

7.0 UNION RESERVOIR PUMP BACK PIPELINE

7.1 Project Overview

The City of Longmont Raw Water Master Plan Update (Tetra Tech RMC January 2004) identified a municipal water supply benefit from moving water stored at Union Reservoir back upstream for Longmont's use. River exchanges, where water is released from Union Reservoir and a like amount is diverted at Longmont's municipal intakes near Lyons, are not reliable during droughts. Therefore, an off-stream alternative was examined.

The Union Reservoir Pump Back Pipeline concept involves constructing a pump station at Union Reservoir near the existing outlet works, constructing a new pipeline from Union Reservoir to Alpine Street and Highway 66, and utilizing an existing treated water transmission pipeline in Highway 66 from Alpine Street to the Nelson-Flanders Water Treatment Plant at Dowe Flats. The project would include a total of approximately 12 miles of pipe (3.6 miles of new pipe and 8.4 miles of existing pipe).

Benefits to Longmont occur in two ways: ditch company shares currently being used for raw water irrigation of parks, schools and golf courses are freed up for use at Longmont's water treatment plants; and Longmont's winter raw water supply is increased either by piping Union water directly to the water treatment plants or by exchanging with the Highland Ditch for water they would otherwise be diverting for storage. Two delivery capacities were examined in the 2004 Raw Water Master Plan Update and a 10 cfs pipeline was shown to have the best cost to firm yield ratio, or unit cost.

This project examined pipeline and pump station sizing, alternative routes, and potential for constructing the project in phases. Six route alternatives were examined for the portion of the project between Union Reservoir and the existing pipeline connection at Alpine Street/Highway 66. Four phases are identified for constructing the project in pieces as an alternative to immediately completing the pipeline to the Nelson-Flanders Water Treatment Plant.

7.2 Pipeline and Pump Station Sizing

The 2004 Raw Water Master Plan Update examined pipeline capacities of 10 cfs and 20 cfs. The 10 cfs version contemplated a new 18-inch diameter pipeline from Union Reservoir to Alpine Street. From Alpine to Hover Street, a distance of 2.5 miles, an existing pipeline consisting of one-half mile of 20-inch and two miles of 18-inch would be utilized. The final 5.75 miles would use existing 36-inch pipe in Highway 66 from Hover Street to the Nelson-Flanders Water Treatment Plant. The 20 cfs version required new 24-inch pipe from Union Reservoir to Hover Street, replacing the existing 20-inch and 18-inch pipe. The pipeline concept plan as envisioned in the 2004 Raw Water Master Plan Update is duplicated herein as **Figure 7.1**.

Because of the effect it has on lowering total pumping head (less friction loss), and consequently reducing the pumping power required, we recommend that the project be constructed for a 10 cfs capacity while utilizing 24-inch pipe from Union Reservoir to Alpine Street rather than 18-inch.

This reduces the long-term cost of pumping and would also allow the possibility of increasing the project capacity in the future by having to replace only 2.5 miles of the existing pipe from Alpine to Hover rather than having to replace over six miles of pipe from Union Reservoir to Hover. It also provides the opportunity to have a dual delivery capacity, i.e. 20 cfs to Highway 66 and 10 cfs on to the West.

In order to provide 10 cfs capacity initially, while preserving the ability to enlarge the capacity in the future, the Union Reservoir pump station building and yard piping could be designed for 20 cfs, but initially equipped with pumps for 10 cfs. The capacity could then be enlarged in the future at reduced cost by adding additional pumps. Results of this analysis show that for 10 cfs the Union Reservoir pump station would require 185 to 505 horsepower. The pumping power required corresponds with delivery points which correspond to the project phasing described in the following section of this report. A second pump station of 100 horsepower capacity is recommended for placement near 81st Street and Highway 66 to provide lift to the Highland Ditch. Final design of the pipeline should include a detailed analysis of pump station placement and resulting pipeline pressures to make sure that the existing pipeline in Highway 66 is not pressurized beyond a safe operating pressure.

7.3 Pipeline Phasing

Examination of the proposed pump back pipeline project shows that it could be constructed in up to four phases, as follows:

- Phase I - Union Reservoir to the Rough & Ready Ditch near Main Street
- Phase II - Rough & Ready Ditch to 81st Street with connections to the Highland, Rough & Ready, Longmont Supply, and Oligarchy Ditches
- Phase III - 81st Street to Burch Lake and the Wade Gaddis Water Treatment Plant
- Phase IV - Burch Lake to the Nelson-Flanders Water Treatment Plant

Figure 7.2 shows the proposed Union Reservoir Pump Back Pipeline phasing plan. **Table 7.1** provides detailed data regarding the components, costs, and yields of the four phases which are described further below. **Tables 7.2 through 7.5** show construction cost estimates for the four phases and **Table 7.6** presents a summary cost estimate for the total project through Phase IV.

Phase I would provide the ability to pump water to the Rough & Ready Ditch for delivery to its users located east of Main Street. In exchange, Longmont could divert water at its intakes on St. Vrain Creek that Rough & Ready would have otherwise diverted. Phase I would provide the ability to exchange an average of approximately 1,060 acre-feet per year during the 100-year drought that would be used for irrigation under the Rough & Ready. It would also present the opportunity to exchange with the minority shareholders Pleasant Valley Reservoir water. The benefit would only occur during the irrigation season of April through October. The projected cost of Phase I is approximately \$4.53 million. **The unit cost of Phase I is estimated to be \$4,270 per acre-foot.**

Phase II would complete the project to 81st Street and connection with the four irrigation ditches in that area (Highland, Rough & Ready, Longmont Supply and Oligarchy). The location was selected because the four ditches mentioned above are in close proximity to each other and to Highway 66. Completing Phase II provides an average of 930 acre-feet per year of additional irrigation exchange opportunity by including the Oligarchy and Longmont Supply Ditches. More importantly for Longmont's water supply situation, it adds the ability to exchange an average of 3,230 acre-feet per year during the non-irrigation season with the Highland Ditch or Pleasant Valley Reservoir. The incremental yield of Phase II is approximately 4,160 acre-feet per year. The total 100-year drought benefit through Phase II is projected to be 5,220 acre-feet per year.¹ Completion of Phase II is projected to add \$3.6 million to the project. For an incremental benefit of 4,160 acre-feet per year the unit cost is only \$870 per acre-foot. The total cost through Phase II is estimated at \$8.13 million. **The unit cost of completing the project through Phase II is approximately \$1,560 per acre-foot.**

Phase III provides the benefit of being able to utilize the water from Union Reservoir at Longmont's Wade Gaddis Water Treatment Plant directly. Thus, the use would not be dependent on exchanges with area irrigation ditches. The addition of Phase III does not add any new yield to Longmont. As described in the 2004 Raw Water Master Plan Update, treatment upgrades may be necessary to utilize the Union Reservoir water directly rather than by exchange. The cost of Phase III is projected to be \$15.16 million. The total cost through Phase III is estimated at \$23.29 million. **The unit cost of completing the project through Phase III is approximately \$4,460 per acre-foot.**

Phase IV has the same yields and benefits as Phase III and for very little cost allows direct treatment at the City of Longmont's Nelson-Flanders Water Treatment Plant. The cost of Phase IV is projected to be \$1.0 million. The total cost through Phase III is estimated at approximately \$24.3 million. **The unit cost of completing the project through Phase IV is approximately \$4,660 per acre-foot.**

Because the greatest yield comes at the lowest price once Phase II is completed, we recommend completion of the pipeline project initially from Union Reservoir to 81st Street with connections with the Highland, Rough & Ready, Oligarchy, and Longmont Supply Ditches. Completion through Phase II would require a pump station capacity at Union Reservoir of approximately 310 horsepower. If available funding is limited, the work could be completed in two stages, the first being Phase I and the second being Phase II as described above. Negotiations and agreements with the ditch companies should be undertaken prior to initiation of Phase II of the project. Further analysis should be conducted regarding the treatment requirements and costs before completing the project through Phases III or IV.

7.4 Pipeline Routing Alternatives

Six alternative pipeline routes were examined for completing the pipeline from Union Reservoir to the connection with the existing transmission pipeline at Alpine Street and Highway 66. The six alternatives are shown on **Figure 7.3**.

¹ 1,060 acre-feet irrigation season yield from Phase I, plus 4,160 acre-feet irrigation and non-irrigation season yield from Phase II.

All six alternatives share the first part of the route from Union Reservoir to County Line Road. The chosen alignment stays north of Spring Gulch, which will be improved in the future as a major drainage channel, to avoid the expense of crossing it twice. From there two major routes alternatives are proposed, Route 1 and Route 2, each with three sub-alternatives A, B and C. Route 1 generally proceeds north along the west side of County Line Road to Highway 66. Route 2 generally proceeds farther west along Spring Gulch maximizing the length of the route located within City of Longmont controlled rights-of-way and property. **Table 7.7** presents details regarding the various aspects of each of the six alternative routes.

Each of the alternative routes were assigned a rank of 1 to 6 in 13 categories including length, cost, type of ground, city control of route, major and minor crossings, traffic control and disruptions, benefits, and future right-of-way needs. The lowest ranking indicates the best option. Based on an unweighted ranking of the 13 aspects of the routes detailed in **Table 7.7**, Route 2a is the preferred alternative with a score of 30. Categories for which this alternative was top ranked include lowest cost, least construction impacting Boulder County Open Space or existing roads, and fewest major and minor crossings. Second rankings include amount of route through existing landscaped areas, and amount of traffic control and disruptions. The second best alternative is Route 2c with a score of 37.

Future right-of-way that should be reserved for Route 2a includes the initial portion from Union Reservoir to County Line Road, and a location in the south portion of the Highway 66 right-of-way from Ute Creek Golf Course to Alpine Street. Construction of the portion of the route through Ute Creek Golf Course should be planned for winter-time and coordinated with City of Longmont Golf.

TABLE 7.1
CITY OF LONGMONT, UNION RESERVOIR FEASIBILITY STUDY
UNION RESERVOIR PUMP BACK PIPELINE - PHASING DETAILS MATRIX

Description	Unit	Phase I	Phase II	Phase III	Phase IV
Phase Segment		Union Reservoir to Rough & Ready Ditch	Rough & Ready Ditch to 81st Street	81st Street to Burch Lake	Burch Lake to Nelson-Flanders WTP
Total Route through Phase		Union Reservoir to Rough & Ready Ditch	Union Reservoir to 81st Street	Union Reservoir to Burch Lake	Union Reservoir to New WTP
Total Pipe in Phase	FT	23,700	20,800	5,300	15,800
New Pipe in Phase	FT	19,200	2,900	0	0
Existing Pipe in Phase	FT	4,500	17,900	5,300	15,800
Total Length through Phase	FT	23,700	44,500	49,800	65,600
Total Length through Phase	MI	4.5	8.4	9.4	12.4
New 24-inch Pipe in Phase	FT	19,200	2,900	0	0
Existing 20-inch Pipe in Phase	FT	2,640	0	0	0
Existing 18-inch Pipe in Phase	FT	1,860	8,700	0	0
Existing 36-inch Pipe in Phase	FT	0	9,200	5,300	15,800
Total New 24-inch Pipe	FT	19,200	22,100	22,100	22,100
Total Existing 20-inch Pipe	FT	2,640	2,640	2,640	2,640
Total Existing 18-inch Pipe	FT	1,860	10,560	10,560	10,560
Total Existing 36-inch Pipe	FT	0	9,200	14,500	30,300
Start Elev	FT	4945	4945	4945	4945
End Elev	FT	5065	5120	5165	5280
Total Elevation Head	FT	120	175	220	335
Total Friction Head	FT	43	95	96	99
Total Head	FT	163	270	316	434
Total Union Pump Hp Req'd	HP	185	310	360	490
Incremental Union Pump Hp for Phase	HP	185	125	50	130
Pump Phasing (at Union)	HP	185	125	0	0
Pump Phasing (at 81st)	HP	0	100	60	0
Pump Phasing (at 81st)	HP	0	0	0	135
Total Pumping Added in Phase	HP	185	225	60	135
Total Pumping through Phase	HP	185	410	470	605
Adds Service To:		Rough & Ready Ditch (lower part)	Oligarchy Ditch, Longmont Supply Ditch, Rough & Ready (upper part) and Highland Ditch for irrigation and storage exchange	Wade Gaddis WTP for blending/direct treatment	New WTP for direct treatment
Season of Use:		Irrigation Season Use Only	Year Round Use by exchange with ditches against reservoir filling	Year Round by exchange or direct use	Year Round by exchange or direct use
Shares Made Available for Use at WTP:		14.9 Rough & Ready Ditch 14.1 Pleasant Valley Res.	30.7 Oligarchy Ditch/Res. 3.1 Longmont Supply 241 McIntosh Reservoir	None Additional	None Additional
100-Year Drought Yield of Shares Made Available for Use at WTP for Phase	AF/YR	1,060	930	0	0
Cumulative Yield through Phase	AF/YR	1,060	1,990	1,990	1,990
100-Year Drought Yield of Raw Water by Exchange w/ ditches or Direct to WTP for Phase	AF/YR	0	3,230	0	0
Cumulative Yield through Phase	AF/YR	0	3,230	3,230	3,230
Combined 100-Year Drought Yield for Phase	AF/YR	1,060	4,160	0	0
Cumulative Yield through Phase	AF/YR	1,060	5,220	5,220	5,220
Estimated Cost of Phase		\$4,530,000	\$3,600,000	\$15,160,000	\$1,020,000
Cumulative Cost through Phase		\$4,530,000	\$8,130,000	\$23,290,000	\$24,310,000
Incremental Unit Cost for Phase	\$/AF	\$4,270	\$870	n/a	n/a
Cumulative Unit Cost through Phase	\$/AF	\$4,270	\$1,560	\$4,460	\$4,660

TABLE 7.2

CITY OF LONGMONT, UNION RESERVOIR FEASIBILITY STUDY
 UNION RESERVOIR PUMP BACK PIPELINE
 PHASE I - UNION TO ROUGH & READY DITCH

Item	Description	Unit	Quantity	Unit Price	Extension
1	Mobilization	LS	1	\$90,000	\$90,000
2	24-inch Dia Ductile Iron Pipe	LF	19,200	\$100	\$1,920,000
3	Pump Station	HP	185	\$2,000	\$370,000
4	Road Crossings	LF	250	\$100	\$25,000
5	Highway Crossings	LF	0	\$1,200	\$0
6	Outlet Structure to Rough & Ready	LS	1	\$50,000	\$50,000
7	24-Inch Line Valves	EA	2	\$16,000	\$32,000
8	36-Inch Line Valves	EA	0	\$25,000	\$0
9	Air Relief/Blowoff/Access Hatches	EA	2	\$15,000	\$30,000
10	Landscape Restoration	LF	400	\$50	\$20,000
11	Abandonment of 18/20/36" Connections	EA	6	\$100,000	\$600,000
12	Easement Acquisition	AC	5	\$1,000	\$5,000
Construction Subtotal:					\$3,142,000
Design, Construction Engineering and Permitting @ 20%:					\$628,400
Construction and Engineering Subtotal:					\$3,770,400
Contingencies @ 20%:					\$754,080
Total Estimated Cost (rounded)					\$4,530,000

Notes:

1. Costs based on Phase I Route Alternate 2a

TABLE 7.3

CITY OF LONGMONT, UNION RESERVOIR FEASIBILITY STUDY
 UNION RESERVOIR PUMP BACK PIPELINE
 PHAASE II - ROUGH & READY DITCH TO 81ST STREET

Item	Description	Unit	Quantity	Unit Price	Extension
1	Mobilization	LS	1	\$70,000	\$70,000
2	24-inch Dia Ductile Iron Pipe	LF	2,900	\$100	\$290,000
3	Pump Station Additional Capacity	HP	125	\$2,000	\$250,000
4	Pump Station to Highland	HP	100	\$2,000	\$200,000
5	Road Crossings	LF	0	\$100	\$0
6	Highway Crossings	LF	300	\$1,200	\$360,000
7	Outlet Structures to Ditches	EA	4	\$50,000	\$200,000
8	24-Inch Line Valves	EA	6	\$16,000	\$96,000
9	36-Inch Line Valves	EA	1	\$25,000	\$25,000
10	Air Relief/Blowoff/Access Hatches	EA	0	\$15,000	\$0
11	Landscape Restoration	LF	0	\$50	\$0
12	Abandonment of 18/20/36" Connections	EA	10	\$100,000	\$1,000,000
13	Easement Acquisition	AC	4	\$1,000	\$4,000
Construction Subtotal:					\$2,495,000
Design, Construction Engineering and Permitting @ 20%:					\$499,000
Construction and Engineering Subtotal:					\$2,994,000
Contingencies @ 20%:					\$598,800
<i>Total Estimated Cost (rounded)</i>					\$3,600,000

TABLE 7.4

CITY OF LONGMONT, UNION RESERVOIR FEASIBILITY STUDY
 UNION RESERVOIR PUMP BACK PIPELINE
 PHASE III - 81ST STREET TO BURCH LAKE

Item	Description	Unit	Quantity	Unit Price	Extension
1	Mobilization	LS	1	\$310,000	\$310,000
2	24-inch Dia Ductile Iron Pipe	LF	0	\$100	\$0
3	Pump Station to Burch Lake	HP	60	\$2,000	\$120,000
4	Road Crossings	LF	0	\$100	\$0
5	Highway Crossings	LF	0	\$1,200	\$0
6	Outlet Structure to Burch Lake	EA	1	\$50,000	\$50,000
7	24-Inch Line Valves	EA	1	\$16,000	\$16,000
8	36-Inch Line Valves	EA	1	\$25,000	\$25,000
9	Air Relief/Blowoff/Access Hatches	EA	0	\$15,000	\$0
10	Landscape Restoration	LF	0	\$50	\$0
11	Abandonment of 18/20/36" Connections	EA	0	\$100,000	\$0
12	Easement Acquisition	AC	1	\$1,000	\$1,000
13	Additional Treatment Cost	LS	1	\$10,000,000	\$10,000,000
Construction Subtotal:					\$10,522,000
Design, Construction Engineering and Permitting @ 20%:					\$2,104,400
Construction and Engineering Subtotal:					\$12,626,400
Contingencies @ 20%:					\$2,525,280
Total Estimated Cost (rounded)					\$15,160,000

TABLE 7.5

CITY OF LONGMONT, UNION RESERVOIR FEASIBILITY STUDY
 UNION RESERVOIR PUMP BACK PIPELINE
 PHASE IV - BURCH LAKE TO NELSON-FLANDERS WTP

Item	Description	Unit	Quantity	Unit Price	Extension
1	Mobilization	LS	1	\$20,000	\$20,000
2	24-inch Dia Ductile Iron Pipe	LF	0	\$100	\$0
3	Pump Station to New WTP	HP	135	\$2,000	\$270,000
4	Road Crossings	LF	0	\$100	\$0
5	Highway Crossings	LF	300	\$1,200	\$360,000
6	Outlet Structures to WTP Forebay	EA	1	\$50,000	\$50,000
7	24-Inch Line Valves	EA	0	\$16,000	\$0
8	36-Inch Line Valves	EA	0	\$25,000	\$0
9	Air Relief/Blowoff/Access Hatches	EA	0	\$15,000	\$0
10	Landscape Restoration	LF	0	\$50	\$0
11	Abandonment of 18/20/36" Connections	EA	0	\$100,000	\$0
12	Easement Acquisition	AC	3	\$1,000	\$3,000
13	Additional Treatment Cost	LS	0	\$10,000,000	\$0
Construction Subtotal:					\$703,000
Design, Construction Engineering and Permitting @ 20%					\$140,600
Construction and Engineering Subtotal:					\$843,600
Contingencies @ 20%					\$168,720
Total Estimated Cost (rounded)					\$1,020,000

TABLE 7.6

**CITY OF LONGMONT, UNION RESERVOIR FEASIBILITY STUDY
UNION RESERVOIR PUMP BACK PIPELINE
SUMMARY OF COSTS**

Phase #	Pipe Type	Pipe Length	Total Motor Horsepower	Total Cost
I	New 24 in.	19200 ft.	185 HP	\$4,530,000
	Exist. 20 in.	2640 ft.		
	Exist. 18 in.	1860 ft.		
	Exist. 36 in.	0 ft.		
	Total	23700 ft.		
II	New 24 in.	2900 ft.	225 HP	\$3,600,000
	Exist. 20 in.	0 ft.		
	Exist. 18 in.	8700 ft.		
	Exist. 36 in.	9200 ft.		
	Total	20800 ft.		
III	New 24 in.	0 ft.	60 HP	\$15,160,000
	Exist. 20 in.	0 ft.		
	Exist. 18 in.	0 ft.		
	Exist. 36 in.	5300 ft.		
	Total	5300 ft.		
IV	New 24 in.	0 ft.	135 HP	\$1,020,000
	Exist. 20 in.	0 ft.		
	Exist. 18 in.	0 ft.		
	Exist. 36 in.	15800 ft.		
	Total	15800 ft.		
Total	New 24 in.	22100 ft.	605 HP	\$24,310,000
All	Exist. 20 in.	2640 ft.		
Phases	Exist. 18 in.	10560 ft.		
	Exist. 36 in.	30300 ft.		
	Total	65600 ft.		

Includes easements, contingencies, engineering & administration and environmental permitting. Phase III includes \$10,000,000 for treatment plant upgrades

**TABLE 7.7
CITY OF LONGMONT, UNION RESERVOIR FEASIBILITY STUDY
UNION RESERVOIR PUMP BACK PIPELINE - PHASE I ROUTE COMPARISON MATRIX**

<i>Factor</i>	<i>Route 1a</i>		<i>Route 1b</i>		<i>Route 1c</i>		<i>Route 2a</i>		<i>Route 2b</i>		<i>Route 2c</i>	
	<i>Description</i>	<i>Rank</i>	<i>Description</i>	<i>Rank</i>	<i>Description</i>	<i>Rank</i>	<i>Description</i>	<i>Rank</i>	<i>Description</i>	<i>Rank</i>	<i>Description</i>	<i>Rank</i>
Segments and Lengths	Oligarchy Ditch/Spring Gulch (3,500 ft) County Line Road (9,400 ft) Highway 66 (7,800 ft)		Oligarchy Ditch/Spring Gulch (3,500 ft) County Line Road (3,600 ft) 17th Avenue (1,600 ft) Boulder County Open Space (5,400 ft) Highway 66 (6,400 ft)		Oligarchy Ditch/Spring Gulch (3,500 ft) County Line Road (3,600 ft) 17th Avenue (2,200 ft) Ute Creek Golf Course (5,900 ft) Highway 66 (4,600 ft)		Oligarchy Ditch/Spring Gulch (3,500 ft) Spring Gulch (4,800 ft) 17th Avenue (400 ft) Ute Creek Golf Course (5,900 ft) Highway 66 (4,600 ft)		Oligarchy Ditch/Spring Gulch (3,500 ft) Spring Gulch (4,800 ft) 17th Avenue (2,900 ft) Pace Street (5,300 ft) Highway 66 (2,600 ft)		Oligarchy Ditch/Spring Gulch (3,500 ft) Spring Gulch (4,800 ft) 17th Avenue (2,900 ft) Pace Street (2,600 ft) Power Easement (2,700 ft) Alpine Street (2,600 ft)	
Estimated Cost	\$4,740,000	2	\$4,820,000	4	\$4,750,000	3	\$4,530,000	1	\$5,120,000	6	\$4,920,000	5
Total Length (feet)	20,700	6	20,500	5	19,800	4	19,200	3	19,100	1	19,100	1
In Open Ground (feet)	20,700	1	13,500	3	11,700	5	12,900	4	10,900	6	13,600	2
In Landscaped Greenway (feet)	0	1	1,600	3	2,200	4	400	2	8,200	6	5,500	5
In Golf Course (feet)	0	1	0	1	5,900	5	5,900	5	0	1	0	1
In BoCo Open Space	0	1	5,400	6	0	1	0	1	0	1	0	1
Adjacent to Roads (feet)	17,200	6	11,600	5	10,400	3	5,000	1	10,800	4	8,100	2
City Control of Route (feet)	3,500	6	5,100	5	11,600	4	14,600	3	16,500	2	19,100	1
City Control of Route (percent)	17%		25%		59%		76%		86%		100%	
Major Crossings	<ul style="list-style-type: none"> County Line Road at Spring Gulch 17th Avenue (at County Line) Pace Street (at Hwy 66) 	4	<ul style="list-style-type: none"> County Line Road at Spring Gulch 17th Avenue (at Sundance) Pace Street (at Hwy 66) 	1	<ul style="list-style-type: none"> County Line Road at Spring Gulch 17th Avenue (at Ute Creek) Pace Street (at Hwy 66) 	1	<ul style="list-style-type: none"> County Line Road at Spring Gulch 17th Avenue (at Ute Creek) Pace Street (at Hwy 66) 	1	<ul style="list-style-type: none"> County Line Road at Spring Gulch Spring Gulch (at 17th) 17th Avenue (at Pace) Spring Gulch (at Pace) Pace Street (at Hwy 66) 	5	<ul style="list-style-type: none"> County Line Road at Spring Gulch Spring Gulch (at 17th) 17th Avenue (at Pace) Spring Gulch (at Pace) Pace Street (at Spring Gulch) 	6
Minor Crossings	<ul style="list-style-type: none"> Union Reservoir Filler Ditch Alpine Street (at Hwy 66) Sundance Drive (at Hwy 66) 	3	<ul style="list-style-type: none"> Union Reservoir Filler Ditch Alpine Street (at Hwy 66) Sundance Drive (at Hwy 66) 	3	<ul style="list-style-type: none"> Union Reservoir Filler Ditch Alpine Street (at Hwy 66) Twilight Drive (at Ute Creek) 	1	<ul style="list-style-type: none"> Union Reservoir Filler Ditch Alpine Street (at Hwy 66) Twilight Drive (at Ute Creek) 	1	<ul style="list-style-type: none"> Union Reservoir Filler Ditch Whitehall Drive (at 17th) Deerwood Drive (at 17th) Whitehall Drive (at Pace) Wyndemere Drive North (at Pace) Wyndemere Drive South (at Pace) Calais Drive (at Pace) Olympia Avenue (at Pace) Alpine Street (at Hwy 66) 	5	<ul style="list-style-type: none"> Union Reservoir Filler Ditch Whitehall Drive (at 17th) Deerwood Drive (at 17th) Whitehall Drive (at Pace) Wyndemere Drive North (at Pace) Wyndemere Drive South (at Pace) Olympia Avenue (at Alpine) Winding Drive (at Alpine) Alpine Street (at Hwy 66) 	5
Traffic Control & Disruptions	<ul style="list-style-type: none"> Minor for County Line Road Moderate for Highway 66 	4	<ul style="list-style-type: none"> Minor for County Line Road Moderate for Highway 66 	3	<ul style="list-style-type: none"> Minor for County Line Road Moderate for Highway 66 	1	<ul style="list-style-type: none"> Crossings only for County Line Road and 17th Ave. Moderate for Highway 66 	2	<ul style="list-style-type: none"> Crossing only for County Line Road Minor to Moderate for Highway 66 Significant for 17th and Pace 	6	<ul style="list-style-type: none"> Crossing only for County Line Road None for Highway 66 Significant for 17th and Pace 	5
Benefits	<ul style="list-style-type: none"> Exchange with Rough & Ready Lateral Shares Adjacent to Future Community Park at Hwy 66 	3	<ul style="list-style-type: none"> Exchange with Rough & Ready Lateral Shares Adjacent to Future Community Park at Hwy 66 	3	<ul style="list-style-type: none"> Exchange with Rough & Ready Lateral Shares Adjacent to Future Community Park at Hwy 66 	3	<ul style="list-style-type: none"> Exchange with Rough & Ready Lateral Shares Adjacent to Future Community Park at Hwy 66 	3	<ul style="list-style-type: none"> Proximity to Ute Creek Golf Course Irrigation Pond Adjacent to Future Community Park at Hwy 66 	1	<ul style="list-style-type: none"> Proximity to Ute Creek Golf Course Irrigation Ponds (2) Proximal to Future Community Park at Hwy 66 	2
Future Right-of-Way Needs to Reserve	<ul style="list-style-type: none"> ROW along Oligarchy and Spring Gulch from Union to County Line Road ROW along County Line Road ROW along Highway 66 	6	<ul style="list-style-type: none"> ROW along Oligarchy and Spring Gulch from Union to County Line Road ROW along County Line Road ROW through Boulder County Open Space ROW along Highway 66 	5	<ul style="list-style-type: none"> ROW along Oligarchy and Spring Gulch from Union to County Line Road ROW along County Line Road ROW along Highway 66 	4	<ul style="list-style-type: none"> ROW along Oligarchy and Spring Gulch from Union to County Line Road ROW along Highway 66 Delay landscaping of Spring Gulch Greenway 	3	<ul style="list-style-type: none"> ROW along Oligarchy and Spring Gulch from Union to County Line Road ROW along Highway 66 	2	<ul style="list-style-type: none"> ROW along Oligarchy and Spring Gulch from Union to County Line Road 	1
Sum All Rankings		44		47		39		30		46		37
Number of 1 Rankings		4		2		4		5		4		5
Number of 2 Rankings		1		0		0		2		2		3
Number of 3 Rankings		2		5		3		4		0		0
Number of 4 Rankings		2		1		4		1		2		0
Number of 5 Rankings		0		4		2		1		2		4
Number of 6 Rankings		4		1		0		0		3		1