

# Mapleton City Council Staff Report

Meeting Date: March 19, 2014

**Applicant:** Ensign Bickford

**Location:** Approx. 5000 S Hwy 89

**Prepared by:** Sean Conroy, Community Development Director

**Public Hearing Item:** No

**Zone:** PD-3

## **REQUEST**

Consideration of a Resolution amending the Development Agreement for the Harmony Ridge development project located at approximately 5000 S Hwy 89.

## **BACKGROUND AND PROJECT DESCRIPTION**

On August 9, 2011 the City approved a Boundary Adjustment and Development Agreement for the Harmony Ridge development project located at the south end of the City. The development agreement authorized up to 850 residential units and also included some commercial and light industrial uses. As part of the agreement, the developer agreed to install all necessary on and off site utilities. Section 5.2 of the development agreement states the following:

*“All public infrastructure improvements necessary to service the Harmony Ridge Project shall be constructed and installed by EBCo, and title thereto shall be conveyed to the City, in conformance with all applicable requirements of Chapter 18.84.420: Adequate Public Facilities, of the City Code...”*

The original concept for the sewer line was to run it north along Highway 89 from the project site for approximately ½ of a mile and then west into Spanish Fork for the remainder of the line. The original concept for the water line was to run a 16” water line from the development site north along Highway 89 to 800 South. The development agreement also outlined the process and methodology for obtaining reimbursements from property owners that benefit from the proposed utility lines.

The following changes are proposed to the development agreement:

- Amend section 5.5.1(1) to clarify the reimbursement methodology.
- Amend exhibits J1, J2 and J4 related to the off-site water line. The amendments identify the proposed alignment as well as the proposed pipe sizes.
- Amend exhibits M1-M4 related to the off-site sewer line. The sewer line is now designed to run north from the project site and remain primarily within the Mapleton city limits until it connects with an existing meter station on Slant Road.

## **EVALUATION**

**Water Line:** Section 5.2.2 of the development agreement states the following:

*“To provide needed looping and redundancy to serve the Harmony Ridge Project, EBCo shall construct and install a culinary water main pipeline and related facilities and equipment (the “Culinary Water Main Line”), as depicted in the “Master Utility Plan – Offsite Culinary Water Main Line,” attached as EXHIBIT “J-1” hereto and incorporated by reference herein. The Culinary Water Main Line shall be constructed and installed in phases in conformance with a phasing plan to be agreed upon by the Parties during the preliminary plan process for the Harmony Ridge Project.*

The applicant has been working with the City to determine that best water line design to accommodate the project as well as the future development of adjacent property. The revised alignment

includes a 12” line from 800 South to 1600 South, a 14” line from 1600 South to approximately 3000 South, a 16” line from approximately 3000 South to the proposed entrance of the Mapleton Village development and then east to just below the Crowd Canyon well and then a 12” line to the Crown Canyon tank.

Staff is supportive of the proposed alignment and design as it will ensure that adequate water is available to serve day-to-day and emergency needs for EBCo’s development as required by section 5.2.2 of the development agreement. The water line is also appropriately sized to accommodate future growth in the south part of the City.

**Sewer Line:** Section 5.2.5 of the development agreement states the following:

*“EBCo shall construct and install sanitary sewer trunk lines and related facilities and equipment as depicted and designed in the “Offsite Sewer Master Plan and Reimbursement Schedule,” attached as EXHIBIT “M” hereto and incorporated by reference herein (the “Offsite Sewer Trunk Line Improvements”). The Offsite Sewer Trunk Line Improvements shall be constructed and installed in conjunction with the development of the first (1st) phase of the Harmony Ridge Project, subject to all applicable terms and provisions of the Sewer Interlocal Agreement.”*

The proposed sewer alignment includes a section of line that is proposed to be installed within the railroad right-of-way. The applicant has not yet received a licensing agreement from the railroad for this alignment. Staff is supportive of the use of the railroad right-of-way, provided there are no significant ongoing costs associated with the licensing agreement and that the City has the ability to access the line for maintenance purposes. If the railroad does not approve the licensing agreement, the applicant is proposing to obtain easements from the property owners adjacent to the railroad tracks in roughly the same alignment.

Staff notes that the proposed plans also includes an alternative alignment for a portion of the project that would allow the sewer line to run through the Boggess property. This alternative is contingent upon obtaining the necessary easements through the Boggess property. This alternative alignment would also be an option for the water line.

Staff is generally supportive of the proposed sewer alignment as it will have a greater potential benefit to property owners in the City than would have the previous alignment. The proposed sewer is being upsized to accommodate future growth along the proposed alignment.

The applicant is proposing to use a new sewer pipe material called Sani-Tite. Sani-Tite provides some cost advantages for the applicant. Several communities in the state are beginning to use Sani-Tite, however, the product has not yet received approval from the American Public Works Association (APWA). Staff is concerned about installing such a large amount of pipe with a material that is not yet proven. Staff will be prepared to discuss this item in more detail at the meeting.

**Reimbursement:** Section 5.5 of the development agreement indicates that since the developer is installing infrastructure that will meet future demand beyond the development, that they are eligible to be reimbursed if/when a benefitting party connects to the improvements. The applicant is proposing the following two criteria for determining reimbursements (see attachment “2” for more information):

- 1) **Actual property frontage along the improvement:** This portion of the reimbursement will be assessed to the landowner based on the cost of an 8” sewer line or a 12” water line for the length of their frontage. This is equivalent to what would have been required of the benefitting property if EBCO had not installed the line for them.
- 2) **Overall Equivalent Residential Units (ERUs) for downstream capacity:** This portion of the reimbursement will be assessed based on the number of units being proposed by the benefitting property owner and on the downstream capacity of the line needed to support their development.

Exhibits J4 and M2 include a cost breakdown by property for the water and sewer lines. These spreadsheets are based on current construction cost estimates and will change once actual costs are incurred. The actual reimbursement amounts owed will not be known until after the construction of the lines.

Staff is supportive of the proposed reimbursement methodology as it accurately and fairly assesses each property owner based on their contribution to the system.

The development agreement indicates that the reimbursement amount shall also include interest, however, no interest rate has been specified. Section 6.2.2 of the development agreement addresses development fees that will be owed to the City and states the following regarding an interest rate:

*“The amount of the Boundary Adjustment Fee shall remain constant for a period of five (5) years, commencing the date of this Agreement; thereafter, commencing with the sixth (6th) year, the amount of the Boundary Adjustment Fee shall be increased annually at the rate of Two and 75/100 percent (2.75%) per year for the remainder of the term of this Agreement.”*

One option would be to apply the same 2.75% interest rate to the reimbursement agreement. The Council should discuss this topic at the meeting.

**Future City Costs:** While the proposed infrastructure will be installed at the expense of the developer, there will be some financial impacts to the City as a result of the proposal. Staff is not recommending that the developer participate in these costs, but wants to make the Council aware for future budgeting purposes. These costs include at least the following:

- 1) The City will replace an existing 8” water line with a 12” water line from approximately 800 West to Highway 89 on 1600 South. This project is already scheduled within the next five years, but will likely need to be moved up to fiscal year 2014/2015. Estimated Cost: \$400,000.
- 2) At the City’s request, the applicant has included a new water line that connects the Crowd Canyon Tank with the Crowd Canyon Well. The cost of this improvement will be split between the applicant, the City and future developers in the south part of the City. Estimated cost: \$135,000. Staff notes that the City has already spent or has committed to spend approximately \$180,000 to improve the well.
- 3) As a result of a new water main along Highway 89, the City will need to replace a number of fire hydrants. Estimated cost: \$30,000.
- 4) The existing City sewer line that runs west of Slant Road through Spanish Fork was not originally designed to accommodate the proposed developments in the south part of town. By realigning the sewer to connect with the City’s existing system, it is likely that the existing sewer main will need to be replaced sooner than previously anticipated. It is anticipated that this sewer main will need to be replaced in approximately 20 years barring no unexpected maintenance issues (see attachment “3”). Estimated cost: \$950,000.

**STAFF RECOMMENDATION**

Adopt the attached Resolution.

**ATTACHMENTS**

1. Resolution amending Sections of the Development Agreement.
2. Summary of Reimbursement Methodology from LEI Engineers.
3. Sewer Report from RB&G Engineering.

## **RESOLUTION NO. 2014-**

### **CONSIDERATION OF A RESOLUTION AMENDING THE DEVELOPMENT AGREEMENT FOR THE HARMONY RIDGE DEVELOPMENT PROJECT LOCATED AT APPROXIMATELY 5000 S HWY 89.**

**WHEREAS**, A Boundary Adjustment and Development Agreement for the Harmony Ridge Development Project was recorded on August 9, 2011; and

**WHEREAS**, the development agreement specified the developers commitments pertaining to the installation of on and off site improvements; and

**WHEREAS**, the development agreement included several exhibits outlining the proposed alignments for water and sewer lines as well as a reimbursement schedule; and

**WHEREAS**, the developer has requested amendments to the development agreement to address revised water and sewer alignments as well as an updated reimbursement schedule.

**NOW THEREFORE, BE IT RESOLVED** by the City Council of Mapleton, Utah, to approve the proposed amendments to the Boundary Adjustment and Development Agreement for the Harmony Ridge Development Project as described in Exhibit "A" attached with the following special condition:

1. The approval of the water and sewer alignments is contingent upon the applicant obtaining all necessary easements, license agreements, rights-of-way, permits, etc. necessary to construct the utilities as proposed.
2. If the licensing agreement for use of the railroad right-of-way is unacceptable to the City due to costs, access limitations, etc., the applicant shall obtain all necessary easements to install the sewer line in the adjacent properties.
3. The alternate sewer alignment through the Boggess property as shown on exhibit M-1 shall also be available as an alternate route for the water line.

PASSED AND ORDERED PUBLISHED BY THE CITY COUNCIL OF MAPLETON, UTAH,

This 19<sup>th</sup> Day of March, 2014.

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Brian Wall  
Mayor

ATTEST:

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Camille Brown  
City Recorder

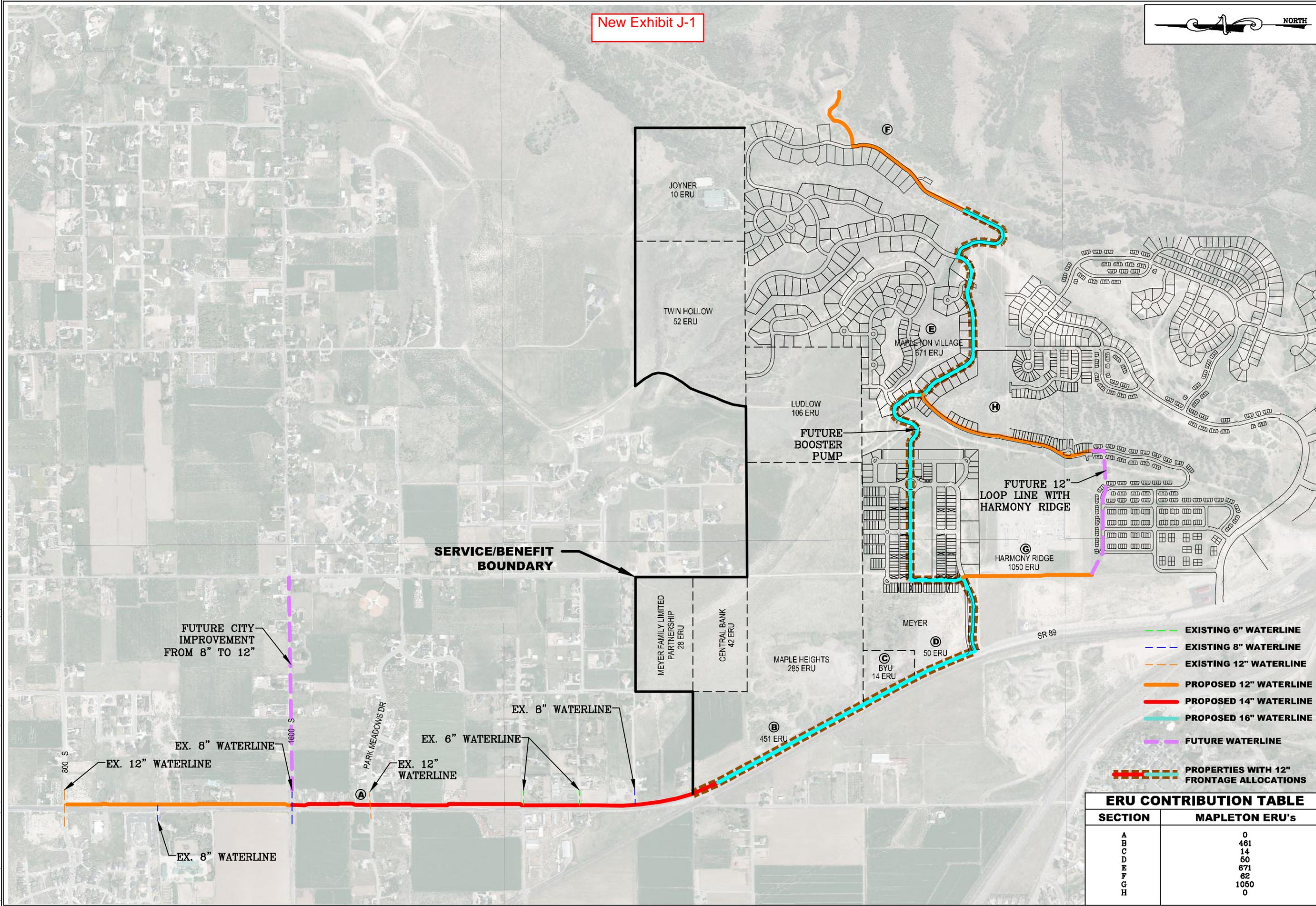
**Publication Date:**  
**Effective Date:**

Exhibit "A"  
Amendments to the Boundary Adjustment and  
Development Agreement for the Harmony  
Ridge Development Project

**5.5. Reimbursement of Offsite Improvements and Secondary Irrigation Reservoir Development Costs.**

**5.5.1. Offsite Improvements Reimbursement.** The Offsite Culinary Water Main Line and the Offsite Sewer Trunk Line Improvements to be constructed by EBCo to serve the Harmony Ridge Project (collectively, the “*Offsite Improvements*”), are being sized and located, by requirement of the City, to serve future development projects on lands serviceable by the Offsite Improvements in addition to the Harmony Ridge Project. As such, EBCo shall be entitled to reimbursement from any future developer of property to be benefited by the Offsite Improvements (each, a “*Future Developer*”), in conformance with Section 17.28.050 of the City Code.

- (1) Section 17.28.050 (as constituted on August 9, 2011) of the City Code is hereby interpreted so as to provide that a developer’s cost includes interest and other fees and charges related thereto; which means, for the purpose of this Agreement, that a Future Developer’s pro-rata share (i.e. that portion of the frontage and capacity of the Offsite Improvements not dedicated to the Harmony Ridge Project as provided herein), of EBCo’s cost of designing, constructing and installing the Offsite Improvements shall be based upon EBCo’s actual costs incurred, including interest and related fees and charges. With respect to the Sewer Offsite Trunk Line Improvements, specifically, the benefitted properties shall be identified, using the “Offsite Sewer Master Plan and Reimbursement Schedule,” Exhibit “M” attached.



- EXISTING 6" WATERLINE
- EXISTING 8" WATERLINE
- EXISTING 12" WATERLINE
- PROPOSED 12" WATERLINE
- PROPOSED 16" WATERLINE
- FUTURE WATERLINE
- --- --- PROPERTIES WITH 12" FRONTAGE ALLOCATIONS

ERU CONTRIBUTION TABLE	
SECTION	MAPLETON ERU's
A	0
B	461
C	14
D	50
E	671
F	62
G	1050
H	0

**HARMONY RIDGE**  
 MAPLETON, UTAH  
**EXHIBIT J**  
**MASTER UTILITY PLAN - OFFSITE CULINARY WATER MAIN LINE**

REVISIONS	
1	
2	
3	
4	
5	
6	

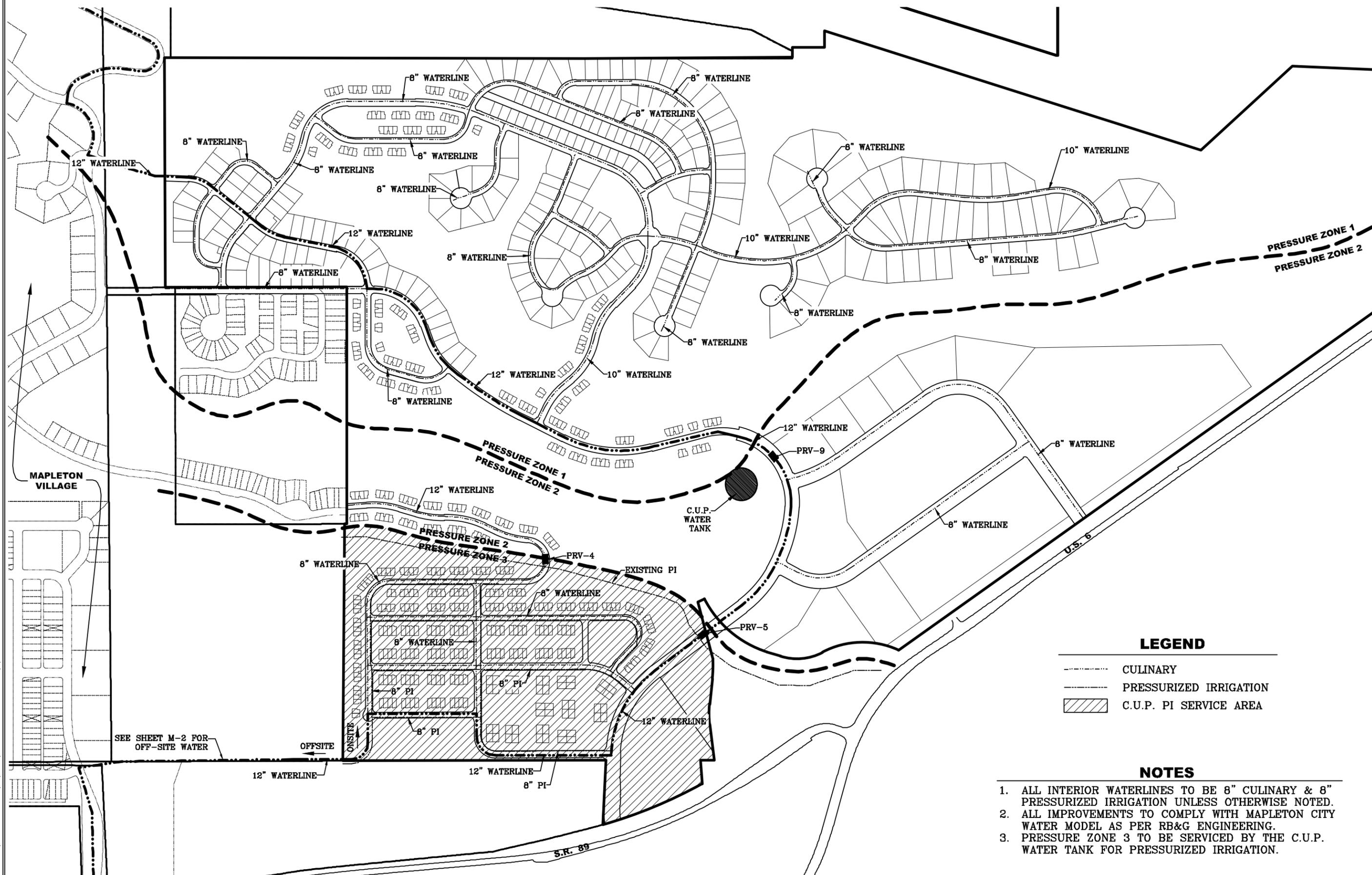
LEI PROJECT #: 2008-4005  
 DRAWN BY: TJP  
 DESIGNED BY: NKW  
 SCALE: 1" = 1000'  
 DATE: 3/11/2014  
 EXHIBIT

U:\LD-PARK CITY\08-4005 ERU MAPLETON\DWG\08-4005 OFF-SITE SEWER & WATER\EXHIBIT\08-4005 EXHIBIT J - WATER.DWG 3/13/2014 12:43 PM



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HARMONY RIDGE  
MAPLETON, UTAH  
EXHIBIT J - MASTER UTILITY PLAN - ONSITE  
CULINARY AND PRESSURIZED IRRIGATION WATER

LEGEND

-  CULINARY
-  PRESSURIZED IRRIGATION
-  C.U.P. PI SERVICE AREA

NOTES

1. ALL INTERIOR WATERLINES TO BE 8" CULINARY & 8" PRESSURIZED IRRIGATION UNLESS OTHERWISE NOTED.
2. ALL IMPROVEMENTS TO COMPLY WITH MAPLETON CITY WATER MODEL AS PER RB&G ENGINEERING.
3. PRESSURE ZONE 3 TO BE SERVICED BY THE C.U.P. WATER TANK FOR PRESSURIZED IRRIGATION.

REVISIONS
1
2
3
4
5

LEI PROJECT #	2008-4005
DRAWN BY:	RWH
DESIGNED BY:	GDM
SCALE:	1" = 500'
DATE:	03/11/2014

SHEET  
**J-2**

U:\J-PARK CITY\08-4005 EBCO MAPLETON\DWG\EXHIBITS\08-4005 MASTER UTILITIES.DWG 3/11/2014 3:01 PM

New Exhibit J-4

**Exhibit J**

**J-4**

Offsite Water Master Plan and Reimbursement Methodology

Note: Cost estimates shown are for purposes of establishing a methodology and are subject to change based on actual bids.

Node	ERU Breakdown (1)	Overall Cost (2)	Frontage Cost (3)	Difference Between Upsize (2 subtract 3)	Mapleton Cost Participation											
					Harmony Ridge	Mapleton Village	Maple Heights	BYU	Meyer	Twin	Joyner	Ludlow	Meyer Family Limited	Central Bank	Mapleton City	
A	0	\$ 886,423	\$ -	\$ 886,423	\$ 403,269	\$ 257,708	\$ 109,459	\$ 5,377	\$ 19,203	\$ 19,971	\$ 3,841	\$ 40,711	\$ 10,754	\$ 16,131	\$ -	
B	461	\$ 228,434	\$ 182,357	\$ 46,076	\$ 23,915	\$ 15,283	\$ 182,357	\$ 319	\$ 1,139	\$ 1,184	\$ 228	\$ 2,414	\$ 638	\$ 957	\$ -	
C	14	\$ 73,466	\$ 58,772	\$ 14,694	\$ 6,726	\$ 4,298	\$ 1,826	\$ 58,772	\$ 320	\$ 333	\$ 64	\$ 679	\$ 179	\$ 269	\$ -	
D	50	\$ 67,958	\$ 54,188	\$ 13,770	\$ 6,403	\$ 4,092	\$ 1,738	\$ 85	\$ 54,188	\$ 317	\$ 61	\$ 646	\$ 171	\$ 256	\$ -	
E	671	\$ 982,621	\$ 799,321	\$ 183,300	\$ 117,572	\$ 799,321	\$ 31,912	\$ 1,568	\$ 5,599	\$ 5,823	\$ 1,120	\$ 11,869	\$ 3,135	\$ 4,703	\$ -	
F	62	\$ 211,099	\$ -	\$ 211,099	\$ 34,312	\$ 21,927	\$ 9,313	\$ 457	\$ 1,634	\$ 1,699	\$ 327	\$ 3,464	\$ 915	\$ 1,372	\$ 135,679	
G	1050	\$ 112,061	\$ -	\$ 112,061	\$ 112,061	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
H	0	\$ 154,084	\$ -	\$ 154,084	\$ -	\$ 154,084	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Subtotal</b>	<b>2308</b>	<b>\$ 2,716,145</b>	<b>\$ 1,094,639</b>	<b>\$ 1,621,507</b>	<b>\$ 704,257</b>	<b>\$ 1,256,712</b>	<b>\$ 336,605</b>	<b>\$ 66,578</b>	<b>\$ 82,083</b>	<b>\$ 29,328</b>	<b>\$ 5,640</b>	<b>\$ 59,784</b>	<b>\$ 15,792</b>	<b>\$ 23,688</b>	<b>\$ 135,679</b>	
<b>Reimbursement Based on Frontage Benefit</b>					\$ -	\$ 799,321	\$ 182,357	\$ 58,772	\$ 54,188	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Reimbursement Based on ERUs</b>					\$ 704,257	\$ 457,391	\$ 154,248	\$ 7,806	\$ 27,895	\$ 29,328	\$ 5,640	\$ 59,784	\$ 15,792	\$ 23,688	\$ 135,679	
<b>Reimbursement per ERU</b>					\$ 671	\$ 682	\$ 541	\$ 558	\$ 558	\$ 564	\$ 564	\$ 564	\$ 564	\$ 564	\$ 564	NA

**Crowd Canyon Tank ERU Allocation**

Harmony Ridge	1050
Mapleton Village	565
Total Between Developments (25% of Tank)	1615
<b>Tank ERU Capacity</b>	<b>6460</b>

	ERU	ERU Percentage
Harmony Ridge	1050	16%
Mapleton Village	671	10%
Maple Heights	285	4%
BYU	14	0%
Meyer	50	1%
Twin	52	1%
Joyner	10	0%
Ludlow	106	2%
Meyer Family Limited	28	0%
Central Bank	42	1%
Mapleton City	4152	64%
<b>Total ERUs</b>	<b>6460</b>	<b>100%</b>

**Table 4.1**

**EBCo Property  
Waterline Estimate**

Item	Unit	Unit Price	NODE										
			A	B	C	D	E	F	G	H			
<b>Street Improvements</b>													
Sawcut and Remove Asphalt/Concrete	sf.	\$ 1.00	480 \$ 480	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4" Asphalt	sf.	\$ 2.00	2560 \$ 5,120	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6" Road Base	tons	\$ 16.00	86 \$ 1,382	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	\$ -	\$ -	\$ -	\$ -	\$ -
12" Subbase	tons	\$ 12.00	173 \$ 2,074	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4" Concrete	sf.	\$ 4.00	190 \$ 760	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6" Road Base	tons	\$ 16.00	6 \$ 103	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	\$ -	\$ -	\$ -	\$ -	\$ -
12" Subbase	tons	\$ 12.00	13 \$ 154	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6" Asphalt	sf.	\$ 4.00	12920 \$ 51,680	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6" Road Base	tons	\$ 16.00	436 \$ 6,977	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	\$ -	\$ -	\$ -	\$ -	\$ -
12" Subbase	tons	\$ 12.00	872 \$ 10,465	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6" Road Base (Gravel Drive)	tons	\$ 18.00	14 \$ 255	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	\$ -	\$ -	\$ -	\$ -	\$ -
12" Subbase (Gravel Drive)	tons	\$ 14.00	28 \$ 397	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Subtotal Street Improvements			\$ 79,847	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Culinary Water</b>													
12" Ductile Iron Pipe	lf	\$ 45.00	2750 \$ 123,750	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	2400 \$ 108,000	1600 \$ 72,000	2200 \$ 99,000		
14" Ductile Iron Pipe	lf	\$ 52.00	4650 \$ 241,800	150 \$ 7,800	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
16" Ductile Iron Pipe	lf	\$ 58.00	0 \$ -	2091 \$ 121,278	685 \$ 39,730	675 \$ 39,150	7400 \$ 429,200	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Fire Hydrant w/ Assembly and Valve	ea	\$ 3,300.00	14 \$ 46,200	2 \$ 6,600	1 \$ 3,300	1 \$ 3,300	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Connect to Existing Main	lf	\$ 5,000.00	5 \$ 25,000	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	1 \$ 5,000	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Connect to Existing Lateral	lf	\$ 500.00	23 \$ 11,500	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Intersection for Future Connection	lf	\$ 3,200.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	15 \$ 48,000	1 \$ 3,200	0 \$ -	0 \$ -	0 \$ -	0 \$ -
8" Gate Valve	ea	\$ 2,200.00	2 \$ 4,400	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
12" Butterfly Valve	ea	\$ 3,200.00	4 \$ 12,800	0 \$ -	0 \$ -	0 \$ -	0 \$ -	6 \$ 19,200	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
14" Butterfly Valve	ea	\$ 3,500.00	8 \$ 28,000	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
16" Butterfly Valve	ea	\$ 3,800.00	0 \$ -	2 \$ 7,600	1 \$ 3,800	0 \$ -	16 \$ 60,800	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Imported Pipe Bedding	tons	\$ 12.00	4,496 \$ 53,946	1,361 \$ 16,337	416 \$ 4,994	410 \$ 4,921	4,496 \$ 53,946	1,458 \$ 17,496	972 \$ 11,664	1,337 \$ 16,038			
Imported Trench Backfill	tons	\$ 10.00	4,496 \$ 44,955	1,361 \$ 13,614	416 \$ 4,161	410 \$ 4,101	4,496 \$ 44,955	1,458 \$ 14,580	972 \$ 9,720	1,337 \$ 13,365			
Offhaul	tons	\$ 3.00	8,991 \$ 26,973	2,723 \$ 8,168	832 \$ 2,497	820 \$ 2,460	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Connection to Tank Vault	ls	\$ 10,000.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	1 \$ 10,000	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Relocate Existing Fire Hydrant	ea	\$ 500.00	7 \$ 3,500	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Remove 8" Waterline	lf	\$ 5.00	1283 \$ 6,415	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Subtotal Misc			\$ 629,239	\$ 181,397	\$ 58,482	\$ 53,932	\$ 656,101	\$ 158,276	\$ 93,384	\$ 128,403			
<b>Other Misc.</b>													
18" Air Vac Valve	ea	\$ 6,500.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	4 \$ 26,000	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Geogrid Replacement	lf	\$ 40.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	700 \$ 28,000	336 \$ 13,440	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Joint Restraints	lf	\$ 12.50	0 \$ -	0 \$ -	0 \$ -	0 \$ -	700 \$ 8,750	336 \$ 4,200	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
18" PRV	ea	\$ 50,000.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	2 \$ 100,000	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Traffic Control (UDOT)	lf	\$ 4.00	7400 \$ 29,600	2241 \$ 8,964	685 \$ 2,740	675 \$ 2,700	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Subtotal Misc			\$ 29,600	\$ 8,964	\$ 2,740	\$ 2,700	\$ 162,750	\$ 17,640	\$ -	\$ -	\$ -	\$ -	\$ -
Soft Costs (Engineering, Legal, Other)		10%	\$ 73,869	\$ 19,036	\$ 6,122	\$ 5,663	\$ 81,885	\$ 17,592	\$ 9,338	\$ 12,840			
Contingency		10%	\$ 73,869	\$ 19,036	\$ 6,122	\$ 5,663	\$ 81,885	\$ 17,592	\$ 9,338	\$ 12,840			
<b>TOTAL CONSTRUCTION COST</b>		<b>\$ 2,716,145</b>	<b>\$ 886,423</b>	<b>\$ 228,434</b>	<b>\$ 73,466</b>	<b>\$ 67,958</b>	<b>\$ 982,621</b>	<b>\$ 211,099</b>	<b>\$ 112,061</b>	<b>\$ 154,084</b>			

3/12/2014

**NOTES:**

1. Estimate assumes all excess roadway & trench cut material will be used on the site of work (no offhaul).
2. Estimate excludes the cost of any permits, bonds, or testing.
3. Estimate assumes no de-watering, or rock excavation will be necessary for construction.
4. Estimate does not include any fees, costs or deposits for upgrades or changes to existing gas, power, telephone or cable services.

**DISCLAIMER**

THE DATA AND INFORMATION PRESENTED HEREIN HAVE BEEN PRODUCED CONSISTENT WITH INDUSTRY STANDARDS BY OPERATORS EXERCISING REASONABLE SKILL AND CARE. THIS DATA AND INFORMATION IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. NO GUARANTEE OR WARRANTY EXPRESSED OR IMPLIED IS MADE WITH RESPECT TO THE ACCURACY OF THIS DATA OR INFORMATION. IN NO EVENT WILL LEI CONSULTING ENGINEERS AND SURVEYORS INC. BE LIABLE FOR ANY LOSS OF PROFIT OR ANY OTHER COMMERCIAL DAMAGE INCLUDING BUT NOT LIMITED TO SPECIAL, INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES RESULTING FROM THE USE OF THIS INFORMATION OR DATA.

**Table 4.1**

**EBCo Property  
Waterline Estimate**

Item	Unit	Unit Price	B	C	D	E
<b>Street Improvements</b>						
Sawcut and Remove Asphalt/Concrete	sf.	\$ 1.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
4" Asphalt	sf.	\$ 2.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
6" Road Base	tons	\$ 16.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
12" Subbase	tons	\$ 12.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
4" Concrete	sf.	\$ 4.00	0 \$ -	\$ -	\$ -	\$ -
6" Road Base	tons	\$ 16.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
12" Subbase	tons	\$ 12.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
6" Asphalt	sf.	\$ 4.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
6" Road Base	tons	\$ 16.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
12" Subbase	tons	\$ 12.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
6" Road Base (Gravel Drive)	tons	\$ 18.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
12" Subbase (Gravel Drive)	tons	\$ 14.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Subtotal Street Improvements			\$ -	\$ -	\$ -	\$ -
<b>Culinary Water</b>						
12" Ductile Iron Pipe	lf	\$ 45.00	2241 \$ 100,845	685 \$ 30,825	675 \$ 30,375	7400 \$ 333,000
18" Ductile Iron Pipe	lf	\$ 65.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Fire Hydrant w/ Assembly and Valve	ea	\$ 3,300.00	2 \$ 6,600	1 \$ 3,300	1 \$ 3,300	0 \$ -
Connect to Existing Main	lf	\$ 5,000.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Connect to Existing Lateral	lf	\$ 500.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Intersection for Future Connection	lf	\$ 3,200.00	0 \$ -	0 \$ -	0 \$ -	15 \$ 48,000
18" Butterfly valve	ea	\$ 4,000.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
12" Butterfly valve	ea	\$ 3,200.00	2 \$ 6,400	1 \$ 3,200	0 \$ -	16 \$ 51,200
Imported Pipe Bedding	tons	\$ 12.00	1,361 \$ 16,337	416 \$ 4,994	410 \$ 4,921	4,496 \$ 53,946
Imported Trench Backfill	tons	\$ 10.00	1,361 \$ 13,614	416 \$ 4,161	410 \$ 4,101	4,496 \$ 44,955
Offhaul	tons	\$ 3.00	2,723 \$ 8,168	832 \$ 2,497	820 \$ 2,460	0 \$ -
Connection to Tank Vault	ls	\$ 10,000.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Relocate Existing Fire Hydrant	ea	\$ 500.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Remove 8" Waterline	lf	\$ 5.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
			\$ 151,964	\$ 48,977	\$ 45,157	\$ 531,101
<b>Other Misc.</b>						
12" Air Vac Valve	ea	\$ 5,000.00	0 \$ -	0 \$ -	0 \$ -	4 \$ 20,000
Geogrid Replacement	lf	\$ 40.00	0 \$ -	0 \$ -	0 \$ -	700 \$ 28,000
Joint Restraints	lf	\$ 10.00	0 \$ -	0 \$ -	0 \$ -	700 \$ 7,000
12" PRV	ea	\$ 40,000.00	0 \$ -	0 \$ -	0 \$ -	2 \$ 80,000
Traffic Control (UDOT)	lf	\$ 4.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Subtotal Misc			\$ -	\$ -	\$ -	\$ 135,000
Soft Costs (Engineering, Legal, Other)		10%	\$ 15,196	\$ 4,898	\$ 4,516	\$ 66,610
Contingency		10%	\$ 15,196	\$ 4,898	\$ 4,516	\$ 66,610
<b>TOTAL CONSTRUCTION COST</b>		<b>\$ 1,094,639</b>	<b>\$ 182,357</b>	<b>\$ 58,772</b>	<b>\$ 54,188</b>	<b>\$ 799,321</b>

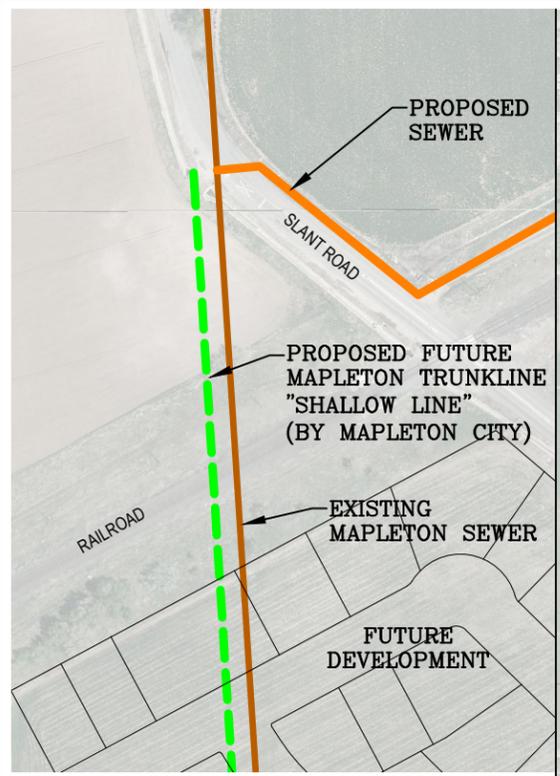
3/9/2010

NOTES:

1. Estimate assumes all excess roadway & trench cut material will be used on the site of work (no offhaul).
2. Estimate excludes the cost of any permits, bonds, or testing.
3. Estimate assumes no de-watering, or rock excavation will be necessary for construction.
4. Estimate does not include any fees, costs or deposits for upgrades or changes to existing gas, power, telephone or cable services.

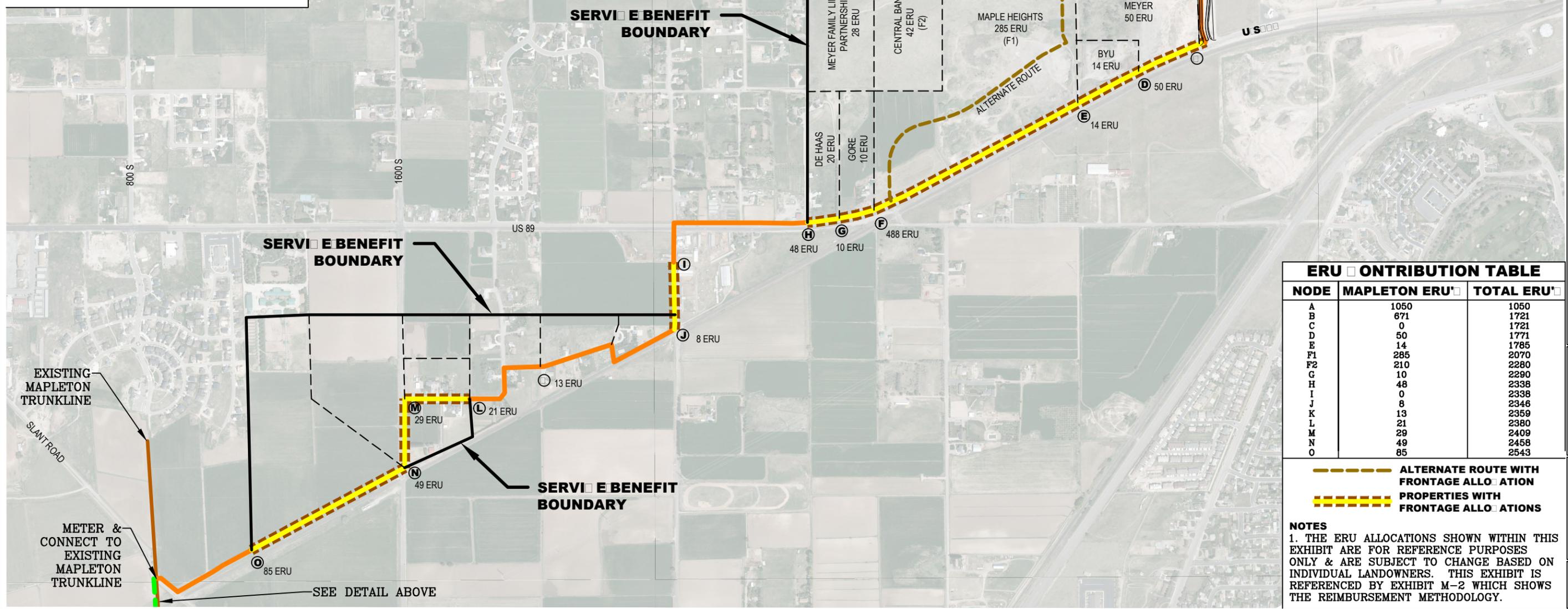
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New Exhibit M-1

**FUTURE SEWER DETAIL**



ERU CONTRIBUTION TABLE		
NODE	MAPLETON ERU	TOTAL ERU
A	1050	1050
B	671	1721
C	0	1721
D	50	1771
E	14	1785
F1	285	2070
F2	210	2280
G	10	2290
H	48	2338
I	0	2338
J	8	2346
K	13	2359
L	21	2380
M	29	2409
N	49	2458
O	85	2543

**NOTES**

1. THE ERU ALLOCATIONS SHOWN WITHIN THIS EXHIBIT ARE FOR REFERENCE PURPOSES ONLY & ARE SUBJECT TO CHANGE BASED ON INDIVIDUAL LANDOWNERS. THIS EXHIBIT IS REFERENCED BY EXHIBIT M-2 WHICH SHOWS THE REIMBURSEMENT METHODOLOGY.

--- ALTERNATE ROUTE WITH FRONTAGE ALLOCATION

--- PROPERTIES WITH FRONTAGE ALLOCATIONS

**LEI**  
- An Utah S Corporation -  
**ENGINEERS**  
**SURVEYORS**  
**PLANNERS**

3302 N. Main Street  
Spanish Fork, UT 84660  
Phone: 801.798.0555  
Fax: 801.798.9393  
office@lei-eng.com  
www.lei-eng.com

**HARMONY RIDGE**  
MAPLETON, UTAH

**OFFSITE SEWER MASTER PLAN AND REIMBURSEMENT SCHEDULE**

REVISIONS

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

LEI PROJECT #  
2008-4005

DRAWN BY:  
TJP

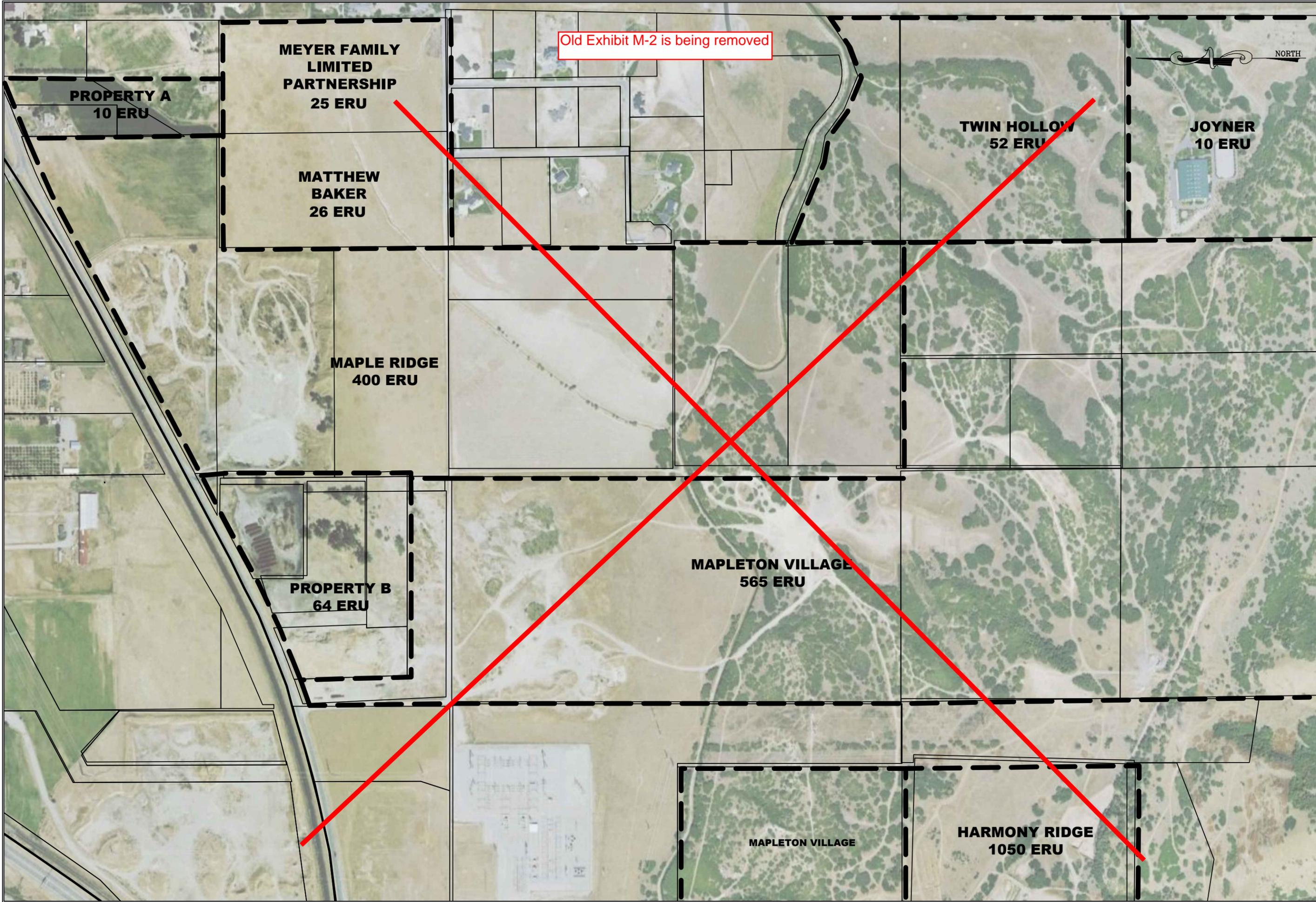
DESIGNED BY:  
NKW

SCALE:  
1" = 1000'

DATE:  
3/11/2014

EXHIBIT  
**M-1**

U:\LEI-PARK CITY\08-4005 EBCO MAPLETON\DWG\08-4005 OFF-SITE SEWER & WATER\EXHIBITS\08-4005 EXHIBIT M-1 SEWER.DWG 3/11/2014 11:54 AM



ENGINEERS  
SURVEYORS  
PLANNERS

3302 N. Main Street  
Spanish Fork, UT 84660  
Phone: 801.798.0555  
office@lei-eng.com  
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HARMONY RIDGE  
MAPLETON, UTAH  
EXHIBIT M - OFFSITE SEWER BENEFITING PARTIES

REVISIONS	
1	
2	
3	
4	
5	

LEI PROJECT #:  
2008-4005  
DRAWN BY:  
RWH  
DESIGNED BY:  
BTG  
SCALE:  
1" = 1000'  
DATE:  
05/17/2011

SHEET  
M-2



**Table 4.1**

**EBCo Property  
Offsite Sewer Node Cost Estimate**

Item	Unit	Unit Price	NODE											
			A	B	C	D	E	F	G	H				
<b>Street Improvements</b>														
Sawcut and Remove Asphalt	sf.	\$ 1.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	340 \$ 340	550 \$ 550	1500 \$ 1,500	1500 \$ 1,500	0
4" Asphalt	sf.	\$ 2.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	340 \$ 680	550 \$ 1,100	1500 \$ 3,000	1500 \$ 3,000	0
8" Road Base	tons	\$ 16.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	15 \$ 245	25 \$ 396	68 \$ 1,080	68 \$ 1,080	0
12" Subbase	tons	\$ 12.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	23 \$ 275	37 \$ 446	101 \$ 1,215	101 \$ 1,215	0
6" Asphalt	sf.	\$ 4.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0
8" Road Base	tons	\$ 16.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0
12" Subbase	tons	\$ 12.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0
1" Asphalt Overlay	sf.	\$ 0.80	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0
8" Road Base (Gravel Drive)	tons	\$ 18.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	9 \$ 162	9 \$ 162	0
12" Subbase (Gravel Drive)	tons	\$ 14.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	14 \$ 189	14 \$ 189	0
Subtotal Street Improvements			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,540	\$ 2,492	\$ 7,146	\$ 7,146	
<b>Sanitary Sewer</b>														
12" PVC	lf	\$ 34.00	1522.1 \$ 51,751	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0
18" Sanittite	lf	\$ 48.00	0 \$ -	922 \$ 44,256	654 \$ 31,392	710 \$ 34,080	2200.7 \$ 105,635	375 \$ 18,000	324 \$ 15,552	1805 \$ 86,616	731 \$ 35,292	1805 \$ 86,616	731 \$ 35,292	647
Imported Pipe Bedding	tons	\$ 12.00	616 \$ 7,397	373 \$ 4,481	265 \$ 3,178	288 \$ 3,451	891 \$ 10,695	152 \$ 1,823	131 \$ 1,575	731 \$ 8,770	262 \$ 3,144	731 \$ 8,770	262 \$ 3,144	262
Imported Trench Backfill	tons	\$ 10.00	1,233 \$ 12,329	747 \$ 7,468	530 \$ 5,297	575 \$ 5,751	1,783 \$ 17,826	304 \$ 3,038	262 \$ 2,624	1,462 \$ 14,617	524 \$ 5,240	1,462 \$ 14,617	524 \$ 5,240	524
Offhaul	tons	\$ 3.00	0 \$ -	0 \$ -	795 \$ 2,384	863 \$ 2,588	2,674 \$ 8,022	456 \$ 1,367	394 \$ 1,181	2,192 \$ 6,577	786 \$ 2,358	2,192 \$ 6,577	786 \$ 2,358	786
Connect to Existing	ls	\$ 3,000.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0
48" Manholes	ea	\$ 2,800.00	5 \$ 14,000	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0
60" Manholes	ea	\$ 3,200.00	0 \$ -	5 \$ 16,000	2 \$ 6,400	3 \$ 9,600	5 \$ 16,000	2 \$ 6,400	2 \$ 6,400	7 \$ 22,400	1 \$ 3,200	7 \$ 22,400	1 \$ 3,200	1
Subtotal Misc			\$ 85,477	\$ 72,205	\$ 48,652	\$ 55,470	\$ 158,178	\$ 30,627	\$ 27,332	\$ 138,980	\$ 138,980	\$ 138,980	\$ 138,980	
<b>Other Misc.</b>														
30" Casing Bore Under Railroad and US89	lf	\$ 600.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	68 \$ 40,800	68 \$ 40,800	0
New Meter Station	ls	\$ 60,000.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0
Traffic Control (UDOT, Railroad)	lf	\$ 4.00	0 \$ -	0 \$ -	654 \$ 2,616	710 \$ 2,840	2200.7 \$ 8,803	375 \$ 1,500	324 \$ 1,296	1805 \$ 7,218	731 \$ 2,924	1805 \$ 7,218	731 \$ 2,924	0
Traffic Control (Other Roads)	lf	\$ 2.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	647
Ditch Crossing	ls	\$ 3,000.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0
Sewer Replacement (Removal, pumping, etc.)	lf	\$ 8.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0
Subtotal Misc			\$ -	\$ -	\$ 2,616	\$ 2,840	\$ 8,803	\$ 1,500	\$ 1,296	\$ 48,018	\$ 48,018	\$ 48,018	\$ 48,018	
Soft Costs (Engineering, Legal, Other)		10%	\$ 8,548	\$ 7,221	\$ 5,127	\$ 5,831	\$ 16,698	\$ 3,367	\$ 3,112	\$ 19,414	\$ 19,414	\$ 19,414	\$ 19,414	
Contingency		10%	\$ 8,548	\$ 7,221	\$ 5,127	\$ 5,831	\$ 16,698	\$ 3,367	\$ 3,112	\$ 19,414	\$ 19,414	\$ 19,414	\$ 19,414	
<b>TOTAL CONSTRUCTION COST</b>		<b>\$ 1,778,590</b>	<b>\$ 102,572</b>	<b>\$ 86,646</b>	<b>\$ 61,521</b>	<b>\$ 69,971</b>	<b>\$ 200,376</b>	<b>\$ 40,400</b>	<b>\$ 37,343</b>	<b>\$ 232,973</b>	<b>\$ 232,973</b>	<b>\$ 232,973</b>	<b>\$ 232,973</b>	

2/20/2014

NOTES:

1. Estimate assumes all excess roadway & trench cut material will be used on the site of work (no offhaul).
2. Estimate excludes the cost of any permits, bonds, or testing.
3. Estimate assumes no de-watering, or rock excavation will be necessary for construction.
4. Estimate does not include any fees, costs or deposits for upgrades or changes to existing gas, power, telephone or cable services.

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**Table 4.1****EBCo Property****Offsite Sewer Node Cost Estimate**

Item	Unit	Unit Price		
<b>Street Improvements</b>				
Sawcut and Remove Asphalt	sf.	\$ 1.00	\$	-
4" Asphalt	sf.	\$ 2.00	\$	-
8" Road Base	tons	\$ 16.00	\$	-
12" Subbase	tons	\$ 12.00	\$	-
6" Asphalt	sf.	\$ 4.00	\$	-
8" Road Base	tons	\$ 16.00	\$	-
12" Subbase	tons	\$ 12.00	\$	-
1" Asphalt Overlay	sf.	\$ 0.80	\$	-
8" Road Base (Gravel Drive)	tons	\$ 18.00	\$	-
12" Subbase (Gravel Drive)	tons	\$ 14.00	\$	-
Subtotal Street Improvements			\$	-
<b>Sanitary Sewer</b>				
12" PVC	lf	\$ 34.00	\$	-
18" Sanitite	lf	\$ 48.00	\$	31,056
Imported Pipe Bedding	tons	\$ 12.00	\$	3,144
Imported Trench Backfill	tons	\$ 10.00	\$	5,241
Offhaul	tons	\$ 3.00	\$	2,358
Connect to Existing	ls	\$ 3,000.00	\$	-
48" Manholes	ea	\$ 2,800.00	\$	-
60" Manholes	ea	\$ 3,200.00	\$	3,200
			\$	<b>44,999</b>
<b>Other Misc.</b>				
30" Casing Bore Under Railroad and US89	lf	\$ 600.00	\$	-
New Meter Station	ls	\$ 60,000.00	\$	-
Traffic Control (UDOT, Railroad)	lf	\$ 4.00	\$	-
Traffic Control (Other Roads)	lf	\$ 2.00	\$	1,294
Ditch Crossing	ls	\$ 3,000.00	\$	-
Sewer Replacement (Removal, pumping, etc.)	lf	\$ 8.00	\$	-
Subtotal Misc			\$	<b>1,294</b>
Soft Costs (Engineering, Legal, Other)		10%	\$	4,629
Contingency		10%	\$	4,629
<b>TOTAL CONSTRUCTION COST</b>		<b>\$ 1,778,590</b>	<b>\$</b>	<b>55,552</b>

2/20/2014

## NOTES:

1. Estimate assumes all excess roadway & trench cut material will be used on the site of work (no offhaul).
2. Estimate excludes the cost of any permits, bonds, or testing.
3. Estimate assumes no de-watering, or rock excavation will be necessary for construction.
4. Estimate does not include any fees, costs or deposits for upgrades or changes to existing gas, power, te or cable services.

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**Table 4.1**

**EBCo Property  
Offsite Sewer Node Cost Estimate**

Item	Unit	Unit Price	NODE											
			J		K		L		M		N		O	
<b>Street Improvements</b>														
Sawcut and Remove Asphalt	sf.	\$ 1.00	7200	\$ 7,200	7120	\$ 7,120	2000	\$ 2,000	200	\$ 200	260	\$ 260	4910	\$ 4,910
4" Asphalt	sf.	\$ 2.00	7200	\$ 14,400	7120	\$ 14,240	2000	\$ 4,000	200	\$ 400	260	\$ 520	4910	\$ 9,820
8" Road Base	tons	\$ 16.00	324	\$ 5,184	320	\$ 5,126	90	\$ 1,440	9	\$ 144	12	\$ 187	221	\$ 3,535
12" Subbase	tons	\$ 12.00	486	\$ 5,832	481	\$ 5,767	135	\$ 1,620	14	\$ 162	18	\$ 211	331	\$ 3,977
6" Asphalt	sf.	\$ 4.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
8" Road Base	tons	\$ 16.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
12" Subbase	tons	\$ 12.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
1" Asphalt Overlay	sf.	\$ 0.80	10,800	\$ 8,640	10,050	\$ 8,040	0	\$ -	0	\$ -	0	\$ -	0	\$ -
8" Road Base (Gravel Drive)	tons	\$ 18.00	0	\$ -	0	\$ -	0	\$ -	21	\$ 381	669	\$ 12,043	349	\$ 6,288
12" Subbase (Gravel Drive)	tons	\$ 14.00	0	\$ -	0	\$ -	0	\$ -	32	\$ 444	0	\$ -	0	\$ -
<b>Subtotal Street Improvements</b>			<b>\$ 41,256</b>	<b>\$ 40,294</b>	<b>\$ 9,060</b>	<b>\$ 1,731</b>	<b>\$ 13,221</b>	<b>\$ 28,530</b>						
<b>Sanitary Sewer</b>														
12" PVC	lf	\$ 34.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -	44	\$ 1,496	0	\$ -
18" Sanitite	lf	\$ 48.00	1512.5	\$ 72,598	1015	\$ 48,720	668	\$ 32,064	673	\$ 32,304	1684.3	\$ 80,848	1104.7	\$ 53,025
Imported Pipe Bedding	tons	\$ 12.00	613	\$ 7,351	411	\$ 4,933	271	\$ 3,246	273	\$ 3,271	700	\$ 8,400	447	\$ 5,369
Imported Trench Backfill	tons	\$ 10.00	1,225	\$ 12,251	822	\$ 8,222	541	\$ 5,411	545	\$ 5,451	1,400	\$ 14,000	895	\$ 8,948
Offhaul	tons	\$ 3.00	1,838	\$ 5,513	1,233	\$ 3,700	812	\$ 2,435	818	\$ 2,453	2,100	\$ 6,300	1,342	\$ 4,027
Connect to Existing	ls	\$ 3,000.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	1	\$ 3,000
48" Manholes	ea	\$ 2,800.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
60" Manholes	ea	\$ 3,200.00	5	\$ 16,000	5	\$ 16,000	1	\$ 3,200	2	\$ 6,400	6	\$ 19,200	6	\$ 19,200
<b>Subtotal Sanitary Sewer</b>			<b>\$ 113,712</b>	<b>\$ 81,574</b>	<b>\$ 46,356</b>	<b>\$ 49,879</b>	<b>\$ 130,243</b>	<b>\$ 93,568</b>						
<b>Other Misc.</b>														
30" Casing Bore Under Railroad and US89	lf	\$ 600.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
New Meter Station	ls	\$ 60,000.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	1	\$ 60,000
Traffic Control (UDOT, Railroad)	lf	\$ 4.00	0	\$ -	0	\$ -	0	\$ -	0	\$ -	1728.3	\$ 6,913	1104.7	\$ 4,419
Traffic Control (Other Roads)	lf	\$ 2.00	1512.5	\$ 3,025	1015	\$ 2,030	668	\$ 1,336	673	\$ 1,346	0	\$ -	0	\$ -
Ditch Crossing	ls	\$ 3,000.00	1	\$ 3,000	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -
Sewer Replacement (Removal, pumping, etc.)	lf	\$ 8.00	720	\$ 5,760	680	\$ 5,440	0	\$ -	0	\$ -	0	\$ -	0	\$ -
<b>Subtotal Other Misc.</b>			<b>\$ 11,785</b>	<b>\$ 7,470</b>	<b>\$ 1,336</b>	<b>\$ 1,346</b>	<b>\$ 6,913</b>	<b>\$ 64,419</b>						
<b>Soft Costs (Engineering, Legal, Other)</b>		10%	\$ 16,675	\$ 12,934	\$ 5,675	\$ 5,296	\$ 15,038	\$ 18,652						
<b>Contingency</b>		10%	\$ 16,675	\$ 12,934	\$ 5,675	\$ 5,296	\$ 15,038	\$ 18,652						
<b>TOTAL CONSTRUCTION COST</b>		<b>\$ 1,778,590</b>	<b>\$ 200,104</b>	<b>\$ 155,205</b>	<b>\$ 68,103</b>	<b>\$ 63,547</b>	<b>\$ 180,453</b>	<b>\$ 223,821</b>						

2/20/2014

**NOTES:**

1. Estimate assumes all excess roadway & trench cut material will be used on the site of work (no offhaul).
2. Estimate excludes the cost of any permits, bonds, or testing.
3. Estimate assumes no de-watering, or rock excavation will be necessary for construction.
4. Estimate does not include any fees, costs or deposits for upgrades or changes to existing gas, power, te or cable services.

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**Table 4.1**

**EBCo Property  
Offsite Sewer Frontage Cost Estimate**

Item	Unit	Unit Price	C	D	E	F	G	I
<b>Street Improvements</b>								
Sawcut and Remove Asphalt	sf.	\$ 1.00	0 \$ -	0 \$ -	0 \$ -	340 \$ 340	550 \$ 550	0 \$ -
4" Asphalt	sf.	\$ 2.00	0 \$ -	0 \$ -	0 \$ -	340 \$ 680	550 \$ 1,100	0 \$ -
8" Road Base	tons	\$ 16.00	0 \$ -	0 \$ -	0 \$ -	15 \$ 245	25 \$ 396	0 \$ -
12" Subbase	tons	\$ 12.00	0 \$ -	0 \$ -	0 \$ -	23 \$ 275	37 \$ 446	0 \$ -
6" Asphalt	sf.	\$ 4.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
8" Road Base	tons	\$ 16.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
12" Subbase	tons	\$ 12.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
1" Asphalt Overlay	sf.	\$ 0.80	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
8" Road Base (Gravel Drive)	tons	\$ 18.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
12" Subbase (Gravel Drive)	tons	\$ 14.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
<b>Subtotal Street Improvements</b>			<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 1,540</b>	<b>\$ 2,492</b>	<b>\$ -</b>
<b>Sanitary Sewer</b>								
8" PVC	lf	\$ 24.00	654 \$ 15,696	710 \$ 17,040	2200.7 \$ 52,817	375 \$ 9,000	324 \$ 7,776	647 \$ 15,528
12" PVC	lf	\$ 34.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
18" PVC	lf	\$ 48.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Imported Pipe Bedding	tons	\$ 12.00	265 \$ 3,178	288 \$ 3,451	891 \$ 10,695	152 \$ 1,823	131 \$ 1,575	262 \$ 3,144
Imported Trench Backfill	tons	\$ 10.00	530 \$ 5,297	575 \$ 5,751	1,783 \$ 17,826	304 \$ 3,038	262 \$ 2,624	524 \$ 5,241
Offhaul	tons	\$ 3.00	795 \$ 2,384	863 \$ 2,588	2,674 \$ 8,022	456 \$ 1,367	394 \$ 1,181	786 \$ 2,358
Connect to Existing	ls	\$ 3,000.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
48" Manholes	ea	\$ 2,800.00	2 \$ 5,600	3 \$ 8,400	5 \$ 14,000	2 \$ 5,600	2 \$ 5,600	1 \$ 2,800
60" Manholes	ea	\$ 3,500.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
			<b>\$ 32,156</b>	<b>\$ 37,230</b>	<b>\$ 103,360</b>	<b>\$ 20,827</b>	<b>\$ 18,756</b>	<b>\$ 29,071</b>
<b>Other Misc.</b>								
30" Casing Bore Under Railroad and US89	lf	\$ 600.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
New Meter Station	ls	\$ 60,000.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Ditch Crossing	ls	\$ 3,000.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
Traffic Control (UDOT, Railroad)	lf	\$ 4.00	654 \$ 2,616	710 \$ 2,840	2200.7 \$ 8,803	375 \$ 1,500	324 \$ 1,296	0 \$ -
Traffic Control (Other Roads)	lf	\$ 2.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	647 \$ 1,294
Sewer Replacement (Removal, pumping, etc.)	lf	\$ 8.00	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -	0 \$ -
<b>Subtotal Misc</b>			<b>\$ 2,616</b>	<b>\$ 2,840</b>	<b>\$ 8,803</b>	<b>\$ 1,500</b>	<b>\$ 1,296</b>	<b>\$ 1,294</b>
<b>Soft Costs (Engineering, Legal, Other)</b>	10%		\$ 3,477	\$ 4,007	\$ 11,216	\$ 2,387	\$ 2,254	\$ 3,037
<b>Soft Costs (Engineering, Legal, Other)</b>	10%		\$ 3,477	\$ 4,007	\$ 11,216	\$ 2,387	\$ 2,254	\$ 3,037
<b>TOTAL CONSTRUCTION COST</b>		<b>\$ 536,662</b>	<b>\$ 41,726</b>	<b>\$ 48,083</b>	<b>\$ 134,596</b>	<b>\$ 28,640</b>	<b>\$ 27,052</b>	<b>\$ 36,439</b>

2/20/2014

NOTES:

1. Estimate assumes all excess roadway & trench cut material will be used on the site of work (no offhaul).
2. Estimate excludes the cost of any permits, bonds, or testing.
3. Estimate assumes no de-watering, or rock excavation will be necessary for construction.
4. Estimate does not include any fees, costs or deposits for upgrades or changes to existing gas, power, telephone or cable services.

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**Table 4.1**

**EBCo Property  
Offsite Sewer Frontage Cost Estimate**

Item	Unit	Unit Price	L		M		N	
<b>Street Improvements</b>								
Sawcut and Remove Asphalt	sf.	\$ 1.00	2000	\$ 2,000	200	\$ 200	260	\$ 260
4" Asphalt	sf.	\$ 2.00	2000	\$ 4,000	200	\$ 400	260	\$ 520
8" Road Base	tons	\$ 16.00	90	\$ 1,440	9	\$ 144	12	\$ 187
12" Subbase	tons	\$ 12.00	135	\$ 1,620	14	\$ 162	18	\$ 211
6" Asphalt	sf.	\$ 4.00	0	\$ -	0	\$ -	0	\$ -
8" Road Base	tons	\$ 16.00	0	\$ -	0	\$ -	0	\$ -
12" Subbase	tons	\$ 12.00	0	\$ -	0	\$ -	0	\$ -
1" Asphalt Overlay	sf.	\$ 0.80	0	\$ -	0	\$ -	0	\$ -
8" Road Base (Gravel Drive)	tons	\$ 18.00	0	\$ -	21	\$ 381	669	\$ 12,043
12" Subbase (Gravel Drive)	tons	\$ 14.00	0	\$ -	32	\$ 444	0	\$ -
<b>Subtotal Street Improvements</b>				<b>\$ 9,060</b>		<b>\$ 1,731</b>		<b>\$ 13,221</b>
<b>Sanitary Sewer</b>								
8" PVC	lf	\$ 24.00	668	\$ 16,032	673	\$ 16,152	1728.3	\$ 41,480
12" PVC	lf	\$ 34.00	0	\$ -	0	\$ -	0	\$ -
18" PVC	lf	\$ 48.00	0	\$ -	0	\$ -	0	\$ -
Imported Pipe Bedding	tons	\$ 12.00	271	\$ 3,246	273	\$ 3,271	700	\$ 8,400
Imported Trench Backfill	tons	\$ 10.00	541	\$ 5,411	545	\$ 5,451	1,400	\$ 14,000
Offhaul	tons	\$ 3.00	812	\$ 2,435	818	\$ 2,453	2,100	\$ 6,300
Connect to Existing	ls	\$ 3,000.00	0	\$ -	0	\$ -	0	\$ -
48" Manholes	ea	\$ 2,800.00	1	\$ 2,800	2	\$ 5,600	6	\$ 16,800
60" Manholes	ea	\$ 3,500.00	0	\$ -	0	\$ -	0	\$ -
<b>Subtotal Sanitary Sewer</b>				<b>\$ 29,924</b>		<b>\$ 32,927</b>		<b>\$ 86,979</b>
<b>Other Misc.</b>								
30" Casing Bore Under Railroad and US89	lf	\$ 600.00	0	\$ -	0	\$ -	0	\$ -
New Meter Station	ls	\$ 60,000.00	0	\$ -	0	\$ -	0	\$ -
Ditch Crossing	ls	\$ 3,000.00	0	\$ -	0	\$ -	0	\$ -
Traffic Control (UDOT, Railroad)	lf	\$ 4.00	0	\$ -	0	\$ -	1728.3	\$ 6,913
Traffic Control (Other Roads)	lf	\$ 2.00	668	\$ 1,336	673	\$ 1,346	0	\$ -
Sewer Replacement (Removal, pumping, etc.)	lf	\$ 8.00	0	\$ -	0	\$ -	0	\$ -
<b>Subtotal Other Misc.</b>				<b>\$ 1,336</b>		<b>\$ 1,346</b>		<b>\$ 6,913</b>
<b>Soft Costs (Engineering, Legal, Other)</b>		10%		\$ 4,032		\$ 3,600		\$ 10,711
<b>Soft Costs (Engineering, Legal, Other)</b>		10%		\$ 4,032		\$ 3,600		\$ 10,711
<b>TOTAL CONSTRUCTION COST</b>		<b>\$ 536,662</b>		<b>\$ 48,384</b>		<b>\$ 43,205</b>		<b>\$ 128,536</b>

2/20/2014

NOTES:

1. Estimate assumes all excess roadway & trench cut material will be used on the site of work (no offhaul).
2. Estimate excludes the cost of any permits, bonds, or testing.
3. Estimate assumes no de-watering, or rock excavation will be necessary for construction.
4. Estimate does not include any fees, costs or deposits for upgrades or changes to existing gas, power, te or cable services.

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ENGINEERS  
SURVEYORS  
PLANNERS

Attachment "2"  
Explanation of Reimbursement Methodology

March 17, 2014

Sean Conroy  
Mapleton City – City Planning Director  
215 West Community Center Way  
Mapleton, Utah 84664

**Re: Methodology Explanation for the Offsite Utility Reimbursements.**

Sean,

The following provides a brief explanation of the methodology behind the reimbursement process for the offsite sewer and water to be constructed and funded by the Harmony Ridge and Mapleton Village developments.

The reimbursement methodology follows the Boundary Adjustment and Development Agreement for the Harmony Ridge Development project which states:

**“5.5.1. Offsite Improvements Reimbursement.** The Offsite Culinary Water Main Line and the offsite Sewer Trunk Line Improvements, to be constructed by EBCo to serve the Harmony Ridge Project (collectively, the “Offsite Improvements”), are being sized and located, by requirement of the City, to serve future development projects on lands serviceable by the offsite Improvements in addition to the Harmony Ridge Project. As such, EBCo shall be entitled to reimbursement from any future developer of property to be benefited by the Offsite Improvements (each, a “Future Developer”), in conformance with Section 17.28.050 of the City Code.

(1) Section 17.28.050 of the City Code is hereby interpreted so as to provide that a developer’s cost includes interest and other fees and charges related thereto; which means, for the purpose of this Agreement, that a Future Developer’s pro-rata share (i.e. that portion of the capacity of the Offsite Improvements not dedicated to the Harmony Ridge Project as provided herein), of EBCo’s cost of designing, constructing and installing the Offsite Improvements shall be based upon EBCO’s actual costs incurred, including interest and related fees and charges. With respect to the Sewer Offsite Trunk Line Improvements, specifically, the benefitted properties shall be identified using the “Offsite Sewer Master Plan and Reimbursement Schedule,” Exhibit “M” attached.”

- Civil Engineering
- Structural Engineering
- Surveying
- Land Planning
- Landscape Architecture

### **Offsite Sewer**

The distribution of improvement costs were allocated based on the two different criteria:

1. Actual property frontage along the improvement.
2. Overall Equivalent Residential Units (ERUs) for downstream capacity.

The overall sewer improvement was split into different nodes based on contributing ERUs and frontage along the alignment. See the attached Offsite Sewer Master Plan and Reimbursement Schedule Exhibit M-1 for locations of nodes and the contributing ERUs. Column (1) within the attached Offsite Sewer Master Plan and Reimbursement Methodology Exhibit M-2 shows the contributing ERUs per node.

An overall cost estimate was completed for each of the nodes over the entire alignment based on the current construction drawings. These costs are shown in Column (3) of Exhibit M-2. A second cost estimate was completed to show the individual future developable properties fronting along the sewer improvement that would be required to install an 8" sewer in order to service their development. These costs are shown in Column (4) of Exhibit M-2. The difference between the Overall Sewer Cost and Frontage Cost yielded the improvement costs to be shared by contributing ERUs upstream of each node.

For example, Harmony Ridge would be responsible for the full improvement of the sewer between Nodes A and B since they are the only contributing ERUs. Mapleton Village will be contributing at Node B so the Overall Cost for Node B is proportionally shared by Mapleton Village and Harmony Ridge based on contributing ERUs. At Node D, the Meyer Family would pay for their frontage of an 8" sewer line and the difference of the upsize would be paid proportionally by the contributing ERUs upstream. This methodology continues to the end of the sewer improvements. Portions of the sewer have been placed in areas of existing development and would not be allocated a frontage costs. The improvement costs for these sections would be shared by contributing ERUs upstream of that particular node.

### **Offsite Water**

The distribution of improvement costs were again allocated based on the two different criteria:

1. Actual property frontage along the improvement.
2. Overall Equivalent Residential Units (ERUs) for up and downstream capacity.

The cost allocation for the overall water improvements were adjusted due to the fact this is a looping system that effects developments both upstream and downstream of the water line. The water improvements were split into different sections based on contributing ERUs and frontage along the alignment. See the attached Offsite Water Master Plan and Reimbursement Schedule Exhibit J-1 Exhibit for locations of sections and the contributing ERUs. Column (1) within the attached Offsite Water Master Plan and Reimbursement Methodology Exhibit J-4 shows the contributing ERUs per section.

An overall cost estimate was completed for each of the sections over the entire alignment based on the current construction drawings. These costs are shown in Column (2) of Exhibit J-4. A second cost estimate was completed to show the individual future developable properties fronting along the sewer improvement that would be required to install a 12" water to service their development.

These costs are shown in Column (3) of Exhibit J-4. The difference between the Overall Water Cost and Frontage Cost yielded the improvement costs to be shared between the overall benefitting ERUs.

For example, the cost for Section A would be shared by everyone who would be utilizing this section based on contributing ERUs. Section B would be required to install their frontage cost of a 12" water line with the upside being proportionally shared between the other benefitting ERUs. The same methodology would occur for Sections C, D, and E. The costs for Section F would be shared by benefitting ERUs due to this section being a system improvement. Sections G and H would solely be the responsibility of Harmony Ridge or Mapleton Village since this would need to be installed for their development.

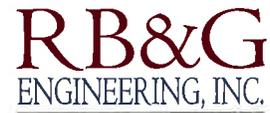
Please call if you have any questions or concerns. Thank you.

Sincerely,

A handwritten signature in blue ink that reads "Nathan Walter". The signature is written in a cursive, flowing style.

Nathan Walter, P.E.  
LEI Consulting Engineers and Surveyors, Inc.

*Attachments: Exhibit M-1 Offsite Sewer Exhibit  
Exhibit M-2 Offsite Sewer Methodology  
Exhibit J-1 Offsite Water Exhibit  
Exhibit J-2 Harmony Ridge Water and PI  
Exhibit J-4 Offsite Water Methodology*



March 17, 2014

Gary Calder, P.E.  
Public Works Director/City Engineer  
1405 West 1600 North  
Mapleton, UT 84664

Re: Sewer Outfall Capacity Evaluation  
Mapleton-Spanish Fork Outfall Pipe

Dear Gary:

We have completed an evaluation of a portion of the existing sanitary sewer outfall pipeline which carries flow from the Mapleton City collection system to the Spanish Fork Wastewater Treatment Plant. The portion of the pipeline which was studied extends from the manhole east of the railroad tracks near Slant Road to the edge of the hill near 1800 East in Spanish Fork. Figure 1 shows a vicinity map with the Mapleton City boundaries with the outfall location shown in yellow.

The identified section of pipeline has a very flat slope and constitutes the portion of the outfall pipe that limits the conveyance capacity from Mapleton to Spanish Fork. The purpose of this letter is to present the results of the evaluation and make recommendations regarding the future sanitary sewer needs of Mapleton City.

### **Background**

The Mapleton City sewer system was constructed in 1995-1996. At that time, the City negotiated a connection to the Spanish Fork Waste Water Treatment Plant (SFWWTP) for treatment of the City sewage. The connection was made by way of an outfall pipeline and a metering station. The outfall pipeline had joint ownership, with Mapleton owning 57% of the capacity and Spanish Fork owning 43%. Mapleton City also initially purchased 11% of the SFWWTP capacity. The City subsequently acquired 23% equity in the plant. An interlocal agreement was executed in May of 2011 that increased the Mapleton ownership in the outfall pipeline to 76%.

### **Future Sewer Outfall Capacity Needs**

The 2012 population estimate for Mapleton City is 8,420 residents, as obtained from the City Planning Department. Based upon the 2010 census information, there are 3.92 residents per household (Equivalent Residential Unit (ERU)). Using the 2012 population information, there are an estimated 2,150 ERUs in Mapleton.

The Mountainland Association of Governments (MAG) estimates that the 2060 population of Mapleton City will be 21,300 residents. This projection does not include the annexation area in the southern part of the City. A potential of 8,630 residents or 2200 ERUs is anticipated within

that area. The build-out population of the City is, therefore, estimated at approximately 30,000 residents or 7,650 ERUs based upon current zoning ordinances.

The administrative rules of the State of Utah Department of Environmental Quality (317-3-2.2.B.2.b) require that sewer outfall pipelines be designed for a minimum flow of 250 gallons per capita per day. With a population per household of 3.92, the outfall sewer flow per household is 980 gallons per day or 0.0015 cubic feet per second (cfs). A capacity study of the Spanish Fork City sewer system, including the jointly owned Mapleton outfall pipeline, was completed for Spanish Fork City by Bowen Collins Associates. The capacity of the existing Mapleton City outfall pipeline as reported in the study is 6.8 cfs or approximately 4,475 ERUs. RB&G Engineering, Inc. recently completed a survey of the manhole elevations of the outfall pipeline. Based upon the survey information obtained, the capacity is estimated to be 8.35 cfs, or approximately 5,500 ERUs. Of this capacity, 76% or 3,400 ERUs, are allocated to Mapleton City. It is clear that Mapleton City needs to acquire 100% of this pipeline. The Public Works Staff has coordinated with the corresponding representatives of Spanish Fork City, and they also recognize this need. For the purposes of this report, the capacity computed by Bowen-Collins will be used, which provides a factor of safety of approximately 20 percent against unforeseen infiltration issues.

The entire capacity of the existing trunkline (4475 ERUs) corresponds to a Mapleton City population of 17,540 residents. Even with the entire capacity of the outfall belonging to Mapleton City, it is apparent that the existing sewer outfall pipeline does not have sufficient capacity for the anticipated build-out population of the City.

### **Future Improvements**

Alternatives have been investigated to provide the additional outfall capacity which will be required for the future needs of the City. The limiting capacity of the existing outfall pipeline occurs in a 30" reinforced concrete pipe between 1600 West (SR-89) in Mapleton and approximately 1800 East in Spanish Fork, a distance of 6,850 feet. Depths of soil cover over the pipe in this area approach 25-28 feet, which makes replacement or upgrading of the pipe capacity cost prohibitive.

The preferred alternative to increase capacity, shown on Figure 2, involves construction of a second outfall trunkline from the railroad tracks near Slant Road to 1700 East in Spanish Fork. The new pipeline would be placed adjacent to, and closely follow the alignment, of the existing outfall pipeline from Slant Road to the power line crossing near 2200 East in the Legacy Farms development. From that location to Spanish Fork 1700 East, the new outfall will leave the existing pipeline alignment and be located in a proposed street within the Legacy Farms development. A crossing of the Union Pacific Railroad tracks will be necessary for construction of the new trunkline. Consequently, approval of Union Pacific will be needed so that a new casing can be bored through the right of way which will carry the second outfall.

A significant advantage of the second outfall is that it can be constructed at a much higher elevation, which will improve constructability and reduce the corresponding cost. A further

benefit will be that the higher elevation will decrease the potential for infiltration into the pipe and the corresponding treatment costs that result from increased flow.

Annexation and development of the Mapleton Village and Harmony Ridge (EBCo) property requires that a new sewer line be constructed to service that area. The sewer line is being designed and constructed by the developers of the property. Initially, the proposed line will connect to the existing outfall trunkline immediately downstream of the current metering station near the Slant Road, and sewer flows from that portion of the City will be carried by the existing outfall. The new sewer line to convey flows from these southern developments is planned to be located along the east edge of the Union Pacific Railroad tracks to 1600 South (SR-147), east to 2100 West, south to 2400 South, east along the road to US Highway 89, and along the highway to the subject properties. When the second outfall is constructed, this sewer collector will be disconnected from the existing outfall and reconnected to the new pipeline. All of the sewer flow from this portion of the City will ultimately be carried by the second outfall pipeline.

As previously stated, the capacity of the existing pipeline from the Railroad tracks to 1700 East, which is currently shared between Mapleton and Spanish Fork Cities, will need to be transferred completely to Mapleton City. The portion of the new second outfall pipeline from the Slant Road to Spanish Fork 2200 East would also be solely the ownership and responsibility of Mapleton City. The remainder of the second outfall pipeline, from 2200 East to 1700 East, would have joint ownership and responsibility between Mapleton City and Spanish Fork City.

**Potential Costs of Second Outfall**

For future budgeting purposes, an estimated cost, based upon 2014 dollars, has been prepared to identify potential construction costs associated with the new trunkline. The costs are summarized in the table below. It is assumed that Mapleton City will be responsible for all costs associated with construction of the outfall for which it has 100% ownership, but only a portion of the pipeline that will be in joint ownership. Since it is unknown at this time what the percentage of ownership will be, the entire cost of the pipe size for the Mapleton portion is included for the purposes of the estimate, and to be somewhat conservative. However, no costs for required right of way or easements have been included.

**Mapleton City Outfall Trunkline  
 Estimated Construction Costs**

Item	Quantity	Unit	Unit Price	Amount
<b>Mapleton City Pipeline:</b>				
24" Sanitary Sewer Pipe	4,000	Lin. Ft.	\$90.00	\$ 360,000.00
60" diameter Manhole	12	Each	\$2,000.00	24,000.00
Imported Backfill Material	4,000	Lin. Ft.	\$50.00	200,000.00
Bore through UPRR Tracks	175	Lin. Ft.	\$1,000.00	175,000.00
Subtotal				759,000.00
Contingencies @ 25%				189,750.00
Total Estimated Cost				948,750.00
Use				\$ 950,000.00

**Timing of Construction of Second Outfall**

The timing of the construction of the second outfall will be based upon two primary factors. First will be the rate of development within Mapleton City. Second will be the development of properties along the pipeline alignment in Spanish Fork. The following table summarizes the capacities and population associated with the existing capacity of the pipeline and approved development within the City.

**Mapleton City Outfall Trunkline  
 Capacity vs. Population**

	ERUs	Population
Existing Outfall Capacity	4,475	17,540
Current Sewer Flows	2,150	8,420
Remaining Capacity of Existing Outfall	2,325	9,120
Capacity Committed to Developed Lots Not Built Upon	400	1,568
Mapleton Village and Harmony Ridge (EBCo)	1,615	6,331
Mapleton Heights (285 ERUs) not included		
Available Capacity for Additional Lot Development	310	1,221

While capacity has been committed to lots in existing subdivisions, Mapleton Village and Harmony Ridge, it is not know when homes will be built upon all of these lots. Development of the latter two projects will move forward in phases. A better way to determine when the second outfall is needed will be upon population growth. It is recommended that the new pipeline be in service prior to the time when the Mapleton City population reaches 16,500.

If a constant annual growth rate of 2.62% is assumed, Mapleton’s population will reach 30,000 residents in the year 2060. It is unlikely that the rate of growth in the City will be constant. However, using this constant growth rate, the City population will reach 16,500 sometime between 2035 and 2040 and the second trunkline will need to be in service.

The pipeline within Spanish Fork, west of the railroad tracks, will pass through the proposed Legacy Farms development. Part of the alignment passes through a future Spanish Fork City park and roadways. Since plans for Legacy Farms are moving forward, it is likely that the subdivision and the new park will be constructed prior to the time when the capacity is needed for development within Mapleton City. Coordination with Spanish Fork City will be necessary to ensure that the sewer line is constructed prior to subdivision and park development, so that construction costs are reduced. This will likely require that the trunkline be constructed prior to the time that it is needed.

**Recommendations:**

1. Mapleton City should develop a new interlocal agreement with Spanish Fork City to transfer 100% of the capacity of the existing 30-inch pipeline from the meter station east of the railroad tracks to Manhole No. 108 at design Station 113+30 to Mapleton City. An additional agreement should also address the second outfall pipe, identify its ownership, and establish parameters and responsibility for its development and maintenance.
2. Mapleton City should work with Spanish Fork City and developers as appropriate to ensure that proper easements for the second outfall are provided to the City as development in Legacy Farms proceeds. The existing easement will likely need to be expanded 20 feet to the north. Acquisition of easements during the preparation of plats will be beneficial to the City in the future.
3. Mapleton City should coordinate with Spanish Fork to ensure that when the joint ownership pipe is constructed, it is sized to accept the anticipated additional flows from Mapleton.
4. Consideration should be given to the possibility that the Mapleton need for a second outfall could proceed the development of the joint pipeline with Spanish Fork. This is not expected to occur, but the possibility exists.
5. It is recommended that the sanitary sewer outfall line be cleaned annually to preserve the existing capacity.

We hope that the foregoing information will be beneficial to Mapleton City as long-range plans for future development and impacts to the sanitary sewer outfall pipe are considered.

Please contact me with any further questions.

Sincerely,

RB&G ENGINEERING, INC.



Carl L. Cook, P.E.  
Project Manager

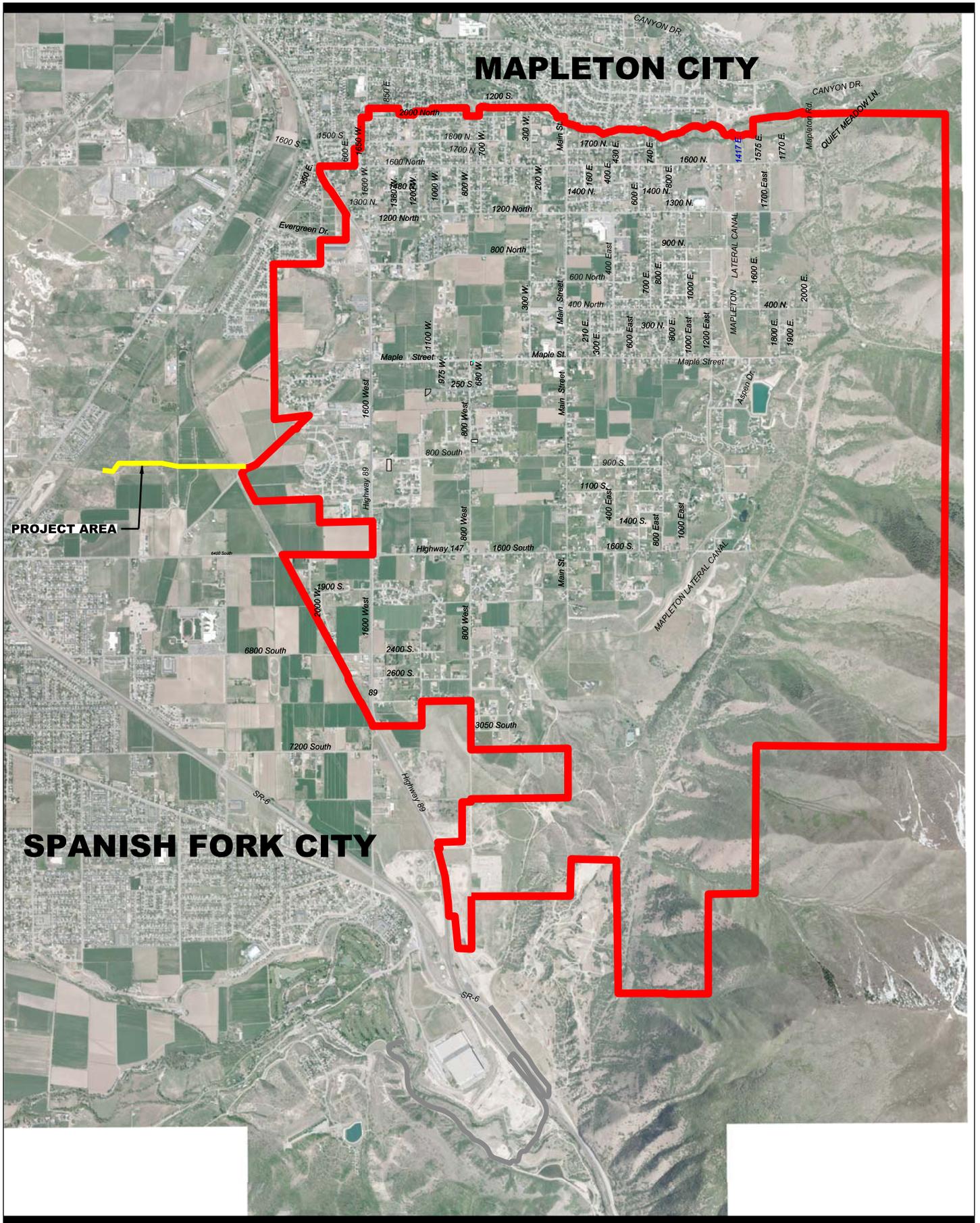


Figure 1 - Vicinity Map

**MAPLETON CITY SEWER TRUNKLINE**

