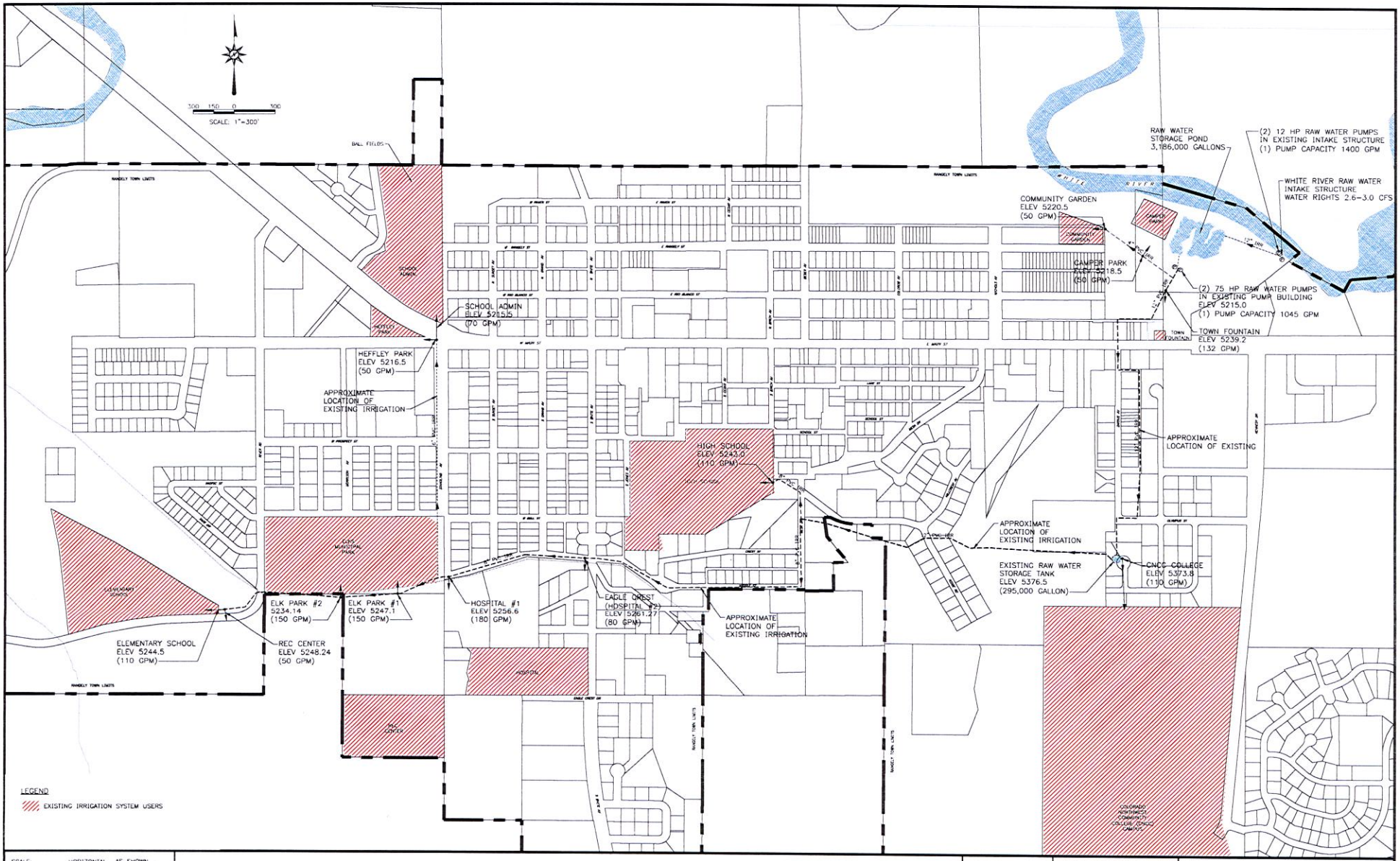
Town of Rangely Irrigation System Summary Analysis

December 2014

WestWater Engineering

EXISTING IRRIGATION SYSTEM



SCALE:	HORIZONTAL AS SHOWN VERTICAL AS SHOWN
REVISIONS	DATE

WestWater Engineering
2516 Foresight Circle, #1
Grand Junction, CO 81505
(970) 241-7076

TOWN OF RANGELY

EXISTING IRRIGATION SYSTEM USERS

EXISTING RAW WATER SYSTEM DEMANDS
WEST SYSTEM

	Raw Water User	July 2010 (gallons)	July 2011 (gallons)	July 2013 (gallons)	Maximum Month Average (gallons)	Maximum Day Volume (gallons)	Pump Flow (gpm)	Pump Run Time (hr\day)
1	Elementary	46,030.00 **	1,206,515.00	2,634,030.00	1,920,272.50	61,944.27	110.00	9.39
2	Rec Center	0.00	422,405.00	673,610.00	548,007.50	17,677.66	50.00	5.89
3	Elks Park #2	NO DATA	NO DATA	959,200.00	959,200.00	30,941.94	150.00	3.44
4	Elks Park #1	4,401,600.00	1,651,800.00	1,018,900.00	2,357,433.33	76,046.24	150.00	8.45
5	School Admin	1,682,230.00	748,790.00	962,310.00	1,131,110.00	36,487.42	70.00	8.69
6	Heffley Park	570,490.00	291,240.00	452,270.00	438,000.00	14,129.03	50.00	4.71
7	Hospital #1	756,320.00	777,340.00	NO DATA	766,830.00	24,736.45	180.00	2.29
8	Eagle Crest (Hospital #2)*	NO DATA	NO DATA	NO DATA	655,280.00	21,138.06	80.00	4.40
9	Jr/Sr High School	2,821,840.00	726,090.00	4,113,150.00	2,553,693.33	82,377.20	110.00	12.48
10	CNCC College	3,930,260.00	2,612,195.00	3,882,550.00	3,475,001.67	112,096.83	110.00	16.98
11	Camper Park	NO DATA	235,690.00	265,580.00	250,635.00	8,085.00	50.00	2.70
12	Community Garden	NO DATA	NO DATA	115,314.00	115,314.00	3,719.81	50.00	1.24
			SUB TOTAL		**14,515,497.33** ***	**489,379.91**	**1,160.00**	
	Fountain					190,080.00	132.00	24
					TOTAL	**679,459.91**	**1,292.00**	

* Flow data is from July 2014 only due to tap reinstallation in 2014

** Suspect Data not included in Average

*** Does not include Eagle Crest flow due to not having full period of record

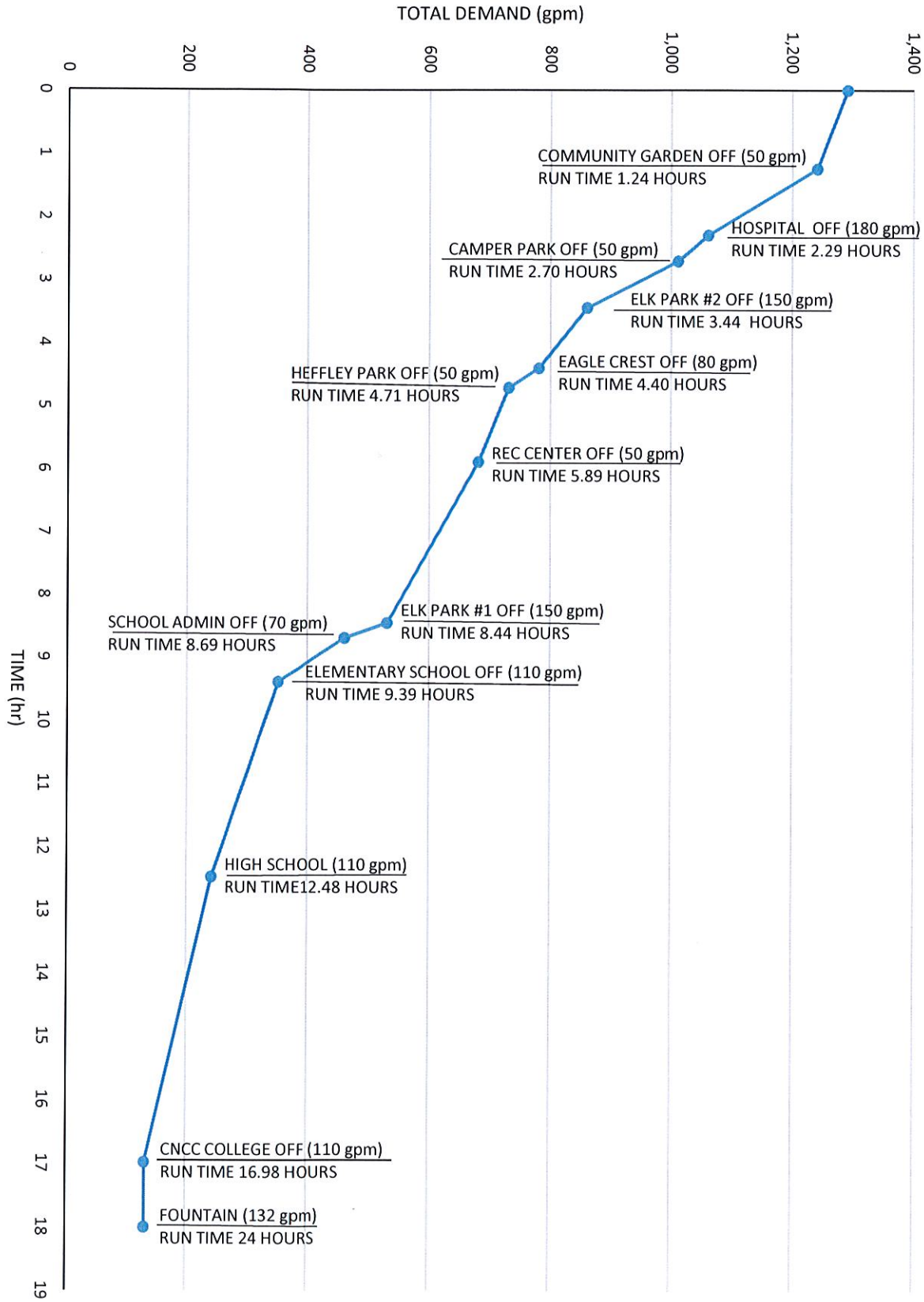
EXISTING RAW WATER SYSTEM DEMANDS
EAST SYSTEM

	Raw Water User	July 2010 (gallons)	July 2011 (gallons)	July 2013 (gallons)	Maximum Month Average (gallons)	Maximum Day Volume (gallons)	Pump Flow (gpm)	Pump Run Time (hr\day)
1	Cemetary	NO DATA	NO DATA	741,703.20	741,703.20	23,925.91	333.20	1.20
2	Golf Course	NO DATA	10,876,550.00	12,777,956.00	11,827,253.00	381,524.29	1,300.00 *	4.89
3	CNCC Ball Diamond	952,790.00	367,220.00	620,940.00	646,983.33	20,870.43	100.00 **	3.48
			SUB TOTAL		**13,215,939.53**	**426,320.63**	**1,733.20**	

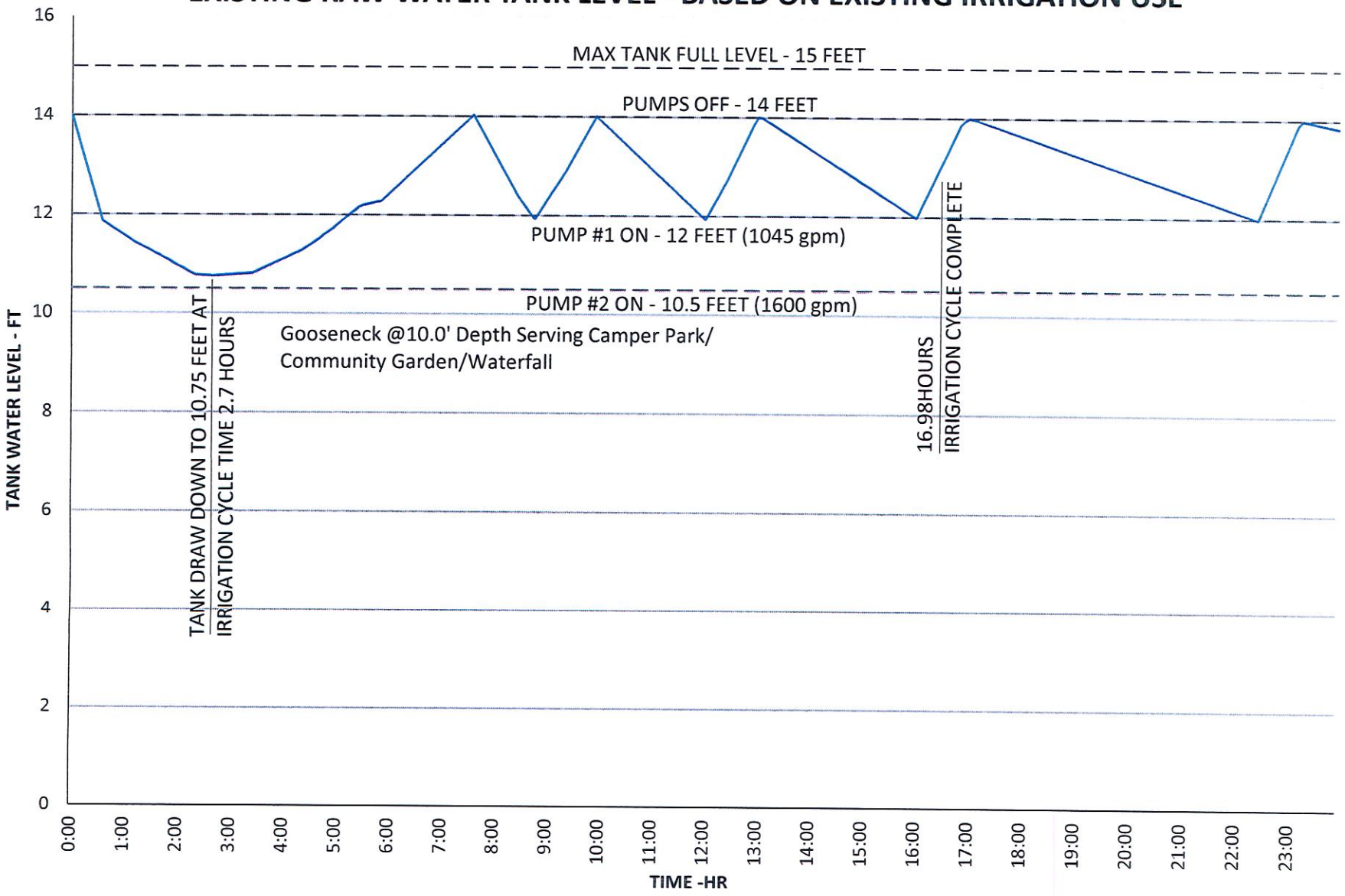
* From Golf Course Maintenance Staff

** Estimated Pump Flow

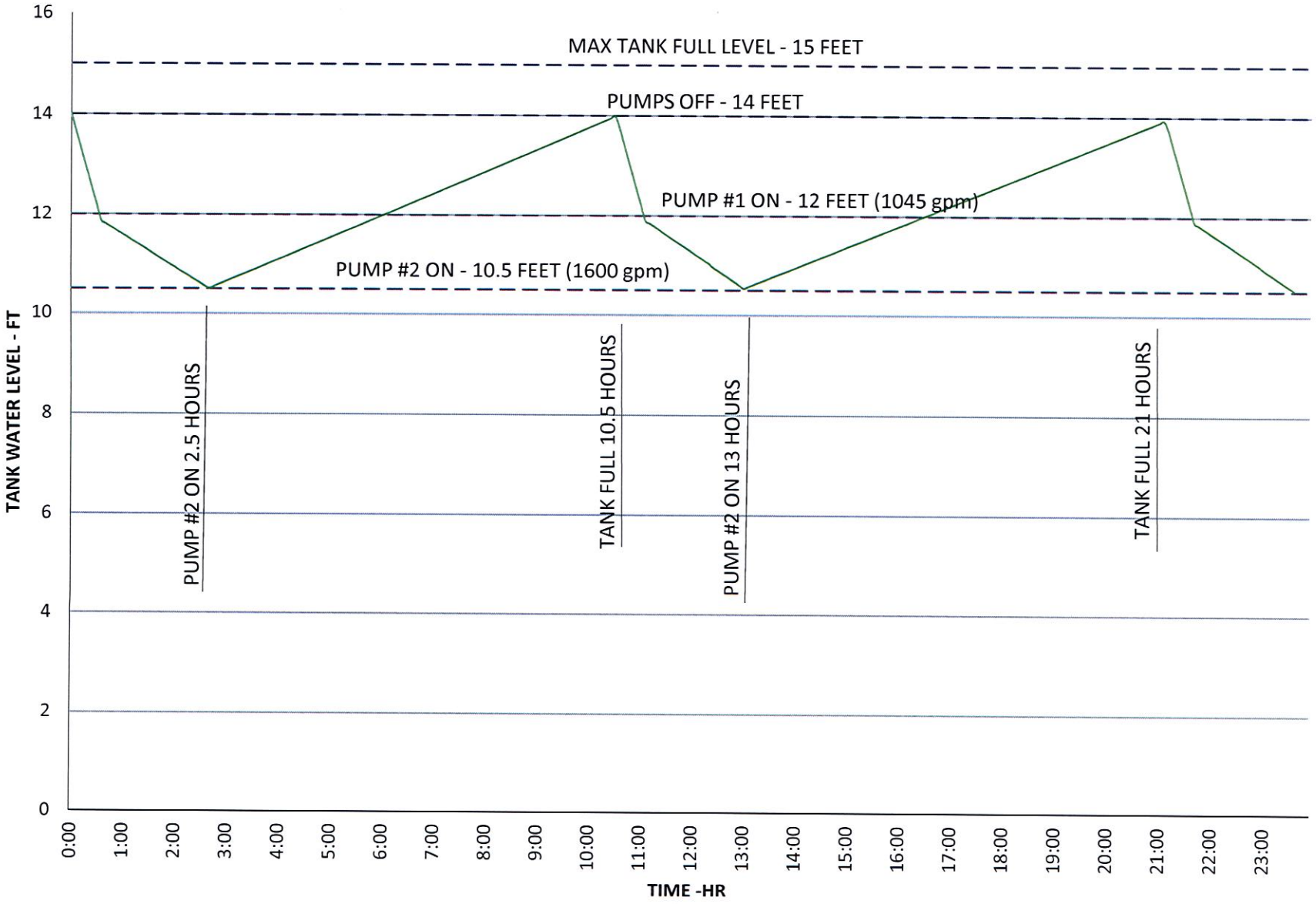
EXISTING WEST SYSTEM DEMANDS



EXISTING RAW WATER TANK LEVEL - BASED ON EXISTING IRRIGATION USE



EXISTING RAW WATER TANK LEVEL - ALL EXISTING USERS ON 24 HOURS



EXISTING SYSTEM ANALYSIS

EXISTING SYSTEM OPERATING PARAMETERS

MINIMUM LEVEL OF SERVICE

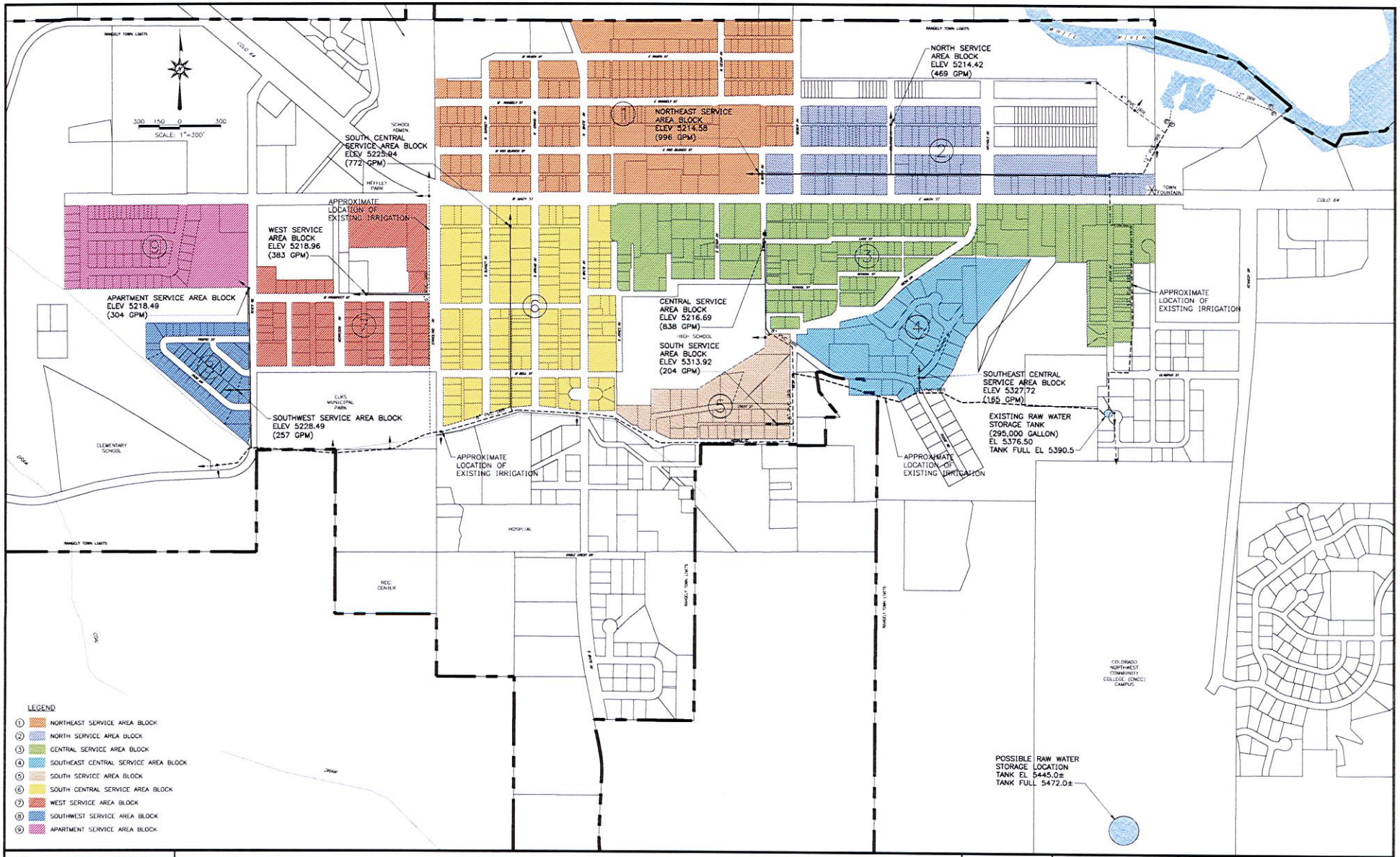
User	Static Pressure (psi)	NPSHr (psi)*	Operating pressure (psi)***	Status (Operating Pressure > NPSHr)
Elementary	63	6.93	24	OK
Rec Center	62	5	23	OK
Elks Park #2	68	6.93	29	OK
Elks Park #1	62	4.76	24	OK
School Admin	76	20**	37	OK
Hefley Park	75	5	37	OK
Hospital	58	1	21	OK
Eagle Crest	56	1	28	OK
Jr/Sr High School	64	5	58	OK
CNCC College	7	1	6	OK
Camper Park	74	20**	72	OK
Community Garden	74	20**	71	OK

* Minimum pressure for all Raw Water users utilizing system

** No pump on System - minimum operating pressure established at 20 psi

*** Based on tank drawn down to 10.75 feet during irrigation cycle at 2.7 hours

FUTURE IRRIGATION SYSTEM SERVICE AREAS



SCALE: HORIZONTAL AS SHOWN
VERTICAL AS SHOWN

REVISIONS DATE

WestWater Engineering
2516 Foresight Circle, #1
Grand Junction, CO 81505
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TOWN OF RANGELY

FUTURE IRRIGATION SYSTEM SERVICE AREA BLOCKS

FUTURE RAW WATER SYSTEM DEMANDS

	Service Block	# Houses	Demand Each Sprinkler System (gpm)	Total Gallons Per Parcel Per Day (gallons)	Total Volume (gallons)	Incremental Irrigation Use (33%)	Total Volume w/ Reduction (gallons)	Req'd Flow (gpm)	Length of Irrigation cycel (hr\day)
①	Northeast Service Area - (Orange)	151	20 *	1,560.00 **	235,560.00	0.33 ***	78,520.00	996.60	1.31
②	North Service Area - (Purple)	71	20 *	1,560.00 **	110,760.00	0.33 ***	36,920.00	468.60	1.31
③	Central Service Area - (Green)	127	20 *	1,560.00 **	198,120.00	0.33 ***	66,040.00	838.20	1.31
④	Southeast Central Service Area - (L.Blue)	25	20 *	1,560.00 **	39,000.00	0.33 ***	13,000.00	165.00	1.31
⑤	High School South Service Area - (Brown)	31	20 *	1,560.00 **	48,360.00	0.33 ***	16,120.00	204.60	1.31
⑥	South Central Service Area - (Yellow)	117	20 *	1,560.00 **	182,520.00	0.33 ***	60,840.00	772.20	1.31
⑦	West Service Area - (Red)	58	20 *	1,560.00 **	90,480.00	0.33 ***	30,160.00	382.80	1.31
⑧	Southwest Service Area - (Blue)	39	20 *	1,560.00 **	60,840.00	0.33 ***	20,280.00	257.40	1.31
⑨	Apartment Service Area - (Magenta)	46	20 *	1,560.00 **	71,760.00	0.33 ***	23,920.00	303.60	1.31
	Total	665			**1,037,400.00**		**345,800.00**	**4,389.00**	

* Based on 20 gpm flow per sprinkler zone per parcel.

** Based on .6 gpd/sq ft with average lot landscaped area of 2,600 sq/ft.

*** 1/3 of parcels water at any one time.

SYSTEM ALTERNATIVE HYDRAULIC SCENARIOS

SCENARIO 1

EXISTING SYSTEM WITH ADDITIONAL FLOW (220 gpm*)

TANK DRAW DOWN - 3.25 FEET

User	Static Pressure (psi)	NPSHr-psi	Operating pressure (psi)	Status (Operating Pressure > NSPHr
Elementary	63	6.93	7	OK
Rec Center	62	5	5	OK
Elks Park #2	68	6.93	12	OK
Elks Park #1	62	4.76	7	OK
School Admin	76	20	20	OK
Hefley Park	75	5	20	OK
Hospital #1	58	1	5	OK
Eagle Crest (Hospital #2)	56	1	14	OK
Jr/Sr High School	64	5	56	OK
CNCC College	7	1	5	OK
Camper Park	74	20	72	OK
Community Garden	74	20	72	OK
South Central Service Area ⑥	71	20	22	OK

Minimum pressure for all Raw Water users utilizing system

* Flow added to South Central Service Area

SCENARIO 2

NEW USERS ONLY WITH EXISTING TANK FULL ELEV 5390.5

FLOW (4,389 gpm)

TANK DRAW DOWN - 12.3 FEET

User	Static Pressure (psi)	MINIMUM RESIDUAL PRESSURE (psi)	Operating pressure (psi)	Status (Operating Pressure > 20 psi
(1) Northeast Service Area - (Orange)	76	20	28	OK
(2) North Service Area - (Purple)	76	20	36	OK
(3) Central Service Area - (Green)	75	20	25	OK
(4) Southeast Central Service Area - (L. Blue)	27	20	4	FAIL
(5) High School South Service Area - (Brown)	33	20	-26	FAIL
(6) South Central Service Area - (Yellow)	71	20	-83	FAIL
(7) West Service Area - (Red)	74	20	-88	FAIL
(8) Southwest Service Area - (Blue)	70	20	-91	FAIL
(9) Apartment Service Area - (Magenta)	75	20	-88	FAIL

SCENARIO 3

EXISTING SYSTEM - NEW USERS ONLY WITH TANK FULL ELEV 5390.5

REDUCED FLOW (3,076 gpm)

TANK DRAW DOWN - 7.98 FEET

User	Static Pressure (psi)	MINIMUM RESIDUAL PRESSURE (psi)	Operating pressure (psi)	Status (Operating Pressure > 20 psi
(1) Northeast Service Area - (Orange)	76	20	27	OK
(2) North Service Area - (Purple)	76	20	35	OK
(3) Central Service Area - (Green)	75	20	51	OK
(4) Southeast Central Service Area - (L. Blue)	27	20	0	FAIL
(5) High School South Service Area - (Brown)	33	20	0	FAIL
(6) South Central Service Area - (Yellow)	71	20	24	OK
(7) West Service Area - (Red)	74	20	0	FAIL
(8) Southwest Service Area - (Blue)	70	20	0	FAIL
(9) Apartment Service Area - (Magenta)	75	20	0	FAIL

SCENARIO 4

EXISTING SYSTEM - NEW USERS WITH COLLEGE ON AND TANK FULL ELEV 5390.5

REDUCED FLOW (3,076 gpm)

TANK DRAW DOWN - 10.34 FEET

User	Static Pressure (psi)	MINUMUM RESIDUAL PRESSURE (psi)	Operating pressure (psi)	Status (Operating Pressure > 20 psi
(1) Northeast Service Area - (Orange)	76	20	27	OK
(2) North Service Area - (Purple)	76	20	35	OK
(3) Central Service Area - (Green)	75	20	51	OK
(4) Southeast Central Service Area - (L. Blue)	27	20	0	FAIL
(5) High School South Service Area - (Brown)	33	20	0	FAIL
(6) South Central Service Area - (Yellow)	71	20	24	OK
(7) West Service Area - (Red)	74	20	0	FAIL
(8) Southwest Service Area - (Blue)	70	20	0	FAIL
(9) Apartment Service Area - (Magenta)	75	20	0	FAIL

SCENARIO 5

NEW TANK AT COLLEGE - TANK FULL ELEV 5472.0

FLOW (4,389 gpm)

1 MG TANK DRAW DOWN 6.91 FEET - 2 MG TANK DRAW DOWN 3.70 FEET

User	Static Pressure (psi)	MINUMUM RESIDUAL PRESSURE (psi)	Operating pressure (psi)	Status (Operating Pressure > 20 psi
(1) Northeast Service Area - (Orange)	112	20	41	OK
(2) North Service Area - (Purple)	112	20	48	OK
(3) Central Service Area - (Green)	111	20	50	OK
(4) Southeast Central Service Area - (L. Blue)	63	20	24	OK
(5) High School South Service Area - (Brown)	69	20	-1	FAIL
(6) South Central Service Area - (Yellow)	107	20	-59	FAIL
(7) West Service Area - (Red)	110	20	-64	FAIL
(8) Southwest Service Area - (Blue)	106	20	-67	FAIL
(9) Apartment Service Area - (Magenta)	110	20	-63	FAIL

SCENARIO 6

NEW STORAGE SITE AT COLLEGE - TANK FULL ELEV 5472.0

REDUCED FLOW (3,445 gpm)

1 MG TANK DRAW DOWN 5.33 FEET - 2 MG TANK DRAW DOWN 2.03 FEET

User	Static Pressure (psi)	MINUMUM RESIDUAL PRESSURE (psi)	Operating pressure (psi)	Status (Operating Pressure > 20 psi
(1) Northeast Service Area - (Orange)	112	20	48	OK
(2) North Service Area - (Purple)	112	20	56	OK
(3) Central Service Area - (Green)	111	20	77	OK
(4) Southeast Central Service Area - (L. Blue)	63	20	44	OK
(5) High School South Service Area - (Brown)	69	20	39	OK
(6) South Central Service Area - (Yellow)	107	20	49	OK
(7) West Service Area - (Red)	110	20	0	FAIL
(8) Southwest Service Area - (Blue)	106	20	0	FAIL
(9) Apartment Service Area - (Magenta)	110	20	0	FAIL

SCENARIO 7

NEW STORAGE SITE AT COLLEGE - TANK FULL ELEV 5472.0

NEW USERS ONLY FLOW (4,389 gpm)

1 MG TANK DRAW DOWN 7.02 FEET - 2 MG TANK DRAW DOWN 3.68 FEET

NOTE: INCREASE EXISTING 8" IRRIGATION DISTRIBUTION PIPE TO 14"Ø

User	Static Pressure (psi)	MINUMUM RESIDUAL PRESSURE (psi)	Operating pressure (psi)	Status (Operating Pressure > 20 psi
(1) Northeast Service Area - (Orange)	112	20	41	OK
(2) North Service Area - (Purple)	112	20	48	OK
(3) Central Service Area - (Green)	111	20	53	OK
(4) Southeast Central Service Area - (L. Blue)	63	20	27	OK
(5) High School South Service Area - (Brown)	69	20	19	FAIL
(6) South Central Service Area - (Yellow)	107	20	44	OK
(7) West Service Area - (Red)	110	20	46	OK
(8) Southwest Service Area - (Blue)	106	20	49	OK
(9) Apartment Service Area - (Magenta)	110	20	52	OK

SCENARIO 8

NEW STORAGE SITE AT COLLEGE - TANK FULL ELEV 5472.0

NEW AND EXISTING USERS FLOW (5,681 gpm)

1 MG TANK DRAW DOWN 9.40 FEET - 2 MG TANK DRAW DOWN 4.86 FEET

NOTE: INCREASE ALL EXISTING IRRIGATION DISTRIBUTION PIPE TO 16"Ø

User - New	Static Pressure (psi)	MINUMUM RESIDUAL PRESSURE (psi)	Operating pressure (psi)	Status (Operating Pressure > 20 psi
(1) Northeast Service Area - (Orange)	112	20	28	OK
(2) North Service Area - (Purple)	112	20	36	OK
(3) Central Service Area - (Green)	111	20	55	OK
(4) Southeast Central Service Area - (L. Blue)	63	20	21	OK
(5) High School South Service Area - (Brown)	69	20	22	OK
(6) South Central Service Area - (Yellow)	107	20	46	OK
(7) West Service Area - (Red)	110	20	43	OK
(8) Southwest Service Area - (Blue)	106	20	51	OK
(9) Apartment Service Area - (Magenta)	110	20	55	OK
User - Existing				
Elementary	99	6.93	46	OK
Rec Center	97	5	44	OK
Elks Park #2	103	6.93	51	OK
Elks Park #1	98	4.76	45	OK
School Admin	111	20	45	OK
Hefley Park	111	5	45	OK
Hospital #1	93	1	41	OK
Eagle Crest (Hospital #2)	91	1	41	OK
Jr/Sr High School	99	5	49	OK
CNCC College	43	1	8	OK
Camper Park	110	20	65	OK
Community Garden	109	20	64	OK

SCENARIO 9

NEW STORAGE SITE AT COLLEGE - TANK FULL ELEV 5472.0

NEW AND EXISTING USERS-EAST SYSTEM INCLUDED FLOW (7,414 gpm)

1 MG TANK DRAW DOWN 19.15 FEET - 2 MG TANK DRAW DOWN 10.0 FEET

5.0 MG RAW WATER RETENTION POND DRAW DOWN - 0.95 FEET

NOTE: INCREASE ALL EXISTING IRRIGATION DISTRIBUTION PIPE TO 16"Ø

AND PUMP STATION TO DUAL PUMPS @1600 GPM CAPACITY

User - New	Static Pressure (psi)	MINUMUM RESIDUAL PRESSURE (psi)	Operating pressure (psi)	Status (Operating Pressure > 20 psi
① Northeast Service Area - (Orange)	112	20	28	OK
② North Service Area - (Purple)	112	20	36	OK
③ Central Service Area - (Green)	111	20	55	OK
④ Southeast Central Service Area - (L. Blue)	63	20	21	OK
⑤ High School South Service Area - (Brown)	69	20	22	OK
⑥ South Central Service Area - (Yellow)	107	20	46	OK
⑦ West Service Area - (Red)	110	20	43	OK
⑧ Southwest Service Area - (Blue)	106	20	51	OK
⑨ Apartment Service Area - (Magenta)	110	20	55	OK
User - Existing West System				
Elementary	99	6.93	46	OK
Rec Center	97	5	44	OK
Elks Park #2	103	6.93	51	OK
Elks Park #1	98	4.76	45	OK
School Admin	111	20	45	OK
Hefley Park	111	5	45	OK
Hospital #1	93	1	41	OK
Eagle Crest (Hospital #2)	91	1	41	OK
Jr/Sr High School	99	5	49	OK
CNCC College	43	1	8	OK
Camper Park	110	20	65	OK
Community Garden	109	20	64	OK
User - Existing East System				
Cemetary	96±			
Golf Course	96±			
CNCC Ball Diamond	96±			

CAPITAL IMPROVEMENTS PLAN
COST ESTIMATES

EXISTING IRRIGATION SYSTEM REINFORCEMENT
Preliminary Cost Estimate
Town of Rangely
Table 1

Item Number	Description	Quantity	Unit	Unit Price	Total Cost
BID CATEGORY R1 - 1 MG STORAGE TANK (ALT 1)					
R1a	1 MG Storage Tank	1	L.S.	$1,250,000.00	$1,250,000.00
R1b	16" C905 CL150 PVC Transmission Main	3,630	L.F.	$70.00	$254,100.00
	Subtotal				**$1,504,100.00**
	20% Contingency	1	L.S.	$1,504,100.00	$300,820.00
	20% Engineering	1	L.S.	$1,504,100.00	$300,820.00
	Total Estimated Cost				**$2,105,740.00**
BID CATEGORY R2 - 2 MG STORAGE TANK (ALT 2)					
R2a	2 MG Storage Tank	1	L.S.	$2,500,000.00	$2,500,000.00
R2b	16" C905 CL150 PVC Transmission Main	3,630	L.F.	$70.00	$254,100.00
	Subtotal				**$2,754,100.00**
	20% Contingency	1	L.S.	$2,754,100.00	$550,820.00
	20% Engineering	1	L.S.	$2,754,100.00	$550,820.00
	Total Estimated Cost				**$3,855,740.00**
BID CATEGORY R3 - UPDRADE EXISTING RAW WATER PUMP STATION					
R3)	HP Pumps and Piping				
R3a)	(1) 75 HP Pump	1	Each	$20,000.00	$20,000.00
R3b)	New Motor Pump/Control Center	1	LS	$12,000.00	$12,000.00
R3c)	New Pump Building	1	LS	$10,000.00	$10,000.00
	Subtotal				**$42,000.00**
	20% Contingency	1	L.S.	$42,000.00	$8,400.00
	20% Engineering	1	L.S.	$42,000.00	$8,400.00
	Total Estimated Cost				**$58,800.00**
BID CATEGORY R4 DISTRIBUTION PIPE ALT - 1 (4,389 gpm)					
R4	14" C905 CL150 PVC Waterline	4,625	L.F.	$70.00	$323,750.00
	Subtotal				**$323,750.00**
	20% Contingency	1	L.S.	$323,750.00	$64,750.00
	20% Engineering	1	L.S.	$323,750.00	$64,750.00
	Total Estimated Cost				**$453,250.00**
BID CATEGORY R5 DISTRIBUTION PIPE ALT - 2 (5,681 gpm)					
R5	16" C905 CL150 PVC Waterline	7,015	L.F.	$80.00	$561,200.00
	Subtotal				**$561,200.00**
	20% Contingency	1	L.S.	$561,200.00	$112,240.00
	20% Engineering	1	L.S.	$561,200.00	$112,240.00
	Total Estimated Cost				**$785,680.00**

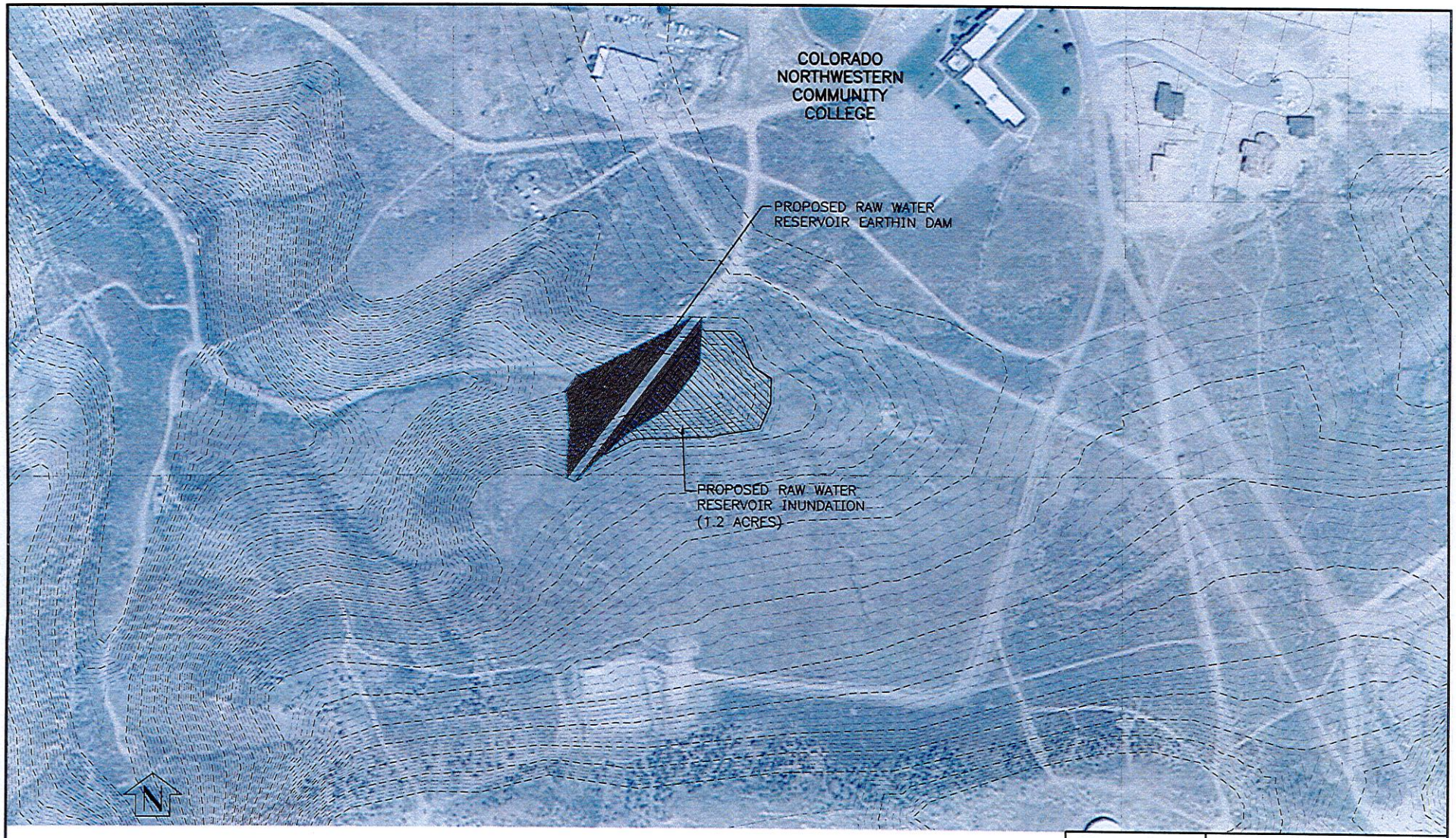
FUTURE SERVICE AREA BLOCK IRRIGATION EXPANSION
Preliminary Cost Estimate
Town of Rangely
Table 2

Item Number	Description	Quantity	Unit	Unit Price	Total Cost
BID CATEGORY - NORTHWEST SERVICE BLOCK ①					
1	8-Inch C900 Class 150 PVC Waterline	10,014	L.F.	$40.00	$400,557.60
2	Service tap - includes tapping saddle and corporation stop	151	Each	$350.00	$52,850.00
3	Service Meter Pit Including Meter Yoke	151	Each	$625.00	$94,375.00
4	2-Inch SCH 40 PVC Service to Property Line	1,510	L.F.	$15.00	$22,650.00
	Subtotal				**$570,432.60**
	20% Contingency	1	L.S.	$570,432.60	$114,086.52
	20% Engineering	1	L.S.	$570,432.60	$114,086.52
	Total Estimated Cost				**$798,605.64**
BID CATEGORY - NORTH SERVICE AREA BLOCK ②					
1	8-Inch C900 Class 150 PVC Waterline	4,098	L.F.	$40.00	$163,927.24
2	Service tap - includes tapping saddle and corporation stop	71	Each	$350.00	$24,850.00
3	Service Meter Pit Including Meter Yoke	71	Each	$625.00	$44,375.00
4	2-Inch SCH 40 PVC Service to Property Line	710	L.F.	$15.00	$10,650.00
	Subtotal				**$243,802.24**
	20% Contingency	1	L.S.	$243,802.24	$48,760.45
	20% Engineering	1	L.S.	$243,802.24	$48,760.45
	Total Estimated Cost				**$341,323.14**
BID CATEGORY - CENTRAL SERVICE AREA BLOCK ③					
1	8-Inch C900 Class 150 PVC Waterline	9,267	L.F.	$44.00	$407,767.32
2	Service tap - includes tapping saddle and corporation stop	127	Each	$350.00	$44,450.00
3	Service Meter Pit Including Meter Yoke	127	Each	$625.00	$79,375.00
4	2-Inch SCH 40 PVC Service to Property Line	1,270	L.F.	$15.00	$19,050.00
	Subtotal				**$550,642.32**
	20% Contingency	1	L.S.	$550,642.32	$110,128.46
	20% Engineering	1	L.S.	$550,642.32	$110,128.46
	Total Estimated Cost				**$770,899.24**
BID CATEGORY - SOUTHEAST CENTRAL SERVICE AREA BLOCK④					
1	8-Inch C900 Class 150 PVC Waterline	2,967	L.F.	$44.00	$130,558.43
2	Service tap - includes tapping saddle and corporation stop	25	Each	$350.00	$8,750.00
3	Service Meter Pit Including Meter Yoke	25	Each	$625.00	$15,625.00
4	2-Inch SCH 40 PVC Service to Property Line	250	L.F.	$15.00	$3,750.00
	Subtotal				**$158,683.43**
	20% Contingency	1	L.S.	$158,683.43	$31,736.69
	20% Engineering	1	L.S.	$158,683.43	$31,736.69
	Total Estimated Cost				**$222,156.80**
BID CATEGORY - SOUTH SERVICE AREA BLOCK ⑤					
1	8-Inch C900 Class 150 PVC Waterline	1,850	L.F.	$44.00	$81,386.67
2	Service tap - includes tapping saddle and corporation stop	31	Each	$350.00	$10,850.00
3	Service Meter Pit Including Meter Yoke	31	Each	$625.00	$19,375.00
4	2-Inch SCH 40 PVC Service to Property Line	310	L.F.	$15.00	$4,650.00
	Subtotal				**$116,261.67**
	20% Contingency	1	L.S.	$116,261.67	$23,252.33
	20% Engineering	1	L.S.	$116,261.67	$23,252.33
	Total Estimated Cost				**$162,766.34**

Item Number	Description	Quantity	Unit	Unit Price	Total Cost
BID CATEGORY - SOUTH CENTRAL SERVICE AREA BLOCK ⑥					
1	8-Inch C900 Class 150 PVC Waterline	6,688	L.F.	$44.00	$294,271.87
2	Service tap - includes tapping saddle and corporation stop	117	Each	$350.00	$40,950.00
3	Service Meter Pit Including Meter Yoke	117	Each	$625.00	$73,125.00
4	2-Inch SCH 40 PVC Service to Property Line	1,170	L.F.	$15.00	$17,550.00
	Subtotal				**$425,896.87**
	20% Contingency	1	L.S.	$425,896.87	$85,179.37
	20% Engineering	1	L.S.	$425,896.87	$85,179.37
	Total Estimated Cost				**$596,255.62**
BID CATEGORY - WEST SERVICE AREA BLOCK ⑦					
	6-Inch C900 Class 150 PVC Waterline	3,868	L.F.	$33.00	$127,643.44
2	Service tap - includes tapping saddle and corporation stop	58	Each	$350.00	$20,300.00
3	Service Meter Pit Including Meter Yoke	58	Each	$625.00	$36,250.00
4	2-Inch Service to Property Line	580	L.F.	$15.00	$8,700.00
	Subtotal				**$192,893.44**
	20% Contingency	1	L.S.	$192,893.44	$38,578.69
	20% Engineering	1	L.S.	$192,893.44	$38,578.69
	Total Estimated Cost				**$270,050.81**
BID CATEGORY - SOUTHWEST SERVICE AREA BLOCK ⑧					
1	8-Inch C900 Class 150 PVC Waterline	3,383	L.F.	$40.00	$135,316.56
2	Service tap - includes tapping saddle and corporation stop	39	Each	$350.00	$13,650.00
3	Service Meter Pit Including Meter Yoke	39	Each	$625.00	$24,375.00
4	2-Inch SCH 40 PVC Service to Property Line	390	L.F.	$15.00	$5,850.00
	Subtotal				**$179,191.56**
	20% Contingency	1	L.S.	$179,191.56	$35,838.31
	20% Engineering	1	L.S.	$179,191.56	$35,838.31
	Total Estimated Cost				**$250,868.18**
BID CATEGORY - APARTMENT SERVICE AREA BLOCK ⑨					
1	8-Inch C900 Class 150 PVC Waterline	4,292	L.F.	$40.00	$171,672.60
2	Service tap - includes tapping saddle and corporation stop	46	Each	$350.00	$16,100.00
3	Service Meter Pit Including Meter Yoke	46	Each	$625.00	$28,750.00
4	2-Inch SCH 40 PVC Service to Property Line	460	L.F.	$15.00	$6,900.00
	Subtotal				**$223,422.60**
	20% Contingency	1	L.S.	$223,422.60	$44,684.52
	20% Engineering	1	L.S.	$223,422.60	$44,684.52
	Total Estimated Cost				**$312,791.64**

TOTAL ESTIMATED COST TO SERVE ALL SERVICE AREA BLOCKS $3,725,717.41

FUTURE RAW WATER RESERVOIR ALTERNATIVES



200 100 0 200

SCALE: 1"=200'

CONTOUR INTERVAL: 2' MINOR
10' MAJOR

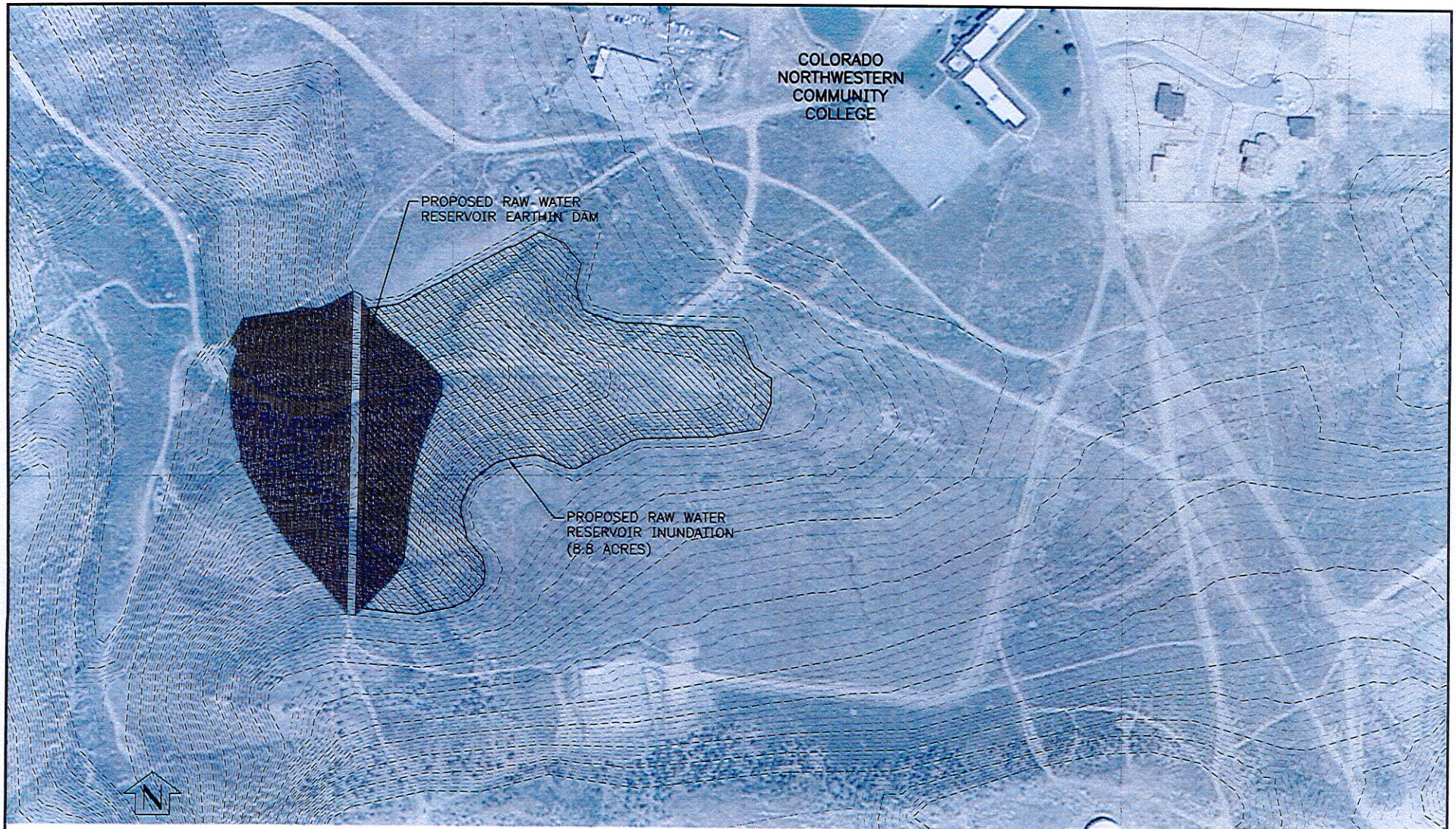
PHOTO: 2009 RIO BLANCO COUNTY (NAIP)

PROPOSED RESERVOIR VOLUME

22	AC-FEET
7,100,300	GALLONS

WestWater Engineering
2516 Foresight Circle, #1
Grand Junction, CO 81505
(970) 241-7076

TOWN OF RANGELY
RAW WATER RESERVOIR
ALTERNATIVE 1



200 100 0 200

SCALE: 1"=200'

CONTOUR INTERVAL: 2' MINOR
10' MAJOR

PHOTO: 2009 RIO BLANCO COUNTY (NAIP)

PROPOSED RESERVOIR VOLUME

307	AC-FEET
100,271,726	GALLONS

WestWater Engineering
2516 Foresight Circle, #1
Grand Junction, CO 81505
(970) 241-7076

TOWN OF RANGELY
RAW WATER RESERVOIR ALTERNATIVE 2

200 100 0 200
SCALE: 1"=200'

CONTOUR INTERVAL: 2' MINOR
10' MAJOR

PHOTO: 2009 RIO BLANCO COUNTY (NAIP)

PROPOSED RESERVOIR VOLUME

15.3 AC-FEET

5,000,000 GALLONS

WestWater Engineering
2516 Foresight Circle, #1
Grand Junction, CO 81505
(970) 241-7076

TOWN OF RANGELY
RAW WATER RETENTION POND
ALTERNATIVE 3

Alternative 3
5 Million Gallon Storage Pond
Preliminary Cost Estimate
Town of Rangely
Table 3

Item No.		Total Units	Unit	Unit Price	Extended Amount
1	Site Preparation	1	L.S.	$10,000.00	$10,000.00
2	Earthwork -				
	a) Excavation	12,487	C.Y.	$10.00	$124,870.00
	b) Compacted Fill	8,904	C.Y.	$15.00	$133,560.00
3	Liner Subgrade Preparation Incl'd Bedding as Necessary	1	L.S.	$30,000.00	$30,000.00
4	45-Mil Reinforced Polypropylene Liner	9,000	S.Y.	$10.50	$94,500.00
5	Anchor Trench for Liner Around Storage Lagoon	1	L.S.	$20,000.00	$20,000.00
6	New Hydrostatic Relief Valve	1	Each	$3,000.00	$3,000.00
7	Liner Batton Attachment	32	L.F.	$30.00	$960.00
8	New Concrete Erosion Pad	1	L.S.	$5,000.00	$5,000.00
9	New 16-inch PVC Inlet/Outlet Piping	40	L.F.	$80.00	$3,200.00
10	New Outlet Control Structure w/ Gates	1	Each	$20,000.00	$20,000.00
11	Gravel Surfacing Around Winter Storage Lagoon	600	Tons	$20.00	$12,000.00
12	Mobilization	1	L.S.	$20,000.00	$20,000.00
	Subtotal				**$477,090.00**
	20% Contingency	1	LS	$95,418.00	$95,418.00
	20% Engineering	1	LS	$95,418.00	$95,418.00
	Total Raw Water Retention Pond				**$667,926.00**
1	New 16" C905 CL150 PVC Transmission Main	3,630	L.F.	$70.00	$254,100.00
	Subtotal				**$254,100.00**
	20% Contingency	1	LS	$50,820.00	$50,820.00
	20% Engineering	1	LS	$50,820.00	$50,820.00
	Total Transmission Main Extension				**$355,740.00**
	Total Estimated Cost				**$1,023,666.00**