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TECHNICAL MEMORANDUM

TO:	<u>Justin Scholz, PE</u>	DATE:	<u>April 27, 2018</u>
FIRM:	<u>City of Greeley</u>	JOB NO.:	<u>2597.1c</u>
ADDRESS:	<u>1100 10th Street, Suite 300</u>	PROJECT:	<u>Ashcroft Draw Basin Sanitary Sewer</u>
	<u>Greeley, CO 80631</u>	SUBJECT:	<u>Ashcroft Lift Station and Forcemain Analysis</u>

The City of Greeley (City) requested JVA to evaluate wastewater service to the Ashcroft Draw Basin service area. In 2016, the City was tasked with providing sanitary service for areas south of Highway 34 in the Ashcroft Draw Basin service area, just north of the St. Michaels subdivision. The City recently completed the construction of an 18" gravity sewer to provide service to portions of the area south of Highway 34. The new 18" sewer alignment is along 71st Avenue and is temporarily connected to a gravity sewer near the intersection of 71st Avenue and 22nd Street. The City is in the process of extending the 18" sewer north along 71st Avenue which will eventually be connected to the existing 24" Sheep Draw Basin interceptor sewer.

Currently, the St. Michaels subdivision area is served by the City of Evans through an Intergovernmental Agreement (IGA) primarily based on gravity service to the Evans wastewater treatment facility (WWTF). However, due to treatment capacity constraints of the Evans WWTF and increased usage rates therefore the City has initiated efforts for the City to serve the St. Michaels area and the remaining service areas the Ashcroft Draw Basin with the new 18" sanitary sewer. Most of the Ashcroft Draw Basin service area will require a major lift station to pump the collected wastewater from St. Michaels and future developed area to the new 18" sewer. The next opportunity for the City to exit the IGA with Evans is 2022. The City would like to consider the future development of the entire Ashcroft Draw Basin service area in these alternatives as well as existing infrastructure.

This memo is a summary of JVA's assessment of available data and information to establish a recommendation for the lift station location site and forcemain alignment. The memo includes two parts, first a Lift Station Site Location Analysis and second a Forcemain Alignment Analysis. Opinions of Probable Cost (OPC) for the Lift Station Site Location and the Forcemain Alignment are described following the respective alternative analyses.

Lift Station Site Location Analysis

After preliminary discussions with the City about lift station site locations, all parties decided to consider site alternatives north of the Ashcroft Draw to avoid crossings of the Ashcroft Draw Drainageway. Three sites were selected west of 65th Avenue and north of the draw to stay within the City of Greeley or Weld County limits. Shown on Figure 1 are the selected alternatives sites considered and assigned alternative numbering. Obstacles facing each of the following alternatives are: acquisition of property, primary and backup power sources, distance to existing houses impacted by noise and odors, and permitting requirements.

Alternative LS Site 1: within HOA, Southeast Corner of Detention Basin

Alternative 1 sits along the St. Michael's HOA wall southeast of the detention basin. This alternative has the shortest distance for intercepting the St. Michaels sewer system to convey flow to the proposed lift station and the shortest distance for reconnecting to the existing 18-inch sewer to the Town of Evans as a potential emergency overflow connection. Natural gas (Atmos), domestic water (City) and 3-phase electric (PVREA) services are available from 65th Avenue. Alternative LS Site 1 may require modifications of the HOA wall and



detention basin due to impacts of the proposed site. In addition, noise and odor control measures will need to be considered due to proximity of residential housing as well as easements for the LS site and access road. This land is within Weld County limits and on private property.

Alternative LS Site 2: North of Draw, south of HOA

Alternative LS Site 2 is located between the existing oil & gas access road and the HOA detention basin area. It is located in the vicinity of the detention basin spillway which would require spillway modifications. Proposed access to the site would be shared with the existing oil & gas private drive requiring an access agreement. The lift station would be further away from residential housing, existing sewer infrastructure, and existing utilities compared to LS Site 1. Since LS Site 2 is further away from the connection point to intercept the existing sewer serving St. Michael's it would require a longer emergency overflow to Evans. An advantage of LS Site 2 is that the location is further away from residential housing compared to LS Site 1 resulting in less impact for noise and odors. Electric, water and natural gas service are available from 65th Avenue as well, however will require longer service distances than LS Site 1. This land is on private property in Weld County. Easements and land acquisition will be required to obtain access and land area required for the LS Site 2.

Alternative LS Site 3: North of Draw, outside of HOA, at the west end of existing oil and gas access drive

Alternative LS Site 3 is located outside of the HOA fence and beyond the end of the oil & gas private drive off 65th street that runs east/west between the HOA wall and the Draw. This site provides more open area than LS Sites 1 and 2, and the site is divided between the City limits and Weld County. Of the three alternative sites, LS Site 3 is closest to existing houses which would have higher impacts due to odors and noise. Advantages of LS Site 3 include that the site is completely outside of the HOA detention basin and HOA wall, leaving each undisturbed. Electric and gas services for LS Site 3, would require the greatest distance of the three alternatives compared. Intercepting the existing sewer collection system and overflow to Evans would also require the longest length of sewer compared to the other alternatives. LS Site 3 would have the greatest impact of the three alternatives for utility easements.

Lift Station Site Alternatives – Methodology of the Evaluation Process

Summary of Criterion and Basis for Selection

The three Alternative LS Sites were evaluated using selected qualitative and quantitative criterion including, distance to houses (odor and noise impact), ease of land acquisition / easements, proximity to existing sewer, electric and gas service, site constraints and ease of access. Each of the alternatives comparison criterion were assigned a weighting factor based on the degree of importance and ranked accordingly.

Score Weighting

To effectively compare the three LS Site location alternatives, each decision criteria was assigned a weighting factor that reflects a valuation of the importance of each criterion as shown in Table 1.

Table 1. Lift Station Decision Criteria with Weighting Factors

Criterion	Weighting Factor
Neighborhood Impact	40%
Land Acquisition and Utility Easements	15%
Infrastructure Cost	30%
Site Constraints and Ease of Access	15%



Neighborhood Impacts

Public acceptance and support of the lift station location is valuable. Therefore, the distance from the proposed lift station sites to the nearest house is taken under consideration. However, there are systems that can be put in place to alleviate potential odors and generator noise, so it was given a low weighting factor. All three alternatives are situated relatively close to houses, however alternative 2 is the farthest removed.

Land Acquisition and Easements

Negotiating with the current land owners and government jurisdiction of the land required for the proposed lift station can be an expensive and timely process. If the property is already annexed in the City of Greeley, the approval process could be simplified. Alternative 1 & 2 are on private property in the County and alternative 3 is on HOA property in the City.

Infrastructure Costs

The existing 18" sewer line crosses 65th avenue to connect to the City of Evans collection system at the southeast corner of the St. Michael's subdivision. The alternatives closest to this tie-in location will have the lowest costs for sewer connections and overflow connection to the City of Evans. Three-phase power is necessary for the lift station to operate the lift station and natural gas service is desired for building heat and fueling a backup generator. Natural gas service will be a new line off an existing service main along 65th avenue. Electric power can be provided from the east side of 65th Avenue from Poudre Valley Rural Electric Association (PVREA). Therefore, the farther from 65th Avenue, the costlier the connections.

Site Constraints and Ease of Access

Additional site constraints and necessary improvements can add cost to the project and impact relations with the nearby HOA and oil and gas entity. Truck access, removal of the existing HOA wall, and revising the detention area shape can increase costs and expand the complexity of the land acquisition and scope of the project. Alternative 3 does not affect the existing HOA wall or detention area, where as alternatives 1 & 2 affect both. Consequently, alternative 1 is a tight area at the intersection of 65th Avenue and the oil & gas access road.

Decision Matrix and Selection of the Recommended Lift Station Site

Shown below in Table 2 is the decision matrix that was used to evaluate the lift station location alternatives based on the selected criterion along with the assigned weighting factor. Each criterion was assigned a numerical rank ranging from 1 to 5 for each alternative, 5 being most favorable. That rank was then multiplied by the weighting factor to obtain the alternative's score for that criteria.

Table 2. Decision Matrix for Lift Station Alternatives Comparison

Comparison Criteria	Weighting	Alternative 1		Alternative 2		Alternative 3	
	Factor	Rank	Score	Rank	Score	Rank	Score
Neighborhood Impacts	40%	4	1.60	5	2.00	1	0.40
Land Acquisition and Utility Easements	15%	5	0.75	3	0.45	1	0.15
Infrastructure Costs	30%	5	1.50	2	0.60	3	0.90
Site Constraints & Ease of Access	15%	4	0.15	3	0.45	3	0.60
TOTAL		4.45		3.50		2.05	
FINAL RANKINGS		1		2		3	

Based on the decision matrix above, LS Site 1 has the highest score of the three alternative lift station sites and is therefore it is the recommended site for the proposed Ashcroft Draw Basin lift station.



Forcemain Alignment Analysis

Three forcemain alignment alternatives were evaluated for conveyance of wastewater to the 18" Ashcroft sewer. Each alignment has two ditch crossings. The forcemain route estimates were based on the preferred lift station site, Alternative 1. Shown in Figure 2 are the three alternative forcemain alignments along with the three proposed lift station site alternatives.

FM Alternative 1: Outside of HOA, West side of St. Michael's

FM Alternative 1 skirts around the south and west side of St. Michael's subdivision in a relatively undeveloped area. The advantage of FM Alternative 1 is that there is limited surface or buried infrastructure to cross along the alignment of the forcemain, which is approximately 6,500 linear feet of pipe. Of the three alternatives compared, FM Alternative 1 may be the least difficult to obtain required easements since a majority of the forcemain alignment would be obtained on undeveloped land areas. Disadvantages include forcemain crossing of the Lower Greeley Loveland Canal and Boomerang Ditch. There is also an irrigation buried pipeline that runs parallel to the proposed forcemain alignment that will need to be avoided and / or relocated during construction of the forcemain.

FM Alternative 2: Up 65th Avenue, Along Highway 34

FM Alternative 2 follows 65th Avenue north to Highway 34, crosses Greeley Loveland Irrigation & Company Ditch (GLIC), and turns west to connect to the 18" Ashcroft sewer. Similar to other forcemain alignment alternatives, there are two ditch crossings which will require review and approval from the respective ditch companies to obtain agreements. For the most part, this forcemain alignment would be within the CDOT right of way and should not require any permanent easements. Road improvements to 65th avenue was completed in 2017, therefore, a significant amount of existing infrastructure will be affected along this alternative. In addition, this alignment would be impacted by crossing two major irrigation ditches; Lower Greeley Loveland Canal and The Company Ditch. For this reason, this alignment is the least feasible alternative. The total pipe distance is mid-range compared to the other two FM alignment alternatives at approximately 7,000 feet.

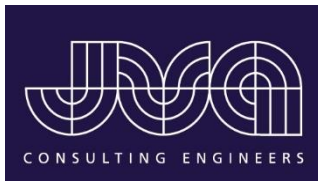
FM Alternative 3: Up 65th Avenue, West through St. Michael's, North on west side

FM Alternative 3 represents a compromise of FM Alternatives 1 and 2. The alignment heads north along the west side of 65th Avenue, turns west at 32nd Street Road, and runs through St. Michael's subdivision along 32nd Street Road. The alignment then bends north along undeveloped land and crosses the Lower Greeley Loveland Canal and Boomerang Ditch before tying into the existing Ashcroft sewer manhole. Similar to FM Alternative 1, the buried irrigation pipeline would have to be avoided and / or relocated during construction of the forcemain. The 32nd Street Road is a divided road with numerous utilities running along the center green space, including a high service power line. This existing electric utility may be difficult to avoid, making construction and future access to the forcemain challenging. The forcemain alignment along 65th Avenue will have construction challenges such as utility conflicts and landscape impacts to the recently completed road widening project. Boring the forcemain would be recommended along the 32nd Street Road alignment to avoid the overhead high service power lines and potentially other surface structure and landscape impacts. The total pipe length for FM Alternative 3 is approximately 7,500 feet.

Description and Methodology of the Evaluation Process

Score Weighting

To effectively compare the three alignment alternatives, the following qualitative criteria were assigned weighting factor that reflects a valuation of the importance of each. Shown in Table 3 are the assigned criterion



along with weighing factors used for the evaluation. Shown in Figure 2 are the three proposed forcemain alternative alignments.

Table 3. Forcemain Alignment Decision Criteria with Weighting Factors

Criterion	Weighting Factor
Infrastructure Cost	30%
Easements	20%
Utility Conflicts / Ditch Crossings	20%
Access / Maintenance	20%

Qualitative Evaluation and Score Weighting

Pipe Length

The three forcemain alignment alternatives were evaluated based on total length of forcemain which was estimated from the discharge point out of the lift station to the connecting UC Health manhole. A weighting factor was assigned to this criterion for the scoring.

Easements

Obtaining the necessary easements can be time consuming and costly. Following a path of existing right-of-way or easement could shorten the overall project schedule. Alternative 3 alignment would follow existing rights-of-way along 65th Avenue and Highway 34; whereas Alternative 1 is entirely along undeveloped private property. The adjacent property west of St. Michaels could be obligated to dedicate easement at subdivision with future development.

Utility Conflicts

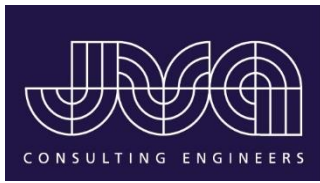
Avoiding existing utilities along rights-of-way can be challenging. 65th Avenue and Highway 34 is heavily impacted by buried gas, communication and a 54-inch water transmission line. Above ground high service electric service runs east-west along the median of W 32nd Street Road within the St Michaels subdivision there are high service power lines above ground. This existing electric utility would impact the Forcemain Alternative 3. It is proposed that the forcemain for Alternative 3 be bored along W 32nd Street where impacted by the overhead electric utility. Based on existing information, Forcemain Alternative 1 is less likely to have major utility conflicts compared to the other alternatives.

Access

Easy and sufficient access for operation and maintenance is important when considering the forcemain alignment alternatives. City staff and crews have to have reliable access to respond, evaluate and repair if necessary forcemain breaks or pipe blockages in a timely manner.

Irrigation Ditch Crossings

Each forcemain alignment alternative was evaluated on impacts to irrigation ditch crossings. As described earlier, utility ditch crossing take time for review and approval by the respective ditch company. As shown in Figure 2, each forcemain alignment crosses two irrigation ditches, so in that respect, there is no significant difference for weighting and scoring the alternatives. Forcemain Alternative 1 may be most impacted due to an existing buried irrigation lateral that runs parallel to the proposed forcemain alignment. It is likely that the lateral would have to be relocated to maintain adequate separation and protection from the proposed forcemain.



Decision Matrix and Selection of Alternate

Shown below in Table 4 is the decision matrix that is used to evaluate the forcemain alignment alternatives using the selected criterion along with the assigned weighting factor. Each criterion was assigned a numerical score ranging from 1 to 5 for each alternative with 1 being least favorable and 5 being most favorable.

Table 4. Decision Matrix for Forcemain Alternatives Comparison

Comparison Criteria	Weighting Factor	Alternative 1		Alternative 2		Alternative 3	
		Rank	Score	Rank	Score	Rank	Score
Infrastructure Costs	30%	5	1.50	1	0.30	4	1.20
Easements	20%	4	0.80	3	0.60	3	0.60
Utility Conflicts / Ditch Crossings	20%	2	0.40	3	0.60	3	0.40
Access / Maintenance	20%	3	0.60	3	0.60	4	0.80
TOTAL		3.30		2.10		3.00	
FINAL RANKINGS		1		3		2	

Based on the decision matrix above, it is shown that Forcemain Alternative 1, the forcemain alignment outside of the HOA, along the west side of St. Michael’s, is the most favorable per the selected criterion and weighting factors closely followed by Forcemain Alternative 3.

Opinion of Probable Cost (OPC) and Recommendations

An OPC for the three alternative LS sites and forcemain alignments are attached to this memorandum. Based on the qualitative evaluation above, LS Site Alternative #1 and Forcemain Alignment Alternative #1 were rated the highest based on the criteria and weighting assigned. As shown in the OPC, both Alternatives #1 for the LS site and forcemain alignment have the lowest total project cost primarily due to the proximity of the LS site off 65th Avenue. Electric, gas, sewer and water utilities exist along 65th Avenue which have sufficient capacity to serve the LS sites. Alternative #1 LS Site may have the least impact for obtaining easements since it is located right off 65th Avenue reducing the distance of site access / easements.

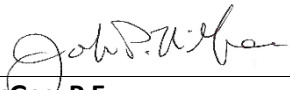
The OPC includes budgetary cost for a skid mount duplex lift station pump system manufactured by Gorman Rupp. It also includes a skid mounted natural gas engine generator to back up power for one pump in the event of an outage. The lift station will be housed inside an insulated pre-cast panel building (or of another material of quality integrity) with overhead doors, entry ways, skylight / access hatches, and HVAC. The pumps will contain VFDs to maintain adequate run time and minimize wet well capacity. The pumps are sized at approximately 1000 gpm each with an ultimate 150 feet of TDH to overcome the friction losses at build out capacity. The initial peak hourly flows to serve the St. Michael’s area is estimated at 420 gpm with an ultimate capacity of 2700 gpm at build-out. Based on the difference between initial pumping demands and ultimate pumping demands, it is proposed to construct two parallel forcemains within the same trench. The proposed forcemain sizes are 10” and 12” C900 PVC pipe. The dual forcemain concept will allow for greater flexibility to maintain adequate scour velocities and to take one line out of service if necessary for operation and maintenance. Due to the proximity of LS Site #1, it is recommended that the lift station include sufficient odor control and noise control. Cost for these features are included with the OPC. Selection of appropriate odor control systems and noise control systems will be further analyzed during the design development of the lift station.

In summary the OPC for LS Site Alternative #1 and Forcemain Alignment Alternative #1 are \$1,985,300 and \$1,682,000 respectively. The life cycle costs comparing all alternatives will primarily be based on monetary costs since the operation, maintenance and replacement costs are similar amongst alternatives.



TECHNICAL MEMORANDUM

Ashcroft Draw Basin Sanitary Sewer
Lift Station Location and Forcemain Alignment Alternatives Analysis
Job No.: 2597.1c
April 27, 2018
Page 7 of 7

Signed: 
John P. McGee, P.E.
Senior Project Manager

Attachments:

- Figure 1 – Lift Station Site Location Alternatives
- Figure 2 – Forcemain Alignment Alternatives
- OPC – Lift Station Site Location Alternatives
- OPC – Forcemain Alignment Alternatives



Job Name: Greeley Ashcroft Lift Station

Job Number: 2597.1c

Date: April 27, 2018

By: MMR/JPM

OPINION OF PROBABLE COST
FOR THE
CITY OF GREELEY, COLORADO
ASHCROFT LIFT STATION

ALTERNATIVE LS Site #1 (Within HOA, Southeast Corner of Detention Basin):

Description	Quantity	Units	Unit Cost	Total Cost
Division 00 and 01 - General Conditions and Requirements				
Mobilization/Demobilization	1	LS	\$80,000	\$80,000
General Requirements Subtotal				\$80,000
Division 02 - Sitework				
Erosion Control - Silt Fence & Vehicle Tracking Control	1	LS	\$7,500	\$7,500
Excavation / Fill	674	CY	\$35	\$23,600
Site Grading	1	LS	\$15,000	\$15,000
Seeding and Landscaping	1	Ac	\$5,000	\$5,000
Gravel Paving	1	LS	\$10,000	\$10,000
Dewatering Allowance	1	LS	\$130,000	\$130,000
Site Piping	1	LS	\$37,000	\$37,000
Access Drive	1	LS	\$10,000	\$10,000
Demo and Reconstruction of HOA Wall / Detention Area	60	LF	\$500	\$30,000
Concrete Subtotal				\$238,100
Division 03 - Concrete				
Concrete Walkway	1	LS	\$3,500	\$3,500
Foundation Stabilization	1	LS	\$40,000	\$40,000
Equipment Pads	1	LS	\$10,000	\$10,000
18-inch Wall Cast-in-place Wet Well (20'x12'x25')	130	CY	\$950	\$123,500
8-inch Building Slab (25'x35')	35	CY	\$500	\$17,500
Concrete Subtotal				\$194,500
Division 05 - Miscellaneous Metals				
36x48-inch Aluminum Hatch	4	EA	\$2,500	\$10,000
Miscellaneous Metals Subtotal				\$10,000
Division 09 - Painting				
Coatings	1	LS	\$40,000	\$40,000
Painting Subtotal				\$40,000
Division 11 - Equipment				
AutoStart Pump System w/ gas fired gen set (Install 2 now, 2 more future)	1	LS	\$160,000	\$208,000
Odor Control	1	LS	\$40,000	\$48,000
Equipment Subtotal				\$256,000
Division 13 - Special Construction				
Aggregate Textured Pre-Cast Panels (Insulated and HVAC)	900	SF	\$140	\$151,200
Special Construction Subtotal				\$151,200
Division 15 - Mechanical				
Station Piping in Wet Well	1	LS	\$14,500	\$14,500
Mechanical Subtotal				\$14,500
Division 16 - Electrical				
Electrical (2 pumps now, rough in for 2 future)	1	LS	\$155,000	\$155,000
Instrumentation and Controls (2 pumps now, rough in for 2 future)	1	LS	\$75,000	\$75,000
Electrical Subtotal				\$230,000

Subtotal \$1,229,300

Contingency (20%) \$246,000

Contractor's OH&P (12%) \$177,000

Gas Service \$15,000

Electrical Service \$30,000

Property and Easement Acquisition \$40,000

Compaction Testing and Inspection Allowance (3%) \$50,000

Design, Permitting, Bidding and Construction Administration (12%) \$198,000

Alternative LS Site #1 (Southeast Corner of Detention Basin) Project Total \$1,985,300



Job Name: Greeley Ashcroft Lift Station

Job Number: 2597.1c

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By: MMR/JPM

ADDITIONAL ITEMS FOR ALTERNATIVE LS Site #2 (North of Draw, south of HOA):

Description	Quantity	Units	Unit Cost	Total Cost
Division 02 - Sitework				
Site Piping	1200	LF	\$80	\$96,000
10-ft Access Drive	600	LF	\$50	\$30,000
Spillway Modification	1	LS	\$50,000	\$50,000
Demo and Reconstruction of HOA Wall (less than Alternative #1)	(20)	LF	\$500	(\$10,000)
				\$126,000

Subtotal \$1,375,300

Contingency (20%)	\$275,000
Contractor's OH&P (12%)	\$198,000
Gas Service - plus additional distance from gas	\$10,000
Electrical Service - plus additional distance from power	\$15,000
Additional Easement (30' min)	\$40,000
Compaction Testing and Inspection Allowance (3%)	\$55,000
Design, Permitting, Bidding and Construction Administration (12%)	\$222,000

Site #2 (North of Draw, south of HOA) Project Total \$2,190,300

ADDITIONAL ITEMS FOR ALTERNATIVE LS Site #3 (North of Draw, outside of HOA, west end of existing oil and gas access drive):

Description	Quantity	Units	Unit Cost	Total Cost
Division 02 - Sitework				
Site Piping	2000	LF	\$80	\$160,000
10-ft Access Drive	1000	LF	\$50	\$50,000
Demo and Reconstruction of HOA Wall (less than Alternative #1)	(20)	LF	\$500	(\$10,000)
				\$210,000

Subtotal \$1,580,300

Contingency (20%)	\$316,000
Contractor's OH&P (12%)	\$228,000
Gas Service - plus additional distance from gas	\$20,000
Electrical Service - plus additional distance from power	\$30,000
Additional Easement (30' min)	\$80,000
Compaction Testing and Inspection Allowance (3%)	\$64,000
Design, Permitting, Bidding and Construction Administration (12%)	\$255,000

Site #3 (North of Draw, within HOA northwest of oil and gas access drive) Project Total \$2,573,300



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Date: April 27, 2018

By: MMR/JPM

**OPINION OF PROBABLE COST
FOR
CITY OF GREELEY, COLORADO
ASHCROFT LIFT STATION - FORCE MAIN**

FM ALTERNATIVE #1 (Outside of HOA, West side of St. Michael's):

Description	Quantity	Units	Unit Cost	Total Cost
Division 00 and 01 - General Conditions and Requirements				
Mobilization/Demobilization	1	LS	\$74,000	\$74,000
General Requirements Subtotal				\$74,000
Division 02 - Sitework				
Erosion Control - Silt Fence & Vehicle Tracking Control	1	LS	\$7,500	\$7,500
Clear and Grub	1	LS	\$3,000	\$3,000
Traffic Control and Signage	1	LS	\$5,000	\$5,000
Mulching and Seeding	5	AC	\$3,500	\$17,500
Construction Surveying	1	LS	\$13,000	\$13,000
Road Base - 6" (repair of O&G / ditch access drive)	5,000	SF	\$3	\$15,000
Gravel Surfacing (repair of O&G / ditch access drive)	5,000	CF	\$4	\$20,000
Isolation Plug Valve	2	EA	\$2,500	\$5,000
Air Relief Assembly	4	EA	\$6,500	\$26,000
Pressure Cleanouts	6	EA	\$3,000	\$18,000
18" F-679 PVC (includes Ditch crossing)	1,000	LF	\$110	\$110,000
10" C900 PVC (common trench)	6,500	LF	\$55	\$357,500
12" C900 PVC (common trench)	6,500	LF	\$65	\$422,500
Sitework Subtotal				\$1,020,000
Division 03 - Concrete				
Precast Manholes with Coatings	3	EA	\$8,000	\$24,000
Concrete Subtotal				\$24,000

Subtotal \$1,118,000

Contingency (20%) \$224,000
 Contractor's OH&P (5%) \$67,000
 Compaction Testing and Inspection Allowance (3%) \$42,000
 Easement along the south boundary of the St Michael Subdivision \$62,000
 Design, Permitting, Bidding and Construction Administration (12%) \$169,000

Alternative #1 (Outside of HOA, West side of St. Michael's) Project Total \$1,682,000

ADDITIONAL ITEMS FOR FM ALTERNATIVE #2 (Up 65th Avenue, Along Highway 34):

Description	Quantity	Units	Unit Cost	Total Cost
Division 02 - Sitework				
Road Base - 6"	25,000	SF	\$3	\$75,000
Asphalt Paving - 6"	25,000	SF	\$10	\$250,000
10" C900 PVC	500	LF	\$55	\$27,500
12" C900 PVC	500	LF	\$65	\$32,500
Sitework Subtotal				\$385,000

Subtotal \$1,503,000

Contingency (20%) \$301,000
 Contractor's OH&P (5%) \$90,000
 Compaction Testing and Inspection Allowance (3%) \$57,000
 Design, Permitting, Bidding and Construction Administration (12%) \$227,000

Alignment #2 (Up 65th street, Along Highway34) Project Total \$2,178,000



Job Name: Greeley Ashcroft Lift Station

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ADDITIONAL ITEMS FOR FM ALTERNATIVE 3 (Up 65th Avenue, West through St. Michael's, North on west side):

Description	Quantity	Units	Unit Cost	Total Cost
Division 02 - Sitework				
Road Base - 6"	9,000	SF	\$3	\$27,000
Asphalt Paving - 6"	9,000	SF	\$10	\$90,000
10" HDPE Boring	2,300	LF	\$75	\$172,500
12" HDPE Boring	2,300	LF	\$85	\$195,500
Sitework Subtotal				\$485,000

Less PVC C900 Total \$276,000

Subtotal \$1,327,000

Contingency (20%) \$265,000

Contractor's OH&P (5%) \$80,000

Compaction Testing and Inspection Allowance (3%) \$50,000

Design, Permitting, Bidding and Construction Administration (12%) \$100,000

Alignment #3 (Up 65th, West through St. Michael's, North on west side) Project Total \$1,822,000

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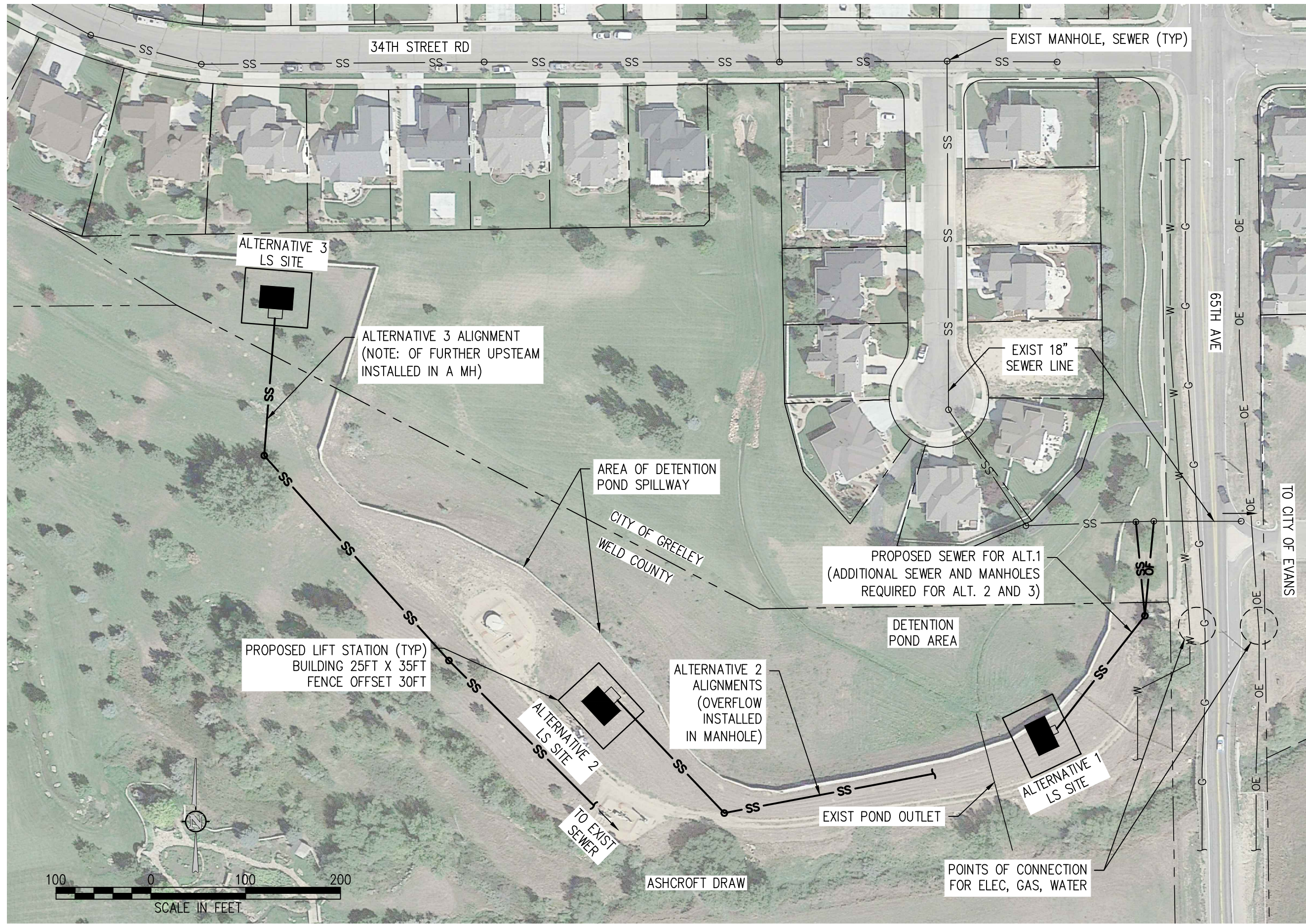
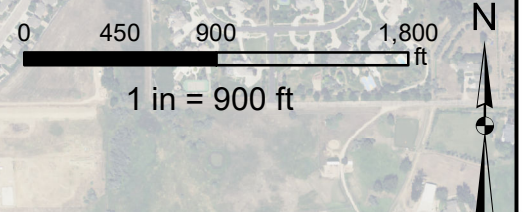
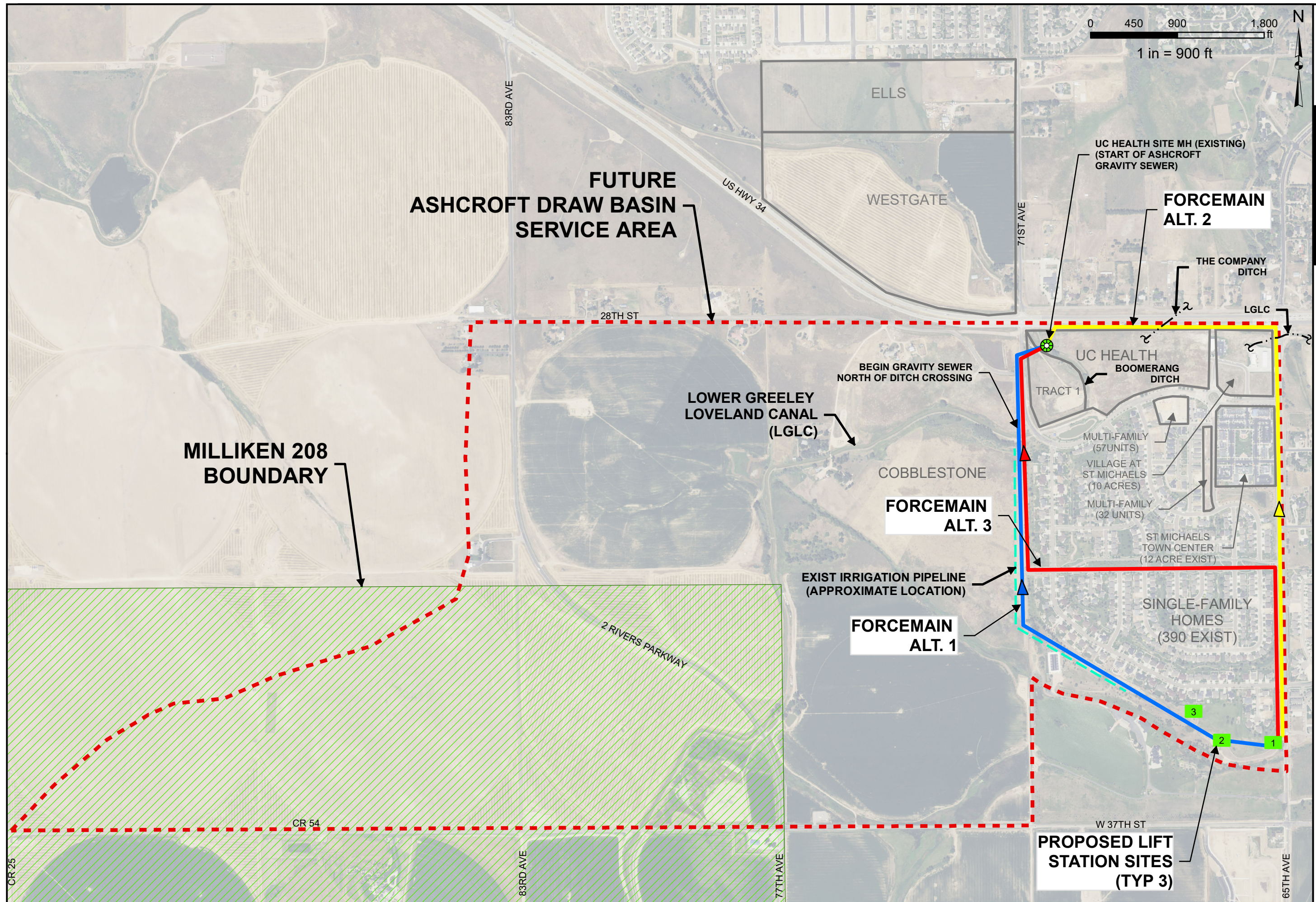


FIGURE 1 - LIFT STATION SITE ALTERNATIVES
CITY OF GREELEY - ASHCROFT DRAW SERVICE AREA
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FIGURE 2 - FORCEMAIN ALIGNMENT ALTERNATIVES
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